STORMWATER MANAGEMENT REPORT

FOR

MEADOWBROOK COMMONS

RESIDENCE EA DISTRICT
MULTI-DWELLING COMMUNITY

84 & 104 COOLIDGE STREET
(MAP 5 LOTS 32, 48A, & PORTION OF 55)
SHERBORN, MASSACHUSETTS

PREPARED FOR:

Pulte HOMES™

115 FLANDERS ROAD, SUITE 200
WESTBOROUGH, MA 01581

PREPARED BY:

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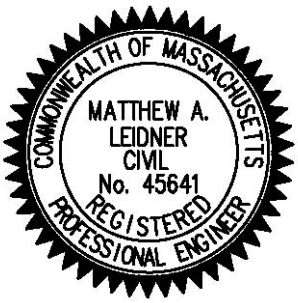

DATE: JULY 29, 2021

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1.0 INTRODUCTION

Civil Design Group, LLC (CDG) has been retained by Pulte Homes to prepare this Stormwater Management Report for the construction of *Meadowbrook Commons*, a residential multi-dwelling housing community to be located on a 25.2± acre site at 84 and 104 Coolidge Street in Sherborn, Massachusetts. A locus plan is included as Figure 1. The project includes 67 townhome-style units consisting of detached single-family homes and duplex-style buildings consisting of two attached homes. It is a cluster-style community that minimizes the development footprint relative to the proposed density thereby conserving land. This compact design will allow more than half of the site's land area to remain as open space. On-site project elements including driveways, parking, sidewalks, trails, stormwater management, utilities, and landscaping are proposed to be privately owned and maintained by the homeowner's association that will be established for the community.

This study presents a comparative analysis of the pre-development and post-development hydrologic characteristics of the site, and outlines the proposed measures to mitigate flow, provide groundwater recharge, and maintain water quality from the site in accordance with the Massachusetts Department of Environmental Protection (DEP's) and applicable local requirements. A detailed description of how this project meets the applicable DEP standards is included herein and the DEP *Checklist for Stormwater Report* is included as Attachment 1.

2.0 SITE DESCRIPTION

Meadowbrook Commons is comprised of Assessor's Map 5 Lots 32, 48A, and a portion of 55. Lot 32 consists of 17.3± acres and is primarily wooded. Lot 48A consists of 3.5± acres and contains a mixture of wooded and open field areas. Lot 55 consists of 15.4± acres and is occupied by a single family house, which is in serious disrepair and will therefore be razed. Approximately 11 acres of Lot 55, which contains the house to be razed, is proposed to be carved off and incorporated into *Coolidge Crossing*, an adjacent residential development being permitted and constructed by others. The remaining 4.4± acres of Lot 55 will be combined with Lot 32 (17.3± acres) and Lot 48A (3.5± acres) to form the 25.2±-acre *Meadowbrook Commons* project site.

The project site is bounded to the west by Coolidge Street, to the north by an MWRA aqueduct, to the east by residential properties, and the south by town-owned land. Topography on the project site generally slopes in a westerly direction and northerly direction.

Meadowbrook Commons has been designed to minimize impacts to wetland areas and associated buffer zones, which exist in the northeastern, western, and southern portions of the project site and extend into adjacent offsite land. Wetlands on Lots 32 and 48A were delineated by SWCA in 2019 and validated via an Order of Resource Area Delineation issued by the Sherborn Conservation Commission on August 15, 2019. Wetlands on Lot 55 were delineated in 2020 by Creative Land and Water Engineering, LLC (CLAWE) on behalf of the adjacent *Coolidge Crossing* project and were validated via Orders of Conditions under DEP file numbers 283-0401 and 283-0404, issued by the Sherborn Conservation Commission on March 3, 2020 and June 24, 2020, respectively. The only proposed direct wetland impact is the access driveway into the *Meadowbrook Commons* project from Coolidge Street, which must cross a wetland in order to gain access to the site. The affected wetland area is a seep, which is classified as a wet meadow Bordering Vegetated Wetland. These wetlands have been previously mowed and maintained as an open field. There is no stream channel or channelized flow, and no trees within the wetland impact area.

According to the most recently available data provided by the Massachusetts Natural Heritage and Endangered Species Program (NHESP), no portion of the Project is within Priority Habitat of Rare Species or Estimated Habitat of Rare Wildlife and there are no Certified or Potential Vernal Pools in the

vicinity of the Project. The most recently issued Flood Insurance Rate Map ("FIRM") for the area, produced by the Federal Emergency Management Agency ("FEMA"), indicates that no portions of the Project are within the mapped floodplain for the 100-year storm event. According to the Massachusetts Department of Environmental Protection ("DEP"), the Project is not located within an Area of Critical Environmental Concern (ACEC) or an area designated as an Outstanding Resource Water (ORW).

3.0 UNTREATED DISCHARGE (STANDARD 1)

Runoff from the proposed developed area that will contribute to the study points will be treated prior to discharging as further discussed herein. No untreated discharges are proposed.

4.0 PEAK RATE ATTENUATION (STANDARD 2)

Pre- and post-development hydrologic modeling was performed using HydroCad 10.0, an industry standard software package that develops a hydrologic model based on the SCS method. This software was used to study the peak discharges from rainfall runoff over the study area in both the pre- and post-development conditions at the points of analysis described below and utilizing curve numbers, times of concentration, and soil data inputs as described herein.

4.1 Points of Analysis

This study utilizes several points of analysis (POAs) that serve as comparison points for the peak discharge rates of the pre- and post-development hydrologic conditions. These design points are illustrated in Figures 3 and 4 and can be described as follows:

POA-1 – This POA represents a section of frontage on Coolidge Street which collects stormwater into an existing catch basin in the right-of-way.

POA-2 – This POA represents the westerly-flowing section of the CLAWE "A" series wetland at the point it discharges into an existing receiving culvert running beneath Coolidge Street.

POA-3 – This POA represents a point at the southwest corner of the site adjacent to Coolidge Street, where runoff from portion of the site concentrates before flowing offsite to the adjacent property to the south of the site. The existing grades in this area keep the water from flowing onto Coolidge Street. This POA is associated with the adjacent *Coolidge Crossing* project and is not utilized in the *Meadowbrook Commons* stormwater analysis (see note below).

POA-4 – This POA represents the CLAWE "C" series wetland at the point it discharges to the adjacent property to the south of the site.

POA-5 – This POA represents the northerly-flowing section of the SWCA "A" series wetland at the point it discharges into an existing receiving culvert running across the MWRA aqueduct.

POA-6 – This POA represents a small depression within the MWRA aqueduct property which directs runoff toward Meadowbrook Road.

POA-7 – This POA represents the northerly-flowing section of the CLAWE "A" series wetland and SWCA "C" series wetlands at the point they enter an existing receiving culvert which crosses the MWRA aqueduct to the north of the site.

Note: This engineer has also been retained by the developer of the adjacent *Coolidge Crossing* project. POA-3 was established for that project and is not utilized in the *Meadowbrook Commons* stormwater analysis.

4.2 Subcatchments

The existing and proposed subcatchments are delineated based on topography and other physical characteristics. This report analyzes the project subcatchments as well as offsite subcatchments that flow onto the project site. Subcatchments numbering corresponds to its associated POA. Subcatchments with the prefix "MC" are those within the *Meadowbrook Commons* project site and those with the prefix "CC" are those within the adjacent *Coolidge Crossing* site that flow onto the *Meadowbrook Commons* site.

The existing conditions analysis encompasses a total of nine (9) subcatchments totaling 27.82 acres, including eight (8) on-site subcatchments and one (1) subcatchment from the *Coolidge Crossing* site that flows onto the *Meadowbrook Commons* site. The proposed conditions analysis encompasses a total of thirty-one (31) subcatchments totaling 26.94 acres, including twenty-nine (29) on-site subcatchments and two (2) subcatchments from the *Coolidge Crossing* site that flow onto the *Meadowbrook Commons* site.

In the proposed condition, 0.88 acres of the offsite *Coolidge Crossing* area that flows onto the *Meadowbrook Commons* site in the existing condition will be redirected in the proposed condition to remain on the *Coolidge Crossing* project site, and as such, the total study area for *Meadowbrook Commons* is reduced to 26.94 acres in the proposed condition.

4.3 Times of Concentration

The times of concentration (Tcs) for each of the existing and proposed watersheds have been calculated. The areas that do not show a Tc travel path on the accompanying figures resulted in travel times of less than 6 minutes.

4.4 Curve Numbers

For purposes of generating the weighted Curve Numbers (CNs), the following values were utilized:

- pavement and concrete were classified as "paved parking"
- gravel paths and drives were classified as "gravel surface"
- roof tops were classified as "roofs"
- wooded upland areas were classified as "woods, good"
- fallow upland areas were classified as "meadow, non-grazed"
- lawn areas were classified as ">75% grass cover, good"
- proposed stormwater basins were classified as "water surface"
- wetlands were assigned a CN of 77 regardless of soil type

4.5 Soils

According to Natural Resources Conservation Service (NRCS) data, as detailed in Figure 2 and also shown on Figures 3, 4, and 5, the on-site soils fall into Hydrologic Soil Groups (HSGs) A, B, C, and D. These HSGs were used in determining the CNs for the various ground covers utilized in this analysis as listed above.

In addition to the NRCS data, subsurface testing was conducted by Ransom Environmental in January 2019 and Creative Land & Water Engineering LLC (CLAWE) in 2015 and 2016, the results of which are

included in Attachments 2 and 3 of this report. This data was utilized in determining the design depths and infiltration rates associated with the proposed stormwater best management practices (BMPs) as further described in the "Mitigation Measures" section of this report.

4.6 Mitigation Measures

Peak flow from the project has been mitigated primarily through the use of BMPs including infiltration basins, subsurface infiltration systems, and subsurface detention systems each of which is described further below and shown in detail on the corresponding design plans.

Subsurface Infiltration System (SIS) MC-1: This BMP is a subsurface infiltration system consisting of a series square open-bottom concrete galleys set on a bed of stone. An outlet control structure has been provided with a weir set at an elevation so as to maximize the static infiltration volume while providing enough freeboard to allow sufficient bypass capacity for larger storms. The following considerations were factored into the design of this BMP:

- Groundwater: Test pits DSW-3 and GT-3 were used to evaluate high groundwater and ledge for this BMP. Test pit DSW-3 showed seasonal high groundwater 6' below grade corresponding to an elevation of 148.1± and did not encounter ledge. Test pit GT-3 encountered weeping groundwater 5.5' below grade corresponding to an elevation of 148.5± and did not encounter ledge down to the termination depth of 15' below grade corresponding to an elevation of 139.0±. The bottom of the system is designed to be at elevation 155.50 and is therefore more than 4' above seasonal high groundwater, which is the more limiting factor between groundwater/ledge based on the test pit data.
- Infiltration Rate: NRCS soil maps indicate that this BMP is located within HSG-A soils, which was verified by the test pit data. As such a "Rawls" infiltration rate of 8.27 inches/hour was used in the modeling of this system.
- Drawdown Time: The highest possible ponded water depth in this system is 4.5' based on the lowest outlet invert. Utilizing the "Rawls" infiltration rate of 8.27 inches/hour, the drawdown time is 54/8.27 = 6.5 hours thereby meeting the DEP drawdown requirement of <72 hours.

Subsurface Infiltration System (SIS) MC-2: This BMP is a subsurface infiltration system consisting of a series square open-bottom concrete galleys set on a bed of stone. An outlet control structure has been provided with a weir set at an elevation so as to maximize the static infiltration volume while providing enough freeboard to allow sufficient bypass capacity for larger storms. The following considerations were factored into the design of this BMP:

- Groundwater: Test pit MW/DHT11 was used to evaluate high groundwater and ledge for this BMP. Test pit MW/DHT11 showed seasonal high groundwater 4' below grade corresponding to an elevation of 156.5± and did not encounter ledge. With an existing ground elevation 18" lower than the ground elevation at MW/DHT11 and with groundwater generally following the surface topography, CDG has projected a seasonal high groundwater elevation at SIS MC-2 18" lower than at test pit MW/DHT11 corresponding to an elevation of 155.0±. The bottom of the system is designed to be at elevation 159.0 and is therefore 4' above seasonal high groundwater, which is the more limiting factor between groundwater/ledge based on the test pit data.
- Infiltration Rate: NRCS soil maps indicate that this BMP is located within HSG-A soils, which was verified by the test pit data. As such a "Rawls" infiltration rate of 8.27 inches/hour was used in the modeling of this system.
- Drawdown Time: The highest possible ponded water depth in this system is 3.5' based on the lowest outlet invert. Utilizing the "Rawls" infiltration rate of 8.27 inches/hour, the drawdown time is 42/8.27 = 5.1 hours thereby meeting the DEP drawdown requirement of <72 hours.

Basin MC-1: This BMP is a surficial infiltration basin. An outlet control structure and overflow weir have been designed to maximize the amount of infiltration that this system will provide (note that the system is

also equipped with a drain valve so it can be drained for maintenance purposes should the need arise). The following considerations were factored into the design of this BMP:

- Groundwater: Test pits DSW-1 and DSW-2 were used to evaluate high groundwater and ledge for this BMP. Test pit DSW-1 showed seasonal high groundwater 6' below grade corresponding to an elevation of 144.2± and did not encounter ledge. Test pit DSW-2 showed seasonal high groundwater 6' below grade corresponding to an elevation of 144.3± and did not encounter ledge. The bottom of the system is designed to be at elevation 151.50 and is therefore more than 4' above seasonal high groundwater, which is the more limiting factor between groundwater/ledge based on the test pit data.
- Infiltration Rate: NRCS soil maps indicate that this BMP is located within HSG-A soils, which was verified by the test pit data. As such a "Rawls" infiltration rate of 8.27 inches/hour was used in the modeling of this system.
- Drawdown Time: The highest possible ponded water depth in this system is 0.15' based on the lowest outlet invert. Utilizing the "Rawls" infiltration rate of 8.27 inches/hour, the drawdown time is 2/8.27 = 0.2 hours thereby meeting the DEP drawdown requirement of <72 hours.

Basin MC-2: This BMP is a surficial infiltration basin. An overflow weir has been designed to maximize the amount of infiltration that this system will provide (note that the system is also equipped with a drain valve so it can be drained for maintenance purposes should the need arise). The following considerations were factored into the design of this BMP:

- Test pits DSW-3 and GT-3 were used to evaluate high groundwater and ledge for this BMP. Test pit DSW-3 showed seasonal high groundwater 6' below grade corresponding to an elevation of 148.1± and did not encounter ledge. Test pit GT-3 encountered weeping groundwater 5.5' below grade corresponding to an elevation of 148.5± and did not encounter ledge down to the termination depth of 15' below grade corresponding to an elevation of 139.0±. The bottom of the system is designed to be at elevation 160.0 and is therefore more than 4' above seasonal high groundwater, which is the more limiting factor between groundwater/ledge based on the test pit data.
- Infiltration Rate: NRCS soil maps indicate that this BMP is located within HSG-A soils, which was verified by the test pit data. As such a "Rawls" infiltration rate of 8.27 inches/hour was used in the modeling of this system.
- Drawdown Time: The highest possible ponded water depth in this system is 1.75' based on the lowest outlet invert. Utilizing the "Rawls" infiltration rate of 8.27 inches/hour, the drawdown time is 21/8.27 = 2.5 hours thereby meeting the DEP drawdown requirement of <72 hours.

Basin MC-3: This BMP is a surficial infiltration basin. An outlet control structure and overflow weir have been designed to maximize the amount of infiltration that this system will provide. The following considerations were factored into the design of this BMP:

- Groundwater: Test pit MW/DHT11 was used to evaluate high groundwater and ledge for this BMP. Test pit MW/DHT11 showed seasonal high groundwater 4' below grade corresponding to an elevation of 156.5± and did not encounter ledge. With an average existing ground elevation 6" lower than the ground elevation at MW/DHT11 and with groundwater generally following the surface topography, CDG has projected a seasonal high groundwater elevation at Basin MC-3 6" lower than at Test pit MW/DHT11 corresponding to an elevation of 156.0±. The bottom of the system is designed to be at elevation 160.0 and is therefore 4' above seasonal high groundwater, which is the more limiting factor between groundwater/ledge based on the test pit data.
- Infiltration Rate: Although the NRCS soil maps indicate that this BMP is located partially within HSG-A soils and partially within HSG-C soils, the test pit data consistently documented sand in this part of the site. As such a "Rawls" infiltration rate of 8.27 inches/hour was used in the modeling of this system.
- Drawdown Time: Not applicable as the lowest orifice in this basin is located at the floor elevation of the basin and as such, this basin does not rely on infiltration to draw down the water level.

Basin MC-4: This BMP is a surficial infiltration basin. An outlet control structure and overflow weir have been designed to maximize the amount of infiltration that this system will provide. The following considerations were factored into the design of this BMP:

- Groundwater: Test pits MW/DHT12 and MW/DHT13 were used to evaluate high groundwater and ledge for this BMP. Test pit MW/DHT12 showed seasonal high groundwater 2.5' below grade corresponding to an elevation of 156.4± and did not encounter ledge. Test pit MW/DHT13 showed seasonal high groundwater 2.5' below grade corresponding to an elevation of 158.1± and did not encounter ledge. With groundwater generally running 2.5' below the surface topography in this section of the site, CDG has projected a seasonal high groundwater elevation at Basin MC-4 at 2.5' below grade corresponding to an elevation of 165.5±. The bottom of the system is designed to be at elevation 169.5 and is therefore 4' above seasonal high groundwater, which is the more limiting factor between groundwater/ledge based on the test pit data.
- Infiltration Rate: Although the NRCS soil maps indicate that this BMP is located within HSG-C soils, the test pit data consistently documented sand in this part of the site. As such a "Rawls" infiltration rate of 8.27 inches/hour was used in the modeling of this system.
- Drawdown Time: Not applicable as the lowest orifice in this basin is located at the floor elevation of the basin and as such, this basin does not rely on infiltration to draw down the water level.

Subsurface Detention Systems (SDSs) MC-1, MC-2, MC-3, and MC-4: These BMPs are subsurface detention systems consisting of a series square closed-bottom concrete galleys. While these BMPs will be closed systems and therefore the hydraulics will not be influenced by ledge or groundwater, every effort has been made to site these BMPs in such a manner as to minimize disruption of ledge or groundwater to accommodate their installation. All of these systems contain outlets at the floor elevation so as to allow for full gravity drawdown between storms. No infiltration has been modeled into these BMPs as they will be closed systems.

4.7 Peak Flow Comparison Table

In accordance with the state stormwater standards, the stormwater management system is designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates for the 2-year, 10-year, and 100-year, 24-hour storm events. The peak flow has been mitigated through the use of the BMPs described in the section above. Rainfall values used for each design storm were obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14. Peak flow rates and volumes for the pre-development and post-development conditions are illustrated in the following table:

RATE

POINT OF ANALYSIS	**2-YEAR STORM EVENT (3.34"/24-HR)**		**10-YEAR STORM EVENT (5.23"/24-HR)**		**100-YEAR STORM EVENT (8.23"/24-HR)**	
	PRE (CFS)	**POST (CFS)**	*PRE (CFS)*	**POST (CFS)**	*PRE (CFS)*	**POST (CFS)**
POA-1	*0.43*	**0.00**	*1.39*	**1.21**	*3.34*	**3.26**
POA-2	*1.53*	**0.00**	*3.82*	**0.00**	*7.96*	**0.00**
POA-3	*0.00*	**0.00**	*0.00*	**0.00**	*0.00*	**0.00**
POA-4	*4.22*	**4.21**	*10.21*	**10.12**	*20.91*	**20.66**
POA-5	*3.47*	**3.39**	*13.12*	**12.02**	*33.97*	**32.43**
POA-6	*0.00*	**0.00**	*0.00*	**0.00**	*0.34*	**0.09**
POA-7	*0.13*	**0.13**	*1.33*	**1.29**	*9.33*	**8.42**

VOLUME

POINT OF ANALYSIS	2-YEAR STORM EVENT (3.34"/24-HR)		10-YEAR STORM EVENT (5.23"/24-HR)		100-YEAR STORM EVENT (8.23"/24-HR)	
	PRE (AC-FT)	**POST (AC-FT)**	*PRE (AC-FT)*	**POST (AC-FT)**	*PRE (AC-FT)*	**POST (AC-FT)**
POA-1	*0.037*	**0.000**	*0.102*	**0.031**	*0.235*	**0.119**
POA-2	*0.101*	**0.000**	*0.241*	**0.000**	*0.502*	**0.000**
POA-3	*0.000*	**0.000**	*0.000*	**0.000**	*0.000*	**0.000**
POA-4	*0.269*	**0.268**	*0.628*	**0.623**	*1.294*	**1.280**
POA-5	*0.393*	**0.367**	*1.181*	**1.112**	*2.833*	**2.818**
POA-6	*0.000*	**0.000**	*0.002*	**0.001**	*0.066*	**0.015**
POA-7	*0.023*	**0.023**	*0.217*	**0.230**	*1.052*	**1.153**

In accordance with local regulations, the post-development rates and volumes have not been increased or decreased by more than 10% with the following exceptions, which we believe are technically justified and represent good engineering practice:

- Since POA-1 flows directly into Coolidge Street, it is our judgement that a reduction of more than 10% in flow and volume is appropriate and justified at this POA in the proposed condition.
- Although the *Meadowbrook Commons* design eliminates any contribution to POA-2 in the proposed condition, the *Coolidge Crossing* design compensates for this thereby maintaining very similar rates and volumes to POA-2 in the proposed condition.
- Since POA-6 flows into a residential area, it is our judgement that a reduction of more than 10% in flow and volume is appropriate and justified at this POA in the proposed condition.

Pre- and post-development Hydrocad output for these storm events is included in Attachments 3 and 4 of this report.

5.0 STORMWATER RECHARGE (STANDARD 3)

The DEP Stormwater Management Policy requires that the site's impervious area be used to calculate the required infiltration in order to approximate the annual recharge from pre-development conditions. On this site, the total proposed impervious area is 5.98± acres whereas no impervious area currently exists. The required recharge equals a depth of runoff corresponding to the underlying soil type multiplied by the impervious area for each soil type in the post development condition. The following values were used for this project:

HSG	RUNOFF DEPTH TO INFILTRATE (in)	EXISTING IMPERVIOUS AREA (ac)	PROPOSED IMPERVIOUS AREA (ac)	NET CHANGE IMPERVIOUS AREA (ac)
A	0.60	0.00	3.73	3.73
B	0.35	0.00	0.00	0.00
C	0.25	0.00	2.14	2.14
D	0.10	0.00	0.11	0.11

Recharge Volume (Rv) = (required runoff depth) x (newly created impervious area) =

	0.60	inch x	3.73	acres x (	43,560	ft^2/acre	) x (	1 ft/	12 inches)
+	0.35	inch x	0.00	acres x (	43,560	ft^2/acre	) x (	1 ft/	12 inches)
+	0.25	inch x	2.14	acres x (	43,560	ft^2/acre	) x (	1 ft/	12 inches)
+	0.10	inch x	0.11	acres x (	43,560	ft^2/acre	) x (	1 ft/	12 inches)

10,106
(cubic feet)

The static recharge volume provided in the BMPs exceeds DEP's recharge requirement as follows:

BMP	STATIC RECHARGE VOLUME (cubic feet)
Basin MC-1	458
Basin MC-2	888
SIS MC-1	12,111
SIS MC-2	2,532
TOTAL STATIC RECHARGE VOLUME	**15,989** (cubic feet)

6.0 WATER QUALITY (STANDARD 4)

By utilizing the BMPs outlined below, the Project achieves the required water quality treatment level of 80% total suspended solids (TSS) removal. Treatment trains documenting the provided TSS removal are provided below.

Deep Sump Hooded Catch Basins: Stormwater runoff from proposed pavement areas will be directed via curbing and site grading to catch basins with deep sumps and hooded outlets. The catch basins will trap and remove sediment and larger particles from the stormwater and will improve the performance of subsequent BMPs. The sumps will be a minimum of 4' in depth and a regular inspection and cleaning schedule has been proposed to ensure optimal effectiveness.

Proprietary Water Quality Units: The proposed proprietary water quality units (WQUs) are designed to remove heavy particles, floating debris and hydrocarbons from stormwater. Stormwater enters the system where floatables and oils are separated prior to the clarified stormwater runoff discharging to an outlet pipe. Water quality unit sizing and selection data is included in Attachment 6 of this report.

Stone Diaphragms: A small section of the entrance drive near Coolidge Street will utilize stone diaphragms for pretreatment upstream of water quality swales. This method of pretreatment was selected to keep the bottoms of the water quality swales as high as possible relative to seasonal high groundwater.

Infiltration: Stormwater from certain paved areas will be discharged to the proposed infiltration BMPs after undergoing pre-treatment from the BMPs listed above. The infiltration BMPs will provide further treatment of the stormwater.

TREATMENT TRAIN: INFILTRATION WITH PRETREATMENT

BMP (A)	TSS Removal Rate (B)	Starting TSS Load (C)	Amount Removed (BxC) (D)	Remaining Load (C-D) (E)
Infiltration with pretreatment (deep sump catch basins and/or WQUs)	0.80	1.0	0.80	0.20
Total TSS Removal = Summation of (D) =			**80%**	

TREATMENT TRAIN: WATER QUALITY SWALE WITH PRETREATMENT

BMP (A)	TSS Removal Rate (B)	Starting TSS Load (C)	Amount Removed (BxC) (D)	Remaining Load (C-D) (E)
Water quality swale with pretreatment (stone diaphragm)	0.70	1.0	0.70	0.30
Total TSS Removal = Summation of (D) =			**70%***	

* Maximum achievable; applies only to a small section of the entrance drive near Coolidge Street

7.0 LUHPPL (STANDARD 5)

Not applicable to the Project.

8.0 CRITICAL AREAS (STANDARD 6)

Not applicable to the Project.

9.0 REDEVELOPMENT (STANDARD 7)

Not applicable to the Project.

10.0 EROSION & SEDIMENT CONTROL PLAN (STANDARD 8)

The project is subject to the National Pollutant Discharge Elimination System (NPDES) program of the United States Environmental Protection Agency, which will require construction operations to comply with the NPDES General Permit for Stormwater Discharges from Construction Activities and will require the implementation of a site-specific a Stormwater Pollution Prevention Plan (SWPPP) addressing erosion and sedimentation control practices to be used throughout the construction period. The SWPPP will be prepared prior to construction as required by the NPDES permit.

Proposed erosion and sedimentation control measures will include compost filter socks, silt fence, crushed stone, riprap, hydroseeding, mulching, erosion control matting, diversion berms, and sedimentation basins. Compost filter sock and siltation fence will be used for the perimeter erosion control barrier and elsewhere as conditions warrant. Sedimentation basins will be used throughout the site to treat runoff and diversion berms will be utilized as needed to divert untreated stormwater to the sedimentation basins. Sedimentation basins and diversion berms will be added, removed, and adjusted as the site evolves throughout the construction process. Hydroseeding or sod will be used as a permanent stabilization measure for all revegetated areas of the site. Slopes 3:1 and steeper will be

stabilized with an erosion control matting. Mulching may be used to reinforce seeded areas where erosion control matting is not required or warranted, but where some protection is warranted. Mulching may also be used to stabilize areas where construction activities will temporarily cease for more than 14 days. Silt sacks will be used to protect catch basins prior to binder and elsewhere as conditions warrant. The contractor will be required to keep a reasonable stock of erosion controls on site to be able to supplement or make repairs as necessary.

11.0 OPERATION & MAINTENANCE PLAN (STANDARD 9)

A post-construction Operation and Maintenance (O&M) Plan for the Project is included as Attachment 6.

12.0 ILLICIT DISCHARGES (STANDARD 10)

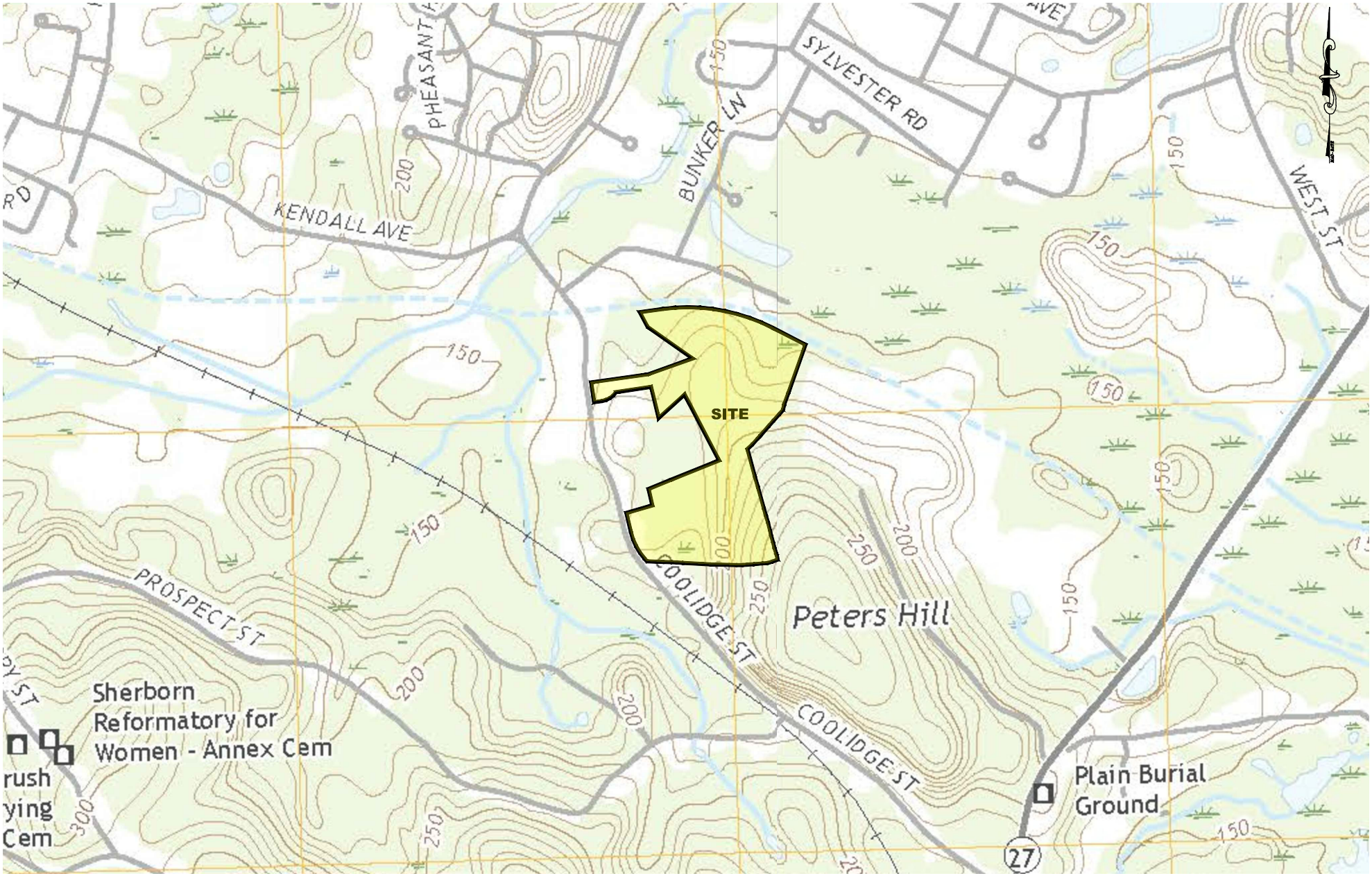
The proposed stormwater management system does not include any illicit discharges. An illicit discharge statement is included as Attachment 7.

13.0 DRAINAGE CONVEYANCE SYSTEM AND CULVERTS

The proposed stormwater conveyance system is designed to collect and convey runoff from developed areas to the associated stormwater management system BMPs described in this report. The drainage system consists of deep-sump hooded catch basins, manholes, water quality units, and pipes. Using the rational method to determine peak runoff flows, the proposed conveyance system is designed for the 100-year storm event. Systems have been designed so as not to have any bypass from the most downstream on-grade structures, and to have a ponding depth less than the curb height for the structures in sags. Hydraflow Storm Sewers output is included in Attachment 8.

The proposed culverts at the wetland crossing were designed to pass a 100-year storm event from the 3.52± acre contributing watershed area as illustrated in Figure 5. The contributing watershed was modeled utilizing HydroCad 10.0 with the area immediately upstream of the culvert modeled as a pond. Utilizing this approach, it was determined that three side-by-side 12” culverts would be the most efficient design to maximize low-flow capacity for small storms, provide sufficient full capacity for large storms, and keep the vertical zone occupied by the culverts to a minimum so as not to conflict with the proposed utilities along the entrance drive. The headwater elevation in the 100-year storm has been designed to peak at 161.51± feet which is entirely accommodated on the subject property. The HydroCad output for the culvert sizing is included in Attachment 8.

Figures



1000 0 500 1000 2000

GRAPHIC SCALE IN FEET

SOURCE: USGS TOPO 2018
QUADS: FRAMINGHAM, HOLLISTON, MEDWAY, & NATICK

CLIENT:

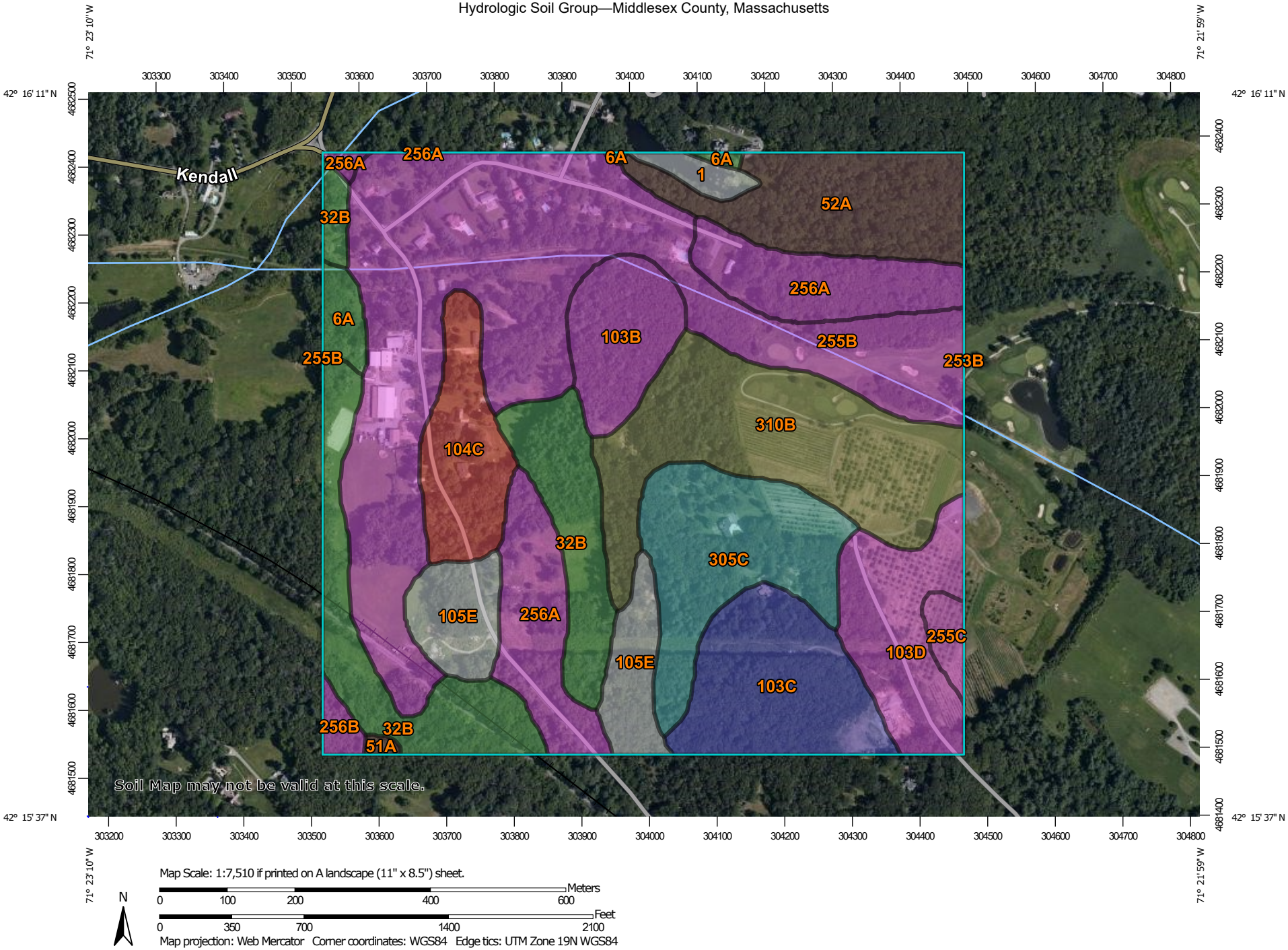
Pulte HOMES

PARCELS 5-32, 5-46A, 5-55
COOLIDGE STREET
SHERBORN, MA 01770

CIVIL DESIGN GROUP, LLC
21 HIGH STREET SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

LOCATION MAP

07/29/2021



Map Scale: 1:7,510 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 100 200 400 600

Feet
0 350 700 1400 2100

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 1:25,000.

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

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

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

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

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

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

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 20, Jun 9, 2020

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

Date(s) aerial images were photographed: Jul 28, 2019—Aug 15, 2019

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		1.6	0.8%
6A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	A/D	2.5	1.2%
32B	Wareham loamy fine sand, 0 to 5 percent slopes	A/D	21.9	10.5%
51A	Swansea muck, 0 to 1 percent slopes	B/D	0.3	0.2%
52A	Freetown muck, 0 to 1 percent slopes	B/D	14.0	6.7%
103B	Charlton-Hollis-Rock outcrop complex, 3 to 8 percent slopes	A	8.1	3.9%
103C	Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes	B	14.3	6.8%
103D	Charlton-Hollis-Rock outcrop complex, 15 to 25 percent slopes	A	11.4	5.5%
104C	Hollis-Rock outcrop-Charlton complex, 0 to 15 percent slopes	D	9.1	4.4%
105E	Rock outcrop-Hollis complex, 3 to 35 percent slopes		9.9	4.7%
253B	Hinckley loamy sand, 3 to 8 percent slopes	A	0.0	0.0%
255B	Windsor loamy sand, 3 to 8 percent slopes	A	54.7	26.2%
255C	Windsor loamy sand, 8 to 15 percent slopes	A	1.6	0.8%
256A	Deerfield loamy fine sand, 0 to 3 percent slopes	A	18.2	8.7%
256B	Deerfield loamy fine sand, 3 to 8 percent slopes	A	1.1	0.6%
305C	Paxton fine sandy loam, 8 to 15 percent slopes	C	15.8	7.6%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	C/D	24.0	11.5%
Totals for Area of Interest			**208.7**	**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.

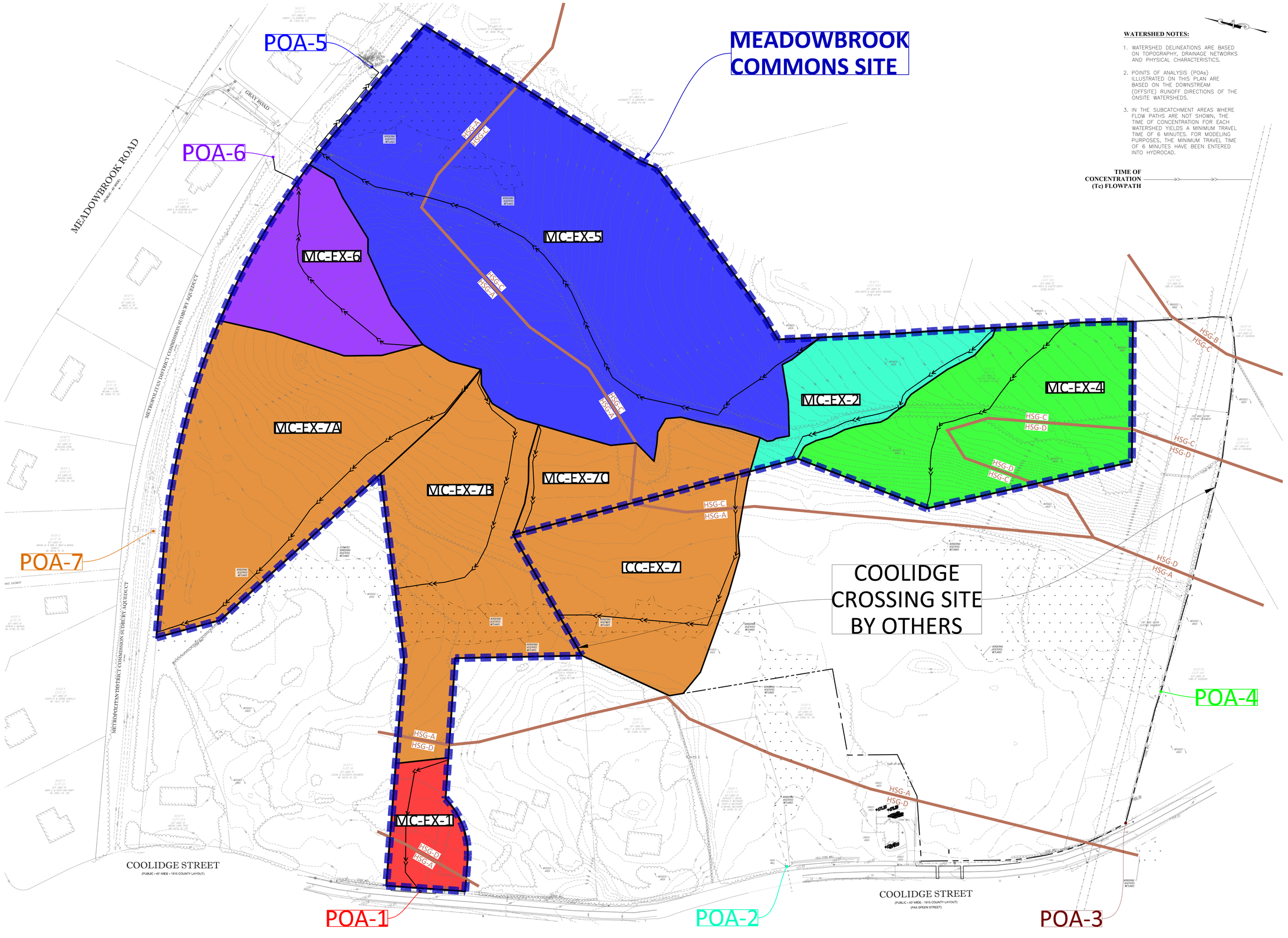
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



WATERSHED NOTES:

1. WATERSHED DELINEATIONS ARE BASED ON TOPOGRAPHY, DRAINAGE NETWORKS AND PHYSICAL CHARACTERISTICS.
2. POINTS OF ANALYSIS (POAs) ILLUSTRATED ON THIS PLAN ARE BASED ON THE DOWNSTREAM (OFFSITE) RUNOFF DIRECTIONS OF THE ONSITE WATERSHEDS.
3. IN THE SUBCATCHMENT AREAS WHERE FLOW PATHS ARE NOT SHOWN, THE TIME OF CONCENTRATION FOR EACH WATERSHED YIELDS A MINIMUM TRAVEL TIME OF 6 MINUTES. FOR MODELING PURPOSES, THE MINIMUM TRAVEL TIME OF 6 MINUTES HAVE BEEN ENTERED INTO HYDROCAD.

NOT FOR CONSTRUCTION

CDG PROJECT #: 19001

REVISIONS:

REV	DATE	COMMENT
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

PLANNING BOARD:

SEAL:

MATTHEW A. LEIDNER, P.E.

PREPARED BY:

CIVIL DESIGN GROUP, LLC

21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

PREPARED FOR:

PULTE HOMES

115 FLANDERS ROAD
SUITE 200
WESTBOROUGH, MA 01581
www.pulte.com

PROJECT:

MEADOWBROOK COMMONS

84 & 104 COOLIDGE STREET
SHERBORN, MASSACHUSETTS

SCALE:

80 0 40 80 160

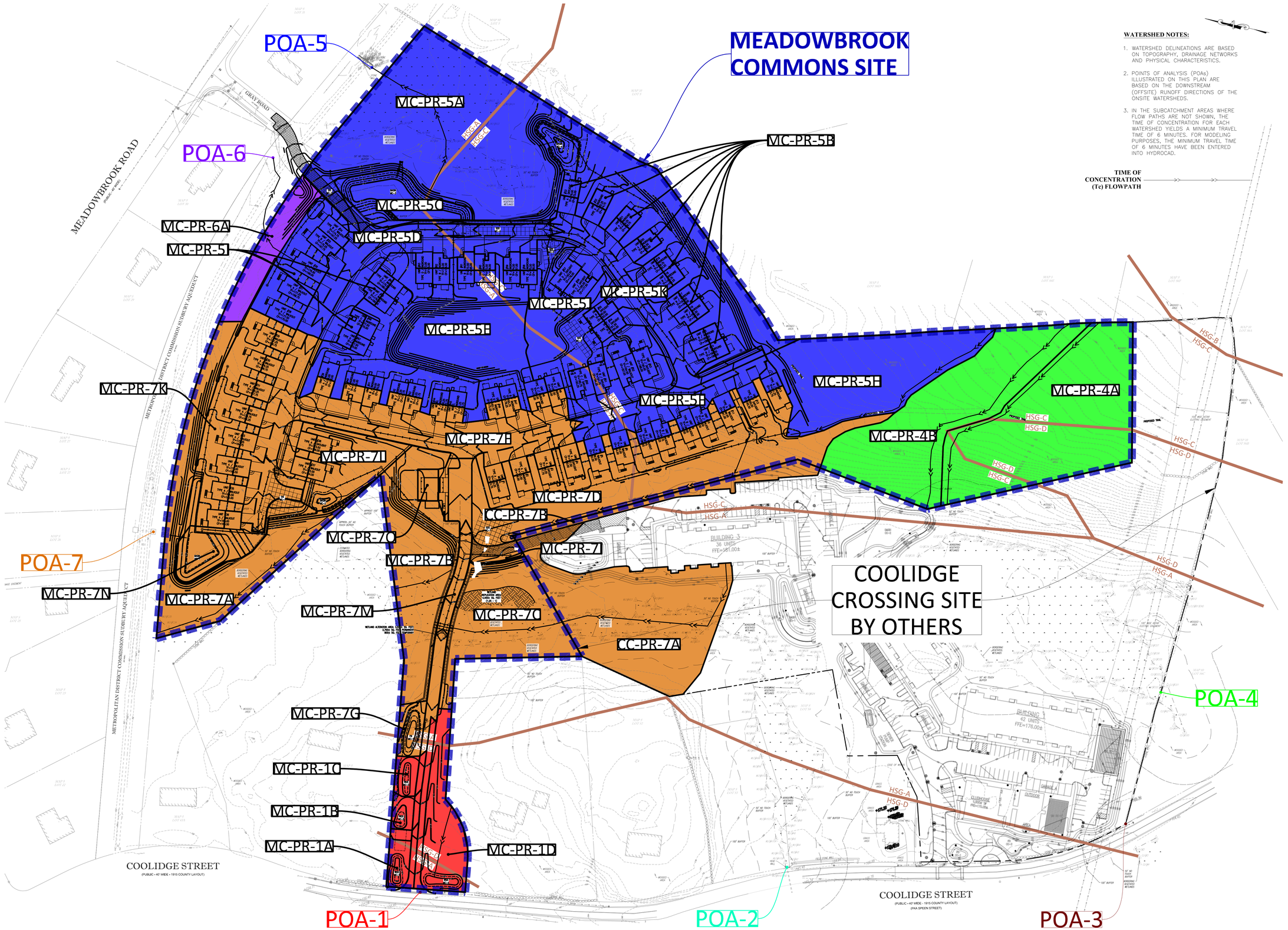
GRAPHIC SCALE IN FEET

SHEET:

PRE-DEVELOPMENT WATERSHEDS

FIGURE 3

DATE: 07/29/2021



WATERSHED NOTES:

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NOT FOR CONSTRUCTION

CDG PROJECT #: 19001

REVISIONS:

REV	DATE	COMMENT
1		
2		
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SHERBORN, MASSACHUSETTS

SCALE:

80 0 40 80 160

GRAPHIC SCALE IN FEET

SHEET:

POST-DEVELOPMENT WATERSHEDS

FIGURE 4

DATE: 07/29/2021

PROPOSED CULVERT LOCATION

HSG-C
HSG-A
HSG-C
HSG-A
HSG-A
HSG-D

ESTIMATED BORDERING VEGETATED WETLANDS
BORDERING VEGETATED WETLANDS
BORDERING VEGETATED WETLANDS
BORDERING VEGETATED WETLANDS
BORDERING VEGETATED WETLANDS
BORDERING VEGETATED WETLANDS
BORDERING VEGETATED WETLANDS
WOODED AREA
WOODED AREA
GRASS AREA
GRASS

MAP 5 LOT 49 N/F LANDS OF KATHLEEN A. HORGAN & DAVID L. DYE BK. 43955, PG. 136

MAP 5 LOT 52 N/F LANDS OF JOHN C. & CATHY BERNARD BK. 23369, PG. 183

MAP 5 LOT 54 N/F LANDS OF JAMES FIRCONO BK. 53898, PG. 154

MAP 5 LOT 53 N/F LANDS OF KATHLEEN S. BACON, PATRICIA R. WESTHAVER, ROCKY A. MELCHORR & MICHAEL MELCHORR BK. 64788, PG. 28

MAP 5 LOT 48 N/F LANDS OF EUGENE & YELIZAVETA ROSENBERG BK. 69270, PG. 261

NOT FOR CONSTRUCTION

CDG PROJECT #: 19001

REVISIONS:

REV	DATE	COMMENT
1		
2		
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8		
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84 & 104 COOLIDGE STREET
SHERBORN, MASSACHUSETTS

SCALE:

40 0 20 40 80

GRAPHIC SCALE IN FEET

SHEET:

CULVERT WATERSHED

FIGURE 5

DATE: 07/29/2021

Attachment 1 –

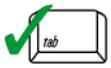
DEP Checklist for Stormwater Report

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.

[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.

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

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.

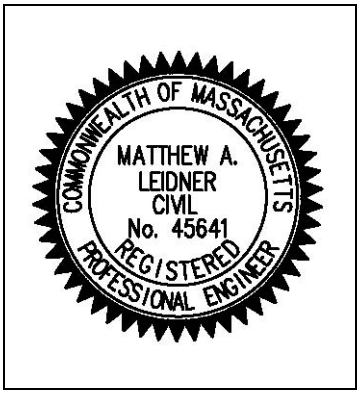
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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



07-29-2021

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.

Attachment 2 – Soils Data & Test Pit Locations

NOTES:

1) THE LAND SHOWN IS A 20.2 Ac.± PARCEL LISTED AS SHERBORN ASSESSOR LOTS 32 & 48A ON MAP 5 AND IS LOCATED IN THE RESIDENCE 'A' ZONE, AND IS NOT LOCATED IN A FEMA SPECIAL FLOOD HAZARD AREA ACCORDING TO FEMA F.I.R.M. MAPS #25017C0519F & #25017538F, DATED JULY 7, 2014.

2) VERTICAL DATUM IS NAVD88 AND HORIZONTAL DATUM IS MAINLAND STATE PLANE COORDINATE SYSTEM NAD83(2011).

2) THE WETLAND RESOURCE LINE SHOWN WAS DELINEATED BY DESHENG WANG, Ph.D., P.E., C.W.S., CREATIVE LAND & WATER ENGINEERING LLC, SOUTHBOROUGH, MA.

3.) PLAN REFERENCES:
DEEDS:
BOOK 64760 PAGE 28
BOOK 42839 PAGE 271
PLANS:
1475 OF 1967
5 OF 2015
1455 OF 1955
330 OF 1991
996 OF 1985
1028 OF 1967
COMMONWEALTH OF MASSACHUSETTS METROPOLITAN WATER WORKS-SUDBURY AQUEDUCT LAND PLANS

LEGEND

X .....DENOTES LOCATION OF GRADE ELEVATION TAKEN AT TEST HOLE

MASS. COORD SYSTEM (NAD83)

NO.	DATE	DESCRIPTION	BY

PREPARED BY:
BRUCE SALUK & ASSOC., INC.
CIVIL ENGINEERING & LAND SURVEYING
576 BOSTON POST ROAD EAST
MARLBOROUGH, MA 01752

SOIL TESTING PLAN
-COOLIDGE CROSSING-
COOLIDGE STREET
SHERBORN,MA

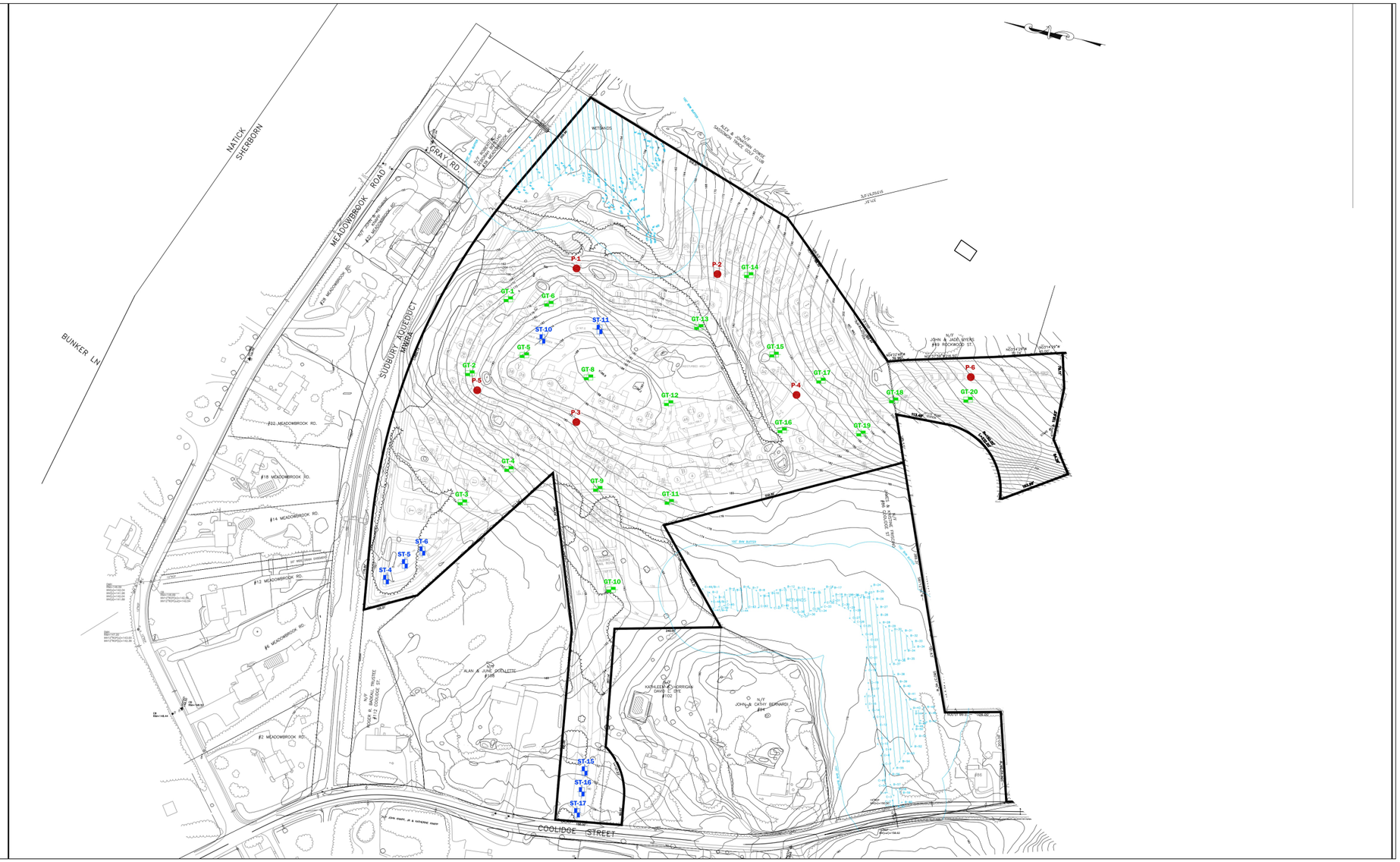
PREPARED FOR:
COOLIDGE CROSSING LLC
30 TURNPIKE RD
SOUTHBOROUGH,MA 01772

DATE: AUGUST 25, 2016

T

FILE: 2603C1.dwg

GRAPHIC SCALE 0 60 120 180 FEET



NOTES:

1. SITE PLAN BASED ON "TEST PIT PLAN" AS PREPARED BY CIVIL DESIGN GROUP, LLC DATED JANUARY 9, 2019. FIELD ACTIVITIES AND OBSERVATIONS PERFORMED BY RANSOM CONSULTING, INC. BETWEEN JANUARY 10 AND JANUARY 30, 2019.
2. SOME FEATURES ARE APPROXIMATE IN LOCATION AND SCALE.
3. THIS PLAN HAS BEEN PREPARED FOR PULTE HOMES, ALL OTHER USES ARE NOT AUTHORIZED, UNLESS WRITTEN PERMISSION IS OBTAINED FROM RANSOM CONSULTING, INC.

LEGEND:

ST-X STORMWATER TEST PIT

GT-X GEOTECHNICAL TEST PIT

P-X LEDGE PROBE

RANSOM Consulting, Inc.

PREPARED FOR:

PULTE HOMES OF NEW ENGLAND LLC
115 FLANDERS ROAD
WESTBOROUGH, MASSACHUSETTS

SITE:

MEADOWBROOK COMMONS
COOLIDGE STREET
SHERBORN, MASSACHUSETTS

SUBSURFACE EXPLORATION PLAN

DATE: JANUARY 2019
PROJECT: 181.01030
FIGURE: 2

W:\2018\181.01030\Geotechnical\Figure 2_Location Plan_Drafting\Location Plan.dwg Jan 31, 2019 - 2:08pm

RANSOM Consulting, Inc.

Consulting Engineers and Scientists

TEST PIT LOG

Project: Coolidge Street	Project #: 181.01030.002
TEST PIT IDENTIFICATION: GT-3	
Location: Sherborn, MA	Ground Elevation: 154 FT AMSL
Client: Pulte Homes of New England LLC	Datum: NA
Contractor: Speroni Excavation	Operator: Rob
Equipment: CAT 320C	Samples Collected __Yes _X_No
Capacity/Reach: ≈18 ft	Time Started: 14:55 Time Completed: 15:05
Weather: Clouds, 20°F	
Logged by: JPJ	Date: 1/11/19
Checked by: JPJ	Date: 1/30/19

TEST PIT INFORMATION

Depth of Stratum Change Feet	Sample No. and Type	Sample Depth Feet	Soil Description
0 – 0.8			Dark Brown, fine SAND and SILT, some roots, trace gravel, organic odor (TOPSOIL).
0.8 – 2			Orange/brown fine SAND, trace silt
2 – 4.75			Brown fine SAND, trace silt
4.75 - 15			Gray/brown fine SAND and SILT, some Gravel, some Cobbles, little boulders (TILL). Gravel sub-angular to sub-rounded.
			End of test pit 15’
			Water entering test pit at 5.5’

Pit Dimensions (Feet) Length 18 Width 10 Depth 15	Remarks: 1. Test pit backfilled with native soils.

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TEST PIT LOG

Project: Coolidge Street	Project #: 181.01030.002
TEST PIT IDENTIFICATION: ST-4	
Location: Sherborn, MA	Ground Elevation: 150 FT AMSL
Client: Pulte Homes of New England LLC	Datum: NA
Contractor: Speroni Excavation	Operator: Rob
Equipment: CAT 320C	Samples Collected _X_Yes __No
Capacity/Reach: ≈18 ft	Time Started: 13:50 Time Completed: 14:05
Weather: Sun, 20°F	
Logged by: JPJ	Date: 1/11/19
Checked by: JPJ	Date: 1/30/19

TEST PIT INFORMATION

Depth of Stratum Change Feet	Sample No. and Type	Sample Depth Feet	Soil Description
0 – 1			Dark Brown, fine SAND and SILT, some roots, trace gravel, organic odor (TOPSOIL).
1 – 2.5			Orange/brown fine SAND and SILT. Orange iron staining 2.25' to 2.5'.
2.5 – 10	S1	5 – 6	Brown fine to medium SAND, little silt.
10 – 11	S2	10 – 11	Gray SILT, little clay, trace fine sand.
			Excavation collapsing at 11', end of test pit.
			Water weeping at 4',

Pit Dimensions (Feet)
Length 13
Width 10
Depth 11

Remarks:
1. Test pit excavated in field area.
2. Test pit backfilled with native soils.
3. Soil sample S1 and S2 submitted for laboratory grain size analyses (sieve & hydrometer).

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Consulting Engineers and Scientists

TEST PIT LOG

Project: Coolidge Street	Project #: 181.01030.002
TEST PIT IDENTIFICATION: ST-5	
Location: Sherborn, MA	Ground Elevation: 150 FT AMSL
Client: Pulte Homes of New England LLC	Datum: NA
Contractor: Speroni Excavation	Operator: Rob
Equipment: CAT 320C	Samples Collected __Yes _X_No
Capacity/Reach: ≈18 ft	Time Started: 14:39 Time Completed: 14:48
Weather: Sun, 20°F	
Logged by: JPJ	Date: 1/11/19
Checked by: JPJ	Date: 1/30/19

TEST PIT INFORMATION

Depth of Stratum Change Feet	Sample No. and Type	Sample Depth Feet	Soil Description
0 – 1.5			Dark Brown, fine SAND and SILT, some roots, trace gravel, organic odor (TOPSOIL).
1.5 – 2.5			Dull orange/brown fine SAND and SILT.
2.5 – 8.5			Brown fine SAND, trace silt. Orange iron stained band from 5' to 5.5'.
8.5 – 9.5			Gray/brown SILT, little clay.
			Excavation collapsing at 9.5', end of test pit.
			Water weeping at 6.75'.

Pit Dimensions (Feet) Length 11.5 Width 5.5 Depth 9.5	Remarks: 1. Test pit excavated in field area. 2. Test pit backfilled with native soils. 3. 4" perforated PVC observation well installed in excavation prior to backfilling.

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TEST PIT LOG

Project: Coolidge Street	Project #: 181.01030.002
TEST PIT IDENTIFICATION: ST-6	
Location: Sherborn, MA	Ground Elevation: 150 FT AMSL
Client: Pulte Homes of New England LLC	Datum: NA
Contractor: Speroni Excavation	Operator: Rob
Equipment: CAT 320C	Samples Collected __Yes _X_No
Capacity/Reach: ≈18 ft	Time Started: 14:14 Time Completed: 14:30
Weather: Sun, 20°F	
Logged by: JPJ	Date: 1/11/19
Checked by: JPJ	Date: 1/30/19

TEST PIT INFORMATION

Depth of Stratum Change Feet	Sample No. and Type	Sample Depth Feet	Soil Description
0 – 0.8			Dark Brown, fine SAND and SILT, some roots, trace gravel, organic odor (TOPSOIL).
0.8 – 1.75			Brown fine SAND and SILT.
1.75 – 9			Brown fine SAND, trace silt. Orange iron stained bands approximately 2" to 3" thick from 3.5' to 4.75'.
9 – 11			Gray/brown SILT, little clay.
			Excavation collapsing at 11', end of test pit.
			Water weeping at 5'.

Pit Dimensions (Feet)
Length 12
Width 9
Depth 11

Remarks:
1. Test pit excavated in field area.
2. Test pit backfilled with native soils.

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Consulting Engineers and Scientists

TEST PIT LOG

Project: Coolidge Street	Project #: 181.01030.002
TEST PIT IDENTIFICATION: ST-10	
Location: Sherborn, MA	Ground Elevation: 184 FT AMSL
Client: Pulte Homes of New England LLC	Datum: NA
Contractor: Speroni Excavation	Operator: Rob
Equipment: CAT 320C	Samples Collected __Yes _X_No
Capacity/Reach: ≈18 ft	Time Started: 9:40 Time Completed: 10:05
Weather: Sun, 20°F	
Logged by: JPJ	Date: 1/14/19
Checked by: JPJ	Date: 1/30/19

TEST PIT INFORMATION

Depth of Stratum Change Feet	Sample No. and Type	Sample Depth Feet	Soil Description
0 – 0.5			Dark Brown, fine SAND and SILT, some roots, trace gravel, organic odor (TOPSOIL).
0.5 – 3.5			Orange/brown fine SAND and SILT, little gravel .
3.5 – 10.75			Gray/brown fine to medium SAND, some silt, some gravel (TILL). Gravel sub-rounded to sub-angular.
			Bedrock surface encountered at 10.75', end of test pit.
			Water weeping at 10'.

Pit Dimensions (Feet)
Length 20
Width 7
Depth 10.75

Remarks:
1. Test pit backfilled with native soils.
2. 4" diameter perforated PVC observation well installed in excavation prior to backfilling.

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Consulting Engineers and Scientists

TEST PIT LOG

Project: Coolidge Street	Project #: 181.01030.002
TEST PIT IDENTIFICATION: ST-11	
Location: Sherborn, MA	Ground Elevation: 150 FT AMSL
Client: Pulte Homes of New England LLC	Datum: NA
Contractor: Speroni Excavation	Operator: Rob
Equipment: CAT 320C	Samples Collected __Yes _X_No
Capacity/Reach: ≈18 ft	Time Started: 10:40 Time Completed: 10:50
Weather: Sun, 20°F	
Logged by: JPJ	Date: 1/14/19
Checked by: JPJ	Date: 1/30/19

TEST PIT INFORMATION

Depth of Stratum Change Feet	Sample No. and Type	Sample Depth Feet	Soil Description
0 – 0.4			Dark Brown, fine SAND and SILT, some roots, trace gravel, organic odor (TOPSOIL).
0.4 – 2			Orange/brown fine SAND and SILT, little gravel.
2 – 5.8			Gray fine SAND and SILT, some gravel, little cobbles. Gravel sub-rounded to sub-angular (TILL).
			Bedrock surface encountered at 2.75' at east end sloping down to 5.8' at west end, end of test pit.
			No groundwater observed.

Pit Dimensions (Feet) Length 20 Width 6 Depth 5.8	Remarks: 1. Test pit backfilled with native soils.

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TEST PIT LOG

Project: Coolidge Street	Project #: 181.01030.002
TEST PIT IDENTIFICATION: ST-15	
Location: Sherborn, MA	Ground Elevation: 162 FT AMSL
Client: Pulte Homes of New England LLC	Datum: NA
Contractor: Speroni Excavation	Operator: Rob
Equipment: CAT 320C	Samples Collected __Yes _X_No
Capacity/Reach: ≈18 ft	Time Started: 13:49 Time Completed: 13:57
Weather: Sun, 20°F	
Logged by: JPJ	Date: 1/14/19
Checked by: JPJ	Date: 1/30/19

TEST PIT INFORMATION

Depth of Stratum Change Feet	Sample No. and Type	Sample Depth Feet	Soil Description
0 – 0.75			Dark Brown, fine SAND and SILT, some roots, trace gravel, organic odor (TOPSOIL).
0.75 – 4			Orange/brown fine to medium SAND, some silt, trace cobbles. Orange iron staining 3' to 4'.
4 – 9.5			Gray fine SAND, some Silt, some gravel, some cobbles (TILL). Gravel sub-rounded to sub-angular.
			Bedrock surface encountered at 9.5', end of test pit.
			Water weeping at 9.25'.

Pit Dimensions (Feet) Length 16 Width 8 Depth 9.5	Remarks: 1. Test pit excavated in open grass area on north side of hemlock hedge. 2. Test pit backfilled with native soils.

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TEST PIT LOG

Project: Coolidge Street	Project #: 181.01030.002
TEST PIT IDENTIFICATION: ST-16	
Location: Sherborn, MA	Ground Elevation: 160 FT AMSL
Client: Pulte Homes of New England LLC	Datum: NA
Contractor: Speroni Excavation	Operator: Rob
Equipment: CAT 320C	Samples Collected __Yes _X_No
Capacity/Reach: ≈18 ft	Time Started: 13:30 Time Completed: 13:45
Weather: Sun, 20°F	
Logged by: JPJ	Date: 1/14/19
Checked by: JPJ	Date: 1/30/19

TEST PIT INFORMATION

Depth of Stratum Change Feet	Sample No. and Type	Sample Depth Feet	Soil Description
0 – 1.25			Dark Brown, fine SAND and SILT, some roots, trace gravel, organic odor (TOPSOIL).
1.25 – 4.5			Orange/brown fine to medium SAND and SILT. Orange iron staining 2.75' to 4.5'.
4.5 – 13			Gray fine to medium SAND and SILT, some gravel, little cobbles (TILL). Gravel sub-rounded to sub-angular.
			Bedrock surface encountered at 13', end of test pit.
			Water weeping at 3'.

Pit Dimensions (Feet) Length 20 Width 8 Depth 13	Remarks: 1. Test pit excavated in open grass area on north side of hemlock hedge. 2. Test pit backfilled with native soils.

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TEST PIT LOG

Project: Coolidge Street	Project #: 181.01030.002
TEST PIT IDENTIFICATION: ST-17	
Location: Sherborn, MA	Ground Elevation: 158 FT AMSL
Client: Pulte Homes of New England LLC	Datum: NA
Contractor: Speroni Excavation	Operator: Rob
Equipment: CAT 320C	Samples Collected __Yes _X_No
Capacity/Reach: ≈18 ft	Time Started: 13:00 Time Completed: 13:24
Weather: Sun, 20°F	
Logged by: JPJ	Date: 1/14/19
Checked by: JPJ	Date: 1/30/19

TEST PIT INFORMATION

Depth of Stratum Change Feet	Sample No. and Type	Sample Depth Feet	Soil Description
0 – 0.5			¾" GRAVEL, driveway.
0.5 – 2.5			Dark brown, fine SAND and SILT, some roots, trace gravel, organic odor (TOPSOIL, buried).
2.5 – 5			Orange/brown fine SAND and SILT, little gravel. Orange iron staining 4' to 5'.
5 – 7.75			Gray fine SAND and SILT, some cobbles, little gravel (TILL). Gravel sub-rounded to sub-angular.
			Bedrock surface encountered at 7.75', end of test pit.
			Water weeping at 2'

Pit Dimensions (Feet)
Length 14
Width 8
Depth 7.75

Remarks:
1. Test pit excavated in open grass area on north side of hemlock hedge.
2. Test pit backfilled with native soils.

Percolation test and Groundwater Monitoring

By Creative Land & Water Engineering LLC

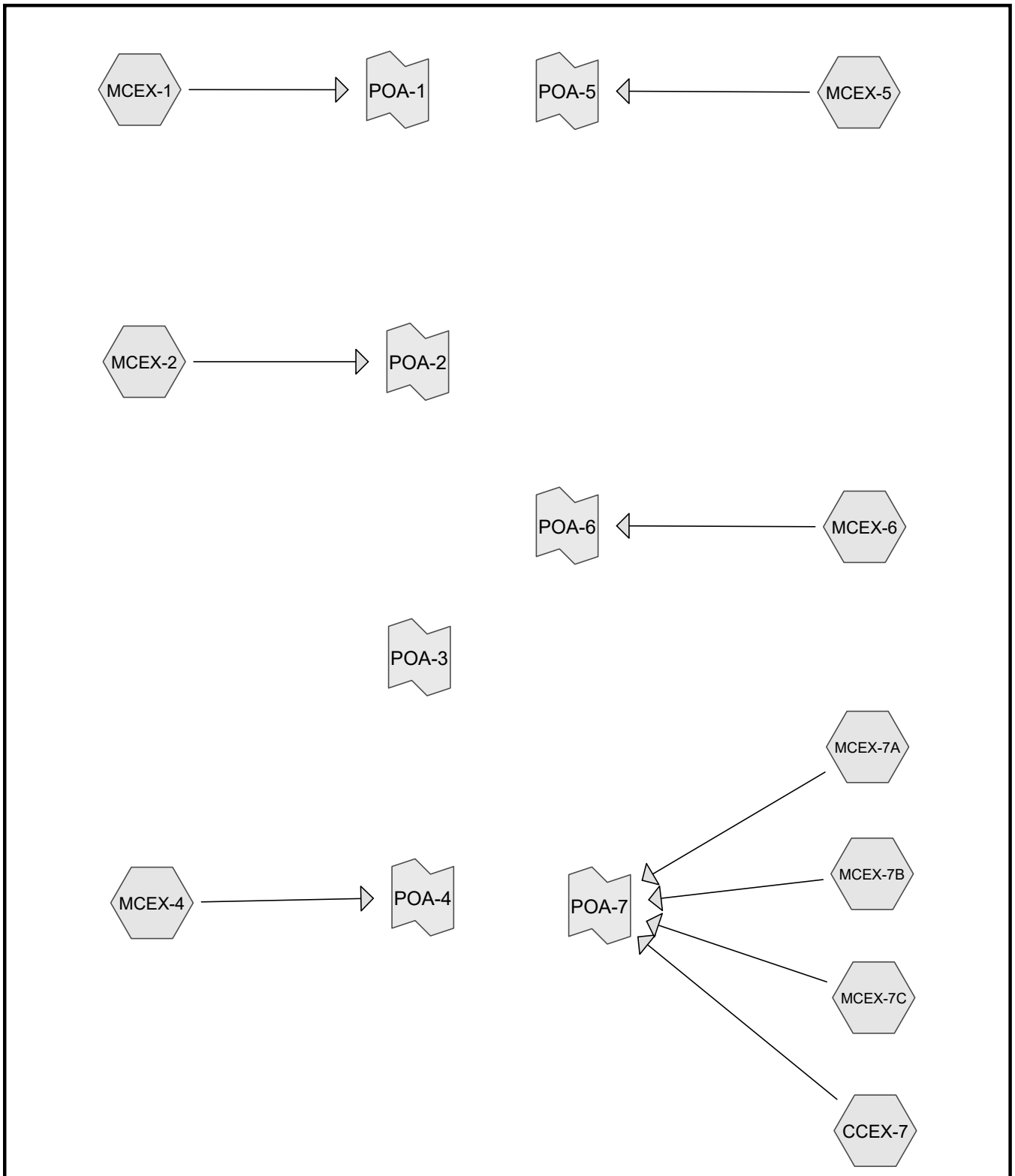
Site: Gray Road- 84 Coolidge Street, Sherborn, MA

Date: 1/29/2015 8/31/2016

Location TP#	Standing pipe ft	Rim or Well Top ft	Ground surface ft	Depth to Bottom ft	TOP to water ft	GS to water ft	Soil	Percolation rate, mpi	EHGW ft	Note	Test date	General Area	MW	TOP to water ft	Well Condition
DHT-1	1.5	175.4	172.8		5.59	4.09	SL	23	4		1/23/2015	Gray Rd	Yes	13.8	dry
DHT-2	3	188.93	185.6		7.2	4.2	SL		4	high water	1/23/2015		Yes	14.35	dry
DHT-3	2		191.09		12.86	10.86	SL-LS	9	5		1/23/2015		Yes	14.9	dry
DHT-4	1		193.8		8.96	7.96	LS	9	5		1/23/2015		Yes	12.15	dry
DHT-5	2.5	187.63	184.9		6.5	4	SL	38?	4	backfill interrupt last inch	1/26/2015		Yes	12.85	dry
DHT-6	1	199.85	198.6		7.5	6.5	LS	8	6	buried and estiamted	1/26/2015		Yes	13.68	dry
DHT-7	3	184.33	180.6		6.23	3.23	SL		3	not observed before backfill	1/26/2015		Yes	14.02	dry
DHT-8			183.9				SL		4	5' ledge obs. Hole	1/26/2015		no		
DHT-9	3.5		180.9		9.81	6.31	SL-LS	10	5		1/26/2015		damaged	7.6	dry
DHT-10	1	170.1	168.4		9	8	LS	3	4	buried and estiamted	1/26/2015		Yes	12.85	dry
DHT-11		163.75	160.5				MS	34 spi	4		8/3/2016		Yes	12.97	
DHT-12		162.48	158.9				MS	20 spi	2.5		8/3/2016		Yes	10.75	
DHT-13		161.15	160.6				MFS	1.55	2.5		8/3/2016		Yes	7.77	
DHT-14		178.88	177.1				LS	3	5		8/3/2016		Yes	10.05	dry
DHT-15		167.15	164				LS	3	4		8/5/2016		Yes	15.25	dry
DHT-16		169.3	165.9				LS	2	2		8/5/2016		Yes	14.66	dry
DHT-17		163.55	162.4				LS	1	4		8/5/2016		Yes	12.82	dry
DSW-1	2	153.24	150.2		9.42	7.42	MS	<2	6	used 1/26/2015 measurement	1/23/2015		Yes	11.83	
DSW-2/5	3.5	154.47	150.3		11	7.5	MS	10spi	6	used 1/26/2015 measurement	1/23/2015		Yes	11.51	
DSW-3/4	3	158.34	154.1		11.9	8.9	MS	5 mpi	6	used 1/26/2015 measurement	1/23/2015	Gray Rd	Yes	14.78	
DSW-6							MS	12 spi	6		5/8/2016		Yes	11.72	
DSW-7							MS	44 spi	8		5/8/2016		Yes	11.45	
DSW-8							LS	Abandoned	6		5/8/2016		Yes	13.15	dry
1										abandoned	12/5/2003				
2A	old							11		Witnessed by Mark Oram	11/24/2004				
3	test							7		Witnessed by Mark Oram	11/11/2004				
4										abandoned	11/24/2004				
5								16		Witnessed by Mark Oram	11/24/2004				
6										abandoned	11/24/2004				
7										abandoned	11/24/2004	Gray Rd			
TP-F1		173.11	172.1				MS	1.5 mpi	2.5		7/18/2016	84 Coolidge St	Yes	7.2	
TP-F2		171.83	172.1				MS	<2 mpi	2.5		7/18/2016	84 Coolidge St	Yes	5.95	
TP-F3			173.1				LS-SL		2.5		7/18/2016	84 Coolidge St	no	n/a	
TP-F4		174.2	172.7				MS	<2 mpi	3		7/18/2016	84 Coolidge St	Yes	8.16	
TP-F5		174.5	172.55				MS	<2 mpi	2	rear field area	7/18/2016	84 Coolidge St	Yes	8.51	
TP-F6		174.45	173				MS	<2 mpi	2		7/18/2016	84 Coolidge St	Yes	8.05	
TP-F7		173.91	172.8				MS	<2 mpi	3		7/18/2016	84 Coolidge St	Yes	7.62	
TP-F8		175.81	170.2				LS	13 mpi	3.33		8/2/2016	84 Coolidge St	Yes	13.73	dry
TP-F9		174.97	173.9				LS	similar to F8	3.50		8/2/2016	84 Coolidge St	Yes	10	
TP-F10		174.3	173.2				LS		2.67	shallow ledge	8/2/2016	84 Coolidge St	Yes	5.94	dry
TP-H1		206.47	204.8				LS-SL	8	3		7/19/2016	84 Coolidge St	Yes	14.72	
TP-H2		245.55	245				LS-SL	4	4	top hill slope area	7/19/2016	84 Coolidge St	Yes	14.9	
TP-H3			225.7				LS-SL	10	4		7/19/2016	84 Coolidge St	no	n/a	

Attachment 3 – HydroCad Output:

Pre-Development Conditions



Routing Diagram for MC Pre Development Condition

Prepared by {enter your company name here}, Printed 7/25/2021

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.100	80	>75% Grass cover, Good, HSG D (MCEX-1)
0.150	96	Gravel surface, HSG A (MCEX-5, MCEX-7C)
0.360	96	Gravel surface, HSG C (MCEX-2, MCEX-4, MCEX-5, MCEX-7C)
0.010	96	Gravel surface, HSG D (MCEX-4)
1.030	30	Meadow, non-grazed, HSG A (MCEX-1, MCEX-5, MCEX-7B)
0.810	71	Meadow, non-grazed, HSG C (MCEX-2, MCEX-4, MCEX-5, MCEX-7C)
0.580	78	Meadow, non-grazed, HSG D (MCEX-1, MCEX-4, MCEX-7B)
1.850	77	Wetlands, HSG A (CCEX-7, MCEX-5, MCEX-7A, MCEX-7B)
0.120	77	Wetlands, HSG C (MCEX-5)
13.260	30	Woods, Good, HSG A (CCEX-7, MCEX-1, MCEX-5, MCEX-6, MCEX-7A, MCEX-7B, MCEX-7C)
8.940	70	Woods, Good, HSG C (CCEX-7, MCEX-2, MCEX-4, MCEX-5, MCEX-7C)
0.610	77	Woods, Good, HSG D (MCEX-1, MCEX-4)
27.820	**51**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
16.290	HSG A	CCEX-7, MCEX-1, MCEX-5, MCEX-6, MCEX-7A, MCEX-7B, MCEX-7C
0.000	HSG B	
10.230	HSG C	CCEX-7, MCEX-2, MCEX-4, MCEX-5, MCEX-7C
1.300	HSG D	MCEX-1, MCEX-4, MCEX-7B
0.000	Other	
27.820		**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.10 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment CCEX-7: Runoff Area=2.610 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=579' Tc=21.0 min CN=38/0 Runoff=0.00 cfs 0.000 af

Subcatchment MCEX-1: Runoff Area=0.710 ac 0.00% Impervious Runoff Depth=0.63"
Flow Length=303' Tc=15.3 min CN=64/0 Runoff=0.43 cfs 0.037 af

Subcatchment MCEX-2: Runoff Area=1.260 ac 0.00% Impervious Runoff Depth=0.96"
Flow Length=460' Tc=12.0 min CN=71/0 Runoff=1.53 cfs 0.101 af

Subcatchment MCEX-4: Runoff Area=3.170 ac 0.00% Impervious Runoff Depth=1.02"
Flow Length=485' Tc=11.1 min CN=72/0 Runoff=4.22 cfs 0.269 af

Subcatchment MCEX-5: Runoff Area=9.390 ac 0.00% Impervious Runoff Depth=0.50"
Flow Length=1,322' Tc=22.6 min CN=61/0 Runoff=3.47 cfs 0.393 af

Subcatchment MCEX-6: Runoff Area=1.690 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=525' Tc=15.1 min CN=30/0 Runoff=0.00 cfs 0.000 af

Subcatchment MCEX-7A: Runoff Area=4.370 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=810' Slope=0.0500 '/' Tc=19.9 min CN=30/0 Runoff=0.00 cfs 0.000 af

Subcatchment MCEX-7B: Runoff Area=3.340 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=496' Tc=14.7 min CN=39/0 Runoff=0.00 cfs 0.001 af

Subcatchment MCEX-7C: Runoff Area=1.280 ac 0.00% Impervious Runoff Depth=0.21"
Flow Length=207' Tc=11.5 min CN=52/0 Runoff=0.13 cfs 0.022 af

Link POA-1: Inflow=0.43 cfs 0.037 af
Primary=0.43 cfs 0.037 af

Link POA-2: Inflow=1.53 cfs 0.101 af
Primary=1.53 cfs 0.101 af

Link POA-3:
Primary=0.00 cfs 0.000 af

Link POA-4: Inflow=4.22 cfs 0.269 af
Primary=4.22 cfs 0.269 af

Link POA-5: Inflow=3.47 cfs 0.393 af
Primary=3.47 cfs 0.393 af

Link POA-6: Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA-7: Inflow=0.13 cfs 0.023 af
Primary=0.13 cfs 0.023 af

Total Runoff Area = 27.820 ac Runoff Volume = 0.823 af Average Runoff Depth = 0.36"
100.00% Pervious = 27.820 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment CCEX-7:

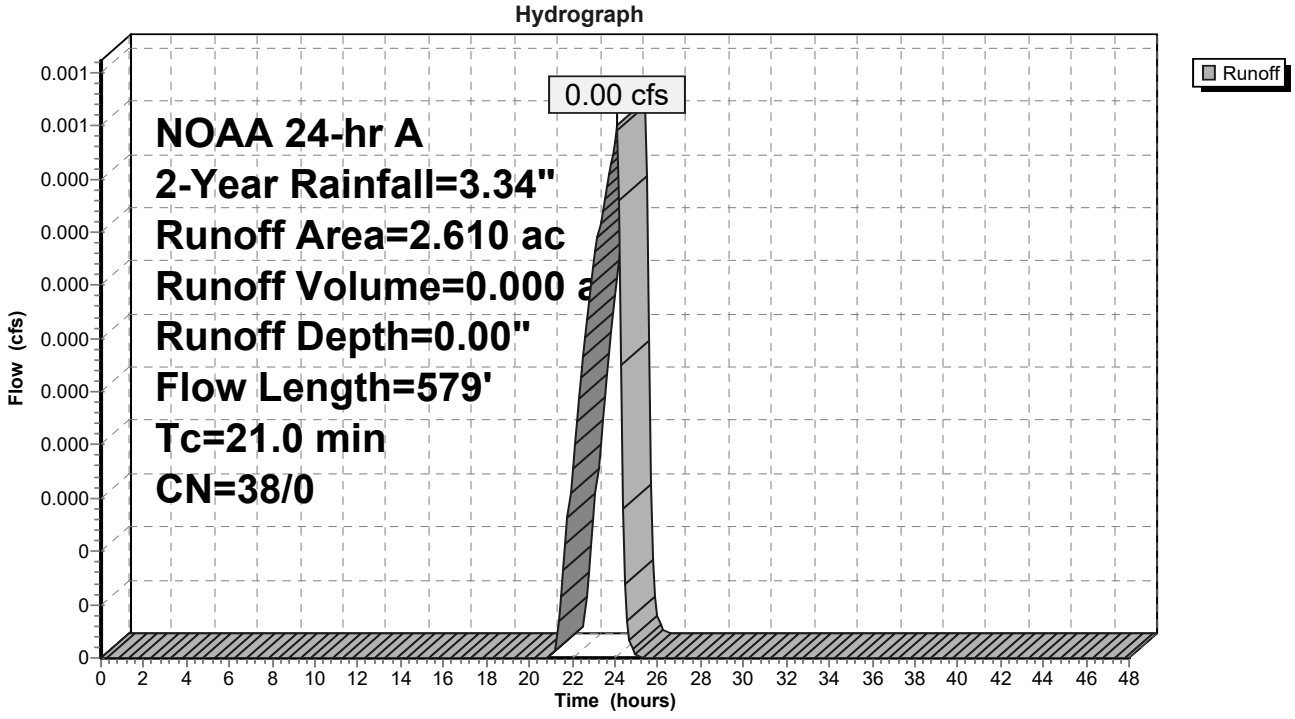
Runoff = 0.00 cfs @ 24.06 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

	Area (ac)	CN	Description
	2.110	30	Woods, Good, HSG A
*	0.300	77	Wetlands, HSG A
	0.200	70	Woods, Good, HSG C
	2.610	38	Weighted Average
	2.610	38	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
13.9	529	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.0	579	Total			

Subcatchment CCEX-7:



Summary for Subcatchment MCEX-1:

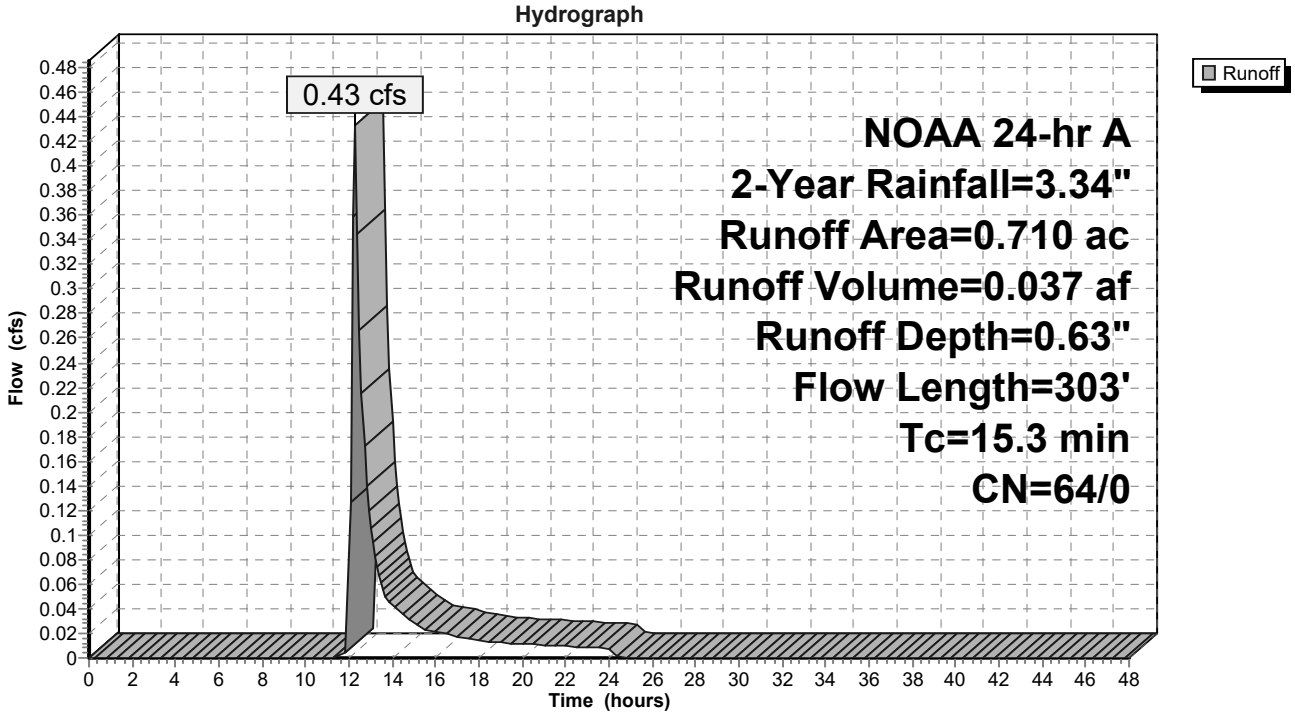
Runoff = 0.43 cfs @ 12.30 hrs, Volume= 0.037 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.050	30	Woods, Good, HSG A
0.150	30	Meadow, non-grazed, HSG A
0.200	77	Woods, Good, HSG D
0.210	78	Meadow, non-grazed, HSG D
0.100	80	>75% Grass cover, Good, HSG D
0.710	64	Weighted Average
0.710	64	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.7	253	0.0320	0.89		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.3	303	Total			

Subcatchment MCEX-1:



Summary for Subcatchment MCEX-2:

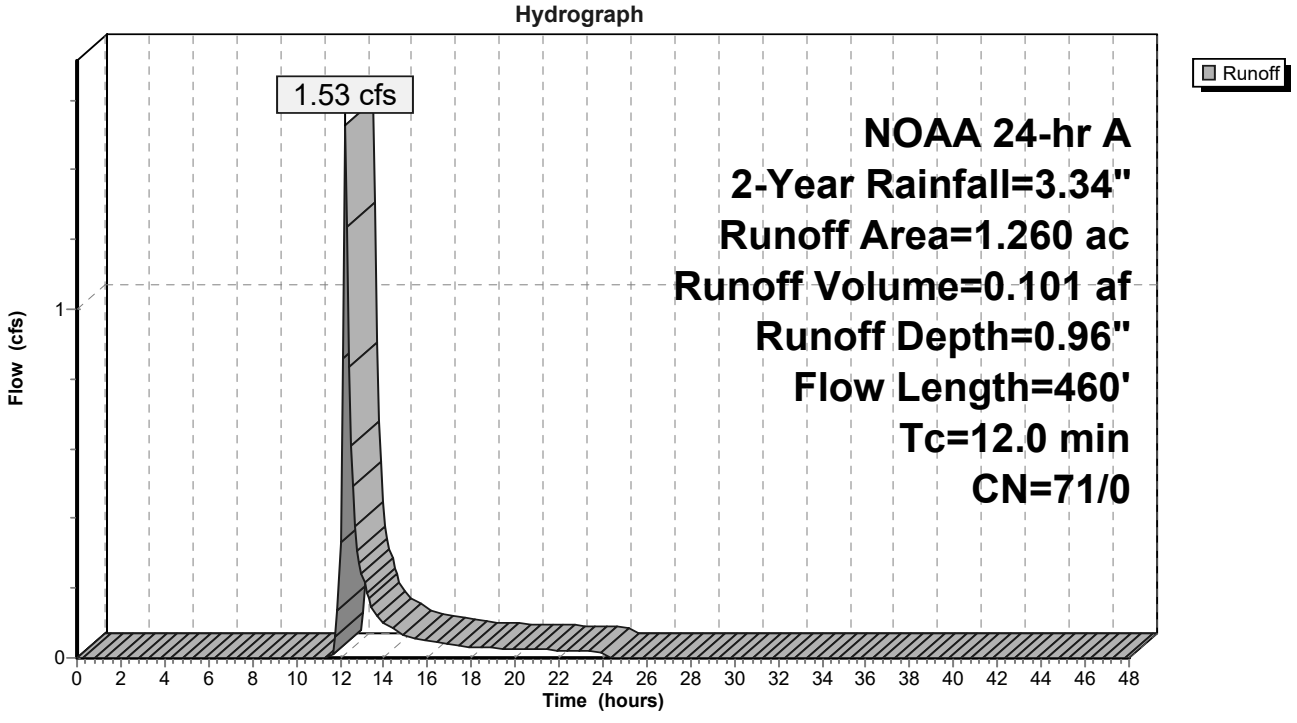
Runoff = 1.53 cfs @ 12.22 hrs, Volume= 0.101 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
1.160	70	Woods, Good, HSG C
0.040	96	Gravel surface, HSG C
0.060	71	Meadow, non-grazed, HSG C
1.260	71	Weighted Average
1.260	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
5.5	410	0.0320	1.25		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.0	460	Total			

Subcatchment MCEX-2:



Summary for Subcatchment MCEX-4:

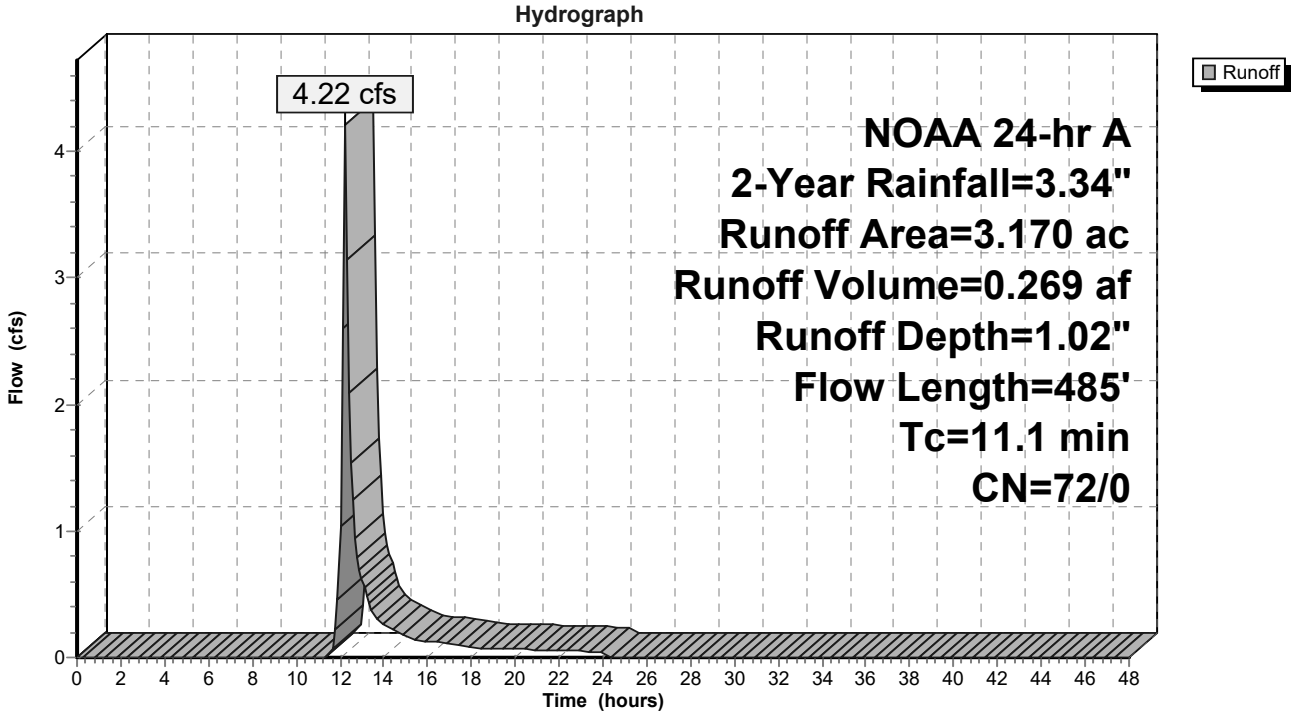
Runoff = 4.22 cfs @ 12.21 hrs, Volume= 0.269 af, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
2.280	70	Woods, Good, HSG C
0.060	96	Gravel surface, HSG C
0.120	71	Meadow, non-grazed, HSG C
0.410	77	Woods, Good, HSG D
0.290	78	Meadow, non-grazed, HSG D
0.010	96	Gravel surface, HSG D
3.170	72	Weighted Average
3.170	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.0	435	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.1	485	Total			

Subcatchment MCEX-4:



Summary for Subcatchment MCEX-5:

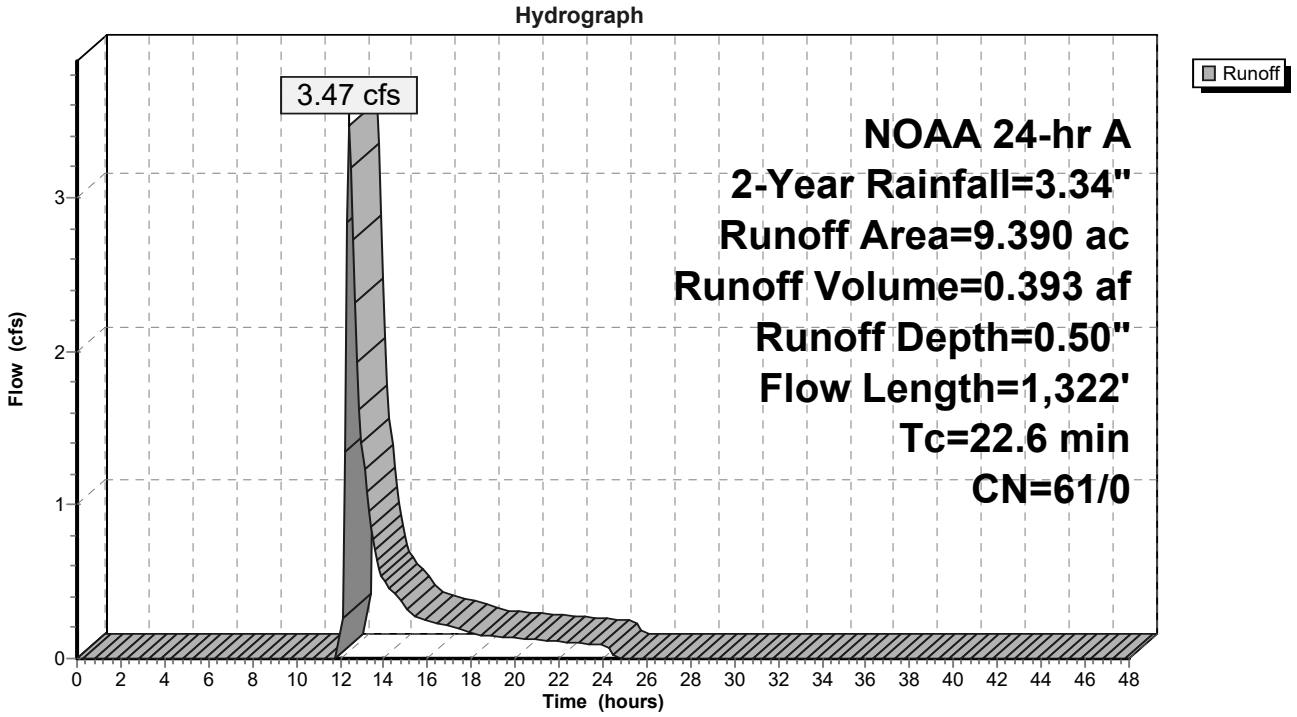
Runoff = 3.47 cfs @ 12.42 hrs, Volume= 0.393 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

	Area (ac)	CN	Description
*	0.950	77	Wetlands, HSG A
	2.520	30	Woods, Good, HSG A
	0.100	96	Gravel surface, HSG A
	0.080	30	Meadow, non-grazed, HSG A
	0.550	71	Meadow, non-grazed, HSG C
	0.200	96	Gravel surface, HSG C
	4.870	70	Woods, Good, HSG C
*	0.120	77	Wetlands, HSG C
	9.390	61	Weighted Average
	9.390	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.0	270	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	555	0.0450	3.42		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
9.4	447	0.0250	0.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.6	1,322	Total			

Subcatchment MCEX-5:



Summary for Subcatchment MCEX-6:

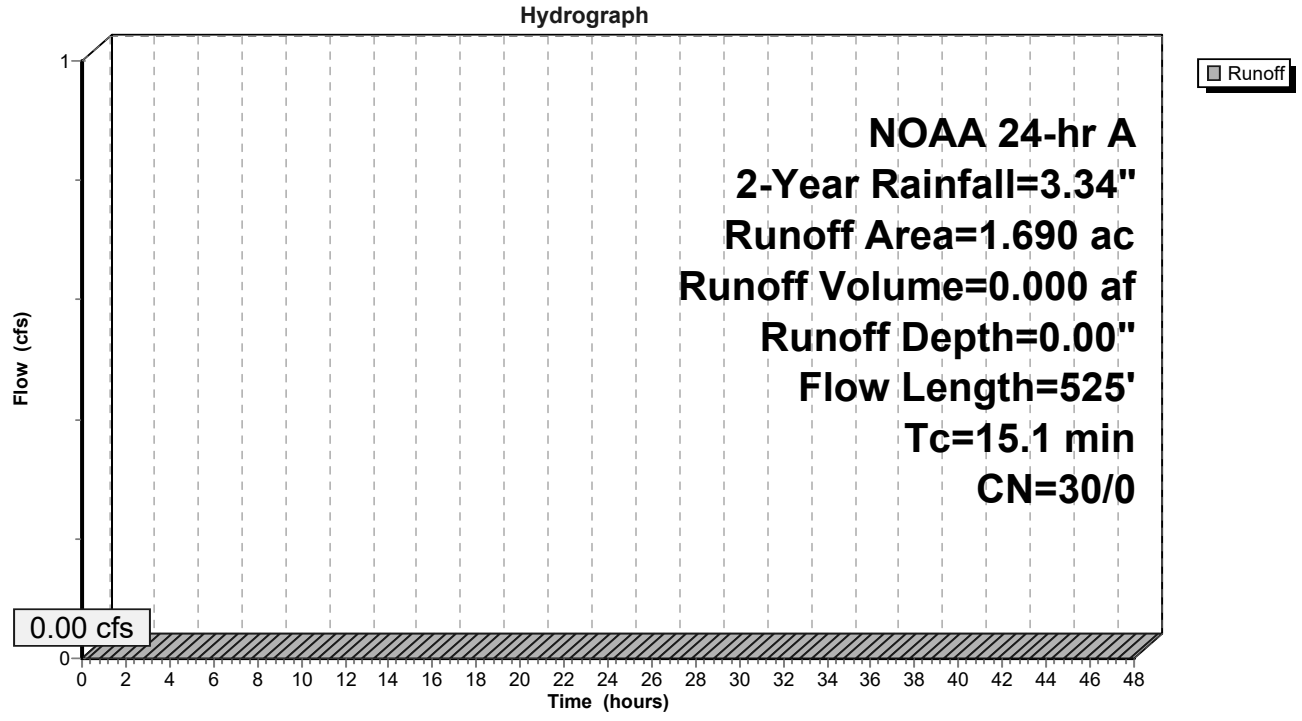
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
1.690	30	Woods, Good, HSG A
1.690	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
5.7	475	0.0760	1.38		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.1	525	Total			

Subcatchment MCEX-6:



Summary for Subcatchment MCEX-7A:

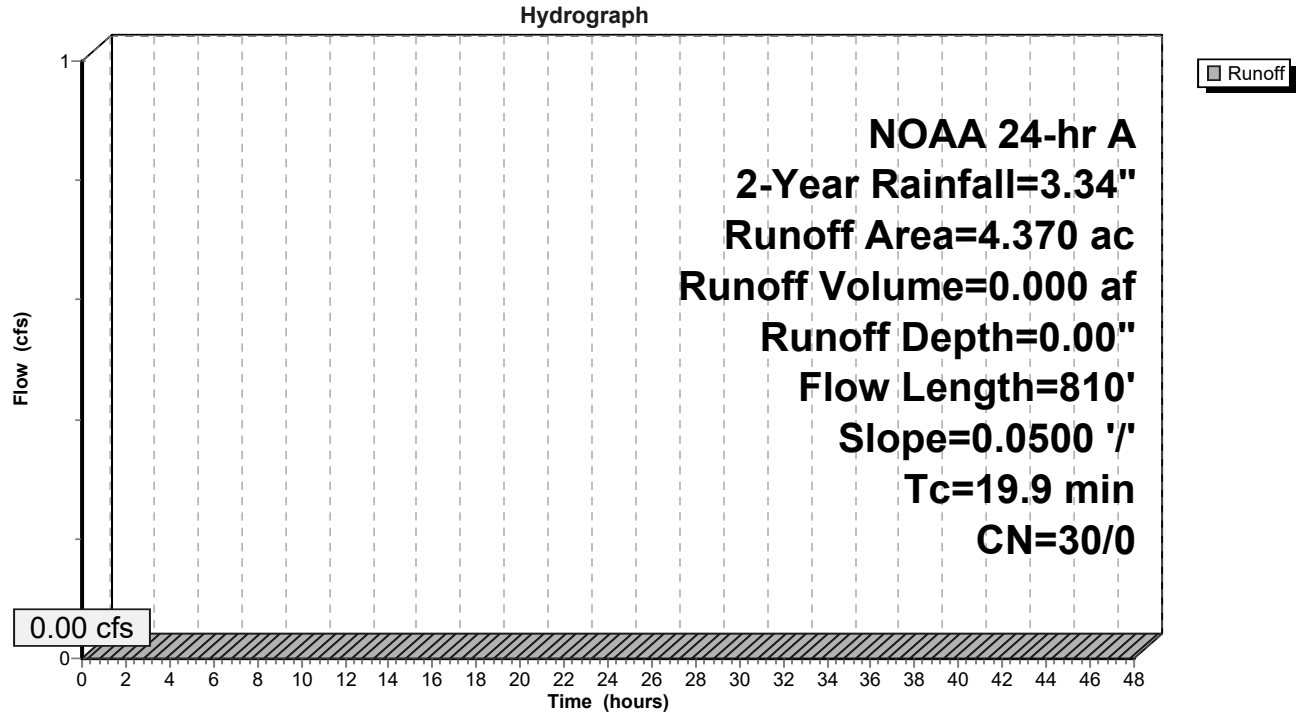
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

	Area (ac)	CN	Description
	4.330	30	Woods, Good, HSG A
*	0.040	77	Wetlands, HSG A
	4.370	30	Weighted Average
	4.370	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
11.3	760	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.9	810	Total			

Subcatchment MCEX-7A:



Summary for Subcatchment MCEX-7B:

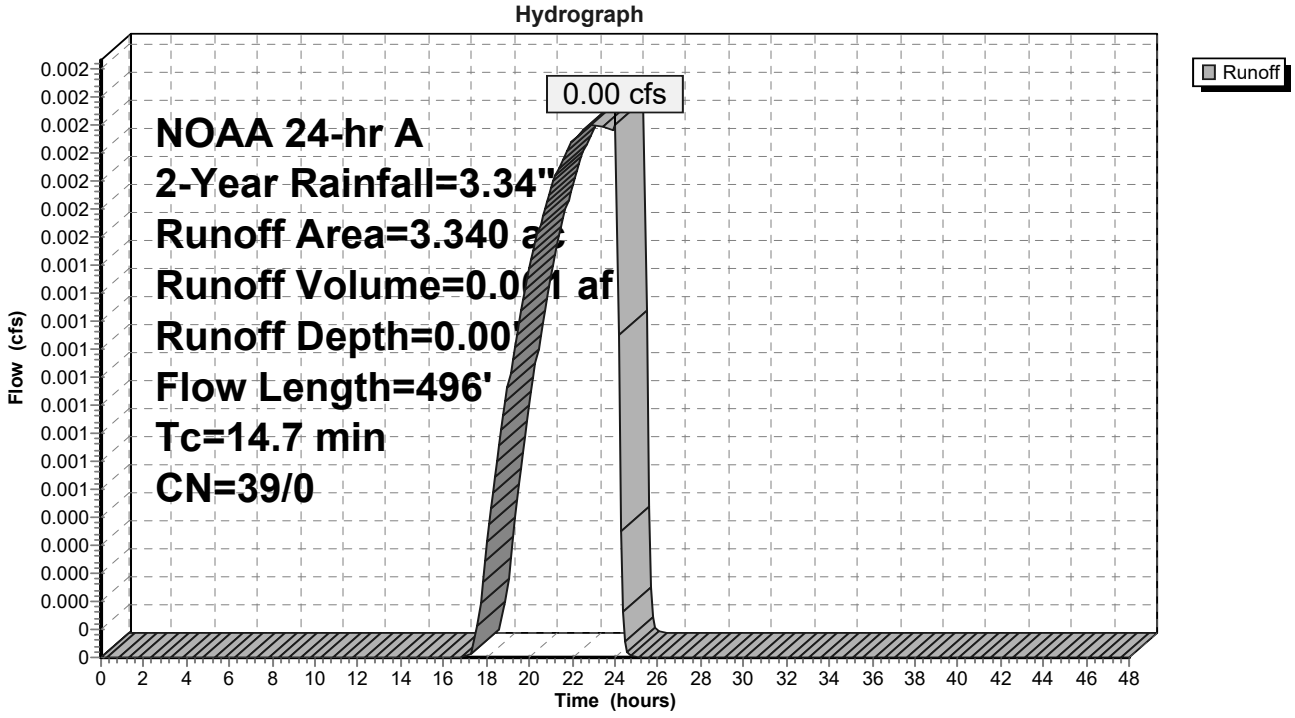
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

	Area (ac)	CN	Description
	1.900	30	Woods, Good, HSG A
	0.800	30	Meadow, non-grazed, HSG A
	0.080	78	Meadow, non-grazed, HSG D
*	0.560	77	Wetlands, HSG A
	3.340	39	Weighted Average
	3.340	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
6.1	446	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.7	496	Total			

Subcatchment MCEX-7B:



Summary for Subcatchment MCEX-7C:

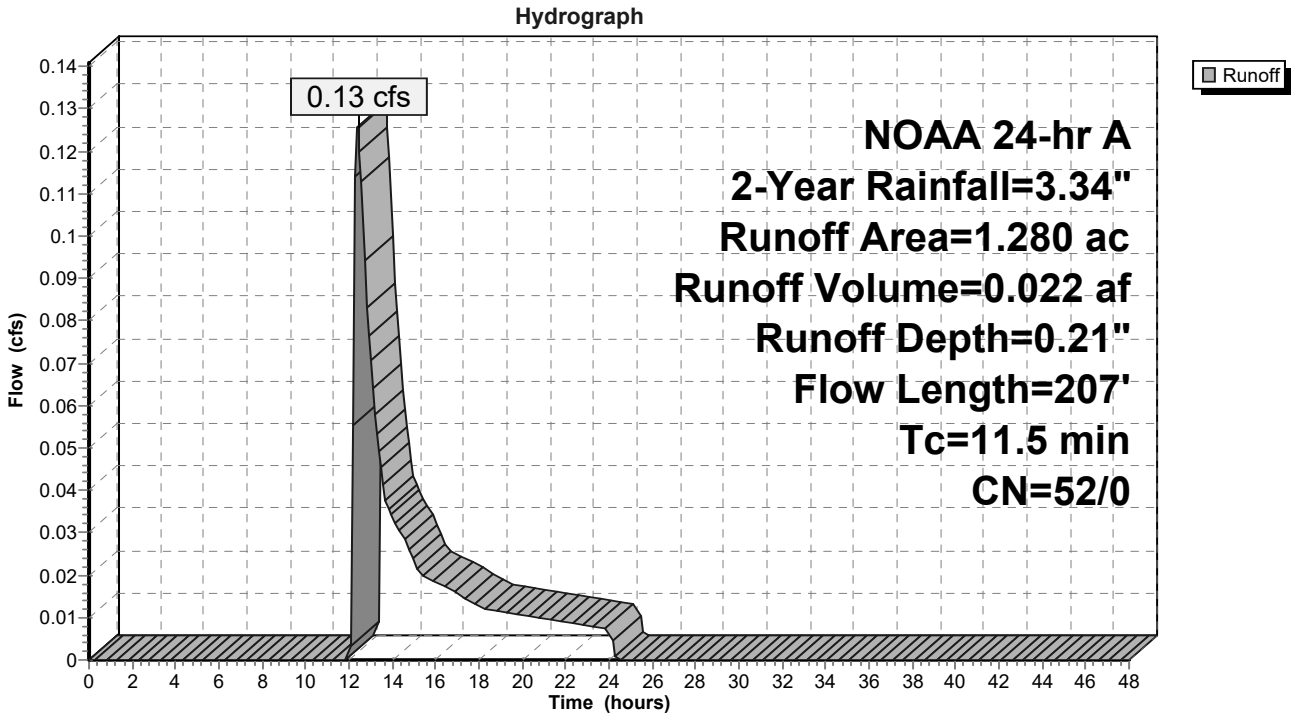
Runoff = 0.13 cfs @ 12.42 hrs, Volume= 0.022 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.660	30	Woods, Good, HSG A
0.050	96	Gravel surface, HSG A
0.060	96	Gravel surface, HSG C
0.430	70	Woods, Good, HSG C
0.080	71	Meadow, non-grazed, HSG C
1.280	52	Weighted Average
1.280	52	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.1	157	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.5	207	Total			

Subcatchment MCEX-7C:

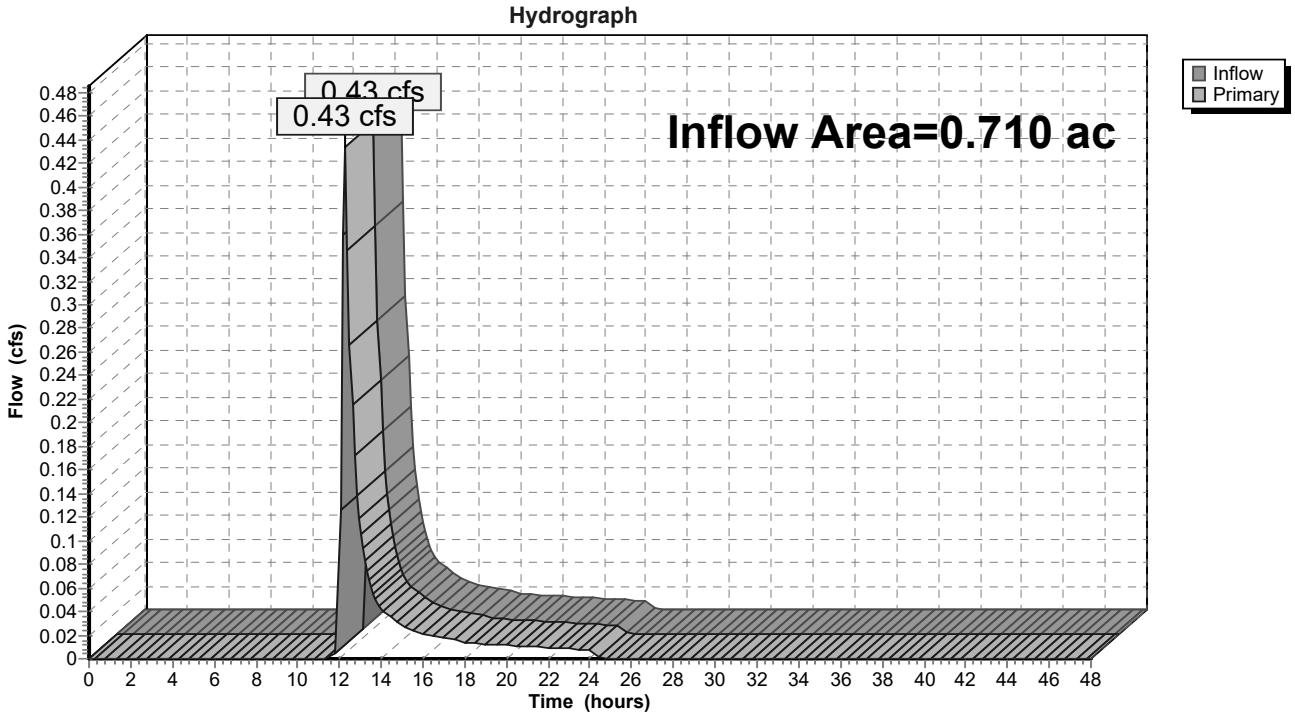


Summary for Link POA-1:

Inflow Area = 0.710 ac, 0.00% Impervious, Inflow Depth = 0.63" for 2-Year event
Inflow = 0.43 cfs @ 12.30 hrs, Volume= 0.037 af
Primary = 0.43 cfs @ 12.30 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-1:

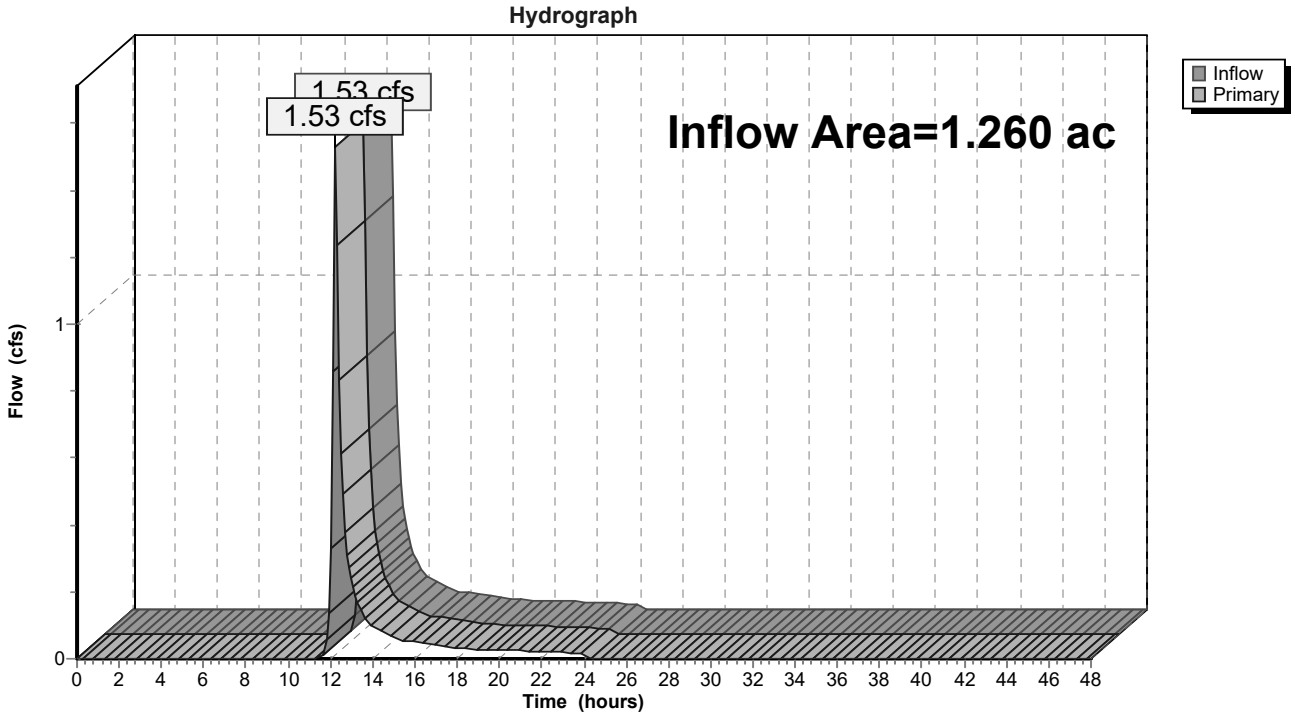


Summary for Link POA-2:

Inflow Area = 1.260 ac, 0.00% Impervious, Inflow Depth = 0.96" for 2-Year event
Inflow = 1.53 cfs @ 12.22 hrs, Volume= 0.101 af
Primary = 1.53 cfs @ 12.22 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-2:

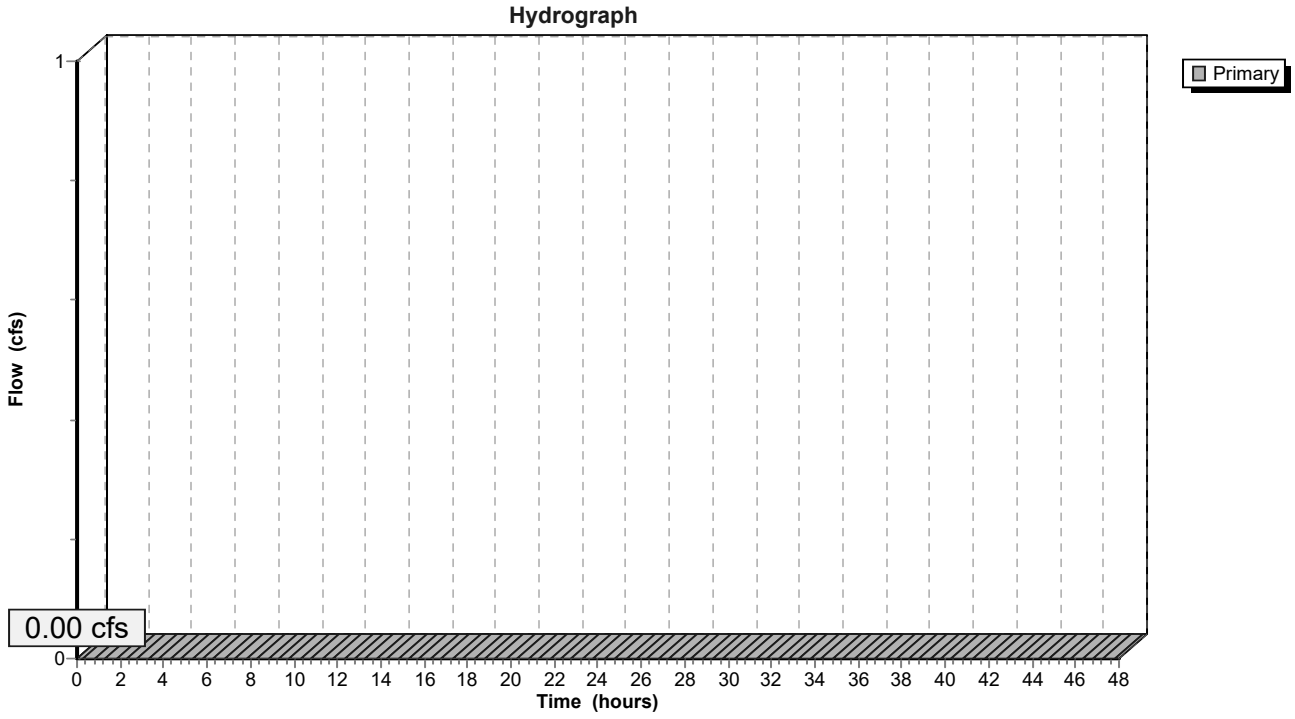


Summary for Link POA-3:

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-3:

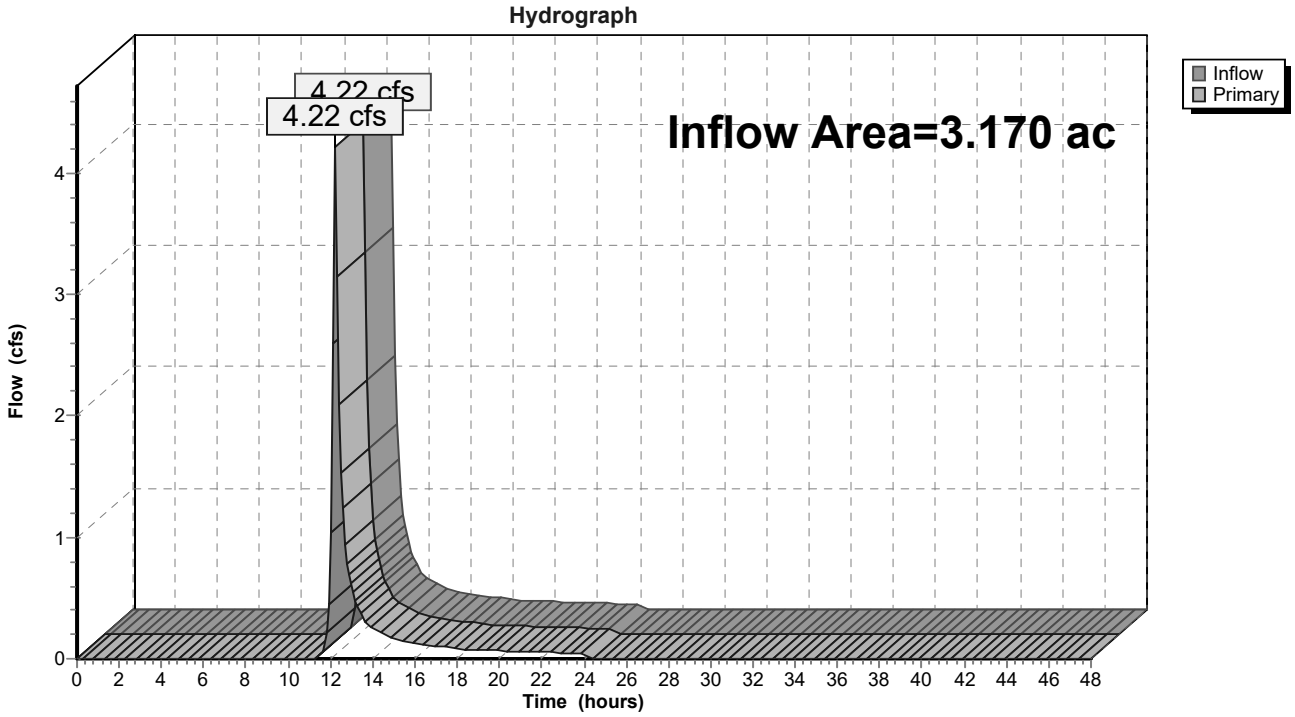


Summary for Link POA-4:

Inflow Area = 3.170 ac, 0.00% Impervious, Inflow Depth = 1.02" for 2-Year event
Inflow = 4.22 cfs @ 12.21 hrs, Volume= 0.269 af
Primary = 4.22 cfs @ 12.21 hrs, Volume= 0.269 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-4:

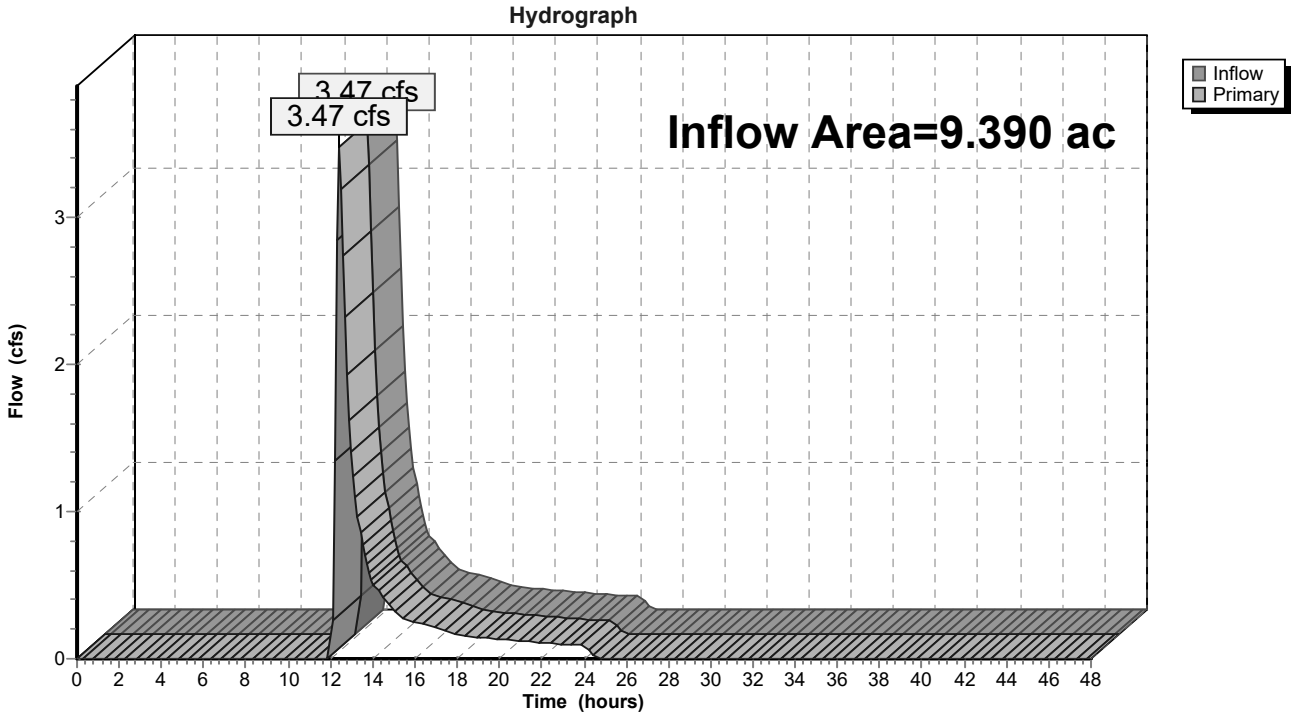


Summary for Link POA-5:

Inflow Area = 9.390 ac, 0.00% Impervious, Inflow Depth = 0.50" for 2-Year event
Inflow = 3.47 cfs @ 12.42 hrs, Volume= 0.393 af
Primary = 3.47 cfs @ 12.42 hrs, Volume= 0.393 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-5:

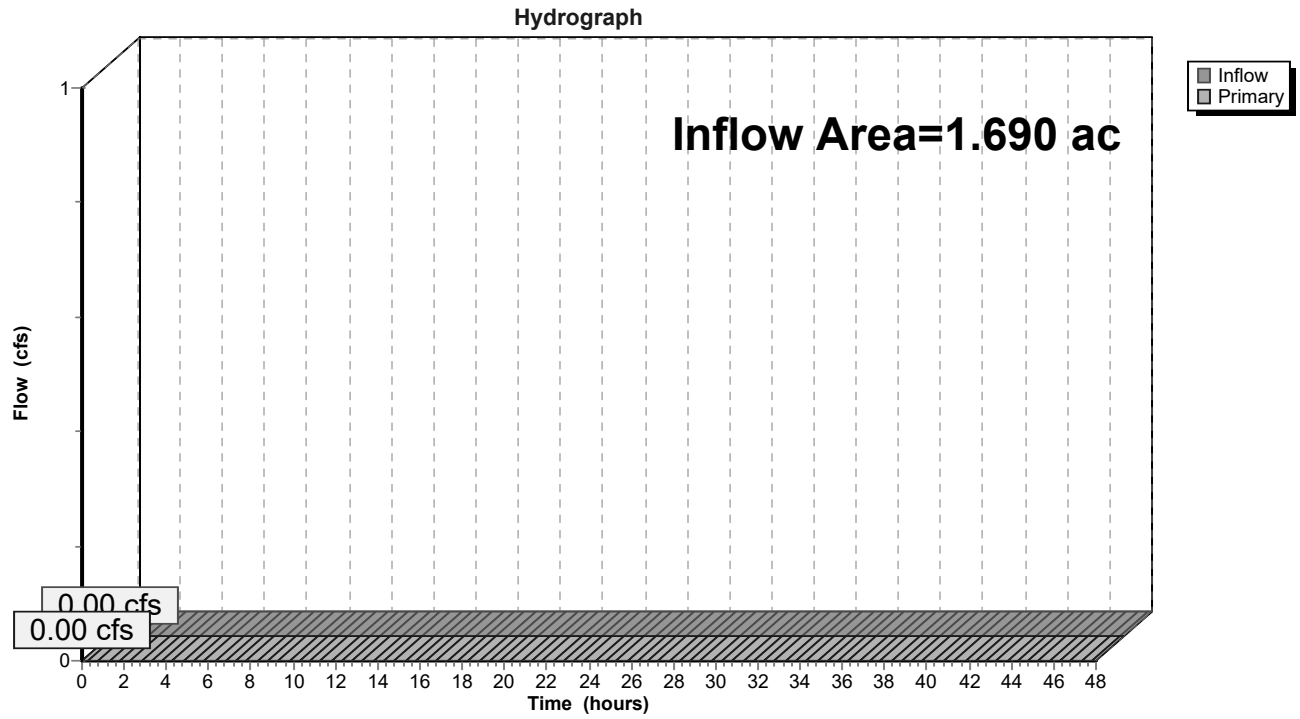


Summary for Link POA-6:

Inflow Area = 1.690 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-6:

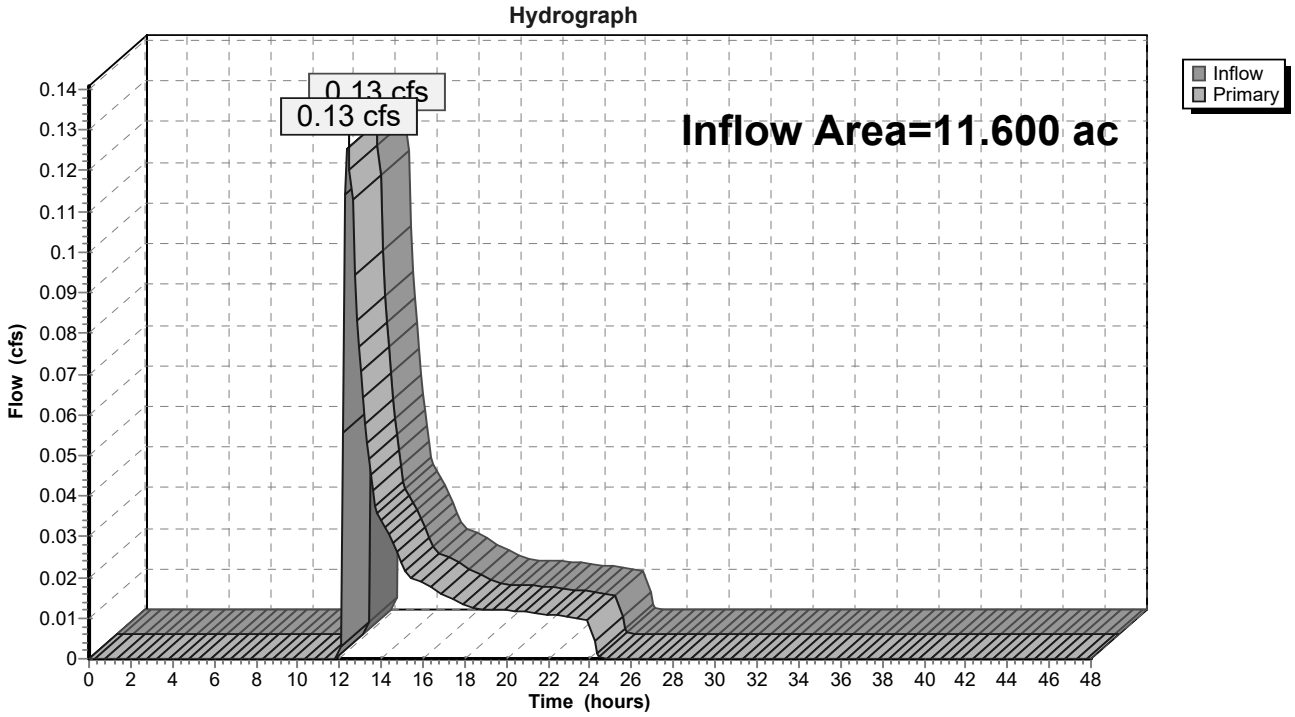


Summary for Link POA-7:

Inflow Area = 11.600 ac, 0.00% Impervious, Inflow Depth = 0.02" for 2-Year event
Inflow = 0.13 cfs @ 12.42 hrs, Volume= 0.023 af
Primary = 0.13 cfs @ 12.42 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-7:



Time span=0.00-48.00 hrs, dt=0.10 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment CCEX-7: Runoff Area=2.610 ac 0.00% Impervious Runoff Depth=0.21"
Flow Length=579' Tc=21.0 min CN=38/0 Runoff=0.18 cfs 0.046 af

Subcatchment MCEX-1: Runoff Area=0.710 ac 0.00% Impervious Runoff Depth=1.73"
Flow Length=303' Tc=15.3 min CN=64/0 Runoff=1.39 cfs 0.102 af

Subcatchment MCEX-2: Runoff Area=1.260 ac 0.00% Impervious Runoff Depth=2.29"
Flow Length=460' Tc=12.0 min CN=71/0 Runoff=3.82 cfs 0.241 af

Subcatchment MCEX-4: Runoff Area=3.170 ac 0.00% Impervious Runoff Depth=2.38"
Flow Length=485' Tc=11.1 min CN=72/0 Runoff=10.21 cfs 0.628 af

Subcatchment MCEX-5: Runoff Area=9.390 ac 0.00% Impervious Runoff Depth=1.51"
Flow Length=1,322' Tc=22.6 min CN=61/0 Runoff=13.12 cfs 1.181 af

Subcatchment MCEX-6: Runoff Area=1.690 ac 0.00% Impervious Runoff Depth=0.01"
Flow Length=525' Tc=15.1 min CN=30/0 Runoff=0.00 cfs 0.002 af

Subcatchment MCEX-7A: Runoff Area=4.370 ac 0.00% Impervious Runoff Depth=0.01"
Flow Length=810' Slope=0.0500 '/' Tc=19.9 min CN=30/0 Runoff=0.01 cfs 0.005 af

Subcatchment MCEX-7B: Runoff Area=3.340 ac 0.00% Impervious Runoff Depth=0.25"
Flow Length=496' Tc=14.7 min CN=39/0 Runoff=0.32 cfs 0.069 af

Subcatchment MCEX-7C: Runoff Area=1.280 ac 0.00% Impervious Runoff Depth=0.91"
Flow Length=207' Tc=11.5 min CN=52/0 Runoff=1.26 cfs 0.097 af

Link POA-1: Inflow=1.39 cfs 0.102 af
Primary=1.39 cfs 0.102 af

Link POA-2: Inflow=3.82 cfs 0.241 af
Primary=3.82 cfs 0.241 af

Link POA-3:
Primary=0.00 cfs 0.000 af

Link POA-4: Inflow=10.21 cfs 0.628 af
Primary=10.21 cfs 0.628 af

Link POA-5: Inflow=13.12 cfs 1.181 af
Primary=13.12 cfs 1.181 af

Link POA-6: Inflow=0.00 cfs 0.002 af
Primary=0.00 cfs 0.002 af

Link POA-7: Inflow=1.33 cfs 0.217 af
Primary=1.33 cfs 0.217 af

Total Runoff Area = 27.820 ac Runoff Volume = 2.371 af Average Runoff Depth = 1.02"
100.00% Pervious = 27.820 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment CCEX-7:

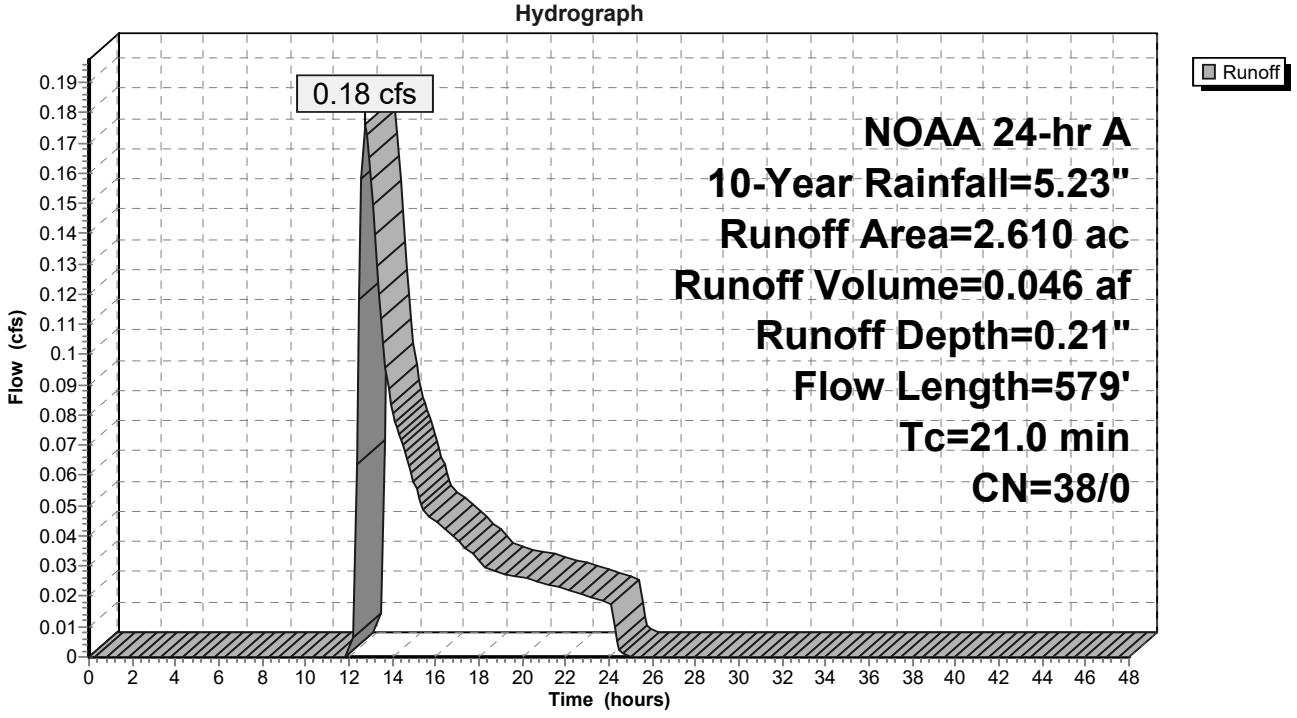
Runoff = 0.18 cfs @ 12.74 hrs, Volume= 0.046 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

	Area (ac)	CN	Description
	2.110	30	Woods, Good, HSG A
*	0.300	77	Wetlands, HSG A
	0.200	70	Woods, Good, HSG C
	2.610	38	Weighted Average
	2.610	38	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
13.9	529	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.0	579	Total			

Subcatchment CCEX-7:



Summary for Subcatchment MCEX-1:

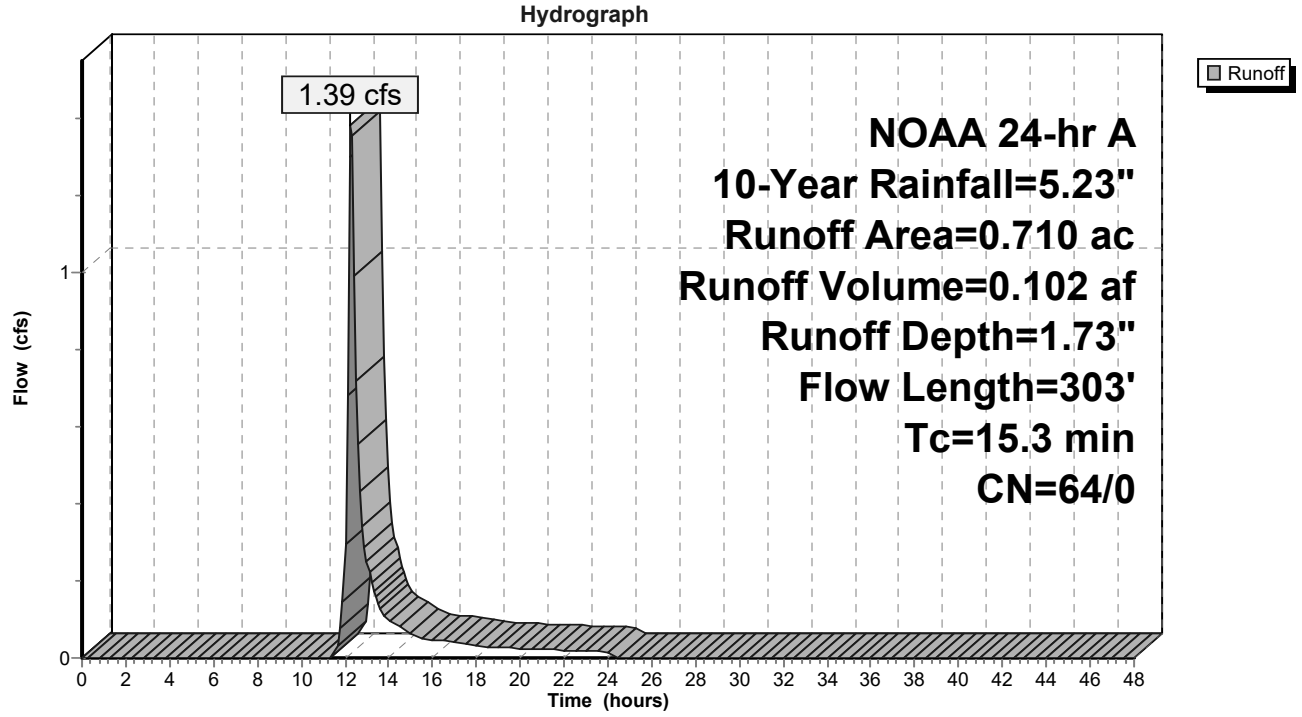
Runoff = 1.39 cfs @ 12.26 hrs, Volume= 0.102 af, Depth= 1.73"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.050	30	Woods, Good, HSG A
0.150	30	Meadow, non-grazed, HSG A
0.200	77	Woods, Good, HSG D
0.210	78	Meadow, non-grazed, HSG D
0.100	80	>75% Grass cover, Good, HSG D
0.710	64	Weighted Average
0.710	64	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.7	253	0.0320	0.89		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.3	303	Total			

Subcatchment MCEX-1:



Summary for Subcatchment MCEX-2:

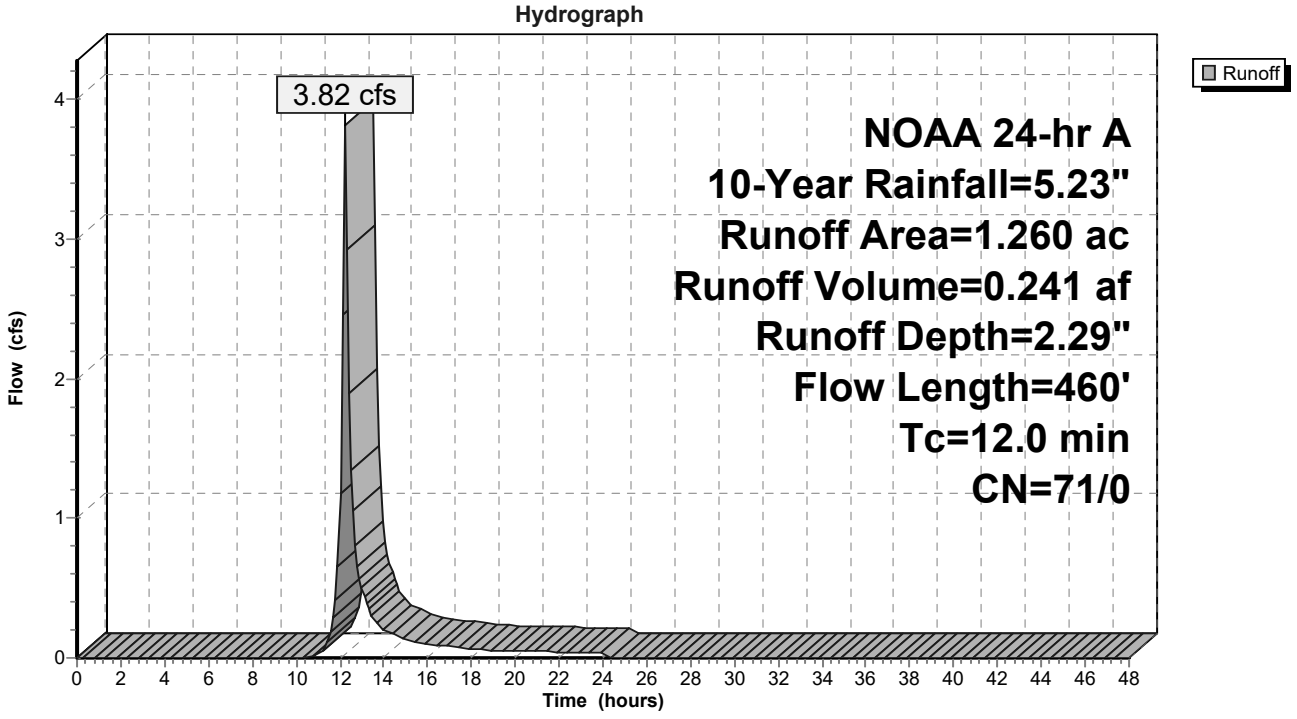
Runoff = 3.82 cfs @ 12.21 hrs, Volume= 0.241 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
1.160	70	Woods, Good, HSG C
0.040	96	Gravel surface, HSG C
0.060	71	Meadow, non-grazed, HSG C
1.260	71	Weighted Average
1.260	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
5.5	410	0.0320	1.25		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.0	460	Total			

Subcatchment MCEX-2:



Summary for Subcatchment MCEX-4:

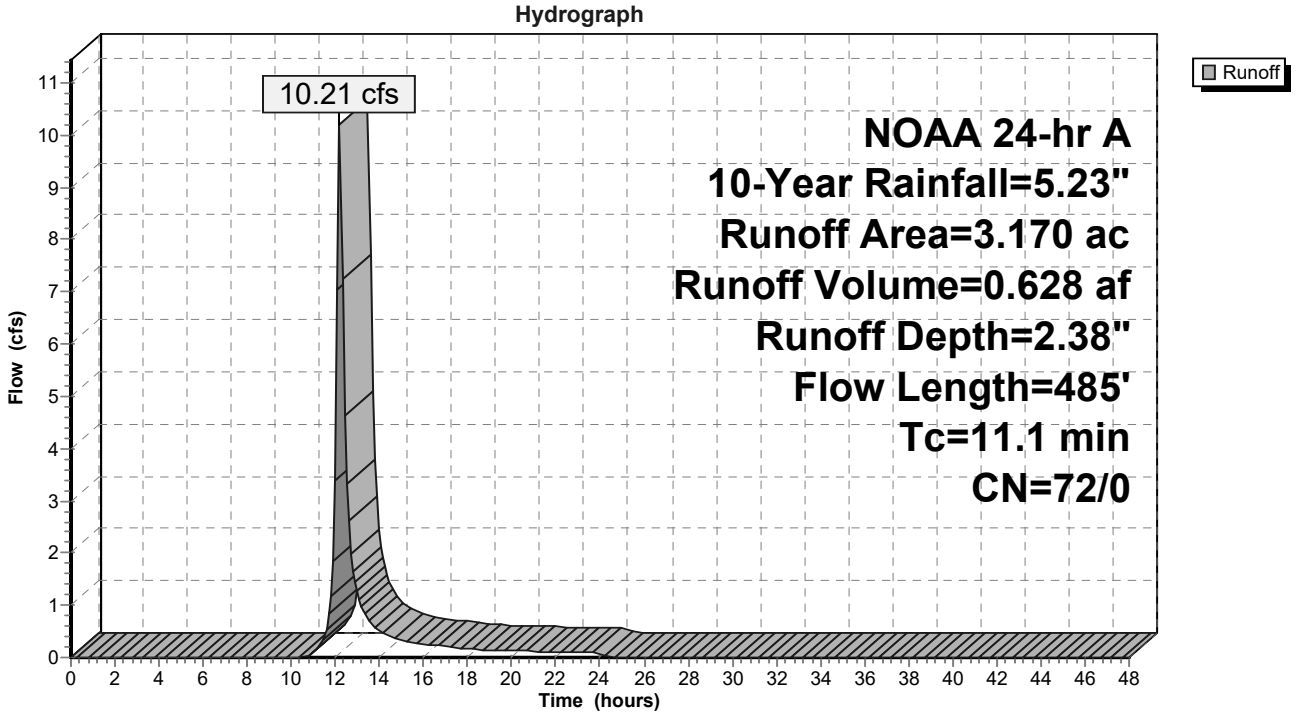
Runoff = 10.21 cfs @ 12.20 hrs, Volume= 0.628 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
2.280	70	Woods, Good, HSG C
0.060	96	Gravel surface, HSG C
0.120	71	Meadow, non-grazed, HSG C
0.410	77	Woods, Good, HSG D
0.290	78	Meadow, non-grazed, HSG D
0.010	96	Gravel surface, HSG D
3.170	72	Weighted Average
3.170	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.0	435	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.1	485	Total			

Subcatchment MCEX-4:



Summary for Subcatchment MCEX-5:

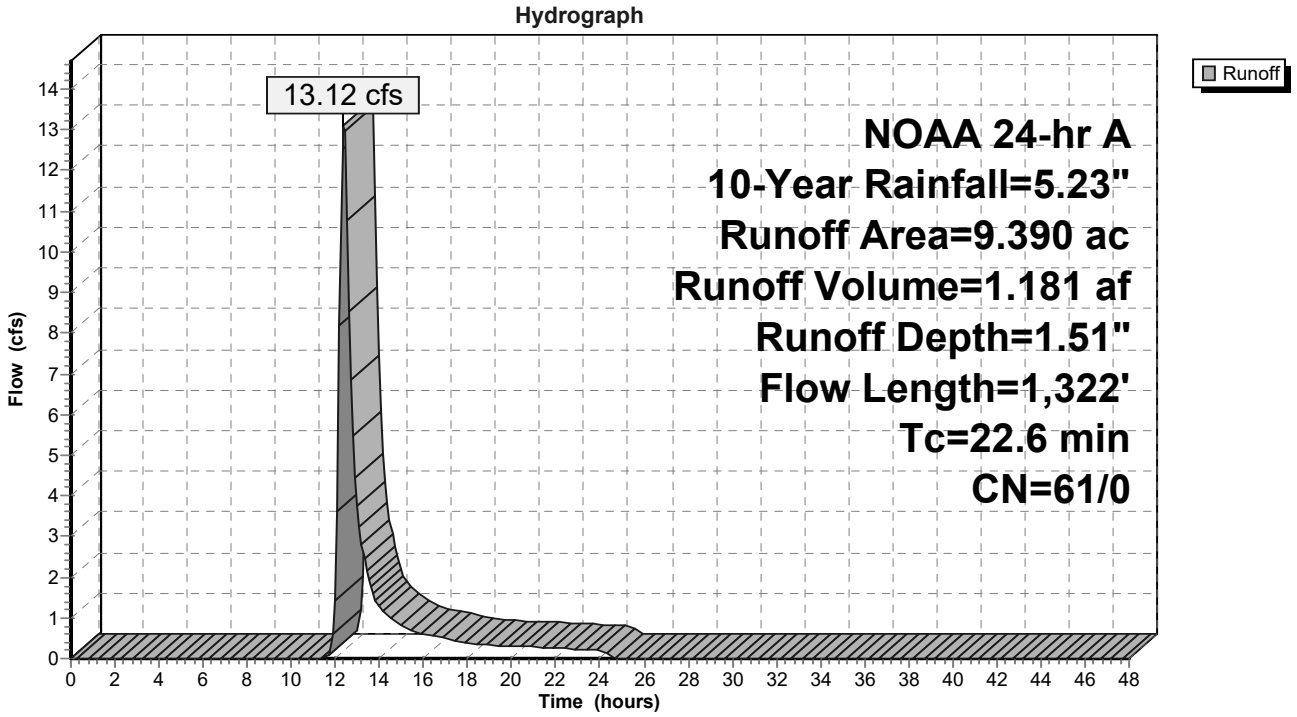
Runoff = 13.12 cfs @ 12.37 hrs, Volume= 1.181 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

	Area (ac)	CN	Description
*	0.950	77	Wetlands, HSG A
	2.520	30	Woods, Good, HSG A
	0.100	96	Gravel surface, HSG A
	0.080	30	Meadow, non-grazed, HSG A
	0.550	71	Meadow, non-grazed, HSG C
	0.200	96	Gravel surface, HSG C
	4.870	70	Woods, Good, HSG C
*	0.120	77	Wetlands, HSG C
	9.390	61	Weighted Average
	9.390	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.0	270	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	555	0.0450	3.42		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
9.4	447	0.0250	0.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.6	1,322	Total			

Subcatchment MCEX-5:



Summary for Subcatchment MCEX-6:

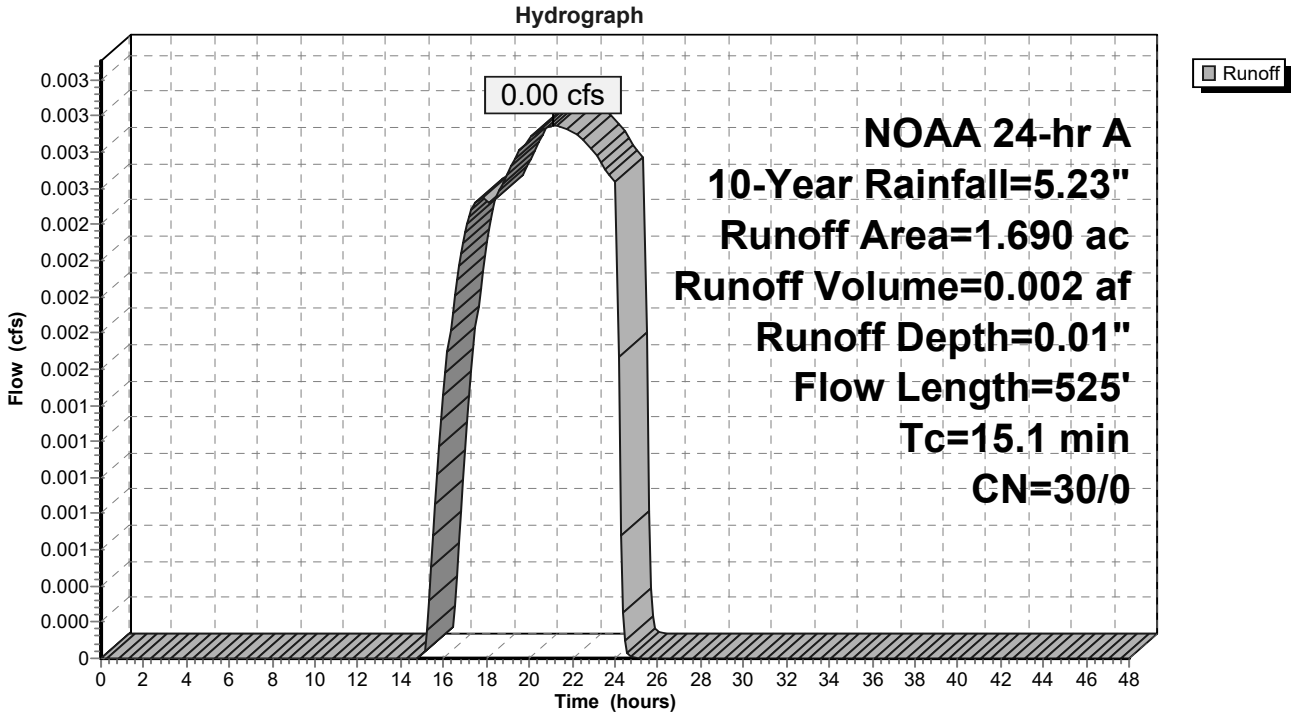
Runoff = 0.00 cfs @ 21.13 hrs, Volume= 0.002 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
1.690	30	Woods, Good, HSG A
1.690	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
5.7	475	0.0760	1.38		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.1	525	Total			

Subcatchment MCEX-6:



Summary for Subcatchment MCEX-7A:

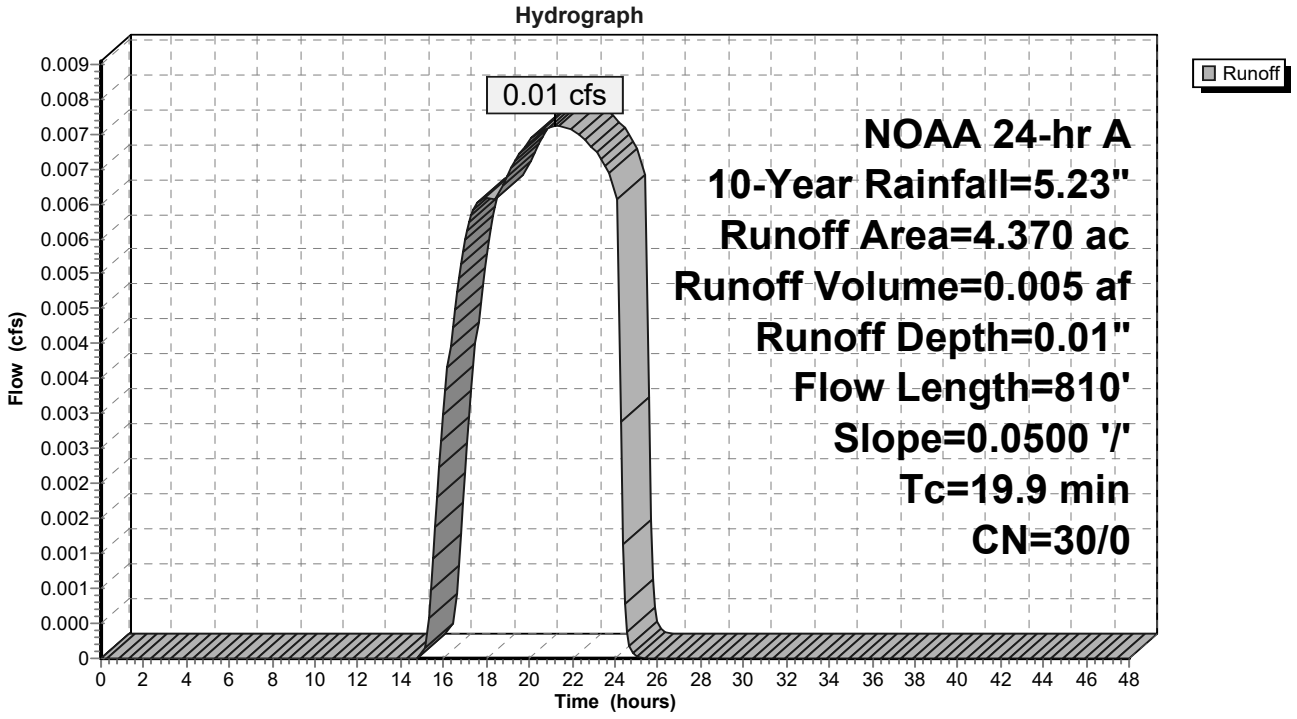
Runoff = 0.01 cfs @ 21.21 hrs, Volume= 0.005 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

	Area (ac)	CN	Description
	4.330	30	Woods, Good, HSG A
*	0.040	77	Wetlands, HSG A
	4.370	30	Weighted Average
	4.370	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
11.3	760	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.9	810	Total			

Subcatchment MCEX-7A:



Summary for Subcatchment MCEX-7B:

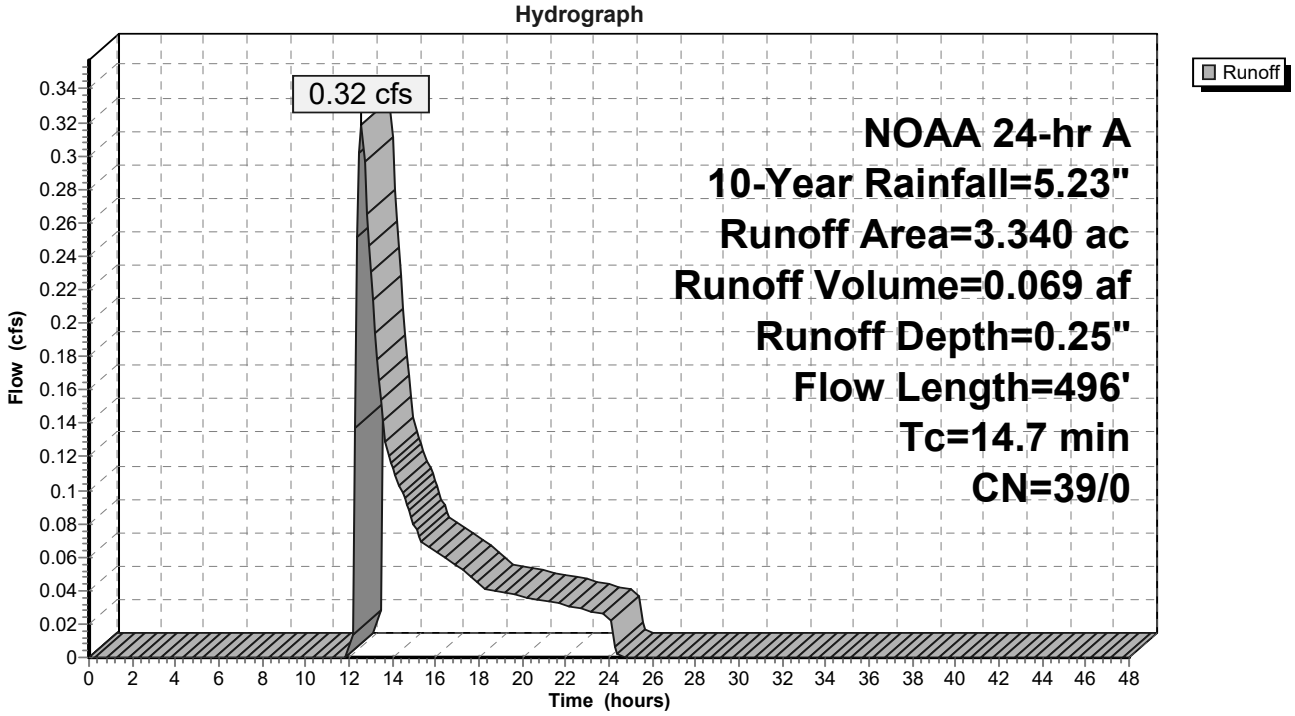
Runoff = 0.32 cfs @ 12.59 hrs, Volume= 0.069 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

