



**HALLISEY, PEARSON & CASSIDY
Engineering Associates, Inc.**

630 Main Street
Cromwell, CT 06416-1444

TELEPHONE: (860) 529-6812
FAX: (860) 721-7709
Paul A. Hallisey, P.E. & L.S.
James P. Cassidy, P.E.

**Drainage Calculations
&
Stormwater Management Report**

Prepared for

The Bongiovanni Group, Inc.

For:

**Penny Lane Subdivision
#347, #349 & #389 Marion Avenue
Southington, Connecticut**

Date: August 11, 2022

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1. PROJECT OVERVIEW

The descriptions and computations included within this Engineering Report and Appendix are provided in support of the development of 347, 349 and 389 Marion Avenue, located along the northerly side of Marion Avenue and the easterly side of Pine Street in Southington, Connecticut. The current permit applications are for the approvals of a wetlands permit application from the Town of Southington Inland Wetlands Commission and a Subdivision application from the Town of Southington Planning & Zoning Commission.

The overall project will consist of the development of a new 12 lot subdivision on a new road called Penny Lane, which is proposed to intersect with Pine Street. An associated stormwater basin and drainage system is proposed to discharge on the north side of the property to the northern wetlands.

The overall site consists of 10.97 acres of R-20/25 zoned land with frontage along both Pine Street and Marion Avenue. The property is presently made up of mostly wooded area with some areas being lawn and overgrowth. The topography slopes to the norther side (the rear) of the property where there is a large wetland area. The property receives runoff from neighboring properties on all sides including the industrial property to the west. There is presently a culvert discharging to a swale towards the northern end of the property which receives the runoff from the industrial property which then flows to the wetlands to the north.

Water and sewer service is proposed to enter the property from the south using mains located in Marion Avenue. All other utilities such as electric, telephone and cable television will be provided by the existing services adjacent to the project site and shall be located underground. More detailed design information regarding the proposed utilities can be obtained from the site plans.

The storm water management system for this site has been designed utilizing Best Management Practices (BMPs) and Low Impact Development (LID) methods to improve the storm water quality and to attenuate the peak flows to prevent increases in the pre-development runoff rates to the northern wetlands. The overall storm water management system will use a Stormwater Quality Basin and underground infiltration basins to collect roof runoff, along with several other water quality measures.

The goal of the storm water management design is to provide removal of total suspended solids while attenuating the post development peak runoff rates. For more detailed information regarding storm water quantity, refer to Section 3 and Section 4 of this report. Refer to Section 5 for storm water quality management provided in the proposed design. Design computations and other relevant information are provided in the Appendix of this report.

2. EXISTING SITE CONDITIONS

The overall site consists of 10.97 acres of R-20/25 zoned property with frontage along both Pine Street and Marion Avenue. The property is presently made up of mostly wooded area with some areas being lawn and overgrowth. The topography slopes to the norther side (the rear) of the property where there is a large wetland area that has been delineated. The property receives runoff from neighboring properties on all sides including the industrial property to the west. There is presently a culvert discharging to a swale towards the northern end of the property which receives the runoff from the industrial property which then flows to the wetlands to the north.

A majority of the property is mapped as Penwood loamy sand with mixtures of Hartford sandy loam as well. This is classified as a well-drained soil of Hydrologic Soil Group A. The site has been disturbed and is partially mapped as Udorthents (308) (i.e. disturbed soils). Soil types in the watershed were determined from the available NRSC GIS (Geographic Information System) web-based mapping.

In addition, this property is not located within 100-year floodplain boundaries as delineated on the current Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM). A portion of this map has been included in the Appendix A of this report.

3. STORMWATER MANAGEMENT DESIGN

The proposed storm water management system has been designed utilizing BMPs design principles to safely convey storm water runoff from the site while providing storm water quality measures. Stormwater management for the proposed project was achieved by collecting stormwater from the development area of the site through a series of catch basins and conveying it to the Stormwater Quality Basin, which has been designed to attenuate the proposed peak flow rates in order to prevent increases in the existing peak flow rates from this project. In addition, the collection system will incorporate several storm water quality measures designed to provide storm water treatment before discharging from the proposed project site. More information regarding water quantity (hydrology) can be found in Section 4. Stormwater quality management is discussed further in Section 5.

The computer program entitled "Stormwater Studio, ver. 3.0" by Hydrology Studio, was used for designing the proposed storm drainage. Storm drainage computations performed include pipe capacity calculations, hydraulic grade line calculations, and gutter flow (inlet capacity) computations. The overall watershed was divided into sub-basins to determine the drainage area and land coverage to each individual catch basin inlet. These values were used to determine the storm water runoff to each inlet using the Rational Method. The rainfall intensities utilized in the storm drainage computations were obtained from the web based NOAA's National Weather Service Hydrometeorological Design Studies Center Precipitation Frequency Data Server (PFDS) NOAA Atlas 14, Vol 10, Ver. 2 for 389 Marion Avenue, Southington.

The proposed storm drainage systems were designed according to sound engineering practices to provide adequate pipe capacity to convey the 25-year storm event. In addition, the storm drainage design analysis includes a complete hydraulic grade line computation, which ensures adequate capacity for the 25-year storm event. A gutter flow analysis was performed on the storm drainage system as well to ensure adequate spacing and inlet capacity for the 25-year storm event. In addition, the outlet pipe from the proposed outlet control structure of the detention basin was sized with adequate capacity to convey the 100-year storm event. All storm drainage computations described in this section are provided in the Appendix of this report.

The use of a riprap energy dissipator was utilized at the discharge point from the Stormwater Quality Basins as well. The purpose of the energy dissipator is to prevent erosion of the soils at the outlet of this system. The energy dissipator has been designed with adequate overflow discharge capacity to meet the 100-year peak flow rate from the proposed stormwater quality basin.

4. HYDROLOGY ANALYSIS

The storm water management system has been designed in part to attenuate the proposed peak rates of runoff from the project site. In order to analyze the predevelopment and post development peak flow rates from this site, the drainage area to the point where it discharges to the northern wetlands was analyzed for this report. This subarea is referred to as SA-A which has a total area of approximately 18 acres. This subarea, shown on a watershed map for both pre and post conditions, is included in the appendix H of this report.

The principal method of predicting the surface water runoff rates utilized in this analysis is a computer program entitled "Hydrology Studio V. 3.0". The "Hydrology Studio" computer modeling program utilizes the same methods for computing runoff rates that were originally developed by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS, formerly known as the Soil Conservation Service or SCS), also utilized in the TR-20 computer modeling program and others. The "Hydrology Studio" computer program forecasts the rate of surface water runoff and river flow rates based upon several factors. The input data includes information on land use, hydrologic soil type, and vegetation conditions, contributing watershed area, time of concentration, rainfall data, storage volumes, and the hydraulic capacity of structures. The computer model predicts the amount of runoff as a function of time, including the attenuation affect due to flow restriction at roadway culverts, ponds, large wetlands, and floodplains. Runoff rates during specific rainstorms may vary due to different assumptions concerning soil moisture, water levels in ponds, snowmelt, and rainfall patterns. The input data for rainfalls with statistical recurrence frequencies of 2, 10, 25, 50, and 100 years were obtained from the NOAA's National Weather Service Hydrometeorological Design Studies Center Precipitation Frequency Data Server (PFDS) NOAA Atlas 14, Vol 10, Ver. 2 for 389 Marion Avenue, Southington analysis a Type III rainfall pattern with 24-hour duration was used.

The land use for the site under pre and post conditions was determined from field survey, the proposed site development plans for the on-site drainage areas and Town of Southington GIS mapping for the overall drainage subareas. Land use types used in the analysis included paved areas, grass area, industrial area, ¼, ½, and 1 acre residential, and wooded areas. Soil types in the watershed were determined from the available GIS (Geographic Information System) database of the NRCS soil survey for Southington, CT. The study area was determined to contain hydrologic soil type D as classified by the NRCS and as shown on attached mapping in Appendix A of this report.

The pre-conditions were modeled with the Hydrographs computer program to determine the flow rates for the various storm events at the analysis point. A revised model was developed incorporating the post site conditions, and flows obtained with the revised model were then compared to the results of the existing conditions model. The stormwater quality basins were incorporated into the proposed model, which illustrated the attenuation capabilities of this structure.

The NRCS Reservoir routing subroutine utilized within the Hydro Studio computer program was used to design the detention basin storage and outlet control requirements. All Hydrographs input computations and model results are included in the Appendix F (for pre-development conditions) and Appendix G (for post development conditions) of this report.

The analysis point, as shown on the existing and proposed conditions watershed maps, was used to determine the peak flow rates. This analysis point was chosen based on the fact that it receives some storm water runoff from a portion of the project site in both pre and post conditions. Therefore, the pre and post hydrology analysis of this area provides a comparison of the peak flow rates that ultimately provided guidance when designing the storm water management system.

Stormwater management for the project was achieved by routing the storm water runoff from the developed subareas of the site through the proposed stormwater quality basin. The stormwater discharge rates were attenuated by using an outlet control structure for the outlet of each Stormwater Quality Basin. This outlet will use a precast concrete structure with a 60 deg. "V" notch weir formed into the face of it. These outlet structures will also have an overflow grate above the top of the weir. The proposed basin has been designed to provide approximately one foot of freeboard during the 100-year storm event. The basin has been designed to hold up to a 25-year storm even without any outlet flow. This has been done to promote infiltration and groundwater recharge to improve the overall stormwater quality of the project. To improve stormwater quality and promote groundwater recharge, we are proposing an underground infiltrations system for each property to collect roof runoff from each of the proposed houses. These have been sized to accommodate a 100-year storm. Since the roof areas will be going to the underground infiltration systems, these roof areas have been subtracted from the overall drainage area going to the stormwater quality basin. The following is the Stormwater Wetland / Pond routing results and the peak flows to the design point:

Stormwater Quality Basin Routing Information for SWQB

Storm Frequency	1	2	5	10	25	50	100
Peak Inflow (c.f.s.)	0.142	0.854	3.649	7.245	13.44	18.96	24.93
Peak Outflow (c.f.s.)	0.000	0.000	0.000	0.000	0.298	1.725	5.700
Max. Water Surface El.	192.03	192.11	192.64	193.64	195.02	195.56	196.00
Max. Storage Vol. (cu.f.)	373	1,268	7,326	18,726	37,602	45,435	51,777

The is the sum result and the peak flows to the design point #1:

Peak Flow at Design Point "1" (Sum of flow to northern wetlands)

Storm Frequency (years)	Peak Flow Rates (cfs)*						
	1	2	5	10	25	50	100
Pre Development Conditions	2.811	4.167	7.585	12.43	20.83	28.24	36.15
<i>Post Development Conditions</i>	<i>2.811</i>	<i>4.162</i>	<i>6.510</i>	<i>8.542</i>	<i>11.37</i>	<i>13.59</i>	<i>15.90</i>

*cfs = cubic feet per second

For more detailed information of these routings, see Appendix H "Hydroflow Hydrograph™ Computer Model Report-Post-Development" in this report. For more detail information of these routings, see Appendix H "Hydroflow Hydrograph™ Computer Model Report-Post-Development" in this report.

The summary of results above shows there are no increases for a 1, 2, 5, 10, 25, 50 & 100 year storm event. Rather, a slight decrease in flow rate for these storm events can be anticipated due to the storm water management system and the detention provided promoting groundwater recharge.

5. WATER QUALITY MANAGEMENT

Several water quality measures or BMPs are incorporated into the storm water management design to maintain water quality. All of the best management control measures described in this section will help maintain the water quality of the storm water runoff from the proposed development.

Storm water runoff from the proposed site will be collected by a subsurface pipe and catch basin drainage system. The drainage system will include catch basins with two-foot sumps with hooded outlet, which trap coarse sediments. The two-foot sumps and hooded outlets utilized in the storm drainage design will increase the system's ability to remove suspended solids and trap floatable debris before discharging to the Stormwater Quality Basin.

The stormwater management system also incorporates the use of a Stormwater Quality Basin in accordance with the Connecticut Department of Environmental Protection's (CT DEEP) Stormwater Quality Manual (SWQM), Chapter 11, Pages 11-P1-1 to 11-P1-15 (for Stormwater Ponds). This Stormwater Quality Basin was designed to treat 100% of the Water Quality Volume (WQV). This will enhance water quality by providing additional storage volume or detention volume within the basin creating a water quality feature. Although the majority of the volume provided in the pond is for flow attenuation purposes, the bottom portion of the pond has been shaped to provide retention volume. Providing this water quality measure serves several purposes including storm water renovation, first flush retention, and creates a new wetlands habitat. A more detailed explanation of each of these measures follows.

The Stormwater Quality Manual (Chapter 7) also recommends methods for sizing storm water treatment measures with the Water Quality Volume (WQV) and computations. The WQV addresses the initial storm water runoff, also commonly referred to as the "first flush" runoff. The WQV provides adequate volume to store the initial one inch of runoff, which tends to contain the highest concentrations of potential pollutants. Supporting calculations for the volume provided, as well as WQV computations, have been included in the Appendix of this report.

There will be a sediment forebay constructed at the outlet of the drainage system into this Stormwater Wetland/Pond. These sediment forebays will improve water quality by trapping floatables, as well as filtering coarse sediment and other pollutants. AS per the recommendation of the DEP SWQM, these forebays were designed to treat a minimum of 25% of the WQV. The forebays will be constructed using a riprap filter berm and a riprap splash pad. Riprap splash pads (Energy Dissipaters) dissipate the potential erosive velocity of storm water entering the basin, as well as trap sediment, while the riprap filter berm will contain the sediment within a small area in the basin allowing easy maintenance.

The Stormwater Basin will be constructed as a dry bottom basin and will be maintained as a mowed grass area. The underlying soils have a high infiltration rate, so the stormwater quality volume will be allowed to infiltrate back into the ground. This will provide enhanced treatment and attenuation of stormwater flows. The (WQV) treatment of this feature will provide approximately 1.5 foot of additional depth below the lowest outlet providing moisture to support the proposed vegetation. The vegetation will provide pollutant removal by filtering

storm water runoff and will utilize excess nutrients that may be present in the storm water. The Stormwater runoff above the (WQV) from this basin will be discharged through concrete outlet structure with a V-notch weir in it to attenuate the flow rate out and as further described in section 4 of this report.

The vegetation will provide pollutant removal by filtering storm water runoff and will utilize excess nutrients that may be present in the storm water. The stormwater runoff above the (WQV) from this basin will be discharged through a concrete outlet structure with a two level weir in it to attenuate the flow rate out and as further described in section 4 of this report.

Erosion and Sediment Control Measures

A detailed Sediment and Erosion (S&E) Control Plan has been developed to mitigate the short-term impacts of the development during construction. The S&E Control Plan includes a detailed proposed construction sequence in addition to descriptive specifications concerning land grading, top soiling, temporary vegetative cover, permanent vegetative cover, and vegetative cover selection and mulching, and erosion checks. Details have been provided for all erosion control measures with corresponding labels on the S&E control site plan. Specific measures are outlined on sheets #7A, 7B, 10 & 12 of the plans.

STORMWATER SYSTEM MAINTENANCE

The site will be maintained in a clean condition at all times by implementing good housekeeping measures. Trash and surface debris will be removed from parking areas and stormwater structures. The site will be regularly cleaned of trash and debris. Stormwater structures (i.e., catch basins, stormwater quality basin, bio retention swales, underground infiltration systems, and level spreader, etc.) and outfalls will be cleaned of sediment and debris at least once a year during the month in the spring (once snow melt is complete) and at other times as necessary to prevent the off-site discharge of pollutants from the structures or outfalls. Special attention will be directed to the stormwater management basin identified on the site engineering drawings.

Stormwater Management Structures	Checked for...
Catch Basin	Accumulated sediment & debris
Stormwater Quality Basin	Accumulated sediments, debris, evidence of erosion, etc.

A member of the maintenance crew will complete thorough, quarterly inspections and complete inspection checklists.

SWEEPING SCHEDULE

All parking areas, sidewalks, loading areas and driveways will be swept as needed, with automatic air sweeping and vacuuming equipment

STORMWATER QUALITY BASIN

The following are the inspection and maintenance practices that will be used to maintain the storm water quality basin.

- **FIRST YEAR MONITORING:**
 - The storm water quality basin shall be inspected by George Logan, soil scientist or other qualified soil scientist or design engineer on the day following a rain event over 0.5 inches during the growing season, in the year following construction. A brief report that the basin has been inspected and appears to comply with the specification will be provided to the Town of Southington Wetlands Enforcement Officer. If problems are noted, a detailed report shall be provided to the Town of Southington Wetlands Enforcement Officer on mitigation measures that will be employed to correct the problem.
 - Inspect and clean storm water quality basin twice a year during the first year, annually thereafter, for cracking or erosion of side slopes, embankments, accumulated sediment, vegetative conditions, etc. Necessary sediment removal, earth repair, and/or reseeding will be performed immediately upon identification. If sediment build-up is found, core aeration or cultivating may be required to ensure adequate infiltration.
- **LONG TERM MAINTENANCE SCHEDULE**
 - Inspect storm water quality basin once annually, in the spring, for accumulated sediment. Necessary sediment removal will be performed immediately upon identification.
 - Inspect sediment forebay monthly for erosion of side slopes and accumulated sediment. Necessary sediment removal, earth repair and/or reseeding shall be performed immediately upon identification. Clean forebay approximately two times a year or as needed.
 - Annually mow bottom of forebay and main cell on basin and other areas as needed to control invasive colorizations. A good time to mow is late winter, under frozen conditions. This lets meadow vegetation provide flowers vegetation provide flowers fall/winter shelter & seeds.
 - The basin area will be regularly inspected within 24 hours following the end of any storm event of 1 inch or greater.
 - A maintenance inspection report will be made after each inspection. All reports shall be kept on file in the on-site maintenance office.
 - The stormwater basin will be maintained in good condition. If a repair is necessary, it will be initiated in a timely manner.

- Built up sediment will be removed from inlets and all other areas in the basins where excessive accumulation of sediment may occur. All sediment will be removed from the forebay area of the stormwater basin when the depth of sediment exceeds 6 inches. There shall be no accumulated sediment allowed in the main cell of the basin.
- Temporary and permanent seeding and planting will be inspected for bare spots, washouts, and healthy growth of vegetation.
- Trash and debris will be cleaned from stormwater quality basin.
- Annual mowing of the side slopes of the basin will be completed each fall to prevent growth of invasive species in the basins. Mowing is required for areas such as the slopes when the grass/ground cover exceeds 6 inches in height. Dense cover on all slopes will be maintained.
- If there is any evidence of rodent holes, the rodents should be removed and any damage repaired.
- Replace rocks missing from splash pads or channel if there is any exposed soil or if there is only one layer of rock above native soil.
- The Outlet Control Structure shall be inspected a minimum of twice a year or after any rain event in excess of 1.0 inch for build-up of debris or vegetation against weirs and outlet pipe from structure. If a build-up occurs, it shall be removed and disposed of off-site.

Yard Maintenance

1. Mowing

- After irrigation, mowing is the most important maintenance operation. With good mowing practices, density, texture, color, root development, wear tolerance and other aspects of turf quality are enhanced, and a healthy turf minimizes the need for use of fertilizers and pesticides.
- When the turf is mowed too closely, it becomes less tolerant of environmental stresses, more disease prone, and more dependent upon a carefully implemented cultural program. The best approach then, is to use a high mowing height.
- Anytime that grass is in a weakened condition, the mowing height will be raised immediately.
- Growth rate and mowing height have the most influence on mowing frequency. As a rule of thumb, mowing should be done often enough that no more than 30 percent of the leaf is removed at any one mowing. This practice minimizes the effect of mowing on photosynthesis and helps maintain a high percentage of leaf surface, which is necessary for healthy root development.
- Varied mowing patterns on all surfaces encourage upright growth and reduce wheel or mower wear and compaction.
- Research has shown that returning grass clippings to the surface does not greatly increase thatch building up on turf that is otherwise properly managed. Clippings do have significant nutrient value and decompose rapidly thus returning some fertilizer and organic matter to the soil. They also help conserve moisture and insulate the soil

Appendices

Appendix A
FEMA FLOOD INSURANCE RATE MAP
AND
NRCS SOILS MAPPING

National Flood Hazard Layer FIRMette

72°54'51"W 41°35'12"N



Legend

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

SPECIAL FLOOD HAZARD AREAS

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

0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*

- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS OF FLOOD HAZARD

- NO SCREEN *Zone X*
- Area of Minimal Flood Hazard *Zone X*
- Effective LOMR *Zone D*
- Area of Undetermined Flood Hazard *Zone D*

OTHER AREAS

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

GENERAL STRUCTURES

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

OTHER FEATURES

- Digital Data Available
- No Digital Data Available
- Unmapped

MAP PANELS



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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **8/11/2022 at 11:38 AM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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



72°54'14"W 41°34'45"N

Soil Map—State of Connecticut



Soil Map may not be valid at this scale.

Map Scale: 1:3,690 if printed on A portrait (8.5" x 11") sheet.



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



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

8/11/2022
Page 1 of 3

MAP LEGEND

- Area of Interest (AOI)
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points
- Special Point Features**
 - Blowout
 - Borrow Pit
 - Clay Spot
 - Closed Depression
 - Gravel Pit
 - Gravelly Spot
 - Landfill
 - Lava Flow
 - Marsh or swamp
 - Mine or Quarry
 - Miscellaneous Water
 - Perennial Water
 - Rock Outcrop
 - Saline Spot
 - Sandy Spot
 - Severely Eroded Spot
 - Sinkhole
 - Slide or Slip
 - Sodic Spot
- Water Features**
 - Streams and Canals
- Transportation**
 - Rails
 - Interstate Highways
 - US Routes
 - Major Roads
 - Local Roads
- Background**
 - Aerial Photography
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

MAP INFORMATION

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

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

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

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

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

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

Soil Survey Area: State of Connecticut
 Survey Area Data: Version 21, Sep 7, 2021

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

Date(s) aerial images were photographed: Sep 25, 2019—Nov 9, 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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
33A	Hartford sandy loam, 0 to 3 percent slopes	5.4	12.9%
35A	Penwood loamy sand, 0 to 3 percent slopes	23.4	55.8%
35B	Penwood loamy sand, 3 to 8 percent slopes	5.7	13.5%
36A	Windsor loamy sand, 0 to 3 percent slopes	0.1	0.3%
235B	Penwood-Urban land complex, 0 to 8 percent slopes	1.6	3.9%
306	Udorthents-Urban land complex	5.8	13.7%
Totals for Area of Interest		42.0	100.0%

Appendix B

STORM DRAINAGE SUBAREA DATA and COMPUTATIONS



HALLISEY, PEARSON & CASSIDY
Engineering Associates, Inc.

630 MAIN STREET
CROMWELL, CT 06416-1444
TELEPHONE (860) 529-6812

JOB #3309 - Pine Street, Southington

SHEET NO. 1 OF 1

CALCULATED BY JJP DATE 5/24/22

CHECKED BY JPC DATE 5/24/22

SCALE NA

Stormwater Management Calculations

Pre-Development Conditions

Pre-SA-A

Total Area = 18.446 AC.

1/4 Acre Res = 2.617 AC.

1/2 Acre Res = 0.805 AC.

1 Acre Res = 3.59 AC.

Industrial = 3.306 AC.

Wooded = 8.128 AC.

$$CN = \frac{(2.617 \times 61) + (0.805 \times 54) + (3.59 \times 51) + (3.306 \times 81) + (8.128 \times 32)}{18.446}$$

CN = 50

T.O.C. = 100' Sheet Flow, Lawn @ 1.0% = 18.06 min.

1200' Shallow Channel, Lawn @ 1.0% = 12.40 min



Stormwater Management Calculations

Post-Development Conditions

Pro-SA-1

Total Area = 1.1531 AC.

Paved = 0.1344 AC.

Lawn = 1.0187 AC.

$$CN = \frac{13.1712 \quad 39.7293}{1.1531} = \frac{(0.1344 \times 98) + (1.0187 \times 39)}{1.1531} =$$

CN = 46

T.O.C. = 100' Sheet Flow, Lawn @ 1.6% =

75' Shallow Channel, Lawn @ 1.6% =

27' Shallow Channel, Pave @ 1.0% =

Pro-SA-2

Total Area = 0.1128 AC.

Paved = 0.0648 AC.

Lawn = 0.0480 AC.

$$CN = \frac{6.3504 \quad 1.8720}{0.1128} = \frac{(0.0648 \times 98) + (0.0480 \times 39)}{0.1128} =$$

CN = 73

T.O.C. = 18' Sheet Flow, Lawn @ 2.0% =

152' Shallow Channel, Pave @ 1.0% =



HALLISEY, PEARSON & CASSIDY
Engineering Associates, Inc.

35 COLD SPRING ROAD, UNIT 511
ROCKY HILL, CT 06067
TELEPHONE (860) 529-6812

JOB # 3309 - Pine Street, Southington

SHEET NO. 2 OF 5

CALCULATED BY JMP DATE 5/24/22

CHECKED BY JPC DATE 5/24/22

SCALE NA

Post-Development Conditions

Pro-SA-3

Total Area = 0.1424 AC.

Paved = 0.0786 AC.

Lawn = 0.0638 AC.

$$CN = \frac{7.7028(0.0786 \times 99) + 2.4882(0.0638 \times 39)}{0.1424} =$$

$$CN = 72$$

T.O.C. = 81' Sheet Flow, Lawn @ 0.5% =

47' Shallow Channel, Pave @ 1.0% =

Pro-SA-4

Total Area =

Pro-SA-5

Total Area = 0.0555 AC

Paved = 0.0277 AC.

Lawn = 0.0277 AC.

$$CN = \frac{2.7146(0.0277 \times 98) + 1.0803(0.0277 \times 39)}{0.0555} =$$

$$CN = 68$$

T.O.C. = 27' Sheet Flow, Lawn @ 1.5% =

68' Shallow Channel, Pave @ 1.0% =



Post-Development Conditions

Pro-SA-6

Total Area = 0.0737 AC.

Paved = 0.0421 AC.

Lawn = 0.0316 AC.

$$CN = \frac{4.1258(0.0421 \times 98) + 1.2324(0.0316 \times 39)}{0.0737} =$$

CN = 73

T.O.C. = 30' Sheet Flow, Lawn @ 1.5% =

95' Shallow Channel, Pave @ 1.0% =

Pro-SA-7

Total Area = 0.2343 AC.

Paved = 0.1418 AC.

Lawn = 0.0925 AC.

$$CN = \frac{13.8964(0.1418 \times 98) + 3.6075(0.0925 \times 39)}{0.2343} =$$

CN = 17.5039 AC.

T.O.C. = 91' Sheet Flow, Lawn @ 3.4% =

169' Shallow Channel, Pave @ 2.8% =

Pro-SA-8

Total Area = 0.1464 AC.

Paved = 0.1219 AC.

Lawn = 0.0245 AC.

$$CN = \frac{11.9462(0.1219 \times 98) + 0.9555(0.0245 \times 39)}{0.1464} =$$

CN = 88

T.O.C. = 19' Sheet Flow, Lawn @ 1.5% =

276' Shallow Channel, Pave @ 2.8% =



Post-Development Conditions

Pro-SA-9

Total Area = 0.3038 AC.

All Pave

CN = 98

T.O.C. ≤ 5 min.

Pro-SA-10

Total Area = 2.9316 AC.

Paved = 0.3299 AC.

Lawn = 1.9730 AC.

Wooded = 0.6287 AC.

$$CN = \frac{32.3362(0.3299 \times 98) + 76.9470(1.9730 \times 39) + 18.840(0.6287 \times 30)}{3.1194}$$

CN = 41

T.O.C. = 100' Sheet Flow, Lawn @ 2.0% =

200' Shallow Channel, Lawn @ 2.0% =

245' Shallow Channel, Pave @ 1.0% =

Pro-SA-11

Total Area = 0.3142 AC.

Paved = 0.1410 AC

Lawn = 0.1732 AC

$$CN = \frac{13.8180(0.1410 \times 98) + 6.7548(0.1732 \times 39)}{0.3142}$$

CN = 65

T.O.C. = 76' Sheet Flow, Lawn @ 2.0% =

312' Shallow Channel, Pave @ 1.5% =



Post-Development Conditions

Pro-SA-12

Total Area = 1.3477 AC.

$$CN = \frac{20.7368(0.2116 \times 98) + 37.8768(0.9712 \times 39) + 4.9470(0.1649 \times 30)}{1.4228}$$

CN = 45

T.O.C. = 100' Sheet Flow, Lawn @ 2.0% =
200' Shallow Channel, Lawn @ 2.0% =
47' Shallow Channel, Pav @ 1.5% =

Paved = 0.2116 AC.
Lawn = 0.9712 AC.
Wooded = 0.1649 AC.

Pro-SA-13

Total Area = 3.3639 AC.

$$CN = \frac{43.3641(1.1119 \times 39) + 67.56(2.2520 \times 30)}{3.3639} = 33$$

T.O.C. = 100' Sheet Flow, Lawn @ 10.0% =
316' Shallow Channel, Lawn @ 0.8% =

Lawn = 1.1119 AC.
Wooded = 2.2520 AC.

Pro-SA-14

Total Area = 0.5506 AC.

CN = 39

T.O.C. ≤ 5 min.

All Lawn

Appendix C

WATER QUALITY COMPUTATIONS

&

Stormwater Swale Storage Volume Computations

	A	B	C	D	E	F	G	H	I
1	Proposed Subdivision - Pine Street & Marion Avenue, Southington CT								
2	<u>SUBAREA</u>	<u>TOTAL AREA</u>	<u>PAVED AREA</u>	<u>% PAVED COV.</u>	<u>WOODED AREA</u>	<u>% WOODED COV.</u>	<u>LAWN AREA</u>	<u>% LANDSCAPE COV.</u>	
3	SA-1	1.1531	0.1344	11.66	0.0000	0.00	1.0187	88.34	
4	SA-2	0.1128	0.0648	57.45	0.0000	0.00	0.0480	42.55	
5	SA-3	0.1424	0.0786	55.20	0.0000	0.00	0.0638	44.80	
6	SA-4	0.0001	0.0001	100.00	0.0000	0.00	0.0000	0.00	
7	SA-5	0.0554	0.0277	50.00	0.0000	0.00	0.0277	50.00	
8	SA-6	0.0737	0.0421	57.12	0.0000	0.00	0.0316	42.88	
9	SA-7	0.2343	0.1418	60.52	0.0000	0.00	0.0925	39.48	
10	SA-8	0.1464	0.1219	83.27	0.0000	0.00	0.0245	16.73	
11	SA-9	0.3038	0.3038	100.00	0.0000	0.00	0.0000	0.00	
12	SA-10	2.9316	0.3299	11.25	0.6287	0.63	1.9730	67.30	
13	SA-11	0.3142	0.141	44.88	0.0000	0.00	0.1732	55.12	
14	SA-12	1.3477	0.2116	15.70	0.1649	0.16	0.9712	72.06	
15	SA-14	0.5506	0.0000	0.00	0.0000	0.00	0.5506	100.00	
16									
17	SUM OF SA TO S.W.Q.B.	7.3661	1.5977	21.69	0.7936	10.77	4.9748	67.54	
18									
19									
20	<u>WATER QUALITY VOLUME (WQV)</u>								
21	WQV= 1" x R x A/12								
22									
23	WQV= water quality volume (ac-ft)								
24	R= volumetric runoff coefficient = 0.05 + 0.009 (I)								
25	I= percent impervious cover								
26	A= site area in acres								
27									
28	WQV=	0.1505	acre-feet						
29									
30	<u>WATER QUALITY VOLUME (WQV) PROVIDED</u>								
31	WQV=	0.2205	acre-feet	from elev. 192 to 193					

Appendix D

Stormwater Studio, ver. 3.0™

Computer Model Report for On-Site Drainage System

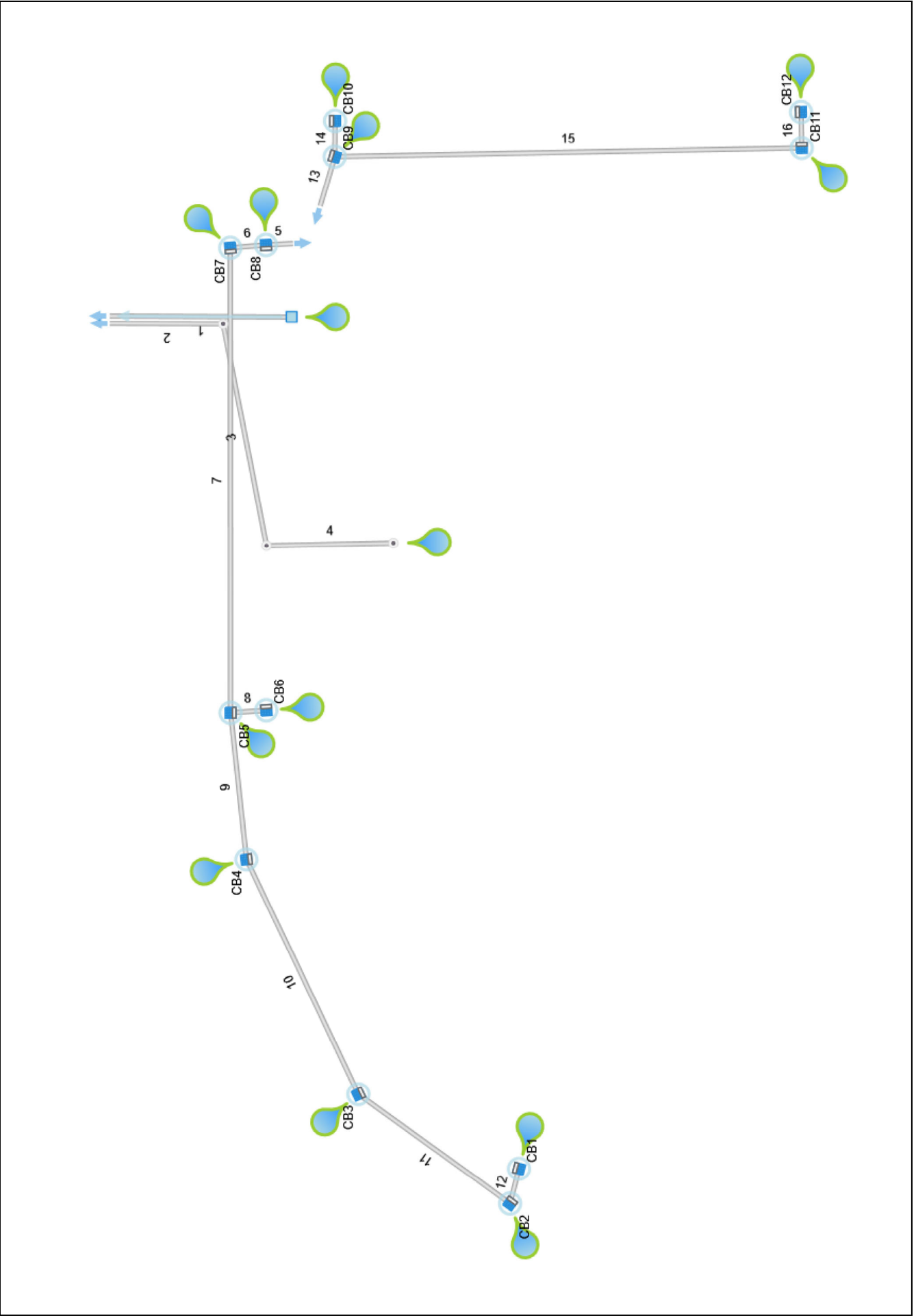
- **Stormwater Studio – Plan View**
- **Storm Sewer Tabulation Report**
- **Inlet Report**
- **Energy Grade Line Calculations**
- **CT DOT Report**

Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: MARION AVENUE STORMWATER

08-11-2022



Storm Sewer Tabulation

Project Name: MARION AVENUE STORMWATER

Stormwater Studio 2022 v 3.0.0.29

08-11-2022

Line ID	Length (ft)		Drng Area (ac)		Rational (C)	C x A		Tc (min)		Intensity (in/hr)	Total Q (cfs)	Capacity (cfs)	Velocity (ft/s)	Line		Invert Elev (ft)		HGL Elev (ft)		Surface Elev (ft)		Line No
	Incr	Total	Incr	Total		Incr	Total	Inlet	Syst					Size (in)	Slope (%)	Up	Dn	Up	Dn	Up	Dn	
Line 1	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.0	0.00	9.12	0.30	16.63	0.11	24	0.54	193.00	192.40	194.40	194.40	197.00	192.40	1
Line 2	0.000	3.306	0.00	0.99	0.00	0.99	0.0	21.09	4.17	4.13	4.13	5.30	2.36	18	0.25	192.58	192.40	194.00	193.90	0.00	0.00	2
Line 3	0.000	3.306	0.00	0.99	0.00	0.99	0.0	20.39	4.24	4.21	4.21	5.30	2.43	18	0.25	192.93	192.58	194.30	194.10	0.00	0.00	3
Line 4	3.306	3.306	0.99	0.99	0.30	0.99	20.0	20.00	4.29	4.25	4.25	5.30	2.44	18	0.25	193.13	192.93	194.53	194.42	0.00	0.00	4
CB8 TO SWQB	0.147	1.853	0.80	0.92	0.80	0.12	5.6	23.63	3.92	3.62	3.62	6.04	4.97	12	2.88	192.96	192.50	193.77	193.50	197.17	192.50	5
CB7 TO CB8	0.167	1.706	0.81	0.81	0.81	0.14	11.5	23.56	3.92	3.16	3.16	3.56	4.03	12	1.00	193.18	192.96	194.18	194.06	197.17	197.17	6
Line 7	0.056	1.539	0.60	0.67	0.60	0.03	6.2	22.51	4.02	2.70	2.70	3.19	4.61	12	0.80	195.57	193.28	196.27	193.98	204.29	197.17	7
CB6 TO CB5	0.074	0.074	0.64	0.05	0.64	0.05	6.9	6.89	7.66	0.36	0.36	3.56	2.49	12	1.00	200.29	200.07	200.55	200.30	204.29	204.29	8
CB4 TO CB5	0.000	1.409	0.90	0.59	0.90	0.00	5.0	22.09	4.06	2.40	2.40	2.50	3.06	12	0.49	196.12	195.67	197.11	196.72	206.63	204.29	9
CB3 TO CB4	0.143	1.409	0.63	0.59	0.63	0.09	21.4	21.36	4.14	2.44	2.44	2.52	3.31	12	0.50	197.02	196.22	197.85	197.19	203.33	206.63	10
CB2 TO CB3	0.113	1.266	0.65	0.50	0.65	0.07	5.0	16.53	4.76	2.38	2.38	2.51	3.38	12	0.50	197.69	197.12	198.48	198.02	199.50	203.33	11
CB1 TO CB2	1.153	1.153	0.37	0.43	0.37	0.43	16.4	16.43	4.77	2.04	2.04	2.52	2.85	12	0.50	197.90	197.79	198.73	198.68	199.50	199.50	12
CB9 TO SWQB	0.304	4.898	0.90	2.03	0.90	0.27	5.0	17.85	4.56	9.28	9.28	11.93	5.75	18	1.29	192.90	192.50	194.08	194.00	197.40	192.50	13
CB10 TO CB9	2.932	2.932	0.36	1.06	0.36	1.06	17.8	17.78	4.57	4.83	4.83	8.07	2.73	18	0.59	193.40	193.27	194.96	194.91	197.40	197.40	14
CB11 TO CB9	0.314	1.662	0.57	0.70	0.57	0.18	13.5	16.11	4.82	3.40	3.40	10.20	3.05	18	0.94	195.71	193.00	196.41	194.95	199.93	197.40	15
CB12 TO CB11	1.348	1.348	0.39	0.53	0.39	0.53	16.0	16.04	4.84	2.54	2.54	3.56	4.08	12	1.00	195.93	195.71	196.61	196.53	199.93	199.93	16

Notes: IDF File = NOAAATLAS14 IDF CURVE 923 BOSTON POST RD OLD SAYBROOK CT.idf, Return Period = 25-yrs.

Project File: 3309-STM.sws

TR55 Worksheet

Line No. 5

CB8

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.250	0.000	0.000	
Flow Length (ft)	19			
2-yr, 24-hr Precip. (in)	3.420	5.568	5.568	
Land Slope (%)	1.5			
Travel Time (min)	4.24	0.00	0.00	4.24
Shallow Concentrated Flow				
Flow Length (ft)	276			
Watercourse Slope (%)	2.8			
Surface Description	Paved	Paved	Paved	
Average Velocity (ft/s)	3.4			
Travel Time (min)	1.35	0.00	0.00	1.35
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.000	0.000	0.000	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				5.59 min

TR55 Worksheet

Project Name: MARION AVENUE STORMWATER

Stormwater Studio 2022 v 3.0.0.29

08-11-2022

Line No. 6

CB7

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.250	0.000	0.000	
Flow Length (ft)	91			
2-yr, 24-hr Precip. (in)	3.420	5.568	5.568	
Land Slope (%)	3.4			
Travel Time (min)	10.70	0.00	0.00	10.70
Shallow Concentrated Flow				
Flow Length (ft)	169			
Watercourse Slope (%)	2.8			
Surface Description	Paved	Paved	Paved	
Average Velocity (ft/s)	3.4			
Travel Time (min)	0.83	0.00	0.00	0.83
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.000	0.000	0.000	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				11.52 min

TR55 Worksheet

Project Name: MARION AVENUE STORMWATER

Stormwater Studio 2022 v 3.0.0.29

08-11-2022

Line No. 7

CB5

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.250	0.000	0.000	
Flow Length (ft)	27			
2-yr, 24-hr Precip. (in)	3.420	5.568	5.568	
Land Slope (%)	1.5			
Travel Time (min)	5.61	0.00	0.00	5.61
Shallow Concentrated Flow				
Flow Length (ft)	68			
Watercourse Slope (%)	1			
Surface Description	Paved	Paved	Paved	
Average Velocity (ft/s)	2.03			
Travel Time (min)	0.56	0.00	0.00	0.56
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.000	0.000	0.000	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				6.17 min

TR55 Worksheet

Project Name: MARION AVENUE STORMWATER

Stormwater Studio 2022 v 3.0.0.29

08-11-2022

Line No. 8

CB6

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.250	0.000	0.000	
Flow Length (ft)	30			
2-yr, 24-hr Precip. (in)	3.420	5.568	5.568	
Land Slope (%)	1.5			
Travel Time (min)	6.11	0.00	0.00	6.11
Shallow Concentrated Flow				
Flow Length (ft)	95			
Watercourse Slope (%)	1			
Surface Description	Paved	Paved	Paved	
Average Velocity (ft/s)	2.03			
Travel Time (min)	0.78	0.00	0.00	0.78
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.000	0.000	0.000	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				6.89 min

TR55 Worksheet

Project Name: MARION AVENUE STORMWATER

Stormwater Studio 2022 v 3.0.0.29

08-11-2022

Line No. 10

CB3

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.250	0.000	0.000	
Flow Length (ft)	81			
2-yr, 24-hr Precip. (in)	3.420	5.568	5.568	
Land Slope (%)	.5			
Travel Time (min)	20.98	0.00	0.00	20.98
Shallow Concentrated Flow				
Flow Length (ft)	47			
Watercourse Slope (%)	1			
Surface Description	Paved	Paved	Paved	
Average Velocity (ft/s)	2.03			
Travel Time (min)	0.39	0.00	0.00	0.39
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.000	0.000	0.000	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				21.36 min

TR55 Worksheet

Project Name: MARION AVENUE STORMWATER

Stormwater Studio 2022 v 3.0.0.29

08-11-2022

Line No. 11

CB2

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.250	0.000	0.000	
Flow Length (ft)	18			
2-yr, 24-hr Precip. (in)	3.420	5.568	5.568	
Land Slope (%)	2			
Travel Time (min)	3.62	0.00	0.00	3.62
Shallow Concentrated Flow				
Flow Length (ft)	152			
Watercourse Slope (%)	1			
Surface Description	Paved	Paved	Paved	
Average Velocity (ft/s)	2.03			
Travel Time (min)	1.25	0.00	0.00	1.25
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.000	0.000	0.000	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				5 min

TR55 Worksheet

Project Name: MARION AVENUE STORMWATER

Stormwater Studio 2022 v 3.0.0.29

08-11-2022

Line No. 12

CB1

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.250	0.000	0.000	
Flow Length (ft)	100			
2-yr, 24-hr Precip. (in)	3.420	5.568	5.568	
Land Slope (%)	1.6			
Travel Time (min)	15.59	0.00	0.00	15.59
Shallow Concentrated Flow				
Flow Length (ft)	75	27		
Watercourse Slope (%)	1.6	1		
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	2.04	2.03		
Travel Time (min)	0.61	0.22	0.00	0.83
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.000	0.000	0.000	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				16.43 min

TR55 Worksheet

Line No. 14

CB10

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.250	0.000	0.000	
Flow Length (ft)	100			
2-yr, 24-hr Precip. (in)	3.420	5.568	5.568	
Land Slope (%)	2			
Travel Time (min)	14.26	0.00	0.00	14.26
Shallow Concentrated Flow				
Flow Length (ft)	206	245		
Watercourse Slope (%)	2	1		
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	2.28	2.03		
Travel Time (min)	1.50	2.01	0.00	3.51
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.000	0.000	0.000	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				17.78 min

TR55 Worksheet

Project Name: MARION AVENUE STORMWATER

Stormwater Studio 2022 v 3.0.0.29

08-11-2022

Line No. 15

CB11

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.250	0.000	0.000	
Flow Length (ft)	76			
2-yr, 24-hr Precip. (in)	3.420	5.568	5.568	
Land Slope (%)	2			
Travel Time (min)	11.45	0.00	0.00	11.45
Shallow Concentrated Flow				
Flow Length (ft)	312			
Watercourse Slope (%)	1.5			
Surface Description	Paved	Paved	Paved	
Average Velocity (ft/s)	2.49			
Travel Time (min)	2.09	0.00	0.00	2.09
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.000	0.000	0.000	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				13.54 min

TR55 Worksheet

Project Name: MARION AVENUE STORMWATER

Stormwater Studio 2022 v 3.0.0.29

08-11-2022

Line No. 16

CB12

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.250	0.000	0.000	
Flow Length (ft)	100			
2-yr, 24-hr Precip. (in)	3.420	5.568	5.568	
Land Slope (%)	2			
Travel Time (min)	14.26	0.00	0.00	14.26
Shallow Concentrated Flow				
Flow Length (ft)	200	47		
Watercourse Slope (%)	2	1.5		
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	2.28	2.49		
Travel Time (min)	1.46	0.31	0.00	1.78
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.000	0.000	0.000	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				16.04 min

Composite C Worksheet

Project Name: MARION AVENUE STORMWATER

Stormwater Studio 2022 v 3.0.0.29

08-11-2022

Line No	Description	Drainage Area (ac)	Runoff Coeff (C)	C x A	Composite (C)	Structure ID
5	PAVE	0.122	0.90	0.110		CB8
	LAWN	0.025	0.30	0.008		
Totals		0.147		0.117	0.80	
6	PAVE	0.142	0.90	0.128		CB7
	LAWN	0.025	0.30	0.008		
Totals		0.167		0.135	0.81	
7	PAVE	0.028	0.90	0.025		CB5
	LAWN	0.028	0.30	0.008		
Totals		0.056		0.034	0.60	
8	PAVE	0.042	0.90	0.038		CB6
	LAWN	0.032	0.30	0.010		
Totals		0.074		0.047	0.64	
10	PAVE	0.079	0.90	0.071		CB3
	LAWN	0.064	0.30	0.019		
Totals		0.143		0.090	0.63	
11	PAVE	0.065	0.90	0.059		CB2
	LAWN	0.048	0.30	0.014		
Totals		0.113		0.073	0.65	
12	PAVE	0.134	0.90	0.121		CB1
	LAWN	1.019	0.30	0.306		
Totals		1.153		0.426	0.37	
14	PAVE	0.330	0.90	0.297		CB10
	LAWN	1.973	0.30	0.592		
	WOODED	0.629	0.25	0.157		
Totals		2.932		1.046	0.36	

Composite C Worksheet

Project Name: MARION AVENUE STORMWATER

Stormwater Studio 2022 v 3.0.0.29

08-11-2022

Line No	Description	Drainage Area (ac)	Runoff Coeff (C)	C x A	Composite (C)	Structure ID
15	PAVED	0.141	0.90	0.127		CB11
	LAWN	0.173	0.30	0.052		
Totals		0.314		0.179	0.57	
16	PAVE	0.212	0.90	0.191		CB12
	LAWN	0.971	0.30	0.291		
	WOODED	0.165	0.25	0.041		
Totals		1.348		0.523	0.39	

Inlet Report

Stormwater Studio 2022 v 3.0.0.29

Project Name: MARION AVENUE STORMWATER

08-11-2022

Line No	Inlet		Q				Curb		Grate			Gutter							Inlet			Byp Line No				
	Id	Type	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Ht (in)	L (ft)	L (ft)	W (ft)	Area (sqft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depth (ft)		Spread (ft)	Depth (ft)	Spread (ft)	Depth (in)
1		Generic	0.30	0.00	0.30	0.00	-	-	-	-	-	0.030	2.00	0.050	0.020	0.013	0.10	1.96	0.10	1.96	0.10	1.96	0.10	1.96	0.0	0
2		Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3		Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4		Manhole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	CB8	Combination	1.01	0.00	1.01	0.00	4.0	4.00	2.00	2.00	Sag	2.00	0.050	0.020	0.013	0.20	7.00	0.20	7.00	0.20	7.00	0.20	7.00	0.0	0	
6	CB7	Combination	0.78	0.00	0.78	0.00	4.0	4.00	2.00	2.00	Sag	2.00	0.050	0.020	0.013	0.18	6.00	0.18	6.00	0.18	6.00	0.18	6.00	0.0	5	
7	CB5	Combination	0.27	0.00	0.27	0.00	4.0	4.00	2.00	2.00	Sag	2.00	0.050	0.020	0.013	0.12	3.00	0.12	3.00	0.12	3.00	0.12	3.00	0.0	6	
8	CB6	Combination	0.36	0.00	0.36	0.00	4.0	4.00	2.00	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.50	0.13	3.50	0.13	3.50	0.13	3.50	0.0	7	
9	CB4	Combination	0.00	0.00	0.00	0.00	4.0	4.00	2.00	2.00	Sag	2.00	0.050	0.020	0.013	0.06	1.20	0.06	1.20	0.06	1.20	0.06	1.20	0.0	7	
10	CB3	Combination	0.37	0.00	0.37	0.00	4.0	4.00	2.00	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.50	0.13	3.50	0.13	3.50	0.13	3.50	0.0	9	
11	CB2	Combination	0.67	0.00	0.67	0.00	4.0	4.00	2.00	2.00	Sag	2.00	0.050	0.020	0.013	0.17	5.50	0.17	5.50	0.17	5.50	0.17	5.50	0.0	10	
12	CB1	Combination	2.04	0.00	2.04	0.00	4.0	4.00	2.00	2.00	Sag	2.00	0.050	0.020	0.013	0.29	11.50	0.29	11.50	0.29	11.50	0.29	11.50	0.0	11	
13	CB9	Combination	2.49	0.00	2.49	0.00	4.0	4.00	2.00	2.00	Sag	2.00	0.050	0.020	0.013	0.32	13.00	0.32	13.00	0.32	13.00	0.32	13.00	0.0	0	
14	CB10	Combination	4.83	0.00	4.83	0.00	4.0	4.00	2.00	2.00	Sag	2.00	0.050	0.020	0.013	0.47	20.50	0.47	20.50	0.47	20.50	0.47	20.50	0.0	13	
15	CB11	Combination	0.95	0.00	0.95	0.00	4.0	4.00	2.00	2.00	Sag	2.00	0.050	0.020	0.013	0.20	7.00	0.20	7.00	0.20	7.00	0.20	7.00	0.0	13	
16	CB12	Combination	2.54	0.00	2.54	0.00	4.0	4.00	2.00	2.00	Sag	2.00	0.050	0.020	0.013	0.33	13.50	0.33	13.50	0.33	13.50	0.33	13.50	0.0	15	

Notes: Return Period = 25-yrs. All curb inlets are Horiz throat.

Project File: 3309-STM.sws

Energy Grade Line Calculations

Project Name: MARION AVENUE STORMWATER

Stormwater Studio 2022 v 3.0.0.29

08-11-2022

Line No	Line Size (in)	Q (cfs)	Downstream						Length (ft)	Upstream							Pipe		Junction			
			Invert Elev (ft)	Depth (ft)	Area (sqft)	HGL Elev (ft)	Vel (ft/s)	Vel Head (ft)		EGL Elev (ft)	Invert Elev (ft)	Depth (ft)	Area (sqft)	HGL Elev (ft)	Vel (ft/s)	Vel Head (ft)	EGL Elev (ft)	n Value	Energy Loss (ft)	HGLa Elev (ft)	EGLa Elev (ft)	Energy Loss (ft)
1	24	0.30	192.40	2.00	3.14	194.40	0.09	0.00	194.40	111.00	193.00	1.40	2.35	194.40	0.13	0.00	194.40	0.013	0.000	194.40	194.40	0.00
2	18	4.13	192.40	1.50	1.77	193.90	2.34	0.09	193.99	69.00	192.58	1.42	1.73	194.00	2.39	0.09	194.08	0.013	0.099	194.07	194.15	0.07
3	18	4.21	192.58	1.50	1.77	194.10	2.38	0.09	194.19	139.00	192.93	1.37	1.69	194.30	2.48	0.10	194.40	0.013	0.209	194.38	194.47	0.08
4	18	4.25	192.93	1.49	1.77	194.42	2.41	0.09	194.51	78.00	193.13	1.40	1.72	194.53	2.48	0.10	194.62	0.013	0.115	194.55	194.64	0.02
5	12	3.62	192.50	1.00	0.79	193.50	4.61	0.33	193.83	16.00	192.96	0.81 ²	0.68	193.77	5.33	0.44	194.21	0.013	0.378	193.77	194.21	0.00
6	12	3.16	192.96	1.00	0.79	194.06	4.03	0.25	194.31	22.00	193.18	1.00	0.79	194.18	4.03	0.25	194.43	0.013	0.121	194.26	194.51	0.08
7	12	2.70	193.28	0.70 ¹	0.58	193.98	4.62	0.33	194.59	286.00	195.57	0.70	0.59	196.27	4.60	0.33	196.60	0.013	2.010	196.47	196.80	0.20
8	12	0.36	200.07	0.23 [‡]	0.13	200.30	2.70	0.11	200.41	22.00	200.29	0.26 ²	0.16	200.55	2.29	0.08	200.63	0.013	0.220	200.55	200.63	0.00
9	12	2.40	195.67	1.00	0.79	196.72	3.05	0.15	196.86	91.00	196.12	0.99	0.78	197.11	3.06	0.15	197.26	0.013	0.398	197.14	197.29	0.03
10	12	2.44	196.22	0.97	0.78	197.19	3.13	0.15	197.35	160.00	197.02	0.83	0.70	197.85	3.49	0.19	198.04	0.013	0.698	197.94	198.13	0.08
11	12	2.38	197.12	0.90	0.75	198.02	3.19	0.16	198.18	115.00	197.69	0.79	0.67	198.48	3.57	0.20	198.68	0.013	0.500	198.56	198.75	0.07
12	12	2.04	197.79	0.88	0.74	198.68	2.77	0.12	198.79	22.00	197.90	0.83	0.70	198.73	2.93	0.13	198.86	0.013	0.068	198.77	198.90	0.04
13	18	9.28	192.50	1.50	1.77	194.00	5.25	0.43	194.43	31.00	192.90	1.18	1.49	194.08	6.25	0.61	194.68	0.013	0.253	194.38	194.98	0.30
14	18	4.83	193.27	1.50	1.77	194.91	2.73	0.12	195.03	22.00	193.40	1.50	1.77	194.96	2.73	0.12	195.08	0.013	0.047	195.02	195.14	0.06
15	18	3.40	193.00	1.50	1.77	194.95	1.92	0.06	195.01	287.00	195.71	0.70 ²	0.81	196.41	4.18	0.27	196.68	0.013	1.678	196.41	196.68	0.00
16	12	2.54	195.71	0.82	0.69	196.53	3.68	0.21	196.74	22.00	195.93	0.68	0.57	196.61	4.48	0.31	196.92	0.013	0.178	197.03	197.34	0.42

Notes: Return Period = 25-yrs. ¹ Critical depth. ² Critical depth. [‡] Supercritical.

Project File: 3309-STM.sws

CT DOT Report

Stormwater Studio 2022 v 3.0.0.29

Project Name: MARION AVENUE STORMWATER

08-11-2022

Line No.	Inlet Time (min)	Pipe Travel (min)	Tc System (min)	Drain Area (ac)	Runoff Coeff (C)	Incr CxA	Total C x A	Incr Q (cfs)	Flow Rate (cfs)	Line Size (in)	Line Length (ft)	Line Slope (ft/ft)	Vel Ave (ft/s)	Capac. Full (cfs)	Vel Hd Dn (ft)	n-value Pipe	Line ID
1	0.0	0.91	0.0	0.000	0.00	0.00	0.00	0.30	0.30	24	111.00	0.0054	0.11	16.63	0.00	0.013	
2	0.0	0.35	21.1	0.000	0.00	0.00	0.99	0.00	4.13	18	69.00	0.0025	2.36	5.30	0.09	0.013	
3	0.0	0.70	20.4	0.000	0.00	0.00	0.99	0.00	4.21	18	139.00	0.0025	2.43	5.30	0.09	0.013	
4	20.0	0.39	20.0	3.306	0.30	0.99	0.99	4.25	4.25	18	78.00	0.0025	2.44	5.30	0.09	0.013	
5	5.6	0.03	23.6	0.147	0.80	0.12	0.92	1.01	3.62	12	16.00	0.0288	4.97	6.04	0.33	0.013	CB8 TO SWQB
6	11.5	0.07	23.6	0.167	0.81	0.14	0.81	0.78	3.16	12	22.00	0.01	4.03	3.56	0.25	0.013	CB7 TO CB8
7	6.2	1.05	22.5	0.056	0.60	0.03	0.67	0.27	2.70	12	286.00	0.008	4.61	3.19	0.33	0.013	
8	6.9	0.13	6.9	0.074	0.64	0.05	0.05	0.36	0.36	12	22.00	0.01	2.49	3.56	0.11	0.013	CB6 TO CB5
9	5.0	0.42	22.1	0.000	0.90	0.00	0.59	0.00	2.40	12	91.00	0.0049	3.06	2.50	0.15	0.013	CB4 TO CB5
10	21.4	0.73	21.4	0.143	0.63	0.09	0.59	0.37	2.44	12	160.00	0.005	3.31	2.52	0.15	0.013	CB3 TO CB4
11	5.0	0.53	16.5	0.113	0.65	0.07	0.50	0.67	2.38	12	115.00	0.005	3.38	2.51	0.16	0.013	CB2 TO CB3
12	16.4	0.10	16.4	1.153	0.37	0.43	0.43	2.04	2.04	12	22.00	0.005	2.85	2.52	0.12	0.013	CB1 TO CB2
13	5.0	0.07	17.9	0.304	0.90	0.27	2.03	2.49	9.28	18	31.00	0.0129	5.75	11.93	0.43	0.013	CB9 TO SWQB
14	17.8	0.08	17.8	2.932	0.36	1.06	1.06	4.83	4.83	18	22.00	0.0059	2.73	8.07	0.12	0.013	CB10 TO CB9
15	13.5	0.92	16.1	0.314	0.57	0.18	0.70	0.95	3.40	18	287.00	0.0094	3.05	10.20	0.06	0.013	CB11 TO CB9
16	16.0	0.07	16.0	1.348	0.39	0.53	0.53	2.54	2.54	12	22.00	0.01	4.08	3.56	0.21	0.013	CB12 TO CB11

Notes: IDF File = NOAAATLAS14 IDF CURVE 923 BOSTON POST RD OLD SAYBROOK CT.idf, Return Period = 25-yrs.

Project File: 3309-STM.sws

Appendix E

Hydrology Studio™

Computer Model Report – Pre-Development

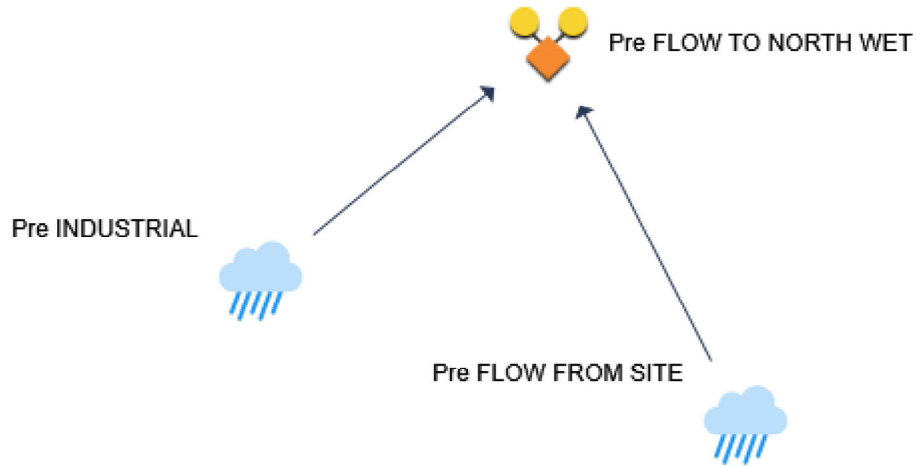
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Basin Model



Hydrograph by Return Period

Project Name: MARION AVENUE PRE DEVELOPMENT

Hydrology Studio v 3.0.0.26

08-11-2022

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Outflow (cfs)							
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
1	NRCS Runoff	Pre FLOW FROM SITE	0.080	0.393		2.594	5.785	11.59	16.92	22.80
2	NRCS Runoff	Pre INDUSTRIAL	2.811	4.162		6.510	8.542	11.37	13.58	15.79
3	Junction	Pre FLOW TO NORTH WET	2.811	4.167		7.585	12.43	20.83	28.24	36.15

Hydrograph 1-yr Summary

Project Name: MARION AVENUE PRE DEVELOPMENT

Hydrology Studio v 3.0.0.26

08-11-2022

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Pre FLOW FROM SITE	0.080	15.50	2,246	---		
2	NRCS Runoff	Pre INDUSTRIAL	2.811	12.23	12,697	---		
3	Junction	Pre FLOW TO NORTH WET	2.811	12.23	14,943	1, 2		

Hydrograph Report

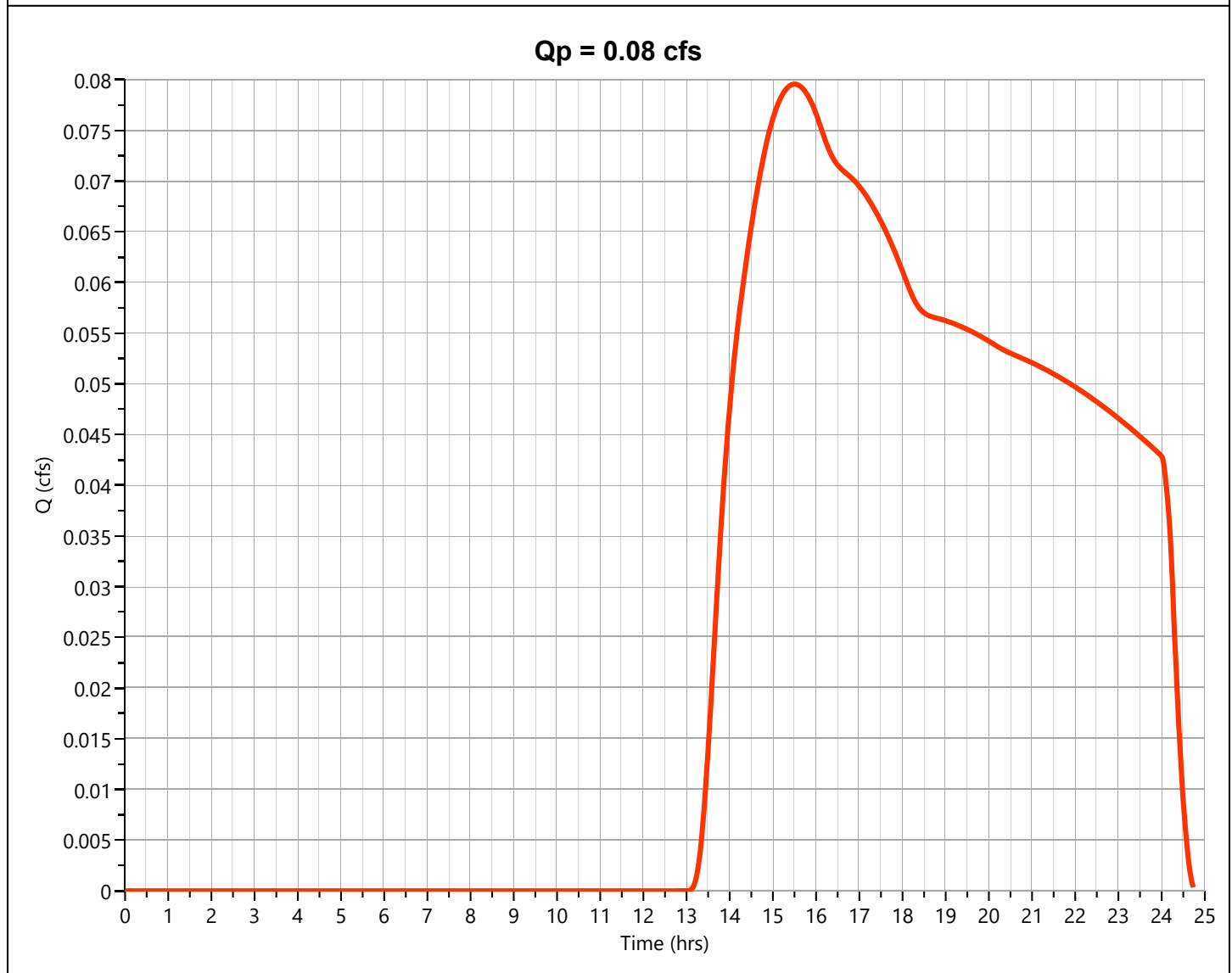
Pre FLOW FROM SITE

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.080 cfs
Storm Frequency	= 1-yr	Time to Peak	= 15.50 hrs
Time Interval	= 1 min	Runoff Volume	= 2,246 cuft
Drainage Area	= 15.14 ac	Curve Number	= 50*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 30.45 min
Total Rainfall	= 2.66 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
2.617	61	1/4 ACRE RES
0.805	54	1/2 ACRE RES
3.59	51	1 ACRE RES
8.128	45	WOODED
15.14	50	Weighted CN Method Employed



Tc by TR55 Worksheet

FLOW FROM SITE NRCS Runoff

Hyd. No. 1

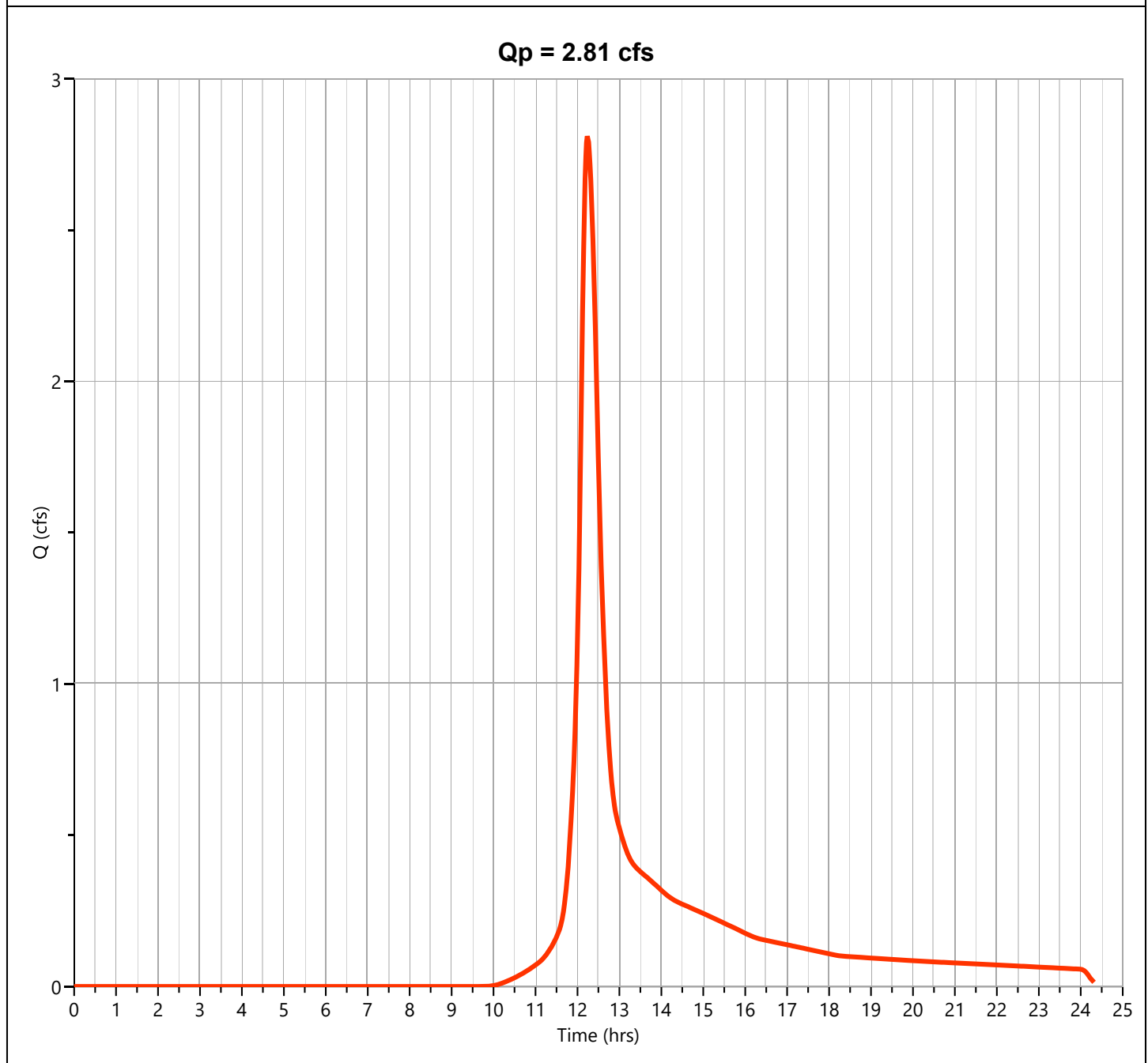
Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description	LAWN			
Manning's n	0.240	0.013	0.013	
Flow Length (ft)	100			
2-yr, 24-hr Precip. (in)	3.48	2.28	2.28	
Land Slope (%)	1			
Travel Time (min)	18.06	0.00	0.00	18.06
Shallow Concentrated Flow				
Flow Length (ft)	1200			
Watercourse Slope (%)	1.00	0.00	0.00	
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	1.61			
Travel Time (min)	12.40	0.00	0.00	12.40
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.013	0.013	0.013	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				30.45 min

Hydrograph Report

Pre INDUSTRIAL

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 2.811 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.23 hrs
Time Interval	= 1 min	Runoff Volume	= 12,697 cuft
Drainage Area	= 3.306 ac	Curve Number	= 81
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 2.66 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

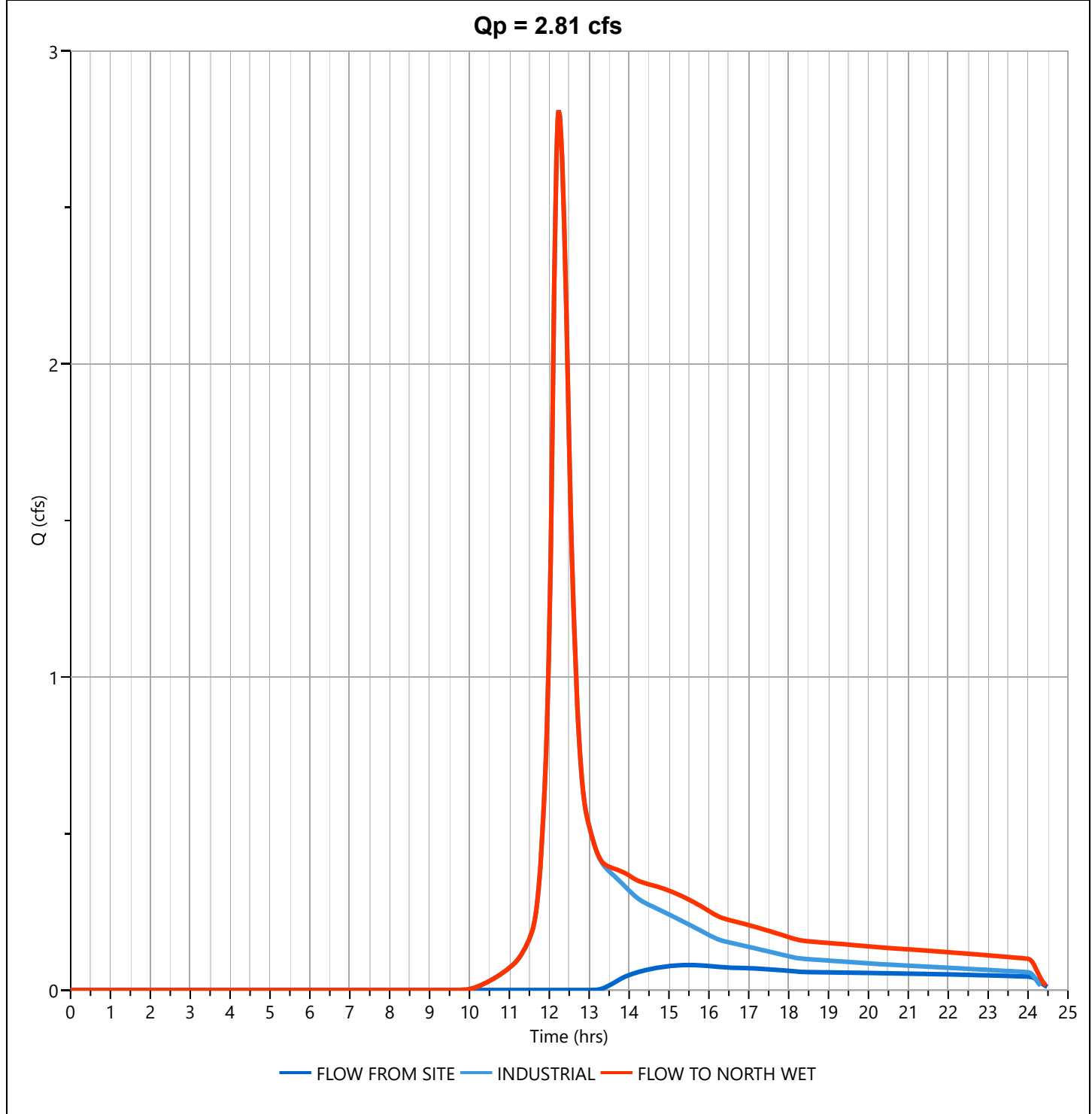


Hydrograph Report

Pre FLOW TO NORTH WET

Hyd. No. 3

Hydrograph Type	= Junction	Peak Flow	= 2.811 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.23 hrs
Time Interval	= 1 min	Hydrograph Volume	= 14,943 cuft
Inflow Hydrographs	= 1, 2	Total Contrib. Area	= 18.446 ac



Design Storm Report

Custom Storm filename:

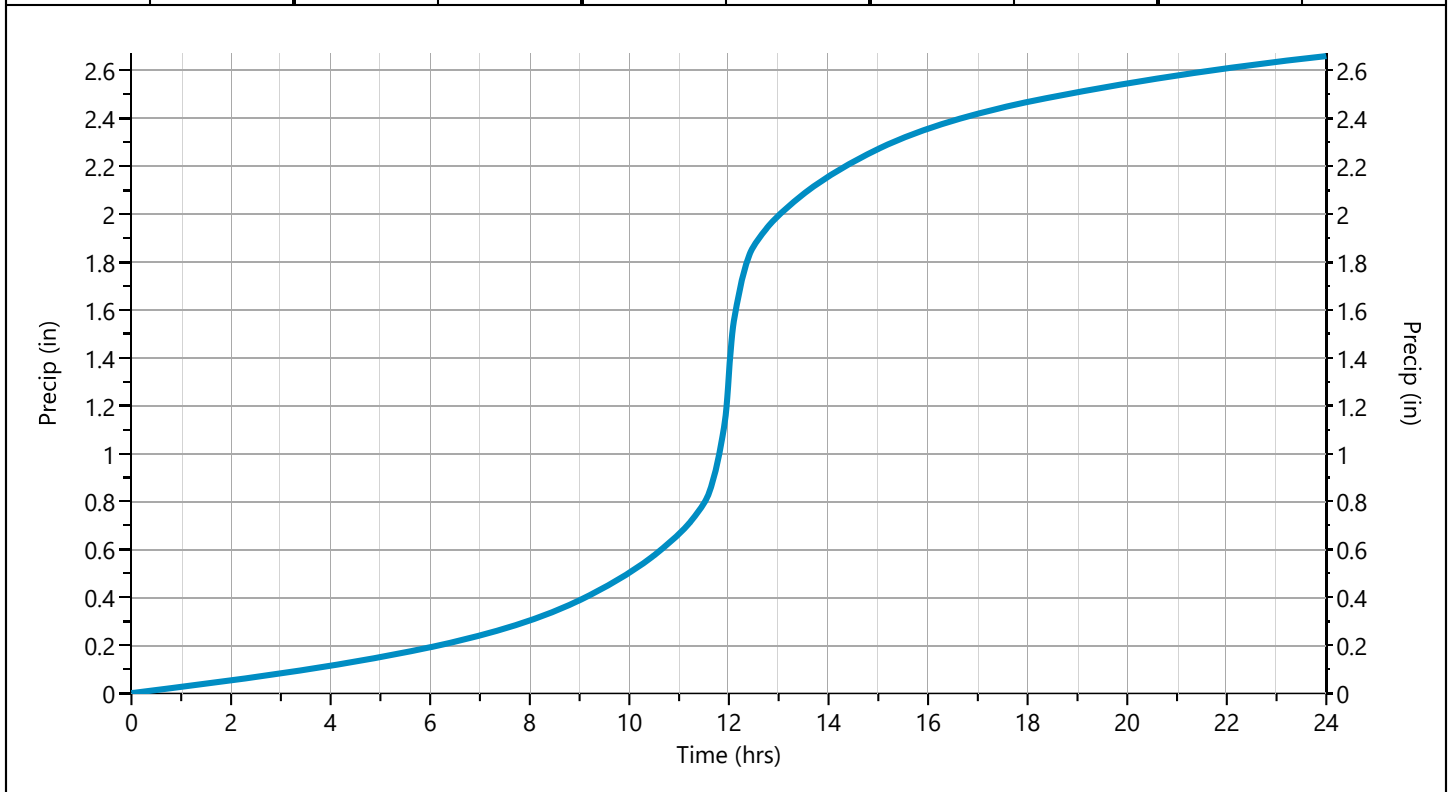
Hydrology Studio v 3.0.0.26

08-11-2022

Storm Distribution: NRCS/SCS - Type III, 24-hr

Storm Duration	Total Rainfall Volume (in)								
	✓ 1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
24 hrs	2.66	3.29	0.00	4.32	5.18	6.35	7.26	8.17	

Incremental Rainfall Distribution, 1-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.50	0.005242	11.68	0.012103	11.87	0.019255	12.05	0.039966	12.23	0.016004
11.52	0.005586	11.70	0.012753	11.88	0.019906	12.07	0.034513	12.25	0.015354
11.53	0.006251	11.72	0.013403	11.90	0.020556	12.08	0.029060	12.27	0.014704
11.55	0.006901	11.73	0.014054	11.92	0.023683	12.10	0.023607	12.28	0.014054
11.57	0.007551	11.75	0.014704	11.93	0.029061	12.12	0.020634	12.30	0.013404
11.58	0.008202	11.77	0.015354	11.95	0.034514	12.13	0.019906	12.32	0.012753
11.60	0.008852	11.78	0.016004	11.97	0.039967	12.15	0.019255	12.33	0.012103
11.62	0.009502	11.80	0.016655	11.98	0.045420	12.17	0.018605	12.35	0.011453
11.63	0.010152	11.82	0.017305	12.00	0.050873	12.18	0.017955	12.37	0.010803
11.65	0.010803	11.83	0.017955	12.02	0.050750	12.20	0.017305	12.38	0.010152
11.67	0.011453	11.85	0.018605	12.03	0.045419	12.22	0.016655	12.40	0.009502



Hydrograph 2-yr Summary

Project Name: MARION AVENUE PRE DEVELOPMENT

Hydrology Studio v 3.0.0.26

08-11-2022

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Pre FLOW FROM SITE	0.393	12.90	8,100	---		
2	NRCS Runoff	Pre INDUSTRIAL	4.162	12.23	18,483	---		
3	Junction	Pre FLOW TO NORTH WET	4.167	12.23	26,584	1, 2		

Hydrograph Report

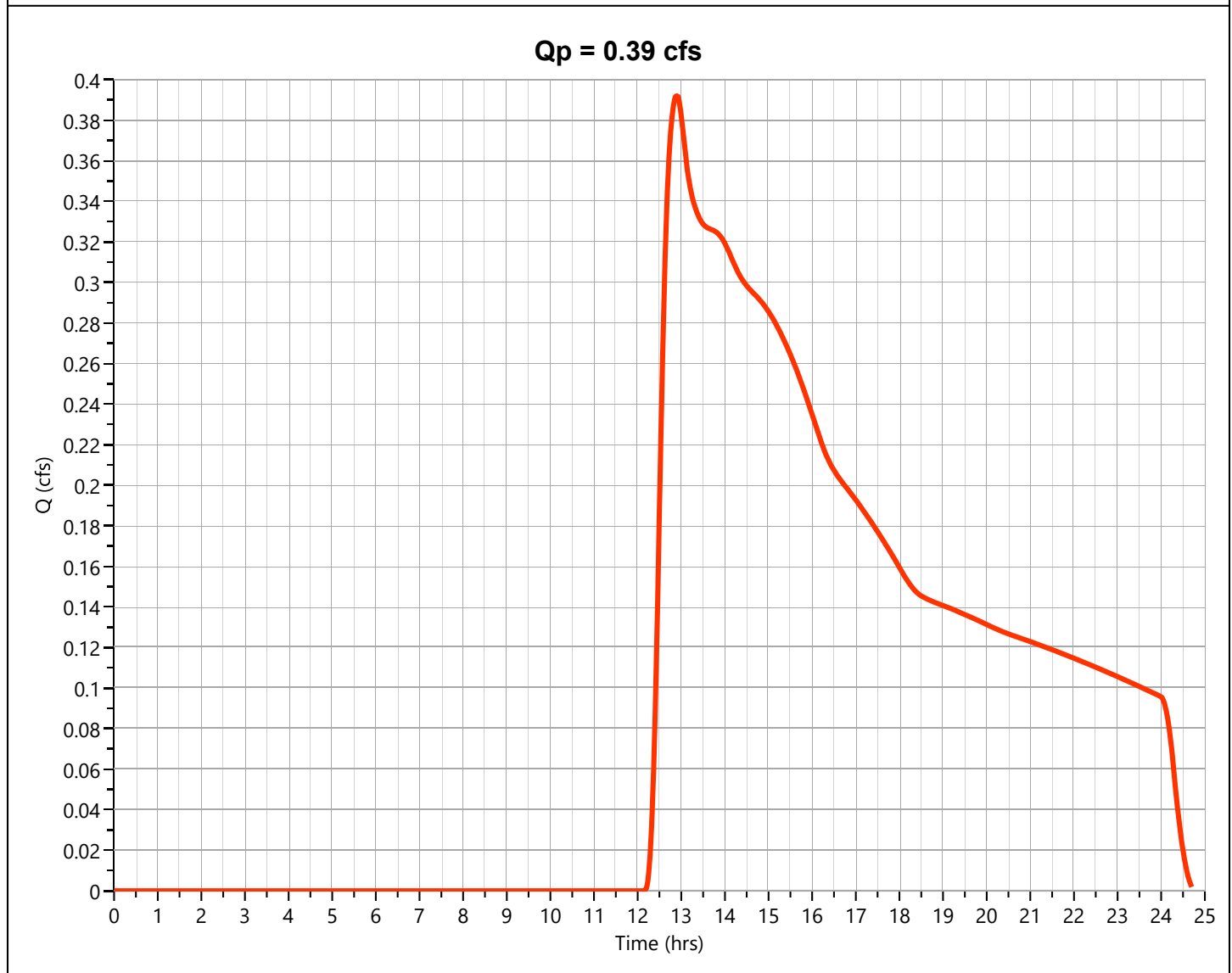
Pre FLOW FROM SITE

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.393 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.90 hrs
Time Interval	= 1 min	Runoff Volume	= 8,100 cuft
Drainage Area	= 15.14 ac	Curve Number	= 50*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 30.45 min
Total Rainfall	= 3.29 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
2.617	61	1/4 ACRE RES
0.805	54	1/2 ACRE RES
3.59	51	1 ACRE RES
8.128	45	WOODED
15.14	50	Weighted CN Method Employed

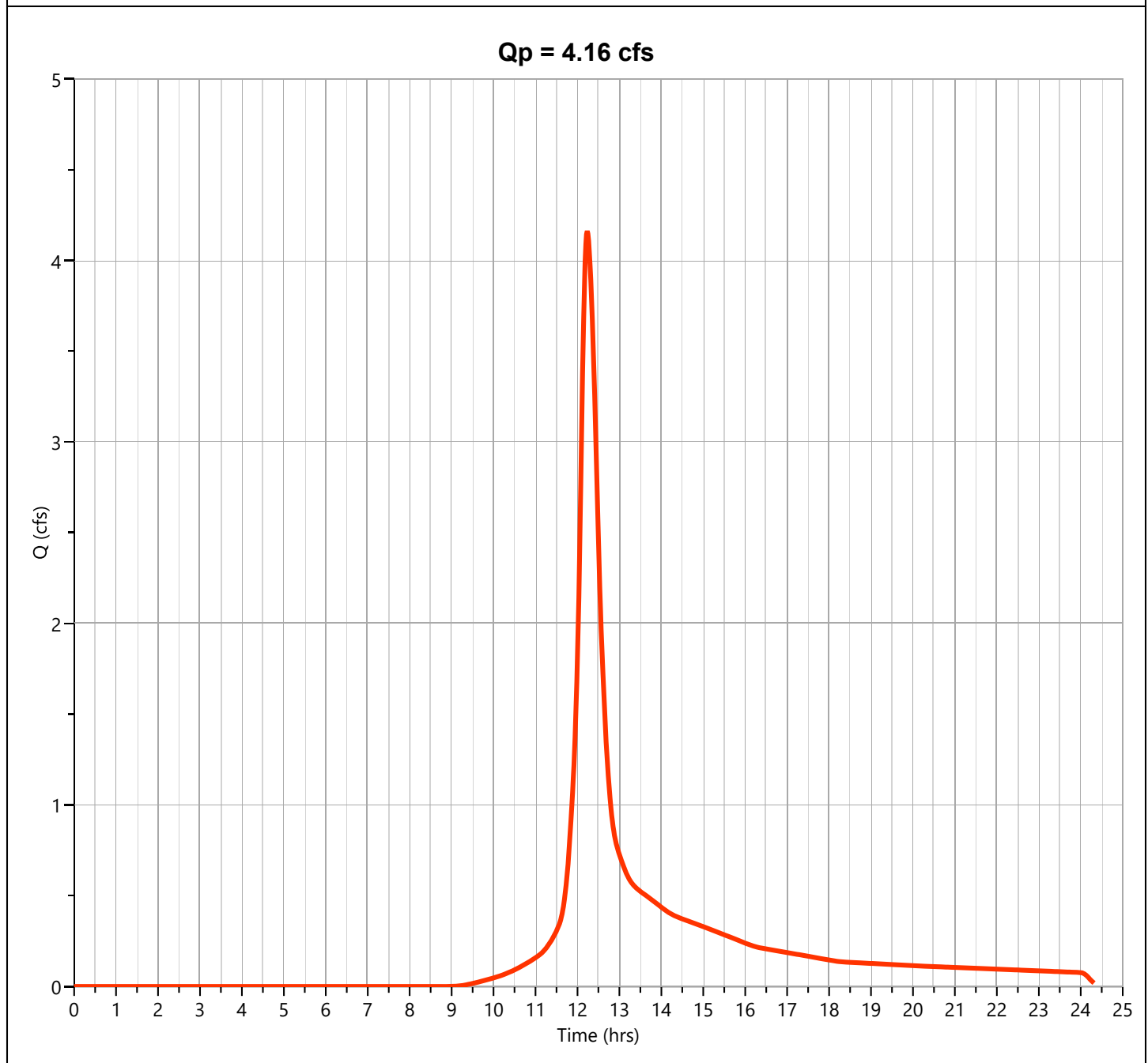


Hydrograph Report

Pre INDUSTRIAL

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 4.162 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.23 hrs
Time Interval	= 1 min	Runoff Volume	= 18,483 cuft
Drainage Area	= 3.306 ac	Curve Number	= 81
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 3.29 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