	Area (ac)	CN	Description
	1.900	30	Woods, Good, HSG A
	0.800	30	Meadow, non-grazed, HSG A
	0.080	78	Meadow, non-grazed, HSG D
*	0.560	77	Wetlands, HSG A
	3.340	39	Weighted Average
	3.340	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
6.1	446	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.7	496	Total			

Subcatchment MCEX-7B:



Summary for Subcatchment MCEX-7C:

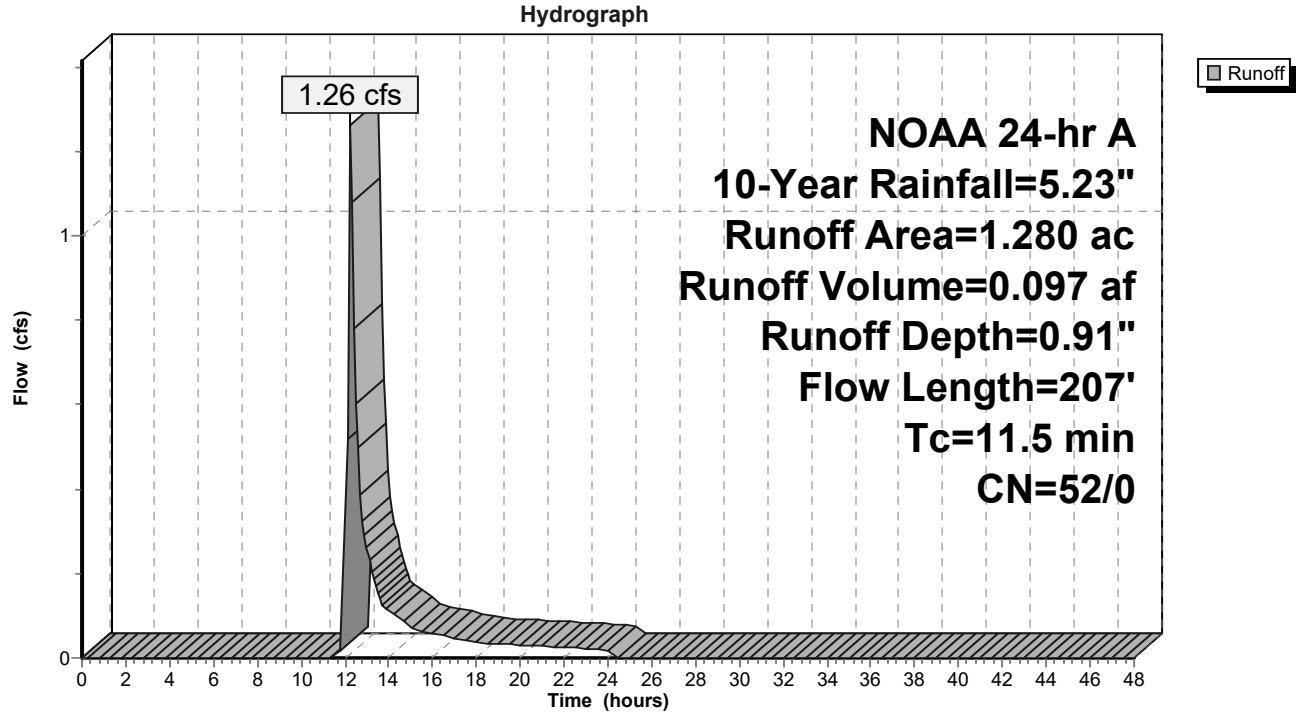
Runoff = 1.26 cfs @ 12.23 hrs, Volume= 0.097 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.660	30	Woods, Good, HSG A
0.050	96	Gravel surface, HSG A
0.060	96	Gravel surface, HSG C
0.430	70	Woods, Good, HSG C
0.080	71	Meadow, non-grazed, HSG C
1.280	52	Weighted Average
1.280	52	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.1	157	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.5	207	Total			

Subcatchment MCEX-7C:

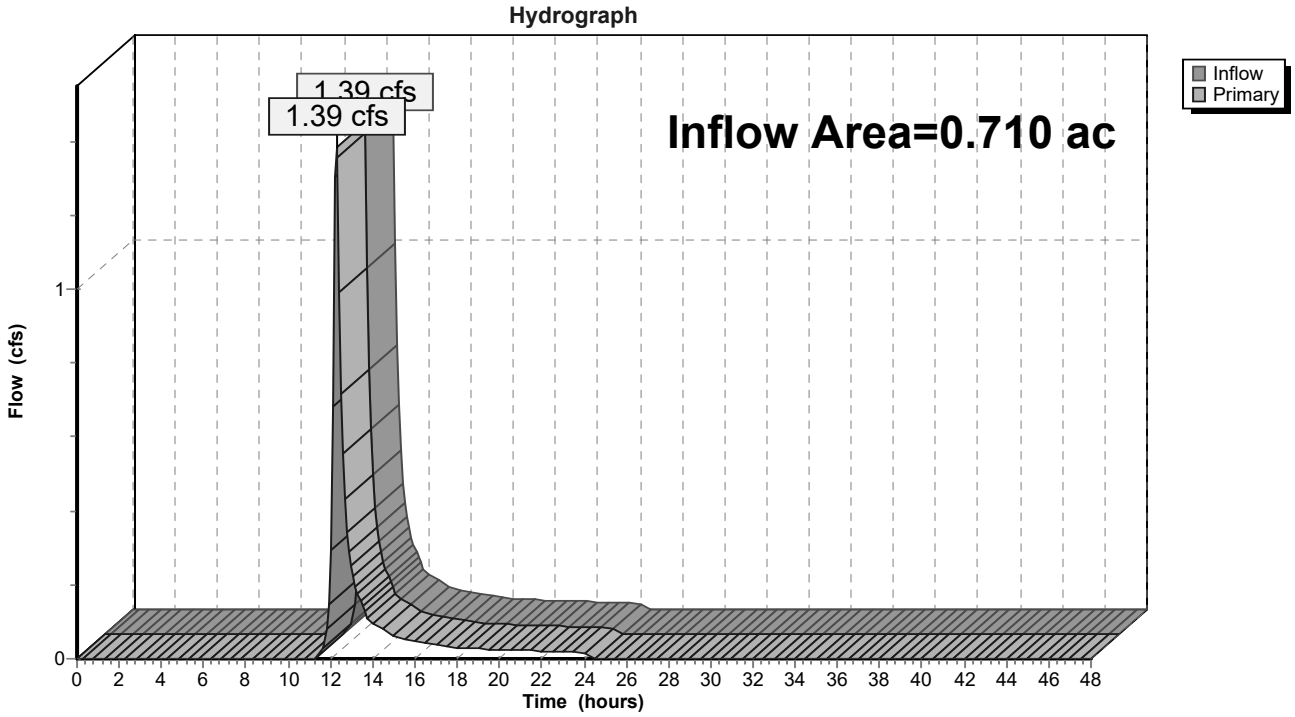


Summary for Link POA-1:

Inflow Area = 0.710 ac, 0.00% Impervious, Inflow Depth = 1.73" for 10-Year event
Inflow = 1.39 cfs @ 12.26 hrs, Volume= 0.102 af
Primary = 1.39 cfs @ 12.26 hrs, Volume= 0.102 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-1:

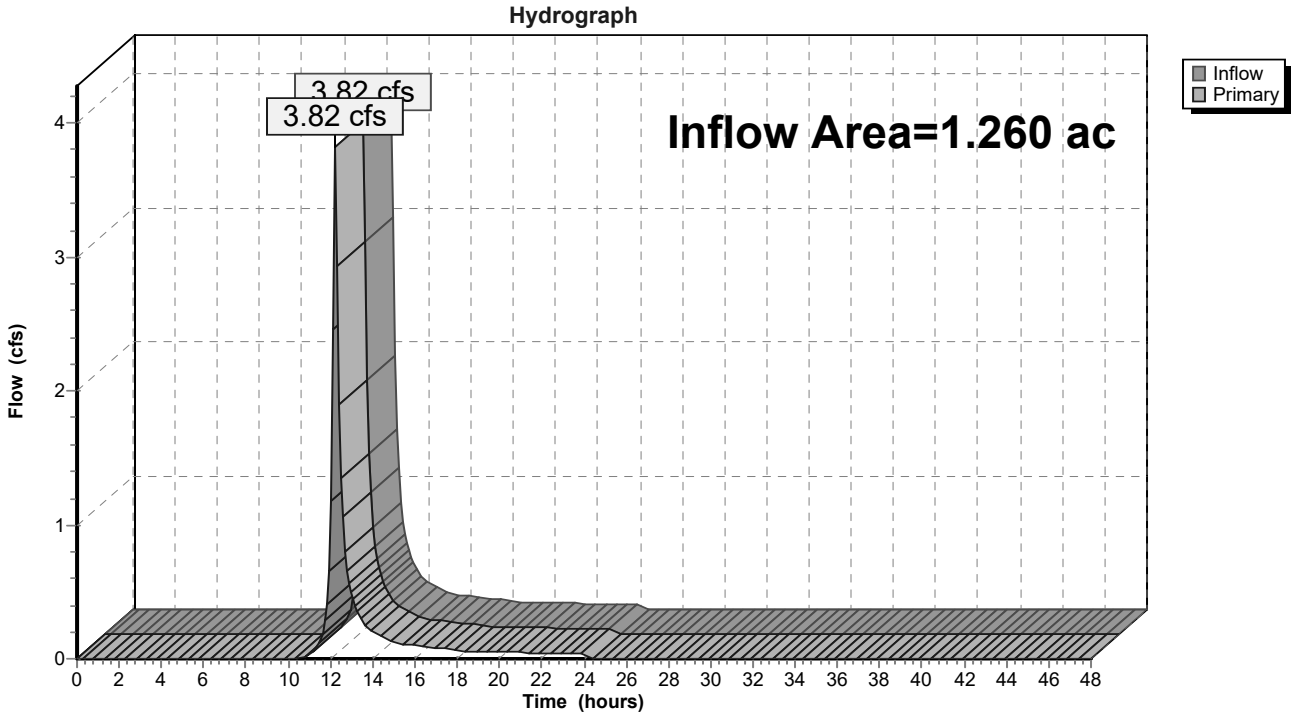


Summary for Link POA-2:

Inflow Area = 1.260 ac, 0.00% Impervious, Inflow Depth = 2.29" for 10-Year event
Inflow = 3.82 cfs @ 12.21 hrs, Volume= 0.241 af
Primary = 3.82 cfs @ 12.21 hrs, Volume= 0.241 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-2:

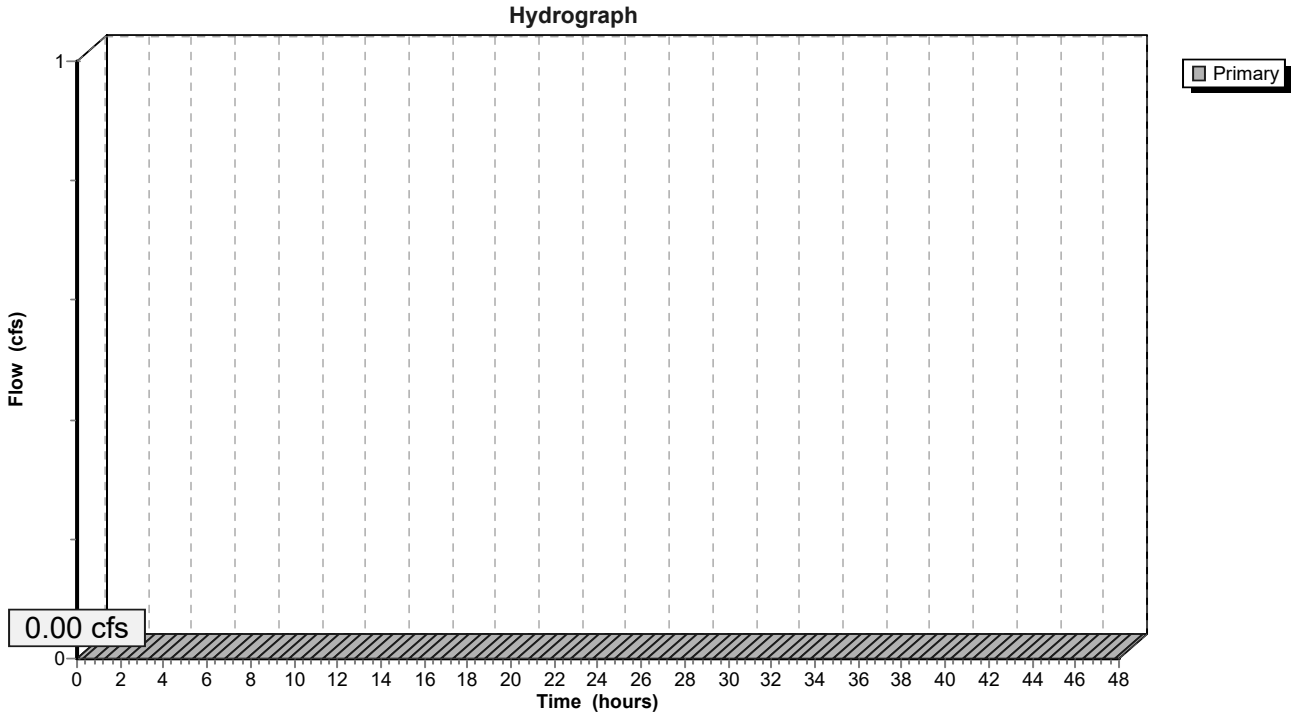


Summary for Link POA-3:

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-3:

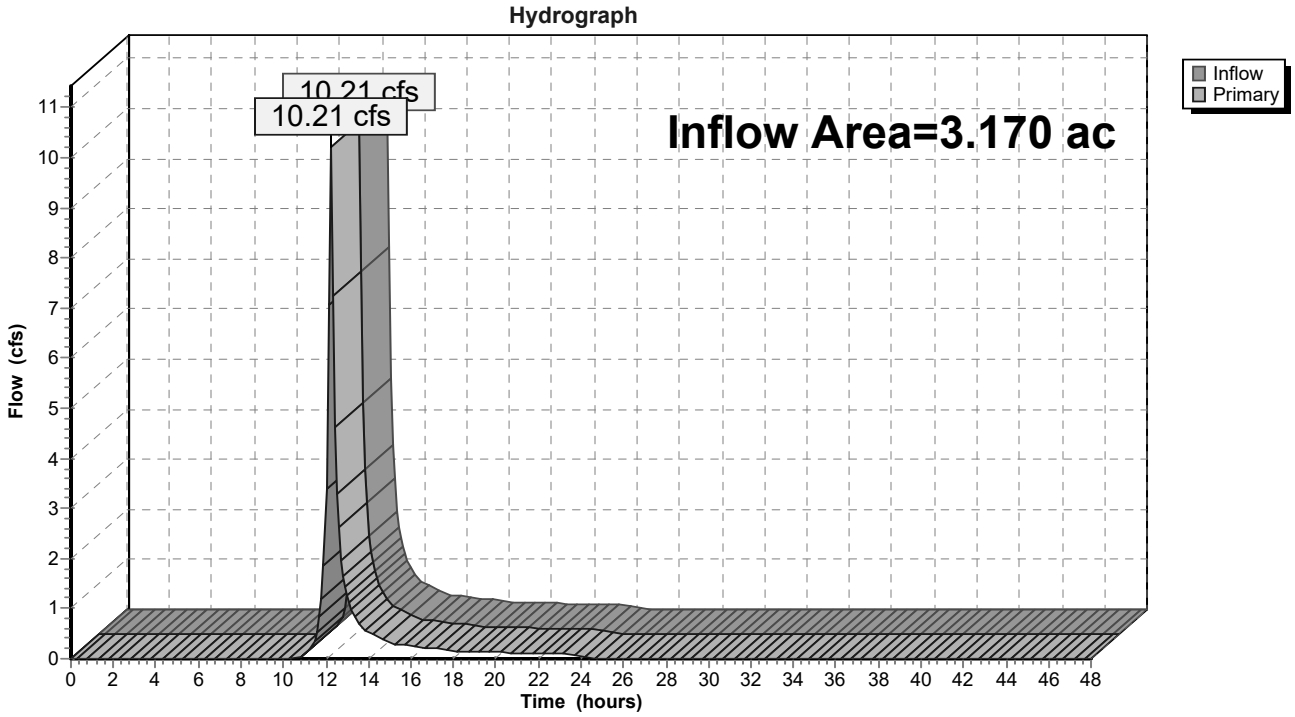


Summary for Link POA-4:

Inflow Area = 3.170 ac, 0.00% Impervious, Inflow Depth = 2.38" for 10-Year event
Inflow = 10.21 cfs @ 12.20 hrs, Volume= 0.628 af
Primary = 10.21 cfs @ 12.20 hrs, Volume= 0.628 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-4:

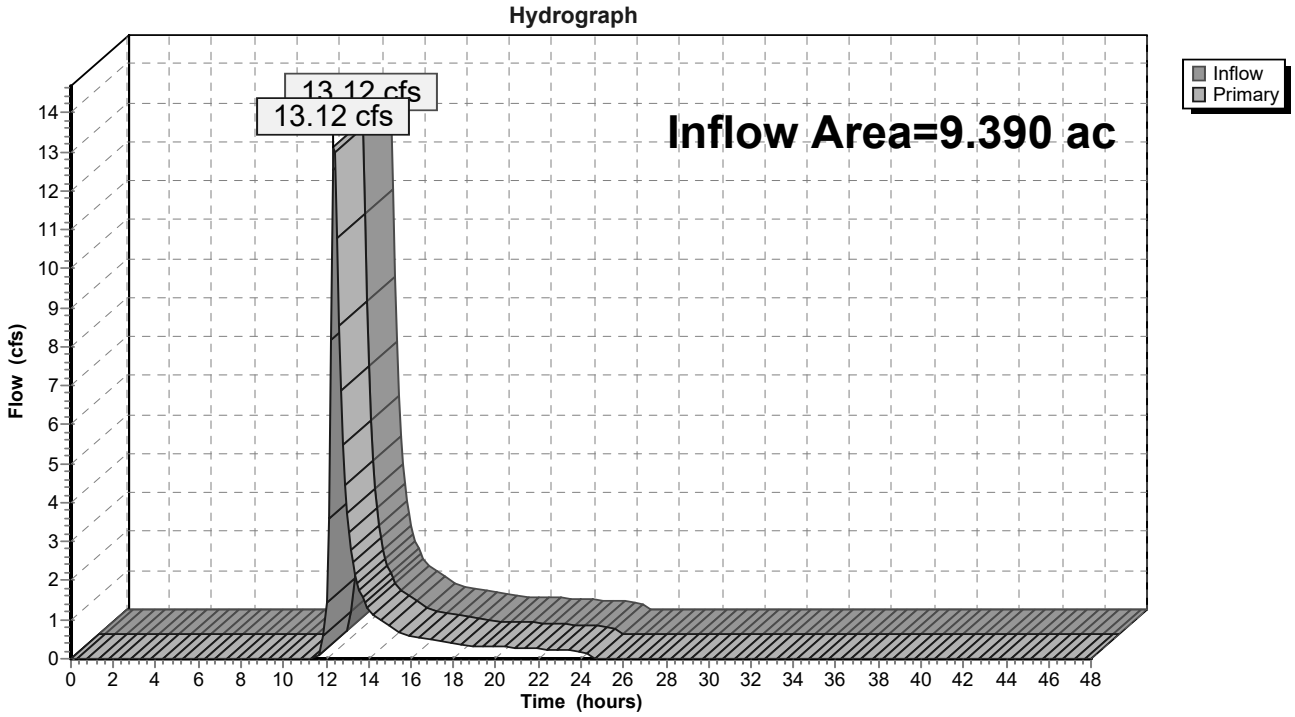


Summary for Link POA-5:

Inflow Area = 9.390 ac, 0.00% Impervious, Inflow Depth = 1.51" for 10-Year event
Inflow = 13.12 cfs @ 12.37 hrs, Volume= 1.181 af
Primary = 13.12 cfs @ 12.37 hrs, Volume= 1.181 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-5:

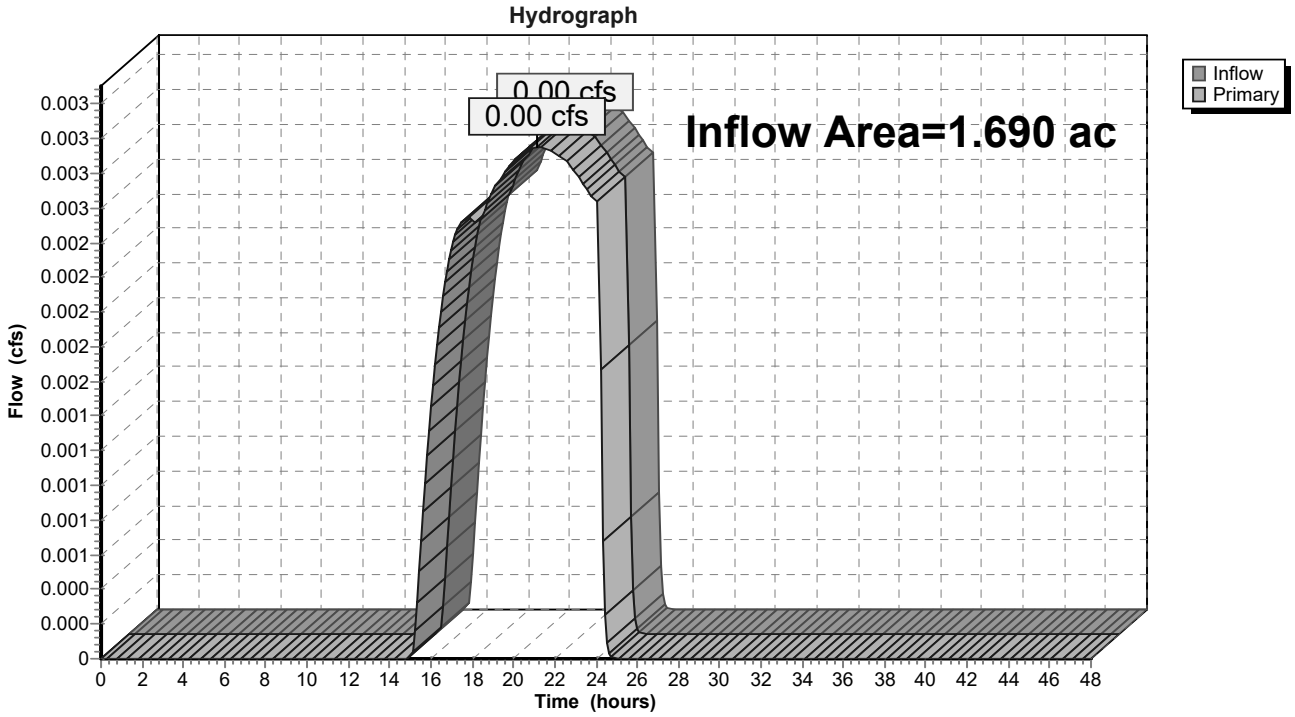


Summary for Link POA-6:

Inflow Area = 1.690 ac, 0.00% Impervious, Inflow Depth = 0.01" for 10-Year event
Inflow = 0.00 cfs @ 21.13 hrs, Volume= 0.002 af
Primary = 0.00 cfs @ 21.13 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-6:

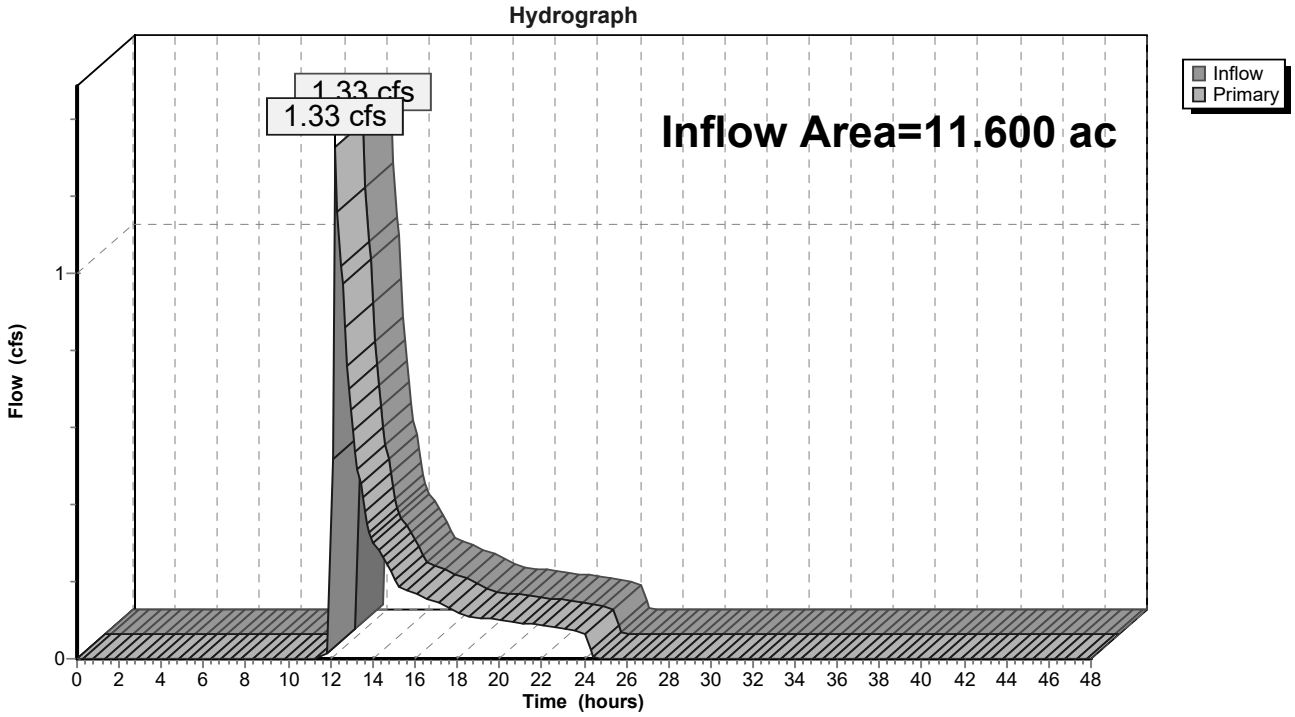


Summary for Link POA-7:

Inflow Area = 11.600 ac, 0.00% Impervious, Inflow Depth = 0.22" for 10-Year event
Inflow = 1.33 cfs @ 12.25 hrs, Volume= 0.217 af
Primary = 1.33 cfs @ 12.25 hrs, Volume= 0.217 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-7:



Time span=0.00-48.00 hrs, dt=0.10 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment CCEX-7: Runoff Area=2.610 ac 0.00% Impervious Runoff Depth=1.16"
Flow Length=579' Tc=21.0 min CN=38/0 Runoff=2.22 cfs 0.252 af

Subcatchment MCEX-1: Runoff Area=0.710 ac 0.00% Impervious Runoff Depth=3.97"
Flow Length=303' Tc=15.3 min CN=64/0 Runoff=3.34 cfs 0.235 af

Subcatchment MCEX-2: Runoff Area=1.260 ac 0.00% Impervious Runoff Depth=4.78"
Flow Length=460' Tc=12.0 min CN=71/0 Runoff=7.96 cfs 0.502 af

Subcatchment MCEX-4: Runoff Area=3.170 ac 0.00% Impervious Runoff Depth=4.90"
Flow Length=485' Tc=11.1 min CN=72/0 Runoff=20.91 cfs 1.294 af

Subcatchment MCEX-5: Runoff Area=9.390 ac 0.00% Impervious Runoff Depth=3.62"
Flow Length=1,322' Tc=22.6 min CN=61/0 Runoff=33.97 cfs 2.833 af

Subcatchment MCEX-6: Runoff Area=1.690 ac 0.00% Impervious Runoff Depth=0.47"
Flow Length=525' Tc=15.1 min CN=30/0 Runoff=0.34 cfs 0.066 af

Subcatchment MCEX-7A: Runoff Area=4.370 ac 0.00% Impervious Runoff Depth=0.47"
Flow Length=810' Slope=0.0500 '/' Tc=19.9 min CN=30/0 Runoff=0.84 cfs 0.172 af

Subcatchment MCEX-7B: Runoff Area=3.340 ac 0.00% Impervious Runoff Depth=1.25"
Flow Length=496' Tc=14.7 min CN=39/0 Runoff=3.77 cfs 0.349 af

Subcatchment MCEX-7C: Runoff Area=1.280 ac 0.00% Impervious Runoff Depth=2.61"
Flow Length=207' Tc=11.5 min CN=52/0 Runoff=4.34 cfs 0.278 af

Link POA-1: Inflow=3.34 cfs 0.235 af
Primary=3.34 cfs 0.235 af

Link POA-2: Inflow=7.96 cfs 0.502 af
Primary=7.96 cfs 0.502 af

Link POA-3:
Primary=0.00 cfs 0.000 af

Link POA-4: Inflow=20.91 cfs 1.294 af
Primary=20.91 cfs 1.294 af

Link POA-5: Inflow=33.97 cfs 2.833 af
Primary=33.97 cfs 2.833 af

Link POA-6: Inflow=0.34 cfs 0.066 af
Primary=0.34 cfs 0.066 af

Link POA-7: Inflow=9.33 cfs 1.052 af
Primary=9.33 cfs 1.052 af

Total Runoff Area = 27.820 ac Runoff Volume = 5.982 af Average Runoff Depth = 2.58"
100.00% Pervious = 27.820 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment CCEX-7:

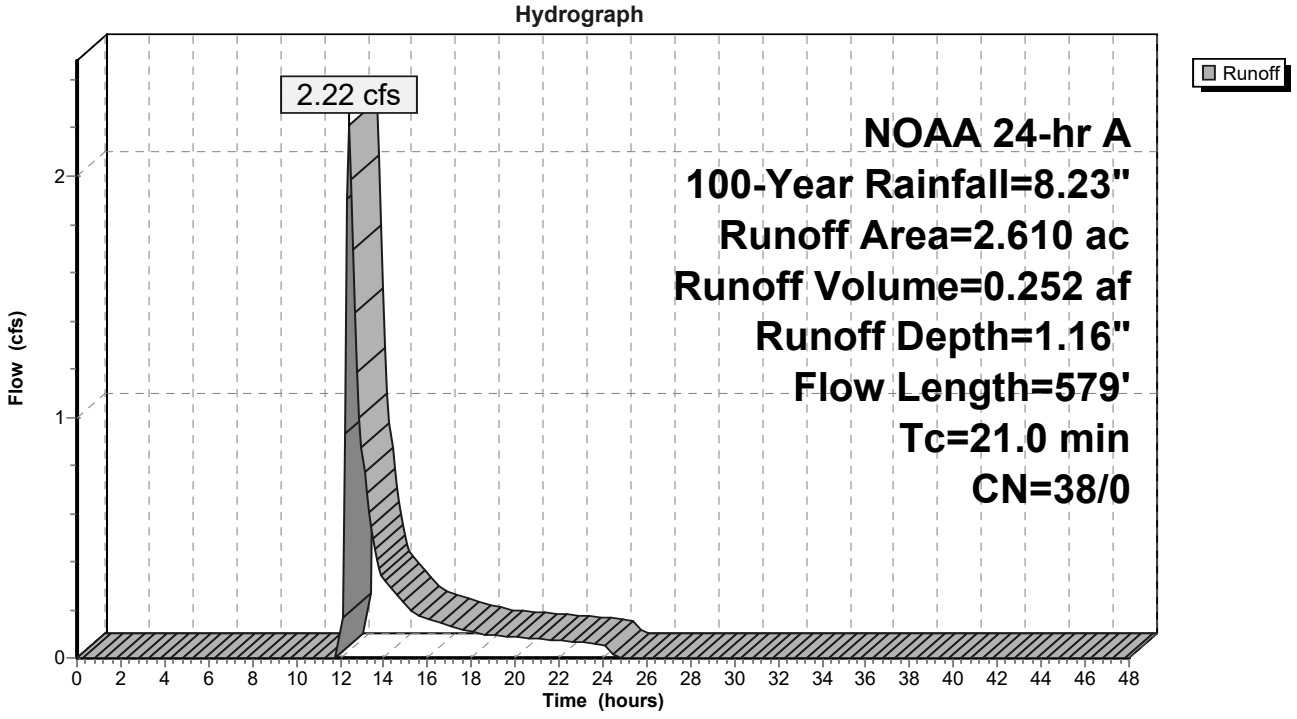
Runoff = 2.22 cfs @ 12.41 hrs, Volume= 0.252 af, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

	Area (ac)	CN	Description
	2.110	30	Woods, Good, HSG A
*	0.300	77	Wetlands, HSG A
	0.200	70	Woods, Good, HSG C
	2.610	38	Weighted Average
	2.610	38	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
13.9	529	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.0	579	Total			

Subcatchment CCEX-7:



Summary for Subcatchment MCEX-1:

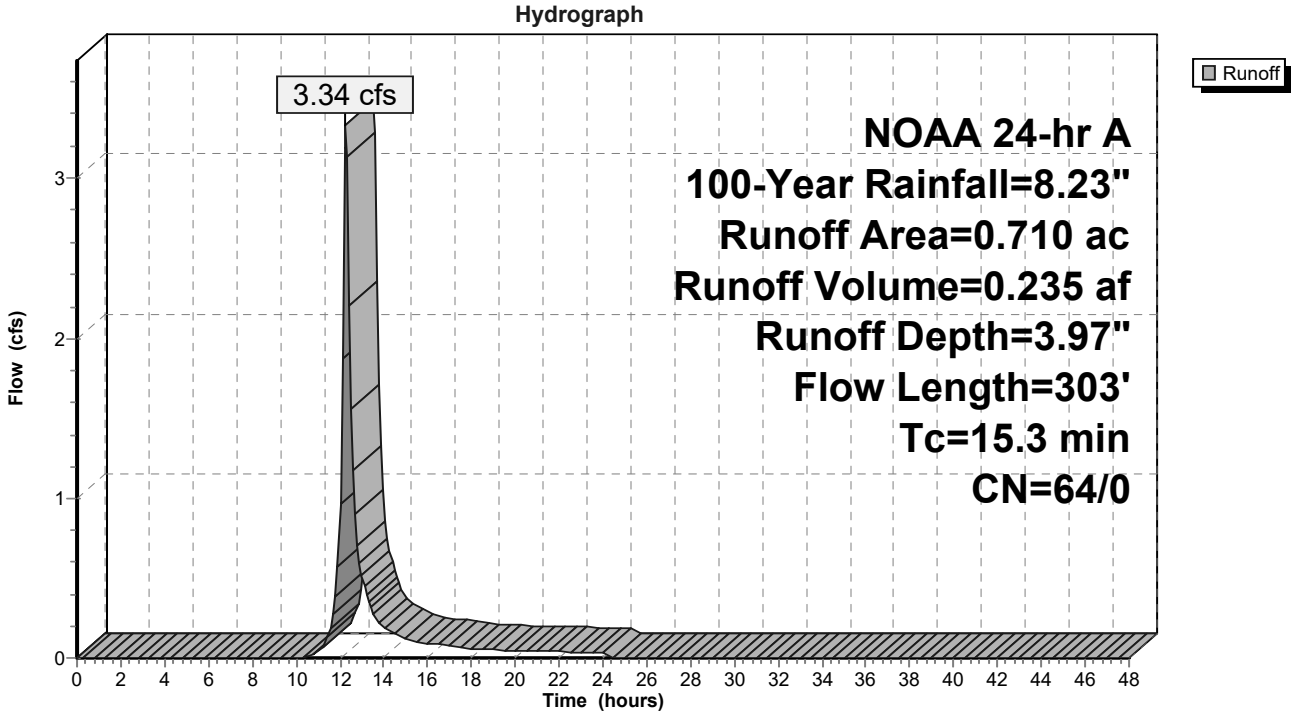
Runoff = 3.34 cfs @ 12.25 hrs, Volume= 0.235 af, Depth= 3.97"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.050	30	Woods, Good, HSG A
0.150	30	Meadow, non-grazed, HSG A
0.200	77	Woods, Good, HSG D
0.210	78	Meadow, non-grazed, HSG D
0.100	80	>75% Grass cover, Good, HSG D
0.710	64	Weighted Average
0.710	64	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.7	253	0.0320	0.89		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.3	303	Total			

Subcatchment MCEX-1:



Summary for Subcatchment MCEX-2:

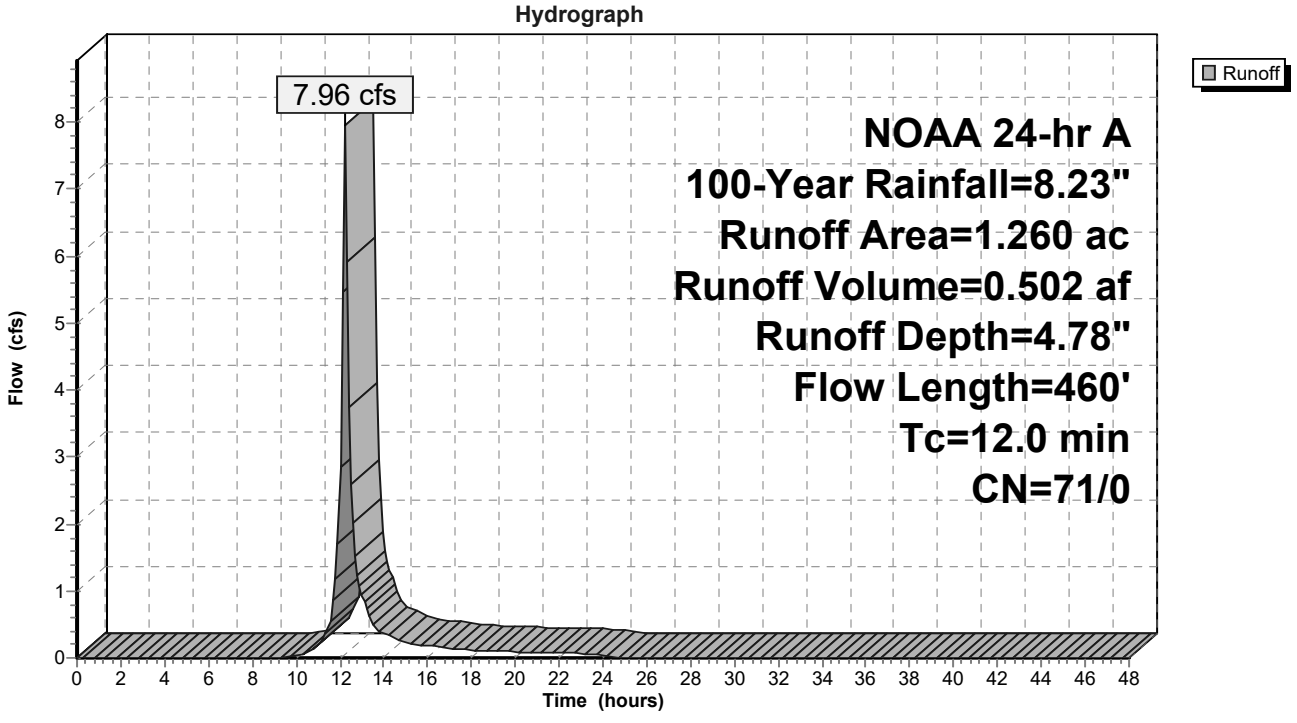
Runoff = 7.96 cfs @ 12.20 hrs, Volume= 0.502 af, Depth= 4.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
1.160	70	Woods, Good, HSG C
0.040	96	Gravel surface, HSG C
0.060	71	Meadow, non-grazed, HSG C
1.260	71	Weighted Average
1.260	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
5.5	410	0.0320	1.25		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.0	460	Total			

Subcatchment MCEX-2:



Summary for Subcatchment MCEX-4:

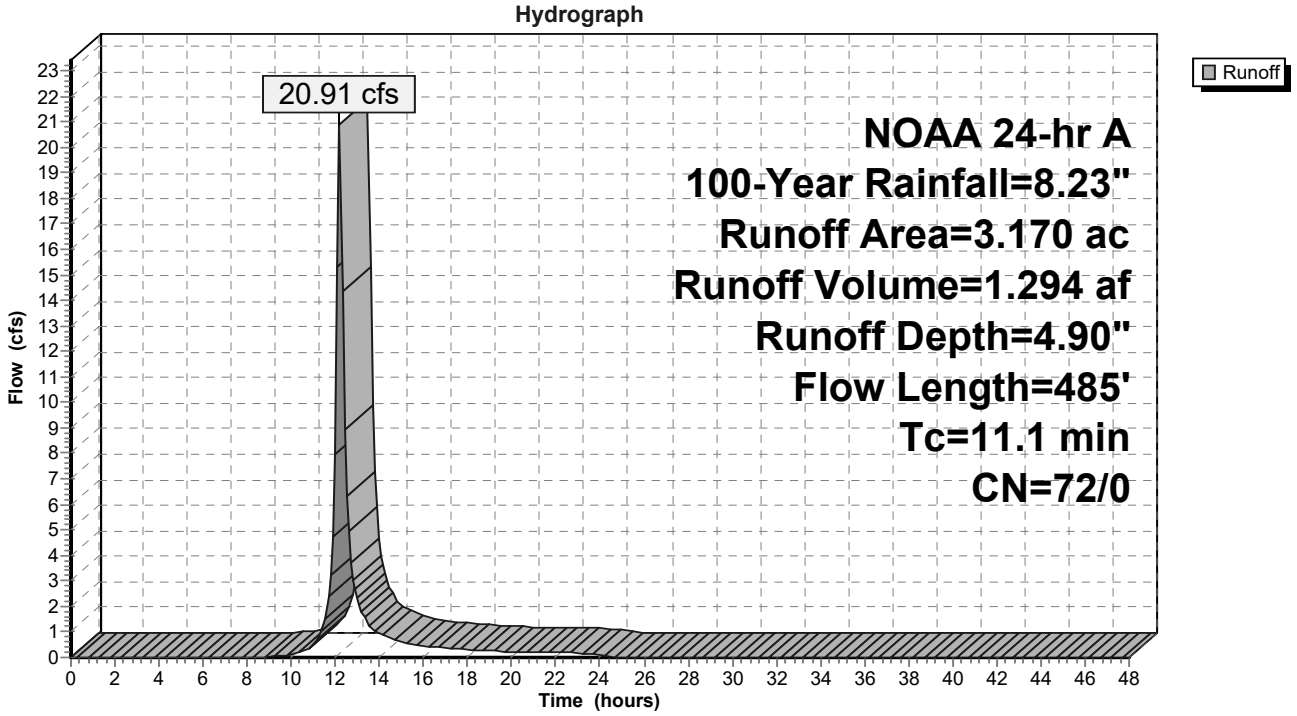
Runoff = 20.91 cfs @ 12.20 hrs, Volume= 1.294 af, Depth= 4.90"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
2.280	70	Woods, Good, HSG C
0.060	96	Gravel surface, HSG C
0.120	71	Meadow, non-grazed, HSG C
0.410	77	Woods, Good, HSG D
0.290	78	Meadow, non-grazed, HSG D
0.010	96	Gravel surface, HSG D
3.170	72	Weighted Average
3.170	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.0	435	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.1	485	Total			

Subcatchment MCEX-4:



Summary for Subcatchment MCEX-5:

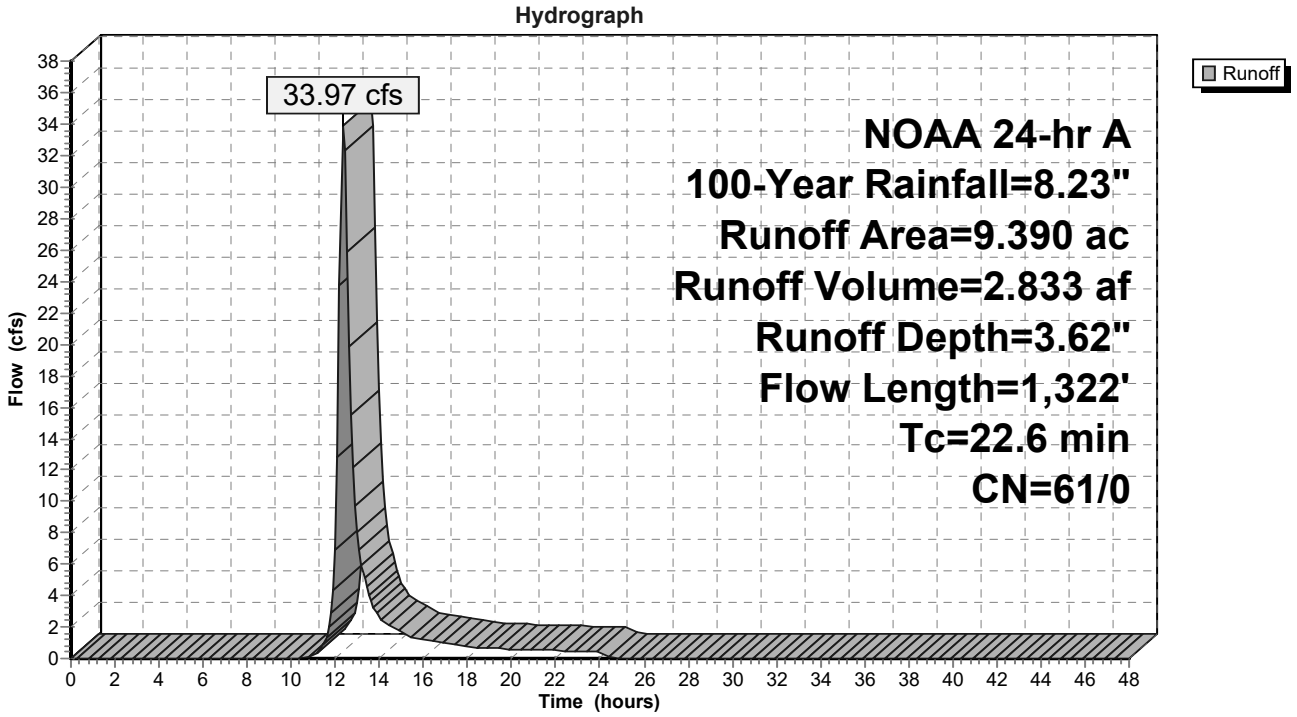
Runoff = 33.97 cfs @ 12.34 hrs, Volume= 2.833 af, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

	Area (ac)	CN	Description
*	0.950	77	Wetlands, HSG A
	2.520	30	Woods, Good, HSG A
	0.100	96	Gravel surface, HSG A
	0.080	30	Meadow, non-grazed, HSG A
	0.550	71	Meadow, non-grazed, HSG C
	0.200	96	Gravel surface, HSG C
	4.870	70	Woods, Good, HSG C
*	0.120	77	Wetlands, HSG C
	9.390	61	Weighted Average
	9.390	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.0	270	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	555	0.0450	3.42		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
9.4	447	0.0250	0.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.6	1,322	Total			

Subcatchment MCEX-5:



Summary for Subcatchment MCEX-6:

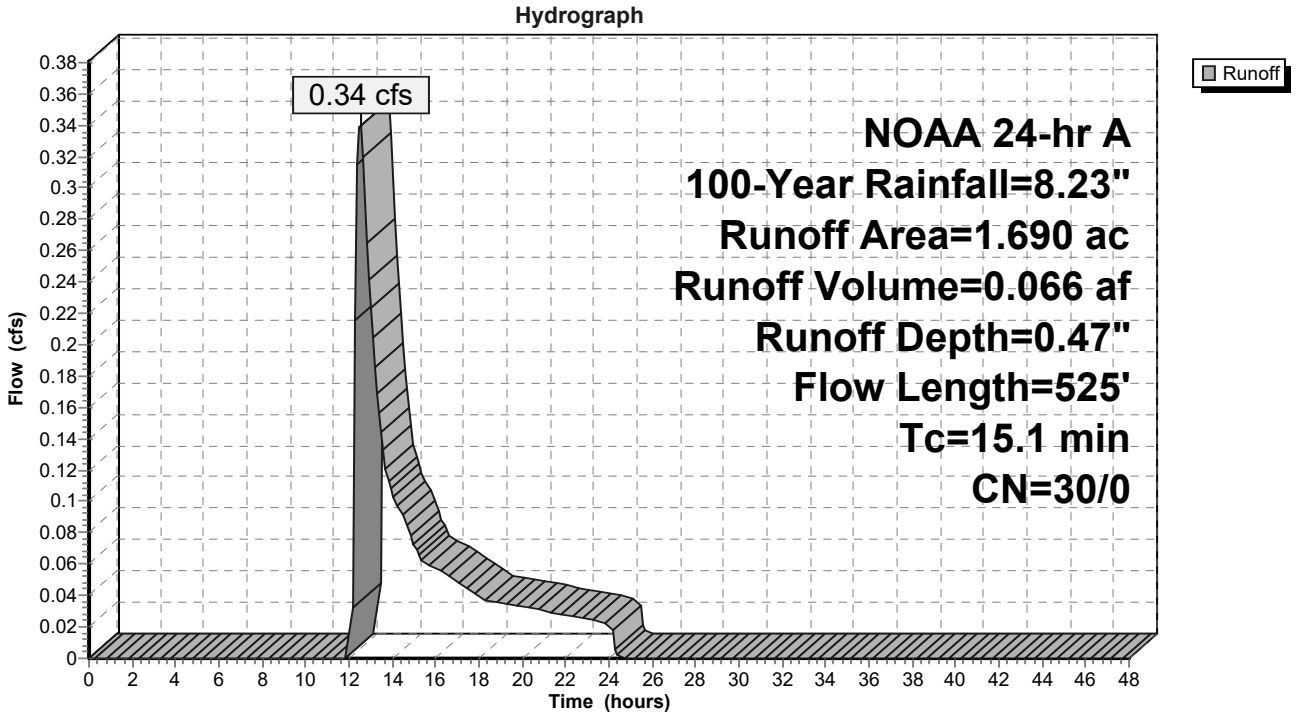
Runoff = 0.34 cfs @ 12.54 hrs, Volume= 0.066 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
1.690	30	Woods, Good, HSG A
1.690	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
5.7	475	0.0760	1.38		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.1	525	Total			

Subcatchment MCEX-6:



Summary for Subcatchment MCEX-7A:

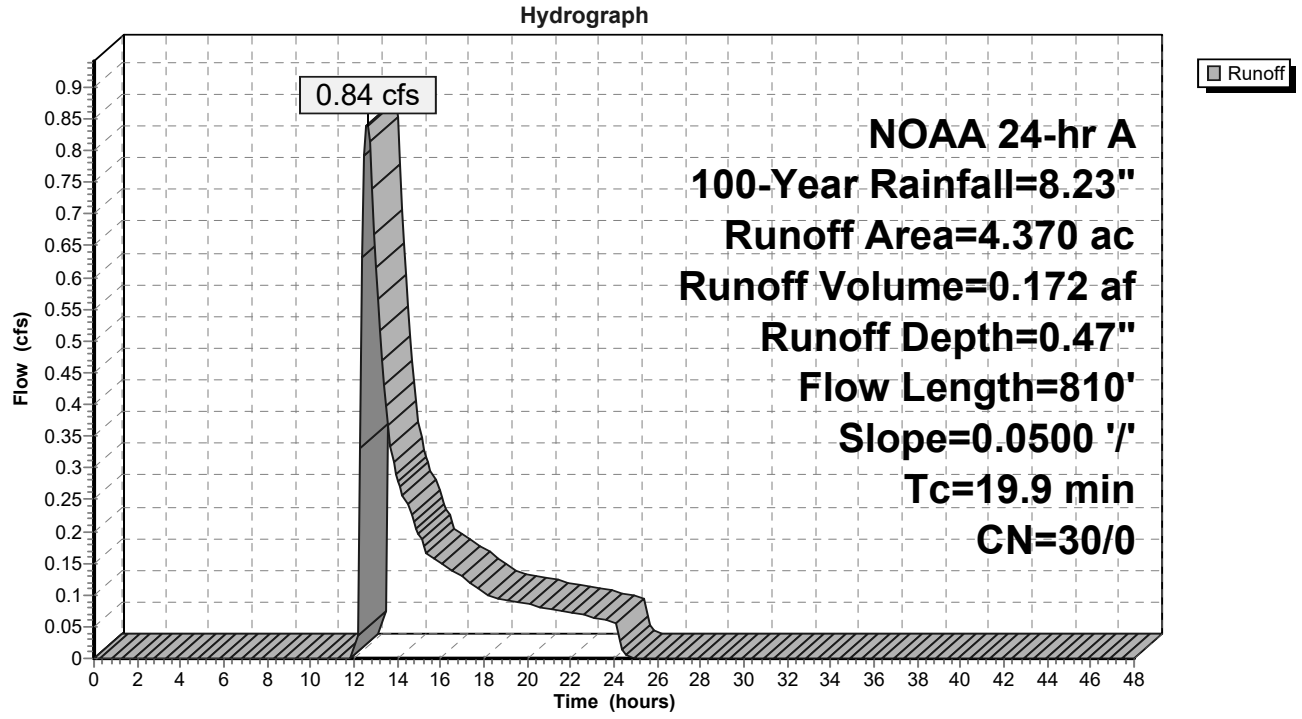
Runoff = 0.84 cfs @ 12.62 hrs, Volume= 0.172 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

	Area (ac)	CN	Description
	4.330	30	Woods, Good, HSG A
*	0.040	77	Wetlands, HSG A
	4.370	30	Weighted Average
	4.370	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
11.3	760	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.9	810	Total			

Subcatchment MCEX-7A:



Summary for Subcatchment MCEX-7B:

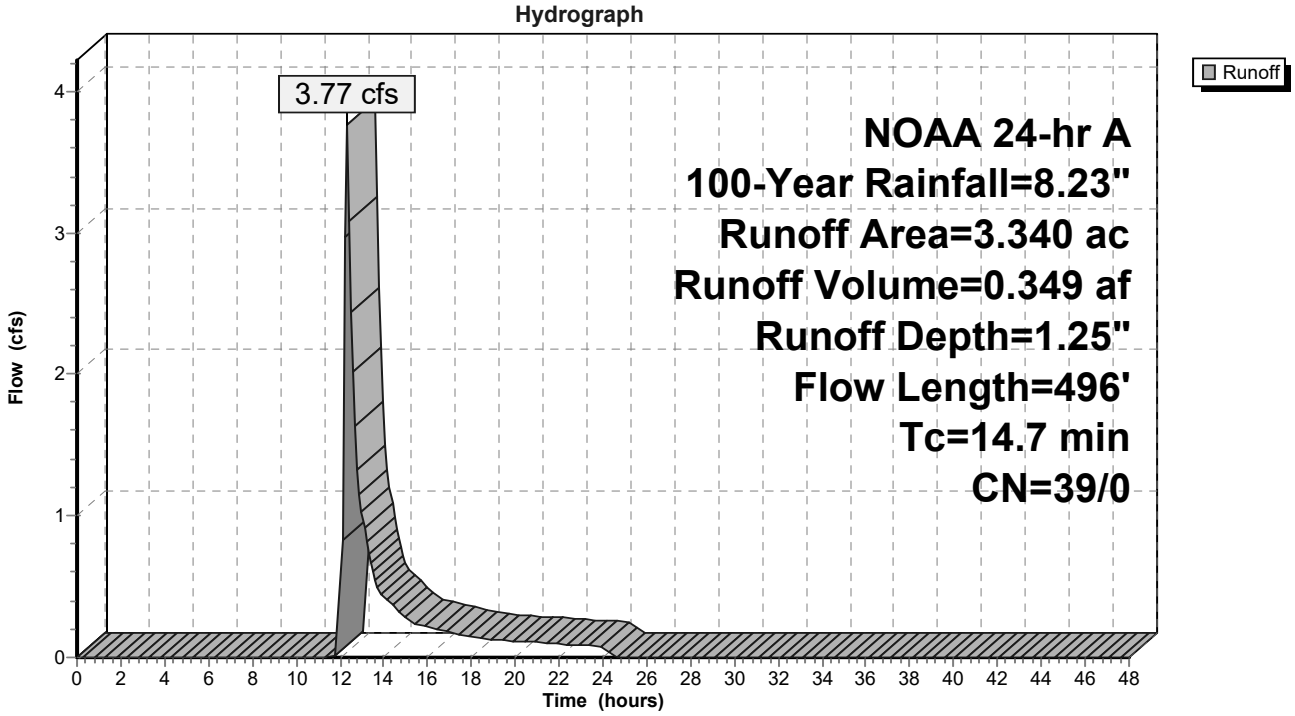
Runoff = 3.77 cfs @ 12.30 hrs, Volume= 0.349 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

	Area (ac)	CN	Description
	1.900	30	Woods, Good, HSG A
	0.800	30	Meadow, non-grazed, HSG A
	0.080	78	Meadow, non-grazed, HSG D
*	0.560	77	Wetlands, HSG A
	3.340	39	Weighted Average
	3.340	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
6.1	446	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.7	496	Total			

Subcatchment MCEX-7B:



Summary for Subcatchment MCEX-7C:

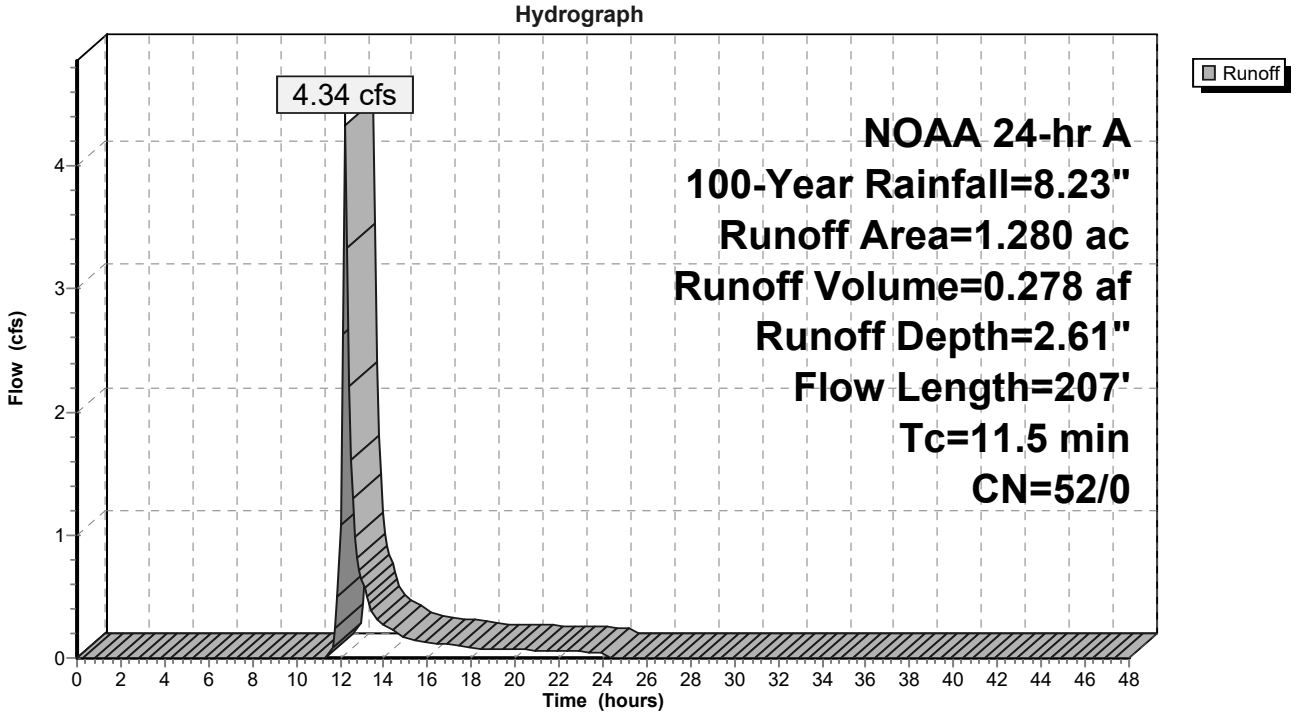
Runoff = 4.34 cfs @ 12.21 hrs, Volume= 0.278 af, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.660	30	Woods, Good, HSG A
0.050	96	Gravel surface, HSG A
0.060	96	Gravel surface, HSG C
0.430	70	Woods, Good, HSG C
0.080	71	Meadow, non-grazed, HSG C
1.280	52	Weighted Average
1.280	52	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.1	157	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.5	207	Total			

Subcatchment MCEX-7C:

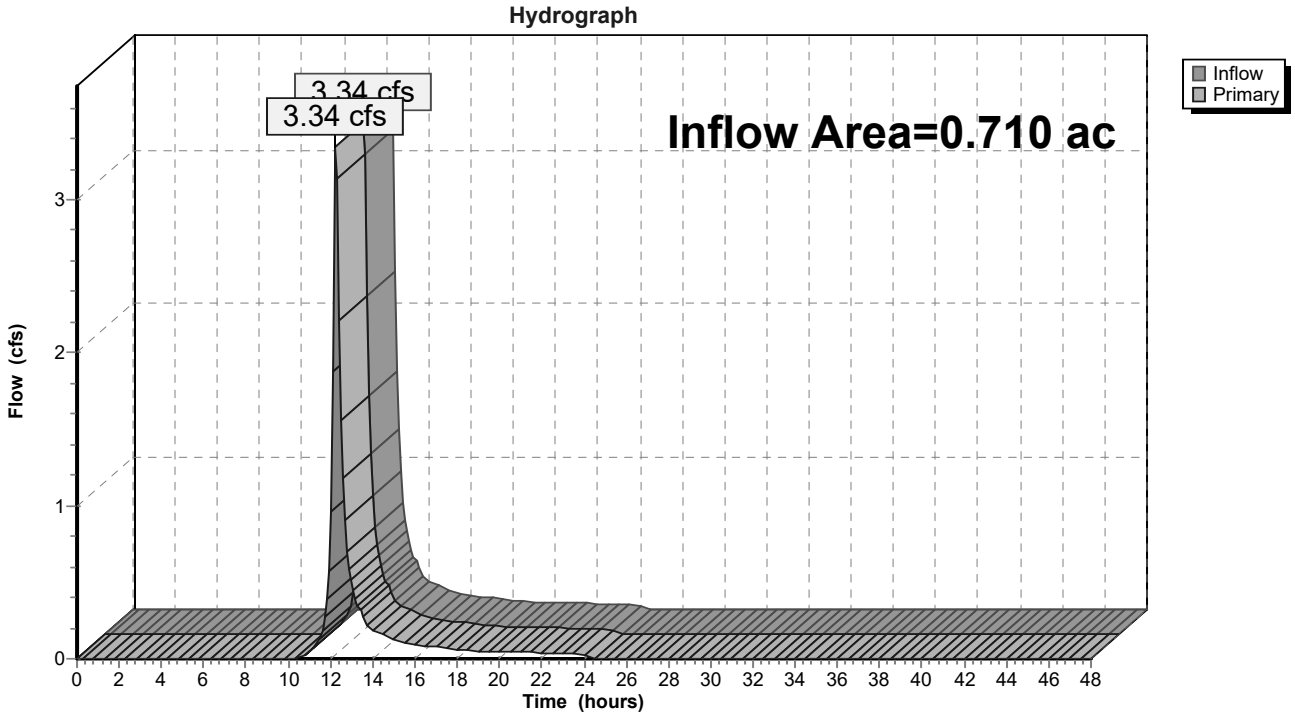


Summary for Link POA-1:

Inflow Area = 0.710 ac, 0.00% Impervious, Inflow Depth = 3.97" for 100-Year event
Inflow = 3.34 cfs @ 12.25 hrs, Volume= 0.235 af
Primary = 3.34 cfs @ 12.25 hrs, Volume= 0.235 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-1:

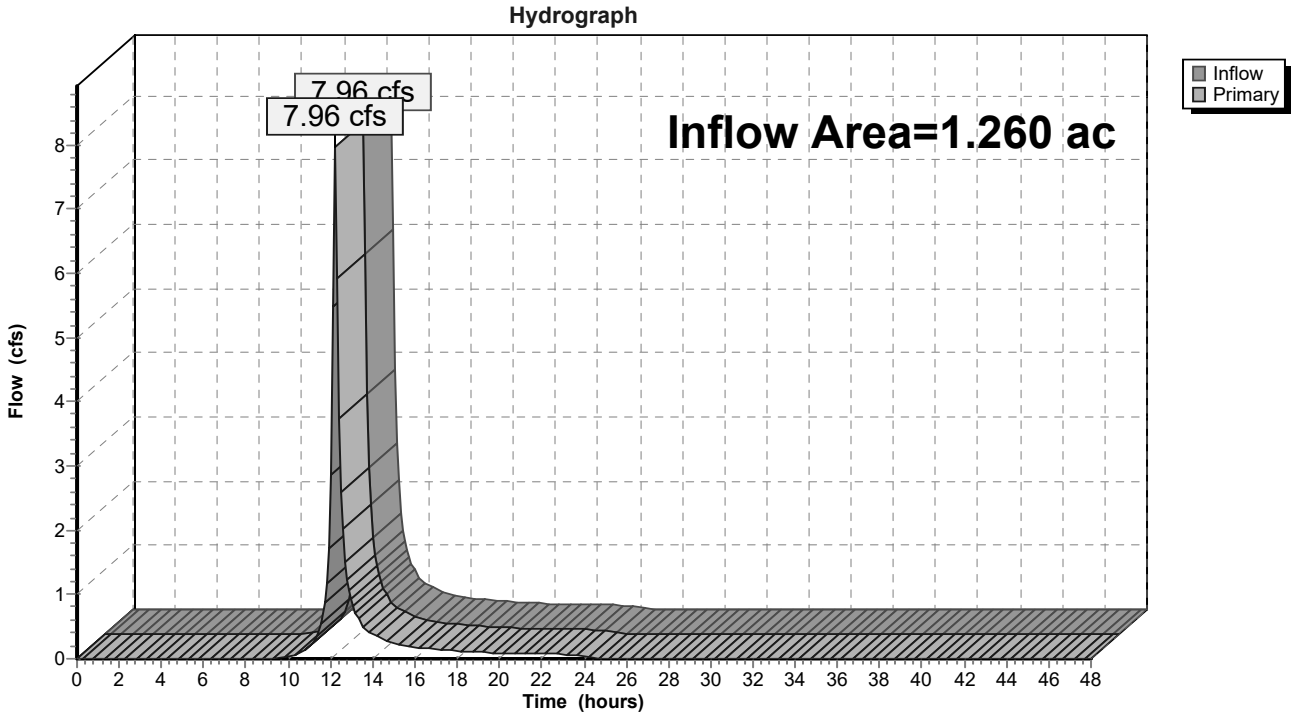


Summary for Link POA-2:

Inflow Area = 1.260 ac, 0.00% Impervious, Inflow Depth = 4.78" for 100-Year event
Inflow = 7.96 cfs @ 12.20 hrs, Volume= 0.502 af
Primary = 7.96 cfs @ 12.20 hrs, Volume= 0.502 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-2:

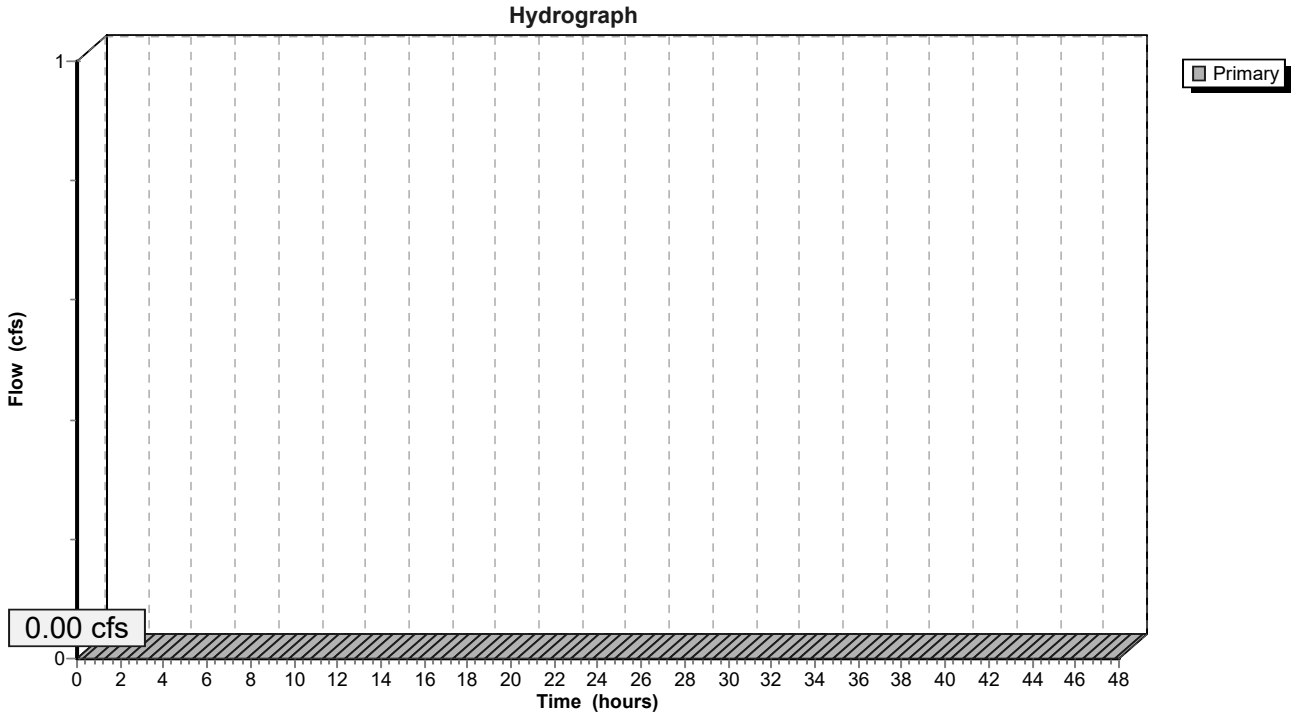


Summary for Link POA-3:

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-3:

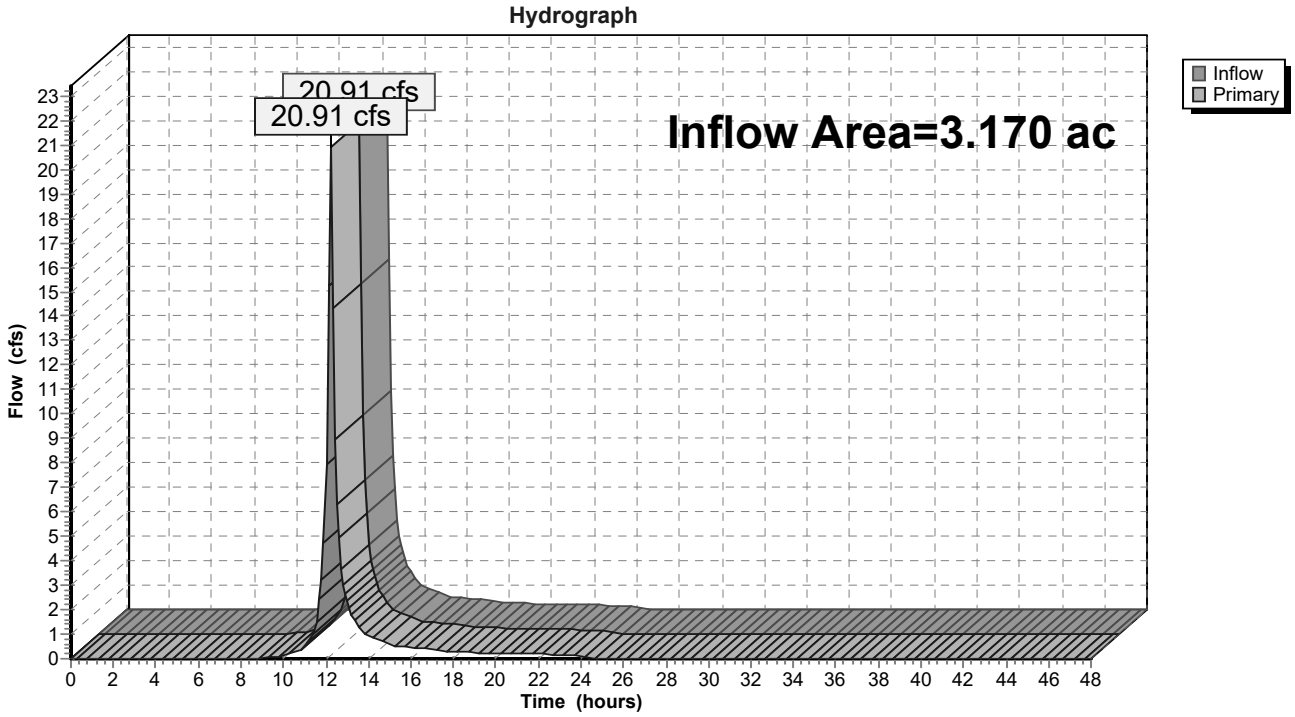


Summary for Link POA-4:

Inflow Area = 3.170 ac, 0.00% Impervious, Inflow Depth = 4.90" for 100-Year event
Inflow = 20.91 cfs @ 12.20 hrs, Volume= 1.294 af
Primary = 20.91 cfs @ 12.20 hrs, Volume= 1.294 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-4:

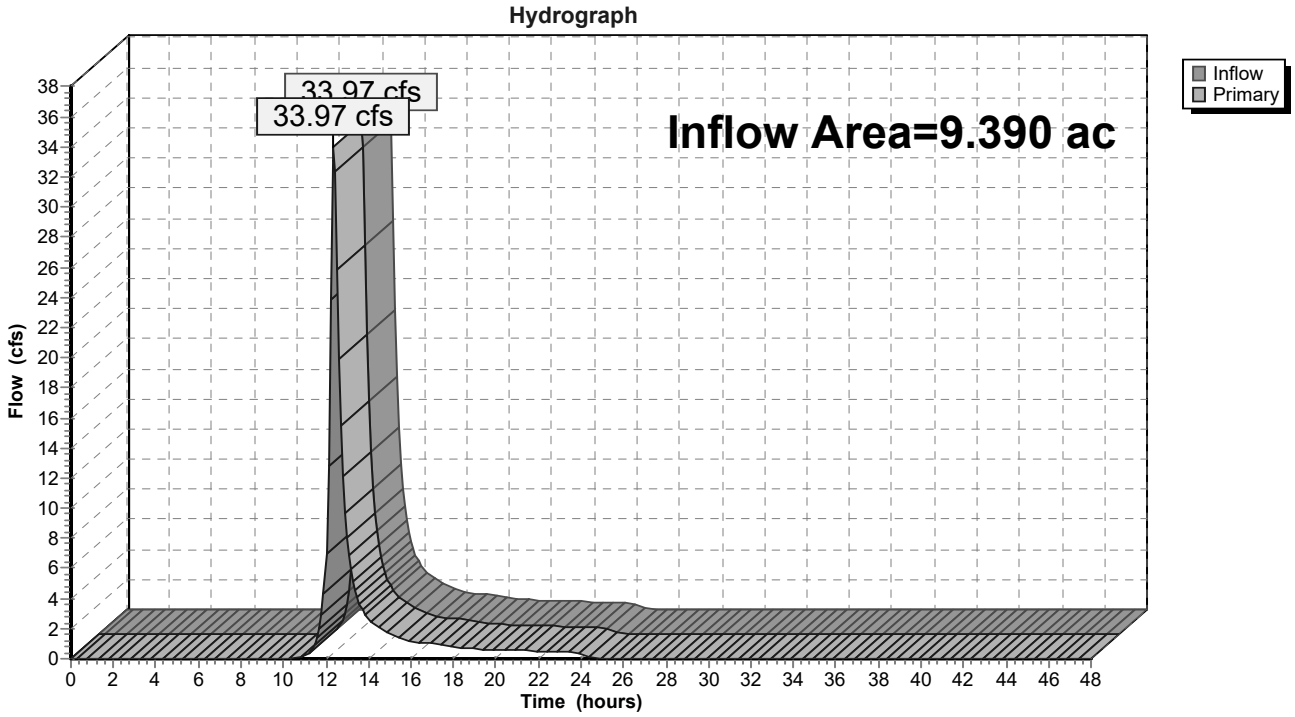


Summary for Link POA-5:

Inflow Area = 9.390 ac, 0.00% Impervious, Inflow Depth = 3.62" for 100-Year event
Inflow = 33.97 cfs @ 12.34 hrs, Volume= 2.833 af
Primary = 33.97 cfs @ 12.34 hrs, Volume= 2.833 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-5:

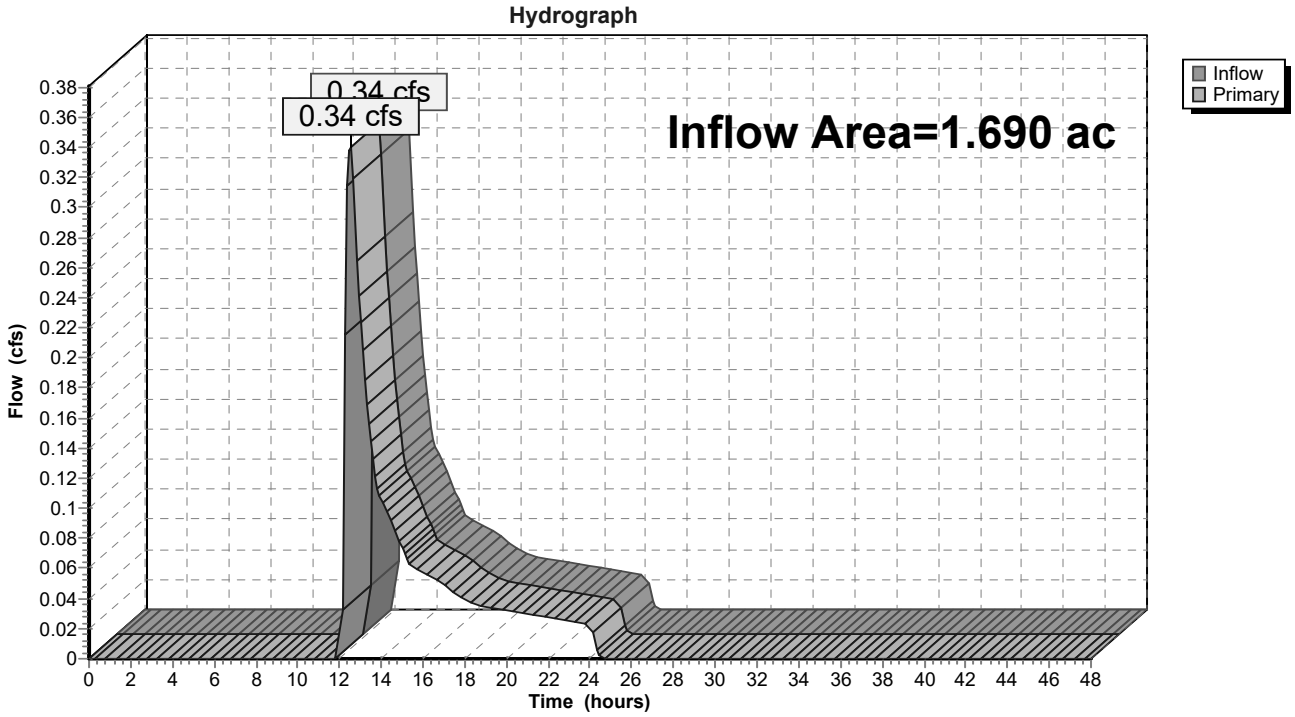


Summary for Link POA-6:

Inflow Area = 1.690 ac, 0.00% Impervious, Inflow Depth = 0.47" for 100-Year event
Inflow = 0.34 cfs @ 12.54 hrs, Volume= 0.066 af
Primary = 0.34 cfs @ 12.54 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-6:

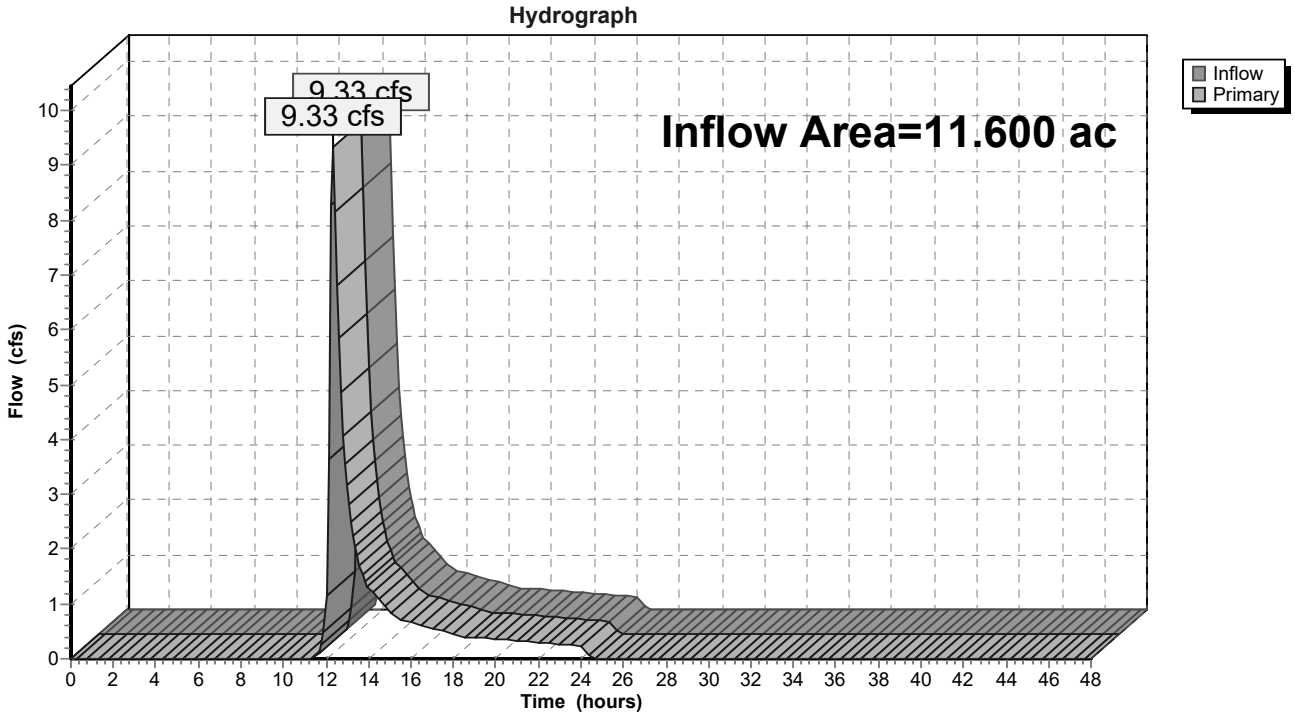


Summary for Link POA-7:

Inflow Area = 11.600 ac, 0.00% Impervious, Inflow Depth = 1.09" for 100-Year event
Inflow = 9.33 cfs @ 12.30 hrs, Volume= 1.052 af
Primary = 9.33 cfs @ 12.30 hrs, Volume= 1.052 af, Atten= 0%, Lag= 0.0 min

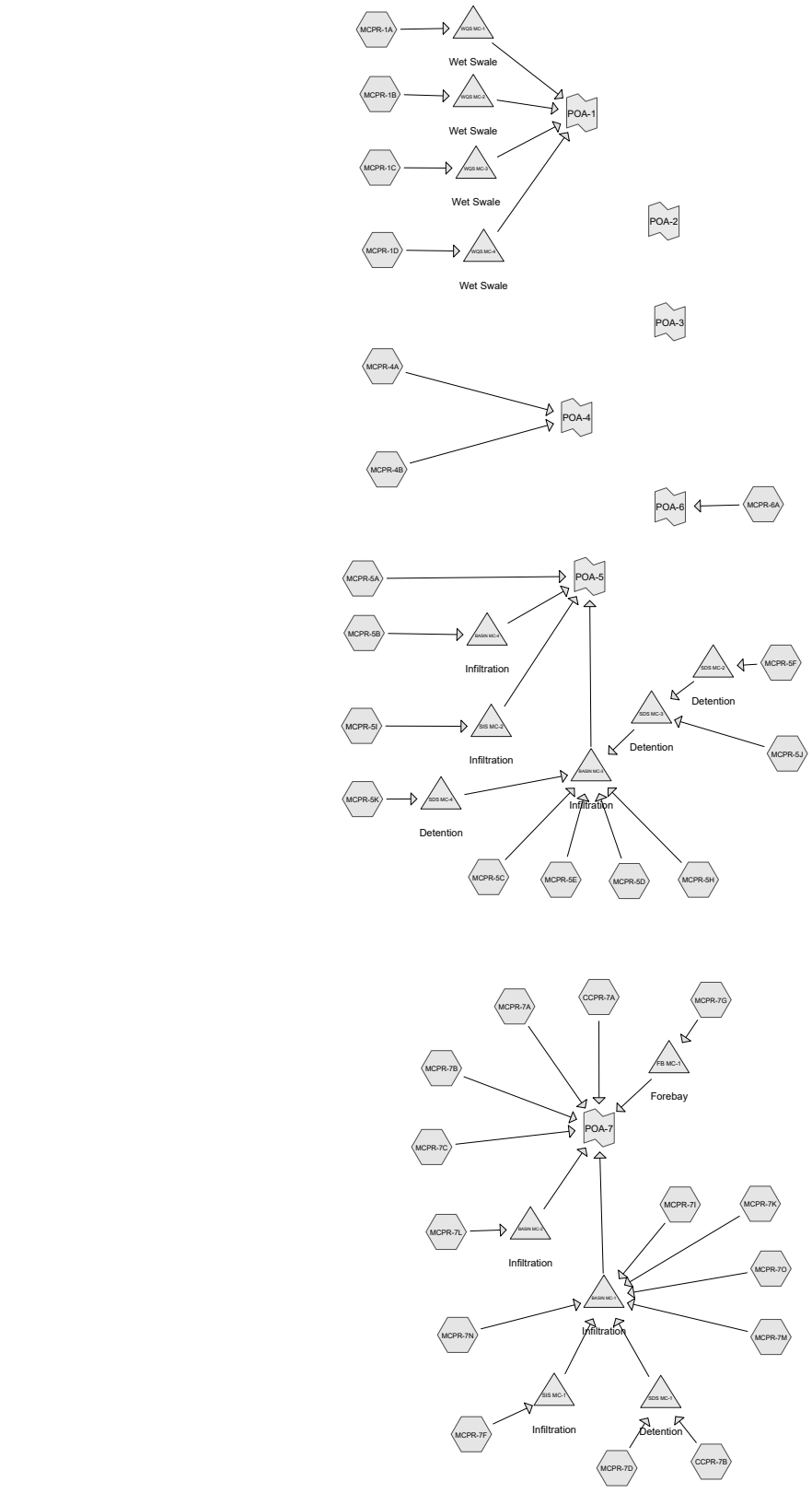
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-7:



Attachment 4 – HydroCad Output:

Post-Development Conditions



Routing Diagram for MC Post Development Condition

Prepared by {enter your company name here}, Printed 7/25/2021

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.230	39	>75% Grass cover, Good, HSG A (CCPR-7A, MCPR-1A, MCPR-1D, MCPR-5D, MCPR-5E, MCPR-5F, MCPR-5I, MCPR-5J, MCPR-6A, MCPR-7A, MCPR-7B, MCPR-7C, MCPR-7D, MCPR-7F, MCPR-7G, MCPR-7I, MCPR-7K, MCPR-7L, MCPR-7N)
2.060	74	>75% Grass cover, Good, HSG C (CCPR-7B, MCPR-5A, MCPR-5B, MCPR-5D, MCPR-5E, MCPR-5F, MCPR-5J, MCPR-5K, MCPR-7D)
0.450	80	>75% Grass cover, Good, HSG D (MCPR-1A, MCPR-1B, MCPR-1C, MCPR-1D, MCPR-7G)
0.170	96	Gravel surface, HSG A (CCPR-7A, MCPR-5A, MCPR-5C, MCPR-7I)
0.100	96	Gravel surface, HSG C (MCPR-4A, MCPR-4B, MCPR-5H)
0.010	96	Gravel surface, HSG D (MCPR-4A)
1.560	30	Meadow, non-grazed, HSG A (CCPR-7A, CCPR-7B, MCPR-5C, MCPR-5E, MCPR-7A, MCPR-7B, MCPR-7C, MCPR-7D)
0.540	71	Meadow, non-grazed, HSG C (CCPR-7B, MCPR-4A, MCPR-4B, MCPR-5A, MCPR-5C, MCPR-7D)
0.290	78	Meadow, non-grazed, HSG D (MCPR-4A)
1.820	98	Paved parking, HSG A (MCPR-1A, MCPR-1D, MCPR-5D, MCPR-5E, MCPR-5F, MCPR-7D, MCPR-7F, MCPR-7G, MCPR-7M)
0.920	98	Paved parking, HSG C (MCPR-5D, MCPR-5E, MCPR-5F, MCPR-5K)
0.110	98	Paved parking, HSG D (MCPR-1A, MCPR-1B, MCPR-1C, MCPR-1D, MCPR-7G)
1.910	98	Roofs, HSG A (MCPR-5D, MCPR-5E, MCPR-5F, MCPR-5I, MCPR-5J, MCPR-5K, MCPR-7D, MCPR-7F, MCPR-7K, MCPR-7L, MCPR-7O)
1.220	98	Roofs, HSG C (MCPR-5B, MCPR-5E, MCPR-5F, MCPR-5J, MCPR-5K, MCPR-7D)
0.660	98	Water Surface, 0% imp, HSG A (MCPR-1A, MCPR-5C, MCPR-7B, MCPR-7D, MCPR-7F, MCPR-7G, MCPR-7I, MCPR-7K, MCPR-7L, MCPR-7N)
0.160	98	Water Surface, 0% imp, HSG C (MCPR-5B, MCPR-5C, MCPR-5J)
0.030	98	Water Surface, 0% imp, HSG D (MCPR-1B, MCPR-1C, MCPR-7G)
1.790	77	Wetlands, HSG A (CCPR-7A, MCPR-5A, MCPR-7A, MCPR-7B, MCPR-7C)
0.120	77	Wetlands, HSG C (MCPR-5A)
3.320	30	Woods, Good, HSG A (CCPR-7A, MCPR-5A, MCPR-5E, MCPR-6A, MCPR-7A, MCPR-7B, MCPR-7D, MCPR-7L)
5.060	70	Woods, Good, HSG C (MCPR-4A, MCPR-4B, MCPR-5A, MCPR-5H, MCPR-5J, MCPR-7D)
0.410	77	Woods, Good, HSG D (MCPR-4A)
26.940	**66**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
15.460	HSG A	CCPR-7A, CCPR-7B, MCPR-1A, MCPR-1D, MCPR-5A, MCPR-5C, MCPR-5D, MCPR-5E, MCPR-5F, MCPR-5I, MCPR-5J, MCPR-5K, MCPR-6A, MCPR-7A, MCPR-7B, MCPR-7C, MCPR-7D, MCPR-7F, MCPR-7G, MCPR-7I, MCPR-7K, MCPR-7L, MCPR-7M, MCPR-7N, MCPR-7O
0.000	HSG B	
10.180	HSG C	CCPR-7B, MCPR-4A, MCPR-4B, MCPR-5A, MCPR-5B, MCPR-5C, MCPR-5D, MCPR-5E, MCPR-5F, MCPR-5H, MCPR-5J, MCPR-5K, MCPR-7D
1.300	HSG D	MCPR-1A, MCPR-1B, MCPR-1C, MCPR-1D, MCPR-4A, MCPR-7G
0.000	Other	
26.940		**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.10 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment CCPR-7A: Runoff Area=1.520 ac 0.00% Impervious Runoff Depth=0.02"
Flow Length=410' Tc=16.8 min CN=42/0 Runoff=0.00 cfs 0.003 af

Subcatchment CCPR-7B: Runoff Area=0.210 ac 0.00% Impervious Runoff Depth=0.46"
Tc=6.0 min CN=60/0 Runoff=0.10 cfs 0.008 af

Subcatchment MCPR-1A: Runoff Area=0.130 ac 23.08% Impervious Runoff Depth=1.05"
Tc=6.0 min CN=59/98 Runoff=0.16 cfs 0.011 af

Subcatchment MCPR-1B: Runoff Area=0.080 ac 12.50% Impervious Runoff Depth=1.90"
Tc=6.0 min CN=83/98 Runoff=0.23 cfs 0.013 af

Subcatchment MCPR-1C: Runoff Area=0.080 ac 12.50% Impervious Runoff Depth=1.90"
Tc=6.0 min CN=83/98 Runoff=0.23 cfs 0.013 af

Subcatchment MCPR-1D: Runoff Area=0.530 ac 20.75% Impervious Runoff Depth=1.21"
Flow Length=137' Tc=9.7 min CN=66/98 Runoff=0.78 cfs 0.054 af

Subcatchment MCPR-4A: Runoff Area=1.720 ac 0.00% Impervious Runoff Depth=1.13"
Flow Length=485' Tc=11.1 min CN=74/0 Runoff=2.58 cfs 0.162 af

Subcatchment MCPR-4B: Runoff Area=1.400 ac 0.00% Impervious Runoff Depth=0.91"
Flow Length=485' Tc=11.1 min CN=70/0 Runoff=1.63 cfs 0.106 af

Subcatchment MCPR-5A: Runoff Area=3.650 ac 0.00% Impervious Runoff Depth=0.81"
Flow Length=313' Tc=21.5 min CN=68/0 Runoff=2.67 cfs 0.246 af

Subcatchment MCPR-5B: Runoff Area=0.310 ac 67.74% Impervious Runoff Depth=2.74"
Tc=6.0 min CN=86/98 Runoff=1.17 cfs 0.071 af

Subcatchment MCPR-5C: Runoff Area=0.400 ac 0.00% Impervious Runoff Depth=1.38"
Tc=6.0 min CN=78/0 Runoff=0.83 cfs 0.046 af

Subcatchment MCPR-5D: Runoff Area=0.890 ac 61.80% Impervious Runoff Depth=1.97"
Tc=6.0 min CN=49/98 Runoff=2.29 cfs 0.146 af

Subcatchment MCPR-5E: Runoff Area=2.030 ac 19.70% Impervious Runoff Depth=0.61"
Tc=6.0 min CN=36/98 Runoff=1.67 cfs 0.104 af

Subcatchment MCPR-5F: Runoff Area=1.140 ac 70.18% Impervious Runoff Depth=2.42"
Tc=6.0 min CN=68/98 Runoff=3.70 cfs 0.230 af

Subcatchment MCPR-5H: Runoff Area=1.160 ac 0.00% Impervious Runoff Depth=0.96"
Flow Length=450' Tc=11.2 min CN=71/0 Runoff=1.45 cfs 0.093 af

Subcatchment MCPR-5I: Runoff Area=0.600 ac 55.00% Impervious Runoff Depth=1.71"
Tc=6.0 min CN=39/98 Runoff=1.38 cfs 0.086 af

Subcatchment MCPR-5J: Runoff Area=0.790 ac 22.78% Impervious Runoff Depth=1.33"
Tc=6.0 min CN=68/98 Runoff=1.42 cfs 0.088 af

Subcatchment MCPR-5K: Runoff Area=1.030 ac 80.58% Impervious Runoff Depth=2.72"
Tc=6.0 min CN=74/98 Runoff=3.79 cfs 0.234 af

Subcatchment MCPR-6A: Runoff Area=0.320 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=235' Tc=8.0 min CN=31/0 Runoff=0.00 cfs 0.000 af

Subcatchment MCPR-7A: Runoff Area=1.110 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=513' Tc=13.9 min CN=34/0 Runoff=0.00 cfs 0.000 af

Subcatchment MCPR-7B: Runoff Area=0.960 ac 0.00% Impervious Runoff Depth=0.08"
Flow Length=112' Slope=0.0500 '/' Tc=9.5 min CN=46/0 Runoff=0.02 cfs 0.006 af

Subcatchment MCPR-7C: Runoff Area=0.770 ac 0.00% Impervious Runoff Depth=0.10"
Flow Length=215' Tc=14.9 min CN=47/0 Runoff=0.02 cfs 0.006 af

Subcatchment MCPR-7D: Runoff Area=2.090 ac 21.53% Impervious Runoff Depth=1.00"
Flow Length=615' Tc=37.8 min CN=59/98 Runoff=1.28 cfs 0.175 af

Subcatchment MCPR-7F: Runoff Area=1.980 ac 77.78% Impervious Runoff Depth=2.42"
Tc=6.0 min CN=42/98 Runoff=6.42 cfs 0.400 af

Subcatchment MCPR-7G: Runoff Area=0.220 ac 50.00% Impervious Runoff Depth=1.91"
Tc=6.0 min CN=66/98 Runoff=0.56 cfs 0.035 af

Subcatchment MCPR-7I: Runoff Area=0.130 ac 0.00% Impervious Runoff Depth=2.12"
Tc=6.0 min CN=88/0 Runoff=0.42 cfs 0.023 af

Subcatchment MCPR-7K: Runoff Area=0.770 ac 25.97% Impervious Runoff Depth=0.83"
Tc=6.0 min CN=43/98 Runoff=0.83 cfs 0.053 af

Subcatchment MCPR-7L: Runoff Area=0.460 ac 10.87% Impervious Runoff Depth=0.34"
Flow Length=175' Slope=0.1000 '/' Tc=7.8 min CN=40/98 Runoff=0.19 cfs 0.013 af

Subcatchment MCPR-7M: Runoff Area=0.110 ac 100.00% Impervious Runoff Depth=3.11"
Tc=6.0 min CN=0/98 Runoff=0.46 cfs 0.028 af

Subcatchment MCPR-7N: Runoff Area=0.290 ac 0.00% Impervious Runoff Depth=0.43"
Tc=6.0 min CN=59/0 Runoff=0.13 cfs 0.010 af

Subcatchment MCPR-7O: Runoff Area=0.060 ac 100.00% Impervious Runoff Depth=3.11"
Tc=6.0 min CN=0/98 Runoff=0.25 cfs 0.016 af

Pond BASIN MC-1: Infiltration Peak Elev=151.89' Storage=1,303 cf Inflow=2.19 cfs 0.314 af
Discarded=0.73 cfs 0.306 af Primary=0.11 cfs 0.008 af Outflow=0.84 cfs 0.314 af

Pond BASIN MC-2: Infiltration Peak Elev=160.51' Storage=133 cf Inflow=0.19 cfs 0.013 af
Discarded=0.07 cfs 0.013 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.013 af

Pond BASIN MC-3: Infiltration Peak Elev=160.78' Storage=6,335 cf Inflow=6.72 cfs 0.940 af
Discarded=1.66 cfs 0.861 af Primary=0.33 cfs 0.079 af Outflow=1.99 cfs 0.940 af

Pond BASIN MC-4: Infiltration Peak Elev=170.74' Storage=512 cf Inflow=1.17 cfs 0.071 af
Discarded=0.16 cfs 0.029 af Primary=0.44 cfs 0.041 af Outflow=0.59 cfs 0.071 af

Pond FB MC-1: Forebay Peak Elev=162.80' Storage=659 cf Inflow=0.56 cfs 0.035 af
Discarded=0.06 cfs 0.035 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.035 af

Pond SDS MC-1: Detention Peak Elev=168.18' Storage=3,168 cf Inflow=1.32 cfs 0.183 af
Outflow=0.42 cfs 0.183 af

Pond SDS MC-2: Detention Peak Elev=180.62' Storage=4,236 cf Inflow=3.70 cfs 0.230 af
Outflow=0.66 cfs 0.230 af

Pond SDS MC-3: Detention Peak Elev=169.54' Storage=3,108 cf Inflow=1.94 cfs 0.318 af
Outflow=0.65 cfs 0.318 af

Pond SDS MC-4: Detention Peak Elev=165.58' Storage=4,426 cf Inflow=3.79 cfs 0.234 af
Outflow=0.65 cfs 0.234 af

Pond SIS MC-1: Infiltration Peak Elev=158.13' Storage=6,792 cf Inflow=6.42 cfs 0.400 af
Discarded=0.71 cfs 0.399 af Primary=0.00 cfs 0.000 af Outflow=0.71 cfs 0.399 af

Pond SIS MC-2: Infiltration Peak Elev=160.88' Storage=1,289 cf Inflow=1.38 cfs 0.086 af
Discarded=0.20 cfs 0.086 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.086 af

Pond WQS MC-1: Wet Swale Peak Elev=155.67' Storage=186 cf Inflow=0.16 cfs 0.011 af
Discarded=0.02 cfs 0.011 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.011 af

Pond WQS MC-2: Wet Swale Peak Elev=159.49' Storage=223 cf Inflow=0.23 cfs 0.013 af
Discarded=0.03 cfs 0.013 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.013 af

Pond WQS MC-3: Wet Swale Peak Elev=161.52' Storage=227 cf Inflow=0.23 cfs 0.013 af
Discarded=0.03 cfs 0.013 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.013 af

Pond WQS MC-4: Wet Swale Peak Elev=156.99' Storage=1,036 cf Inflow=0.78 cfs 0.054 af
Discarded=0.08 cfs 0.053 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.053 af

Link POA-1: Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA-2:
Primary=0.00 cfs 0.000 af

Link POA-3:
Primary=0.00 cfs 0.000 af

Link POA-4: Inflow=4.21 cfs 0.268 af
Primary=4.21 cfs 0.268 af

Link POA-5: Inflow=3.39 cfs 0.367 af
Primary=3.39 cfs 0.367 af

Link POA-6: Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA-7: Inflow=0.13 cfs 0.023 af
Primary=0.13 cfs 0.023 af

Total Runoff Area = 26.940 ac Runoff Volume = 2.478 af Average Runoff Depth = 1.10"
77.80% Pervious = 20.960 ac 22.20% Impervious = 5.980 ac

Summary for Subcatchment CCPR-7A:

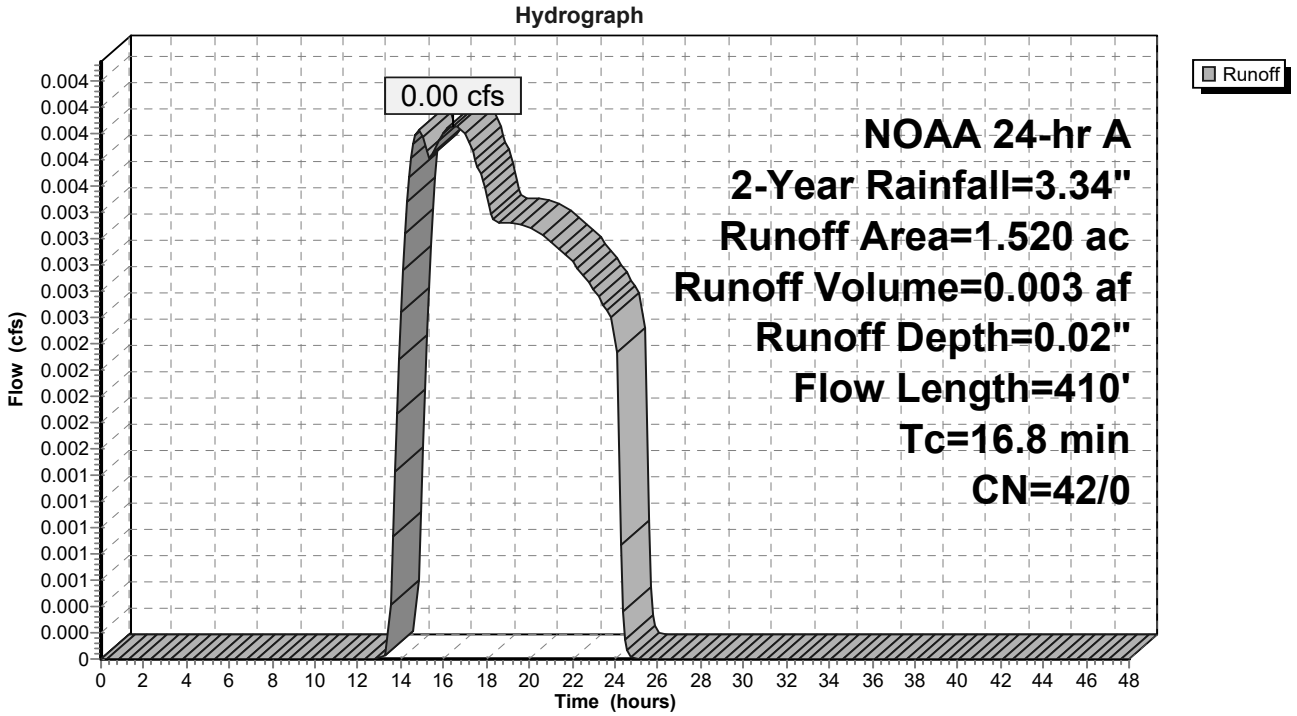
Runoff = 0.00 cfs @ 16.43 hrs, Volume= 0.003 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

	Area (ac)	CN	Description
	0.050	96	Gravel surface, HSG A
	0.110	39	>75% Grass cover, Good, HSG A
	0.110	30	Meadow, non-grazed, HSG A
	0.950	30	Woods, Good, HSG A
*	0.300	77	Wetlands, HSG A
	1.520	42	Weighted Average
	1.520	42	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	25	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.16"
0.6	10	0.5000	0.27		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.16"
9.9	375	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.8	410	Total			

Subcatchment CCPR-7A:



Summary for Subcatchment CCPR-7B:

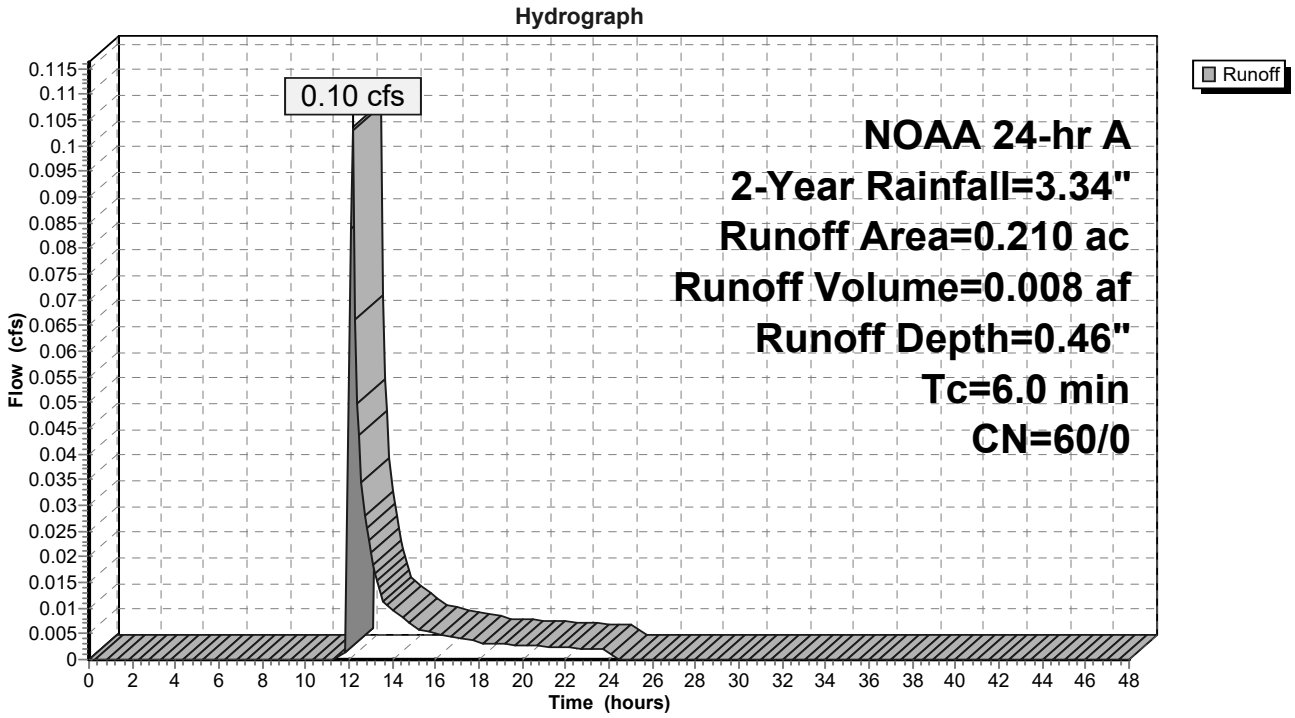
Runoff = 0.10 cfs @ 12.18 hrs, Volume= 0.008 af, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.080	74	>75% Grass cover, Good, HSG C
0.060	30	Meadow, non-grazed, HSG A
0.070	71	Meadow, non-grazed, HSG C
0.210	60	Weighted Average
0.210	60	100.00% Pervious Area

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

Subcatchment CCPR-7B:



Summary for Subcatchment MCPR-1A:

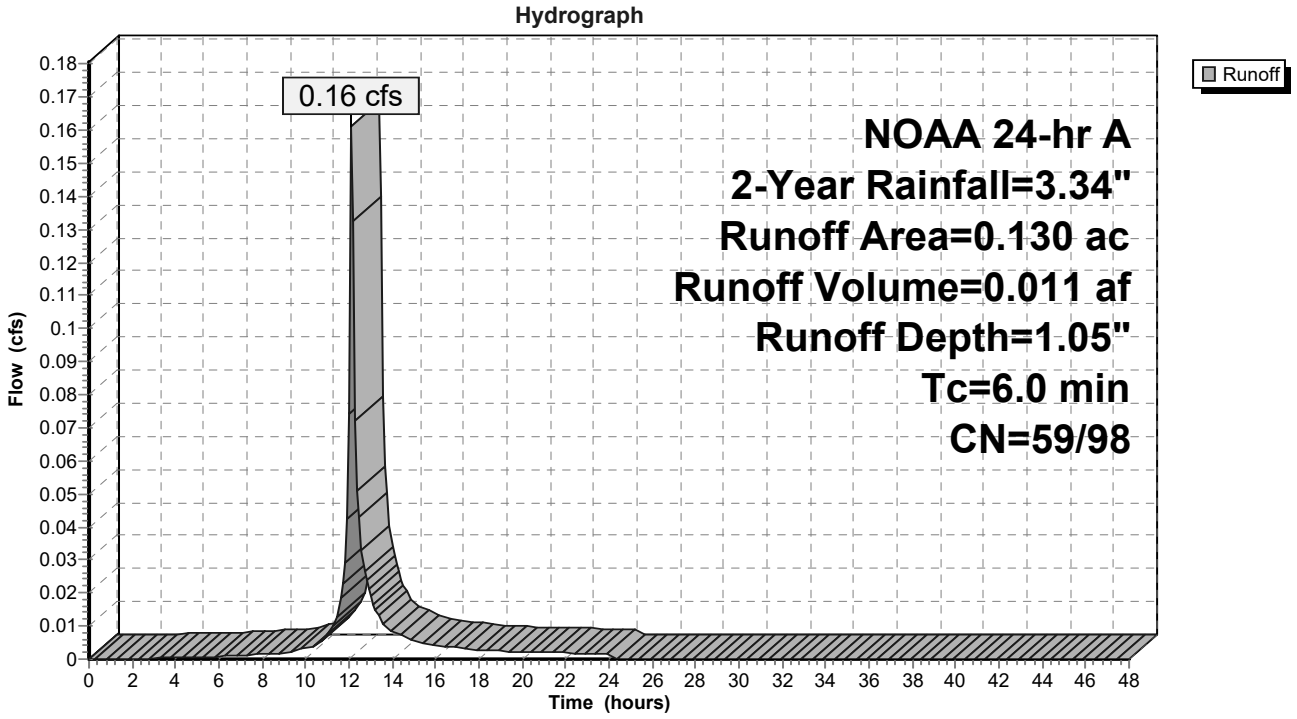
Runoff = 0.16 cfs @ 12.13 hrs, Volume= 0.011 af, Depth= 1.05"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.020	98	Paved parking, HSG A
0.010	98	Paved parking, HSG D
0.060	39	>75% Grass cover, Good, HSG A
0.020	80	>75% Grass cover, Good, HSG D
0.020	98	Water Surface, 0% imp, HSG A
0.130	68	Weighted Average
0.100	59	76.92% Pervious Area
0.030	98	23.08% Impervious Area

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

Subcatchment MCPR-1A:



Summary for Subcatchment MCPR-1B:

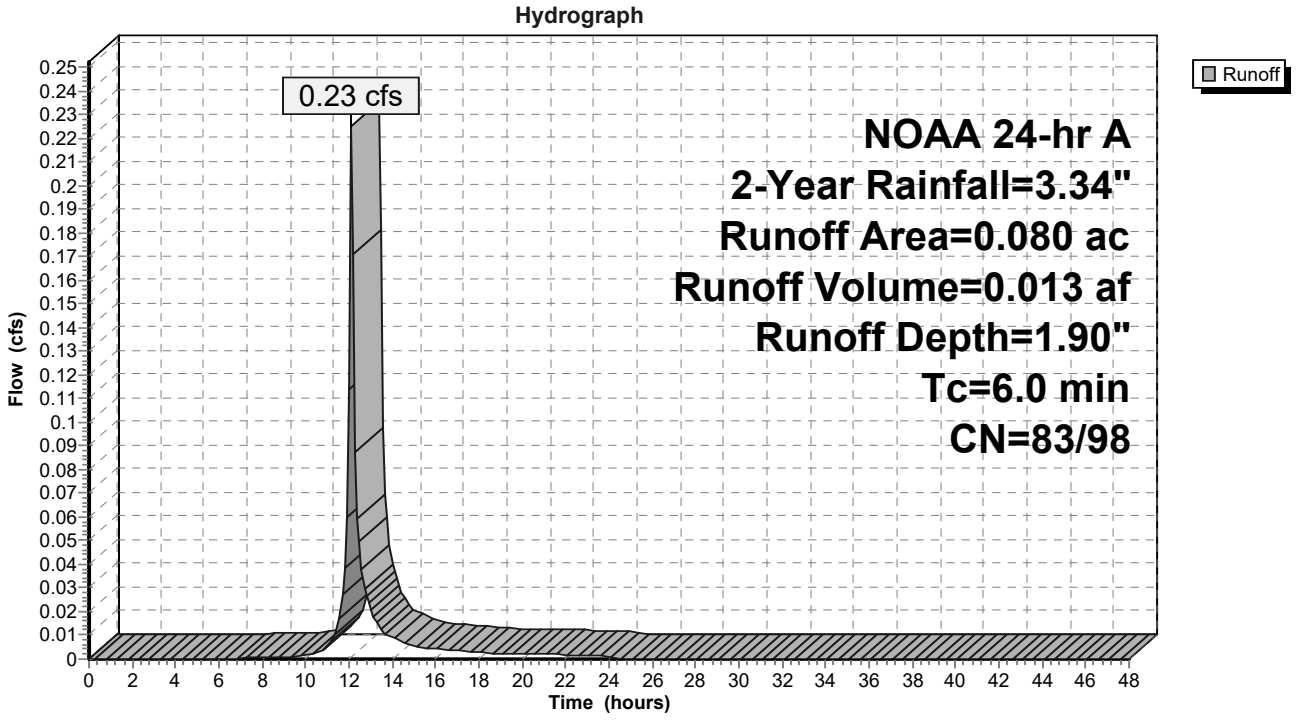
Runoff = 0.23 cfs @ 12.12 hrs, Volume= 0.013 af, Depth= 1.90"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.010	98	Paved parking, HSG D
0.060	80	>75% Grass cover, Good, HSG D
0.010	98	Water Surface, 0% imp, HSG D
0.080	85	Weighted Average
0.070	83	87.50% Pervious Area
0.010	98	12.50% Impervious Area

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

Subcatchment MCPR-1B:



Summary for Subcatchment MCPR-1C:

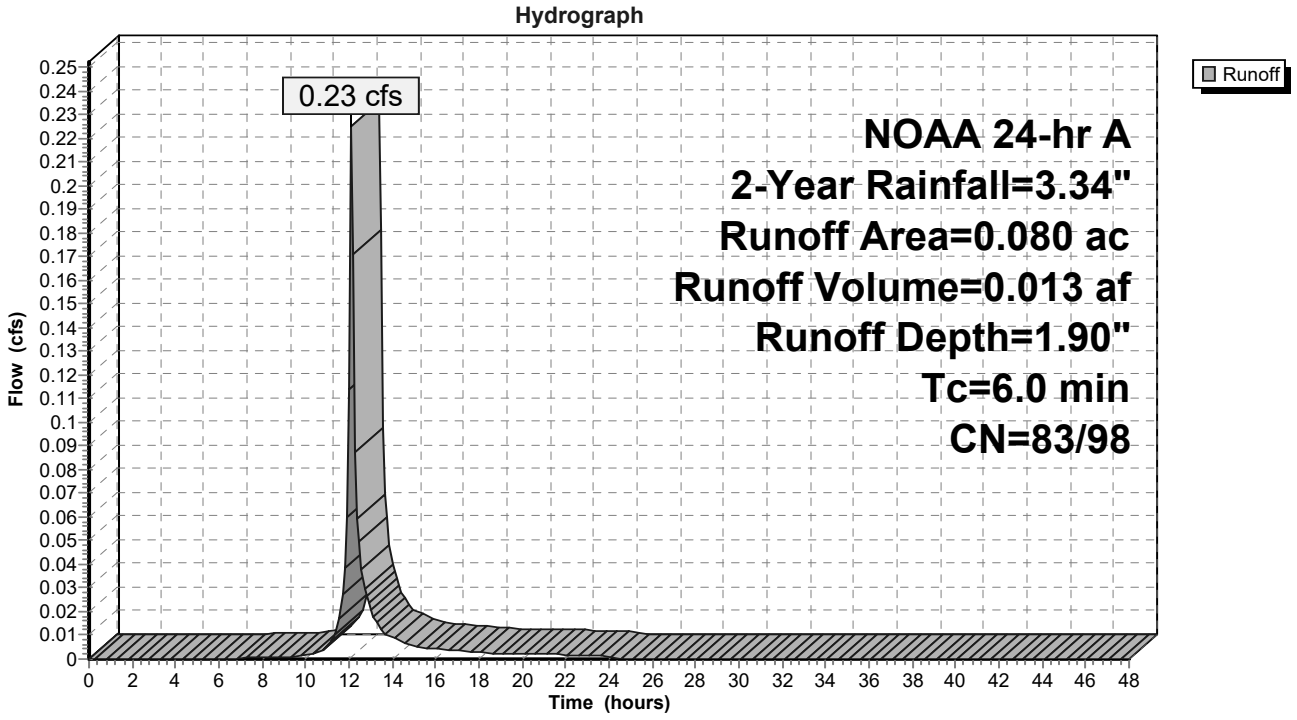
Runoff = 0.23 cfs @ 12.12 hrs, Volume= 0.013 af, Depth= 1.90"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.010	98	Paved parking, HSG D
0.060	80	>75% Grass cover, Good, HSG D
0.010	98	Water Surface, 0% imp, HSG D
0.080	85	Weighted Average
0.070	83	87.50% Pervious Area
0.010	98	12.50% Impervious Area

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

Subcatchment MCPR-1C:



Summary for Subcatchment MCPR-1D:

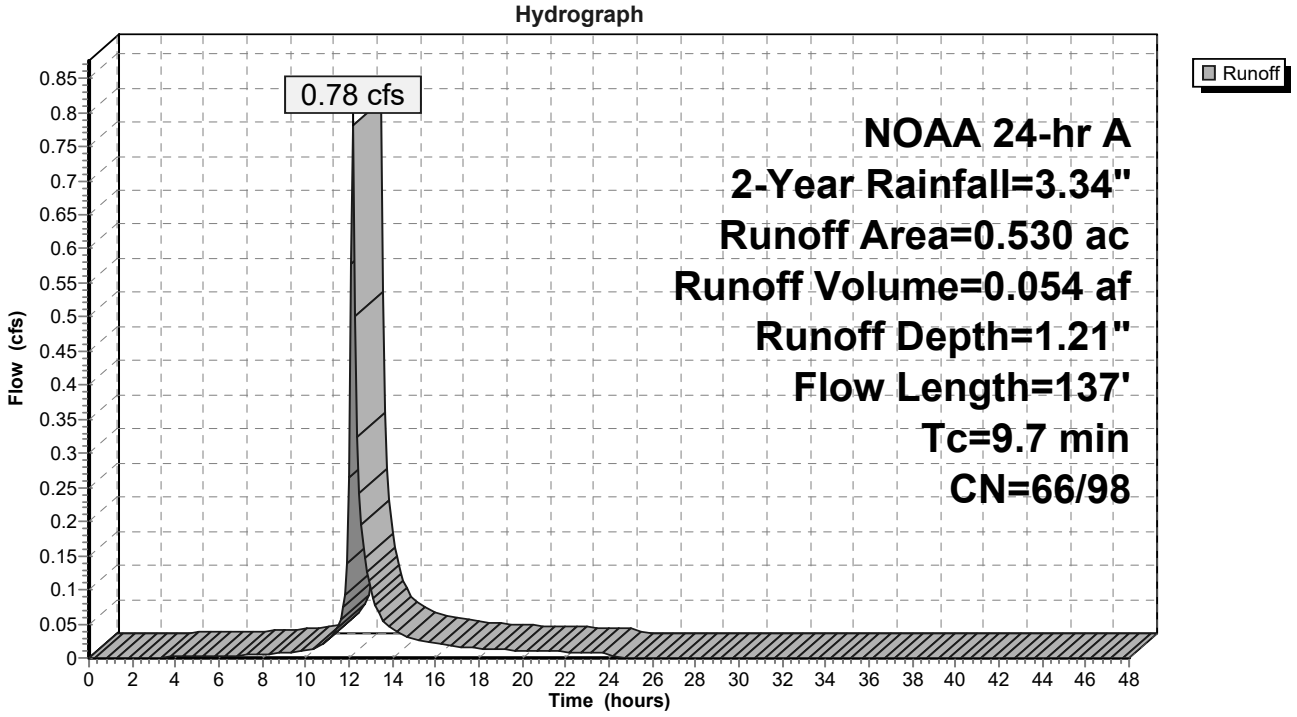
Runoff = 0.78 cfs @ 12.19 hrs, Volume= 0.054 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.040	98	Paved parking, HSG A
0.070	98	Paved parking, HSG D
0.140	39	>75% Grass cover, Good, HSG A
0.280	80	>75% Grass cover, Good, HSG D
0.530	73	Weighted Average
0.420	66	79.25% Pervious Area
0.110	98	20.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.1	87	0.0360	1.33		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.7	137	Total			

Subcatchment MCPR-1D:



Summary for Subcatchment MCPR-4A:

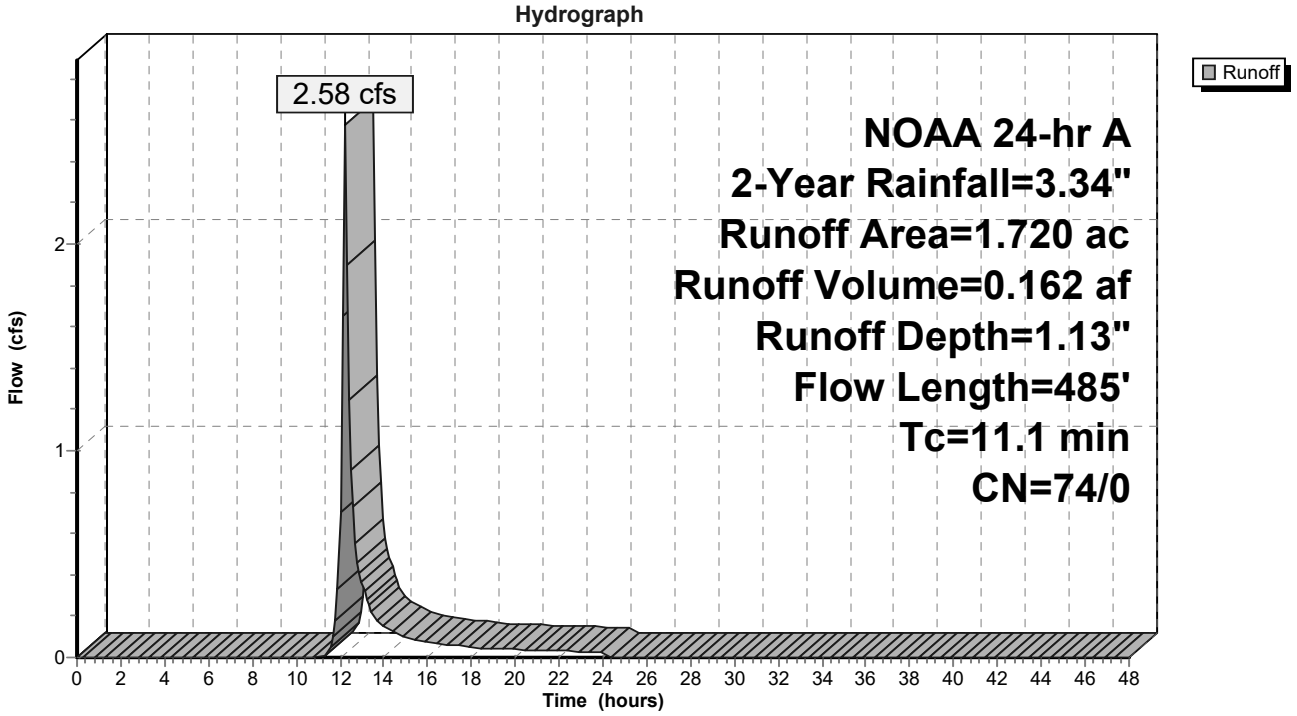
Runoff = 2.58 cfs @ 12.21 hrs, Volume= 0.162 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.870	70	Woods, Good, HSG C
0.040	96	Gravel surface, HSG C
0.100	71	Meadow, non-grazed, HSG C
0.410	77	Woods, Good, HSG D
0.290	78	Meadow, non-grazed, HSG D
0.010	96	Gravel surface, HSG D
1.720	74	Weighted Average
1.720	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.0	435	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.1	485	Total			

Subcatchment MCPR-4A:



Summary for Subcatchment MCPR-4B:

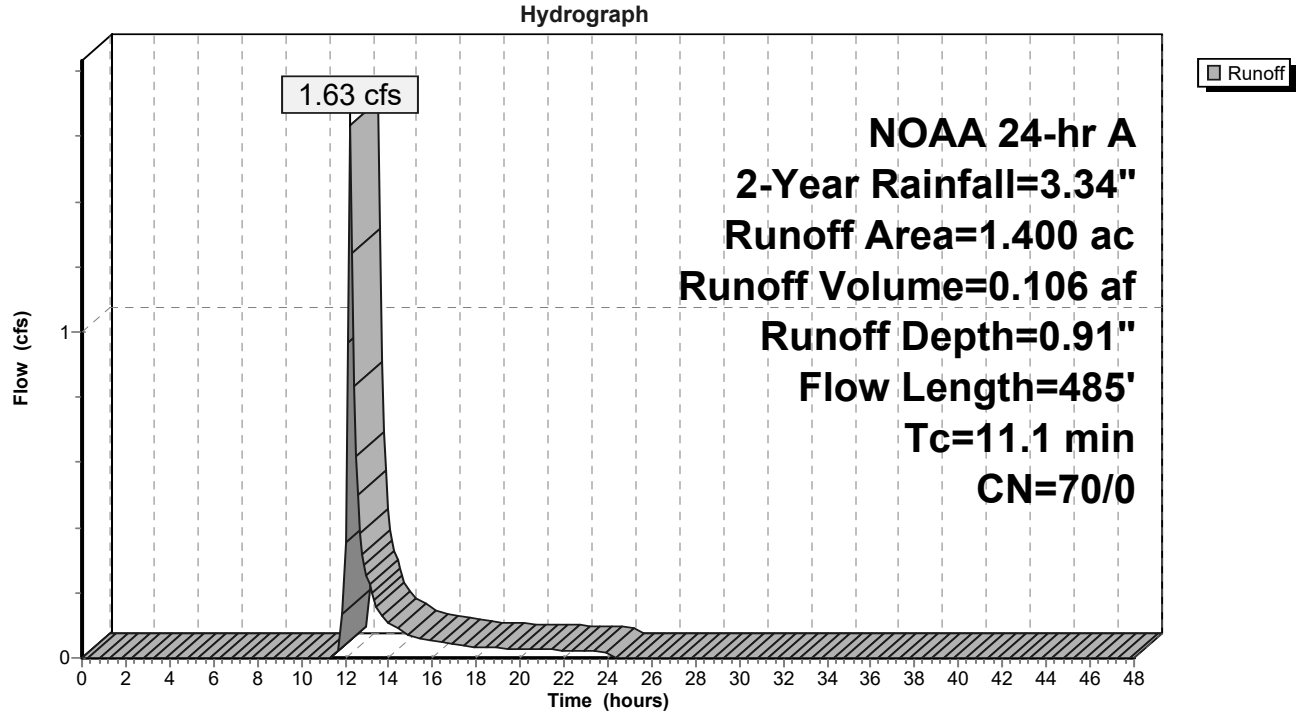
Runoff = 1.63 cfs @ 12.21 hrs, Volume= 0.106 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
1.360	70	Woods, Good, HSG C
0.020	96	Gravel surface, HSG C
0.020	71	Meadow, non-grazed, HSG C
1.400	70	Weighted Average
1.400	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.0	435	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.1	485	Total			

Subcatchment MCPR-4B:



Summary for Subcatchment MCPR-5A:

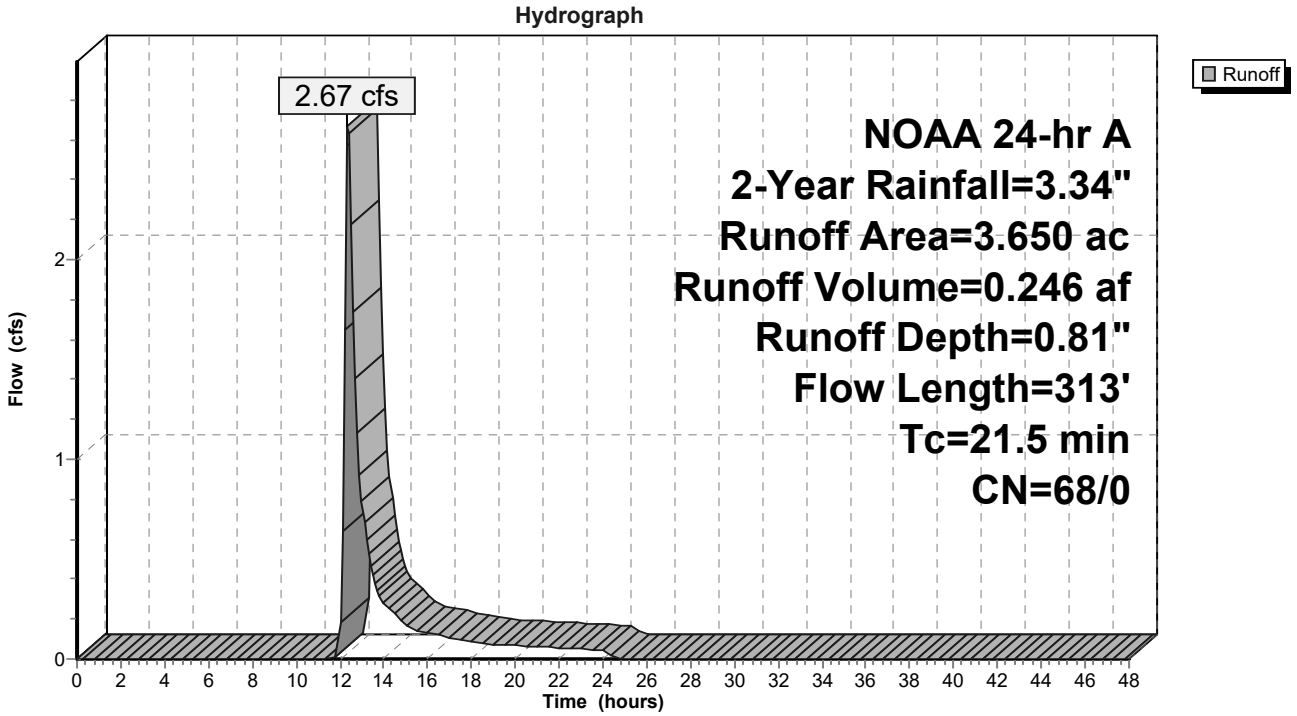
Runoff = 2.67 cfs @ 12.36 hrs, Volume= 0.246 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

	Area (ac)	CN	Description
	0.480	30	Woods, Good, HSG A
	1.230	70	Woods, Good, HSG C
*	0.950	77	Wetlands, HSG A
*	0.120	77	Wetlands, HSG C
	0.060	96	Gravel surface, HSG A
	0.660	74	>75% Grass cover, Good, HSG C
	0.150	71	Meadow, non-grazed, HSG C
	3.650	68	Weighted Average
	3.650	68	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
5.1	263	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.5	313	Total			

Subcatchment MCPR-5A:



Summary for Subcatchment MCPR-5B:

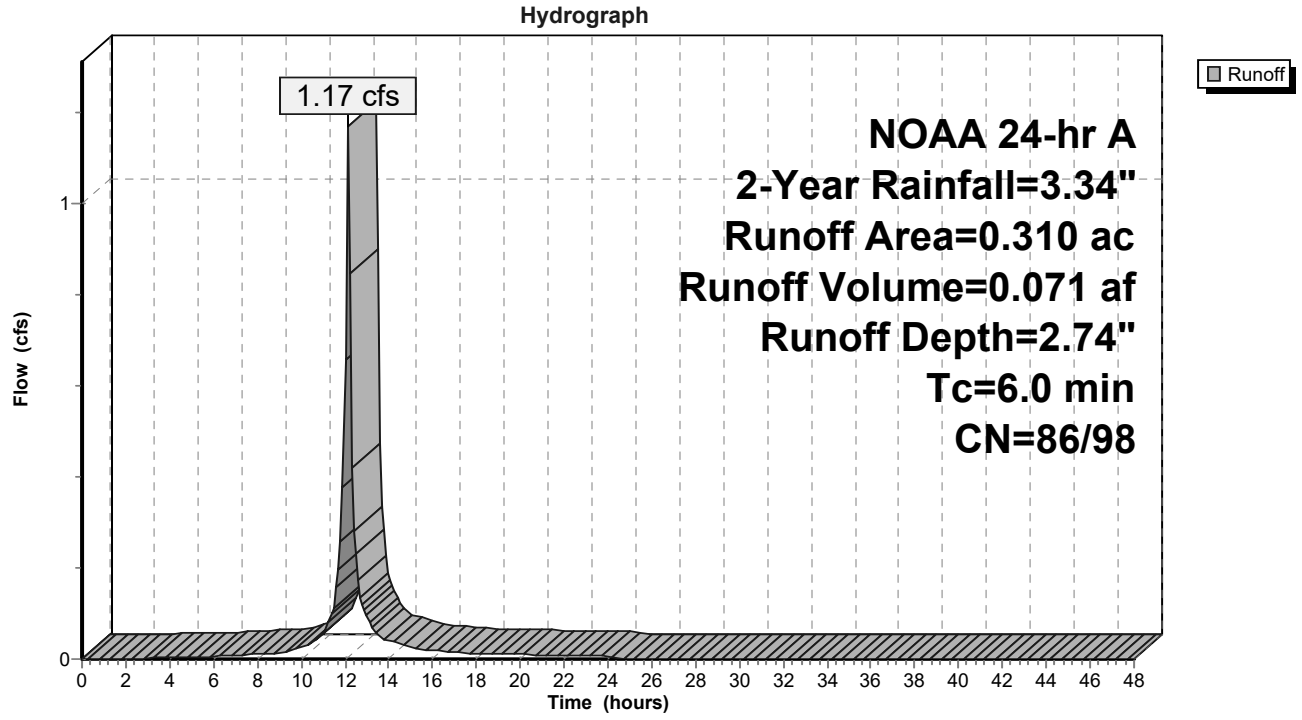
Runoff = 1.17 cfs @ 12.11 hrs, Volume= 0.071 af, Depth= 2.74"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.210	98	Roofs, HSG C
0.050	98	Water Surface, 0% imp, HSG C
0.050	74	>75% Grass cover, Good, HSG C
0.310	94	Weighted Average
0.100	86	32.26% Pervious Area
0.210	98	67.74% Impervious Area

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

Subcatchment MCPR-5B:



Summary for Subcatchment MCPR-5C:

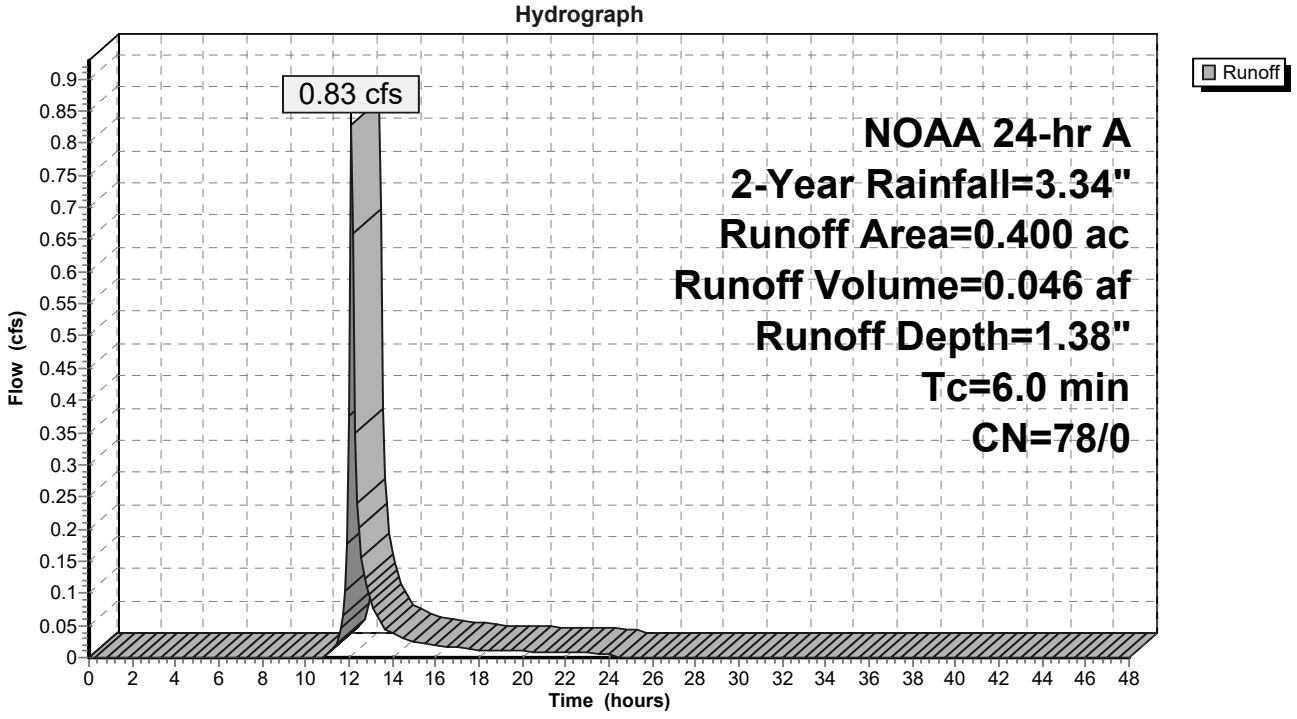
Runoff = 0.83 cfs @ 12.12 hrs, Volume= 0.046 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.010	96	Gravel surface, HSG A
0.100	30	Meadow, non-grazed, HSG A
0.040	71	Meadow, non-grazed, HSG C
0.220	98	Water Surface, 0% imp, HSG A
0.030	98	Water Surface, 0% imp, HSG C
0.400	78	Weighted Average
0.400	78	100.00% Pervious Area

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

Subcatchment MCPR-5C:



Summary for Subcatchment MCPR-5D:

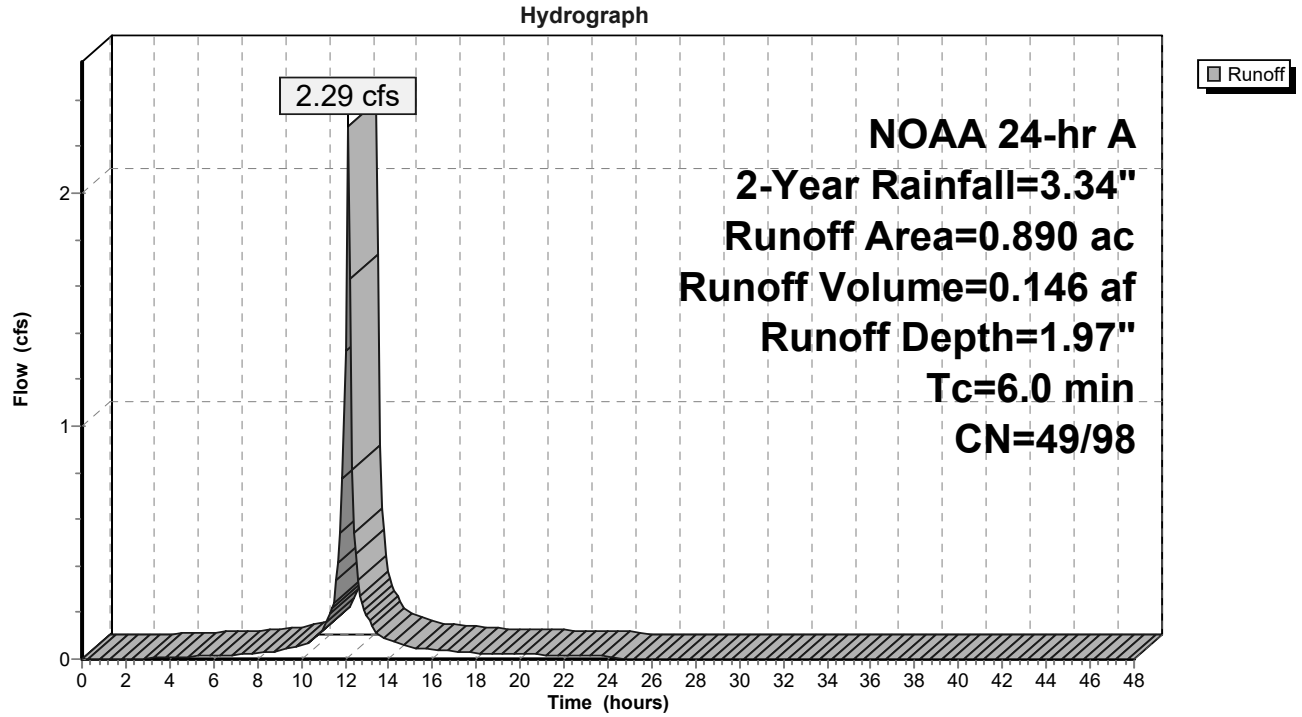
Runoff = 2.29 cfs @ 12.11 hrs, Volume= 0.146 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.030	98	Roofs, HSG A
0.240	39	>75% Grass cover, Good, HSG A
0.100	74	>75% Grass cover, Good, HSG C
0.350	98	Paved parking, HSG A
0.170	98	Paved parking, HSG C
0.890	79	Weighted Average
0.340	49	38.20% Pervious Area
0.550	98	61.80% Impervious Area

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

Subcatchment MCPR-5D:



Summary for Subcatchment MCPR-5E:

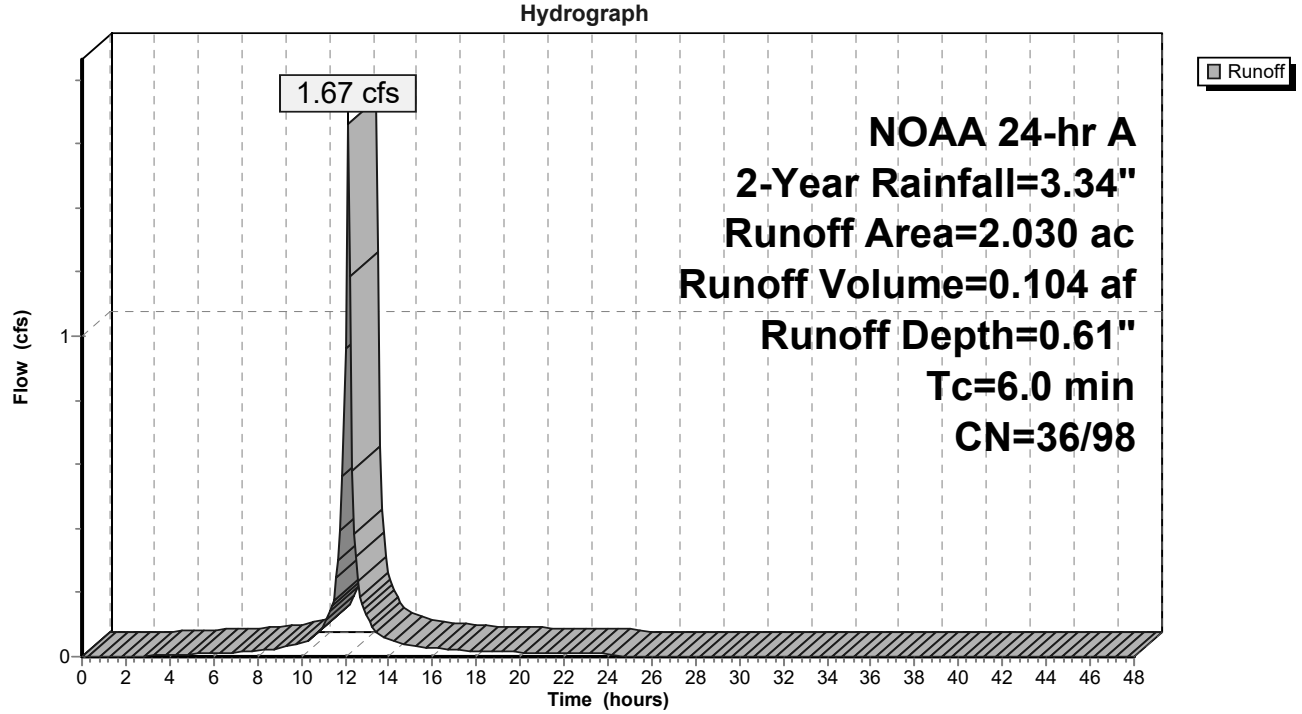
Runoff = 1.67 cfs @ 12.11 hrs, Volume= 0.104 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.350	98	Roofs, HSG A
0.030	98	Roofs, HSG C
0.780	39	>75% Grass cover, Good, HSG A
0.070	74	>75% Grass cover, Good, HSG C
0.010	98	Paved parking, HSG A
0.010	98	Paved parking, HSG C
0.330	30	Meadow, non-grazed, HSG A
0.450	30	Woods, Good, HSG A
2.030	48	Weighted Average
1.630	36	80.30% Pervious Area
0.400	98	19.70% Impervious Area

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

Subcatchment MCPR-5E:



Summary for Subcatchment MCPR-5F:

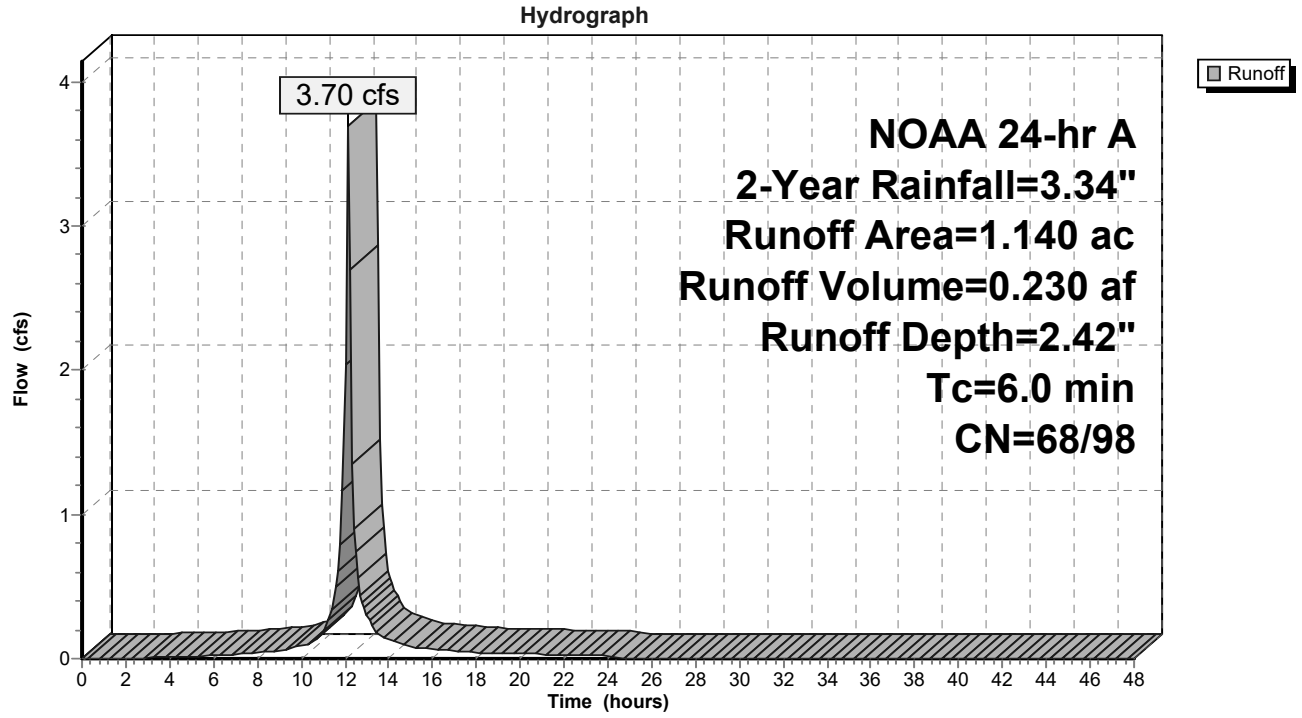
Runoff = 3.70 cfs @ 12.11 hrs, Volume= 0.230 af, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.110	98	Roofs, HSG A
0.350	98	Roofs, HSG C
0.060	39	>75% Grass cover, Good, HSG A
0.280	74	>75% Grass cover, Good, HSG C
0.090	98	Paved parking, HSG A
0.250	98	Paved parking, HSG C
1.140	89	Weighted Average
0.340	68	29.82% Pervious Area
0.800	98	70.18% Impervious Area

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

Subcatchment MCPR-5F:



Summary for Subcatchment MCPR-5H:

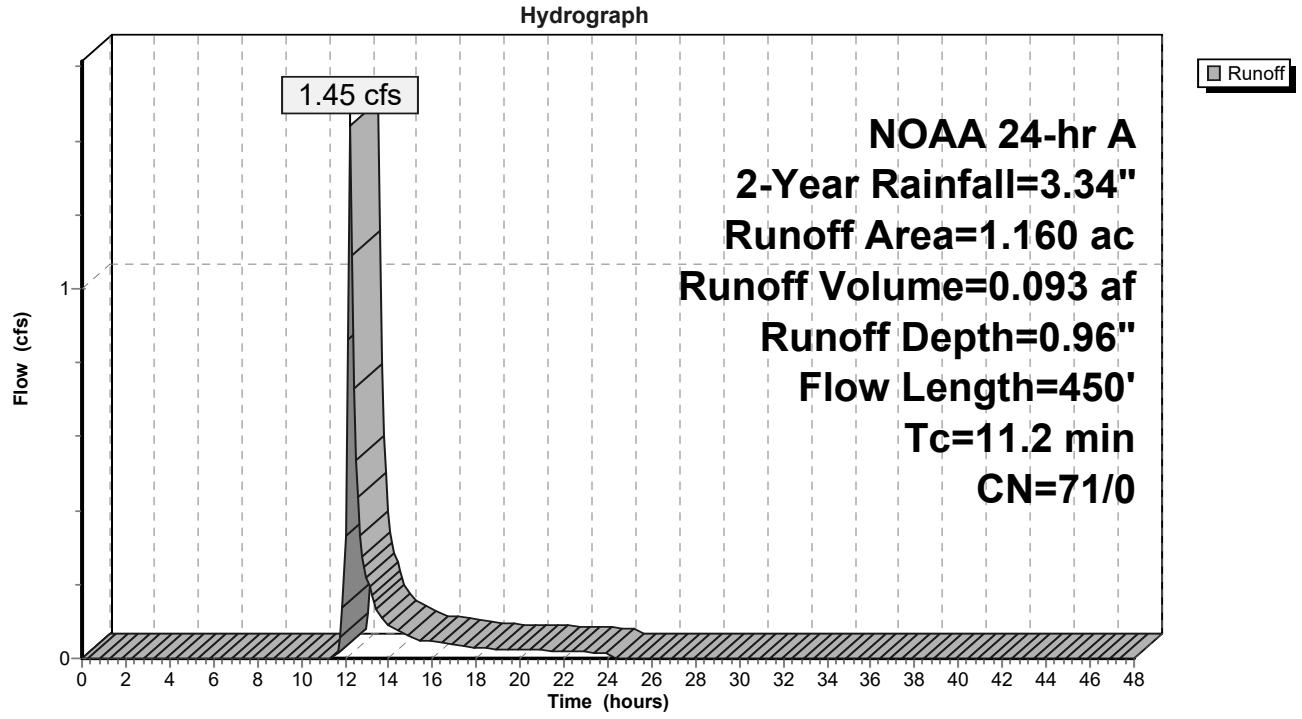
Runoff = 1.45 cfs @ 12.21 hrs, Volume= 0.093 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
1.120	70	Woods, Good, HSG C
0.040	96	Gravel surface, HSG C
1.160	71	Weighted Average
1.160	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.7	400	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.2	450	Total			

Subcatchment MCPR-5H:



Summary for Subcatchment MCPR-5l:

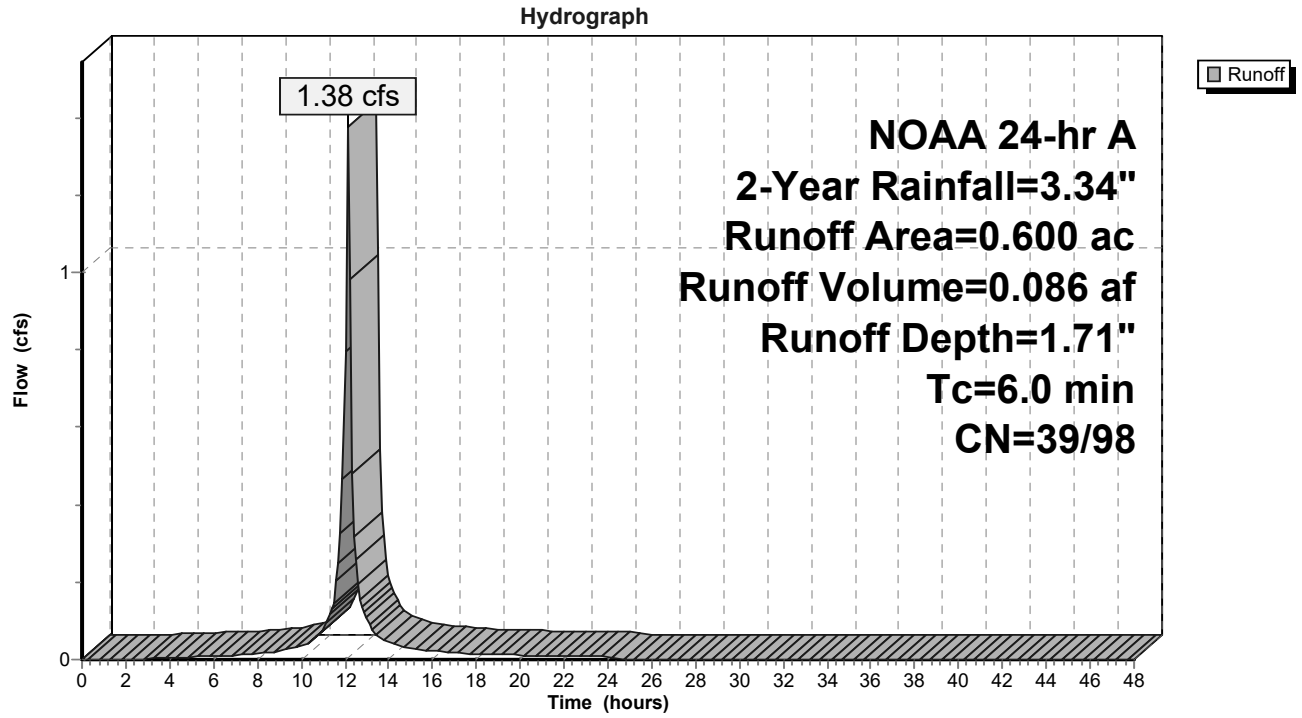
Runoff = 1.38 cfs @ 12.11 hrs, Volume= 0.086 af, Depth= 1.71"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.330	98	Roofs, HSG A
0.270	39	>75% Grass cover, Good, HSG A
0.600	71	Weighted Average
0.270	39	45.00% Pervious Area
0.330	98	55.00% Impervious Area

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

Subcatchment MCPR-5l:



Summary for Subcatchment MCPR-5J:

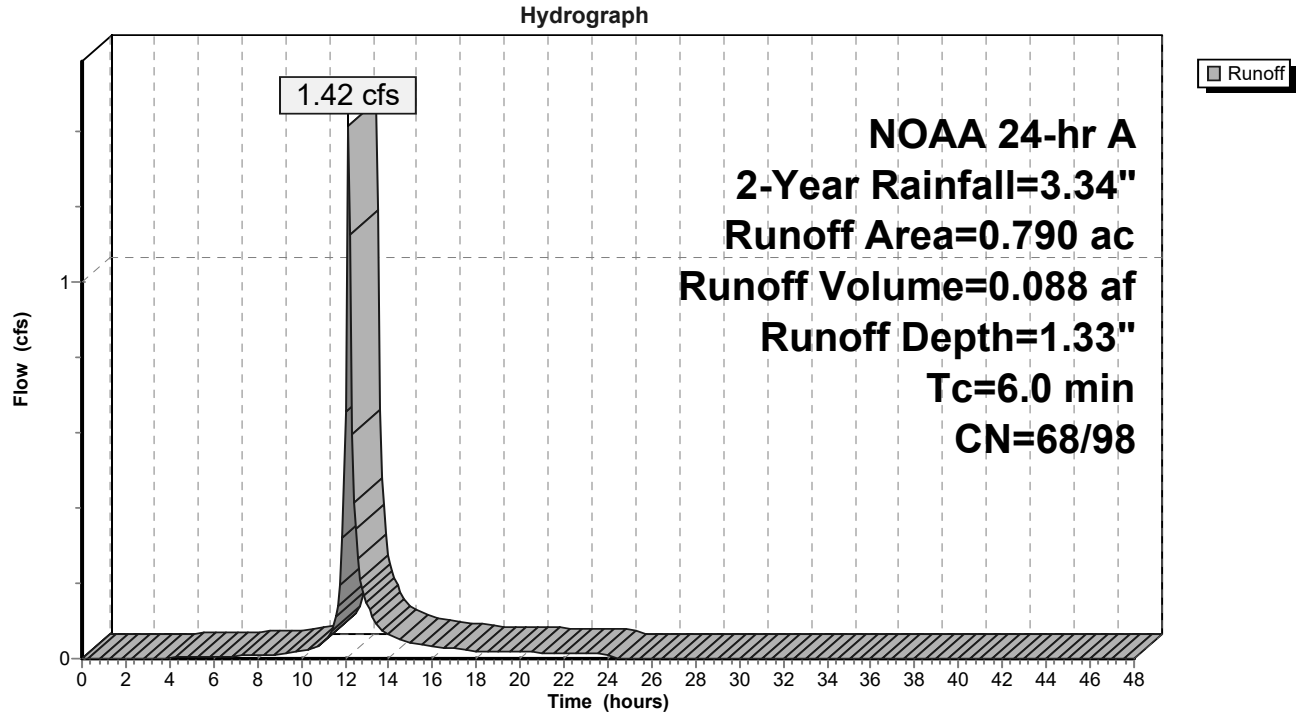
Runoff = 1.42 cfs @ 12.12 hrs, Volume= 0.088 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.020	98	Roofs, HSG A
0.160	98	Roofs, HSG C
0.150	39	>75% Grass cover, Good, HSG A
0.290	74	>75% Grass cover, Good, HSG C
0.090	70	Woods, Good, HSG C
0.080	98	Water Surface, 0% imp, HSG C
0.790	75	Weighted Average
0.610	68	77.22% Pervious Area
0.180	98	22.78% Impervious Area

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

Subcatchment MCPR-5J:



Summary for Subcatchment MCPR-5K:

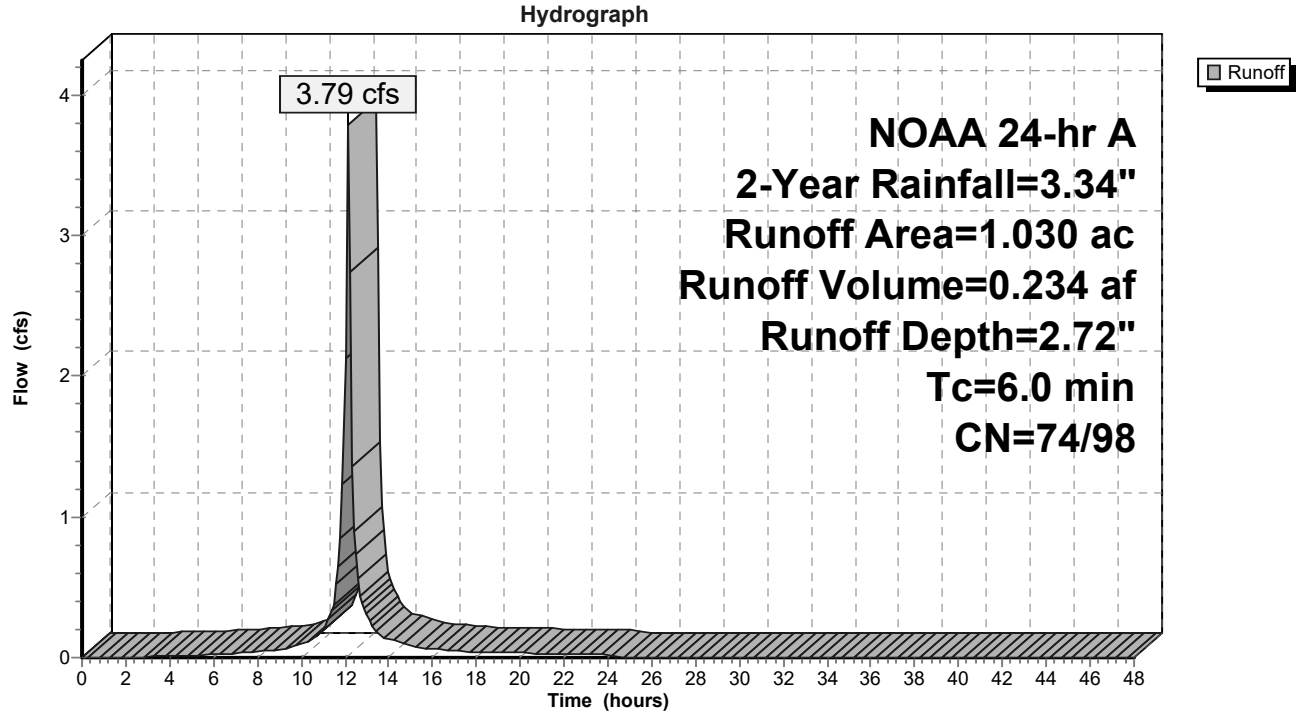
Runoff = 3.79 cfs @ 12.11 hrs, Volume= 0.234 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.020	98	Roofs, HSG A
0.320	98	Roofs, HSG C
0.200	74	>75% Grass cover, Good, HSG C
0.490	98	Paved parking, HSG C
1.030	93	Weighted Average
0.200	74	19.42% Pervious Area
0.830	98	80.58% Impervious Area

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

Subcatchment MCPR-5K:



Summary for Subcatchment MCPR-6A:

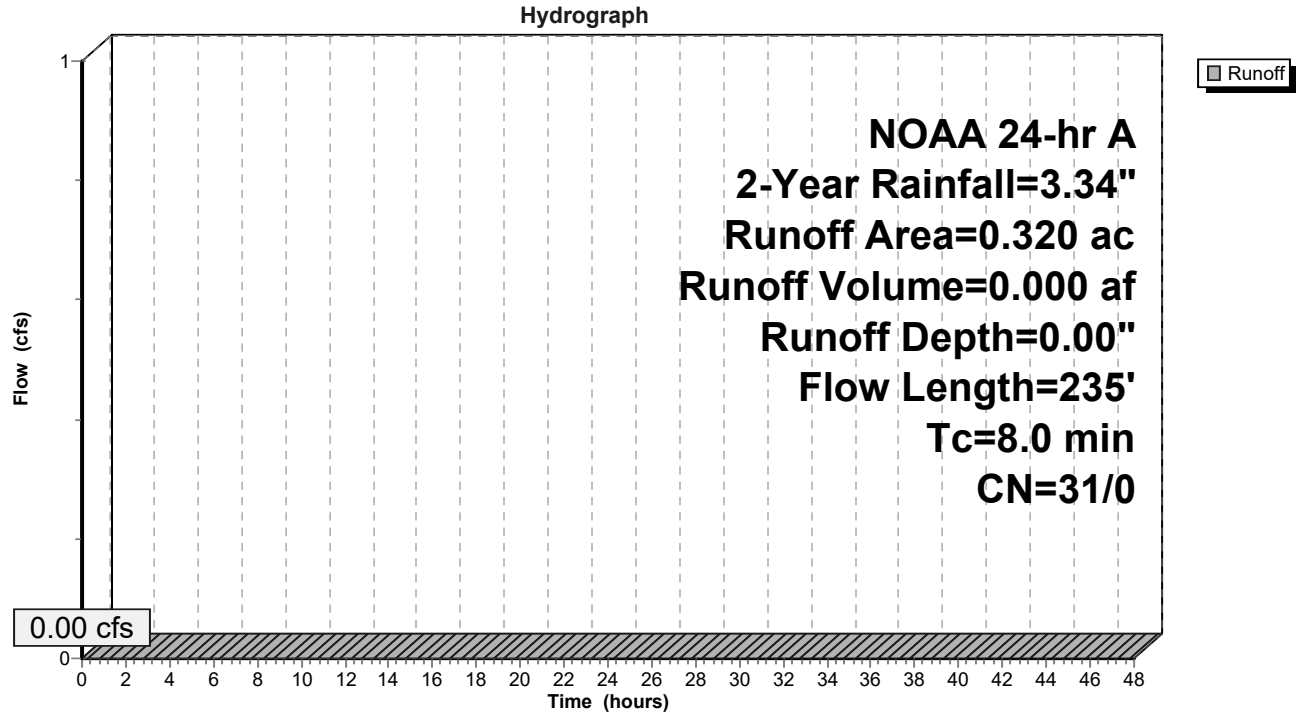
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.050	39	>75% Grass cover, Good, HSG A
0.270	30	Woods, Good, HSG A
0.320	31	Weighted Average
0.320	31	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	35	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
2.4	200	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.0	235	Total			