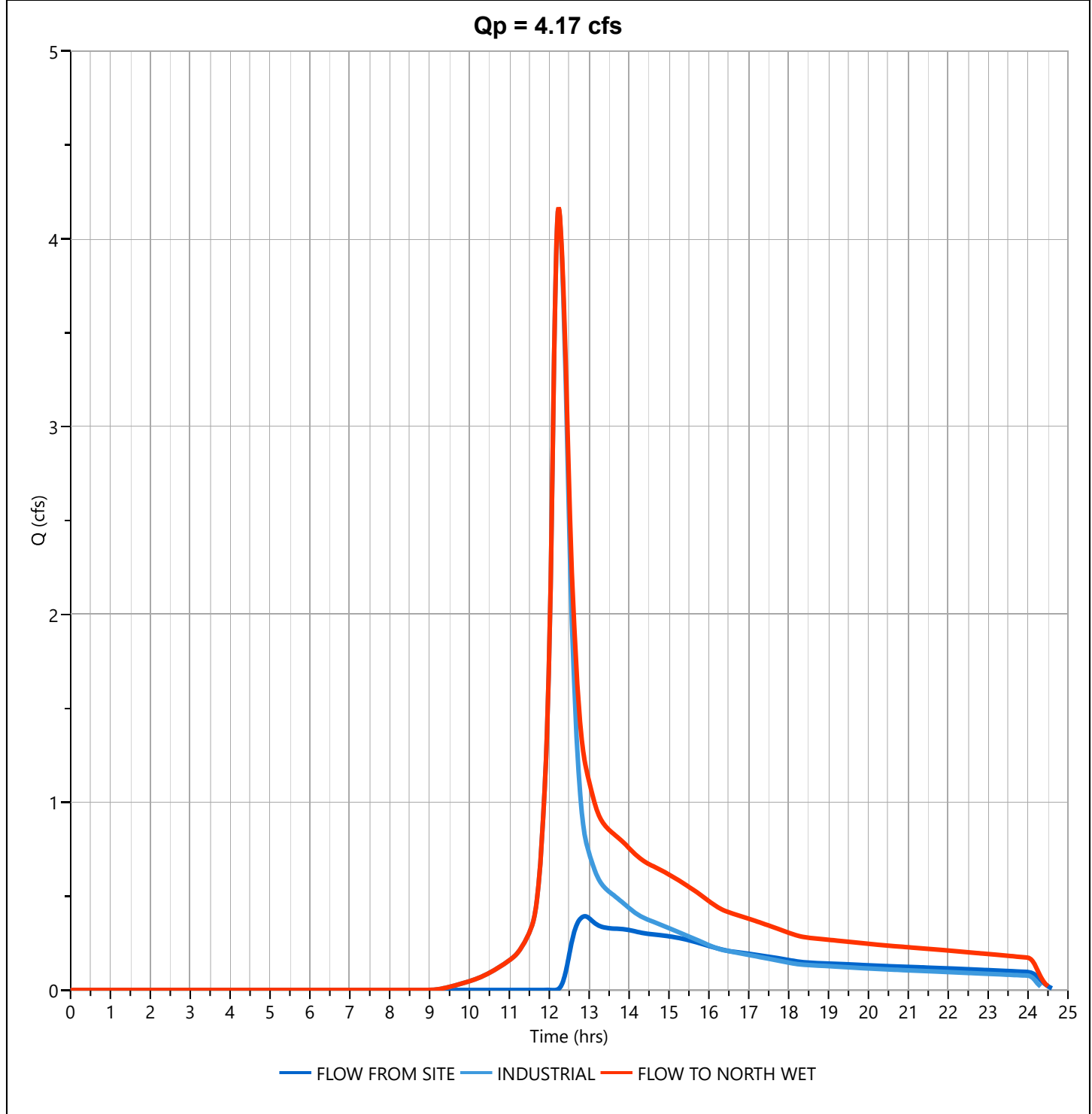


Hydrograph Report

Pre FLOW TO NORTH WET

Hyd. No. 3

Hydrograph Type	= Junction	Peak Flow	= 4.167 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.23 hrs
Time Interval	= 1 min	Hydrograph Volume	= 26,584 cuft
Inflow Hydrographs	= 1, 2	Total Contrib. Area	= 18.446 ac



Design Storm Report

Custom Storm filename:

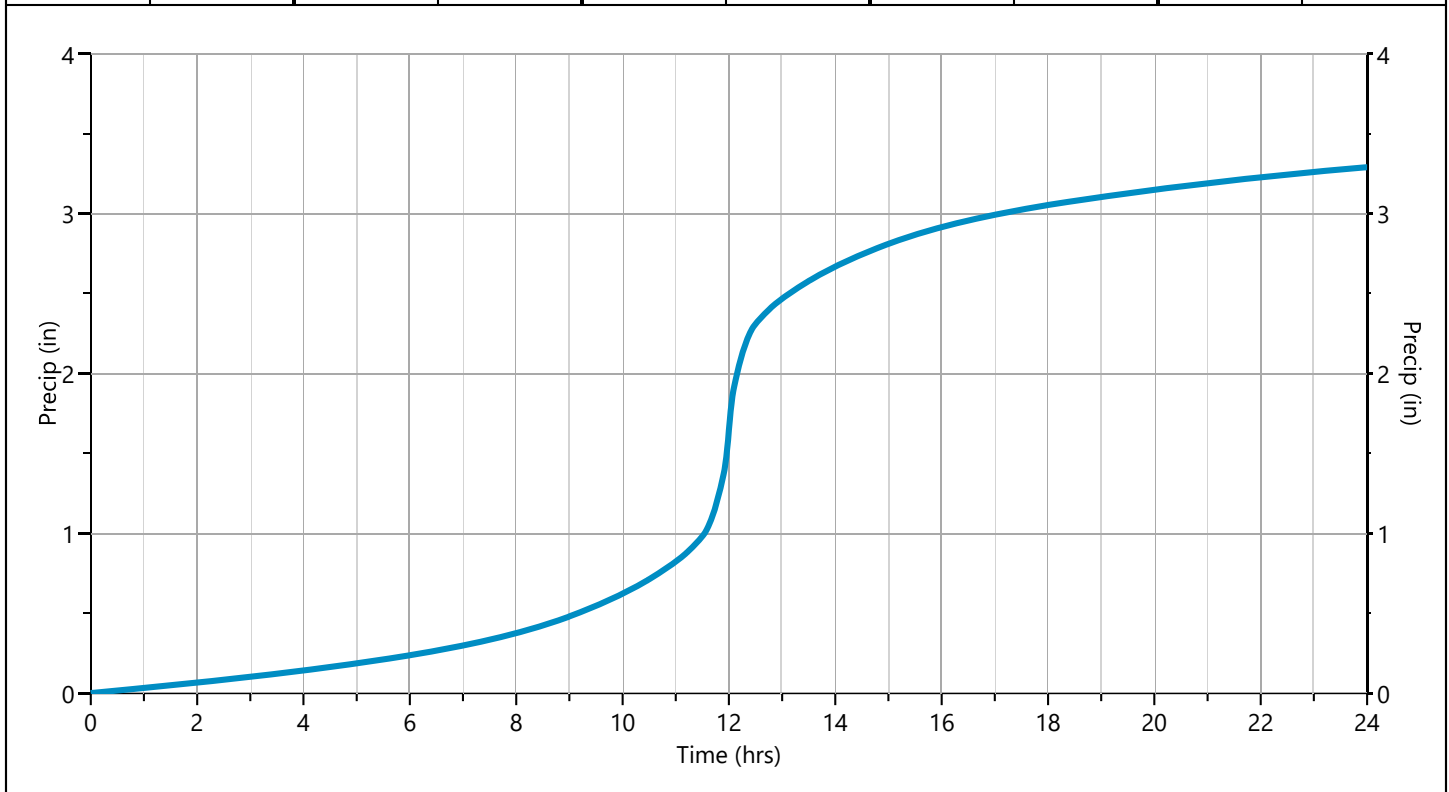
Hydrology Studio v 3.0.0.26

08-11-2022

Storm Distribution: NRCS/SCS - Type III, 24-hr

Storm Duration	Total Rainfall Volume (in)								
	1-yr	✓ 2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
24 hrs	2.66	3.29	0.00	4.32	5.18	6.35	7.26	8.17	

Incremental Rainfall Distribution, 2-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.50	0.006483	11.68	0.014969	11.87	0.023816	12.05	0.049432	12.23	0.019795
11.52	0.006909	11.70	0.015774	11.88	0.024620	12.07	0.042688	12.25	0.018991
11.53	0.007731	11.72	0.016578	11.90	0.025424	12.08	0.035943	12.27	0.018187
11.55	0.008536	11.73	0.017382	11.92	0.029293	12.10	0.029198	12.28	0.017382
11.57	0.009340	11.75	0.018186	11.93	0.035943	12.12	0.025521	12.30	0.016578
11.58	0.010144	11.77	0.018991	11.95	0.042688	12.13	0.024620	12.32	0.015774
11.60	0.010948	11.78	0.019795	11.97	0.049432	12.15	0.023816	12.33	0.014969
11.62	0.011752	11.80	0.020599	11.98	0.056177	12.17	0.023012	12.35	0.014165
11.63	0.012557	11.82	0.021403	12.00	0.062922	12.18	0.022208	12.37	0.013361
11.65	0.013361	11.83	0.022208	12.02	0.062770	12.20	0.021403	12.38	0.012557
11.67	0.014165	11.85	0.023012	12.03	0.056177	12.22	0.020599	12.40	0.011753



Hydrograph 5-yr Summary

Project Name: MARION AVENUE PRE DEVELOPMENT

Hydrology Studio v 3.0.0.26

08-11-2022

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Pre FLOW FROM SITE	2.594	12.58	24,010	---		
2	NRCS Runoff	Pre INDUSTRIAL	6.510	12.23	28,719	---		
3	Junction	Pre FLOW TO NORTH WET	7.585	12.30	52,730	1, 2		

Hydrograph Report

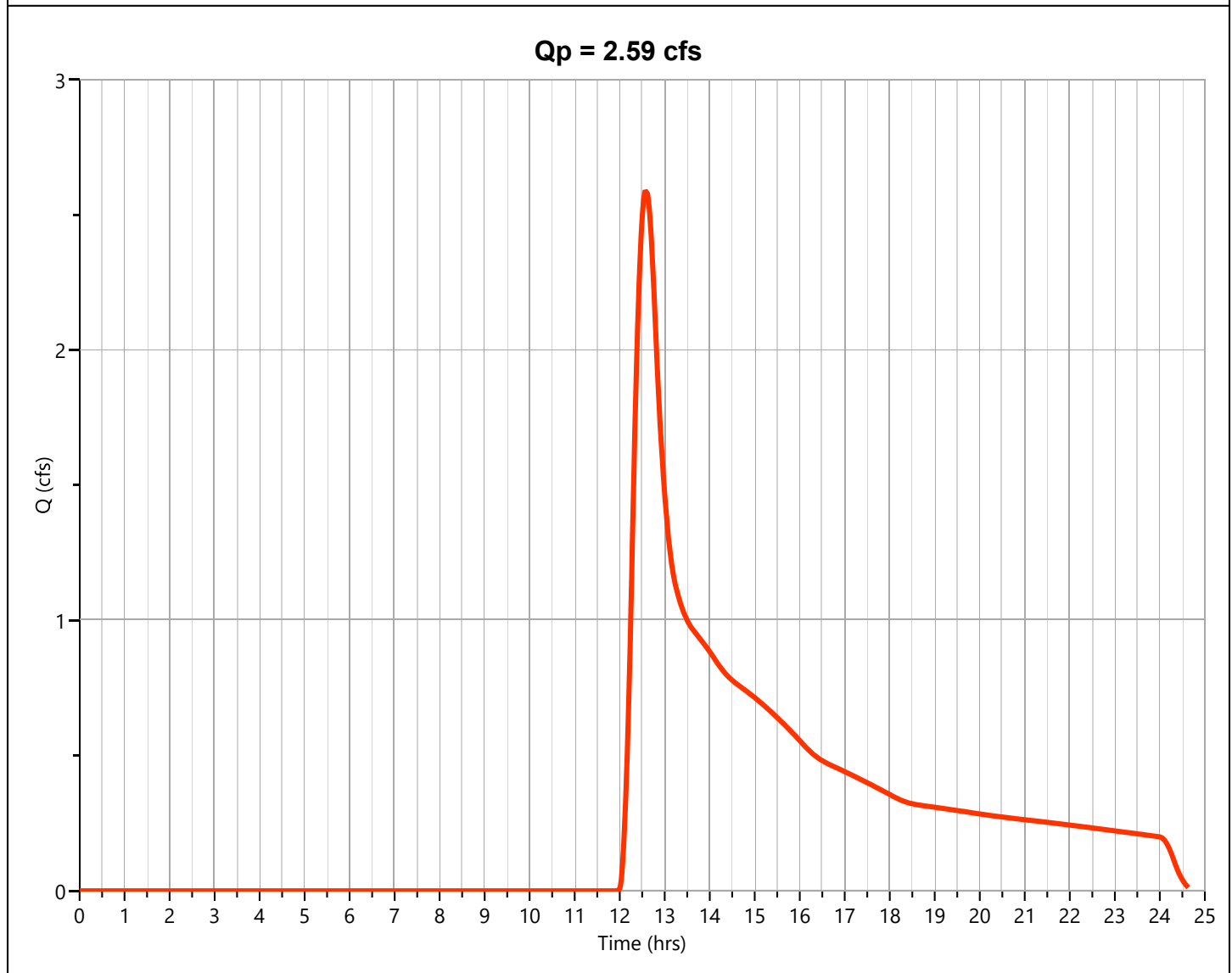
Pre FLOW FROM SITE

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 2.594 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.58 hrs
Time Interval	= 1 min	Runoff Volume	= 24,010 cuft
Drainage Area	= 15.14 ac	Curve Number	= 50*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 30.45 min
Total Rainfall	= 4.32 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
2.617	61	1/4 ACRE RES
0.805	54	1/2 ACRE RES
3.59	51	1 ACRE RES
8.128	45	WOODED
15.14	50	Weighted CN Method Employed

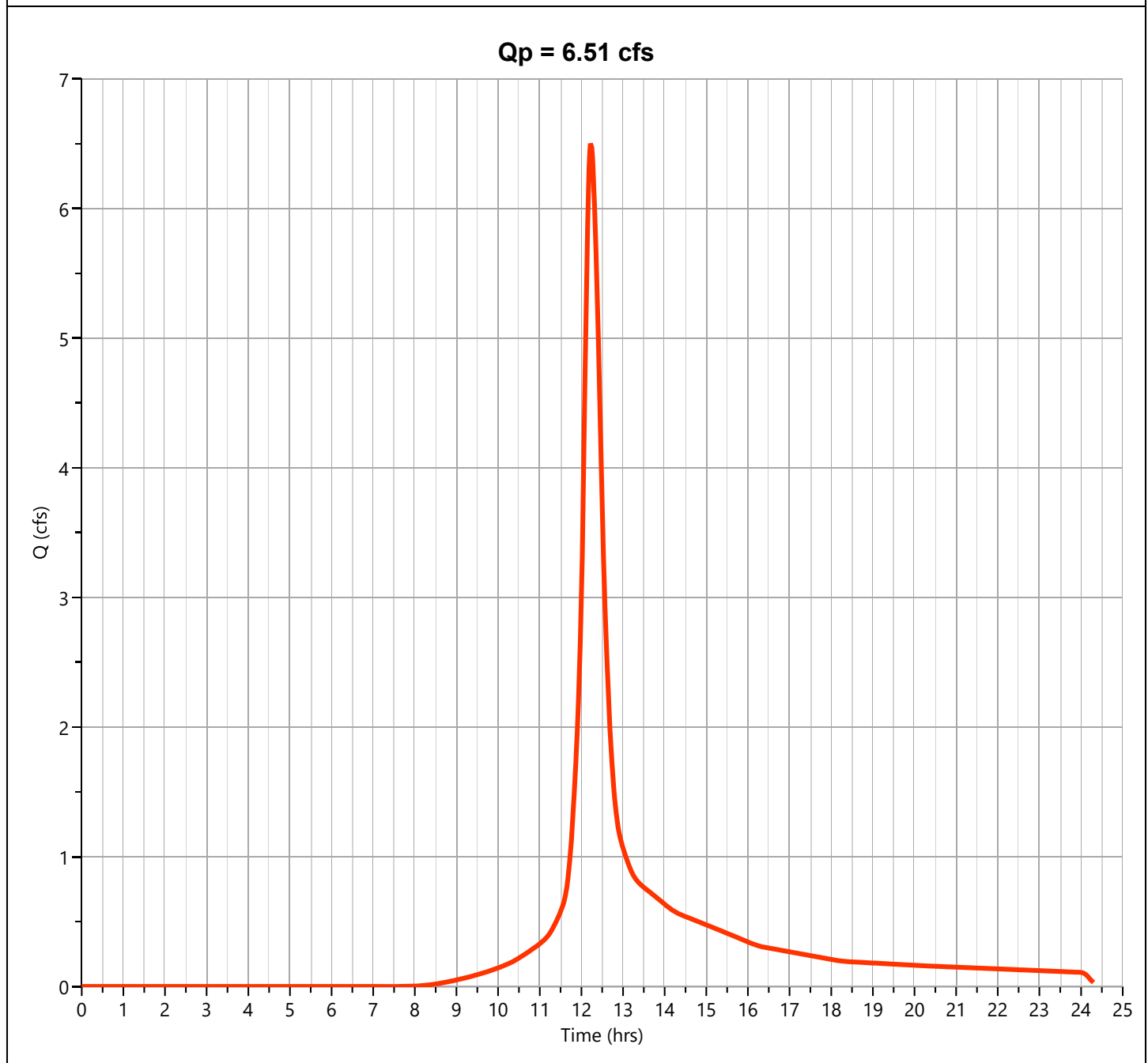


Hydrograph Report

Pre INDUSTRIAL

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 6.510 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.23 hrs
Time Interval	= 1 min	Runoff Volume	= 28,719 cuft
Drainage Area	= 3.306 ac	Curve Number	= 81
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 4.32 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

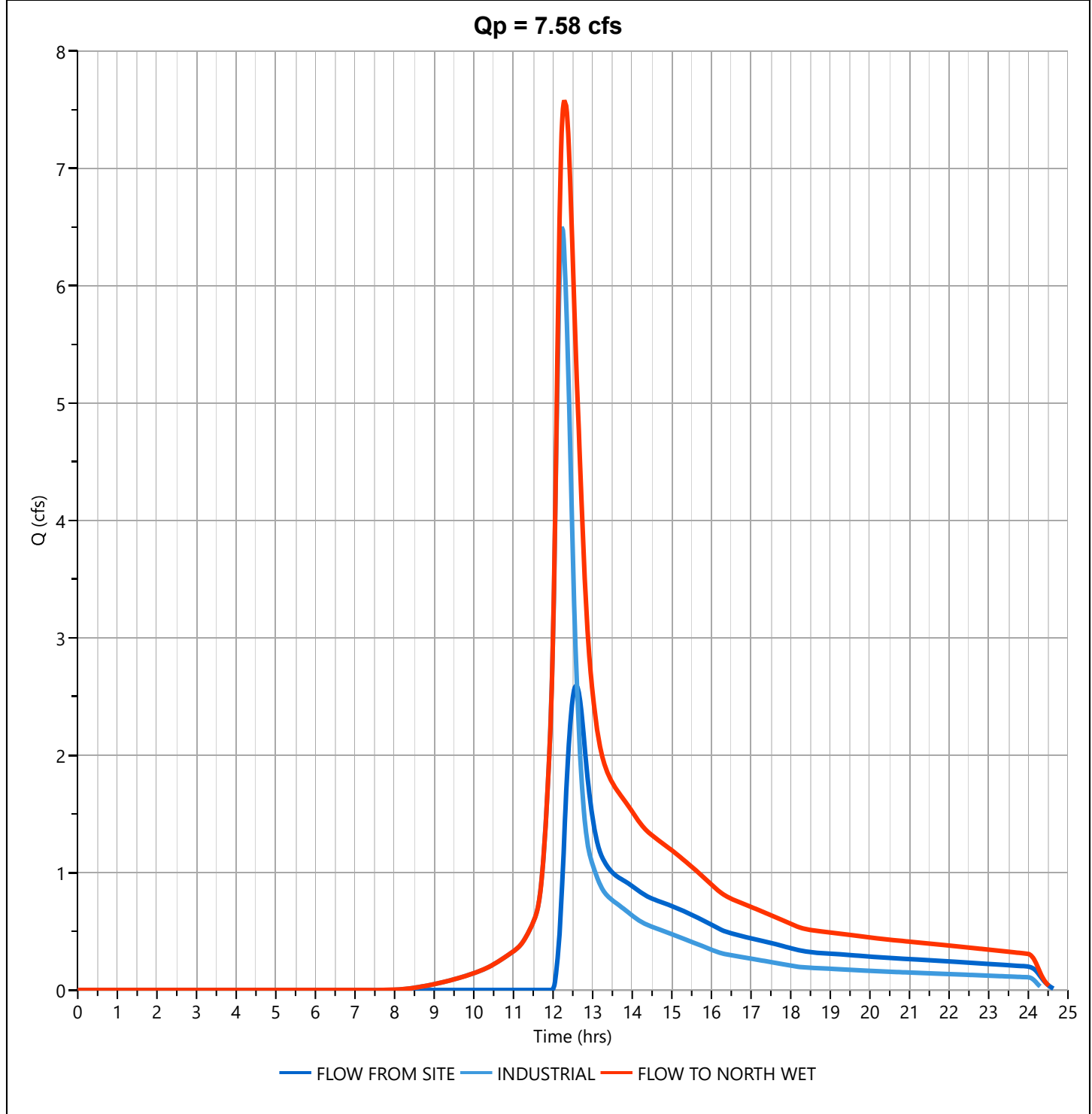


Hydrograph Report

Pre FLOW TO NORTH WET

Hyd. No. 3

Hydrograph Type	= Junction	Peak Flow	= 7.585 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.30 hrs
Time Interval	= 1 min	Hydrograph Volume	= 52,730 cuft
Inflow Hydrographs	= 1, 2	Total Contrib. Area	= 18.446 ac



Design Storm Report

Custom Storm filename:

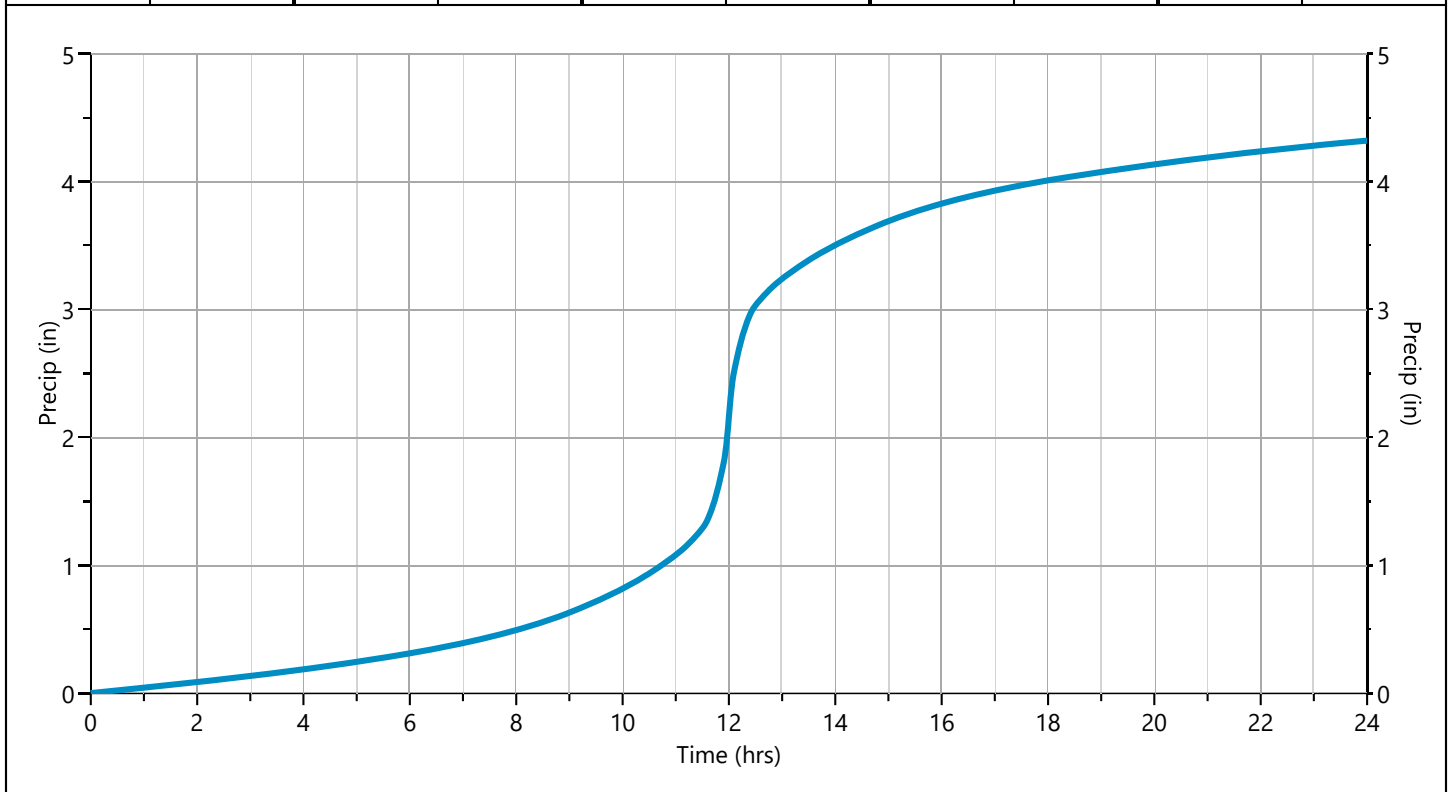
Hydrology Studio v 3.0.0.26

08-11-2022

Storm Distribution: NRCS/SCS - Type III, 24-hr

Storm Duration	Total Rainfall Volume (in)							
	1-yr	2-yr	3-yr	✓ 5-yr	10-yr	25-yr	50-yr	100-yr
24 hrs	2.66	3.29	0.00	4.32	5.18	6.35	7.26	8.17

Incremental Rainfall Distribution, 5-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.50	0.008513	11.68	0.019656	11.87	0.031272	12.05	0.064908	12.23	0.025992
11.52	0.009072	11.70	0.020712	11.88	0.032328	12.07	0.056052	12.25	0.024936
11.53	0.010152	11.72	0.021768	11.90	0.033384	12.08	0.047196	12.27	0.023880
11.55	0.011208	11.73	0.022824	11.92	0.038463	12.10	0.038340	12.28	0.022824
11.57	0.012264	11.75	0.023880	11.93	0.047196	12.12	0.033511	12.30	0.021768
11.58	0.013320	11.77	0.024936	11.95	0.056052	12.13	0.032328	12.32	0.020712
11.60	0.014376	11.78	0.025992	11.97	0.064908	12.15	0.031272	12.33	0.019656
11.62	0.015432	11.80	0.027048	11.98	0.073764	12.17	0.030216	12.35	0.018600
11.63	0.016488	11.82	0.028104	12.00	0.082620	12.18	0.029160	12.37	0.017544
11.65	0.017544	11.83	0.029160	12.02	0.082422	12.20	0.028104	12.38	0.016488
11.67	0.018600	11.85	0.030216	12.03	0.073764	12.22	0.027048	12.40	0.015432



Hydrograph 10-yr Summary

Project Name: MARION AVENUE PRE DEVELOPMENT

Hydrology Studio v 3.0.0.26

08-11-2022

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Pre FLOW FROM SITE	5.785	12.52	42,167	---		
2	NRCS Runoff	Pre INDUSTRIAL	8.542	12.22	37,741	---		
3	Junction	Pre FLOW TO NORTH WET	12.43	12.32	79,908	1, 2		

Hydrograph Report

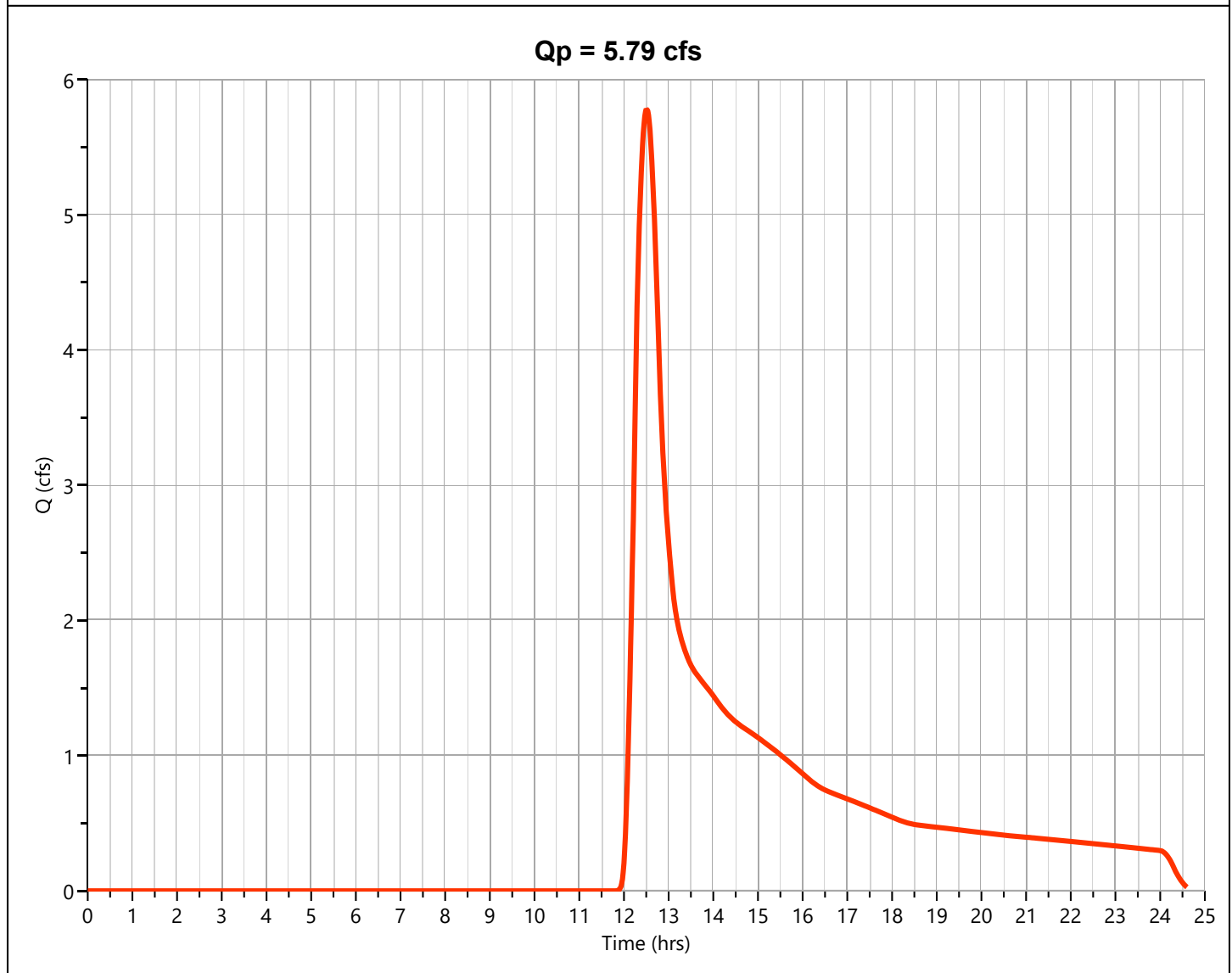
Pre FLOW FROM SITE

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 5.785 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.52 hrs
Time Interval	= 1 min	Runoff Volume	= 42,167 cuft
Drainage Area	= 15.14 ac	Curve Number	= 50*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 30.45 min
Total Rainfall	= 5.18 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
2.617	61	1/4 ACRE RES
0.805	54	1/2 ACRE RES
3.59	51	1 ACRE RES
8.128	45	WOODED
15.14	50	Weighted CN Method Employed

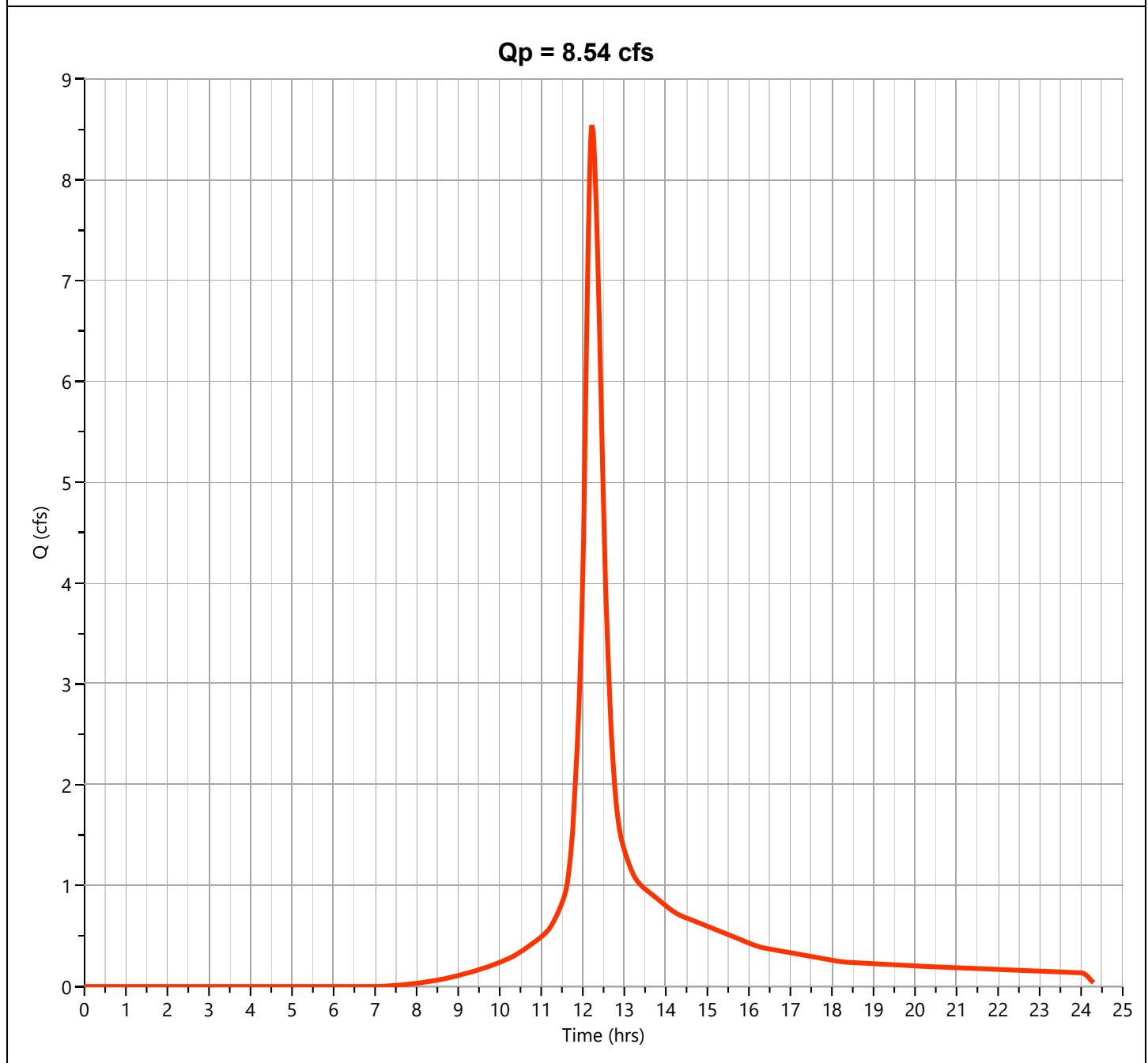


Hydrograph Report

Pre INDUSTRIAL

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 8.542 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.22 hrs
Time Interval	= 1 min	Runoff Volume	= 37,741 cuft
Drainage Area	= 3.306 ac	Curve Number	= 81
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 5.18 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

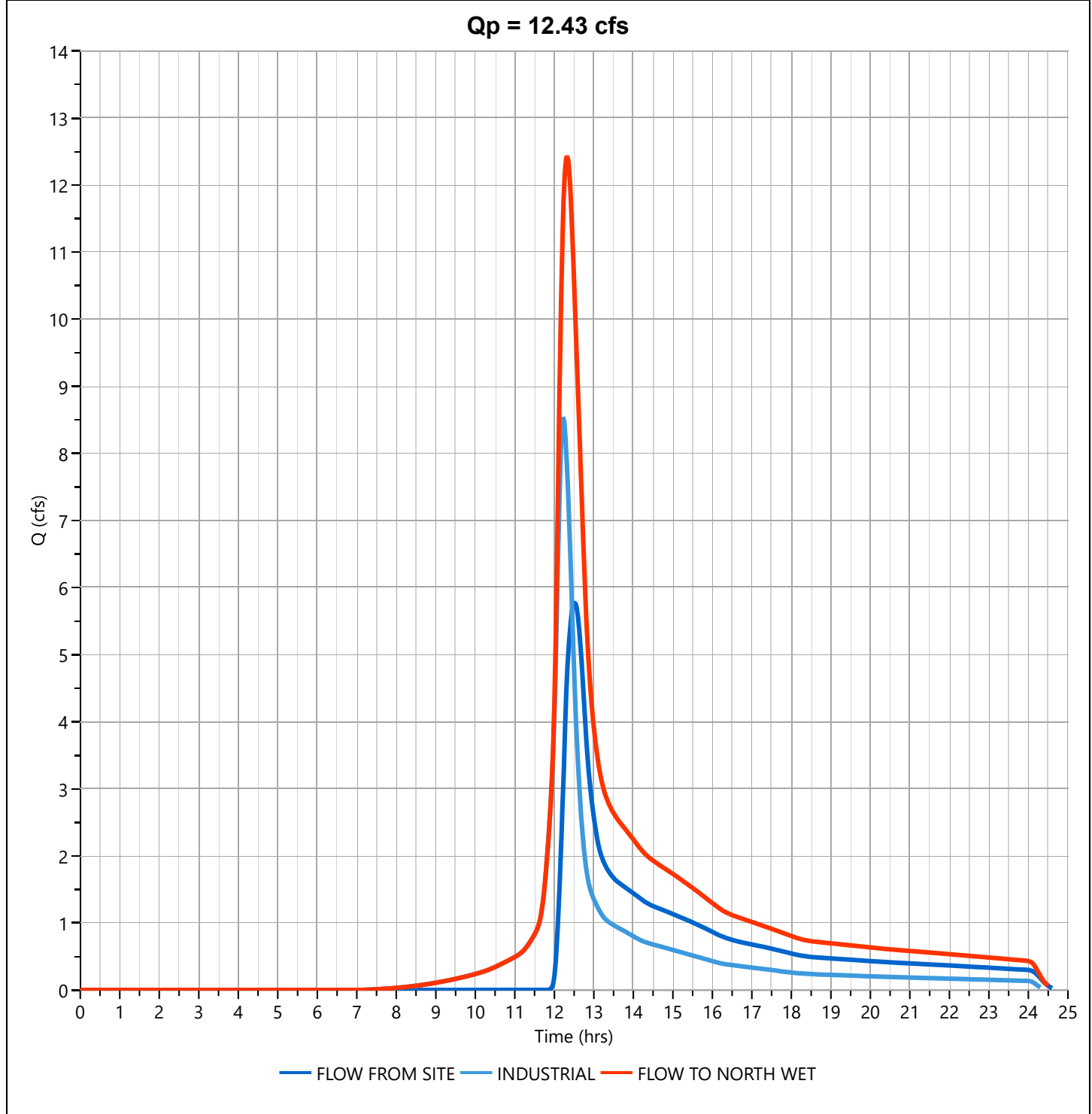


Hydrograph Report

Pre FLOW TO NORTH WET

Hyd. No. 3

Hydrograph Type	= Junction	Peak Flow	= 12.43 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.32 hrs
Time Interval	= 1 min	Hydrograph Volume	= 79,908 cuft
Inflow Hydrographs	= 1, 2	Total Contrib. Area	= 18.446 ac



Design Storm Report

Custom Storm filename:

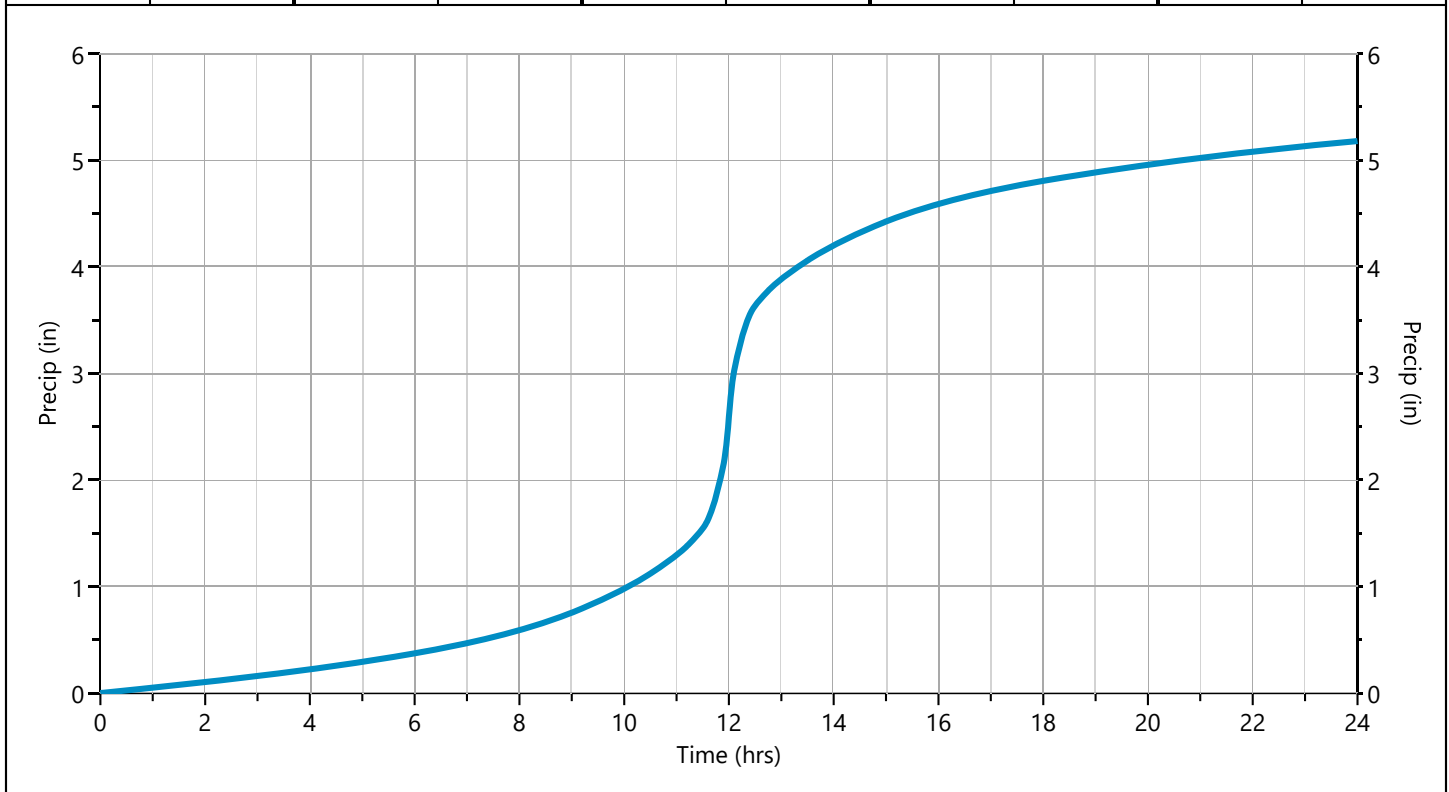
Hydrology Studio v 3.0.0.26

08-11-2022

Storm Distribution: NRCS/SCS - Type III, 24-hr

Storm Duration	Total Rainfall Volume (in)								
	1-yr	2-yr	3-yr	5-yr	✓ 10-yr	25-yr	50-yr	100-yr	
24 hrs	2.66	3.29	0.00	4.32	5.18	6.35	7.26	8.17	

Incremental Rainfall Distribution, 10-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.50	0.010207	11.68	0.023569	11.87	0.037498	12.05	0.077829	12.23	0.031166
11.52	0.010877	11.70	0.024835	11.88	0.038764	12.07	0.067210	12.25	0.029900
11.53	0.012173	11.72	0.026101	11.90	0.040030	12.08	0.056591	12.27	0.028634
11.55	0.013439	11.73	0.027368	11.92	0.046120	12.10	0.045972	12.28	0.027368
11.57	0.014705	11.75	0.028634	11.93	0.056592	12.12	0.040182	12.30	0.026101
11.58	0.015972	11.77	0.029900	11.95	0.067211	12.13	0.038764	12.32	0.024835
11.60	0.017238	11.78	0.031166	11.97	0.077830	12.15	0.037498	12.33	0.023569
11.62	0.018504	11.80	0.032432	11.98	0.088449	12.17	0.036231	12.35	0.022303
11.63	0.019770	11.82	0.033699	12.00	0.099068	12.18	0.034965	12.37	0.021037
11.65	0.021037	11.83	0.034965	12.02	0.098830	12.20	0.033699	12.38	0.019770
11.67	0.022303	11.85	0.036231	12.03	0.088448	12.22	0.032433	12.40	0.018504