Subcatchment MCPR-6A:



Summary for Subcatchment MCPR-7A:

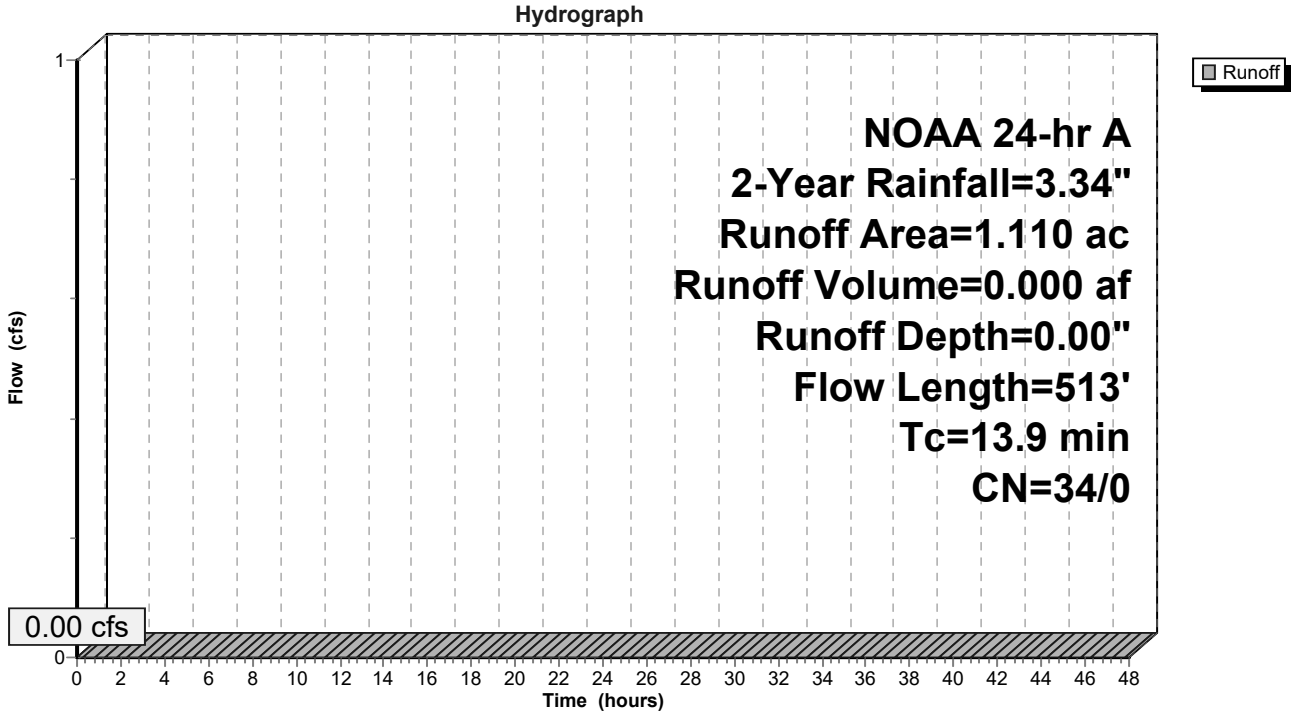
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

	Area (ac)	CN	Description
	0.310	39	>75% Grass cover, Good, HSG A
	0.250	30	Meadow, non-grazed, HSG A
	0.510	30	Woods, Good, HSG A
*	0.040	77	Wetlands, HSG A
	1.110	34	Weighted Average
	1.110	34	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
7.4	463	0.0440	1.05		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.9	513	Total			

Subcatchment MCPR-7A:



Summary for Subcatchment MCPR-7B:

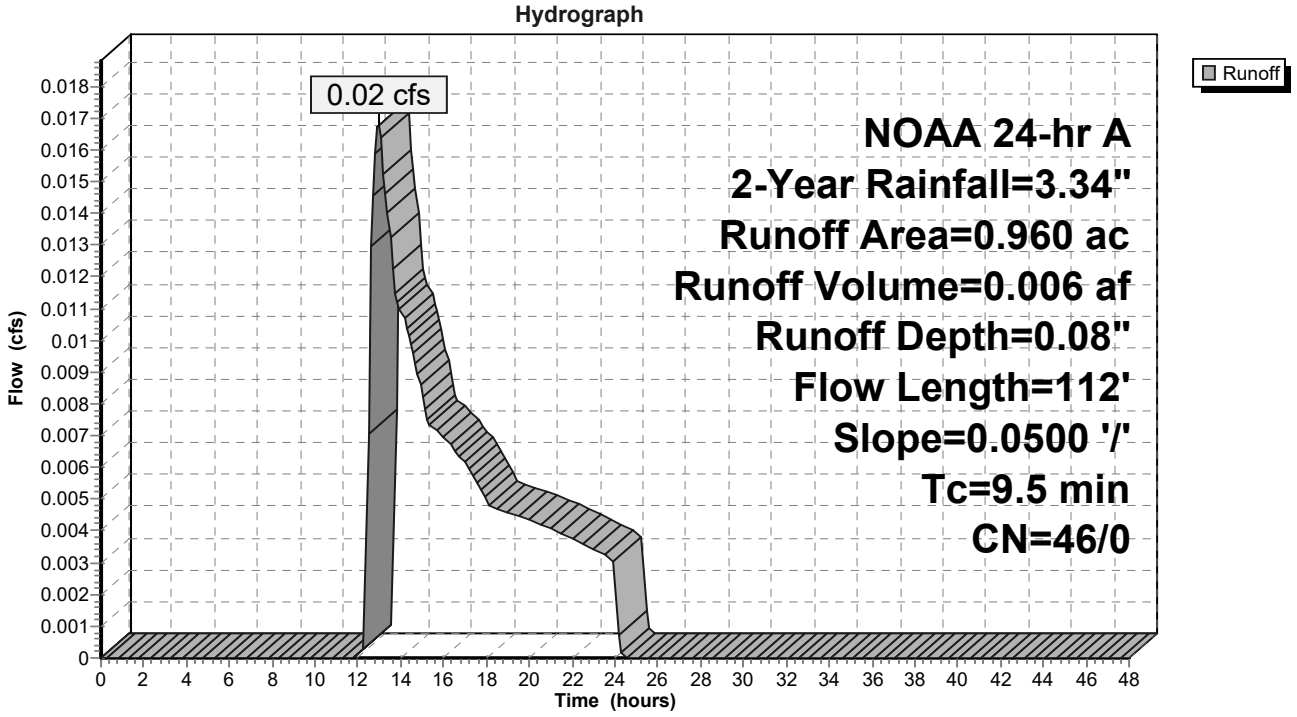
Runoff = 0.02 cfs @ 12.96 hrs, Volume= 0.006 af, Depth= 0.08"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

	Area (ac)	CN	Description
	0.200	39	>75% Grass cover, Good, HSG A
	0.290	30	Woods, Good, HSG A
	0.200	30	Meadow, non-grazed, HSG A
*	0.220	77	Wetlands, HSG A
	0.050	98	Water Surface, 0% imp, HSG A
	0.960	46	Weighted Average
	0.960	46	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
0.9	62	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.5	112	Total			

Subcatchment MCPR-7B:



Summary for Subcatchment MCPR-7C:

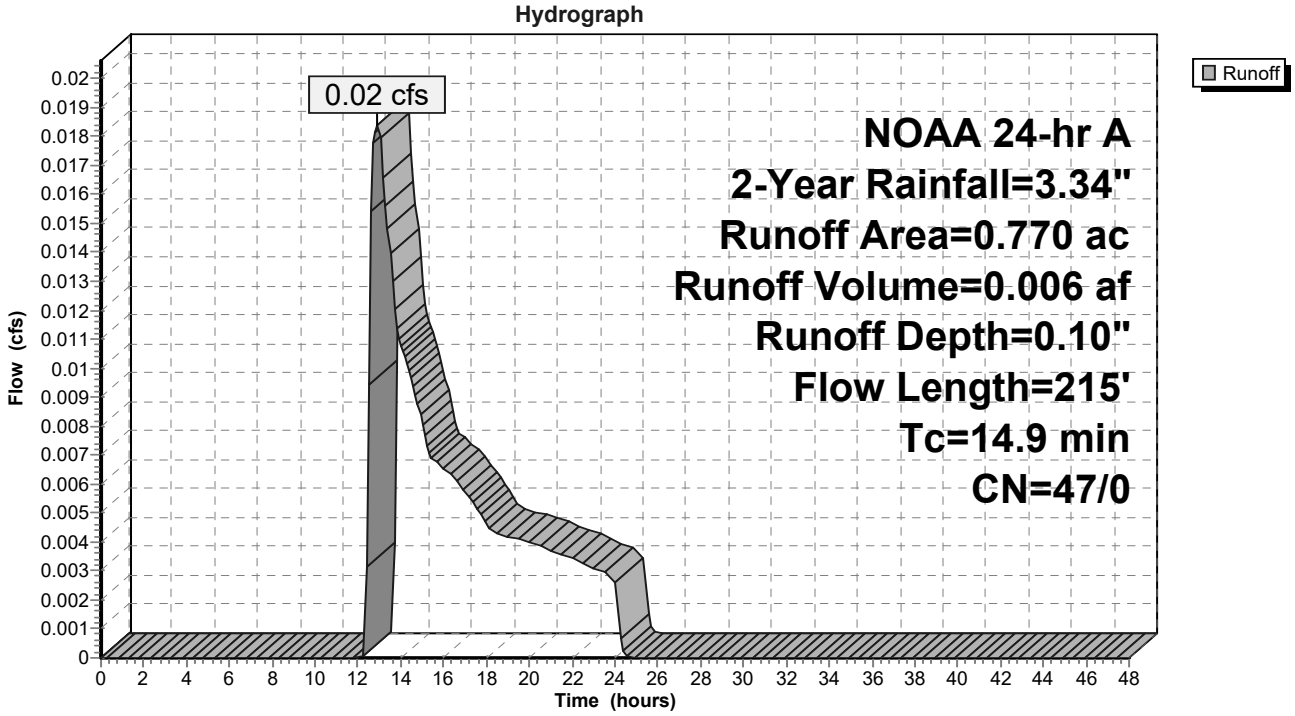
Runoff = 0.02 cfs @ 12.92 hrs, Volume= 0.006 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

	Area (ac)	CN	Description
	0.030	39	>75% Grass cover, Good, HSG A
	0.460	30	Meadow, non-grazed, HSG A
*	0.280	77	Wetlands, HSG A
	0.770	47	Weighted Average
	0.770	47	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.3	165	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.9	215	Total			

Subcatchment MCPR-7C:



Summary for Subcatchment MCPR-7D:

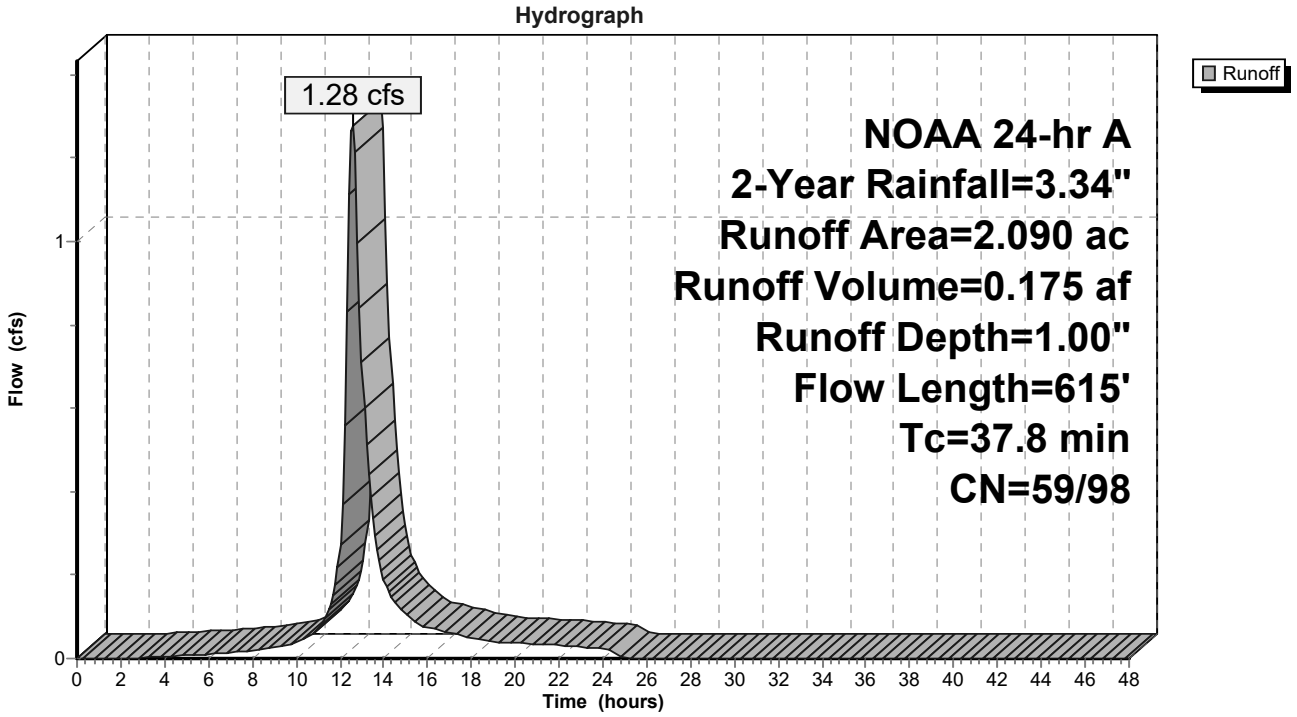
Runoff = 1.28 cfs @ 12.55 hrs, Volume= 0.175 af, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.140	98	Roofs, HSG A
0.150	98	Roofs, HSG C
0.160	98	Paved parking, HSG A
0.410	39	>75% Grass cover, Good, HSG A
0.330	74	>75% Grass cover, Good, HSG C
0.200	30	Woods, Good, HSG A
0.390	70	Woods, Good, HSG C
0.050	30	Meadow, non-grazed, HSG A
0.160	71	Meadow, non-grazed, HSG C
0.100	98	Water Surface, 0% imp, HSG A
2.090	67	Weighted Average
1.640	59	78.47% Pervious Area
0.450	98	21.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.16"
0.9	125	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
27.8	250	0.0001	0.15		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.9	190	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
37.8	615	Total			

Subcatchment MCPR-7D:



Summary for Subcatchment MCPR-7F:

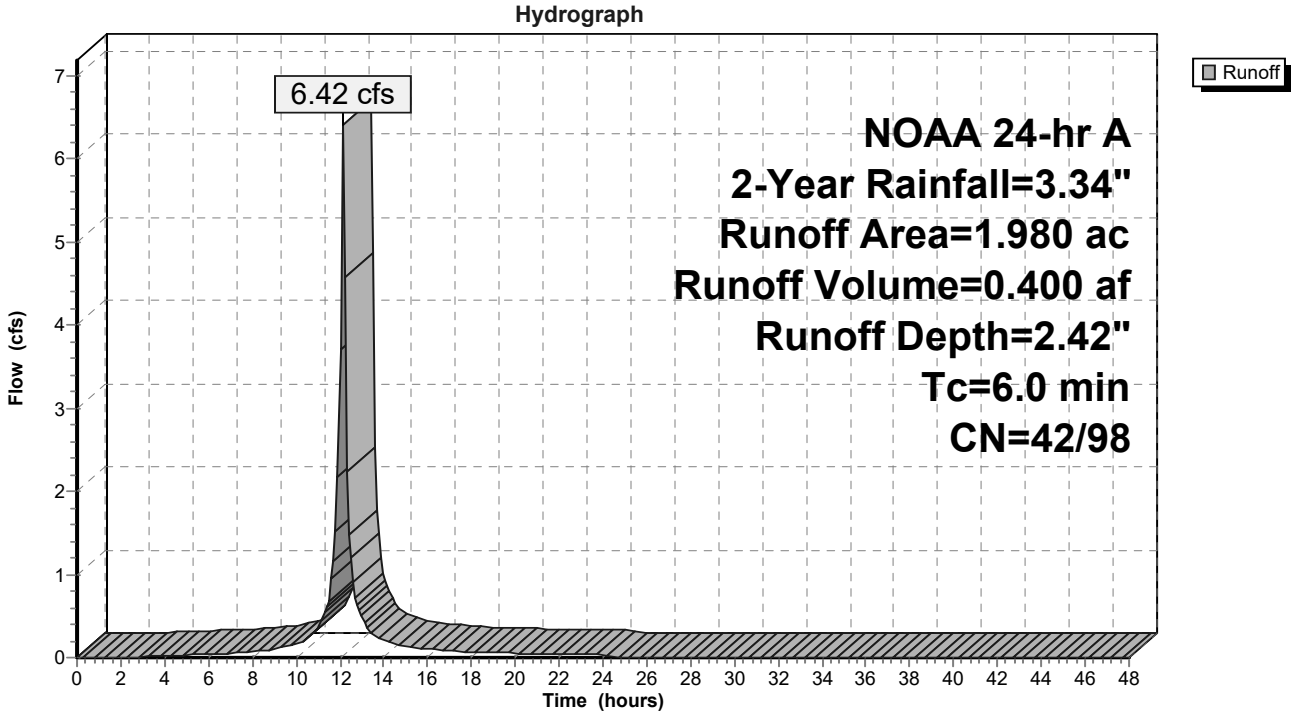
Runoff = 6.42 cfs @ 12.11 hrs, Volume= 0.400 af, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.600	98	Roofs, HSG A
0.940	98	Paved parking, HSG A
0.420	39	>75% Grass cover, Good, HSG A
0.020	98	Water Surface, 0% imp, HSG A
1.980	85	Weighted Average
0.440	42	22.22% Pervious Area
1.540	98	77.78% Impervious Area

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

Subcatchment MCPR-7F:



Summary for Subcatchment MCPR-7G:

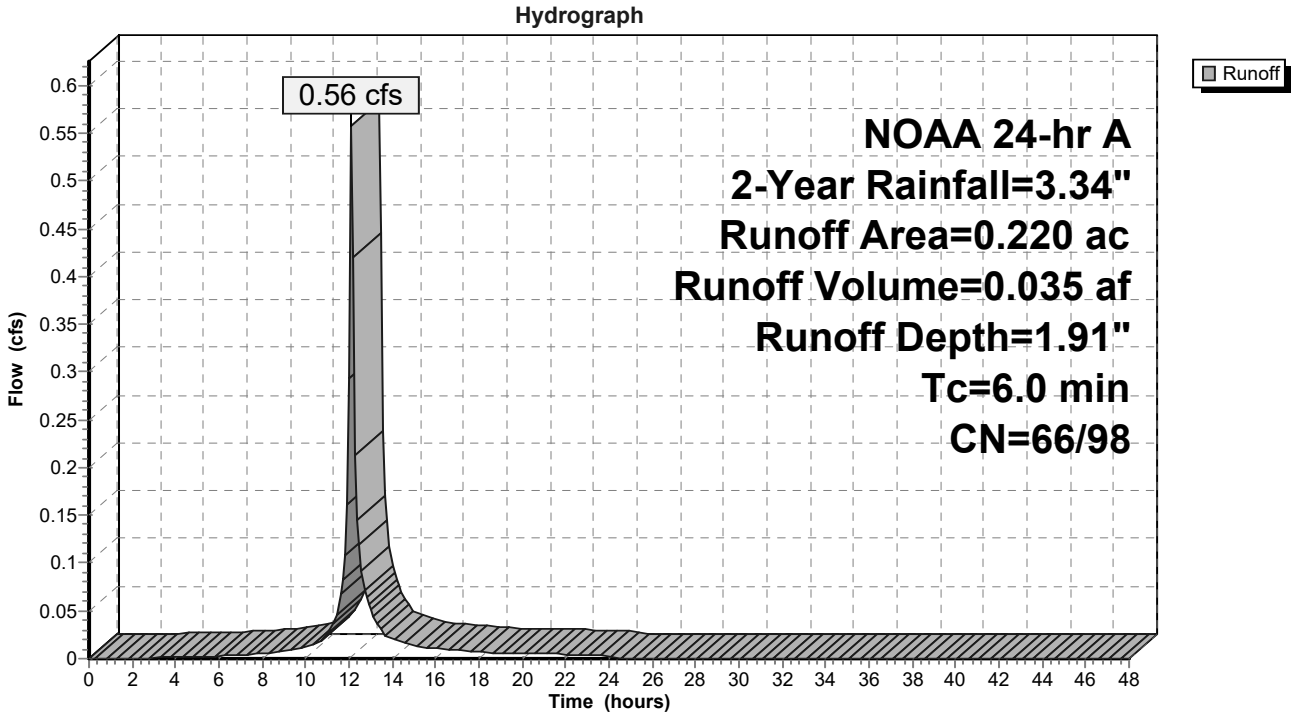
Runoff = 0.56 cfs @ 12.12 hrs, Volume= 0.035 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.100	98	Paved parking, HSG A
0.010	98	Paved parking, HSG D
0.050	39	>75% Grass cover, Good, HSG A
0.030	80	>75% Grass cover, Good, HSG D
0.020	98	Water Surface, 0% imp, HSG A
0.010	98	Water Surface, 0% imp, HSG D
0.220	82	Weighted Average
0.110	66	50.00% Pervious Area
0.110	98	50.00% Impervious Area

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

Subcatchment MCPR-7G:



Summary for Subcatchment MCPR-7I:

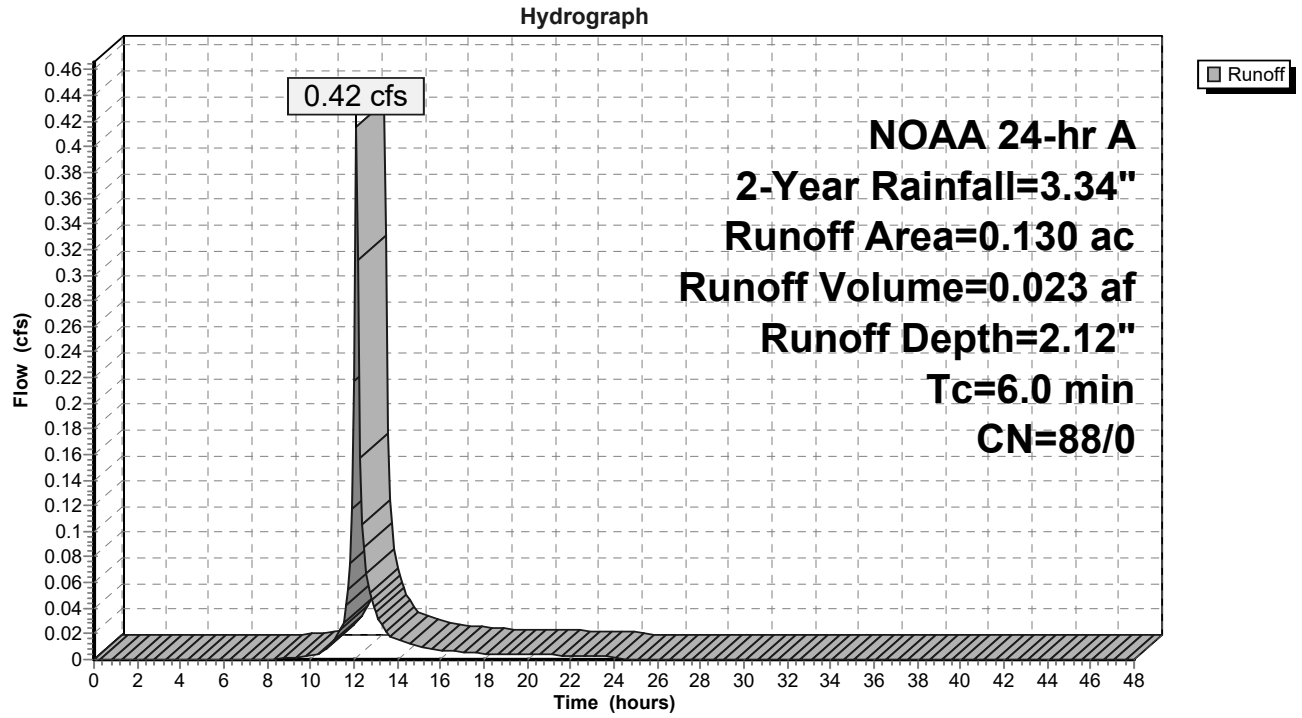
Runoff = 0.42 cfs @ 12.12 hrs, Volume= 0.023 af, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.050	96	Gravel surface, HSG A
0.020	39	>75% Grass cover, Good, HSG A
0.060	98	Water Surface, 0% imp, HSG A
0.130	88	Weighted Average
0.130	88	100.00% Pervious Area

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

Subcatchment MCPR-7I:



Summary for Subcatchment MCPR-7K:

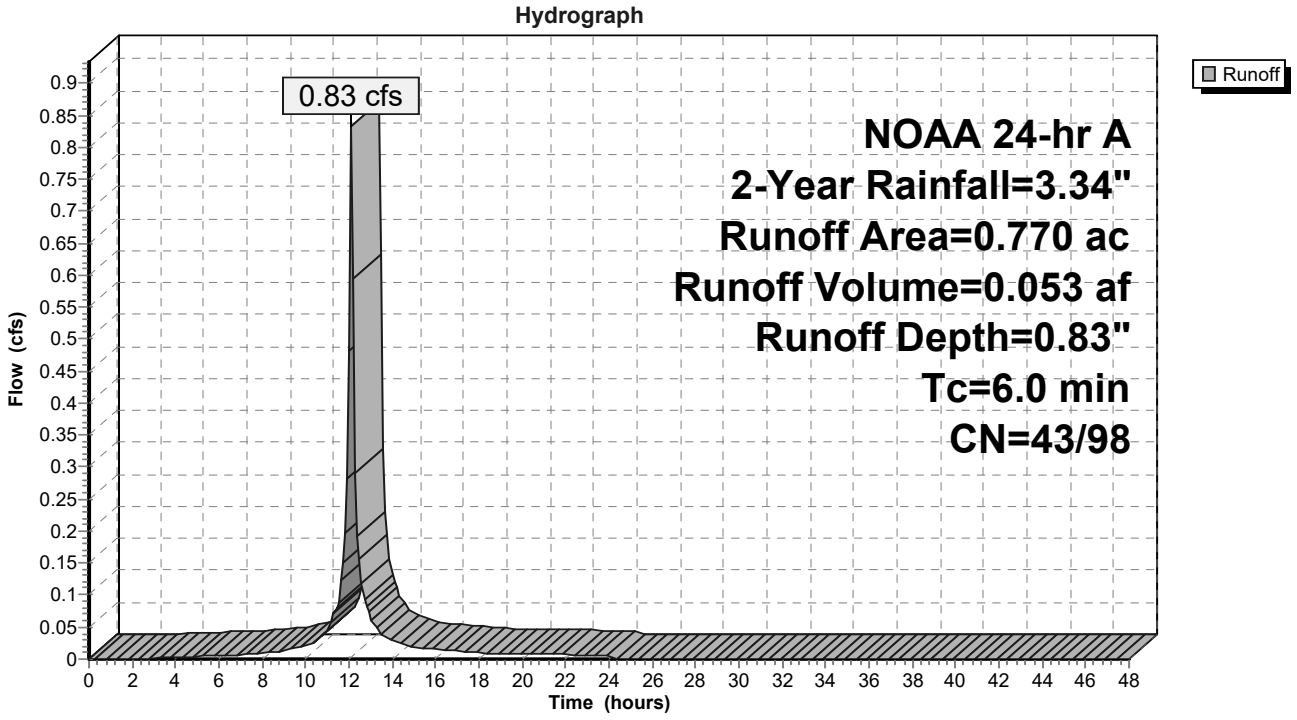
Runoff = 0.83 cfs @ 12.11 hrs, Volume= 0.053 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.200	98	Roofs, HSG A
0.530	39	>75% Grass cover, Good, HSG A
0.040	98	Water Surface, 0% imp, HSG A
0.770	57	Weighted Average
0.570	43	74.03% Pervious Area
0.200	98	25.97% Impervious Area

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

Subcatchment MCPR-7K:



Summary for Subcatchment MCPR-7L:

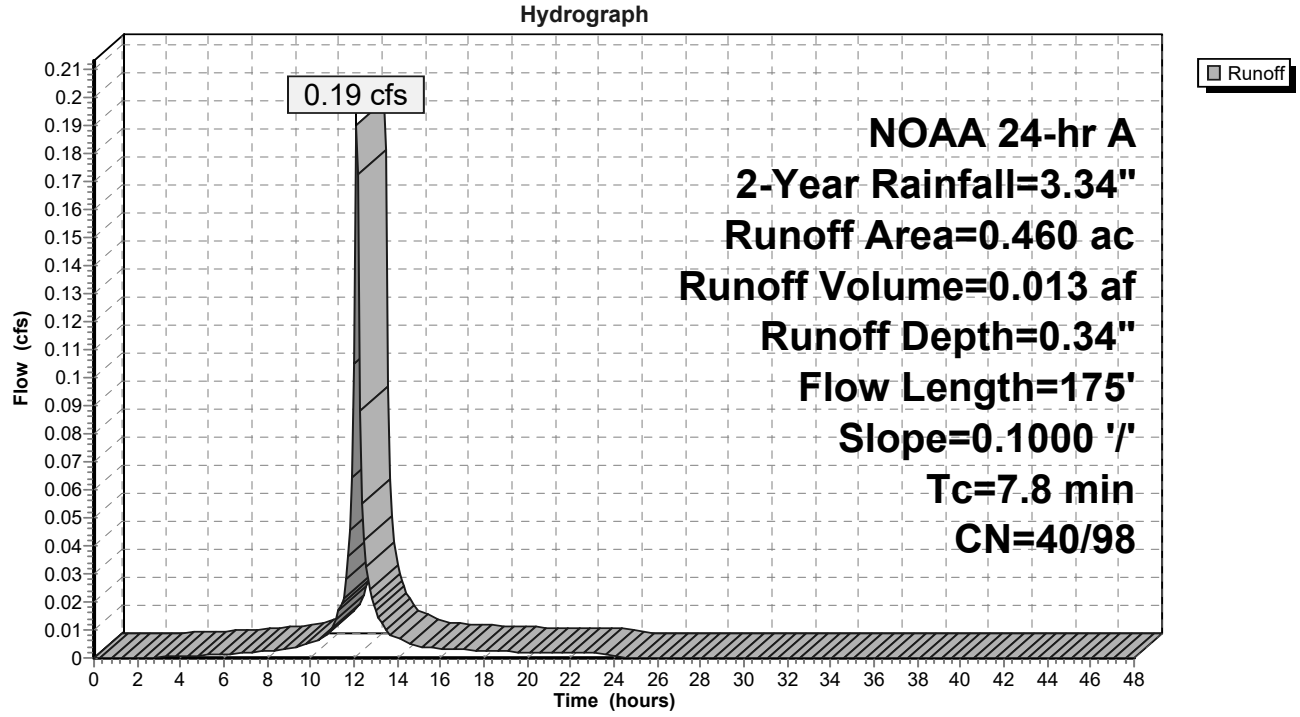
Runoff = 0.19 cfs @ 12.14 hrs, Volume= 0.013 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.050	98	Roofs, HSG A
0.210	39	>75% Grass cover, Good, HSG A
0.170	30	Woods, Good, HSG A
0.030	98	Water Surface, 0% imp, HSG A
0.460	46	Weighted Average
0.410	40	89.13% Pervious Area
0.050	98	10.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.3	125	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.8	175	Total			

Subcatchment MCPR-7L:



Summary for Subcatchment MCPR-7M:

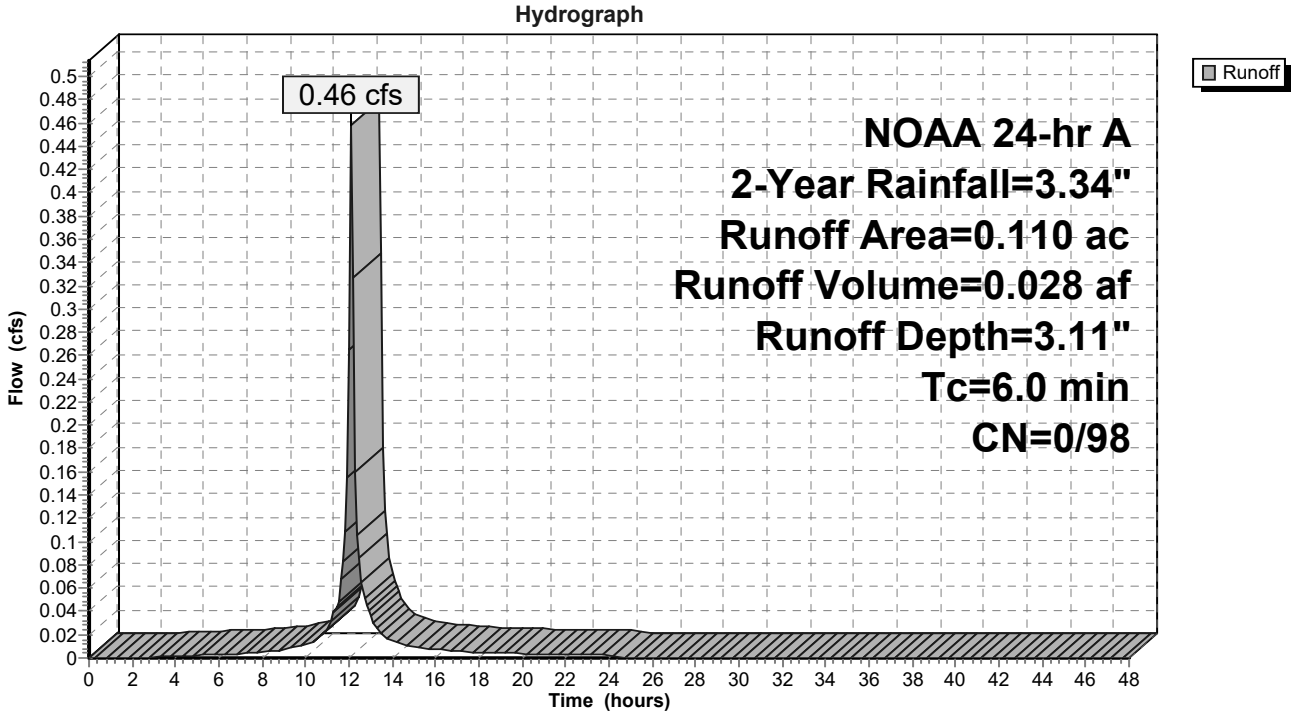
Runoff = 0.46 cfs @ 12.11 hrs, Volume= 0.028 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.110	98	Paved parking, HSG A
0.110	98	100.00% Impervious Area

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

Subcatchment MCPR-7M:



Summary for Subcatchment MCPR-7N:

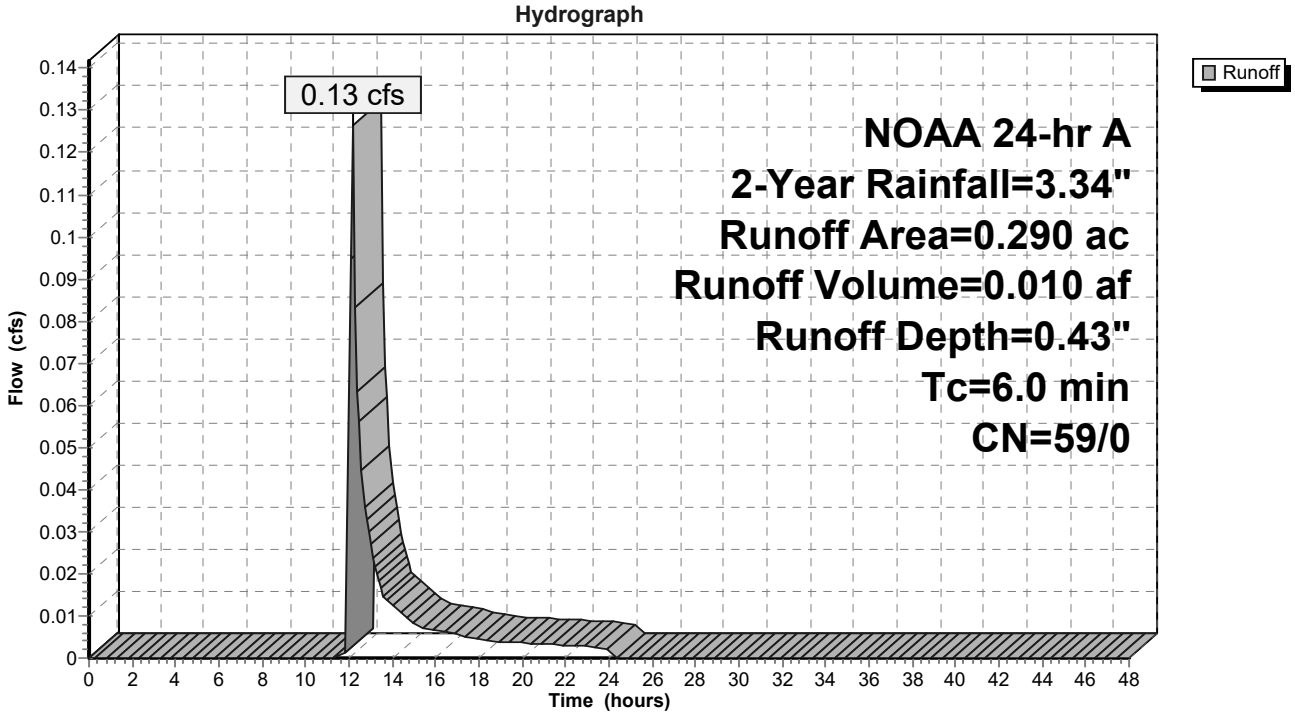
Runoff = 0.13 cfs @ 12.19 hrs, Volume= 0.010 af, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.190	39	>75% Grass cover, Good, HSG A
0.100	98	Water Surface, 0% imp, HSG A
0.290	59	Weighted Average
0.290	59	100.00% Pervious Area

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

Subcatchment MCPR-7N:



Summary for Subcatchment MCPR-7O:

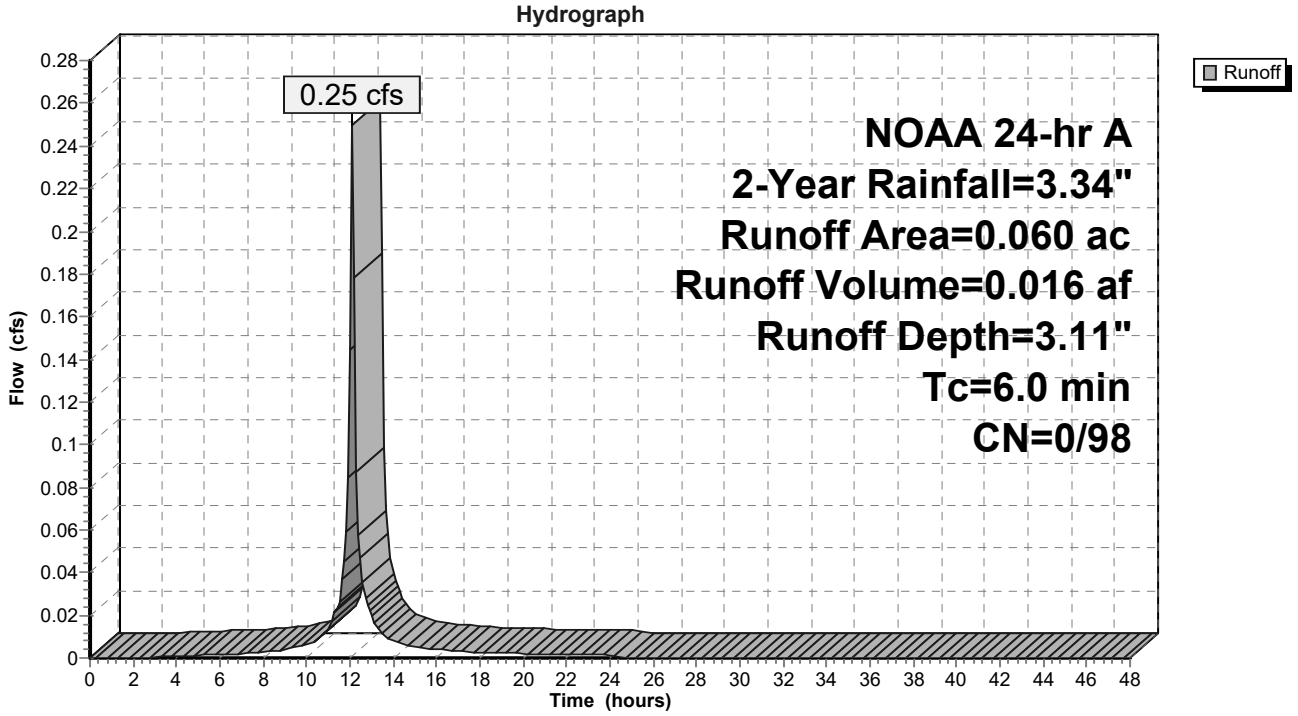
Runoff = 0.25 cfs @ 12.11 hrs, Volume= 0.016 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.060	98	Roofs, HSG A
0.060	98	100.00% Impervious Area

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

Subcatchment MCPR-7O:



Summary for Pond BASIN MC-1: Infiltration

Inflow Area = 5.640 ac, 41.84% Impervious, Inflow Depth = 0.67" for 2-Year event
Inflow = 2.19 cfs @ 12.12 hrs, Volume= 0.314 af
Outflow = 0.84 cfs @ 12.38 hrs, Volume= 0.314 af, Atten= 62%, Lag= 15.5 min
Discarded = 0.73 cfs @ 12.38 hrs, Volume= 0.306 af
Primary = 0.11 cfs @ 12.38 hrs, Volume= 0.008 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 151.89' @ 12.38 hrs Surf.Area= 3,801 sf Storage= 1,303 cf

Plug-Flow detention time= 10.8 min calculated for 0.314 af (100% of inflow)
Center-of-Mass det. time= 10.8 min (884.1 - 873.3)

Volume	Invert	Avail.Storage	Storage Description
#1	151.50'	28,683 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

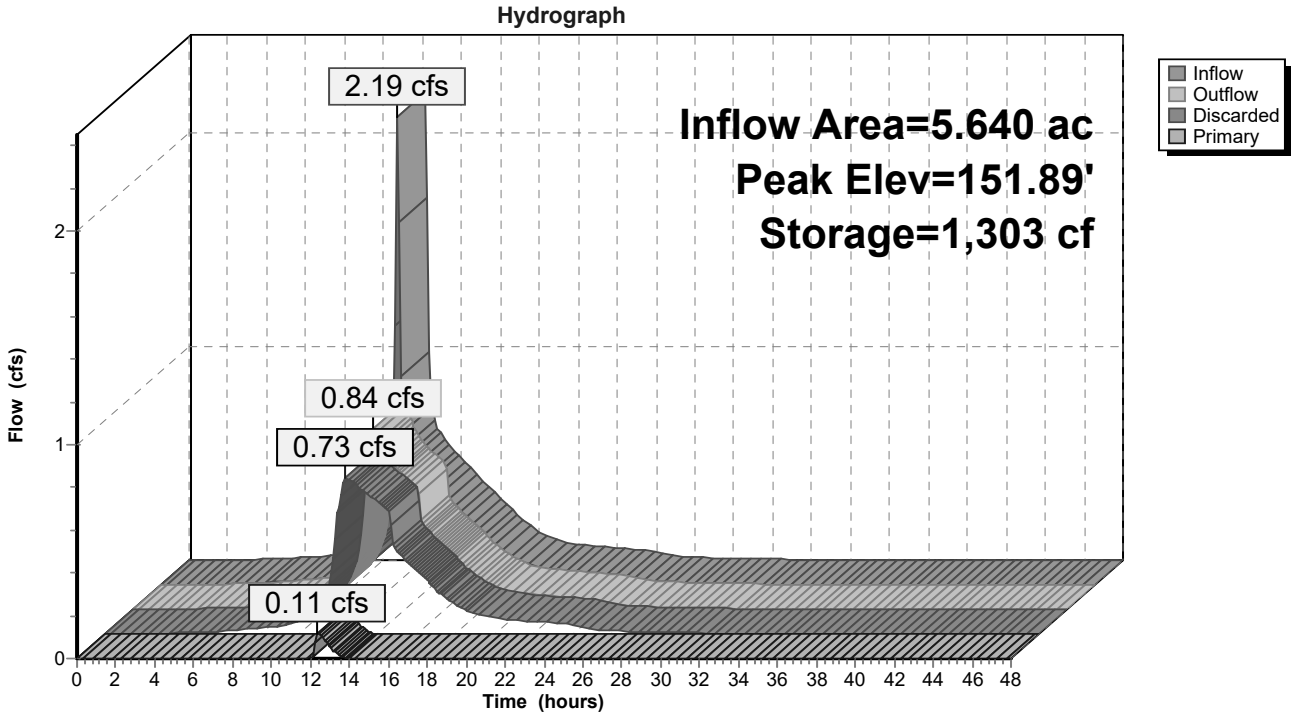
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
151.50	2,847	0	0
152.00	4,064	1,728	1,728
154.00	6,675	10,739	12,467
156.00	9,541	16,216	28,683

Device	Routing	Invert	Outlet Devices
#1	Primary	151.50'	**12.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 151.50' / 150.50' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	151.65'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	154.50'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	154.25'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#5	Discarded	151.50'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.73 cfs @ 12.38 hrs HW=151.89' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.73 cfs)

Primary OutFlow Max=0.11 cfs @ 12.38 hrs HW=151.89' (Free Discharge)
├**1=Culvert** (Passes 0.11 cfs of 0.61 cfs potential flow)
│ ├**2=Orifice/Grate** (Orifice Controls 0.11 cfs @ 1.67 fps)
│ └**3=Orifice/Grate** (Controls 0.00 cfs)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond BASIN MC-1: Infiltration



Summary for Pond BASIN MC-2: Infiltration

Inflow Area = 0.460 ac, 10.87% Impervious, Inflow Depth = 0.34" for 2-Year event
Inflow = 0.19 cfs @ 12.14 hrs, Volume= 0.013 af
Outflow = 0.07 cfs @ 12.36 hrs, Volume= 0.013 af, Atten= 63%, Lag= 13.3 min
Discarded = 0.07 cfs @ 12.36 hrs, Volume= 0.013 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 160.51' @ 12.36 hrs Surf.Area= 363 sf Storage= 133 cf

Plug-Flow detention time= 13.8 min calculated for 0.013 af (100% of inflow)
Center-of-Mass det. time= 13.5 min (776.7 - 763.2)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	2,432 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

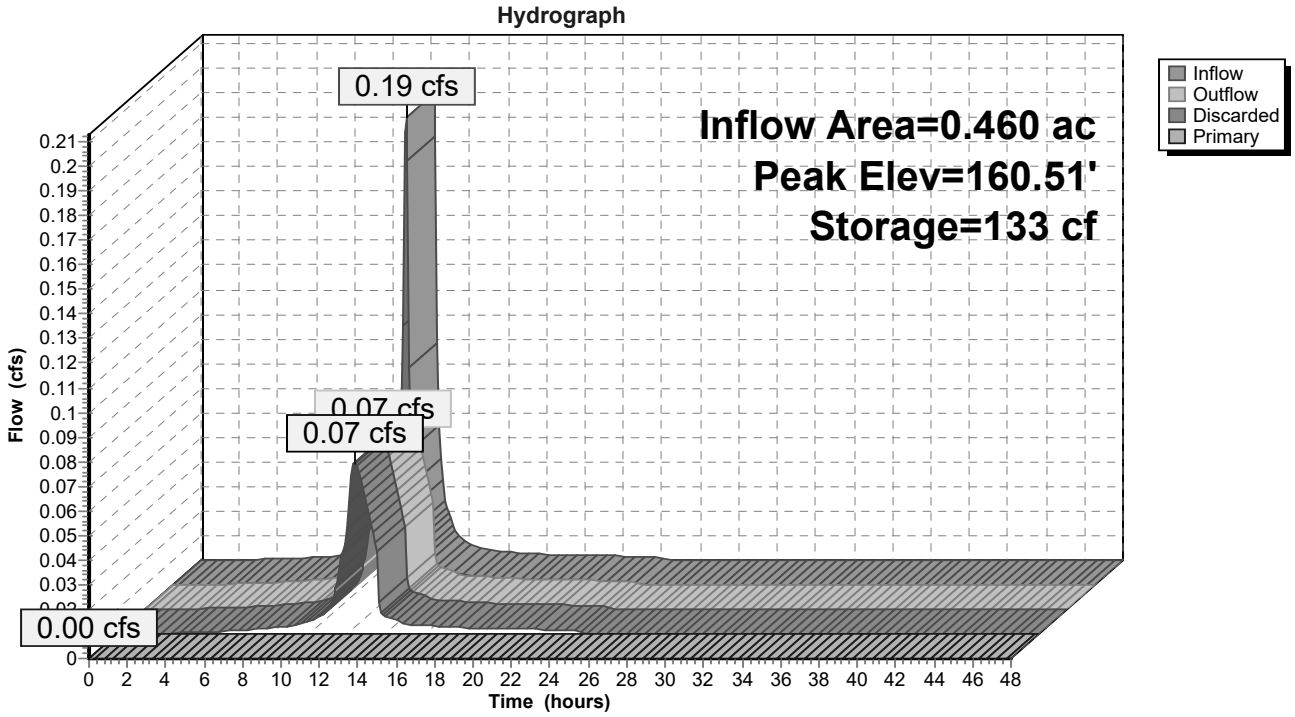
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	156	0	0
162.00	959	1,115	1,115
163.00	1,674	1,317	2,432

Device	Routing	Invert	Outlet Devices
#1	Primary	161.75'	**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
#2	Discarded	160.00'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.07 cfs @ 12.36 hrs HW=160.51' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=160.00' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond BASIN MC-2: Infiltration



Summary for Pond BASIN MC-3: Infiltration

Inflow Area = 7.440 ac, 37.10% Impervious, Inflow Depth = 1.52" for 2-Year event
Inflow = 6.72 cfs @ 12.13 hrs, Volume= 0.940 af
Outflow = 1.99 cfs @ 12.87 hrs, Volume= 0.940 af, Atten= 70%, Lag= 44.2 min
Discarded = 1.66 cfs @ 12.87 hrs, Volume= 0.861 af
Primary = 0.33 cfs @ 12.87 hrs, Volume= 0.079 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 3
Peak Elev= 160.78' @ 12.87 hrs Surf.Area= 8,665 sf Storage= 6,335 cf

Plug-Flow detention time= 26.1 min calculated for 0.938 af (100% of inflow)
Center-of-Mass det. time= 25.9 min (864.4 - 838.5)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	41,868 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

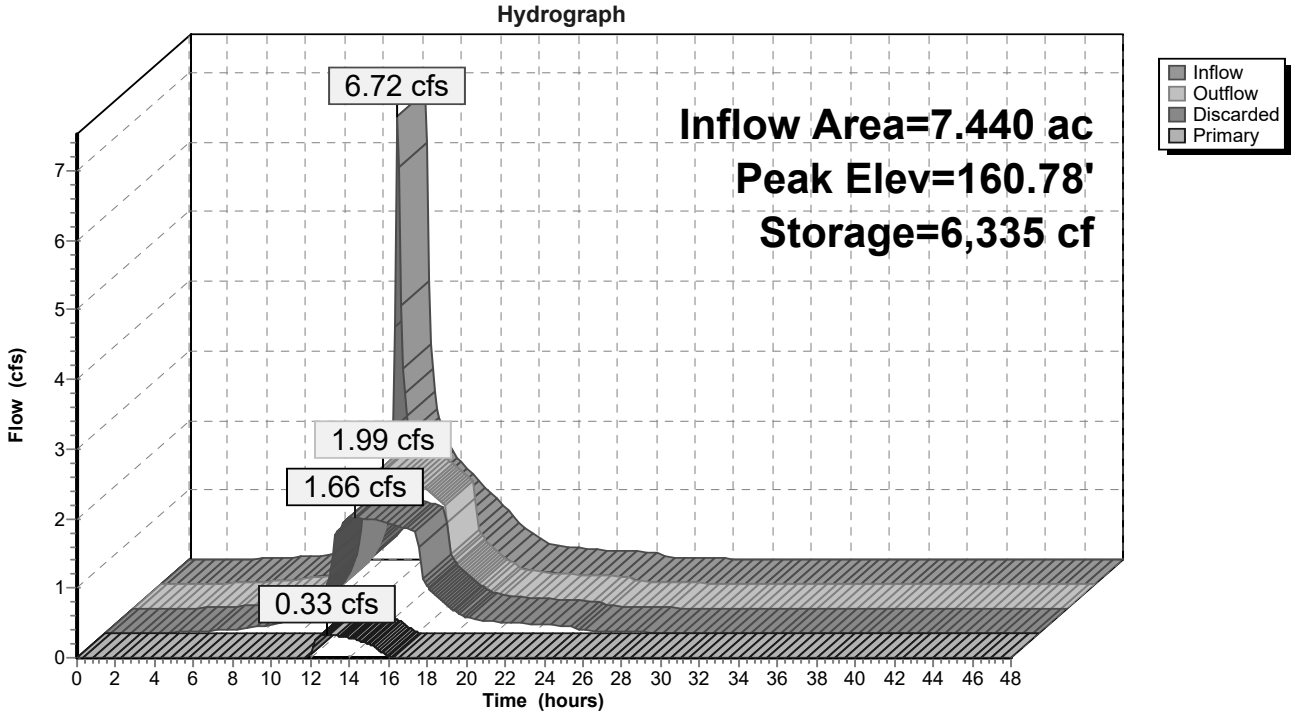
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	7,503	0	0
161.00	8,986	8,245	8,245
162.00	10,468	9,727	17,972
163.00	11,948	11,208	29,180
164.00	13,428	12,688	41,868

Device	Routing	Invert	Outlet Devices
#1	Primary	159.50'	**12.0" Round Culvert X 2.00** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.50' / 159.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	160.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	161.25'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	161.50'	**12.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 161.50' / 159.00' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#5	Primary	162.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#6	Discarded	160.00'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=1.66 cfs @ 12.87 hrs HW=160.78' (Free Discharge)
└**6=Exfiltration** (Exfiltration Controls 1.66 cfs)

Primary OutFlow Max=0.33 cfs @ 12.87 hrs HW=160.78' (Free Discharge)
└**1=Culvert** (Passes 0.33 cfs of 6.69 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.33 cfs @ 3.78 fps)
└**3=Orifice/Grate** (Controls 0.00 cfs)
└**4=Culvert** (Controls 0.00 cfs)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond BASIN MC-3: Infiltration



Summary for Pond BASIN MC-4: Infiltration

Inflow Area = 0.310 ac, 67.74% Impervious, Inflow Depth = 2.74" for 2-Year event
Inflow = 1.17 cfs @ 12.11 hrs, Volume= 0.071 af
Outflow = 0.59 cfs @ 12.27 hrs, Volume= 0.071 af, Atten= 50%, Lag= 9.3 min
Discarded = 0.16 cfs @ 12.27 hrs, Volume= 0.029 af
Primary = 0.44 cfs @ 12.27 hrs, Volume= 0.041 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 170.74' @ 12.27 hrs Surf.Area= 810 sf Storage= 512 cf

Plug-Flow detention time= 6.9 min calculated for 0.071 af (100% of inflow)
Center-of-Mass det. time= 6.9 min (770.8 - 763.9)

Volume	Invert	Avail.Storage	Storage Description
#1	169.50'	4,729 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

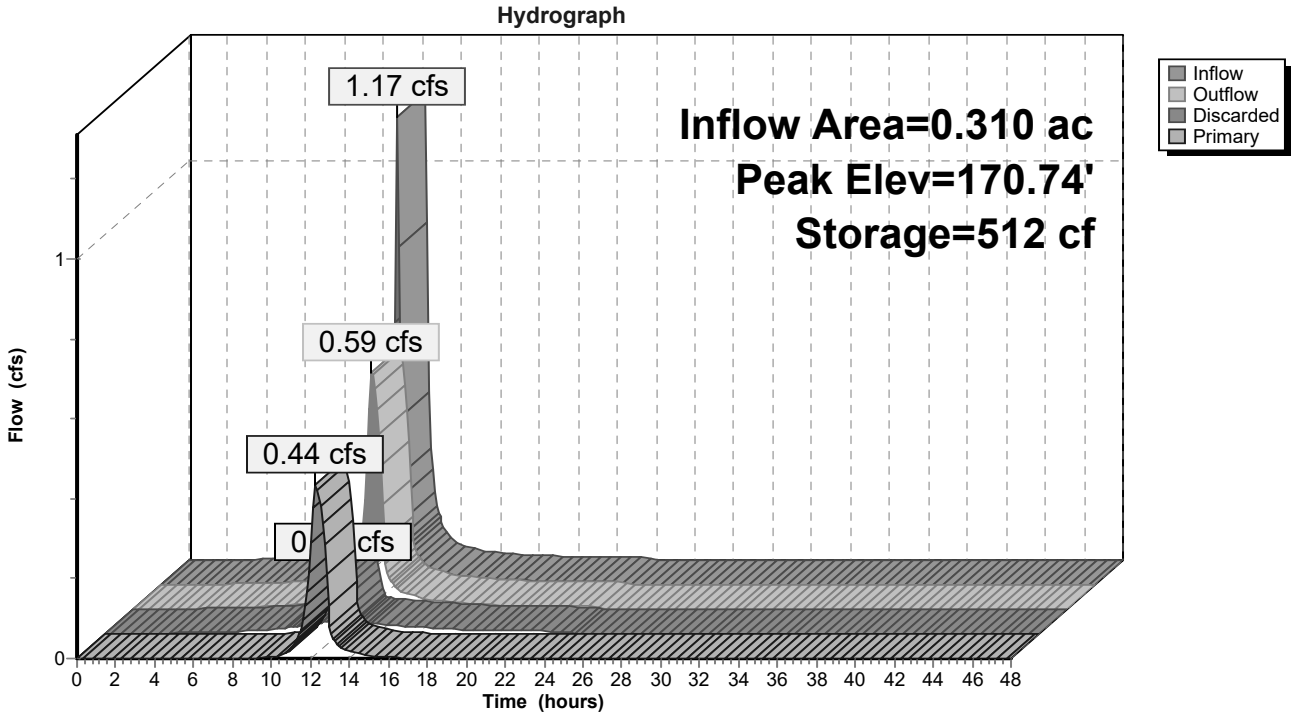
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
169.50	93	0	0
170.00	304	99	99
171.00	988	646	745
172.00	1,939	1,464	2,209
173.00	3,101	2,520	4,729

Device	Routing	Invert	Outlet Devices
#1	Primary	169.50'	**12.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 169.50' / 168.00' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	169.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	171.75'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#4	Discarded	169.50'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.15 cfs @ 12.27 hrs HW=170.73' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=0.43 cfs @ 12.27 hrs HW=170.73' (Free Discharge)
└**1=Culvert** (Passes 0.43 cfs of 3.22 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.43 cfs @ 4.96 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond BASIN MC-4: Infiltration



Summary for Pond FB MC-1: Forebay

Inflow Area = 0.220 ac, 50.00% Impervious, Inflow Depth = 1.91" for 2-Year event
Inflow = 0.56 cfs @ 12.12 hrs, Volume= 0.035 af
Outflow = 0.06 cfs @ 12.90 hrs, Volume= 0.035 af, Atten= 90%, Lag= 47.1 min
Discarded = 0.06 cfs @ 12.90 hrs, Volume= 0.035 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 162.80' @ 12.90 hrs Surf.Area= 1,027 sf Storage= 659 cf

Plug-Flow detention time= 99.2 min calculated for 0.035 af (100% of inflow)
Center-of-Mass det. time= 99.0 min (870.2 - 771.2)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	2,785 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

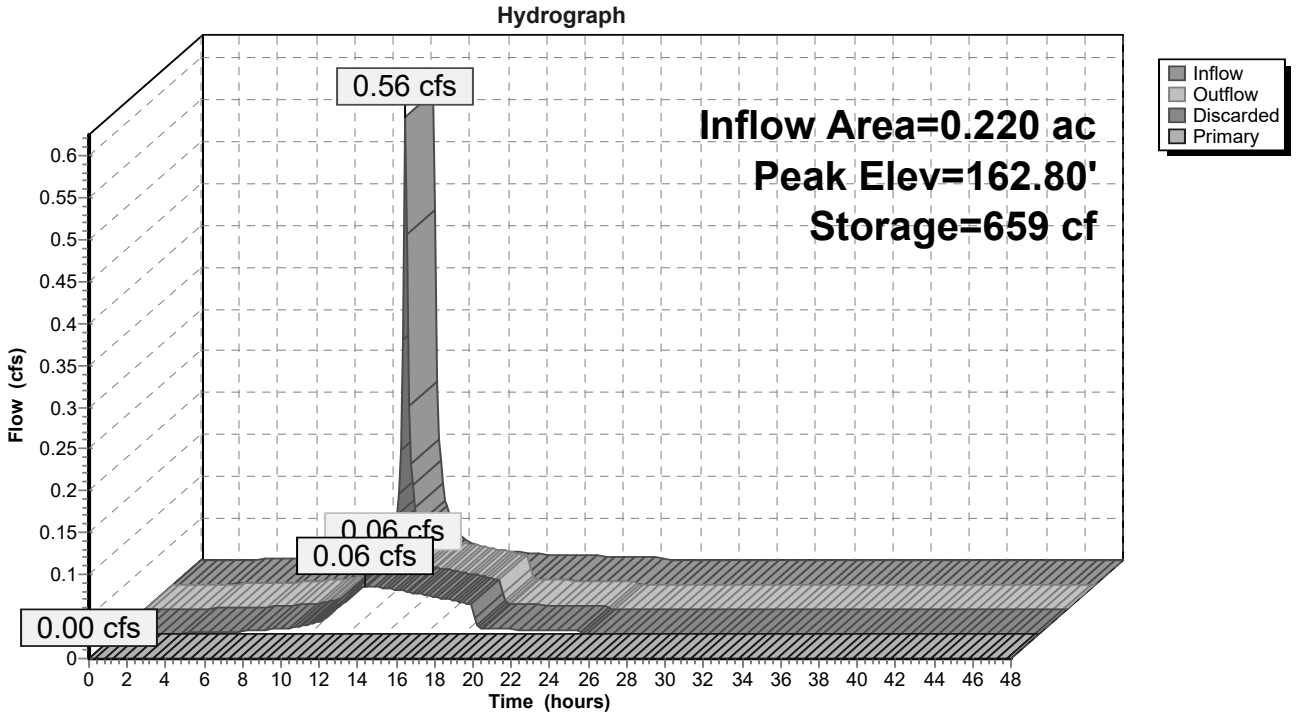
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.00	615	0	0
163.00	1,129	872	872
164.00	1,766	1,448	2,320
164.25	1,961	466	2,785

Device	Routing	Invert	Outlet Devices
#1	Discarded	162.00'	**2.410 in/hr Exfiltration over Horizontal area**
#2	Primary	164.25'	**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

Discarded OutFlow Max=0.06 cfs @ 12.90 hrs HW=162.80' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=162.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond FB MC-1: Forebay



Summary for Pond SDS MC-1: Detention

Inflow Area = 2.300 ac, 19.57% Impervious, Inflow Depth = 0.96" for 2-Year event
Inflow = 1.32 cfs @ 12.55 hrs, Volume= 0.183 af
Outflow = 0.42 cfs @ 13.36 hrs, Volume= 0.183 af, Atten= 68%, Lag= 49.0 min
Primary = 0.42 cfs @ 13.36 hrs, Volume= 0.183 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 168.18' @ 13.36 hrs Surf.Area= 2,695 sf Storage= 3,168 cf

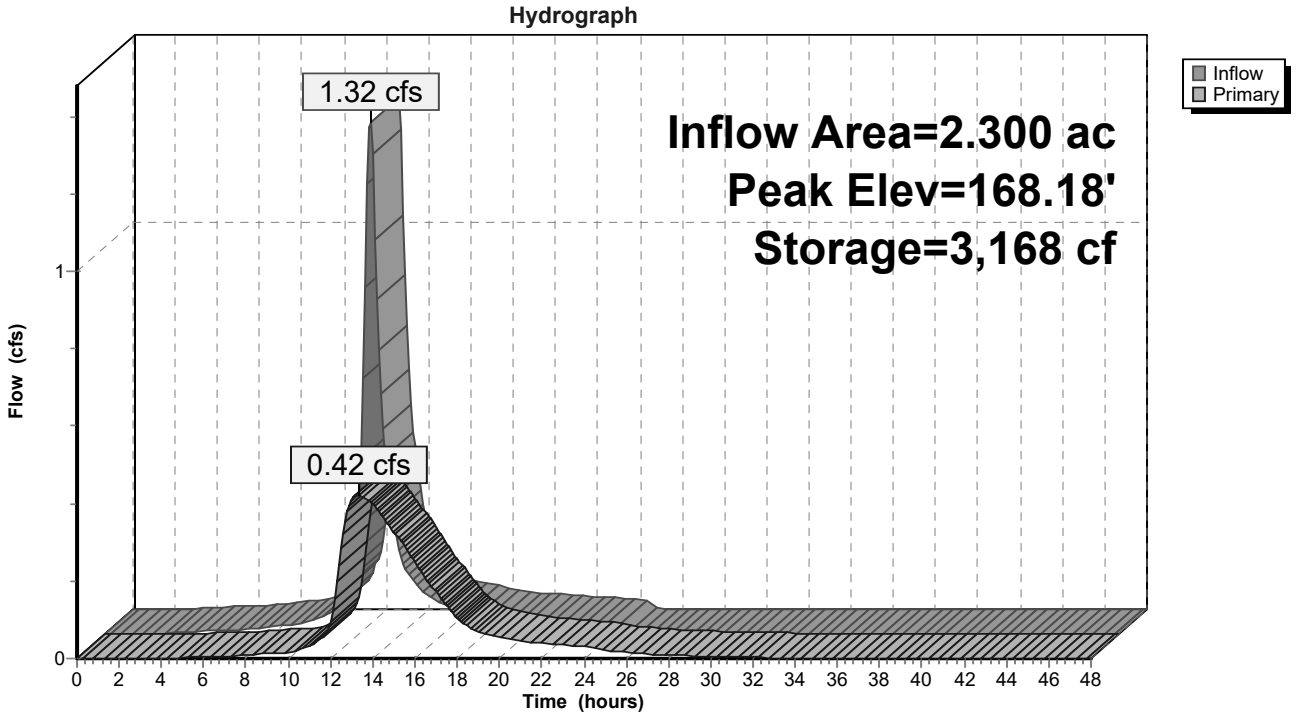
Plug-Flow detention time= 118.1 min calculated for 0.183 af (100% of inflow)
Center-of-Mass det. time= 117.7 min (944.1 - 826.4)

Volume	Invert	Avail.Storage	Storage Description
#1	167.00'	13,475 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 55
#2	172.00'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		13,491 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	167.00'	**12.0" Round Culvert** L= 100.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 167.00' / 166.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	167.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	171.50'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.42 cfs @ 13.36 hrs HW=168.17' (Free Discharge)
└**1=Culvert** (Passes 0.42 cfs of 3.11 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.42 cfs @ 4.83 fps)
  └**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SDS MC-1: Detention



Summary for Pond SDS MC-2: Detention

Inflow Area = 1.140 ac, 70.18% Impervious, Inflow Depth = 2.42" for 2-Year event
Inflow = 3.70 cfs @ 12.11 hrs, Volume= 0.230 af
Outflow = 0.66 cfs @ 12.55 hrs, Volume= 0.230 af, Atten= 82%, Lag= 26.1 min
Primary = 0.66 cfs @ 12.55 hrs, Volume= 0.230 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 180.62' @ 12.55 hrs Surf.Area= 1,617 sf Storage= 4,236 cf

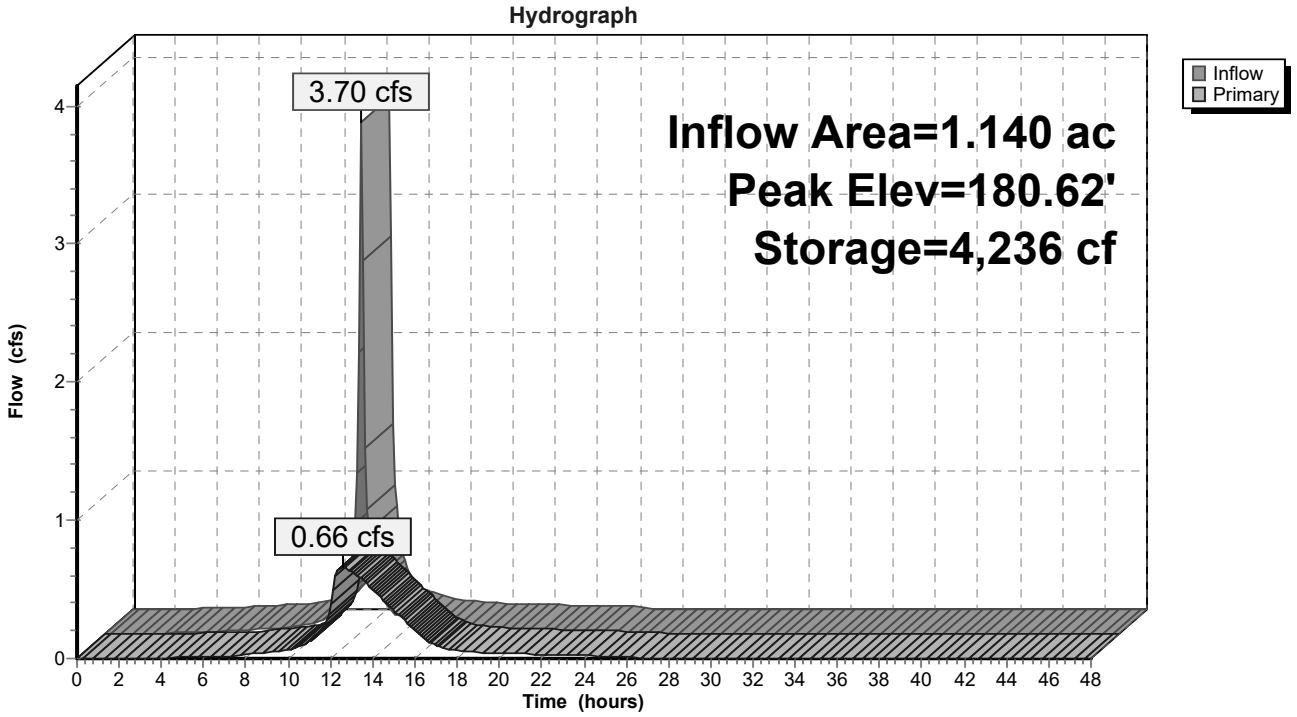
Plug-Flow detention time= 84.9 min calculated for 0.230 af (100% of inflow)
Center-of-Mass det. time= 83.9 min (845.8 - 761.9)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	8,085 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 33
#2	183.00'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		8,101 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**12.0" Round Culvert** L= 200.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 178.00' / 174.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	178.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	182.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.66 cfs @ 12.55 hrs HW=180.61' (Free Discharge)
└**1=Culvert** (Passes 0.66 cfs of 5.35 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.66 cfs @ 7.53 fps)
  └**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SDS MC-2: Detention



Summary for Pond SDS MC-3: Detention

Inflow Area = 1.930 ac, 50.78% Impervious, Inflow Depth = 1.98" for 2-Year event
Inflow = 1.94 cfs @ 12.13 hrs, Volume= 0.318 af
Outflow = 0.65 cfs @ 13.51 hrs, Volume= 0.318 af, Atten= 66%, Lag= 82.7 min
Primary = 0.65 cfs @ 13.51 hrs, Volume= 0.318 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 4
Peak Elev= 169.54' @ 13.51 hrs Surf.Area= 1,225 sf Storage= 3,108 cf

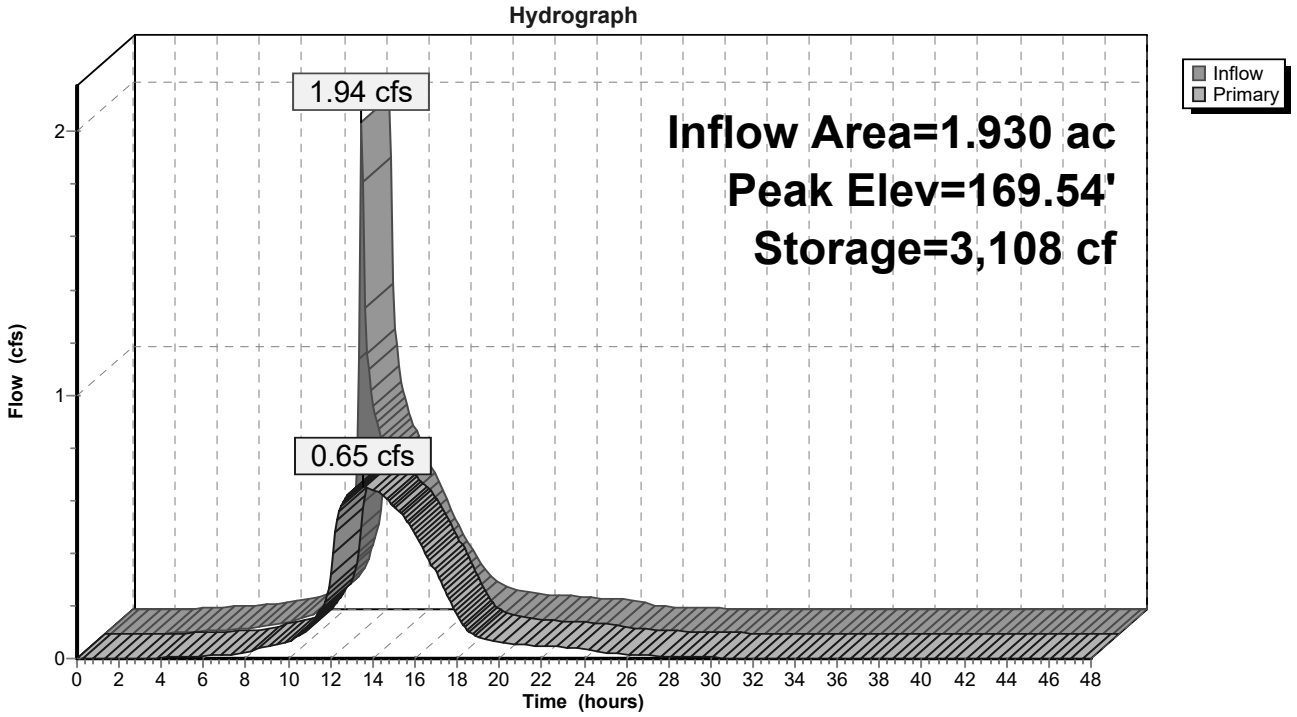
Plug-Flow detention time= 66.1 min calculated for 0.317 af (100% of inflow)
Center-of-Mass det. time= 66.4 min (898.5 - 832.1)

Volume	Invert	Avail.Storage	Storage Description
#1	167.00'	6,125 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 25
#2	172.00'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		6,141 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	167.00'	**12.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 167.00' / 166.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	167.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	169.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	171.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.65 cfs @ 13.51 hrs HW=169.54' (Free Discharge)
└**1=Culvert** (Passes 0.65 cfs of 5.40 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.65 cfs @ 7.41 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.65 fps)
  └**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SDS MC-3: Detention



Summary for Pond SDS MC-4: Detention

Inflow Area = 1.030 ac, 80.58% Impervious, Inflow Depth = 2.72" for 2-Year event
Inflow = 3.79 cfs @ 12.11 hrs, Volume= 0.234 af
Outflow = 0.65 cfs @ 12.55 hrs, Volume= 0.234 af, Atten= 83%, Lag= 26.2 min
Primary = 0.65 cfs @ 12.55 hrs, Volume= 0.234 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 3
Peak Elev= 165.58' @ 12.55 hrs Surf.Area= 1,715 sf Storage= 4,426 cf

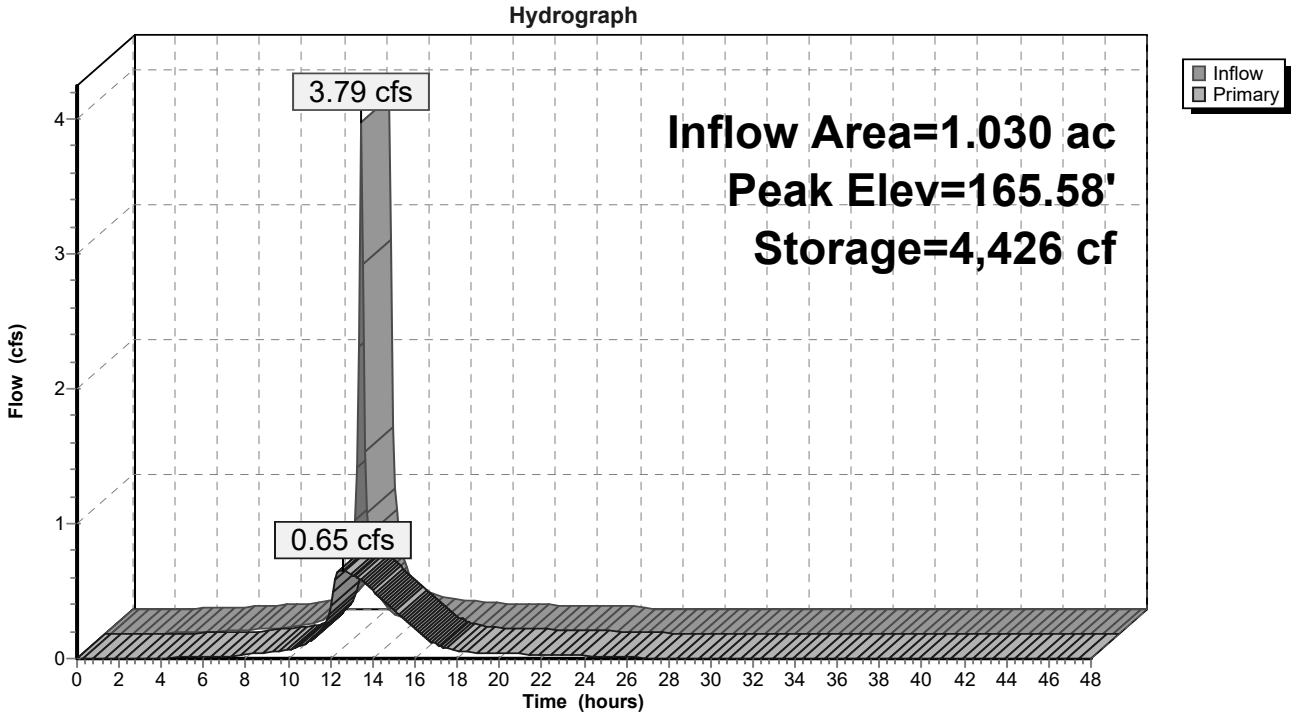
Plug-Flow detention time= 87.9 min calculated for 0.233 af (100% of inflow)
Center-of-Mass det. time= 88.6 min (847.4 - 758.8)

Volume	Invert	Avail.Storage	Storage Description
#1	163.00'	8,575 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 35
#2	168.00'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		8,591 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	163.00'	**12.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 163.00' / 162.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	163.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	165.65'	**4.0" Vert. Orifice/Grate X 2.00** C= 0.600
#4	Device 1	167.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.65 cfs @ 12.55 hrs HW=165.58' (Free Discharge)
└**1=Culvert** (Passes 0.65 cfs of 5.45 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.65 cfs @ 7.47 fps)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SDS MC-4: Detention



Summary for Pond SIS MC-1: Infiltration

Inflow Area = 1.980 ac, 77.78% Impervious, Inflow Depth = 2.42" for 2-Year event
Inflow = 6.42 cfs @ 12.11 hrs, Volume= 0.400 af
Outflow = 0.71 cfs @ 11.60 hrs, Volume= 0.399 af, Atten= 89%, Lag= 0.0 min
Discarded = 0.71 cfs @ 11.60 hrs, Volume= 0.399 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 158.13' @ 12.72 hrs Surf.Area= 3,712 sf Storage= 6,792 cf

Plug-Flow detention time= 66.6 min calculated for 0.398 af (100% of inflow)
Center-of-Mass det. time= 65.9 min (819.2 - 753.3)

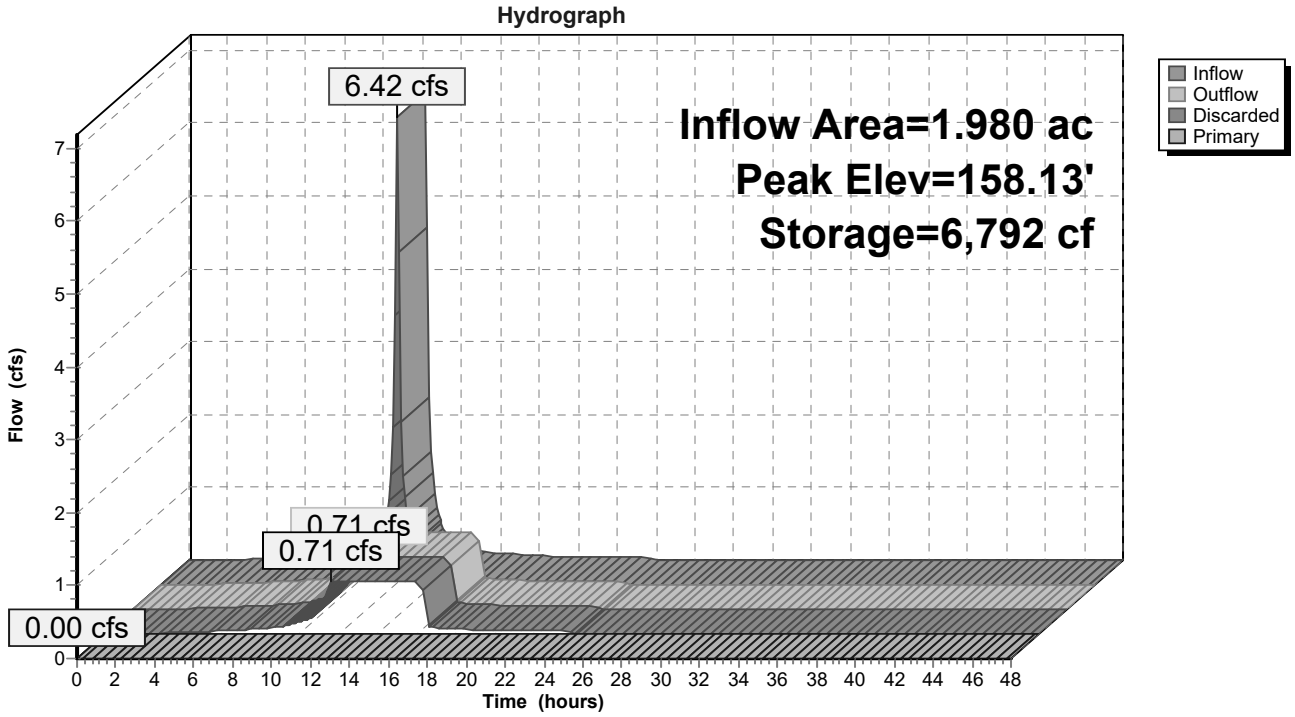
Volume	Invert	Avail.Storage	Storage Description
#1	155.50'	742 cf	**8.00'W x 8.00'L x 0.50'H Prismatoid** x 58 1,856 cf Overall x 40.0% Voids
#2	156.00'	14,210 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 58 -Impervious
#3	161.00'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		14,968 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	156.00'	**15.0" Round Culvert** L= 100.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 156.00' / 155.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	160.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Discarded	155.50'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.71 cfs @ 11.60 hrs HW=155.62' (Free Discharge)
↑ **3=Exfiltration** (Exfiltration Controls 0.71 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=155.50' (Free Discharge)
↑ **1=Culvert** (Controls 0.00 cfs)
↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SIS MC-1: Infiltration



Summary for Pond SIS MC-2: Infiltration

Inflow Area = 0.600 ac, 55.00% Impervious, Inflow Depth = 1.71" for 2-Year event
Inflow = 1.38 cfs @ 12.11 hrs, Volume= 0.086 af
Outflow = 0.20 cfs @ 11.70 hrs, Volume= 0.086 af, Atten= 86%, Lag= 0.0 min
Discarded = 0.20 cfs @ 11.70 hrs, Volume= 0.086 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 160.88' @ 12.61 hrs Surf.Area= 1,024 sf Storage= 1,289 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 43.5 min (796.4 - 752.9)

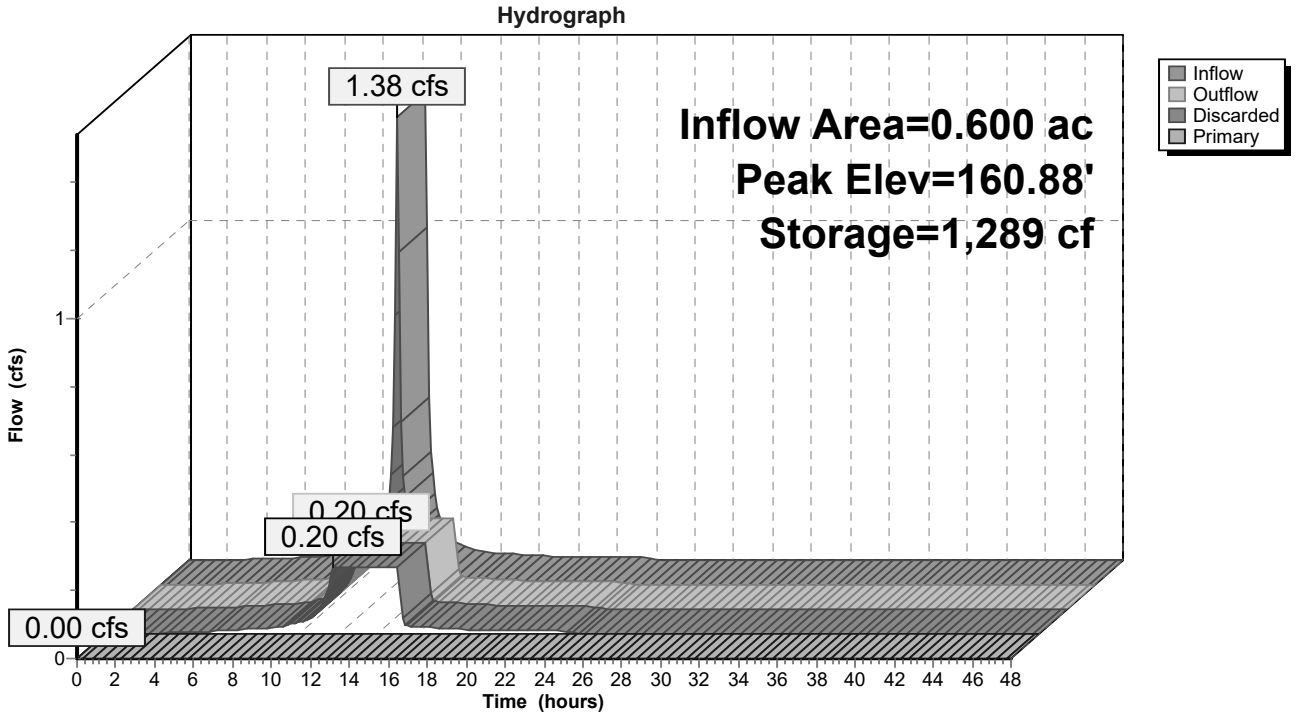
Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	205 cf	**8.00'W x 8.00'L x 0.50'H Prismatoid** x 16 512 cf Overall x 40.0% Voids
#2	159.50'	1,470 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 6 -Impervious
#3	159.50'	1,470 cf	**7.00'W x 7.00'L x 3.00'H Prismatoid** x 10 -Impervious
#4	164.50'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		3,161 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	159.00'	**12.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 159.00' / 158.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	162.50'	**4.0" Vert. Orifice/Grate X 3.00** C= 0.600
#3	Device 1	164.25'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Discarded	159.00'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.20 cfs @ 11.70 hrs HW=159.12' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SIS MC-2: Infiltration



Summary for Pond WQS MC-1: Wet Swale

Inflow Area = 0.130 ac, 23.08% Impervious, Inflow Depth = 1.05" for 2-Year event
Inflow = 0.16 cfs @ 12.13 hrs, Volume= 0.011 af
Outflow = 0.02 cfs @ 12.82 hrs, Volume= 0.011 af, Atten= 86%, Lag= 41.5 min
Discarded = 0.02 cfs @ 12.82 hrs, Volume= 0.011 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 155.67' @ 12.82 hrs Surf.Area= 417 sf Storage= 186 cf

Plug-Flow detention time= 73.9 min calculated for 0.011 af (100% of inflow)
Center-of-Mass det. time= 73.7 min (866.0 - 792.3)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	1,156 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

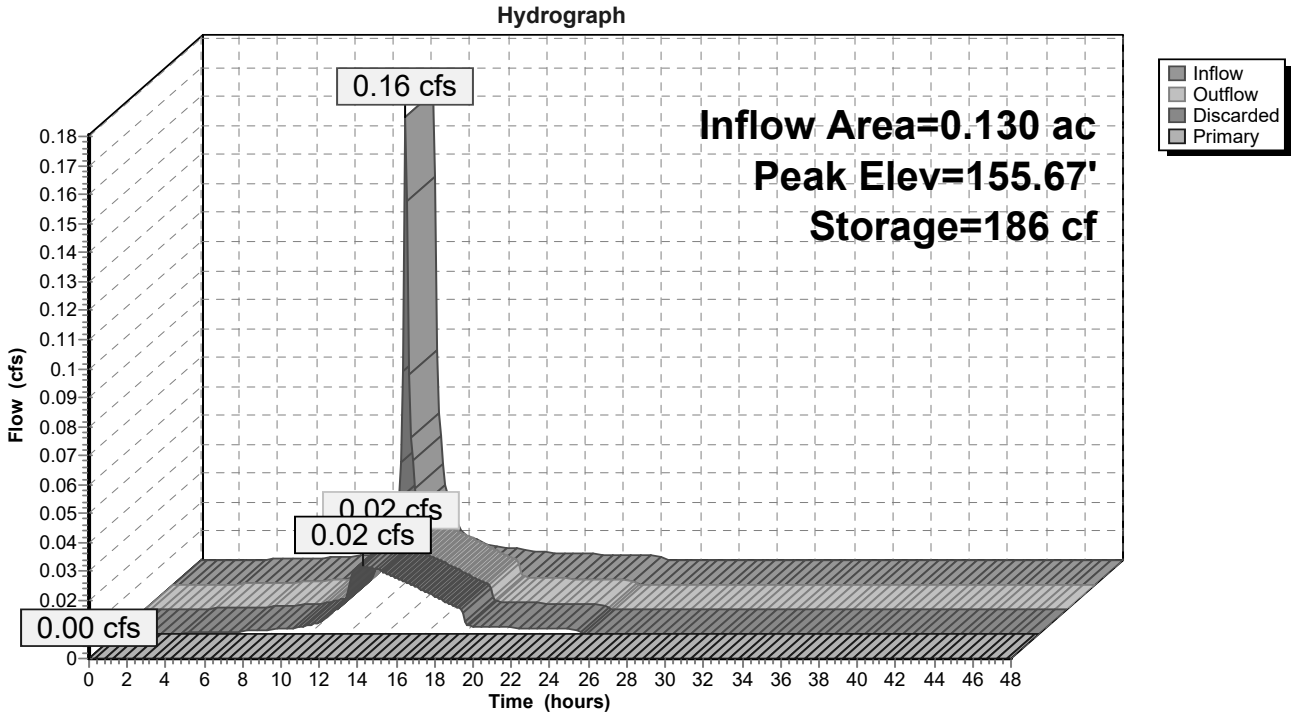
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
155.00	142	0	0
156.00	555	349	349
157.00	1,060	808	1,156

Device	Routing	Invert	Outlet Devices
#1	Discarded	155.00'	**2.410 in/hr Exfiltration over Horizontal area**
#2	Primary	157.00'	**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

Discarded OutFlow Max=0.02 cfs @ 12.82 hrs HW=155.67' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=155.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond WQS MC-1: Wet Swale



Summary for Pond WQS MC-2: Wet Swale

Inflow Area = 0.080 ac, 12.50% Impervious, Inflow Depth = 1.90" for 2-Year event
Inflow = 0.23 cfs @ 12.12 hrs, Volume= 0.013 af
Outflow = 0.03 cfs @ 12.69 hrs, Volume= 0.013 af, Atten= 86%, Lag= 34.1 min
Discarded = 0.03 cfs @ 12.69 hrs, Volume= 0.013 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 159.49' @ 12.69 hrs Surf.Area= 564 sf Storage= 223 cf

Plug-Flow detention time= 62.1 min calculated for 0.013 af (100% of inflow)
Center-of-Mass det. time= 62.0 min (859.5 - 797.5)

Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	1,022 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

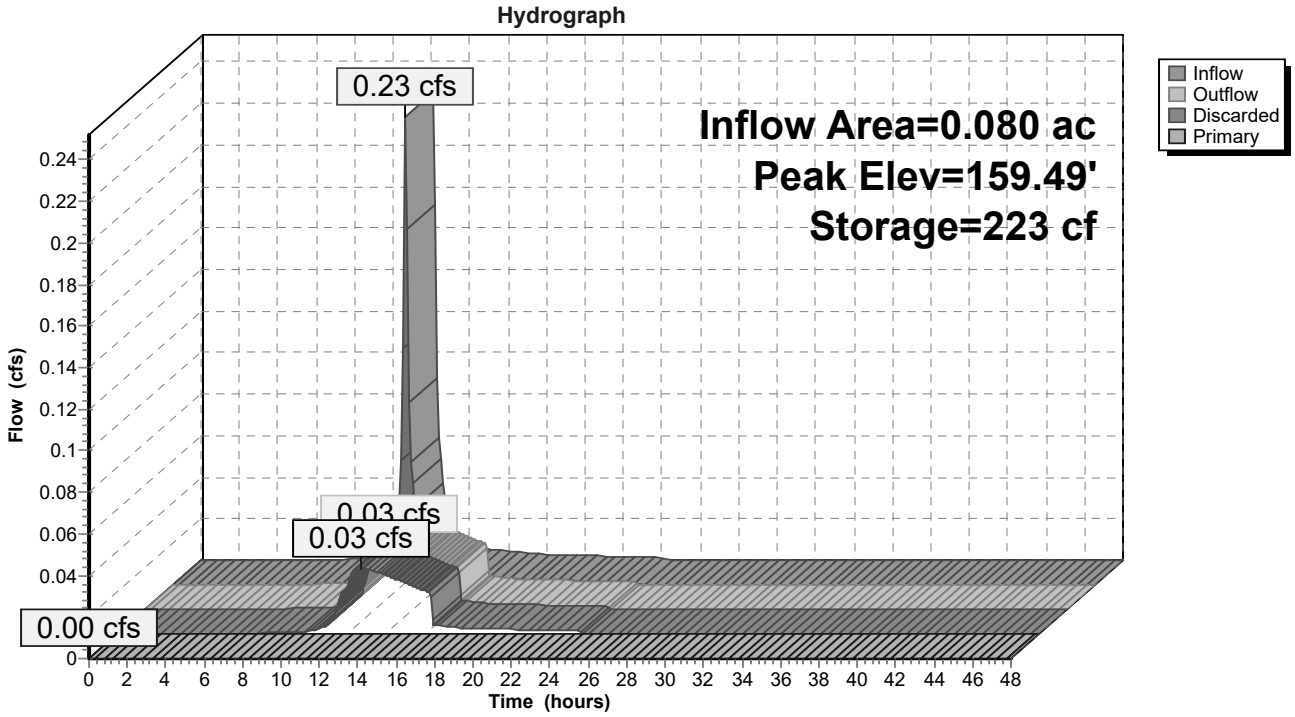
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
159.00	344	0	0
160.00	791	568	568
160.50	1,028	455	1,022

Device	Routing	Invert	Outlet Devices
#1	Discarded	159.00'	**2.410 in/hr Exfiltration over Horizontal area**
#2	Primary	160.50'	**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

Discarded OutFlow Max=0.03 cfs @ 12.69 hrs HW=159.49' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond WQS MC-2: Wet Swale



Summary for Pond WQS MC-3: Wet Swale

Inflow Area = 0.080 ac, 12.50% Impervious, Inflow Depth = 1.90" for 2-Year event
Inflow = 0.23 cfs @ 12.12 hrs, Volume= 0.013 af
Outflow = 0.03 cfs @ 12.69 hrs, Volume= 0.013 af, Atten= 86%, Lag= 34.1 min
Discarded = 0.03 cfs @ 12.69 hrs, Volume= 0.013 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 161.52' @ 12.69 hrs Surf.Area= 563 sf Storage= 227 cf

Plug-Flow detention time= 64.9 min calculated for 0.013 af (100% of inflow)
Center-of-Mass det. time= 64.8 min (862.3 - 797.5)

Volume	Invert	Avail.Storage	Storage Description
#1	161.00'	1,024 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

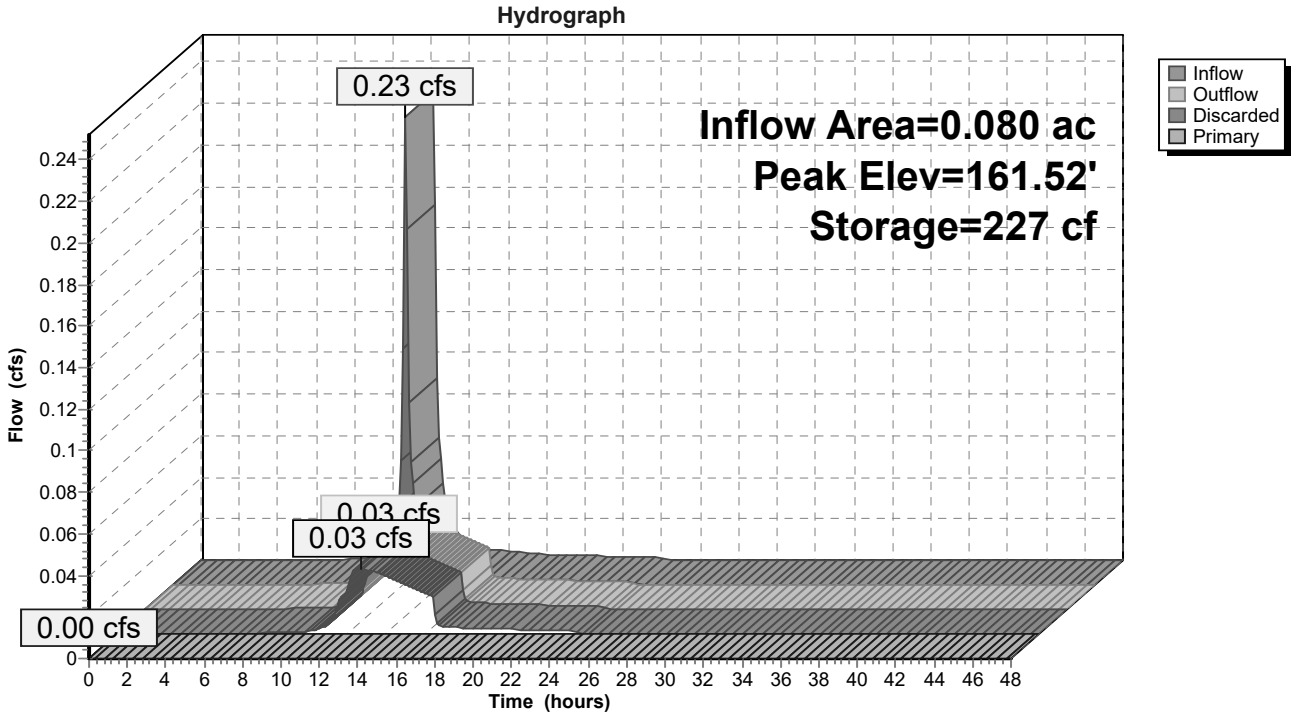
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.00	301	0	0
162.00	801	551	551
162.50	1,089	473	1,024

Device	Routing	Invert	Outlet Devices
#1	Discarded	161.00'	**2.410 in/hr Exfiltration over Horizontal area**
#2	Primary	162.50'	**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

Discarded OutFlow Max=0.03 cfs @ 12.69 hrs HW=161.52' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond WQS MC-3: Wet Swale



Summary for Pond WQS MC-4: Wet Swale

Inflow Area = 0.530 ac, 20.75% Impervious, Inflow Depth = 1.21" for 2-Year event
Inflow = 0.78 cfs @ 12.19 hrs, Volume= 0.054 af
Outflow = 0.08 cfs @ 13.23 hrs, Volume= 0.053 af, Atten= 90%, Lag= 62.5 min
Discarded = 0.08 cfs @ 13.23 hrs, Volume= 0.053 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 156.99' @ 13.23 hrs Surf.Area= 1,353 sf Storage= 1,036 cf

Plug-Flow detention time= 129.4 min calculated for 0.053 af (100% of inflow)
Center-of-Mass det. time= 129.0 min (931.6 - 802.6)

Volume	Invert	Avail.Storage	Storage Description
#1	156.00'	1,815 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

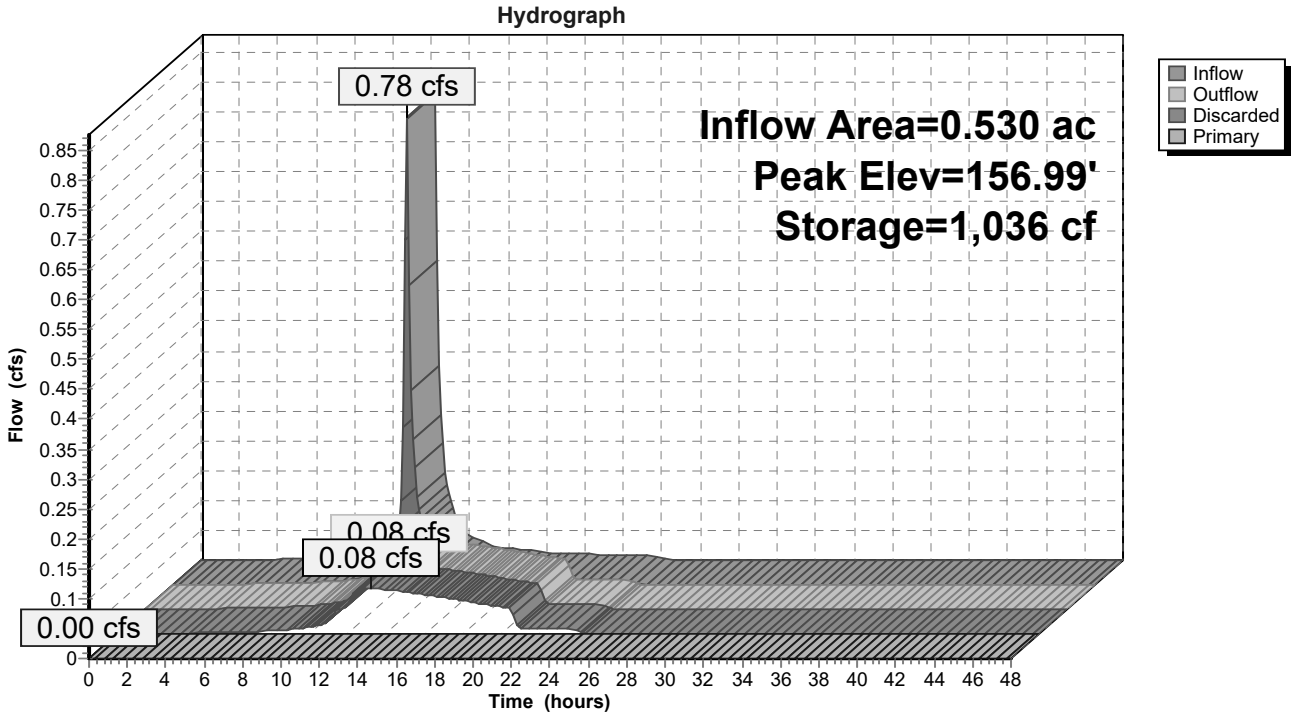
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
156.00	738	0	0
157.00	1,359	1,049	1,049
157.50	1,707	767	1,815

Device	Routing	Invert	Outlet Devices
#1	Discarded	156.00'	**2.410 in/hr Exfiltration over Horizontal area**
#2	Primary	157.25'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.08 cfs @ 13.23 hrs HW=156.99' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=156.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond WQS MC-4: Wet Swale

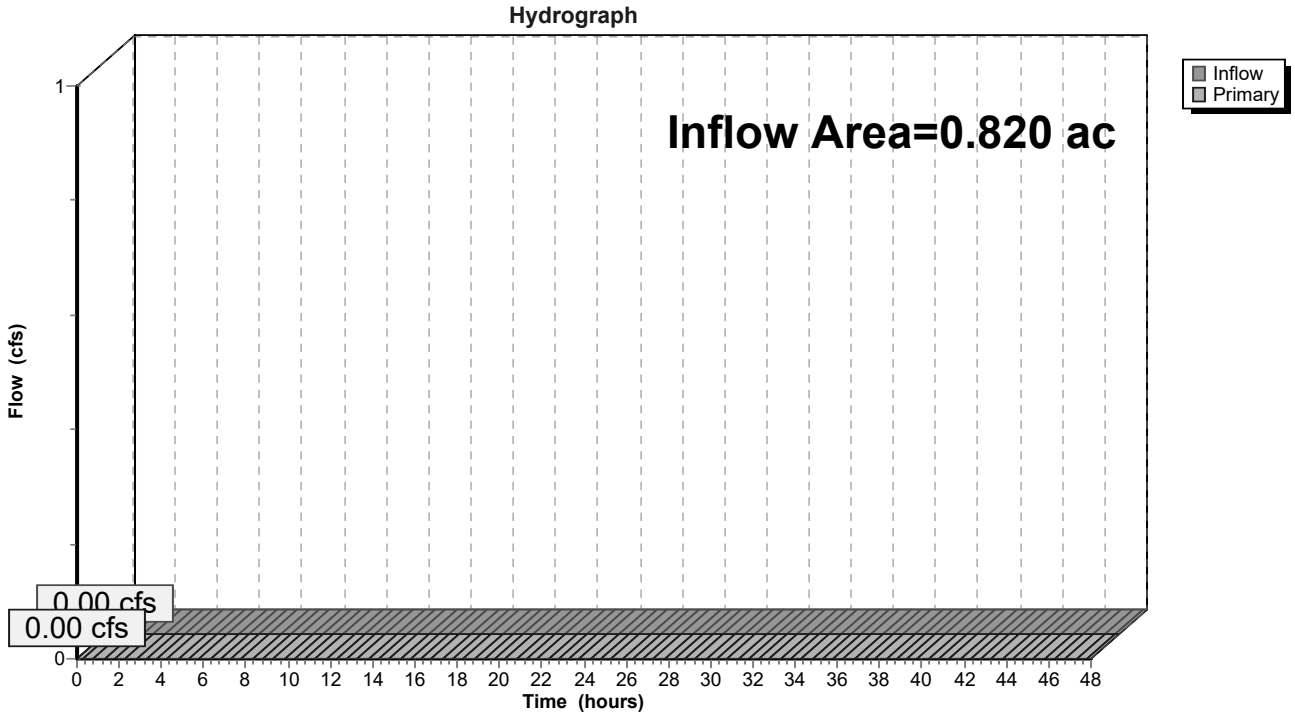


Summary for Link POA-1:

Inflow Area = 0.820 ac, 19.51% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-1:

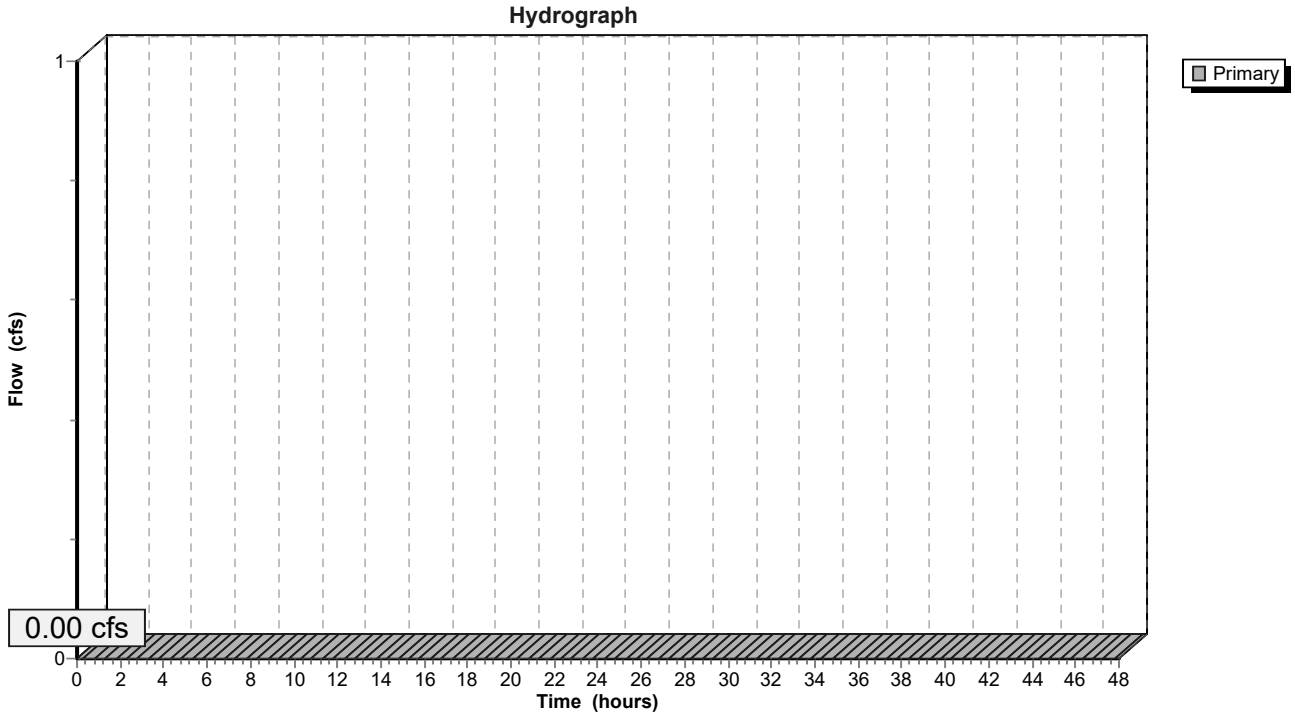


Summary for Link POA-2:

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-2:

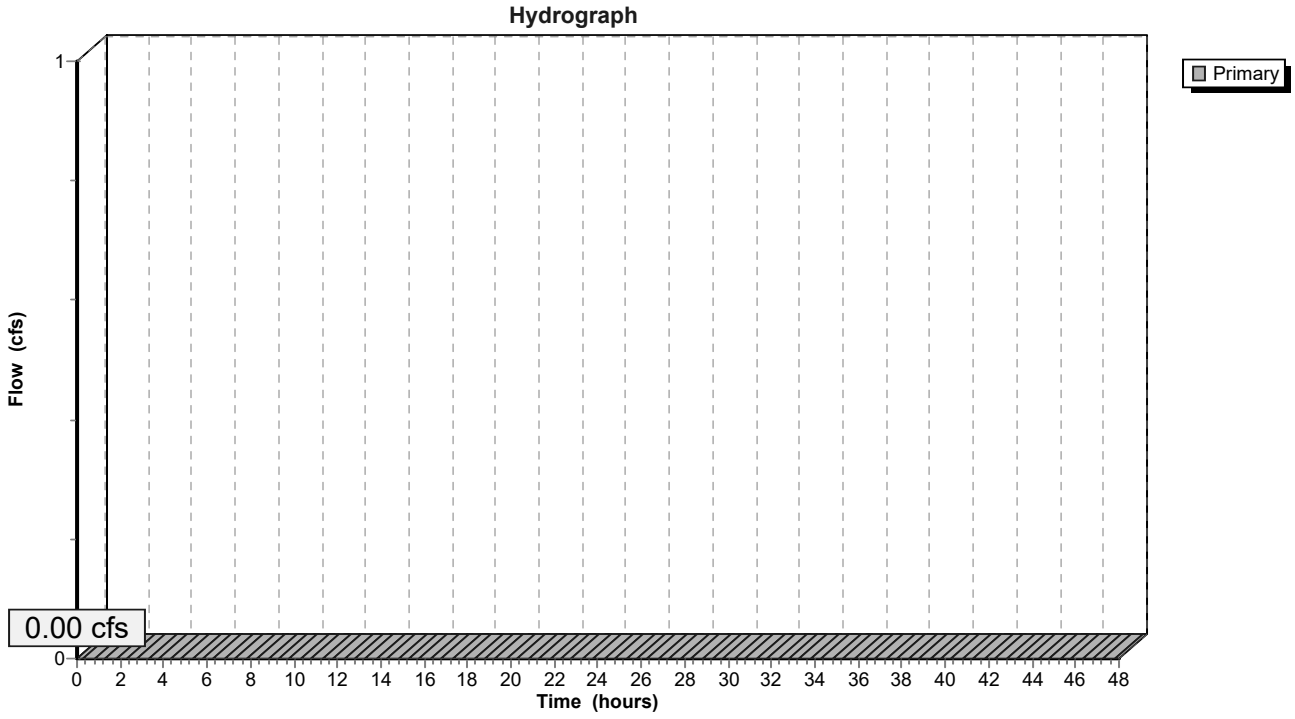


Summary for Link POA-3:

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-3:

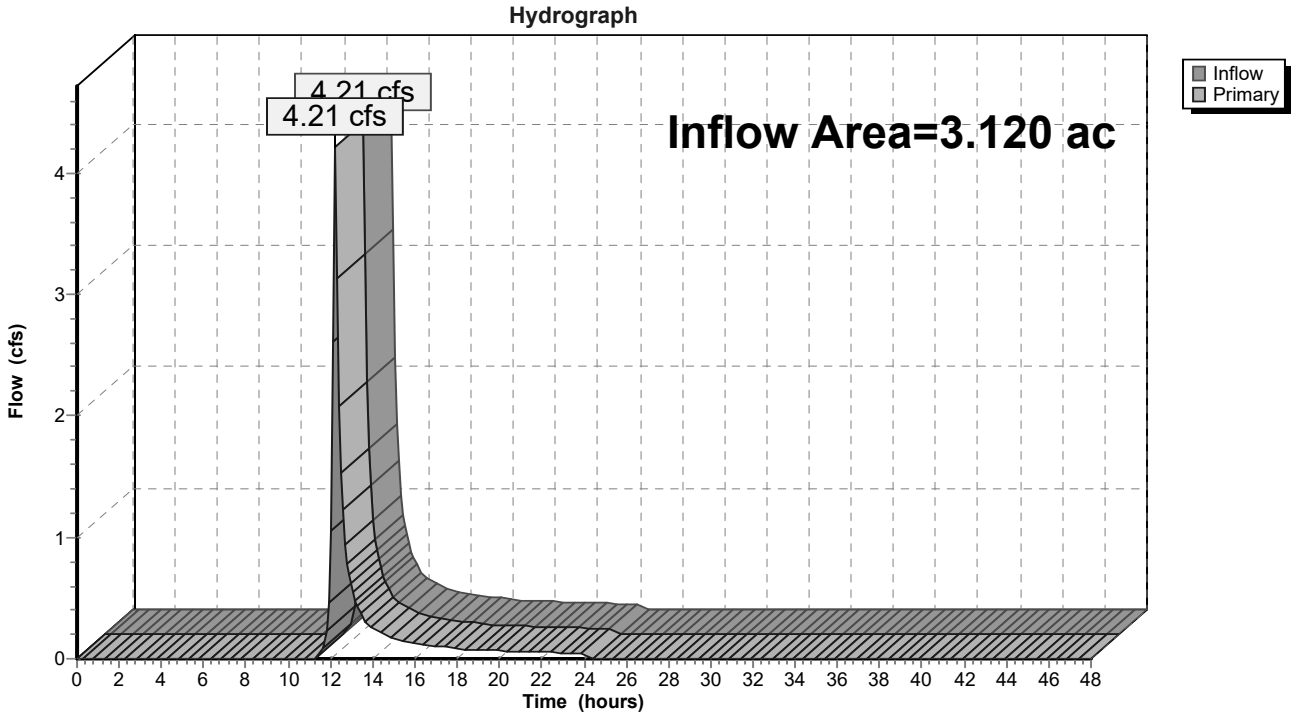


Summary for Link POA-4:

Inflow Area = 3.120 ac, 0.00% Impervious, Inflow Depth = 1.03" for 2-Year event
Inflow = 4.21 cfs @ 12.21 hrs, Volume= 0.268 af
Primary = 4.21 cfs @ 12.21 hrs, Volume= 0.268 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-4:

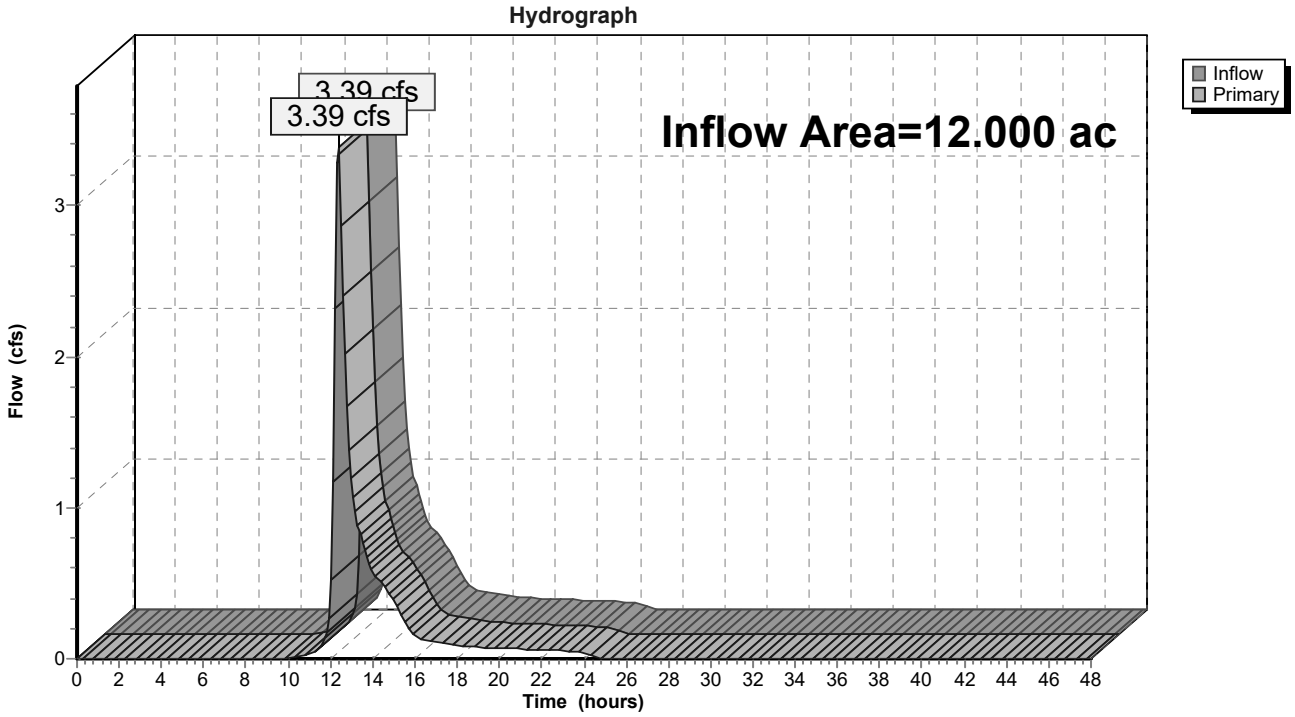


Summary for Link POA-5:

Inflow Area = 12.000 ac, 27.50% Impervious, Inflow Depth = 0.37" for 2-Year event
Inflow = 3.39 cfs @ 12.36 hrs, Volume= 0.367 af
Primary = 3.39 cfs @ 12.36 hrs, Volume= 0.367 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-5:

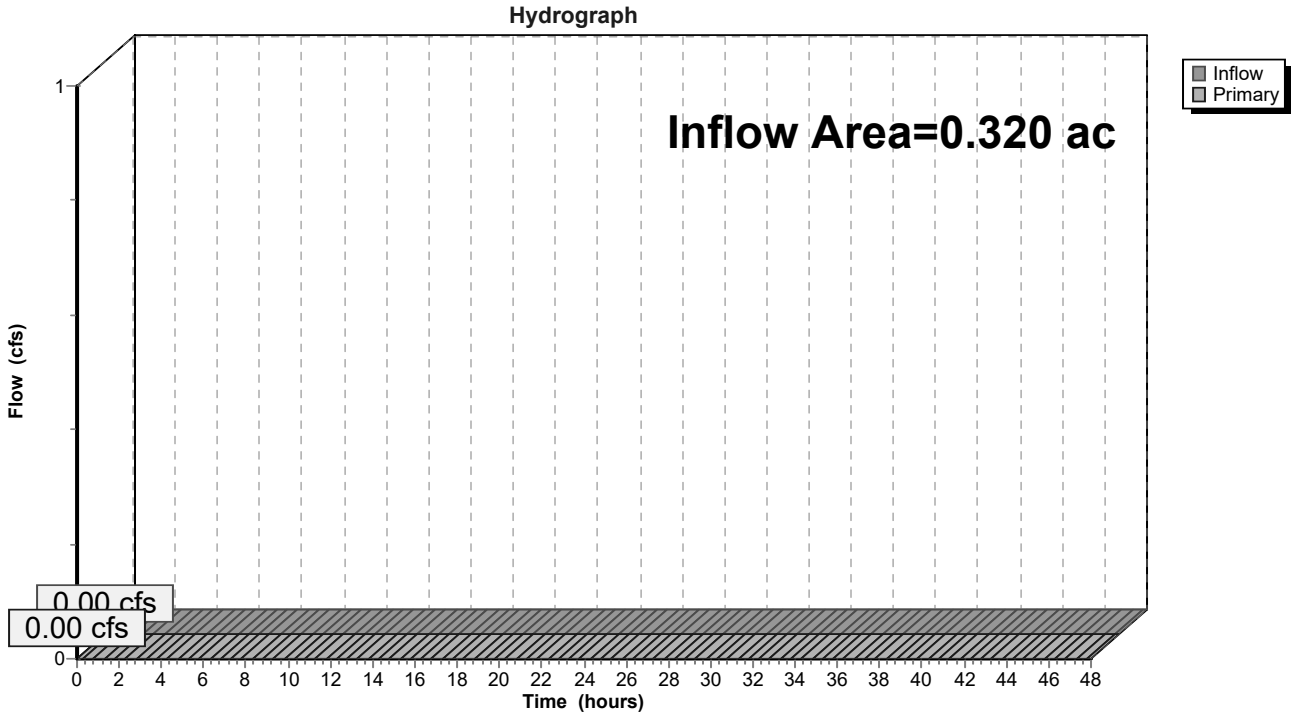


Summary for Link POA-6:

Inflow Area = 0.320 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-6:

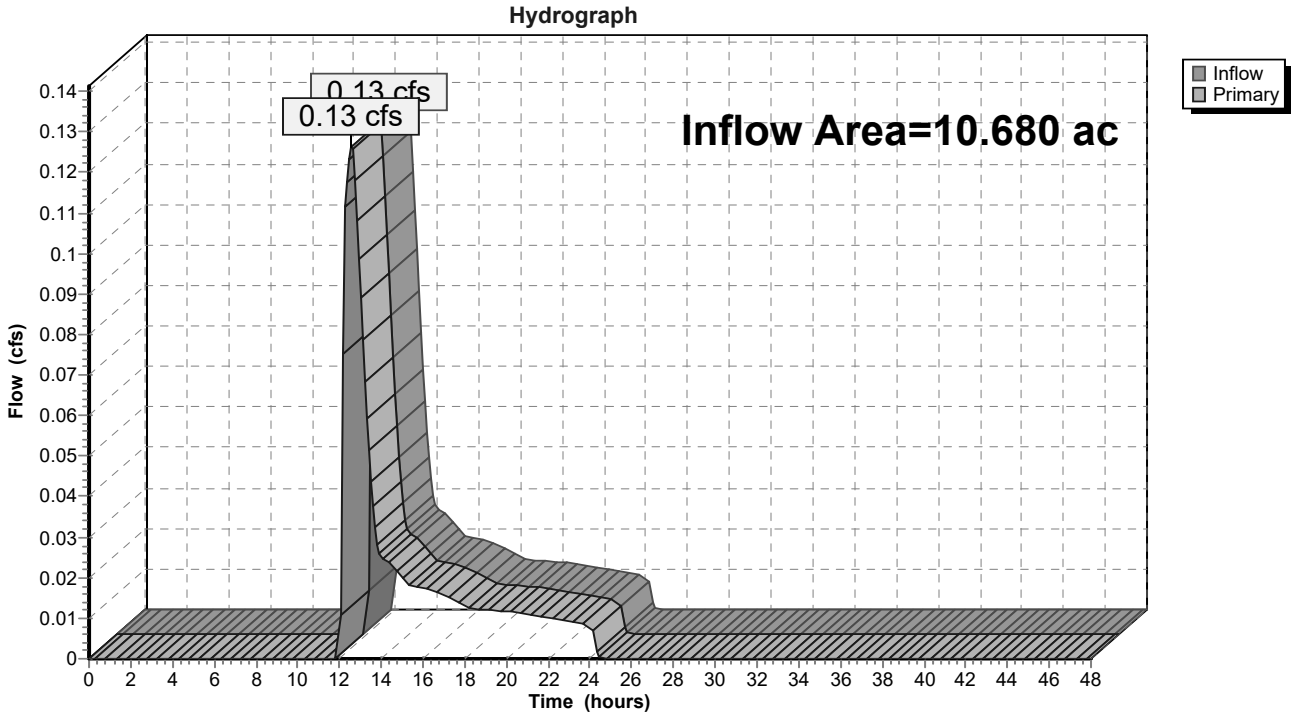


Summary for Link POA-7:

Inflow Area = 10.680 ac, 23.60% Impervious, Inflow Depth = 0.03" for 2-Year event
Inflow = 0.13 cfs @ 12.57 hrs, Volume= 0.023 af
Primary = 0.13 cfs @ 12.57 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-7:



Time span=0.00-48.00 hrs, dt=0.10 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment CCPR-7A: Runoff Area=1.520 ac 0.00% Impervious Runoff Depth=0.37"
Flow Length=410' Tc=16.8 min CN=42/0 Runoff=0.28 cfs 0.047 af

Subcatchment CCPR-7B: Runoff Area=0.210 ac 0.00% Impervious Runoff Depth=1.44"
Tc=6.0 min CN=60/0 Runoff=0.43 cfs 0.025 af

Subcatchment MCPR-1A: Runoff Area=0.130 ac 23.08% Impervious Runoff Depth=2.20"
Tc=6.0 min CN=59/98 Runoff=0.39 cfs 0.024 af

Subcatchment MCPR-1B: Runoff Area=0.080 ac 12.50% Impervious Runoff Depth=3.58"
Tc=6.0 min CN=83/98 Runoff=0.42 cfs 0.024 af

Subcatchment MCPR-1C: Runoff Area=0.080 ac 12.50% Impervious Runoff Depth=3.58"
Tc=6.0 min CN=83/98 Runoff=0.42 cfs 0.024 af

Subcatchment MCPR-1D: Runoff Area=0.530 ac 20.75% Impervious Runoff Depth=2.53"
Flow Length=137' Tc=9.7 min CN=66/98 Runoff=1.74 cfs 0.112 af

Subcatchment MCPR-4A: Runoff Area=1.720 ac 0.00% Impervious Runoff Depth=2.55"
Flow Length=485' Tc=11.1 min CN=74/0 Runoff=5.95 cfs 0.365 af

Subcatchment MCPR-4B: Runoff Area=1.400 ac 0.00% Impervious Runoff Depth=2.21"
Flow Length=485' Tc=11.1 min CN=70/0 Runoff=4.18 cfs 0.258 af

Subcatchment MCPR-5A: Runoff Area=3.650 ac 0.00% Impervious Runoff Depth=2.04"
Flow Length=313' Tc=21.5 min CN=68/0 Runoff=7.54 cfs 0.622 af

Subcatchment MCPR-5B: Runoff Area=0.310 ac 67.74% Impervious Runoff Depth=4.57"
Tc=6.0 min CN=86/98 Runoff=1.93 cfs 0.118 af

Subcatchment MCPR-5C: Runoff Area=0.400 ac 0.00% Impervious Runoff Depth=2.91"
Tc=6.0 min CN=78/0 Runoff=1.77 cfs 0.097 af

Subcatchment MCPR-5D: Runoff Area=0.890 ac 61.80% Impervious Runoff Depth=3.36"
Tc=6.0 min CN=49/98 Runoff=3.84 cfs 0.250 af

Subcatchment MCPR-5E: Runoff Area=2.030 ac 19.70% Impervious Runoff Depth=1.10"
Tc=6.0 min CN=36/98 Runoff=2.63 cfs 0.186 af

Subcatchment MCPR-5F: Runoff Area=1.140 ac 70.18% Impervious Runoff Depth=4.11"
Tc=6.0 min CN=68/98 Runoff=6.29 cfs 0.391 af

Subcatchment MCPR-5H: Runoff Area=1.160 ac 0.00% Impervious Runoff Depth=2.29"
Flow Length=450' Tc=11.2 min CN=71/0 Runoff=3.60 cfs 0.222 af

Subcatchment MCPR-5I: Runoff Area=0.600 ac 55.00% Impervious Runoff Depth=2.86"
Tc=6.0 min CN=39/98 Runoff=2.17 cfs 0.143 af

Subcatchment MCPR-5J: Runoff Area=0.790 ac 22.78% Impervious Runoff Depth=2.72"
Tc=6.0 min CN=68/98 Runoff=3.05 cfs 0.179 af

Subcatchment MCPR-5K: Runoff Area=1.030 ac 80.58% Impervious Runoff Depth=4.52"
Tc=6.0 min CN=74/98 Runoff=6.23 cfs 0.388 af

Subcatchment MCPR-6A: Runoff Area=0.320 ac 0.00% Impervious Runoff Depth=0.03"
Flow Length=235' Tc=8.0 min CN=31/0 Runoff=0.00 cfs 0.001 af

Subcatchment MCPR-7A: Runoff Area=1.110 ac 0.00% Impervious Runoff Depth=0.09"
Flow Length=513' Tc=13.9 min CN=34/0 Runoff=0.02 cfs 0.008 af

Subcatchment MCPR-7B: Runoff Area=0.960 ac 0.00% Impervious Runoff Depth=0.57"
Flow Length=112' Slope=0.0500 '/' Tc=9.5 min CN=46/0 Runoff=0.48 cfs 0.045 af

Subcatchment MCPR-7C: Runoff Area=0.770 ac 0.00% Impervious Runoff Depth=0.62"
Flow Length=215' Tc=14.9 min CN=47/0 Runoff=0.37 cfs 0.040 af

Subcatchment MCPR-7D: Runoff Area=2.090 ac 21.53% Impervious Runoff Depth=2.15"
Flow Length=615' Tc=37.8 min CN=59/98 Runoff=3.02 cfs 0.374 af

Subcatchment MCPR-7F: Runoff Area=1.980 ac 77.78% Impervious Runoff Depth=3.97"
Tc=6.0 min CN=42/98 Runoff=10.15 cfs 0.654 af

Subcatchment MCPR-7G: Runoff Area=0.220 ac 50.00% Impervious Runoff Depth=3.44"
Tc=6.0 min CN=66/98 Runoff=1.03 cfs 0.063 af

Subcatchment MCPR-7I: Runoff Area=0.130 ac 0.00% Impervious Runoff Depth=3.89"
Tc=6.0 min CN=88/0 Runoff=0.74 cfs 0.042 af

Subcatchment MCPR-7K: Runoff Area=0.770 ac 25.97% Impervious Runoff Depth=1.61"
Tc=6.0 min CN=43/98 Runoff=1.39 cfs 0.103 af

Subcatchment MCPR-7L: Runoff Area=0.460 ac 10.87% Impervious Runoff Depth=0.80"
Flow Length=175' Slope=0.1000 '/' Tc=7.8 min CN=40/98 Runoff=0.31 cfs 0.031 af

Subcatchment MCPR-7M: Runoff Area=0.110 ac 100.00% Impervious Runoff Depth=4.99"
Tc=6.0 min CN=0/98 Runoff=0.72 cfs 0.046 af

Subcatchment MCPR-7N: Runoff Area=0.290 ac 0.00% Impervious Runoff Depth=1.37"
Tc=6.0 min CN=59/0 Runoff=0.55 cfs 0.033 af

Subcatchment MCPR-7O: Runoff Area=0.060 ac 100.00% Impervious Runoff Depth=4.99"
Tc=6.0 min CN=0/98 Runoff=0.39 cfs 0.025 af

Pond BASIN MC-1: Infiltration Peak Elev=152.51' Storage=3,966 cf Inflow=4.02 cfs 0.671 af
Discarded=0.91 cfs 0.581 af Primary=0.35 cfs 0.090 af Outflow=1.25 cfs 0.671 af

Pond BASIN MC-2: Infiltration Peak Elev=160.90' Storage=304 cf Inflow=0.31 cfs 0.031 af
Discarded=0.10 cfs 0.031 af Primary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.031 af

Pond BASIN MC-3: Infiltration Peak Elev=161.47' Storage=12,670 cf Inflow=12.45 cfs 1.711 af
Discarded=1.85 cfs 1.294 af Primary=4.63 cfs 0.418 af Outflow=6.48 cfs 1.712 af

Pond BASIN MC-4: Infiltration Peak Elev=171.31' Storage=1,096 cf Inflow=1.93 cfs 0.118 af
Discarded=0.25 cfs 0.046 af Primary=0.54 cfs 0.072 af Outflow=0.78 cfs 0.118 af

Pond FB MC-1: Forebay Peak Elev=163.40' Storage=1,380 cf Inflow=1.03 cfs 0.063 af
Discarded=0.08 cfs 0.063 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.063 af

Pond SDS MC-1: Detention Peak Elev=169.98' Storage=8,040 cf Inflow=3.13 cfs 0.399 af
Outflow=0.71 cfs 0.399 af

Pond SDS MC-2: Detention Peak Elev=182.76' Storage=7,704 cf Inflow=6.29 cfs 0.391 af
Outflow=0.93 cfs 0.391 af

Pond SDS MC-3: Detention Peak Elev=170.85' Storage=4,715 cf Inflow=3.75 cfs 0.570 af
Outflow=1.26 cfs 0.570 af

Pond SDS MC-4: Detention Peak Elev=166.96' Storage=6,789 cf Inflow=6.23 cfs 0.388 af
Outflow=1.72 cfs 0.387 af

Pond SIS MC-1: Infiltration Peak Elev=160.13' Storage=12,472 cf Inflow=10.15 cfs 0.654 af
Discarded=0.71 cfs 0.632 af Primary=0.62 cfs 0.023 af Outflow=1.33 cfs 0.655 af

Pond SIS MC-2: Infiltration Peak Elev=162.53' Storage=2,565 cf Inflow=2.17 cfs 0.143 af
Discarded=0.20 cfs 0.143 af Primary=0.01 cfs 0.000 af Outflow=0.21 cfs 0.143 af

Pond WQS MC-1: Wet Swale Peak Elev=156.22' Storage=485 cf Inflow=0.39 cfs 0.024 af
Discarded=0.04 cfs 0.024 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.024 af

Pond WQS MC-2: Wet Swale Peak Elev=159.91' Storage=500 cf Inflow=0.42 cfs 0.024 af
Discarded=0.04 cfs 0.024 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.024 af

Pond WQS MC-3: Wet Swale Peak Elev=161.94' Storage=502 cf Inflow=0.42 cfs 0.024 af
Discarded=0.04 cfs 0.024 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.024 af

Pond WQS MC-4: Wet Swale Peak Elev=157.34' Storage=1,559 cf Inflow=1.74 cfs 0.112 af
Discarded=0.09 cfs 0.081 af Primary=1.21 cfs 0.031 af Outflow=1.30 cfs 0.112 af

Link POA-1: Inflow=1.21 cfs 0.031 af
Primary=1.21 cfs 0.031 af

Link POA-2:
Primary=0.00 cfs 0.000 af

Link POA-3:
Primary=0.00 cfs 0.000 af

Link POA-4: Inflow=10.12 cfs 0.623 af
Primary=10.12 cfs 0.623 af

Link POA-5: Inflow=12.02 cfs 1.112 af
Primary=12.02 cfs 1.112 af

Link POA-6: Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Link POA-7: Inflow=1.29 cfs 0.230 af
Primary=1.29 cfs 0.230 af

Total Runoff Area = 26.940 ac Runoff Volume = 4.939 af Average Runoff Depth = 2.20"
77.80% Pervious = 20.960 ac 22.20% Impervious = 5.980 ac

Summary for Subcatchment CCPR-7A:

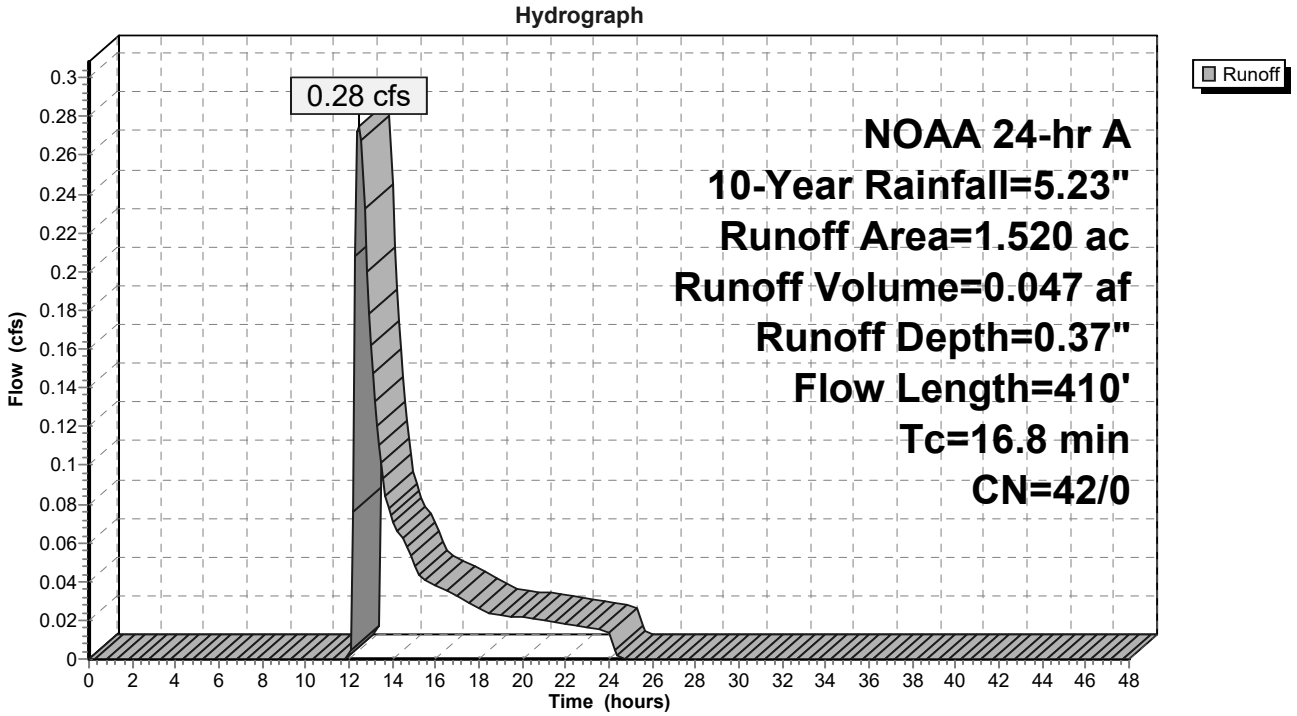
Runoff = 0.28 cfs @ 12.46 hrs, Volume= 0.047 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

	Area (ac)	CN	Description
	0.050	96	Gravel surface, HSG A
	0.110	39	>75% Grass cover, Good, HSG A
	0.110	30	Meadow, non-grazed, HSG A
	0.950	30	Woods, Good, HSG A
*	0.300	77	Wetlands, HSG A
	1.520	42	Weighted Average
	1.520	42	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	25	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.16"
0.6	10	0.5000	0.27		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.16"
9.9	375	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.8	410	Total			

Subcatchment CCPR-7A:



Summary for Subcatchment CCPR-7B:

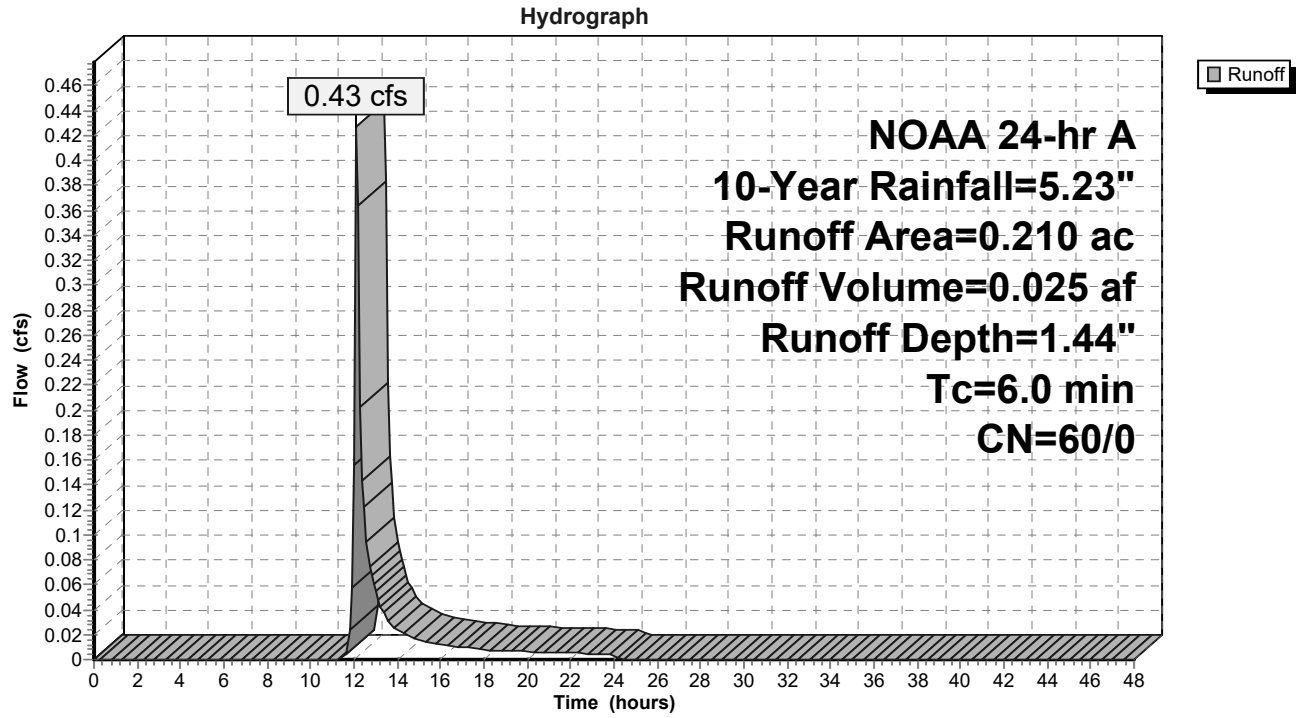
Runoff = 0.43 cfs @ 12.13 hrs, Volume= 0.025 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.080	74	>75% Grass cover, Good, HSG C
0.060	30	Meadow, non-grazed, HSG A
0.070	71	Meadow, non-grazed, HSG C
0.210	60	Weighted Average
0.210	60	100.00% Pervious Area

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

Subcatchment CCPR-7B:



Summary for Subcatchment MCPR-1A:

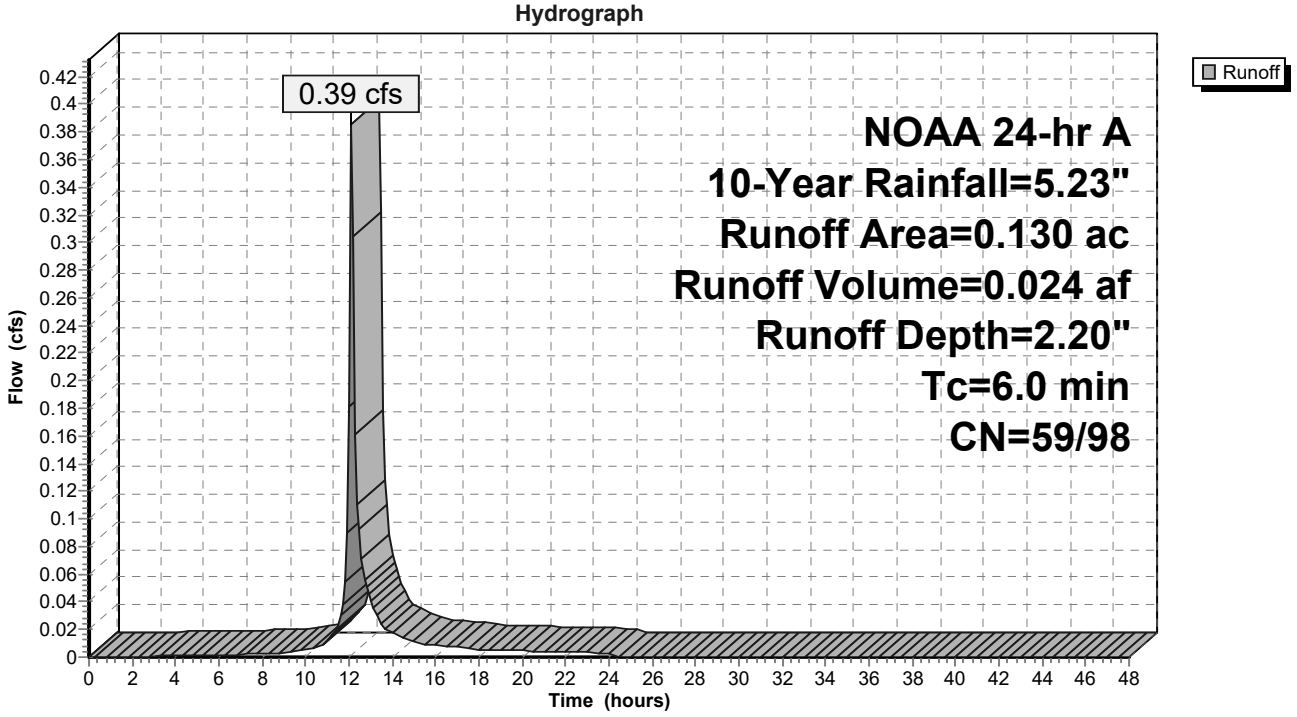
Runoff = 0.39 cfs @ 12.12 hrs, Volume= 0.024 af, Depth= 2.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.020	98	Paved parking, HSG A
0.010	98	Paved parking, HSG D
0.060	39	>75% Grass cover, Good, HSG A
0.020	80	>75% Grass cover, Good, HSG D
0.020	98	Water Surface, 0% imp, HSG A
0.130	68	Weighted Average
0.100	59	76.92% Pervious Area
0.030	98	23.08% Impervious Area

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

Subcatchment MCPR-1A:



Summary for Subcatchment MCPR-1B:

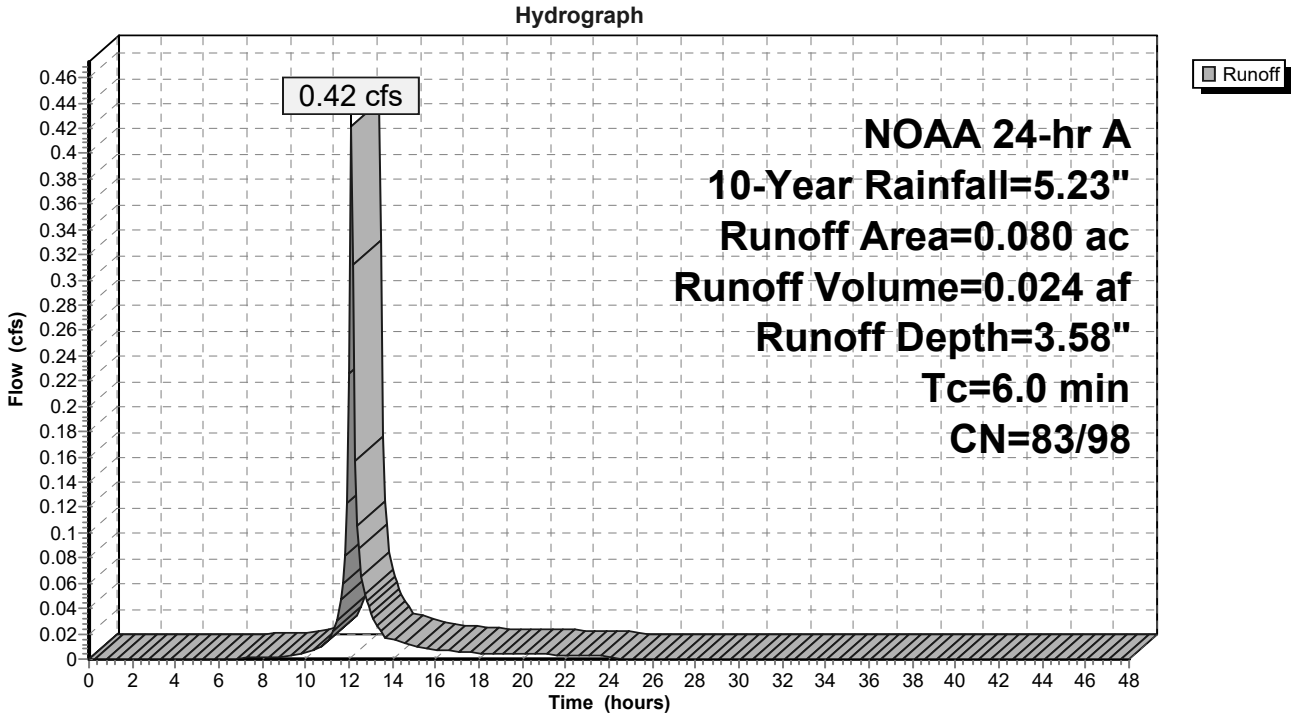
Runoff = 0.42 cfs @ 12.11 hrs, Volume= 0.024 af, Depth= 3.58"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.010	98	Paved parking, HSG D
0.060	80	>75% Grass cover, Good, HSG D
0.010	98	Water Surface, 0% imp, HSG D
0.080	85	Weighted Average
0.070	83	87.50% Pervious Area
0.010	98	12.50% Impervious Area

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

Subcatchment MCPR-1B:



Summary for Subcatchment MCPR-1C:

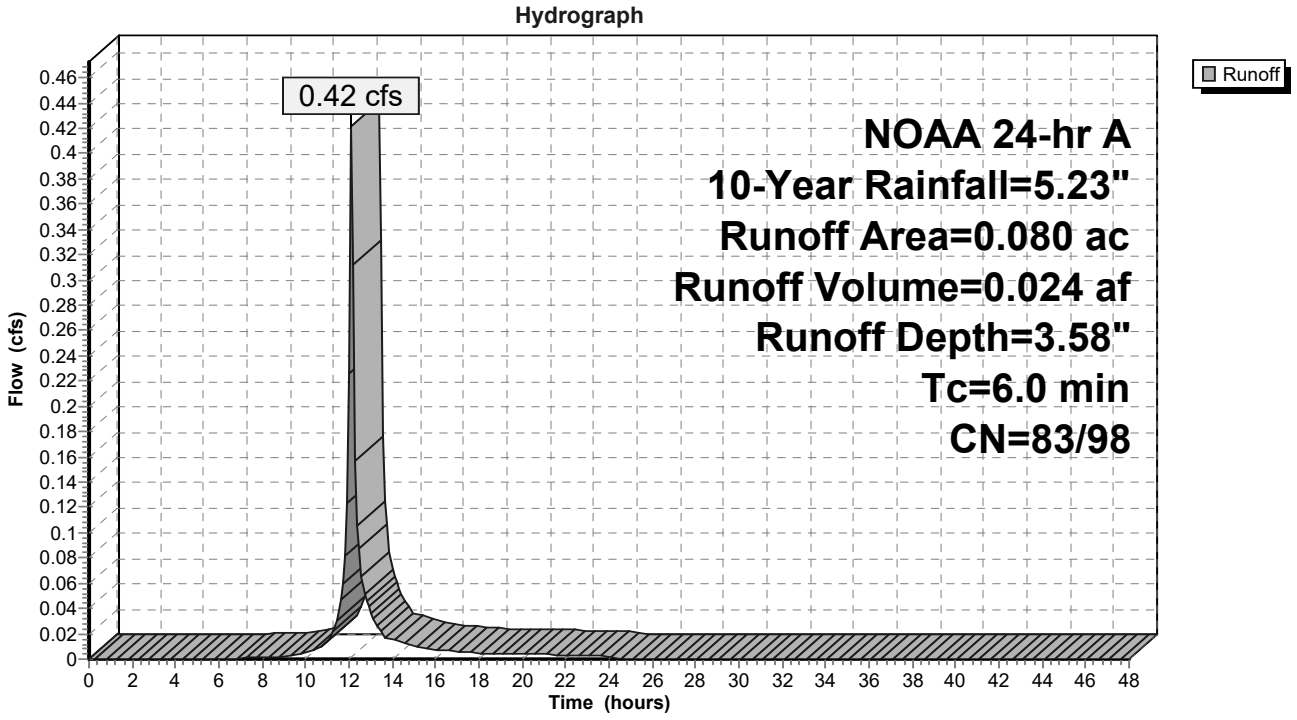
Runoff = 0.42 cfs @ 12.11 hrs, Volume= 0.024 af, Depth= 3.58"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.010	98	Paved parking, HSG D
0.060	80	>75% Grass cover, Good, HSG D
0.010	98	Water Surface, 0% imp, HSG D
0.080	85	Weighted Average
0.070	83	87.50% Pervious Area
0.010	98	12.50% Impervious Area

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

Subcatchment MCPR-1C:



Summary for Subcatchment MCPR-1D:

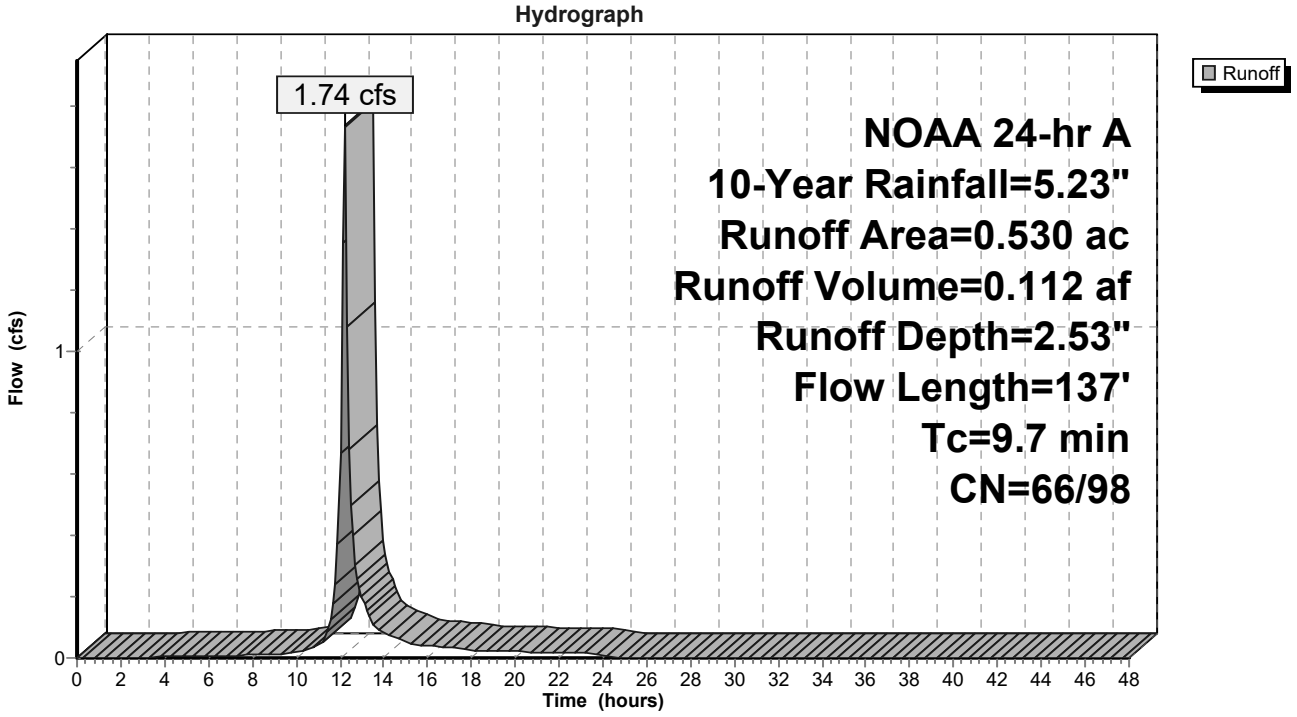
Runoff = 1.74 cfs @ 12.19 hrs, Volume= 0.112 af, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.040	98	Paved parking, HSG A
0.070	98	Paved parking, HSG D
0.140	39	>75% Grass cover, Good, HSG A
0.280	80	>75% Grass cover, Good, HSG D
0.530	73	Weighted Average
0.420	66	79.25% Pervious Area
0.110	98	20.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.1	87	0.0360	1.33		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.7	137	Total			

Subcatchment MCPR-1D:



Summary for Subcatchment MCPR-4A:

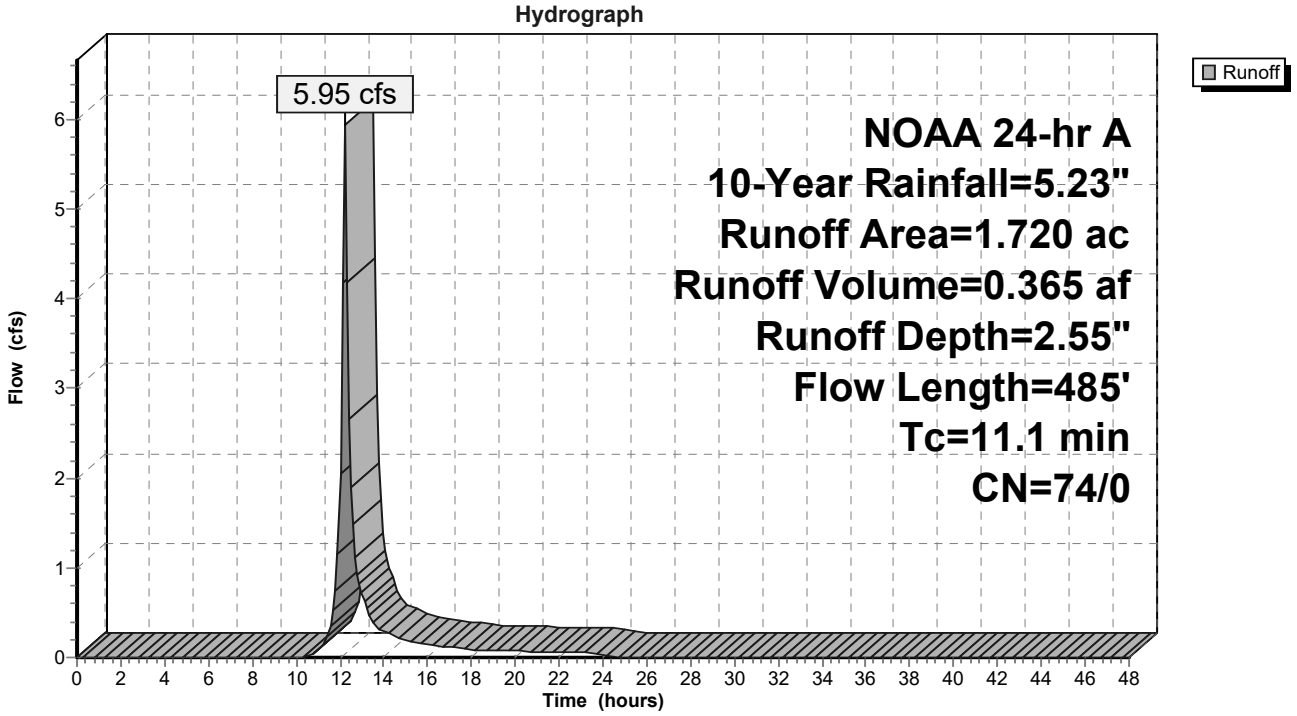
Runoff = 5.95 cfs @ 12.20 hrs, Volume= 0.365 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.870	70	Woods, Good, HSG C
0.040	96	Gravel surface, HSG C
0.100	71	Meadow, non-grazed, HSG C
0.410	77	Woods, Good, HSG D
0.290	78	Meadow, non-grazed, HSG D
0.010	96	Gravel surface, HSG D
1.720	74	Weighted Average
1.720	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.0	435	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.1	485	Total			

Subcatchment MCPR-4A:



Summary for Subcatchment MCPR-4B:

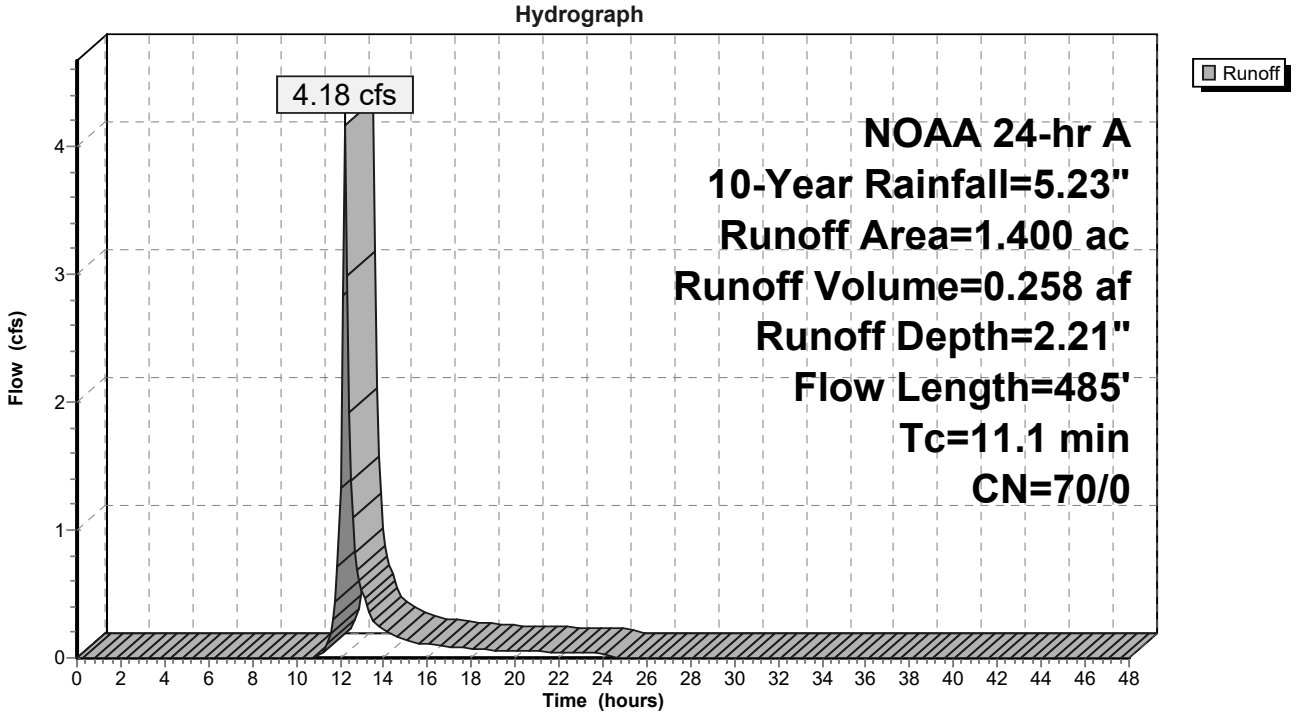
Runoff = 4.18 cfs @ 12.20 hrs, Volume= 0.258 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
1.360	70	Woods, Good, HSG C
0.020	96	Gravel surface, HSG C
0.020	71	Meadow, non-grazed, HSG C
1.400	70	Weighted Average
1.400	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.0	435	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.1	485	Total			

Subcatchment MCPR-4B:



Summary for Subcatchment MCPR-5A:

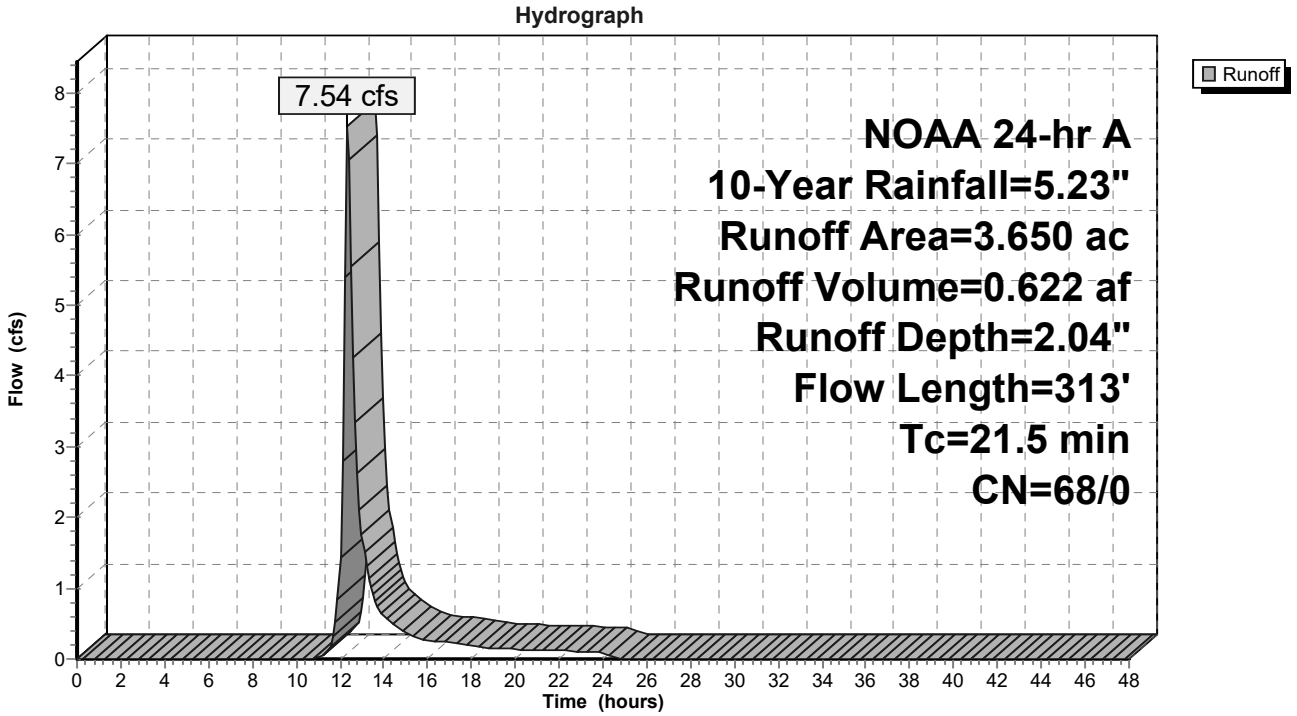
Runoff = 7.54 cfs @ 12.34 hrs, Volume= 0.622 af, Depth= 2.04"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

	Area (ac)	CN	Description
	0.480	30	Woods, Good, HSG A
	1.230	70	Woods, Good, HSG C
*	0.950	77	Wetlands, HSG A
*	0.120	77	Wetlands, HSG C
	0.060	96	Gravel surface, HSG A
	0.660	74	>75% Grass cover, Good, HSG C
	0.150	71	Meadow, non-grazed, HSG C
	3.650	68	Weighted Average
	3.650	68	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
5.1	263	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.5	313	Total			

Subcatchment MCPR-5A:



Summary for Subcatchment MCPR-5B:

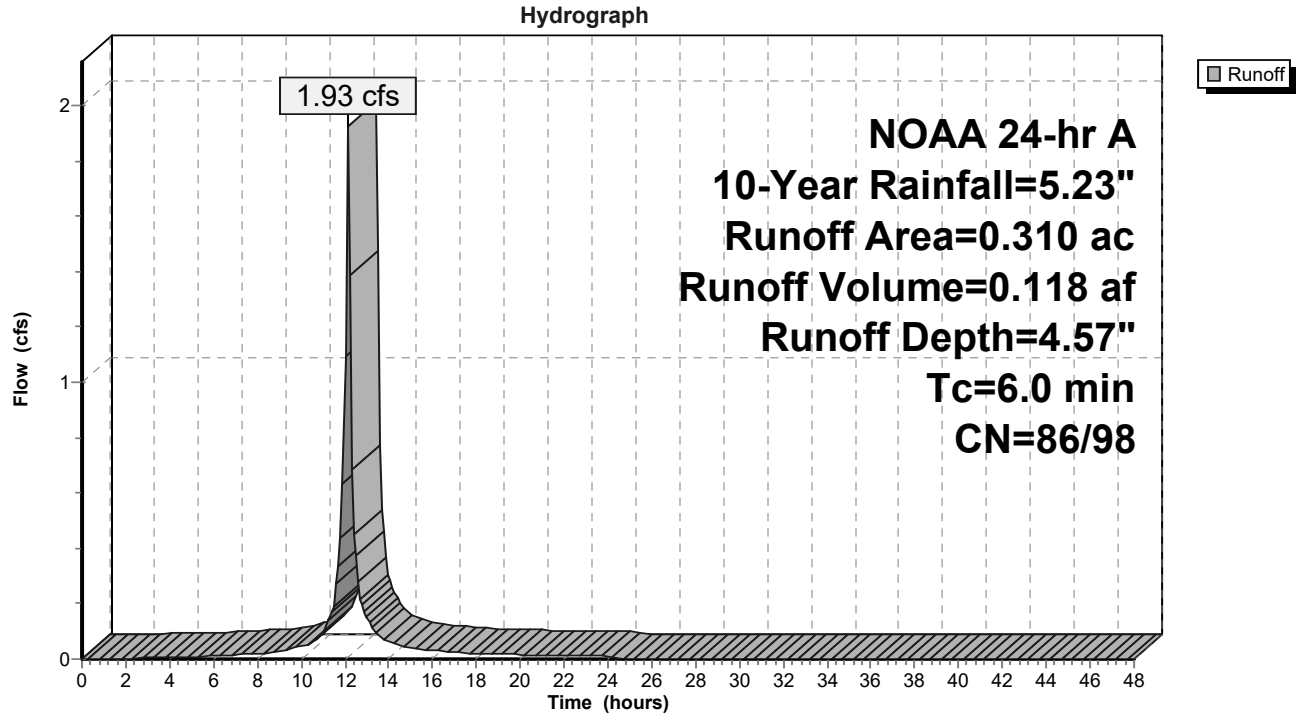
Runoff = 1.93 cfs @ 12.11 hrs, Volume= 0.118 af, Depth= 4.57"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.210	98	Roofs, HSG C
0.050	98	Water Surface, 0% imp, HSG C
0.050	74	>75% Grass cover, Good, HSG C
0.310	94	Weighted Average
0.100	86	32.26% Pervious Area
0.210	98	67.74% Impervious Area

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

Subcatchment MCPR-5B:



Summary for Subcatchment MCPR-5C:

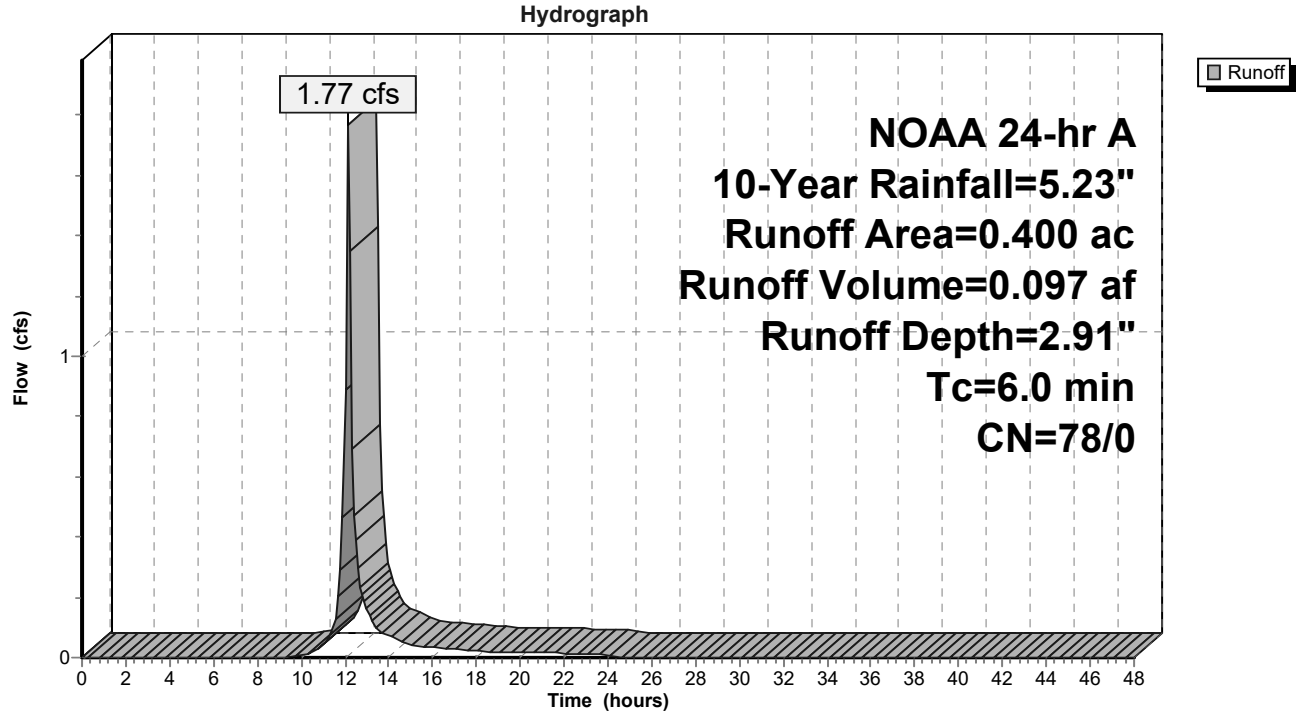
Runoff = 1.77 cfs @ 12.12 hrs, Volume= 0.097 af, Depth= 2.91"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.010	96	Gravel surface, HSG A
0.100	30	Meadow, non-grazed, HSG A
0.040	71	Meadow, non-grazed, HSG C
0.220	98	Water Surface, 0% imp, HSG A
0.030	98	Water Surface, 0% imp, HSG C
0.400	78	Weighted Average
0.400	78	100.00% Pervious Area

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

Subcatchment MCPR-5C:



Summary for Subcatchment MCPR-5D:

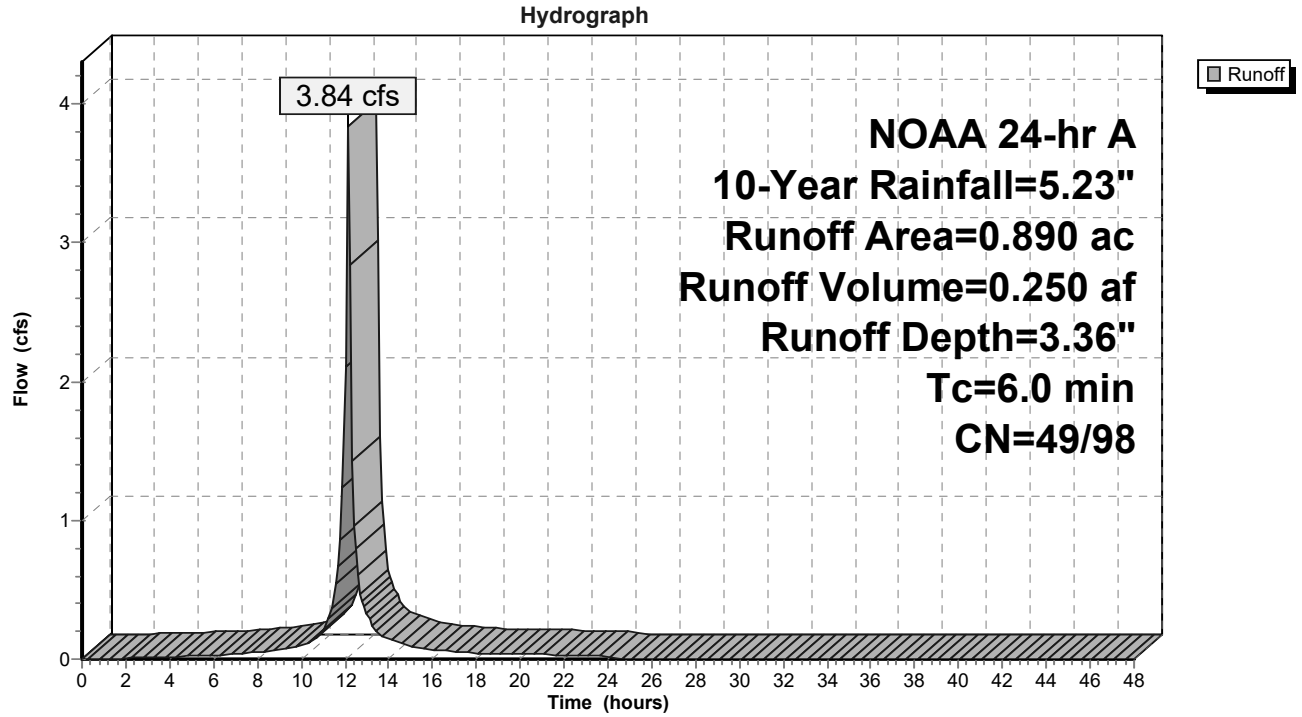
Runoff = 3.84 cfs @ 12.11 hrs, Volume= 0.250 af, Depth= 3.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.030	98	Roofs, HSG A
0.240	39	>75% Grass cover, Good, HSG A
0.100	74	>75% Grass cover, Good, HSG C
0.350	98	Paved parking, HSG A
0.170	98	Paved parking, HSG C
0.890	79	Weighted Average
0.340	49	38.20% Pervious Area
0.550	98	61.80% Impervious Area

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

Subcatchment MCPR-5D:



Summary for Subcatchment MCPR-5E:

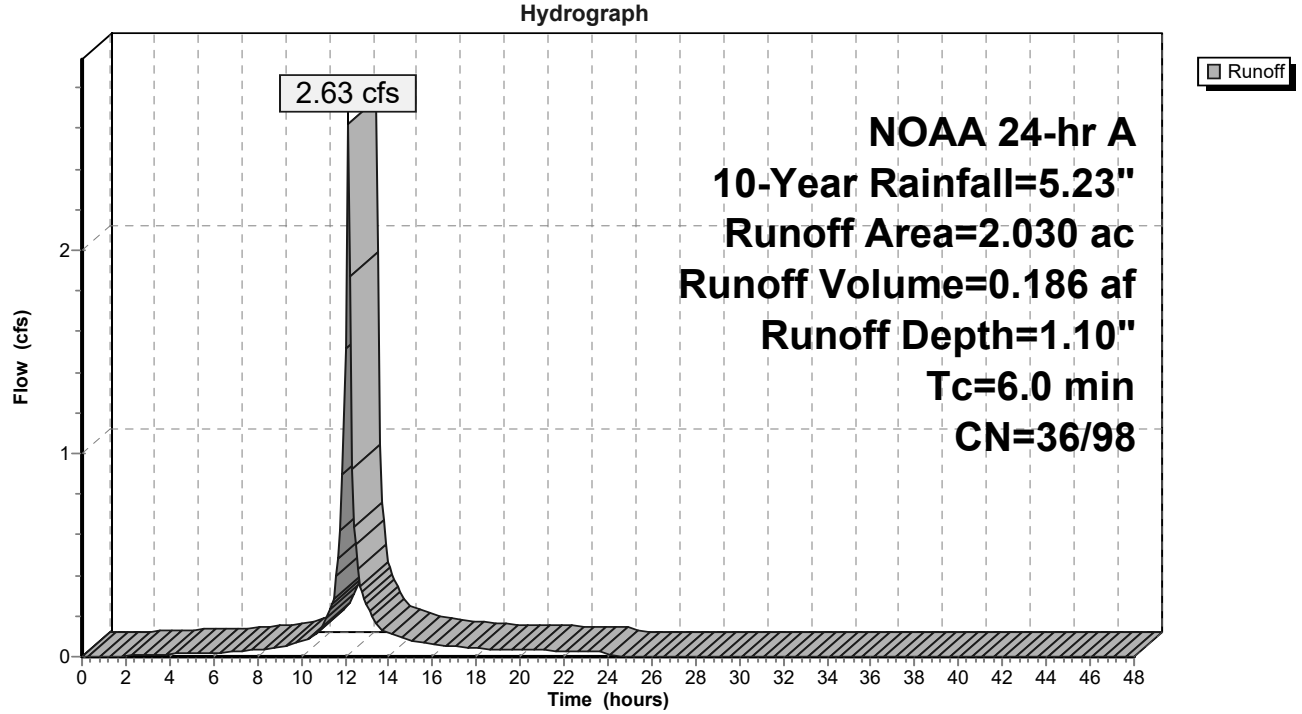
Runoff = 2.63 cfs @ 12.11 hrs, Volume= 0.186 af, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.350	98	Roofs, HSG A
0.030	98	Roofs, HSG C
0.780	39	>75% Grass cover, Good, HSG A
0.070	74	>75% Grass cover, Good, HSG C
0.010	98	Paved parking, HSG A
0.010	98	Paved parking, HSG C
0.330	30	Meadow, non-grazed, HSG A
0.450	30	Woods, Good, HSG A
2.030	48	Weighted Average
1.630	36	80.30% Pervious Area
0.400	98	19.70% Impervious Area

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

Subcatchment MCPR-5E:



Summary for Subcatchment MCPR-5F:

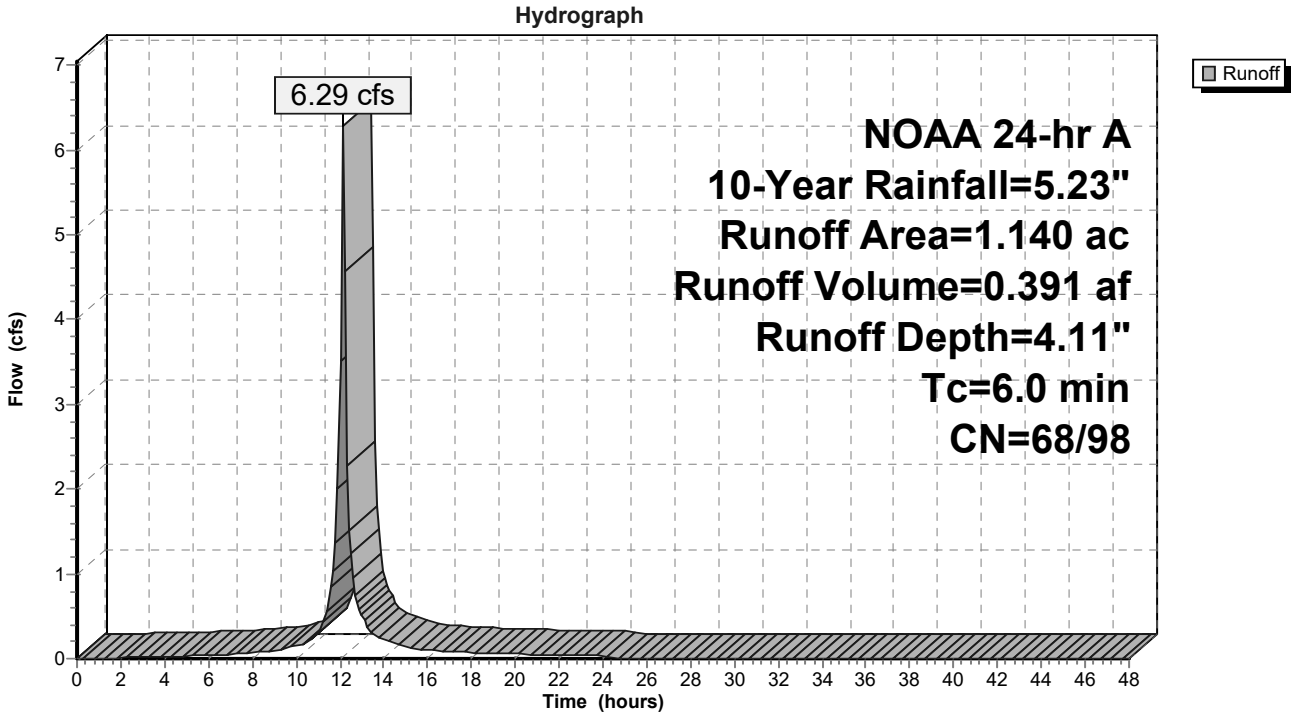
Runoff = 6.29 cfs @ 12.11 hrs, Volume= 0.391 af, Depth= 4.11"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.110	98	Roofs, HSG A
0.350	98	Roofs, HSG C
0.060	39	>75% Grass cover, Good, HSG A
0.280	74	>75% Grass cover, Good, HSG C
0.090	98	Paved parking, HSG A
0.250	98	Paved parking, HSG C
1.140	89	Weighted Average
0.340	68	29.82% Pervious Area
0.800	98	70.18% Impervious Area

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

Subcatchment MCPR-5F:



Summary for Subcatchment MCPR-5H:

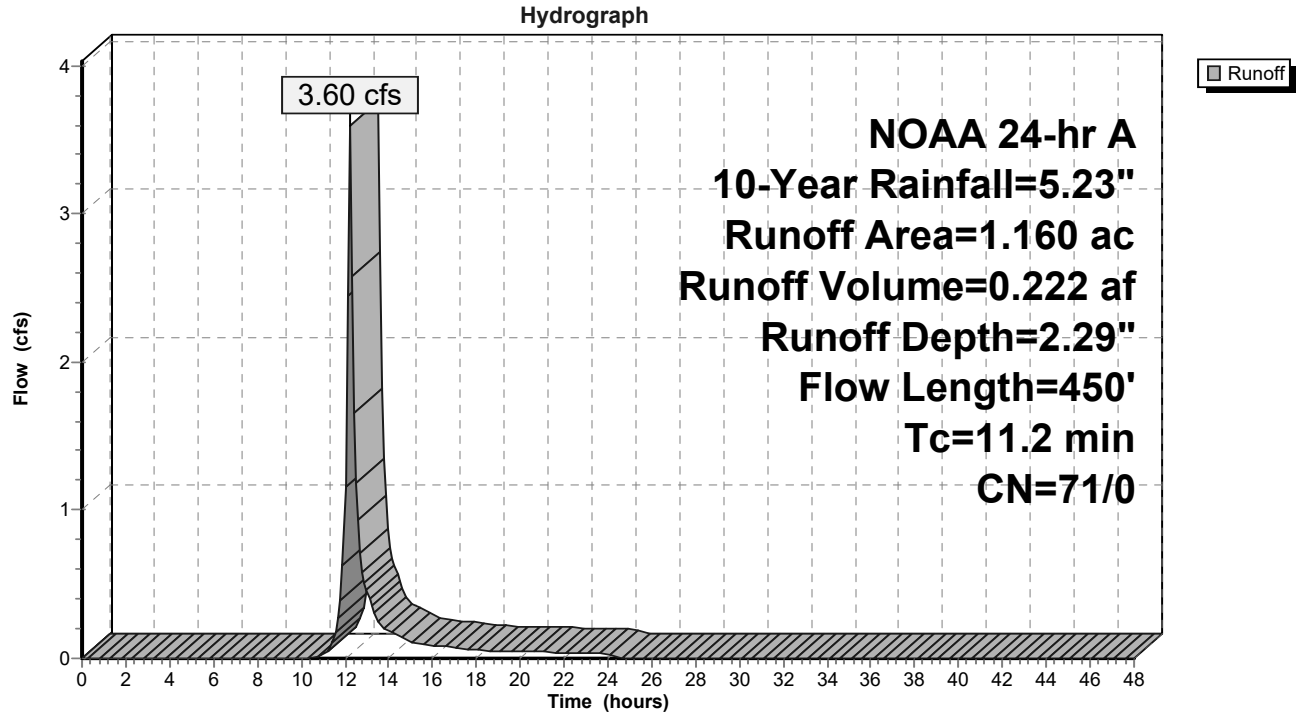
Runoff = 3.60 cfs @ 12.20 hrs, Volume= 0.222 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
1.120	70	Woods, Good, HSG C
0.040	96	Gravel surface, HSG C
1.160	71	Weighted Average
1.160	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.7	400	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.2	450	Total			

Subcatchment MCPR-5H:



Summary for Subcatchment MCPR-5l:

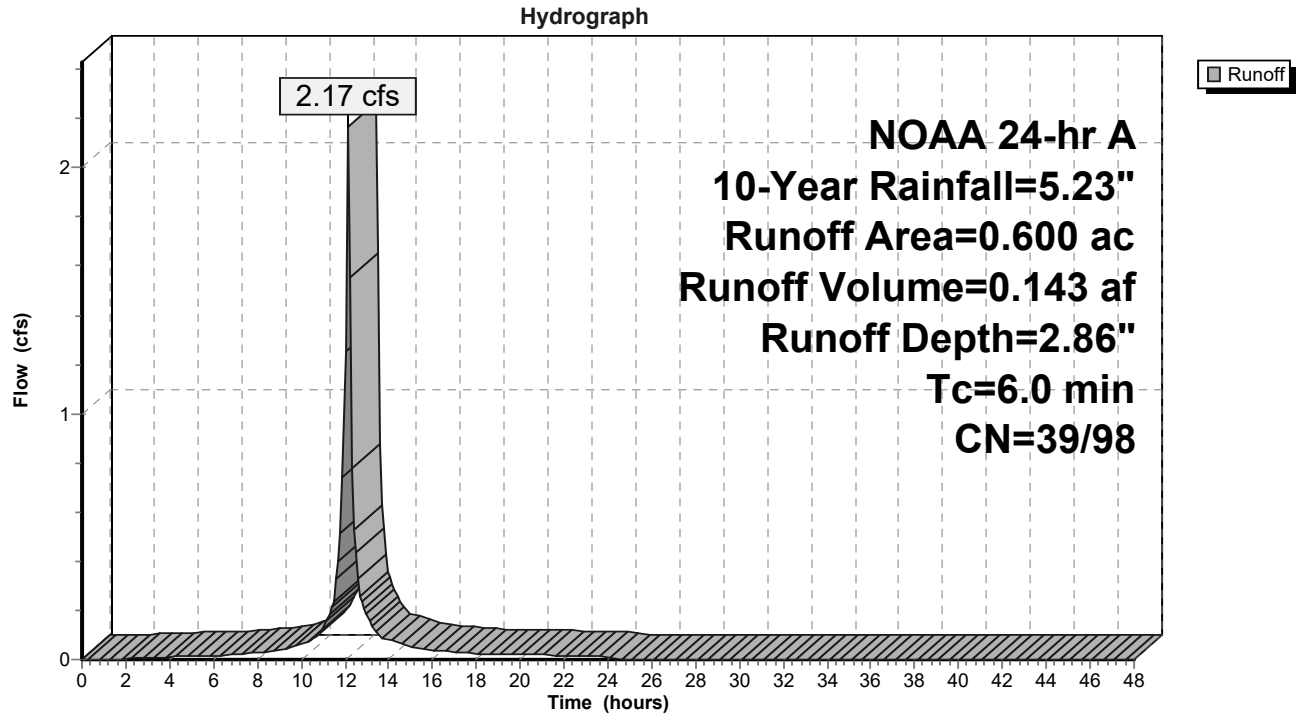
Runoff = 2.17 cfs @ 12.11 hrs, Volume= 0.143 af, Depth= 2.86"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.330	98	Roofs, HSG A
0.270	39	>75% Grass cover, Good, HSG A
0.600	71	Weighted Average
0.270	39	45.00% Pervious Area
0.330	98	55.00% Impervious Area

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

Subcatchment MCPR-5l:



Summary for Subcatchment MCPR-5J:

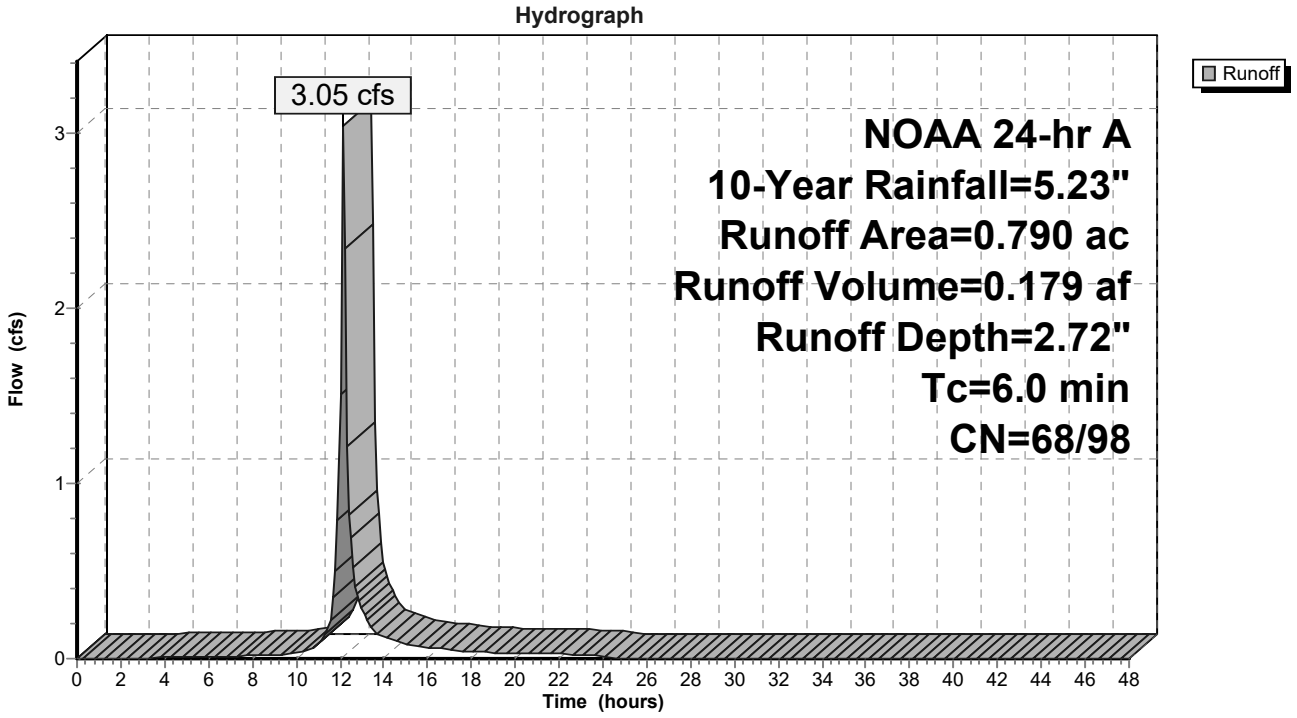
Runoff = 3.05 cfs @ 12.12 hrs, Volume= 0.179 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.020	98	Roofs, HSG A
0.160	98	Roofs, HSG C
0.150	39	>75% Grass cover, Good, HSG A
0.290	74	>75% Grass cover, Good, HSG C
0.090	70	Woods, Good, HSG C
0.080	98	Water Surface, 0% imp, HSG C
0.790	75	Weighted Average
0.610	68	77.22% Pervious Area
0.180	98	22.78% Impervious Area

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

Subcatchment MCPR-5J:



Summary for Subcatchment MCPR-5K:

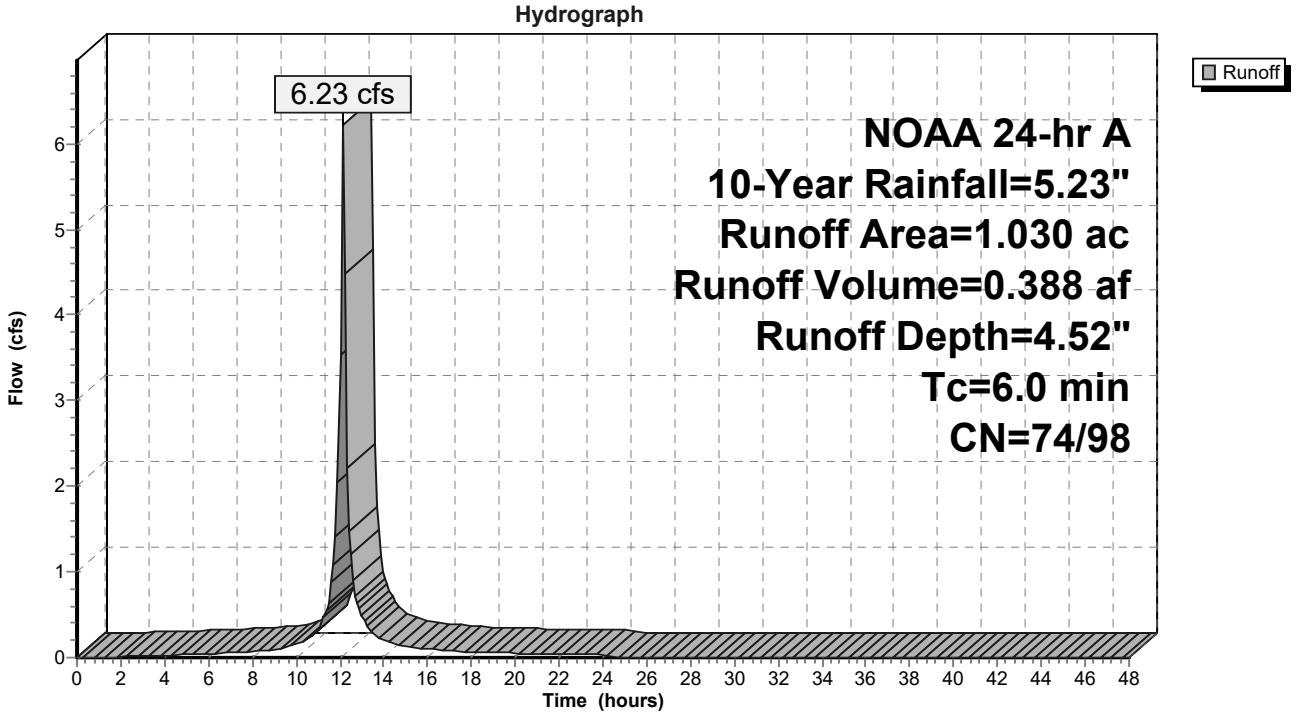
Runoff = 6.23 cfs @ 12.11 hrs, Volume= 0.388 af, Depth= 4.52"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.020	98	Roofs, HSG A
0.320	98	Roofs, HSG C
0.200	74	>75% Grass cover, Good, HSG C
0.490	98	Paved parking, HSG C
1.030	93	Weighted Average
0.200	74	19.42% Pervious Area
0.830	98	80.58% Impervious Area

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

Subcatchment MCPR-5K:



Summary for Subcatchment MCPR-6A:

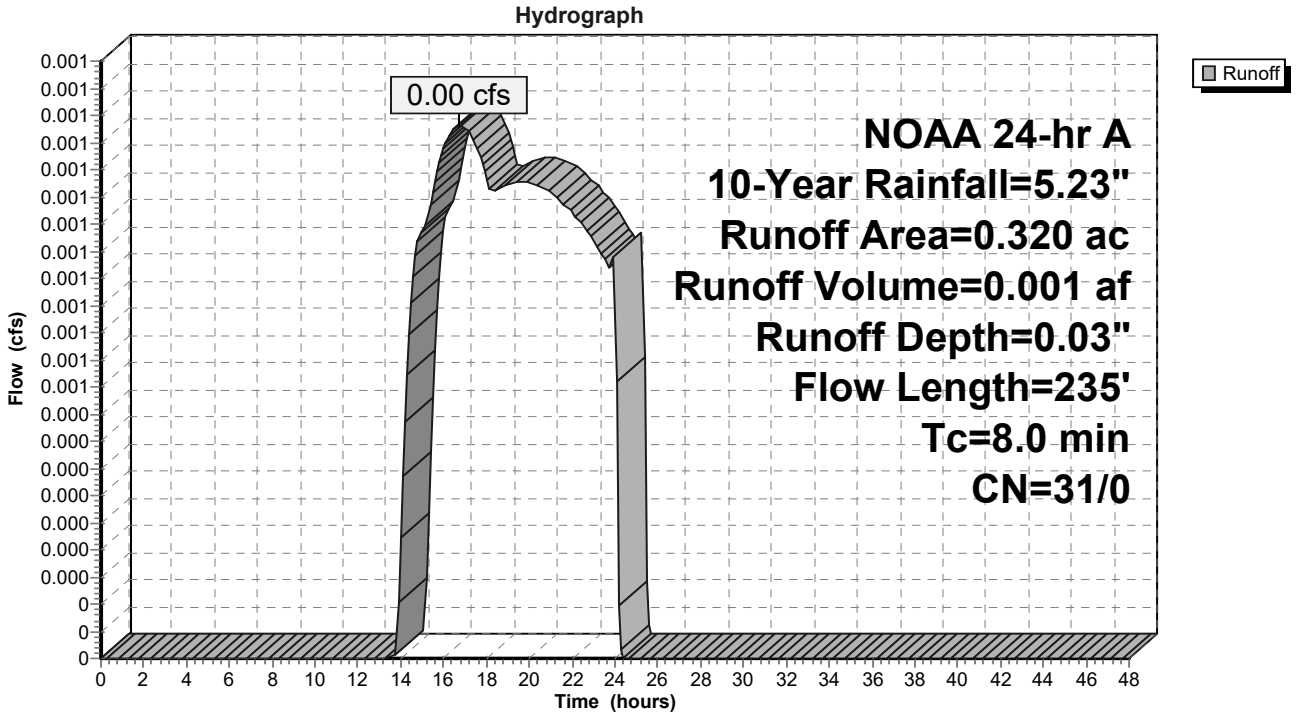
Runoff = 0.00 cfs @ 16.72 hrs, Volume= 0.001 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.050	39	>75% Grass cover, Good, HSG A
0.270	30	Woods, Good, HSG A
0.320	31	Weighted Average
0.320	31	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	35	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
2.4	200	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.0	235	Total			

Subcatchment MCPR-6A:



Summary for Subcatchment MCPR-7A:

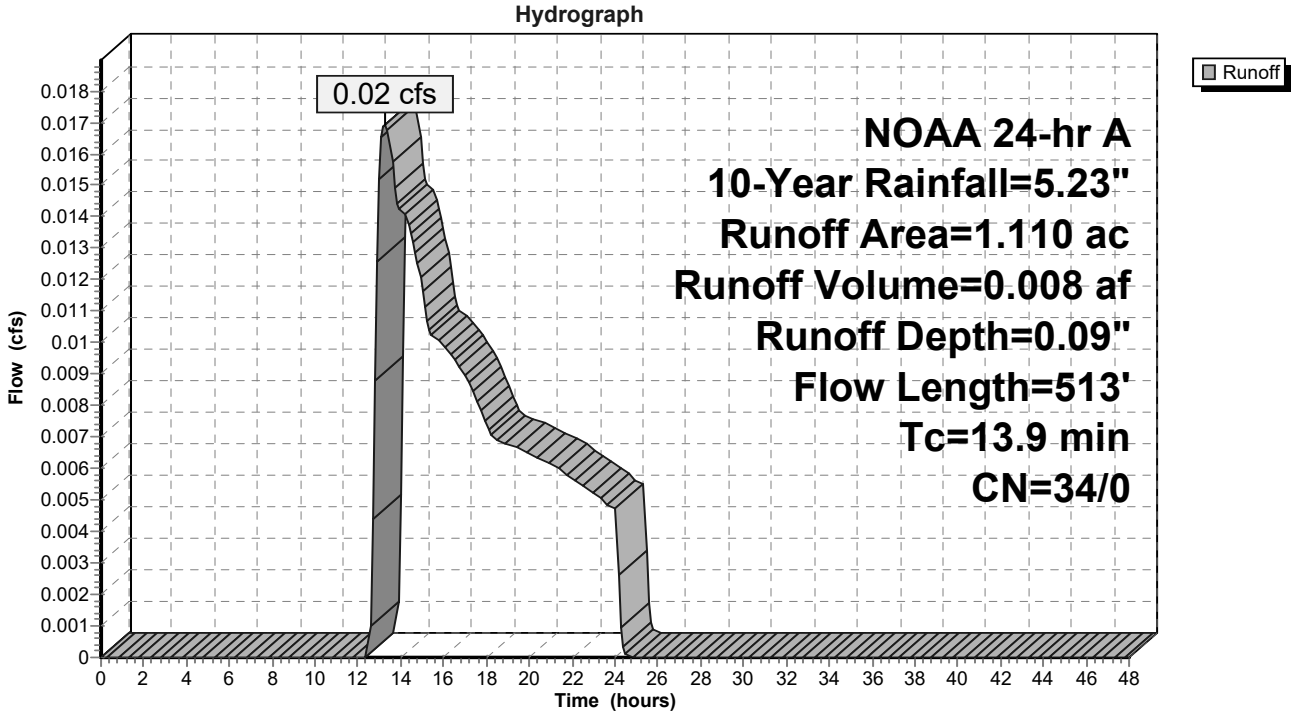
Runoff = 0.02 cfs @ 13.29 hrs, Volume= 0.008 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

	Area (ac)	CN	Description
	0.310	39	>75% Grass cover, Good, HSG A
	0.250	30	Meadow, non-grazed, HSG A
	0.510	30	Woods, Good, HSG A
*	0.040	77	Wetlands, HSG A
	1.110	34	Weighted Average
	1.110	34	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
7.4	463	0.0440	1.05		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.9	513	Total			

Subcatchment MCPR-7A:



Summary for Subcatchment MCPR-7B:

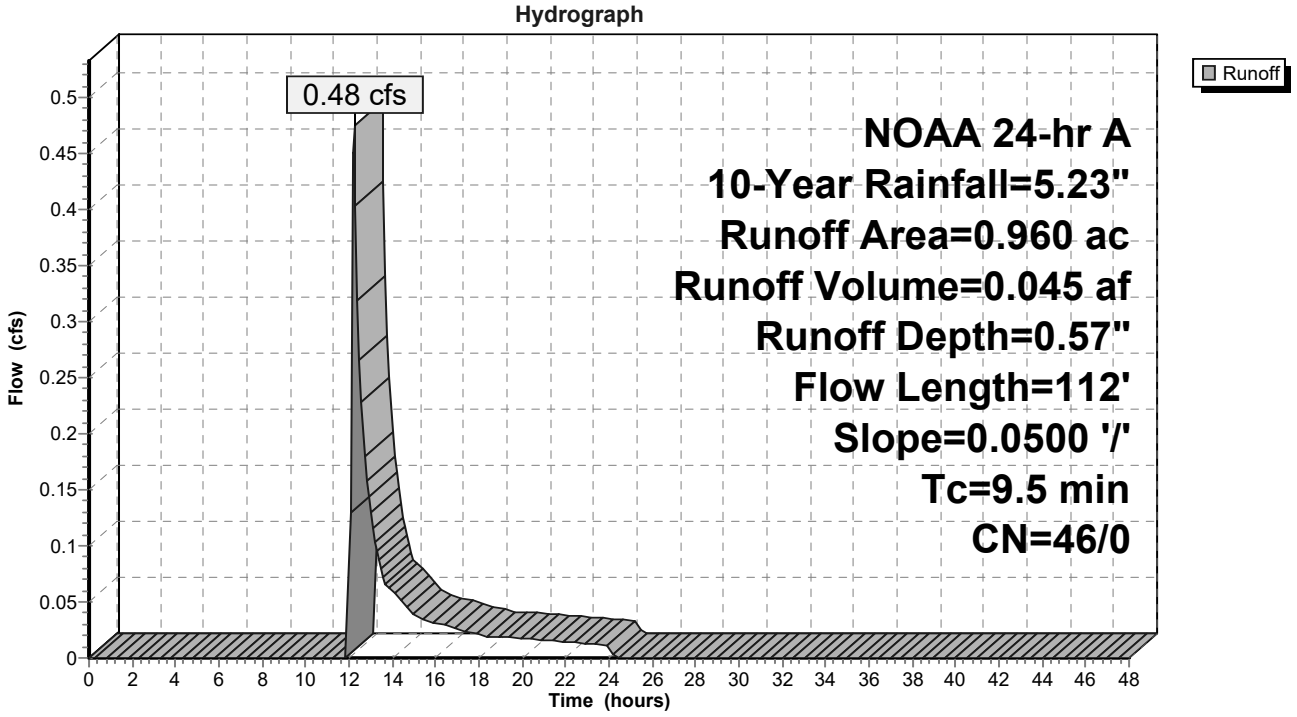
Runoff = 0.48 cfs @ 12.24 hrs, Volume= 0.045 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

	Area (ac)	CN	Description
	0.200	39	>75% Grass cover, Good, HSG A
	0.290	30	Woods, Good, HSG A
	0.200	30	Meadow, non-grazed, HSG A
*	0.220	77	Wetlands, HSG A
	0.050	98	Water Surface, 0% imp, HSG A
	0.960	46	Weighted Average
	0.960	46	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
0.9	62	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.5	112	Total			

Subcatchment MCPR-7B:



Summary for Subcatchment MCPR-7C:

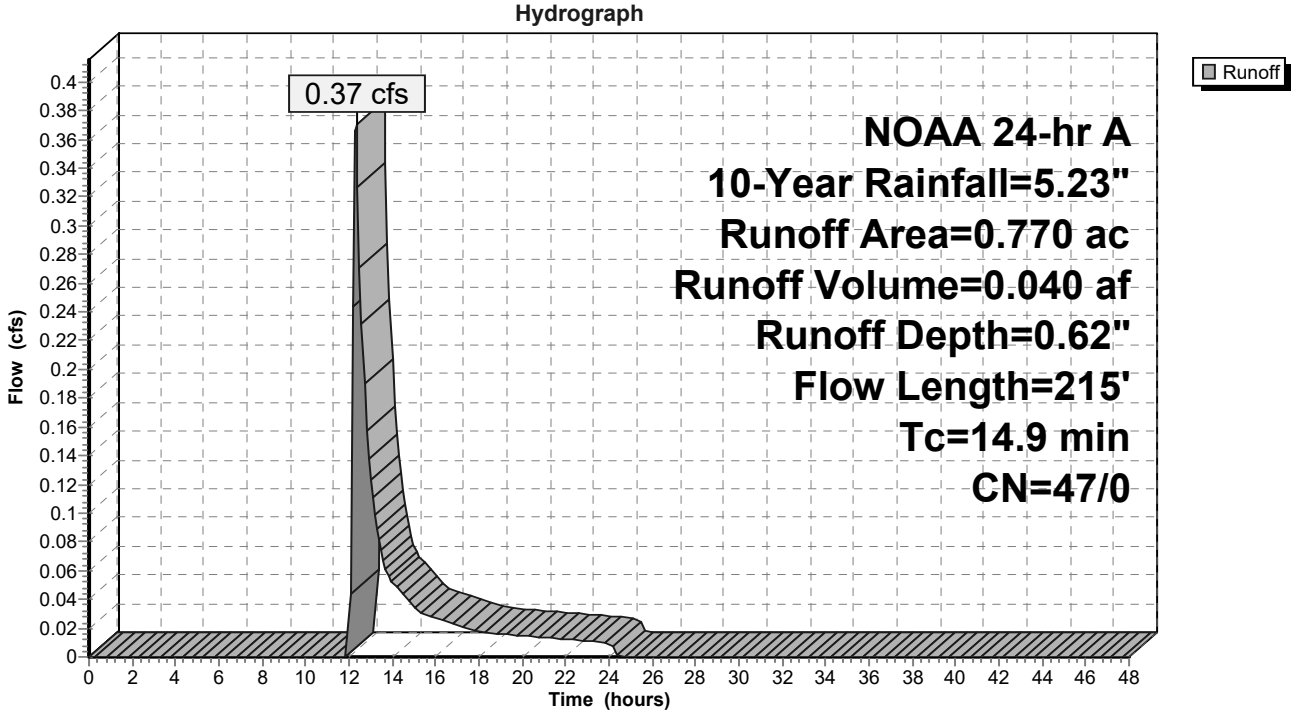
Runoff = 0.37 cfs @ 12.33 hrs, Volume= 0.040 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

	Area (ac)	CN	Description
	0.030	39	>75% Grass cover, Good, HSG A
	0.460	30	Meadow, non-grazed, HSG A
*	0.280	77	Wetlands, HSG A
	0.770	47	Weighted Average
	0.770	47	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.3	165	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.9	215	Total			

Subcatchment MCPR-7C:



Summary for Subcatchment MCPR-7D:

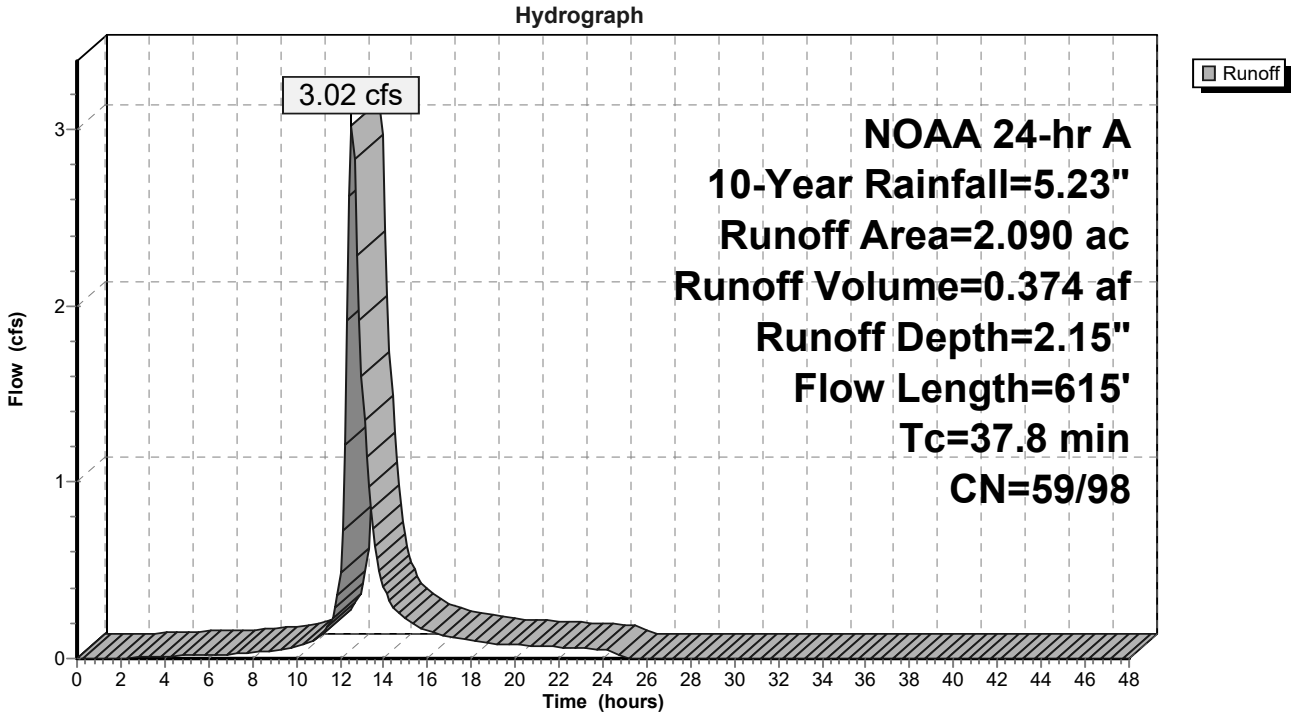
Runoff = 3.02 cfs @ 12.55 hrs, Volume= 0.374 af, Depth= 2.15"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.140	98	Roofs, HSG A
0.150	98	Roofs, HSG C
0.160	98	Paved parking, HSG A
0.410	39	>75% Grass cover, Good, HSG A
0.330	74	>75% Grass cover, Good, HSG C
0.200	30	Woods, Good, HSG A
0.390	70	Woods, Good, HSG C
0.050	30	Meadow, non-grazed, HSG A
0.160	71	Meadow, non-grazed, HSG C
0.100	98	Water Surface, 0% imp, HSG A
2.090	67	Weighted Average
1.640	59	78.47% Pervious Area
0.450	98	21.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.16"
0.9	125	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
27.8	250	0.0001	0.15		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.9	190	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
37.8	615	Total			

Subcatchment MCPR-7D:



Summary for Subcatchment MCPR-7F:

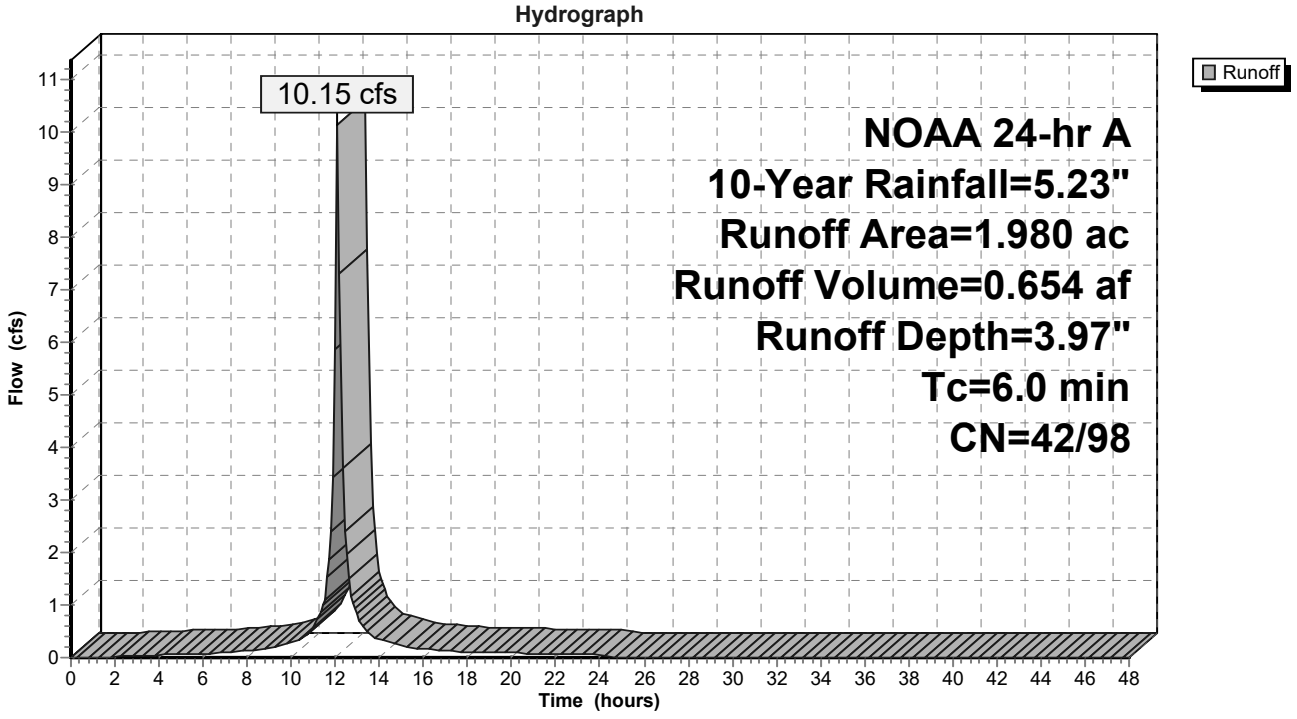
Runoff = 10.15 cfs @ 12.11 hrs, Volume= 0.654 af, Depth= 3.97"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.600	98	Roofs, HSG A
0.940	98	Paved parking, HSG A
0.420	39	>75% Grass cover, Good, HSG A
0.020	98	Water Surface, 0% imp, HSG A
1.980	85	Weighted Average
0.440	42	22.22% Pervious Area
1.540	98	77.78% Impervious Area

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

Subcatchment MCPR-7F:



Summary for Subcatchment MCPR-7G:

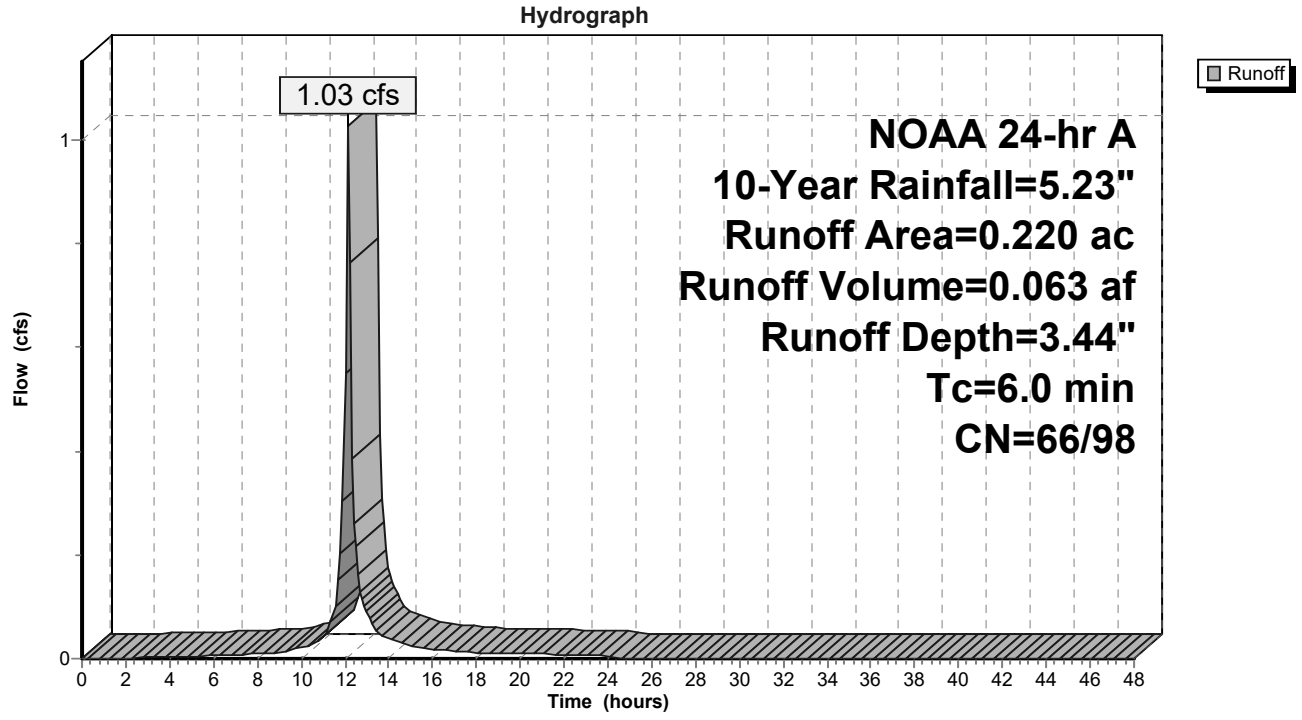
Runoff = 1.03 cfs @ 12.11 hrs, Volume= 0.063 af, Depth= 3.44"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.100	98	Paved parking, HSG A
0.010	98	Paved parking, HSG D
0.050	39	>75% Grass cover, Good, HSG A
0.030	80	>75% Grass cover, Good, HSG D
0.020	98	Water Surface, 0% imp, HSG A
0.010	98	Water Surface, 0% imp, HSG D
0.220	82	Weighted Average
0.110	66	50.00% Pervious Area
0.110	98	50.00% Impervious Area

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

Subcatchment MCPR-7G:



Summary for Subcatchment MCPR-7I:

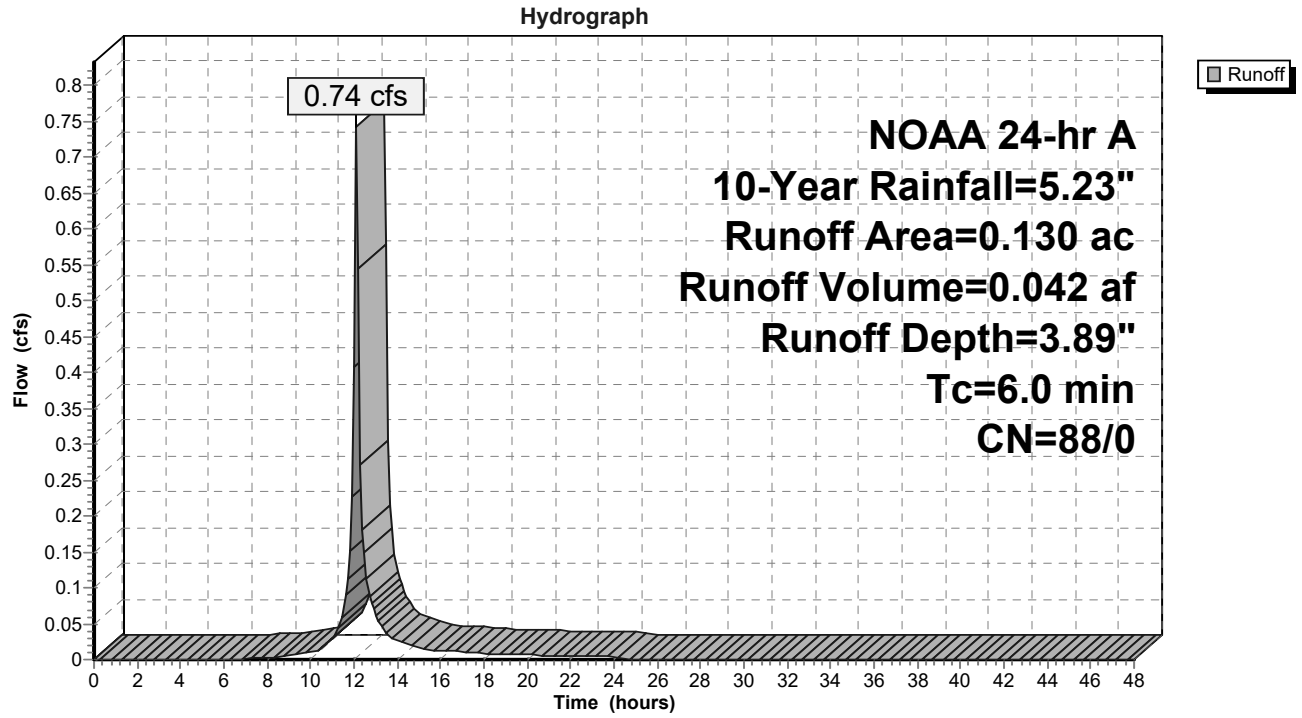
Runoff = 0.74 cfs @ 12.11 hrs, Volume= 0.042 af, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.050	96	Gravel surface, HSG A
0.020	39	>75% Grass cover, Good, HSG A
0.060	98	Water Surface, 0% imp, HSG A
0.130	88	Weighted Average
0.130	88	100.00% Pervious Area

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

Subcatchment MCPR-7I:



Summary for Subcatchment MCPR-7K:

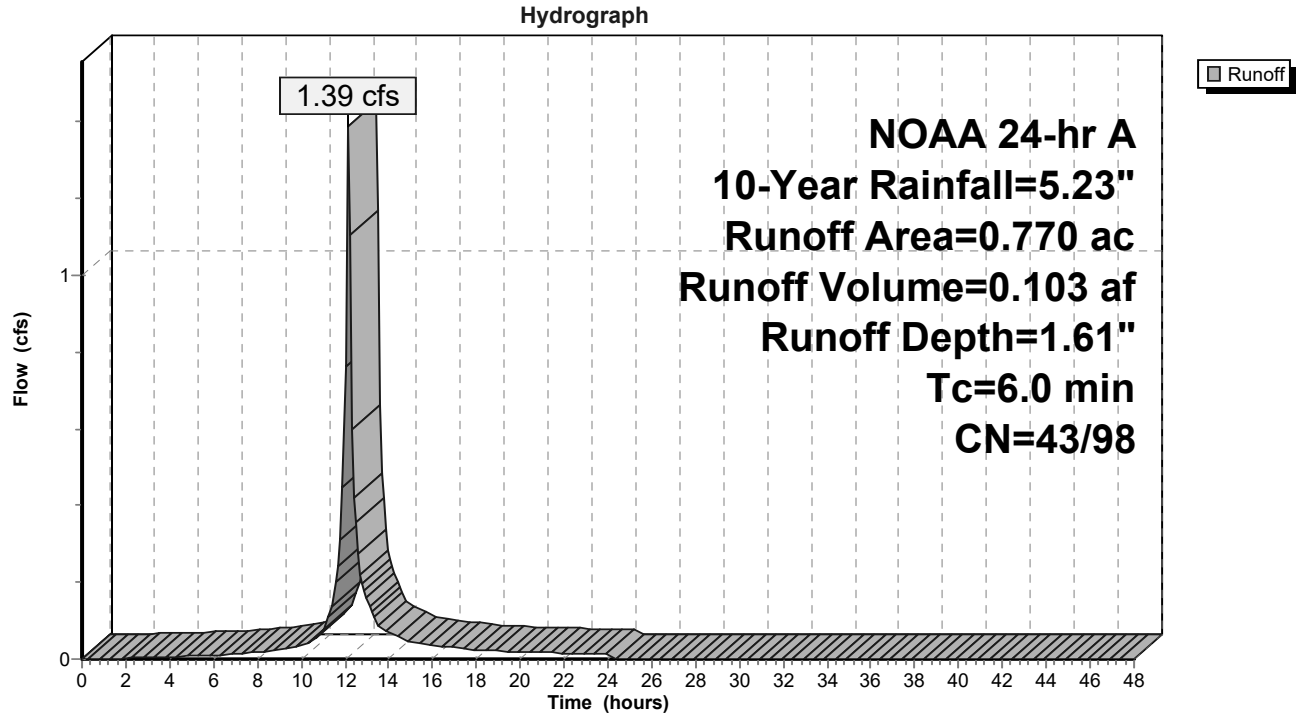
Runoff = 1.39 cfs @ 12.12 hrs, Volume= 0.103 af, Depth= 1.61"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.200	98	Roofs, HSG A
0.530	39	>75% Grass cover, Good, HSG A
0.040	98	Water Surface, 0% imp, HSG A
0.770	57	Weighted Average
0.570	43	74.03% Pervious Area
0.200	98	25.97% Impervious Area

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

Subcatchment MCPR-7K:



Summary for Subcatchment MCPR-7L:

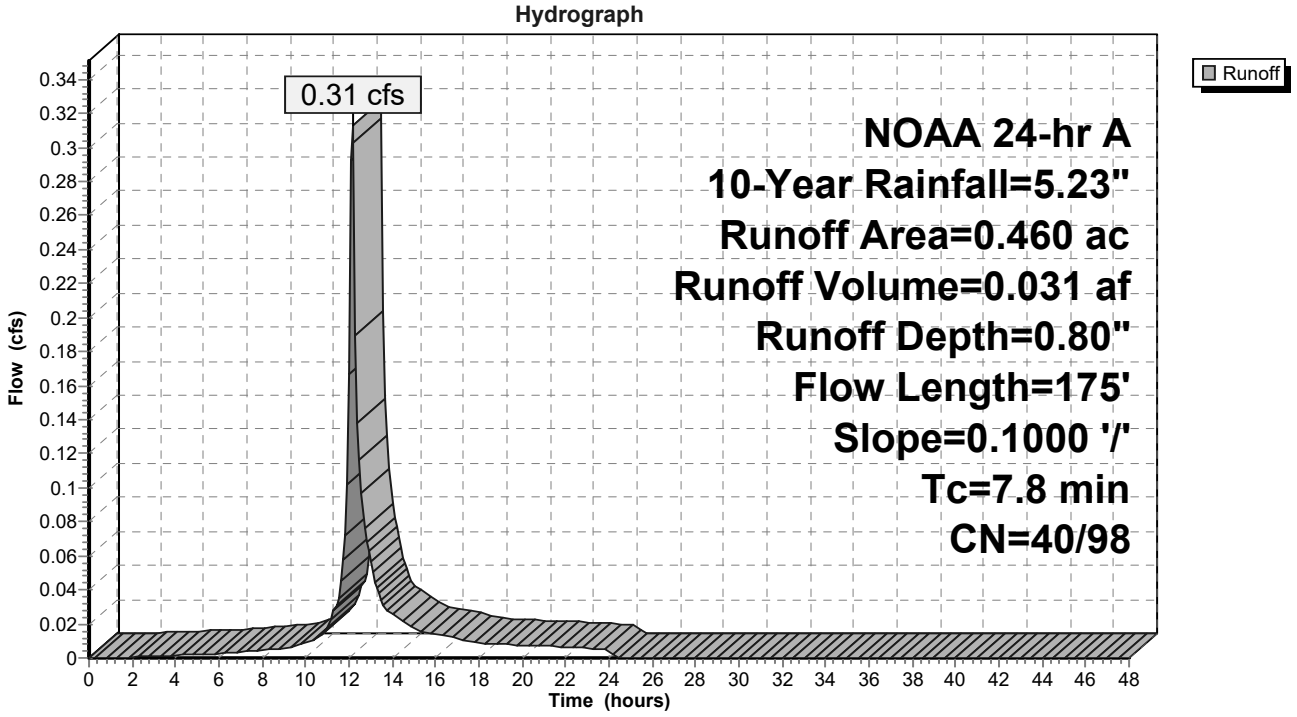
Runoff = 0.31 cfs @ 12.16 hrs, Volume= 0.031 af, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.050	98	Roofs, HSG A
0.210	39	>75% Grass cover, Good, HSG A
0.170	30	Woods, Good, HSG A
0.030	98	Water Surface, 0% imp, HSG A
0.460	46	Weighted Average
0.410	40	89.13% Pervious Area
0.050	98	10.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.3	125	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.8	175	Total			

Subcatchment MCPR-7L:



Summary for Subcatchment MCPR-7M:

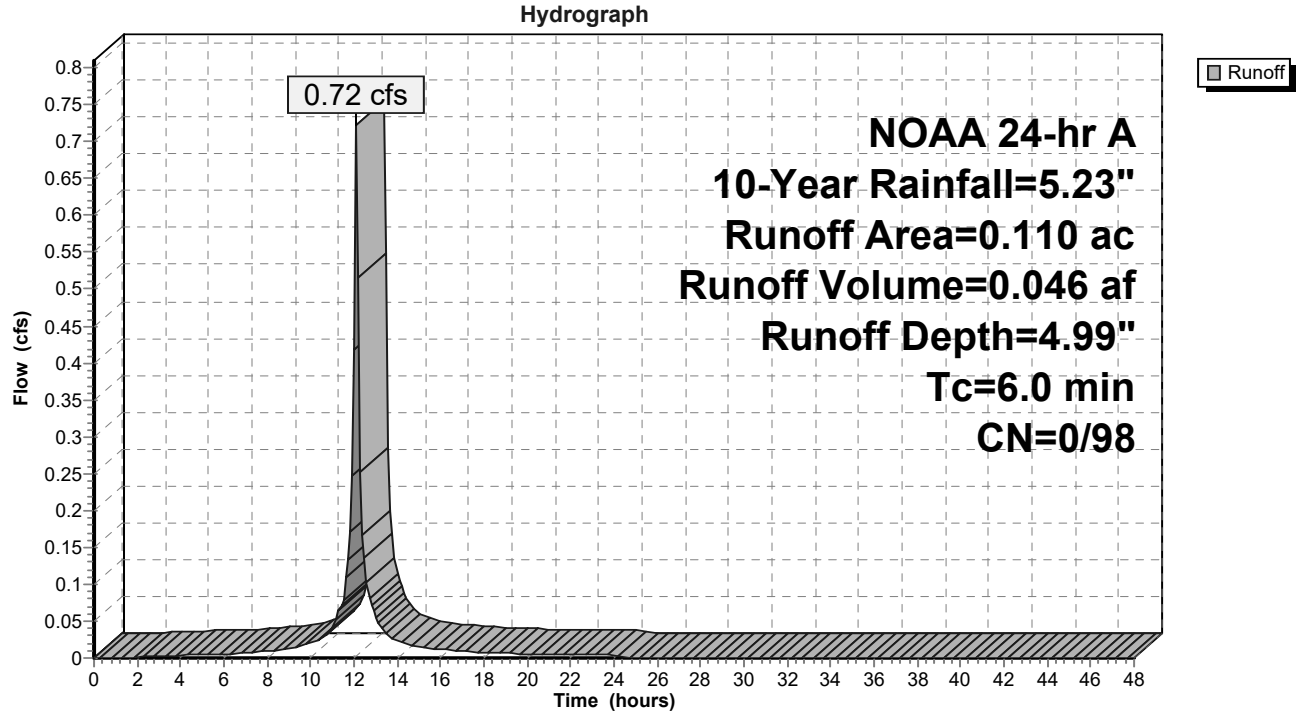
Runoff = 0.72 cfs @ 12.11 hrs, Volume= 0.046 af, Depth= 4.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.110	98	Paved parking, HSG A
0.110	98	100.00% Impervious Area

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

Subcatchment MCPR-7M:



Summary for Subcatchment MCPR-7N:

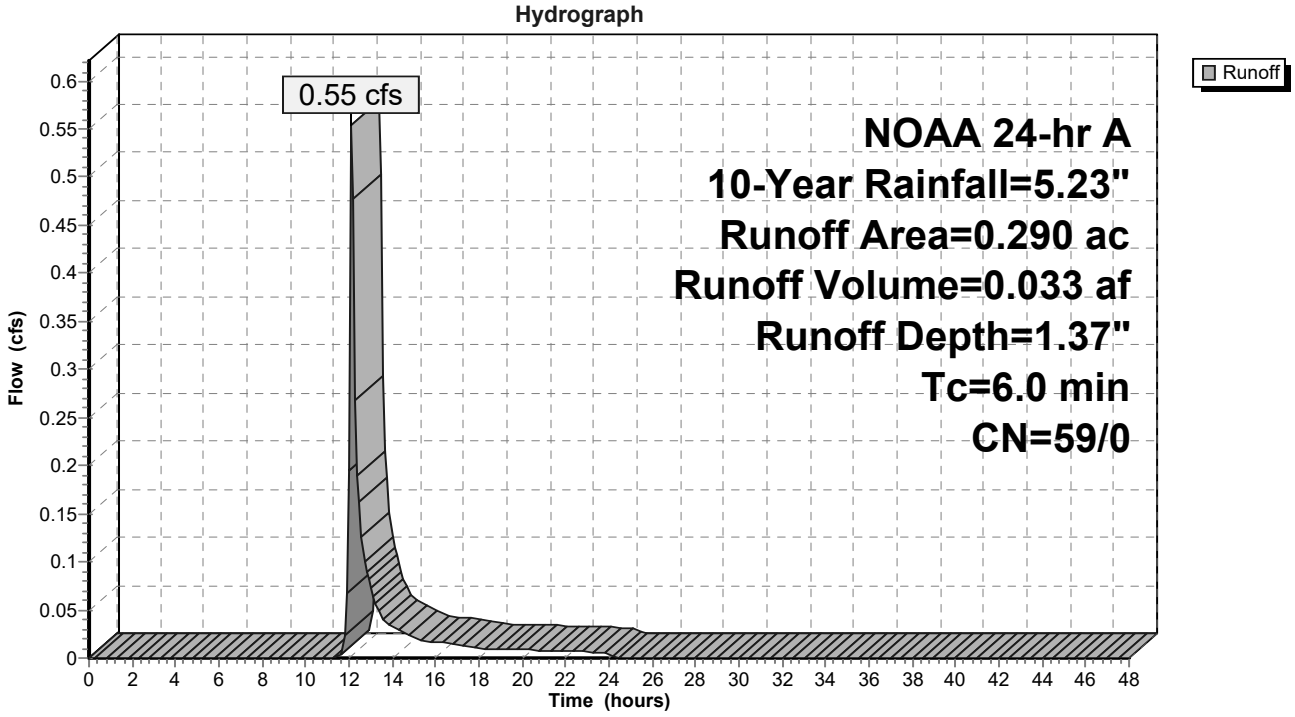
Runoff = 0.55 cfs @ 12.14 hrs, Volume= 0.033 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.190	39	>75% Grass cover, Good, HSG A
0.100	98	Water Surface, 0% imp, HSG A
0.290	59	Weighted Average
0.290	59	100.00% Pervious Area

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

Subcatchment MCPR-7N:



Summary for Subcatchment MCPR-7O:

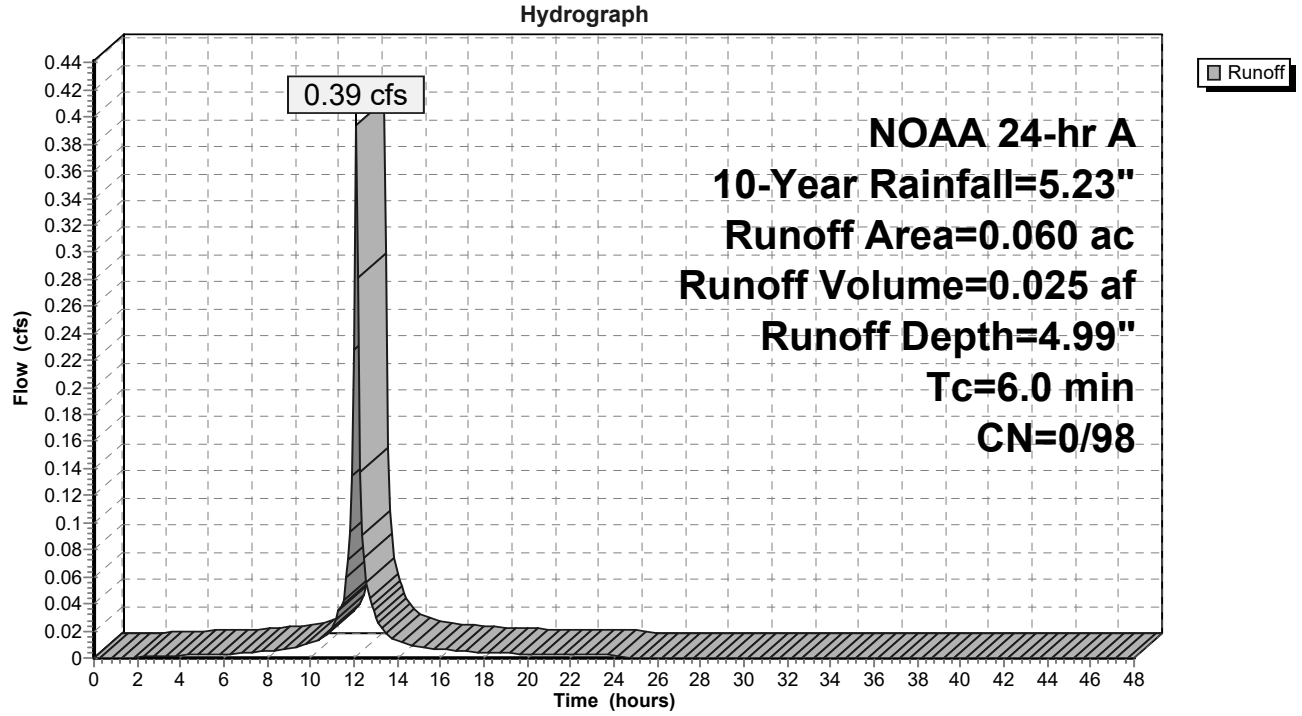
Runoff = 0.39 cfs @ 12.11 hrs, Volume= 0.025 af, Depth= 4.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 10-Year Rainfall=5.23"

Area (ac)	CN	Description
0.060	98	Roofs, HSG A
0.060	98	100.00% Impervious Area

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

Subcatchment MCPR-7O:



Summary for Pond BASIN MC-1: Infiltration

Inflow Area = 5.640 ac, 41.84% Impervious, Inflow Depth = 1.43" for 10-Year event
Inflow = 4.02 cfs @ 12.12 hrs, Volume= 0.671 af
Outflow = 1.25 cfs @ 13.04 hrs, Volume= 0.671 af, Atten= 69%, Lag= 54.9 min
Discarded = 0.91 cfs @ 13.04 hrs, Volume= 0.581 af
Primary = 0.35 cfs @ 13.04 hrs, Volume= 0.090 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 152.51' @ 13.04 hrs Surf.Area= 4,729 sf Storage= 3,966 cf

Plug-Flow detention time= 26.5 min calculated for 0.669 af (100% of inflow)
Center-of-Mass det. time= 26.5 min (919.3 - 892.8)

Volume	Invert	Avail.Storage	Storage Description
#1	151.50'	28,683 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

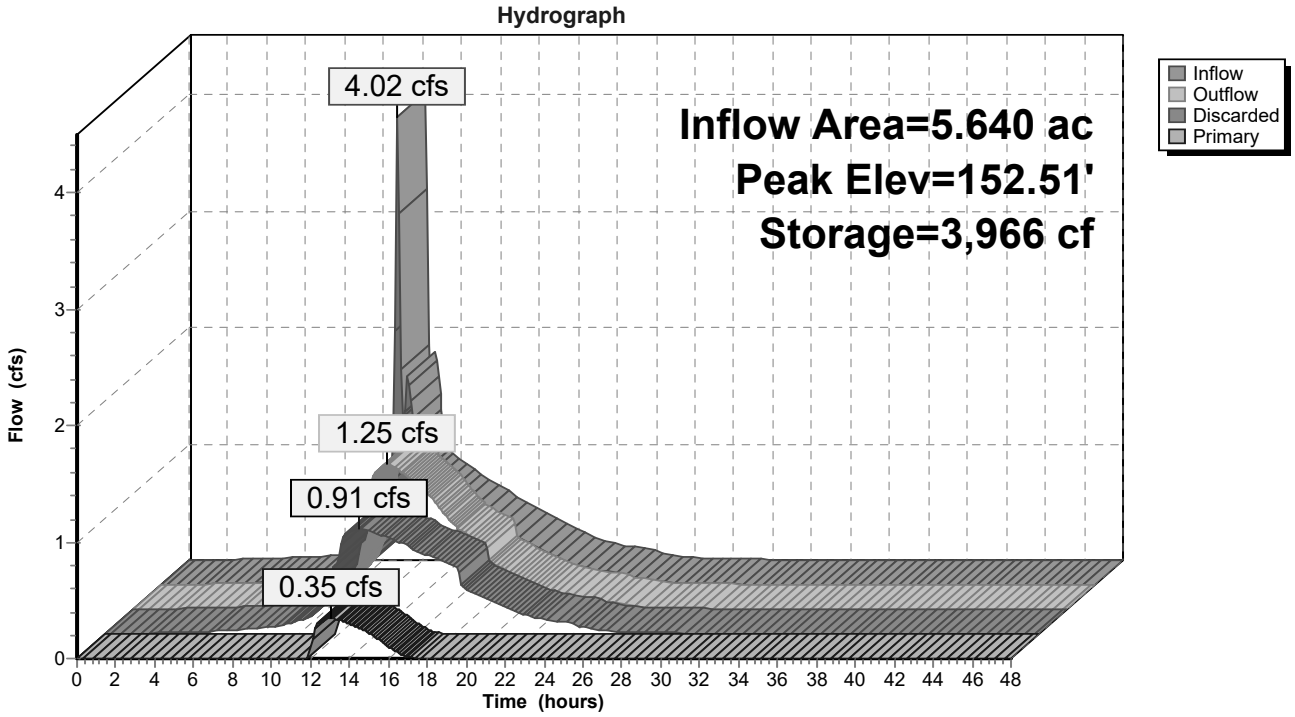
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
151.50	2,847	0	0
152.00	4,064	1,728	1,728
154.00	6,675	10,739	12,467
156.00	9,541	16,216	28,683

Device	Routing	Invert	Outlet Devices
#1	Primary	151.50'	**12.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 151.50' / 150.50' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	151.65'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	154.50'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	154.25'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#5	Discarded	151.50'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.90 cfs @ 13.04 hrs HW=152.51' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.90 cfs)

Primary OutFlow Max=0.35 cfs @ 13.04 hrs HW=152.51' (Free Discharge)
├**1=Culvert** (Passes 0.35 cfs of 2.69 cfs potential flow)
│ ├**2=Orifice/Grate** (Orifice Controls 0.35 cfs @ 4.00 fps)
│ └**3=Orifice/Grate** (Controls 0.00 cfs)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond BASIN MC-1: Infiltration



Summary for Pond BASIN MC-2: Infiltration

Inflow Area = 0.460 ac, 10.87% Impervious, Inflow Depth = 0.80" for 10-Year event
Inflow = 0.31 cfs @ 12.16 hrs, Volume= 0.031 af
Outflow = 0.10 cfs @ 12.59 hrs, Volume= 0.031 af, Atten= 68%, Lag= 25.7 min
Discarded = 0.10 cfs @ 12.59 hrs, Volume= 0.031 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 160.90' @ 12.59 hrs Surf.Area= 518 sf Storage= 304 cf

Plug-Flow detention time= 23.5 min calculated for 0.031 af (100% of inflow)
Center-of-Mass det. time= 23.8 min (830.9 - 807.1)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	2,432 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

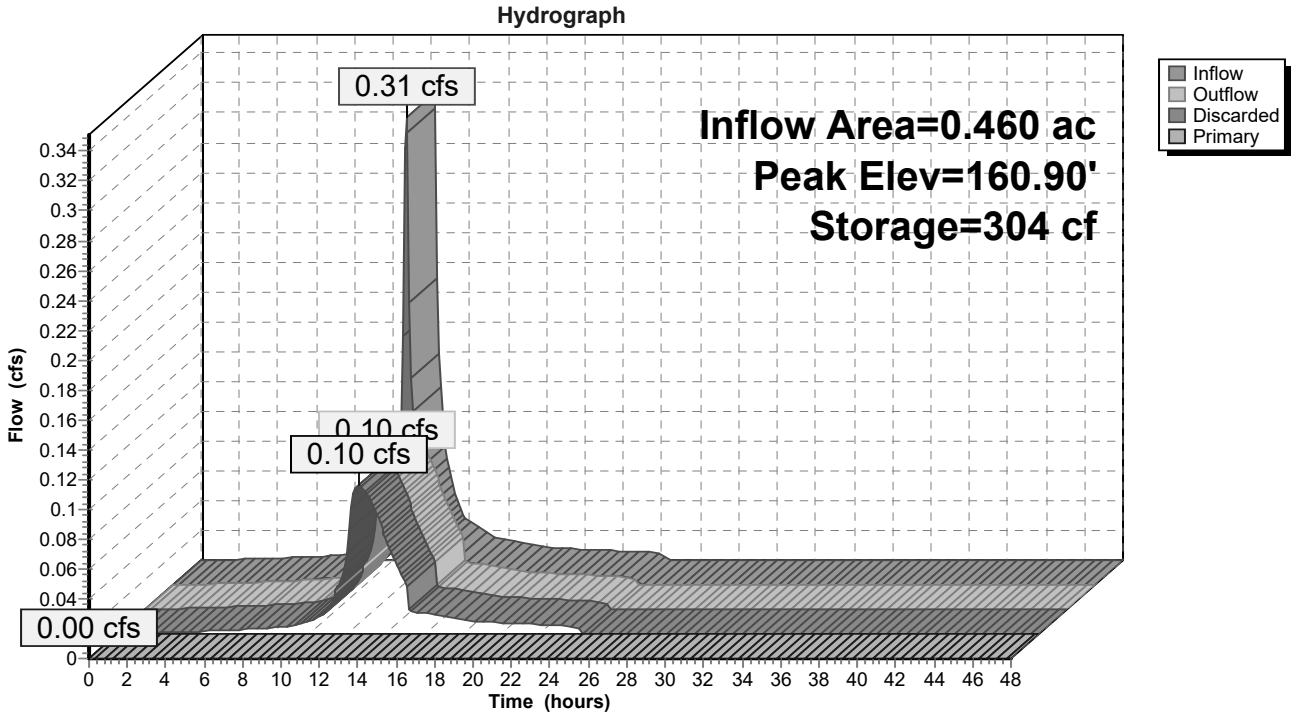
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	156	0	0
162.00	959	1,115	1,115
163.00	1,674	1,317	2,432

Device	Routing	Invert	Outlet Devices
#1	Primary	161.75'	**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
#2	Discarded	160.00'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.10 cfs @ 12.59 hrs HW=160.90' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=160.00' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond BASIN MC-2: Infiltration



Summary for Pond BASIN MC-3: Infiltration

Inflow Area = 7.440 ac, 37.10% Impervious, Inflow Depth = 2.76" for 10-Year event
Inflow = 12.45 cfs @ 12.15 hrs, Volume= 1.711 af
Outflow = 6.48 cfs @ 12.45 hrs, Volume= 1.712 af, Atten= 48%, Lag= 17.5 min
Discarded = 1.85 cfs @ 12.45 hrs, Volume= 1.294 af
Primary = 4.63 cfs @ 12.45 hrs, Volume= 0.418 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 3
Peak Elev= 161.47' @ 12.45 hrs Surf.Area= 9,688 sf Storage= 12,670 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 40.4 min (874.5 - 834.1)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	41,868 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

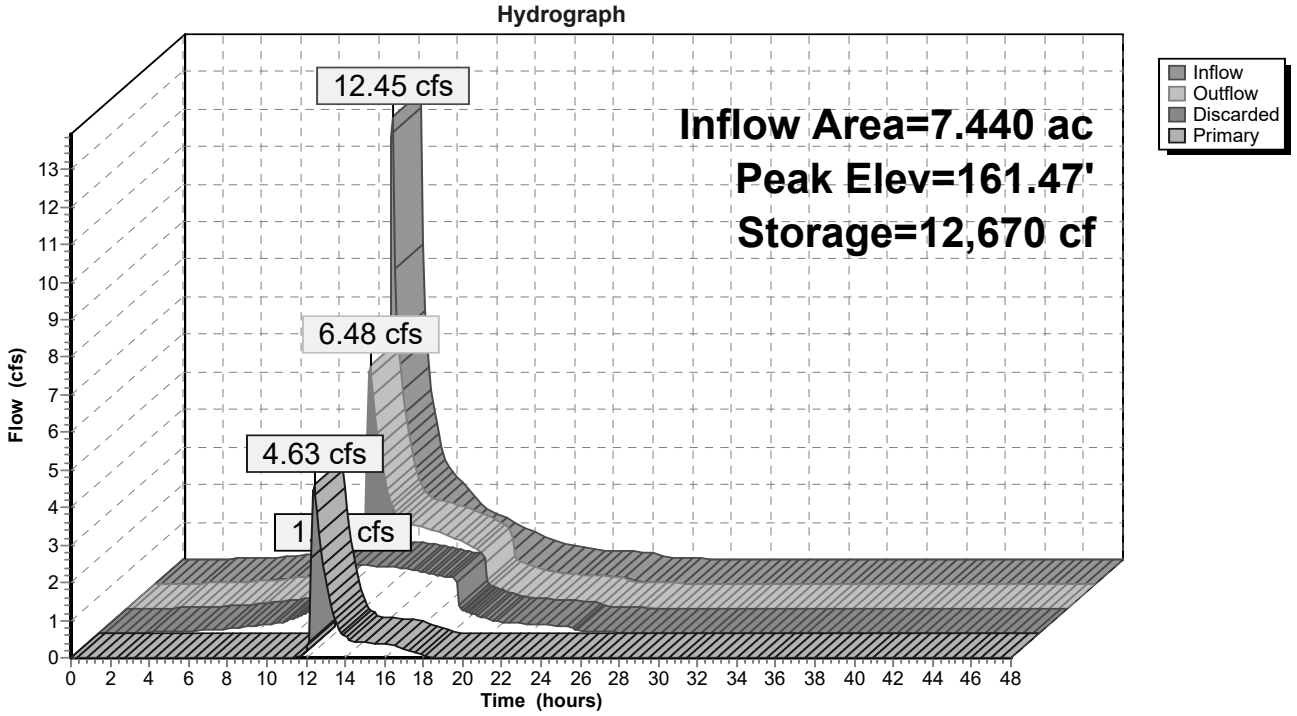
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	7,503	0	0
161.00	8,986	8,245	8,245
162.00	10,468	9,727	17,972
163.00	11,948	11,208	29,180
164.00	13,428	12,688	41,868

Device	Routing	Invert	Outlet Devices
#1	Primary	159.50'	**12.0" Round Culvert X 2.00** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.50' / 159.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	160.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	161.25'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	161.50'	**12.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 161.50' / 159.00' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#5	Primary	162.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#6	Discarded	160.00'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=1.85 cfs @ 12.45 hrs HW=161.46' (Free Discharge)
└**6=Exfiltration** (Exfiltration Controls 1.85 cfs)

Primary OutFlow Max=4.38 cfs @ 12.45 hrs HW=161.46' (Free Discharge)
└**1=Culvert** (Passes 4.38 cfs of 8.71 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.48 cfs @ 5.49 fps)
└**3=Orifice/Grate** (Weir Controls 3.91 cfs @ 1.52 fps)
└**4=Culvert** (Controls 0.00 cfs)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond BASIN MC-3: Infiltration



Summary for Pond BASIN MC-4: Infiltration

Inflow Area = 0.310 ac, 67.74% Impervious, Inflow Depth = 4.57" for 10-Year event
Inflow = 1.93 cfs @ 12.11 hrs, Volume= 0.118 af
Outflow = 0.78 cfs @ 12.31 hrs, Volume= 0.118 af, Atten= 59%, Lag= 11.7 min
Discarded = 0.25 cfs @ 12.31 hrs, Volume= 0.046 af
Primary = 0.54 cfs @ 12.31 hrs, Volume= 0.072 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 171.31' @ 12.31 hrs Surf.Area= 1,282 sf Storage= 1,096 cf

Plug-Flow detention time= 10.7 min calculated for 0.118 af (100% of inflow)
Center-of-Mass det. time= 10.7 min (767.5 - 756.8)

Volume	Invert	Avail.Storage	Storage Description
#1	169.50'	4,729 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

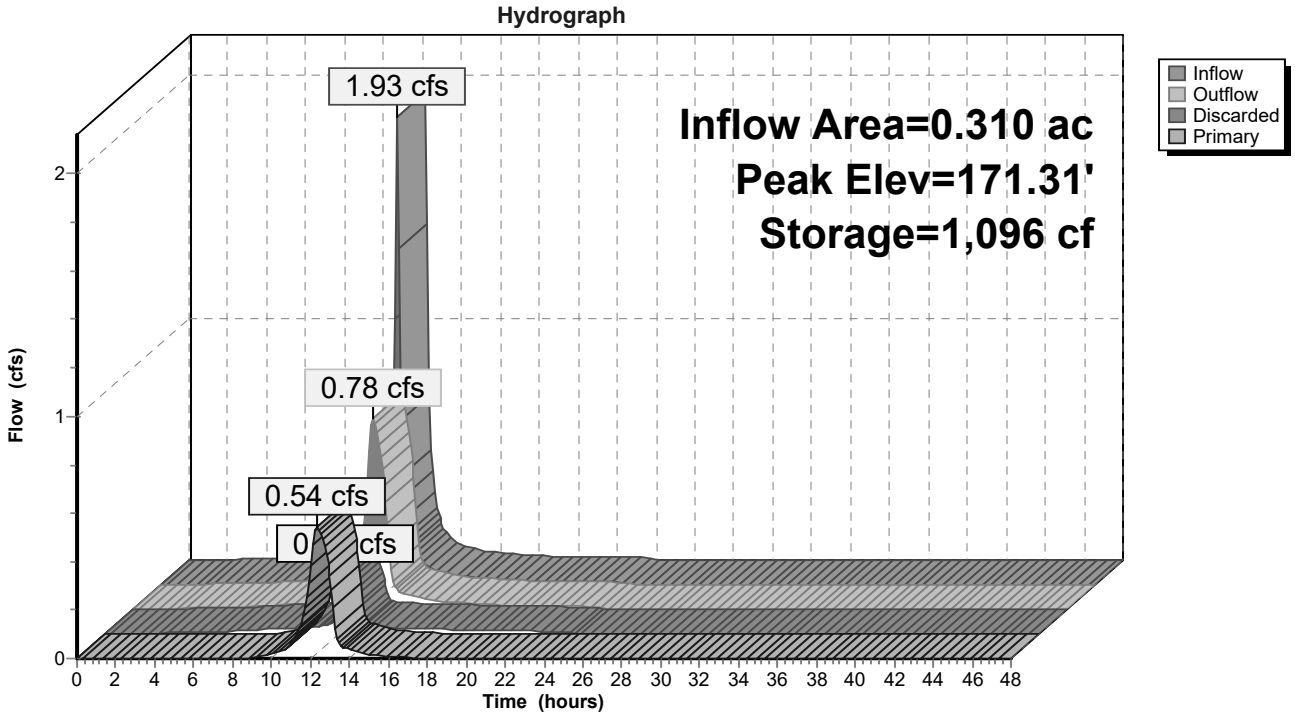
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
169.50	93	0	0
170.00	304	99	99
171.00	988	646	745
172.00	1,939	1,464	2,209
173.00	3,101	2,520	4,729

Device	Routing	Invert	Outlet Devices
#1	Primary	169.50'	**12.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 169.50' / 168.00' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	169.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	171.75'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#4	Discarded	169.50'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.24 cfs @ 12.31 hrs HW=171.31' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=0.54 cfs @ 12.31 hrs HW=171.31' (Free Discharge)
└**1=Culvert** (Passes 0.54 cfs of 4.32 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.54 cfs @ 6.16 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond BASIN MC-4: Infiltration



Summary for Pond FB MC-1: Forebay

Inflow Area = 0.220 ac, 50.00% Impervious, Inflow Depth = 3.44" for 10-Year event
Inflow = 1.03 cfs @ 12.11 hrs, Volume= 0.063 af
Outflow = 0.08 cfs @ 13.12 hrs, Volume= 0.063 af, Atten= 92%, Lag= 60.1 min
Discarded = 0.08 cfs @ 13.12 hrs, Volume= 0.063 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 163.40' @ 13.12 hrs Surf.Area= 1,386 sf Storage= 1,380 cf

Plug-Flow detention time= 175.2 min calculated for 0.063 af (100% of inflow)
Center-of-Mass det. time= 174.9 min (942.9 - 768.0)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	2,785 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

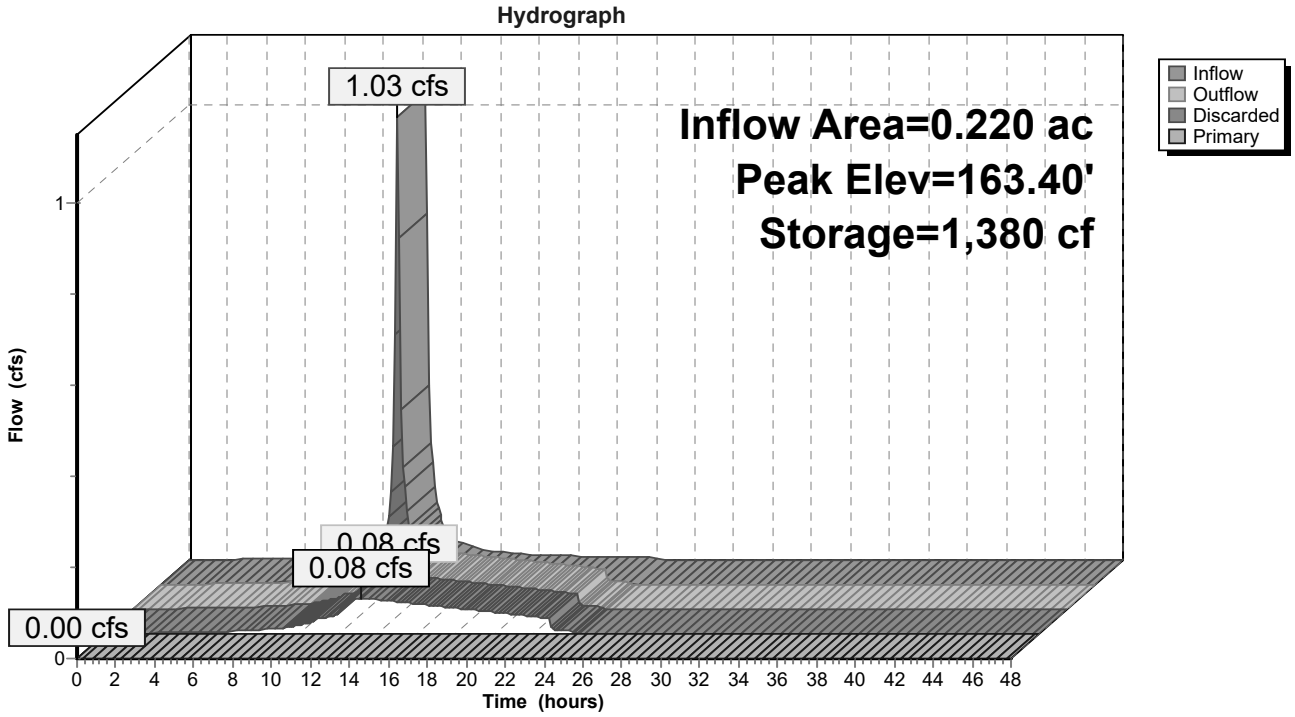
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.00	615	0	0
163.00	1,129	872	872
164.00	1,766	1,448	2,320
164.25	1,961	466	2,785

Device	Routing	Invert	Outlet Devices
#1	Discarded	162.00'	**2.410 in/hr Exfiltration over Horizontal area**
#2	Primary	164.25'	**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

Discarded OutFlow Max=0.08 cfs @ 13.12 hrs HW=163.40' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=162.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond FB MC-1: Forebay



Summary for Pond SDS MC-1: Detention

Inflow Area = 2.300 ac, 19.57% Impervious, Inflow Depth = 2.08" for 10-Year event
Inflow = 3.13 cfs @ 12.54 hrs, Volume= 0.399 af
Outflow = 0.71 cfs @ 13.56 hrs, Volume= 0.399 af, Atten= 77%, Lag= 61.3 min
Primary = 0.71 cfs @ 13.56 hrs, Volume= 0.399 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 169.98' @ 13.56 hrs Surf.Area= 2,695 sf Storage= 8,040 cf

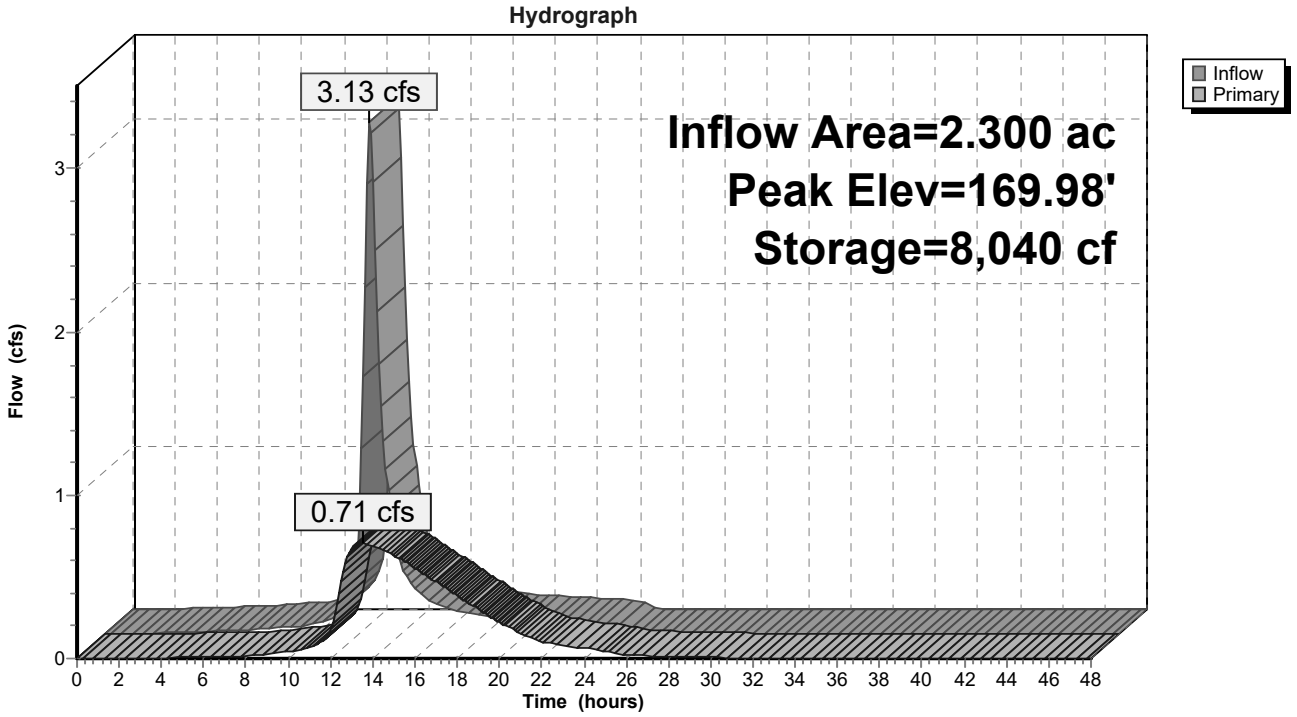
Plug-Flow detention time= 147.6 min calculated for 0.399 af (100% of inflow)
Center-of-Mass det. time= 147.1 min (971.7 - 824.6)

Volume	Invert	Avail.Storage	Storage Description
#1	167.00'	13,475 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 55
#2	172.00'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		13,491 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	167.00'	**12.0" Round Culvert** L= 100.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 167.00' / 166.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	167.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	171.50'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.71 cfs @ 13.56 hrs HW=169.98' (Free Discharge)
└**1=Culvert** (Passes 0.71 cfs of 5.05 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.71 cfs @ 8.08 fps)
  └**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SDS MC-1: Detention



Summary for Pond SDS MC-2: Detention

Inflow Area = 1.140 ac, 70.18% Impervious, Inflow Depth = 4.11" for 10-Year event
Inflow = 6.29 cfs @ 12.11 hrs, Volume= 0.391 af
Outflow = 0.93 cfs @ 12.60 hrs, Volume= 0.391 af, Atten= 85%, Lag= 29.4 min
Primary = 0.93 cfs @ 12.60 hrs, Volume= 0.391 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 182.76' @ 12.62 hrs Surf.Area= 1,617 sf Storage= 7,704 cf

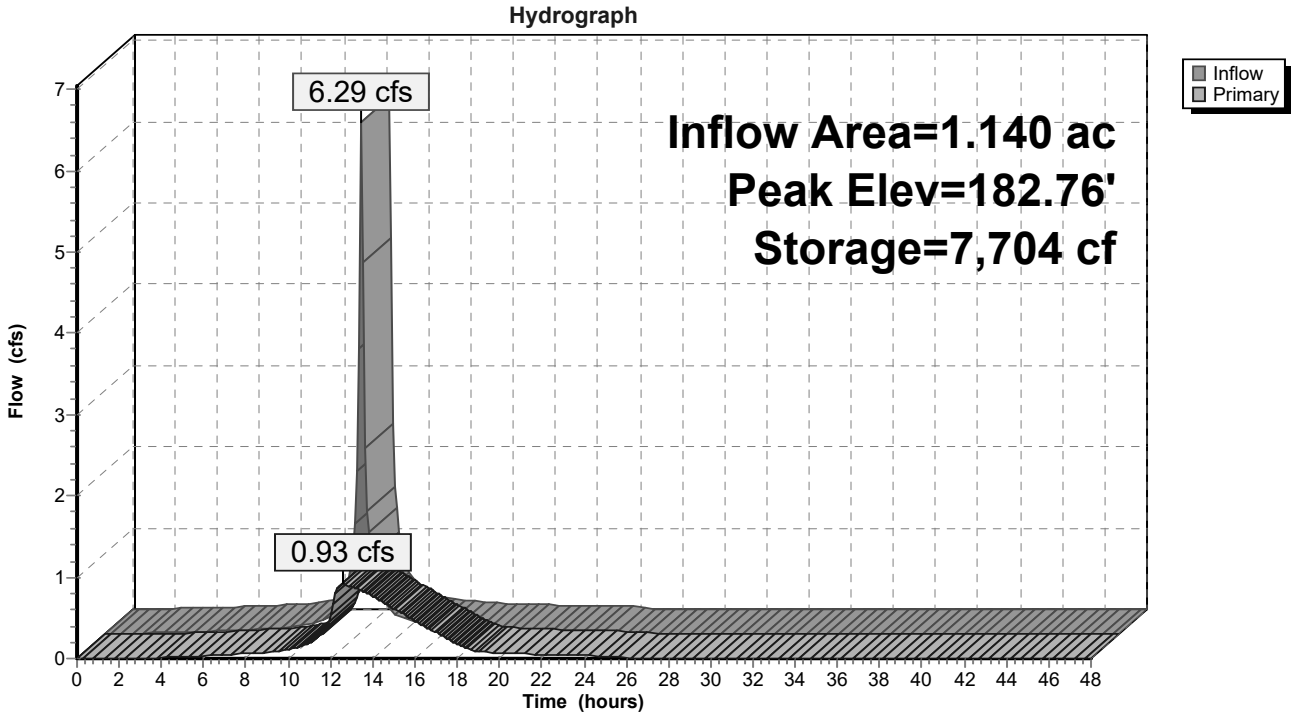
Plug-Flow detention time= 100.1 min calculated for 0.390 af (100% of inflow)
Center-of-Mass det. time= 100.7 min (857.8 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	8,085 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 33
#2	183.00'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		8,101 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**12.0" Round Culvert** L= 200.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 178.00' / 174.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	178.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	182.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.92 cfs @ 12.60 hrs HW=182.76' (Free Discharge)
└**1=Culvert** (Passes 0.92 cfs of 6.30 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.90 cfs @ 10.32 fps)
  └**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.02 cfs @ 0.37 fps)

Pond SDS MC-2: Detention



Summary for Pond SDS MC-3: Detention

Inflow Area = 1.930 ac, 50.78% Impervious, Inflow Depth = 3.54" for 10-Year event
Inflow = 3.75 cfs @ 12.13 hrs, Volume= 0.570 af
Outflow = 1.26 cfs @ 12.80 hrs, Volume= 0.570 af, Atten= 66%, Lag= 40.7 min
Primary = 1.26 cfs @ 12.80 hrs, Volume= 0.570 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 4
Peak Elev= 170.85' @ 12.80 hrs Surf.Area= 1,225 sf Storage= 4,715 cf

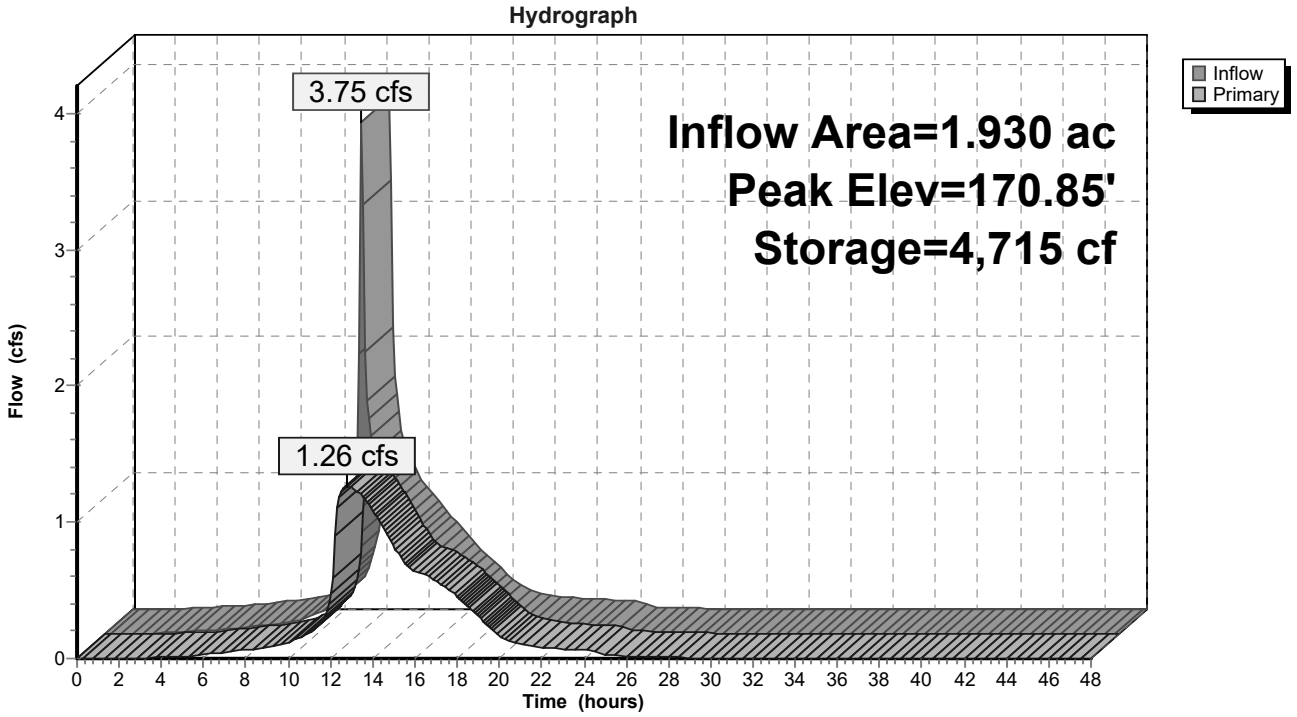
Plug-Flow detention time= 62.1 min calculated for 0.569 af (100% of inflow)
Center-of-Mass det. time= 62.6 min (899.4 - 836.8)

Volume	Invert	Avail.Storage	Storage Description
#1	167.00'	6,125 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 25
#2	172.00'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		6,141 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	167.00'	**12.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 167.00' / 166.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	167.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	169.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	171.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.26 cfs @ 12.80 hrs HW=170.85' (Free Discharge)
└**1=Culvert** (Passes 1.26 cfs of 6.92 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.81 cfs @ 9.24 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.46 cfs @ 5.23 fps)
  └**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SDS MC-3: Detention



Summary for Pond SDS MC-4: Detention

Inflow Area = 1.030 ac, 80.58% Impervious, Inflow Depth = 4.52" for 10-Year event
Inflow = 6.23 cfs @ 12.11 hrs, Volume= 0.388 af
Outflow = 1.72 cfs @ 12.38 hrs, Volume= 0.387 af, Atten= 72%, Lag= 15.9 min
Primary = 1.72 cfs @ 12.38 hrs, Volume= 0.387 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 3
Peak Elev= 166.96' @ 12.38 hrs Surf.Area= 1,715 sf Storage= 6,789 cf

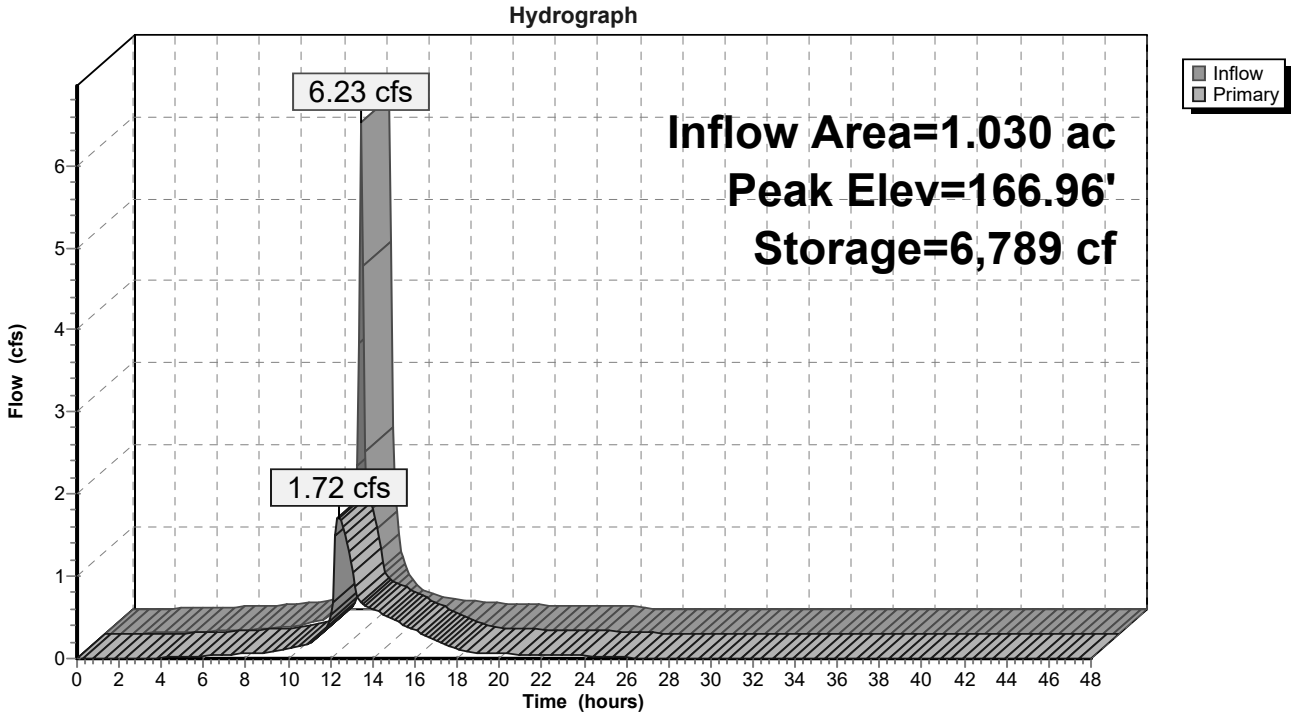
Plug-Flow detention time= 80.7 min calculated for 0.386 af (100% of inflow)
Center-of-Mass det. time= 79.8 min (832.7 - 752.9)

Volume	Invert	Avail.Storage	Storage Description
#1	163.00'	8,575 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 35
#2	168.00'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		8,591 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	163.00'	**12.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 163.00' / 162.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	163.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	165.65'	**4.0" Vert. Orifice/Grate X 2.00** C= 0.600
#4	Device 1	167.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.71 cfs @ 12.38 hrs HW=166.95' (Free Discharge)
└**1=Culvert** (Passes 1.71 cfs of 7.02 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.82 cfs @ 9.36 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.89 cfs @ 5.12 fps)
  └**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SDS MC-4: Detention



Summary for Pond SIS MC-1: Infiltration

Inflow Area = 1.980 ac, 77.78% Impervious, Inflow Depth = 3.97" for 10-Year event
Inflow = 10.15 cfs @ 12.11 hrs, Volume= 0.654 af
Outflow = 1.33 cfs @ 12.65 hrs, Volume= 0.655 af, Atten= 87%, Lag= 32.5 min
Discarded = 0.71 cfs @ 11.20 hrs, Volume= 0.632 af
Primary = 0.62 cfs @ 12.65 hrs, Volume= 0.023 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 160.13' @ 12.65 hrs Surf.Area= 3,712 sf Storage= 12,472 cf

Plug-Flow detention time= 123.9 min calculated for 0.653 af (100% of inflow)
Center-of-Mass det. time= 123.7 min (872.8 - 749.1)

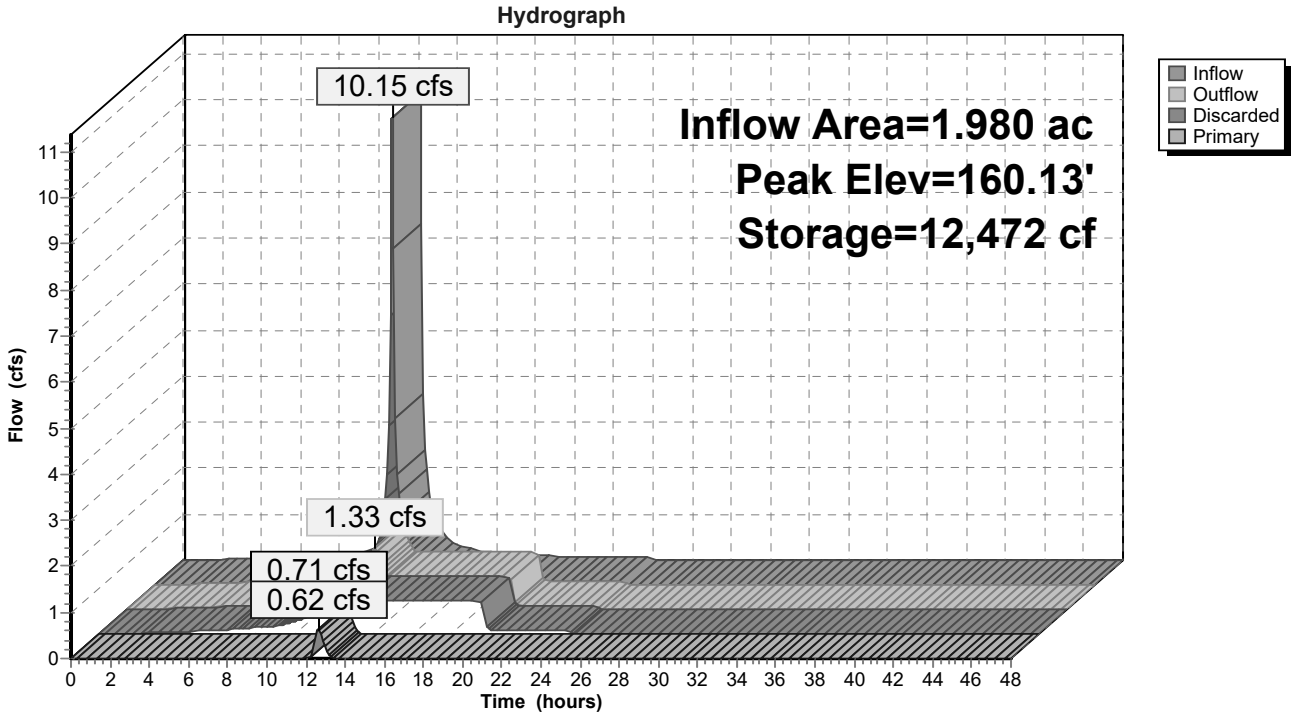
Volume	Invert	Avail.Storage	Storage Description
#1	155.50'	742 cf	**8.00'W x 8.00'L x 0.50'H Prismatoid** x 58 1,856 cf Overall x 40.0% Voids
#2	156.00'	14,210 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 58 -Impervious
#3	161.00'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		14,968 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	156.00'	**15.0" Round Culvert** L= 100.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 156.00' / 155.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	160.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Discarded	155.50'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.71 cfs @ 11.20 hrs HW=155.60' (Free Discharge)
↑└**3=Exfiltration** (Exfiltration Controls 0.71 cfs)

Primary OutFlow Max=0.57 cfs @ 12.65 hrs HW=160.12' (Free Discharge)
↑└**1=Culvert** (Passes 0.57 cfs of 9.90 cfs potential flow)
↑└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.57 cfs @ 1.15 fps)

Pond SIS MC-1: Infiltration



Summary for Pond SIS MC-2: Infiltration

Inflow Area = 0.600 ac, 55.00% Impervious, Inflow Depth = 2.86" for 10-Year event
Inflow = 2.17 cfs @ 12.11 hrs, Volume= 0.143 af
Outflow = 0.21 cfs @ 12.91 hrs, Volume= 0.143 af, Atten= 90%, Lag= 47.7 min
Discarded = 0.20 cfs @ 11.40 hrs, Volume= 0.143 af
Primary = 0.01 cfs @ 12.91 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 162.53' @ 12.91 hrs Surf.Area= 1,024 sf Storage= 2,565 cf

Plug-Flow detention time= 93.6 min calculated for 0.143 af (100% of inflow)
Center-of-Mass det. time= 93.4 min (846.8 - 753.3)

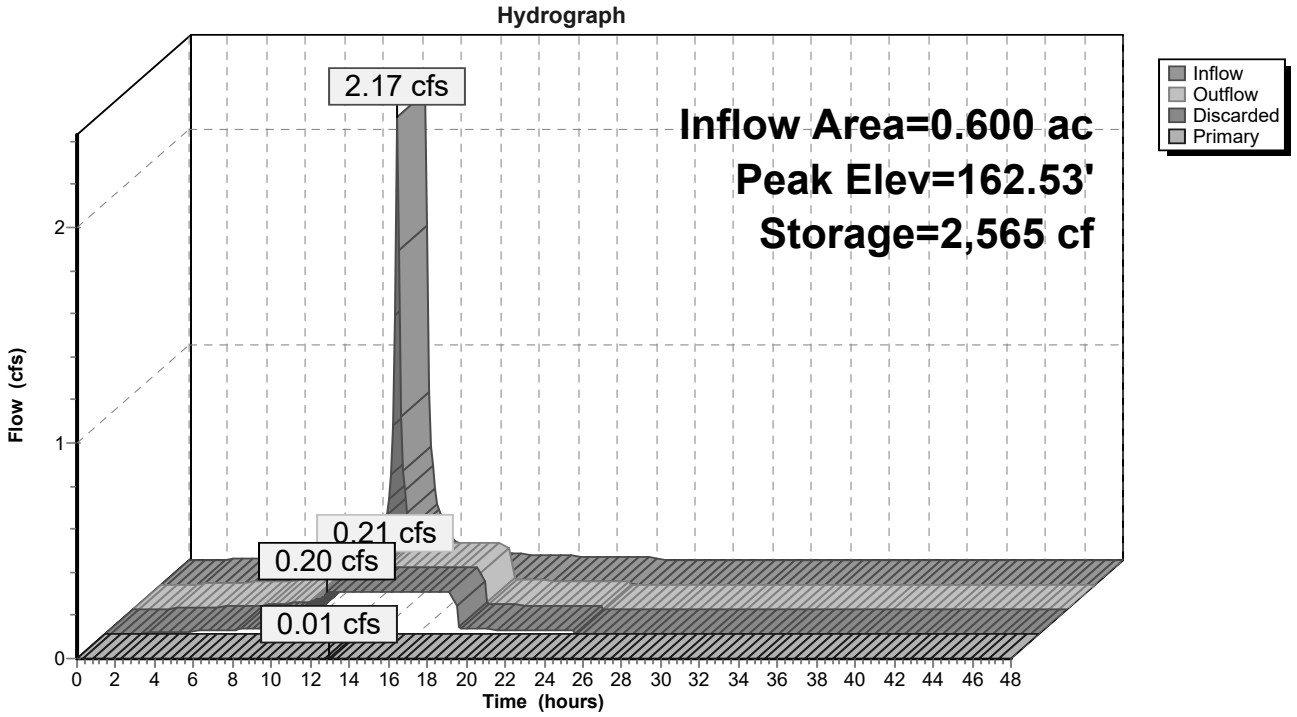
Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	205 cf	**8.00'W x 8.00'L x 0.50'H Prismatoid** x 16 512 cf Overall x 40.0% Voids
#2	159.50'	1,470 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 6 -Impervious
#3	159.50'	1,470 cf	**7.00'W x 7.00'L x 3.00'H Prismatoid** x 10 -Impervious
#4	164.50'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		3,161 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	159.00'	**12.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 159.00' / 158.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	162.50'	**4.0" Vert. Orifice/Grate X 3.00** C= 0.600
#3	Device 1	164.25'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Discarded	159.00'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.20 cfs @ 11.40 hrs HW=159.10' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.01 cfs @ 12.91 hrs HW=162.53' (Free Discharge)
└**1=Culvert** (Passes 0.01 cfs of 6.58 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 0.57 fps)
  └**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SIS MC-2: Infiltration



Summary for Pond WQS MC-1: Wet Swale

Inflow Area = 0.130 ac, 23.08% Impervious, Inflow Depth = 2.20" for 10-Year event
Inflow = 0.39 cfs @ 12.12 hrs, Volume= 0.024 af
Outflow = 0.04 cfs @ 13.06 hrs, Volume= 0.024 af, Atten= 90%, Lag= 56.0 min
Discarded = 0.04 cfs @ 13.06 hrs, Volume= 0.024 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 156.22' @ 13.06 hrs Surf.Area= 668 sf Storage= 485 cf

Plug-Flow detention time= 138.8 min calculated for 0.024 af (100% of inflow)
Center-of-Mass det. time= 138.5 min (930.4 - 791.9)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	1,156 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

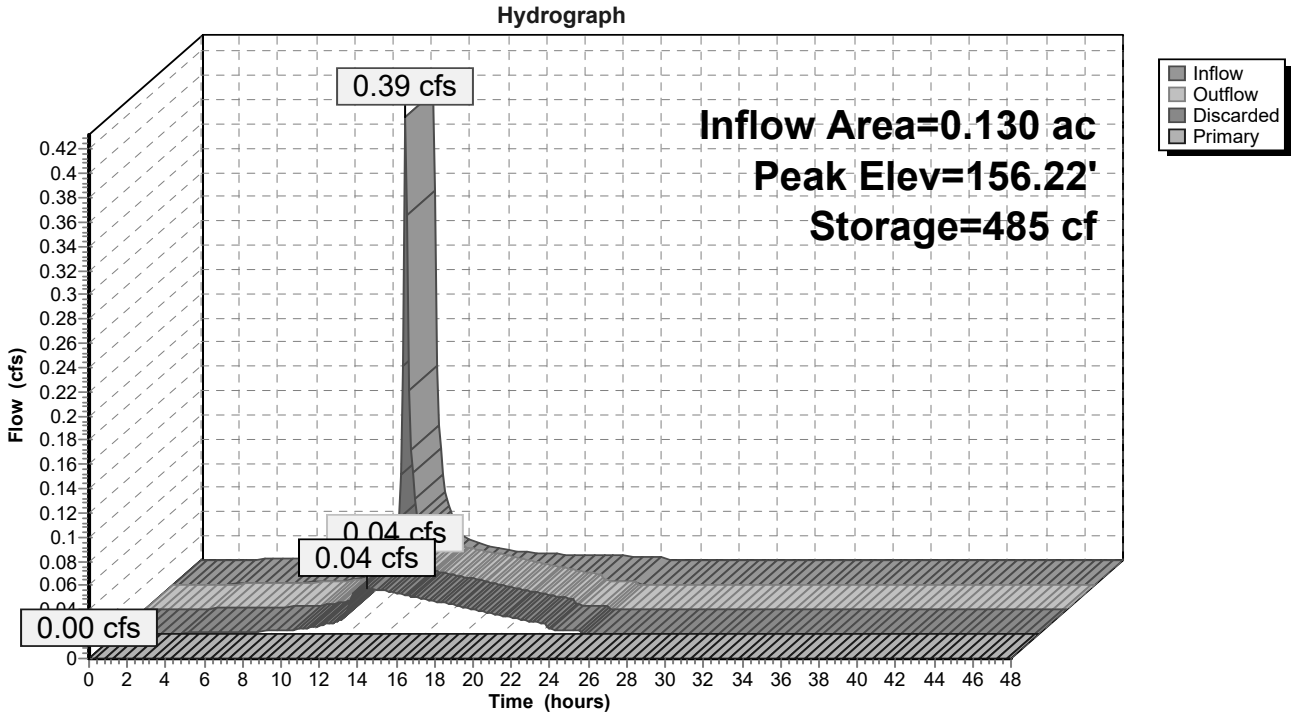
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
155.00	142	0	0
156.00	555	349	349
157.00	1,060	808	1,156

Device	Routing	Invert	Outlet Devices
#1	Discarded	155.00'	**2.410 in/hr Exfiltration over Horizontal area**
#2	Primary	157.00'	**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

Discarded OutFlow Max=0.04 cfs @ 13.06 hrs HW=156.22' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=155.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond WQS MC-1: Wet Swale



Summary for Pond WQS MC-2: Wet Swale

Inflow Area = 0.080 ac, 12.50% Impervious, Inflow Depth = 3.58" for 10-Year event
Inflow = 0.42 cfs @ 12.11 hrs, Volume= 0.024 af
Outflow = 0.04 cfs @ 12.88 hrs, Volume= 0.024 af, Atten= 90%, Lag= 46.1 min
Discarded = 0.04 cfs @ 12.88 hrs, Volume= 0.024 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 159.91' @ 12.88 hrs Surf.Area= 752 sf Storage= 500 cf

Plug-Flow detention time= 114.7 min calculated for 0.024 af (100% of inflow)
Center-of-Mass det. time= 114.6 min (901.1 - 786.5)

Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	1,022 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

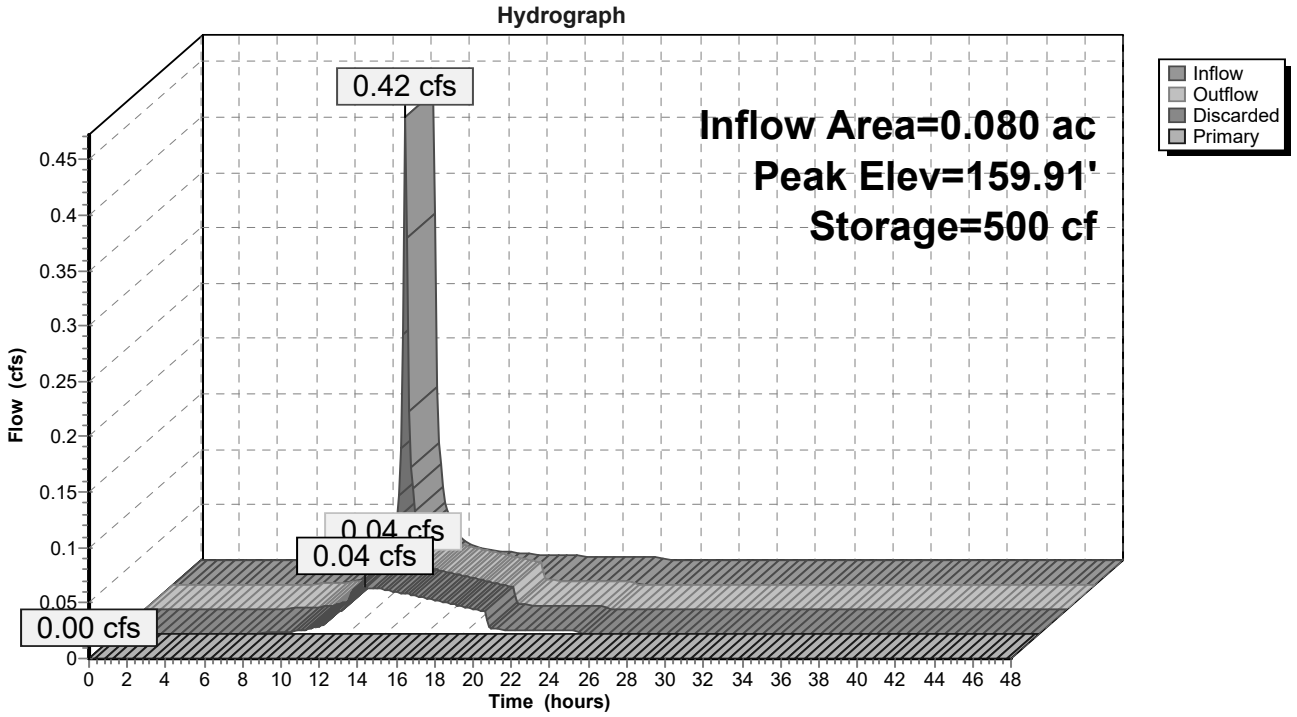
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
159.00	344	0	0
160.00	791	568	568
160.50	1,028	455	1,022

Device	Routing	Invert	Outlet Devices
#1	Discarded	159.00'	**2.410 in/hr Exfiltration over Horizontal area**
#2	Primary	160.50'	**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

Discarded OutFlow Max=0.04 cfs @ 12.88 hrs HW=159.91' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond WQS MC-2: Wet Swale



Summary for Pond WQS MC-3: Wet Swale

Inflow Area = 0.080 ac, 12.50% Impervious, Inflow Depth = 3.58" for 10-Year event
Inflow = 0.42 cfs @ 12.11 hrs, Volume= 0.024 af
Outflow = 0.04 cfs @ 12.86 hrs, Volume= 0.024 af, Atten= 90%, Lag= 44.8 min
Discarded = 0.04 cfs @ 12.86 hrs, Volume= 0.024 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 161.94' @ 12.86 hrs Surf.Area= 770 sf Storage= 502 cf

Plug-Flow detention time= 115.2 min calculated for 0.024 af (100% of inflow)
Center-of-Mass det. time= 114.9 min (901.5 - 786.5)

Volume	Invert	Avail.Storage	Storage Description
#1	161.00'	1,024 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

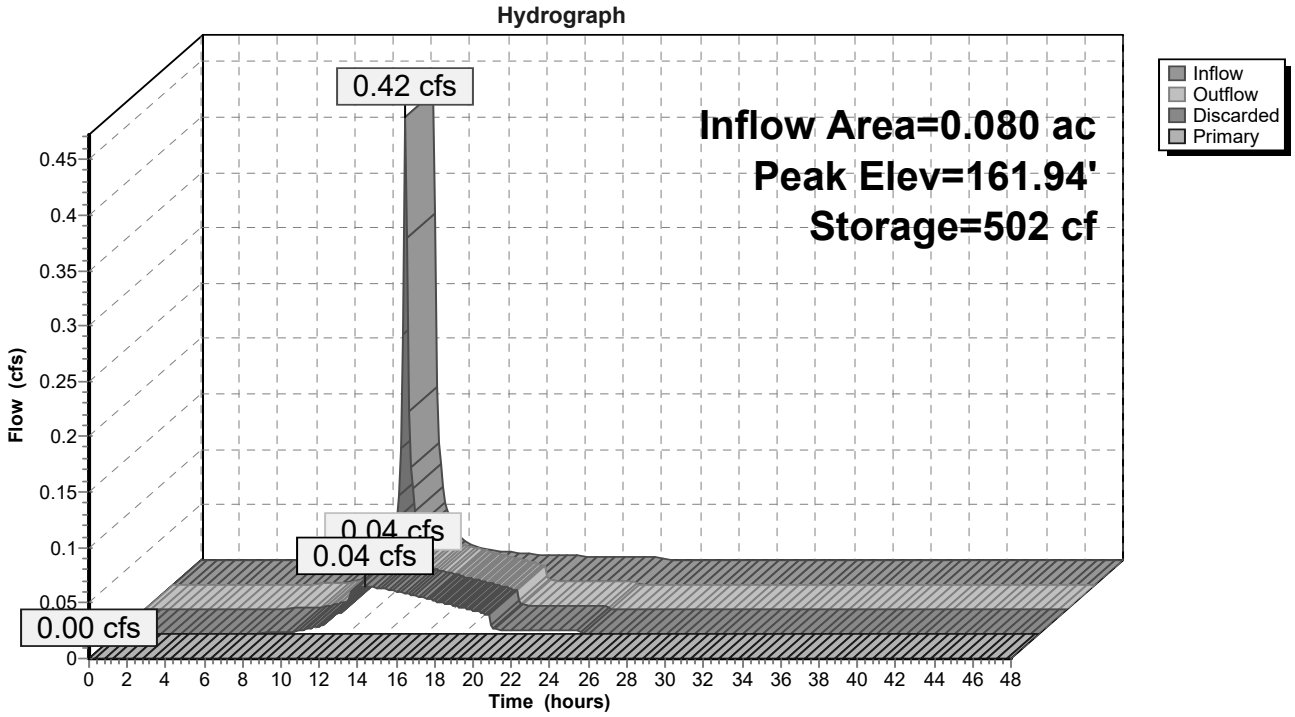
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.00	301	0	0
162.00	801	551	551
162.50	1,089	473	1,024

Device	Routing	Invert	Outlet Devices
#1	Discarded	161.00'	**2.410 in/hr Exfiltration over Horizontal area**
#2	Primary	162.50'	**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

Discarded OutFlow Max=0.04 cfs @ 12.86 hrs HW=161.94' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond WQS MC-3: Wet Swale



Summary for Pond WQS MC-4: Wet Swale

Inflow Area = 0.530 ac, 20.75% Impervious, Inflow Depth = 2.53" for 10-Year event
Inflow = 1.74 cfs @ 12.19 hrs, Volume= 0.112 af
Outflow = 1.30 cfs @ 12.32 hrs, Volume= 0.112 af, Atten= 25%, Lag= 8.0 min
Discarded = 0.09 cfs @ 12.34 hrs, Volume= 0.081 af
Primary = 1.21 cfs @ 12.32 hrs, Volume= 0.031 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 157.34' @ 12.34 hrs Surf.Area= 1,599 sf Storage= 1,559 cf

Plug-Flow detention time= 126.6 min calculated for 0.112 af (100% of inflow)
Center-of-Mass det. time= 127.5 min (924.8 - 797.3)

Volume	Invert	Avail.Storage	Storage Description
#1	156.00'	1,815 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

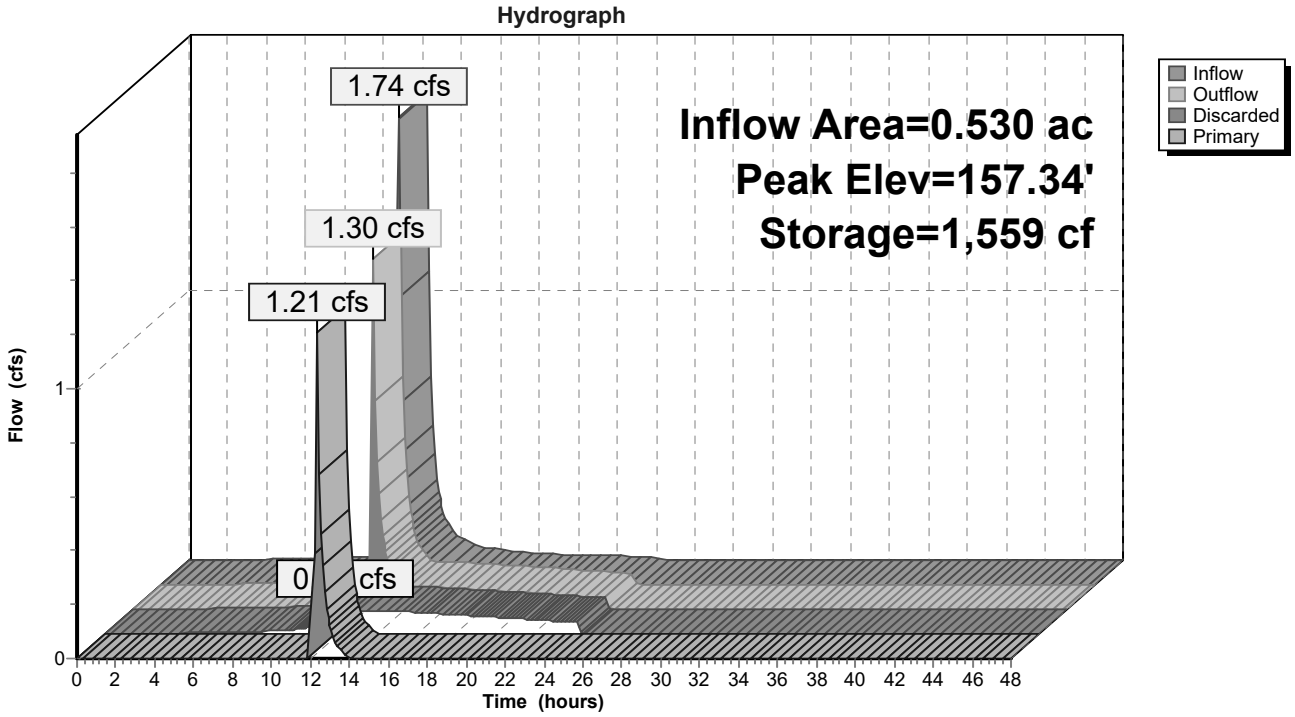
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
156.00	738	0	0
157.00	1,359	1,049	1,049
157.50	1,707	767	1,815

Device	Routing	Invert	Outlet Devices
#1	Discarded	156.00'	**2.410 in/hr Exfiltration over Horizontal area**
#2	Primary	157.25'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.09 cfs @ 12.34 hrs HW=157.32' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=1.07 cfs @ 12.32 hrs HW=157.33' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.07 cfs @ 0.69 fps)

Pond WQS MC-4: Wet Swale

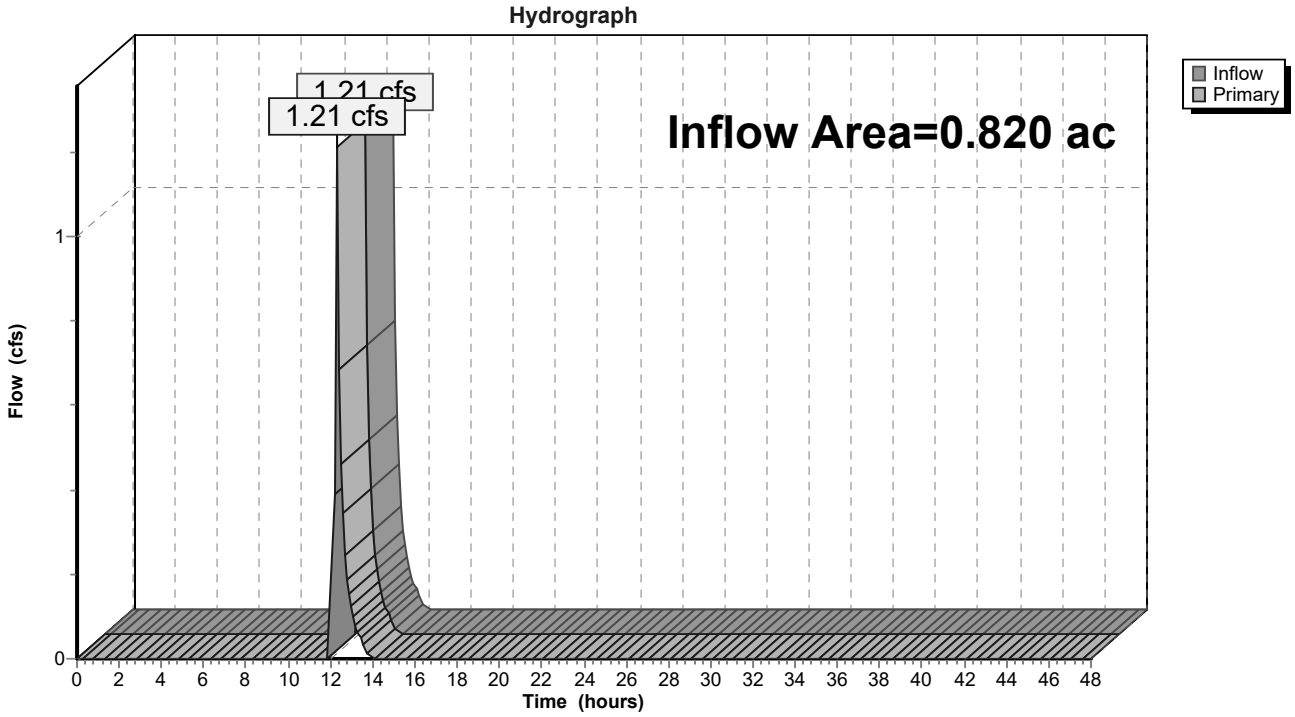


Summary for Link POA-1:

Inflow Area = 0.820 ac, 19.51% Impervious, Inflow Depth = 0.45" for 10-Year event
Inflow = 1.21 cfs @ 12.32 hrs, Volume= 0.031 af
Primary = 1.21 cfs @ 12.32 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-1:

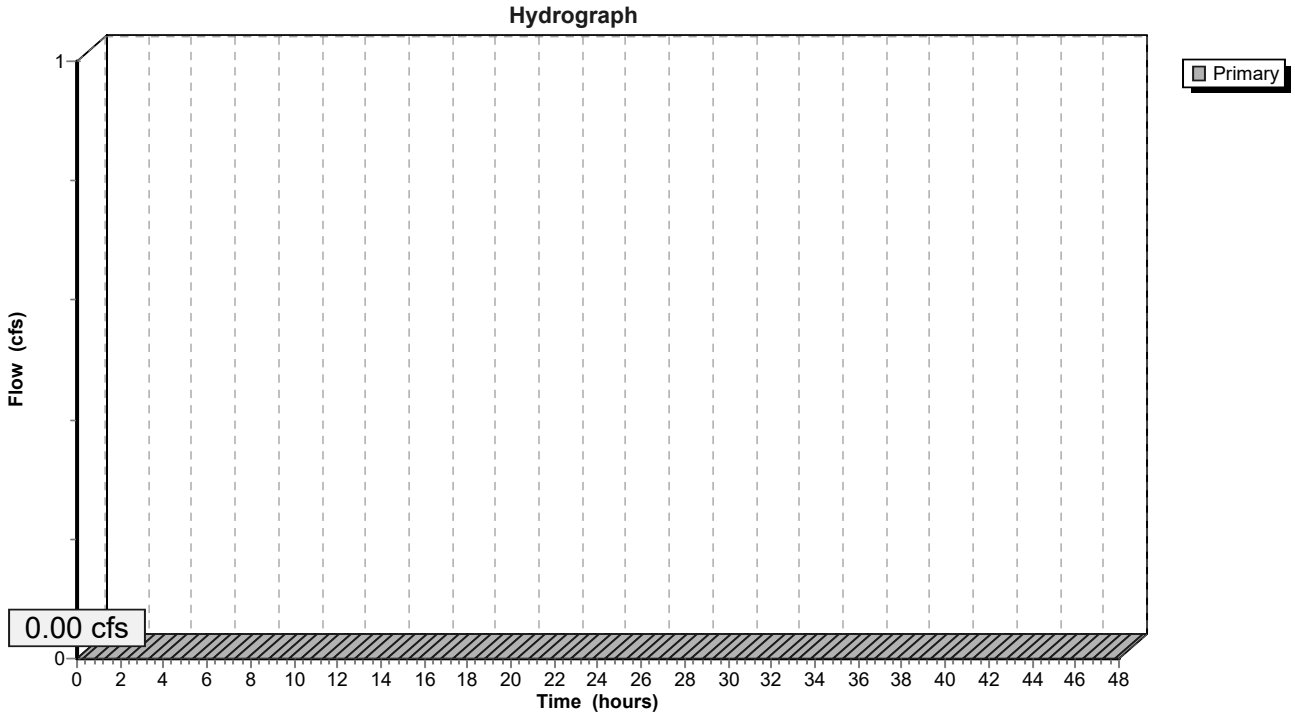


Summary for Link POA-2:

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-2:

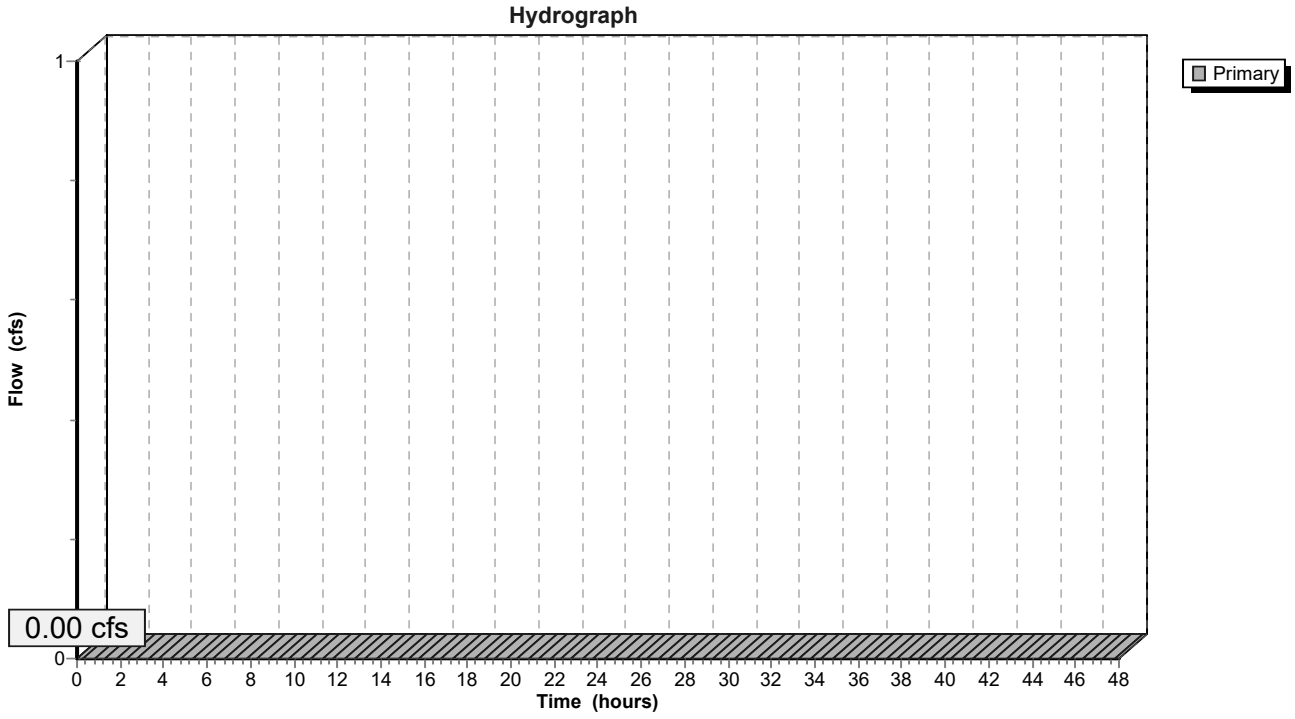


Summary for Link POA-3:

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-3:

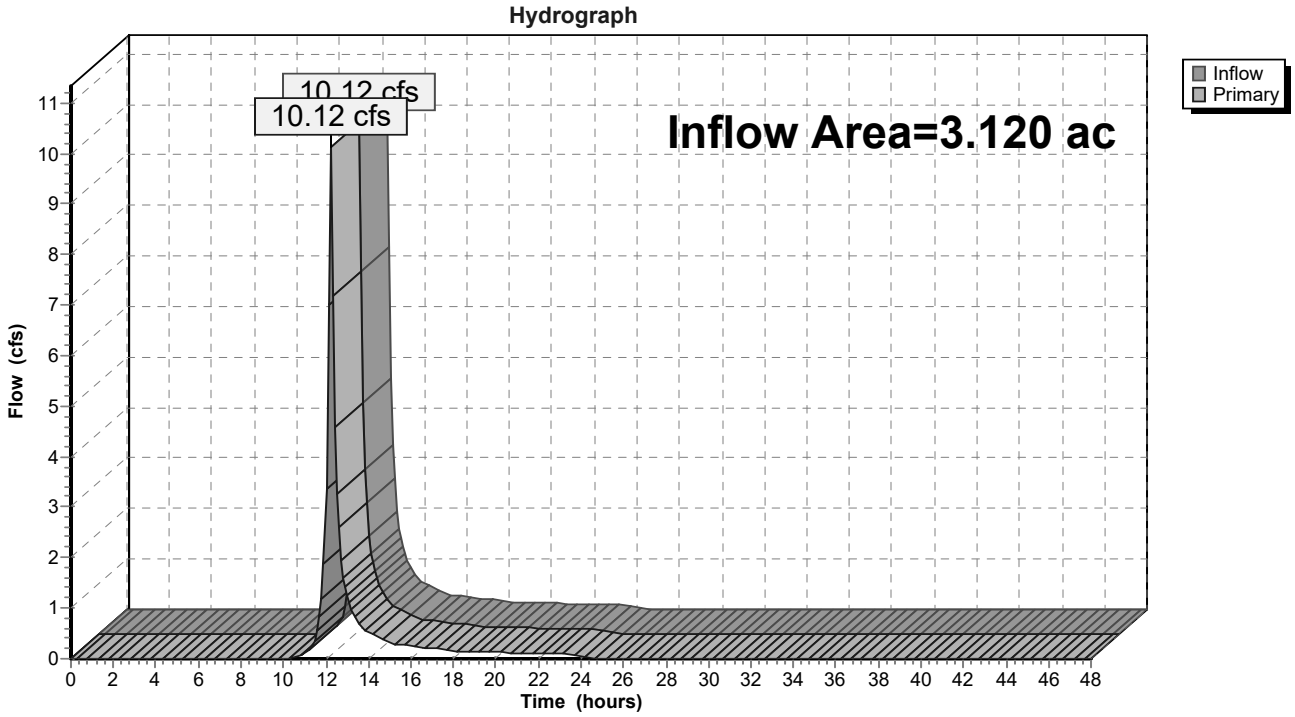


Summary for Link POA-4:

Inflow Area = 3.120 ac, 0.00% Impervious, Inflow Depth = 2.40" for 10-Year event
Inflow = 10.12 cfs @ 12.20 hrs, Volume= 0.623 af
Primary = 10.12 cfs @ 12.20 hrs, Volume= 0.623 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-4:

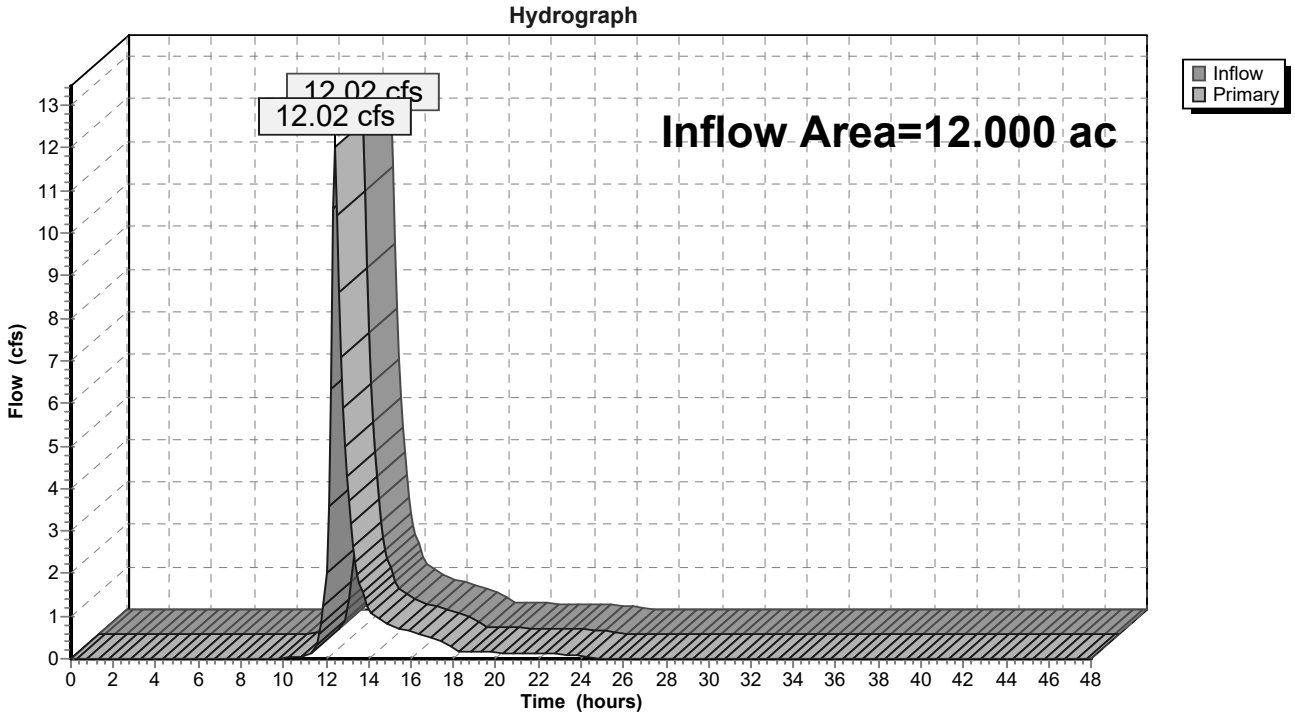


Summary for Link POA-5:

Inflow Area = 12.000 ac, 27.50% Impervious, Inflow Depth = 1.11" for 10-Year event
Inflow = 12.02 cfs @ 12.40 hrs, Volume= 1.112 af
Primary = 12.02 cfs @ 12.40 hrs, Volume= 1.112 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-5:

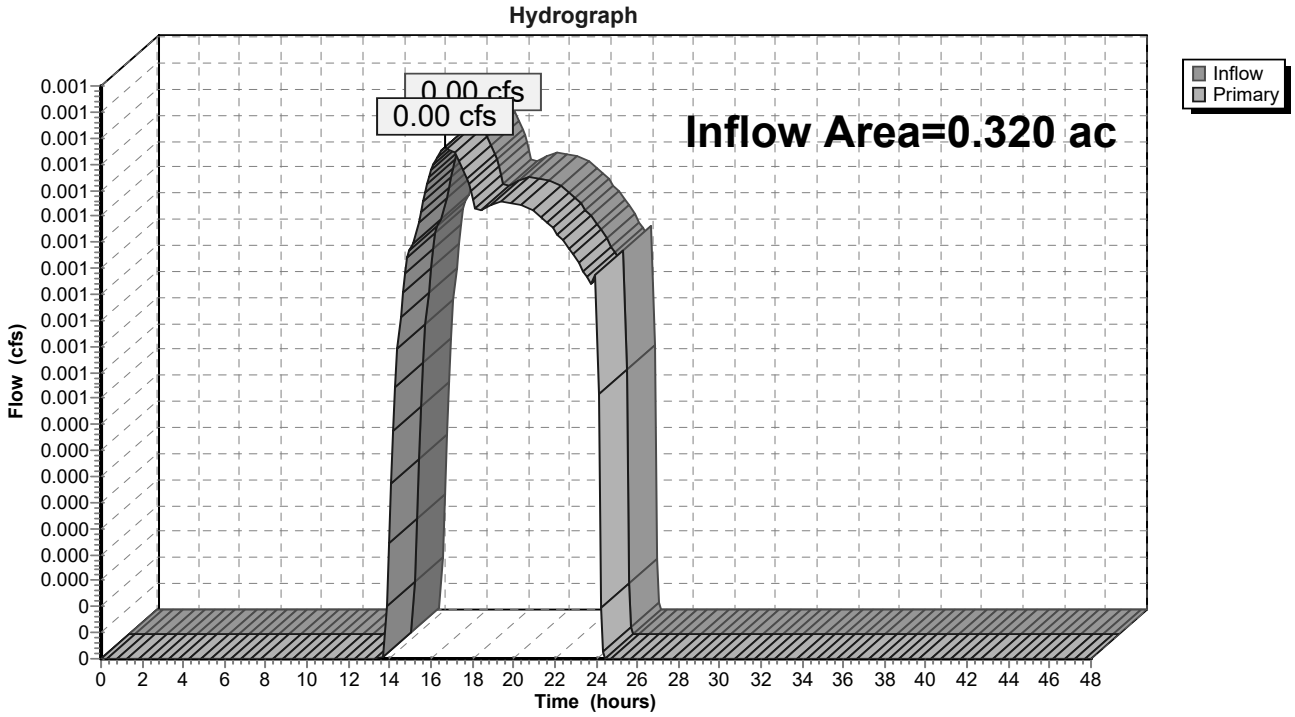


Summary for Link POA-6:

Inflow Area = 0.320 ac, 0.00% Impervious, Inflow Depth = 0.03" for 10-Year event
Inflow = 0.00 cfs @ 16.72 hrs, Volume= 0.001 af
Primary = 0.00 cfs @ 16.72 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-6:

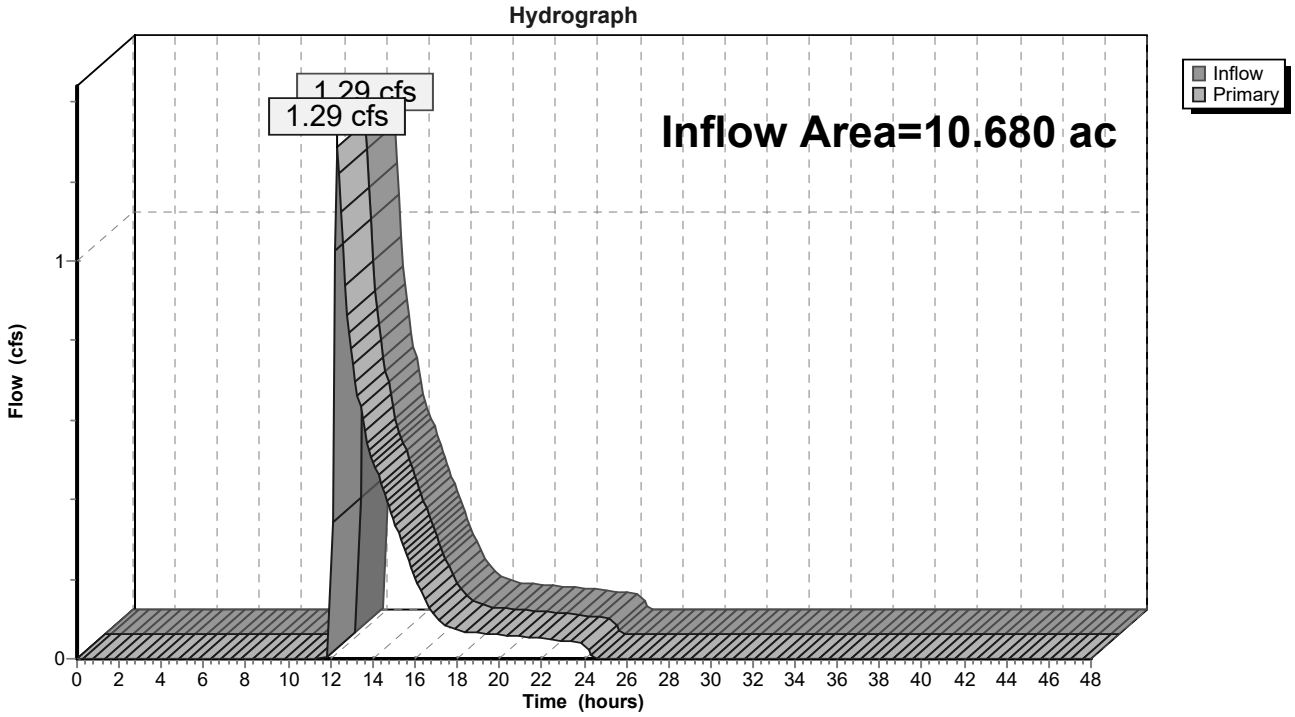


Summary for Link POA-7:

Inflow Area = 10.680 ac, 23.60% Impervious, Inflow Depth = 0.26" for 10-Year event
Inflow = 1.29 cfs @ 12.33 hrs, Volume= 0.230 af
Primary = 1.29 cfs @ 12.33 hrs, Volume= 0.230 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-7:



Time span=0.00-48.00 hrs, dt=0.10 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment CCPR-7A: Runoff Area=1.520 ac 0.00% Impervious Runoff Depth=1.55"
Flow Length=410' Tc=16.8 min CN=42/0 Runoff=2.24 cfs 0.196 af

Subcatchment CCPR-7B: Runoff Area=0.210 ac 0.00% Impervious Runoff Depth=3.51"
Tc=6.0 min CN=60/0 Runoff=1.11 cfs 0.061 af

Subcatchment MCPR-1A: Runoff Area=0.130 ac 23.08% Impervious Runoff Depth=4.45"
Tc=6.0 min CN=59/98 Runoff=0.82 cfs 0.048 af

Subcatchment MCPR-1B: Runoff Area=0.080 ac 12.50% Impervious Runoff Depth=6.42"
Tc=6.0 min CN=83/98 Runoff=0.74 cfs 0.043 af

Subcatchment MCPR-1C: Runoff Area=0.080 ac 12.50% Impervious Runoff Depth=6.42"
Tc=6.0 min CN=83/98 Runoff=0.74 cfs 0.043 af

Subcatchment MCPR-1D: Runoff Area=0.530 ac 20.75% Impervious Runoff Depth=4.98"
Flow Length=137' Tc=9.7 min CN=66/98 Runoff=3.47 cfs 0.220 af

Subcatchment MCPR-4A: Runoff Area=1.720 ac 0.00% Impervious Runoff Depth=5.13"
Flow Length=485' Tc=11.1 min CN=74/0 Runoff=11.84 cfs 0.736 af