Hydrograph 25-yr Summary

Project Name: MARION AVENUE PRE DEVELOPMENT

Hydrology Studio v 3.0.0.26

08-11-2022

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Pre FLOW FROM SITE	11.59	12.45	72,470	---		
2	NRCS Runoff	Pre INDUSTRIAL	11.37	12.22	50,452	---		
3	Junction	Pre FLOW TO NORTH WET	20.83	12.32	122,922	1, 2		

Hydrograph Report

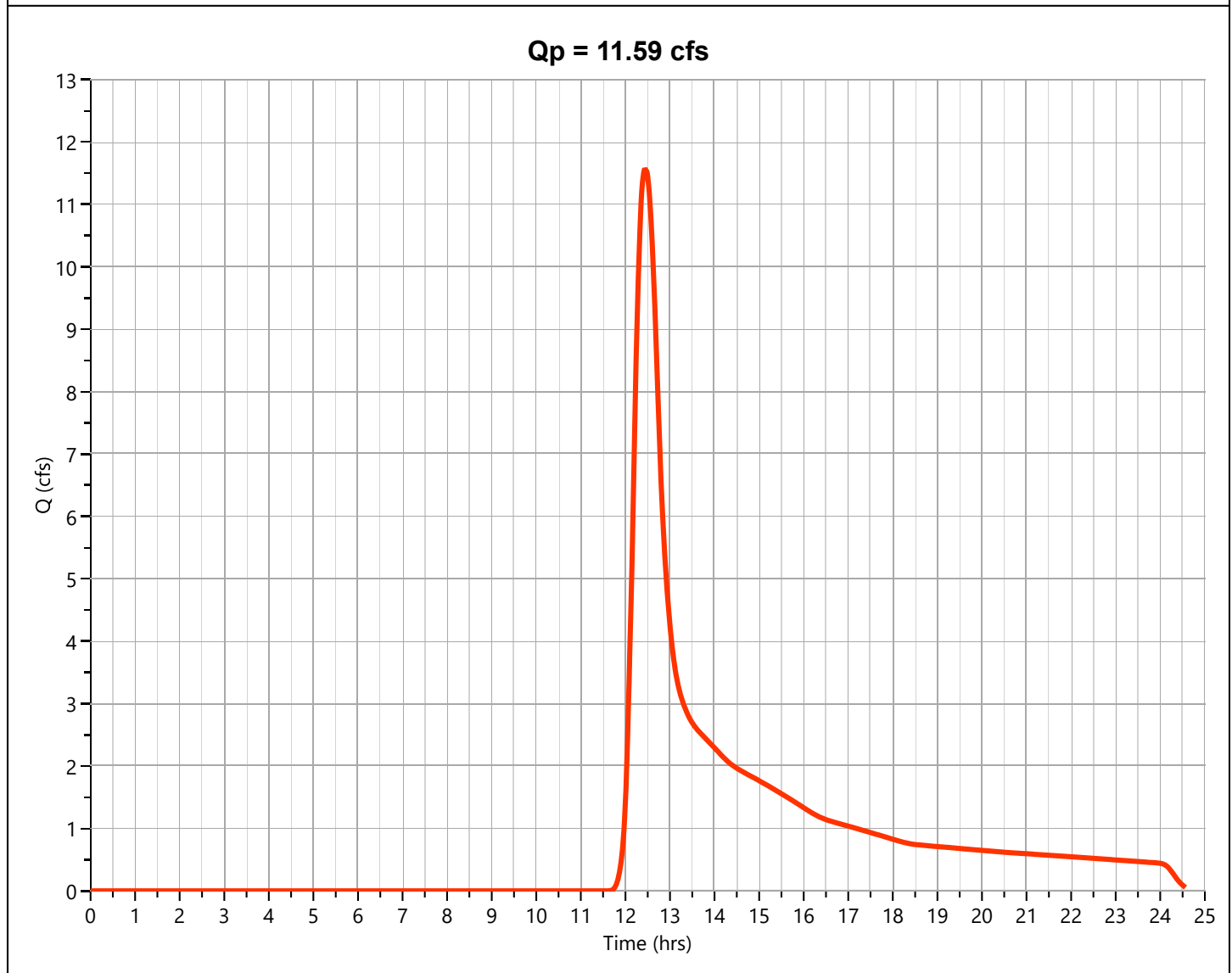
Pre FLOW FROM SITE

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 11.59 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.45 hrs
Time Interval	= 1 min	Runoff Volume	= 72,470 cuft
Drainage Area	= 15.14 ac	Curve Number	= 50*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 30.45 min
Total Rainfall	= 6.35 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
2.617	61	1/4 ACRE RES
0.805	54	1/2 ACRE RES
3.59	51	1 ACRE RES
8.128	45	WOODED
15.14	50	Weighted CN Method Employed

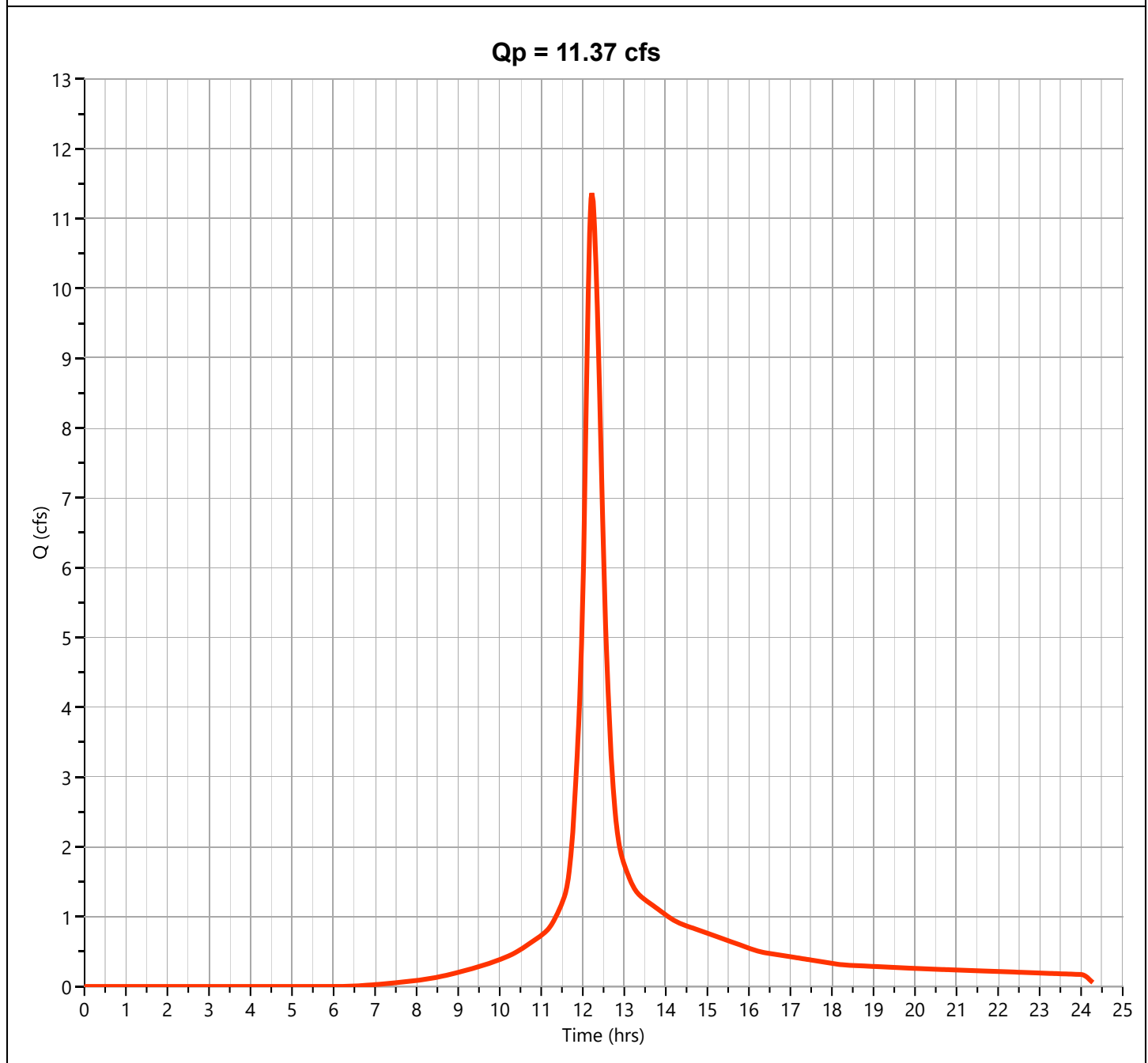


Hydrograph Report

Pre INDUSTRIAL

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 11.37 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.22 hrs
Time Interval	= 1 min	Runoff Volume	= 50,452 cuft
Drainage Area	= 3.306 ac	Curve Number	= 81
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 6.35 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

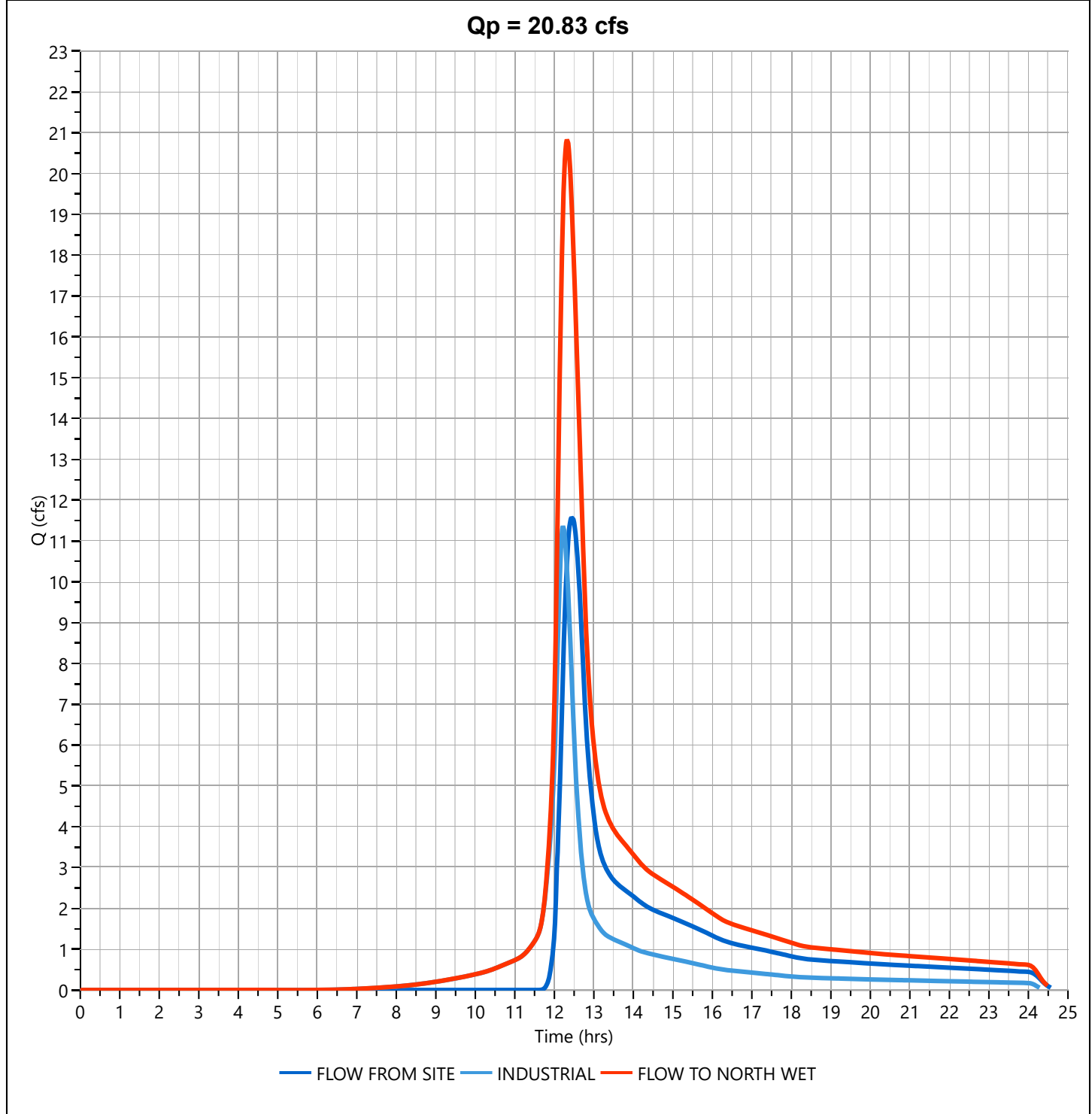


Hydrograph Report

Pre FLOW TO NORTH WET

Hyd. No. 3

Hydrograph Type	= Junction	Peak Flow	= 20.83 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.32 hrs
Time Interval	= 1 min	Hydrograph Volume	= 122,922 cuft
Inflow Hydrographs	= 1, 2	Total Contrib. Area	= 18.446 ac



Design Storm Report

Custom Storm filename:

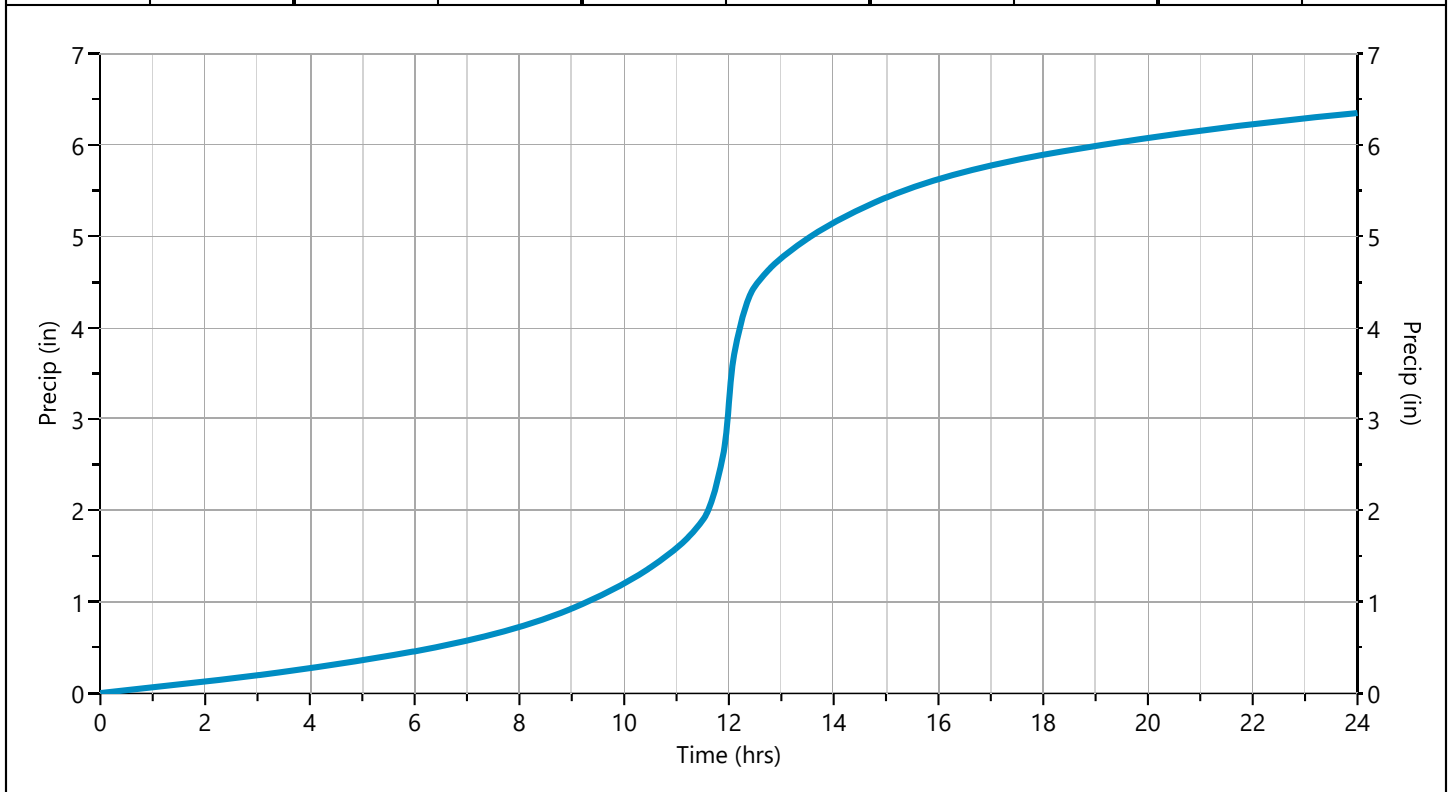
Hydrology Studio v 3.0.0.26

08-11-2022

Storm Distribution: NRCS/SCS - Type III, 24-hr

Storm Duration	Total Rainfall Volume (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	✓ 25-yr	50-yr	100-yr
24 hrs	2.66	3.29	0.00	4.32	5.18	6.35	7.26	8.17

Incremental Rainfall Distribution, 25-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.50	0.012513	11.68	0.028893	11.87	0.045967	12.05	0.095408	12.23	0.038206
11.52	0.013334	11.70	0.030445	11.88	0.047519	12.07	0.082391	12.25	0.036654
11.53	0.014922	11.72	0.031997	11.90	0.049071	12.08	0.069373	12.27	0.035101
11.55	0.016475	11.73	0.033549	11.92	0.056537	12.10	0.056356	12.28	0.033549
11.57	0.018027	11.75	0.035101	11.93	0.069374	12.12	0.049258	12.30	0.031997
11.58	0.019579	11.77	0.036654	11.95	0.082392	12.13	0.047519	12.32	0.030445
11.60	0.021131	11.78	0.038206	11.97	0.095409	12.15	0.045967	12.33	0.028893
11.62	0.022684	11.80	0.039758	11.98	0.108427	12.17	0.044415	12.35	0.027340
11.63	0.024236	11.82	0.041310	12.00	0.121444	12.18	0.042862	12.37	0.025788
11.65	0.025788	11.83	0.042862	12.02	0.121153	12.20	0.041310	12.38	0.024236
11.67	0.027340	11.85	0.044415	12.03	0.108426	12.22	0.039758	12.40	0.022684



Hydrograph 50-yr Summary

Project Name: MARION AVENUE PRE DEVELOPMENT

Hydrology Studio v 3.0.0.26

08-11-2022

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Pre FLOW FROM SITE	16.92	12.42	99,644	---		
2	NRCS Runoff	Pre INDUSTRIAL	13.58	12.22	60,573	---		
3	Junction	Pre FLOW TO NORTH WET	28.24	12.32	160,217	1, 2		

Hydrograph Report

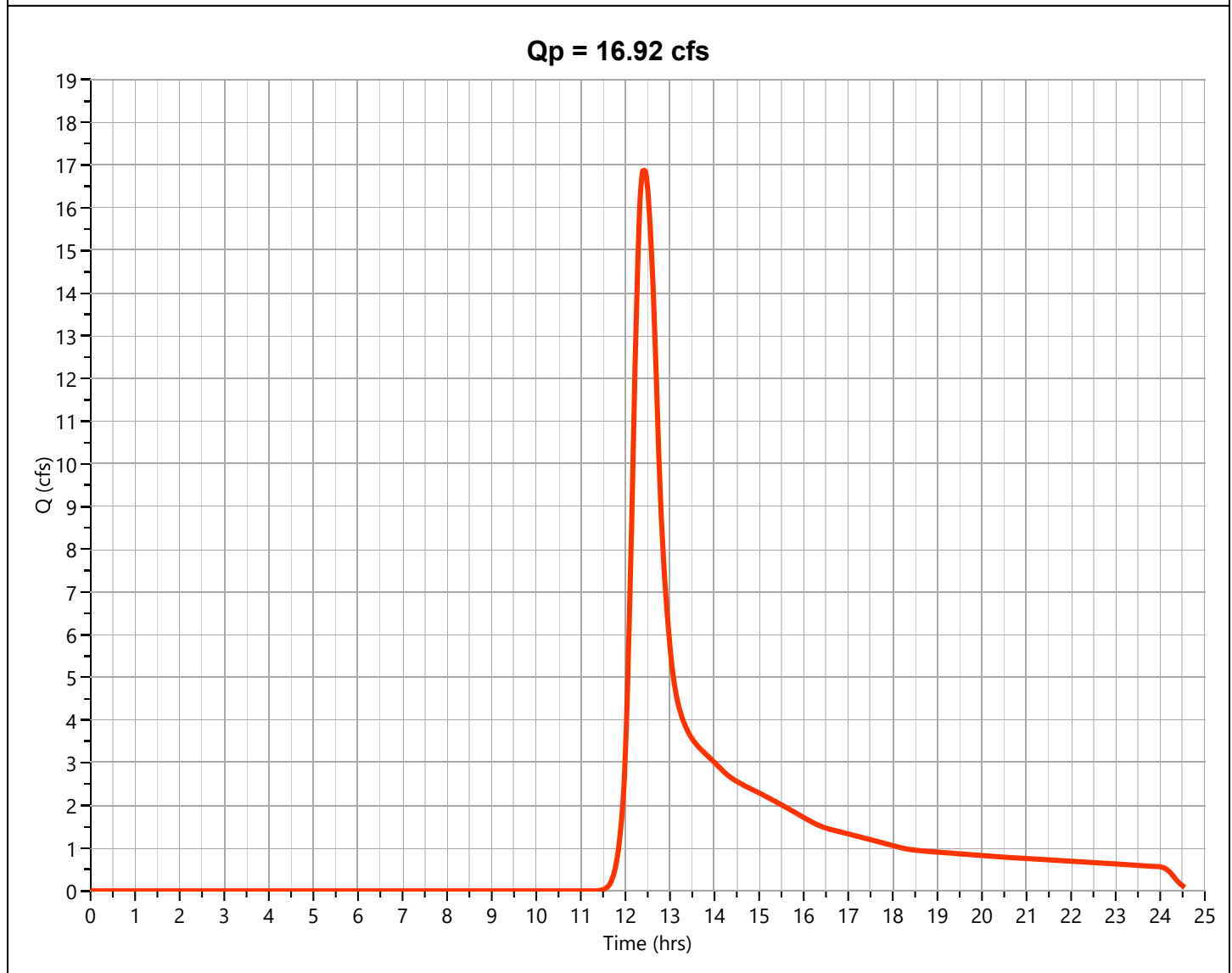
Pre FLOW FROM SITE

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 16.92 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.42 hrs
Time Interval	= 1 min	Runoff Volume	= 99,644 cuft
Drainage Area	= 15.14 ac	Curve Number	= 50*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 30.45 min
Total Rainfall	= 7.26 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
2.617	61	1/4 ACRE RES
0.805	54	1/2 ACRE RES
3.59	51	1 ACRE RES
8.128	45	WOODED
15.14	50	Weighted CN Method Employed

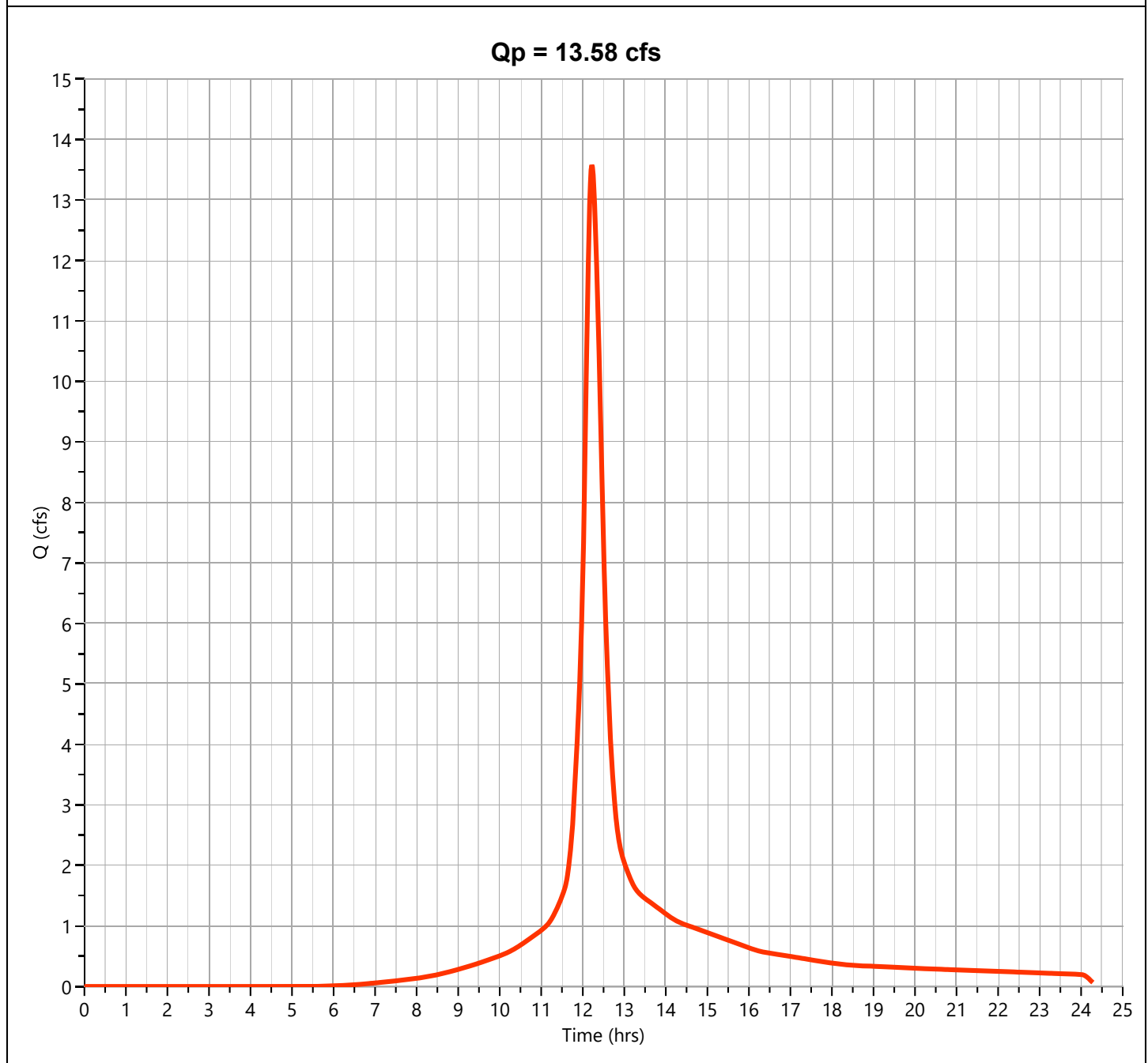


Hydrograph Report

Pre INDUSTRIAL

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 13.58 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.22 hrs
Time Interval	= 1 min	Runoff Volume	= 60,573 cuft
Drainage Area	= 3.306 ac	Curve Number	= 81
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 7.26 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

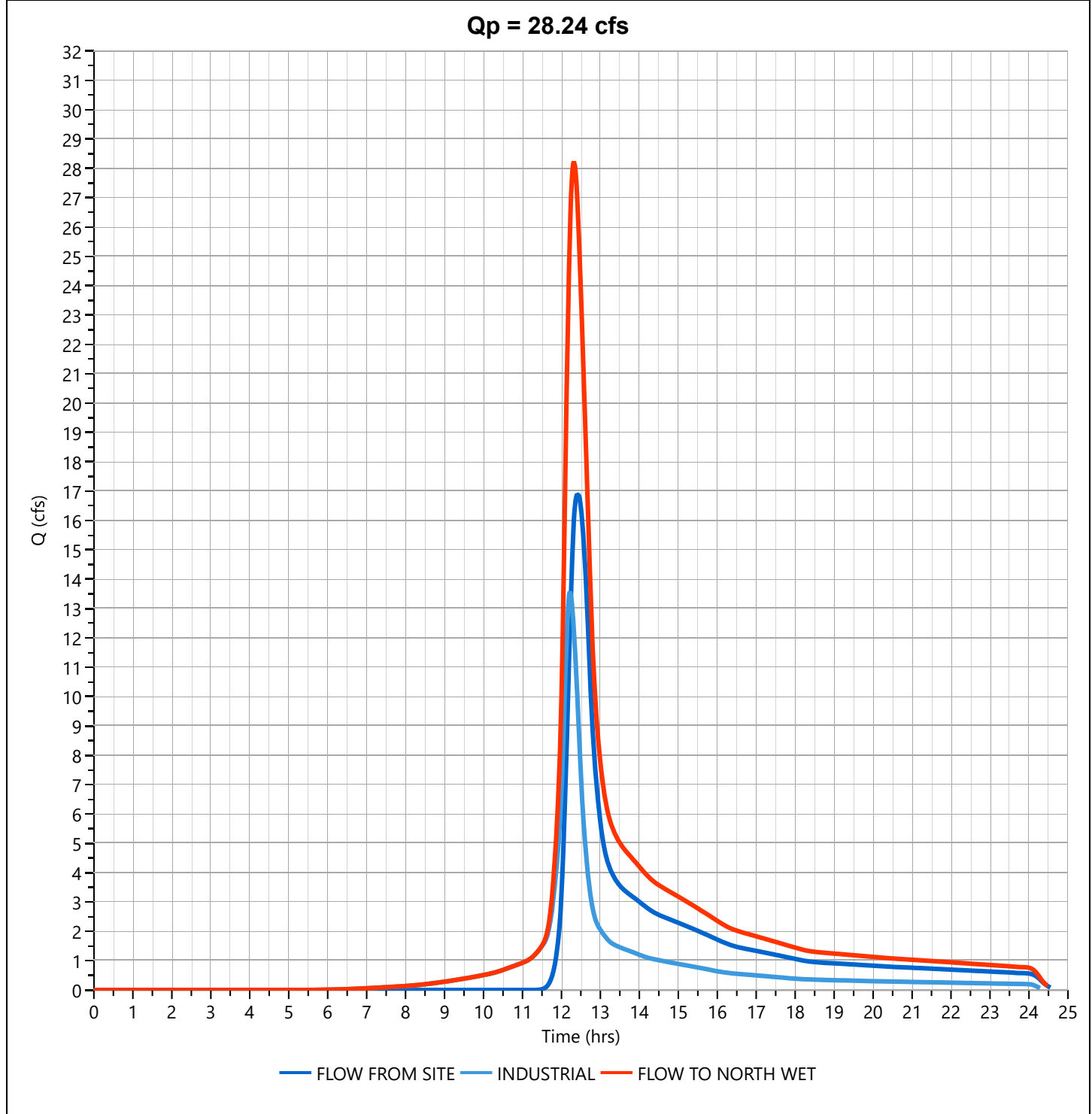


Hydrograph Report

Pre FLOW TO NORTH WET

Hyd. No. 3

Hydrograph Type	= Junction	Peak Flow	= 28.24 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.32 hrs
Time Interval	= 1 min	Hydrograph Volume	= 160,217 cuft
Inflow Hydrographs	= 1, 2	Total Contrib. Area	= 18.446 ac



Design Storm Report

Custom Storm filename:

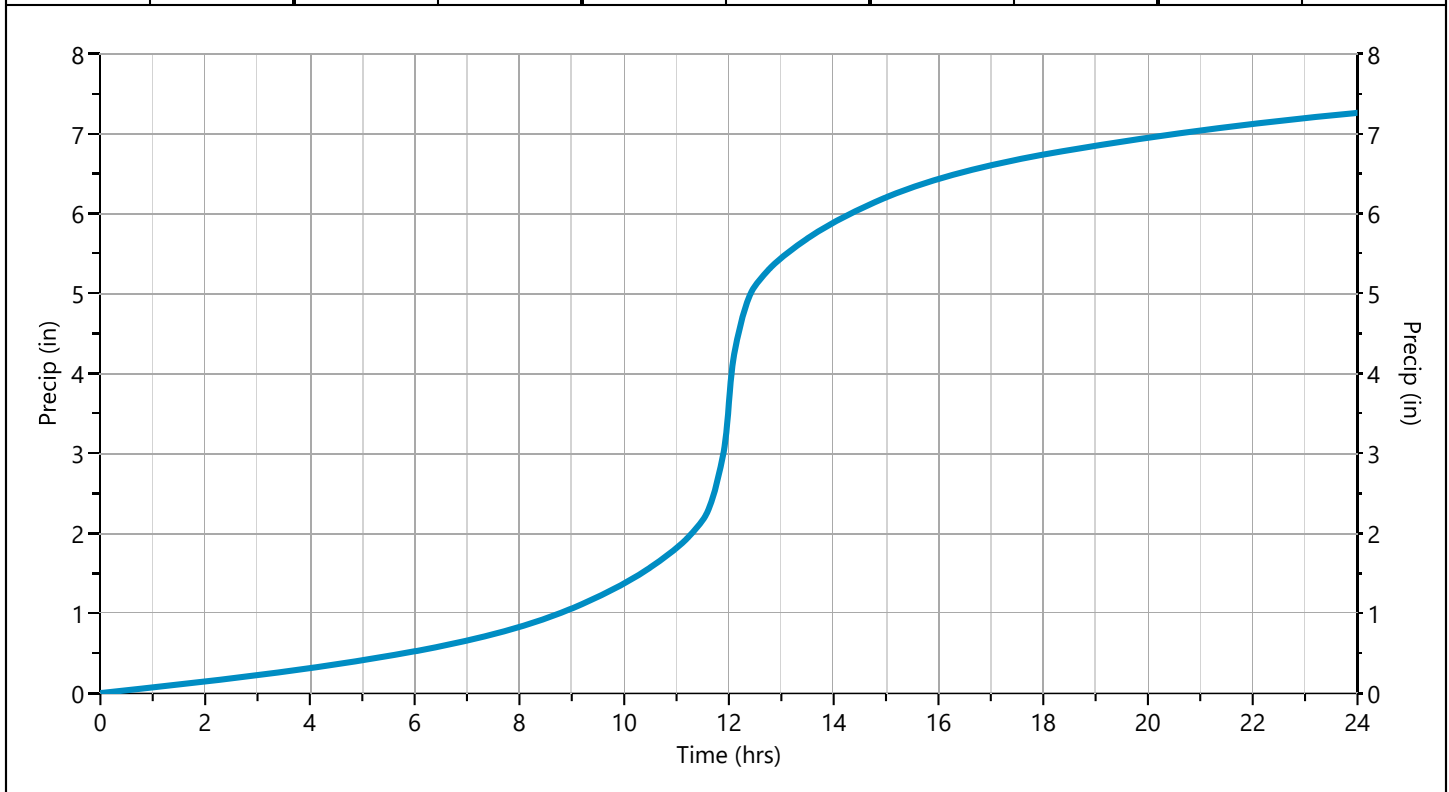
Hydrology Studio v 3.0.0.26

08-11-2022

Storm Distribution: NRCS/SCS - Type III, 24-hr

Storm Duration	Total Rainfall Volume (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	✓ 50-yr	100-yr
24 hrs	2.66	3.29	0.00	4.32	5.18	6.35	7.26	8.17

Incremental Rainfall Distribution, 50-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.50	0.014306	11.68	0.033033	11.87	0.052554	12.05	0.109081	12.23	0.043681
11.52	0.015245	11.70	0.034808	11.88	0.054329	12.07	0.094198	12.25	0.041906
11.53	0.017061	11.72	0.036582	11.90	0.056104	12.08	0.079315	12.27	0.040132
11.55	0.018836	11.73	0.038357	11.92	0.064640	12.10	0.064432	12.28	0.038357
11.57	0.020610	11.75	0.040132	11.93	0.079316	12.12	0.056317	12.30	0.036582
11.58	0.022385	11.77	0.041906	11.95	0.094199	12.13	0.054329	12.32	0.034808
11.60	0.024160	11.78	0.043681	11.97	0.109082	12.15	0.052555	12.33	0.033033
11.62	0.025934	11.80	0.045455	11.98	0.123965	12.17	0.050780	12.35	0.031259
11.63	0.027709	11.82	0.047230	12.00	0.138848	12.18	0.049005	12.37	0.029483
11.65	0.029484	11.83	0.049005	12.02	0.138515	12.20	0.047230	12.38	0.027709
11.67	0.031258	11.85	0.050780	12.03	0.123964	12.22	0.045456	12.40	0.025935



Hydrograph 100-yr Summary

Project Name: MARION AVENUE PRE DEVELOPMENT

Hydrology Studio v 3.0.0.26

08-11-2022

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Pre FLOW FROM SITE	22.80	12.40	129,388	---		
2	NRCS Runoff	Pre INDUSTRIAL	15.79	12.22	70,839	---		
3	Junction	Pre FLOW TO NORTH WET	36.15	12.32	200,226	1, 2		

Hydrograph Report

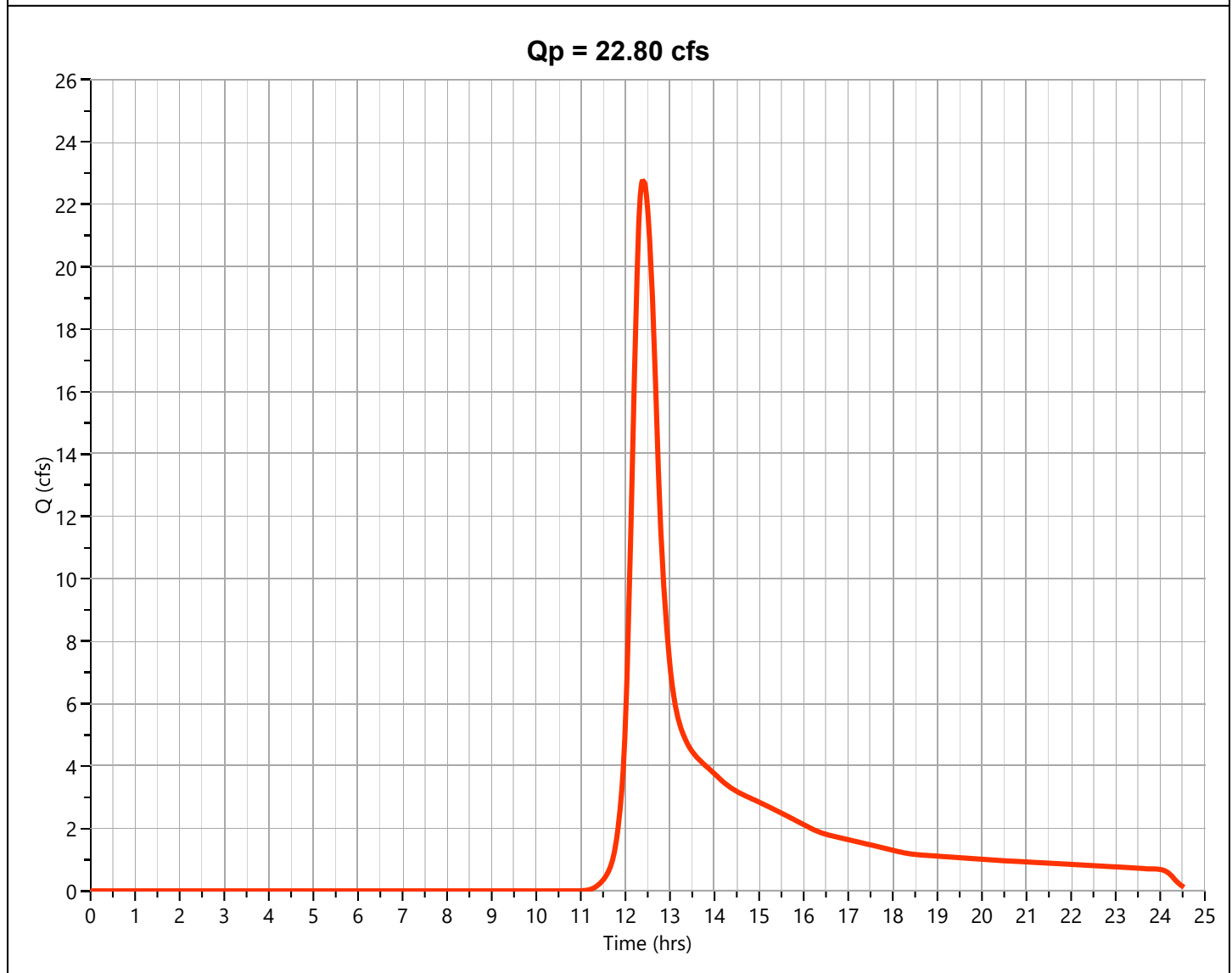
Pre FLOW FROM SITE

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 22.80 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.40 hrs
Time Interval	= 1 min	Runoff Volume	= 129,388 cuft
Drainage Area	= 15.14 ac	Curve Number	= 50*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 30.45 min
Total Rainfall	= 8.17 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
2.617	61	1/4 ACRE RES
0.805	54	1/2 ACRE RES
3.59	51	1 ACRE RES
8.128	45	WOODED
15.14	50	Weighted CN Method Employed

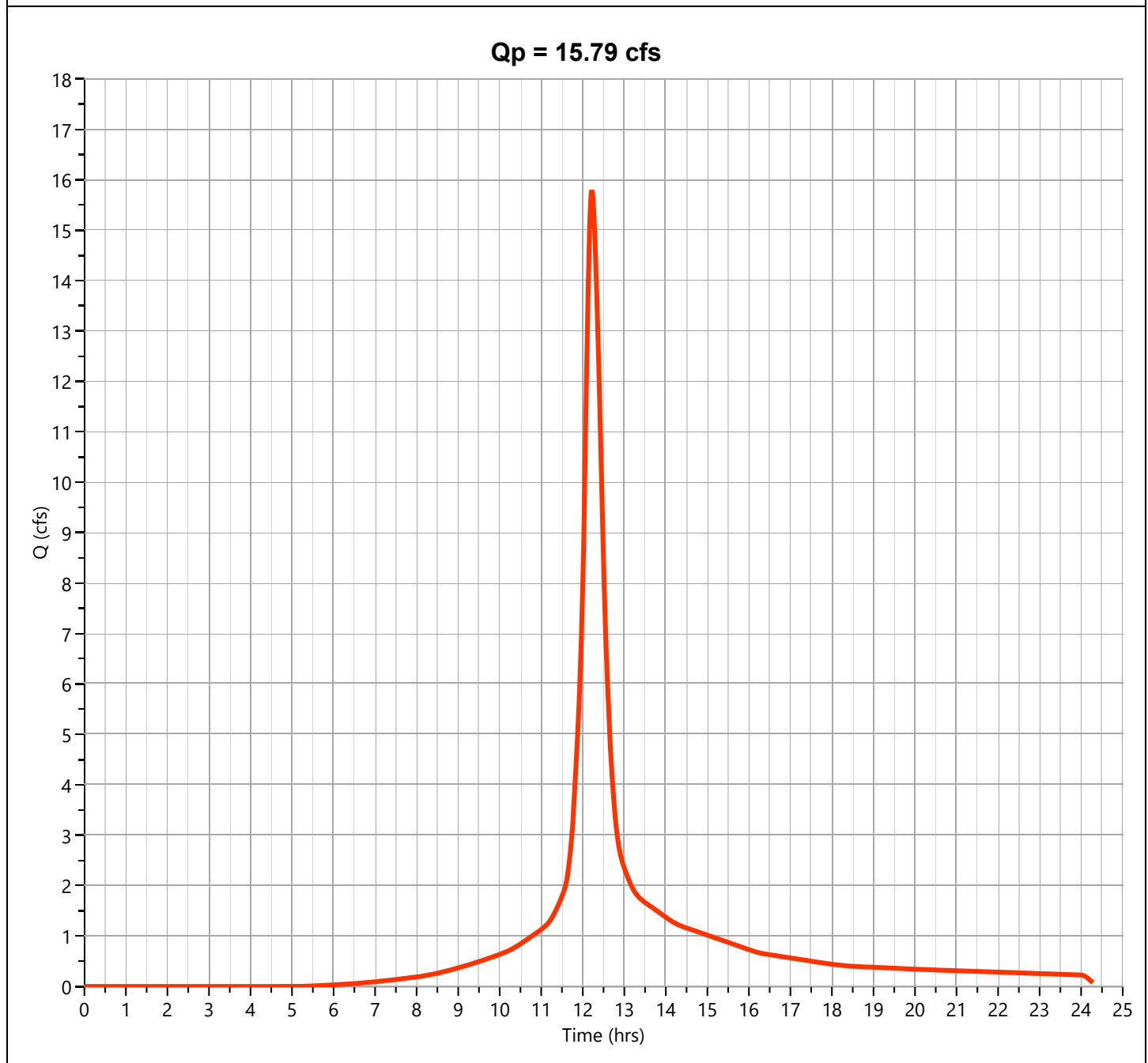


Hydrograph Report

Pre INDUSTRIAL

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 15.79 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.22 hrs
Time Interval	= 1 min	Runoff Volume	= 70,839 cuft
Drainage Area	= 3.306 ac	Curve Number	= 81
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 8.17 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