Subcatchment MCPR-4B: Runoff Area=1.400 ac 0.00% Impervious Runoff Depth=4.66"
Flow Length=485' Tc=11.1 min CN=70/0 Runoff=8.82 cfs 0.544 af

Subcatchment MCPR-5A: Runoff Area=3.650 ac 0.00% Impervious Runoff Depth=4.43"
Flow Length=313' Tc=21.5 min CN=68/0 Runoff=16.66 cfs 1.347 af

Subcatchment MCPR-5B: Runoff Area=0.310 ac 67.74% Impervious Runoff Depth=7.53"
Tc=6.0 min CN=86/98 Runoff=3.13 cfs 0.194 af

Subcatchment MCPR-5C: Runoff Area=0.400 ac 0.00% Impervious Runoff Depth=5.60"
Tc=6.0 min CN=78/0 Runoff=3.35 cfs 0.187 af

Subcatchment MCPR-5D: Runoff Area=0.890 ac 61.80% Impervious Runoff Depth=5.81"
Tc=6.0 min CN=49/98 Runoff=6.79 cfs 0.431 af

Subcatchment MCPR-5E: Runoff Area=2.030 ac 19.70% Impervious Runoff Depth=2.36"
Tc=6.0 min CN=36/98 Runoff=5.36 cfs 0.399 af

Subcatchment MCPR-5F: Runoff Area=1.140 ac 70.18% Impervious Runoff Depth=6.93"
Tc=6.0 min CN=68/98 Runoff=10.59 cfs 0.658 af

Subcatchment MCPR-5H: Runoff Area=1.160 ac 0.00% Impervious Runoff Depth=4.78"
Flow Length=450' Tc=11.2 min CN=71/0 Runoff=7.48 cfs 0.462 af

Subcatchment MCPR-5I: Runoff Area=0.600 ac 55.00% Impervious Runoff Depth=4.96"
Tc=6.0 min CN=39/98 Runoff=3.77 cfs 0.248 af

Subcatchment MCPR-5J: Runoff Area=0.790 ac 22.78% Impervious Runoff Depth=5.24"
Tc=6.0 min CN=68/98 Runoff=5.97 cfs 0.345 af

Subcatchment MCPR-5K: Runoff Area=1.030 ac 80.58% Impervious Runoff Depth=7.44"
Tc=6.0 min CN=74/98 Runoff=10.16 cfs 0.638 af

Subcatchment MCPR-6A: Runoff Area=0.320 ac 0.00% Impervious Runoff Depth=0.55"
Flow Length=235' Tc=8.0 min CN=31/0 Runoff=0.09 cfs 0.015 af

Subcatchment MCPR-7A: Runoff Area=1.110 ac 0.00% Impervious Runoff Depth=0.80"
Flow Length=513' Tc=13.9 min CN=34/0 Runoff=0.60 cfs 0.074 af

Subcatchment MCPR-7B: Runoff Area=0.960 ac 0.00% Impervious Runoff Depth=1.96"
Flow Length=112' Slope=0.0500 '/' Tc=9.5 min CN=46/0 Runoff=2.45 cfs 0.157 af

Subcatchment MCPR-7C: Runoff Area=0.770 ac 0.00% Impervious Runoff Depth=2.07"
Flow Length=215' Tc=14.9 min CN=47/0 Runoff=1.71 cfs 0.133 af

Subcatchment MCPR-7D: Runoff Area=2.090 ac 21.53% Impervious Runoff Depth=4.38"
Flow Length=615' Tc=37.8 min CN=59/98 Runoff=6.53 cfs 0.763 af

Subcatchment MCPR-7F: Runoff Area=1.980 ac 77.78% Impervious Runoff Depth=6.56"
Tc=6.0 min CN=42/98 Runoff=16.78 cfs 1.082 af

Subcatchment MCPR-7G: Runoff Area=0.220 ac 50.00% Impervious Runoff Depth=6.09"
Tc=6.0 min CN=66/98 Runoff=1.84 cfs 0.112 af

Subcatchment MCPR-7I: Runoff Area=0.130 ac 0.00% Impervious Runoff Depth=6.79"
Tc=6.0 min CN=88/0 Runoff=1.26 cfs 0.074 af

Subcatchment MCPR-7K: Runoff Area=0.770 ac 25.97% Impervious Runoff Depth=3.30"
Tc=6.0 min CN=43/98 Runoff=3.25 cfs 0.212 af

Subcatchment MCPR-7L: Runoff Area=0.460 ac 10.87% Impervious Runoff Depth=2.07"
Flow Length=175' Slope=0.1000 '/' Tc=7.8 min CN=40/98 Runoff=1.09 cfs 0.079 af

Subcatchment MCPR-7M: Runoff Area=0.110 ac 100.00% Impervious Runoff Depth=7.99"
Tc=6.0 min CN=0/98 Runoff=1.14 cfs 0.073 af

Subcatchment MCPR-7N: Runoff Area=0.290 ac 0.00% Impervious Runoff Depth=3.39"
Tc=6.0 min CN=59/0 Runoff=1.48 cfs 0.082 af

Subcatchment MCPR-7O: Runoff Area=0.060 ac 100.00% Impervious Runoff Depth=7.99"
Tc=6.0 min CN=0/98 Runoff=0.62 cfs 0.040 af

Pond BASIN MC-1: Infiltration Peak Elev=154.46' Storage=15,672 cf Inflow=17.06 cfs 1.602 af
Discarded=1.40 cfs 1.017 af Primary=5.15 cfs 0.585 af Outflow=6.55 cfs 1.602 af

Pond BASIN MC-2: Infiltration Peak Elev=161.81' Storage=939 cf Inflow=1.09 cfs 0.079 af
Discarded=0.17 cfs 0.072 af Primary=0.34 cfs 0.008 af Outflow=0.50 cfs 0.079 af

Pond BASIN MC-3: Infiltration Peak Elev=162.36' Storage=21,833 cf Inflow=28.18 cfs 2.953 af
Discarded=2.11 cfs 1.676 af Primary=13.32 cfs 1.284 af Outflow=15.43 cfs 2.960 af

Pond BASIN MC-4: Infiltration Peak Elev=171.85' Storage=1,934 cf Inflow=3.13 cfs 0.194 af
Discarded=0.34 cfs 0.070 af Primary=1.45 cfs 0.125 af Outflow=1.79 cfs 0.195 af

Pond FB MC-1: Forebay Peak Elev=164.22' Storage=2,730 cf Inflow=1.84 cfs 0.112 af
Discarded=0.11 cfs 0.112 af Primary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.112 af

Pond SDS MC-1: Detention Peak Elev=171.96' Storage=13,376 cf Inflow=6.78 cfs 0.825 af
Outflow=4.92 cfs 0.826 af

Pond SDS MC-2: Detention Peak Elev=183.01' Storage=8,085 cf Inflow=10.59 cfs 0.658 af
Outflow=2.65 cfs 0.567 af

Pond SDS MC-3: Detention Peak Elev=172.14' Storage=6,126 cf Inflow=7.97 cfs 0.912 af
Outflow=4.81 cfs 0.877 af

Pond SDS MC-4: Detention Peak Elev=168.00' Storage=8,575 cf Inflow=10.16 cfs 0.638 af
Outflow=3.80 cfs 0.597 af

Pond SIS MC-1: Infiltration Peak Elev=160.97' Storage=14,869 cf Inflow=16.78 cfs 1.082 af
Discarded=0.71 cfs 0.780 af Primary=11.16 cfs 0.296 af Outflow=11.88 cfs 1.076 af

Pond SIS MC-2: Infiltration Peak Elev=164.53' Storage=3,145 cf Inflow=3.77 cfs 0.248 af
Discarded=0.20 cfs 0.183 af Primary=2.07 cfs 0.062 af Outflow=2.27 cfs 0.244 af

Pond WQS MC-1: Wet Swale Peak Elev=156.98' Storage=1,136 cf Inflow=0.82 cfs 0.048 af
Discarded=0.06 cfs 0.048 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.048 af

Pond WQS MC-2: Wet Swale Peak Elev=160.48' Storage=1,001 cf Inflow=0.74 cfs 0.043 af
Discarded=0.06 cfs 0.043 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.043 af

Pond WQS MC-3: Wet Swale Peak Elev=162.48' Storage=997 cf Inflow=0.74 cfs 0.043 af
Discarded=0.06 cfs 0.043 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.043 af

Pond WQS MC-4: Wet Swale Peak Elev=157.41' Storage=1,668 cf Inflow=3.47 cfs 0.220 af
Discarded=0.09 cfs 0.104 af Primary=3.26 cfs 0.119 af Outflow=3.35 cfs 0.223 af

Link POA-1: Inflow=3.26 cfs 0.119 af
Primary=3.26 cfs 0.119 af

Link POA-2:
Primary=0.00 cfs 0.000 af

Link POA-3:
Primary=0.00 cfs 0.000 af

Link POA-4: Inflow=20.66 cfs 1.280 af
Primary=20.66 cfs 1.280 af

Link POA-5: Inflow=32.43 cfs 2.818 af
Primary=32.43 cfs 2.818 af

Link POA-6: Inflow=0.09 cfs 0.015 af
Primary=0.09 cfs 0.015 af

Link POA-7: Inflow=8.42 cfs 1.153 af
Primary=8.42 cfs 1.153 af

Total Runoff Area = 26.940 ac Runoff Volume = 9.696 af Average Runoff Depth = 4.32"
77.80% Pervious = 20.960 ac 22.20% Impervious = 5.980 ac

Summary for Subcatchment CCPR-7A:

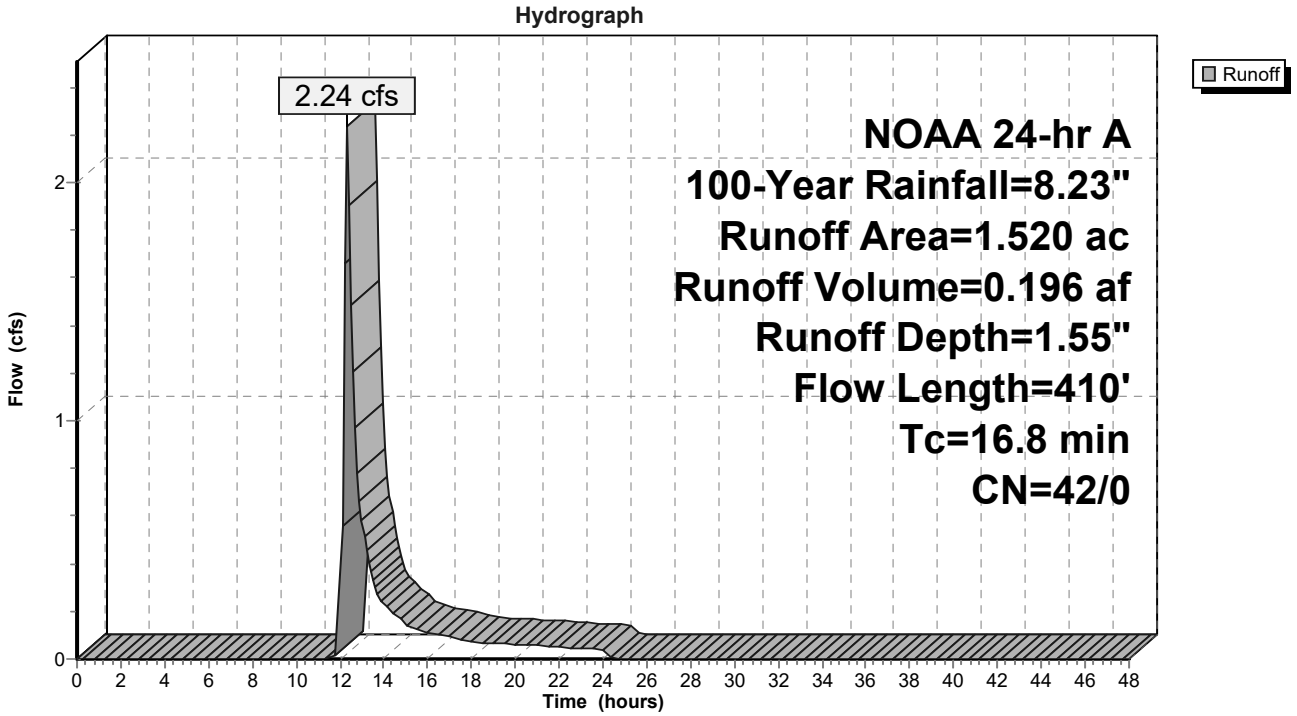
Runoff = 2.24 cfs @ 12.31 hrs, Volume= 0.196 af, Depth= 1.55"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

	Area (ac)	CN	Description
	0.050	96	Gravel surface, HSG A
	0.110	39	>75% Grass cover, Good, HSG A
	0.110	30	Meadow, non-grazed, HSG A
	0.950	30	Woods, Good, HSG A
*	0.300	77	Wetlands, HSG A
	1.520	42	Weighted Average
	1.520	42	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	25	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.16"
0.6	10	0.5000	0.27		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.16"
9.9	375	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.8	410	Total			

Subcatchment CCPR-7A:



Summary for Subcatchment CCPR-7B:

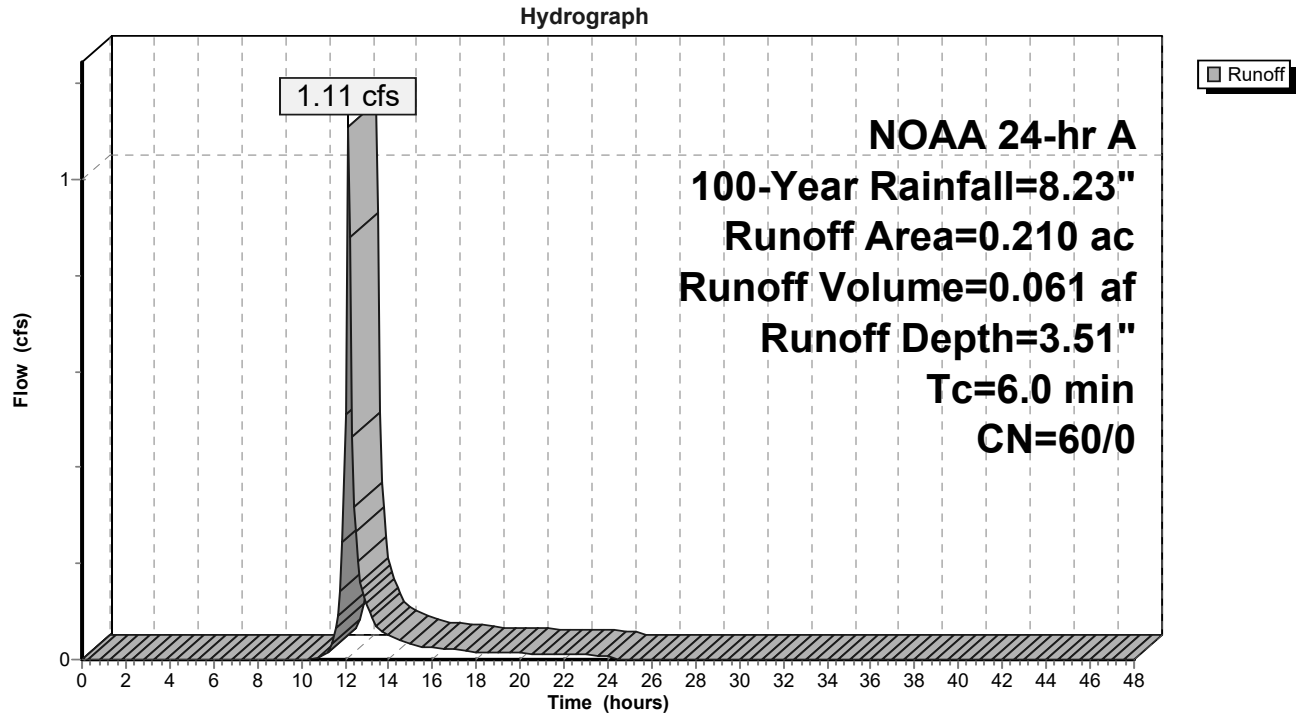
Runoff = 1.11 cfs @ 12.12 hrs, Volume= 0.061 af, Depth= 3.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.080	74	>75% Grass cover, Good, HSG C
0.060	30	Meadow, non-grazed, HSG A
0.070	71	Meadow, non-grazed, HSG C
0.210	60	Weighted Average
0.210	60	100.00% Pervious Area

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

Subcatchment CCPR-7B:



Summary for Subcatchment MCPR-1A:

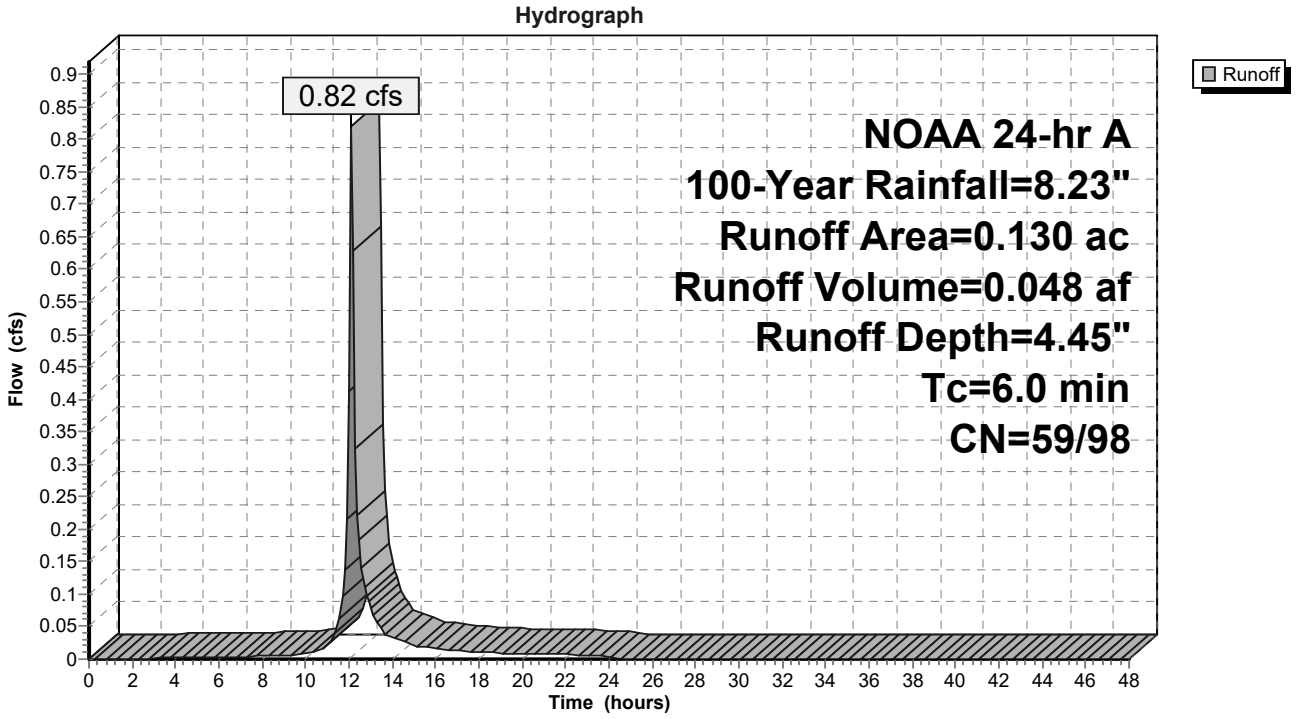
Runoff = 0.82 cfs @ 12.12 hrs, Volume= 0.048 af, Depth= 4.45"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.020	98	Paved parking, HSG A
0.010	98	Paved parking, HSG D
0.060	39	>75% Grass cover, Good, HSG A
0.020	80	>75% Grass cover, Good, HSG D
0.020	98	Water Surface, 0% imp, HSG A
0.130	68	Weighted Average
0.100	59	76.92% Pervious Area
0.030	98	23.08% Impervious Area

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

Subcatchment MCPR-1A:



Summary for Subcatchment MCPR-1B:

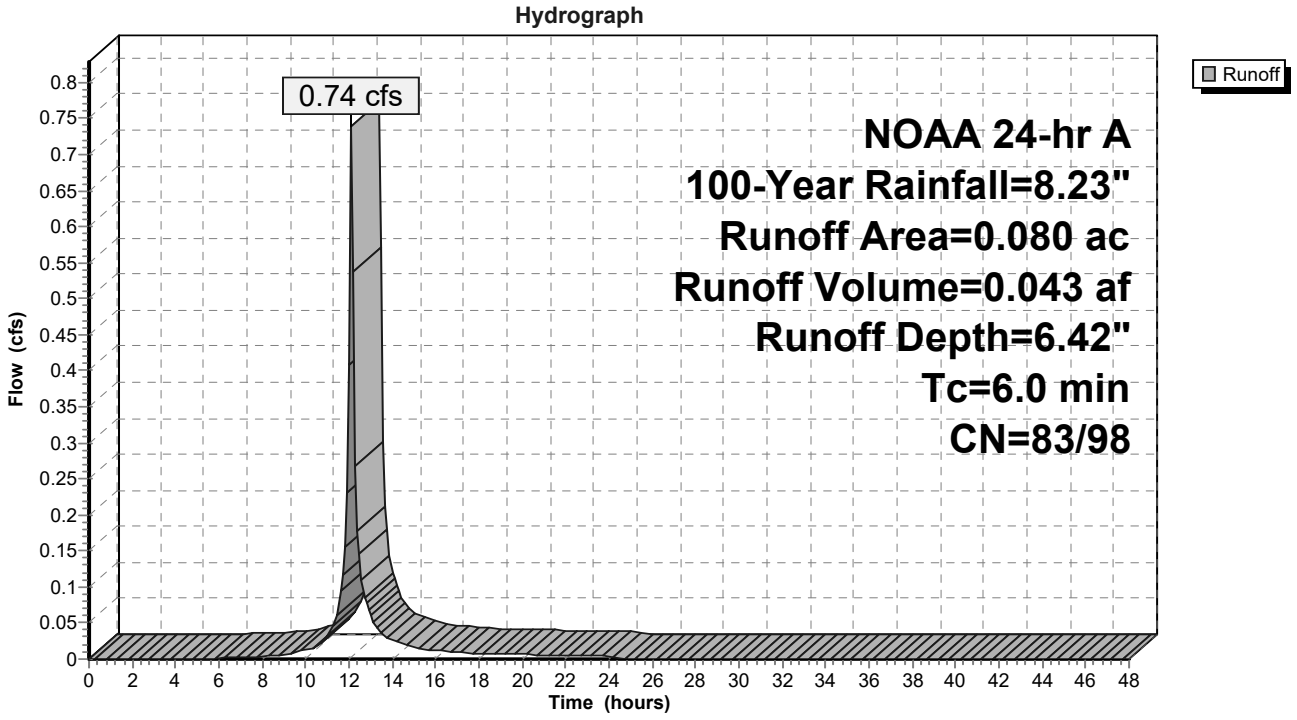
Runoff = 0.74 cfs @ 12.11 hrs, Volume= 0.043 af, Depth= 6.42"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.010	98	Paved parking, HSG D
0.060	80	>75% Grass cover, Good, HSG D
0.010	98	Water Surface, 0% imp, HSG D
0.080	85	Weighted Average
0.070	83	87.50% Pervious Area
0.010	98	12.50% Impervious Area

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

Subcatchment MCPR-1B:



Summary for Subcatchment MCPR-1C:

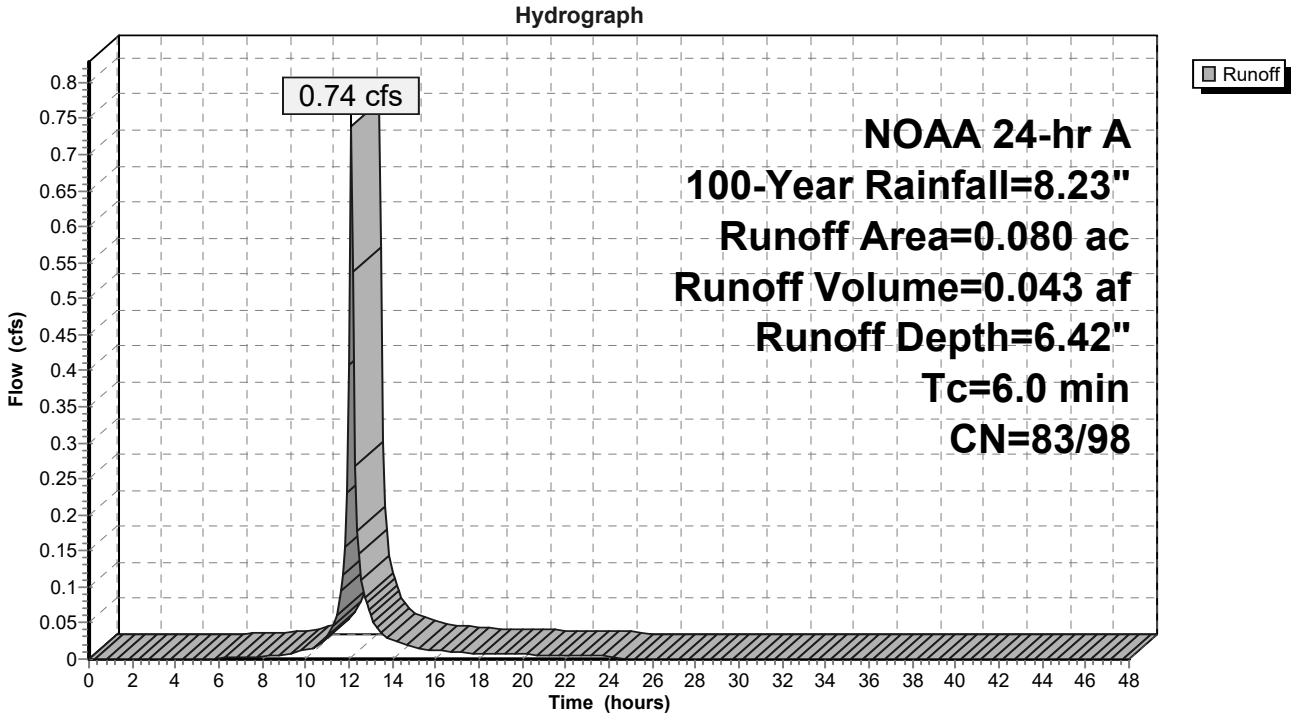
Runoff = 0.74 cfs @ 12.11 hrs, Volume= 0.043 af, Depth= 6.42"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.010	98	Paved parking, HSG D
0.060	80	>75% Grass cover, Good, HSG D
0.010	98	Water Surface, 0% imp, HSG D
0.080	85	Weighted Average
0.070	83	87.50% Pervious Area
0.010	98	12.50% Impervious Area

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

Subcatchment MCPR-1C:



Summary for Subcatchment MCPR-1D:

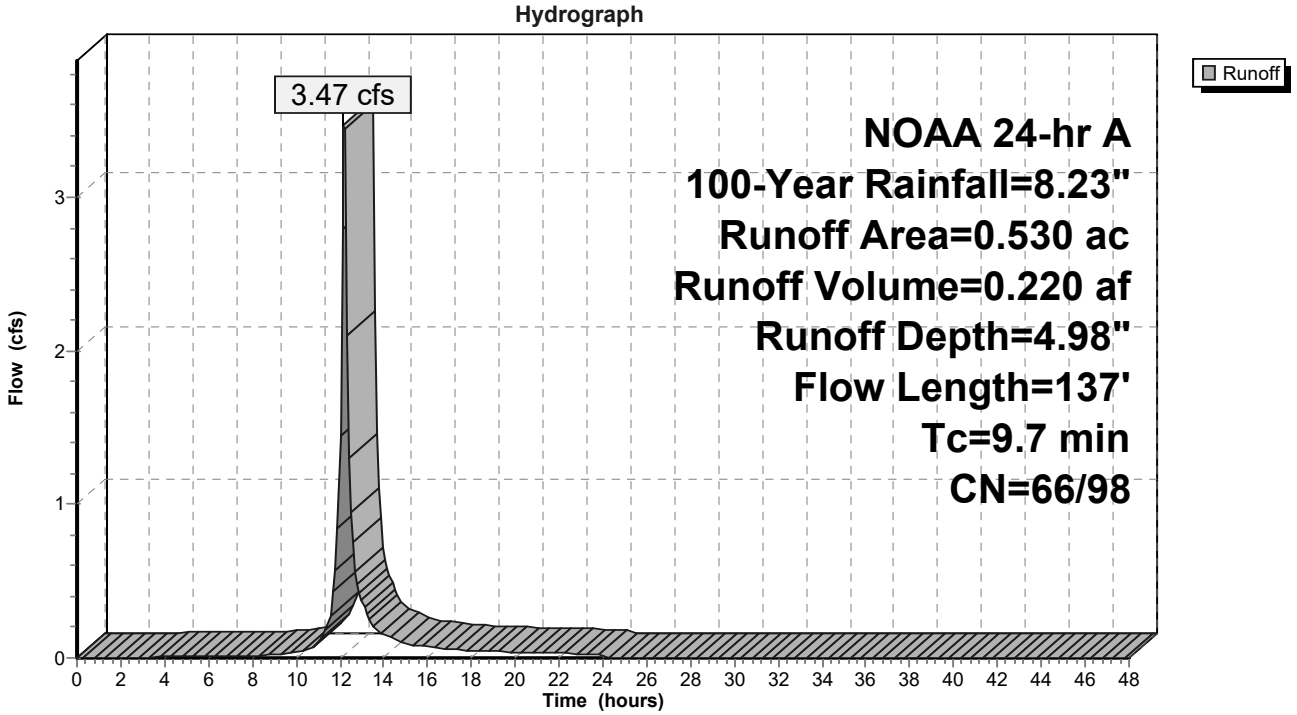
Runoff = 3.47 cfs @ 12.18 hrs, Volume= 0.220 af, Depth= 4.98"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.040	98	Paved parking, HSG A
0.070	98	Paved parking, HSG D
0.140	39	>75% Grass cover, Good, HSG A
0.280	80	>75% Grass cover, Good, HSG D
0.530	73	Weighted Average
0.420	66	79.25% Pervious Area
0.110	98	20.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.1	87	0.0360	1.33		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.7	137	Total			

Subcatchment MCPR-1D:



Summary for Subcatchment MCPR-4A:

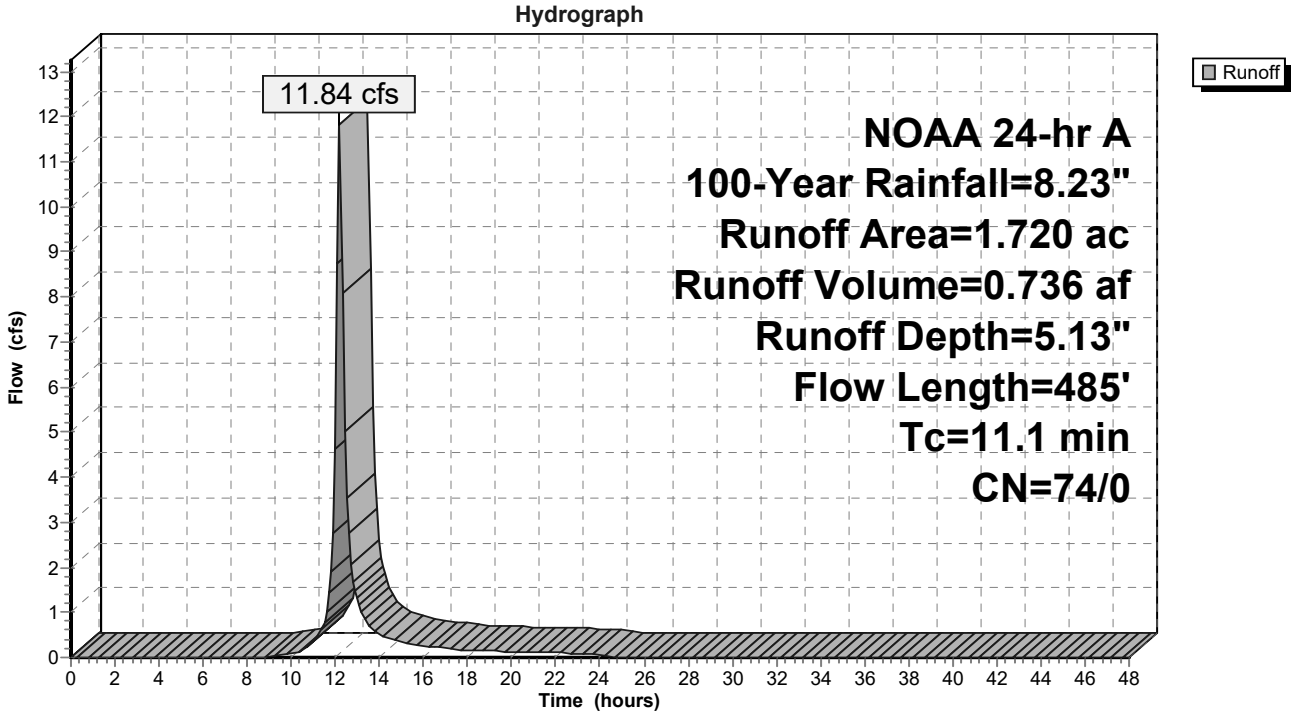
Runoff = 11.84 cfs @ 12.20 hrs, Volume= 0.736 af, Depth= 5.13"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.870	70	Woods, Good, HSG C
0.040	96	Gravel surface, HSG C
0.100	71	Meadow, non-grazed, HSG C
0.410	77	Woods, Good, HSG D
0.290	78	Meadow, non-grazed, HSG D
0.010	96	Gravel surface, HSG D
1.720	74	Weighted Average
1.720	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.0	435	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.1	485	Total			

Subcatchment MCPR-4A:



Summary for Subcatchment MCPR-4B:

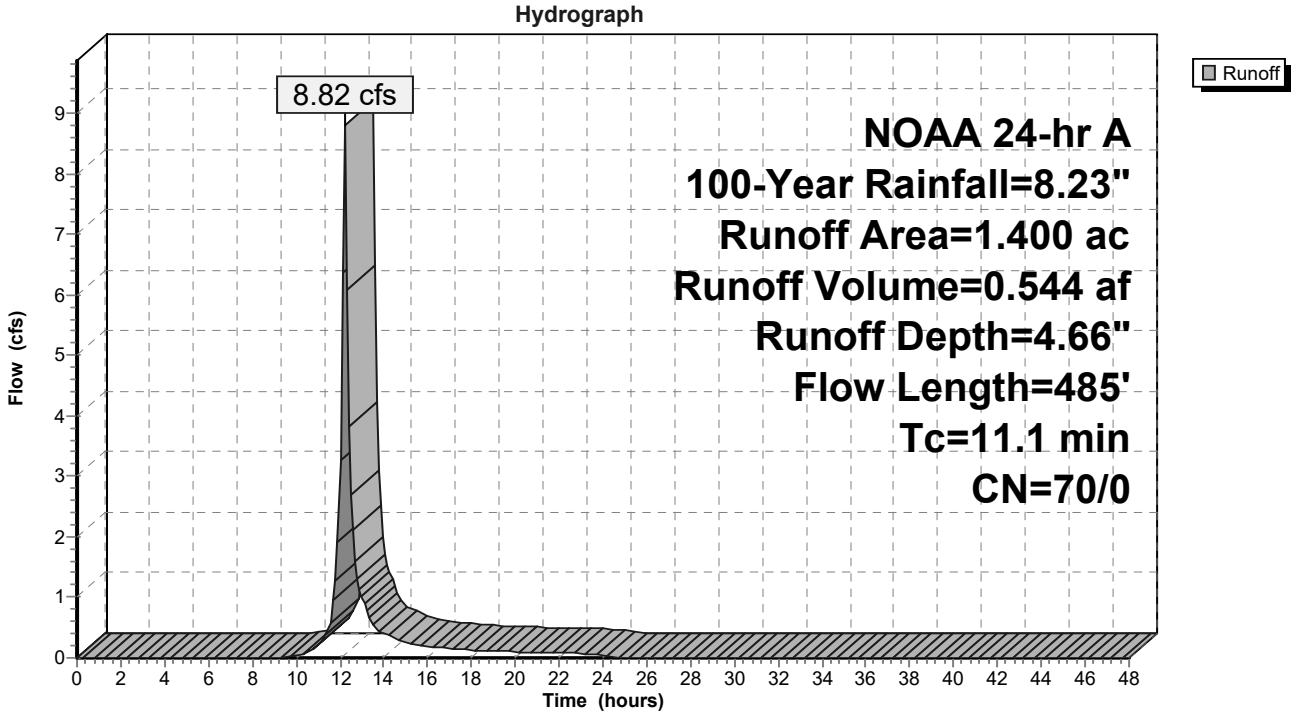
Runoff = 8.82 cfs @ 12.20 hrs, Volume= 0.544 af, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
1.360	70	Woods, Good, HSG C
0.020	96	Gravel surface, HSG C
0.020	71	Meadow, non-grazed, HSG C
1.400	70	Weighted Average
1.400	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.0	435	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.1	485	Total			

Subcatchment MCPR-4B:



Summary for Subcatchment MCPR-5A:

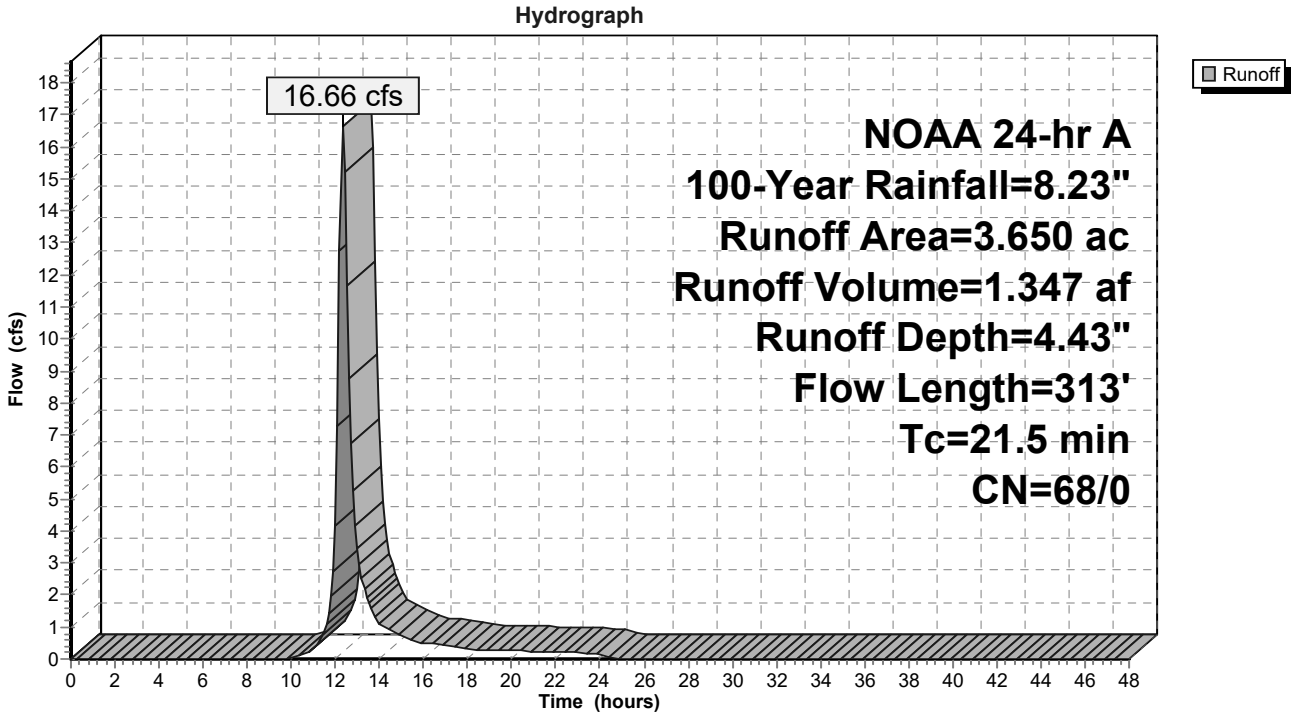
Runoff = 16.66 cfs @ 12.32 hrs, Volume= 1.347 af, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

	Area (ac)	CN	Description
	0.480	30	Woods, Good, HSG A
	1.230	70	Woods, Good, HSG C
*	0.950	77	Wetlands, HSG A
*	0.120	77	Wetlands, HSG C
	0.060	96	Gravel surface, HSG A
	0.660	74	>75% Grass cover, Good, HSG C
	0.150	71	Meadow, non-grazed, HSG C
	3.650	68	Weighted Average
	3.650	68	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
5.1	263	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.5	313	Total			

Subcatchment MCPR-5A:



Summary for Subcatchment MCPR-5B:

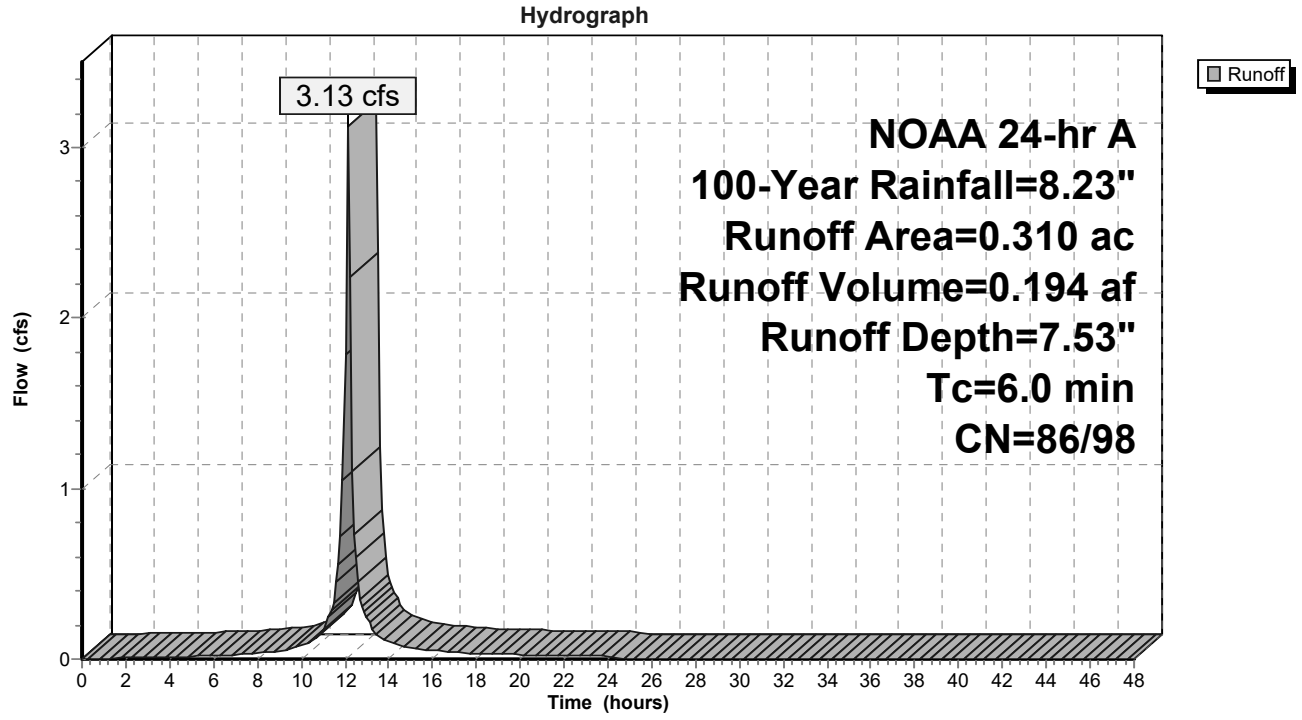
Runoff = 3.13 cfs @ 12.11 hrs, Volume= 0.194 af, Depth= 7.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.210	98	Roofs, HSG C
0.050	98	Water Surface, 0% imp, HSG C
0.050	74	>75% Grass cover, Good, HSG C
0.310	94	Weighted Average
0.100	86	32.26% Pervious Area
0.210	98	67.74% Impervious Area

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

Subcatchment MCPR-5B:



Summary for Subcatchment MCPR-5C:

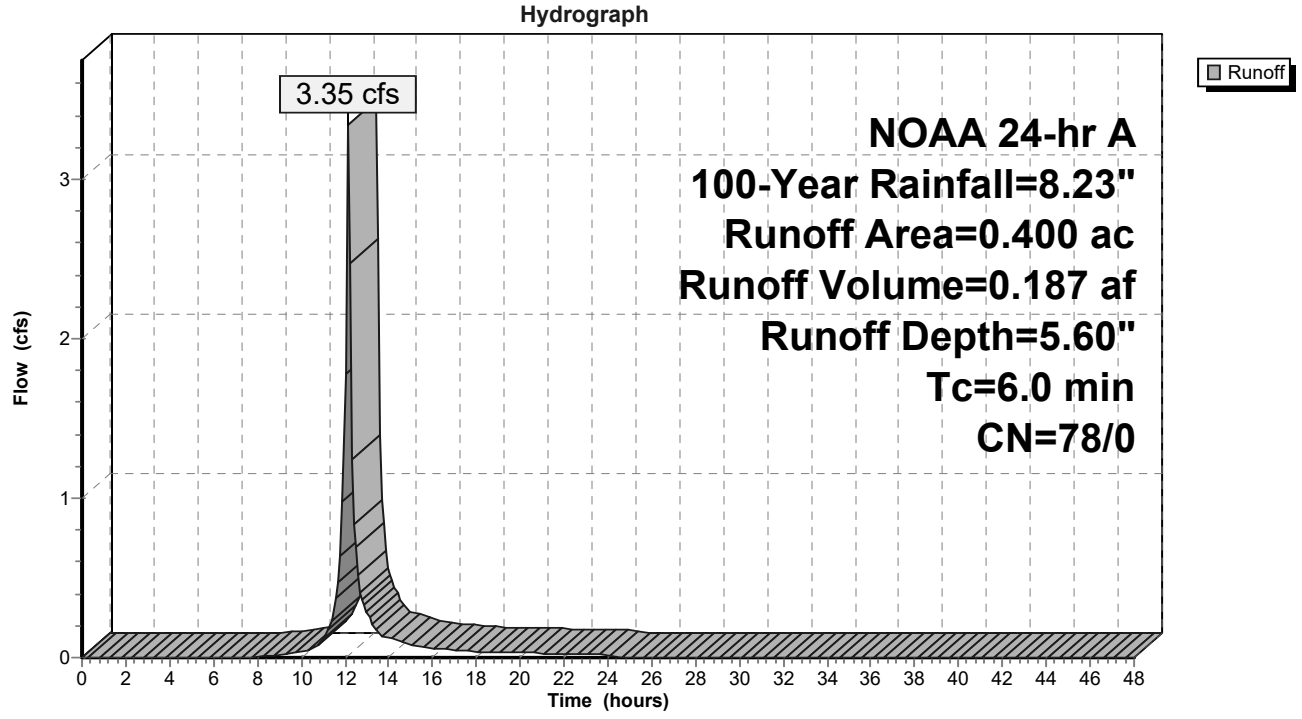
Runoff = 3.35 cfs @ 12.11 hrs, Volume= 0.187 af, Depth= 5.60"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.010	96	Gravel surface, HSG A
0.100	30	Meadow, non-grazed, HSG A
0.040	71	Meadow, non-grazed, HSG C
0.220	98	Water Surface, 0% imp, HSG A
0.030	98	Water Surface, 0% imp, HSG C
0.400	78	Weighted Average
0.400	78	100.00% Pervious Area

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

Subcatchment MCPR-5C:



Summary for Subcatchment MCPR-5D:

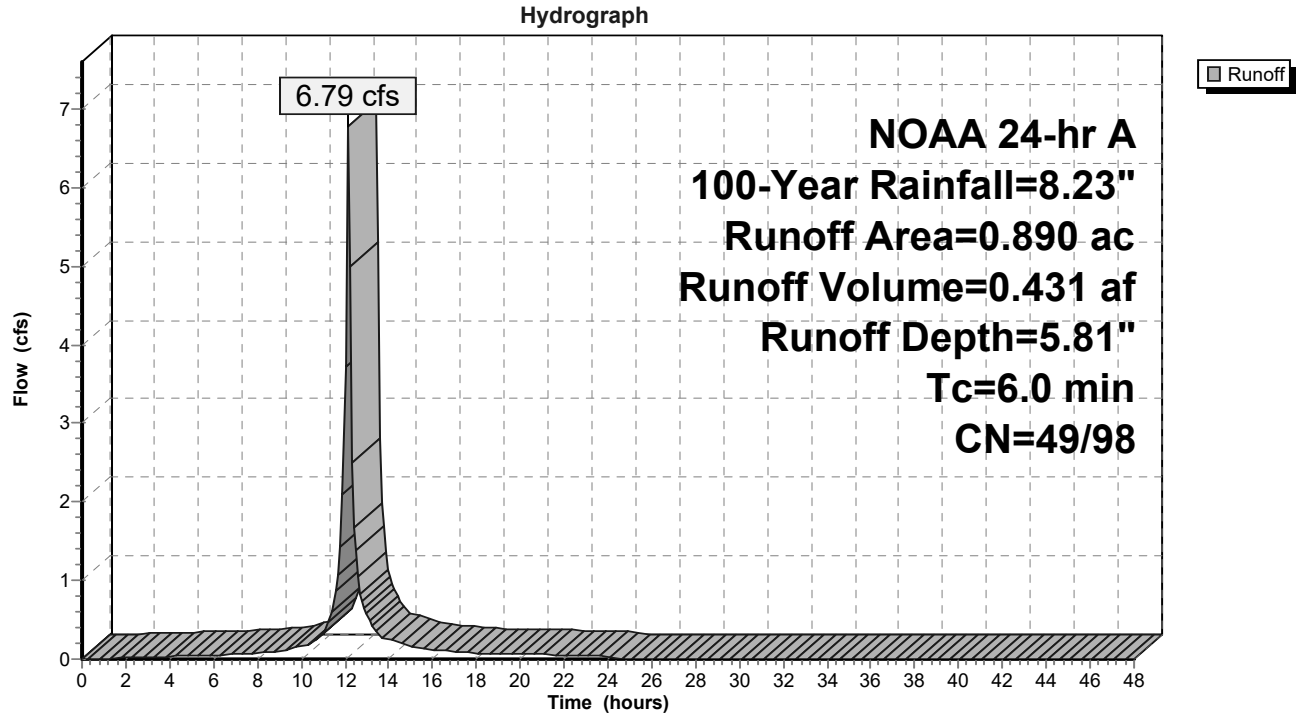
Runoff = 6.79 cfs @ 12.11 hrs, Volume= 0.431 af, Depth= 5.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.030	98	Roofs, HSG A
0.240	39	>75% Grass cover, Good, HSG A
0.100	74	>75% Grass cover, Good, HSG C
0.350	98	Paved parking, HSG A
0.170	98	Paved parking, HSG C
0.890	79	Weighted Average
0.340	49	38.20% Pervious Area
0.550	98	61.80% Impervious Area

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

Subcatchment MCPR-5D:



Summary for Subcatchment MCPR-5E:

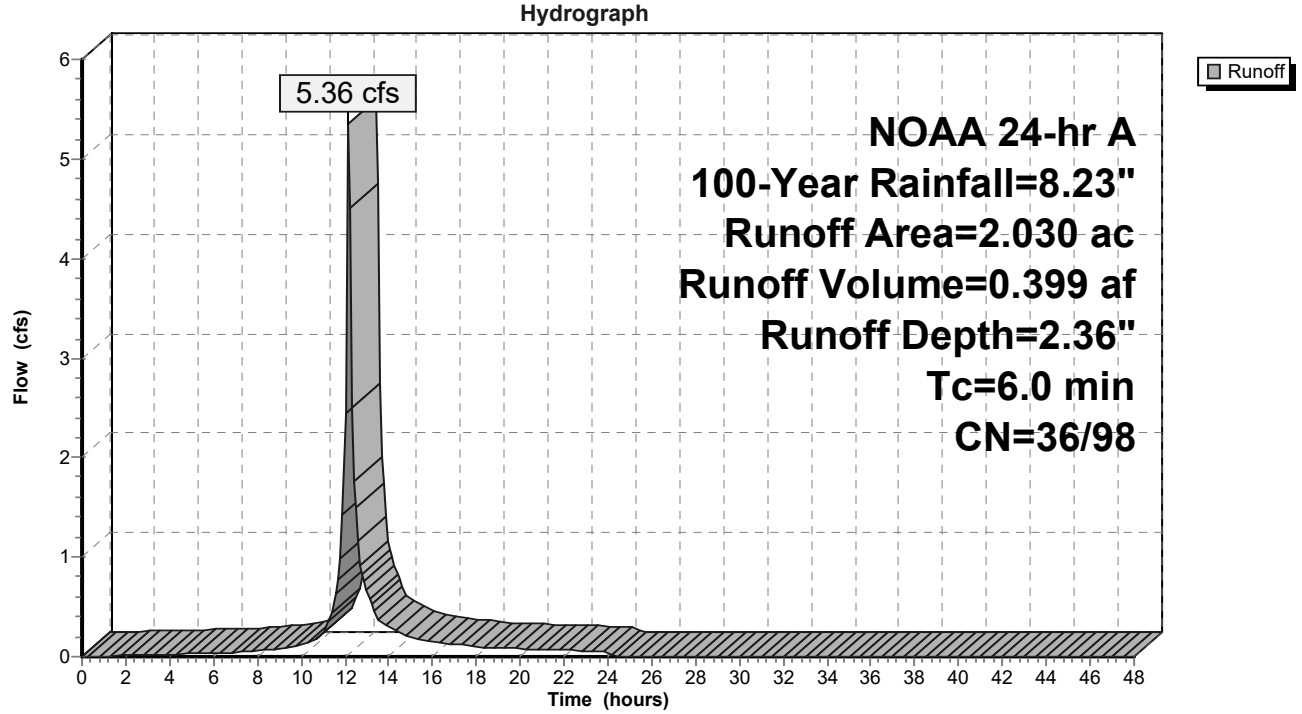
Runoff = 5.36 cfs @ 12.13 hrs, Volume= 0.399 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.350	98	Roofs, HSG A
0.030	98	Roofs, HSG C
0.780	39	>75% Grass cover, Good, HSG A
0.070	74	>75% Grass cover, Good, HSG C
0.010	98	Paved parking, HSG A
0.010	98	Paved parking, HSG C
0.330	30	Meadow, non-grazed, HSG A
0.450	30	Woods, Good, HSG A
2.030	48	Weighted Average
1.630	36	80.30% Pervious Area
0.400	98	19.70% Impervious Area

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

Subcatchment MCPR-5E:



Summary for Subcatchment MCPR-5F:

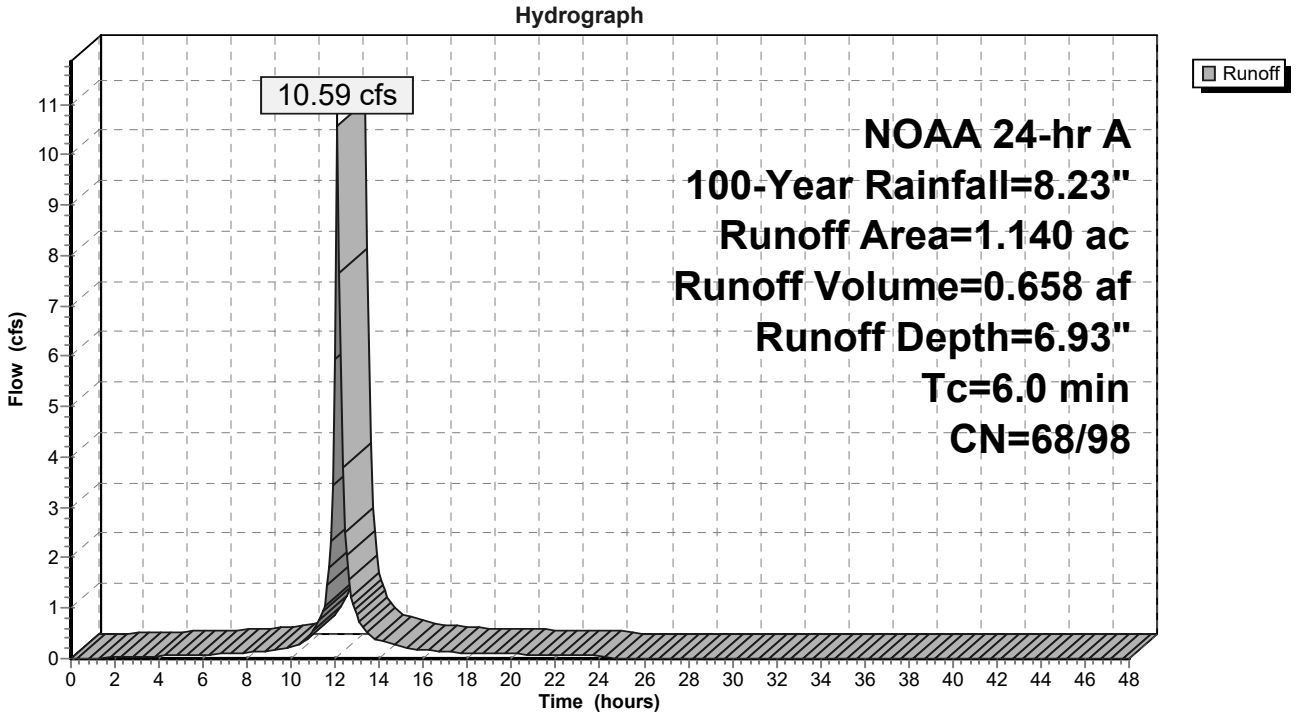
Runoff = 10.59 cfs @ 12.11 hrs, Volume= 0.658 af, Depth= 6.93"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.110	98	Roofs, HSG A
0.350	98	Roofs, HSG C
0.060	39	>75% Grass cover, Good, HSG A
0.280	74	>75% Grass cover, Good, HSG C
0.090	98	Paved parking, HSG A
0.250	98	Paved parking, HSG C
1.140	89	Weighted Average
0.340	68	29.82% Pervious Area
0.800	98	70.18% Impervious Area

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

Subcatchment MCPR-5F:



Summary for Subcatchment MCPR-5H:

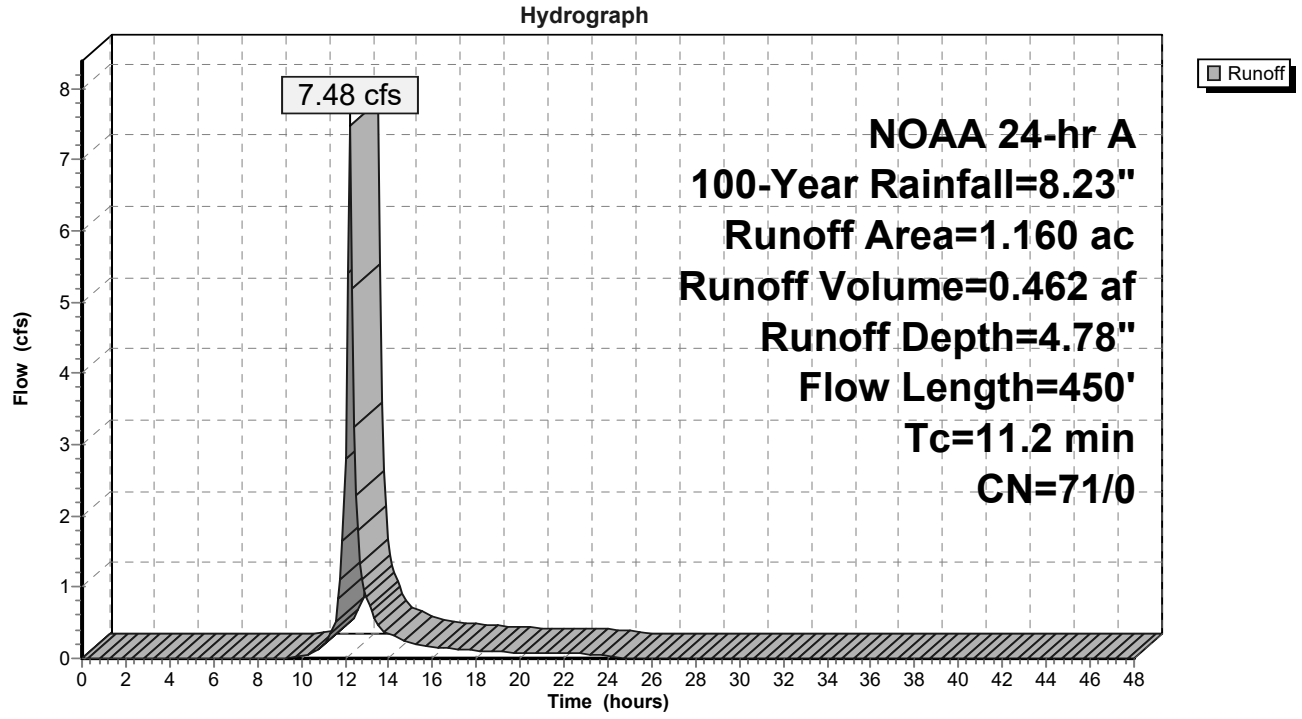
Runoff = 7.48 cfs @ 12.20 hrs, Volume= 0.462 af, Depth= 4.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
1.120	70	Woods, Good, HSG C
0.040	96	Gravel surface, HSG C
1.160	71	Weighted Average
1.160	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.7	400	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.2	450	Total			

Subcatchment MCPR-5H:



Summary for Subcatchment MCPR-5l:

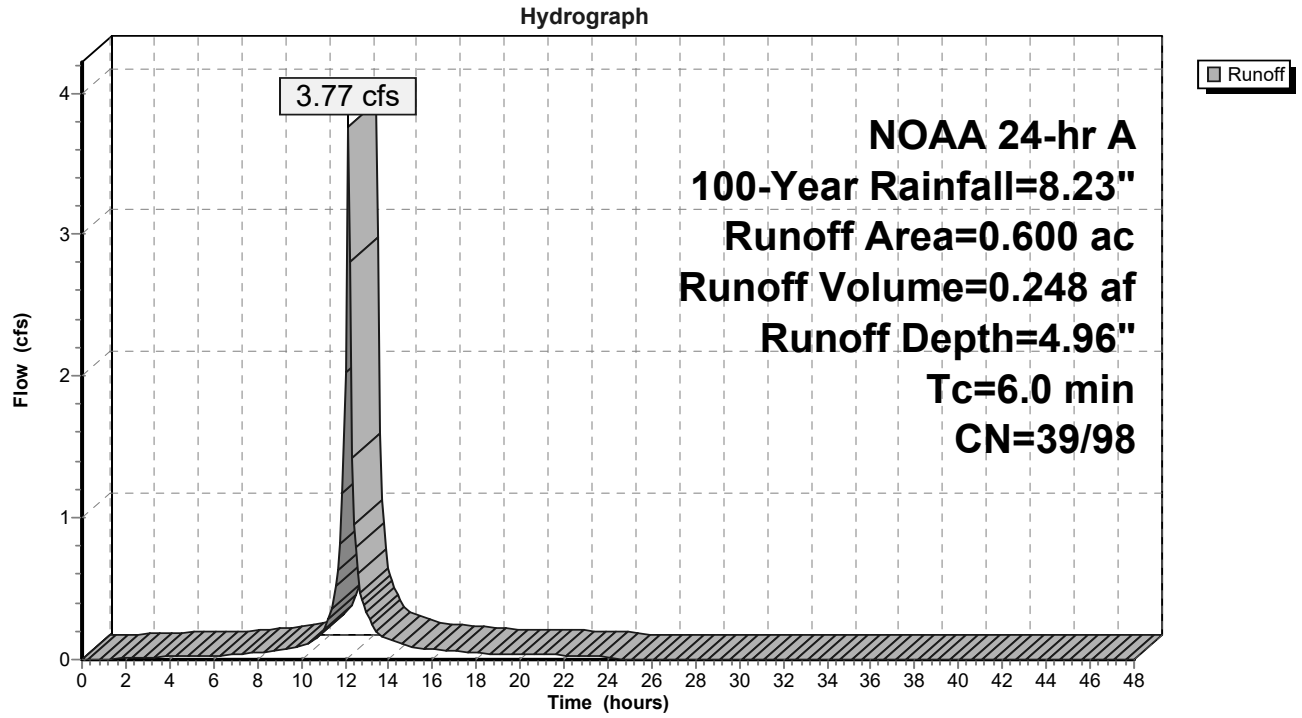
Runoff = 3.77 cfs @ 12.11 hrs, Volume= 0.248 af, Depth= 4.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.330	98	Roofs, HSG A
0.270	39	>75% Grass cover, Good, HSG A
0.600	71	Weighted Average
0.270	39	45.00% Pervious Area
0.330	98	55.00% Impervious Area

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

Subcatchment MCPR-5l:



Summary for Subcatchment MCPR-5J:

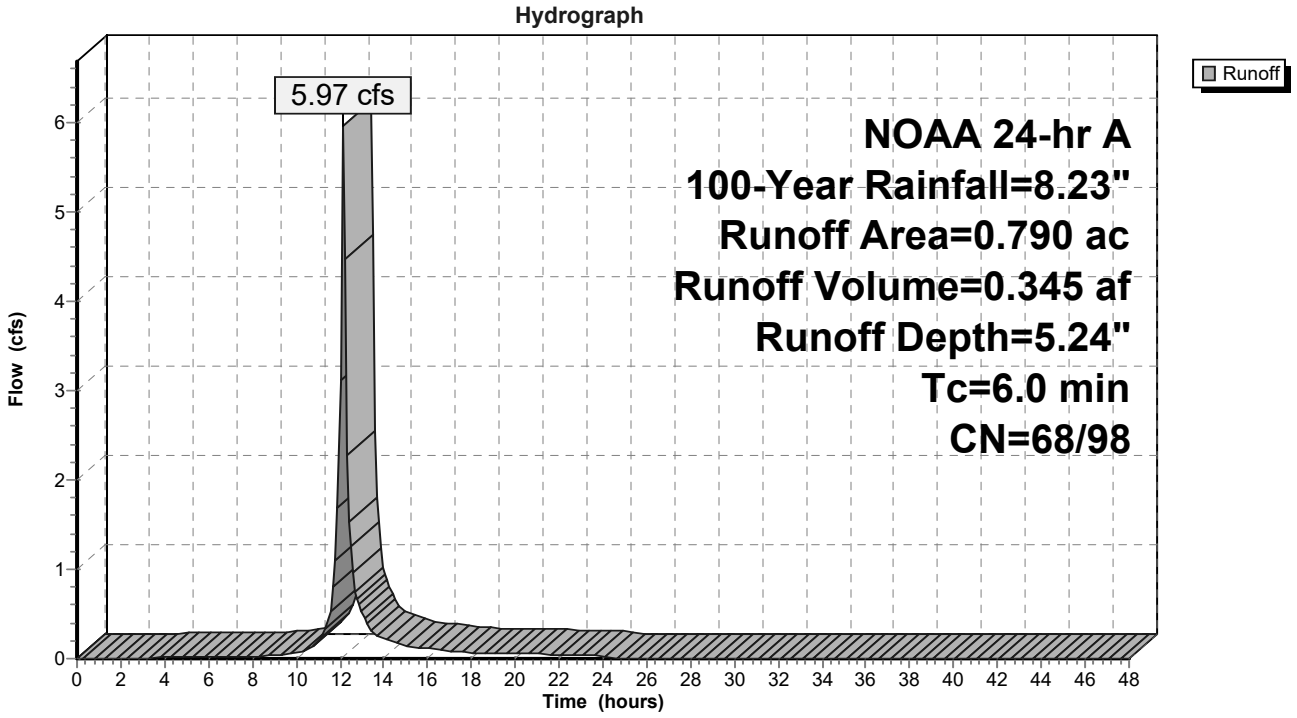
Runoff = 5.97 cfs @ 12.12 hrs, Volume= 0.345 af, Depth= 5.24"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.020	98	Roofs, HSG A
0.160	98	Roofs, HSG C
0.150	39	>75% Grass cover, Good, HSG A
0.290	74	>75% Grass cover, Good, HSG C
0.090	70	Woods, Good, HSG C
0.080	98	Water Surface, 0% imp, HSG C
0.790	75	Weighted Average
0.610	68	77.22% Pervious Area
0.180	98	22.78% Impervious Area

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

Subcatchment MCPR-5J:



Summary for Subcatchment MCPR-5K:

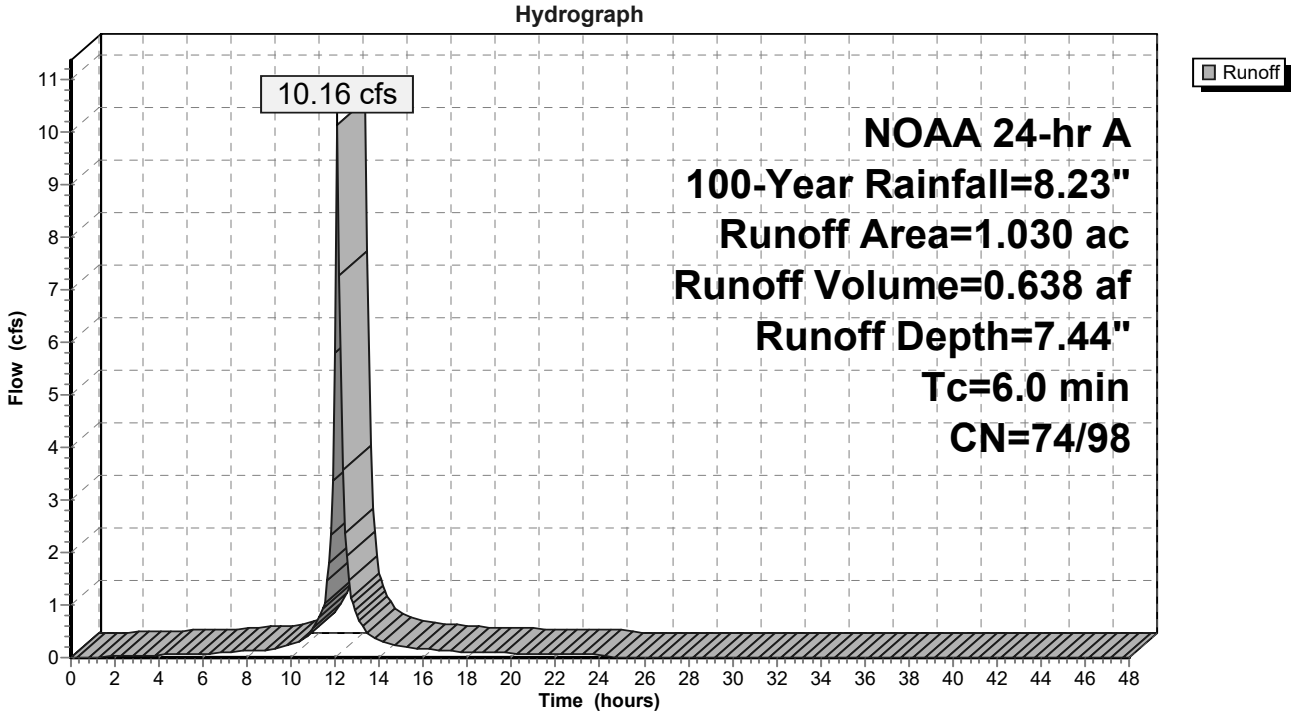
Runoff = 10.16 cfs @ 12.11 hrs, Volume= 0.638 af, Depth= 7.44"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.020	98	Roofs, HSG A
0.320	98	Roofs, HSG C
0.200	74	>75% Grass cover, Good, HSG C
0.490	98	Paved parking, HSG C
1.030	93	Weighted Average
0.200	74	19.42% Pervious Area
0.830	98	80.58% Impervious Area

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

Subcatchment MCPR-5K:



Summary for Subcatchment MCPR-6A:

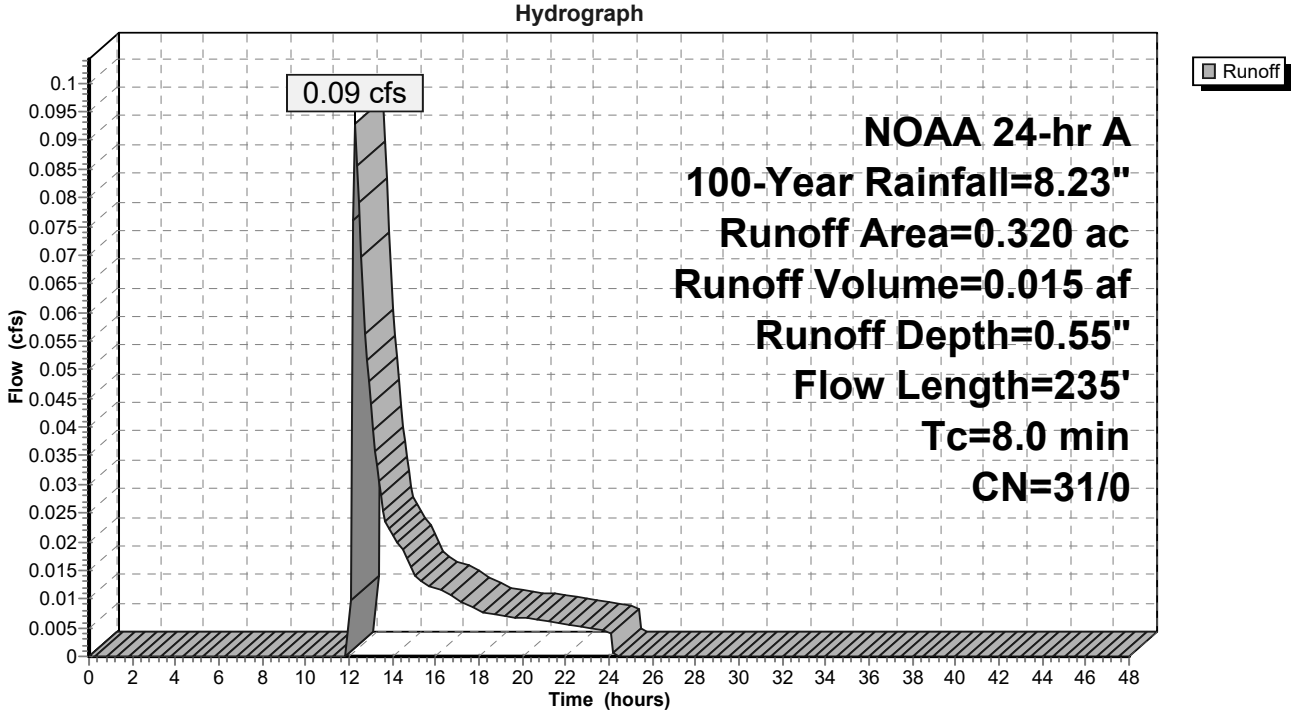
Runoff = 0.09 cfs @ 12.32 hrs, Volume= 0.015 af, Depth= 0.55"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.050	39	>75% Grass cover, Good, HSG A
0.270	30	Woods, Good, HSG A
0.320	31	Weighted Average
0.320	31	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	35	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
2.4	200	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.0	235	Total			

Subcatchment MCPR-6A:



Summary for Subcatchment MCPR-7A:

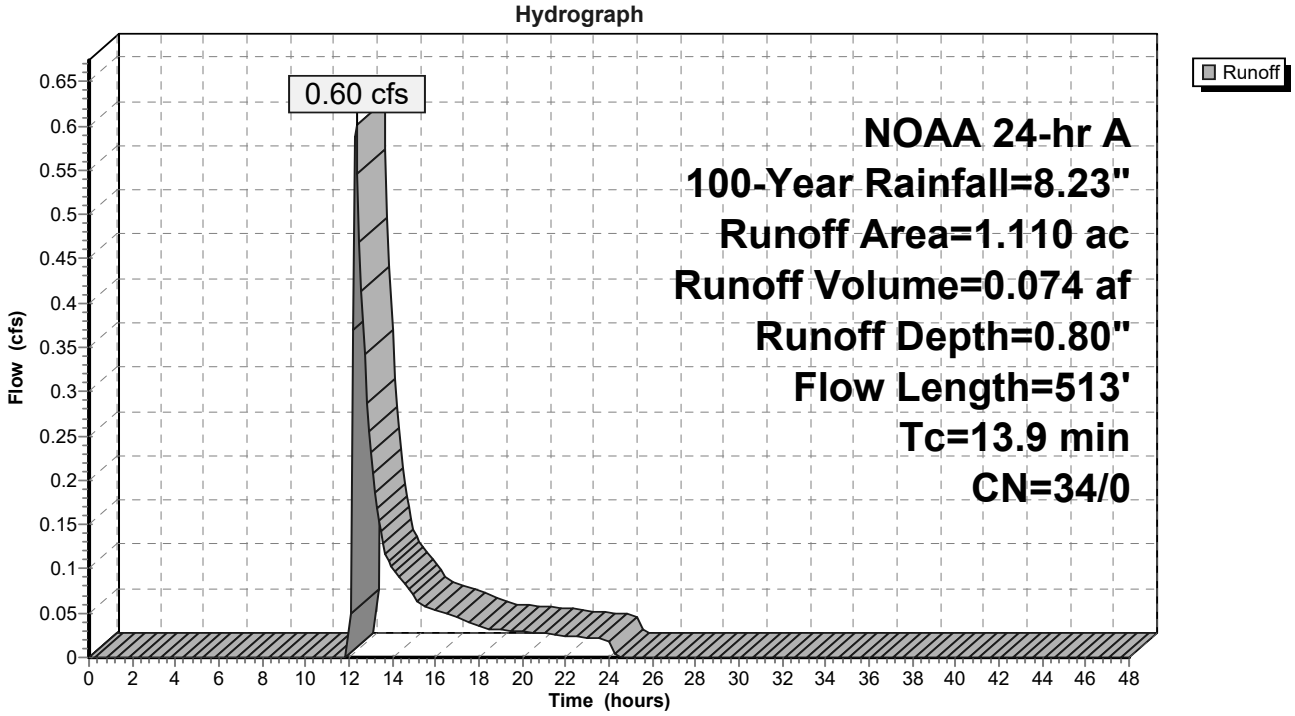
Runoff = 0.60 cfs @ 12.33 hrs, Volume= 0.074 af, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

	Area (ac)	CN	Description
	0.310	39	>75% Grass cover, Good, HSG A
	0.250	30	Meadow, non-grazed, HSG A
	0.510	30	Woods, Good, HSG A
*	0.040	77	Wetlands, HSG A
	1.110	34	Weighted Average
	1.110	34	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
7.4	463	0.0440	1.05		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.9	513	Total			

Subcatchment MCPR-7A:



Summary for Subcatchment MCPR-7B:

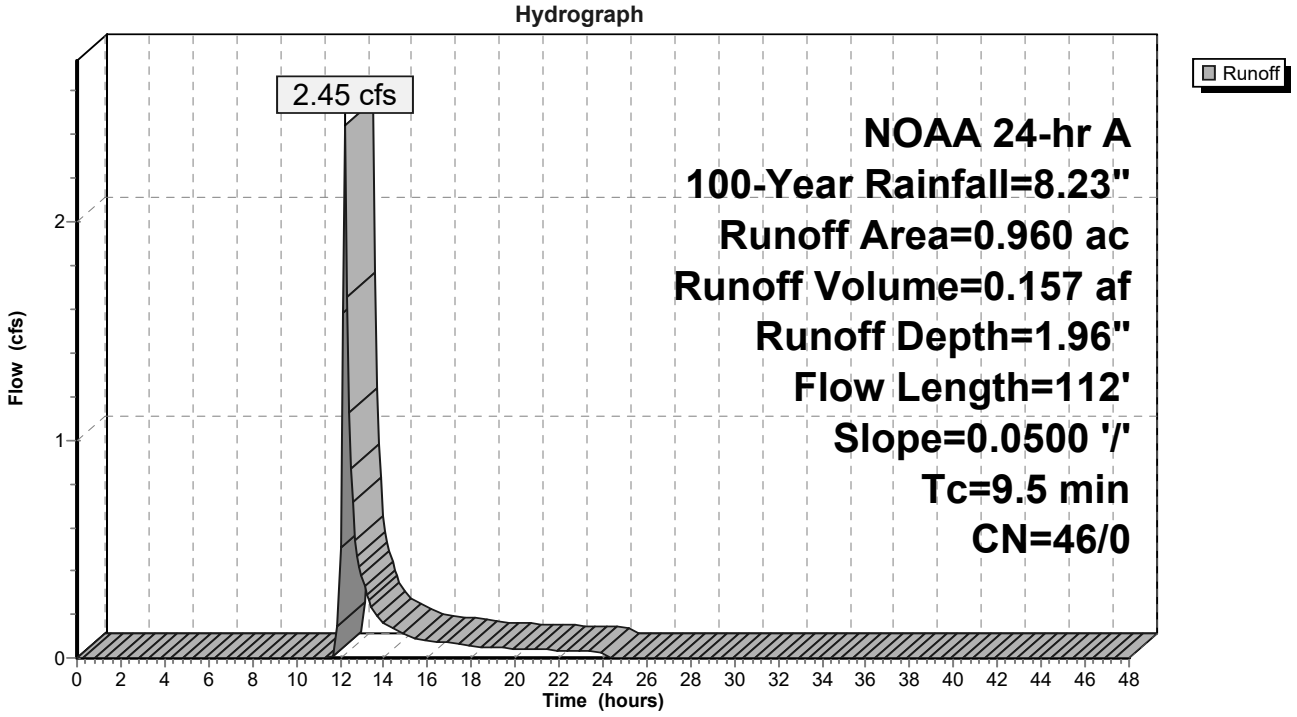
Runoff = 2.45 cfs @ 12.20 hrs, Volume= 0.157 af, Depth= 1.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

	Area (ac)	CN	Description
	0.200	39	>75% Grass cover, Good, HSG A
	0.290	30	Woods, Good, HSG A
	0.200	30	Meadow, non-grazed, HSG A
*	0.220	77	Wetlands, HSG A
	0.050	98	Water Surface, 0% imp, HSG A
	0.960	46	Weighted Average
	0.960	46	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
0.9	62	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.5	112	Total			

Subcatchment MCPR-7B:



Summary for Subcatchment MCPR-7C:

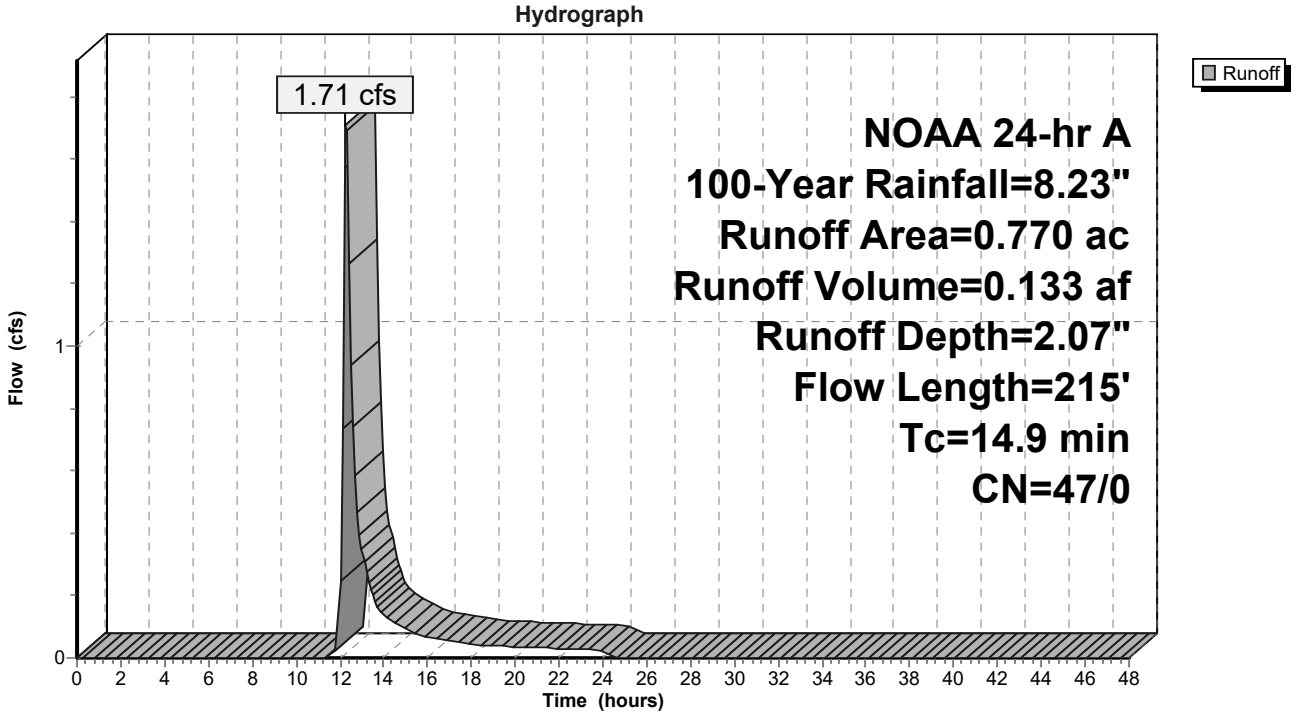
Runoff = 1.71 cfs @ 12.27 hrs, Volume= 0.133 af, Depth= 2.07"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

	Area (ac)	CN	Description
	0.030	39	>75% Grass cover, Good, HSG A
	0.460	30	Meadow, non-grazed, HSG A
*	0.280	77	Wetlands, HSG A
	0.770	47	Weighted Average
	0.770	47	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
4.3	165	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.9	215	Total			

Subcatchment MCPR-7C:



Summary for Subcatchment MCPR-7D:

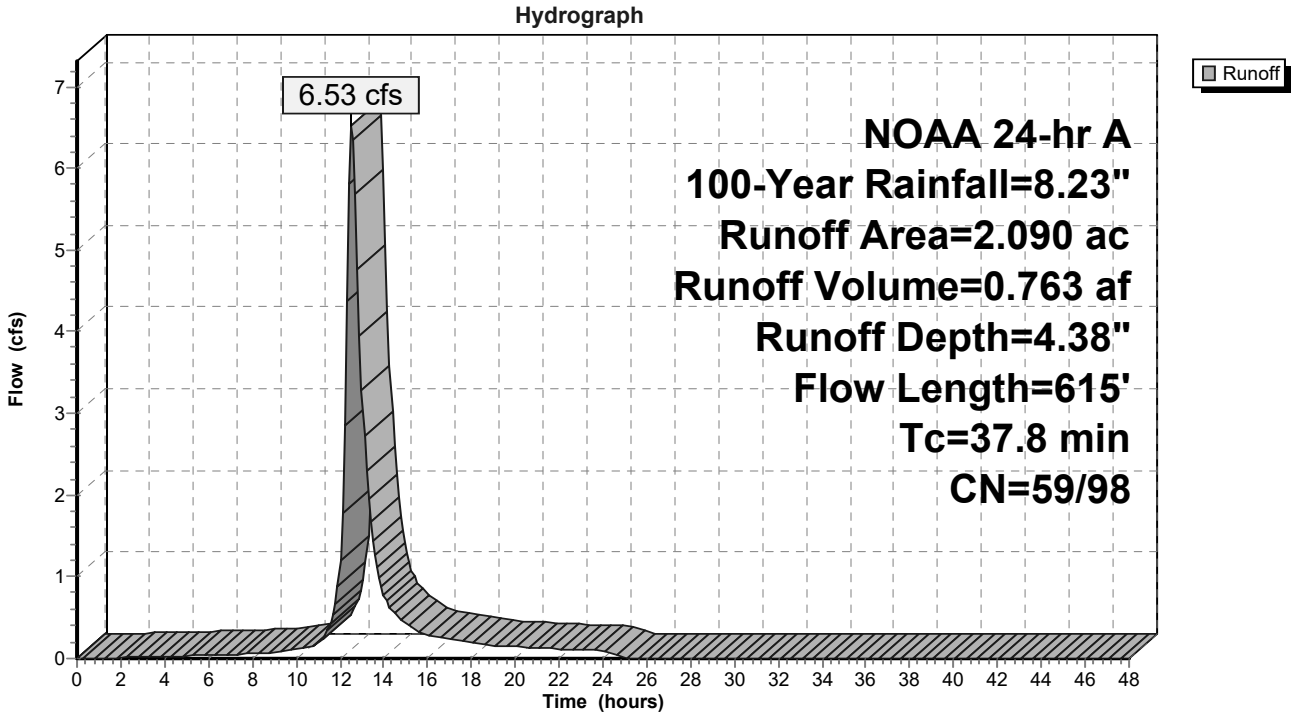
Runoff = 6.53 cfs @ 12.53 hrs, Volume= 0.763 af, Depth= 4.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.140	98	Roofs, HSG A
0.150	98	Roofs, HSG C
0.160	98	Paved parking, HSG A
0.410	39	>75% Grass cover, Good, HSG A
0.330	74	>75% Grass cover, Good, HSG C
0.200	30	Woods, Good, HSG A
0.390	70	Woods, Good, HSG C
0.050	30	Meadow, non-grazed, HSG A
0.160	71	Meadow, non-grazed, HSG C
0.100	98	Water Surface, 0% imp, HSG A
2.090	67	Weighted Average
1.640	59	78.47% Pervious Area
0.450	98	21.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.16"
0.9	125	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
27.8	250	0.0001	0.15		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.9	190	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
37.8	615	Total			

Subcatchment MCPR-7D:



Summary for Subcatchment MCPR-7F:

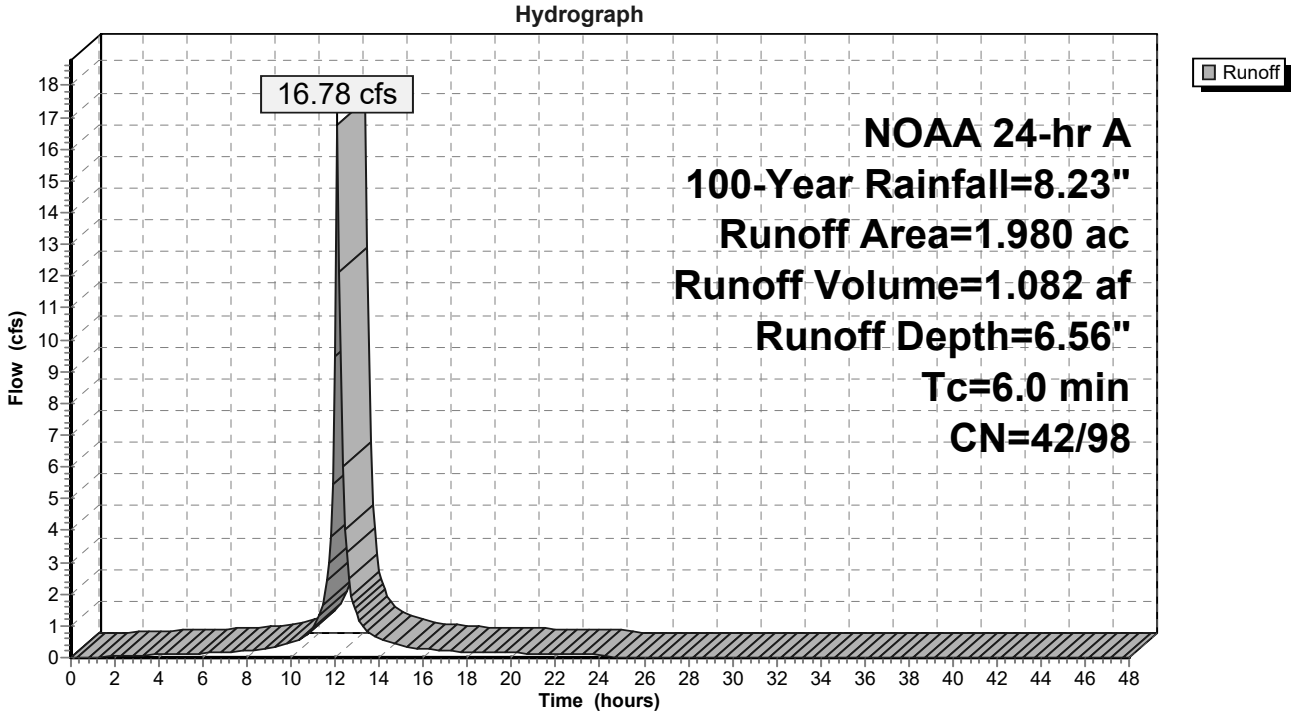
Runoff = 16.78 cfs @ 12.11 hrs, Volume= 1.082 af, Depth= 6.56"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.600	98	Roofs, HSG A
0.940	98	Paved parking, HSG A
0.420	39	>75% Grass cover, Good, HSG A
0.020	98	Water Surface, 0% imp, HSG A
1.980	85	Weighted Average
0.440	42	22.22% Pervious Area
1.540	98	77.78% Impervious Area

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

Subcatchment MCPR-7F:



Summary for Subcatchment MCPR-7G:

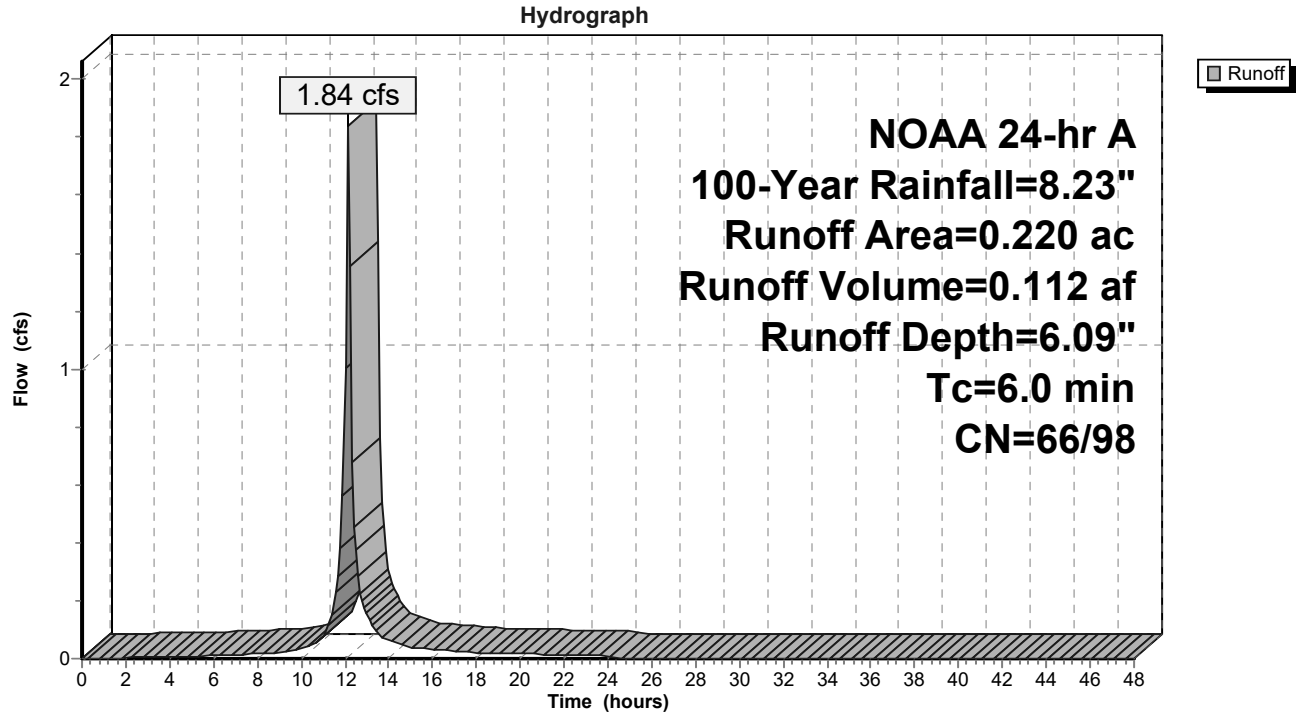
Runoff = 1.84 cfs @ 12.11 hrs, Volume= 0.112 af, Depth= 6.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.100	98	Paved parking, HSG A
0.010	98	Paved parking, HSG D
0.050	39	>75% Grass cover, Good, HSG A
0.030	80	>75% Grass cover, Good, HSG D
0.020	98	Water Surface, 0% imp, HSG A
0.010	98	Water Surface, 0% imp, HSG D
0.220	82	Weighted Average
0.110	66	50.00% Pervious Area
0.110	98	50.00% Impervious Area

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

Subcatchment MCPR-7G:



Summary for Subcatchment MCPR-7I:

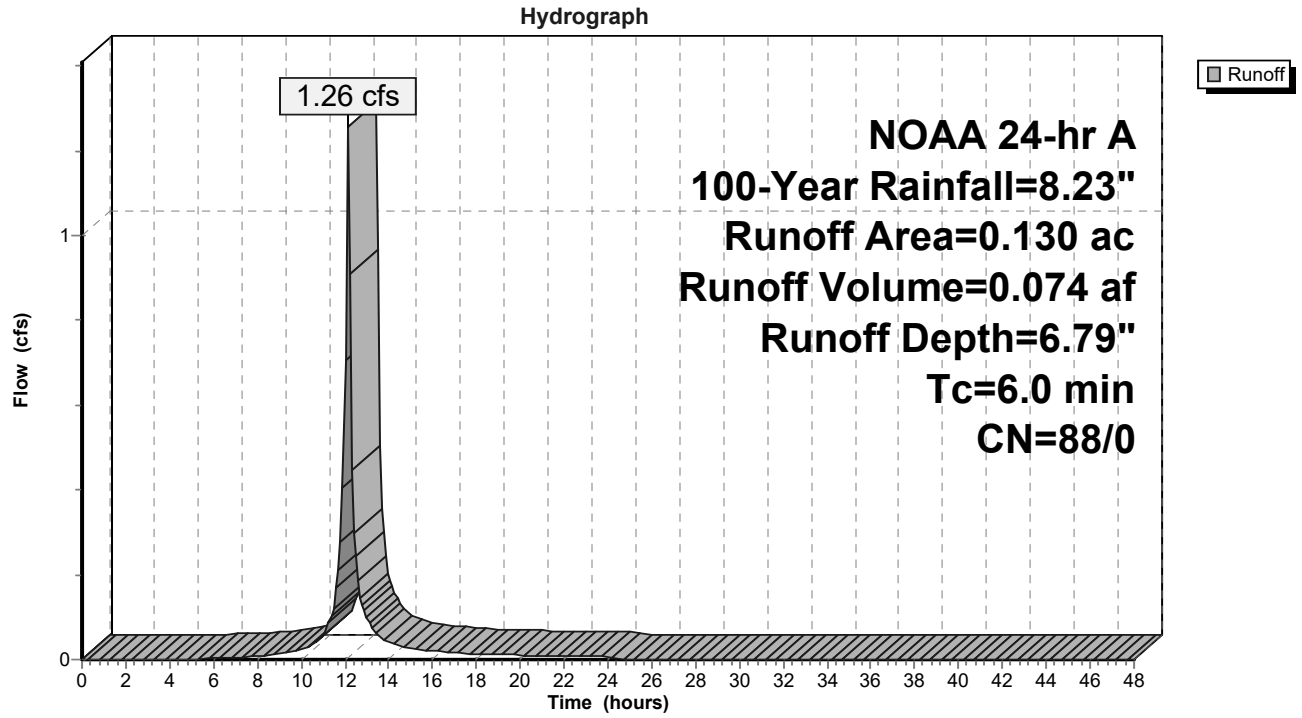
Runoff = 1.26 cfs @ 12.11 hrs, Volume= 0.074 af, Depth= 6.79"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.050	96	Gravel surface, HSG A
0.020	39	>75% Grass cover, Good, HSG A
0.060	98	Water Surface, 0% imp, HSG A
0.130	88	Weighted Average
0.130	88	100.00% Pervious Area

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

Subcatchment MCPR-7I:



Summary for Subcatchment MCPR-7K:

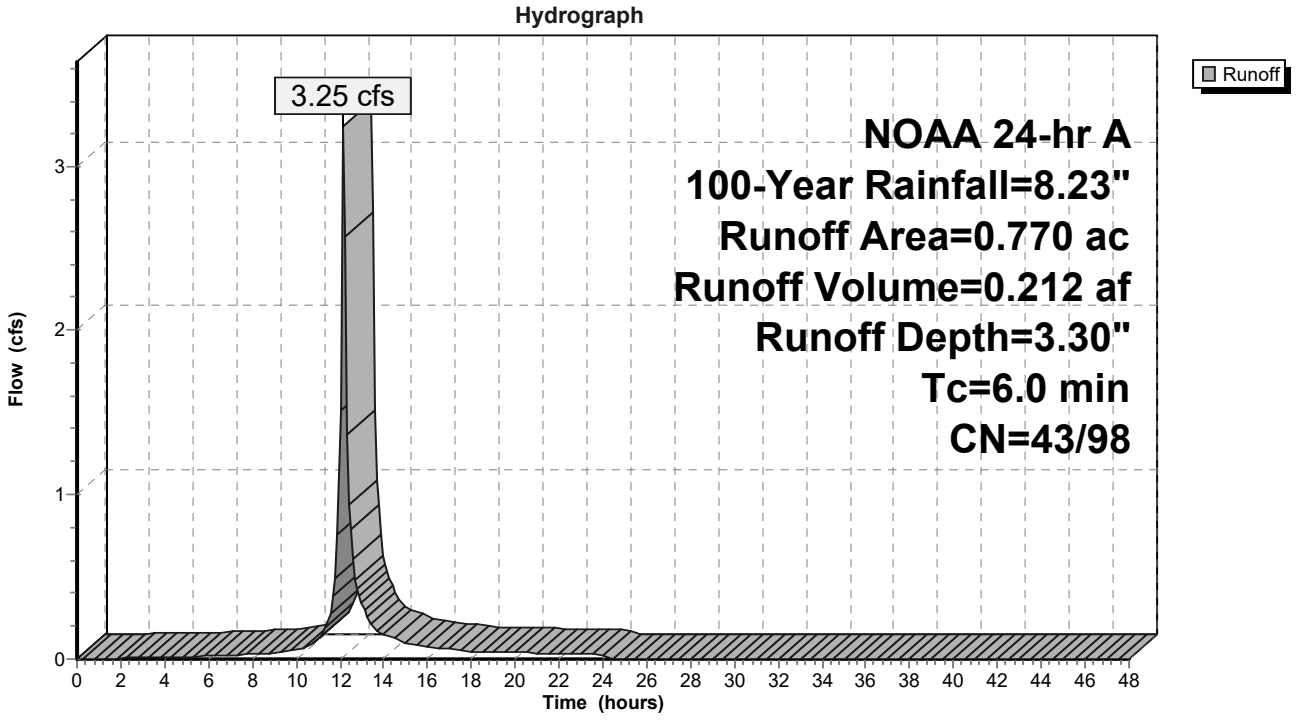
Runoff = 3.25 cfs @ 12.12 hrs, Volume= 0.212 af, Depth= 3.30"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.200	98	Roofs, HSG A
0.530	39	>75% Grass cover, Good, HSG A
0.040	98	Water Surface, 0% imp, HSG A
0.770	57	Weighted Average
0.570	43	74.03% Pervious Area
0.200	98	25.97% Impervious Area

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

Subcatchment MCPR-7K:



Summary for Subcatchment MCPR-7L:

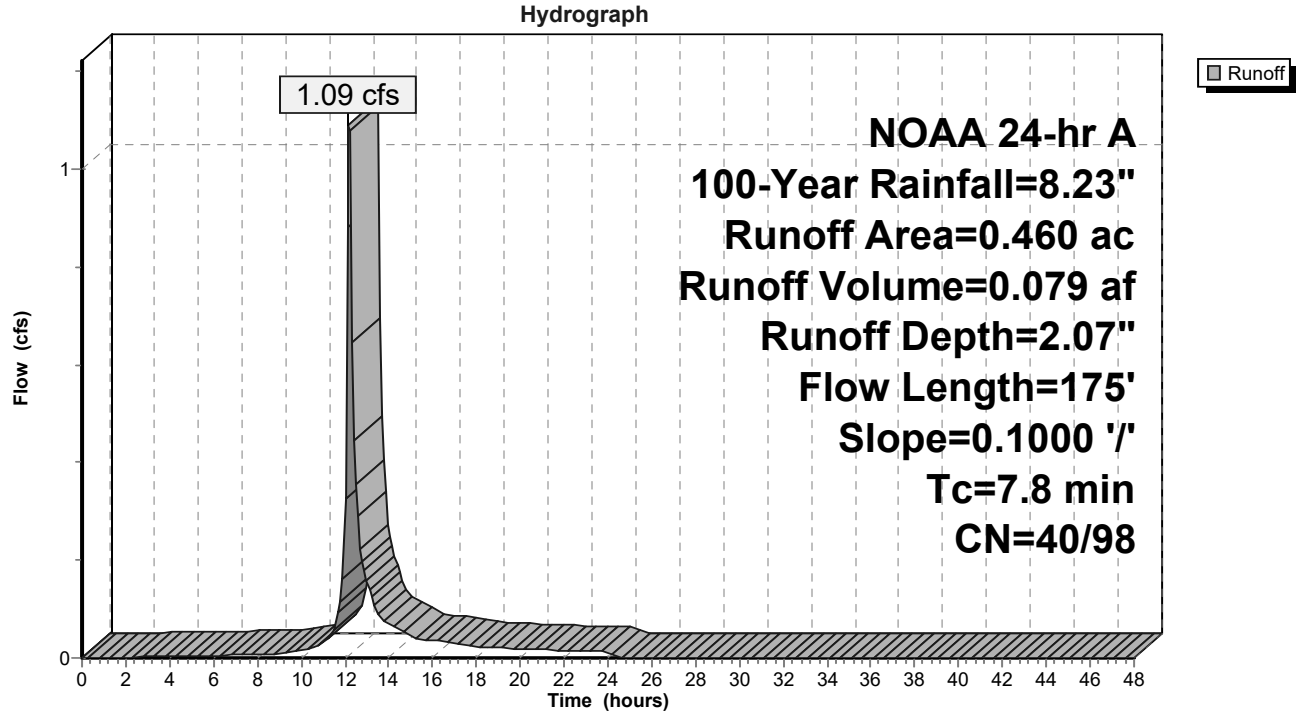
Runoff = 1.09 cfs @ 12.18 hrs, Volume= 0.079 af, Depth= 2.07"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.050	98	Roofs, HSG A
0.210	39	>75% Grass cover, Good, HSG A
0.170	30	Woods, Good, HSG A
0.030	98	Water Surface, 0% imp, HSG A
0.460	46	Weighted Average
0.410	40	89.13% Pervious Area
0.050	98	10.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.3	125	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.8	175	Total			

Subcatchment MCPR-7L:



Summary for Subcatchment MCPR-7M:

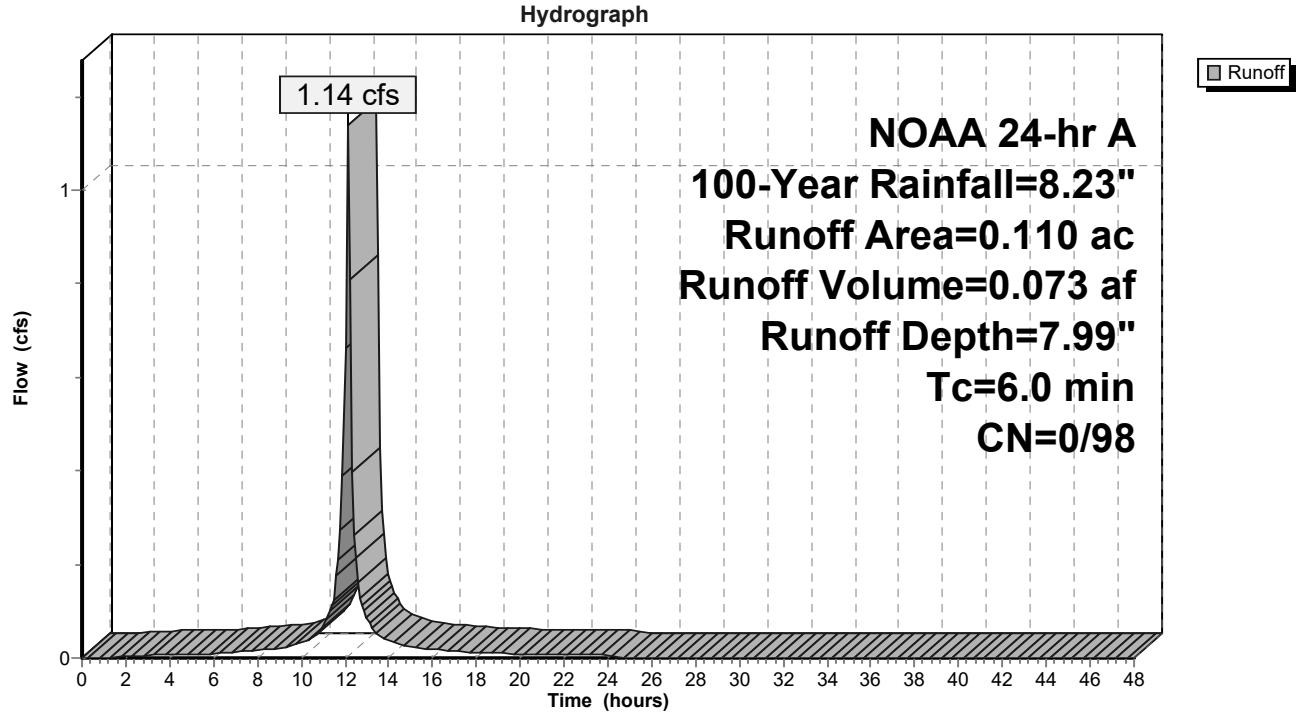
Runoff = 1.14 cfs @ 12.11 hrs, Volume= 0.073 af, Depth= 7.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.110	98	Paved parking, HSG A
0.110	98	100.00% Impervious Area

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

Subcatchment MCPR-7M:



Summary for Subcatchment MCPR-7N:

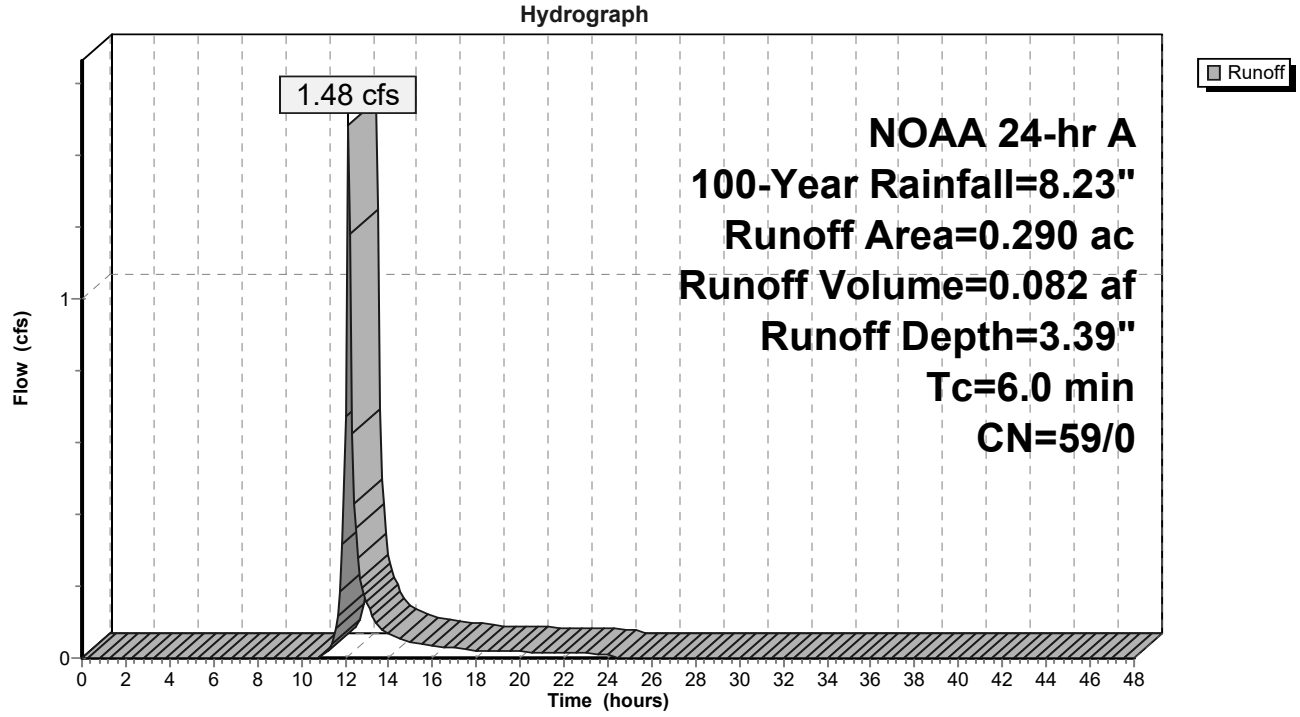
Runoff = 1.48 cfs @ 12.12 hrs, Volume= 0.082 af, Depth= 3.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.190	39	>75% Grass cover, Good, HSG A
0.100	98	Water Surface, 0% imp, HSG A
0.290	59	Weighted Average
0.290	59	100.00% Pervious Area

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

Subcatchment MCPR-7N:



Summary for Subcatchment MCPR-7O:

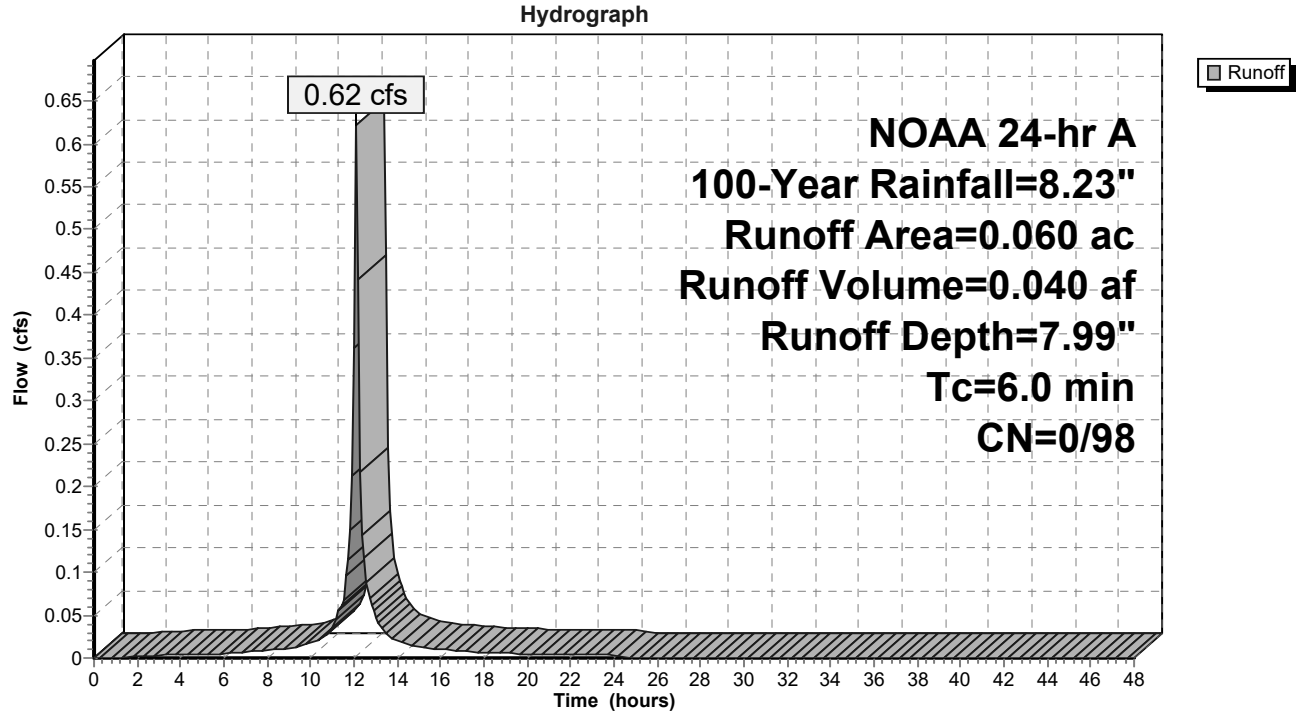
Runoff = 0.62 cfs @ 12.11 hrs, Volume= 0.040 af, Depth= 7.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

Area (ac)	CN	Description
0.060	98	Roofs, HSG A
0.060	98	100.00% Impervious Area

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

Subcatchment MCPR-7O:



Summary for Pond BASIN MC-1: Infiltration

Inflow Area = 5.640 ac, 41.84% Impervious, Inflow Depth = 3.41" for 100-Year event
Inflow = 17.06 cfs @ 12.21 hrs, Volume= 1.602 af
Outflow = 6.55 cfs @ 12.90 hrs, Volume= 1.602 af, Atten= 62%, Lag= 41.4 min
Discarded = 1.40 cfs @ 12.90 hrs, Volume= 1.017 af
Primary = 5.15 cfs @ 12.90 hrs, Volume= 0.585 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 154.46' @ 12.90 hrs Surf.Area= 7,331 sf Storage= 15,672 cf

Plug-Flow detention time= 58.5 min calculated for 1.599 af (100% of inflow)
Center-of-Mass det. time= 58.4 min (923.9 - 865.5)

Volume	Invert	Avail.Storage	Storage Description
#1	151.50'	28,683 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

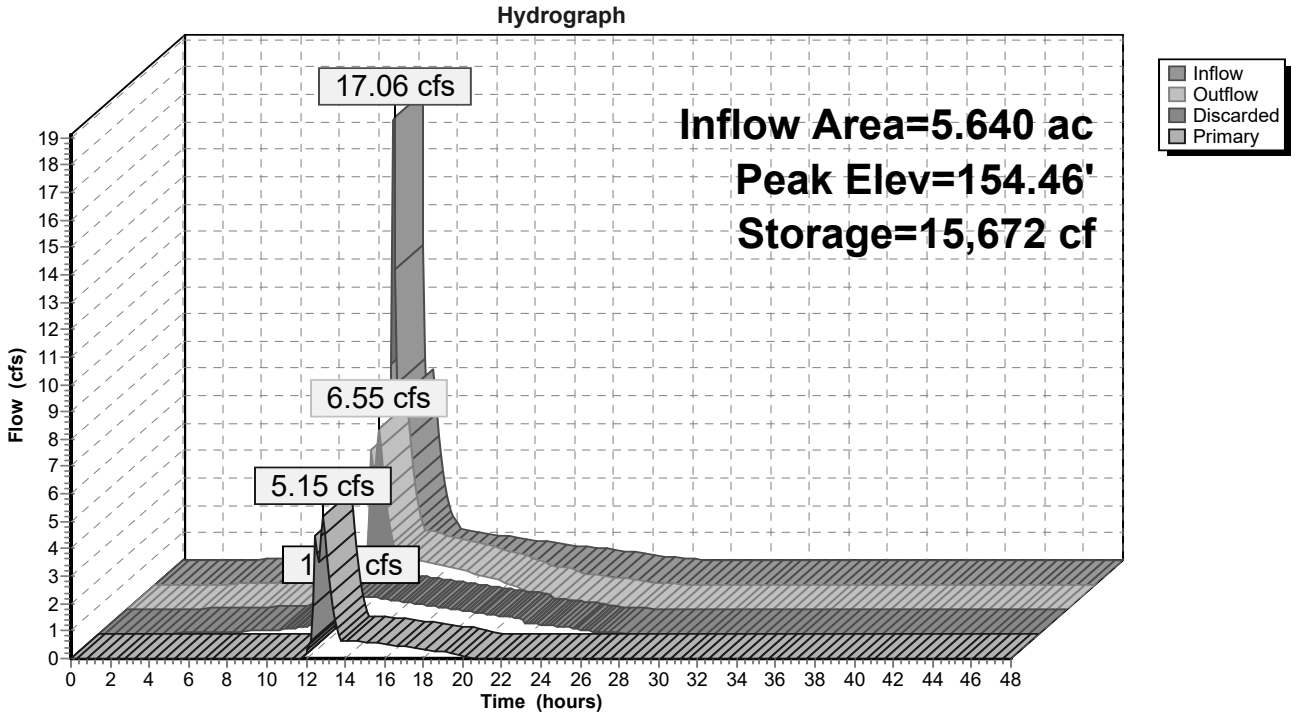
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
151.50	2,847	0	0
152.00	4,064	1,728	1,728
154.00	6,675	10,739	12,467
156.00	9,541	16,216	28,683

Device	Routing	Invert	Outlet Devices
#1	Primary	151.50'	**12.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 151.50' / 150.50' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	151.65'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	154.50'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	154.25'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#5	Discarded	151.50'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=1.40 cfs @ 12.90 hrs HW=154.46' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 1.40 cfs)

Primary OutFlow Max=5.11 cfs @ 12.90 hrs HW=154.46' (Free Discharge)
├**1=Culvert** (Passes 0.68 cfs of 5.93 cfs potential flow)
│ ├**2=Orifice/Grate** (Orifice Controls 0.68 cfs @ 7.82 fps)
│ └**3=Orifice/Grate** (Controls 0.00 cfs)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 4.43 cfs @ 1.07 fps)

Pond BASIN MC-1: Infiltration



Summary for Pond BASIN MC-2: Infiltration

Inflow Area = 0.460 ac, 10.87% Impervious, Inflow Depth = 2.07" for 100-Year event
Inflow = 1.09 cfs @ 12.18 hrs, Volume= 0.079 af
Outflow = 0.50 cfs @ 12.42 hrs, Volume= 0.079 af, Atten= 54%, Lag= 14.5 min
Discarded = 0.17 cfs @ 12.43 hrs, Volume= 0.072 af
Primary = 0.34 cfs @ 12.42 hrs, Volume= 0.008 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 161.81' @ 12.43 hrs Surf.Area= 882 sf Storage= 939 cf

Plug-Flow detention time= 51.1 min calculated for 0.079 af (99% of inflow)
Center-of-Mass det. time= 47.3 min (861.9 - 814.6)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	2,432 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

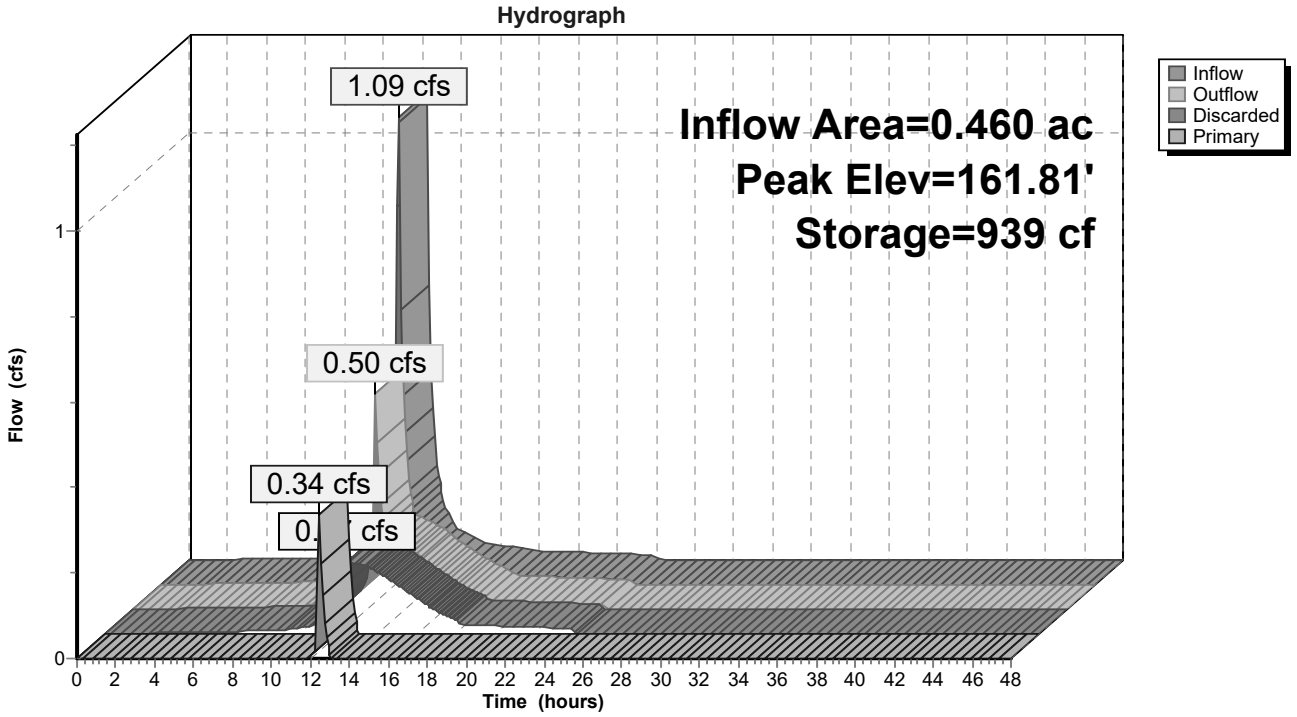
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	156	0	0
162.00	959	1,115	1,115
163.00	1,674	1,317	2,432

Device	Routing	Invert	Outlet Devices
#1	Primary	161.75'	**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
#2	Discarded	160.00'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.17 cfs @ 12.43 hrs HW=161.80' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=0.30 cfs @ 12.42 hrs HW=161.80' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.30 cfs @ 0.54 fps)

Pond BASIN MC-2: Infiltration



Summary for Pond BASIN MC-3: Infiltration

Inflow Area = 7.440 ac, 37.10% Impervious, Inflow Depth = 4.76" for 100-Year event
Inflow = 28.18 cfs @ 12.18 hrs, Volume= 2.953 af
Outflow = 15.43 cfs @ 12.37 hrs, Volume= 2.960 af, Atten= 45%, Lag= 11.8 min
Discarded = 2.11 cfs @ 12.38 hrs, Volume= 1.676 af
Primary = 13.32 cfs @ 12.37 hrs, Volume= 1.284 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 3
Peak Elev= 162.36' @ 12.38 hrs Surf.Area= 11,000 sf Storage= 21,833 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 33.8 min (853.7 - 819.9)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	41,868 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

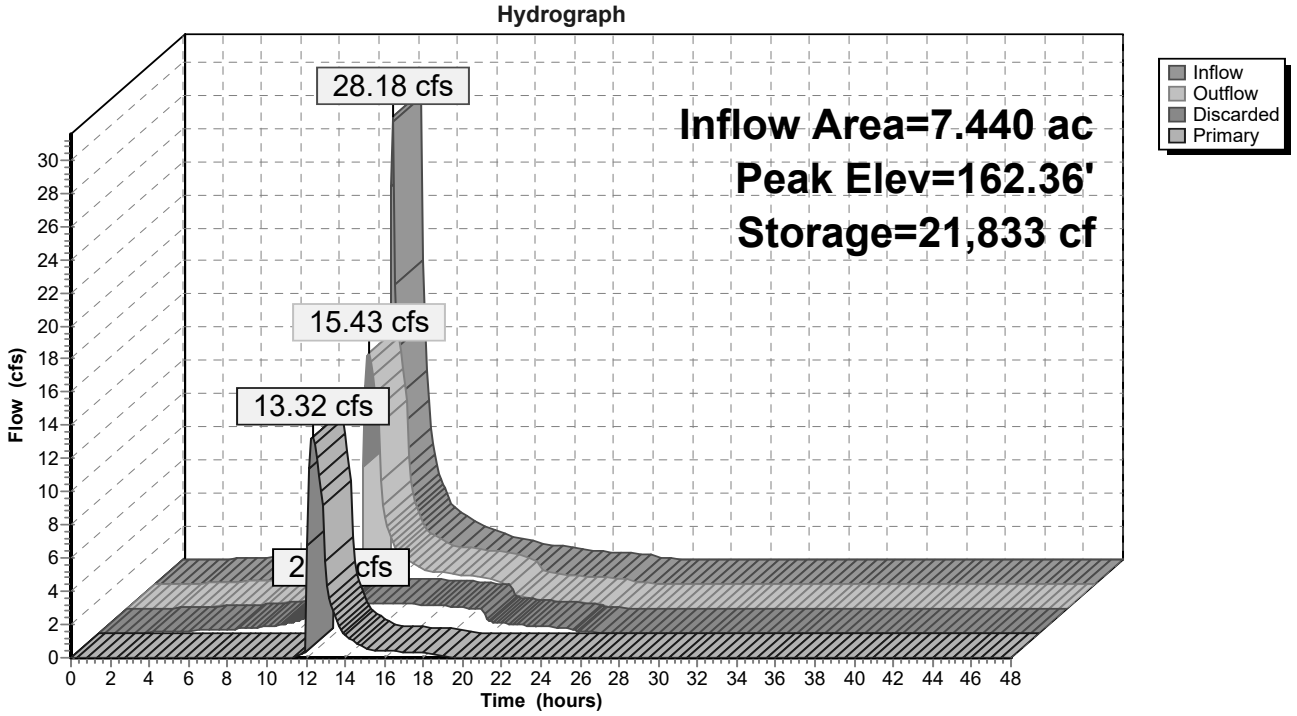
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	7,503	0	0
161.00	8,986	8,245	8,245
162.00	10,468	9,727	17,972
163.00	11,948	11,208	29,180
164.00	13,428	12,688	41,868

Device	Routing	Invert	Outlet Devices
#1	Primary	159.50'	**12.0" Round Culvert X 2.00** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.50' / 159.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	160.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	161.25'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	161.50'	**12.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 161.50' / 159.00' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#5	Primary	162.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#6	Discarded	160.00'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=2.10 cfs @ 12.38 hrs HW=162.35' (Free Discharge)
└**6=Exfiltration** (Exfiltration Controls 2.10 cfs)

Primary OutFlow Max=13.26 cfs @ 12.37 hrs HW=162.35' (Free Discharge)
└**1=Culvert** (Barrel Controls 11.03 cfs @ 7.02 fps)
└**2=Orifice/Grate** (Passes < 0.62 cfs potential flow)
└**3=Orifice/Grate** (Passes < 45.27 cfs potential flow)
└**4=Culvert** (Inlet Controls 2.23 cfs @ 3.14 fps)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond BASIN MC-3: Infiltration



Summary for Pond BASIN MC-4: Infiltration

Inflow Area = 0.310 ac, 67.74% Impervious, Inflow Depth = 7.53" for 100-Year event
Inflow = 3.13 cfs @ 12.11 hrs, Volume= 0.194 af
Outflow = 1.79 cfs @ 12.22 hrs, Volume= 0.195 af, Atten= 43%, Lag= 6.8 min
Discarded = 0.34 cfs @ 12.24 hrs, Volume= 0.070 af
Primary = 1.45 cfs @ 12.22 hrs, Volume= 0.125 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 171.85' @ 12.24 hrs Surf.Area= 1,799 sf Storage= 1,934 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.9 min (764.3 - 750.4)

Volume	Invert	Avail.Storage	Storage Description
#1	169.50'	4,729 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

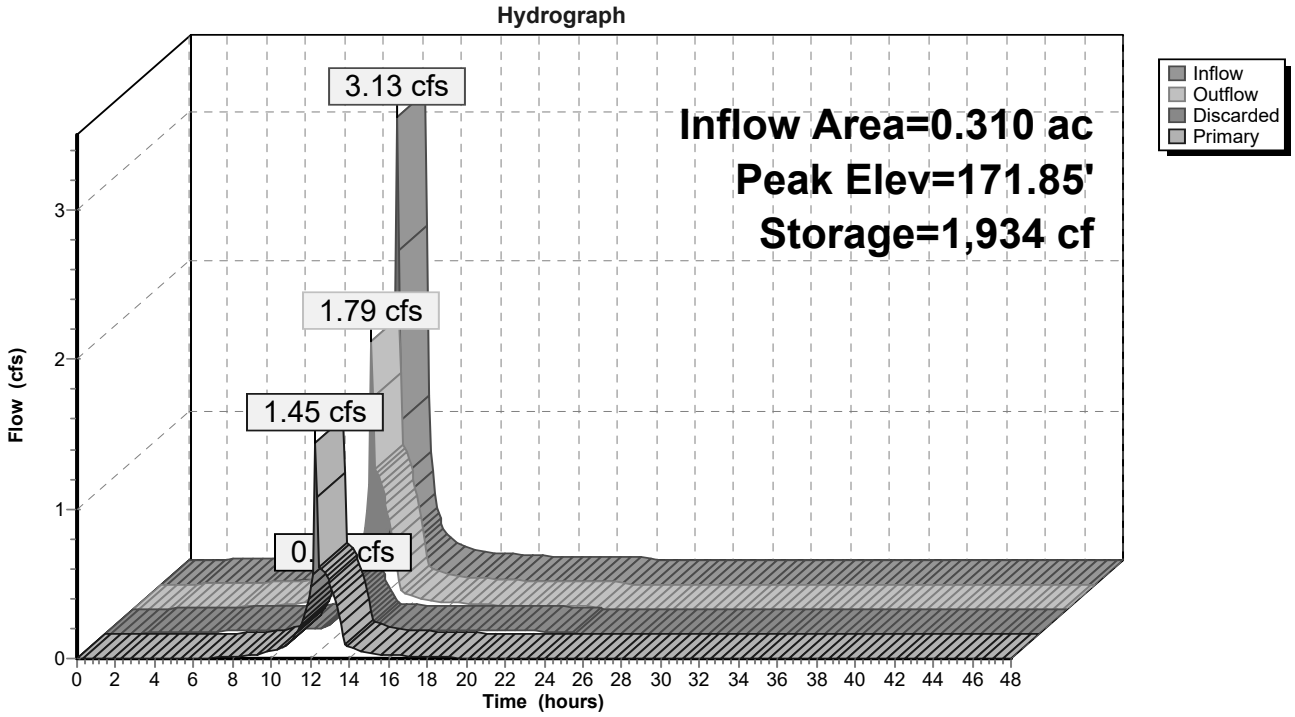
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
169.50	93	0	0
170.00	304	99	99
171.00	988	646	745
172.00	1,939	1,464	2,209
173.00	3,101	2,520	4,729

Device	Routing	Invert	Outlet Devices
#1	Primary	169.50'	**12.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 169.50' / 168.00' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	169.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	171.75'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#4	Discarded	169.50'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.34 cfs @ 12.24 hrs HW=171.81' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=1.32 cfs @ 12.22 hrs HW=171.81' (Free Discharge)
├**1=Culvert** (Passes 0.62 cfs of 5.09 cfs potential flow)
│ └**2=Orifice/Grate** (Orifice Controls 0.62 cfs @ 7.05 fps)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 0.71 cfs @ 0.58 fps)

Pond BASIN MC-4: Infiltration



Summary for Pond FB MC-1: Forebay

Inflow Area = 0.220 ac, 50.00% Impervious, Inflow Depth = 6.09" for 100-Year event
Inflow = 1.84 cfs @ 12.11 hrs, Volume= 0.112 af
Outflow = 0.11 cfs @ 13.31 hrs, Volume= 0.112 af, Atten= 94%, Lag= 72.0 min
Discarded = 0.11 cfs @ 13.31 hrs, Volume= 0.112 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 164.22' @ 13.31 hrs Surf.Area= 1,939 sf Storage= 2,730 cf

Plug-Flow detention time= 271.8 min calculated for 0.112 af (100% of inflow)
Center-of-Mass det. time= 271.7 min (1,035.7 - 764.1)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	2,785 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

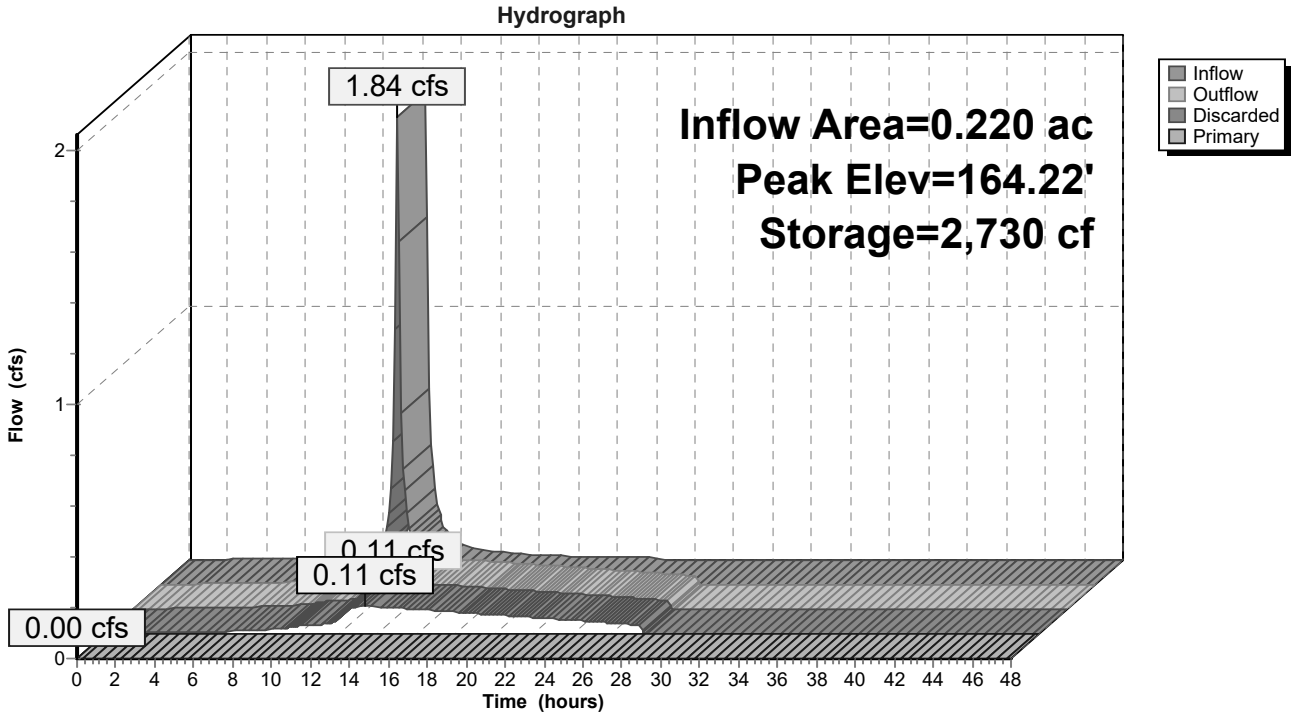
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.00	615	0	0
163.00	1,129	872	872
164.00	1,766	1,448	2,320
164.25	1,961	466	2,785

Device	Routing	Invert	Outlet Devices
#1	Discarded	162.00'	**2.410 in/hr Exfiltration over Horizontal area**
#2	Primary	164.25'	**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

Discarded OutFlow Max=0.11 cfs @ 13.31 hrs HW=164.22' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=162.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond FB MC-1: Forebay



Summary for Pond SDS MC-1: Detention

Inflow Area = 2.300 ac, 19.57% Impervious, Inflow Depth = 4.30" for 100-Year event
Inflow = 6.78 cfs @ 12.53 hrs, Volume= 0.825 af
Outflow = 4.92 cfs @ 12.84 hrs, Volume= 0.826 af, Atten= 27%, Lag= 18.8 min
Primary = 4.92 cfs @ 12.84 hrs, Volume= 0.826 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 171.96' @ 12.84 hrs Surf.Area= 2,695 sf Storage= 13,376 cf

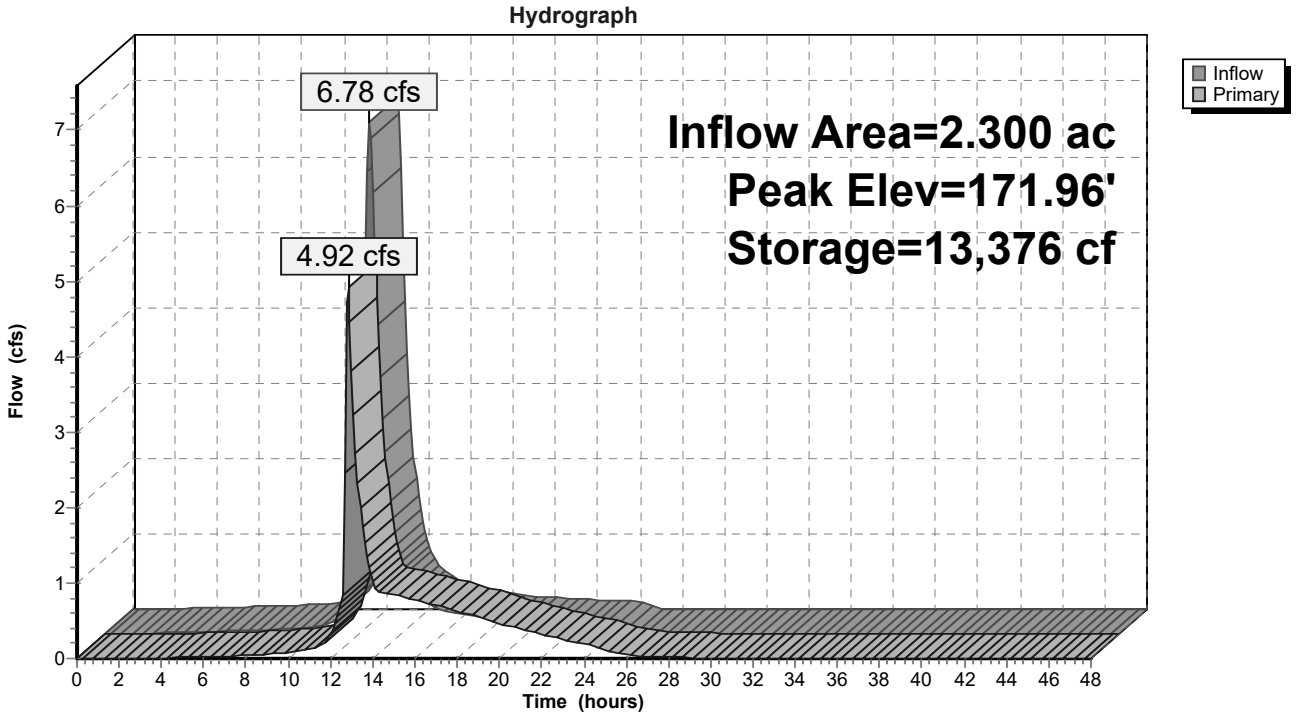
Plug-Flow detention time= 138.7 min calculated for 0.824 af (100% of inflow)
Center-of-Mass det. time= 140.4 min (959.0 - 818.6)

Volume	Invert	Avail.Storage	Storage Description
#1	167.00'	13,475 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 55
#2	172.00'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		13,491 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	167.00'	**12.0" Round Culvert** L= 100.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 167.00' / 166.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	167.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	171.50'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=4.61 cfs @ 12.84 hrs HW=171.94' (Free Discharge)
└**1=Culvert** (Passes 4.61 cfs of 6.50 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.92 cfs @ 10.52 fps)
  └**3=Sharp-Crested Rectangular Weir** (Weir Controls 3.69 cfs @ 2.16 fps)

Pond SDS MC-1: Detention



Summary for Pond SDS MC-2: Detention

Inflow Area = 1.140 ac, 70.18% Impervious, Inflow Depth = 6.93" for 100-Year event
Inflow = 10.59 cfs @ 12.11 hrs, Volume= 0.658 af
Outflow = 2.65 cfs @ 12.42 hrs, Volume= 0.567 af, Atten= 75%, Lag= 18.7 min
Primary = 2.65 cfs @ 12.42 hrs, Volume= 0.567 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 183.01' @ 12.42 hrs Surf.Area= 1,621 sf Storage= 8,085 cf

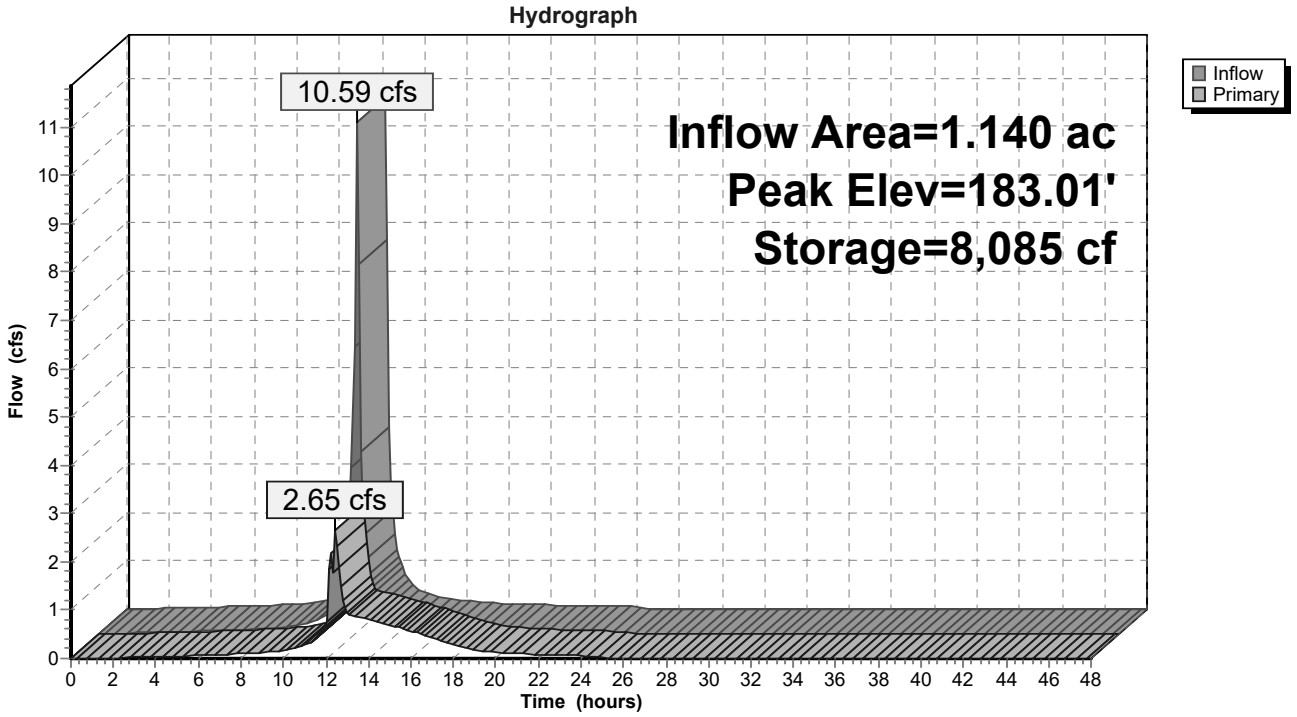
Plug-Flow detention time= 143.0 min calculated for 0.566 af (86% of inflow)
Center-of-Mass det. time= 90.4 min (843.2 - 752.8)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	8,085 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 33
#2	183.00'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		8,101 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**12.0" Round Culvert** L= 200.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 178.00' / 174.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	178.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	182.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=2.52 cfs @ 12.42 hrs HW=183.00' (Free Discharge)
└**1=Culvert** (Passes 2.52 cfs of 6.39 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.92 cfs @ 10.58 fps)
  └**3=Sharp-Crested Rectangular Weir** (Weir Controls 1.59 cfs @ 1.63 fps)

Pond SDS MC-2: Detention



Summary for Pond SDS MC-3: Detention

Inflow Area = 1.930 ac, 50.78% Impervious, Inflow Depth = 5.67" for 100-Year event
Inflow = 7.97 cfs @ 12.13 hrs, Volume= 0.912 af
Outflow = 4.81 cfs @ 12.22 hrs, Volume= 0.877 af, Atten= 40%, Lag= 5.2 min
Primary = 4.81 cfs @ 12.22 hrs, Volume= 0.877 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 4
Peak Elev= 172.14' @ 12.20 hrs Surf.Area= 1,229 sf Storage= 6,126 cf

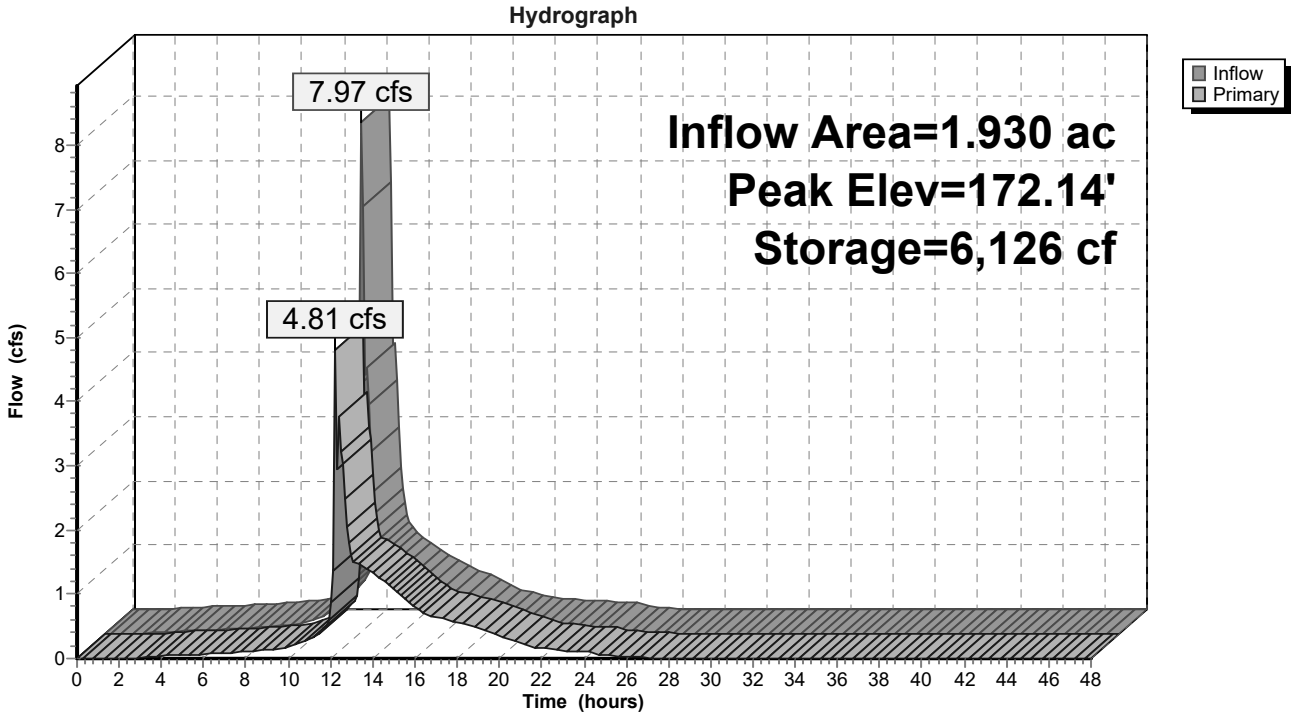
Plug-Flow detention time= 79.6 min calculated for 0.875 af (96% of inflow)
Center-of-Mass det. time= 58.6 min (879.2 - 820.6)

Volume	Invert	Avail.Storage	Storage Description
#1	167.00'	6,125 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 25
#2	172.00'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		6,141 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	167.00'	**12.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 167.00' / 166.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	167.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	169.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	171.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=4.45 cfs @ 12.22 hrs HW=172.12' (Free Discharge)
└**1=Culvert** (Passes 4.45 cfs of 8.13 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.93 cfs @ 10.71 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.66 cfs @ 7.54 fps)
  └**4=Sharp-Crested Rectangular Weir** (Weir Controls 2.85 cfs @ 1.98 fps)

Pond SDS MC-3: Detention



Summary for Pond SDS MC-4: Detention

Inflow Area = 1.030 ac, 80.58% Impervious, Inflow Depth = 7.44" for 100-Year event
Inflow = 10.16 cfs @ 12.11 hrs, Volume= 0.638 af
Outflow = 3.80 cfs @ 12.26 hrs, Volume= 0.597 af, Atten= 63%, Lag= 9.0 min
Primary = 3.80 cfs @ 12.26 hrs, Volume= 0.597 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 3
Peak Elev= 168.00' @ 12.26 hrs Surf.Area= 1,719 sf Storage= 8,575 cf

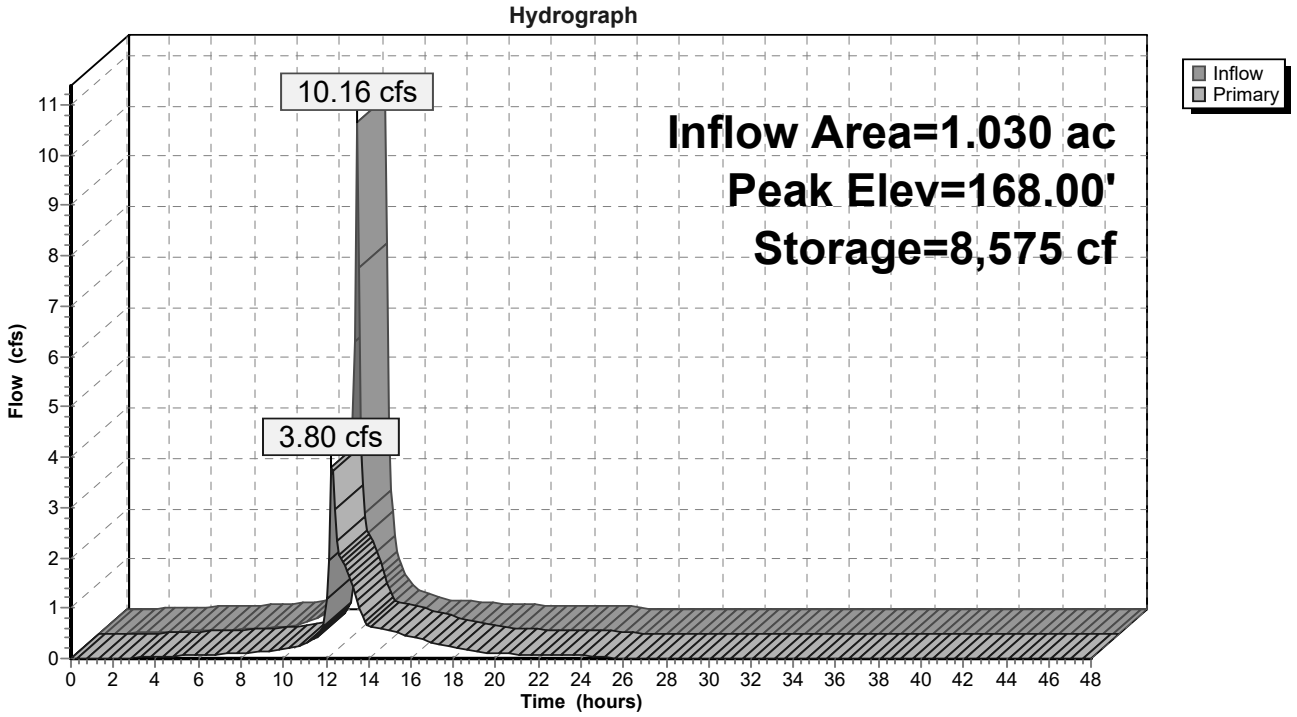
Plug-Flow detention time= 106.5 min calculated for 0.597 af (94% of inflow)
Center-of-Mass det. time= 72.3 min (820.1 - 747.8)

Volume	Invert	Avail.Storage	Storage Description
#1	163.00'	8,575 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 35
#2	168.00'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		8,591 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	163.00'	**12.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 163.00' / 162.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	163.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	165.65'	**4.0" Vert. Orifice/Grate X 2.00** C= 0.600
#4	Device 1	167.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=3.70 cfs @ 12.26 hrs HW=167.99' (Free Discharge)
└**1=Culvert** (Passes 3.70 cfs of 8.01 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.92 cfs @ 10.58 fps)
  ├**3=Orifice/Grate** (Orifice Controls 1.24 cfs @ 7.10 fps)
  └**4=Sharp-Crested Rectangular Weir** (Weir Controls 1.54 cfs @ 1.61 fps)

Pond SDS MC-4: Detention



Summary for Pond SIS MC-1: Infiltration

Inflow Area = 1.980 ac, 77.78% Impervious, Inflow Depth = 6.56" for 100-Year event
Inflow = 16.78 cfs @ 12.11 hrs, Volume= 1.082 af
Outflow = 11.88 cfs @ 12.23 hrs, Volume= 1.076 af, Atten= 29%, Lag= 7.1 min
Discarded = 0.71 cfs @ 10.80 hrs, Volume= 0.780 af
Primary = 11.16 cfs @ 12.23 hrs, Volume= 0.296 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 160.97' @ 12.24 hrs Surf.Area= 3,712 sf Storage= 14,869 cf

Plug-Flow detention time= 101.1 min calculated for 1.074 af (99% of inflow)
Center-of-Mass det. time= 97.0 min (843.3 - 746.3)

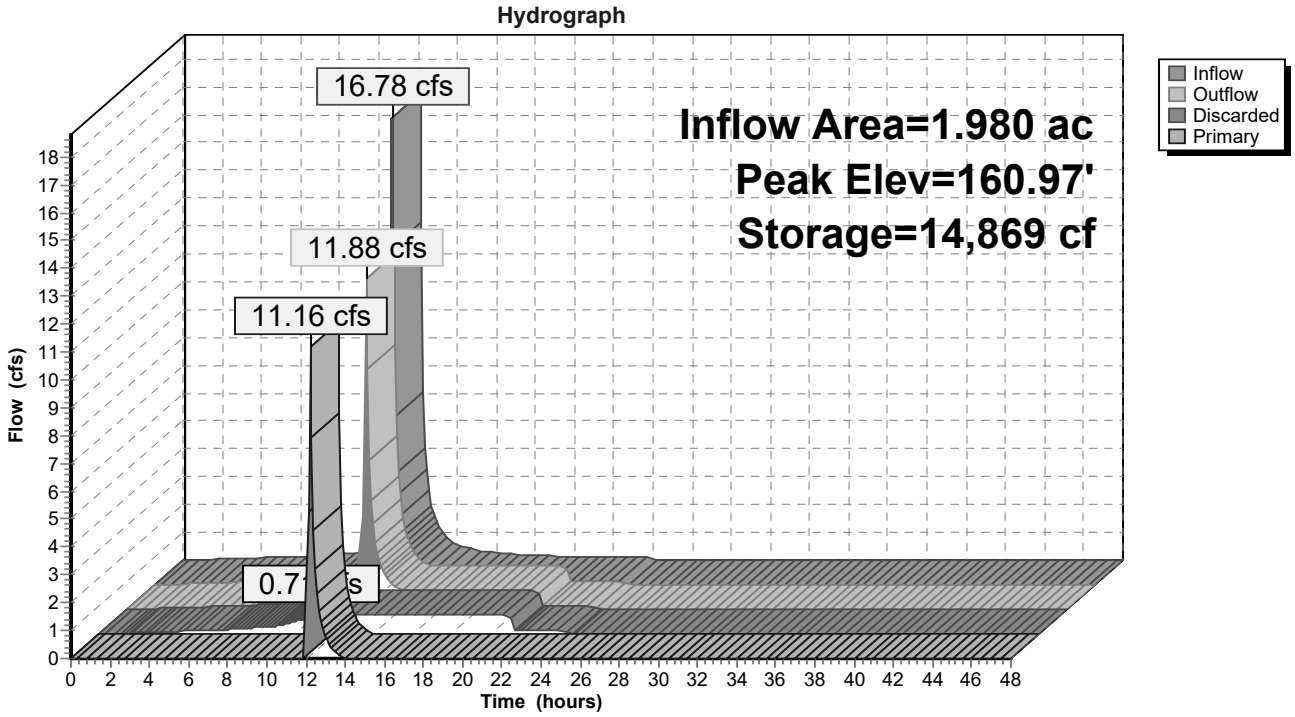
Volume	Invert	Avail.Storage	Storage Description
#1	155.50'	742 cf	**8.00'W x 8.00'L x 0.50'H Prismatoid** x 58 1,856 cf Overall x 40.0% Voids
#2	156.00'	14,210 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 58 -Impervious
#3	161.00'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		14,968 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	156.00'	**15.0" Round Culvert** L= 100.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 156.00' / 155.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	160.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Discarded	155.50'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.71 cfs @ 10.80 hrs HW=155.60' (Free Discharge)
↑**3=Exfiltration** (Exfiltration Controls 0.71 cfs)

Primary OutFlow Max=9.78 cfs @ 12.23 hrs HW=160.85' (Free Discharge)
↑**1=Culvert** (Passes 9.78 cfs of 10.79 cfs potential flow)
↑**2=Sharp-Crested Rectangular Weir** (Weir Controls 9.78 cfs @ 3.01 fps)

Pond SIS MC-1: Infiltration



Summary for Pond SIS MC-2: Infiltration

Inflow Area = 0.600 ac, 55.00% Impervious, Inflow Depth = 4.96" for 100-Year event
Inflow = 3.77 cfs @ 12.11 hrs, Volume= 0.248 af
Outflow = 2.27 cfs @ 12.23 hrs, Volume= 0.244 af, Atten= 40%, Lag= 7.1 min
Discarded = 0.20 cfs @ 11.10 hrs, Volume= 0.183 af
Primary = 2.07 cfs @ 12.23 hrs, Volume= 0.062 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 164.53' @ 12.24 hrs Surf.Area= 1,028 sf Storage= 3,145 cf

Plug-Flow detention time= 83.8 min calculated for 0.244 af (98% of inflow)
Center-of-Mass det. time= 74.7 min (829.5 - 754.8)

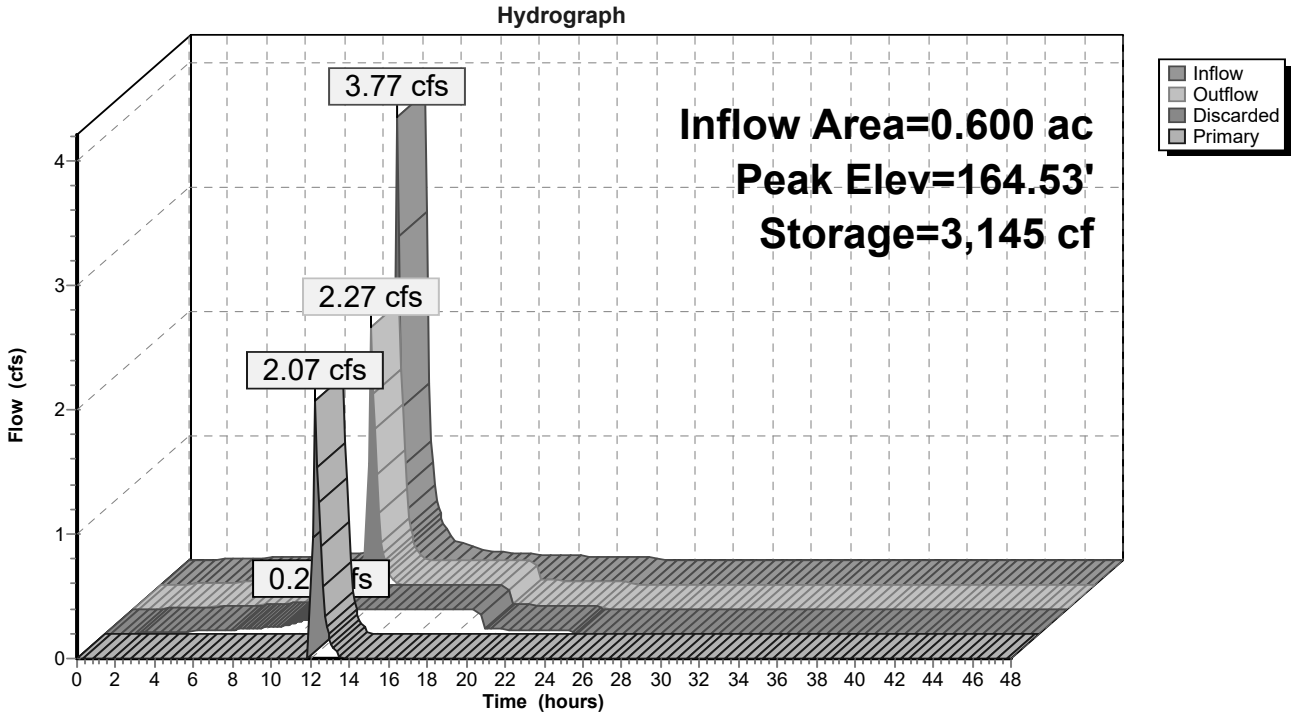
Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	205 cf	**8.00'W x 8.00'L x 0.50'H Prismatoid** x 16 512 cf Overall x 40.0% Voids
#2	159.50'	1,470 cf	**7.00'W x 7.00'L x 5.00'H Prismatoid** x 6 -Impervious
#3	159.50'	1,470 cf	**7.00'W x 7.00'L x 3.00'H Prismatoid** x 10 -Impervious
#4	164.50'	16 cf	**2.00'W x 2.00'L x 4.00'H Prismatoid**
		3,161 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	159.00'	**12.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 159.00' / 158.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	162.50'	**4.0" Vert. Orifice/Grate X 3.00** C= 0.600
#3	Device 1	164.25'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Discarded	159.00'	**8.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.20 cfs @ 11.10 hrs HW=159.11' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=1.65 cfs @ 12.23 hrs HW=164.27' (Free Discharge)
└**1=Culvert** (Passes 1.65 cfs of 8.26 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.60 cfs @ 6.11 fps)
  └**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.05 cfs @ 0.51 fps)

Pond SIS MC-2: Infiltration



Summary for Pond WQS MC-1: Wet Swale

Inflow Area = 0.130 ac, 23.08% Impervious, Inflow Depth = 4.45" for 100-Year event
Inflow = 0.82 cfs @ 12.12 hrs, Volume= 0.048 af
Outflow = 0.06 cfs @ 13.23 hrs, Volume= 0.048 af, Atten= 93%, Lag= 66.9 min
Discarded = 0.06 cfs @ 13.23 hrs, Volume= 0.048 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 156.98' @ 13.23 hrs Surf.Area= 1,051 sf Storage= 1,136 cf

Plug-Flow detention time= 223.2 min calculated for 0.048 af (100% of inflow)
Center-of-Mass det. time= 223.1 min (1,010.4 - 787.4)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	1,156 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

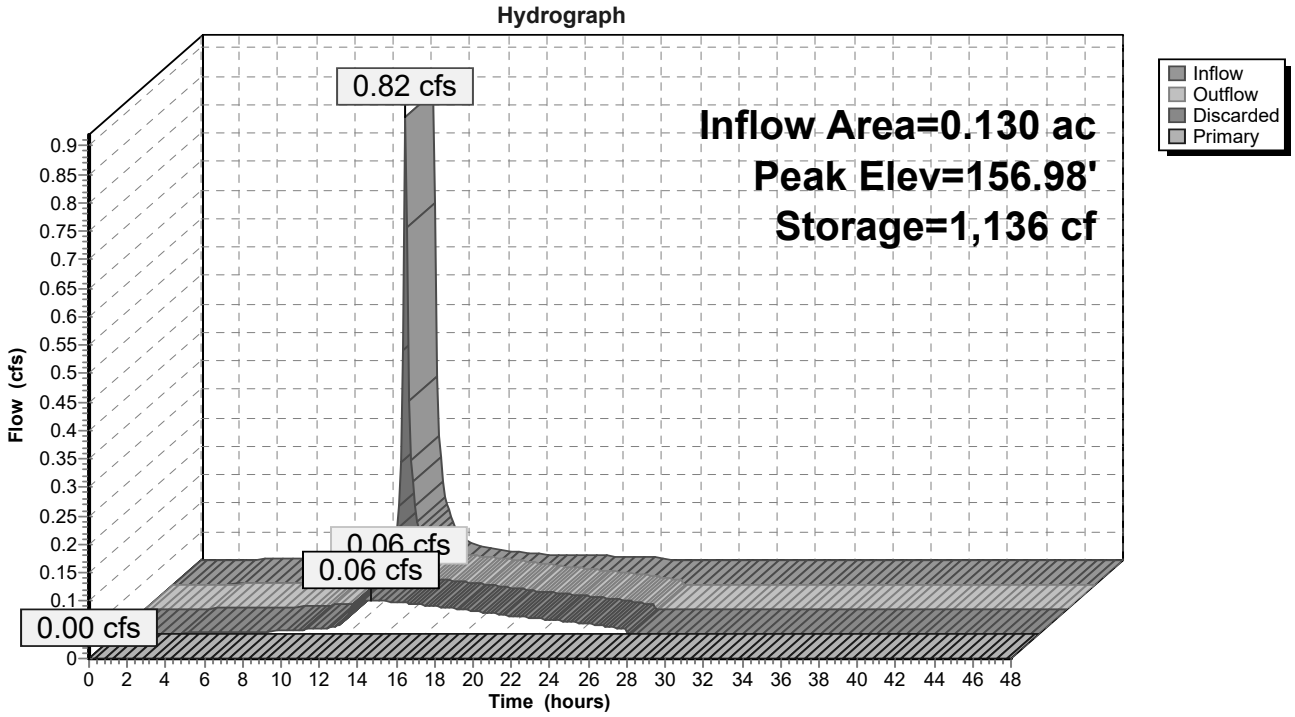
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
155.00	142	0	0
156.00	555	349	349
157.00	1,060	808	1,156

Device	Routing	Invert	Outlet Devices
#1	Discarded	155.00'	**2.410 in/hr Exfiltration over Horizontal area**
#2	Primary	157.00'	**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

Discarded OutFlow Max=0.06 cfs @ 13.23 hrs HW=156.98' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=155.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond WQS MC-1: Wet Swale



Summary for Pond WQS MC-2: Wet Swale

Inflow Area = 0.080 ac, 12.50% Impervious, Inflow Depth = 6.42" for 100-Year event
Inflow = 0.74 cfs @ 12.11 hrs, Volume= 0.043 af
Outflow = 0.06 cfs @ 13.04 hrs, Volume= 0.043 af, Atten= 92%, Lag= 55.9 min
Discarded = 0.06 cfs @ 13.04 hrs, Volume= 0.043 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 160.48' @ 13.04 hrs Surf.Area= 1,018 sf Storage= 1,001 cf

Plug-Flow detention time= 182.5 min calculated for 0.043 af (100% of inflow)
Center-of-Mass det. time= 182.5 min (958.6 - 776.1)

Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	1,022 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

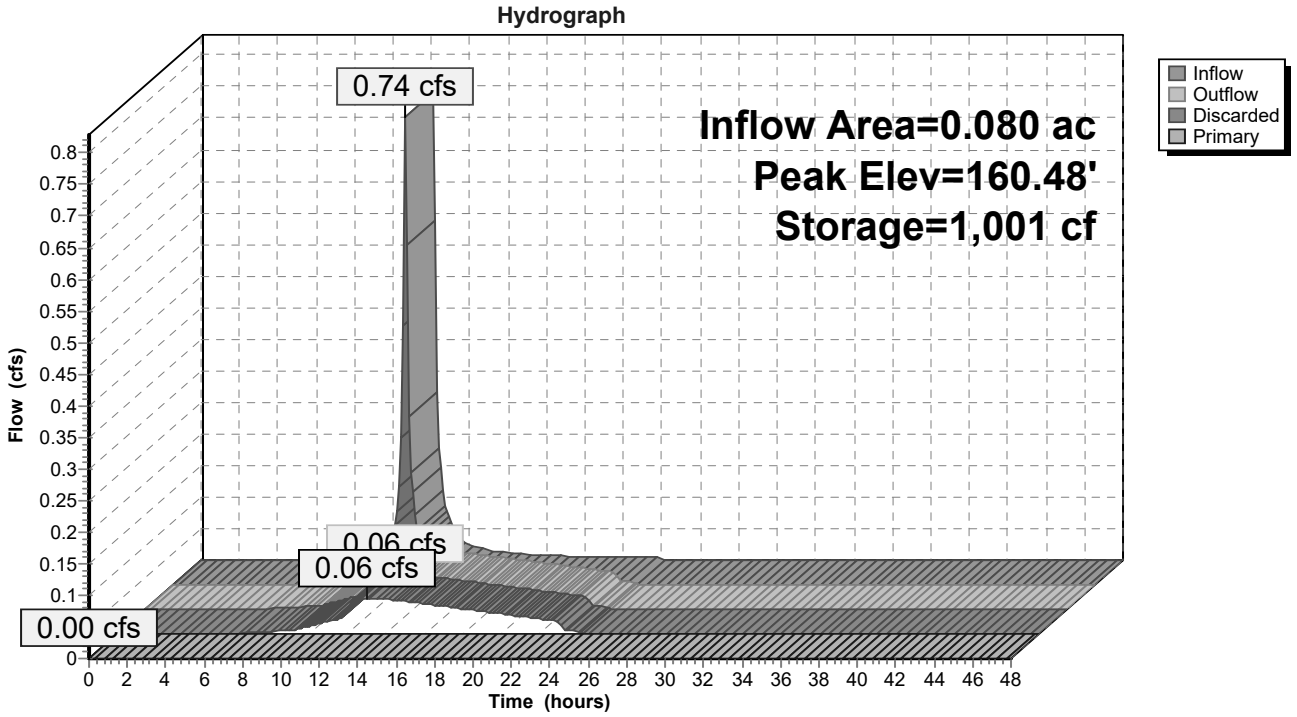
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
159.00	344	0	0
160.00	791	568	568
160.50	1,028	455	1,022

Device	Routing	Invert	Outlet Devices
#1	Discarded	159.00'	**2.410 in/hr Exfiltration over Horizontal area**
#2	Primary	160.50'	**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

Discarded OutFlow Max=0.06 cfs @ 13.04 hrs HW=160.48' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond WQS MC-2: Wet Swale



Summary for Pond WQS MC-3: Wet Swale

Inflow Area = 0.080 ac, 12.50% Impervious, Inflow Depth = 6.42" for 100-Year event
Inflow = 0.74 cfs @ 12.11 hrs, Volume= 0.043 af
Outflow = 0.06 cfs @ 13.01 hrs, Volume= 0.043 af, Atten= 92%, Lag= 53.6 min
Discarded = 0.06 cfs @ 13.01 hrs, Volume= 0.043 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 162.48' @ 13.01 hrs Surf.Area= 1,075 sf Storage= 997 cf

Plug-Flow detention time= 176.7 min calculated for 0.043 af (100% of inflow)
Center-of-Mass det. time= 176.3 min (952.5 - 776.1)

Volume	Invert	Avail.Storage	Storage Description
#1	161.00'	1,024 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

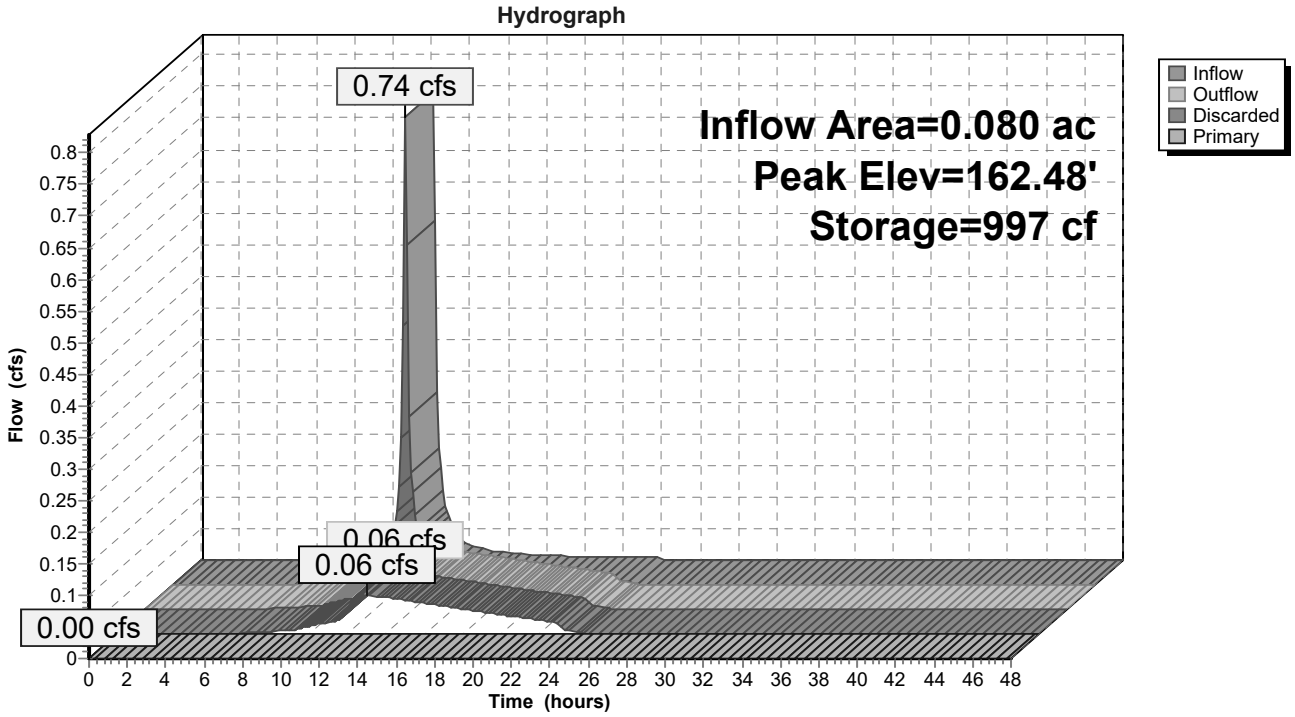
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.00	301	0	0
162.00	801	551	551
162.50	1,089	473	1,024

Device	Routing	Invert	Outlet Devices
#1	Discarded	161.00'	**2.410 in/hr Exfiltration over Horizontal area**
#2	Primary	162.50'	**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

Discarded OutFlow Max=0.06 cfs @ 13.01 hrs HW=162.48' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond WQS MC-3: Wet Swale



Summary for Pond WQS MC-4: Wet Swale

Inflow Area = 0.530 ac, 20.75% Impervious, Inflow Depth = 4.98" for 100-Year event
Inflow = 3.47 cfs @ 12.18 hrs, Volume= 0.220 af
Outflow = 3.35 cfs @ 12.19 hrs, Volume= 0.223 af, Atten= 3%, Lag= 0.4 min
Discarded = 0.09 cfs @ 12.19 hrs, Volume= 0.104 af
Primary = 3.26 cfs @ 12.19 hrs, Volume= 0.119 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 157.41' @ 12.19 hrs Surf.Area= 1,646 sf Storage= 1,668 cf

Plug-Flow detention time= 81.1 min calculated for 0.220 af (100% of inflow)
Center-of-Mass det. time= 88.8 min (878.8 - 790.0)

Volume	Invert	Avail.Storage	Storage Description
#1	156.00'	1,815 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

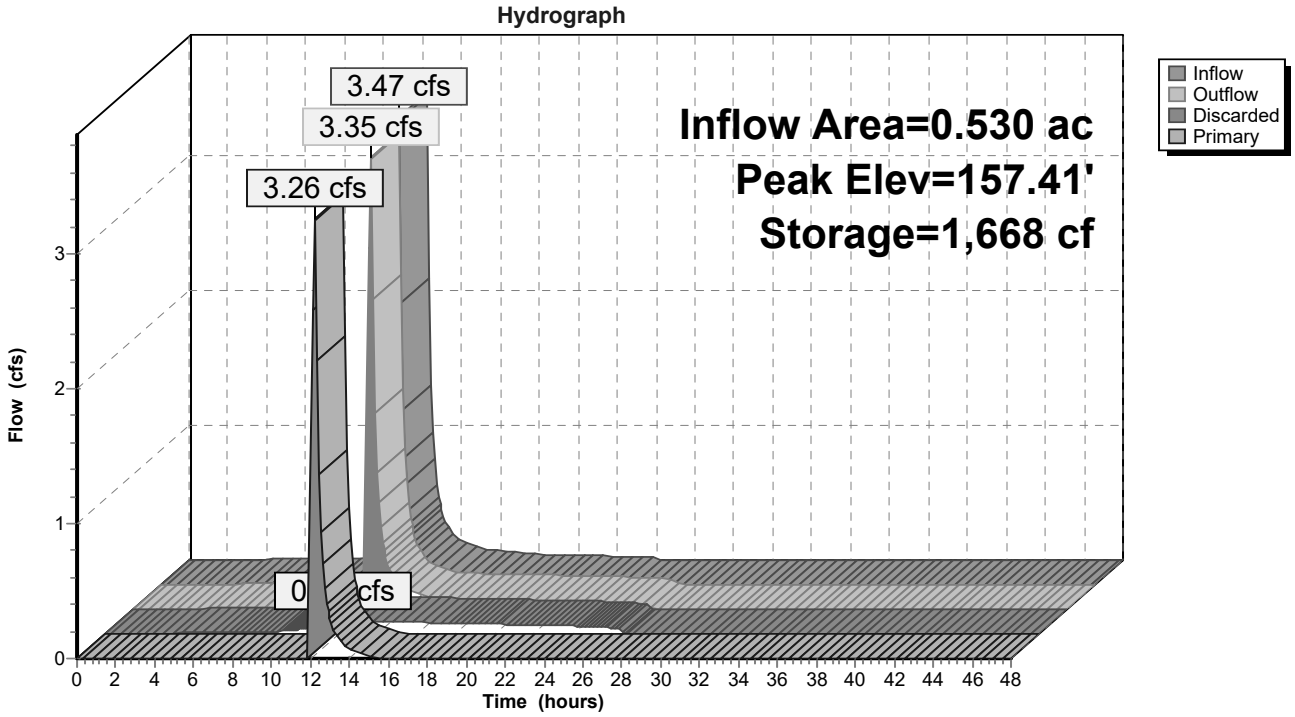
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
156.00	738	0	0
157.00	1,359	1,049	1,049
157.50	1,707	767	1,815

Device	Routing	Invert	Outlet Devices
#1	Discarded	156.00'	**2.410 in/hr Exfiltration over Horizontal area**
#2	Primary	157.25'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.09 cfs @ 12.19 hrs HW=157.41' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=3.17 cfs @ 12.19 hrs HW=157.41' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 3.17 cfs @ 0.99 fps)

Pond WQS MC-4: Wet Swale

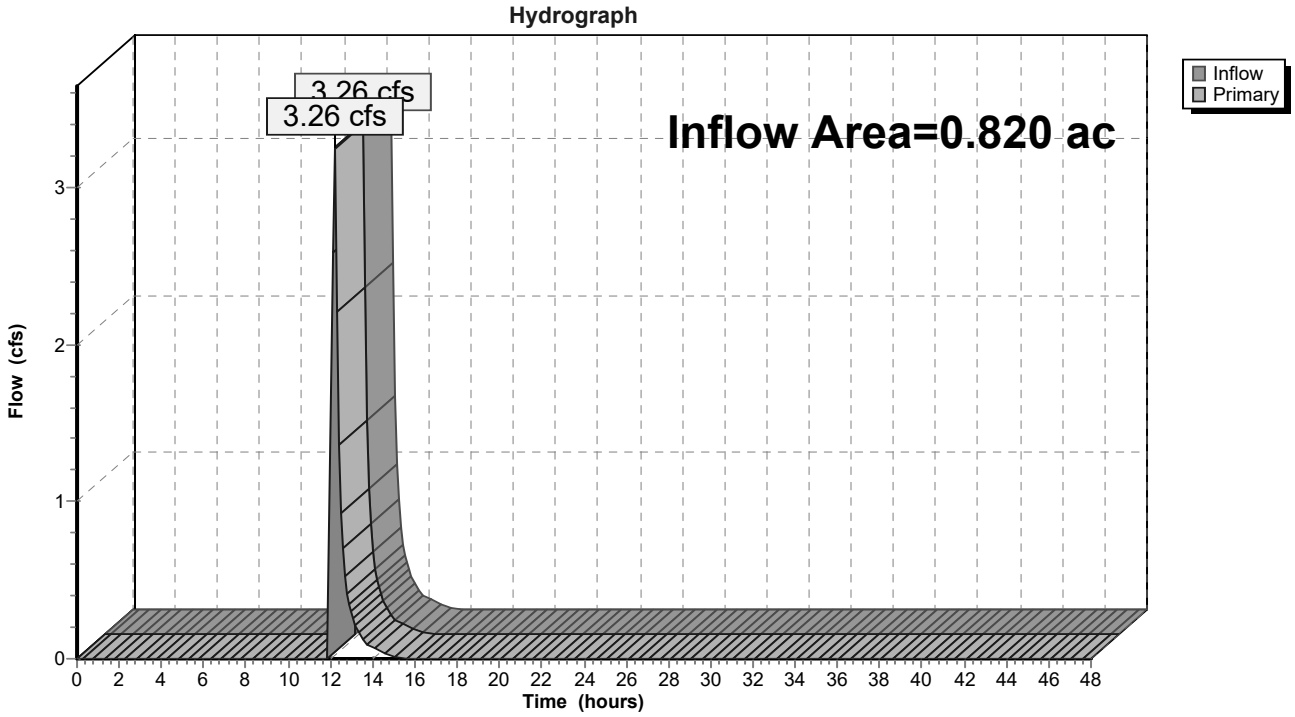


Summary for Link POA-1:

Inflow Area = 0.820 ac, 19.51% Impervious, Inflow Depth = 1.74" for 100-Year event
Inflow = 3.26 cfs @ 12.19 hrs, Volume= 0.119 af
Primary = 3.26 cfs @ 12.19 hrs, Volume= 0.119 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-1:

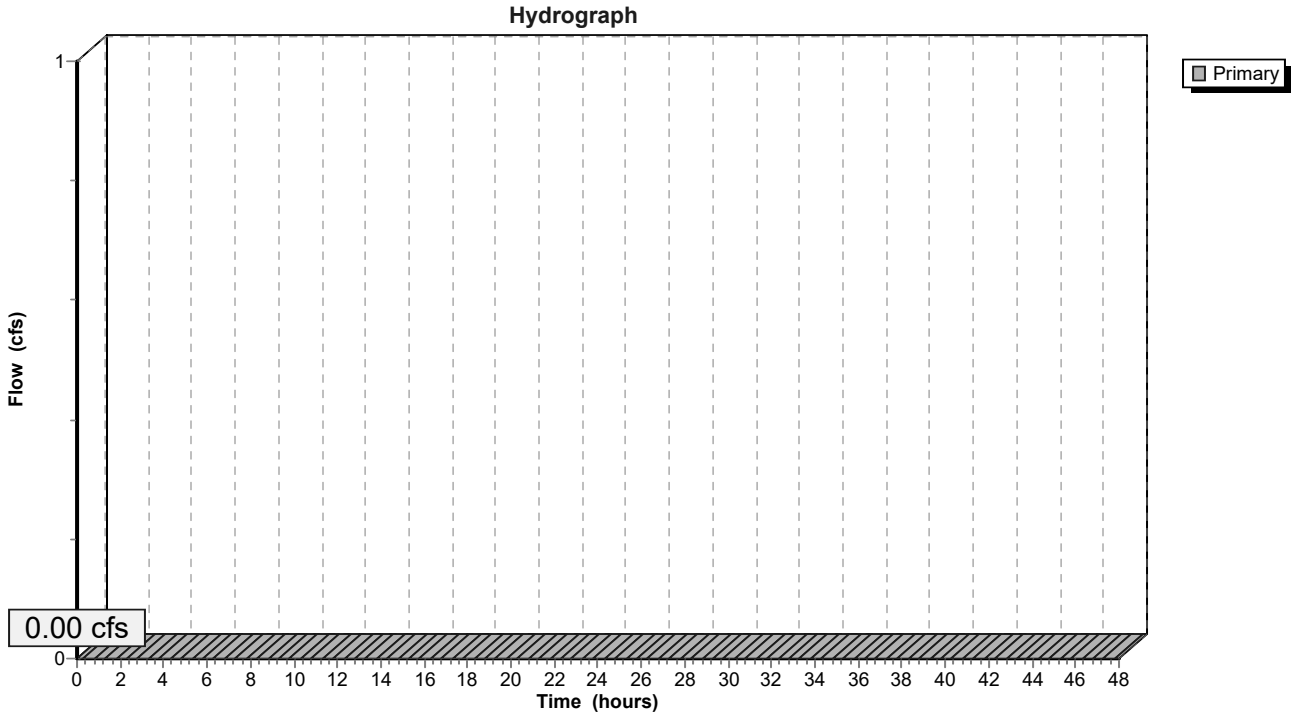


Summary for Link POA-2:

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-2:

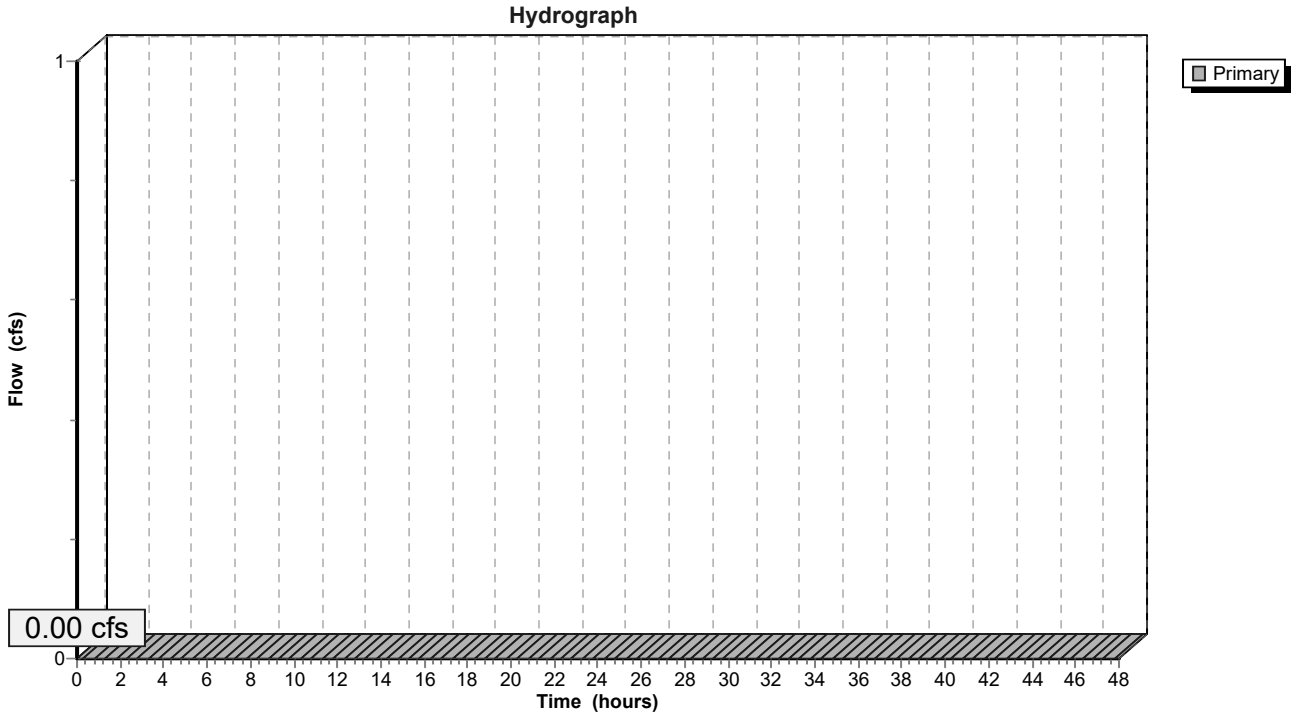


Summary for Link POA-3:

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-3:

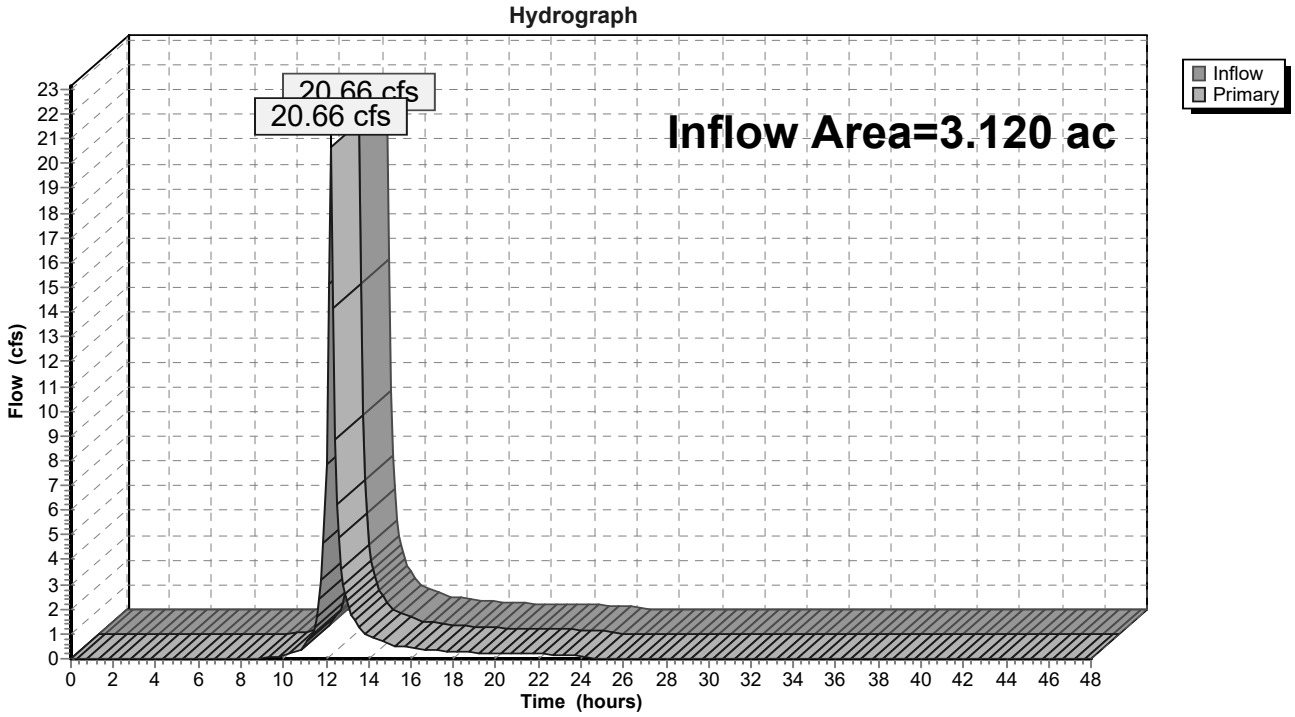


Summary for Link POA-4:

Inflow Area = 3.120 ac, 0.00% Impervious, Inflow Depth = 4.92" for 100-Year event
Inflow = 20.66 cfs @ 12.20 hrs, Volume= 1.280 af
Primary = 20.66 cfs @ 12.20 hrs, Volume= 1.280 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-4:

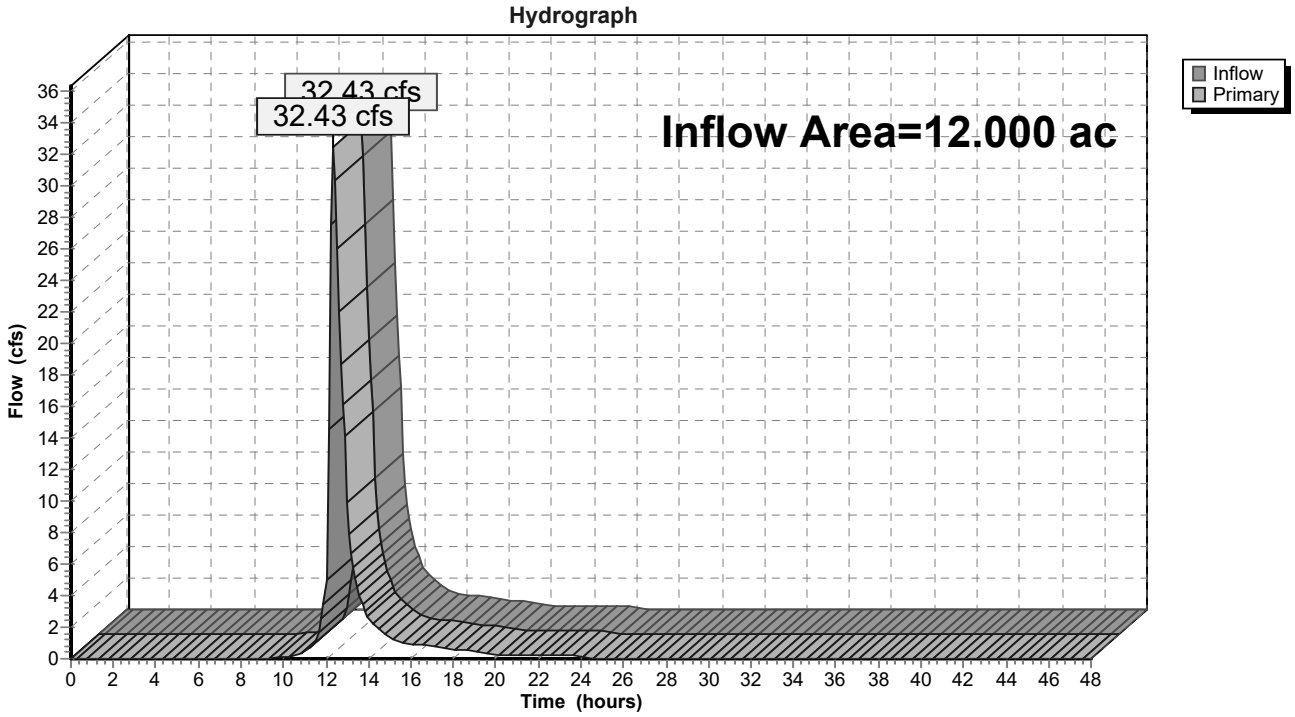


Summary for Link POA-5:

Inflow Area = 12.000 ac, 27.50% Impervious, Inflow Depth = 2.82" for 100-Year event
Inflow = 32.43 cfs @ 12.32 hrs, Volume= 2.818 af
Primary = 32.43 cfs @ 12.32 hrs, Volume= 2.818 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-5:

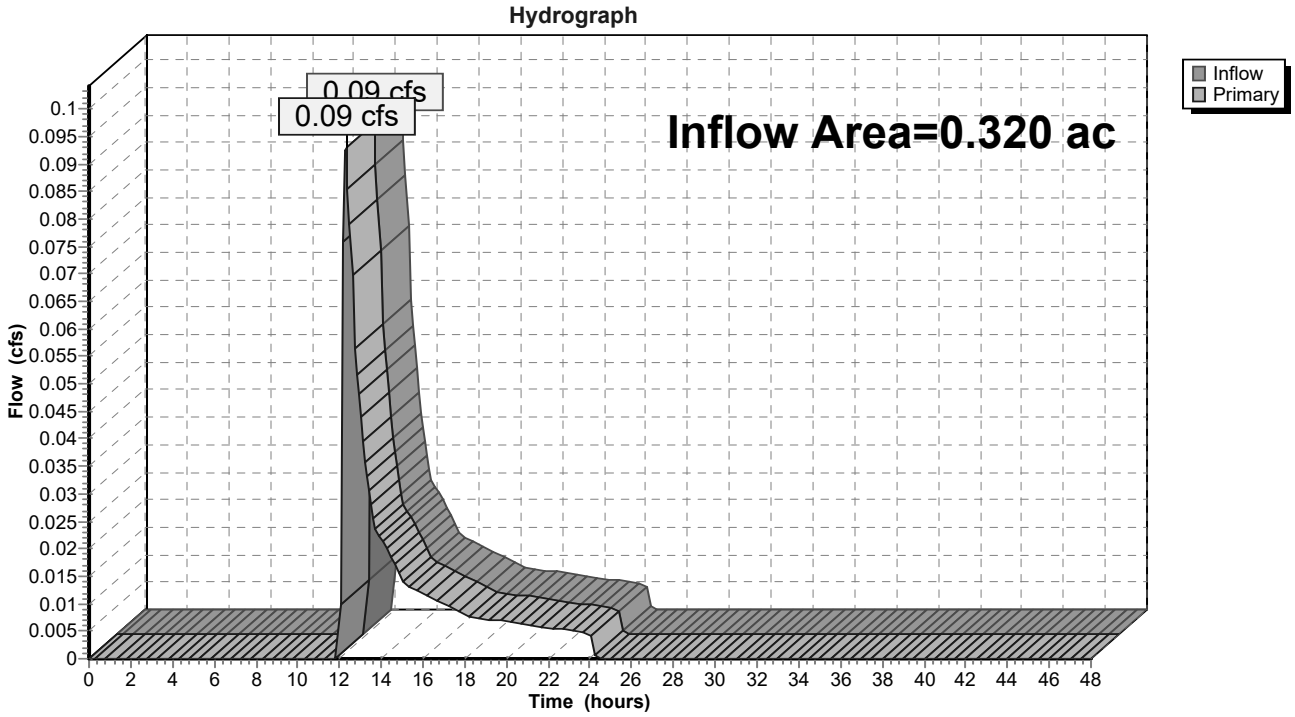


Summary for Link POA-6:

Inflow Area = 0.320 ac, 0.00% Impervious, Inflow Depth = 0.55" for 100-Year event
Inflow = 0.09 cfs @ 12.32 hrs, Volume= 0.015 af
Primary = 0.09 cfs @ 12.32 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-6:

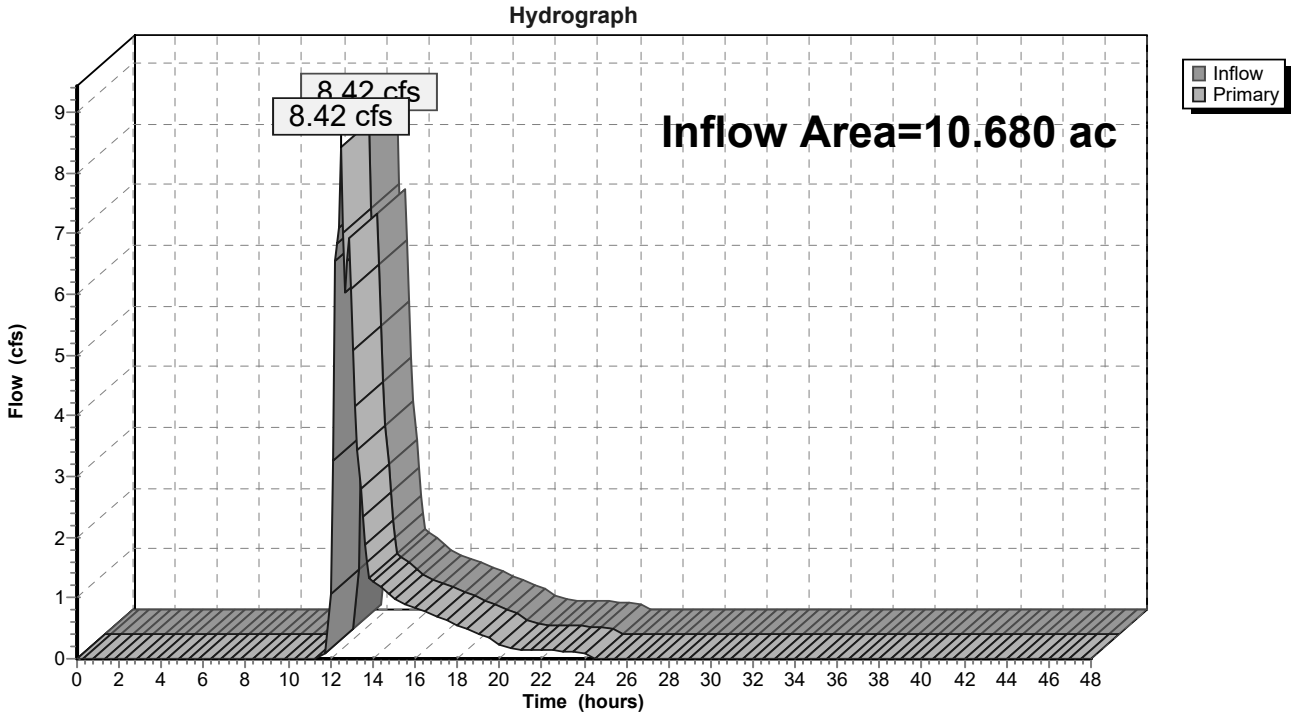


Summary for Link POA-7:

Inflow Area = 10.680 ac, 23.60% Impervious, Inflow Depth = 1.30" for 100-Year event
Inflow = 8.42 cfs @ 12.50 hrs, Volume= 1.153 af
Primary = 8.42 cfs @ 12.50 hrs, Volume= 1.153 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs

Link POA-7:



Attachment 5 – Water Quality Unit Sizing

Project: Meadowbrook Commons
Location: Sherborn, MA
Prepared For: Civil Design Group

Purpose: To calculate the water quality flow rate (WQF) over a given site area. In this situation the WQF is derived from the first 1/2" of runoff from the contributing impervious surface.

Reference: Massachusetts Dept. of Environmental Protection Wetlands Program / United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual

Procedure: Determine unit peak discharge using Figure 1 or 2. Figure 2 is in tabular form so is preferred. Using the tc, read the unit peak discharge (qu) from Figure 1 or Table in Figure 2. qu is expressed in the following units: cfs/mi^2/watershed inches (csm/in).

Compute Q Rate using the following equation:

$$Q = (qu)\ (A)\ (WQV)$$

where:

Q = flow rate associated with first 1/2" of runoff
qu = the unit peak discharge, in csm/in.
A = impervious surface drainage area (in square miles)
WQV = water quality volume in watershed inches (1/2" in this case)

Structure Name	Impv. (acres)	A (miles^2)	t_c (min)	t_c (hr)	WQV (in)	qu (csm/in.)	Q (cfs)
CB-B	0.15	0.0002344	6.0	0.100	0.50	752.00	0.09
DMH-3	0.11	0.0001719	6.0	0.100	0.50	752.00	0.06
DMH-13	0.15	0.0002344	6.0	0.100	0.50	752.00	0.09
DMH-14	1.26	0.0019688	6.0	0.100	0.50	752.00	0.74
DMH-26	1.02	0.0015938	6.0	0.100	0.50	752.00	0.60
DMH-32	0.73	0.0011406	6.0	0.100	0.50	752.00	0.43
DMH-34	0.55	0.0008594	6.0	0.100	0.50	752.00	0.32

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD

MEADOWBROOK COMMONS
SHERBORN, MA

Area	**0.15 ac**	Unit Site Designation	**CB-B**
Weighted C	**0.9**	Rainfall Station #	**69**
t_c	**6 min**		
CDS Model	**2015-5**	CDS Treatment Capacity	**1.4 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.00	0.00	10.2
0.04	9.6%	19.8%	0.01	0.01	9.6
0.06	9.4%	29.3%	0.01	0.01	9.4
0.08	7.7%	37.0%	0.01	0.01	7.7
0.10	8.6%	45.6%	0.01	0.01	8.6
0.12	6.3%	51.9%	0.02	0.02	6.3
0.14	4.7%	56.5%	0.02	0.02	4.6
0.16	4.6%	61.2%	0.02	0.02	4.6
0.18	3.5%	64.7%	0.02	0.02	3.5
0.20	4.3%	69.1%	0.03	0.03	4.3
0.25	8.0%	77.1%	0.03	0.03	7.9
0.30	5.6%	82.7%	0.04	0.04	5.5
0.35	4.4%	87.0%	0.05	0.05	4.3
0.40	2.5%	89.5%	0.05	0.05	2.5
0.45	2.5%	92.1%	0.06	0.06	2.5
0.50	1.4%	93.5%	0.07	0.07	1.3
0.75	5.0%	98.5%	0.10	0.10	4.8
1.00	1.0%	99.5%	0.14	0.14	1.0
1.50	0.0%	99.5%	0.20	0.20	0.0
2.00	0.0%	99.5%	0.27	0.27	0.0
3.00	0.5%	100.0%	0.41	0.41	0.4
					99.2
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.5%
				Predicted Net Annual Load Removal Efficiency =	**92.7%**

1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD

MEADOWBROOK COMMONS
SHERBORN, MA

Area	**0.11 ac**	Unit Site Designation	**DMH-3**
Weighted C	**0.9**	Rainfall Station #	**69**
t_c	**6 min**		
CDS Model	**1515-3**	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.00	0.00	10.2
0.04	9.6%	19.8%	0.00	0.00	9.6
0.06	9.4%	29.3%	0.01	0.01	9.4
0.08	7.7%	37.0%	0.01	0.01	7.7
0.10	8.6%	45.6%	0.01	0.01	8.6
0.12	6.3%	51.9%	0.01	0.01	6.3
0.14	4.7%	56.5%	0.01	0.01	4.6
0.16	4.6%	61.2%	0.02	0.02	4.6
0.18	3.5%	64.7%	0.02	0.02	3.5
0.20	4.3%	69.1%	0.02	0.02	4.3
0.25	8.0%	77.1%	0.02	0.02	7.9
0.30	5.6%	82.7%	0.03	0.03	5.5
0.35	4.4%	87.0%	0.03	0.03	4.3
0.40	2.5%	89.5%	0.04	0.04	2.5
0.45	2.5%	92.1%	0.04	0.04	2.5
0.50	1.4%	93.5%	0.05	0.05	1.3
0.75	5.0%	98.5%	0.07	0.07	4.8
1.00	1.0%	99.5%	0.10	0.10	1.0
1.50	0.0%	99.5%	0.15	0.15	0.0
2.00	0.0%	99.5%	0.20	0.20	0.0
3.00	0.5%	100.0%	0.30	0.30	0.4
					99.1
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.5%
				Predicted Net Annual Load Removal Efficiency =	**92.7%**

1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD

MEADOWBROOK COMMONS
SHERBORN, MA

Area	**0.15 ac**	Unit Site Designation	**DMH-13**
Weighted C	**0.9**	Rainfall Station #	**69**
t_c	**6 min**		
CDS Model	**1515-3**	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.00	0.00	10.2
0.04	9.6%	19.8%	0.01	0.01	9.6
0.06	9.4%	29.3%	0.01	0.01	9.4
0.08	7.7%	37.0%	0.01	0.01	7.7
0.10	8.6%	45.6%	0.01	0.01	8.5
0.12	6.3%	51.9%	0.02	0.02	6.3
0.14	4.7%	56.5%	0.02	0.02	4.6
0.16	4.6%	61.2%	0.02	0.02	4.6
0.18	3.5%	64.7%	0.02	0.02	3.5
0.20	4.3%	69.1%	0.03	0.03	4.3
0.25	8.0%	77.1%	0.03	0.03	7.9
0.30	5.6%	82.7%	0.04	0.04	5.5
0.35	4.4%	87.0%	0.05	0.05	4.3
0.40	2.5%	89.5%	0.05	0.05	2.5
0.45	2.5%	92.1%	0.06	0.06	2.4
0.50	1.4%	93.5%	0.07	0.07	1.3
0.75	5.0%	98.5%	0.10	0.10	4.7
1.00	1.0%	99.5%	0.14	0.14	0.9
1.50	0.0%	99.5%	0.20	0.20	0.0
2.00	0.0%	99.5%	0.27	0.27	0.0
3.00	0.5%	100.0%	0.41	0.41	0.4
					98.7
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.5%
				Predicted Net Annual Load Removal Efficiency =	**92.2%**

1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD

MEADOWBROOK COMMONS
SHERBORN, MA

Area	1.26 ac	Unit Site Designation	DMH-14
Weighted C	0.9	Rainfall Station #	69
t_c	6 min		
CDS Model	2015-4	CDS Treatment Capacity	**1.4 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.02	0.02	10.1
0.04	9.6%	19.8%	0.05	0.05	9.5
0.06	9.4%	29.3%	0.07	0.07	9.2
0.08	7.7%	37.0%	0.09	0.09	7.4
0.10	8.6%	45.6%	0.11	0.11	8.2
0.12	6.3%	51.9%	0.14	0.14	5.9
0.14	4.7%	56.5%	0.16	0.16	4.3
0.16	4.6%	61.2%	0.18	0.18	4.3
0.18	3.5%	64.7%	0.20	0.20	3.2
0.20	4.3%	69.1%	0.23	0.23	3.9
0.25	8.0%	77.1%	0.28	0.28	7.0
0.30	5.6%	82.7%	0.34	0.34	4.7
0.35	4.4%	87.0%	0.40	0.40	3.6
0.40	2.5%	89.5%	0.45	0.45	2.0
0.45	2.5%	92.1%	0.51	0.51	1.9
0.50	1.4%	93.5%	0.57	0.57	1.0
0.75	5.0%	98.5%	0.85	0.85	3.0
1.00	1.0%	99.5%	1.13	1.13	0.5
1.50	0.0%	99.5%	1.70	1.40	0.0
2.00	0.0%	99.5%	2.27	1.40	0.0
3.00	0.5%	100.0%	3.40	1.40	0.1
					89.7
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.3%
				Predicted Net Annual Load Removal Efficiency =	**83.3%**

1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD

MEADOWBROOK COMMONS
SHERBORN, MA

Area	**1.02 ac**	Unit Site Designation	**DMH-26**
Weighted C	**0.9**	Rainfall Station #	**69**
t_c	**6 min**		
CDS Model	**2015-4**	CDS Treatment Capacity	**1.4 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.02	0.02	10.1
0.04	9.6%	19.8%	0.04	0.04	9.5
0.06	9.4%	29.3%	0.06	0.06	9.3
0.08	7.7%	37.0%	0.07	0.07	7.5
0.10	8.6%	45.6%	0.09	0.09	8.2
0.12	6.3%	51.9%	0.11	0.11	6.0
0.14	4.7%	56.5%	0.13	0.13	4.4
0.16	4.6%	61.2%	0.15	0.15	4.3
0.18	3.5%	64.7%	0.17	0.17	3.3
0.20	4.3%	69.1%	0.18	0.18	4.0
0.25	8.0%	77.1%	0.23	0.23	7.2
0.30	5.6%	82.7%	0.28	0.28	4.9
0.35	4.4%	87.0%	0.32	0.32	3.7
0.40	2.5%	89.5%	0.37	0.37	2.1
0.45	2.5%	92.1%	0.41	0.41	2.0
0.50	1.4%	93.5%	0.46	0.46	1.1
0.75	5.0%	98.5%	0.69	0.69	3.4
1.00	1.0%	99.5%	0.92	0.92	0.6
1.50	0.0%	99.5%	1.38	1.38	0.0
2.00	0.0%	99.5%	1.84	1.40	0.0
3.00	0.5%	100.0%	2.75	1.40	0.1
					91.8
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.3%
				Predicted Net Annual Load Removal Efficiency =	**85.3%**

1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD

MEADOWBROOK COMMONS
SHERBORN, MA

Area	**0.73 ac**	Unit Site Designation	**DMH-32**
Weighted C	**0.9**	Rainfall Station #	**69**
t_c	**6 min**		
CDS Model	**2015-4**	CDS Treatment Capacity	**1.4 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.01	0.01	10.2
0.04	9.6%	19.8%	0.03	0.03	9.6
0.06	9.4%	29.3%	0.04	0.04	9.3
0.08	7.7%	37.0%	0.05	0.05	7.6
0.10	8.6%	45.6%	0.07	0.07	8.4
0.12	6.3%	51.9%	0.08	0.08	6.1
0.14	4.7%	56.5%	0.09	0.09	4.5
0.16	4.6%	61.2%	0.11	0.11	4.4
0.18	3.5%	64.7%	0.12	0.12	3.4
0.20	4.3%	69.1%	0.13	0.13	4.1
0.25	8.0%	77.1%	0.16	0.16	7.4
0.30	5.6%	82.7%	0.20	0.20	5.1
0.35	4.4%	87.0%	0.23	0.23	3.9
0.40	2.5%	89.5%	0.26	0.26	2.2
0.45	2.5%	92.1%	0.30	0.30	2.2
0.50	1.4%	93.5%	0.33	0.33	1.2
0.75	5.0%	98.5%	0.49	0.49	3.9
1.00	1.0%	99.5%	0.66	0.66	0.7
1.50	0.0%	99.5%	0.99	0.99	0.0
2.00	0.0%	99.5%	1.31	1.31	0.0
3.00	0.5%	100.0%	1.97	1.40	0.1
					94.2
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.4%
				Predicted Net Annual Load Removal Efficiency =	**87.7%**

1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Estimated Net Annual Solids Load Reduction
Based on the Rational Rainfall Method

CONTECH ENGINEERED SOLUTIONS

CASCADE separator™

MEADOWBROOK COMMONS

DMH-34

SHERBORN, MA

AREA	0.55	acres	**CASCADE MODEL**	CS-4	
WEIGHTED C	0.90		**PARTICLE SIZE**	110	microns
TC	6.00	minutes	**RAINFALL STATION**	69	

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Hydraulic Loading Rate (gpm/ft2)	Removal Efficiency (%)	Incremental Removal (%)
0.02	10.2%	0.35	100.0	10.2
0.04	9.6%	0.71	100.0	9.6
0.06	9.4%	1.06	100.0	9.4
0.08	7.7%	1.41	100.0	7.7
0.10	8.6%	1.77	100.0	8.6
0.12	6.3%	2.12	100.0	6.3
0.14	4.7%	2.48	100.0	4.7
0.16	4.6%	2.83	100.0	4.6
0.18	3.5%	3.18	100.0	3.5
0.20	4.3%	3.54	100.0	4.3
0.25	8.0%	4.42	100.0	8.0
0.30	5.6%	5.30	100.0	5.6
0.35	4.4%	6.19	100.0	4.4
0.40	2.5%	7.07	100.0	2.5
0.45	2.5%	7.96	100.0	2.5
0.50	1.4%	8.84	100.0	1.4
0.75	5.0%	13.26	99.4	5.0
1.00	1.0%	17.68	95.3	1.0
1.50	0.0%	26.52	87.0	0.0
2.00	0.0%	35.36	78.7	0.0
3.00	0.5%	53.04	62.0	0.3
				99.7
			Removal Efficiency Adjustment[2] =	6.5%
			Predicted % Annual Rainfall Treated =	93.5%
			Predicted Net Annual Load Removal Efficiency =	**93.3%**

1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA

2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Attachment 6 – Operation & Maintenance Plan

OPERATION AND MAINTENANCE PLAN

&

LONG-TERM POLLUTION PREVENTION PLAN

FOR

MEADOWBROOK COMMONS

RESIDENCE EA DISTRICT
MULTI-DWELLING COMMUNITY

84 & 104 COOLIDGE STREET
(MAP 5 LOTS 32, 48A, & PORTION OF 55)
SHERBORN, MASSACHUSETTS

PREPARED FOR:

115 FLANDERS ROAD, SUITE 200
WESTBOROUGH, MA 01581

PREPARED BY:

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845

DATE: JULY 29, 2021

1.0 OPERATION AND MAINTENANCE PLAN

1.1 INTRODUCTION

In accordance with the standards set forth by the Massachusetts Department of Environmental Protection (MADEP) Stormwater Management Policy, Civil Design Group, LLC has prepared the following Operation and Maintenance (O&M) Plan for *Meadowbrook Commons*.

PROPERTY INFORMATION

PROPERTY ADDRESS	LANDOWNER & STORMWATER MANAGEMENT SYSTEM OWNER
MEADOWBROOK COMMONS ASSESSORS MAP 5 LOTS 32, 48A, & PORTION OF 55 SHERBORN, MA 01770	Owner: Pulte Homes of New England, LLC
	Contact: TBD (interim contact Pulte Homes of New England, LLC)
	Phone: TBD (interim phone 508-870-9999 – Pulte Homes)

The landowner shall be responsible for the long-term operation and maintenance of the site and the stormwater management system and shall be responsible for record keeping of inspections, maintenance and repairs. If the site owner changes, the new site owner shall assume all responsibilities outlined in this O&M plan. The site owner shall hire a qualified professional to conduct scheduled inspections and maintain records in accordance with the inspection schedule outline enclosed within this document.

Site Engineer: Civil Design Group, LLC
Address: 21 High Street, Suite 207, North Andover, MA 01845
Office Phone: 978-794-5400
Contact: Matthew Leidner, P.E.

The components of the stormwater management system shall be inspected, monitored and maintained in accordance with the following to ensure that the on-site stormwater management/ best management practice facilities for the project function as intended. Routine inspection and proper maintenance of these individual components is essential to providing the long-term enhancement of both the quality and quantity of the runoff from the site.

The proposed stormwater management best management practices (BMPs) have been designed to collect and convey runoff from developed areas in accordance with the Massachusetts DEP's Stormwater Management Handbook. The drainage system consists of deep sump hooded catch basins, manholes, water quality units, infiltration basins, subsurface infiltration systems (SISs), subsurface detention systems (SDSs), water quality swales, and outfalls with riprap aprons.

Street Sweeping

Sweeping of the project roadways shall be performed twice a year, once in the spring and once in the fall, to reduce the amount of sediment and debris entering the catch basins.

Deep Sump Hooded Catch Basins

Stormwater runoff from proposed pavement areas is directed via curbing and site grading to catch basins with deep sumps and hooded outlets. These structures are designed to trap and remove sediment and larger particles from the stormwater and improve the performance of subsequent BMP's. The sumps are a minimum of 4' in depth and a routine inspection and cleaning schedule shall be followed to ensure optimal effectiveness.

Inspection Frequency:	Quarterly
Inspection Tools:	Manhole hook; survey rod; sludge judge
Items to Inspect:	Measure sediment in sump using survey rod; visually check for floating debris or trash; visually check for oil and if more than a sheen is present, use sludge judge to measure thickness of layer; visually ensure that hood is in place; visually ensure that grate is in good condition; visually ensure that outlet pipe is unobstructed
Maintenance Threshold(s):	Annually or ≥24" sediment in sump (whichever comes first); discernible layer of oil/hydrocarbons on surface; floating trash
Maintenance Equipment:	Vactor or clamshell for sediment removal; vactor and/or oil sorbent pads for oil/hydrocarbon removal; net for floating debris or trash removal

Water Quality Units

Proprietary water quality units are designed to remove heavy particles, floating debris and hydrocarbons from stormwater. Stormwater enters the system where floatables and oils are separated prior to the clarified stormwater runoff discharging to an outlet pipe. The project design proposes to use Contech model CDS1515-3, Contech model CDS 2015-4, Contech model CDS 2015-5, and Contech model Cascade CS-4 units.

Inspection Frequency:	Quarterly
Inspection Tools:	Manhole hook; survey rod; sludge judge
Items to Inspect:	Measure sediment in sump using survey rod; use sludge judge to measure thickness of oil layer through oil port; visually ensure that insert and weir are in good condition; visually ensure that cover is in good condition
Maintenance Threshold(s):	≥8" sediment and/or a discernible layer of oil/hydrocarbons
Maintenance Equipment:	Vactor

Infiltration Basins

Basins MC-1, MC-2, MC-3, and MC-4 are designed to treat, detain, and infiltrate stormwater. The side slopes and floor of the basin are designed to be vegetated.

Inspection Frequency:	Quarterly
Inspection Tools:	Ruler or survey rod to measure sediment
Items to Inspect:	Measure any accumulated sediment using a ruler or survey rod; visually inspect for erosion on the side slopes

Maintenance Threshold(s):	≥4" sediment; mow side slopes at least twice annually and remove clippings to avoid clogging of downstream structures; remove weeds, sediment, and other debris from stone routinely throughout the year and replace stone as needed to maintain a clean & neat appearance of the basin floor; repair any noted issues as required
Maintenance Equipment:	Skid steer or similar small machine for removing sediment; shovels for hand removal of sediment in tight areas such as around the outlet control structures; mower/trimmer for mowing (mow at least twice per year and remove clippings)

Subsurface Infiltration Systems (SISs)

Subsurface infiltration systems (SISs) MC-1 and MC-2 are designed to treat, detain, and infiltrate stormwater. These systems are comprised of open-bottom concrete galleys underlain by stone. The systems are equipped with inspection/cleanout ports to facilitate inspection for standing water and sediment accumulation.

Inspection Frequency:	Quarterly
Inspection Tools:	Ruler or survey rod to measure sediment
Items to Inspect:	Measure any accumulated sediment using a ruler or survey rod; inspect for standing water if more than 72 hours have elapsed since the previous rain event.
Maintenance Threshold(s):	≥1" sediment
Maintenance Equipment:	Water jet and vactor

Subsurface Detention Systems (SDSs)

Subsurface detention systems (SDSs) MC-1, MC-2, MC-3, and MC-4 are designed to detain and release stormwater to a downstream BMP or outfall. These systems are comprised of concrete galleys with concrete floors. The systems are equipped with inspection/cleanout ports to facilitate inspection for standing water and sediment accumulation.

Inspection Frequency:	Quarterly
Inspection Tools:	Ruler or survey rod to measure sediment
Items to Inspect:	Measure any accumulated sediment using a ruler or survey rod; inspect for standing water if more than 72 hours have elapsed since the previous rain event.
Maintenance Threshold(s):	≥1" sediment
Maintenance Equipment:	Water jet and vactor

Water Quality Swales

The water quality swales are designed to detain and treat stormwater.

Inspection Frequency:	Quarterly
Inspection Tools:	None (all visual)
Items to Inspect:	Inspect swales to make sure vegetation is adequate and slopes are not eroding. Check for rilling and gullying. Repair eroded areas and revegetate
Maintenance Threshold(s):	Trim vegetation at least twice annually and remove clippings, remove sediment if present, reseed as necessary, repair any noted issues as required
Maintenance Equipment:	Mower/trimmer for trimming vegetation, hand methods or equipment as required for sediment removal

Riprap Aprons

The riprap aprons are intended to dissipate energy and spread out flow prior to discharge.

Inspection Frequency:	Quarterly
Inspection Tools:	None (all visual)
Items to Inspect:	Visually ensure that flared end section is intact; visually ensure that riprap and interspersed boulders are intact; visually inspect that pipe is unobstructed; visually inspect downgradient slope for evidence of re-concentration of sheet flow; visually inspect downgradient wetland area(s) for signs of adverse impacts such as erosion or sedimentation
Maintenance Threshold(s):	Trim vegetation around pipe annually to maintain accessibility and visibility for inspection purposes, remove sediment if present, replace any displaced stones
Maintenance Equipment:	Mower/trimmer for trimming vegetation, hand methods or equipment as required for sediment removal and stone replacement

1.2 ILLICIT DISCHARGE STATEMENT

Illicit discharges to the stormwater management system are discharges not entirely comprised of stormwater. Discharges to the stormwater management system from the following activities or facilities are permissible: 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.

There are no known illicit discharges currently at the site nor are any illicit discharges proposed as part of the project. The stormwater management system is not intended to convey any illicit discharges and or pollutants and as such, control measures that are identified within this report shall be strictly adhered to in order to minimize the risk of contamination. Any unknown existing illicit discharges that are discovered as part of the development of the subject site shall be eliminated in accordance with local, state and federal regulations.

2.0 LONG-TERM POLLUTION PREVENTION PLAN (LTPPP)

The Massachusetts DEP Stormwater Management Handbook requires that a Long-Term Pollution Prevention Plan (LTPPP) be prepared and incorporated as part of the Operation & Maintenance of the Stormwater Management System. The purpose of the LTPPP is to identify potential sources of pollution that may affect the quality of stormwater discharges, and to describe the implementation of practices to reduce the pollutants in stormwater discharges. The following items describe the source control and proper procedures for the LTPPP.

Solid Waste Storage:

There are no proposed exterior (un-covered) solid waste storage areas. Trash and recycling shall be stored either indoors or in closed containers. The homeowners association shall contract with a waste hauling company to service the development on a routine basis.

Street Sweeping
Sweeping of site drives and parking lots shall be performed twice a year, once in the spring and once in the fall, to reduce the amount of sediment and debris entering the catch basins. Swept materials shall be disposed of in accordance with applicable local and state requirements.

Deicing and Salt Storage
Deicing methods shall be used in conjunction with snow removal to maintain safe pedestrian and vehicular access. The management company will be responsible for maintaining roads, driveways, sidewalks and pedestrian access onsite. To the extent practicable, snow shall be piled in areas where the snowmelt will receive maximum treatment through the proposed BMPs. Deicing products shall be stored off-site or in a covered location. Deicing products such as calcium chloride, rock salt and/or sand may be used unless otherwise restricted by the municipality.

Snow Disposal
To the extent possible, snow shall be stored on pervious surfaces in upland areas away from water resources and wells. At these locations, snow meltwater can filter in to the soil, leaving behind sand and debris, which can be removed in the springtime. Avoid disposing of snow on top of storm drain catch basins or in stormwater drainage swales or ditches. Snow combined with sand and debris may block a storm drainage system, causing localized flooding. In addition, a high volume of sand, sediment, and litter released from melting snow may be quickly transported through the drainage system into surface water. In no case shall snow be disposed of or stored in environmentally sensitive areas such as wetlands, floodplains, streams or other water bodies. If necessary to remove snow from the site, the snow shall be disposed of at an off-site location in accordance with applicable local, state and federal regulations.

Hazardous Materials Containment
Sources of potential spill hazards include vehicle fluids, liquid fuels, pesticides, paints, solvents, and liquid cleaning products. The majority of the spill hazards would likely occur within buildings and would not enter the stormwater drainage system. However, there are potential spill hazards from vehicle fluids or liquid fuels located outside of the buildings. These exterior spill hazards have the potential to enter the stormwater drainage system and shall be addressed as follows:

- Spill Hazards of pesticides, paints, and solvents shall be remediated using the manufacturers' recommended spill cleanup protocol.
- Vehicle fluids and liquid fuel spill shall be remediated according to the local and state regulations governing fuel spills.
- Any hazardous spills shall be cleaned up immediately after discovery
- Should a spill occur, this pollution prevention plan should be adjusted to include measures to prevent another spill of a similar nature. A description of the spill, along with the causes and cleanup measures should be included in the updated pollution prevention plan.

Septic System Management
Not applicable – the project utilizes a public sewer system.

Lawn, Garden, and Landscape Management:
Lawn areas shall be maintained and mowed regularly throughout the growing season. Any bare areas of lawn shall be reseeded and plants shall be pruned on an as-needed basis. Trash and debris shall be removed from landscaped and planted areas as-needed. Fertilizers, herbicides and pesticides shall be used within the amounts recommended by the manufacturer. These products shall be stored in containers indoors. Pet waste shall be disposed of properly.

APPENDIX-A

EXAMPLE
OPERATION AND MAINTENANCE
REPORT FORMS

CIVIL DESIGN GROUP, LLC

ENGINEERING. LAND USE. PLANNING. PERMITTING.

21 High Street, Suite 207
North Andover, MA 01845
Tel 978.794.5400
www.cdgengineering.com

QUARTERLY STORMWATER INSPECTION REPORT (1/3)

Site:	Meadowbrook Commons	**Date:**	
Address:	Coolidge Street, Sherborn, MA	**Time:**	
Inspector:		**Weather:**	

CATCH BASINS

Unit #	Sediment (inches)	Oil (inches)	Hood/ Pipes	Grate	Last Cleaned	Attention Recommended

p: 978-794-5400 f : 978.965.3971 www.cdgengineering.com

CIVIL DESIGN GROUP, LLC

ENGINEERING. LAND USE. PLANNING. PERMITTING.

21 High Street, Suite 207
North Andover, MA 01845
Tel 978.794.5400
www.cdgengineering.com

QUARTERLY STORMWATER INSPECTION REPORT (2/3)

Site:	Meadowbrook Commons	**Date:**	
Address:	Coolidge Street, Sherborn, MA	**Time:**	
Inspector:		**Weather:**	

WATER QUALITY UNITS

Unit #	Sediment (inches)	Oil (inches)	Trash	Cover	Last Cleaned	Attention Recommended

INFILTRATION BASINS

Unit #	Notes	Attention Recommended

SUBSURFACE INFILTRATION SYSTEMS

Unit #	Notes	Attention Recommended

SUBSURFACE DETENTION SYSTEMS

Unit #	Notes	Attention Recommended

CIVIL DESIGN GROUP, LLC
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www.cdgengineering.com

QUARTERLY STORMWATER INSPECTION REPORT (3/3)

Site:	Meadowbrook Commons	**Date:**	
Address:	Coolidge Street, Sherborn, MA	**Time:**	
Inspector:		**Weather:**	

WATER QUALITY UNITS

Unit #	Sediment (inches)	Oil (inches)	Trash	Cover	Last Cleaned	Attention Recommended

WATER QUALITY SWALES

Unit #	Notes	Attention Recommended

APPENDIX-B

WATER QUALITY UNIT MAINTENANCE GUIDELINES

CONTECH®
ENGINEERED SOLUTIONS

CDS® Inspection and Maintenance Guide

CDS TECHNOLOGIES

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allows both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine weather the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.

CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	y^3	m^3
CDS1515	3	0.9	3.0	0.9	0.5	0.4
CDS2015	4	1.2	3.0	0.9	0.9	0.7
CDS2015	5	1.5	3.0	0.9	1.3	1.0
CDS2020	5	1.5	3.5	1.1	1.3	1.0
CDS2025	5	1.5	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3025	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3
CDS5640	10	3.0	6.3	1.9	8.7	6.7
CDS5653	10	3.0	7.7	2.3	8.7	6.7
CDS5668	10	3.0	9.3	2.8	8.7	6.7
CDS5678	10	3.0	10.3	3.1	8.7	6.7

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater, earth stabilization and wastewater treament products. For information, visit www.ContechES.com or call 800.338.1122

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www.ContechES.com

CDS Inspection & Maintenance Log

CDS Model: _____ Location: _____

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.**

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

CONTECH®
ENGINEERED SOLUTIONS

Cascade Separator™ Inspection and Maintenance Guide

CASCADE
separator™

Maintenance

The Cascade Separator™ system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects sediment and debris will depend upon on-site activities and site pollutant characteristics. For example, unstable soils or heavy winter sanding will cause the sediment storage sump to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (i.e. spring and fall). However, more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment wash-down areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

A visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet chamber, flumes or outlet channel. The inspection should also quantify the accumulation of hydrocarbons, trash and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided in this Inspection and Maintenance Guide.

Access to the Cascade Separator unit is typically achieved through one manhole access cover. The opening allows for inspection and cleanout of the center chamber (cylinder) and sediment storage sump, as well as inspection of the inlet chamber and slanted skirt. For large units, multiple manhole covers allow access to the chambers and sump.

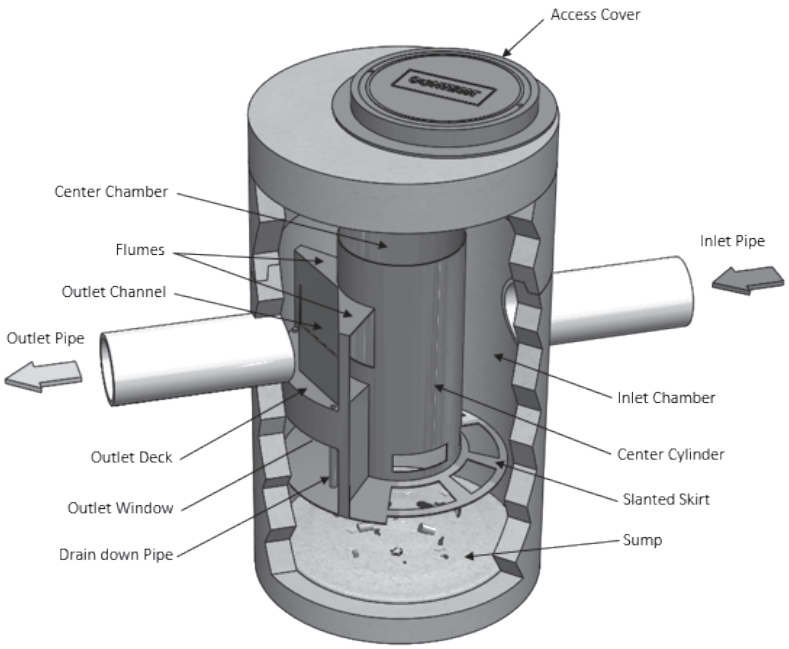
The Cascade Separator system should be cleaned before the level of sediment in the sump reaches the maximum sediment depth and/or when an appreciable level of hydrocarbons and trash has accumulated. If sorbent material is used, it must be replaced when significant discoloration has occurred. Performance may be impacted when maximum sediment storage capacity is exceeded. Contech recommends maintaining the system when sediment level reaches 50% of maximum storage volume. The level of sediment is easily determined by measuring the distance from the system outlet invert (standing water level) to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Finer, silty particles at the top of the pile typically offer less resistance to the end of the rod than larger particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the chart in this document to determine if the height of the sediment pile off the bottom of the sump floor exceeds 50% of the maximum sediment storage.

Cleaning

Cleaning of a Cascade Separator system should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole cover and insert the vacuum tube down through the center chamber and into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The areas outside the center chamber and the slanted skirt should also be washed off if pollutant build-up exists in these areas.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. Then the system should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and to ensure proper safety precautions. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the Cascade Separator system must be done in accordance with local regulations. In many locations, disposal of evacuated sediments may be handled in the same manner as disposal of sediments removed from catch basins or deep sump manholes. Check your local regulations for specific requirements on disposal. If any components are damaged, replacement parts can be ordered from the manufacturer.



Cascade Separator™ Maintenance Indicators and Sediment Storage Capacities

Model Number	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	y^3	m^3
CS-4	4	1.2	1.5	0.5	0.7	0.5
CS-5	5	1.3	1.5	0.5	1.1	0.8
CS-6	6	1.8	1.5	0.5	1.6	1.2
CS-8	8	2.4	1.5	0.5	2.8	2.1
CS-10	10	3.0	1.5	0.5	4.4	3.3
CS-12	12	3.6	1.5	0.5	6.3	4.8

Note: The information in the chart is for standard units. Units may have been designed with non-standard sediment storage depth.

A Cascade Separator unit can be easily cleaned in less than 30 minutes.

A vacuum truck excavates pollutants from the systems.

Cascade Separator™ Inspection & Maintenance Log

Cascade Model:			Location:		
Date	Depth Below Invert to Top of Sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The depth to sediment is determined by taking a measurement from the manhole outlet invert (standing water level) to the top of the sediment pile. Once this measurement is recorded, it should be compared to the chart in the maintenance guide to determine if the height of the sediment pile off the bottom of the sump floor exceeds 50% of the maximum sediment storage. Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.
2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

SUPPORT

- Drawings and specifications are available at www.ContechES.com.
- Site-specific design support is available from our engineers.

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater, and earth stabilization products. For information, visit www.ContechES.com or call 800.338.1122

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Attachment 7 – Illicit Discharge Statement

ILLICIT DISCHARGE STATEMENT

FOR

MEADOWBROOK COMMONS
RESIDENCE EA DISTRICT
MULTI-DWELLING COMMUNITY

84 & 104 COOLIDGE STREET
(MAP 5 LOTS 32, 48A, & PORTION OF 55)
SHERBORN, MASSACHUSETTS

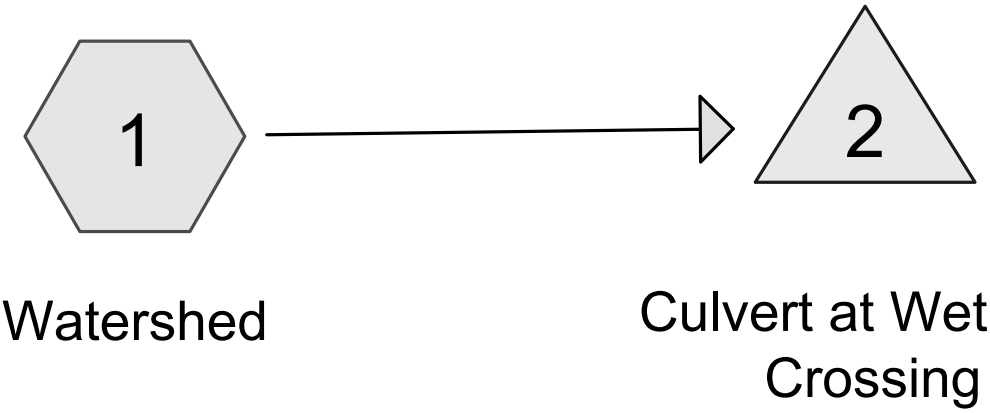
DATE: JULY 29, 2021

Illicit discharges to the stormwater management system are discharges not entirely comprised of stormwater. Discharges to the stormwater management system from the following activities or facilities are permissible: 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.

There are no known illicit discharges currently at the site nor are any illicit discharges proposed as part of the project. The stormwater management system is *not* intended to convey any illicit discharges and/or pollutants and as such, control measures that are identified within this report shall be strictly adhered to in order to minimize the risk of contamination. Any unknown existing illicit discharges that are discovered as part of the development of the subject site shall be eliminated in accordance with local, state and federal regulations.

Attachment 8 –

Hydraflow Storm Sewers Output
Culvert Sizing



Subcat Reach Pond Link

Routing Diagram for MC Culvert Sizing

Prepared by {enter your company name here}, Printed 7/27/2021

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.180	39	>75% Grass cover, Good, HSG A (1)
0.190	80	>75% Grass cover, Good, HSG D (1)
0.050	96	Gravel surface, HSG A (1)
0.570	30	Meadow, non-grazed, HSG A (1)
0.580	77	Wetlands, HSG A (1)
0.950	30	Woods, Good, HSG A (1)
3.520	**44**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
3.330	HSG A	1
0.000	HSG B	
0.000	HSG C	
0.190	HSG D	1
0.000	Other	
3.520		**TOTAL AREA**

Summary for Subcatchment 1: Watershed

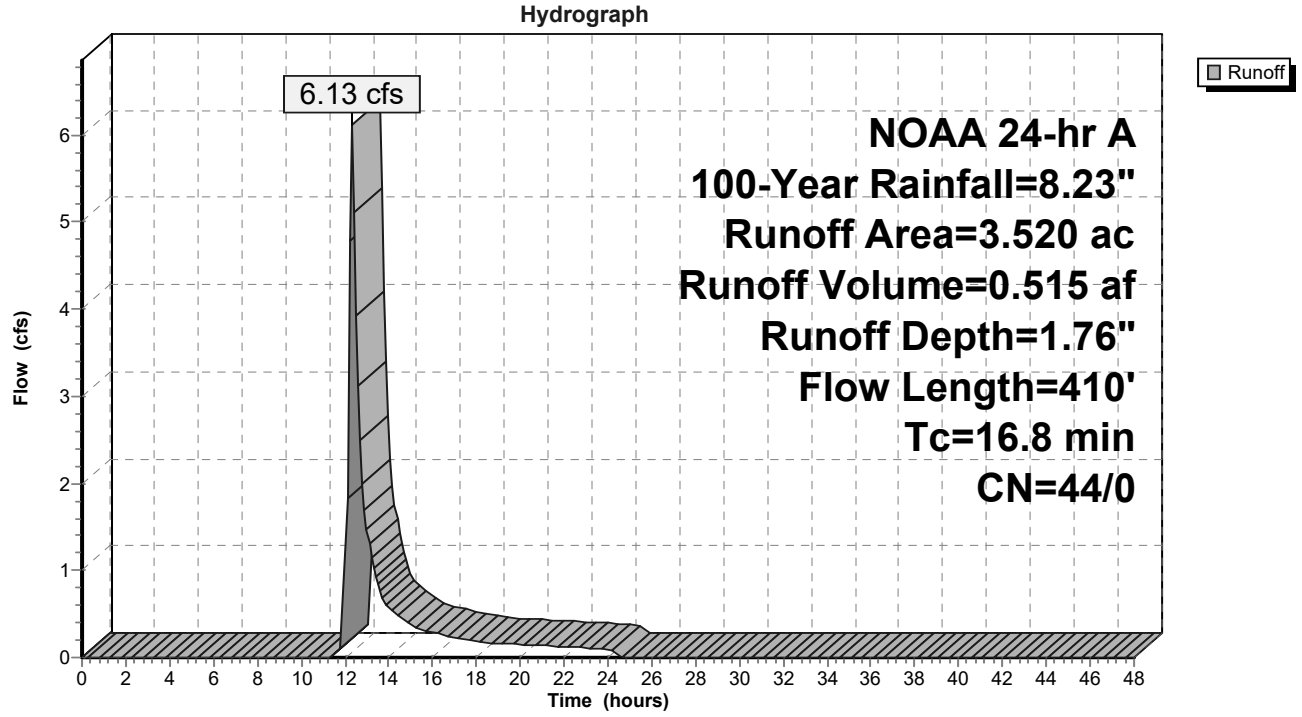
Runoff = 6.13 cfs @ 12.31 hrs, Volume= 0.515 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.10
NOAA 24-hr A 100-Year Rainfall=8.23"

	Area (ac)	CN	Description
	0.050	96	Gravel surface, HSG A
	1.180	39	>75% Grass cover, Good, HSG A
	0.190	80	>75% Grass cover, Good, HSG D
	0.570	30	Meadow, non-grazed, HSG A
	0.950	30	Woods, Good, HSG A
*	0.580	77	Wetlands, HSG A
	3.520	44	Weighted Average
	3.520	44	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	25	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.16"
0.6	10	0.5000	0.27		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.16"
9.9	375	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.8	410	Total			

Subcatchment 1: Watershed



Summary for Pond 2: Culvert at Wetland Crossing

Inflow Area = 3.520 ac, 0.00% Impervious, Inflow Depth = 1.76" for 100-Year event
Inflow = 6.13 cfs @ 12.31 hrs, Volume= 0.515 af
Outflow = 5.73 cfs @ 12.36 hrs, Volume= 0.515 af, Atten= 6%, Lag= 2.9 min
Primary = 5.73 cfs @ 12.36 hrs, Volume= 0.515 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 161.51' @ 12.36 hrs Surf.Area= 2,106 sf Storage= 805 cf

Plug-Flow detention time= 2.0 min calculated for 0.514 af (100% of inflow)
Center-of-Mass det. time= 2.0 min (864.4 - 862.4)

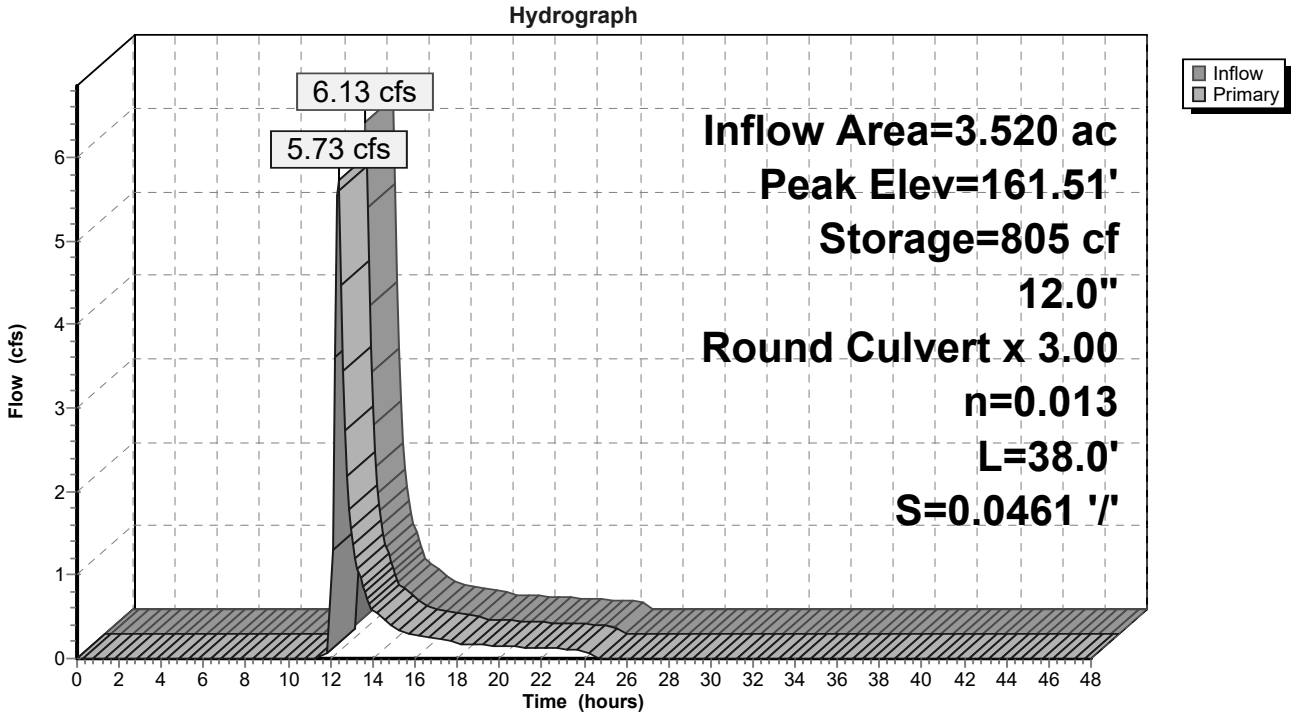
Volume	Invert	Avail.Storage	Storage Description
#1	160.75'	2,159 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.75	5	0	0
162.00	3,450	2,159	2,159

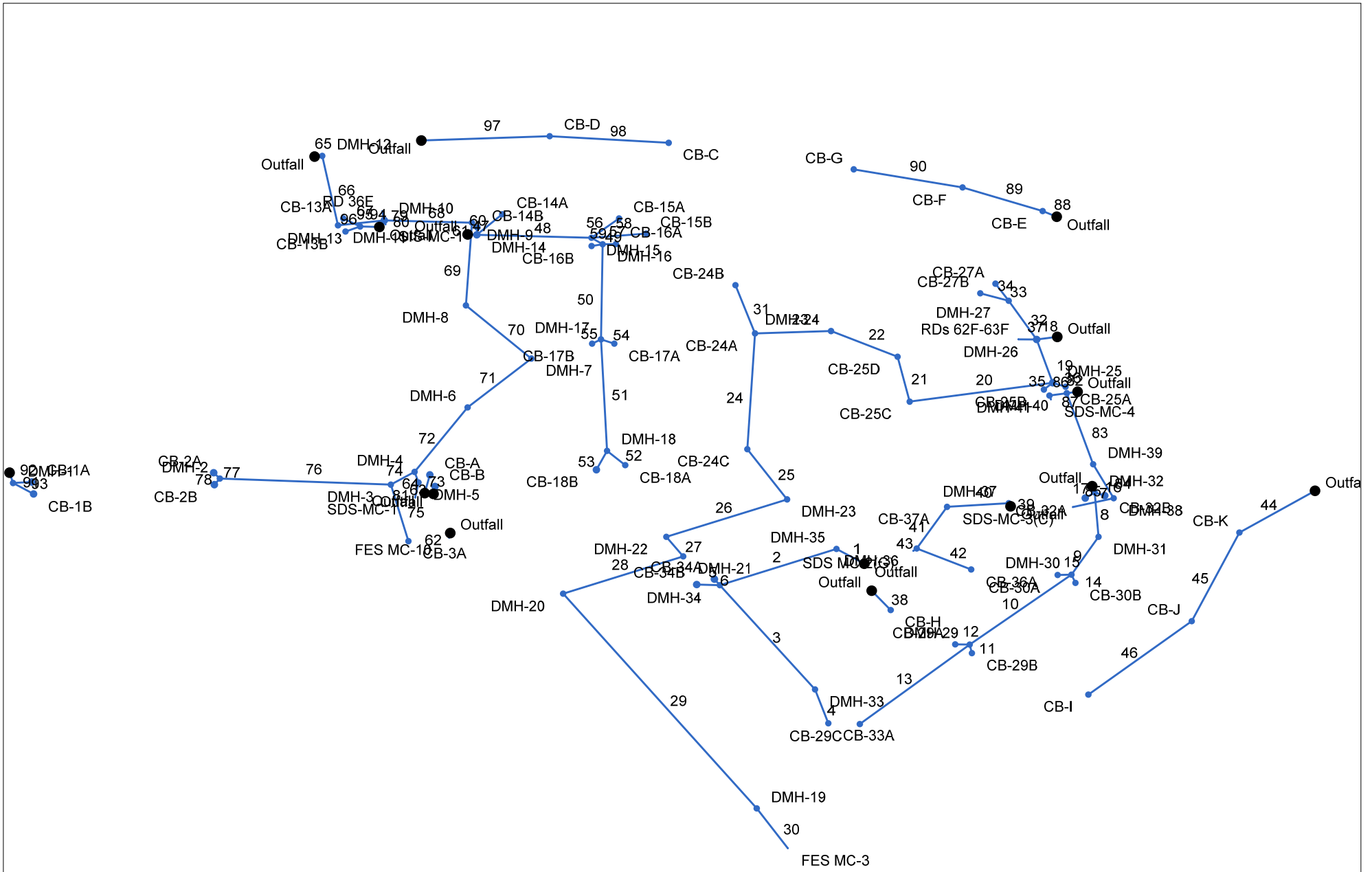
Device	Routing	Invert	Outlet Devices
#1	Primary	160.75'	**12.0" Round Culvert X 3.00** L= 38.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 160.75' / 159.00' S= 0.0461 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=5.58 cfs @ 12.36 hrs HW=161.50' (Free Discharge)
1=Culvert (Inlet Controls 5.58 cfs @ 2.95 fps)

Pond 2: Culvert at Wetland Crossing



Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



100-yr storm event

Project File: System-1.stm	Number of lines: 98	Date: 6/25/2021

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	33.480	-138.394	MH	0.00	0.00	0.00	6.0	180.00	2.24	180.75	18	Cir	0.012	0.95	185.00	Pipe - (162)
2	1	118.492	-69.109	MH	0.00	0.00	0.00	6.0	180.85	1.01	182.05	18	Cir	0.012	1.00	186.57	Pipe - (161)
3	2	179.028	-91.126	MH	0.00	0.00	0.00	6.0	183.00	4.33	190.75	12	Cir	0.012	0.31	193.88	Pipe - (256)
4	3	52.444	15.409	Grate	0.00	0.19	0.70	6.0	190.85	2.96	192.40	12	Cir	0.012	1.00	195.32	Pipe - (193)
5	2	20.835	30.240	Grate	0.00	0.35	0.75	6.0	182.55	2.16	183.00	12	Cir	0.012	1.00	186.04	Pipe - (159)
6	2	10.493	90.000	Grate	0.00	0.20	0.65	6.0	182.55	4.29	183.00	12	Cir	0.012	1.00	186.04	Pipe - (160)
7	End	9.773	76.757	MH	0.00	0.00	0.00	6.0	165.00	5.12	165.50	18	Cir	0.012	0.88	175.00	Pipe - (180)
8	7	66.978	10.229	MH	0.00	0.00	0.00	6.0	171.50	5.97	175.50	12	Cir	0.012	0.50	179.01	Pipe - (188)
9	8	62.141	26.119	MH	0.00	0.00	0.00	6.0	175.60	5.95	179.30	12	Cir	0.012	0.92	182.77	Pipe - (179)
10	9	139.702	17.908	MH	0.00	0.00	0.00	6.0	179.40	6.01	187.80	12	Cir	0.012	0.81	190.98	Pipe - (178)
11	10	13.056	-49.397	Grate	0.00	0.23	0.65	6.0	187.90	1.91	188.15	12	Cir	0.012	1.00	191.17	Pipe - (189)
12	10	13.056	50.581	Grate	0.00	0.06	0.85	6.0	187.90	1.91	188.15	12	Cir	0.012	1.00	191.17	Pipe - (190)
13	10	155.672	-1.501	Grate	0.00	0.06	0.80	6.0	187.00	3.63	192.65	12	Cir	0.012	1.00	195.65	Pipe - (177)
14	9	12.846	-39.061	Grate	0.00	0.19	0.75	6.0	179.40	4.67	180.00	12	Cir	0.012	1.00	183.04	Pipe - (191)
15	9	12.525	64.986	Grate	0.00	0.11	0.70	6.0	179.40	4.79	180.00	12	Cir	0.012	1.00	183.04	Pipe - (192)
16	7	10.182	-49.860	Grate	0.00	0.19	0.65	66.0	171.75	4.42	172.20	12	Cir	0.012	1.00	175.23	Pipe - (181)
17	7	12.014	58.236	Grate	0.00	0.12	0.70	6.0	171.75	3.75	172.20	12	Cir	0.012	1.00	175.23	Pipe - (182)
18	End	19.000	167.518	MH	0.00	0.00	0.00	6.0	160.50	5.26	161.50	24	Cir	0.012	1.00	170.83	Pipe - (235)
19	18	66.758	-90.000	MH	0.00	0.00	0.00	6.0	162.70	2.02	164.05	18	Cir	0.012	1.00	169.84	Pipe - (155)
20	19	131.969	90.000	DrGrt	0.00	0.80	0.35	6.0	164.15	1.02	165.50	18	Cir	0.012	1.50	171.44	Pipe - (152)
21	20	68.617	93.342	DrGrt	0.00	0.35	0.40	6.0	165.60	1.31	166.50	18	Cir	0.012	1.17	169.00	Pipe - (151)
22	21	71.340	-47.990	MH	0.00	0.00	0.00	6.0	166.60	2.45	168.35	18	Cir	0.012	0.64	175.00	Pipe - (150)
23	22	68.595	-35.645	DrGrt	0.00	0.53	0.50	6.0	168.45	1.02	169.15	18	Cir	0.012	2.22	174.00	Pipe - (149)

Project File: System-1.stm | Number of lines: 98 | Date: 6/25/2021

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
24	23	174.934	-84.957	DrGrt	0.00	0.17	0.60	6.0	170.60	2.23	174.50	18	Cir	0.012	0.78	179.00	Pipe - (148)
25	24	83.769	-27.607	MH	0.00	0.00	0.00	6.0	174.60	1.01	175.45	18	Cir	0.012	1.00	181.75	Pipe - (175)
26	25	122.667	87.835	MH	0.00	0.00	0.00	6.0	175.55	1.02	176.80	18	Cir	0.012	1.00	182.69	Pipe - (174)
27	26	33.031	-90.000	MH	0.00	0.00	0.00	6.0	176.90	1.06	177.25	18	Cir	0.012	1.00	184.07	Pipe - (173)
28	27	121.997	90.000	MH	0.00	0.00	0.00	6.0	177.35	0.94	178.50	18	Cir	0.012	1.00	181.90	Pipe - (172)
29	28	367.980	-90.779	MH	0.00	0.00	0.00	6.0	179.00	2.42	187.90	12	Cir	0.012	0.15	191.25	Pipe - (171)
30	29	66.286	3.321	None	0.00	1.16	0.70	6.0	188.00	9.81	194.50	12	Cir	0.012	1.00	195.66	Pipe - (144)
31	23	74.897	79.156	DrGrt	0.00	0.19	0.40	6.0	169.65	0.80	170.25	12	Cir	0.012	1.00	173.25	Pipe - (147)
32	18	63.863	79.243	MH	0.00	0.00	0.00	6.0	167.50	2.35	169.00	12	Cir	0.012	0.73	172.08	Pipe - (232)
33	32	28.393	-1.674	Grate	0.00	0.17	0.65	6.0	169.10	1.06	169.40	12	Cir	0.012	1.00	172.43	Pipe - (230)
34	32	27.933	-43.260	Grate	0.00	0.20	0.70	6.0	169.10	1.07	169.40	12	Cir	0.012	1.00	172.43	Pipe - (231)
35	19	12.995	50.309	Grate	0.00	0.37	0.65	6.0	166.25	2.69	166.60	12	Cir	0.012	1.00	169.63	Pipe - (233)
36	19	12.995	-50.309	Grate	0.00	0.13	0.70	6.0	166.25	2.69	166.60	12	Cir	0.012	1.00	169.63	Pipe - (234)
37	18	16.510	14.012	None	0.00	0.04	0.90	6.0	166.00	1.21	166.20	6	Cir	0.012	1.00	167.36	Pipe - (252)
38	End	33.843	59.527	DrGrt	0.00	0.20	0.45	6.0	180.00	4.43	181.50	12	Cir	0.012	1.00	185.50	Pipe - (164)
39	End	5.000	-109.832	MH	0.00	0.00	0.00	6.0	169.00	1.00	169.05	18	Cir	0.012	0.97	174.00	Pipe - (146)
40	39	55.783	-75.712	DrGrt	0.00	0.54	0.35	6.0	169.15	0.63	169.50	18	Cir	0.012	1.34	173.00	Pipe - (145)
41	40	68.513	-60.959	MH	0.00	0.00	0.00	6.0	170.00	11.68	178.00	12	Cir	0.012	0.99	184.00	Pipe - (158)
42	41	58.512	-80.522	DrGrt	0.00	0.10	0.60	6.0	178.10	1.37	178.90	12	Cir	0.012	1.00	182.00	Pipe - (163)
43	41	4.657	18.109	None	2.65	0.00	0.00	6.0	178.00	0.00	178.00	12	Cir	0.012	1.00	185.00	Pipe - (157)
44	End	92.803	137.207	DrGrt	0.00	0.28	0.30	6.0	169.00	2.05	170.90	12	Cir	0.012	0.82	174.00	Pipe - (143)
45	44	140.354	-29.398	DrGrt	0.00	0.32	0.30	6.0	171.00	5.45	178.65	12	Cir	0.012	0.65	181.75	Pipe - (142)
46	45	144.790	22.244	DrGrt	0.00	0.38	0.30	6.0	178.75	4.49	185.25	12	Cir	0.012	1.00	188.25	Pipe - (141)

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
47	End	8.265	2.493	MH	0.00	0.00	0.00	6.0	156.00	6.05	156.50	24	Cir	0.012	1.00	168.44	Pipe - (224)
48	47	103.328	0.000	MH	0.00	0.00	0.00	6.0	165.00	3.00	168.10	24	Cir	0.012	0.82	172.70	Pipe - (223)
49	48	13.926	41.414	MH	0.00	0.00	0.00	6.0	168.60	2.15	168.90	18	Cir	0.012	1.00	173.16	Pipe - (220)
50	49	143.534	46.670	MH	0.00	0.00	0.00	6.0	169.00	2.23	172.20	18	Cir	0.012	0.90	176.00	Pipe - (215)
51	50	168.381	-2.440	MH	0.00	0.00	0.00	6.0	172.70	2.11	176.25	12	Cir	0.012	0.63	179.37	Pipe - (214)
52	51	27.117	-35.310	Grate	0.00	0.29	0.70	6.0	176.35	1.29	176.70	12	Cir	0.012	1.00	179.70	Pipe - (213)
53	51	30.032	20.576	Grate	0.00	0.25	0.75	6.0	176.35	0.83	176.60	12	Cir	0.012	1.00	179.60	Pipe - (212)
54	50	13.625	-61.923	Grate	0.00	0.30	0.70	6.0	172.70	1.83	172.95	12	Cir	0.012	1.00	175.97	Pipe - (226)
55	50	10.406	50.046	Grate	0.00	0.06	0.85	6.0	172.70	2.40	172.95	12	Cir	0.012	1.00	175.97	Pipe - (227)
56	48	38.336	-52.004	Grate	0.00	0.18	0.70	6.0	169.10	2.87	170.20	12	Cir	0.012	1.00	173.22	Pipe - (219)
57	49	12.021	-44.119	Grate	0.00	0.26	0.65	6.0	169.50	2.08	169.75	12	Cir	0.012	1.00	172.75	Pipe - (216)
58	48	49.718	-9.672	Grate	0.00	0.05	0.85	6.0	169.70	2.61	171.00	12	Cir	0.012	1.00	174.03	Pipe - (222)
59	49	10.429	119.401	Grate	0.00	0.04	0.90	6.0	169.50	2.40	169.75	12	Cir	0.012	1.00	173.02	Pipe - (218)
60	47	38.496	-56.028	Grate	0.00	0.13	0.75	6.0	166.50	1.43	167.05	12	Cir	0.012	1.00	170.08	Pipe - (228)
61	47	10.908	-90.000	Grate	0.00	0.10	0.65	6.0	166.00	3.67	166.40	12	Cir	0.012	1.00	169.41	Pipe - (225)
62	End	7.000	98.836	None	0.00	2.00	0.30	6.0	170.00	14.29	171.00	18	Cir	0.012	1.00	172.72	Pipe - (131)
63	End	11.356	-82.998	Grate	0.00	0.13	0.50	6.0	170.00	4.40	170.50	12	Cir	0.012	1.00	175.93	Pipe - (130)
64	End	27.836	-80.415	Grate	0.00	0.13	0.85	6.0	170.00	7.18	172.00	12	Cir	0.012	1.00	175.90	Pipe - (128)
65	End	7.000	-7.701	MH	0.00	0.00	0.00	6.0	151.75	2.14	151.90	24	Cir	0.012	1.00	159.00	Pipe - (121)
66	65	105.694	90.000	MH	0.00	0.00	0.00	6.0	152.90	2.03	155.05	18	Cir	0.012	1.00	162.04	Pipe - (120)
67	66	42.351	-92.303	MH	0.00	0.00	0.00	6.0	155.15	2.01	156.00	18	Cir	0.012	1.00	167.03	Pipe - (134)
68	67	79.000	12.496	MH	0.00	0.00	0.00	6.0	156.55	2.03	158.15	15	Cir	0.012	1.00	169.41	Pipe - (119)
69	68	124.829	90.000	MH	0.00	0.00	0.00	6.0	158.25	0.52	158.90	15	Cir	0.012	0.68	164.22	Pipe - (118)

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
70	69	99.545	-38.789	MH	0.00	0.03	0.90	6.0	159.00	3.11	162.10	15	Cir	0.012	0.97	168.96	Pipe - (116)
71	70	93.435	74.160	MH	0.00	0.03	0.90	6.0	162.20	0.54	162.70	15	Cir	0.012	0.24	169.69	Pipe - (125)
72	71	108.414	-11.735	MH	0.00	0.00	0.00	6.0	162.80	0.51	163.35	15	Cir	0.012	0.67	175.60	Pipe - (111)
73	72	16.242	-38.611	MH	0.00	0.00	0.00	6.0	166.50	3.08	167.00	12	Cir	0.012	0.40	175.60	Pipe - (115)
74	72	28.731	22.097	MH	0.00	0.00	0.00	6.0	163.60	0.52	163.75	12	Cir	0.012	0.88	174.51	Pipe - (110)
75	74	86.771	-58.760	DrGrt	0.00	0.05	0.30	6.0	164.85	6.80	170.75	12	Cir	0.012	1.00	173.75	Pipe - (112)
76	74	154.272	45.162	MH	0.00	0.00	0.00	6.0	163.85	0.58	164.75	12	Cir	0.012	0.92	168.31	Pipe - (109)
77	76	10.447	54.477	Grate	0.00	0.08	0.70	6.0	164.85	1.44	165.00	12	Cir	0.012	1.00	168.02	Pipe - (113)
78	76	10.409	-64.836	Grate	0.00	0.08	0.65	6.0	164.85	1.44	165.00	12	Cir	0.012	1.00	168.02	Pipe - (114)
79	67	13.992	-87.697	None	0.00	0.03	0.90	6.0	160.00	1.07	160.15	6	Cir	0.012	1.00	161.31	Pipe - (244)
80	67	6.000	90.000	None	11.16	0.00	0.00	6.0	156.00	0.00	156.00	15	Cir	0.012	1.00	167.00	Pipe
81	73	23.000	20.000	None	4.92	0.00	0.00	6.0	167.00	0.00	167.00	12	Cir	0.012	1.00	175.00	Pipe
82	End	10.000	167.452	MH	0.00	0.00	0.00	6.0	161.00	5.00	161.50	12	Cir	0.012	1.00	169.67	Pipe - (229)
83	82	110.000	-89.934	MH	0.00	0.00	0.00	6.0	163.50	2.09	165.80	12	Cir	0.012	0.16	172.52	Pipe - (156)
84	83	54.398	-7.350	MH	0.00	0.07	0.90	6.0	165.90	2.02	167.00	12	Cir	0.012	1.00	175.90	Pipe - (154)
85	84	39.000	90.000	None	4.81	0.00	0.00	6.0	167.00	0.00	167.00	12	Cir	0.012	1.00	177.00	Pipe
86	82	16.000	0.000	MH	0.00	0.00	0.00	6.0	162.65	2.19	163.00	12	Cir	0.012	1.00	169.70	Pipe
87	86	6.000	-90.000	None	3.80	0.00	0.00	6.0	163.00	0.00	163.00	12	Cir	0.012	1.00	169.80	Pipe
88	End	15.243	-146.612	DrGrt	0.00	0.16	0.50	6.0	160.50	2.30	160.85	18	Cir	0.012	0.50	165.50	Pipe - (137)
89	88	80.479	-6.998	DrGrt	0.00	0.21	0.55	6.0	161.35	2.55	163.40	12	Cir	0.012	0.50	166.50	Pipe - (136)
90	89	101.790	-10.870	DrGrt	0.00	0.14	0.50	6.0	163.50	1.47	165.00	12	Cir	0.012	1.00	168.00	Pipe - (140)
91	End	15.845	78.650	MH	0.00	0.00	0.00	6.0	162.00	0.95	162.15	12	Cir	0.012	1.00	165.27	Pipe - (255)
92	91	16.912	-83.848	Grate	0.00	0.06	0.75	6.0	162.25	1.48	162.50	12	Cir	0.012	1.00	165.53	Pipe - (253)

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Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
93	91	24.699	-37.063	Grate	0.00	0.06	0.80	6.0	162.25	1.01	162.50	12	Cir	0.012	1.00	165.53	Pipe - (254)
94	End	17.313	-177.507	MH	0.00	0.00	0.00	6.0	157.00	2.89	157.50	12	Cir	0.012	0.64	166.36	Pipe - (132)
95	94	19.542	36.112	Grate	0.00	0.11	0.70	6.0	162.00	4.09	162.80	12	Cir	0.012	1.00	165.81	Pipe - (124)
96	94	15.290	-32.731	Grate	0.00	0.12	0.80	6.0	162.00	5.23	162.80	12	Cir	0.012	1.00	165.81	Pipe - (123)
97	End	115.860	-3.279	DrGrt	0.00	0.19	0.45	6.0	152.00	6.04	159.00	12	Cir	0.012	0.50	163.50	Pipe - (139)
98	97	107.618	8.610	DrGrt	0.00	0.19	0.45	6.0	160.50	2.79	163.50	12	Cir	0.012	1.00	166.50	Pipe - (138)

MyReport

Line No.	Line ID	Flow Rate (cfs)	Line Length (ft)	Invert Dn (ft)	Invert Up (ft)	Line Slope (%)	HGL Dn (ft)	HGL Up (ft)	Q Byp (cfs)	Byp Ln No	Minor Loss (ft)	HGL Jnct (ft)	DnStm Ln No	Junct Type	Vel Dn (ft/s)	Vel Up (ft/s)	
1	Pipe - (162)	3.34	33.480	180.00	180.75	2.24	183.01	183.04	....	n/a	0.05	183.09	Outfall	MH	1.89	1.89	
2	Pipe - (161)	3.46	118.492	180.85	182.05	1.01	183.09	183.18	....	n/a	0.09	183.27	1	MH	1.96	2.42	
3	Pipe - (256)	0.96	179.028	183.00	190.75	4.33	183.27	191.16	....	n/a	n/a	191.16	2	MH	5.61	3.16	
4	Pipe - (193)	0.99	52.444	190.85	192.40	2.96	191.16	192.82	0.15	6	0.16	192.82	3	Grate	4.75	3.19	
5	Pipe - (159)	1.96	20.835	182.55	183.00	2.16	183.27	183.60 j	0.00	Offsite	n/a	183.60	2	Grate	3.23	4.01	
6	Pipe - (160)	0.97	10.493	182.55	183.00	4.29	183.27	183.41 j	0.00	Offsite	n/a	183.41	2	Grate	1.60	3.17	
7	Pipe - (180)	1.58	9.773	165.00	165.50	5.12	165.47	165.97	....	n/a	n/a	165.97	Outfall	MH	3.33	3.32	
8	Pipe - (188)	2.70	66.978	171.50	175.50	5.97	171.87	176.20	....	n/a	n/a	176.20	7	MH	10.36	4.57	
9	Pipe - (179)	2.72	62.141	175.60	179.30	5.95	176.20	180.01	....	n/a	n/a	180.01	8	MH	5.49	4.59	
10	Pipe - (178)	1.49	139.702	179.40	187.80	6.01	180.01	188.32 j	....	n/a	n/a	188.32	9	MH	3.00	3.64	
11	Pipe - (189)	1.11	13.056	187.90	188.15	1.91	188.32	188.59	0.10	15	0.17	188.59	10	Grate	3.59	3.31	
12	Pipe - (190)	0.38	13.056	187.90	188.15	1.91	188.32	188.40 j	0.00	16	n/a	188.40	10	Grate	1.22	2.41	
13	Pipe - (177)	0.36	155.672	187.00	192.65	3.63	188.32	192.90 j	0.00	11	n/a	192.90	10	Grate	0.46	2.37	
14	Pipe - (191)	1.06	12.846	179.40	180.00	4.67	180.01	180.43 j	0.07	17	n/a	180.43	9	Grate	2.13	3.26	
15	Pipe - (192)	0.57	12.525	179.40	180.00	4.79	180.01	180.31 j	0.01	18	n/a	180.31	9	Grate	1.15	2.71	
16	Pipe - (181)	0.29	10.182	171.75	172.20	4.42	171.88	172.42	0.00	Offsite	0.08	172.42	7	Grate	4.86	2.24	
17	Pipe - (182)	0.63	12.014	171.75	172.20	3.75	171.95	172.53	0.00	Offsite	n/a	172.53	7	Grate	5.77	2.78	
18	Pipe - (235)	14.00	19.000	160.50	161.50	5.26	162.36	162.85 j	....	n/a	n/a	162.85	Outfall	MH	4.60	6.22	
19	Pipe - (155)	12.33	66.758	162.70	164.05	2.02	163.68	165.38	....	n/a	n/a	165.38	18	MH	10.07	7.46	
20	Pipe - (152)	10.43	131.969	164.15	165.50	1.02	165.38	166.74	0.00	Sag	n/a	166.74	19	Dp-Grate	6.75	6.67	
21	Pipe - (151)	8.76	68.617	165.60	166.50	1.31	166.74	167.65	0.00	Sag	n/a	167.65	20	Dp-Grate	6.08	6.05	
22	Pipe - (150)	7.96	71.340	166.60	168.35	2.45	167.65	169.44	....	n/a	0.33	169.44	21	MH	6.06	5.78	
23	Pipe - (149)	8.04	68.595	168.45	169.15	1.02	169.44	170.25	0.00	Sag	n/a	170.25	22	Dp-Grate	6.48	5.80	

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NOTES: ** Critical depth

MyReport

Line No.	Line ID	Flow Rate (cfs)	Line Length (ft)	Invert Dn (ft)	Invert Up (ft)	Line Slope (%)	HGL Dn (ft)	HGL Up (ft)	Q Byp (cfs)	Byp Ln No	Minor Loss (ft)	HGL Jnct (ft)	DnStm Ln No	Junct Type	Vel Dn (ft/s)	Vel Up (ft/s)	
24	Pipe - (148)	6.05	174.934	170.60	174.50	2.23	171.22	175.45	0.00	Sag	0.32	175.45	23	Dp-Grate	8.80	5.13	
25	Pipe - (175)	5.47	83.769	174.60	175.45	1.01	175.45	176.35	....	n/a	n/a	176.35	24	MH	5.30	4.94	
26	Pipe - (174)	5.62	122.667	175.55	176.80	1.02	176.35	177.71	....	n/a	n/a	177.71	25	MH	5.85	4.99	
27	Pipe - (173)	5.66	33.031	176.90	177.25	1.06	177.71	178.17	....	n/a	n/a	178.17	26	MH	5.78	5.00	
28	Pipe - (172)	5.81	121.997	177.35	178.50	0.94	178.17	179.43	....	n/a	0.40	179.43	27	MH	5.91	5.05	
29	Pipe - (171)	6.02	367.980	179.00	187.90	2.42	179.82	188.86	....	n/a	n/a	188.86	28	MH	8.71	7.78	
30	Pipe - (144)	6.05	66.286	188.00	194.50	9.81	188.86	195.46	....	n/a	n/a	195.46	29	None	8.46	7.83	
31	Pipe - (147)	0.57	74.897	169.65	170.25	0.80	170.25	170.56 j	0.00	Sag	n/a	170.56	23	Dp-Grate	1.16	2.70	
32	Pipe - (232)	1.83	63.863	167.50	169.00	2.35	167.88	169.58	....	n/a	n/a	169.58	18	MH	6.64	3.91	
33	Pipe - (230)	0.82	28.393	169.10	169.40	1.06	169.58	169.78 j	0.09	36	n/a	169.78	32	Grate	2.24	3.02	
34	Pipe - (231)	1.04	27.933	169.10	169.40	1.07	169.58	169.83 j	0.16	35	n/a	169.83	32	Grate	2.83	3.24	
35	Pipe - (233)	1.79	12.995	166.25	166.60	2.69	166.61	167.17	0.00	Sag	0.23	167.17	19	Grate	6.93	3.88	
36	Pipe - (234)	0.68	12.995	166.25	166.60	2.69	166.47	166.94	0.00	Sag	n/a	166.94	19	Grate	5.26	2.85	
37	Pipe - (252)	0.27	16.510	166.00	166.20	1.21	166.22	166.46	....	n/a	0.10	166.46	18	None	3.22	2.59	
38	Pipe - (164)	0.67	33.843	180.00	181.50	4.43	183.01	183.02	0.00	Sag	0.01	183.03	Outfall	Dp-Grate	0.85	0.85	
39	Pipe - (146)	4.33	5.000	169.00	169.05	1.00	172.14	172.15	....	n/a	0.09	172.24	Outfall	MH	2.45	2.45	
40	Pipe - (145)	4.36	55.783	169.15	169.50	0.63	172.24	172.32	0.00	Sag	0.13	172.45	39	Dp-Grate	2.47	2.47	
41	Pipe - (158)	3.07	68.513	170.00	178.00	11.68	172.45	178.75 j	....	n/a	n/a	178.75	40	MH	3.91	4.85	
42	Pipe - (163)	0.45	58.512	178.10	178.90	1.37	178.75	179.18 j	0.00	Sag	n/a	179.18	41	Dp-Grate	0.83	2.53	
43	Pipe - (157)	2.65	4.657	178.00	178.00	0.00	178.75	178.82	....	n/a	0.23	179.05	41	None	4.20	3.86	
44	Pipe - (143)	1.91	92.803	169.00	170.90	2.05	170.00	171.49 j	0.00	Sag	n/a	171.49	Outfall	Dp-Grate	2.43	3.97	
45	Pipe - (142)	1.43	140.354	171.00	178.65	5.45	171.49	179.16	0.70	44	n/a	179.16	44	Dp-Grate	3.75	3.59	
46	Pipe - (141)	0.85	144.790	178.75	185.25	4.49	179.16	185.64 j	0.47	45	n/a	185.64	45	Dp-Grate	2.84	3.04	

Project File: System-1.stm | Number of lines: 98 | Date: 6/25/2021

NOTES: ** Critical depth

MyReport

Line No.	Line ID	Flow Rate (cfs)	Line Length (ft)	Invert Dn (ft)	Invert Up (ft)	Line Slope (%)	HGL Dn (ft)	HGL Up (ft)	Q Byp (cfs)	Byp Ln No	Minor Loss (ft)	HGL Jnct (ft)	DnStm Ln No	Junct Type	Vel Dn (ft/s)	Vel Up (ft/s)	
47	Pipe - (224)	7.90	8.265	156.00	156.50	6.05	160.97	160.98	....	n/a	0.10	161.08	Outfall	MH	2.51	2.51	
48	Pipe - (223)	7.02	103.328	165.00	168.10	3.00	165.55	169.04	....	n/a	0.30	169.04	47	MH	9.99	4.84	
49	Pipe - (220)	5.89	13.926	168.60	168.90	2.15	169.22	169.84	....	n/a	0.40	169.84	48	MH	8.62	5.08	
50	Pipe - (215)	4.65	143.534	169.00	172.20	2.23	169.84	173.03 j	....	n/a	n/a	173.03	49	MH	4.59	4.65	
51	Pipe - (214)	2.88	168.381	172.70	176.25	2.11	173.21	176.98	....	n/a	n/a	176.98	50	MH	7.18	4.71	
52	Pipe - (213)	1.51	27.117	176.35	176.70	1.29	176.98	177.22 j	0.35	56	n/a	177.22	51	Grate	2.92	3.66	
53	Pipe - (212)	1.40	30.032	176.35	176.60	0.83	176.98	177.10 j	0.00	Offsite	n/a	177.10	51	Grate	2.70	3.56	
54	Pipe - (226)	1.57	13.625	172.70	172.95	1.83	173.08	173.48	0.38	59	n/a	173.48	50	Grate	5.81	3.70	
55	Pipe - (227)	0.38	10.406	172.70	172.95	2.40	173.03	173.20 j	0.00	61	n/a	173.20	50	Grate	1.70	2.41	
56	Pipe - (219)	0.94	38.336	169.10	170.20	2.87	169.36	170.61	0.26	62	0.15	170.61	48	Grate	5.91	3.14	
57	Pipe - (216)	1.26	12.021	169.50	169.75	2.08	169.84	170.22	0.25	63	0.18	170.22	49	Grate	5.44	3.44	
58	Pipe - (222)	0.32	49.718	169.70	171.00	2.61	169.85	171.23	0.00	62	n/a	171.23	48	Grate	4.16	2.30	
59	Pipe - (218)	0.27	10.429	169.50	169.75	2.40	169.84	169.96 j	0.04	62	n/a	169.96	49	Grate	1.16	2.20	
60	Pipe - (228)	0.73	38.496	166.50	167.05	1.43	166.77	167.41	0.04	98	n/a	167.41	47	Grate	4.28	2.91	
61	Pipe - (225)	0.48	10.908	166.00	166.40	3.67	166.17	166.69	0.01	98	n/a	166.69	47	Grate	5.31	2.58	
62	Pipe - (131)	4.47	7.000	170.00	171.00	14.29	171.96	171.81	....	n/a	0.33	171.81	Outfall	None	2.53	4.59	
63	Pipe - (130)	0.48	11.356	170.00	170.50	4.40	171.96	171.96	0.00	Offsite	0.01	171.97	Outfall	Grate	0.62	0.62	
64	Pipe - (128)	0.82	27.836	170.00	172.00	7.18	171.96	172.38 j	0.00	Offsite	n/a	172.38	Outfall	Grate	1.05	3.02	
65	Pipe - (121)	17.08	7.000	151.75	151.90	2.14	154.46	154.49	....	n/a	0.46	154.95	Outfall	MH	5.44	5.44	
66	Pipe - (120)	17.09	105.694	152.90	155.05	2.03	154.95	157.34	....	n/a	1.45	158.79	65	MH	9.67	9.67	
67	Pipe - (134)	17.09	42.351	155.15	156.00	2.01	158.79	159.75	....	n/a	1.45	161.20	66	MH	9.67	9.67	
68	Pipe - (119)	5.80	79.000	156.55	158.15	2.03	161.20	161.75	....	n/a	0.35	162.10	67	MH	4.73	4.73	
69	Pipe - (118)	5.81	124.829	158.25	158.90	0.52	162.10	162.96	....	n/a	0.24	163.19	68	MH	4.74	4.74	

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NOTES: ** Critical depth

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Line No.	Line ID	Flow Rate (cfs)	Line Length (ft)	Invert Dn (ft)	Invert Up (ft)	Line Slope (%)	HGL Dn (ft)	HGL Up (ft)	Q Byp (cfs)	Byp Ln No	Minor Loss (ft)	HGL Jnct (ft)	DnStm Ln No	Junct Type	Vel Dn (ft/s)	Vel Up (ft/s)	
70	Pipe - (116)	5.82	99.545	159.00	162.10	3.11	163.19	163.88	....	n/a	0.34	164.22	69	MH	4.74	4.74	
71	Pipe - (125)	5.69	93.435	162.20	162.70	0.54	164.22	164.84	....	n/a	0.08	164.92	70	MH	4.64	4.64	
72	Pipe - (111)	5.56	108.414	162.80	163.35	0.51	164.92	165.61	....	n/a	0.21	165.82	71	MH	4.53	4.53	
73	Pipe - (115)	4.92	16.242	166.50	167.00	3.08	167.13	167.91	....	n/a	n/a	167.91	72	MH	9.40	6.55	
74	Pipe - (110)	0.65	28.731	163.60	163.75	0.52	165.82	165.83	....	n/a	0.01	165.84	72	MH	0.82	0.82	
75	Pipe - (112)	0.11	86.771	164.85	170.75	6.80	165.84	170.89 j	0.00	Sag	n/a	170.89	74	Dp-Grate	0.14	1.74	
76	Pipe - (109)	0.79	154.272	163.85	164.75	0.58	165.84	165.90	....	n/a	0.01	165.92	74	MH	1.01	1.01	
77	Pipe - (113)	0.42	10.447	164.85	165.00	1.44	165.92	165.92	0.00	Offsite	0.00	165.92	76	Grate	0.53	0.55	
78	Pipe - (114)	0.39	10.409	164.85	165.00	1.44	165.92	165.92	0.00	Offsite	0.00	165.92	76	Grate	0.49	0.51	
79	Pipe - (244)	0.20	13.992	160.00	160.15	1.07	161.20	161.22	....	n/a	0.02	161.24	67	None	1.03	1.03	
80	Pipe	11.16	6.000	156.00	156.00	0.00	161.20	161.36	....	n/a	1.29	162.64	67	None	9.10	9.09	
81	Pipe	4.92	23.000	167.00	167.00	0.00	167.91	168.32	....	n/a	0.61	168.93	73	None	6.55	6.26	
82	Pipe - (229)	9.07	10.000	161.00	161.50	5.00	162.36	162.91	....	n/a	2.07	164.99	Outfall	MH	11.55	11.55	
83	Pipe - (156)	5.27	110.000	163.50	165.80	2.09	164.99	167.04	....	n/a	0.11	167.16	82	MH	6.72	6.72	
84	Pipe - (154)	5.28	54.398	165.90	167.00	2.02	167.16	168.17	....	n/a	0.70	168.88	83	MH	6.72	6.72	
85	Pipe	4.81	39.000	167.00	167.00	0.00	168.88	169.48	....	n/a	0.58	170.07	84	None	6.13	6.12	
86	Pipe	3.80	16.000	162.65	163.00	2.19	164.99	165.14	....	n/a	0.36	165.51	82	MH	4.84	4.84	
87	Pipe	3.80	6.000	163.00	163.00	0.00	165.51	165.56	....	n/a	0.36	165.93	86	None	4.84	4.84	
88	Pipe - (137)	1.73	15.243	160.50	160.85	2.30	164.58	164.58	0.00	Sag	0.01	164.59	Outfall	Dp-Grate	0.98	0.98	
89	Pipe - (136)	1.25	80.479	161.35	163.40	2.55	164.59	164.68	0.64	88	0.02	164.69	88	Dp-Grate	1.59	1.59	
90	Pipe - (140)	0.52	101.790	163.50	165.00	1.47	164.69	165.30 j	0.25	89	n/a	165.30	89	Dp-Grate	0.66	2.64	
91	Pipe - (255)	0.67	15.845	162.00	162.15	0.95	164.22	164.22	....	n/a	0.01	164.24	Outfall	MH	0.85	0.85	
92	Pipe - (253)	0.34	16.912	162.25	162.50	1.48	164.24	164.24	0.00	Offsite	0.00	164.24	91	Grate	0.43	0.43	

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NOTES: ** Critical depth

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Line No.	Line ID	Flow Rate (cfs)	Line Length (ft)	Invert Dn (ft)	Invert Up (ft)	Line Slope (%)	HGL Dn (ft)	HGL Up (ft)	Q Byp (cfs)	Byp Ln No	Minor Loss (ft)	HGL Jnct (ft)	DnStm Ln No	Junct Type	Vel Dn (ft/s)	Vel Up (ft/s)	
93	Pipe - (254)	0.36	24.699	162.25	162.50	1.01	164.24	164.24	0.00	Offsite	0.00	164.24	91	Grate	0.46	0.46	
94	Pipe - (132)	1.27	17.313	157.00	157.50	2.89	160.97	160.99	....	n/a	0.03	161.01	Outfall	MH	1.61	1.61	
95	Pipe - (124)	0.57	19.542	162.00	162.80	4.09	162.18	163.11	0.00	Sag	n/a	163.11	94	Grate	5.80	2.71	
96	Pipe - (123)	0.72	15.290	162.00	162.80	5.23	162.19	163.15	0.00	Sag	n/a	163.15	94	Grate	6.75	2.89	
97	Pipe - (139)	1.16	115.860	152.00	159.00	6.04	154.46	159.45 j	0.56	Offsite	n/a	159.45	Outfall	Dp-Grate	1.48	3.36	
98	Pipe - (138)	0.64	107.618	160.50	163.50	2.79	160.71	163.83	0.35	97	n/a	163.83	97	Dp-Grate	5.22	2.79	

Project File: System-1.stm | Number of lines: 98 | Date: 6/25/2021

NOTES: ** Critical depth

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	Pipe - (162)	3.34	18	Cir	33.480	180.00	180.75	2.240	183.01*	183.04*	0.05	183.09	End	Manhole
2	Pipe - (161)	3.46	18	Cir	118.492	180.85	182.05	1.013	183.09	183.18	0.09	183.27	1	Manhole
3	Pipe - (256)	0.96	12	Cir	179.028	183.00	190.75	4.329	183.27	191.16	n/a	191.16	2	Manhole
4	Pipe - (193)	0.99	12	Cir	52.444	190.85	192.40	2.956	191.16	192.82	0.16	192.82	3	Grate
5	Pipe - (159)	1.96	12	Cir	20.835	182.55	183.00	2.160	183.27	183.60	n/a	183.60 j	2	Grate
6	Pipe - (160)	0.97	12	Cir	10.493	182.55	183.00	4.289	183.27	183.41	n/a	183.41 j	2	Grate
7	Pipe - (180)	1.58	18	Cir	9.773	165.00	165.50	5.116	165.47	165.97	n/a	165.97	End	Manhole
8	Pipe - (188)	2.70	12	Cir	66.978	171.50	175.50	5.972	171.87	176.20	n/a	176.20	7	Manhole
9	Pipe - (179)	2.72	12	Cir	62.141	175.60	179.30	5.954	176.20	180.01	n/a	180.01	8	Manhole
10	Pipe - (178)	1.49	12	Cir	139.702	179.40	187.80	6.013	180.01	188.32	n/a	188.32 j	9	Manhole
11	Pipe - (189)	1.11	12	Cir	13.056	187.90	188.15	1.915	188.32	188.59	0.17	188.59	10	Grate
12	Pipe - (190)	0.38	12	Cir	13.056	187.90	188.15	1.915	188.32	188.40	n/a	188.40 j	10	Grate
13	Pipe - (177)	0.36	12	Cir	155.672	187.00	192.65	3.629	188.32	192.90	n/a	192.90 j	10	Grate
14	Pipe - (191)	1.06	12	Cir	12.846	179.40	180.00	4.671	180.01	180.43	n/a	180.43 j	9	Grate
15	Pipe - (192)	0.57	12	Cir	12.525	179.40	180.00	4.790	180.01	180.31	n/a	180.31 j	9	Grate
16	Pipe - (181)	0.29	12	Cir	10.182	171.75	172.20	4.420	171.88	172.42	0.08	172.42	7	Grate
17	Pipe - (182)	0.63	12	Cir	12.014	171.75	172.20	3.746	171.95	172.53	n/a	172.53	7	Grate
18	Pipe - (235)	14.00	24	Cir	19.000	160.50	161.50	5.263	162.36	162.85	n/a	162.85 j	End	Manhole
19	Pipe - (155)	12.33	18	Cir	66.758	162.70	164.05	2.022	163.68	165.38	n/a	165.38	18	Manhole
20	Pipe - (152)	10.43	18	Cir	131.969	164.15	165.50	1.023	165.38	166.74	n/a	166.74	19	DropGrate
21	Pipe - (151)	8.76	18	Cir	68.617	165.60	166.50	1.312	166.74	167.65	n/a	167.65	20	DropGrate
22	Pipe - (150)	7.96	18	Cir	71.340	166.60	168.35	2.453	167.65	169.44	0.33	169.44	21	Manhole
23	Pipe - (149)	8.04	18	Cir	68.595	168.45	169.15	1.020	169.44	170.25	n/a	170.25	22	DropGrate
24	Pipe - (148)	6.05	18	Cir	174.934	170.60	174.50	2.229	171.22	175.45	0.32	175.45	23	DropGrate

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NOTES: Return period = 100 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	Pipe - (175)	5.47	18	Cir	83.769	174.60	175.45	1.015	175.45	176.35	n/a	176.35	24	Manhole
26	Pipe - (174)	5.62	18	Cir	122.667	175.55	176.80	1.019	176.35	177.71	n/a	177.71	25	Manhole
27	Pipe - (173)	5.66	18	Cir	33.031	176.90	177.25	1.060	177.71	178.17	n/a	178.17	26	Manhole
28	Pipe - (172)	5.81	18	Cir	121.997	177.35	178.50	0.943	178.17	179.43	0.40	179.43	27	Manhole
29	Pipe - (171)	6.02	12	Cir	367.980	179.00	187.90	2.419	179.82	188.86	n/a	188.86	28	Manhole
30	Pipe - (144)	6.05	12	Cir	66.286	188.00	194.50	9.806	188.86	195.46	n/a	195.46	29	None
31	Pipe - (147)	0.57	12	Cir	74.897	169.65	170.25	0.801	170.25	170.56	n/a	170.56 j	23	DropGrate
32	Pipe - (232)	1.83	12	Cir	63.863	167.50	169.00	2.349	167.88	169.58	n/a	169.58	18	Manhole
33	Pipe - (230)	0.82	12	Cir	28.393	169.10	169.40	1.057	169.58	169.78	n/a	169.78 j	32	Grate
34	Pipe - (231)	1.04	12	Cir	27.933	169.10	169.40	1.074	169.58	169.83	n/a	169.83 j	32	Grate
35	Pipe - (233)	1.79	12	Cir	12.995	166.25	166.60	2.693	166.61	167.17	0.23	167.17	19	Grate
36	Pipe - (234)	0.68	12	Cir	12.995	166.25	166.60	2.693	166.47	166.94	n/a	166.94	19	Grate
37	Pipe - (252)	0.27	6	Cir	16.510	166.00	166.20	1.211	166.22	166.46	0.10	166.46	18	None
38	Pipe - (164)	0.67	12	Cir	33.843	180.00	181.50	4.432	183.01*	183.02*	0.01	183.03	End	DropGrate
39	Pipe - (146)	4.33	18	Cir	5.000	169.00	169.05	1.000	172.14*	172.15*	0.09	172.24	End	Manhole
40	Pipe - (145)	4.36	18	Cir	55.783	169.15	169.50	0.627	172.24*	172.32*	0.13	172.45	39	DropGrate
41	Pipe - (158)	3.07	12	Cir	68.513	170.00	178.00	11.677	172.45	178.75	n/a	178.75 j	40	Manhole
42	Pipe - (163)	0.45	12	Cir	58.512	178.10	178.90	1.367	178.75	179.18	n/a	179.18 j	41	DropGrate
43	Pipe - (157)	2.65	12	Cir	4.657	178.00	178.00	0.000	178.75	178.82	0.23	179.05	41	None
44	Pipe - (143)	1.91	12	Cir	92.803	169.00	170.90	2.047	170.00	171.49	n/a	171.49 j	End	DropGrate
45	Pipe - (142)	1.43	12	Cir	140.354	171.00	178.65	5.450	171.49	179.16	n/a	179.16	44	DropGrate
46	Pipe - (141)	0.85	12	Cir	144.790	178.75	185.25	4.489	179.16	185.64	n/a	185.64 j	45	DropGrate
47	Pipe - (224)	7.90	24	Cir	8.265	156.00	156.50	6.050	160.97*	160.98*	0.10	161.08	End	Manhole
48	Pipe - (223)	7.02	24	Cir	103.328	165.00	168.10	3.000	165.55	169.04	0.30	169.04	47	Manhole

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Storm Sewer Summary Report

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49	Pipe - (220)	5.89	18	Cir	13.926	168.60	168.90	2.154	169.22	169.84	0.40	169.84	48	Manhole
50	Pipe - (215)	4.65	18	Cir	143.534	169.00	172.20	2.229	169.84	173.03	n/a	173.03 j	49	Manhole
51	Pipe - (214)	2.88	12	Cir	168.381	172.70	176.25	2.108	173.21	176.98	n/a	176.98	50	Manhole
52	Pipe - (213)	1.51	12	Cir	27.117	176.35	176.70	1.291	176.98	177.22	n/a	177.22 j	51	Grate
53	Pipe - (212)	1.40	12	Cir	30.032	176.35	176.60	0.832	176.98	177.10	n/a	177.10 j	51	Grate
54	Pipe - (226)	1.57	12	Cir	13.625	172.70	172.95	1.835	173.08	173.48	n/a	173.48	50	Grate
55	Pipe - (227)	0.38	12	Cir	10.406	172.70	172.95	2.402	173.03	173.20	n/a	173.20 j	50	Grate
56	Pipe - (219)	0.94	12	Cir	38.336	169.10	170.20	2.869	169.36	170.61	0.15	170.61	48	Grate
57	Pipe - (216)	1.26	12	Cir	12.021	169.50	169.75	2.080	169.84	170.22	0.18	170.22	49	Grate
58	Pipe - (222)	0.32	12	Cir	49.718	169.70	171.00	2.615	169.85	171.23	n/a	171.23	48	Grate
59	Pipe - (218)	0.27	12	Cir	10.429	169.50	169.75	2.397	169.84	169.96	n/a	169.96 j	49	Grate
60	Pipe - (228)	0.73	12	Cir	38.496	166.50	167.05	1.429	166.77	167.41	n/a	167.41	47	Grate
61	Pipe - (225)	0.48	12	Cir	10.908	166.00	166.40	3.667	166.17	166.69	n/a	166.69	47	Grate
62	Pipe - (131)	4.47	18	Cir	7.000	170.00	171.00	14.286	171.96	171.81	0.33	171.81	End	None
63	Pipe - (130)	0.48	12	Cir	11.356	170.00	170.50	4.403	171.96*	171.96*	0.01	171.97	End	Grate
64	Pipe - (128)	0.82	12	Cir	27.836	170.00	172.00	7.185	171.96	172.38	n/a	172.38 j	End	Grate
65	Pipe - (121)	17.08	24	Cir	7.000	151.75	151.90	2.143	154.46*	154.49*	0.46	154.95	End	Manhole
66	Pipe - (120)	17.09	18	Cir	105.694	152.90	155.05	2.034	154.95*	157.34*	1.45	158.79	65	Manhole
67	Pipe - (134)	17.09	18	Cir	42.351	155.15	156.00	2.007	158.79*	159.75*	1.45	161.20	66	Manhole
68	Pipe - (119)	5.80	15	Cir	79.000	156.55	158.15	2.025	161.20*	161.75*	0.35	162.10	67	Manhole
69	Pipe - (118)	5.81	15	Cir	124.829	158.25	158.90	0.521	162.10*	162.96*	0.24	163.19	68	Manhole
70	Pipe - (116)	5.82	15	Cir	99.545	159.00	162.10	3.114	163.19*	163.88*	0.34	164.22	69	Manhole
71	Pipe - (125)	5.69	15	Cir	93.435	162.20	162.70	0.535	164.22*	164.84*	0.08	164.92	70	Manhole
72	Pipe - (111)	5.56	15	Cir	108.414	162.80	163.35	0.507	164.92*	165.61*	0.21	165.82	71	Manhole

Project File: System-1.stm | Number of lines: 98 | Run Date: 6/25/2021

NOTES: Return period = 100 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
73	Pipe - (115)	4.92	12	Cir	16.242	166.50	167.00	3.078	167.13	167.91	n/a	167.91	72	Manhole
74	Pipe - (110)	0.65	12	Cir	28.731	163.60	163.75	0.522	165.82*	165.83*	0.01	165.84	72	Manhole
75	Pipe - (112)	0.11	12	Cir	86.771	164.85	170.75	6.800	165.84	170.89	n/a	170.89 j	74	DropGrate
76	Pipe - (109)	0.79	12	Cir	154.272	163.85	164.75	0.583	165.84*	165.90*	0.01	165.92	74	Manhole
77	Pipe - (113)	0.42	12	Cir	10.447	164.85	165.00	1.436	165.92	165.92	0.00	165.92	76	Grate
78	Pipe - (114)	0.39	12	Cir	10.409	164.85	165.00	1.441	165.92	165.92	0.00	165.92	76	Grate
79	Pipe - (244)	0.20	6	Cir	13.992	160.00	160.15	1.072	161.20*	161.22*	0.02	161.24	67	None
80	Pipe	11.16	15	Cir	6.000	156.00	156.00	0.000	161.20*	161.36*	1.29	162.64	67	None
81	Pipe	4.92	12	Cir	23.000	167.00	167.00	0.000	167.91*	168.32*	0.61	168.93	73	None
82	Pipe - (229)	9.07	12	Cir	10.000	161.00	161.50	5.000	162.36*	162.91*	2.07	164.99	End	Manhole
83	Pipe - (156)	5.27	12	Cir	110.000	163.50	165.80	2.091	164.99*	167.04*	0.11	167.16	82	Manhole
84	Pipe - (154)	5.28	12	Cir	54.398	165.90	167.00	2.022	167.16*	168.17*	0.70	168.88	83	Manhole
85	Pipe	4.81	12	Cir	39.000	167.00	167.00	0.000	168.88*	169.48*	0.58	170.07	84	None
86	Pipe	3.80	12	Cir	16.000	162.65	163.00	2.188	164.99*	165.14*	0.36	165.51	82	Manhole
87	Pipe	3.80	12	Cir	6.000	163.00	163.00	0.000	165.51*	165.56*	0.36	165.93	86	None
88	Pipe - (137)	1.73	18	Cir	15.243	160.50	160.85	2.296	164.58*	164.58*	0.01	164.59	End	DropGrate
89	Pipe - (136)	1.25	12	Cir	80.479	161.35	163.40	2.547	164.59*	164.68*	0.02	164.69	88	DropGrate
90	Pipe - (140)	0.52	12	Cir	101.790	163.50	165.00	1.474	164.69	165.30	n/a	165.30 j	89	DropGrate
91	Pipe - (255)	0.67	12	Cir	15.845	162.00	162.15	0.947	164.22*	164.22*	0.01	164.24	End	Manhole
92	Pipe - (253)	0.34	12	Cir	16.912	162.25	162.50	1.478	164.24*	164.24*	0.00	164.24	91	Grate
93	Pipe - (254)	0.36	12	Cir	24.699	162.25	162.50	1.012	164.24*	164.24*	0.00	164.24	91	Grate
94	Pipe - (132)	1.27	12	Cir	17.313	157.00	157.50	2.888	160.97*	160.99*	0.03	161.01	End	Manhole
95	Pipe - (124)	0.57	12	Cir	19.542	162.00	162.80	4.094	162.18	163.11	n/a	163.11	94	Grate
96	Pipe - (123)	0.72	12	Cir	15.290	162.00	162.80	5.232	162.19	163.15	n/a	163.15	94	Grate

Project File: System-1.stm | Number of lines: 98 | Run Date: 6/25/2021

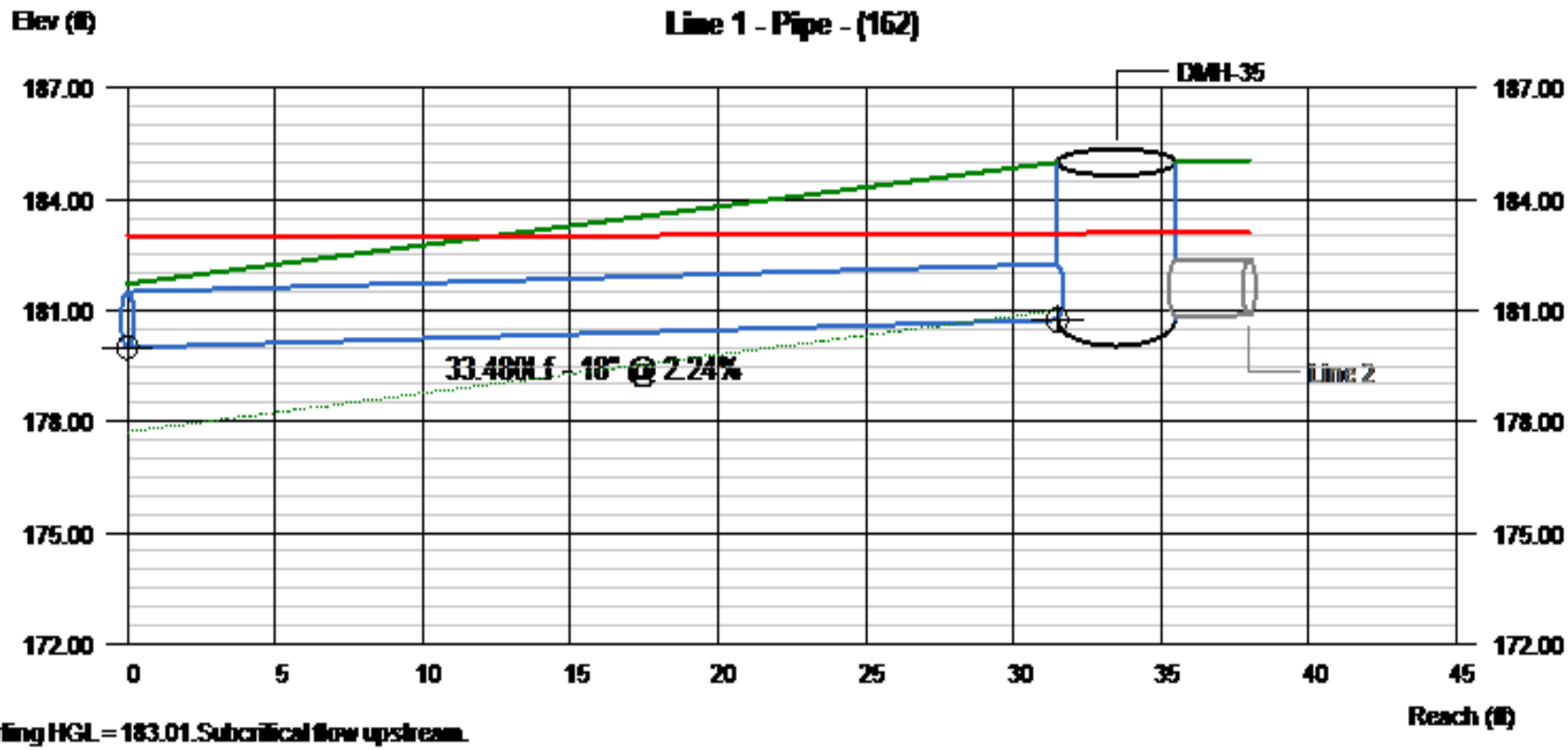
NOTES: Return period = 100 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

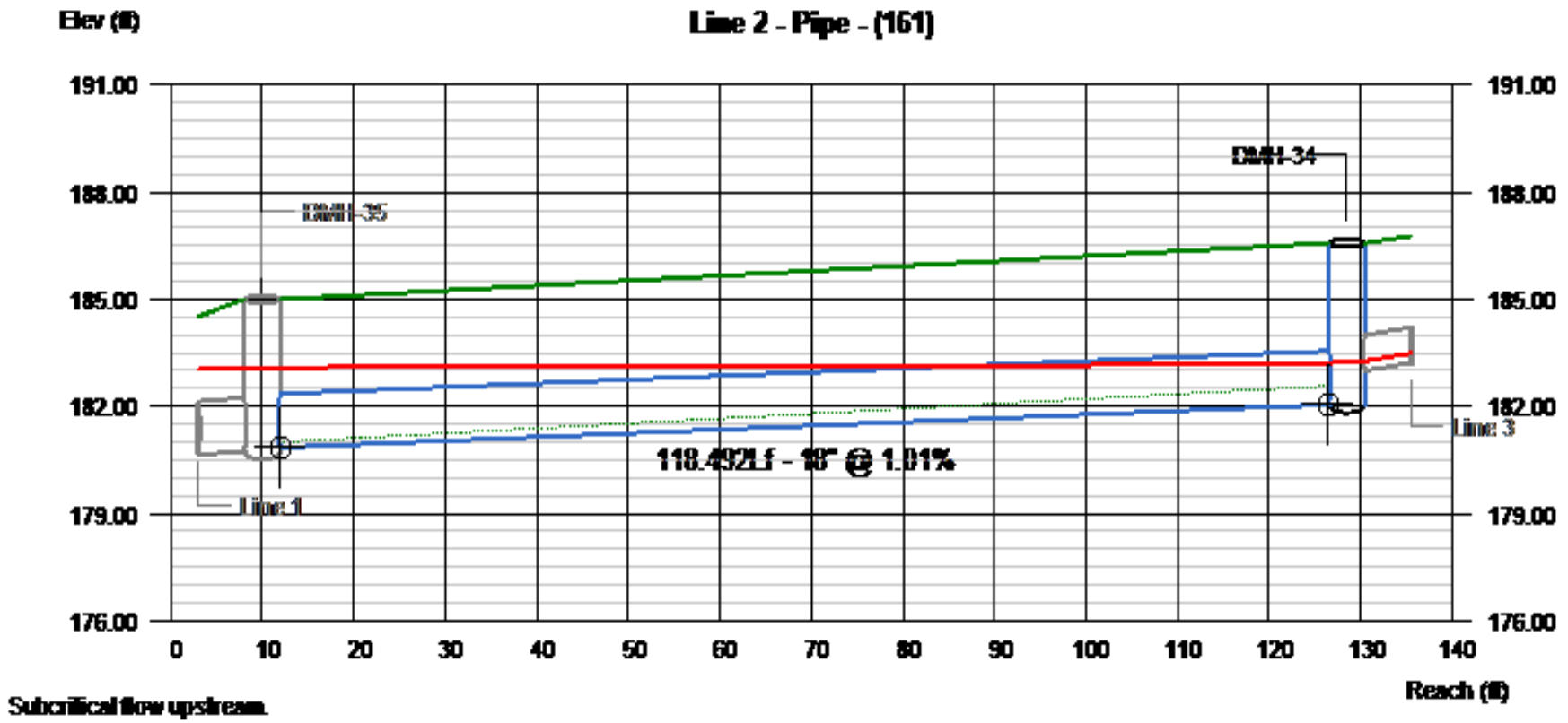
Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
97	Pipe - (139)	1.16	12	Cir	115.860	152.00	159.00	6.042	154.46	159.45	n/a	159.45 j	End	DropGrate
98	Pipe - (138)	0.64	12	Cir	107.618	160.50	163.50	2.788	160.71	163.83	n/a	163.83	97	DropGrate

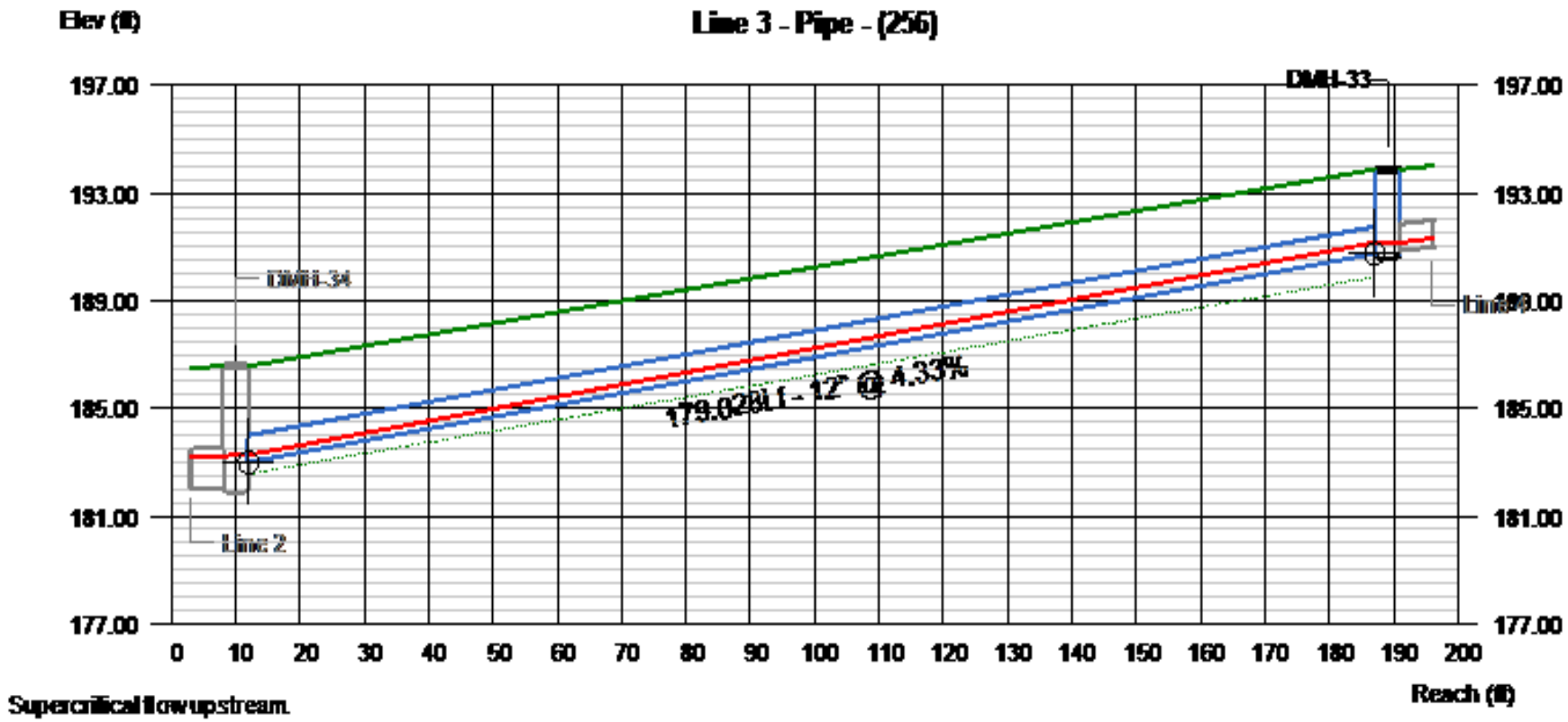
Project File: System-1.stm | Number of lines: 98 | Run Date: 6/25/2021

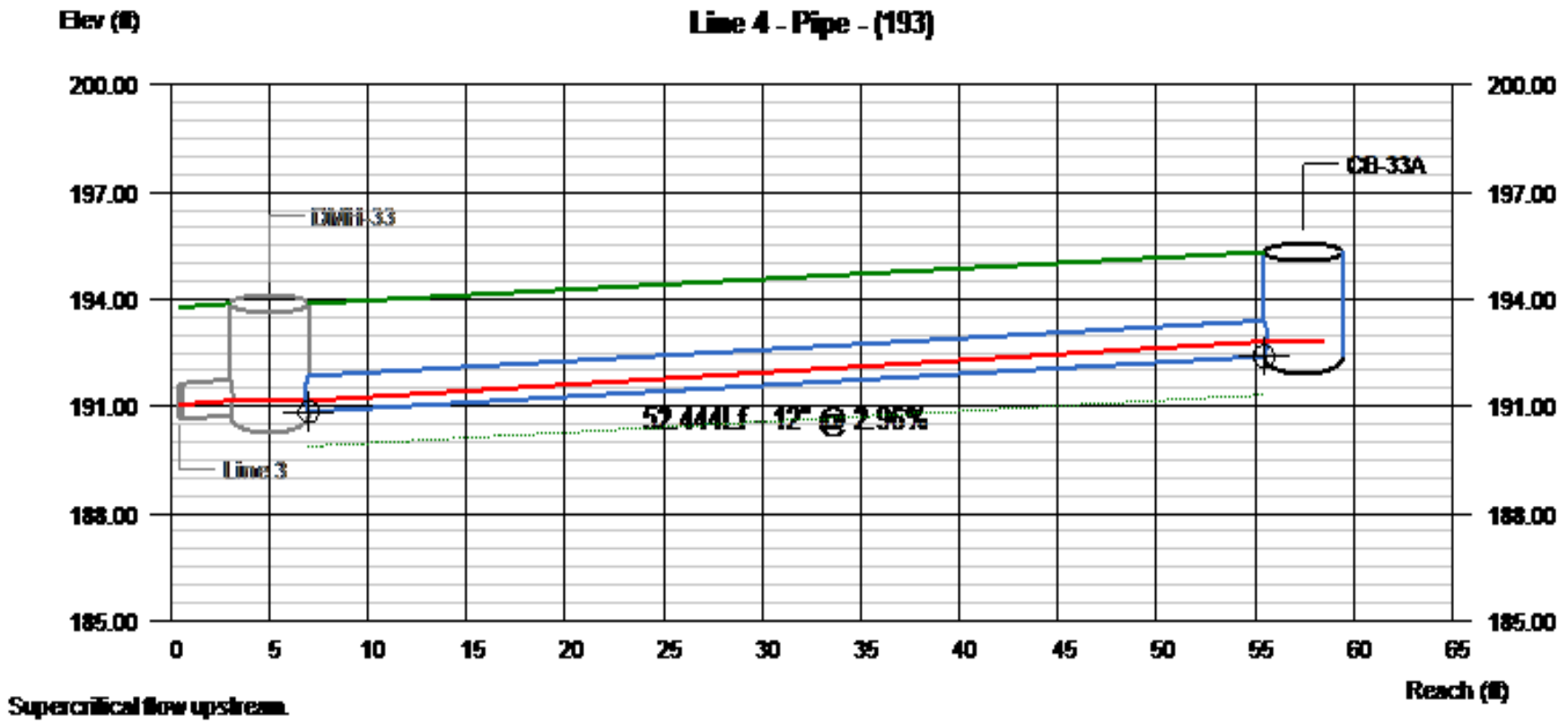
NOTES: Return period = 100 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

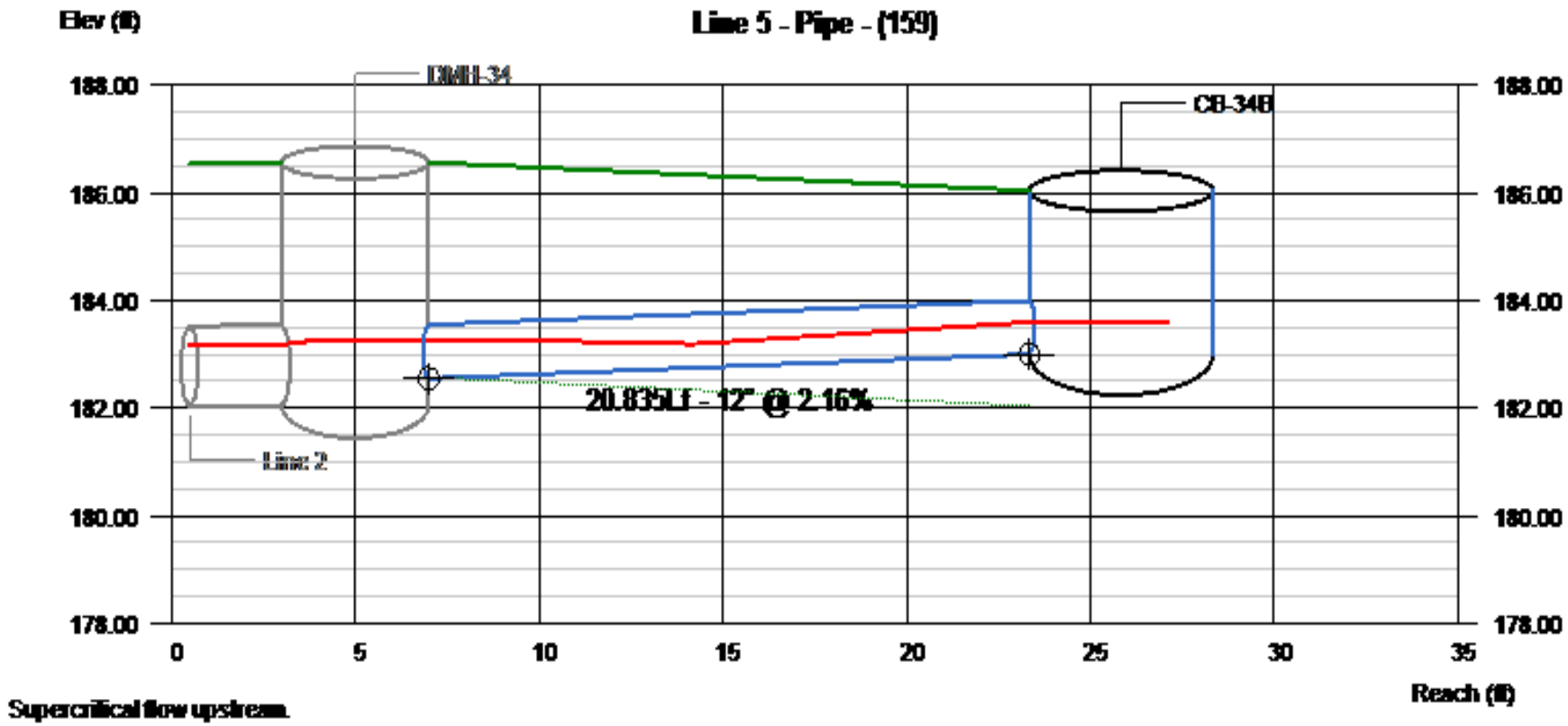


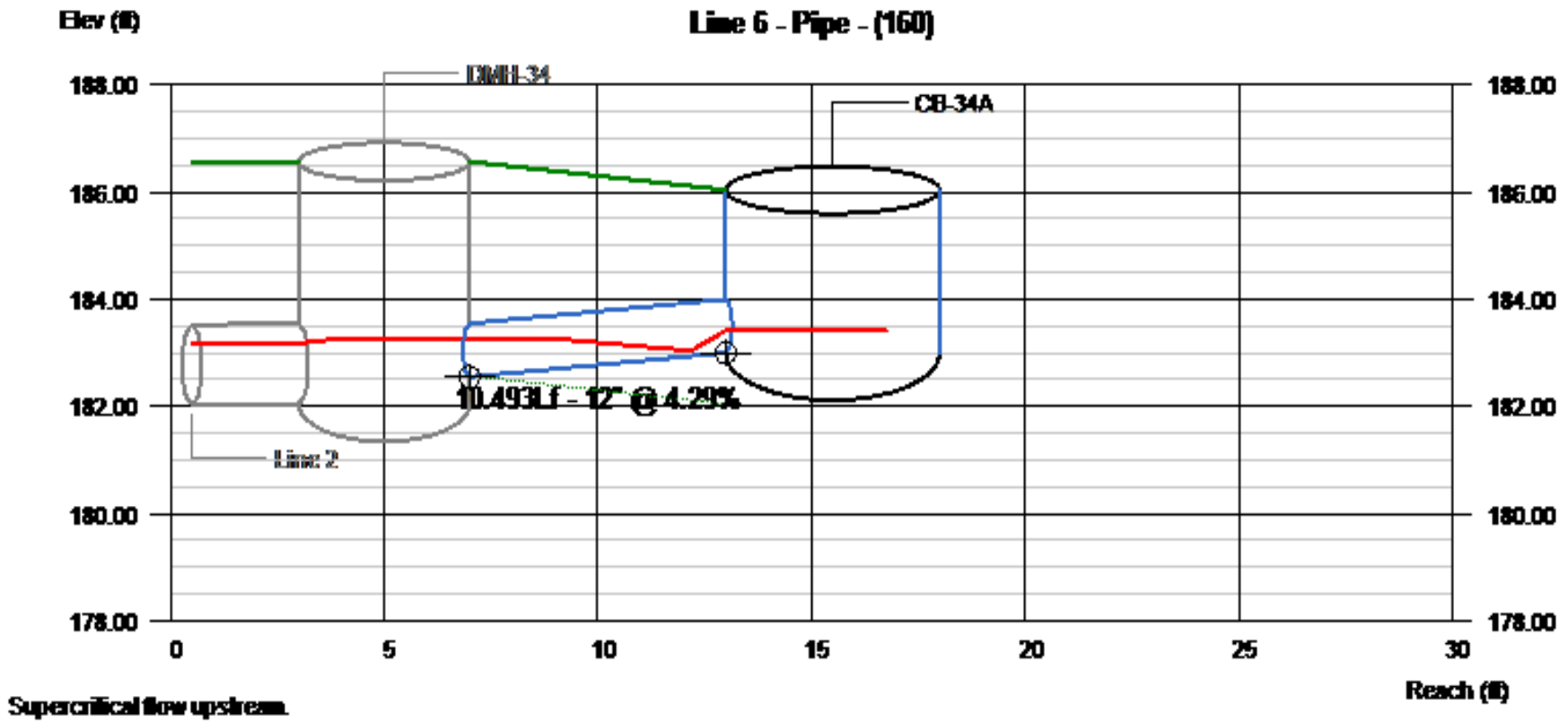
Starting HGL = 183.01.Subcritical flow upstream.


Elev (ft)
Line 2 - Pipe - (161)
191.00
188.00
185.00
182.00
179.00
176.00
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Reach (ft)
DMH-34
DMH-35
Line 1
Line 3
118.492Lf - 18" @ 1.01%
Subcritical flow upstream.

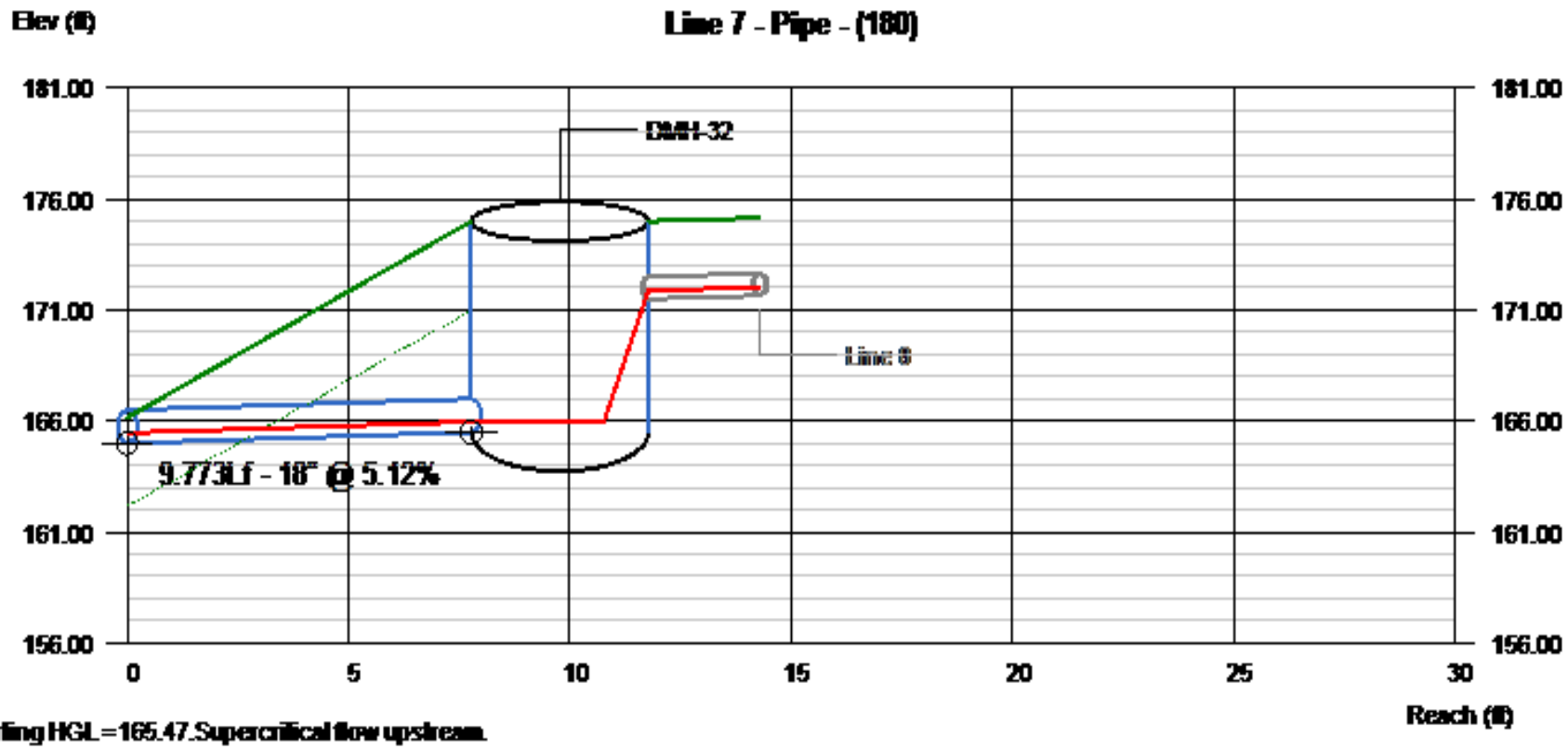

Elev (ft)
Line 3 - Pipe - (256)
197.00
193.00
189.00
185.00
181.00
177.00
DMH-33
DMH-34
Line 2
179.02ft - 12" @ 4.33%
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
Reach (ft)
Supercritical flow upstream.


Elev (ft)
Line 4 - Pipe - (193)
200.00
197.00
194.00
191.00
188.00
185.00
0
5
10
15
20
25
30
35
40
45
50
55
60
65
Reach (ft)
DMH-33
CB-33A
Line 3
52.444Lf - 12" @ 2.96%
Supercritical flow upstream.

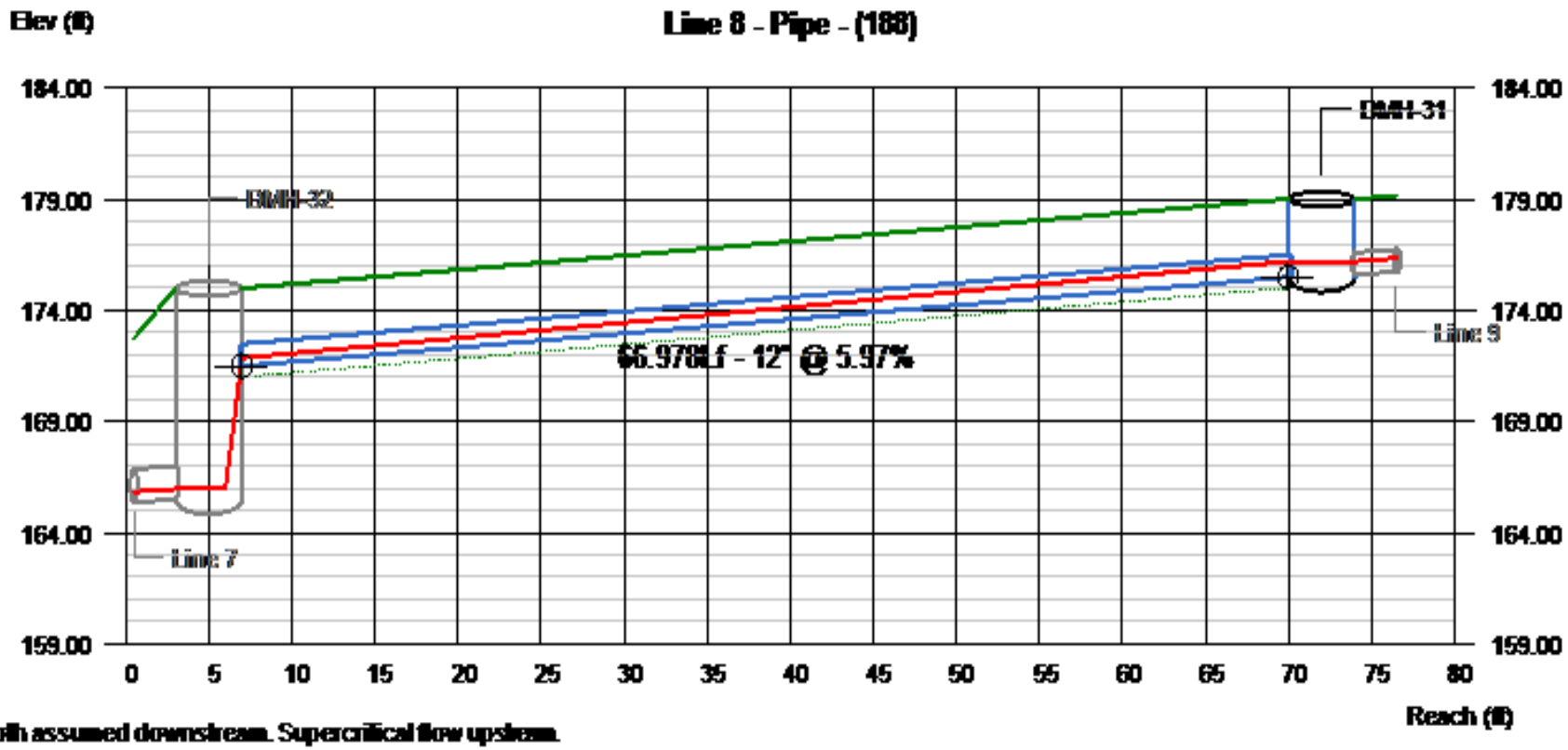

Elev (ft)
Line 5 - Pipe - (159)
DMH-34
CB-348
188.00
186.00
184.00
182.00
180.00
178.00
20.835Lf - 12" @ 2.16%
Line 2
0
5
10
15
20
25
30
35
Reach (ft)
Supercritical flow upstream.