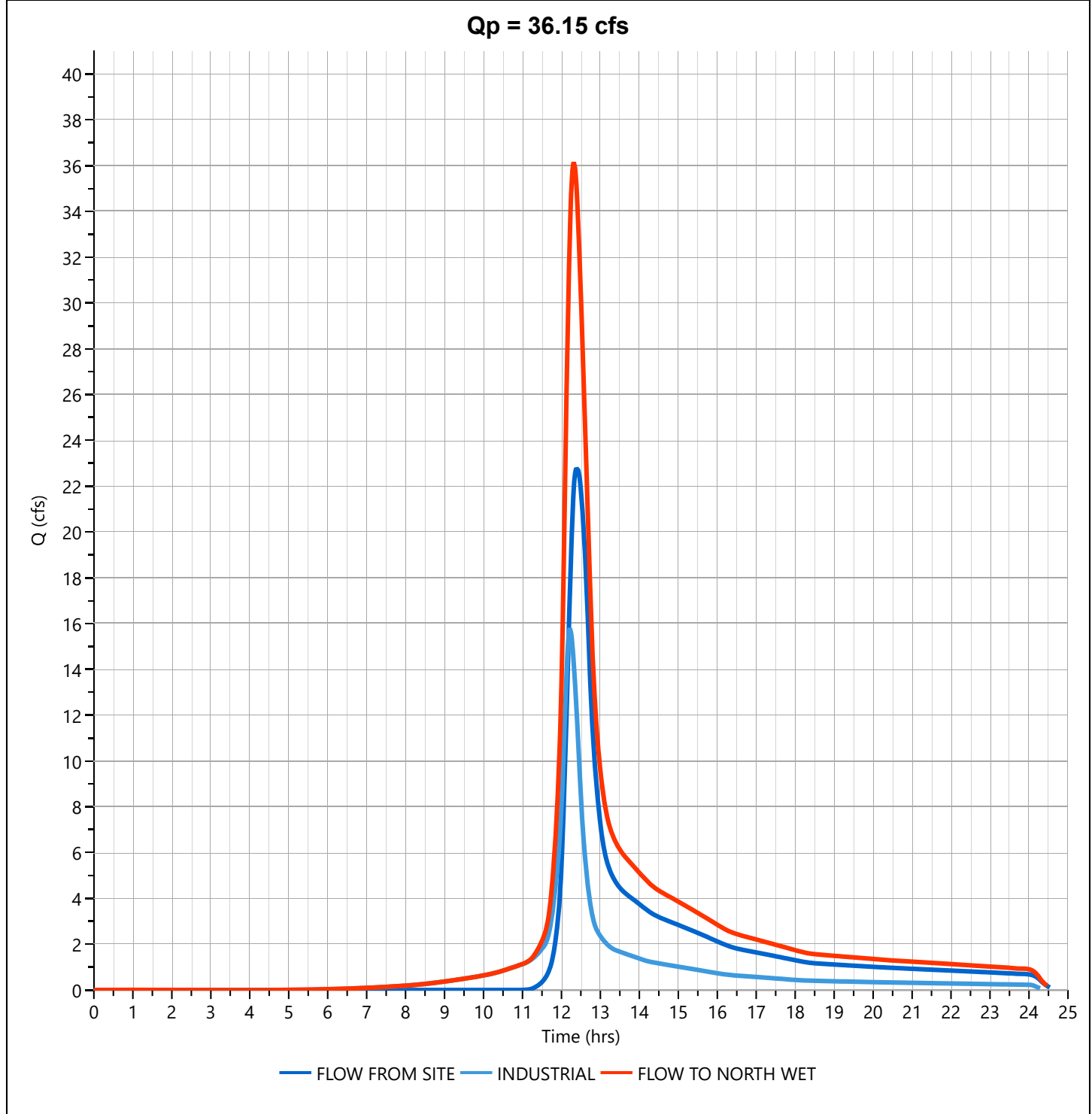


Hydrograph Report

Pre FLOW TO NORTH WET

Hyd. No. 3

Hydrograph Type	= Junction	Peak Flow	= 36.15 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.32 hrs
Time Interval	= 1 min	Hydrograph Volume	= 200,226 cuft
Inflow Hydrographs	= 1, 2	Total Contrib. Area	= 18.446 ac



Design Storm Report

Custom Storm filename:

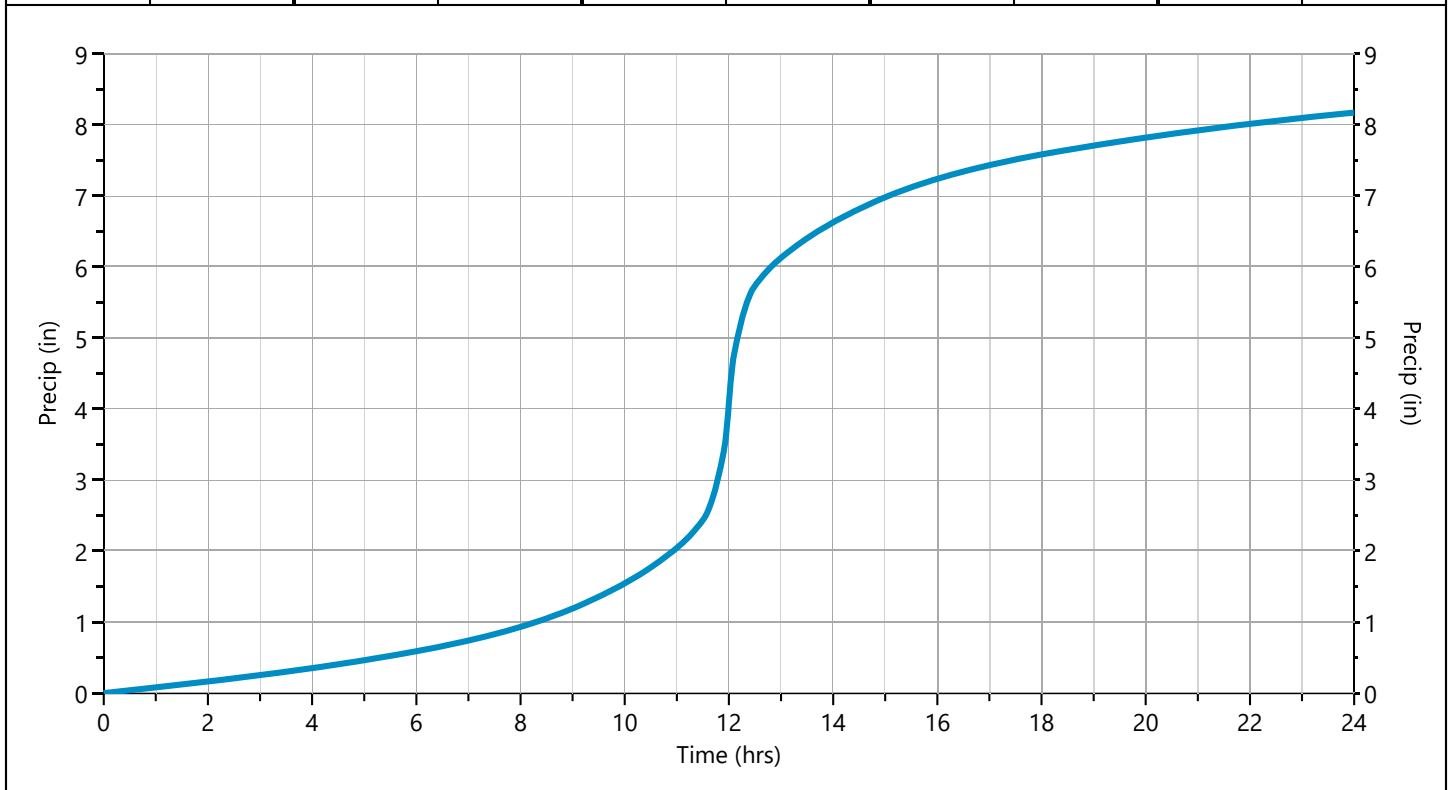
Hydrology Studio v 3.0.0.26

08-11-2022

Storm Distribution: NRCS/SCS - Type III, 24-hr

Storm Duration	Total Rainfall Volume (in)								
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	✓ 100-yr	
24 hrs	2.66	3.29	0.00	4.32	5.18	6.35	7.26	8.17	

Incremental Rainfall Distribution, 100-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.50	0.016099	11.68	0.037174	11.87	0.059142	12.05	0.122754	12.23	0.049157
11.52	0.017156	11.70	0.039171	11.88	0.061139	12.07	0.106005	12.25	0.047159
11.53	0.019199	11.72	0.041168	11.90	0.063136	12.08	0.089256	12.27	0.045162
11.55	0.021197	11.73	0.043165	11.92	0.072742	12.10	0.072508	12.28	0.043165
11.57	0.023194	11.75	0.045162	11.93	0.089258	12.12	0.063376	12.30	0.041168
11.58	0.025191	11.77	0.047159	11.95	0.106006	12.13	0.061139	12.32	0.039170
11.60	0.027188	11.78	0.049156	11.97	0.122755	12.15	0.059142	12.33	0.037174
11.62	0.029185	11.80	0.051153	11.98	0.139503	12.17	0.057145	12.35	0.035176
11.63	0.031182	11.82	0.053150	12.00	0.156252	12.18	0.055148	12.37	0.033180
11.65	0.033179	11.83	0.055147	12.02	0.155877	12.20	0.053150	12.38	0.031182
11.67	0.035176	11.85	0.057145	12.03	0.139503	12.22	0.051153	12.40	0.029185



IDF Report

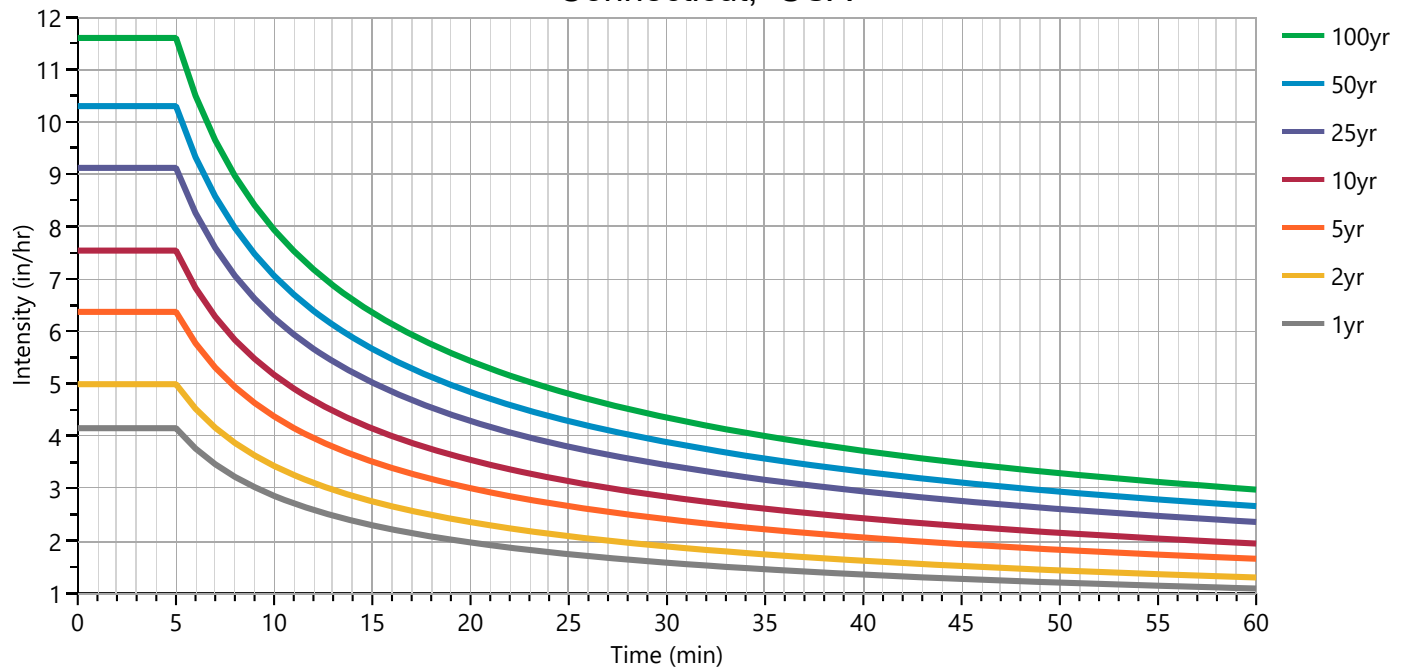
Equation Coefficients	Intensity = B / (Tc + D)^E (in/hr)								
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
B	9.8802	11.9354	0.0000	15.2514	18.1249	21.8950	24.7570	27.9951	
D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
E	0.5390	0.5418	0.0000	0.5425	0.5449	0.5442	0.5449	0.5474	

Minimum Tc = 5 minutes

Tc (min)	Intensity Values (in/hr)								
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
Cf	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
5	4.15	4.99	0	6.37	7.54	9.12	10.30	11.60	
10	2.86	3.43	0	4.37	5.17	6.25	7.06	7.94	
15	2.30	2.75	0	3.51	4.14	5.02	5.66	6.36	
20	1.97	2.35	0	3.00	3.54	4.29	4.84	5.43	
25	1.74	2.09	0	2.66	3.14	3.80	4.29	4.81	
30	1.58	1.89	0	2.41	2.84	3.44	3.88	4.35	
35	1.45	1.74	0	2.22	2.61	3.16	3.57	4.00	
40	1.35	1.62	0	2.06	2.43	2.94	3.32	3.72	
45	1.27	1.52	0	1.93	2.28	2.76	3.11	3.48	
50	1.20	1.43	0	1.83	2.15	2.61	2.94	3.29	
55	1.14	1.36	0	1.73	2.04	2.47	2.79	3.12	
60	1.09	1.30	0	1.65	1.95	2.36	2.66	2.98	

Cf = Correction Factor applied to Rational Method runoff coefficient.

Connecticut, USA



Precipitation Report

	Active	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Active		✓	✓		✓	✓	✓	✓	✓
SCS Storms	> SCS Dimensionless Storms								
SCS 6hr		1.20	1.50	0	1.86	2.18	2.64	3.01	3.41
Type I, 24-hr		0	0	0	0	0	0	0	0
Type IA, 24-hr		0	0	0	0	0	0	0	0
Type II, 24-hr		1.82	2.28	0	2.85	3.31	3.94	4.43	4.94
Type II FL, 24-hr		0	0	0	0	0	0	0	0
Type III, 24-hr	✓	2.66	3.29	0	4.32	5.18	6.35	7.26	8.17
Synthetic Storms	> IDF-Based Synthetic Storms								
1-hr		1.09	1.30	0	1.65	1.95	2.36	2.66	2.98
2-hr		1.50	1.78	0	2.27	2.67	3.24	3.65	4.07
3-hr		1.80	2.15	0	2.74	3.21	3.89	4.38	4.89
6-hr		2.48	2.95	0	3.76	4.40	5.34	6.01	6.70
12-hr		3.42	4.05	0	5.16	6.03	7.32	8.24	9.16
24-hr		4.71	5.57	0	7.08	8.27	10.04	11.30	12.54
Huff Distribution	> 1st Quartile (0 to 6 hrs)								
1-hr		0.76	0.98	0	1.33	1.61	2.01	2.34	2.69
2-hr		0.89	1.14	0	1.50	1.80	2.24	2.60	2.99
3-hr		0.98	1.24	0	1.59	1.90	2.33	2.68	3.07
6-hr		1.20	1.50	0	1.86	2.18	2.64	3.01	3.41
Huff Distribution	> 2nd Quartile (>6 to 12 hrs)								
8-hr		0	0	0	0	0	0	0	0
12-hr		0	0	0	0	0	0	0	0
Huff Distribution	> 3rd Quartile (>12 to 24 hrs)								
18-hr		0	0	0	0	0	0	0	0
24-hr		0	0	0	0	0	0	0	0
Custom Storms	> Custom Storm Distributions								
My Custom Storm 1		0	0	0	0	0	0	0	0
My Custom Storm 2		0	0	0	0	0	0	0	0
My Custom Storm 3		0	0	0	0	0	0	0	0
My Custom Storm 4		0	0	0	0	0	0	0	0
My Custom Storm 5		0	0	0	0	0	0	0	0
My Custom Storm 6		0	0	0	0	0	0	0	0
My Custom Storm 7		0	0	0	0	0	0	0	0
My Custom Storm 8		0	0	0	0	0	0	0	0
My Custom Storm 9		0	0	0	0	0	0	0	0
My Custom Storm 10		0	0	0	0	0	0	0	0

Precipitation Report Cont'd

Precipitation filename: SamplePrecip.pcp

Rainfall totals in Inches

08-11-2022

	Active	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Active		✓	✓		✓	✓	✓	✓	✓
Huff Indiana	> Indianapolis								
30-min		0	0	0	0	0	0	0	0
1-hr		0	0	0	0	0	0	0	0
2-hr		0	0	0	0	0	0	0	0
3-hr		0	0	0	0	0	0	0	0
6-hr		0	0	0	0	0	0	0	0
12-hr		0	0	0	0	0	0	0	0
24-hr		0	0	0	0	0	0	0	0
Huff Indiana	> Evansville								
30-min		0	0	0	0	0	0	0	0
1-hr		0	0	0	0	0	0	0	0
2-hr		0	0	0	0	0	0	0	0
3-hr		0	0	0	0	0	0	0	0
6-hr		0	0	0	0	0	0	0	0
12-hr		0	0	0	0	0	0	0	0
24-hr		0	0	0	0	0	0	0	0
Huff Indiana	> Fort Wayne								
30-min		0	0	0	0	0	0	0	0
1-hr		0	0	0	0	0	0	0	0
2-hr		0	0	0	0	0	0	0	0
3-hr		0	0	0	0	0	0	0	0
6-hr		0	0	0	0	0	0	0	0
12-hr		0	0	0	0	0	0	0	0
24-hr		0	0	0	0	0	0	0	0
Huff Indiana	> South Bend								
30-min		0	0	0	0	0	0	0	0
1-hr		0	0	0	0	0	0	0	0
2-hr		0	0	0	0	0	0	0	0
3-hr		0	0	0	0	0	0	0	0
6-hr		0	0	0	0	0	0	0	0
12-hr		0	0	0	0	0	0	0	0
24-hr		0	0	0	0	0	0	0	0

Precipitation Report Cont'd

Precipitation filename: SamplePrecip.pcp

Rainfall totals in Inches

08-11-2022

	Active	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Active		✓	✓		✓	✓	✓	✓	✓
NRCS Storms	> NRCS Dimensionless Storms								
NRCS MSE1, 24-hr		0	0	0	0	0	0	0	0
NRCS MSE2, 24-hr		0	0	0	0	0	0	0	0
NRCS MSE3, 24-hr		0	0	0	0	0	0	0	0
NRCS MSE4, 24-hr		0	0	0	0	0	0	0	0
NRCS MSE5, 24-hr		0	0	0	0	0	0	0	0
NRCS MSE6, 24-hr		0	0	0	0	0	0	0	0
NOAA-A, 24-hr		0	0	0	0	0	0	0	0
NOAA-B, 24-hr		0	0	0	0	0	0	0	0
NOAA-C, 24-hr		0	0	0	0	0	0	0	0
NOAA-D, 24-hr		0	0	0	0	0	0	0	0
NRCC-A, 24-hr		0	0	0	0	0	0	0	0
NRCC-B, 24-hr		0	0	0	0	0	0	0	0
NRCC-C, 24-hr		0	0	0	0	0	0	0	0
NRCC-D, 24-hr		0	0	0	0	0	0	0	0
CA-1, 24-hr		0	0	0	0	0	0	0	0
CA-2, 24-hr		0	0	0	0	0	0	0	0
CA-3, 24-hr		0	0	0	0	0	0	0	0
CA-4, 24-hr		0	0	0	0	0	0	0	0
CA-5, 24-hr		0	0	0	0	0	0	0	0
CA-6, 24-hr		0	0	0	0	0	0	0	0
FDOT Storms	> Florida DOT Storms								
FDOT, 1-hr		0	0	0	0	0	0	0	0
FDOT, 2-hr		0	0	0	0	0	0	0	0
FDOT, 4-hr		0	0	0	0	0	0	0	0
FDOT, 8-hr		0	0	0	0	0	0	0	0
FDOT, 24-hr		0	0	0	0	0	0	0	0
FDOT, 72-hr		0	0	0	0	0	0	0	0
SFWMD, 72-hr		0	0	0	0	0	0	0	0
Austin Storms	> Austin Frequency Storms								
Austin Zone 1, 24-hr		0	0	0	0	0	0	0	0
Austin Zone 2, 24-hr		0	0	0	0	0	0	0	0

Appendix F

Hydrology Studio™

Computer Model Report – Post Development

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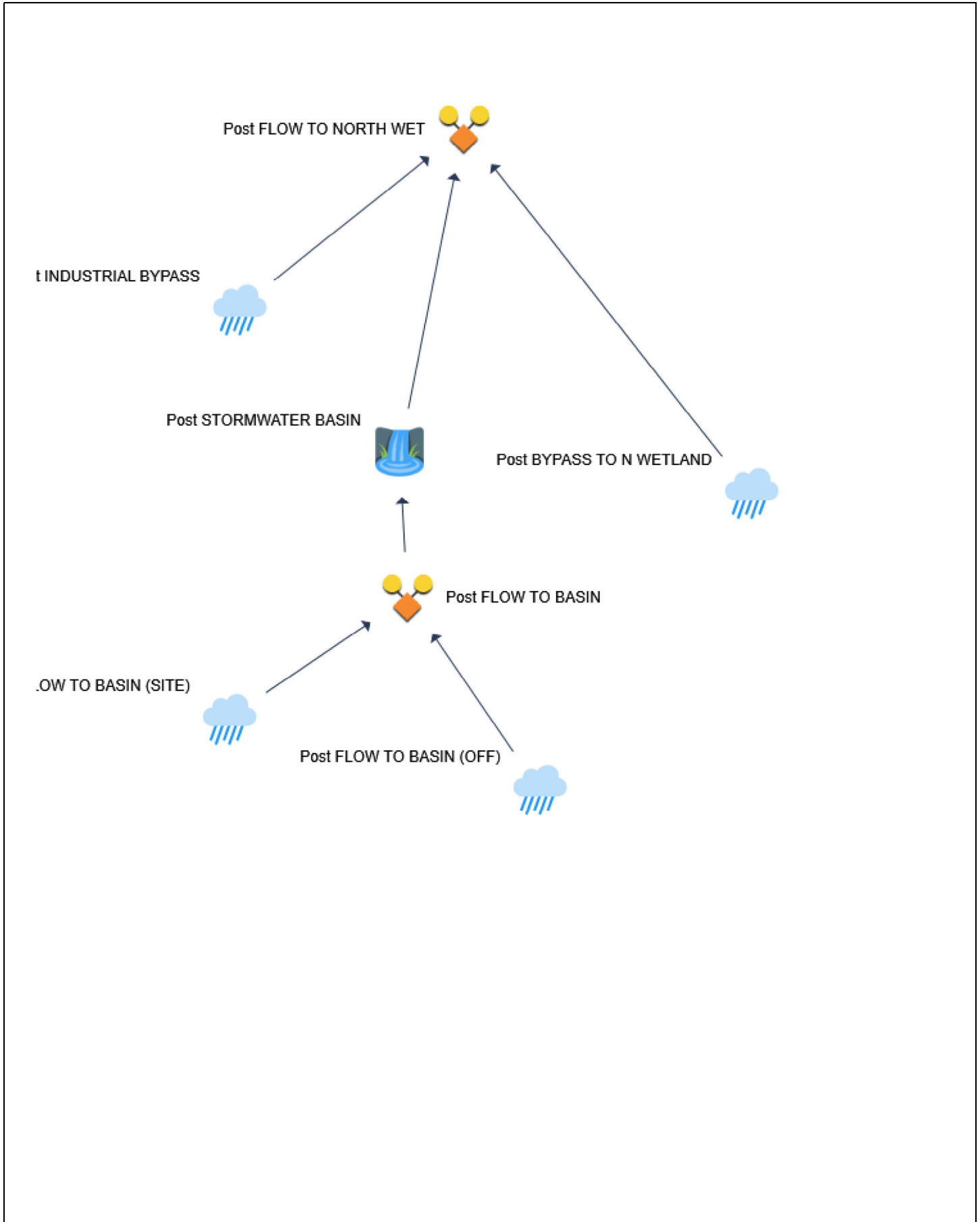
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Basin Model



Hydrograph by Return Period

Project Name: MARION AVENUE POST DEVELOPMENT

Hydrology Studio v 3.0.0.26

08-11-2022

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Outflow (cfs)							
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
1	NRCS Runoff	Post FLOW TO BASIN (SITE)	0.051	0.263		1.476	3.145	6.098	8.780	11.72
2	NRCS Runoff	Post BYPASS TO N WETLAND	0.000	0.000		0.003	0.024	0.109	0.326	0.705
3	NRCS Runoff	Post INDUSTRIAL BYPASS	2.811	4.162		6.510	8.542	11.37	13.58	15.79
4	NRCS Runoff	Post FLOW TO BASIN (OFF)	0.126	0.687		2.437	4.526	7.978	11.00	14.24
5	Junction	Post FLOW TO BASIN	0.142	0.854		3.649	7.245	13.44	18.96	24.93
6	Pond Route	Post STORMWATER BASIN	0.000	0.000		0.000	0.000	0.298	1.725	5.700
7	Junction	Post FLOW TO NORTH WET	2.811	4.162		6.510	8.542	11.37	13.59	15.90

Hydrograph 1-yr Summary

Project Name: MARION AVENUE POST DEVELOPMENT

Hydrology Studio v 3.0.0.26

08-11-2022

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Post FLOW TO BASIN (SITE)	0.051	15.22	1,409	---		
2	NRCS Runoff	Post BYPASS TO N WETLAND	0.000	0.00	0.000	---		
3	NRCS Runoff	Post INDUSTRIAL BYPASS	2.811	12.23	12,697	---		
4	NRCS Runoff	Post FLOW TO BASIN (OFF)	0.126	12.67	2,565	---		
5	Junction	Post FLOW TO BASIN	0.142	14.70	3,974	1, 4		
6	Pond Route	Post STORMWATER BASIN	0.000	15.73	0.000	5	192.03	373
7	Junction	Post FLOW TO NORTH WET	2.811	12.23	12,697	2, 3, 6		

Hydrograph Report

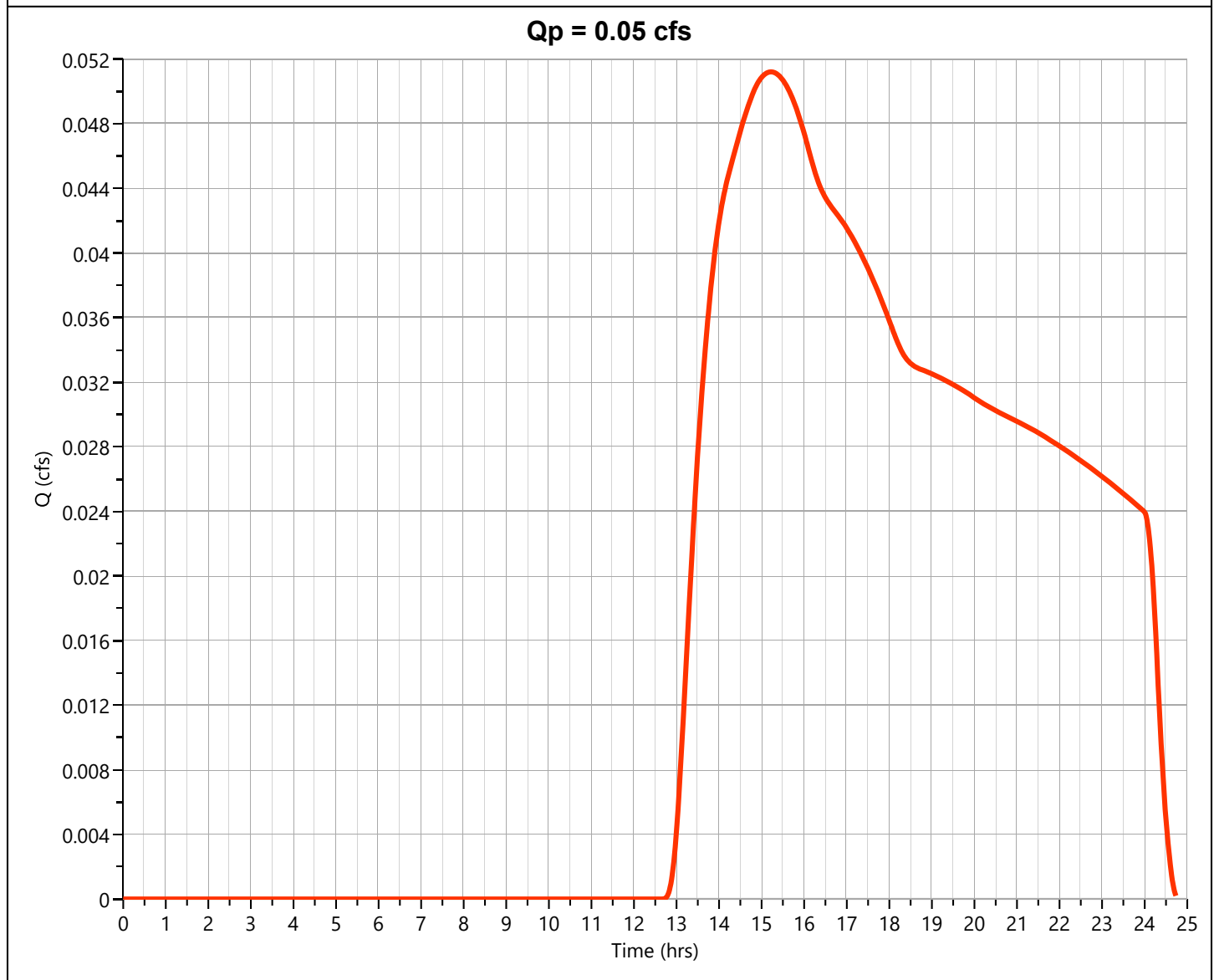
Post FLOW TO BASIN (SITE)

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.051 cfs
Storm Frequency	= 1-yr	Time to Peak	= 15.22 hrs
Time Interval	= 1 min	Runoff Volume	= 1,409 cuft
Drainage Area	= 7.367 ac	Curve Number	= 51*
Tc Method	= User	Time of Conc. (Tc)	= 30.0 min
Total Rainfall	= 2.66 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.598	98	PAVE
4.975	39	LAWN
0.794	30	WOODED
7.367	51	Weighted CN Method Employed



Hydrograph Report

Post BYPASS TO N WETLAND

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.000 cfs
Storm Frequency	= 1-yr	Time to Peak	= 0.00 hrs
Time Interval	= 1 min	Runoff Volume	= 0.000 cuft
Drainage Area	= 3.364 ac	Curve Number	= 32.98*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 37.67 min
Total Rainfall	= 2.66 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.112	39	LAWN
2.252	30	WOODED
3.364	33	Weighted CN Method Employed

Qp = 0.00 cfs

Tc by TR55 Worksheet

BYPASS TO N WETLAND NRCS Runoff

Hyd. No. 2

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description	LAWN			
Manning's n	0.250	0.013	0.013	
Flow Length (ft)	100			
2-yr, 24-hr Precip. (in)	3.42	2.28	2.28	
Land Slope (%)	2			
Travel Time (min)	14.26	0.00	0.00	14.26
Shallow Concentrated Flow				
Flow Length (ft)	316			
Watercourse Slope (%)	0.80	0.00	0.00	
Surface Description	Forest	Paved	Paved	
Average Velocity (ft/s)	.23			
Travel Time (min)	23.40	0.00	0.00	23.40
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.013	0.013	0.013	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				37.67 min

Hydrograph Report

Project Name: MARION AVENUE POST DEVELOPMENT

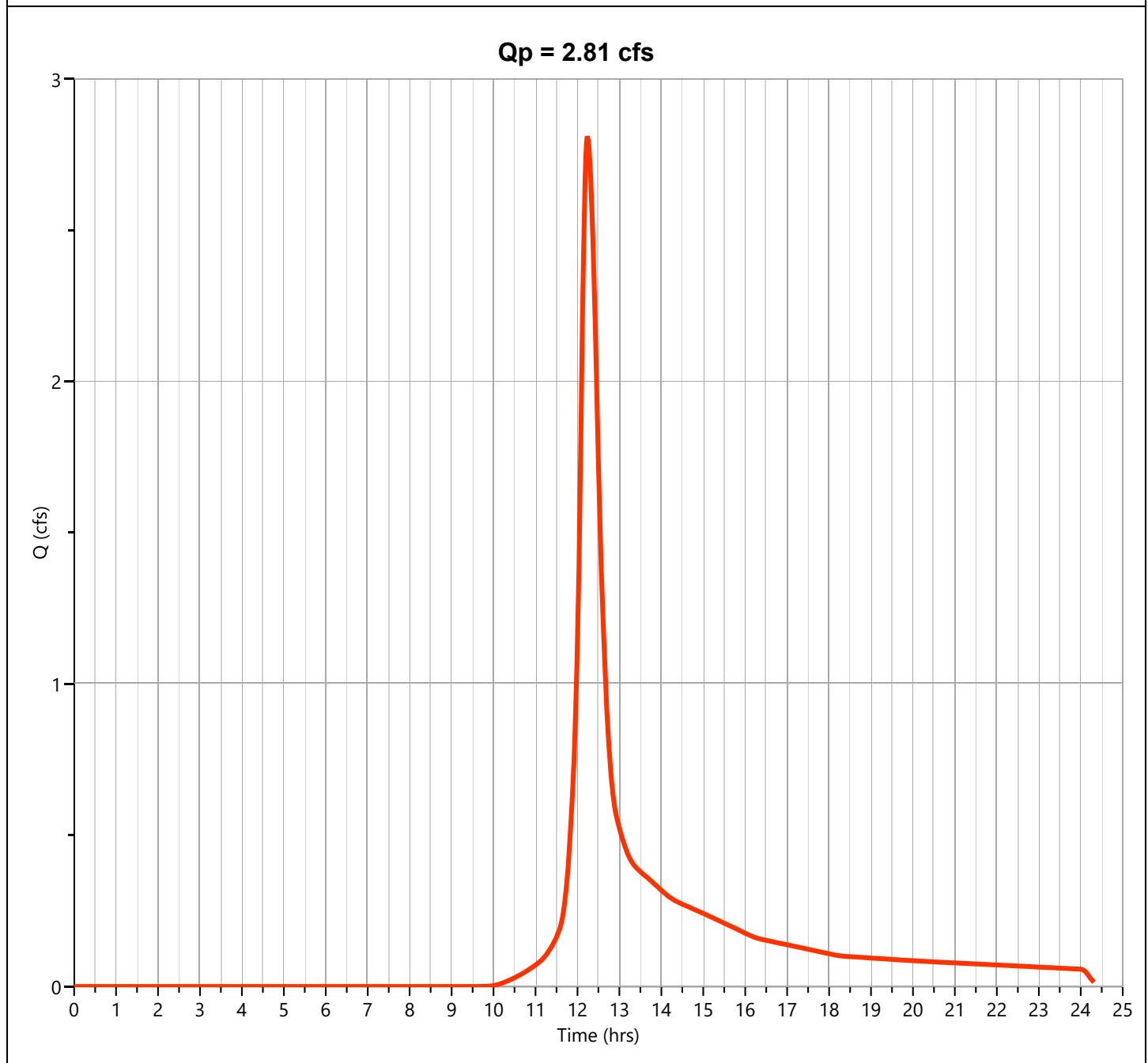
Hydrology Studio v 3.0.0.26

08-11-2022

Post INDUSTRIAL BYPASS

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 2.811 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.23 hrs
Time Interval	= 1 min	Runoff Volume	= 12,697 cuft
Drainage Area	= 3.306 ac	Curve Number	= 81
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 2.66 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484



Hydrograph Report

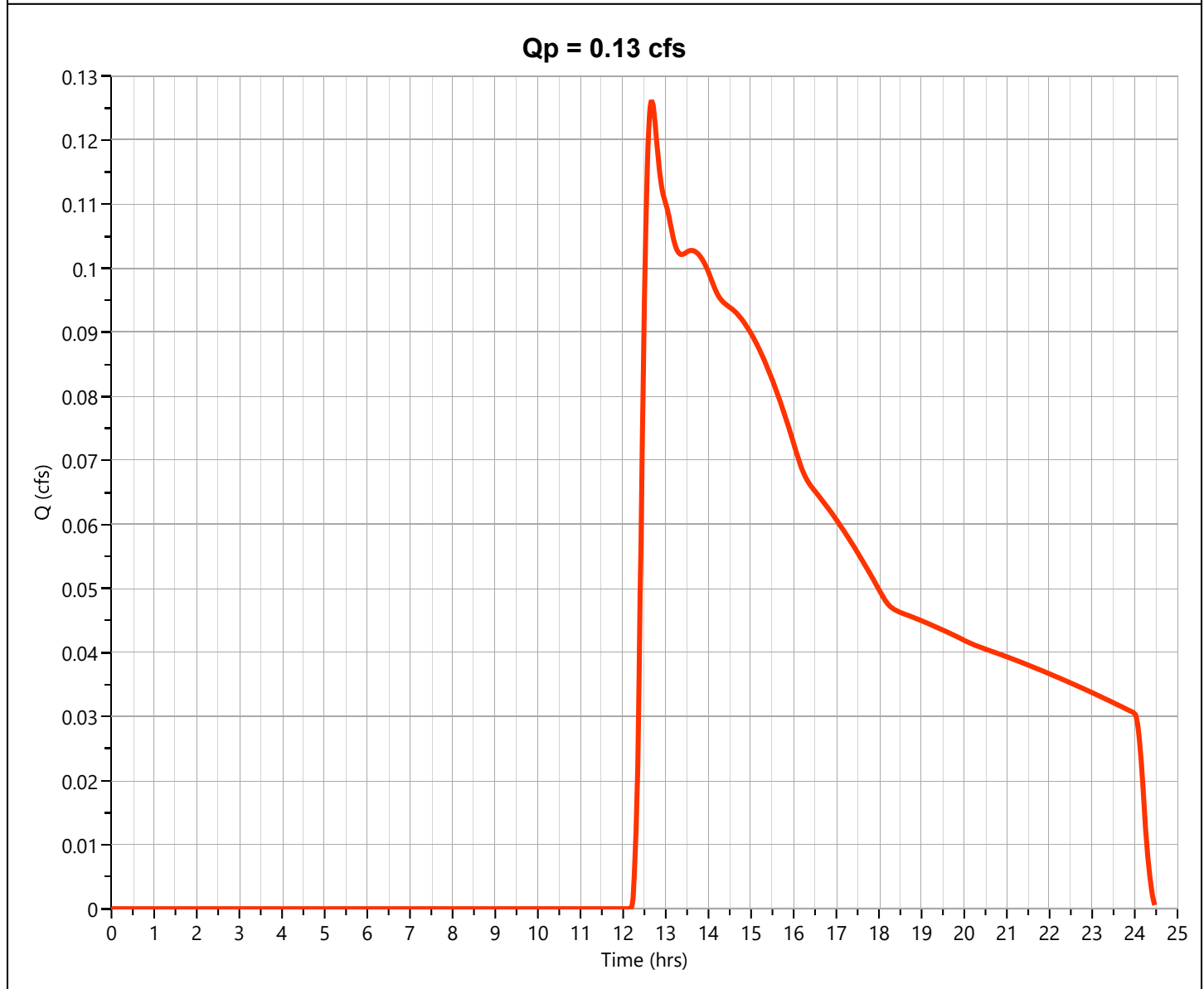
Post FLOW TO BASIN (OFF)

Hyd. No. 4

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.126 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.67 hrs
Time Interval	= 1 min	Runoff Volume	= 2,565 cuft
Drainage Area	= 6.207 ac	Curve Number	= 55*
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 2.66 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
2.617	61	1/4 ACRE RES
3.59	51	1 ACRE RES
6.207	55	Weighted CN Method Employed

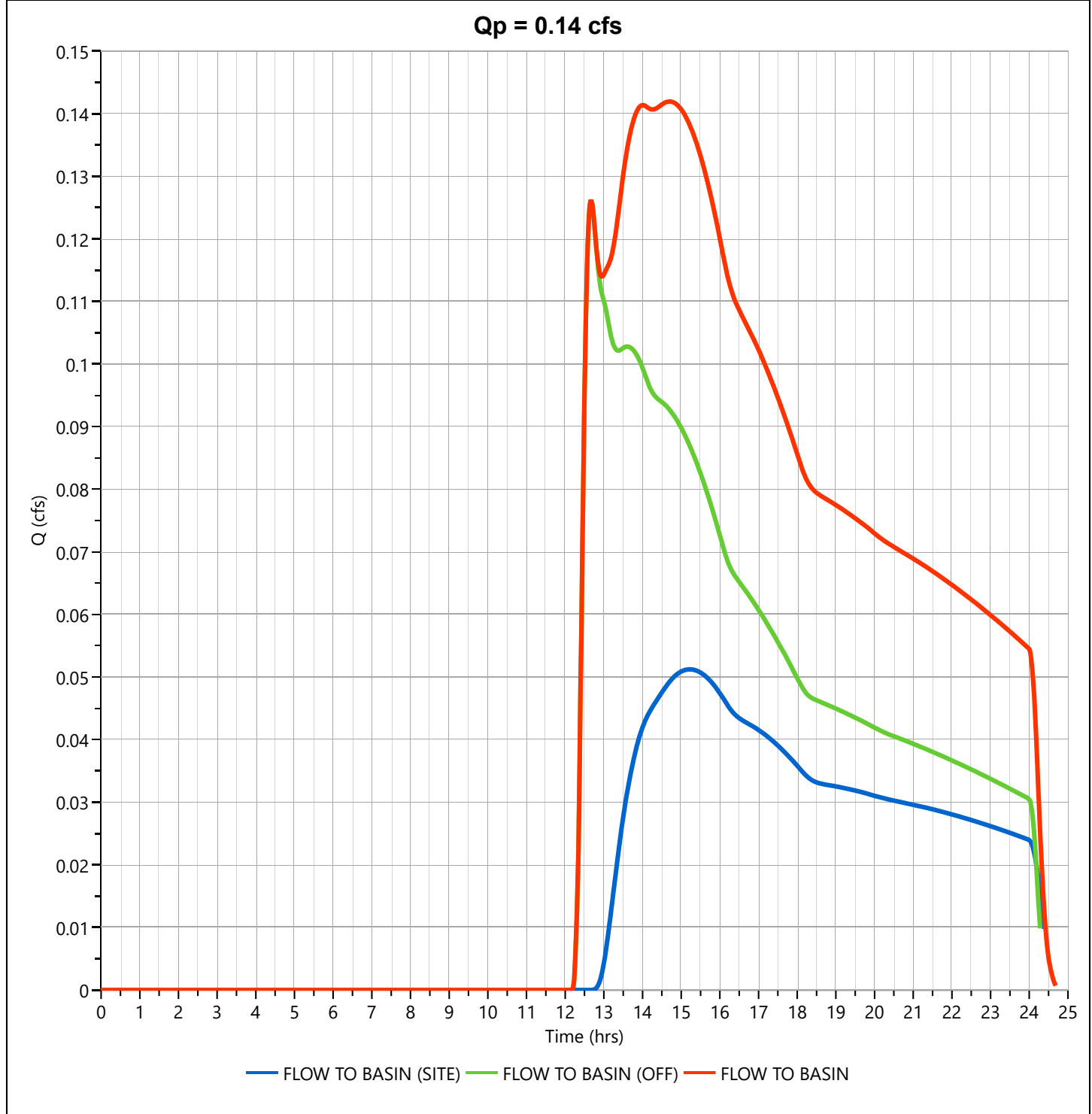


Hydrograph Report

Post FLOW TO BASIN

Hyd. No. 5

Hydrograph Type	= Junction	Peak Flow	= 0.142 cfs
Storm Frequency	= 1-yr	Time to Peak	= 14.70 hrs
Time Interval	= 1 min	Hydrograph Volume	= 3,974 cuft
Inflow Hydrographs	= 1, 4	Total Contrib. Area	= 13.574 ac