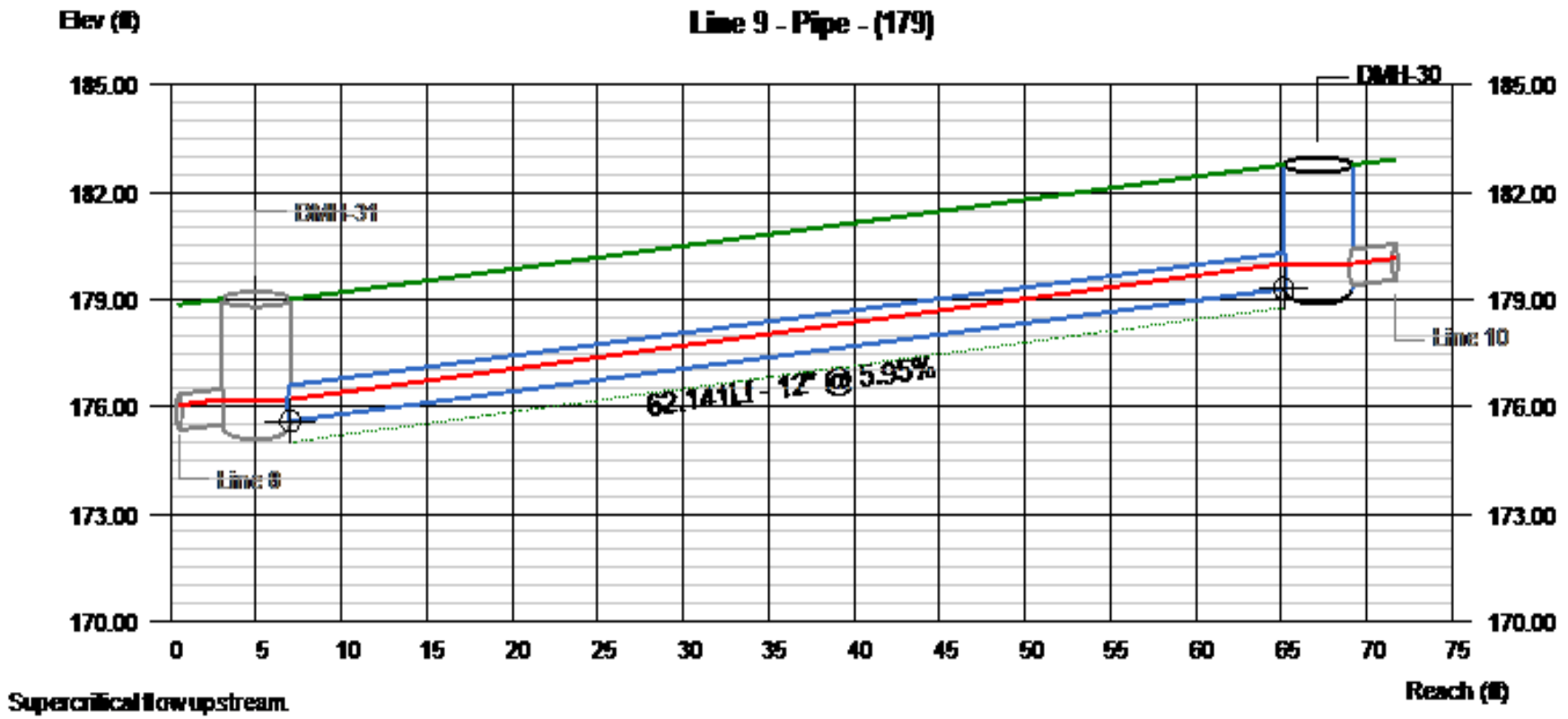
Supercritical flow upstream.

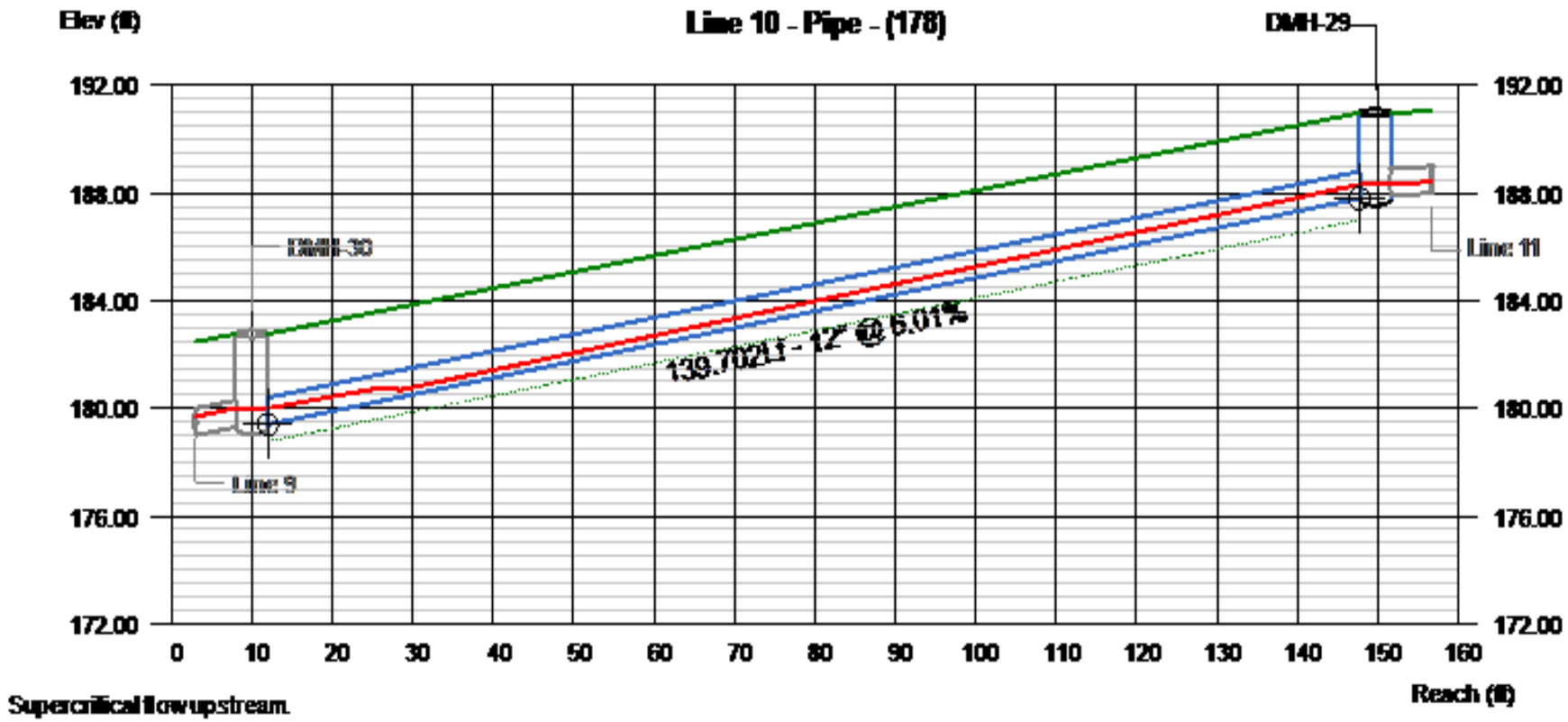


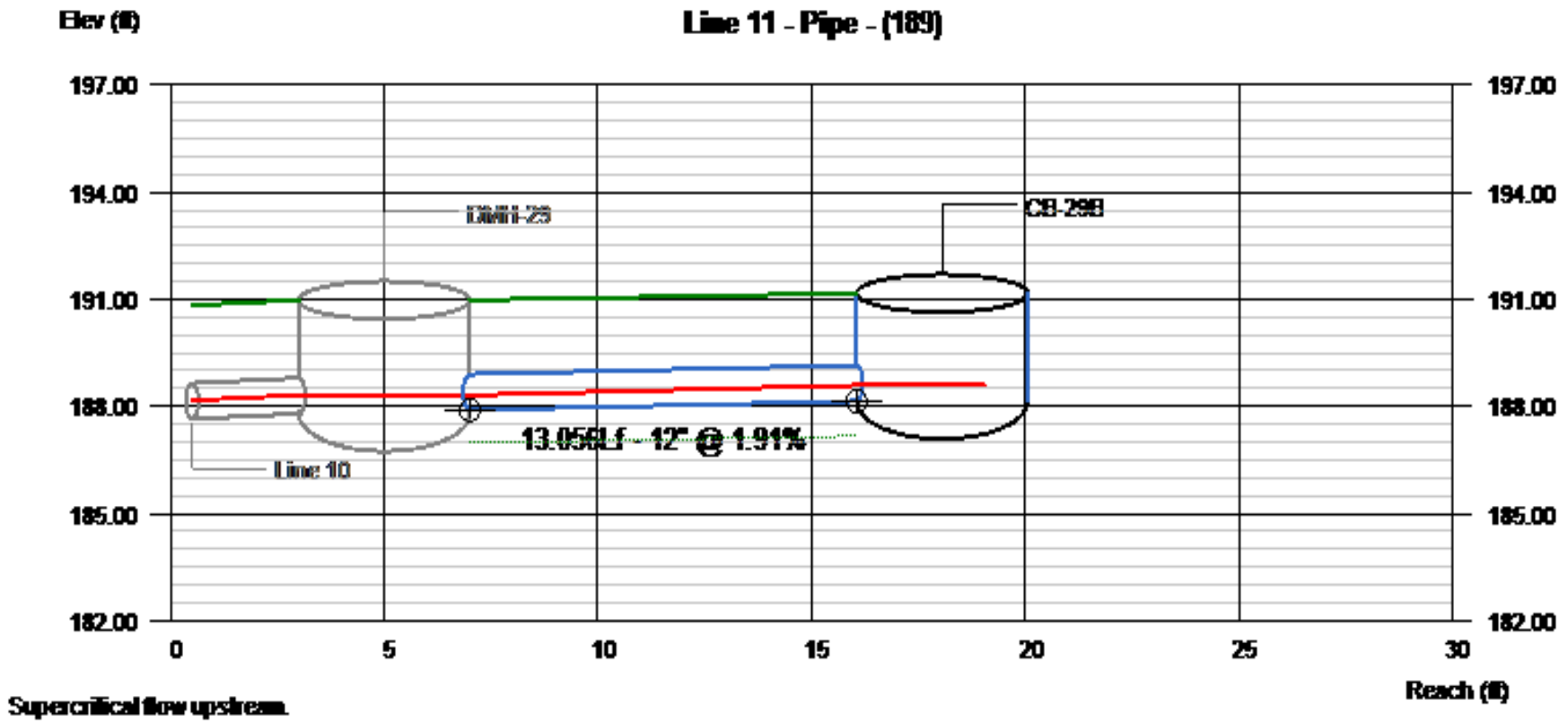
Starting HGL = 165.47 Supercritical flow upstream.

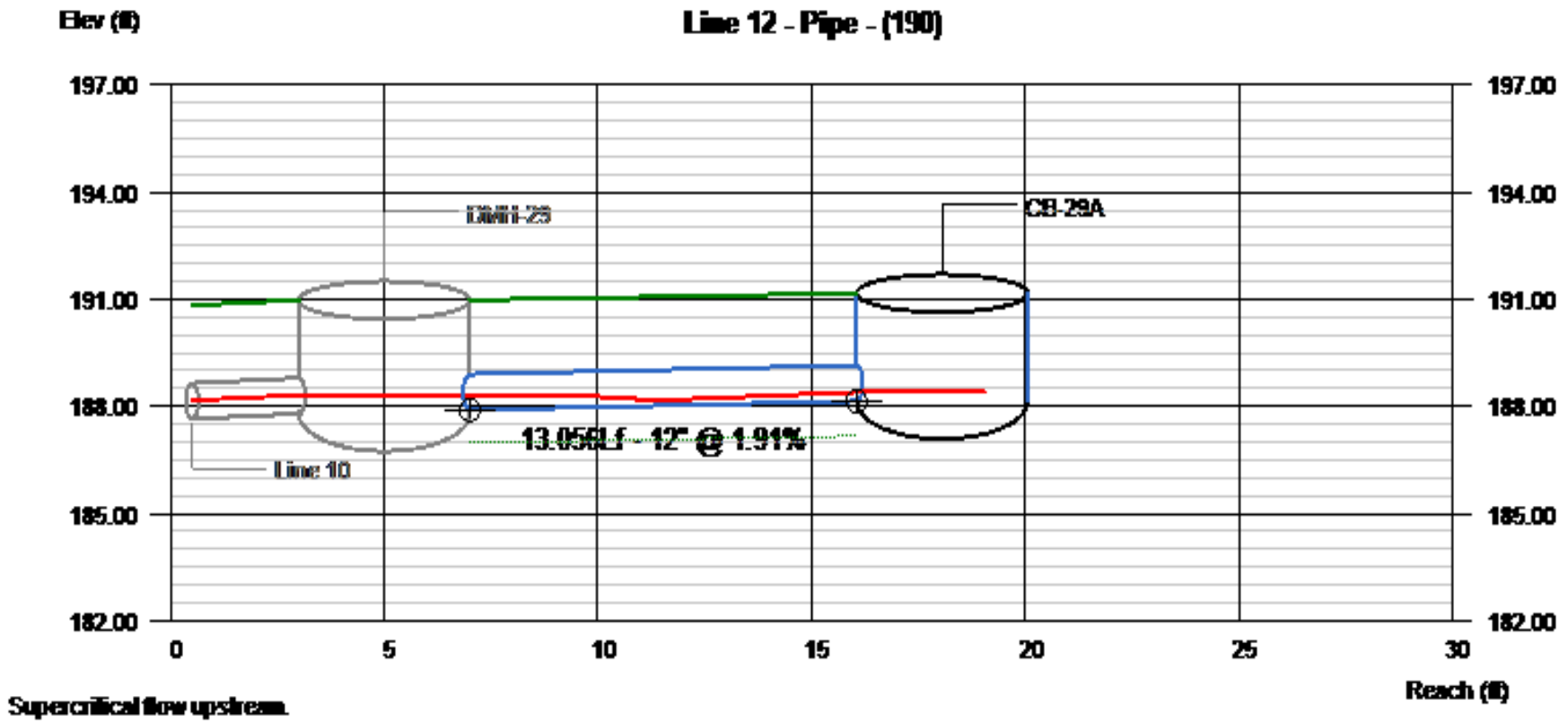


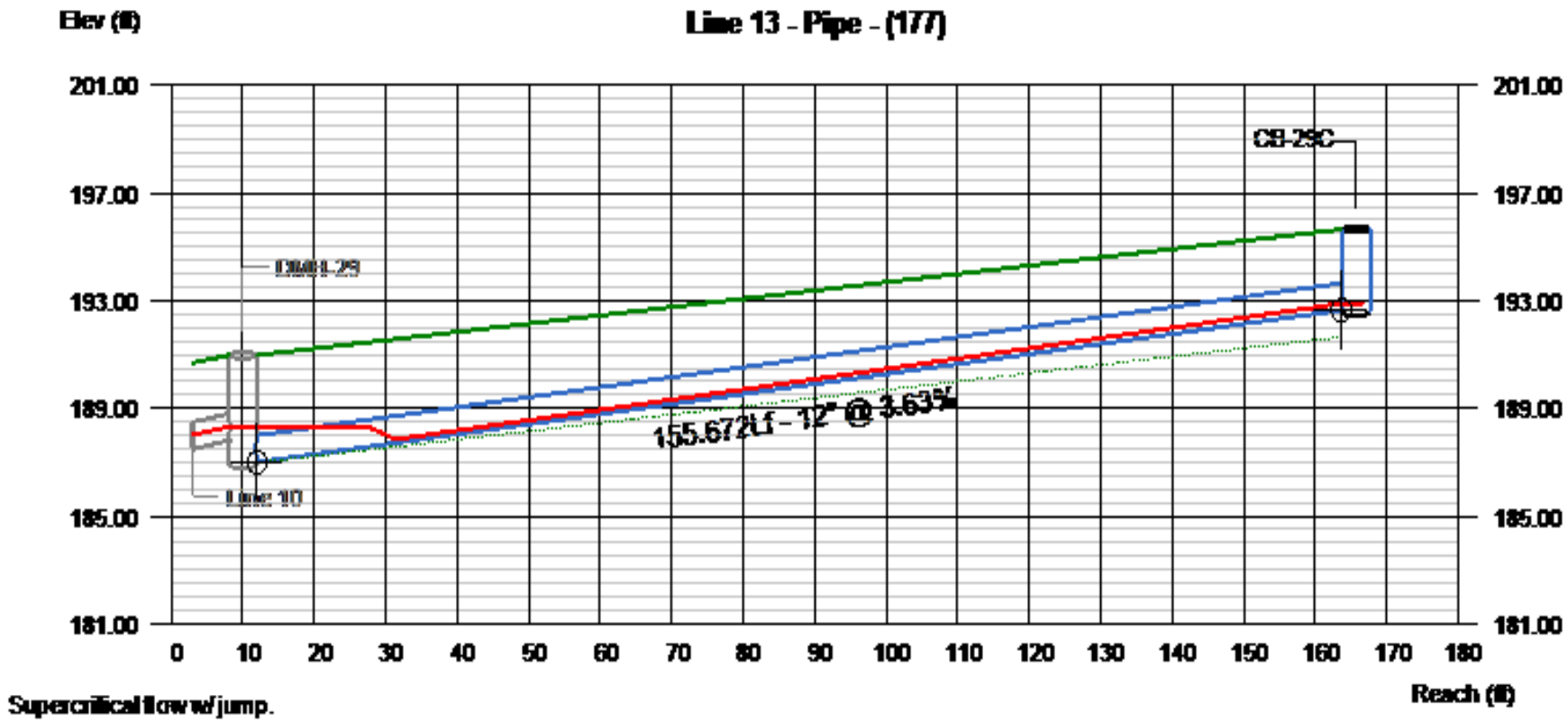
depth assumed downstream. Supercritical flow upstream.


Elev (ft)
Line 9 - Pipe - (179)
185.00
182.00
179.00
176.00
173.00
170.00
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
DMH-30
DMH-31
Line: 10
Line: 9
62.141LF - 12" @ 5.95%
Supercritical flow upstream.
Reach (ft)

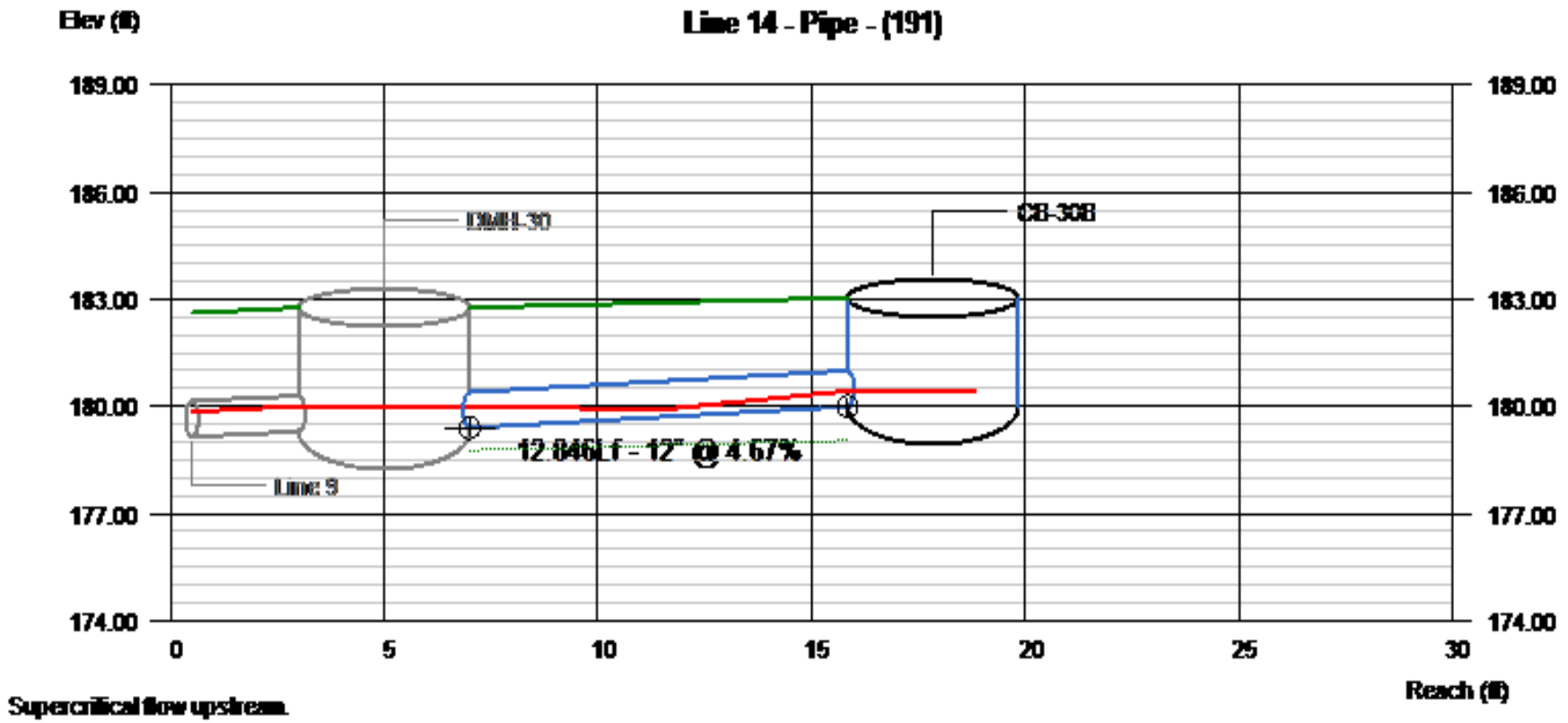

Elev (ft)
Line 10 - Pipe - (178)
DMH-29
192.00
188.00
184.00
180.00
176.00
172.00
DMH-30
Line: 11
139.70ft - 12" @ 6.01%
Line: 9
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
Supercritical flow upstream.
Reach (ft)

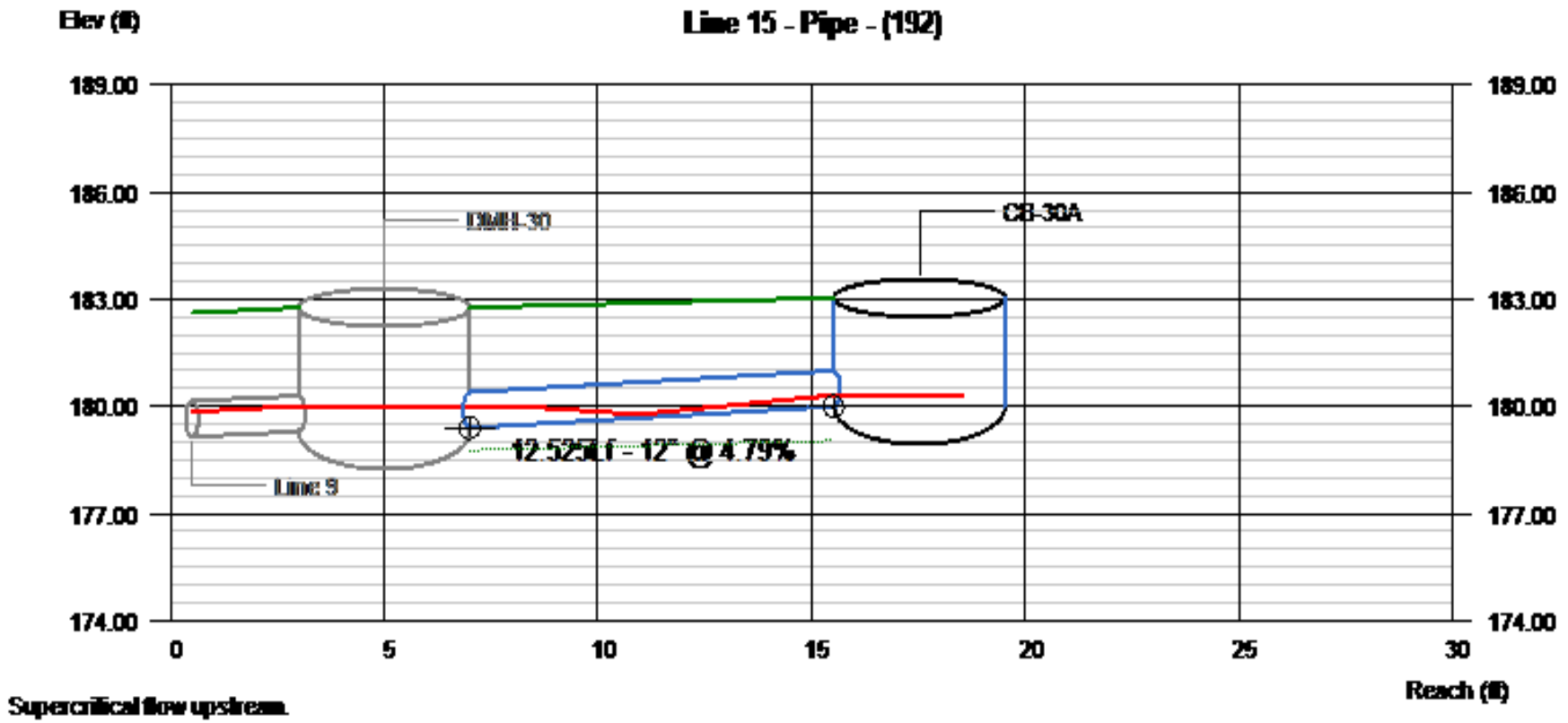

Elev (ft)
Line 11 - Pipe - (189)
197.00
194.00
191.00
188.00
185.00
182.00
0
5
10
15
20
25
30
Reach (ft)
DMH-25
CB-298
13.058Lf - 12" @ 1.91%
Line 10
Supercritical flow upstream.

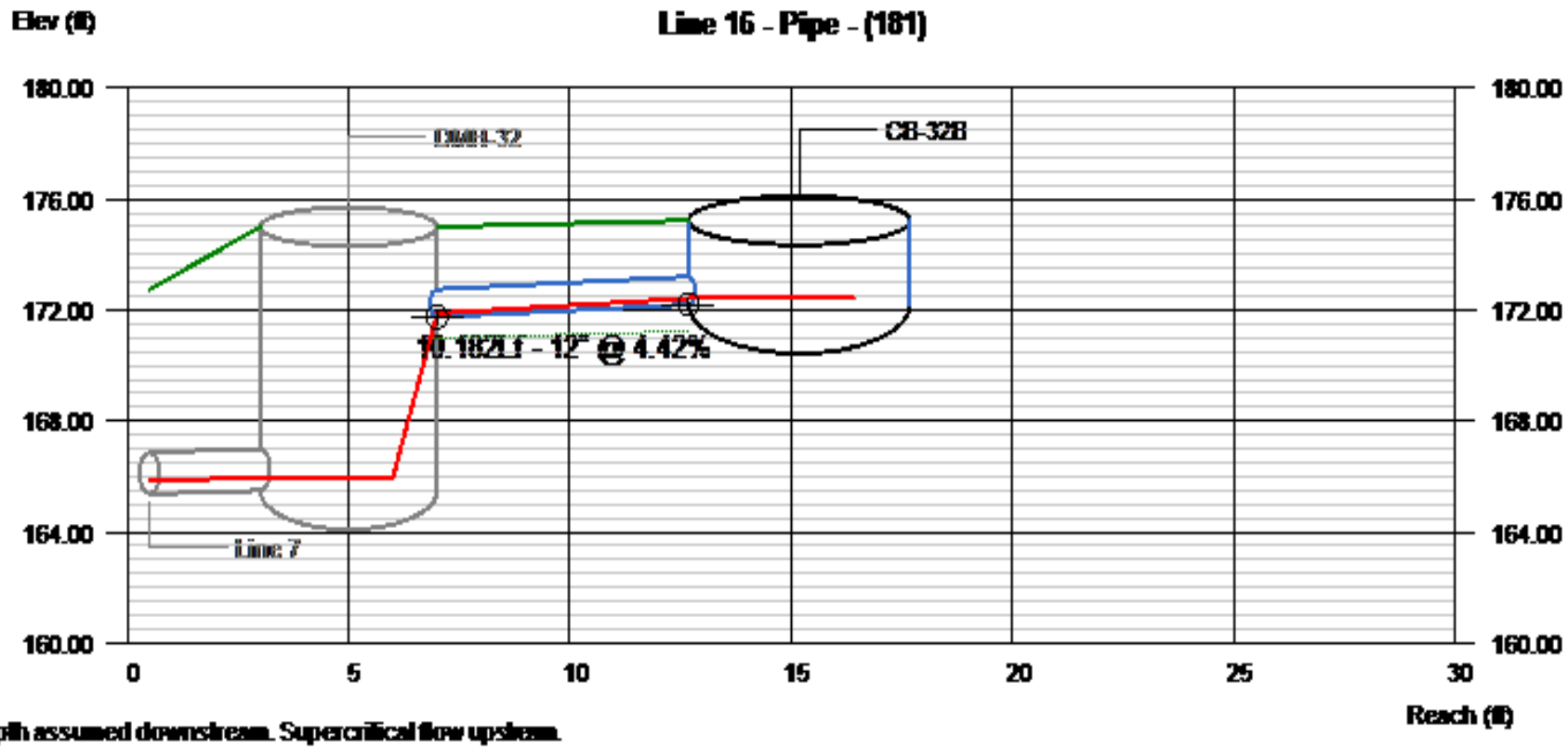

Elev (ft)
Line 12 - Pipe - (190)
197.00
194.00
191.00
188.00
185.00
182.00
0
5
10
15
20
25
30
Reach (ft)
CB-29A
13.05@1.91%
Line 10
Supercritical flow upstream.



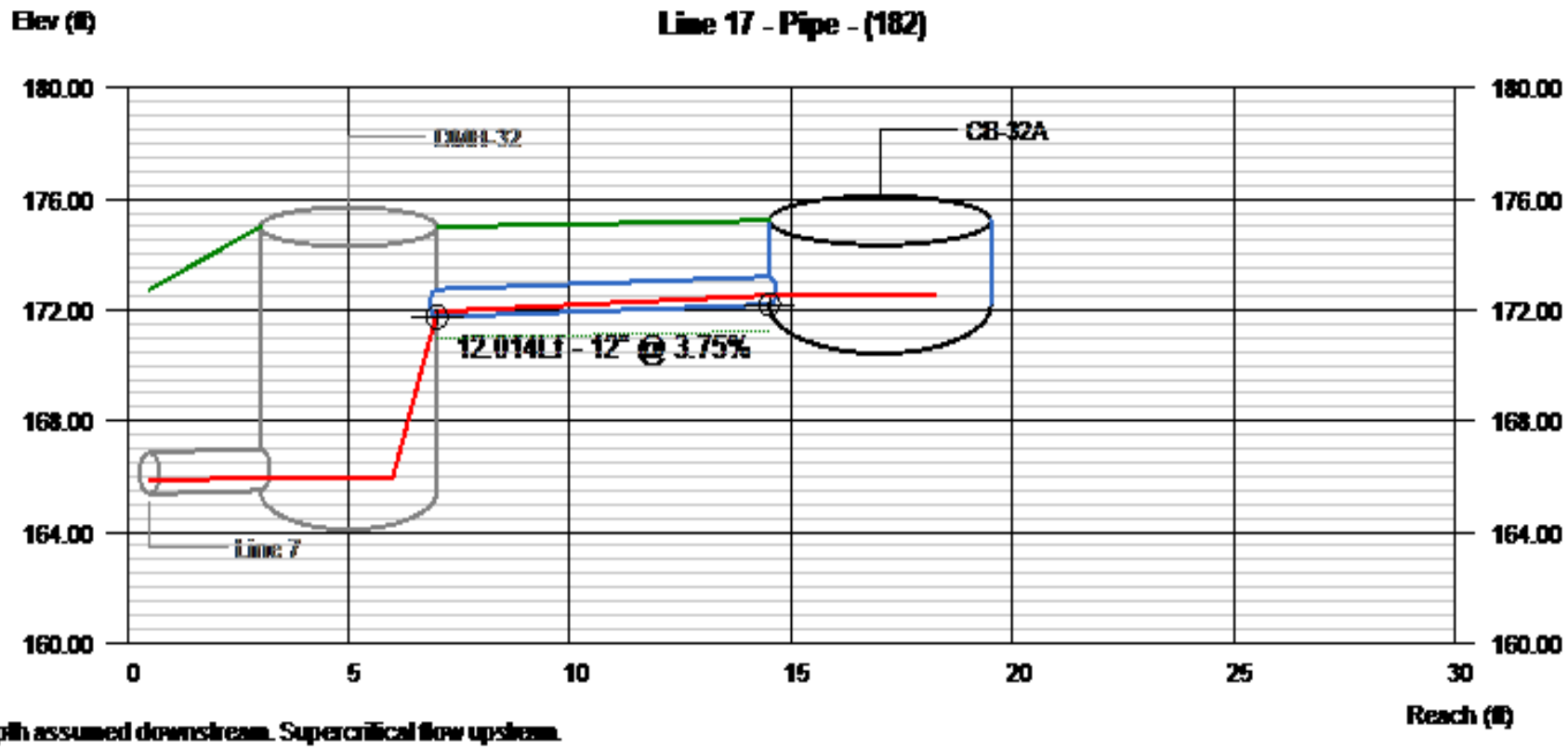
Supercritical flow w/jump.


Elev (ft)
Line 14 - Pipe - (191)
189.00
186.00
183.00
180.00
177.00
174.00
0
5
10
15
20
25
30
Reach (ft)
CB-308
Line: 9
12.846Lf - 12" @ 4.67%
Supercritical flow upstream.

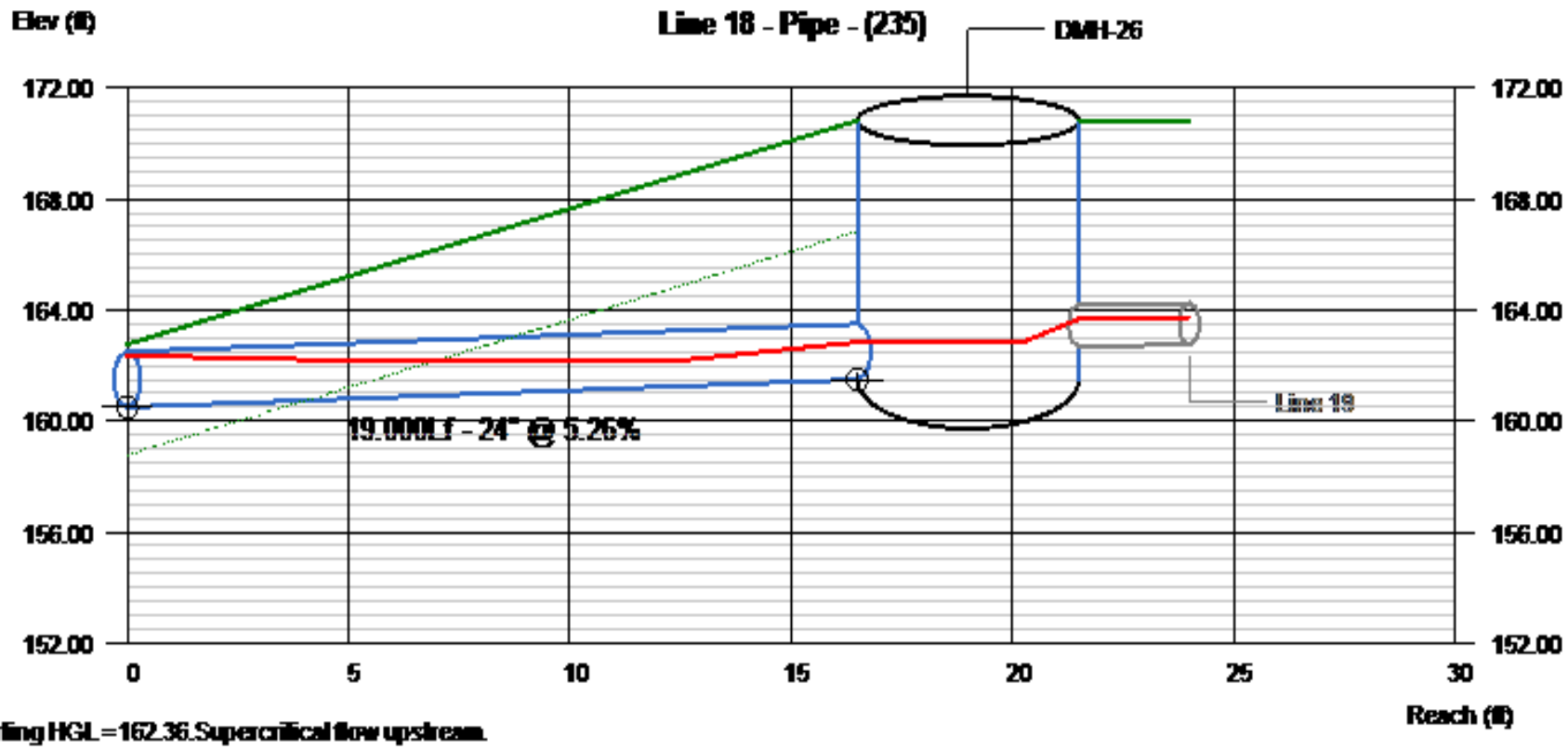

Elev (ft)
Line 15 - Pipe - (192)
189.00
186.00
183.00
180.00
177.00
174.00
0
5
10
15
20
25
30
Reach (ft)
CB-30A
Line: 9
12.525cf - 12" @ 4.79%
Supercritical flow upstream.



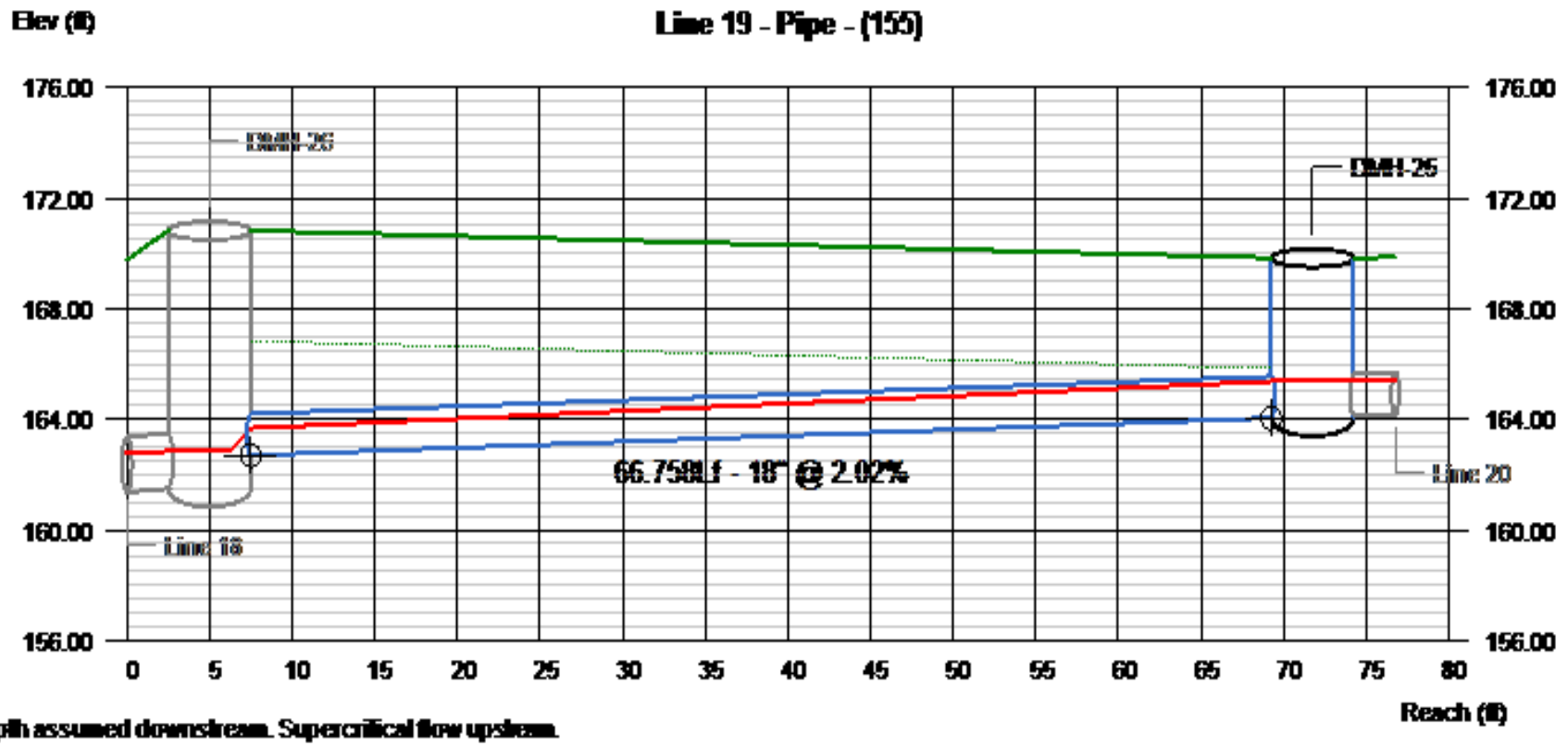
depth assumed downstream. Supercritical flow upstream.



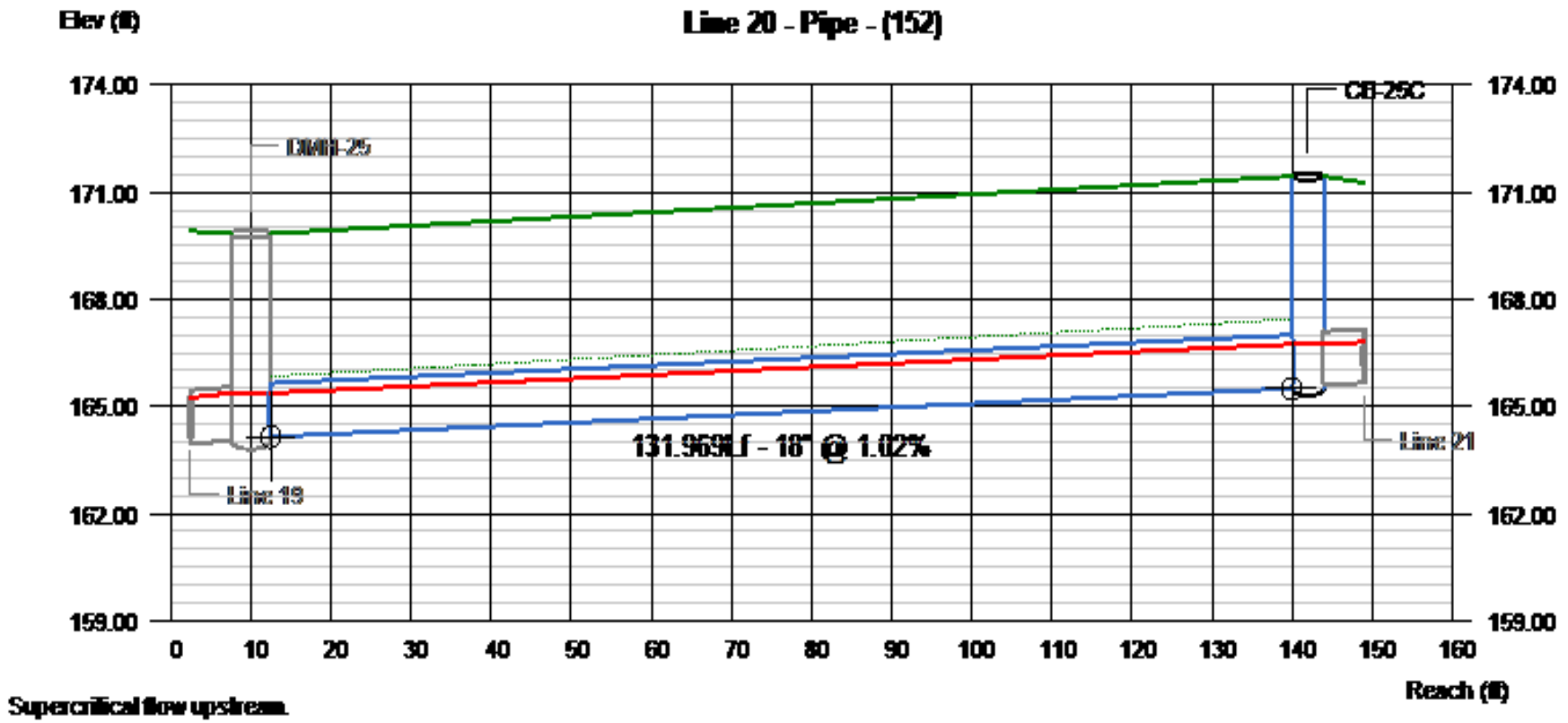
depth assumed downstream. Supercritical flow upstream.

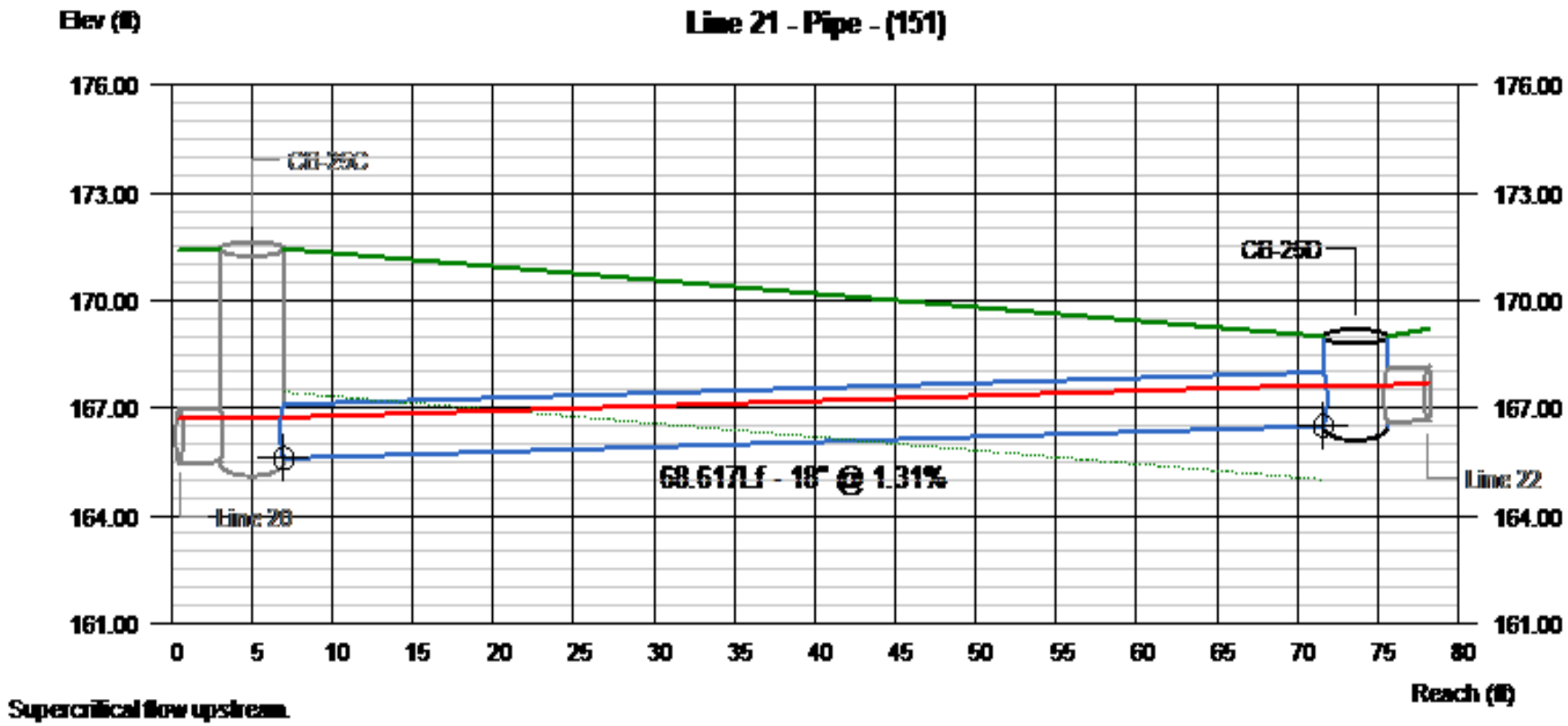


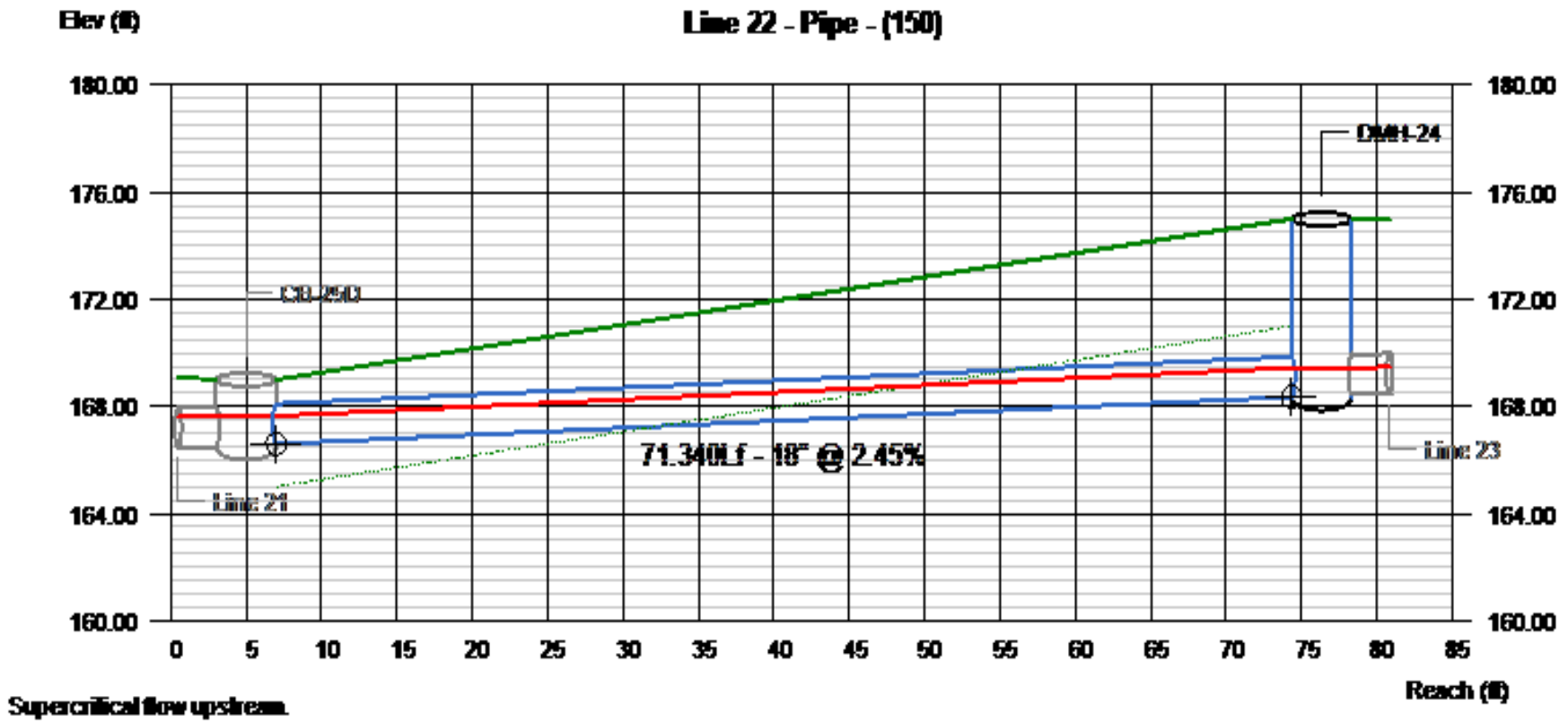
Starting HGL = 162.36. Supercritical flow upstream.

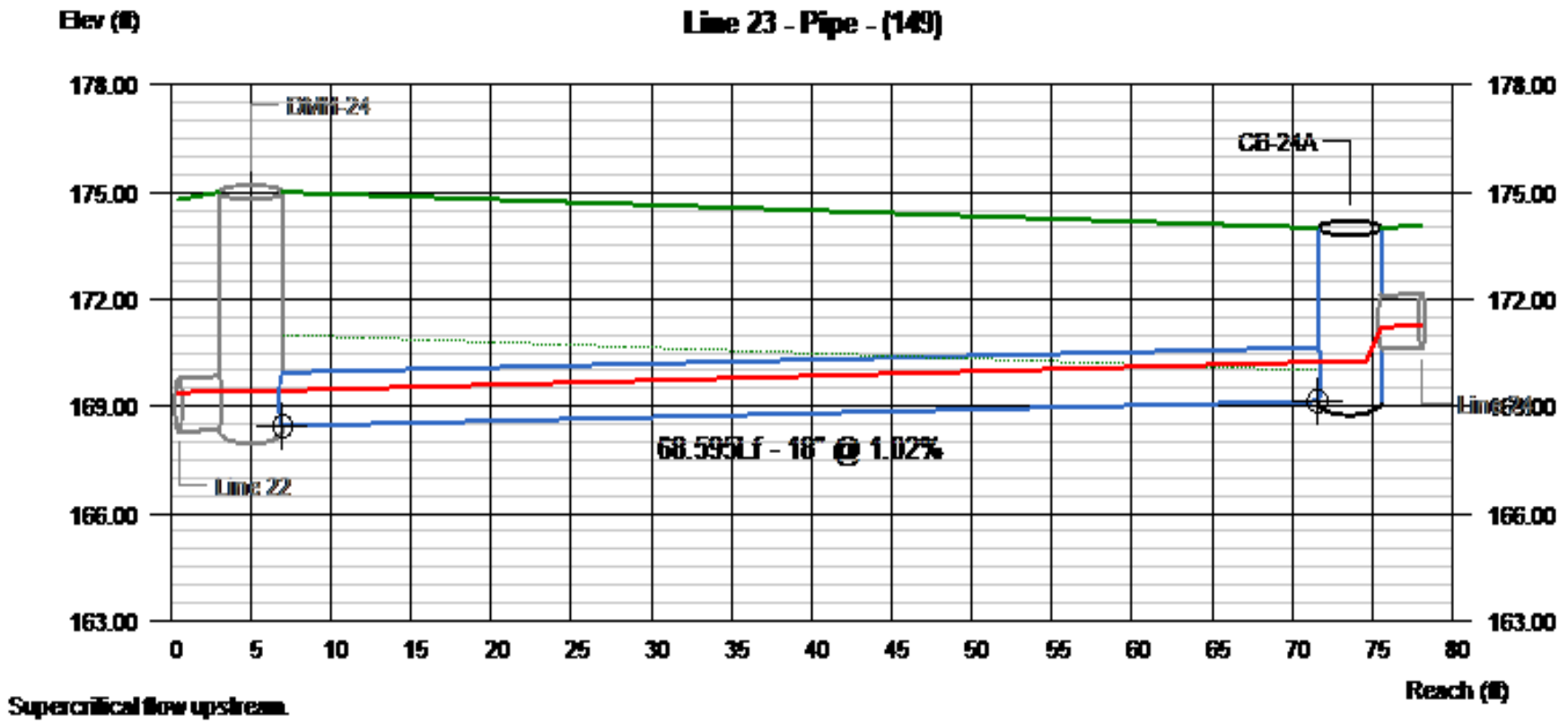


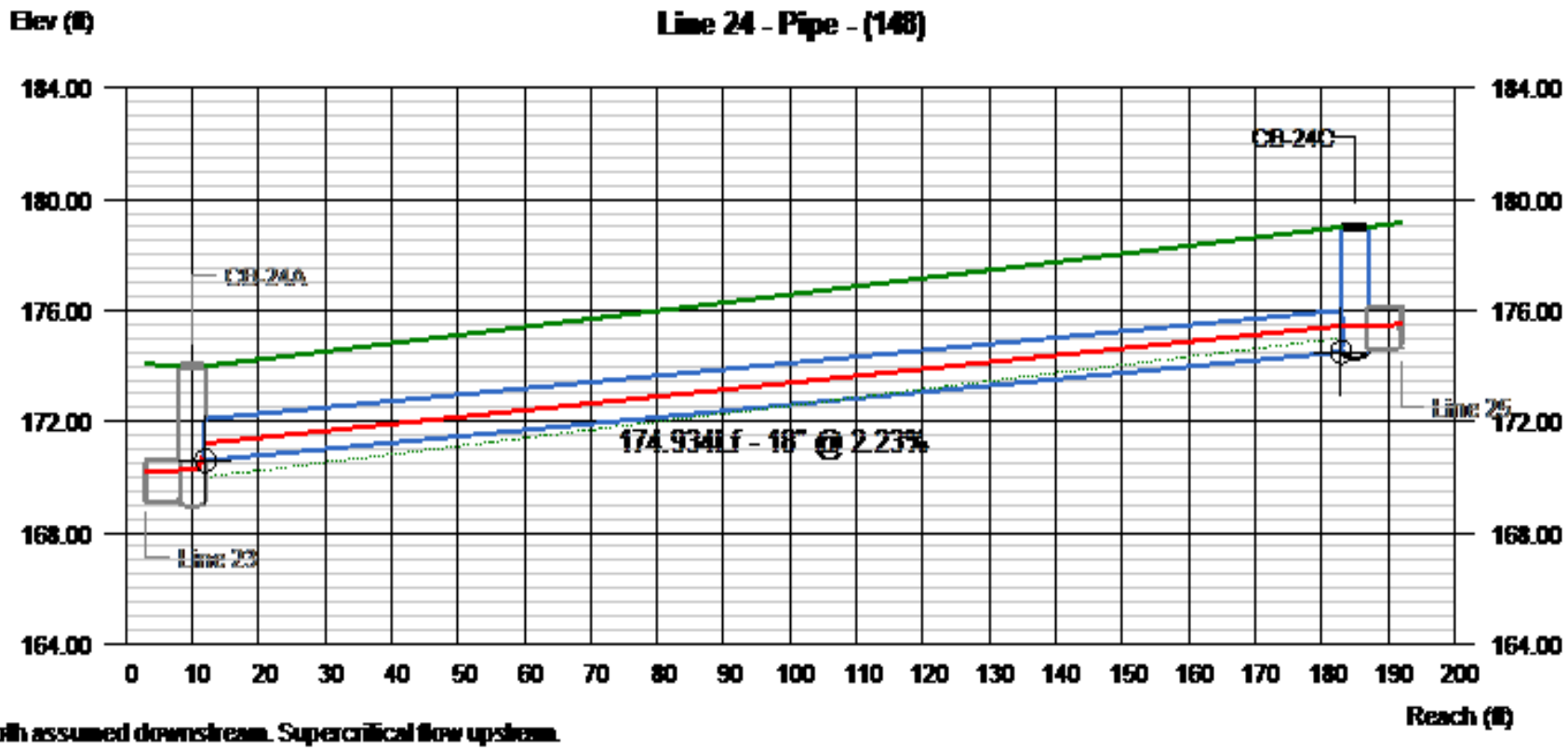
depth assumed downstream. Supercritical flow upstream.


Elev (ft)
Line 20 - Pipe - (152)
174.00
171.00
168.00
165.00
162.00
159.00
DMH-25
CB-25C
Line: 19
131.969LF - 18" @ 1.02%
Line: 21
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
Reach (ft)
Supercritical flow upstream.

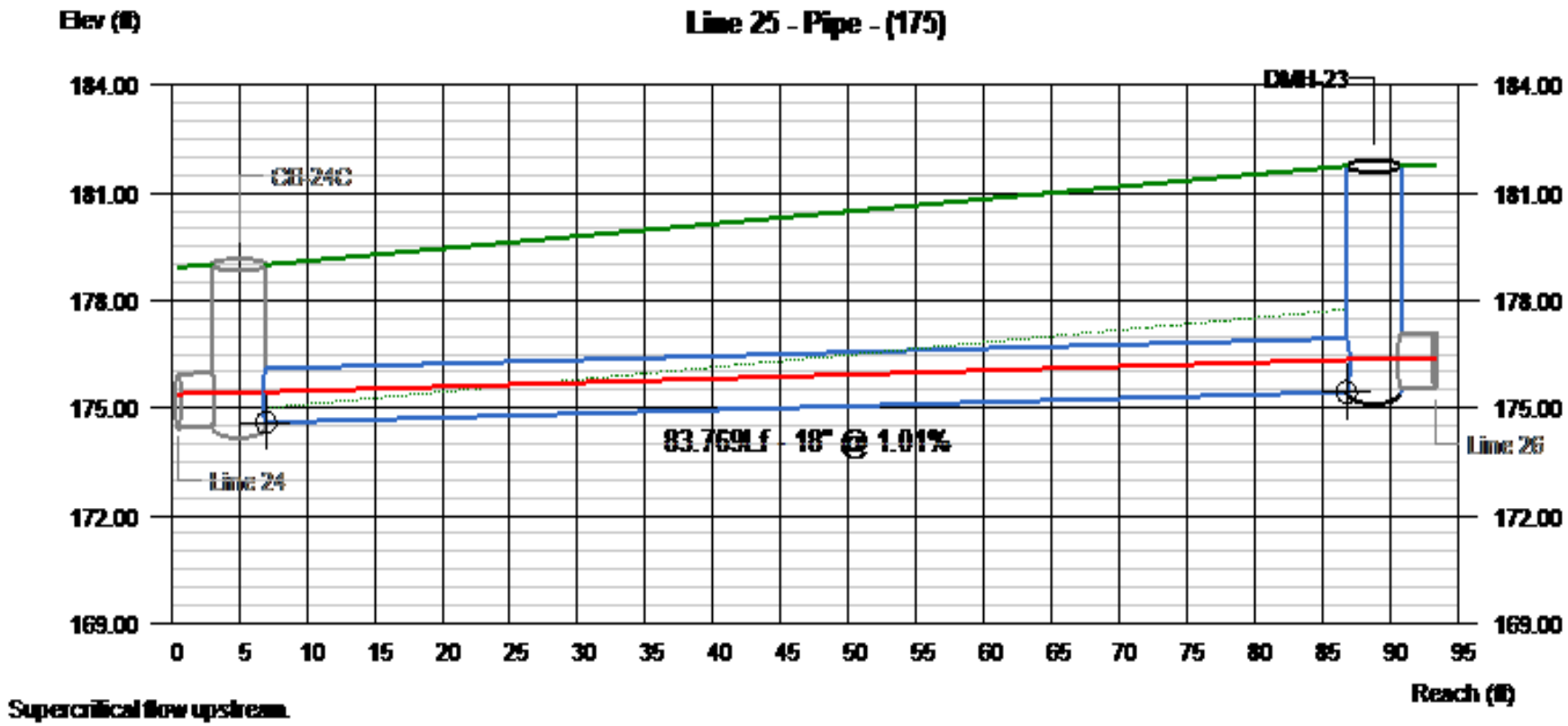

Elev (ft)
Line 21 - Pipe - (151)
176.00
173.00
170.00
167.00
164.00
161.00
CB-25C
CB-25D
68.617Lf - 18" @ 1.31%
Line: 20
Line: 22
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
Reach (ft)
Supercritical flow upstream.

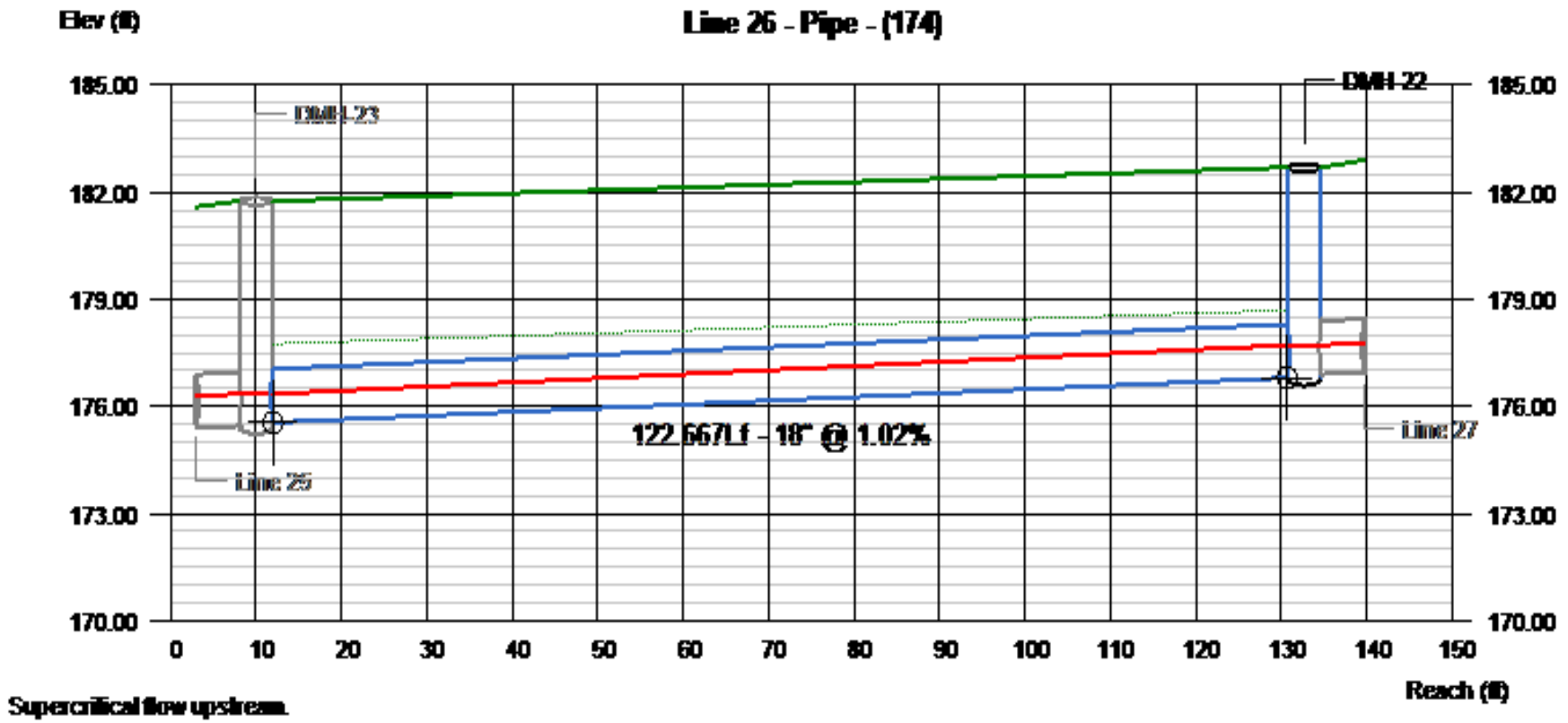

Elev (ft)
Line 22 - Pipe - (150)
180.00
176.00
172.00
168.00
164.00
160.00
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
Reach (ft)
DMH-24
CB-250
71.340Lf - 18" @ 2.45%
Line: 21
Line: 23
Supercritical flow upstream.

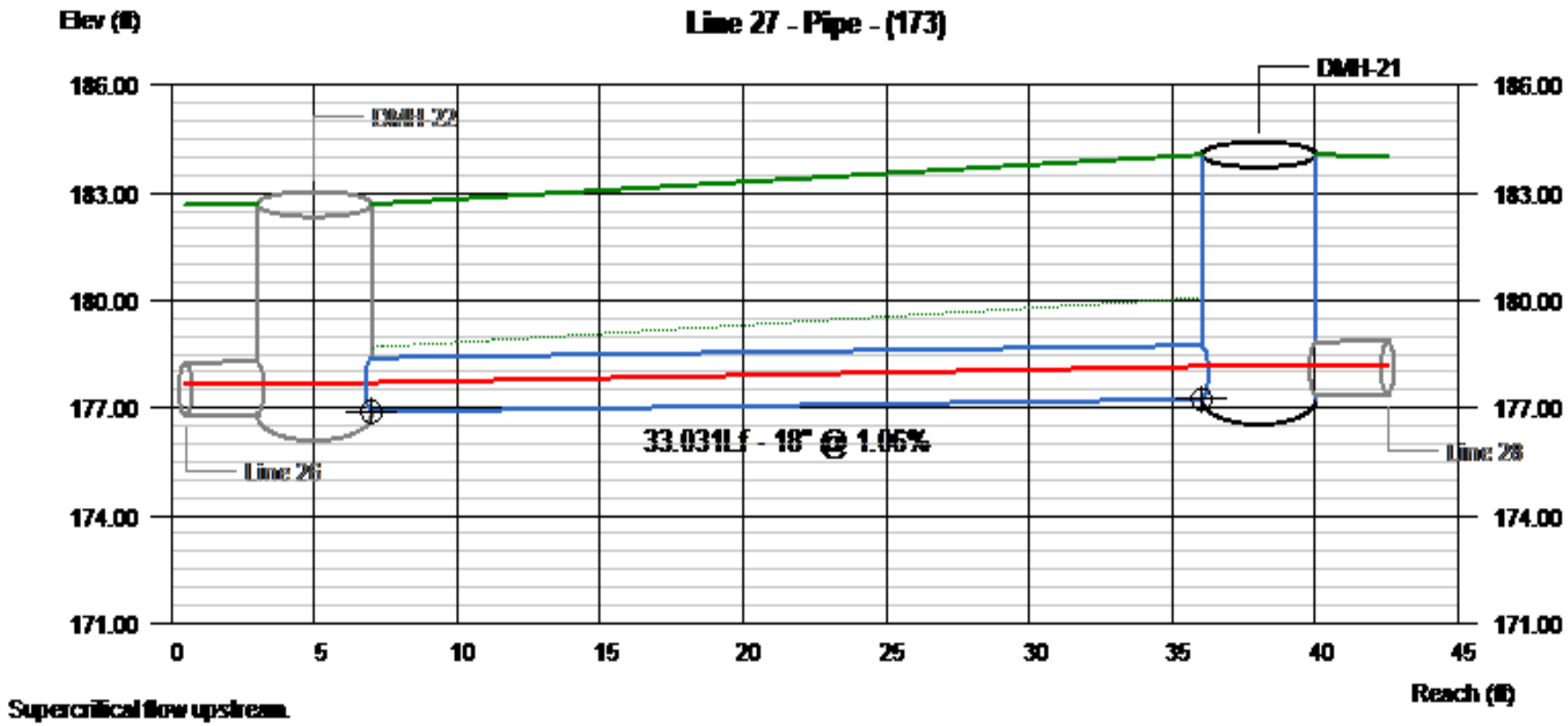

Elev (ft)
Line 23 - Pipe - (149)
178.00
175.00
172.00
169.00
166.00
163.00
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
Reach (ft)
CB-24A
Line: 22
Supercritical flow upstream.



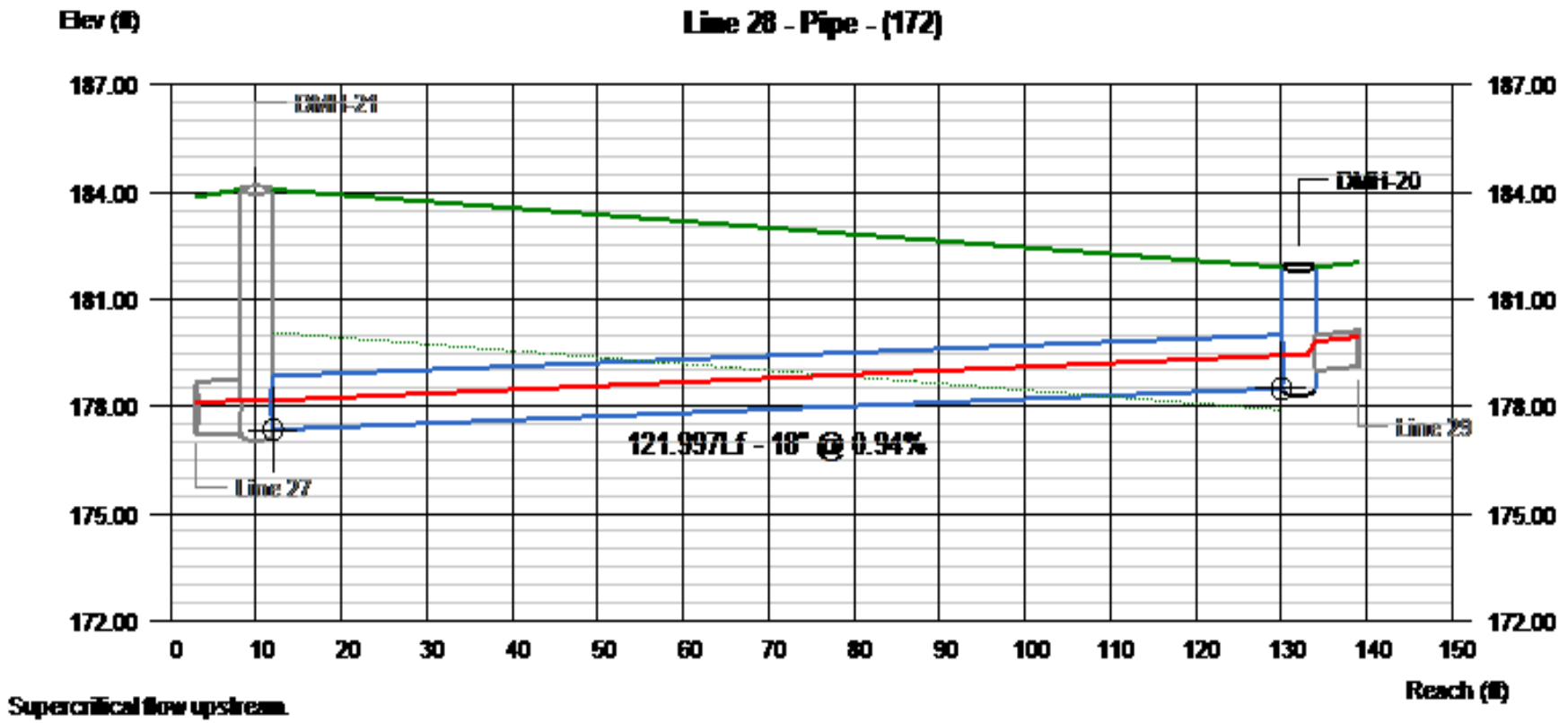
depth assumed downstream. Supercritical flow upstream.

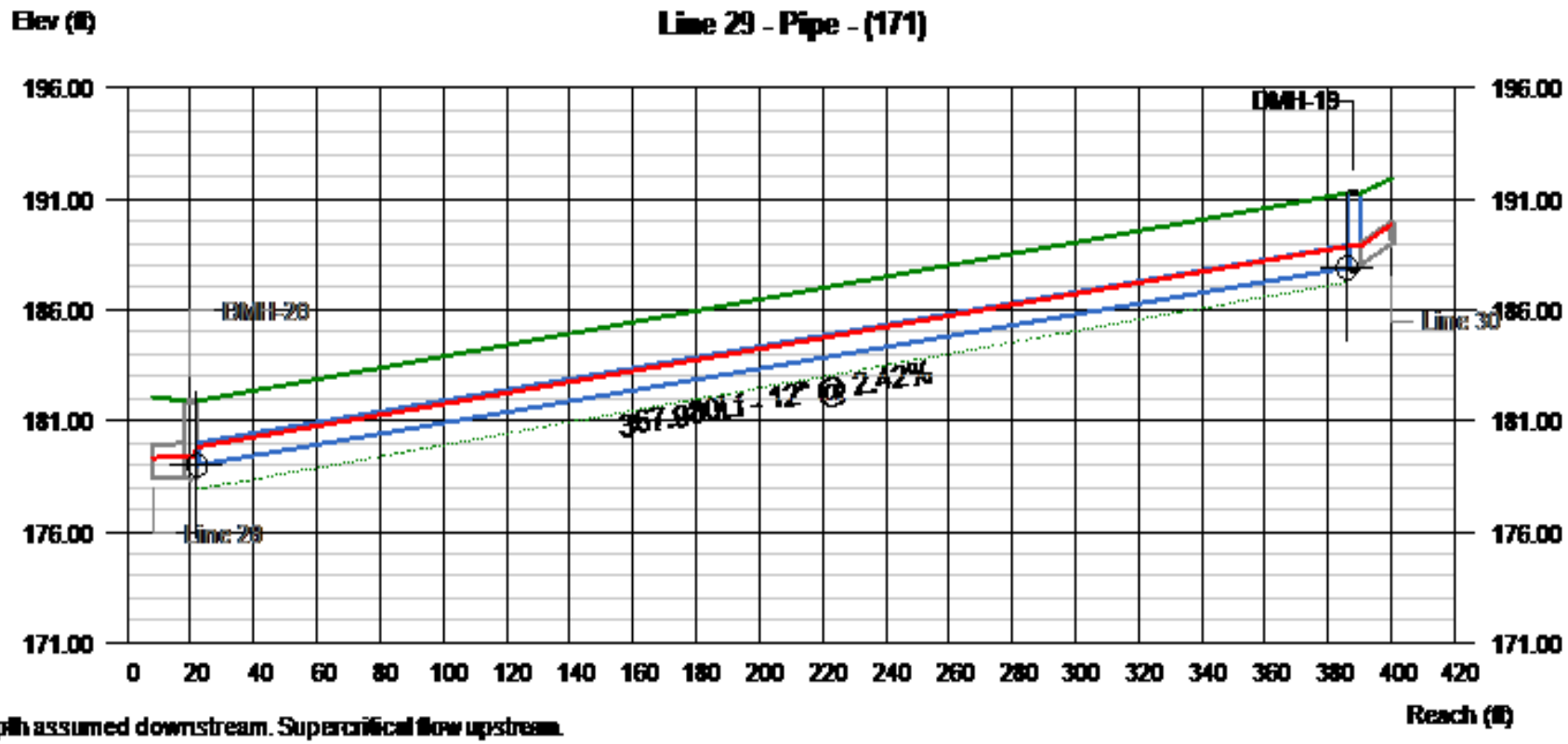

Elev (ft)
Line 25 - Pipe - (175)
184.00
181.00
178.00
175.00
172.00
169.00
DMH-23
CB-24C
Line 24
83.769LF - 18" @ 1.01%
Line 26
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
Reach (ft)
Supercritical flow upstream.


Elev (ft)
Line 26 - Pipe - (174)
185.00
182.00
179.00
176.00
173.00
170.00
DMH 23
DMH 22
Line 25
Line 27
122.667Lf - 18" @ 1.02%
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Reach (ft)
Supercritical flow upstream.

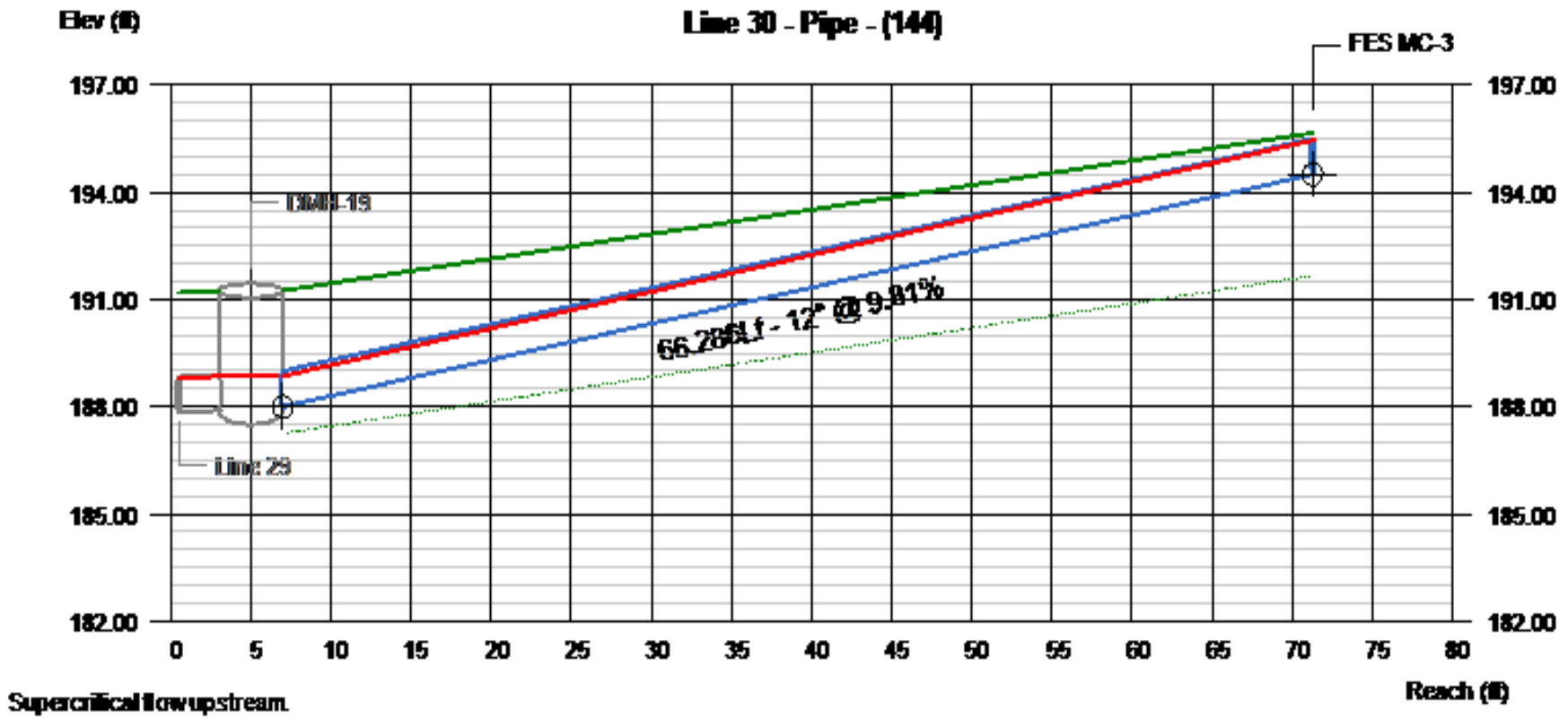


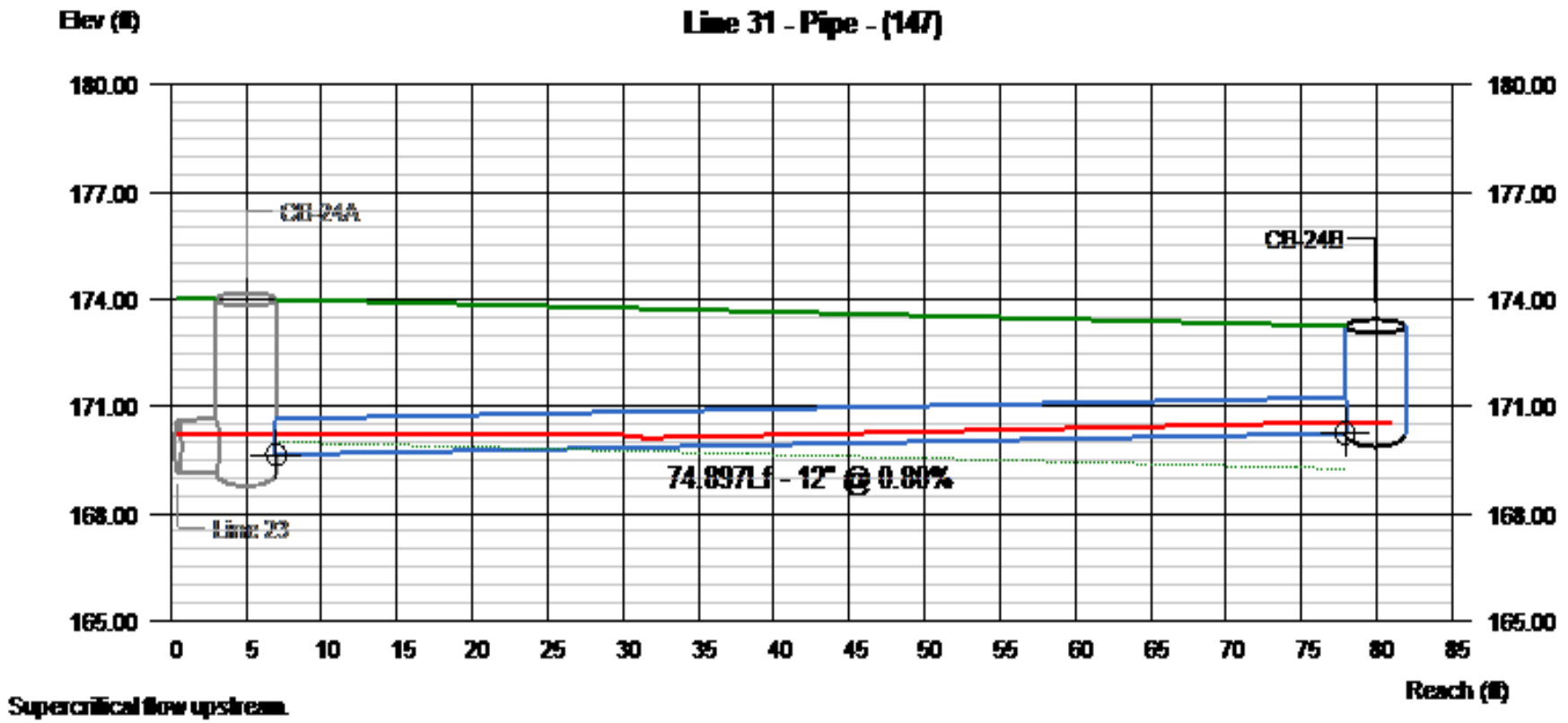
Supercritical flow upstream.

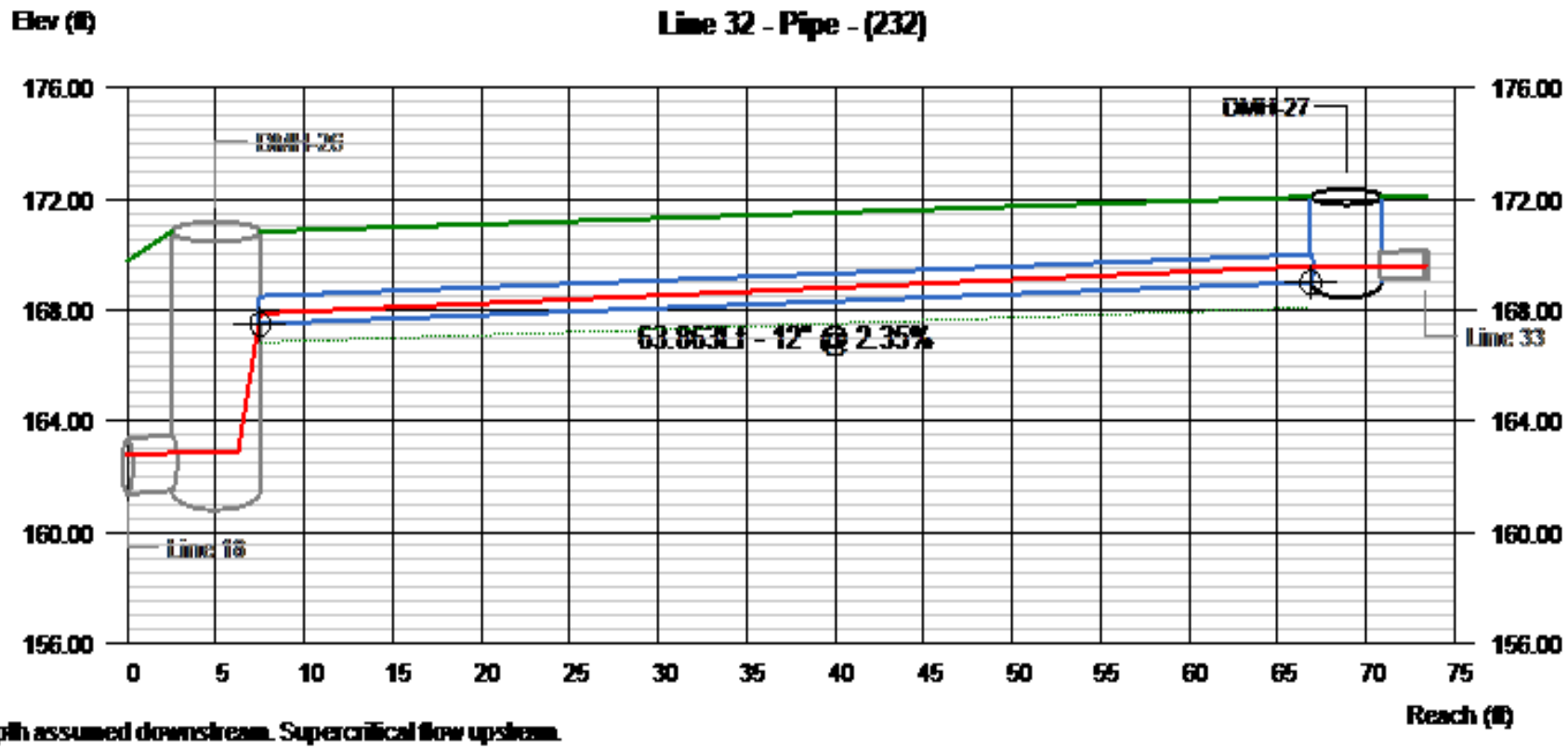

Elev (ft)
Line 28 - Pipe - (172)
187.00
184.00
181.00
178.00
175.00
172.00
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Reach (ft)
DMH-20
Line 29
Line 27
121.997Lf - 18" @ 0.94%
Supercritical flow upstream.



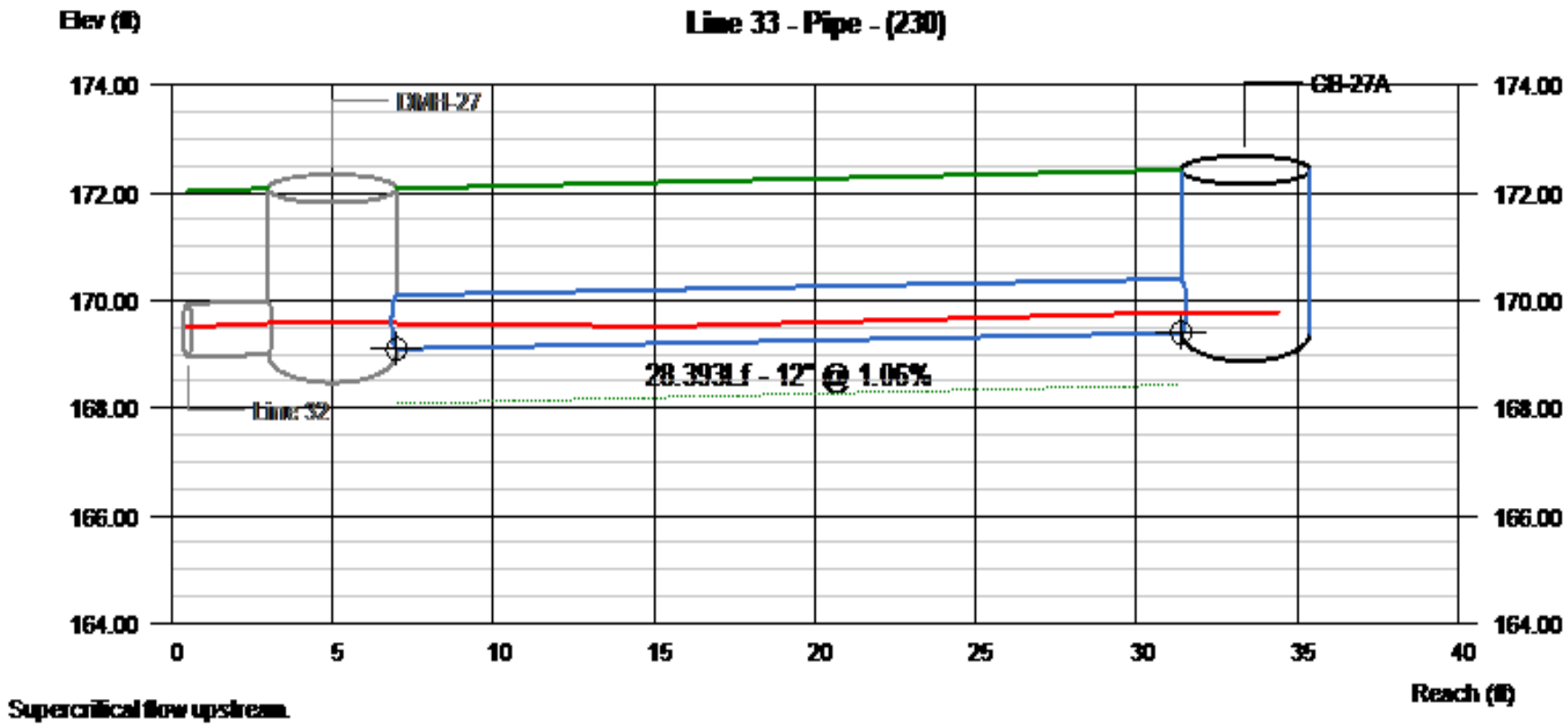
depth assumed downstream. Supercritical flow upstream.

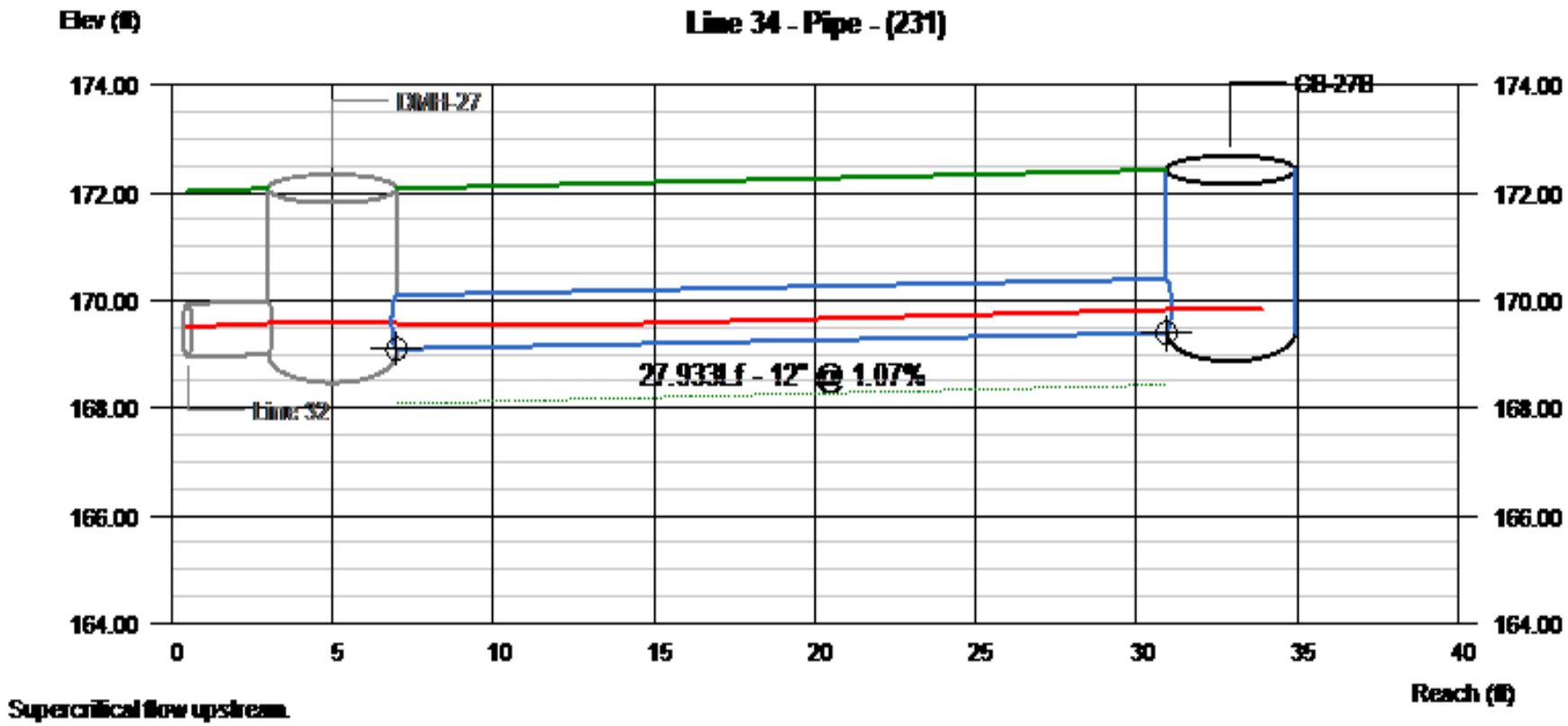

Elev (ft)
Line 30 - Pipe - (144)
FES MC-3
197.00
194.00
191.00
188.00
185.00
182.00
DMH-19
Line 29
66.28ft - 12" @ 9.81%
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
Reach (ft)
Supercritical flow upstream.

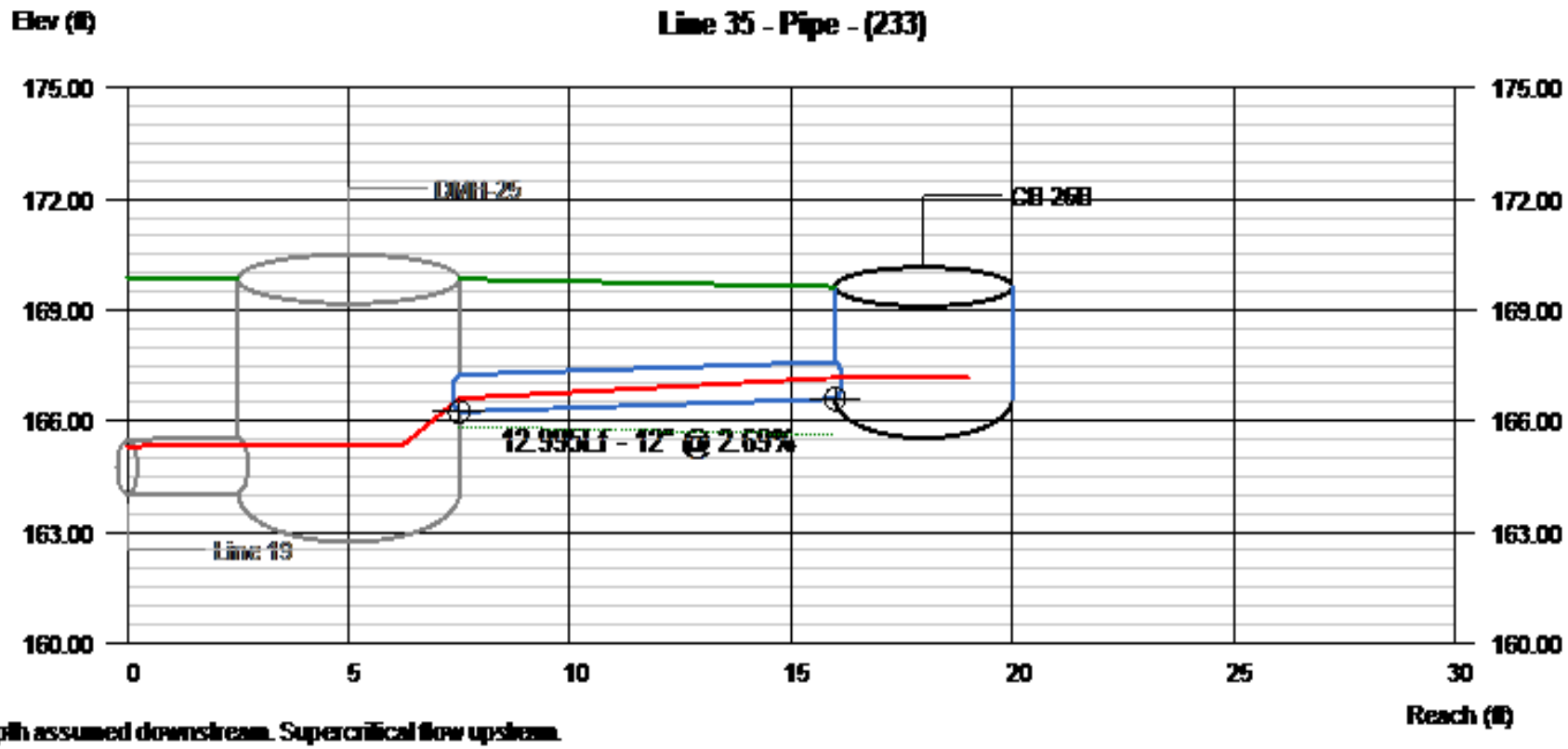

Elev (ft)
Line 31 - Pipe - (147)
180.00
177.00
174.00
171.00
168.00
165.00
CB-24A
CB-24B
74.897Lf - 12" @ 0.80%
Line: 23
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
Reach (ft)
Supercritical flow upstream.



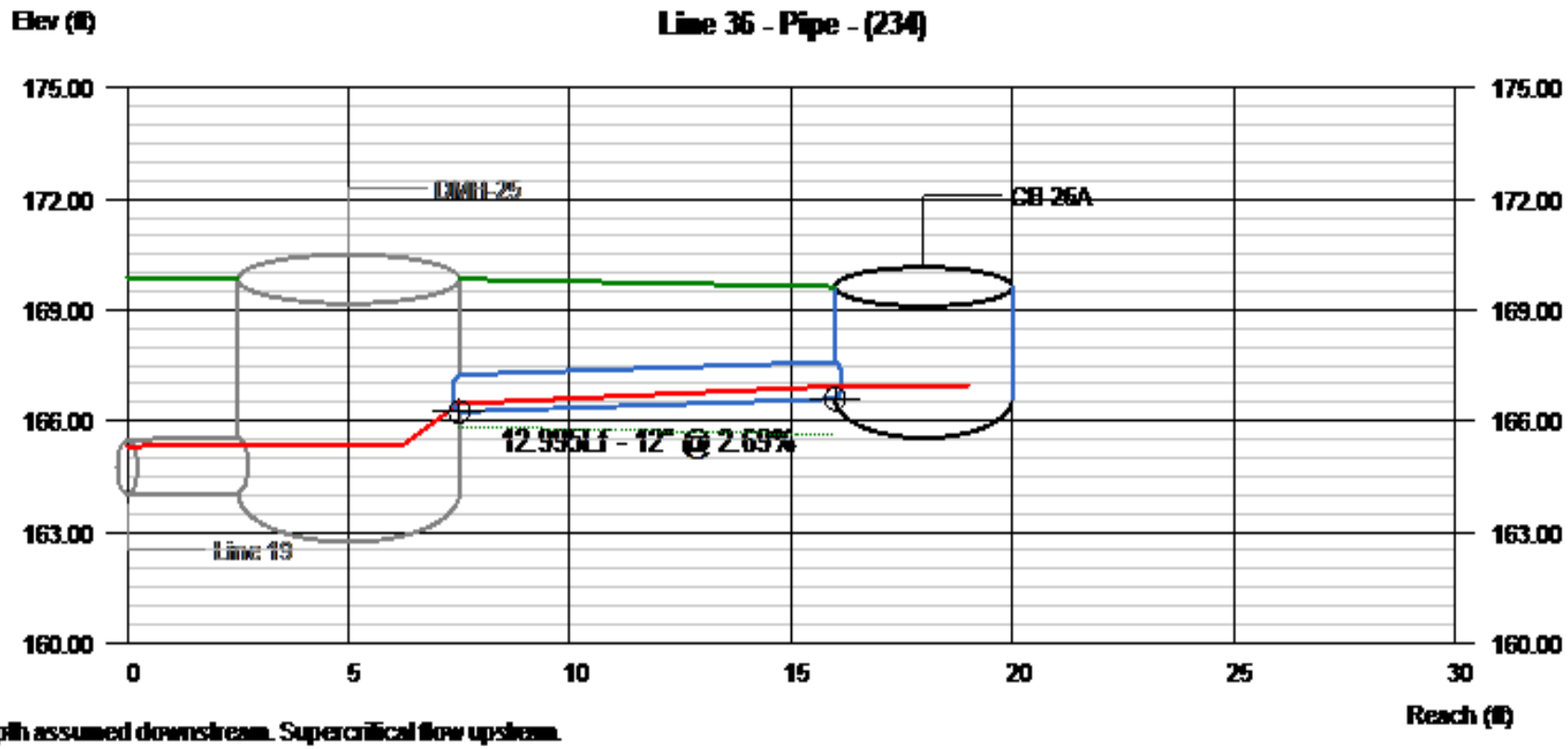
depth assumed downstream. Supercritical flow upstream.


Elev (ft)
Line 33 - Pipe - (230)
174.00
172.00
170.00
168.00
166.00
164.00
DMH-27
CB-27A
Line: 32
28.393Lf - 12" @ 1.06%
0
5
10
15
20
25
30
35
40
Reach (ft)
Supercritical flow upstream.

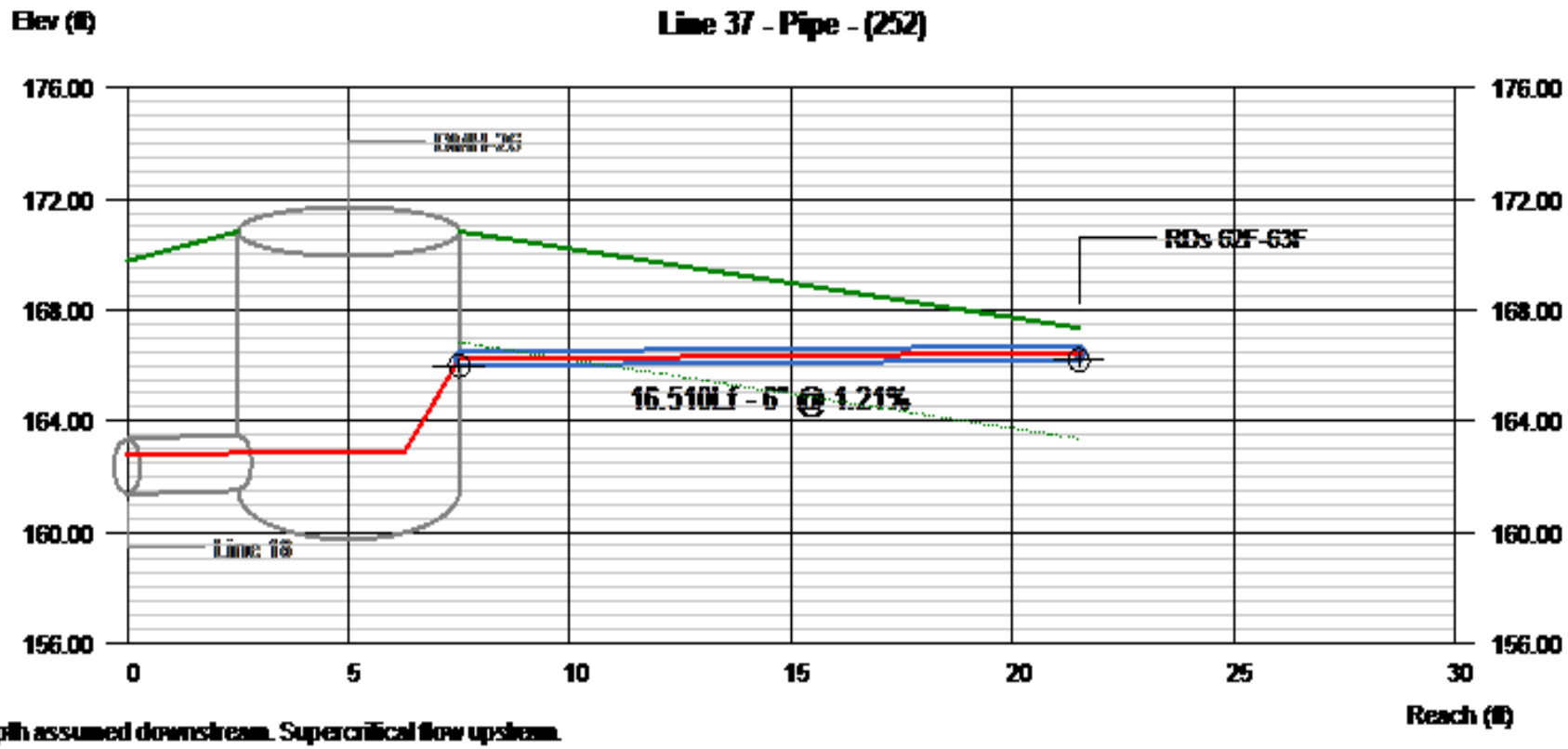

Elev (ft)
Line 34 - Pipe - (231)
174.00
172.00
170.00
168.00
166.00
164.00
DMH-27
GB-278
27.933ft - 12" @ 1.07%
Line: 32
0
5
10
15
20
25
30
35
40
Reach (ft)
Supercritical flow upstream.



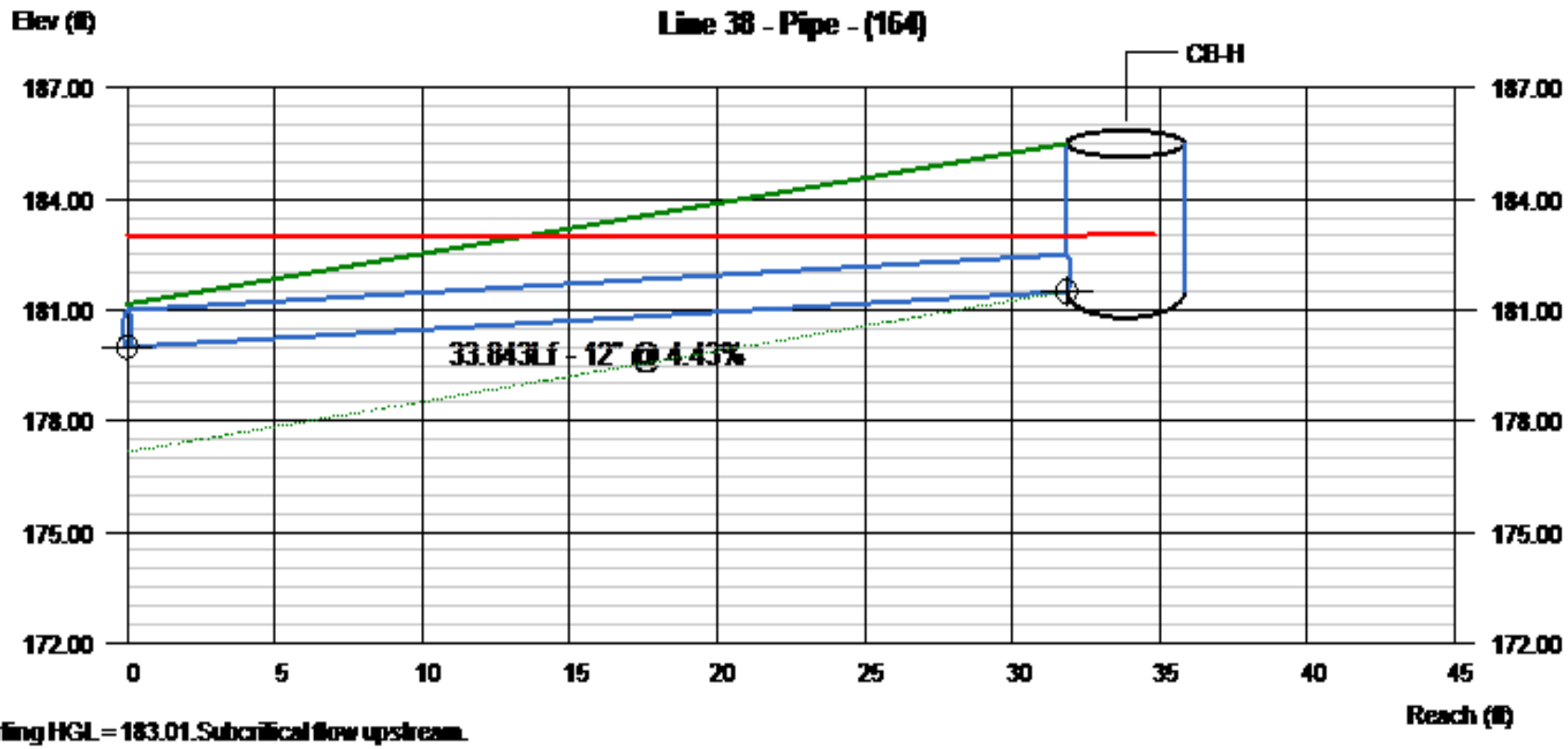
depth assumed downstream. Supercritical flow upstream.



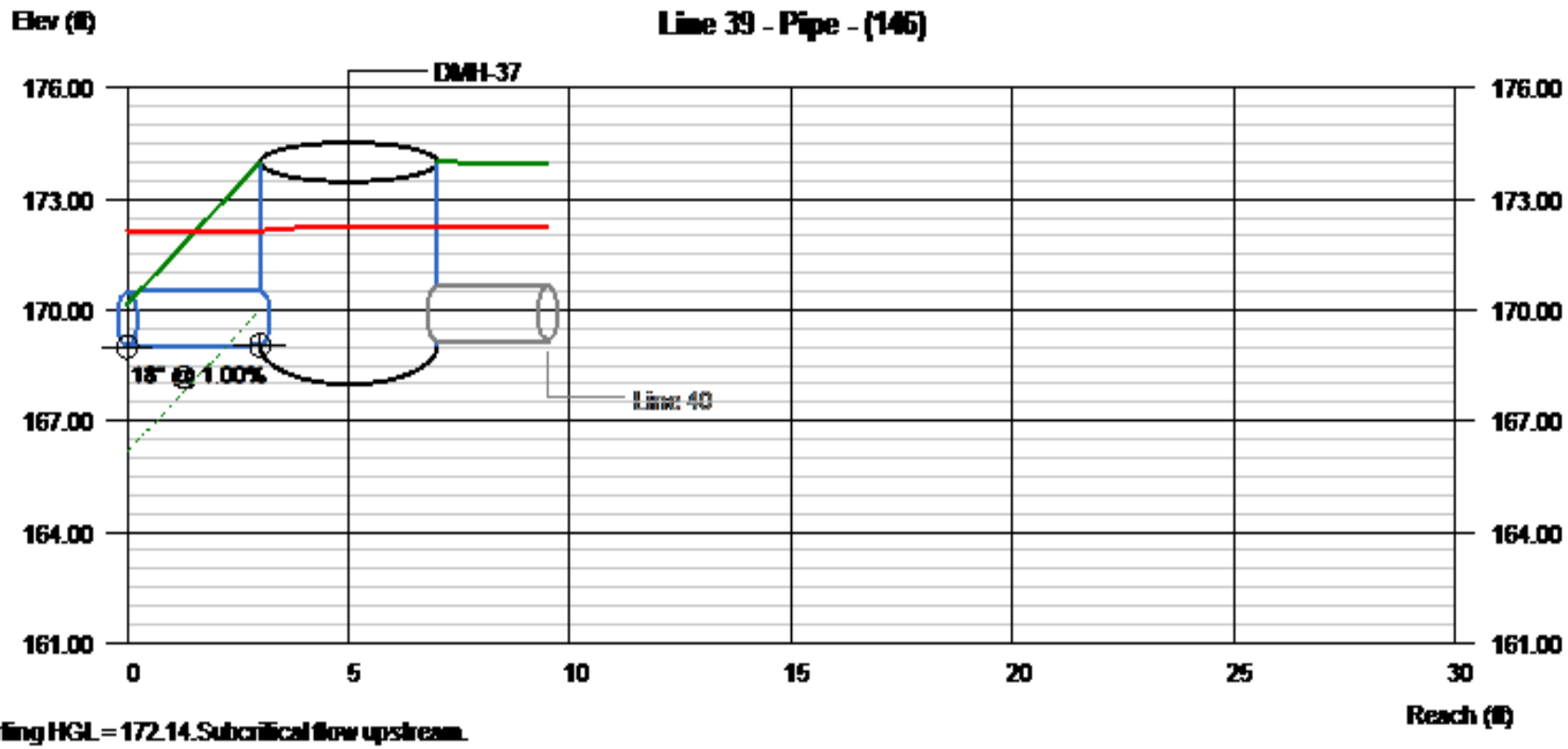
depth assumed downstream. Supercritical flow upstream.



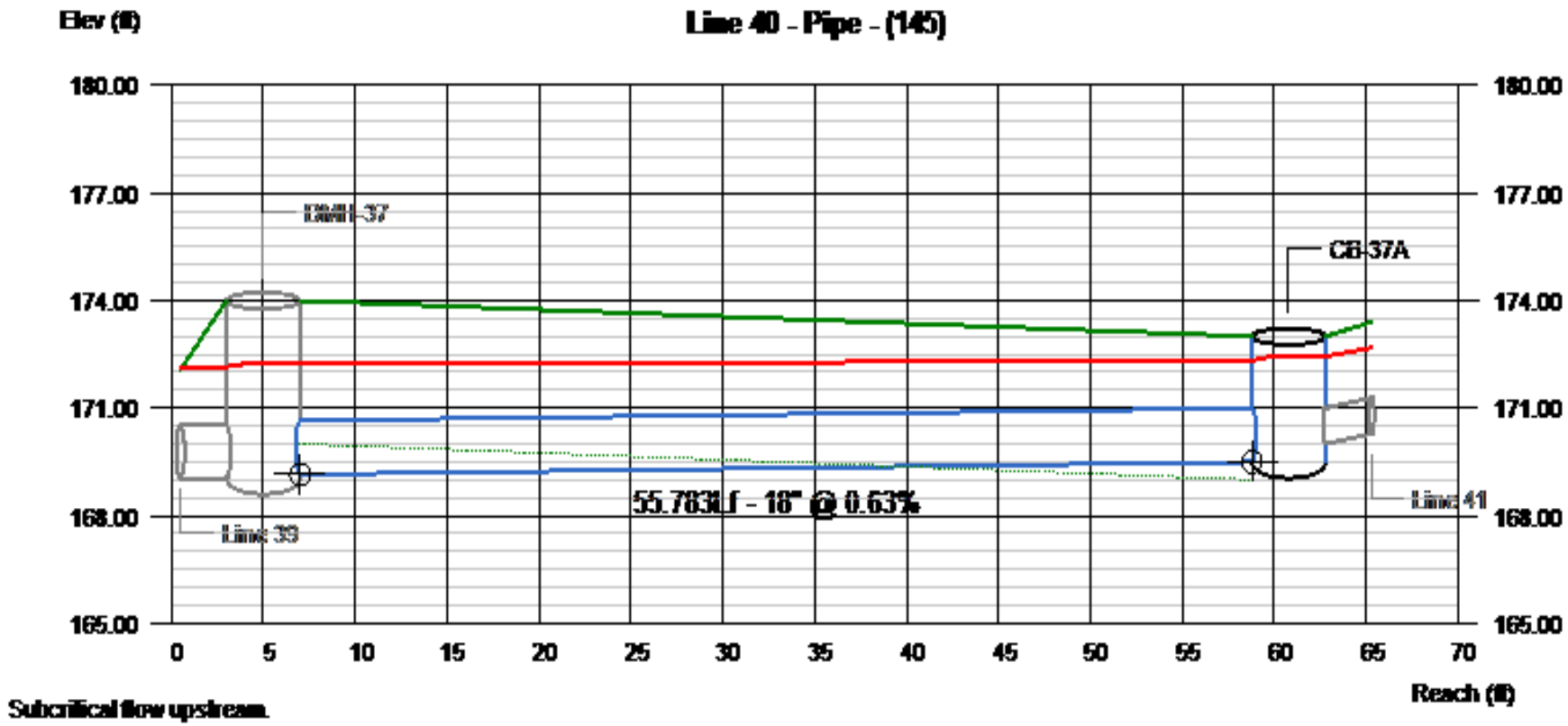
depth assumed downstream. Supercritical flow upstream.

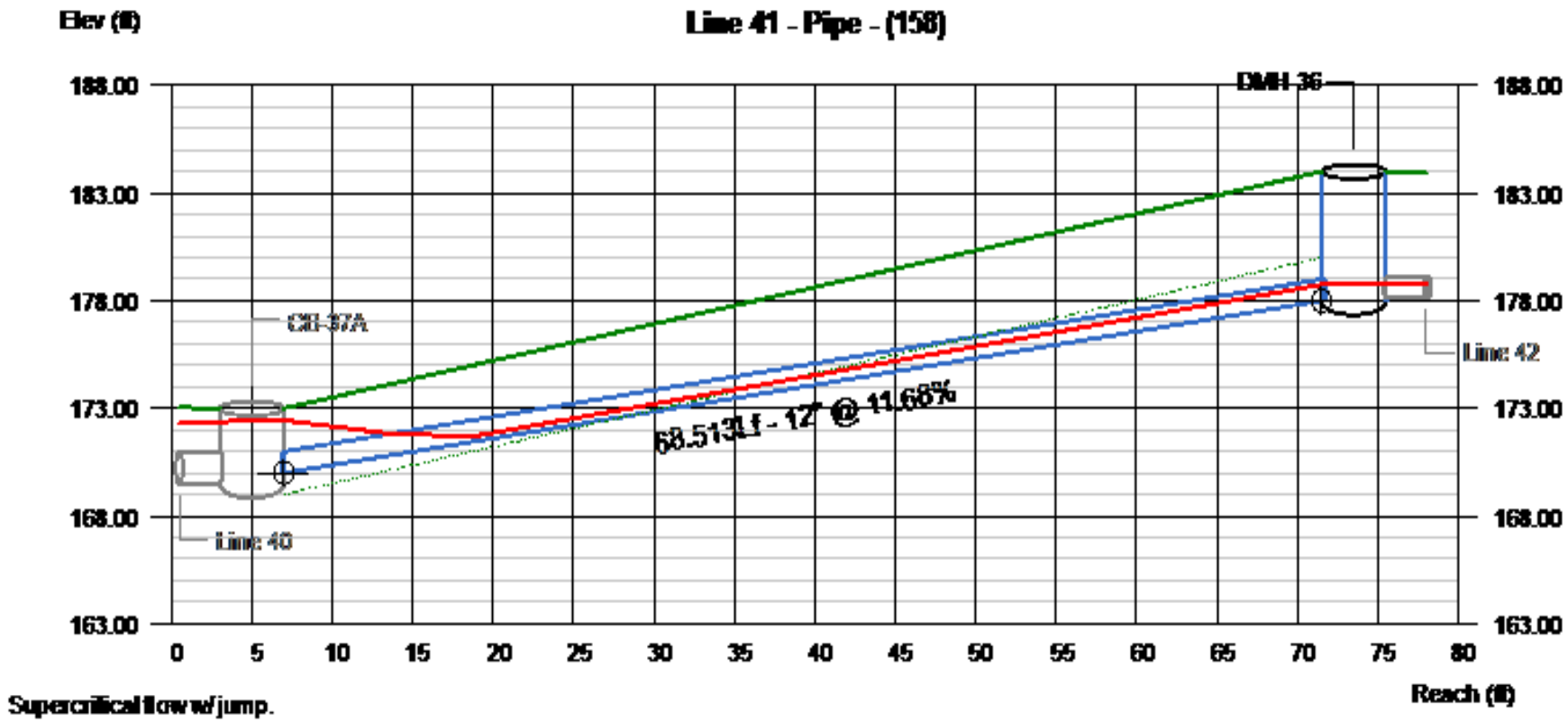


Starting HGL = 183.01. Subcritical flow upstream.

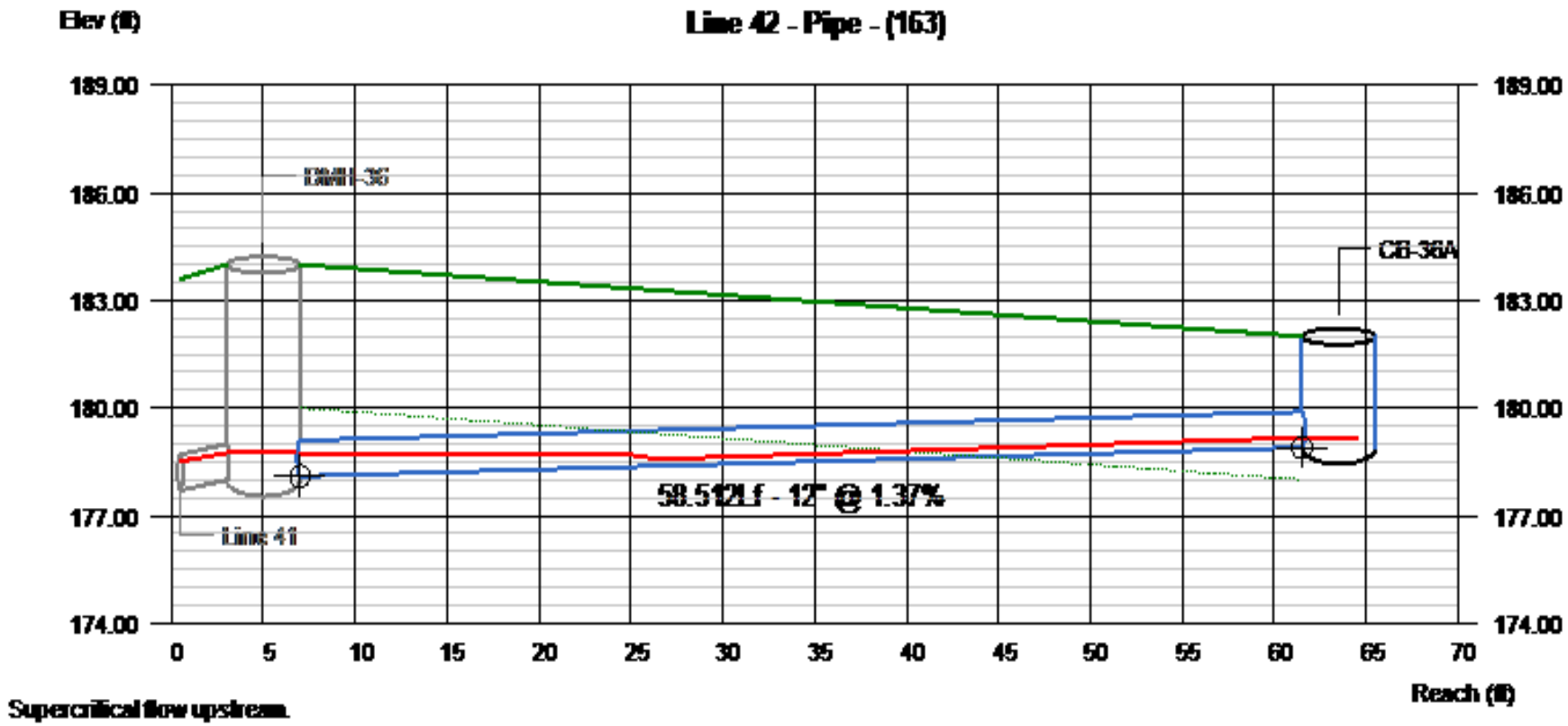


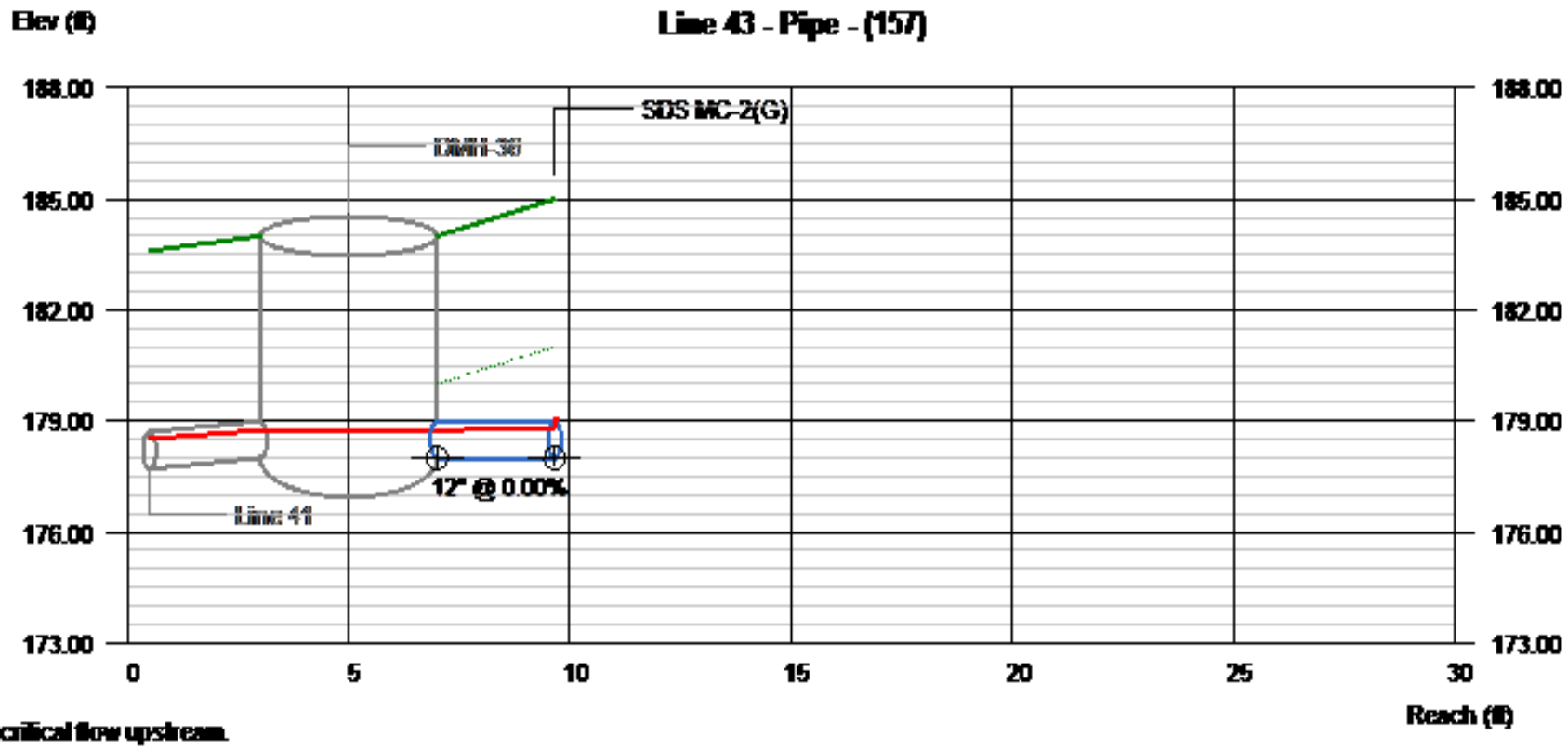
Starting HGL = 172.14. Subcritical flow upstream.


Elev (ft)
Line 40 - Pipe - (145)
180.00
177.00
174.00
171.00
168.00
165.00
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Reach (ft)
CB-37A
Line 39
55.783 lf - 18" @ 0.63%
Line 41
Subcritical flow upstream.

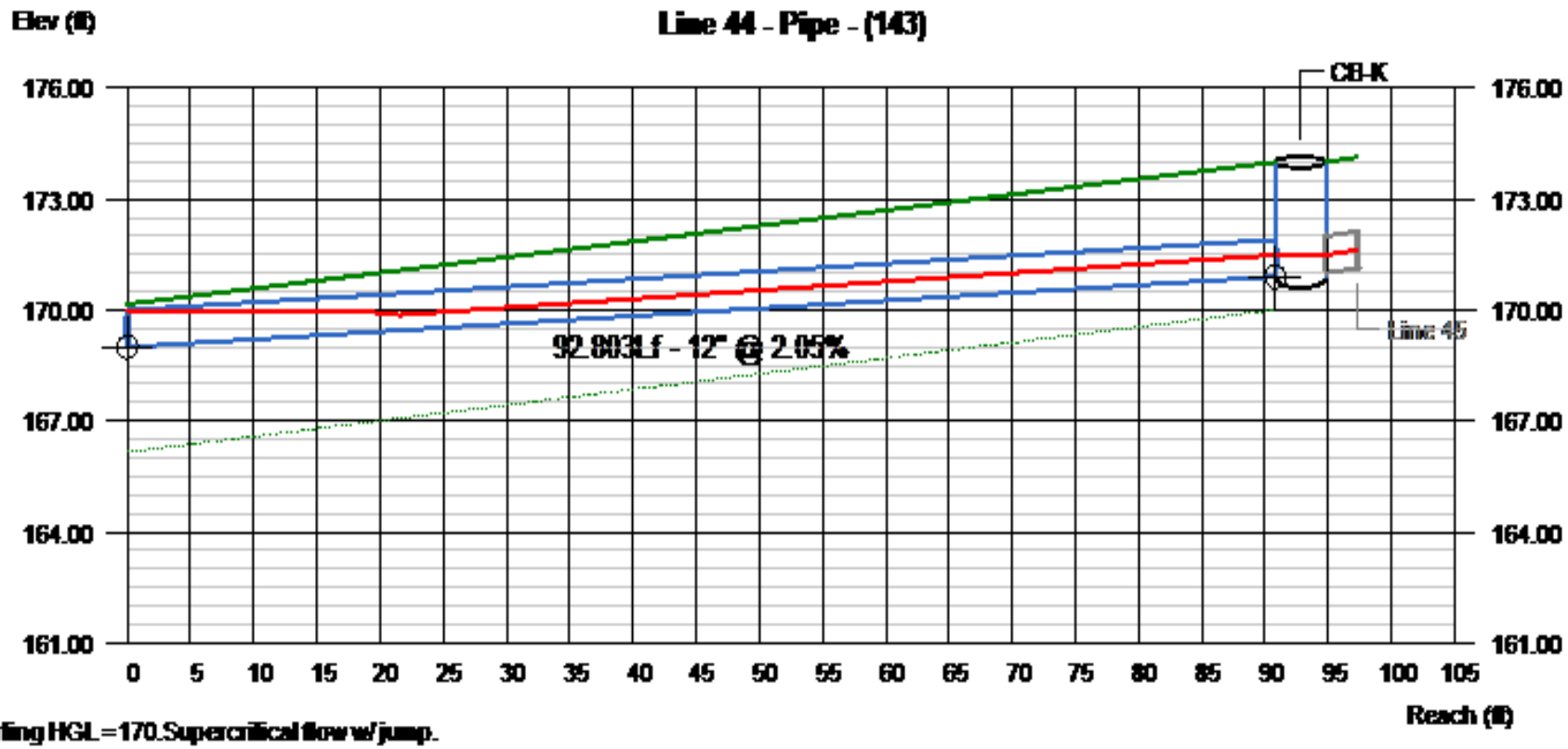


Supercritical flow w/jump.

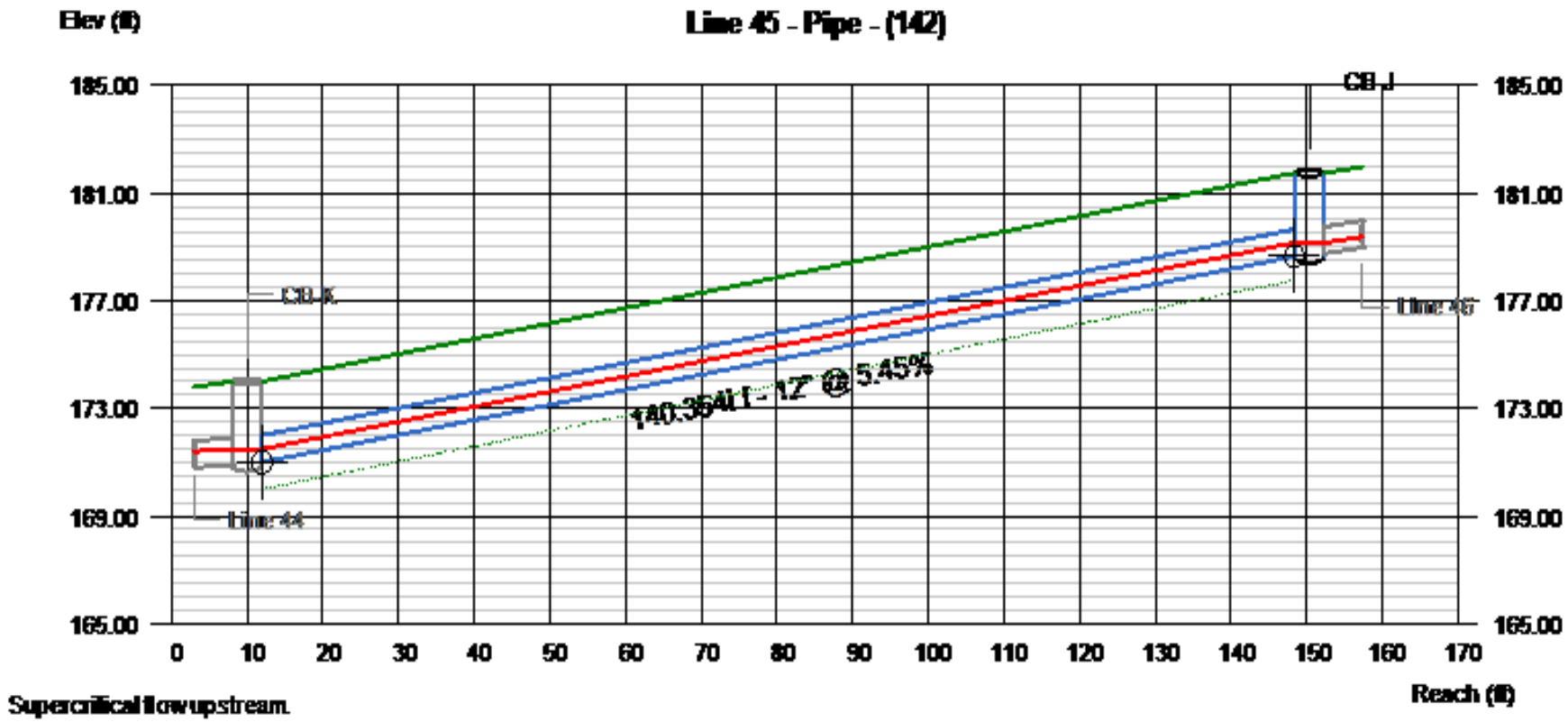

Elev (ft)
Line 42 - Pipe - (163)
189.00
186.00
183.00
180.00
177.00
174.00
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Reach (ft)
CB-36A
Line 41
58.51ft - 12" @ 1.37%
Supercritical flow upstream.

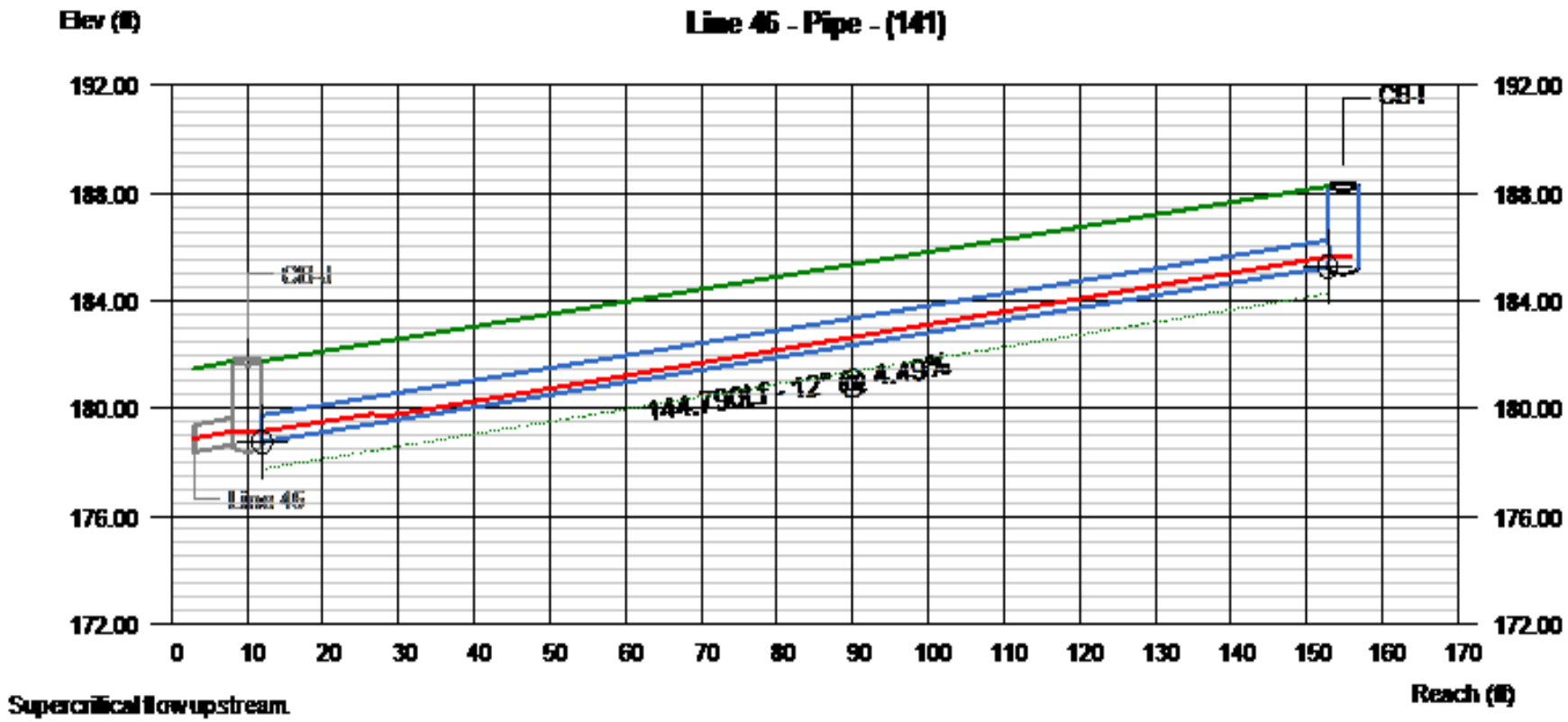


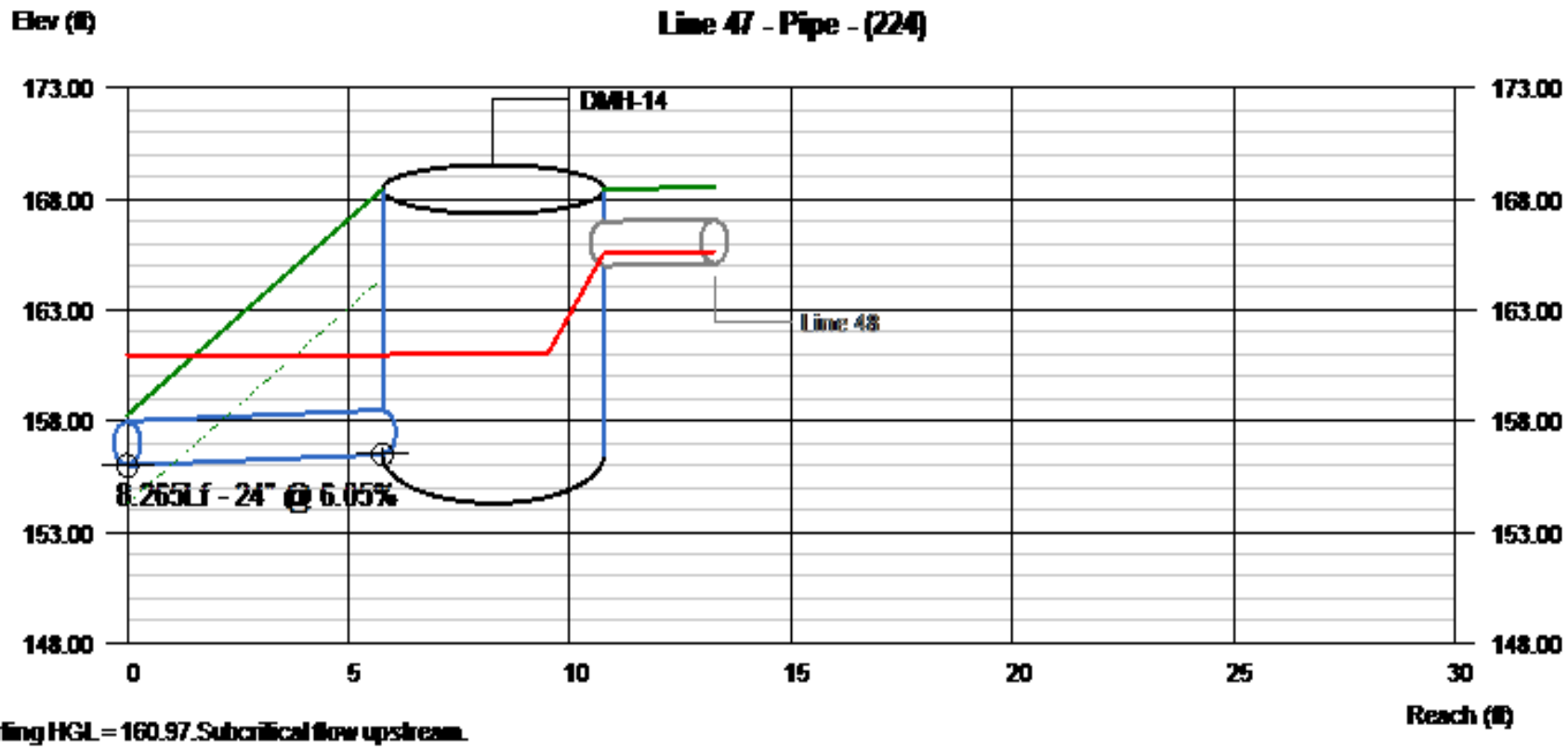
Subcritical flow upstream.



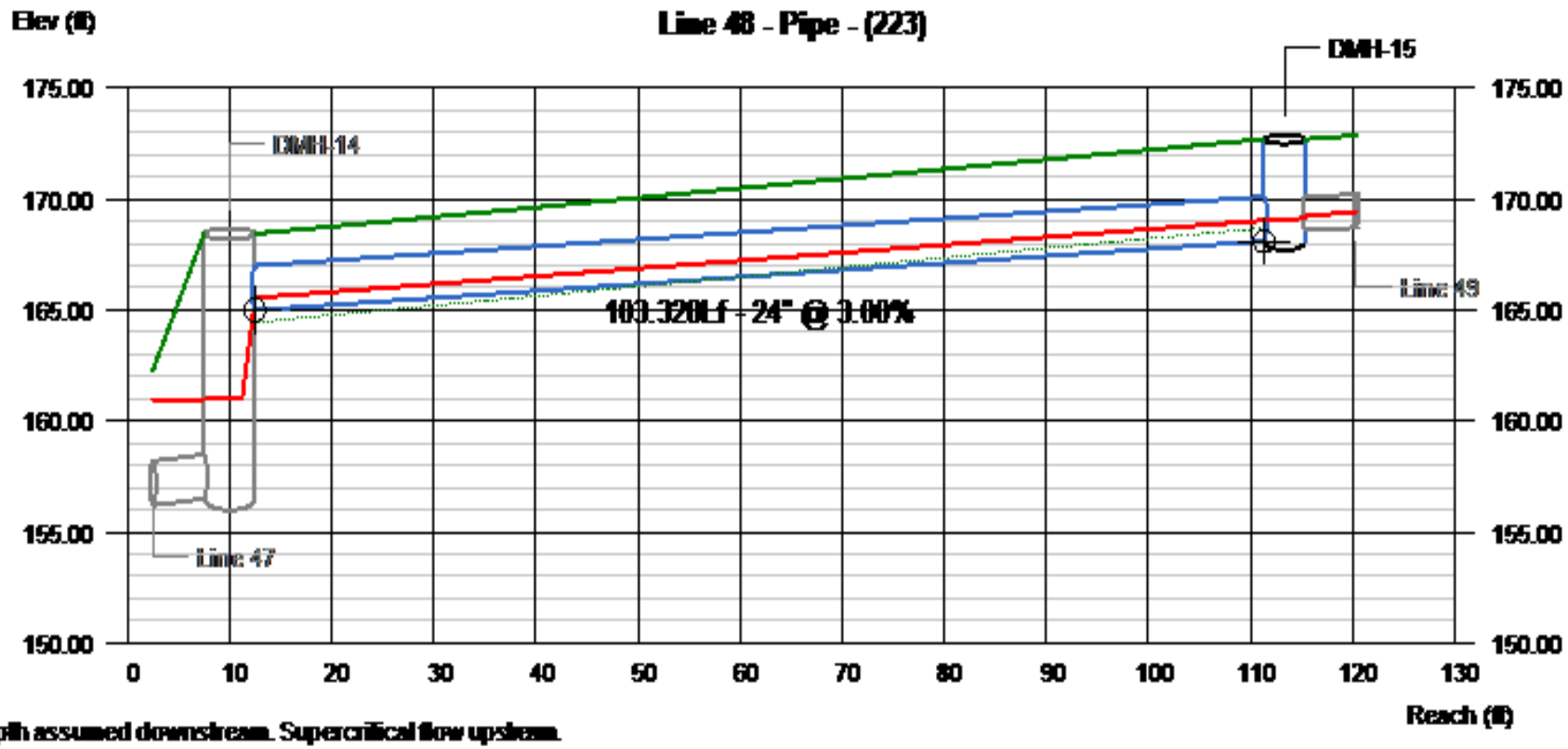
Starting HGL = 170.Supercritical flow w/jump.


Elev (ft)
Line 45 - Pipe - (142)
185.00
181.00
177.00
173.00
169.00
165.00
CB J
CB K
Line 46
Line 44
140.36ft 12" @ 5.45%
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
Reach (ft)
Supercritical flow upstream.

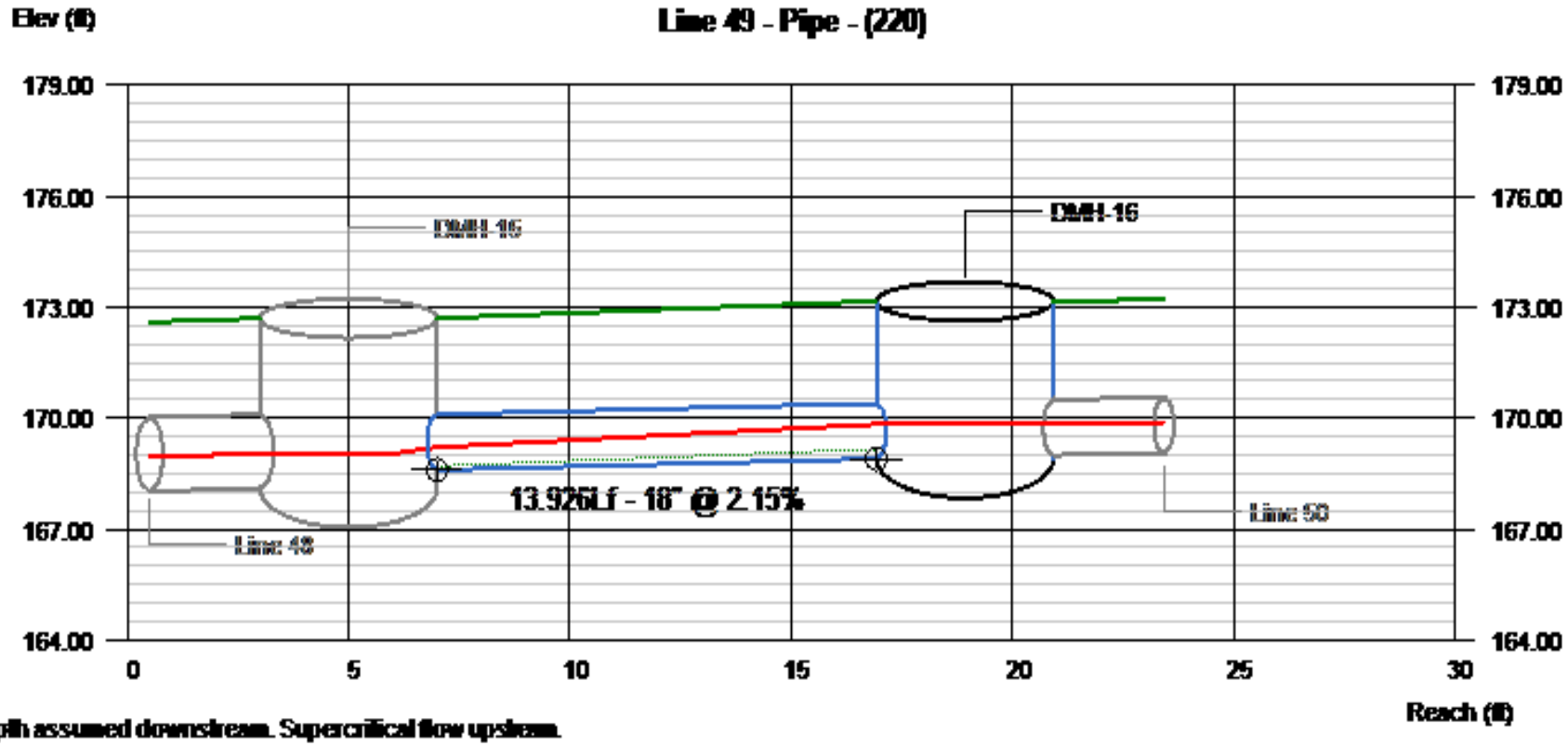

Elev (ft)
Line 46 - Pipe - (141)
192.00
188.00
184.00
180.00
176.00
172.00
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
CB-1
CB-1
Line 46
144.79ft - 12" @ 4.49%
Supercritical flow upstream.
Reach (ft)



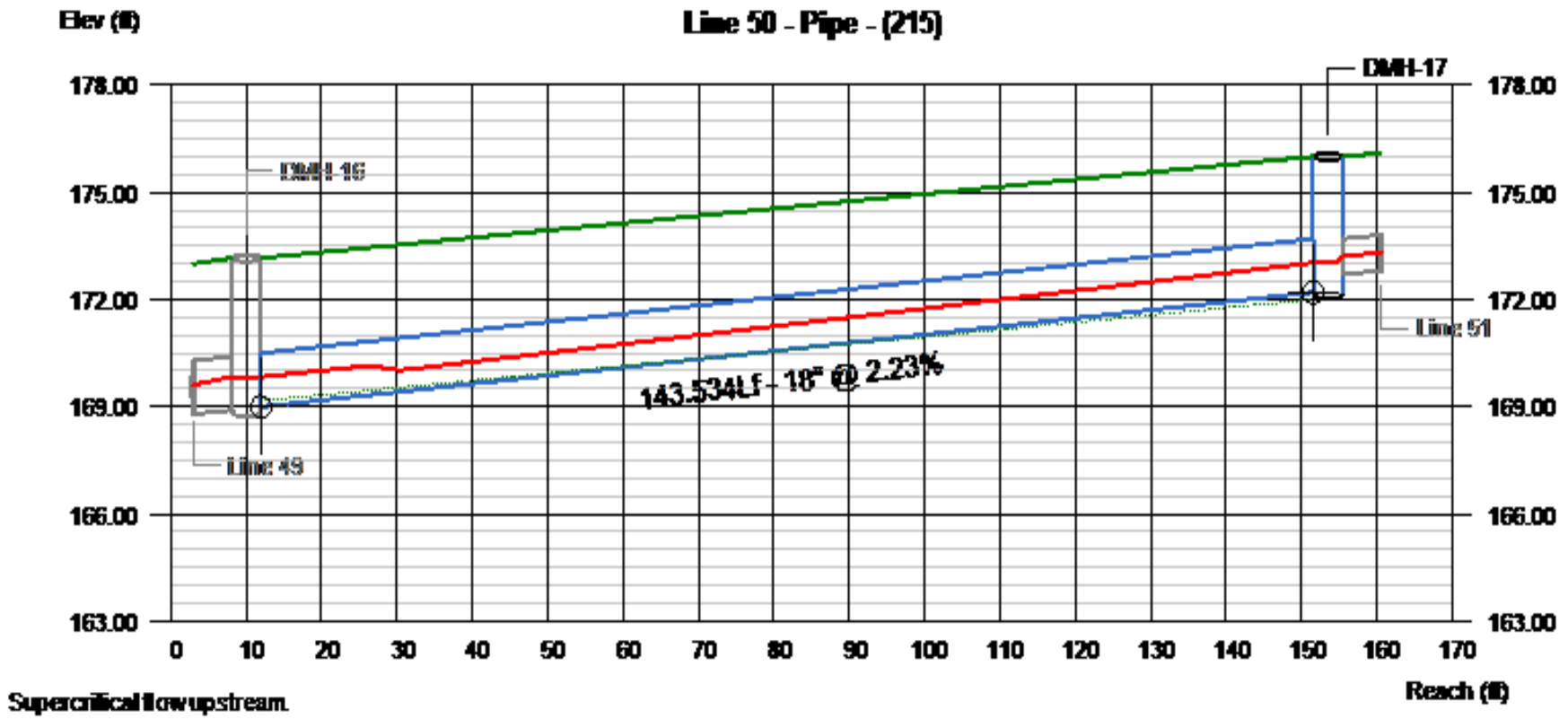
Starting HGL = 160.97. Subcritical flow upstream.

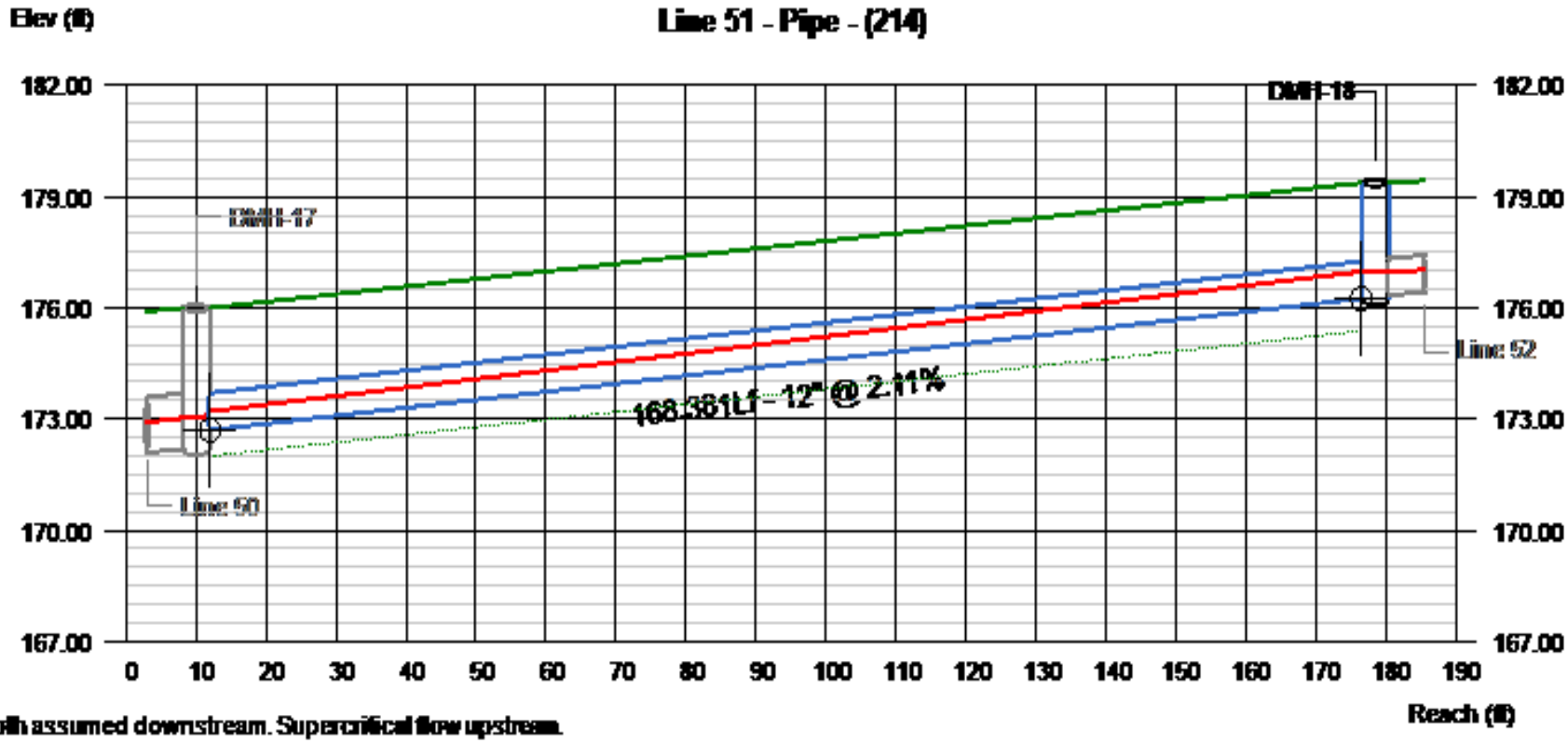


depth assumed downstream. Supercritical flow upstream.

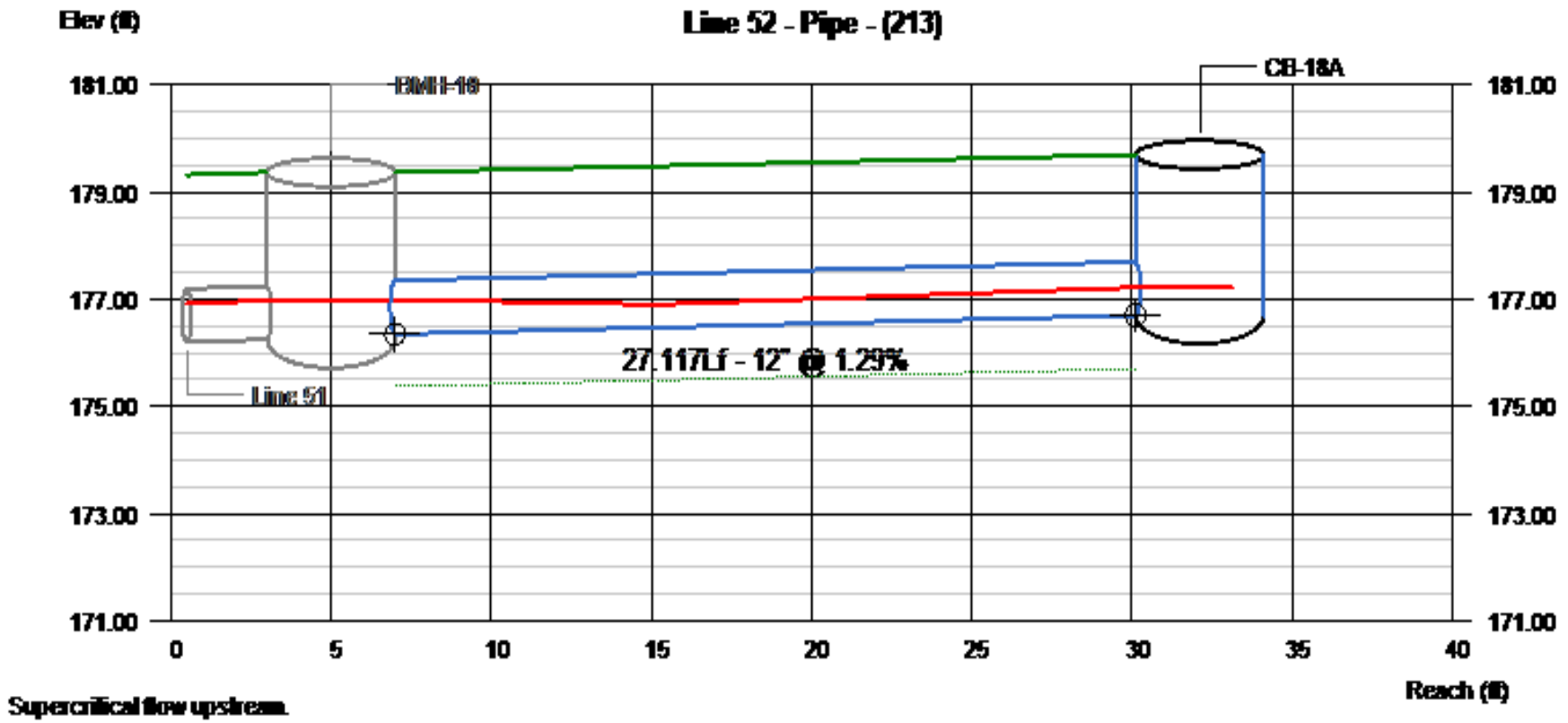


depth assumed downstream. Supercritical flow upstream.

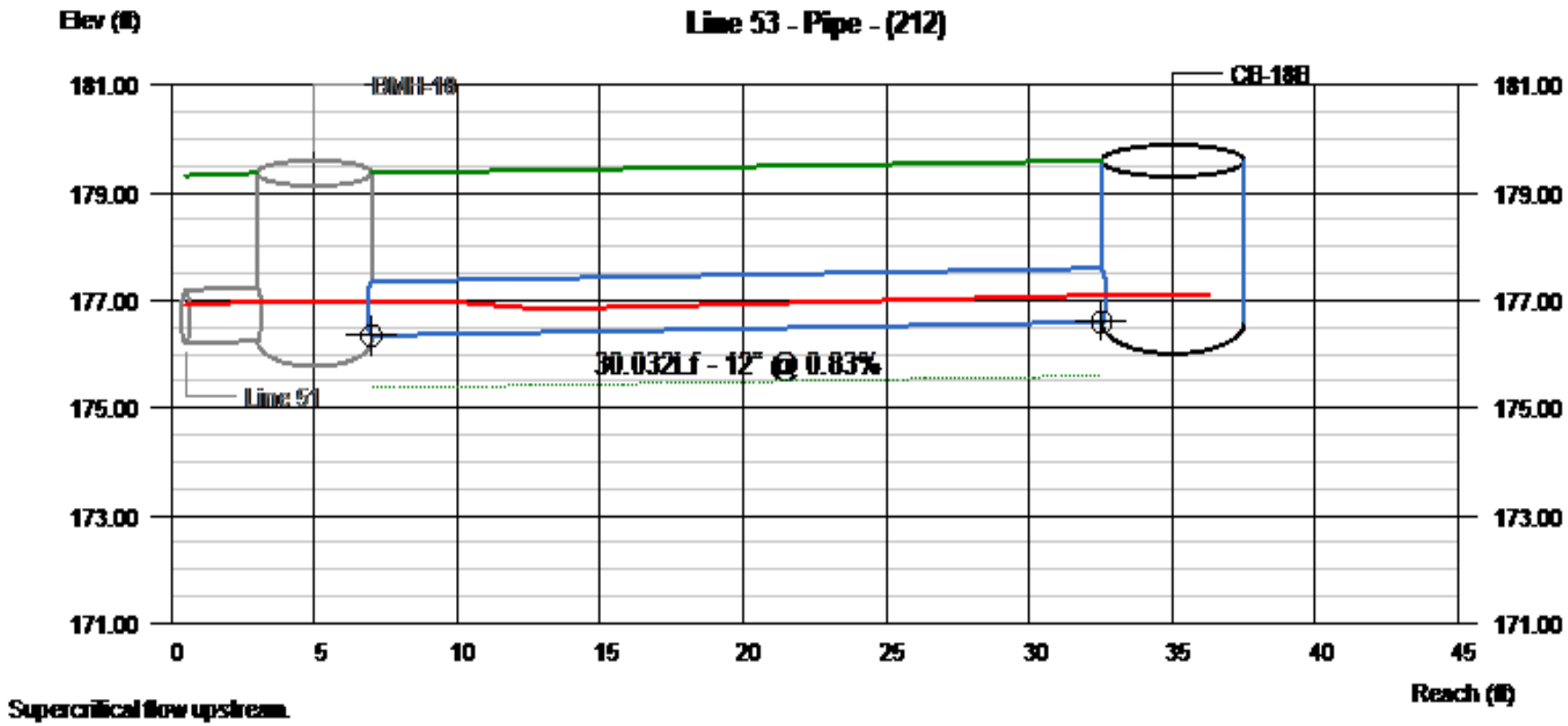

Elev (ft)
Line 50 - Pipe - (215)
DMH-17
DMH-16
178.00
175.00
172.00
169.00
166.00
163.00
Line: 51
143.534Lf - 18" @ 2.23%
Line: 49
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
Reach (ft)
Supercritical flow upstream.