Hydrograph Report

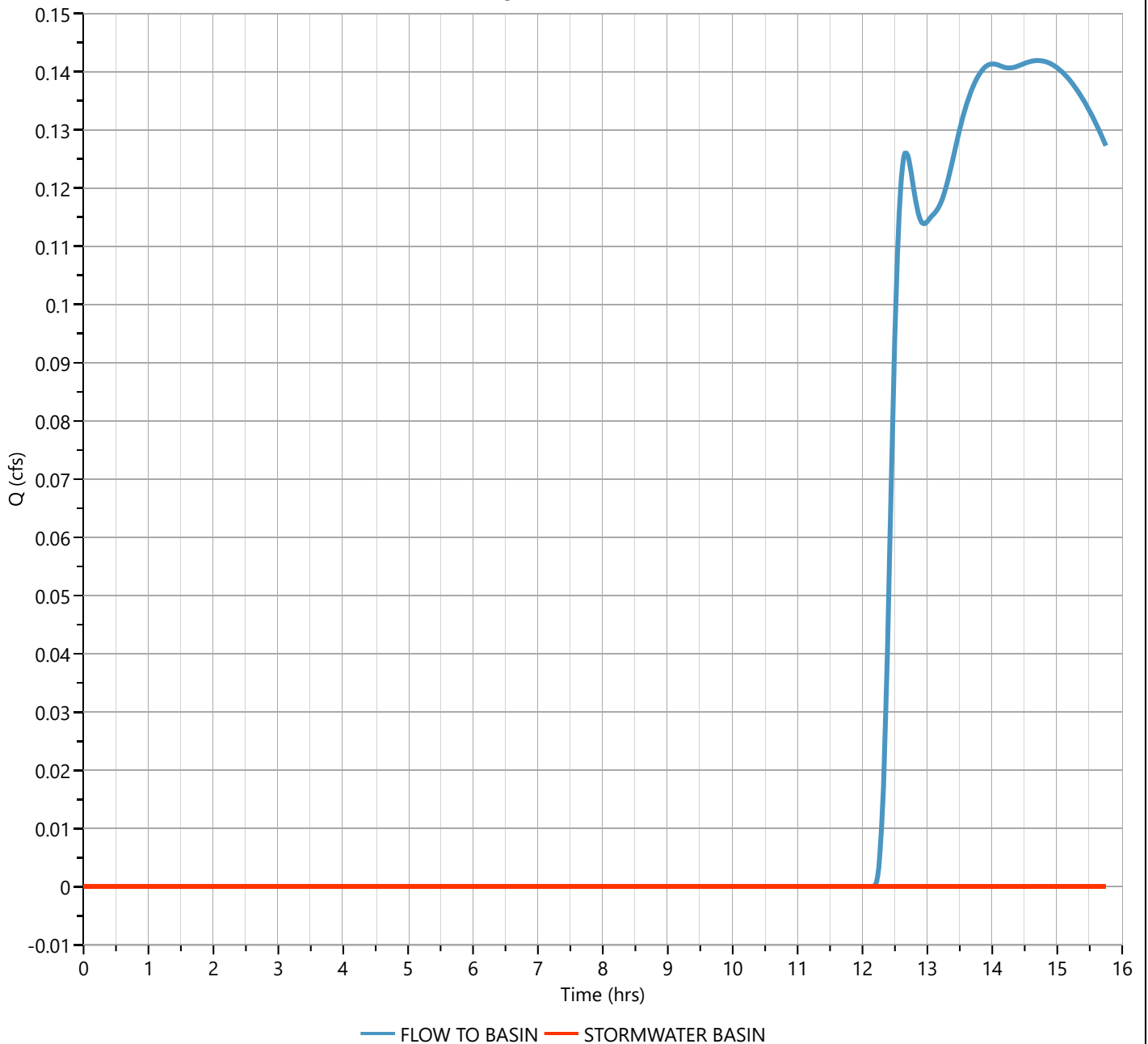
Post STORMWATER BASIN

Hyd. No. 6

Hydrograph Type	= Pond Route	Peak Flow	= 0.000 cfs
Storm Frequency	= 1-yr	Time to Peak	= 15.73 hrs
Time Interval	= 1 min	Hydrograph Volume	= 0.000 cuft
Inflow Hydrograph	= 5 - FLOW TO BASIN	Max. Elevation	= 192.03 ft
Pond Name	= STORMWATER BASIN	Max. Storage	= 373 cuft

Pond Routing by Storage Indication Method

Qp = 0.00 cfs



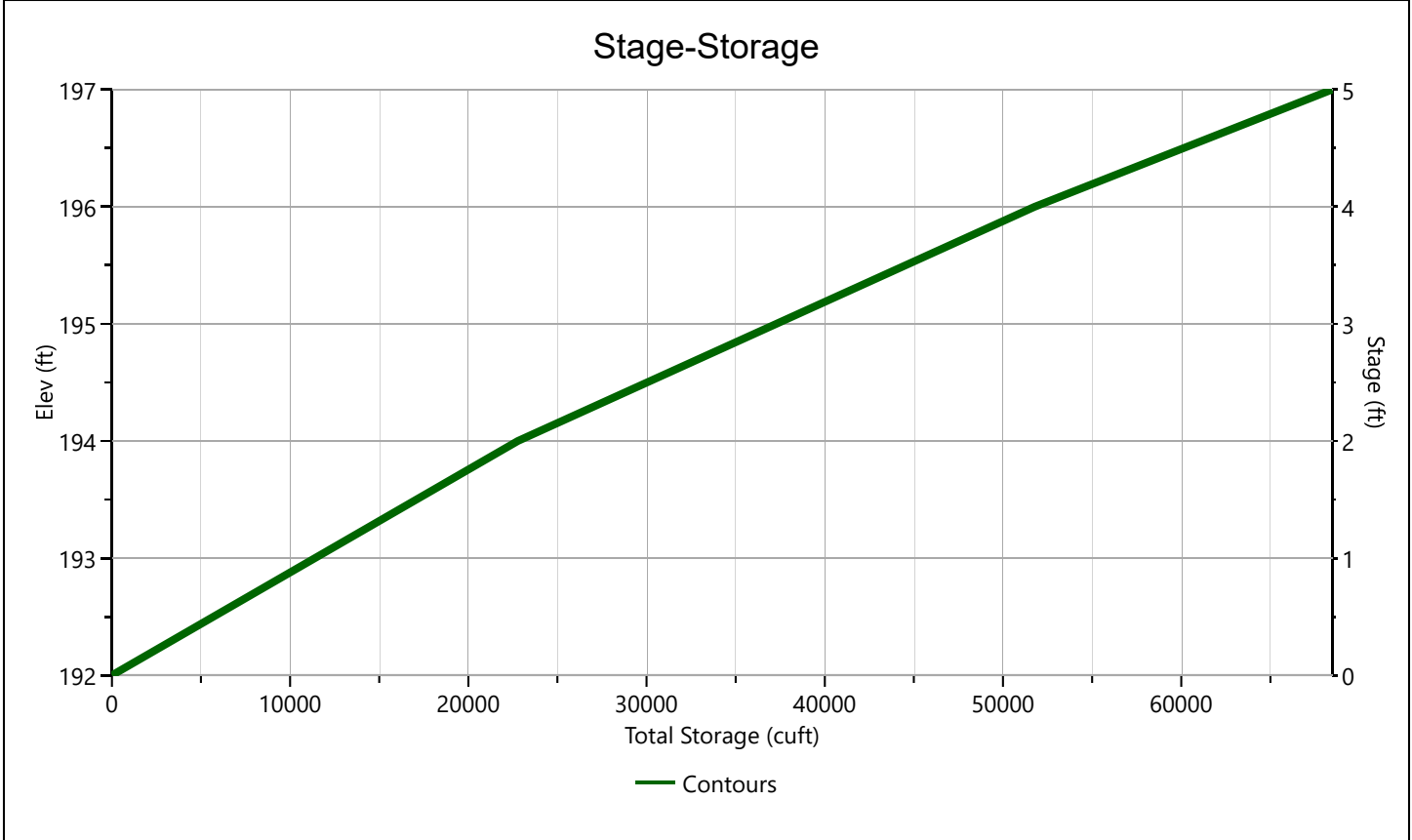
Pond Report

STORMWATER BASIN

Stage-Storage

User Defined Contours		Stage / Storage Table				
Description	Input	Stage (ft)	Elevation (ft)	Contour Area (sqft)	Incr. Storage (cuft)	Total Storage (cuft)
Bottom Elevation, ft	192.00	0.00	192.00	9,934	0.000	0.000
Voids (%)	100.00	2.00	194.00	12,917	22,783	22,783
Volume Calc	Conic	4.00	196.00	16,134	28,988	51,771
		5.00	197.00	17,258	16,691	68,462

Stage-Storage



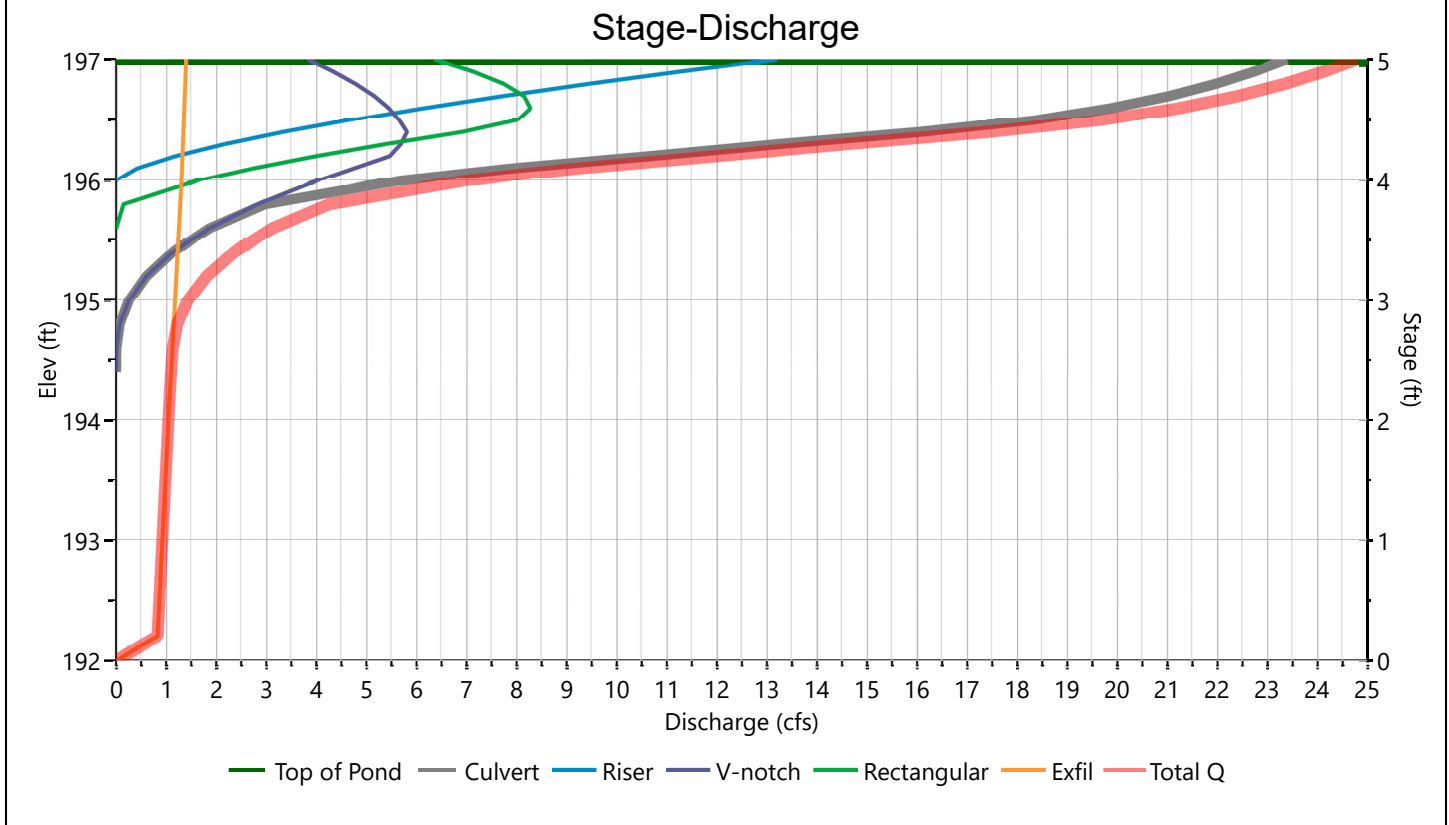
Pond Report

STORMWATER BASIN

Stage-Discharge

Culvert / Orifices	Culvert	Orifices			Orifice Plate
		1	2	3	
Rise, in	24				Orifice Dia, in
Span, in	24				No. Orifices
No. Barrels	1				Invert Elevation, ft
Invert Elevation, ft	193.00				Height, ft
Orifice Coefficient, Co	0.60				Orifice Coefficient, Co
Length, ft	117				
Barrel Slope, %	.5				
N-Value, n	0.013				
Weirs	Riser*	Weirs			Ancillary
Shape / Type	Box	1*	2*	3	Exfiltration, in/hr
Crest Elevation, ft	196	V-notch	Rectangular		3.50**
Crest Length, ft	4	194.5	195.75		
Angle, deg		4	60		
Weir Coefficient, Cw	3.3	1.47	3.3		

*Routes through Culvert. **Exfiltration extracted from outflow hydrograph. Rate applied to contours.



Pond Report

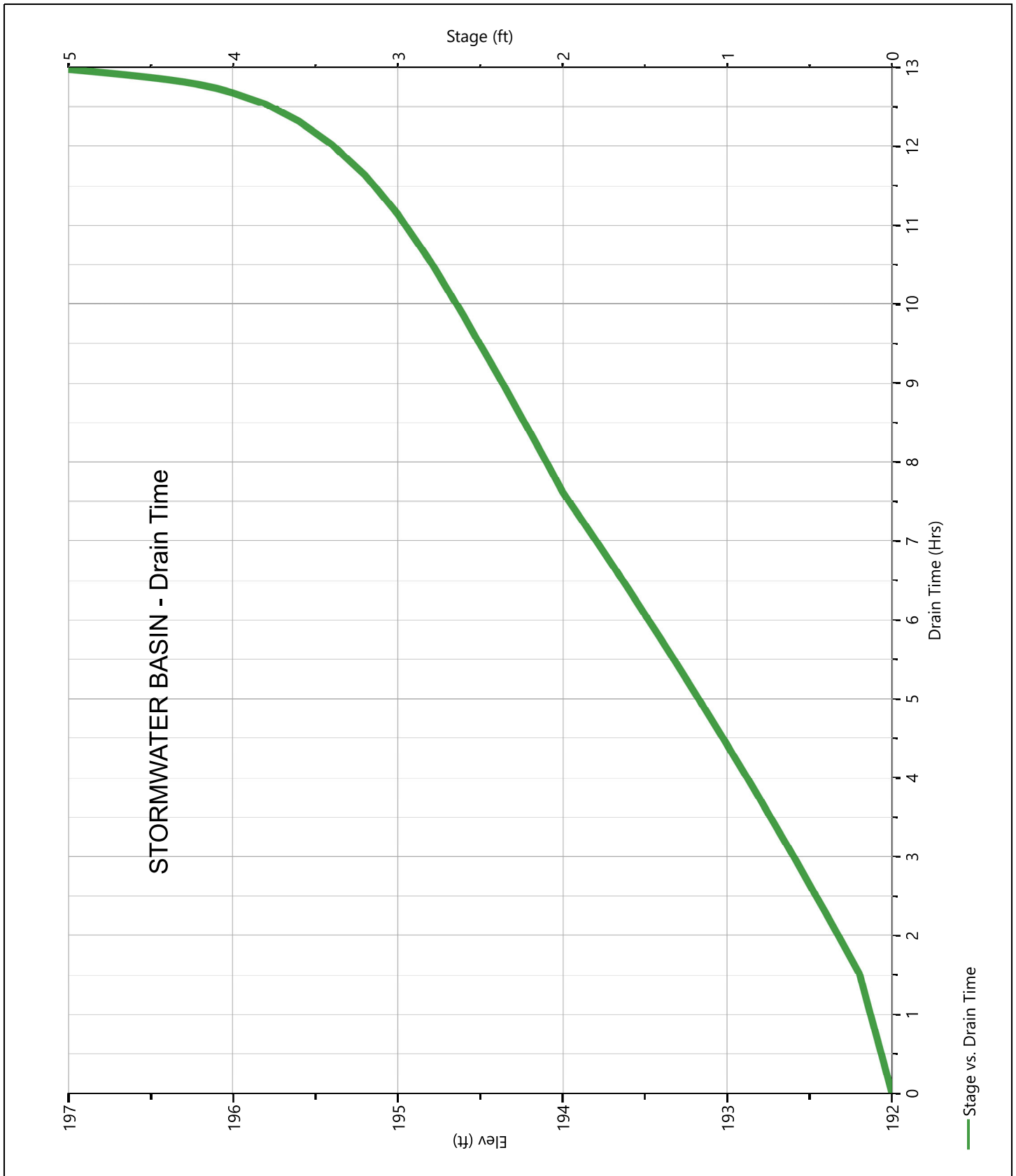
STORMWATER BASIN

Stage-Storage-Discharge Summary

Stage (ft)	Elev. (ft)	Storage (cuft)	Culvert (cfs)	Orifices, cfs			Riser (cfs)	Weirs, cfs			Pf Riser (cfs)	Exfil (cfs)	User (cfs)	Total (cfs)
				1	2	3		1	2	3				
0.00	192.00	0.000	0.000				0.000	0.000	0.000			0.000		0.000
2.00	194.00	22,783	0.000				0.000	0.000	0.000			1.046		1.046
4.00	196.00	51,771	5.691 ic				0.000	4.041	1.650			1.307		6.998
5.00	197.00	68,462	23.39 oc				13.20	3.831 s	6.355 s			1.398		24.78

STORMWATER BASIN

Pond Drawdown

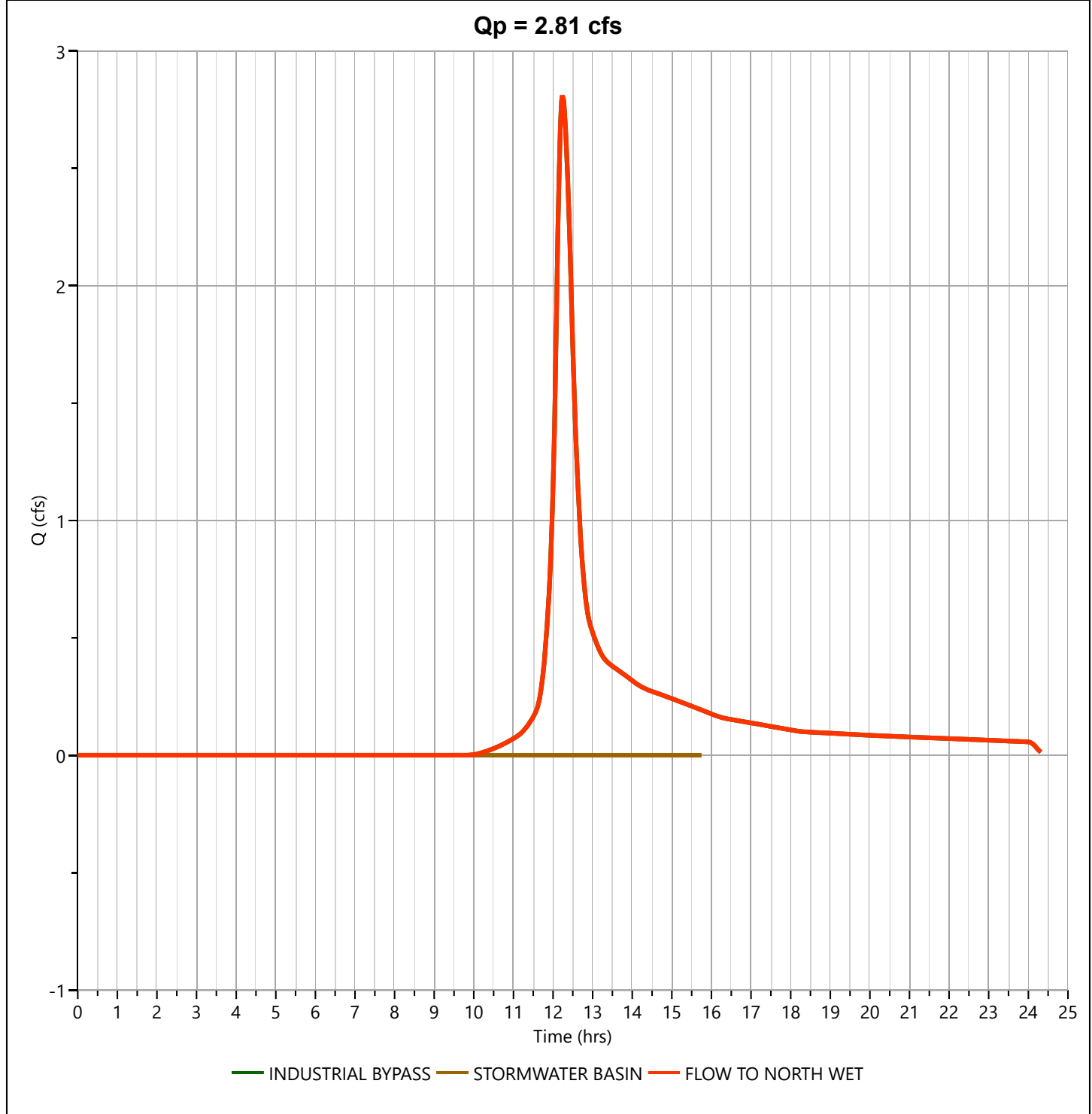


Hydrograph Report

Post FLOW TO NORTH WET

Hyd. No. 7

Hydrograph Type	= Junction	Peak Flow	= 2.811 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.23 hrs
Time Interval	= 1 min	Hydrograph Volume	= 12,697 cuft
Inflow Hydrographs	= 2, 3, 6	Total Contrib. Area	= 6.67 ac



Design Storm Report

Custom Storm filename:

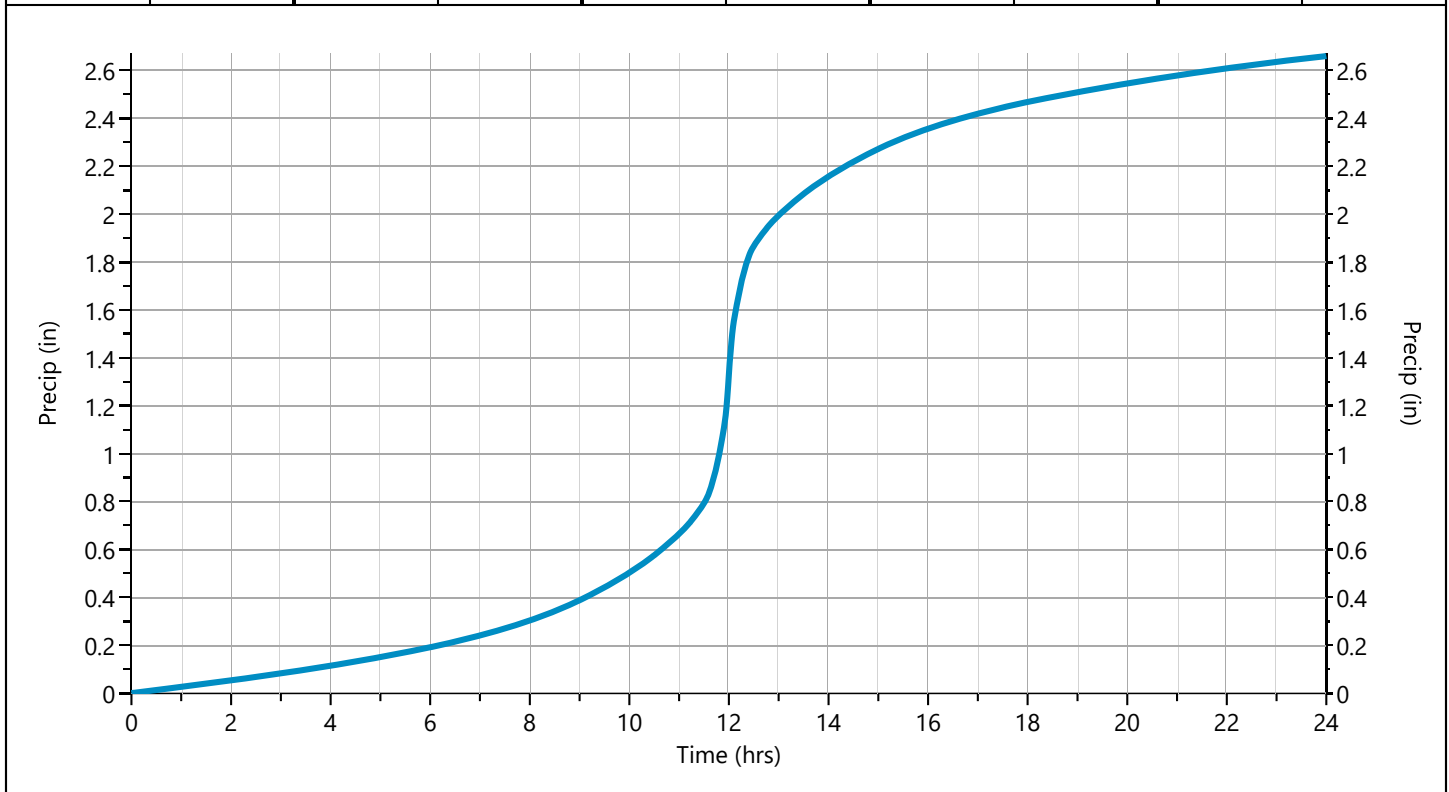
Hydrology Studio v 3.0.0.26

08-11-2022

Storm Distribution: NRCS/SCS - Type III, 24-hr

Storm Duration	Total Rainfall Volume (in)								
	✓ 1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
24 hrs	2.66	3.29	0.00	4.32	5.18	6.35	7.26	8.17	

Incremental Rainfall Distribution, 1-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.50	0.005242	11.68	0.012103	11.87	0.019255	12.05	0.039966	12.23	0.016004
11.52	0.005586	11.70	0.012753	11.88	0.019906	12.07	0.034513	12.25	0.015354
11.53	0.006251	11.72	0.013403	11.90	0.020556	12.08	0.029060	12.27	0.014704
11.55	0.006901	11.73	0.014054	11.92	0.023683	12.10	0.023607	12.28	0.014054
11.57	0.007551	11.75	0.014704	11.93	0.029061	12.12	0.020634	12.30	0.013404
11.58	0.008202	11.77	0.015354	11.95	0.034514	12.13	0.019906	12.32	0.012753
11.60	0.008852	11.78	0.016004	11.97	0.039967	12.15	0.019255	12.33	0.012103
11.62	0.009502	11.80	0.016655	11.98	0.045420	12.17	0.018605	12.35	0.011453
11.63	0.010152	11.82	0.017305	12.00	0.050873	12.18	0.017955	12.37	0.010803
11.65	0.010803	11.83	0.017955	12.02	0.050750	12.20	0.017305	12.38	0.010152
11.67	0.011453	11.85	0.018605	12.03	0.045419	12.22	0.016655	12.40	0.009502



Hydrograph 2-yr Summary

Project Name: MARION AVENUE POST DEVELOPMENT

Hydrology Studio v 3.0.0.26

08-11-2022

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Post FLOW TO BASIN (SITE)	0.263	12.78	4,562	---		
2	NRCS Runoff	Post BYPASS TO N WETLAND	0.000	0.00	0.000	---		
3	NRCS Runoff	Post INDUSTRIAL BYPASS	4.162	12.23	18,483	---		
4	NRCS Runoff	Post FLOW TO BASIN (OFF)	0.687	12.48	6,264	---		
5	Junction	Post FLOW TO BASIN	0.854	12.52	10,826	1, 4		
6	Pond Route	Post STORMWATER BASIN	0.000	13.35	0.000	5	192.11	1,268
7	Junction	Post FLOW TO NORTH WET	4.162	12.23	18,483	2, 3, 6		

Hydrograph Report

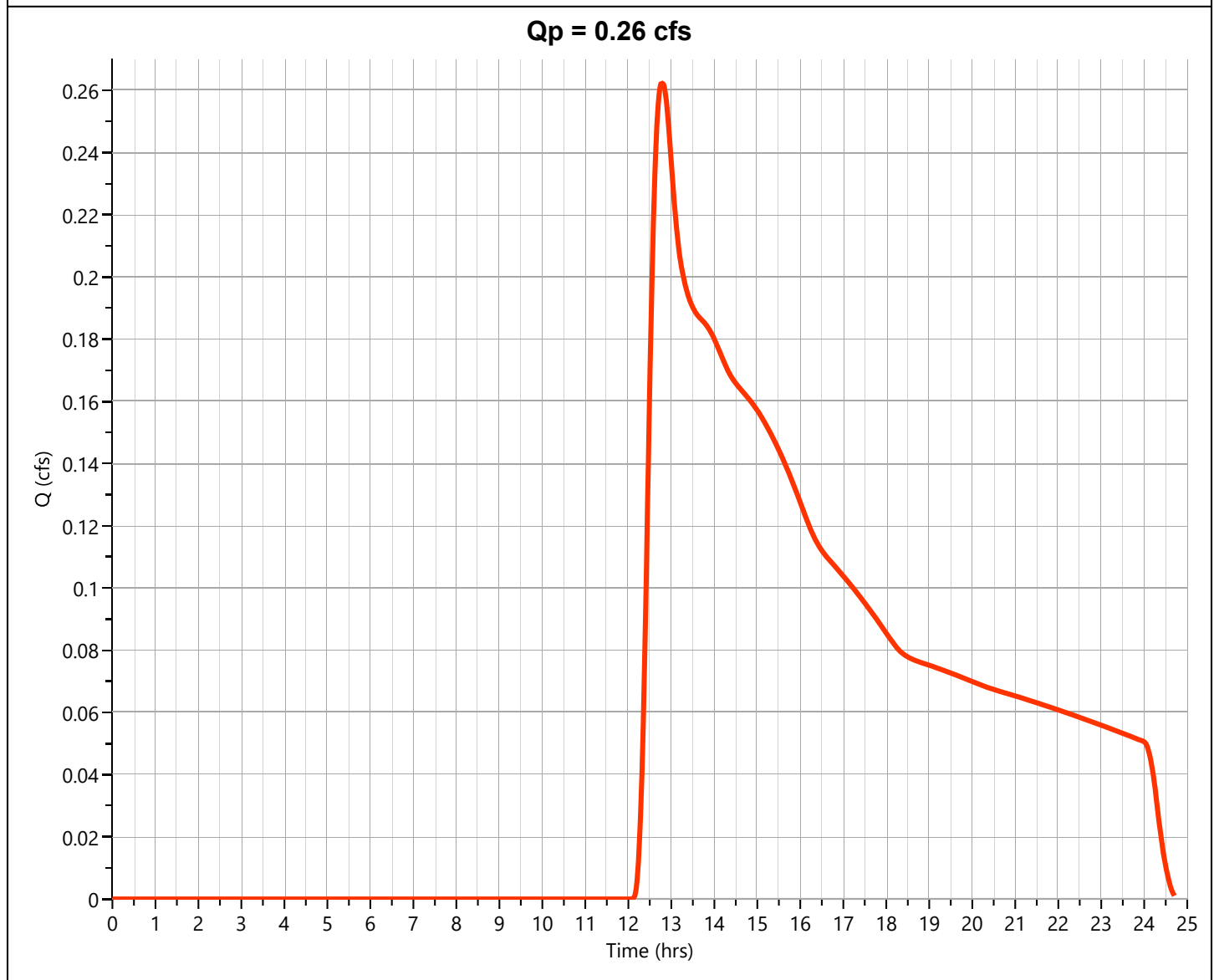
Post FLOW TO BASIN (SITE)

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.263 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.78 hrs
Time Interval	= 1 min	Runoff Volume	= 4,562 cuft
Drainage Area	= 7.367 ac	Curve Number	= 51*
Tc Method	= User	Time of Conc. (Tc)	= 30.0 min
Total Rainfall	= 3.29 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.598	98	PAVE
4.975	39	LAWN
0.794	30	WOODED
7.367	51	Weighted CN Method Employed



Hydrograph Report

Post BYPASS TO N WETLAND

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.000 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.00 hrs
Time Interval	= 1 min	Runoff Volume	= 0.000 cuft
Drainage Area	= 3.364 ac	Curve Number	= 32.98*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 37.67 min
Total Rainfall	= 3.29 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.112	39	LAWN
2.252	30	WOODED
3.364	33	Weighted CN Method Employed

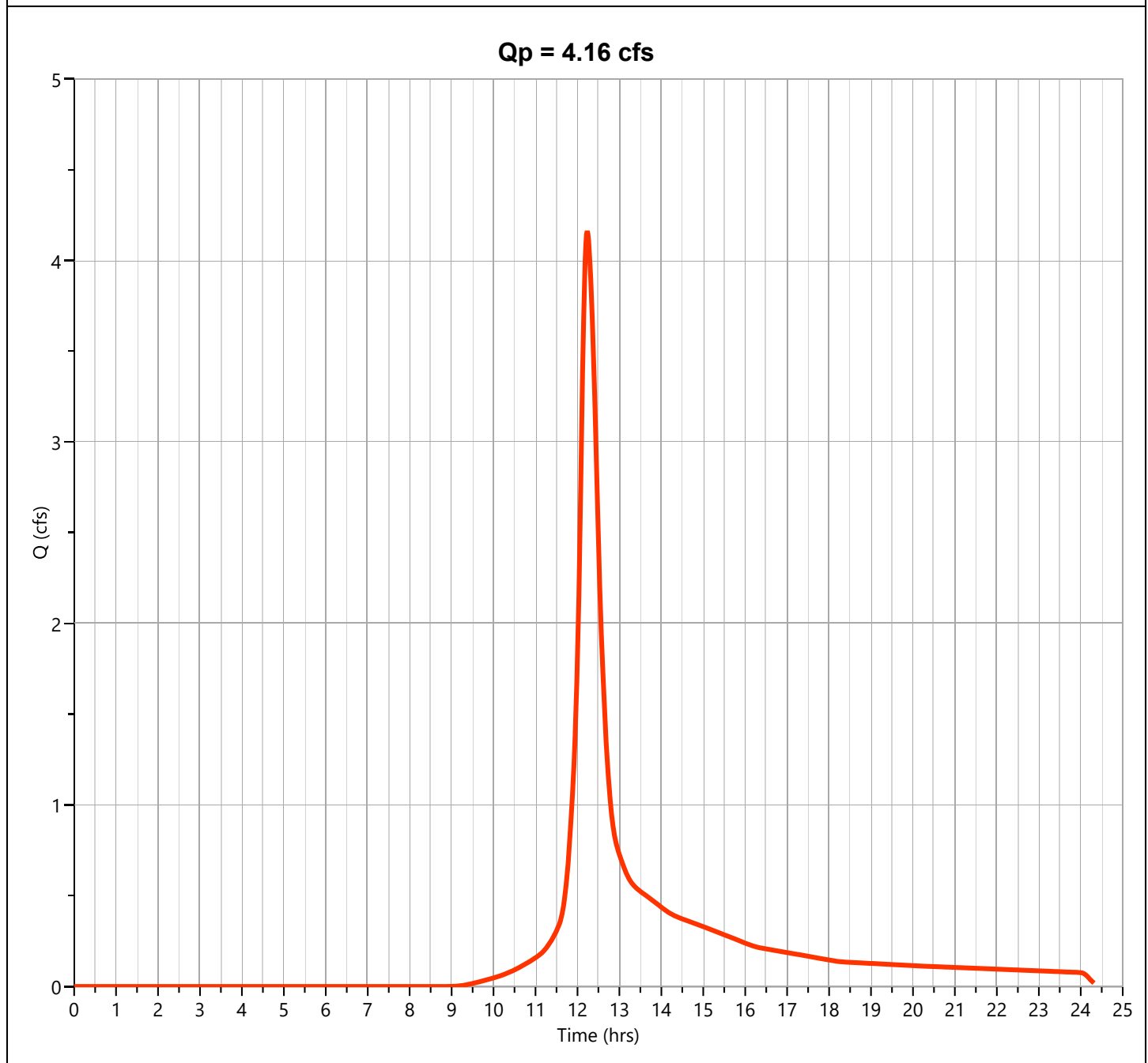
Qp = 0.00 cfs

Hydrograph Report

Post INDUSTRIAL BYPASS

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 4.162 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.23 hrs
Time Interval	= 1 min	Runoff Volume	= 18,483 cuft
Drainage Area	= 3.306 ac	Curve Number	= 81
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 3.29 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484



Hydrograph Report

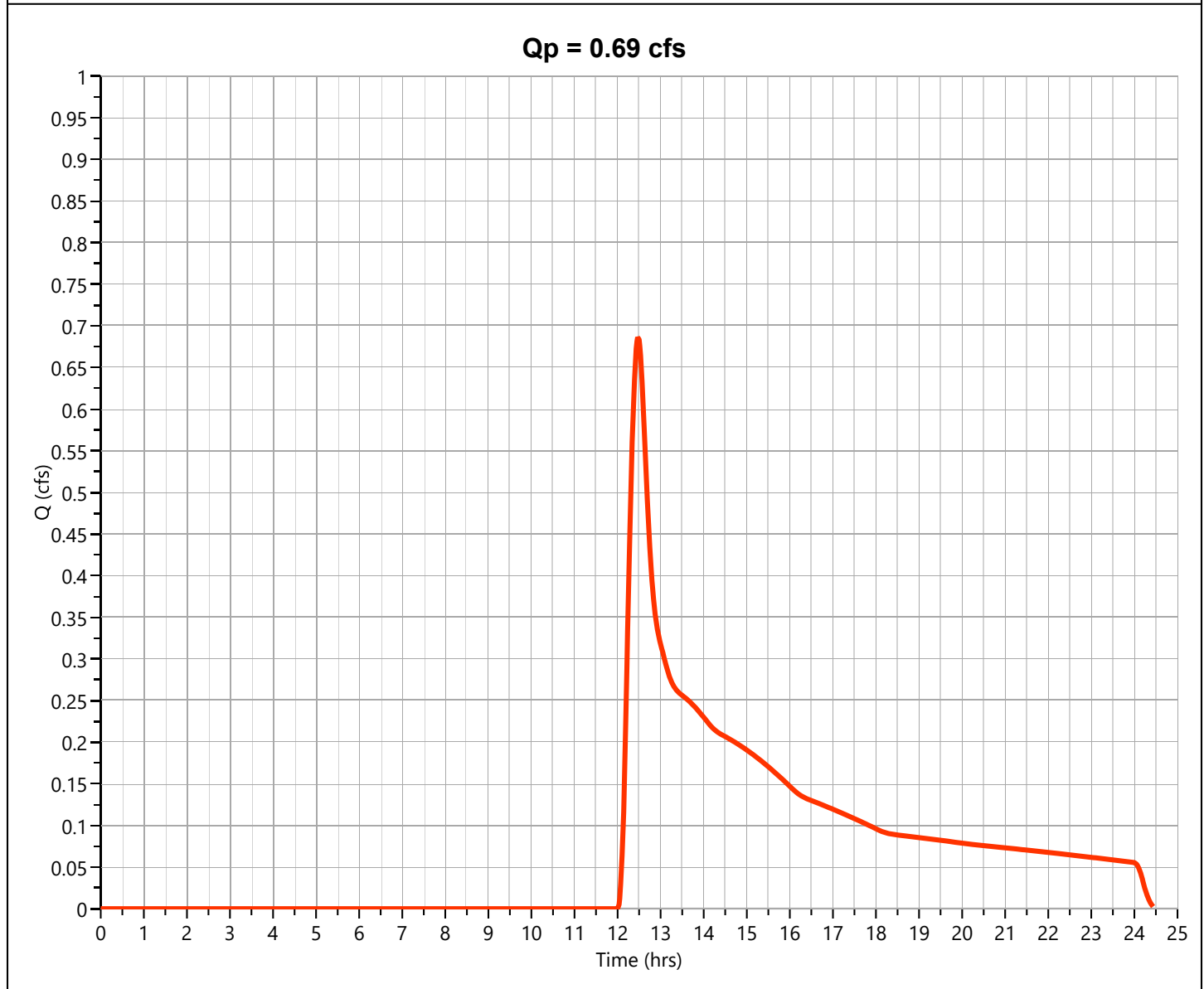
Post FLOW TO BASIN (OFF)

Hyd. No. 4

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.687 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.48 hrs
Time Interval	= 1 min	Runoff Volume	= 6,264 cuft
Drainage Area	= 6.207 ac	Curve Number	= 55*
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 3.29 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
2.617	61	1/4 ACRE RES
3.59	51	1 ACRE RES
6.207	55	Weighted CN Method Employed

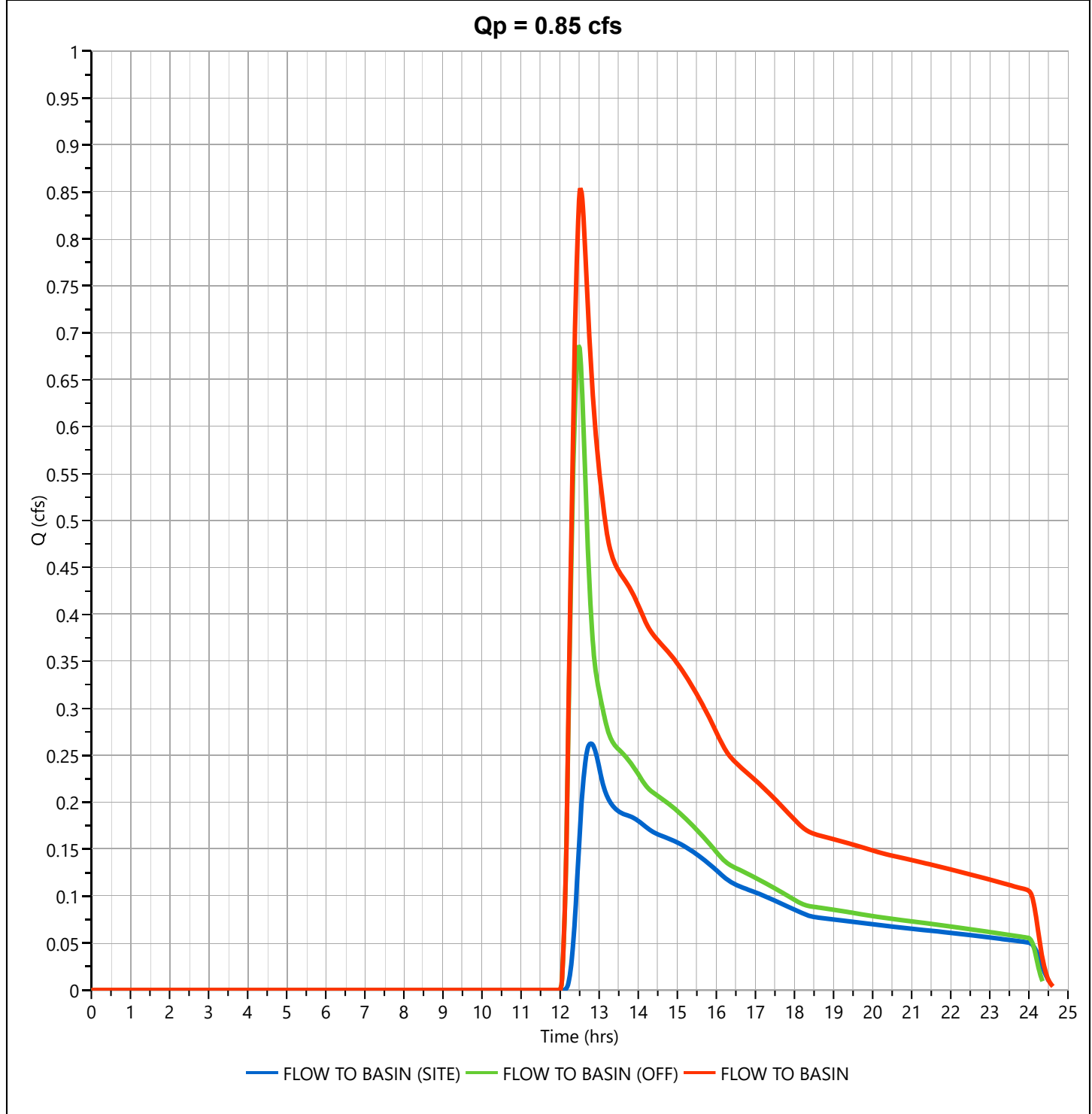


Hydrograph Report

Post FLOW TO BASIN

Hyd. No. 5

Hydrograph Type	= Junction	Peak Flow	= 0.854 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.52 hrs
Time Interval	= 1 min	Hydrograph Volume	= 10,826 cuft
Inflow Hydrographs	= 1, 4	Total Contrib. Area	= 13.574 ac