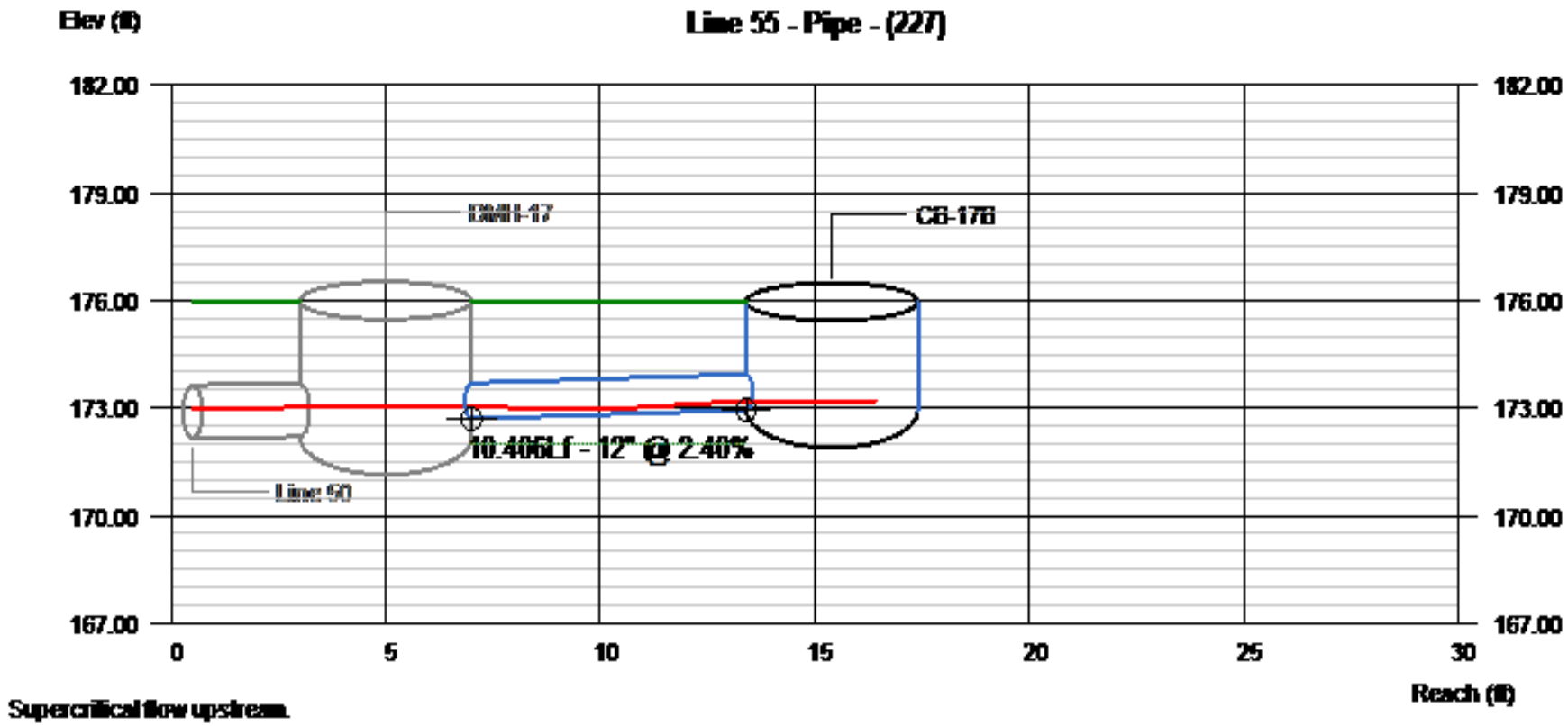
depth assumed downstream. Supercritical flow upstream.

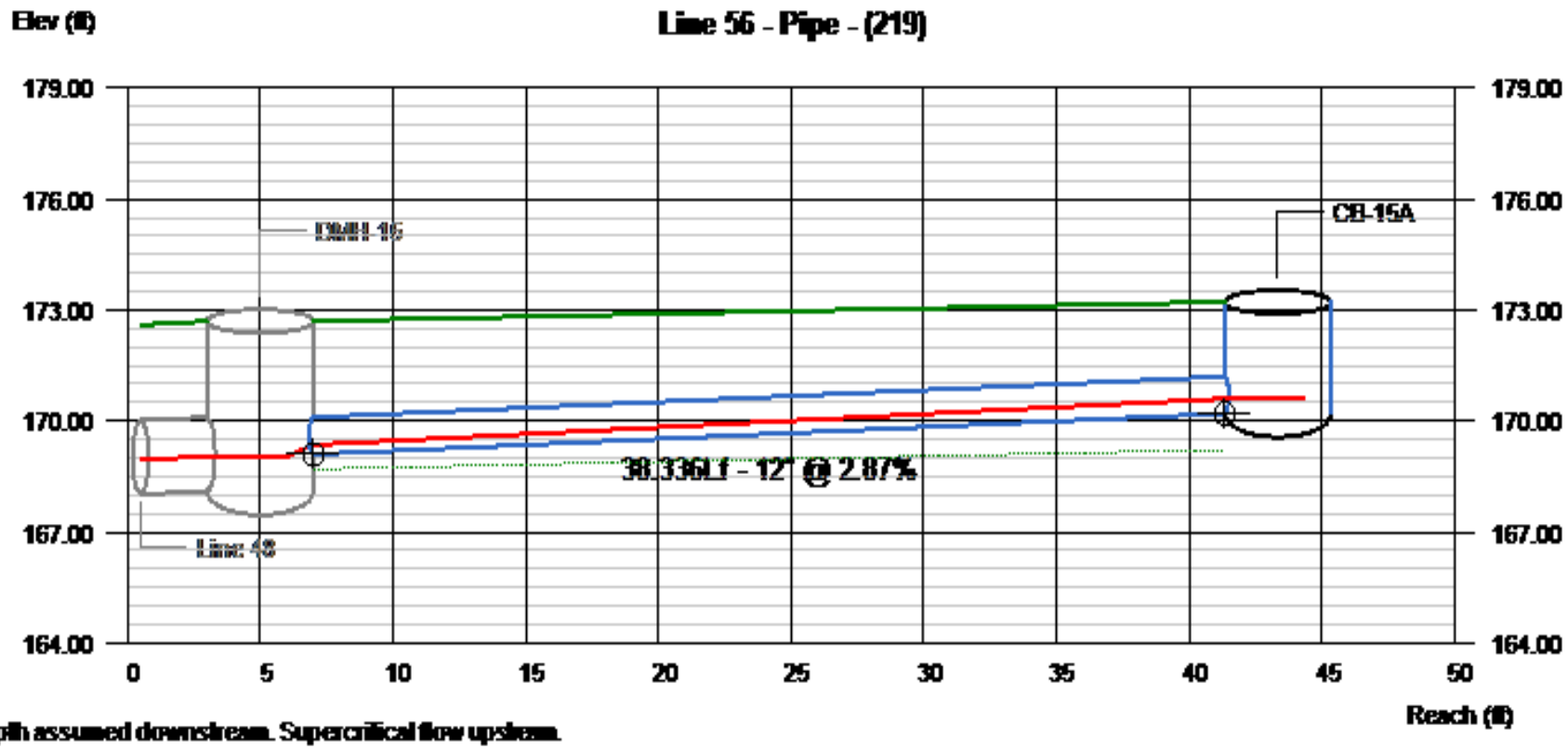


Supercritical flow upstream.

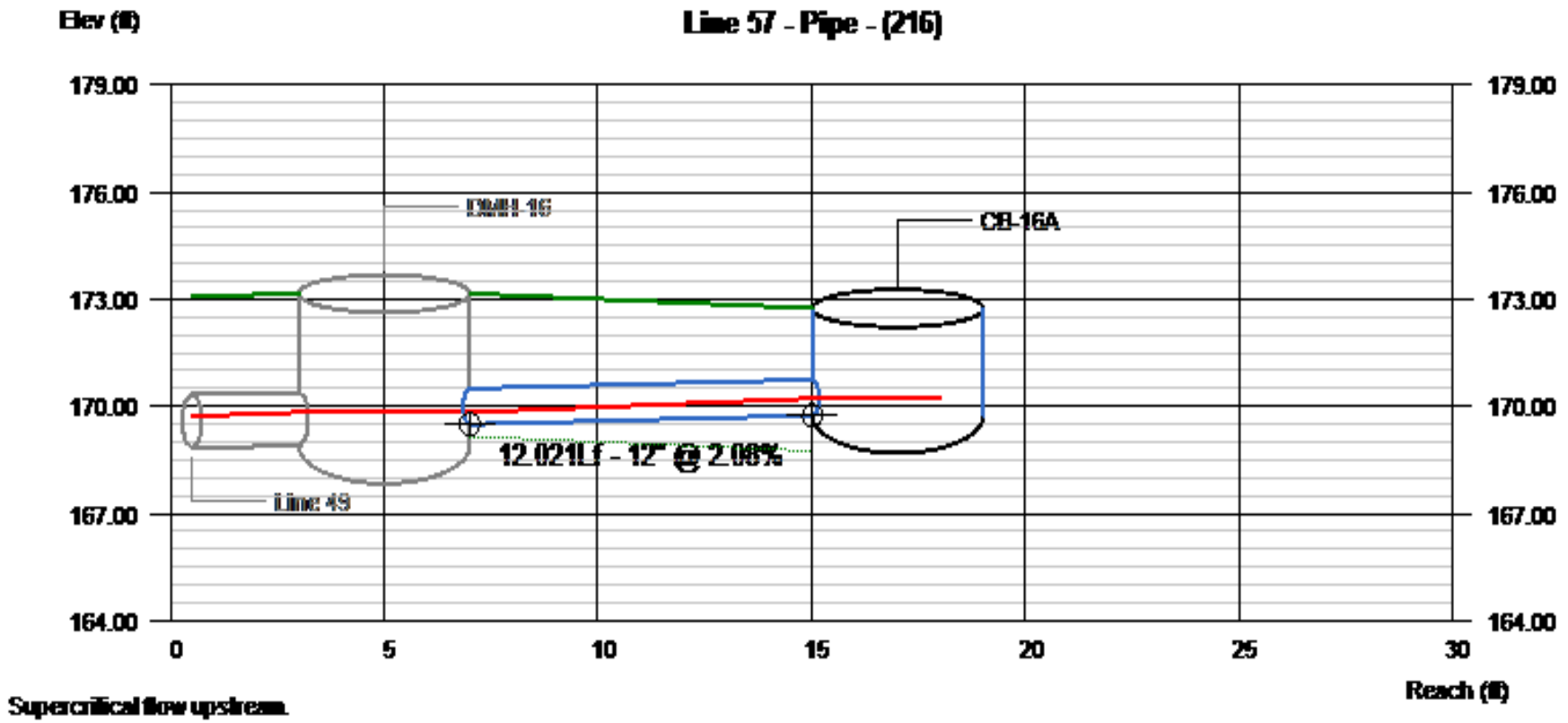

Elev (ft)
Line 53 - Pipe - (212)
181.00
179.00
177.00
175.00
173.00
171.00
EMH-19
CB-188
Line 51
30.032Lf - 12" @ 0.83%
0
5
10
15
20
25
30
35
40
45
Reach (ft)
Supercritical flow upstream.

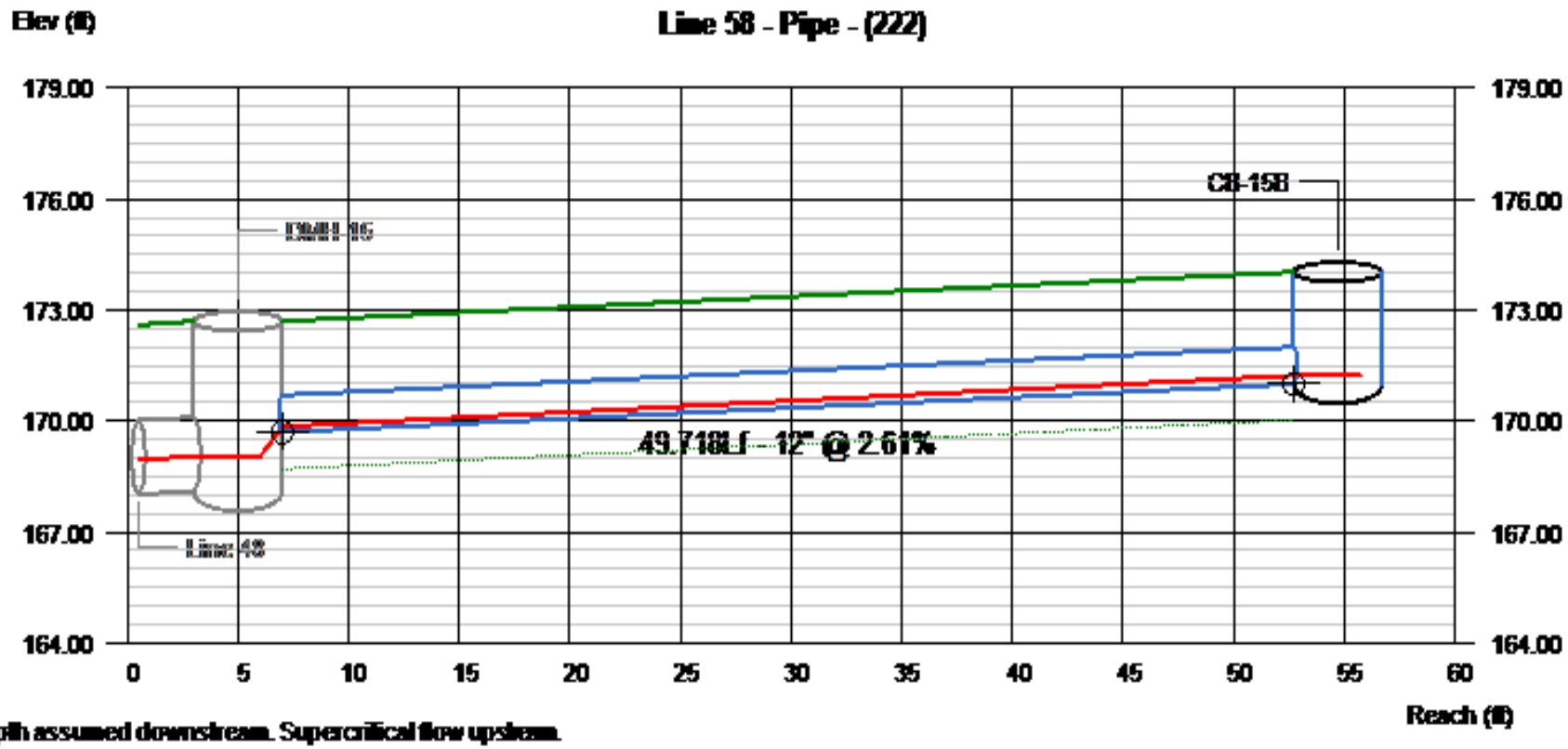
depth assumed downstream. Supercritical flow upstream.

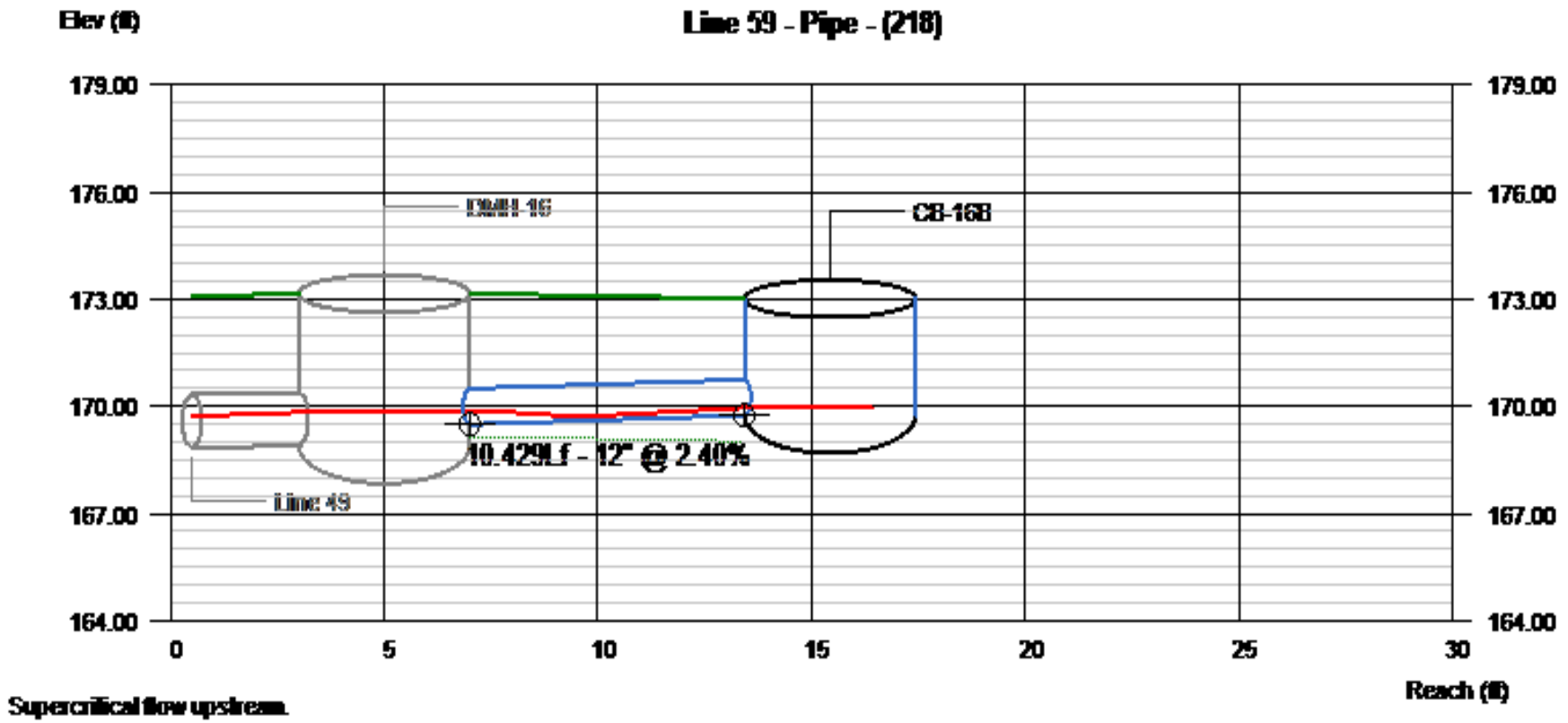

Elev (ft)
Line 55 - Pipe - (227)
182.00
179.00
176.00
173.00
170.00
167.00
0
5
10
15
20
25
30
Reach (ft)
EMH-47
CB-176
Line 50
10.406Lf - 12" @ 2.40%
Supercritical flow upstream.

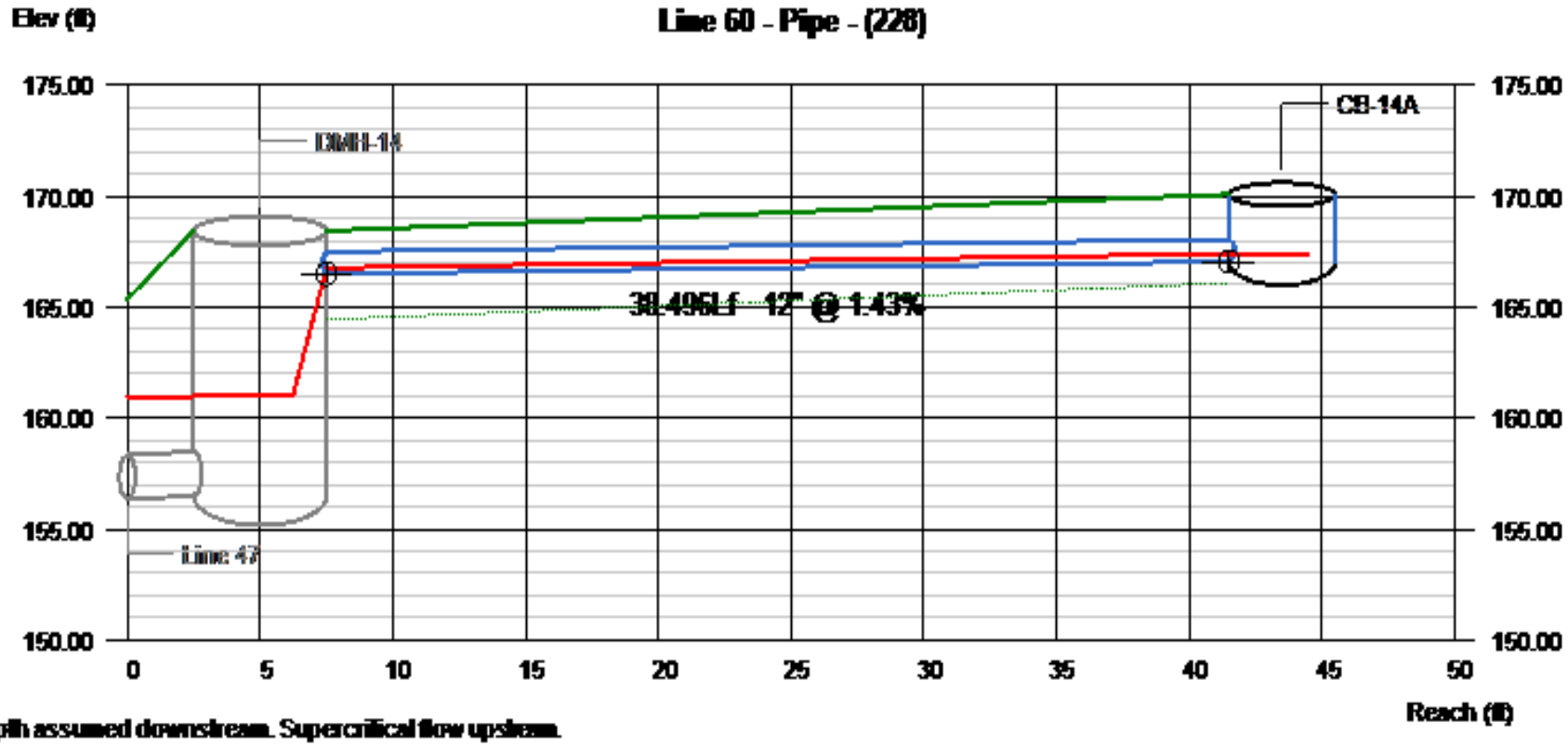


depth assumed downstream. Supercritical flow upstream.

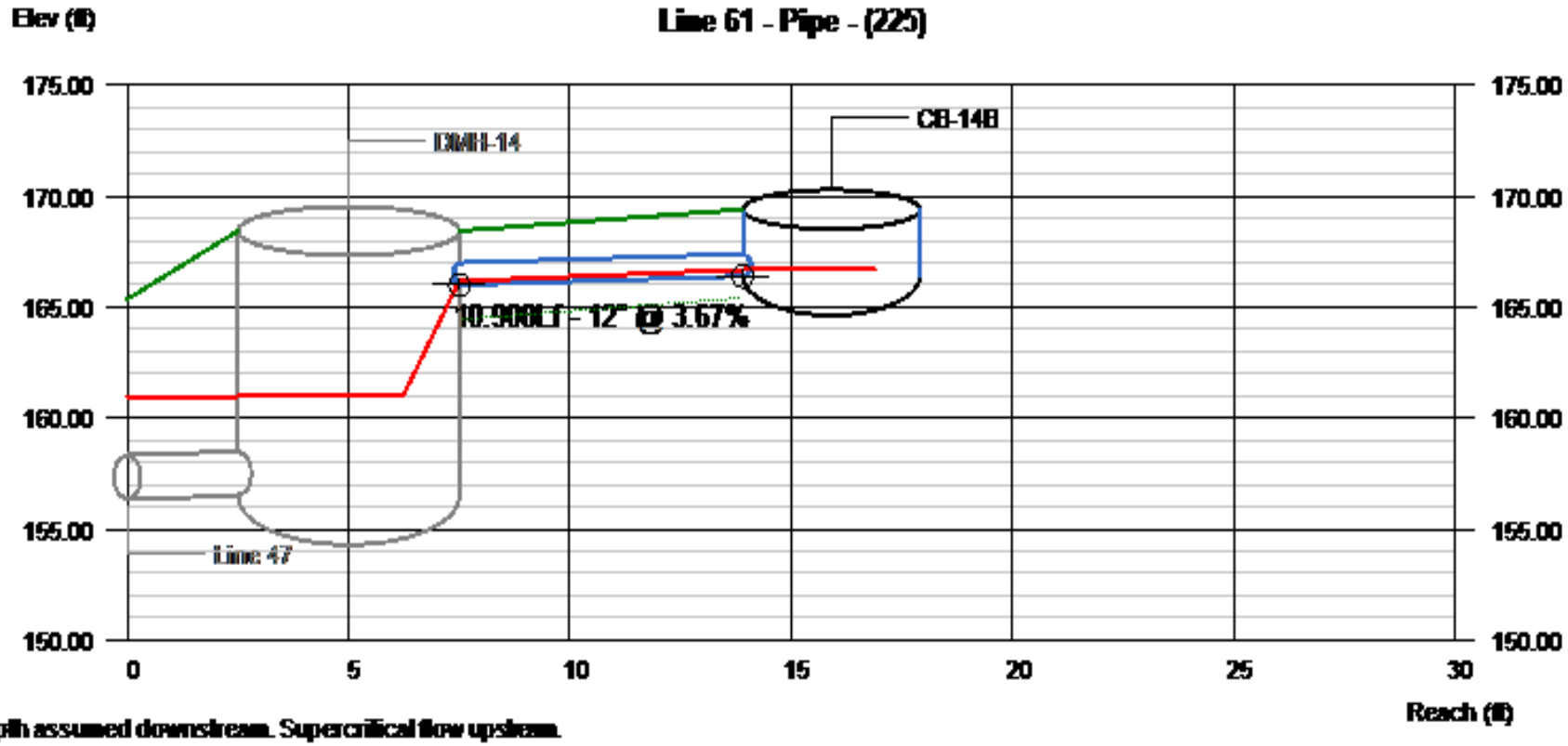

Elev (ft)
Line 57 - Pipe - (216)
179.00
176.00
173.00
170.00
167.00
164.00
0
5
10
15
20
25
30
Reach (ft)
CB-16A
Line 49
12.021Lf - 12" @ 2.08%
Supercritical flow upstream.


Elev (ft)
Line 58 - Pipe - (222)
179.00
176.00
173.00
170.00
167.00
164.00
0
5
10
15
20
25
30
35
40
45
50
55
60
Reach (ft)
CB-158
Line 48
49.71ft L - 12" @ 2.61%
depth assumed downstream. Supercritical flow upstream.

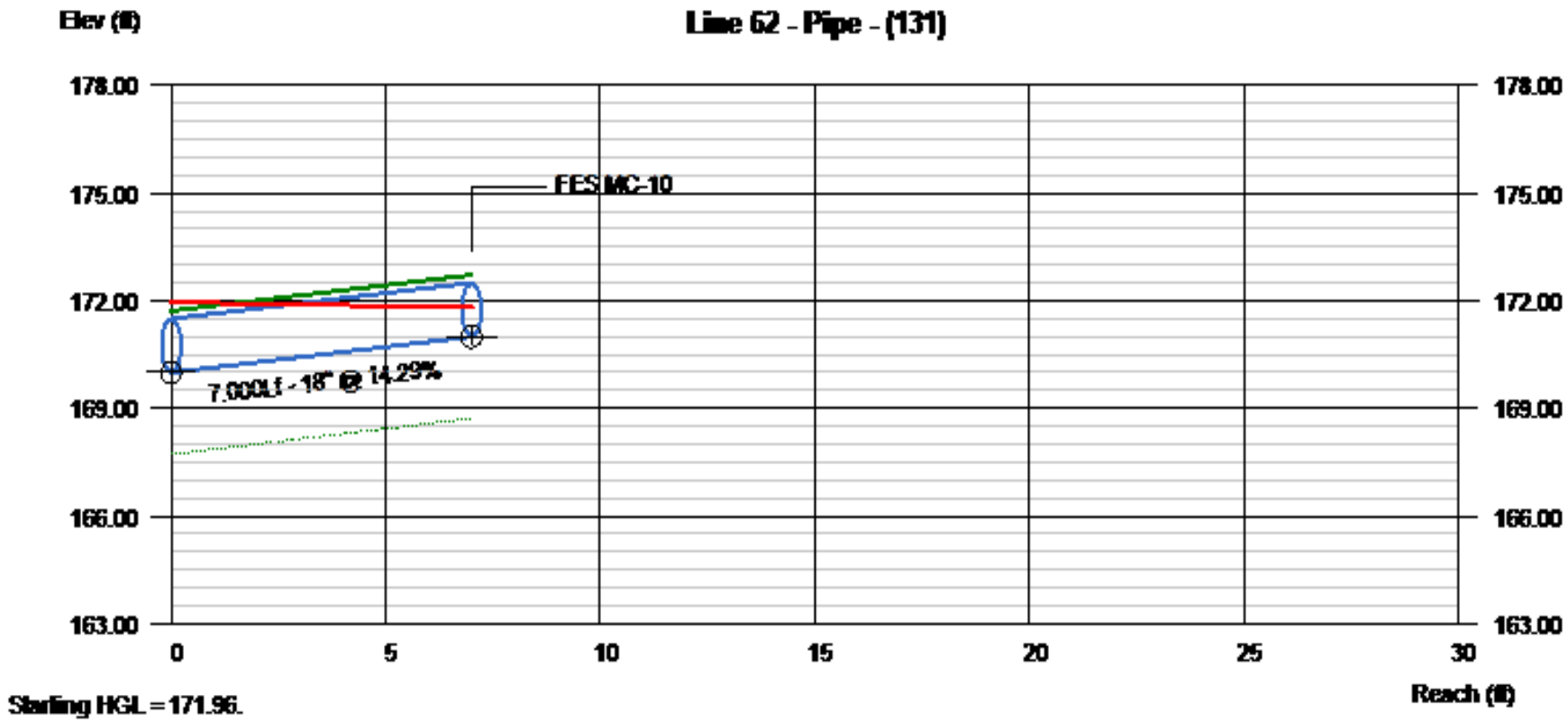

Elev (ft)
Line 59 - Pipe - (218)
179.00
176.00
173.00
170.00
167.00
164.00
0
5
10
15
20
25
30
Reach (ft)
CB-168
10.429Lf - 12" @ 2.40%
Line 49
Supercritical flow upstream.



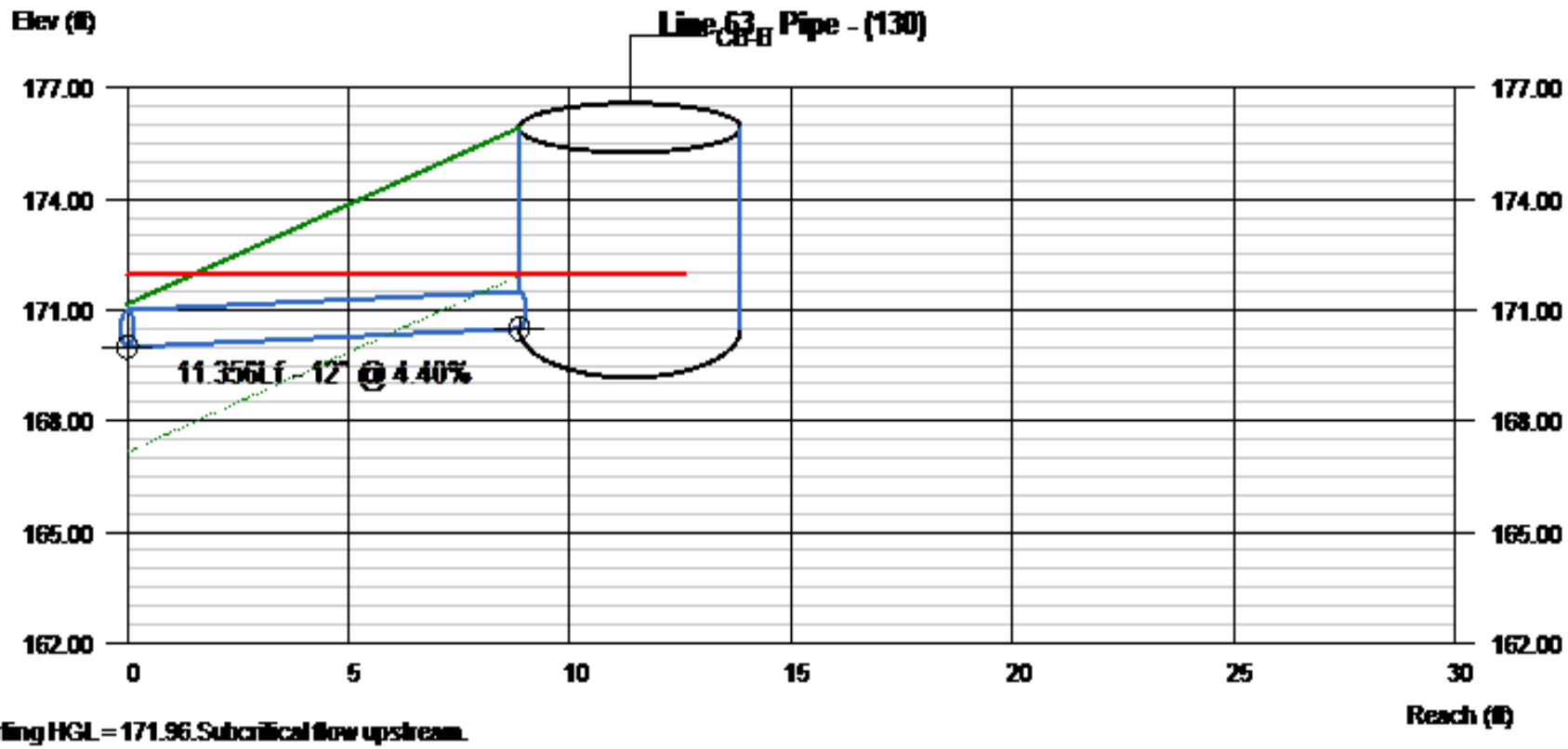
depth assumed downstream. Supercritical flow upstream.



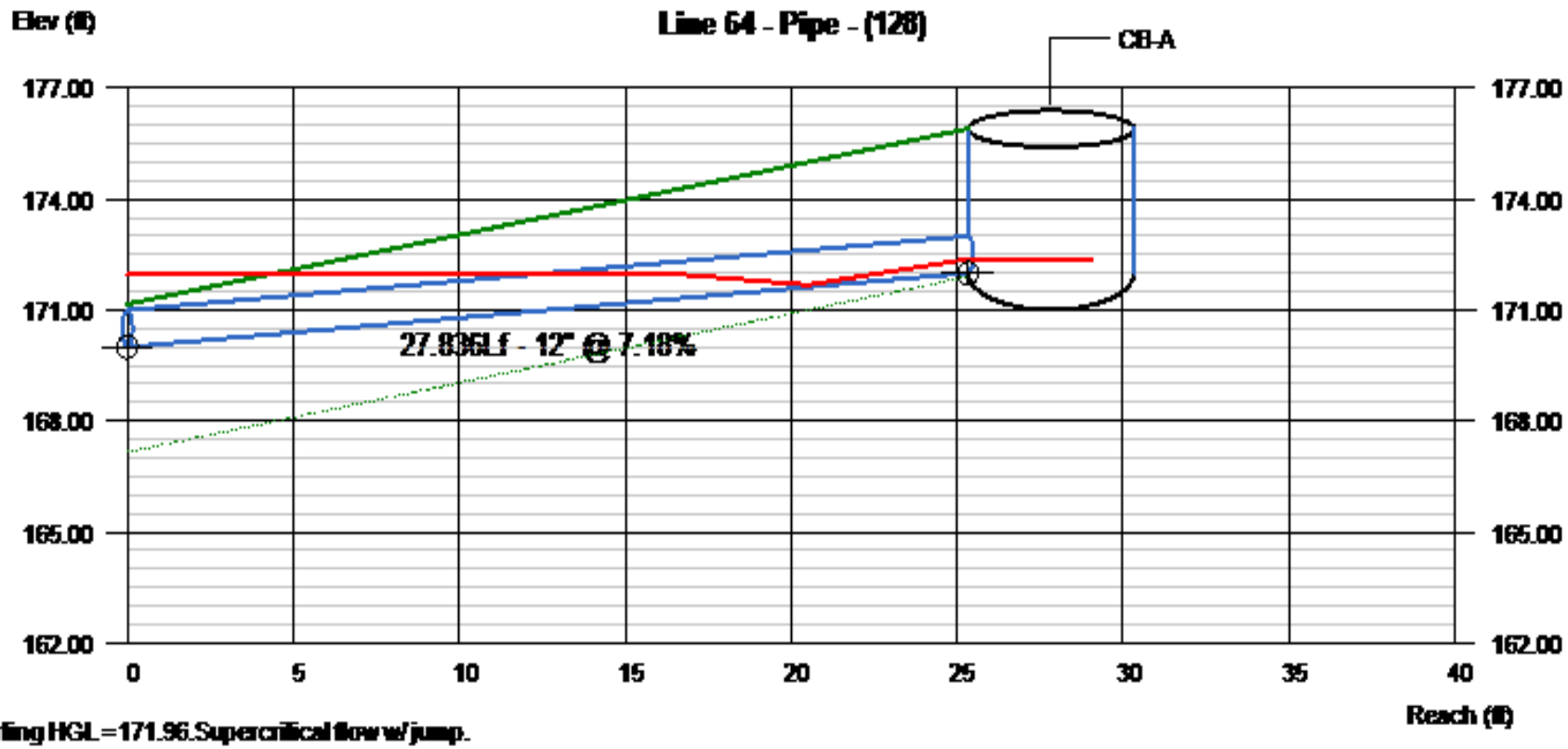
depth assumed downstream. Supercritical flow upstream.



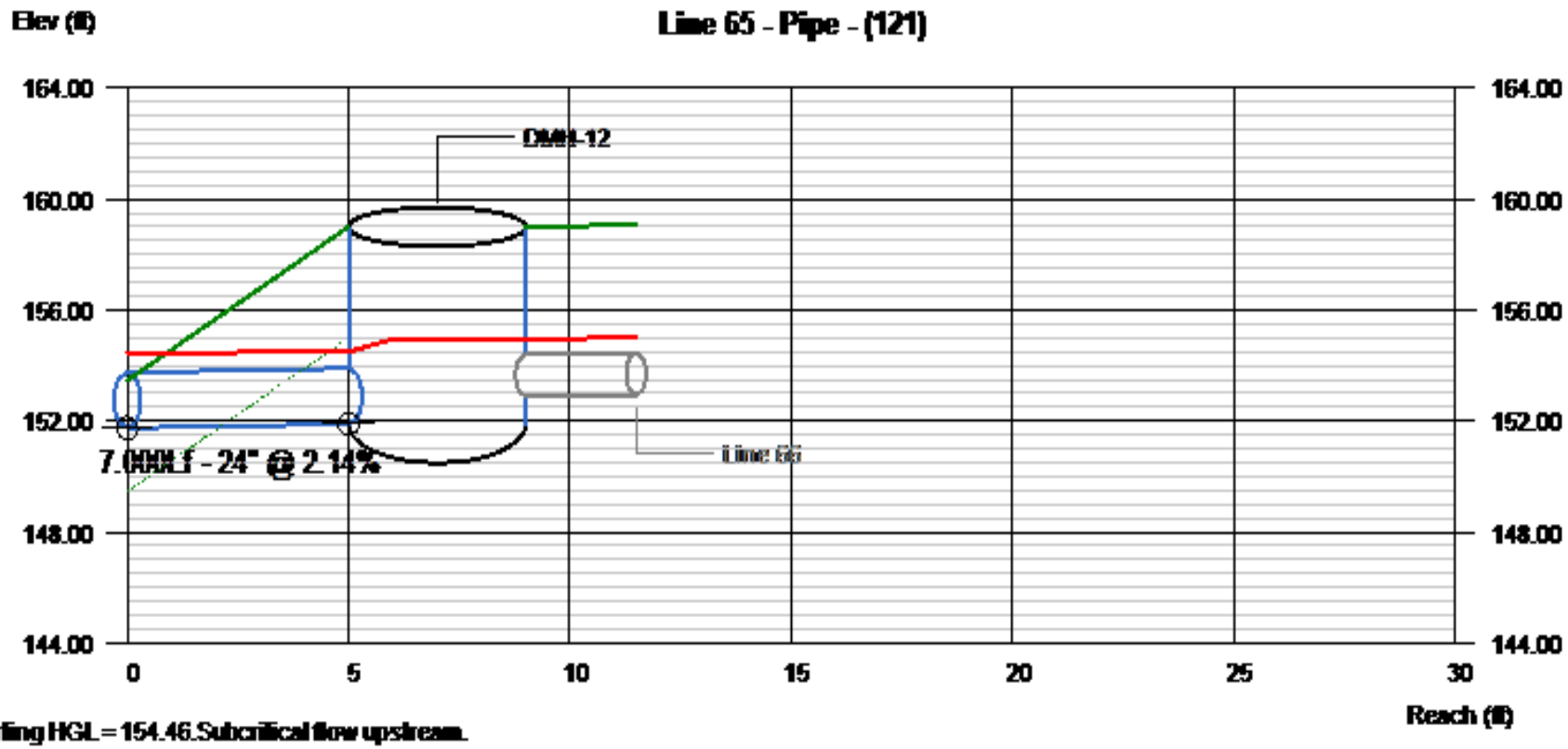
Starting HGL = 171.96.



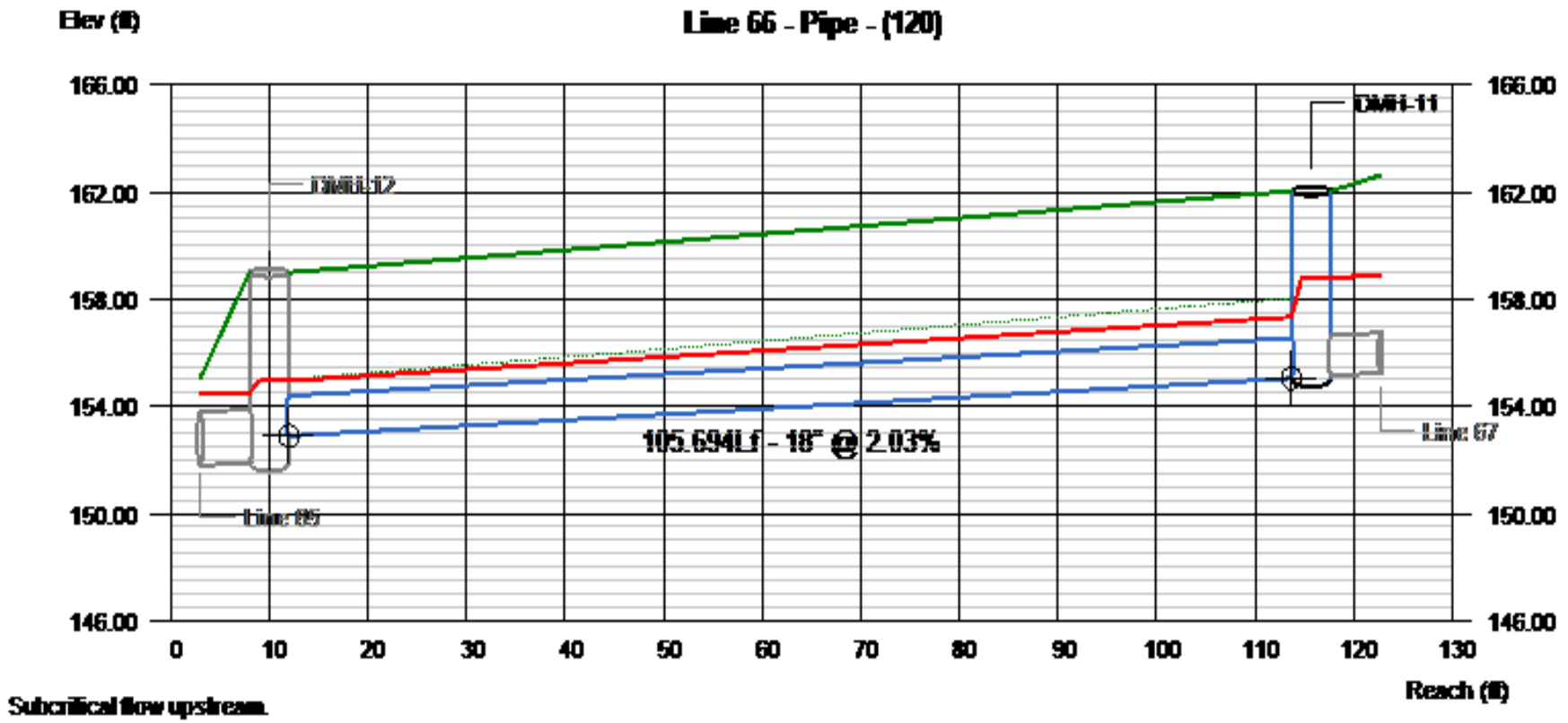
Starting HGL = 171.96.Subcritical flow upstream.

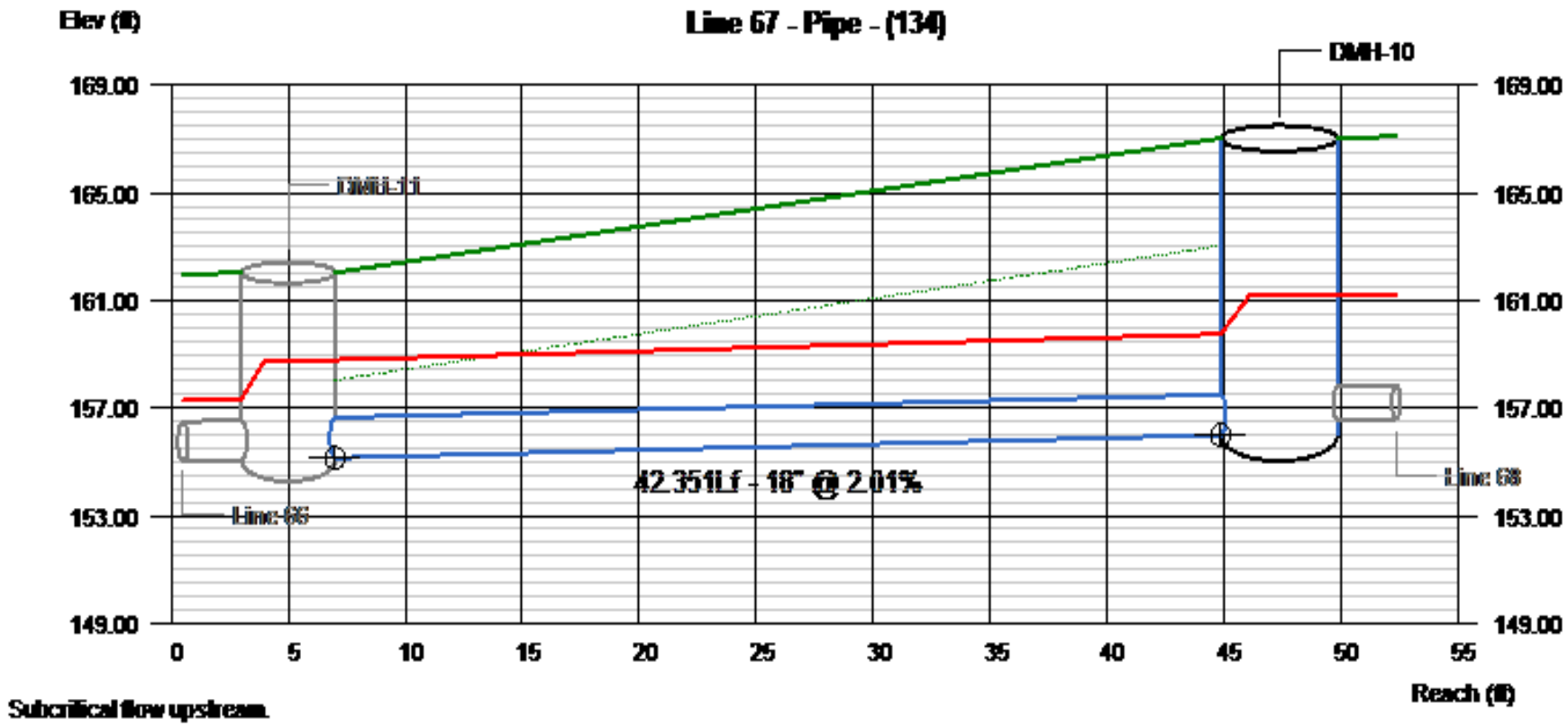


Starting HGL = 171.96 Supercritical flow w/jump.

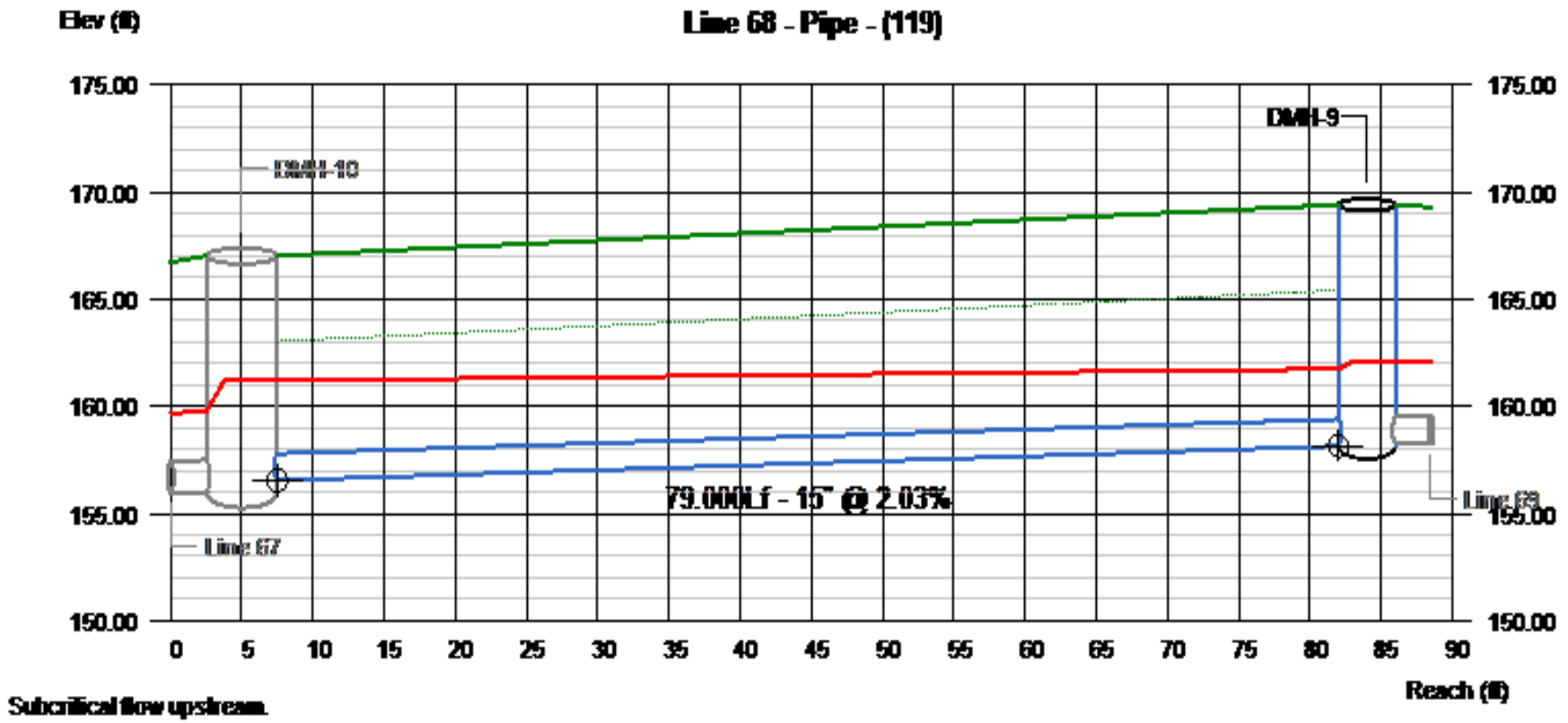


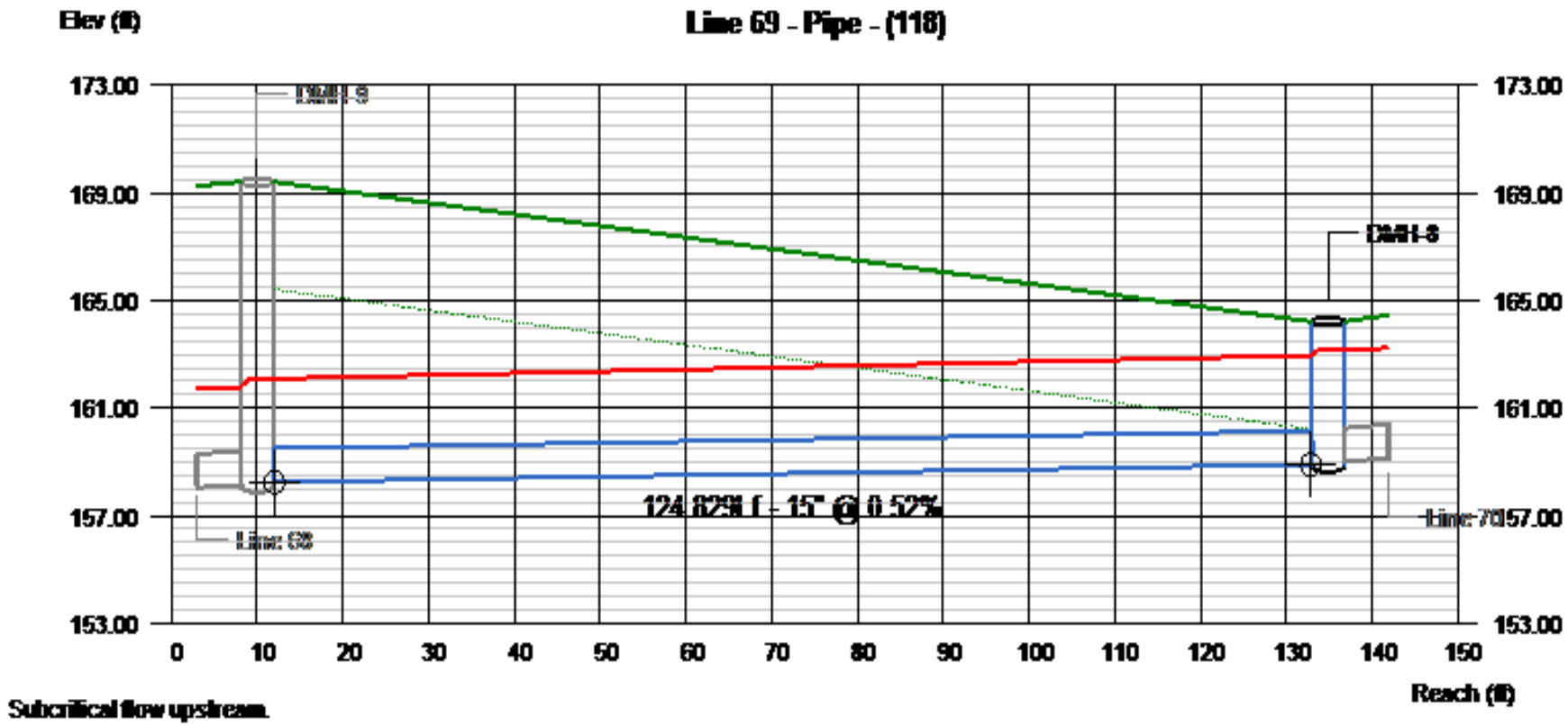
Starting HGL = 154.46. Subcritical flow upstream.

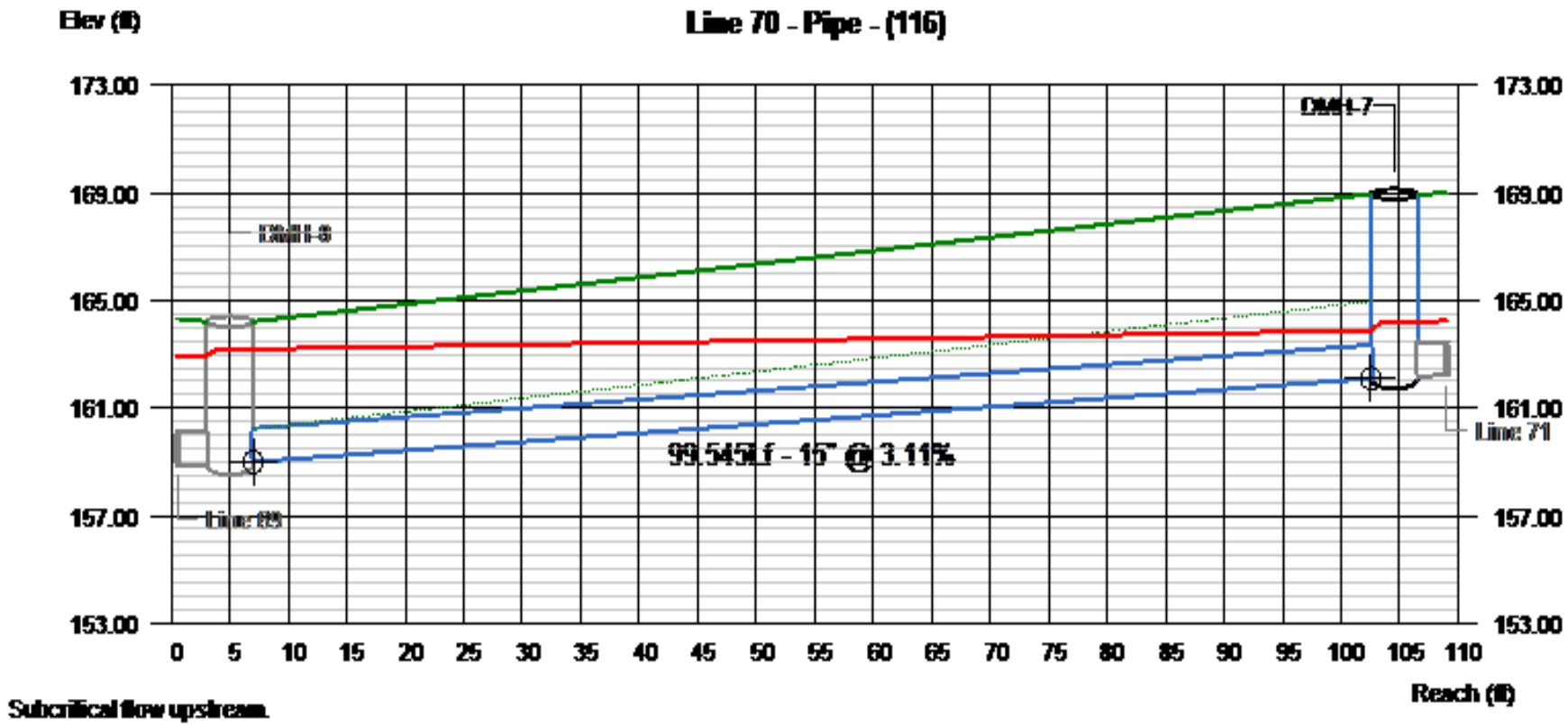

Elev (ft)
Line 66 - Pipe - (120)
166.00
162.00
158.00
154.00
150.00
146.00
0
10
20
30
40
50
60
70
80
90
100
110
120
130
DMH-11
DMH-12
Line 67
Line 65
105.694Lf - 18" @ 2.03%
Reach (ft)
Subcritical flow upstream.

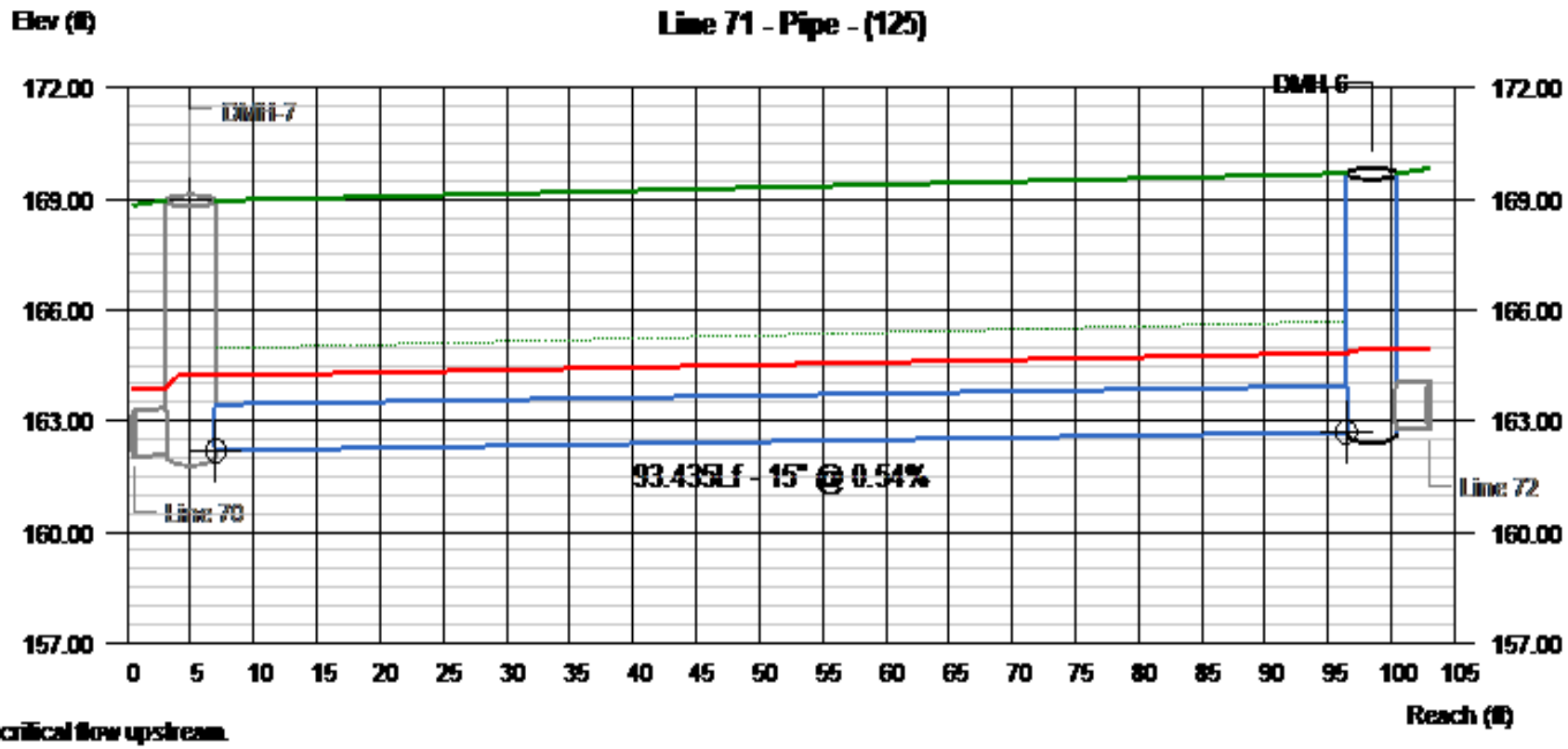


Subcritical flow upstream.

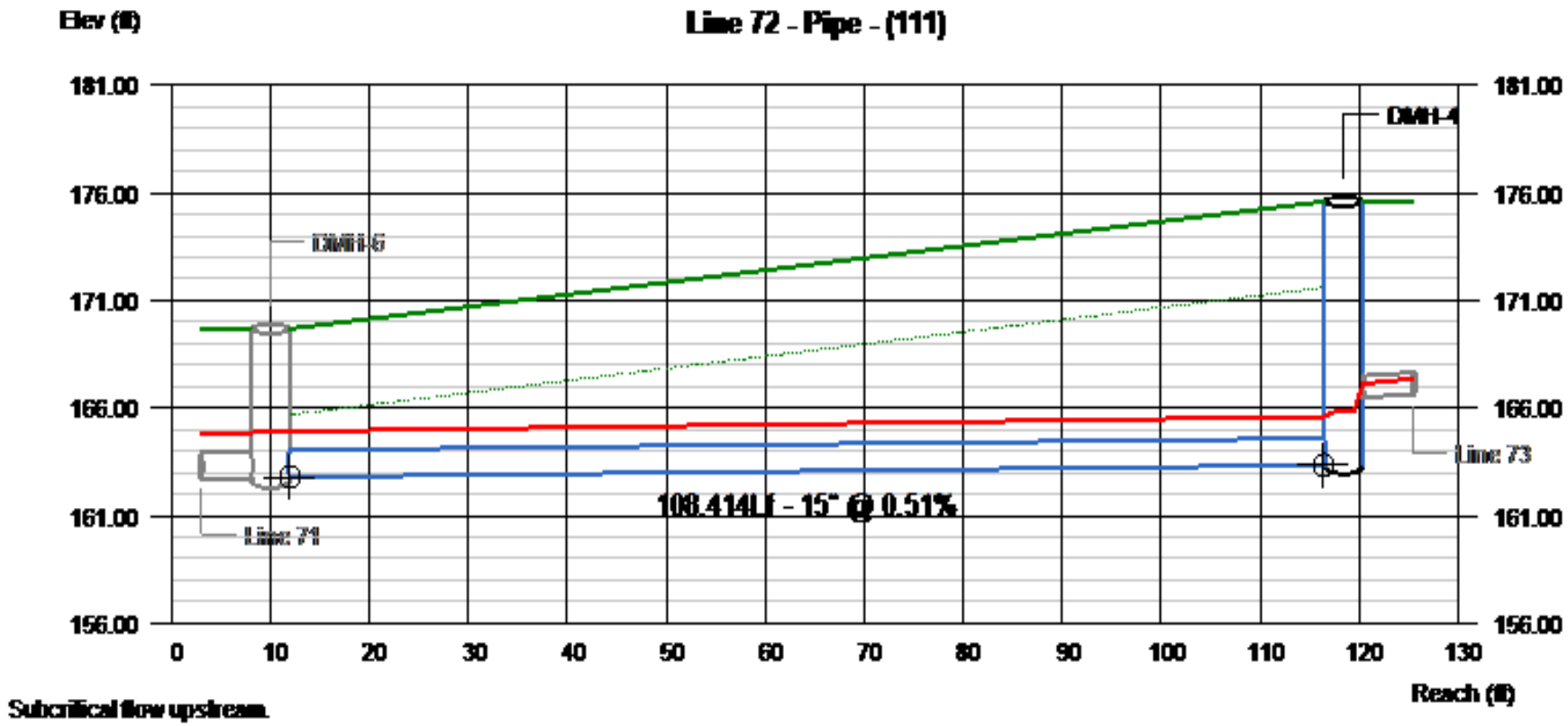

Elev (ft)
Line 68 - Pipe - (119)
175.00
170.00
165.00
160.00
155.00
150.00
DMH-9
DMH-10
79.000Lf - 15" @ 2.03%
Line 67
Line 69
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
Reach (ft)
Subcritical flow upstream.

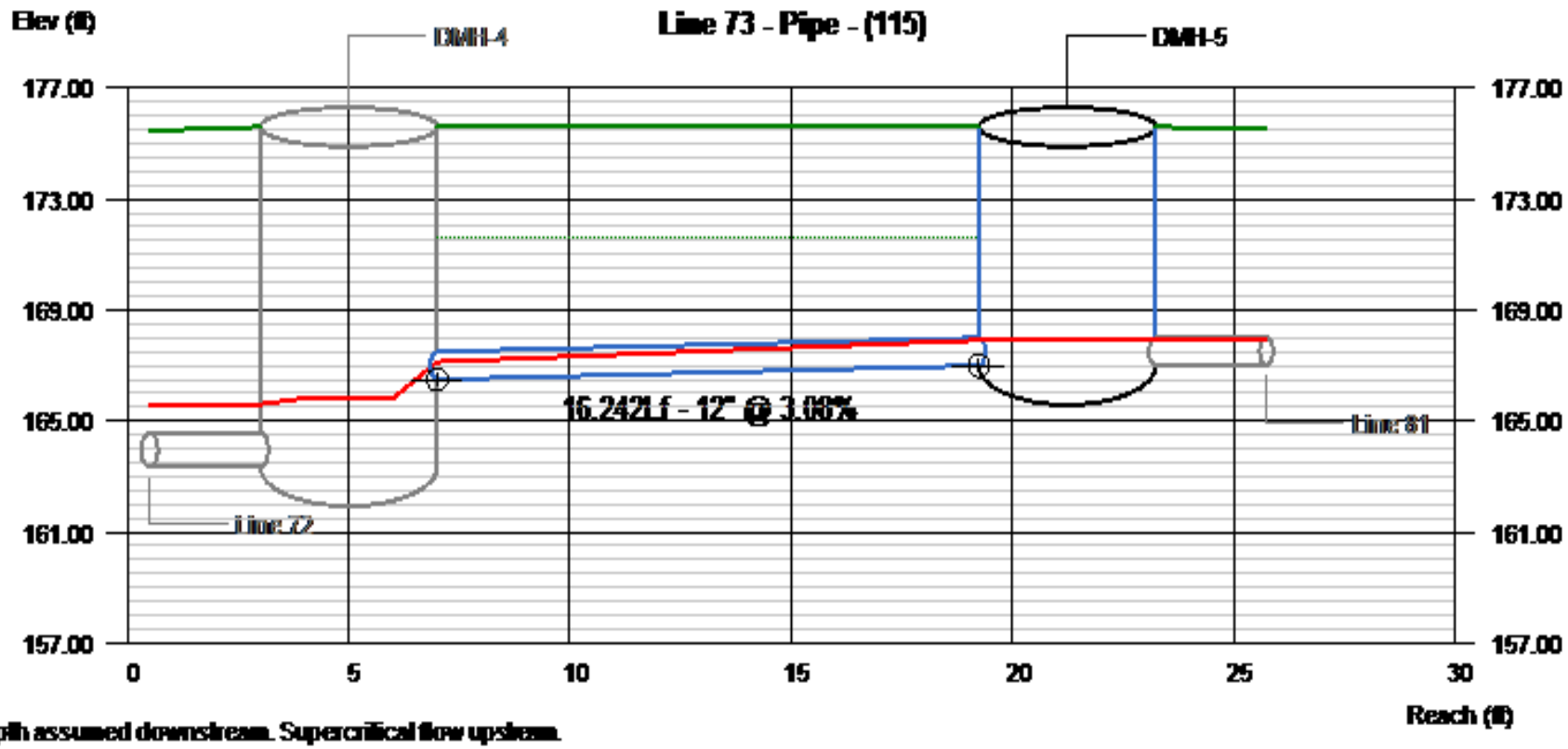

Elev (ft)
Line 69 - Pipe - (118)
173.00
169.00
165.00
161.00
157.00
153.00
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Reach (ft)
Line: 69
Line: 70
124.82ft L - 15" @ 0.52%
Subcritical flow upstream.


Elev (ft)
Line 70 - Pipe - (116)
173.00
169.00
165.00
161.00
157.00
153.00
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110
Reach (ft)
Line 71
99.545ft - 15" @ 3.11%
Subcritical flow upstream.

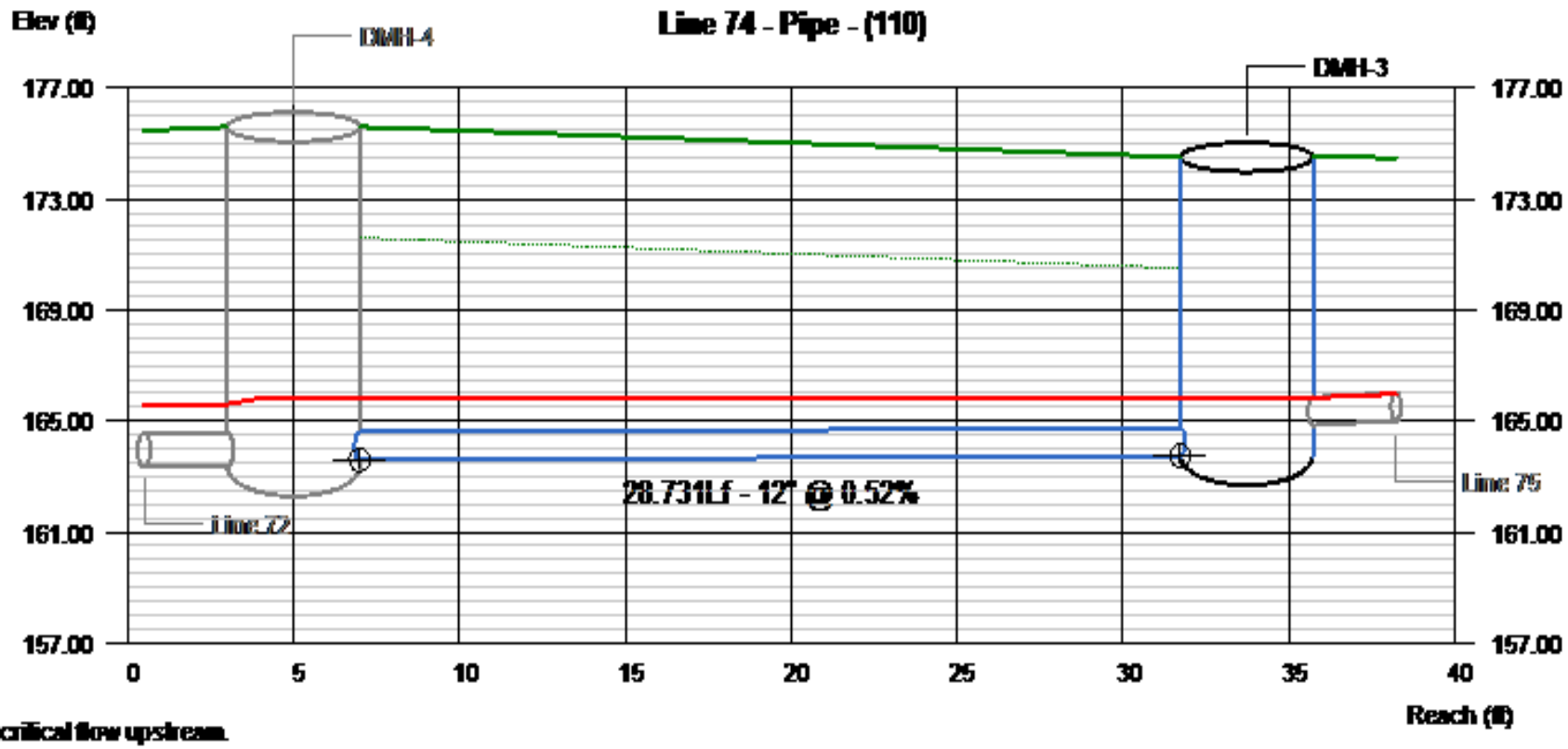


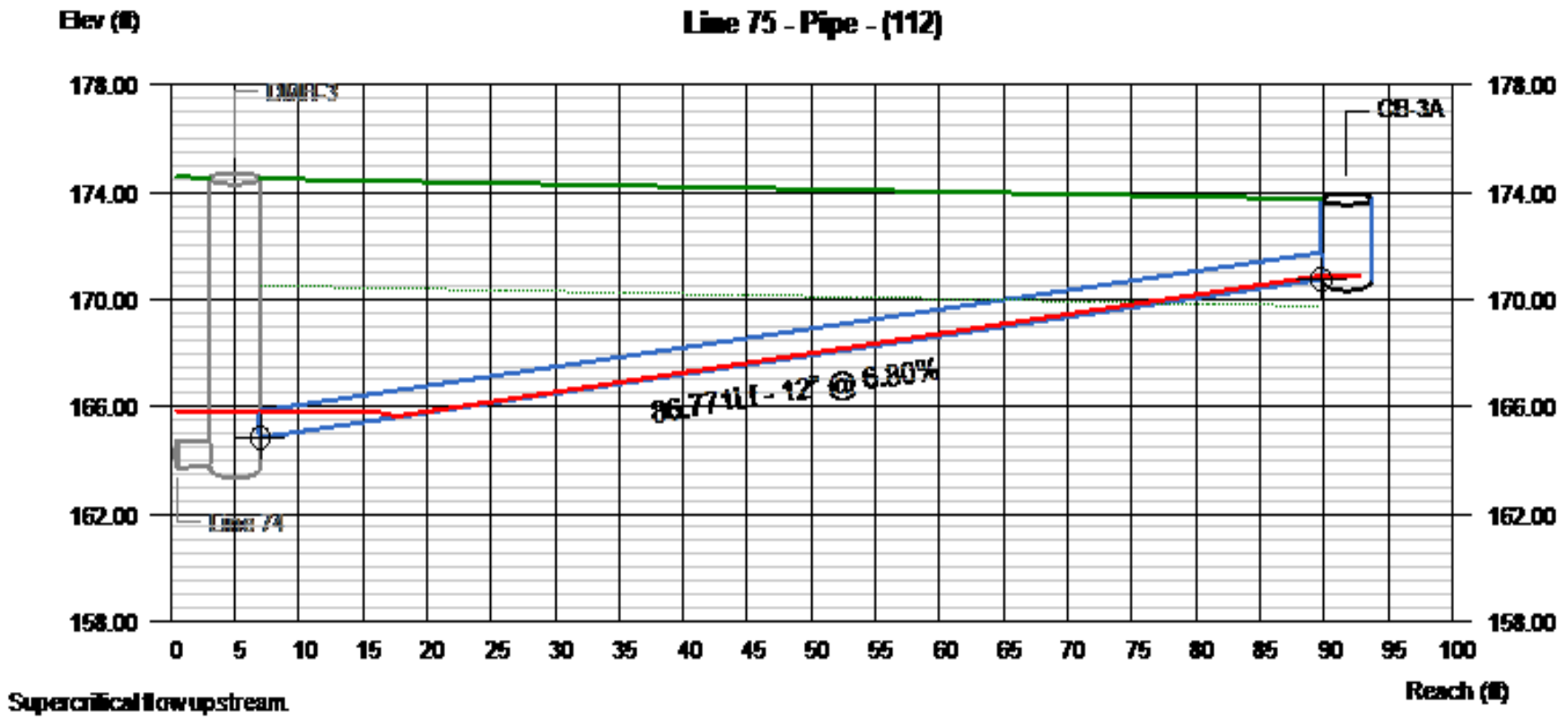
Subcritical flow upstream.

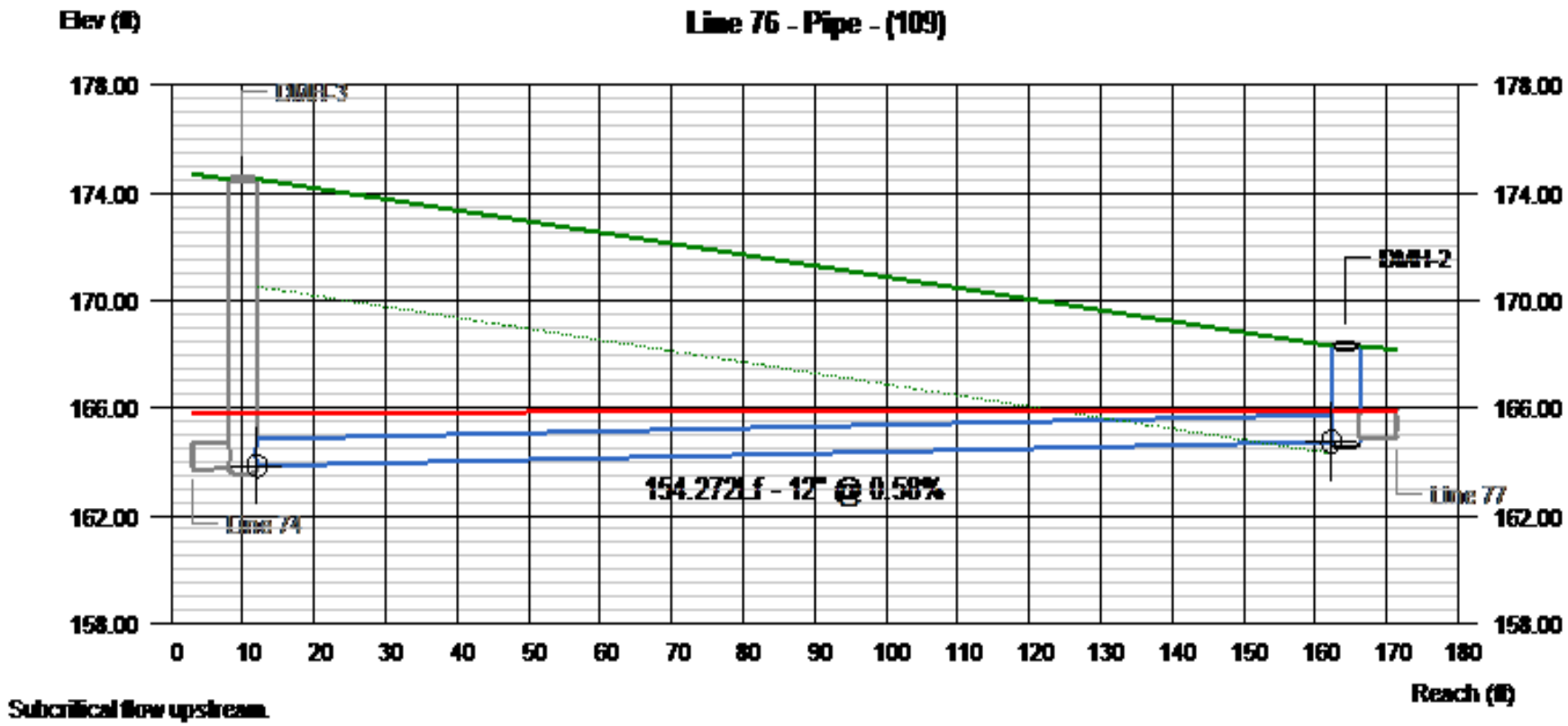

Elev (ft)
Line 72 - Pipe - (111)
181.00
176.00
171.00
166.00
161.00
156.00
0
10
20
30
40
50
60
70
80
90
100
110
120
130
Reach (ft)
DMH-5
DMH-4
Line: 73
Line: 71
108.414LF - 15" @ 0.51%
Subcritical flow upstream.

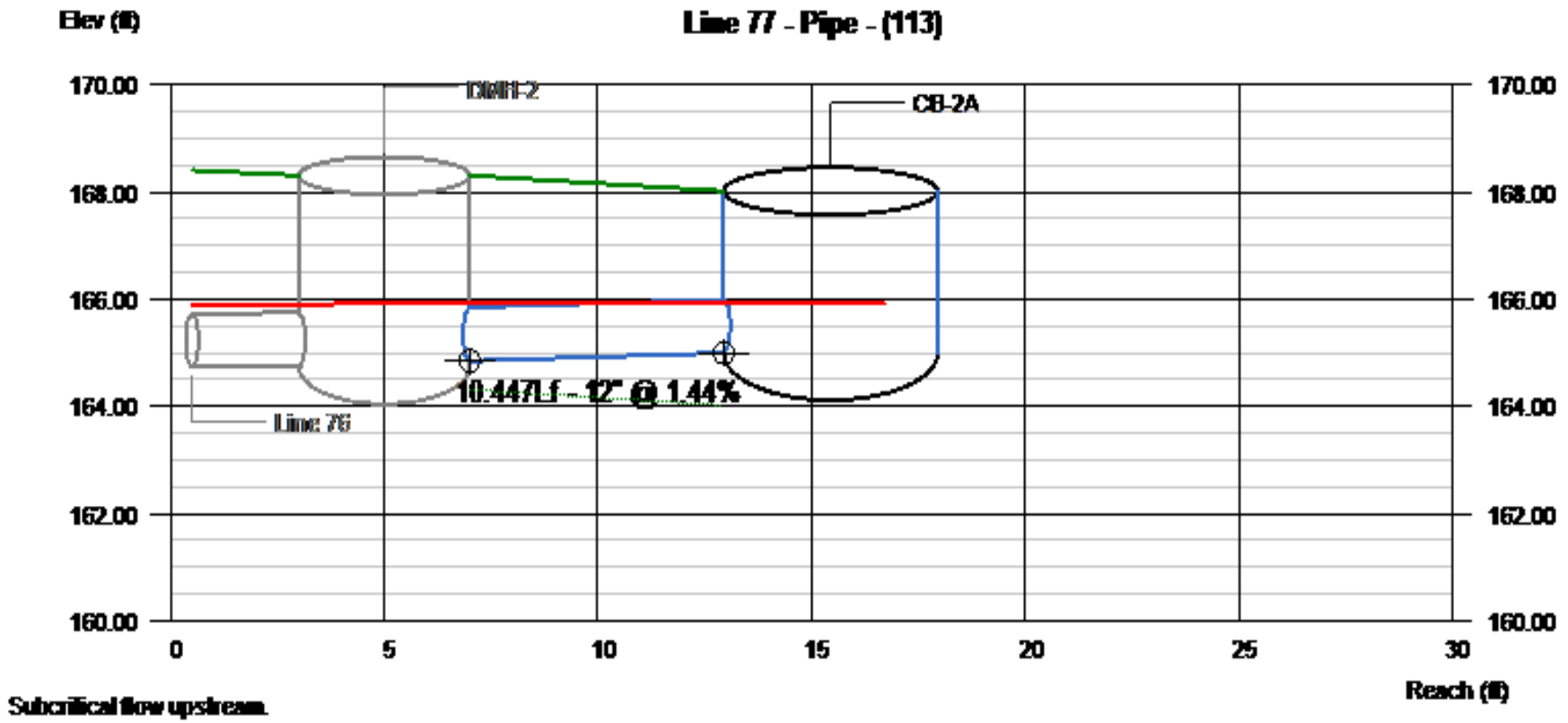


depth assumed downstream. Supercritical flow upstream.

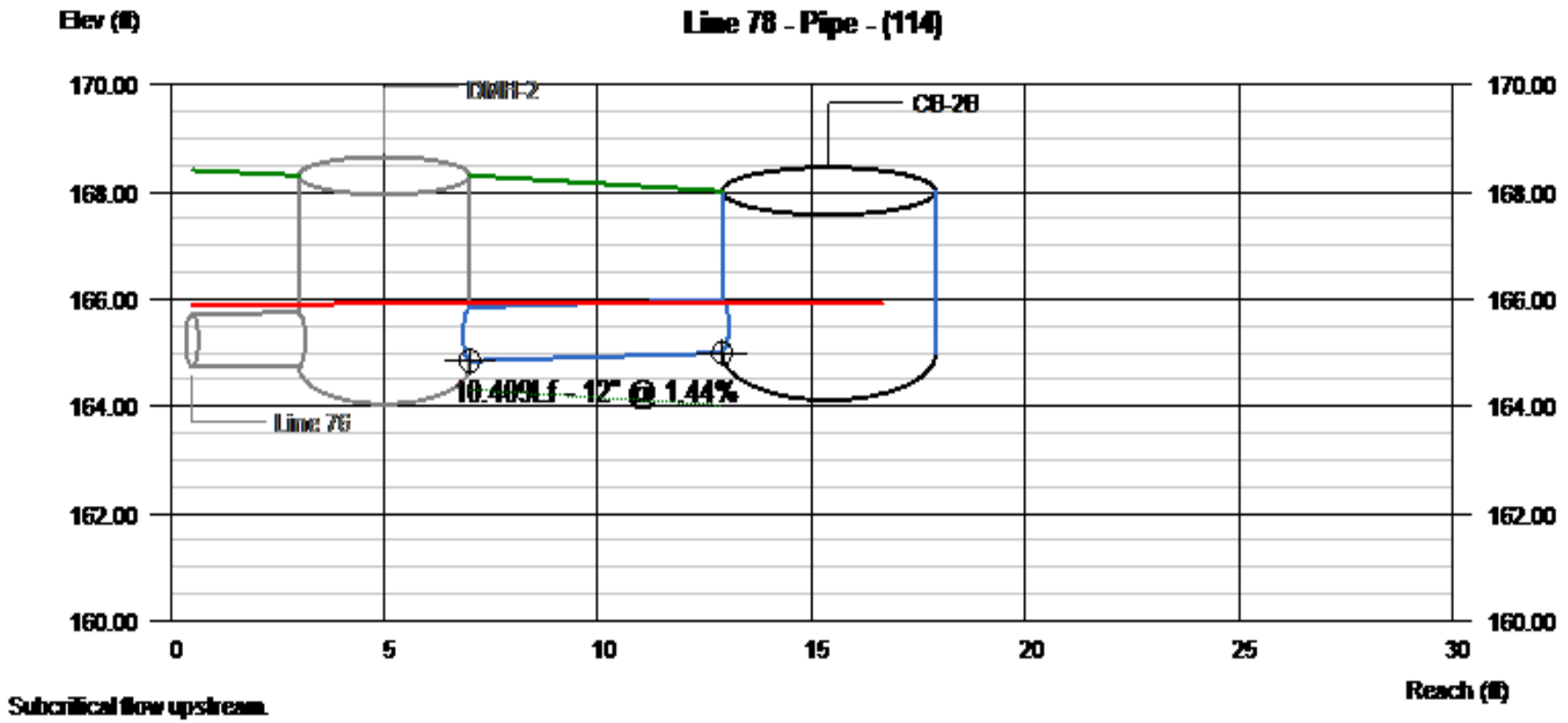

Elev (ft)
Line 74 - Pipe - (110)
DMH-4
DMH-3
177.00
173.00
169.00
165.00
161.00
157.00
0
5
10
15
20
25
30
35
40
28.731Lf - 12" @ 0.52%
Line: 75
Reach (ft)
Subcritical flow upstream.

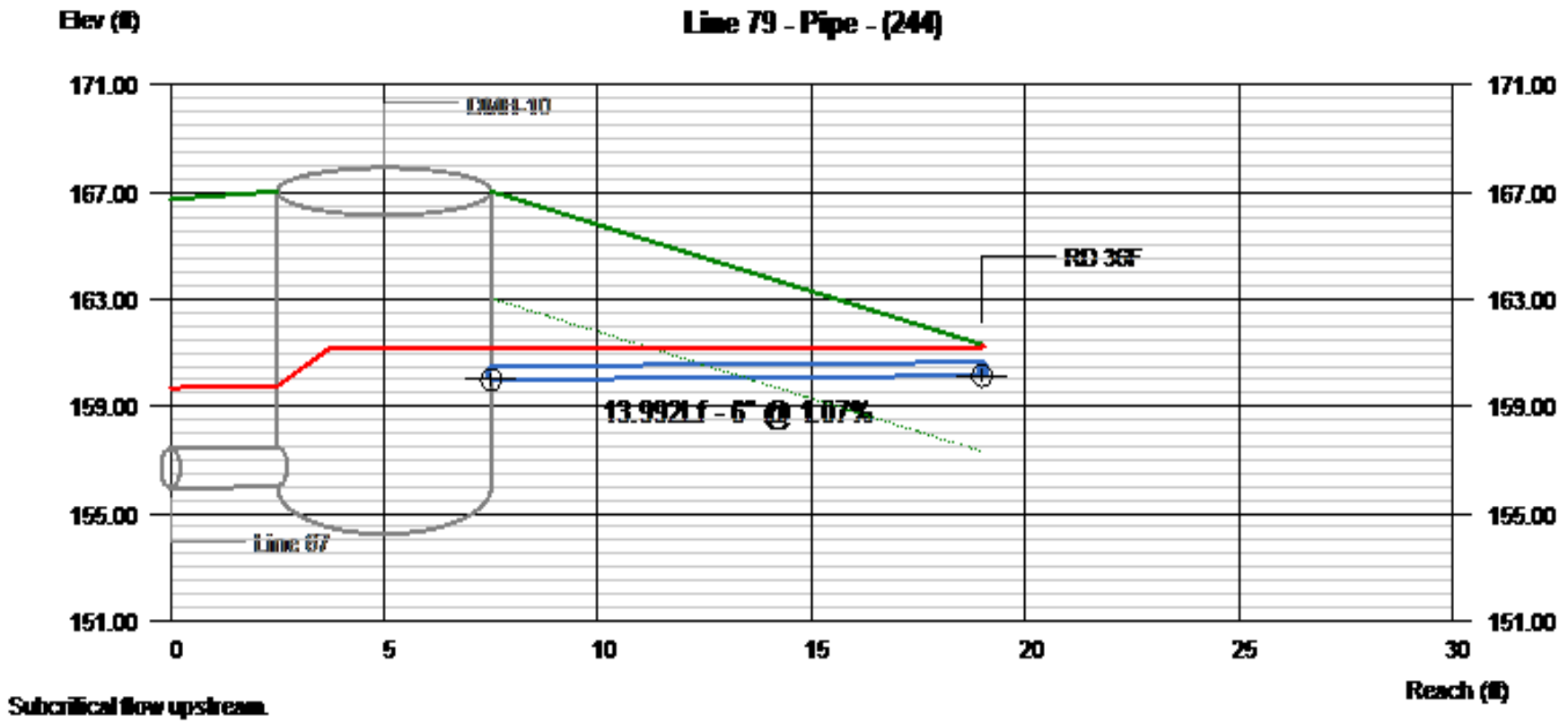

Elev (ft)
Line 75 - Pipe - (112)
178.00
174.00
170.00
166.00
162.00
158.00
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
CB-3A
86.77 ft - 12" @ 6.80%
Reach (ft)
Supercritical flow upstream.

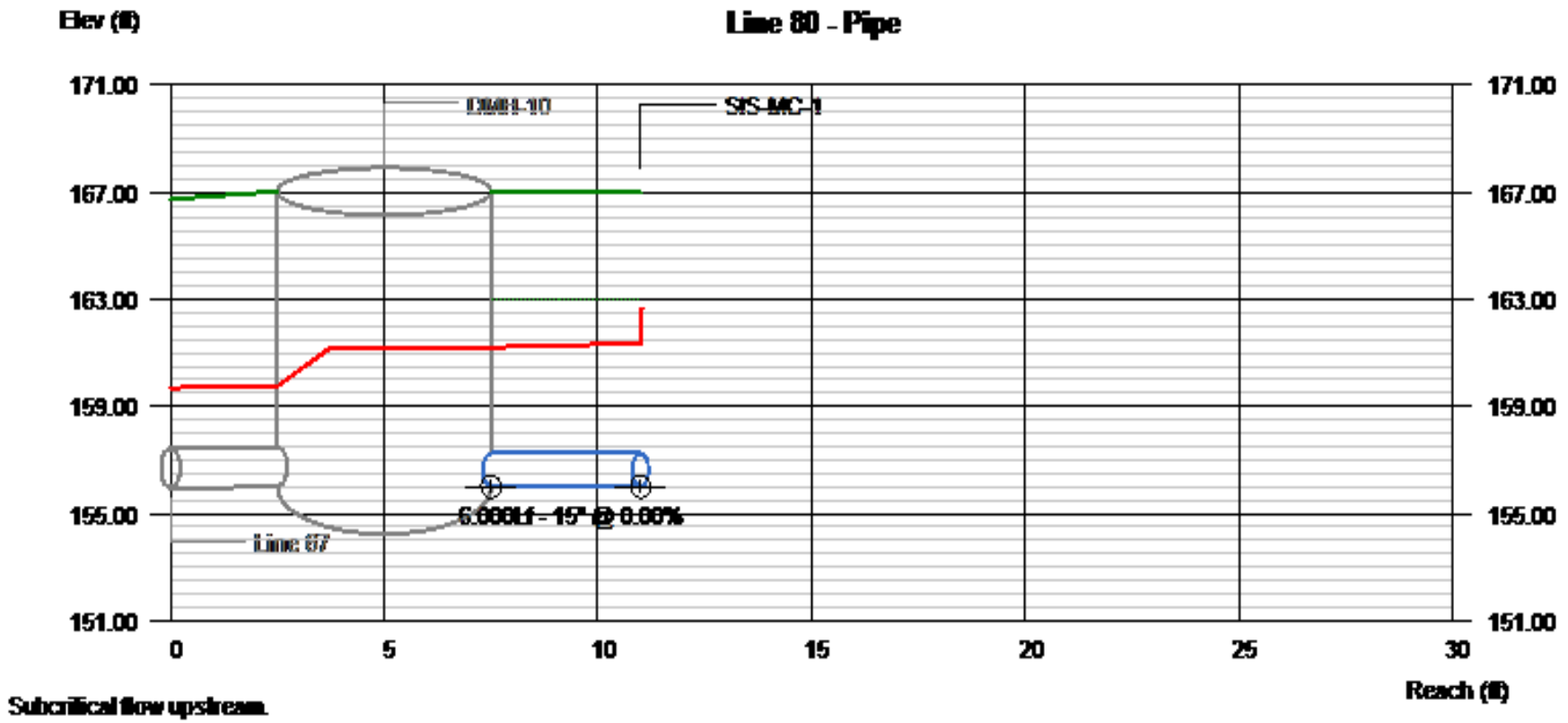

Elev (ft)
Line 76 - Pipe - (109)
178.00
174.00
170.00
166.00
162.00
158.00
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
Reach (ft)
Line: 77
154.272 ft - 12" @ 0.58%
Subcritical flow upstream.

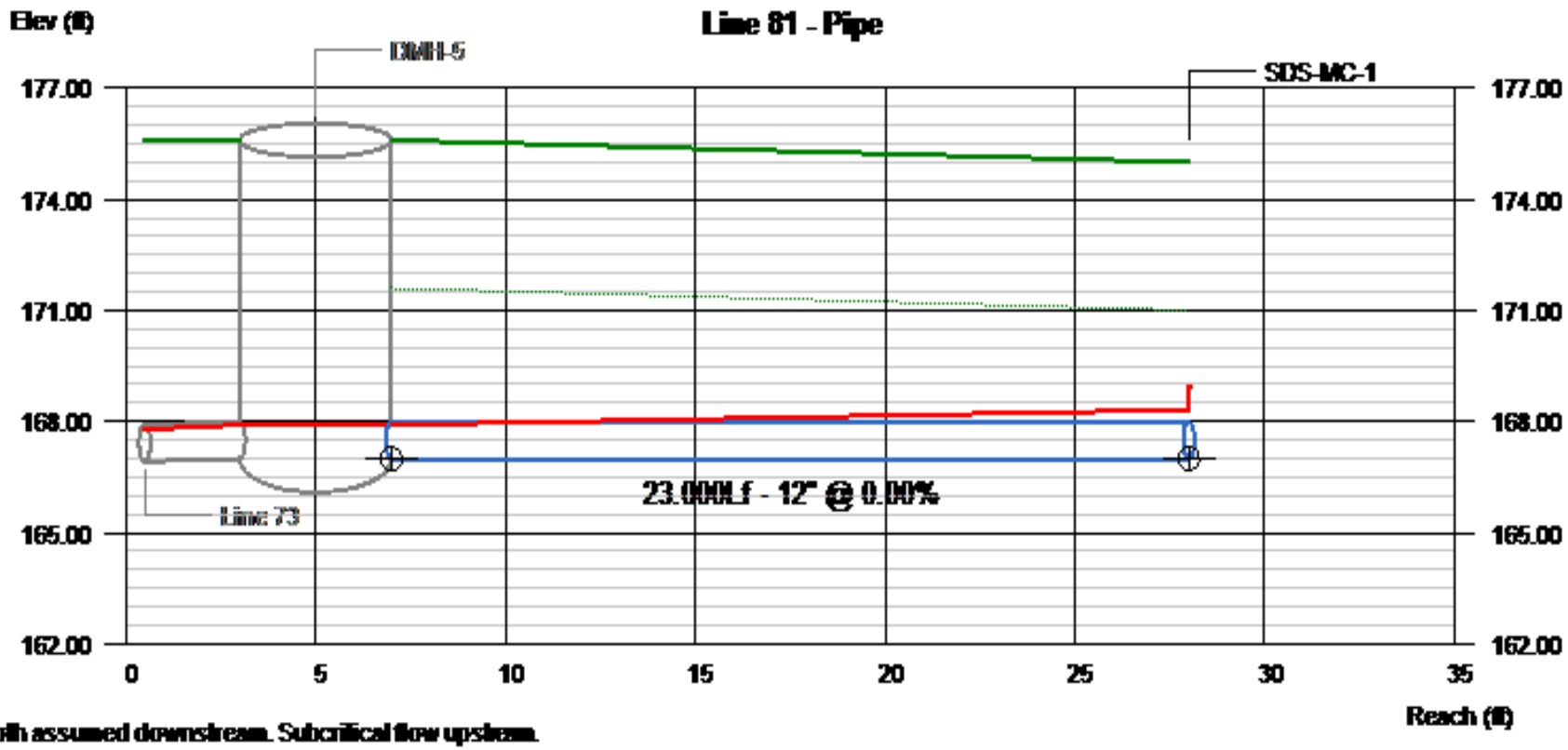


Subcritical flow upstream.

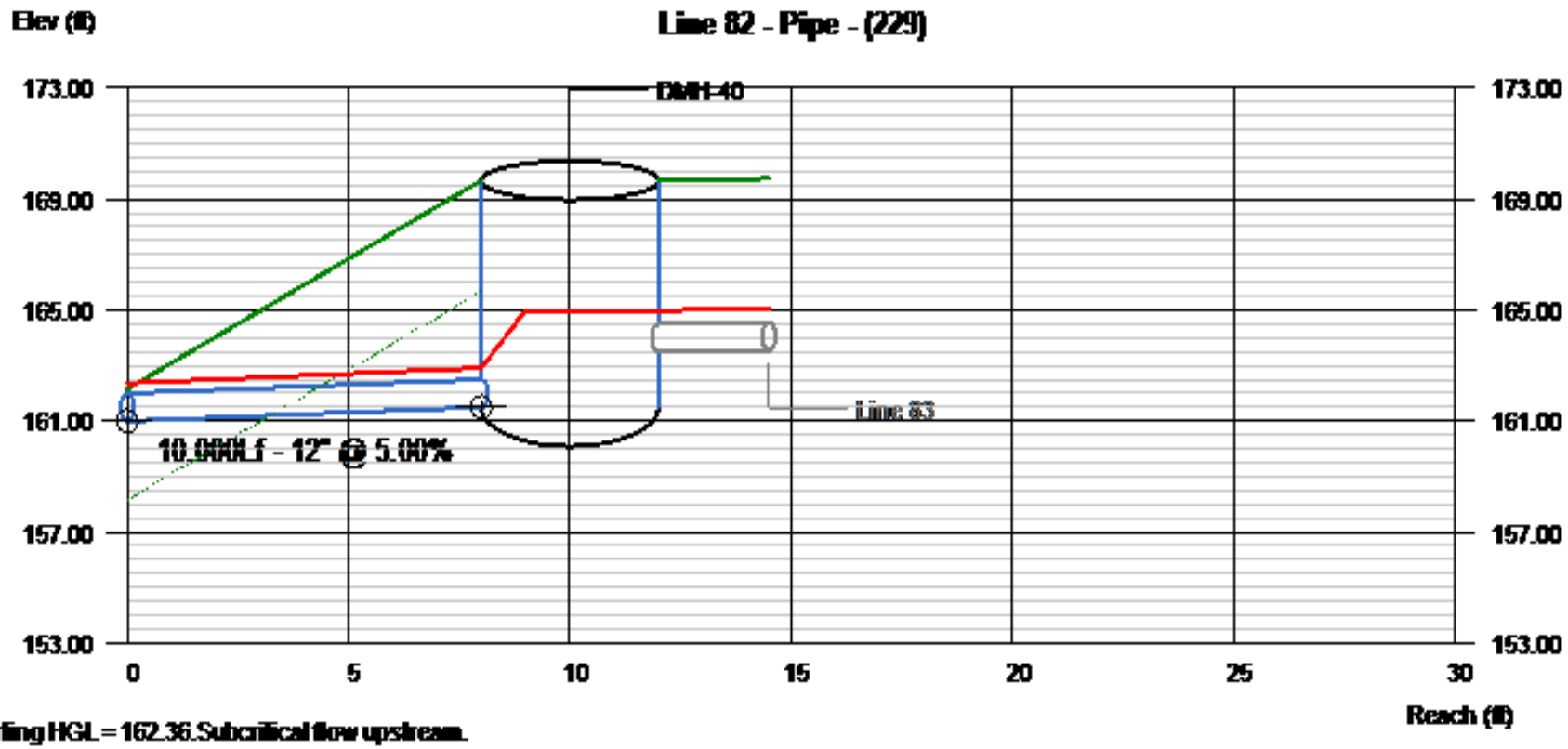

Elev (ft)
Line 78 - Pipe - (114)
170.00
168.00
166.00
164.00
162.00
160.00
DMH-2
CB-26
Line 76
10.40ft - 12" @ 1.44%
0
5
10
15
20
25
30
Reach (ft)
Subcritical flow upstream.


Elev (ft)
Line 79 - Pipe - (244)
171.00
167.00
163.00
159.00
155.00
151.00
0
5
10
15
20
25
30
Reach (ft)
RD 36F
13.992Lf - 6" @ 1.07%
Line 67
Subcritical flow upstream.

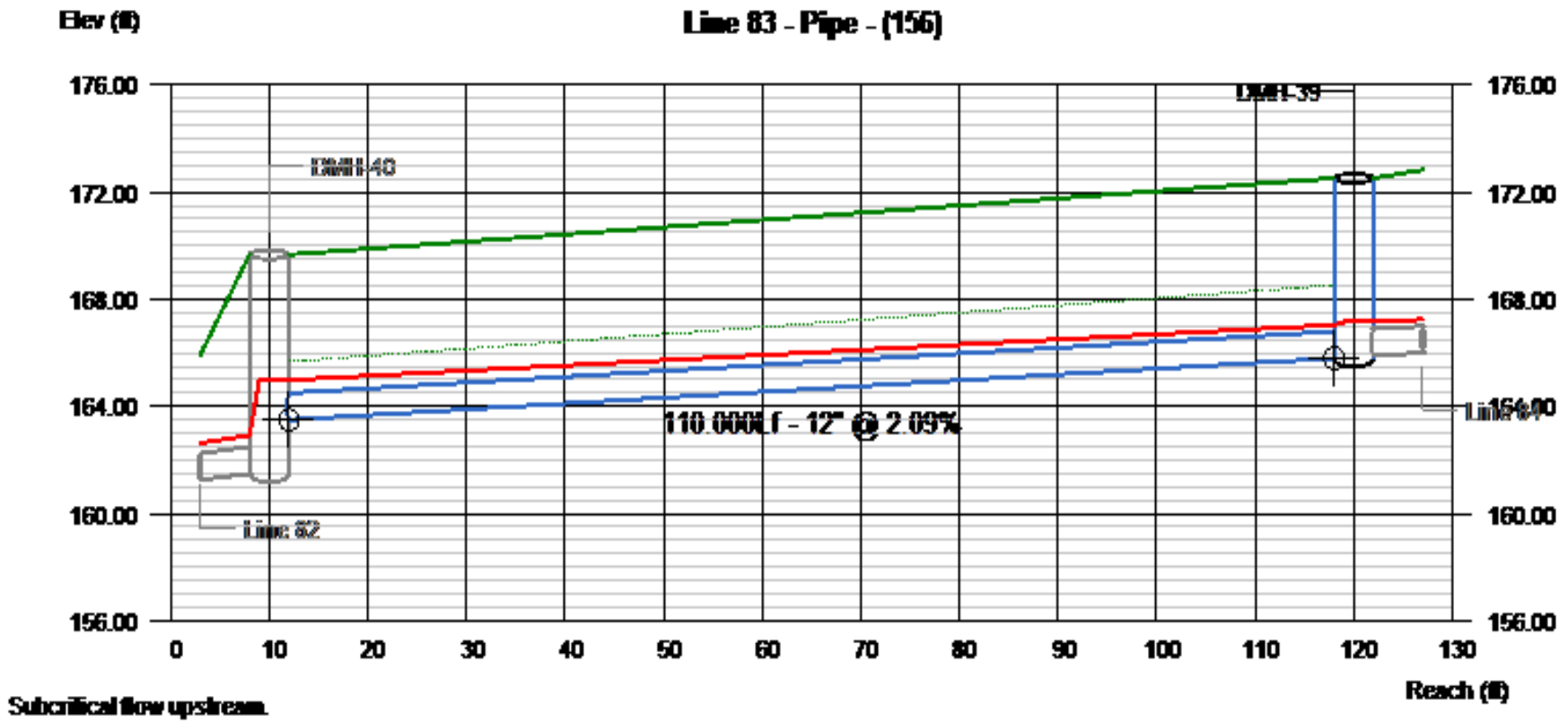

Elev (ft)
Line 80 - Pipe
171.00
167.00
163.00
159.00
155.00
151.00
0
5
10
15
20
25
30
Reach (ft)
SIS-MC-1
Line 67
Subcritical flow upstream.

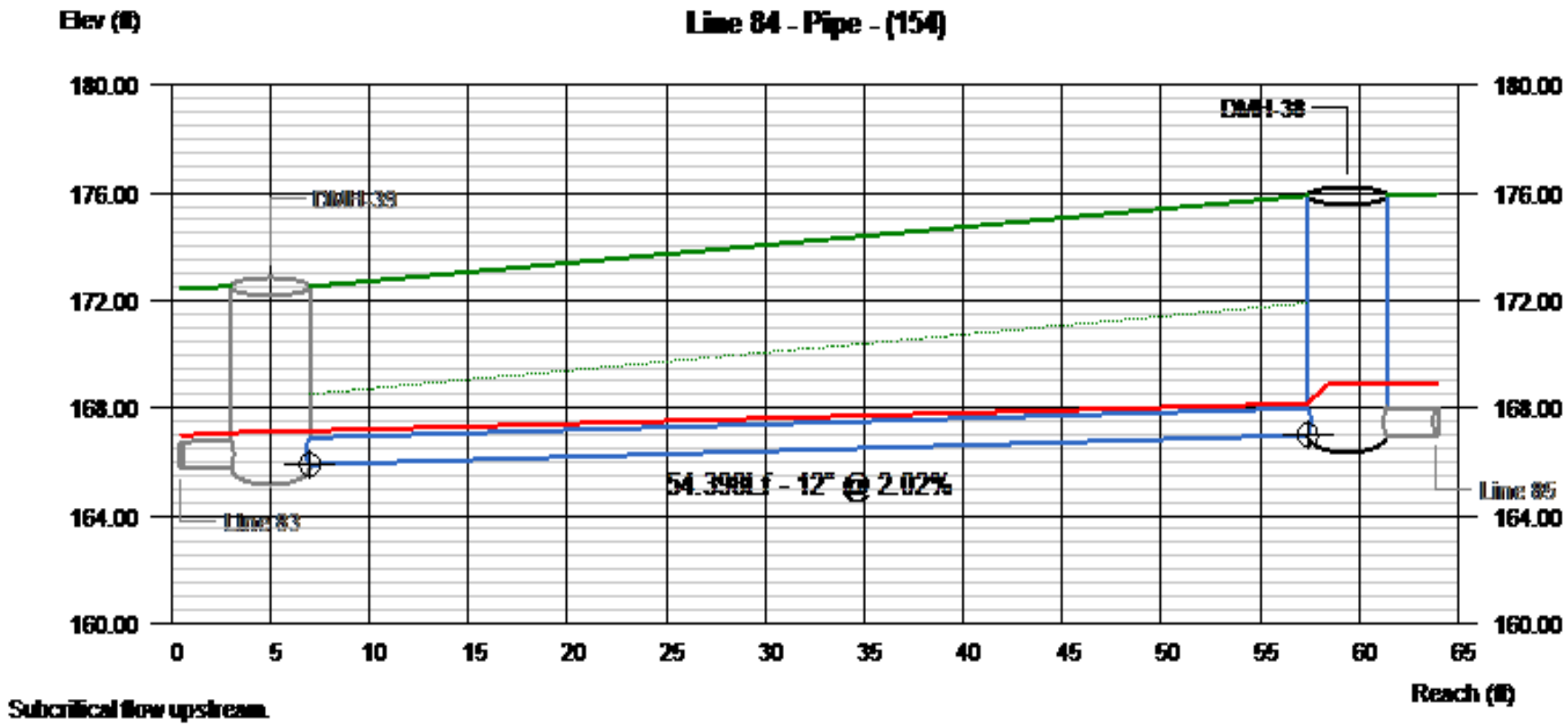


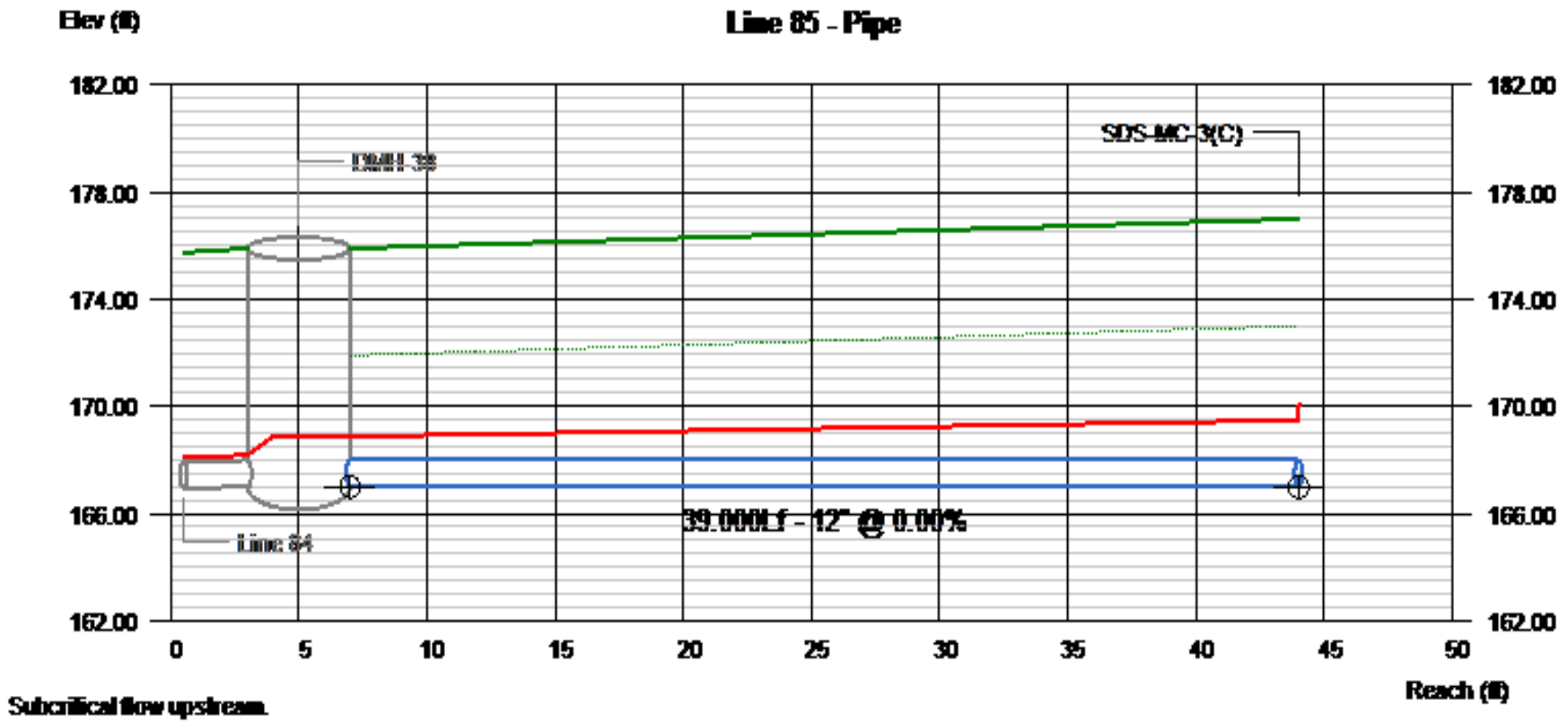
depth assumed downstream. Subcritical flow upstream.



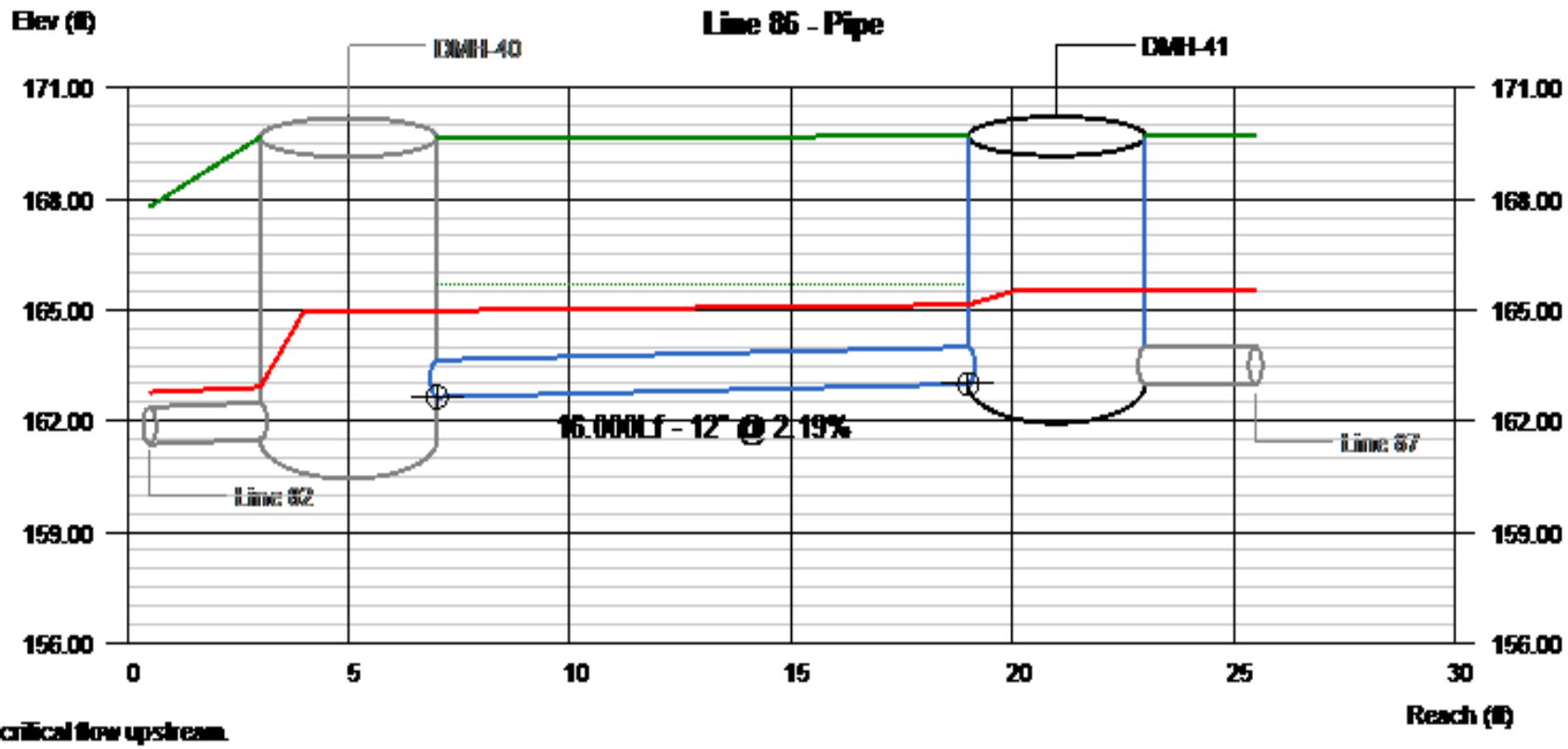
Starting HGL = 162.36. Subcritical flow upstream.

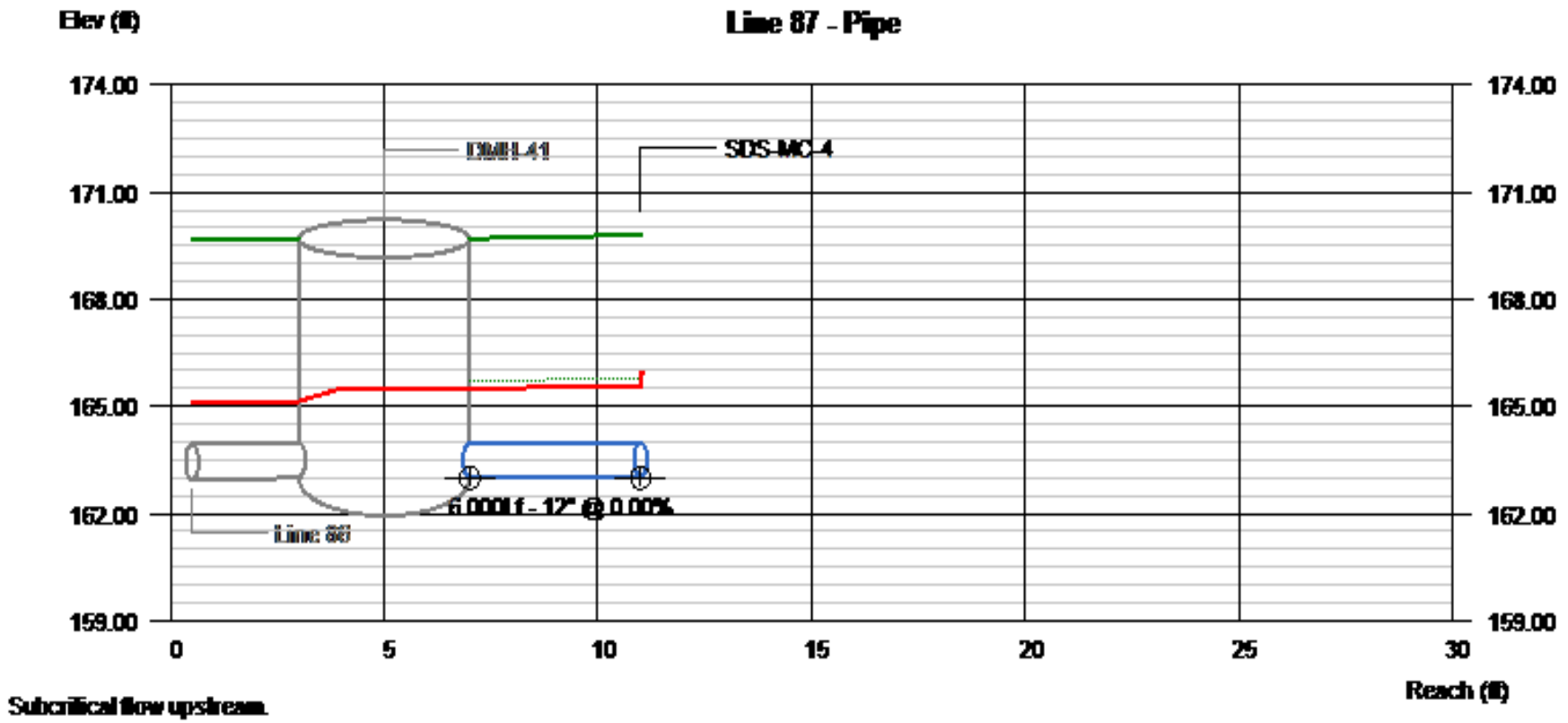

Elev (ft)
Line 83 - Pipe - (156)
176.00
172.00
168.00
164.00
160.00
156.00
0
10
20
30
40
50
60
70
80
90
100
110
120
130
Reach (ft)
Line: 82
110.000 ft - 12" @ 2.09%
Subcritical flow upstream.


Elev (ft)
Line 84 - Pipe - (154)
180.00
176.00
172.00
168.00
164.00
160.00
0
5
10
15
20
25
30
35
40
45
50
55
60
65
Reach (ft)
Line: 85
Subcritical flow upstream.

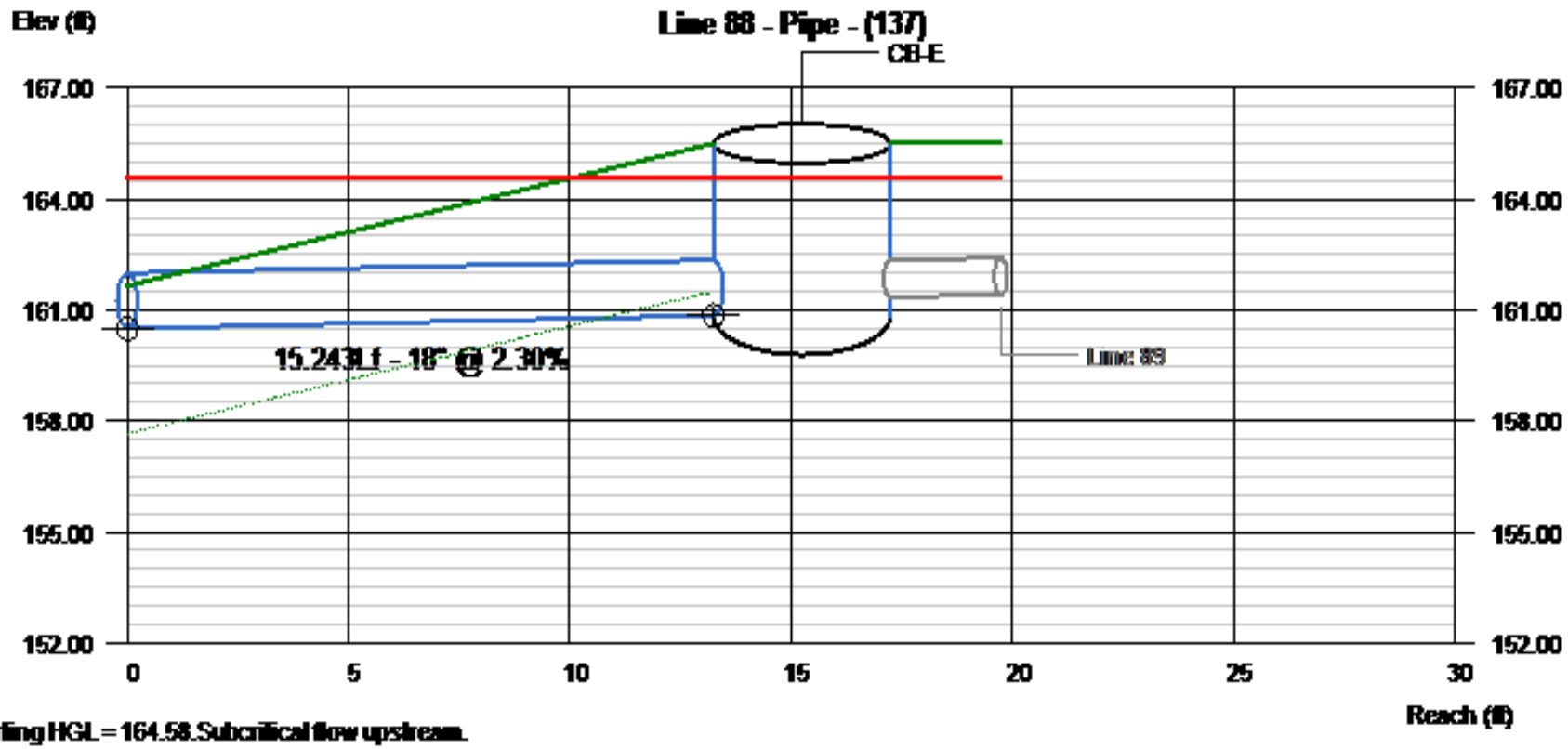


Subcritical flow upstream.

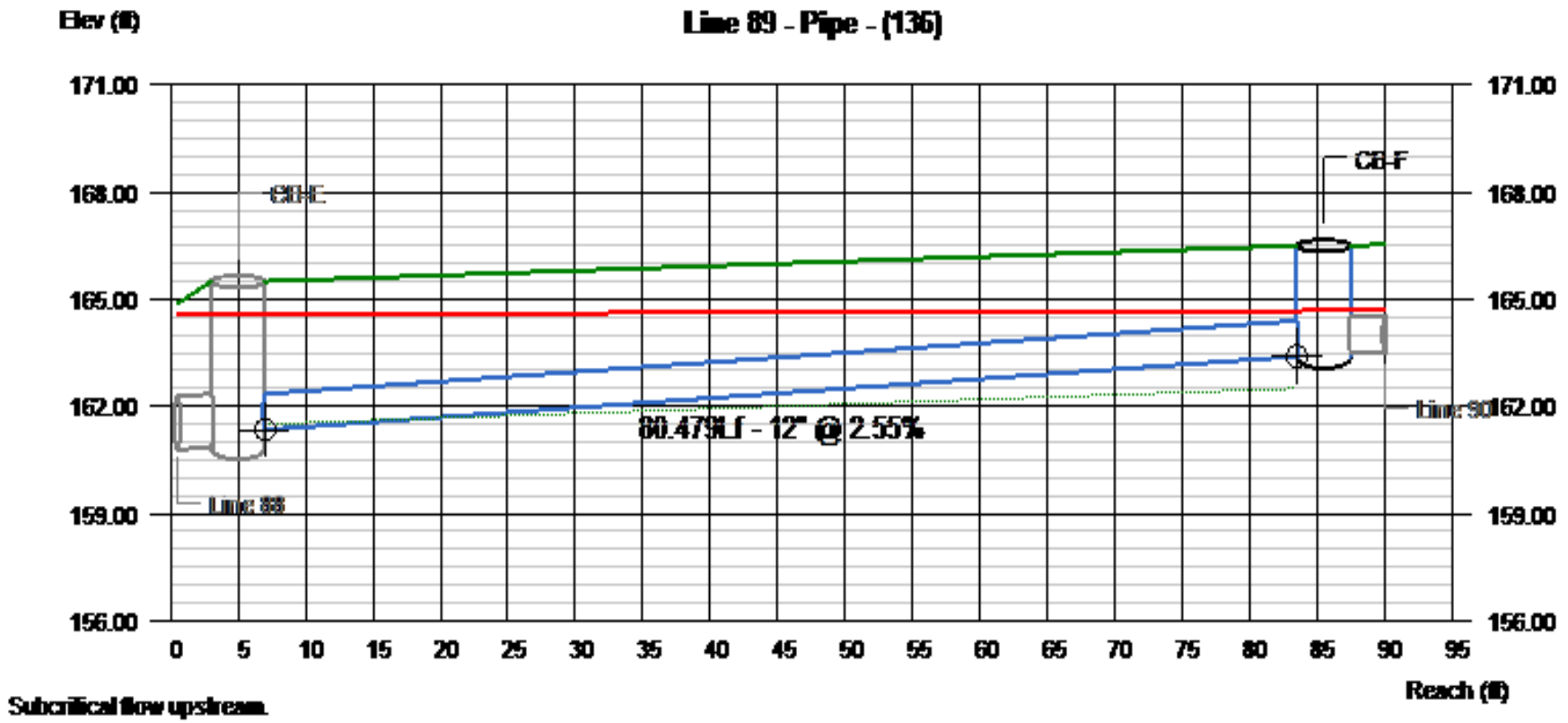

Line 86 - Pipe
Elev (ft)
DMH-40
DMH-41
171.00
168.00
165.00
162.00
159.00
156.00
16.000Lf - 12" @ 2.19%
Line: 87
Line: 82
0
5
10
15
20
25
30
Reach (ft)
Subcritical flow upstream.



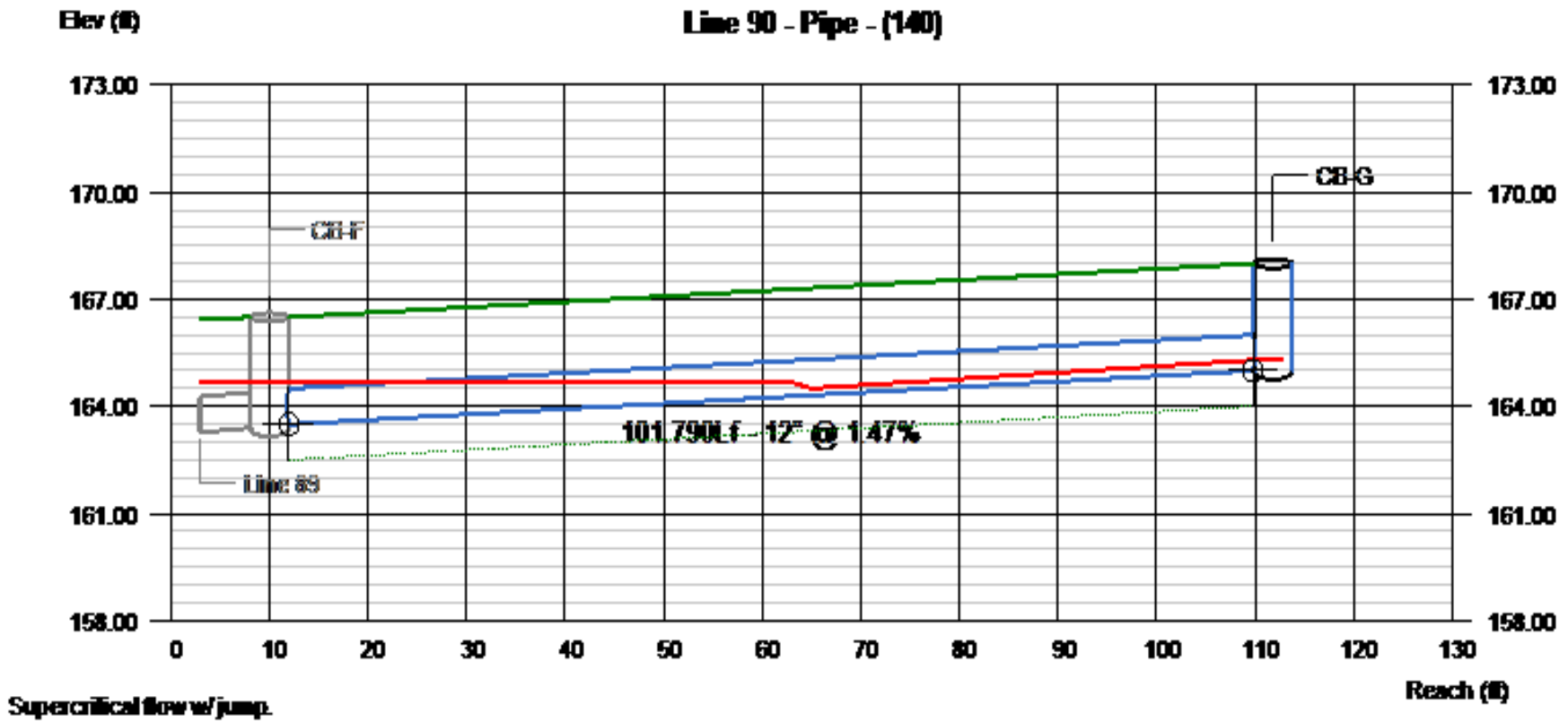
Subcritical flow upstream.

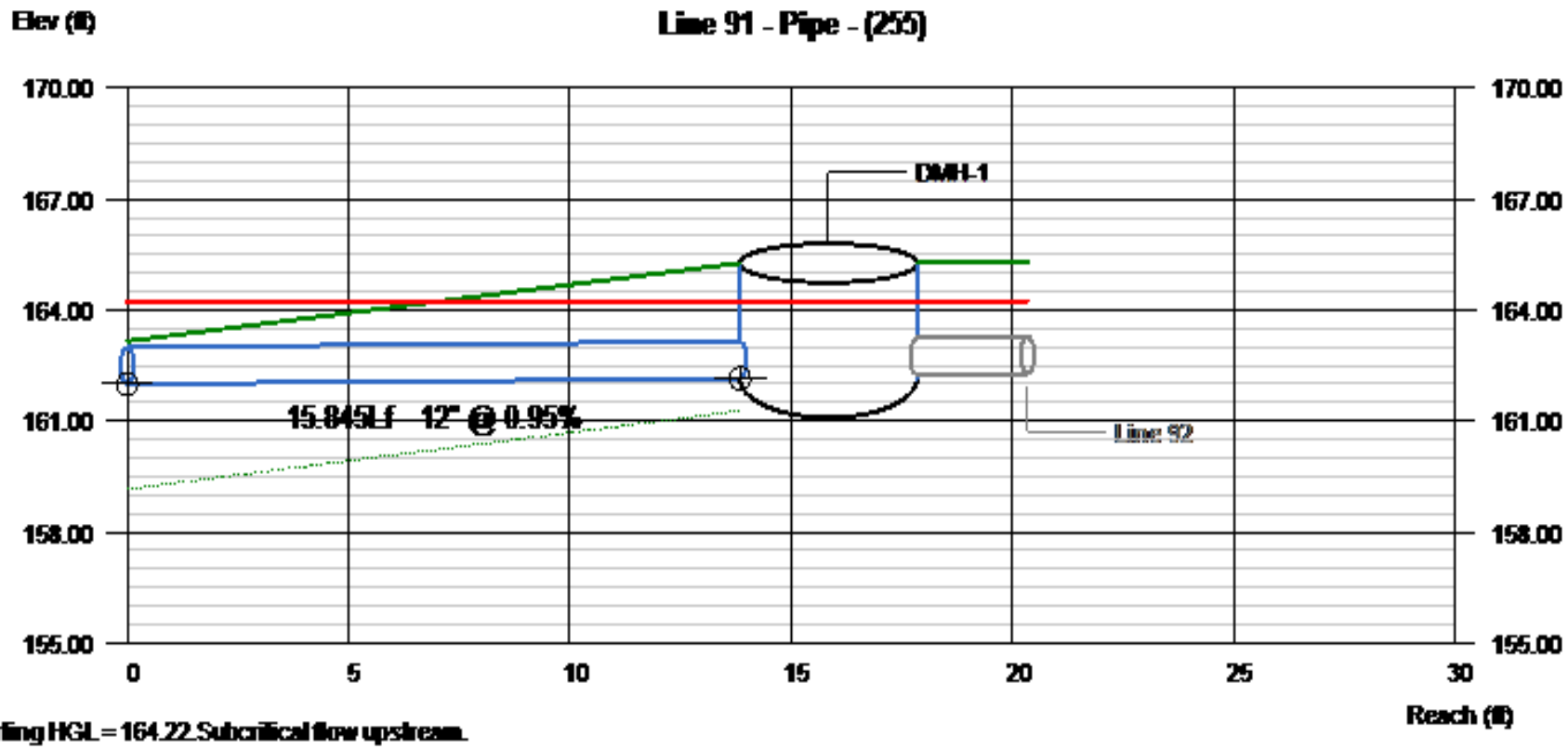


Starting HGL = 164.58. Subcritical flow upstream.

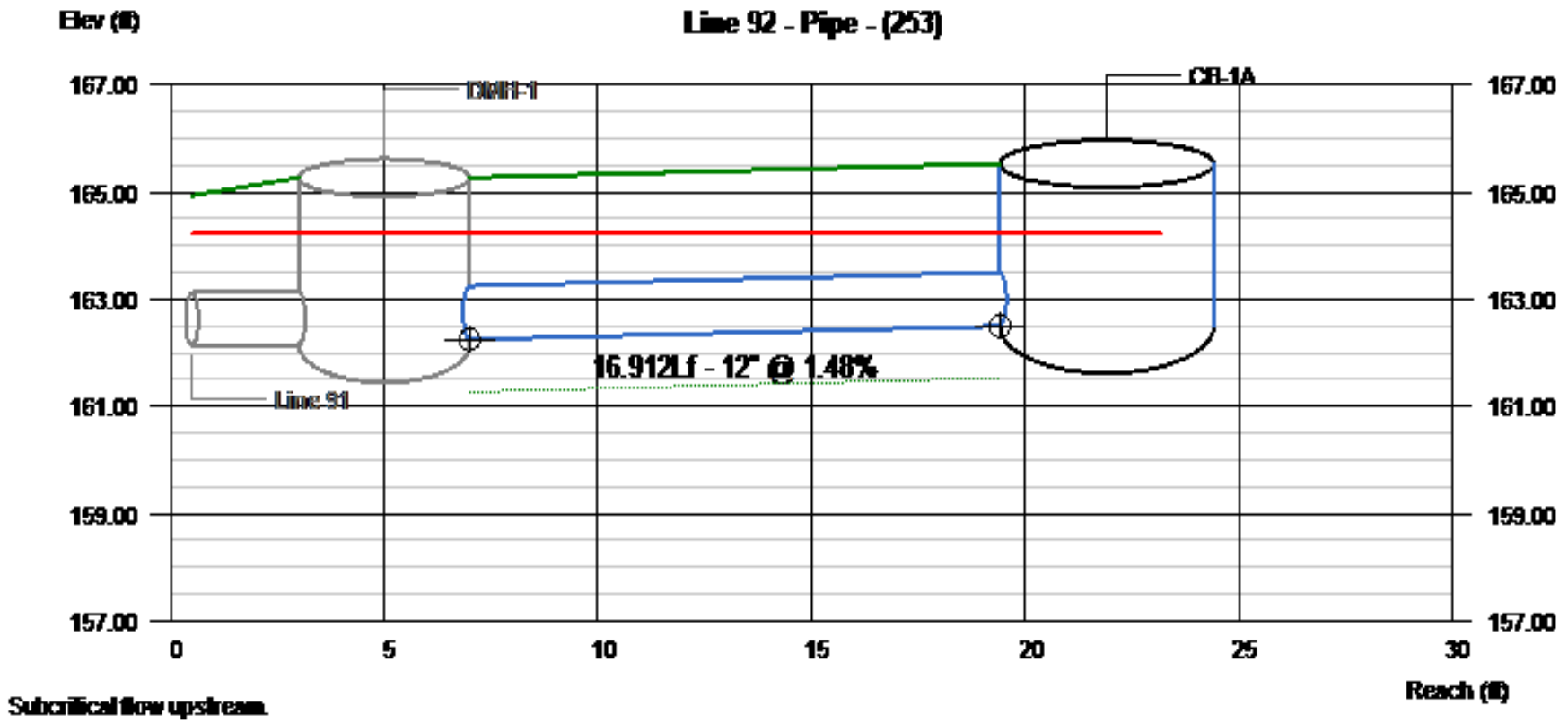


Subcritical flow upstream.

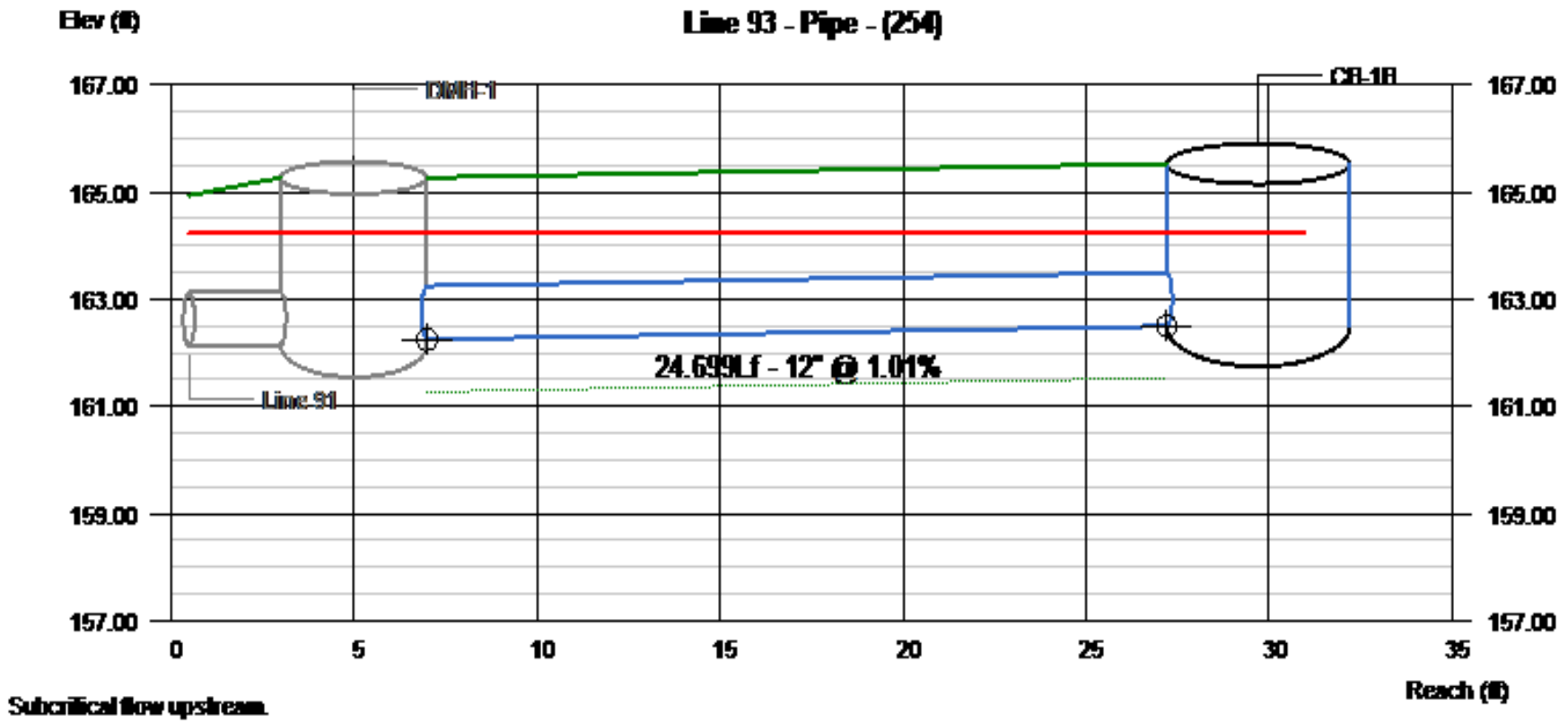

Elev (ft)
Line 90 - Pipe - (140)
173.00
170.00
167.00
164.00
161.00
158.00
0
10
20
30
40
50
60
70
80
90
100
110
120
130
Reach (ft)
CB-F
CB-G
101.790 ft - 12" @ 1.47%
Line: 89
Supercritical flow w/jump.

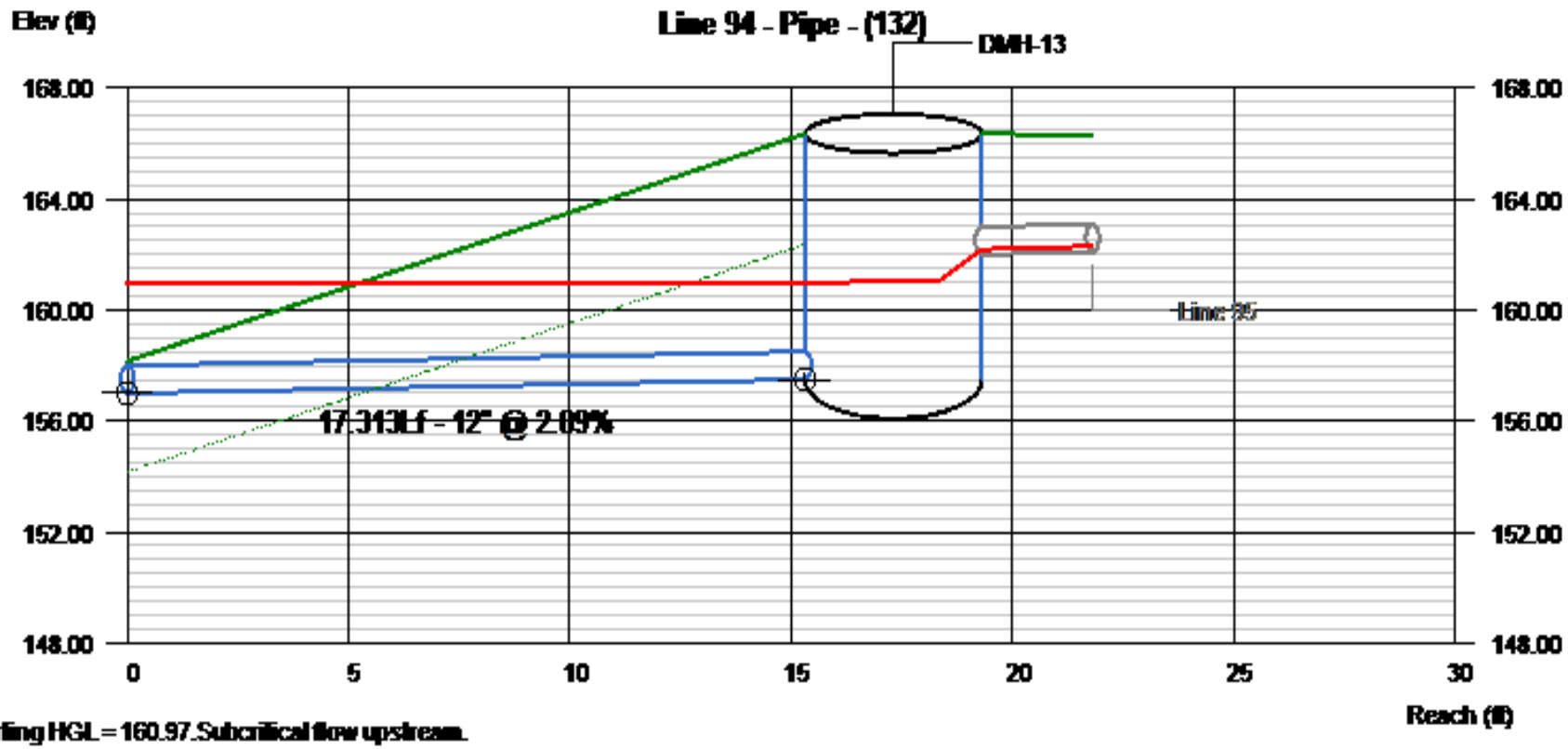


Starting HGL = 164.22 Subcritical flow upstream.

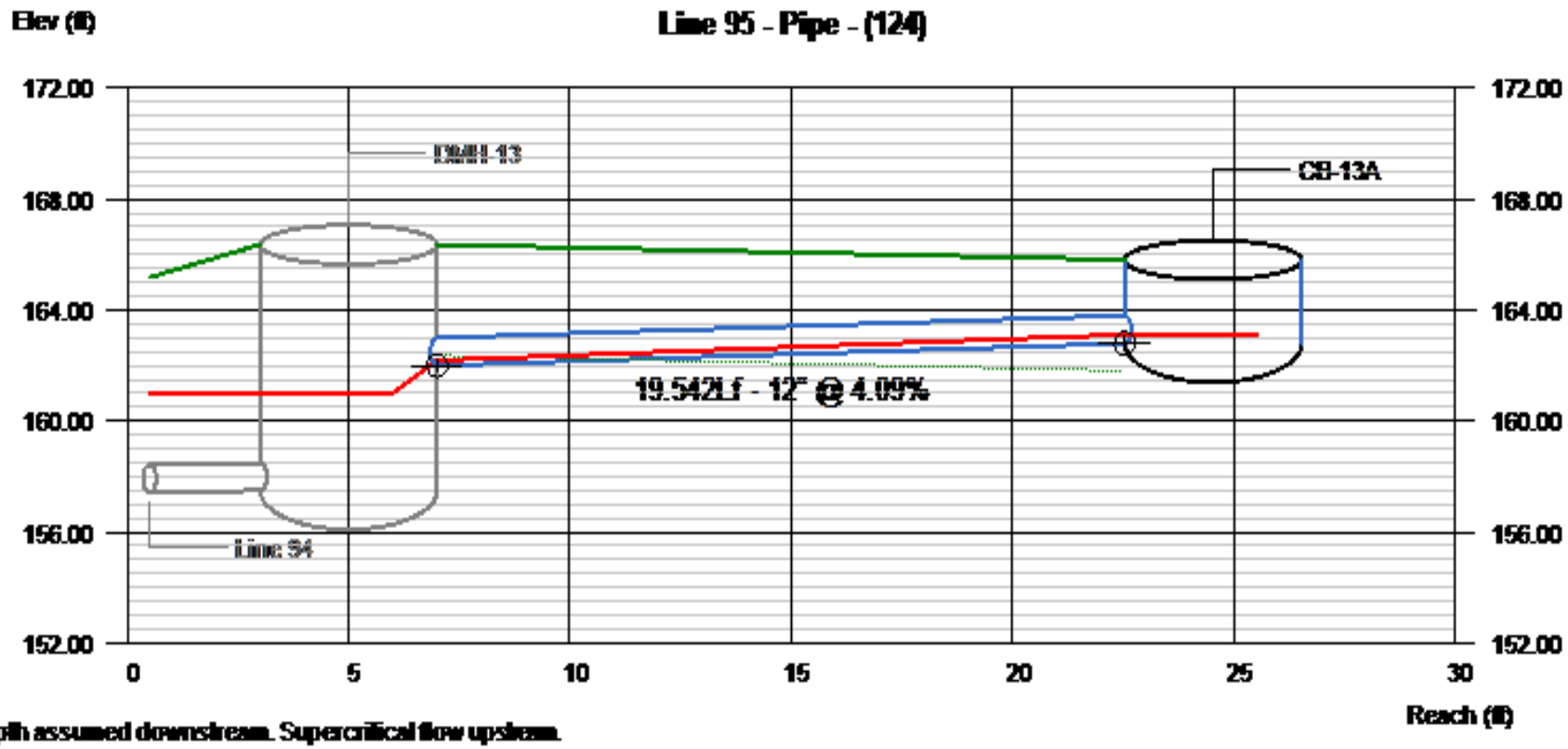


Subcritical flow upstream.

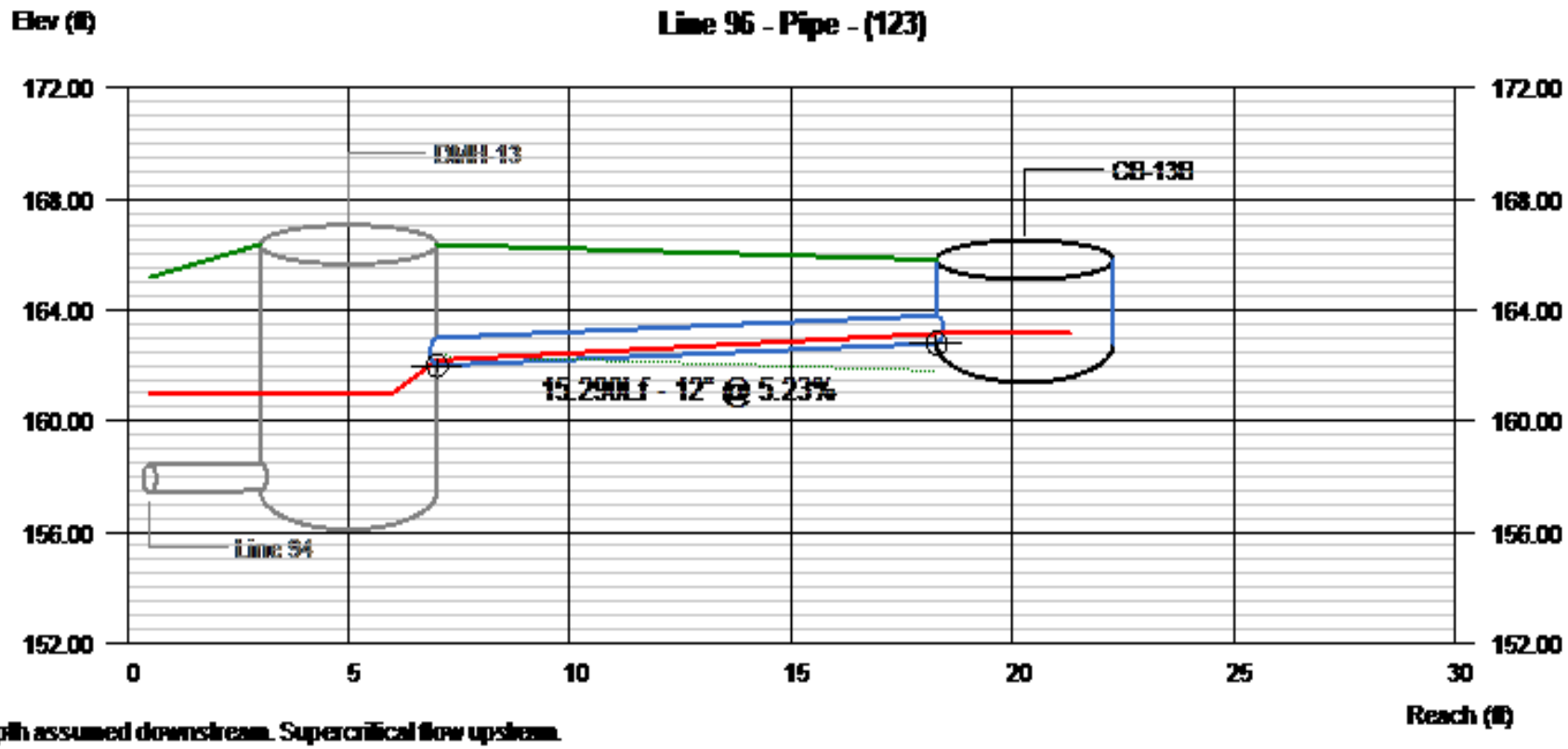

Elev (ft)
Line 93 - Pipe - (254)
167.00
165.00
163.00
161.00
159.00
157.00
DWH-1
CB-18
Line 91
24.699Lf - 12" @ 1.01%
0
5
10
15
20
25
30
35
Reach (ft)
Subcritical flow upstream.



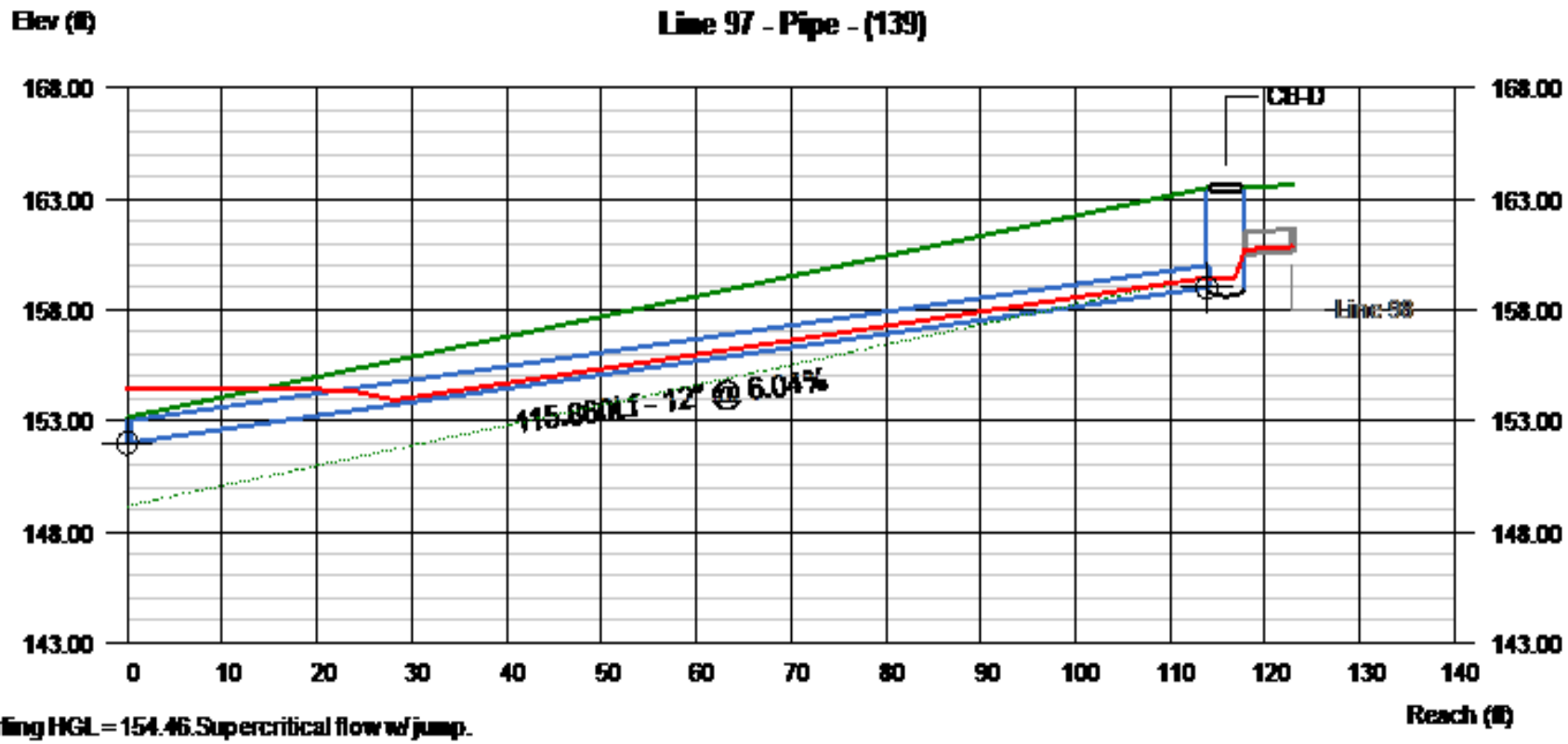
Starting HGL = 160.97. Subcritical flow upstream.



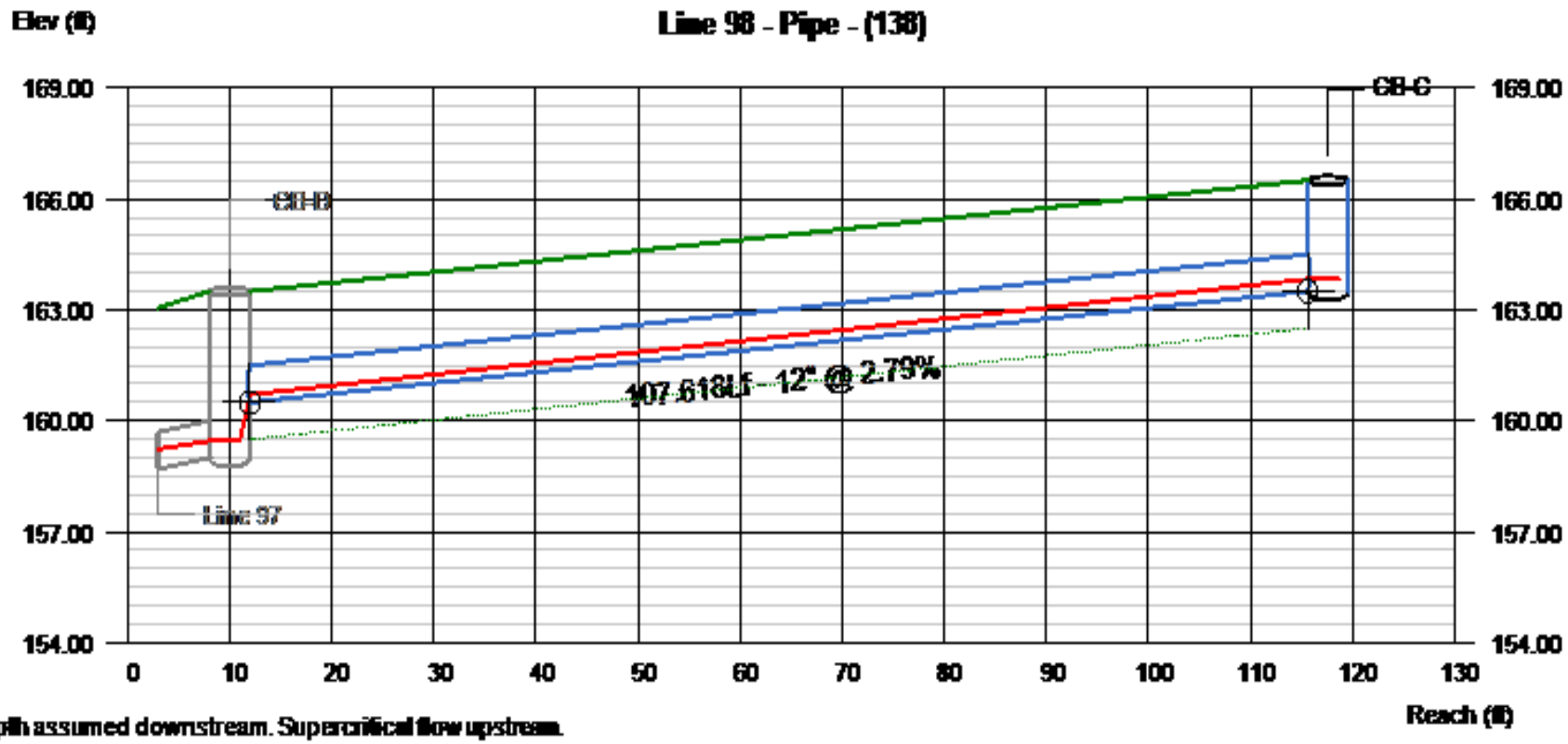
depth assumed downstream. Supercritical flow upstream.



depth assumed downstream. Supercritical flow upstream.



Starting HGL = 154.46. Supercritical flow w/ jump.



depth assumed downstream. Supercritical flow upstream.