Hydrograph Report

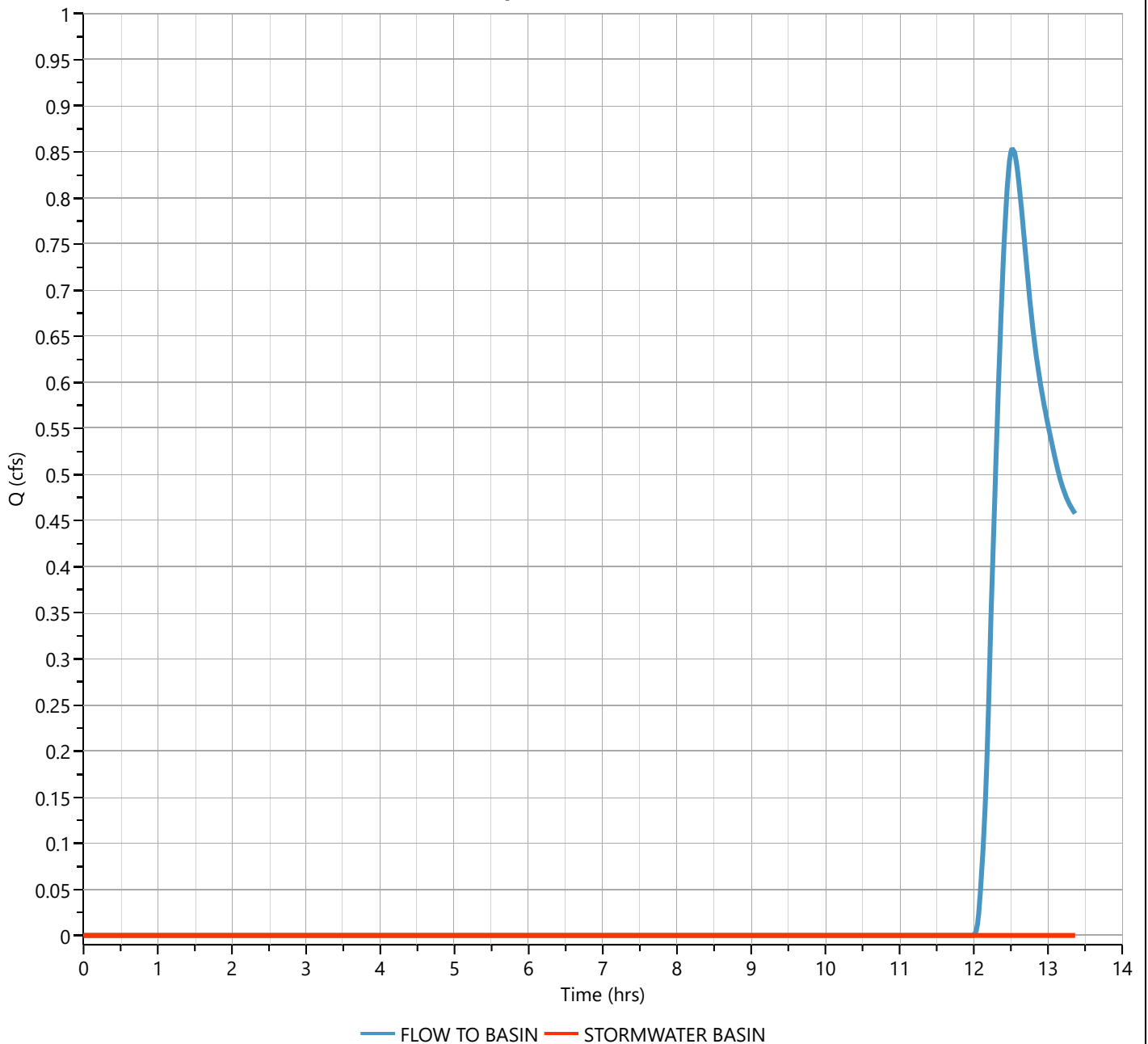
Post STORMWATER BASIN

Hyd. No. 6

Hydrograph Type	= Pond Route	Peak Flow	= 0.000 cfs
Storm Frequency	= 2-yr	Time to Peak	= 13.35 hrs
Time Interval	= 1 min	Hydrograph Volume	= 0.000 cuft
Inflow Hydrograph	= 5 - FLOW TO BASIN	Max. Elevation	= 192.11 ft
Pond Name	= STORMWATER BASIN	Max. Storage	= 1,268 cuft

Pond Routing by Storage Indication Method

Qp = 0.00 cfs

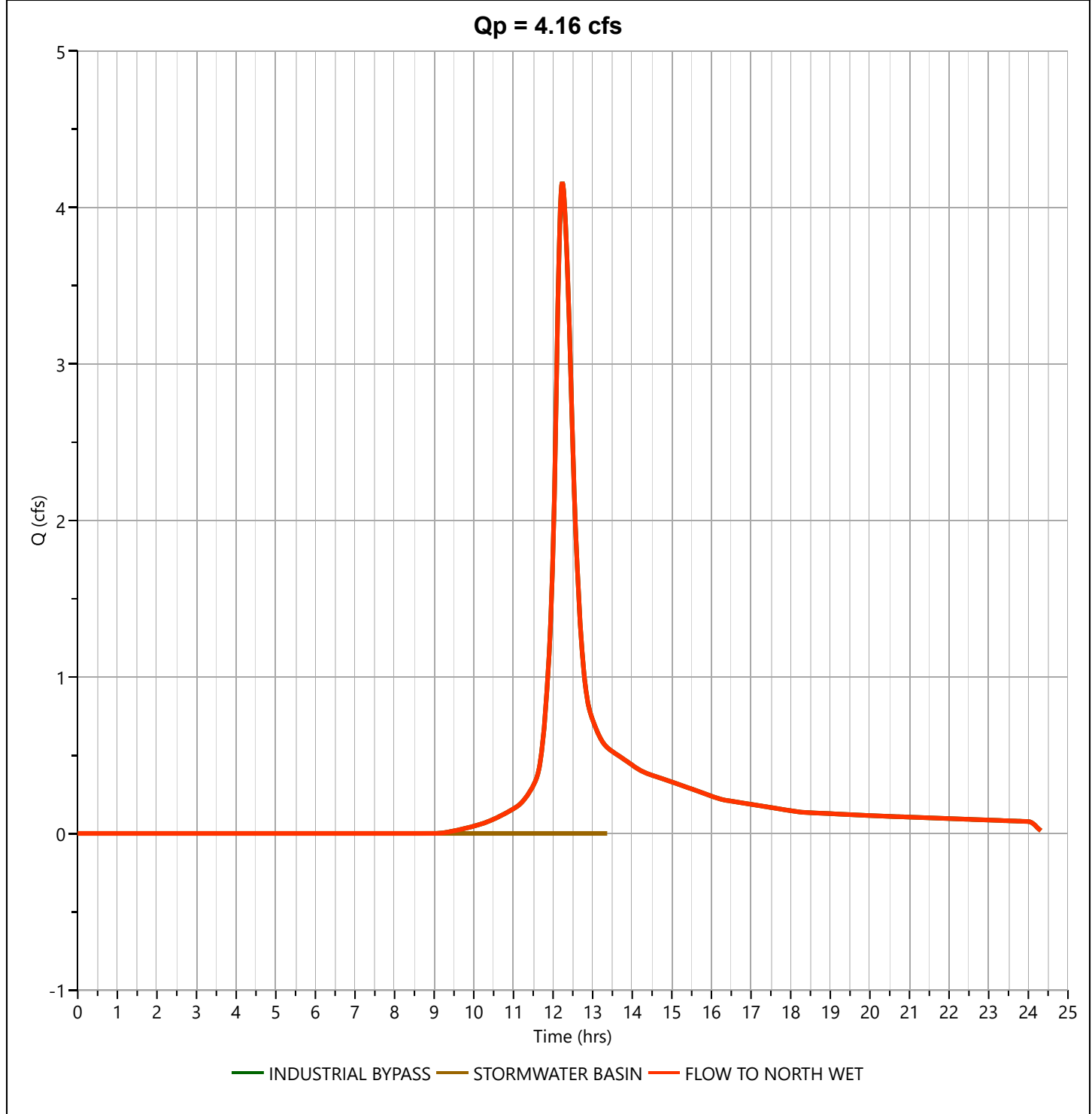


Hydrograph Report

Post FLOW TO NORTH WET

Hyd. No. 7

Hydrograph Type	= Junction	Peak Flow	= 4.162 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.23 hrs
Time Interval	= 1 min	Hydrograph Volume	= 18,483 cuft
Inflow Hydrographs	= 2, 3, 6	Total Contrib. Area	= 6.67 ac



Design Storm Report

Custom Storm filename:

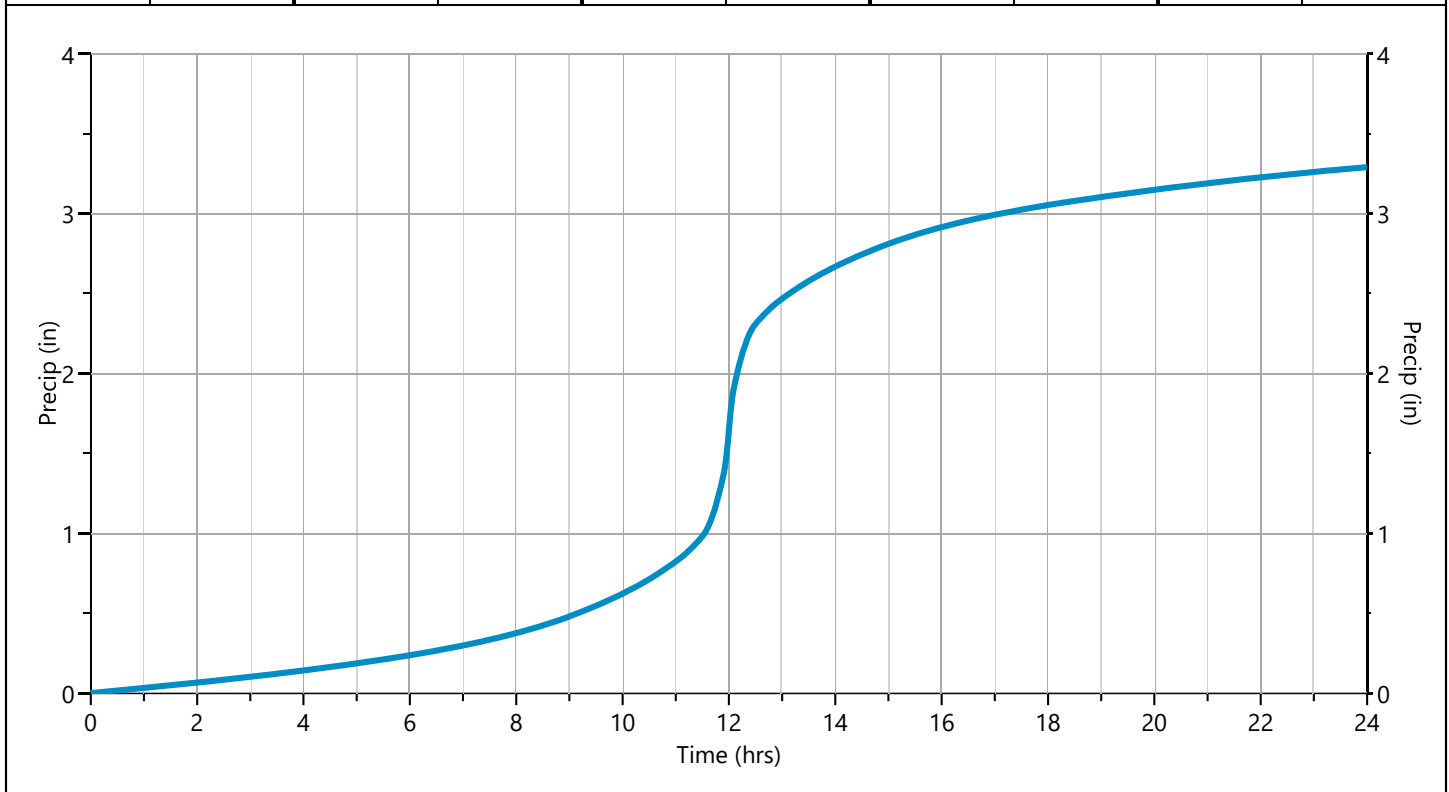
Hydrology Studio v 3.0.0.26

08-11-2022

Storm Distribution: NRCS/SCS - Type III, 24-hr

Storm Duration	Total Rainfall Volume (in)								
	1-yr	✓ 2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
24 hrs	2.66	3.29	0.00	4.32	5.18	6.35	7.26	8.17	

Incremental Rainfall Distribution, 2-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.50	0.006483	11.68	0.014969	11.87	0.023816	12.05	0.049432	12.23	0.019795
11.52	0.006909	11.70	0.015774	11.88	0.024620	12.07	0.042688	12.25	0.018991
11.53	0.007731	11.72	0.016578	11.90	0.025424	12.08	0.035943	12.27	0.018187
11.55	0.008536	11.73	0.017382	11.92	0.029293	12.10	0.029198	12.28	0.017382
11.57	0.009340	11.75	0.018186	11.93	0.035943	12.12	0.025521	12.30	0.016578
11.58	0.010144	11.77	0.018991	11.95	0.042688	12.13	0.024620	12.32	0.015774
11.60	0.010948	11.78	0.019795	11.97	0.049432	12.15	0.023816	12.33	0.014969
11.62	0.011752	11.80	0.020599	11.98	0.056177	12.17	0.023012	12.35	0.014165
11.63	0.012557	11.82	0.021403	12.00	0.062922	12.18	0.022208	12.37	0.013361
11.65	0.013361	11.83	0.022208	12.02	0.062770	12.20	0.021403	12.38	0.012557
11.67	0.014165	11.85	0.023012	12.03	0.056177	12.22	0.020599	12.40	0.011753



Hydrograph 5-yr Summary

Project Name: MARION AVENUE POST DEVELOPMENT

Hydrology Studio v 3.0.0.26

08-11-2022

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Post FLOW TO BASIN (SITE)	1.476	12.57	12,812	---		
2	NRCS Runoff	Post BYPASS TO N WETLAND	0.003	24.00	38.6	---		
3	NRCS Runoff	Post INDUSTRIAL BYPASS	6.510	12.23	28,719	---		
4	NRCS Runoff	Post FLOW TO BASIN (OFF)	2.437	12.35	14,934	---		
5	Junction	Post FLOW TO BASIN	3.649	12.42	27,746	1, 4		
6	Pond Route	Post STORMWATER BASIN	0.000	18.98	0.000	5	192.64	7,326
7	Junction	Post FLOW TO NORTH WET	6.510	12.23	28,758	2, 3, 6		

Hydrograph Report

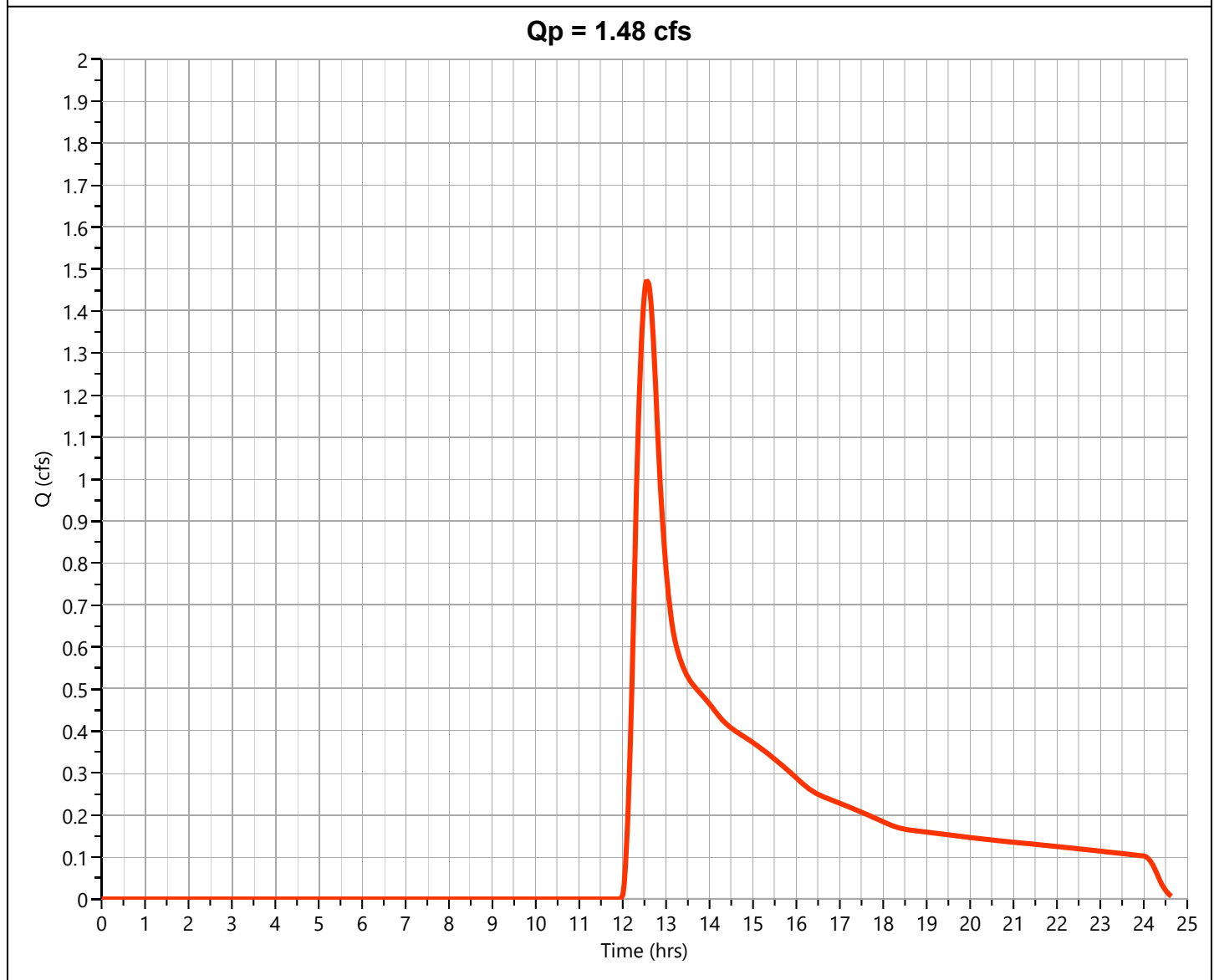
Post FLOW TO BASIN (SITE)

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 1.476 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.57 hrs
Time Interval	= 1 min	Runoff Volume	= 12,812 cuft
Drainage Area	= 7.367 ac	Curve Number	= 51*
Tc Method	= User	Time of Conc. (Tc)	= 30.0 min
Total Rainfall	= 4.32 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.598	98	PAVE
4.975	39	LAWN
0.794	30	WOODED
7.367	51	Weighted CN Method Employed



Hydrograph Report

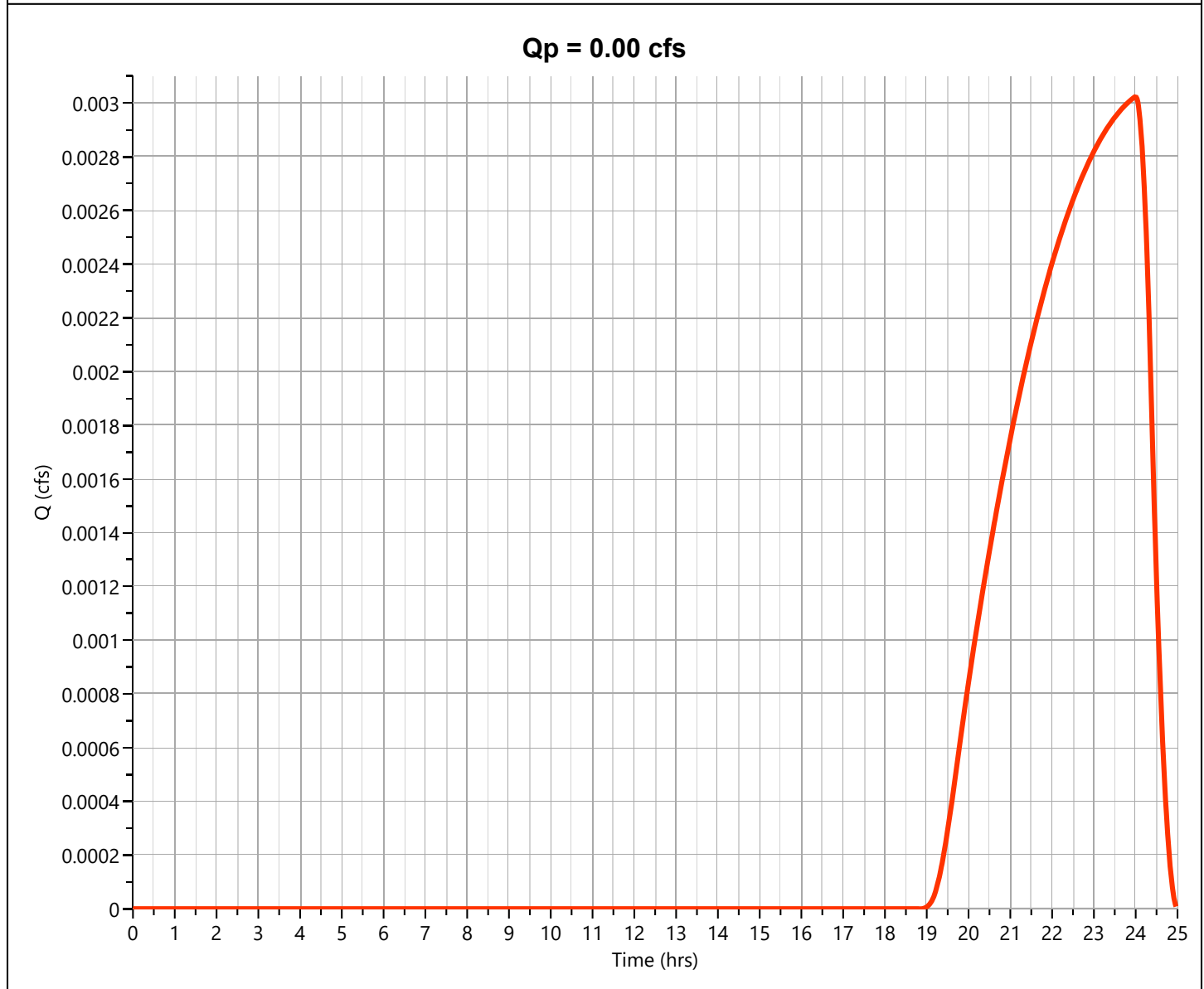
Post BYPASS TO N WETLAND

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.003 cfs
Storm Frequency	= 5-yr	Time to Peak	= 24.00 hrs
Time Interval	= 1 min	Runoff Volume	= 38.6 cuft
Drainage Area	= 3.364 ac	Curve Number	= 32.98*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 37.67 min
Total Rainfall	= 4.32 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.112	39	LAWN
2.252	30	WOODED
3.364	33	Weighted CN Method Employed

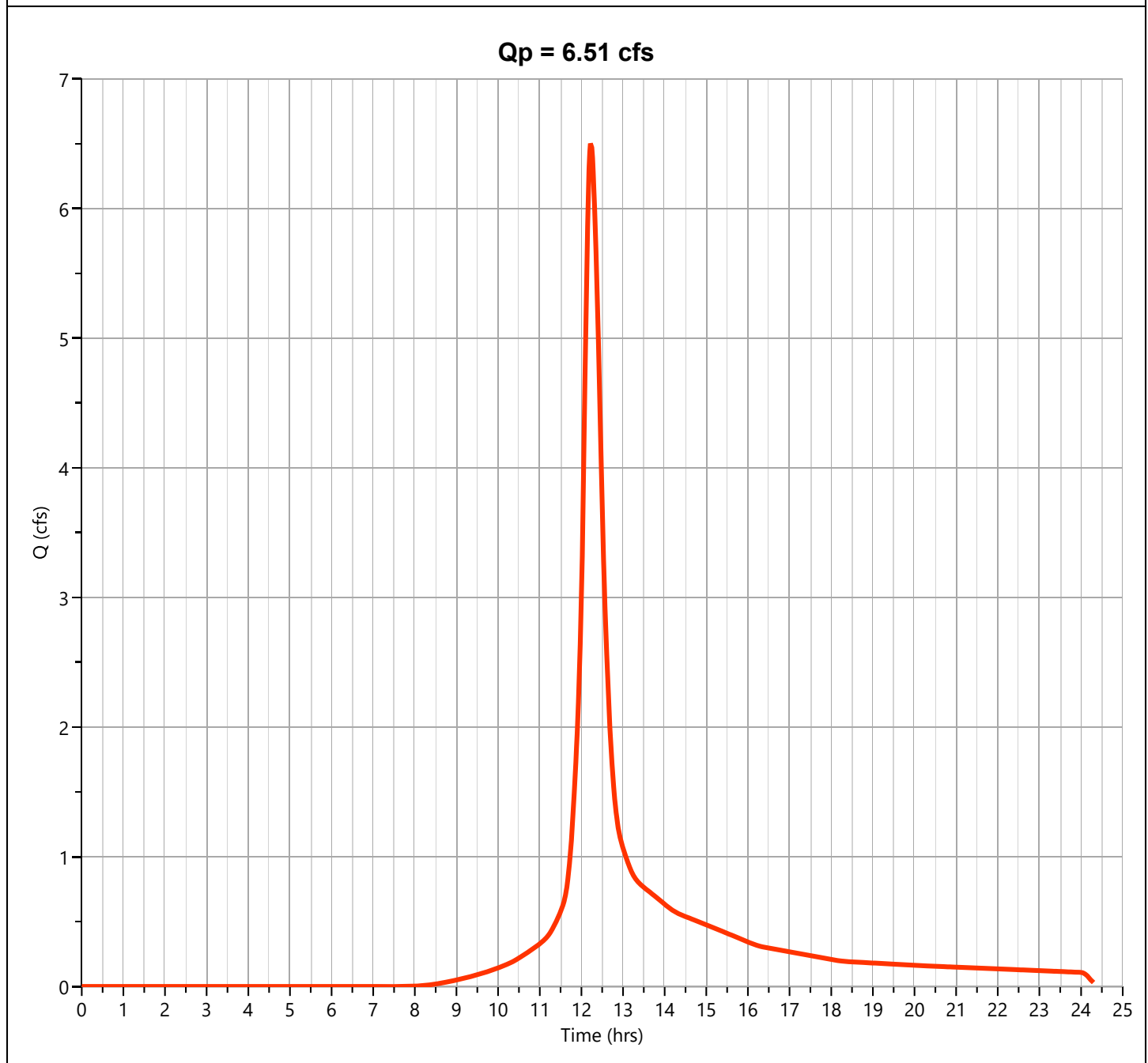


Hydrograph Report

Post INDUSTRIAL BYPASS

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 6.510 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.23 hrs
Time Interval	= 1 min	Runoff Volume	= 28,719 cuft
Drainage Area	= 3.306 ac	Curve Number	= 81
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 4.32 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484



Hydrograph Report

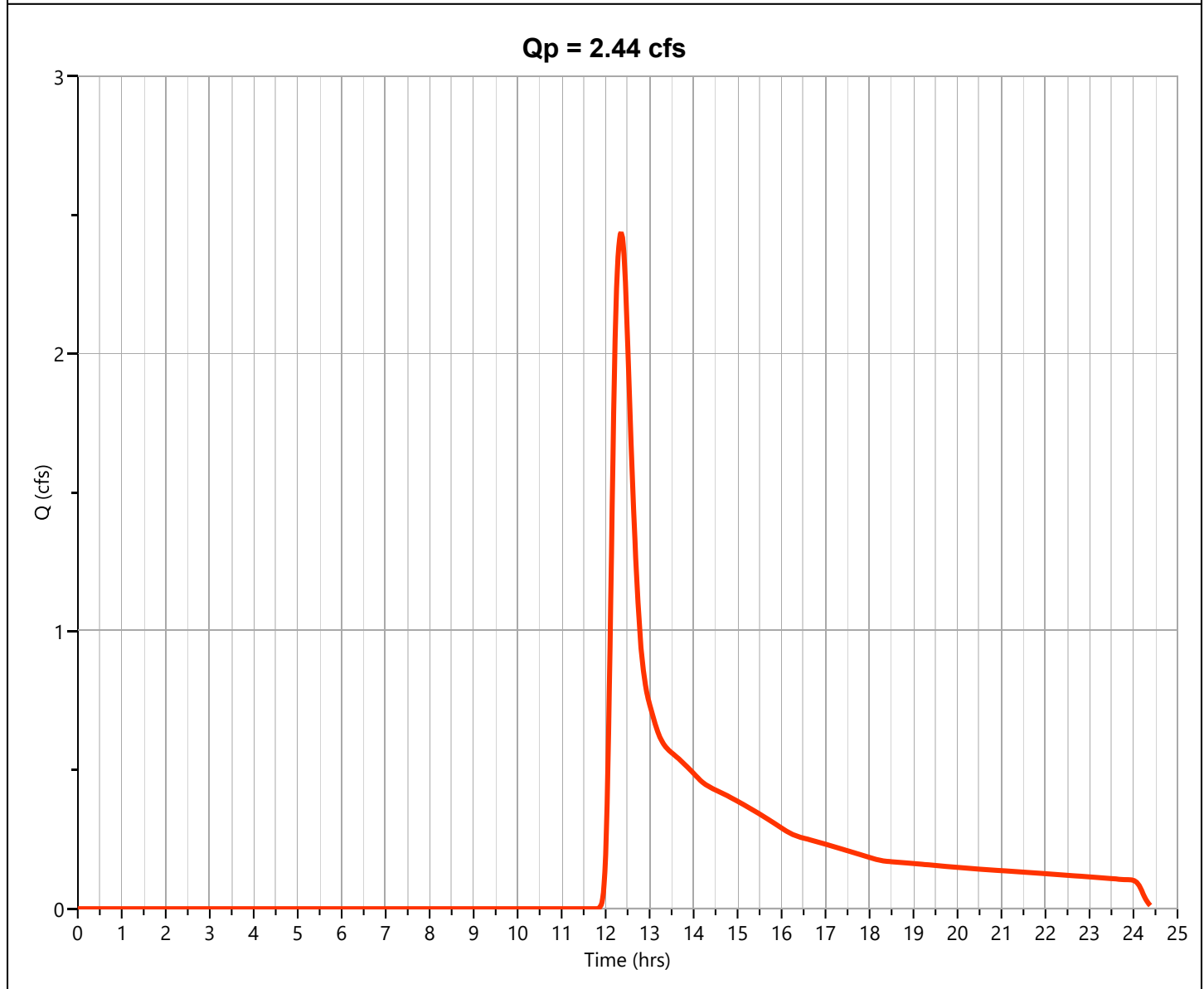
Post FLOW TO BASIN (OFF)

Hyd. No. 4

Hydrograph Type	= NRCS Runoff	Peak Flow	= 2.437 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.35 hrs
Time Interval	= 1 min	Runoff Volume	= 14,934 cuft
Drainage Area	= 6.207 ac	Curve Number	= 55*
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 4.32 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
2.617	61	1/4 ACRE RES
3.59	51	1 ACRE RES
6.207	55	Weighted CN Method Employed

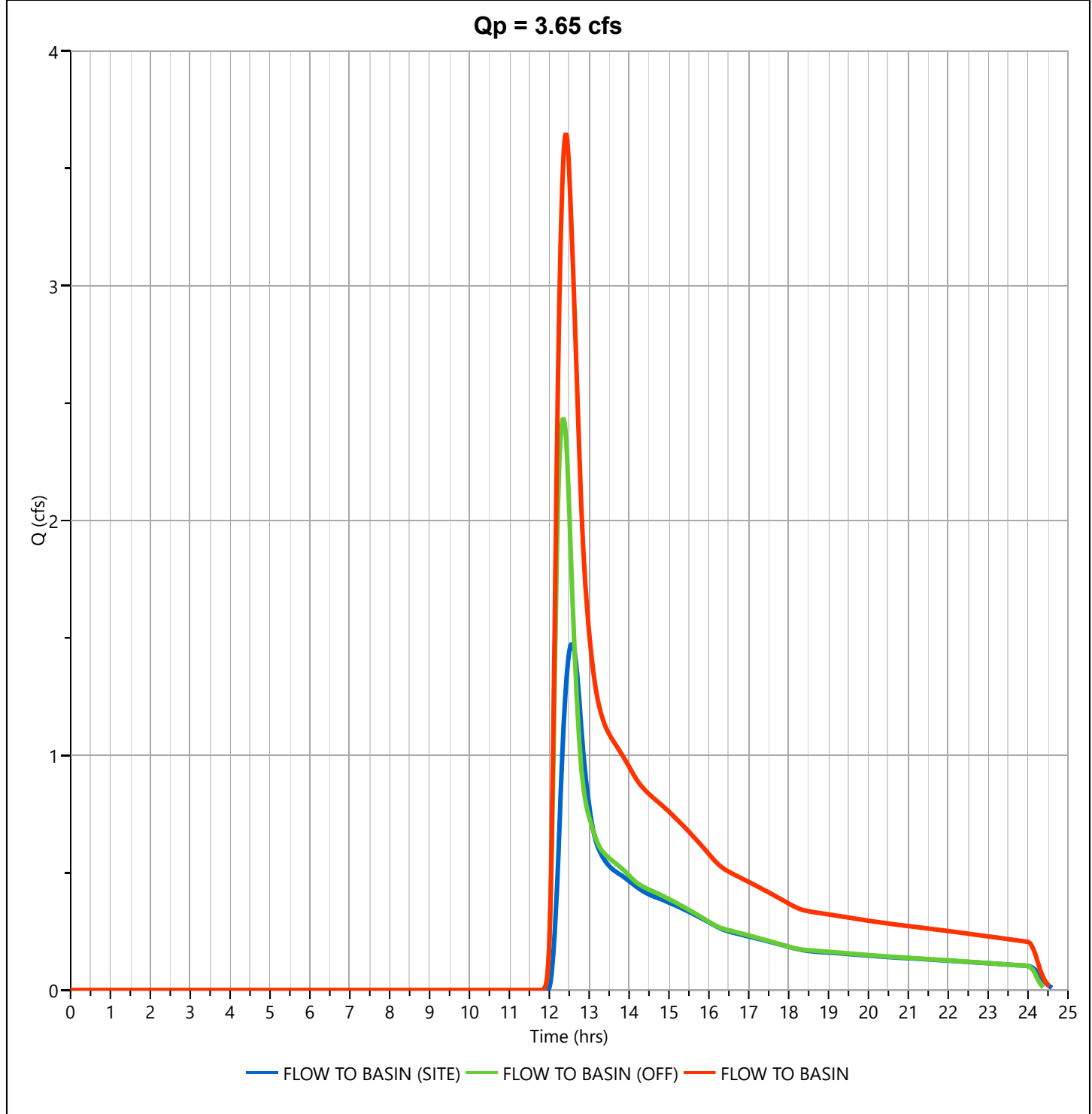


Hydrograph Report

Post FLOW TO BASIN

Hyd. No. 5

Hydrograph Type	= Junction	Peak Flow	= 3.649 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.42 hrs
Time Interval	= 1 min	Hydrograph Volume	= 27,746 cuft
Inflow Hydrographs	= 1, 4	Total Contrib. Area	= 13.574 ac



Hydrograph Report

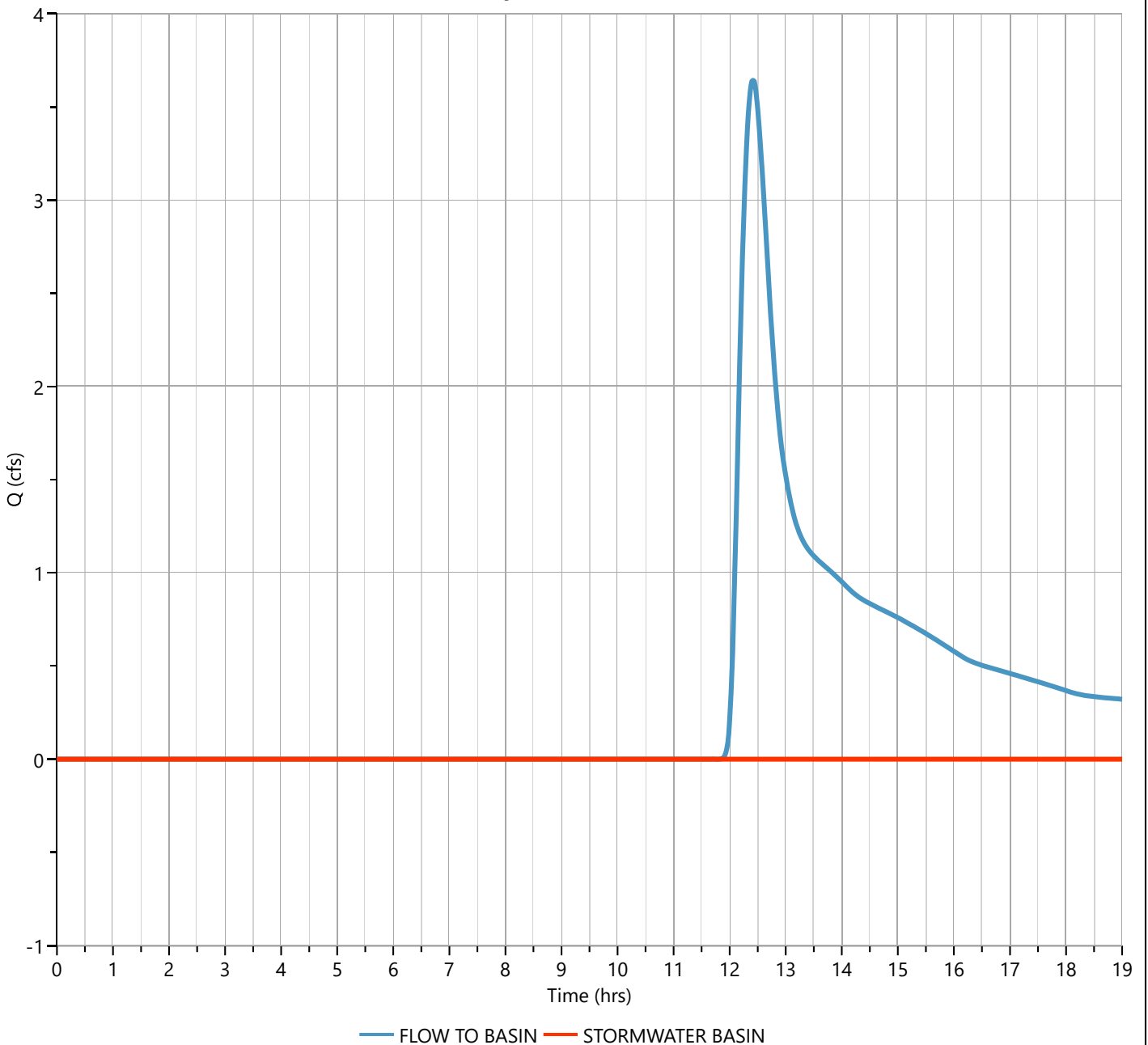
Post STORMWATER BASIN

Hyd. No. 6

Hydrograph Type	= Pond Route	Peak Flow	= 0.000 cfs
Storm Frequency	= 5-yr	Time to Peak	= 18.98 hrs
Time Interval	= 1 min	Hydrograph Volume	= 0.000 cuft
Inflow Hydrograph	= 5 - FLOW TO BASIN	Max. Elevation	= 192.64 ft
Pond Name	= STORMWATER BASIN	Max. Storage	= 7,326 cuft

Pond Routing by Storage Indication Method

Qp = 0.00 cfs

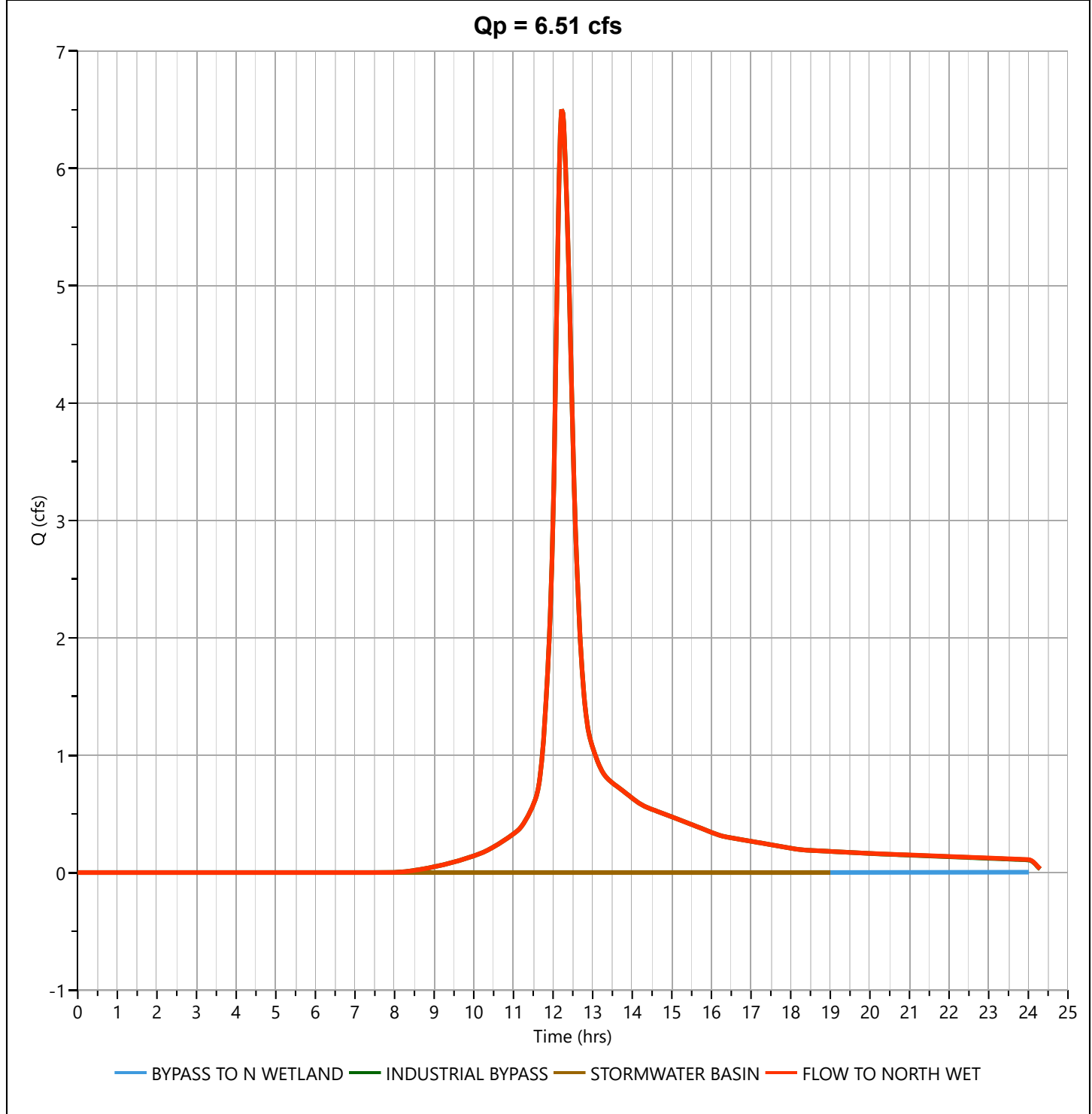


Hydrograph Report

Post FLOW TO NORTH WET

Hyd. No. 7

Hydrograph Type	= Junction	Peak Flow	= 6.510 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.23 hrs
Time Interval	= 1 min	Hydrograph Volume	= 28,758 cuft
Inflow Hydrographs	= 2, 3, 6	Total Contrib. Area	= 6.67 ac



Design Storm Report

Custom Storm filename:

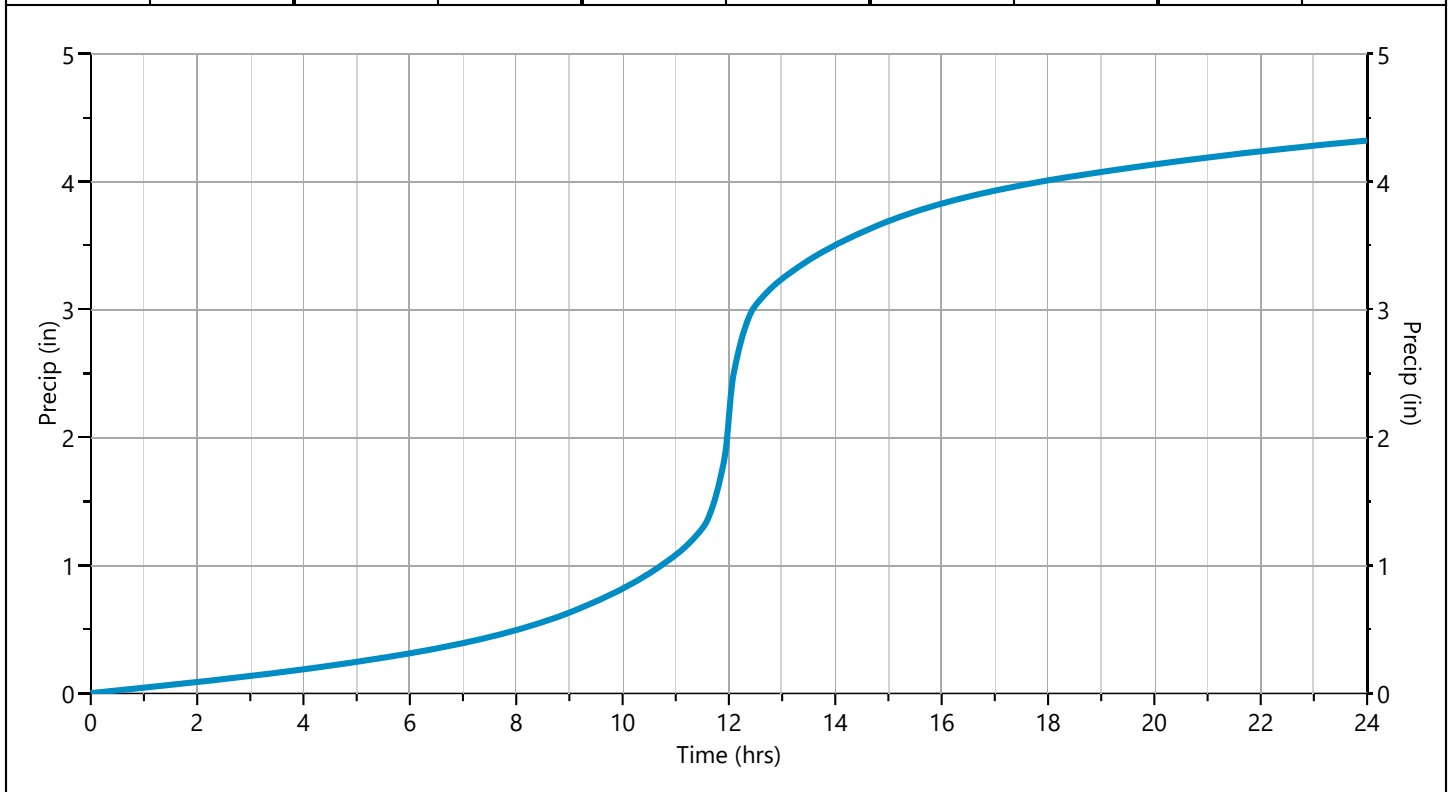
Hydrology Studio v 3.0.0.26

08-11-2022

Storm Distribution: NRCS/SCS - Type III, 24-hr

Storm Duration	Total Rainfall Volume (in)							
	1-yr	2-yr	3-yr	✓ 5-yr	10-yr	25-yr	50-yr	100-yr
24 hrs	2.66	3.29	0.00	4.32	5.18	6.35	7.26	8.17

Incremental Rainfall Distribution, 5-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.50	0.008513	11.68	0.019656	11.87	0.031272	12.05	0.064908	12.23	0.025992
11.52	0.009072	11.70	0.020712	11.88	0.032328	12.07	0.056052	12.25	0.024936
11.53	0.010152	11.72	0.021768	11.90	0.033384	12.08	0.047196	12.27	0.023880
11.55	0.011208	11.73	0.022824	11.92	0.038463	12.10	0.038340	12.28	0.022824
11.57	0.012264	11.75	0.023880	11.93	0.047196	12.12	0.033511	12.30	0.021768
11.58	0.013320	11.77	0.024936	11.95	0.056052	12.13	0.032328	12.32	0.020712
11.60	0.014376	11.78	0.025992	11.97	0.064908	12.15	0.031272	12.33	0.019656
11.62	0.015432	11.80	0.027048	11.98	0.073764	12.17	0.030216	12.35	0.018600
11.63	0.016488	11.82	0.028104	12.00	0.082620	12.18	0.029160	12.37	0.017544
11.65	0.017544	11.83	0.029160	12.02	0.082422	12.20	0.028104	12.38	0.016488
11.67	0.018600	11.85	0.030216	12.03	0.073764	12.22	0.027048	12.40	0.015432



Hydrograph 10-yr Summary

Project Name: MARION AVENUE POST DEVELOPMENT

Hydrology Studio v 3.0.0.26

08-11-2022

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Post FLOW TO BASIN (SITE)	3.145	12.50	22,068	---		
2	NRCS Runoff	Post BYPASS TO N WETLAND	0.024	15.95	705	---		
3	NRCS Runoff	Post INDUSTRIAL BYPASS	8.542	12.22	37,741	---		
4	NRCS Runoff	Post FLOW TO BASIN (OFF)	4.526	12.30	24,130	---		
5	Junction	Post FLOW TO BASIN	7.245	12.37	46,197	1, 4		
6	Pond Route	Post STORMWATER BASIN	0.000	14.75	0.002	5	193.64	18,726
7	Junction	Post FLOW TO NORTH WET	8.542	12.22	38,447	2, 3, 6		

Hydrograph Report

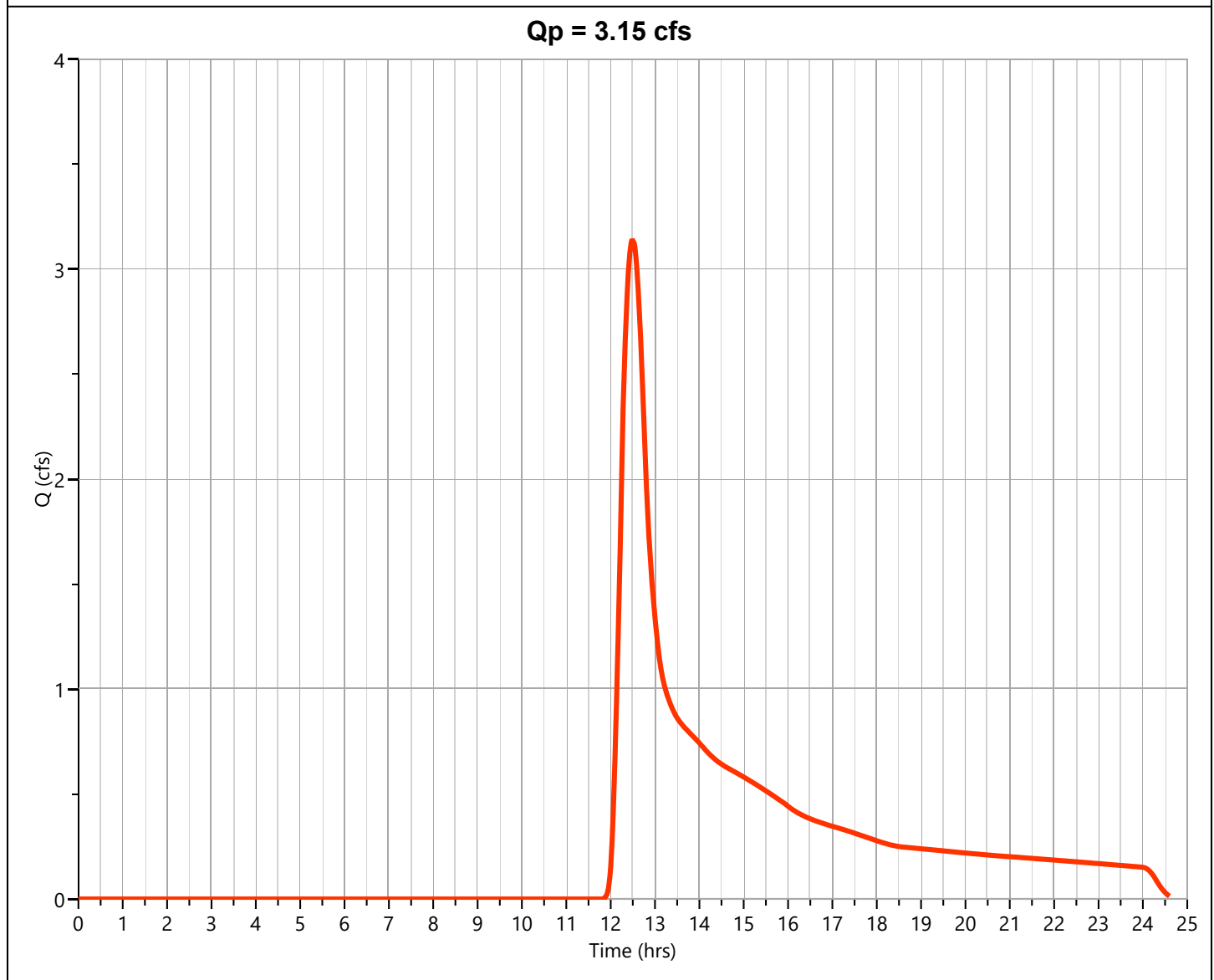
Post FLOW TO BASIN (SITE)

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 3.145 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.50 hrs
Time Interval	= 1 min	Runoff Volume	= 22,068 cuft
Drainage Area	= 7.367 ac	Curve Number	= 51*
Tc Method	= User	Time of Conc. (Tc)	= 30.0 min
Total Rainfall	= 5.18 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.598	98	PAVE
4.975	39	LAWN
0.794	30	WOODED
7.367	51	Weighted CN Method Employed



Hydrograph Report

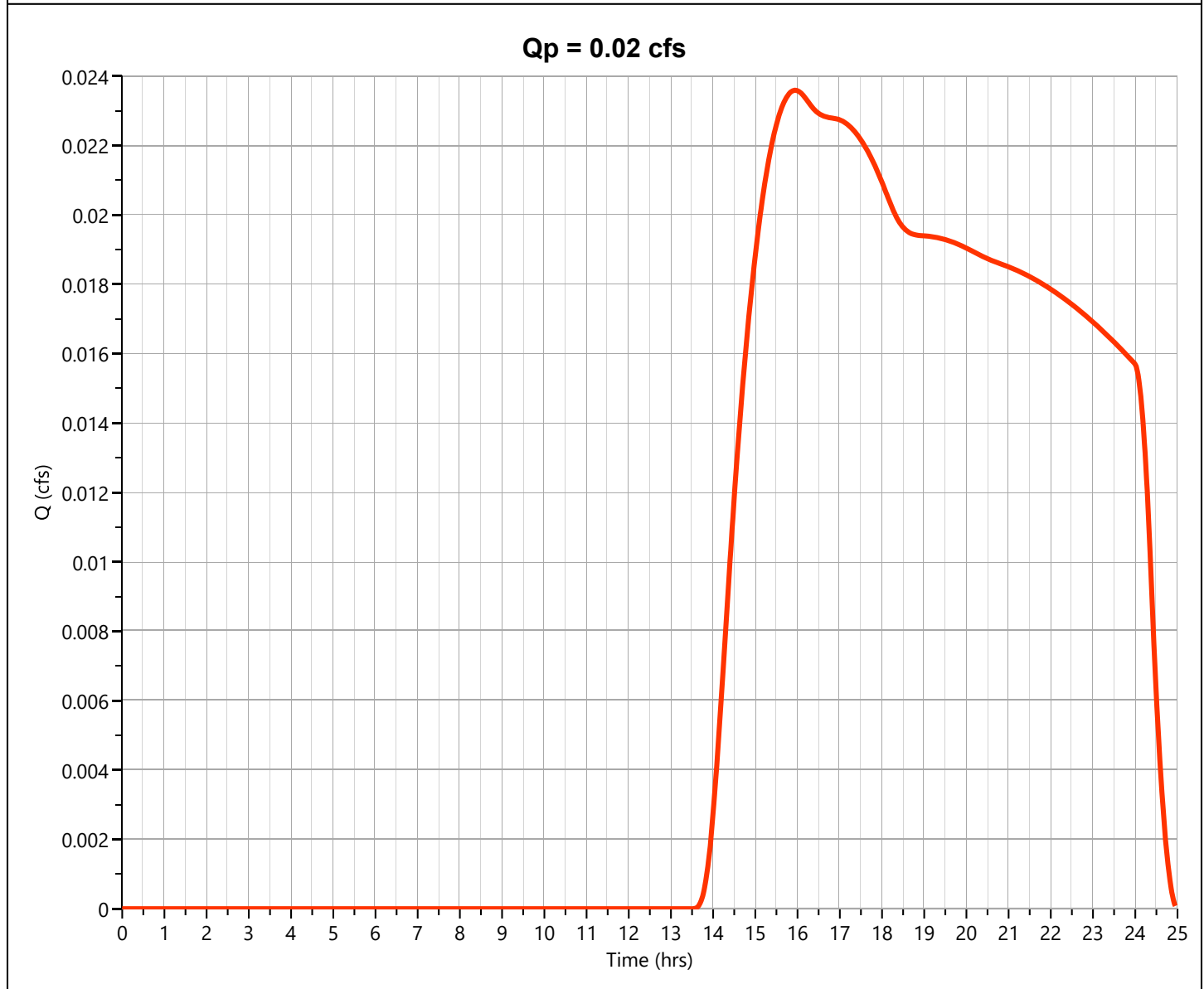
Post BYPASS TO N WETLAND

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.024 cfs
Storm Frequency	= 10-yr	Time to Peak	= 15.95 hrs
Time Interval	= 1 min	Runoff Volume	= 705 cuft
Drainage Area	= 3.364 ac	Curve Number	= 32.98*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 37.67 min
Total Rainfall	= 5.18 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.112	39	LAWN
2.252	30	WOODED
3.364	33	Weighted CN Method Employed

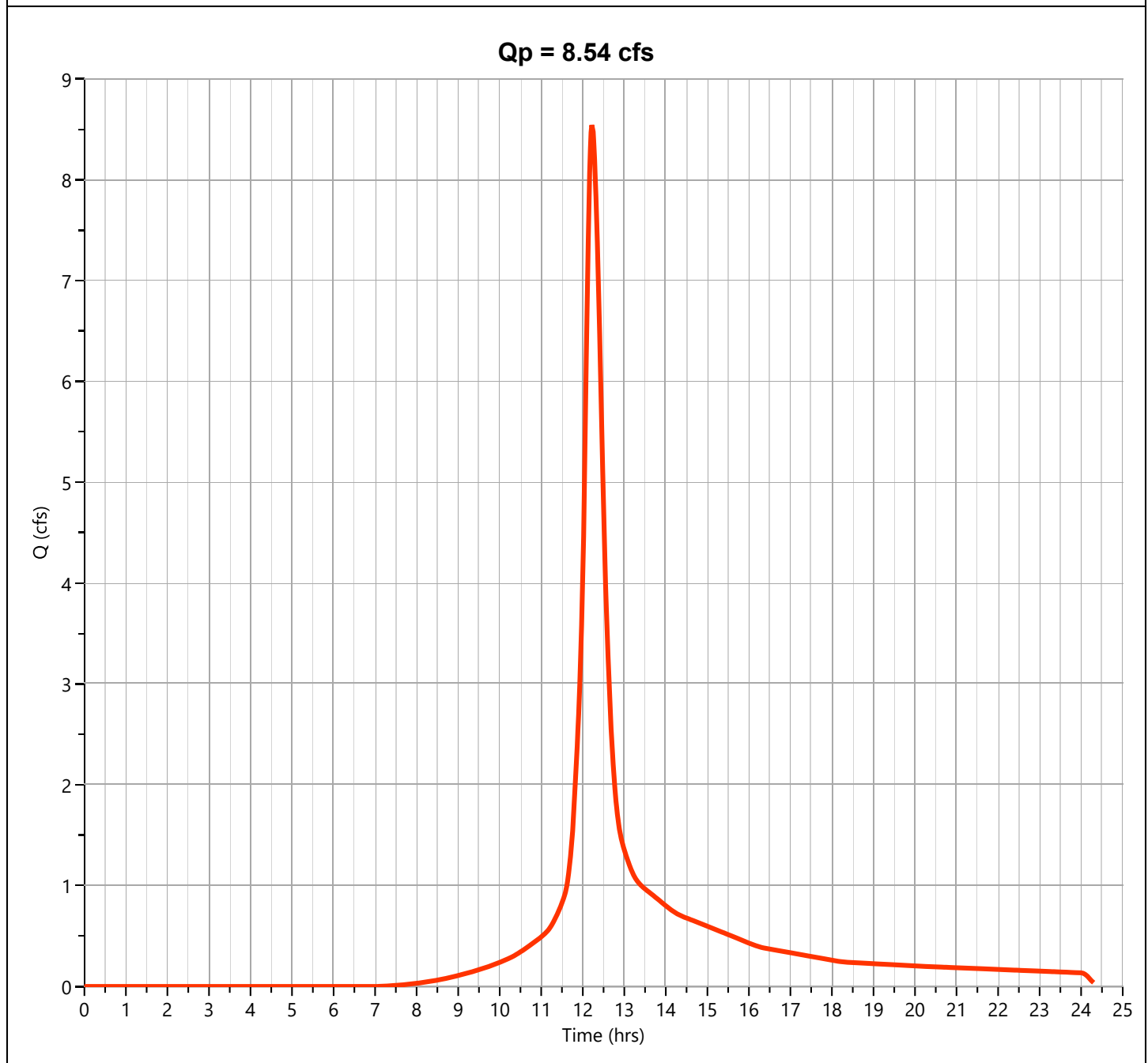


Hydrograph Report

Post INDUSTRIAL BYPASS

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 8.542 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.22 hrs
Time Interval	= 1 min	Runoff Volume	= 37,741 cuft
Drainage Area	= 3.306 ac	Curve Number	= 81
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 5.18 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484



Hydrograph Report

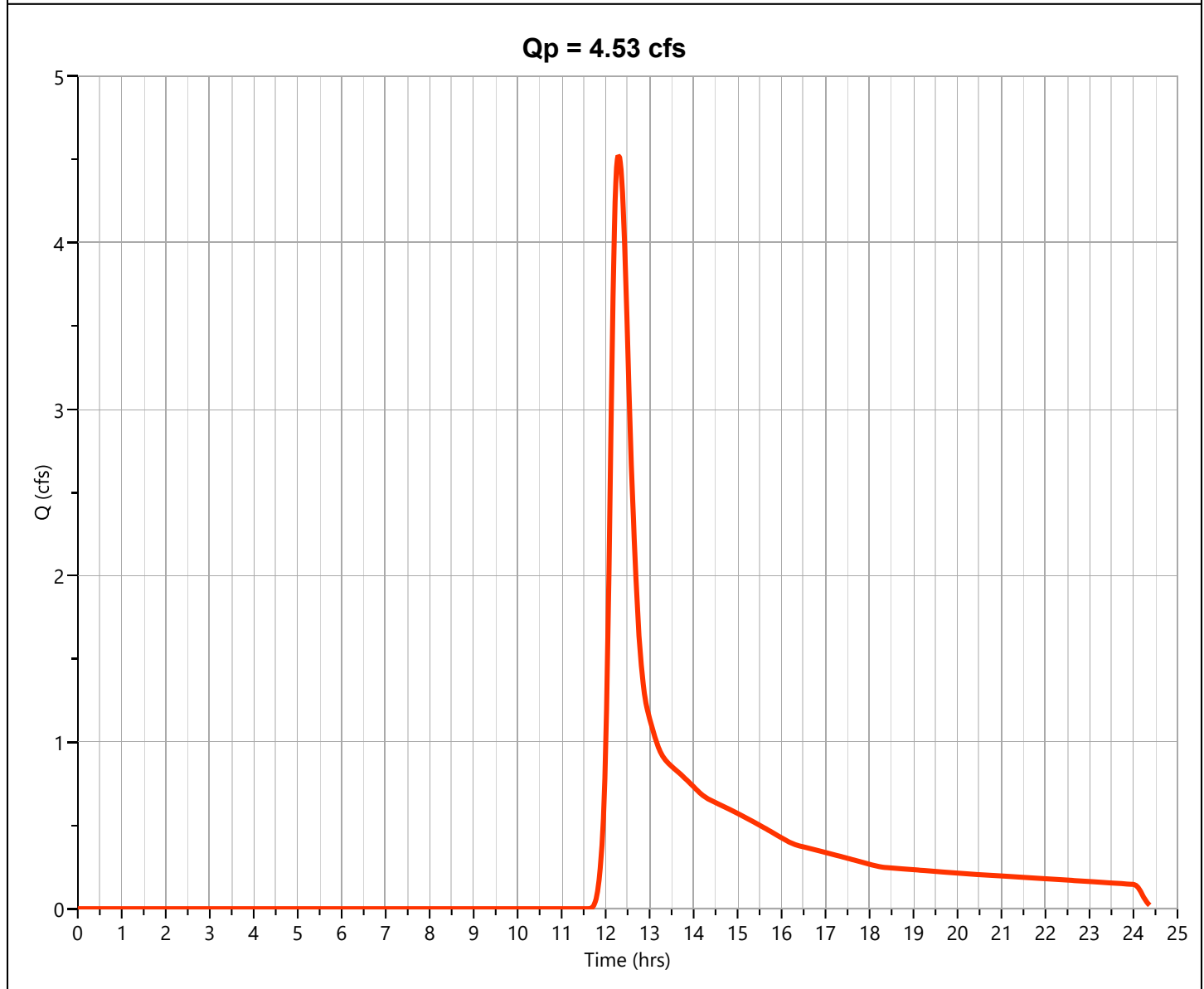
Post FLOW TO BASIN (OFF)

Hyd. No. 4

Hydrograph Type	= NRCS Runoff	Peak Flow	= 4.526 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.30 hrs
Time Interval	= 1 min	Runoff Volume	= 24,130 cuft
Drainage Area	= 6.207 ac	Curve Number	= 55*
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 5.18 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
2.617	61	1/4 ACRE RES
3.59	51	1 ACRE RES
6.207	55	Weighted CN Method Employed

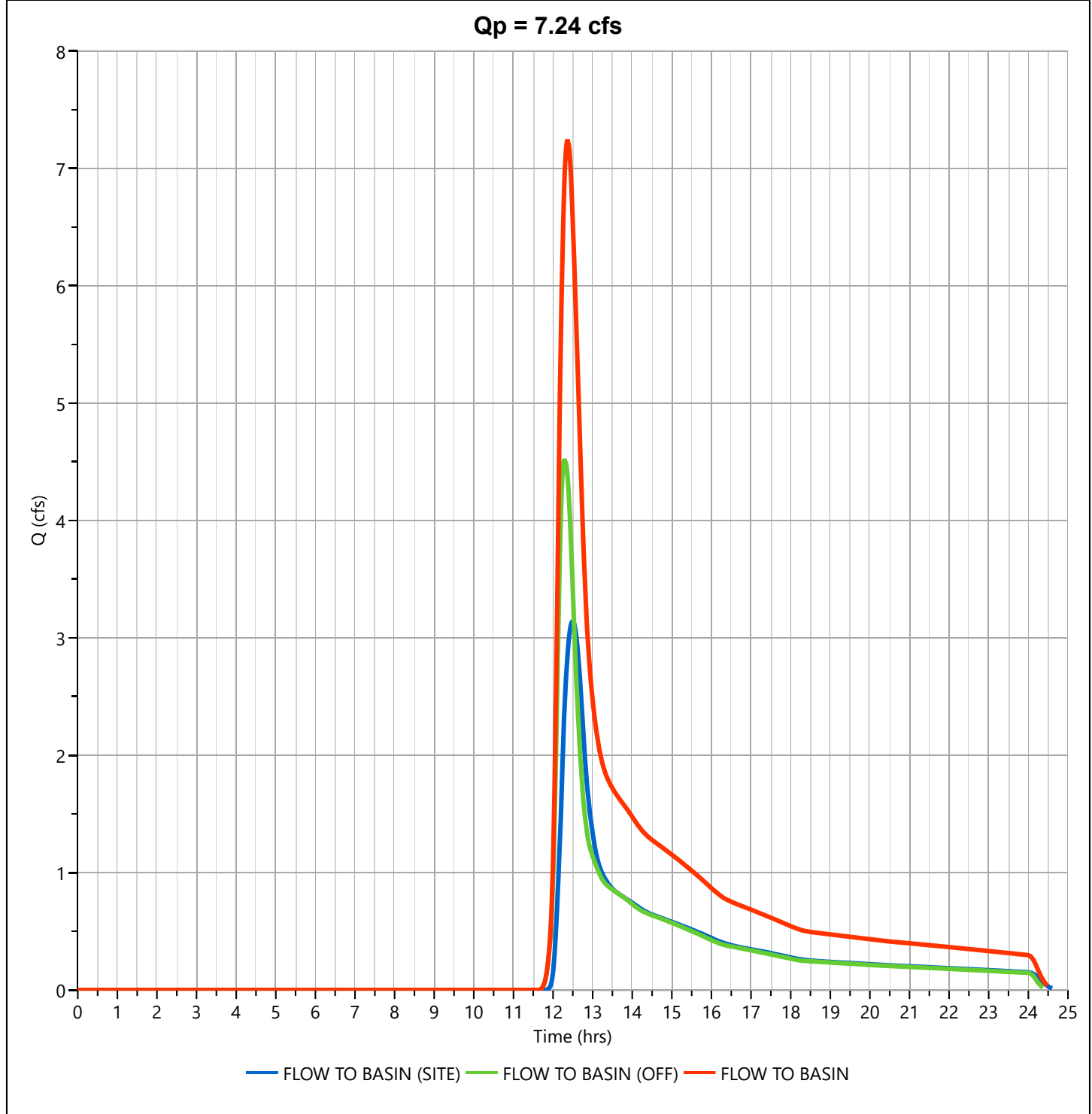


Hydrograph Report

Post FLOW TO BASIN

Hyd. No. 5

Hydrograph Type	= Junction	Peak Flow	= 7.245 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.37 hrs
Time Interval	= 1 min	Hydrograph Volume	= 46,197 cuft
Inflow Hydrographs	= 1, 4	Total Contrib. Area	= 13.574 ac



Hydrograph Report

Post STORMWATER BASIN

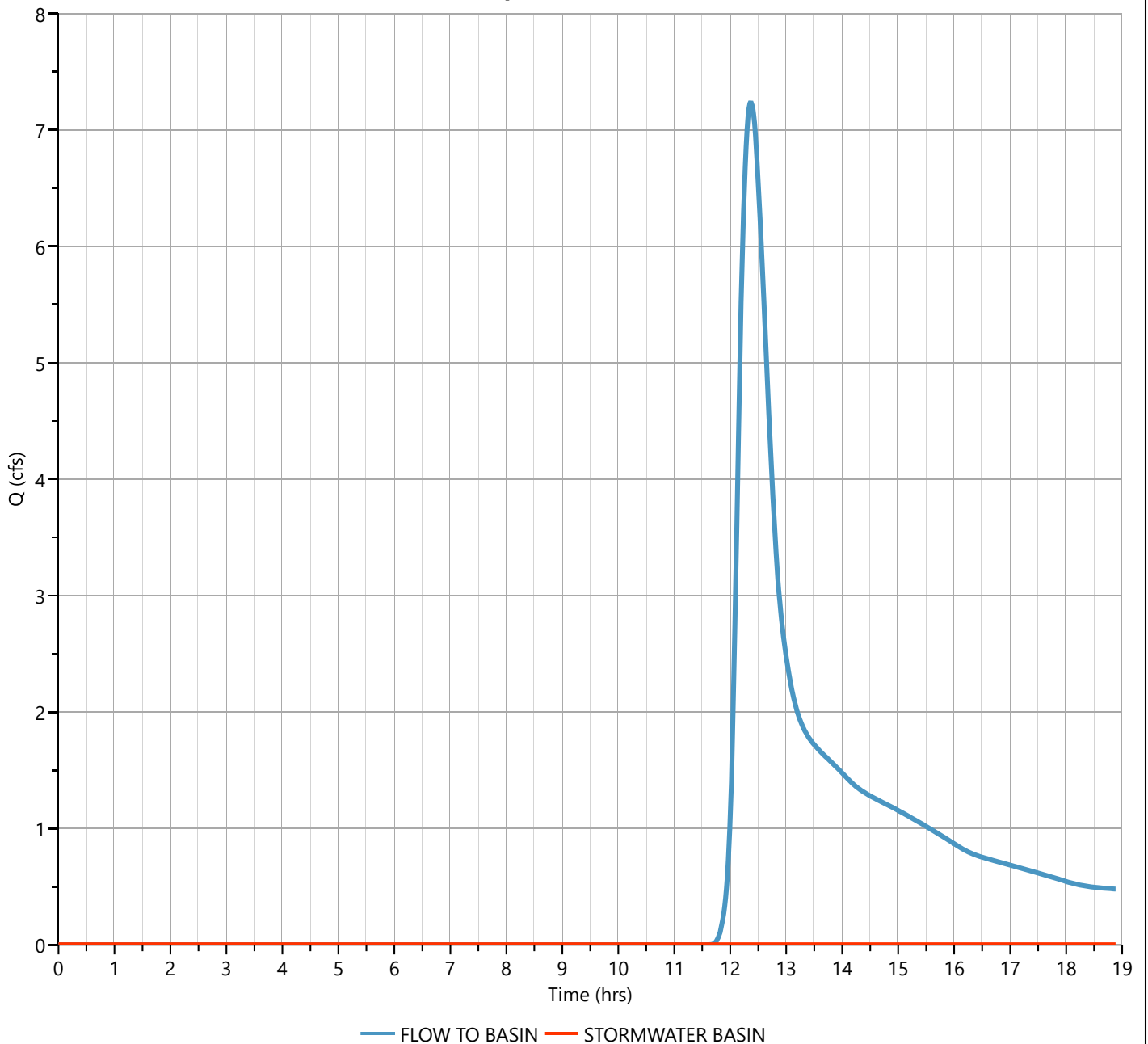
Hyd. No. 6

Hydrograph Type	= Pond Route	Peak Flow	= 0.000 cfs
Storm Frequency	= 10-yr	Time to Peak	= 14.75 hrs
Time Interval	= 1 min	Hydrograph Volume	= 0.002 cuft
Inflow Hydrograph	= 5 - FLOW TO BASIN	Max. Elevation	= 193.64 ft
Pond Name	= STORMWATER BASIN	Max. Storage	= 18,726 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 44 min

Qp = 0.00 cfs

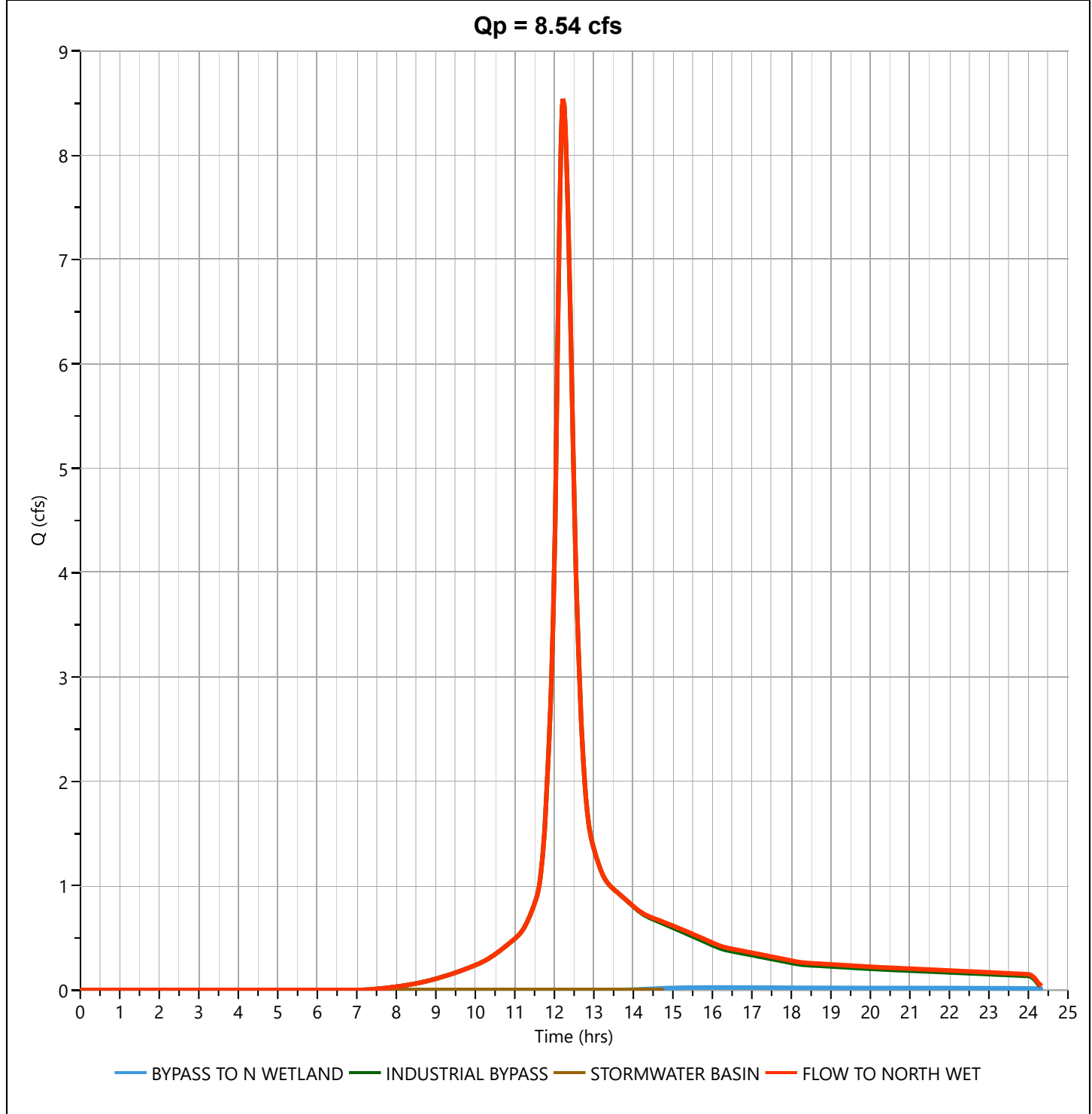


Hydrograph Report

Post FLOW TO NORTH WET

Hyd. No. 7

Hydrograph Type	= Junction	Peak Flow	= 8.542 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.22 hrs
Time Interval	= 1 min	Hydrograph Volume	= 38,447 cuft
Inflow Hydrographs	= 2, 3, 6	Total Contrib. Area	= 6.67 ac



Design Storm Report

Custom Storm filename:

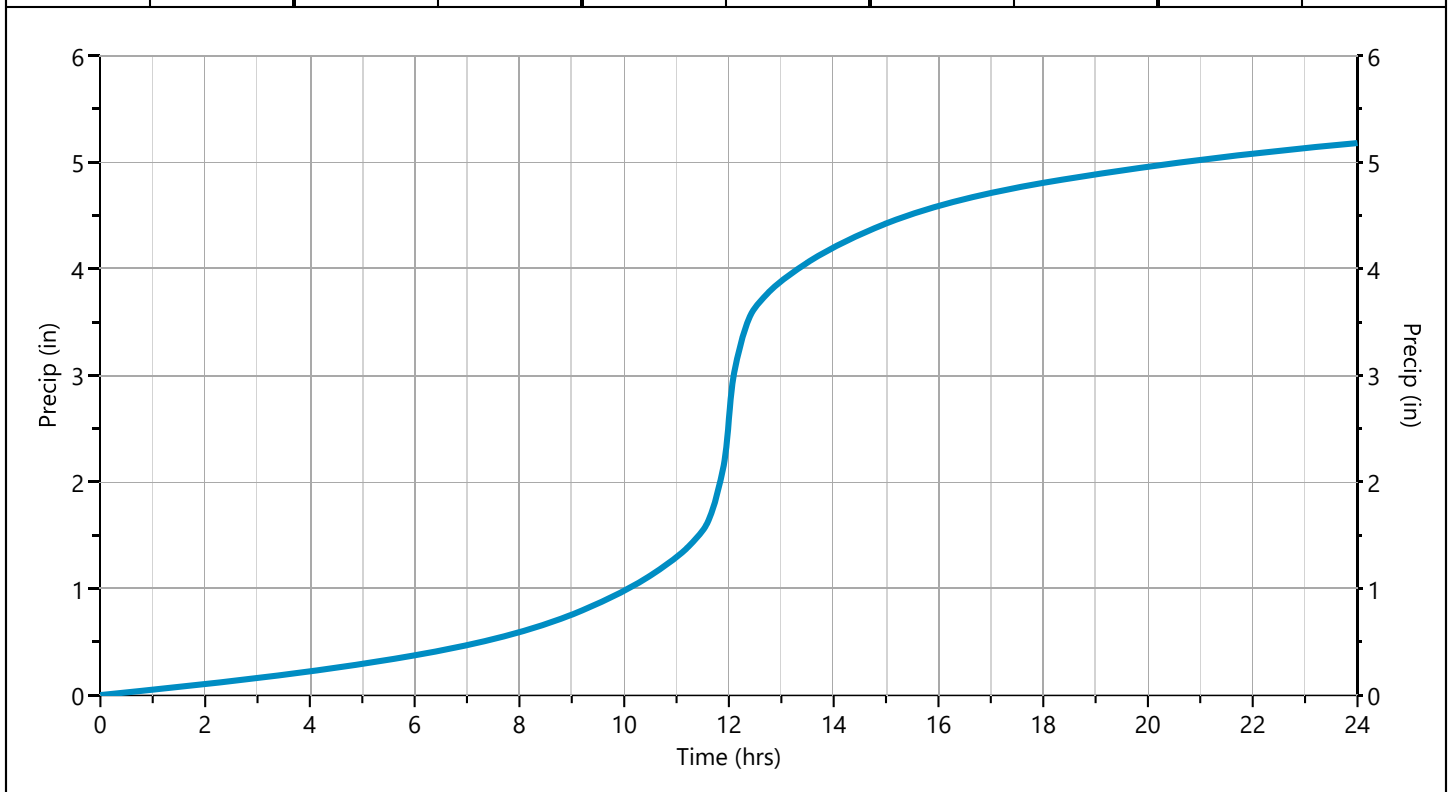
Hydrology Studio v 3.0.0.26

08-11-2022

Storm Distribution: NRCS/SCS - Type III, 24-hr

Storm Duration	Total Rainfall Volume (in)								
	1-yr	2-yr	3-yr	5-yr	✓ 10-yr	25-yr	50-yr	100-yr	
24 hrs	2.66	3.29	0.00	4.32	5.18	6.35	7.26	8.17	

Incremental Rainfall Distribution, 10-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.50	0.010207	11.68	0.023569	11.87	0.037498	12.05	0.077829	12.23	0.031166
11.52	0.010877	11.70	0.024835	11.88	0.038764	12.07	0.067210	12.25	0.029900
11.53	0.012173	11.72	0.026101	11.90	0.040030	12.08	0.056591	12.27	0.028634
11.55	0.013439	11.73	0.027368	11.92	0.046120	12.10	0.045972	12.28	0.027368
11.57	0.014705	11.75	0.028634	11.93	0.056592	12.12	0.040182	12.30	0.026101
11.58	0.015972	11.77	0.029900	11.95	0.067211	12.13	0.038764	12.32	0.024835
11.60	0.017238	11.78	0.031166	11.97	0.077830	12.15	0.037498	12.33	0.023569
11.62	0.018504	11.80	0.032432	11.98	0.088449	12.17	0.036231	12.35	0.022303
11.63	0.019770	11.82	0.033699	12.00	0.099068	12.18	0.034965	12.37	0.021037
11.65	0.021037	11.83	0.034965	12.02	0.098830	12.20	0.033699	12.38	0.019770
11.67	0.022303	11.85	0.036231	12.03	0.088448	12.22	0.032433	12.40	0.018504



Hydrograph 25-yr Summary

Project Name: MARION AVENUE POST DEVELOPMENT

Hydrology Studio v 3.0.0.26

08-11-2022

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Post FLOW TO BASIN (SITE)	6.098	12.43	37,363	---		
2	NRCS Runoff	Post BYPASS TO N WETLAND	0.109	13.98	2,807	---		
3	NRCS Runoff	Post INDUSTRIAL BYPASS	11.37	12.22	50,452	---		
4	NRCS Runoff	Post FLOW TO BASIN (OFF)	7.978	12.27	38,821	---		
5	Junction	Post FLOW TO BASIN	13.44	12.33	76,184	1, 4		
6	Pond Route	Post STORMWATER BASIN	0.298	15.60	3,733	5	195.02	37,602
7	Junction	Post FLOW TO NORTH WET	11.37	12.22	56,991	2, 3, 6		

Hydrograph Report

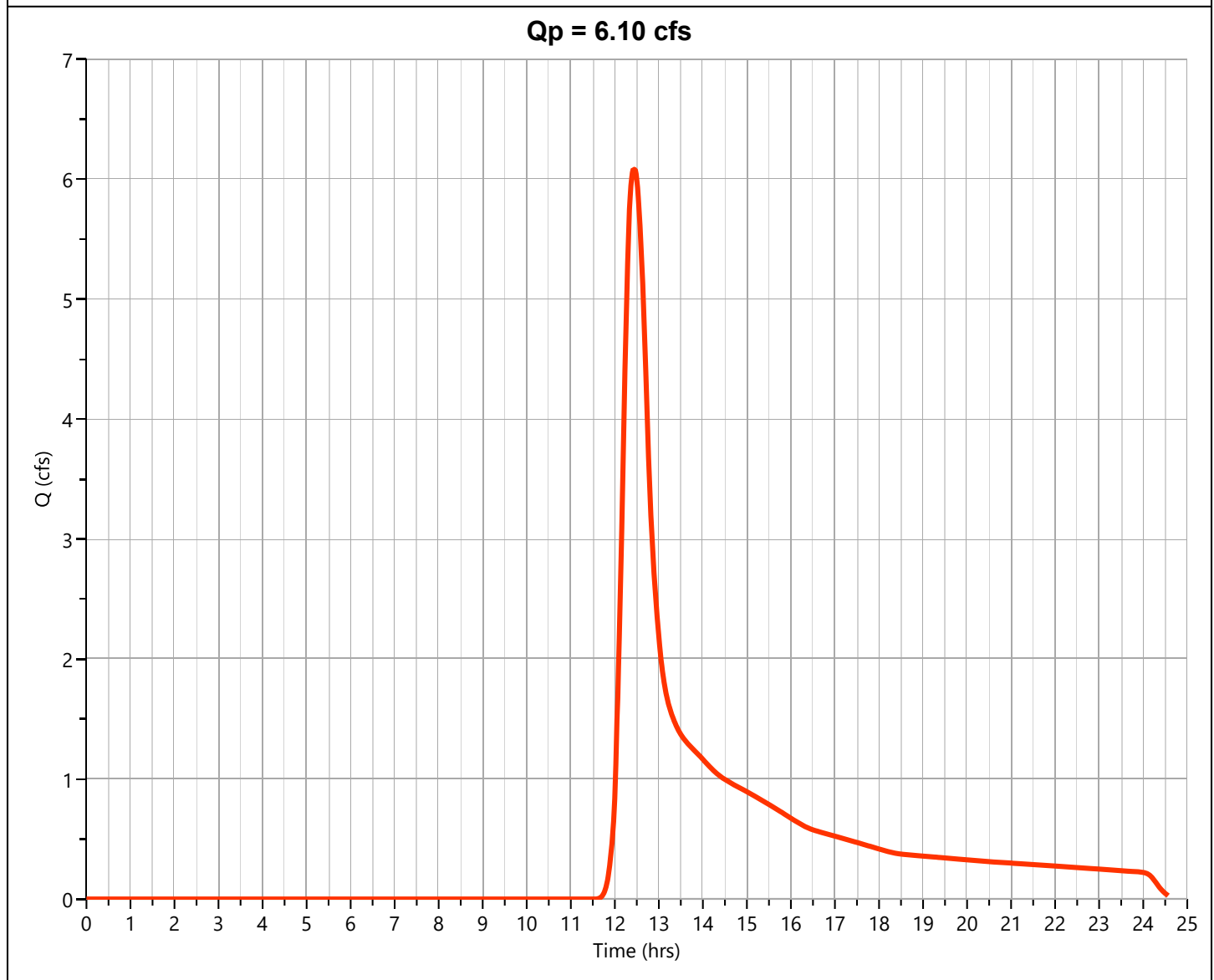
Post FLOW TO BASIN (SITE)

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 6.098 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.43 hrs
Time Interval	= 1 min	Runoff Volume	= 37,363 cuft
Drainage Area	= 7.367 ac	Curve Number	= 51*
Tc Method	= User	Time of Conc. (Tc)	= 30.0 min
Total Rainfall	= 6.35 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.598	98	PAVE
4.975	39	LAWN
0.794	30	WOODED
7.367	51	Weighted CN Method Employed



Hydrograph Report

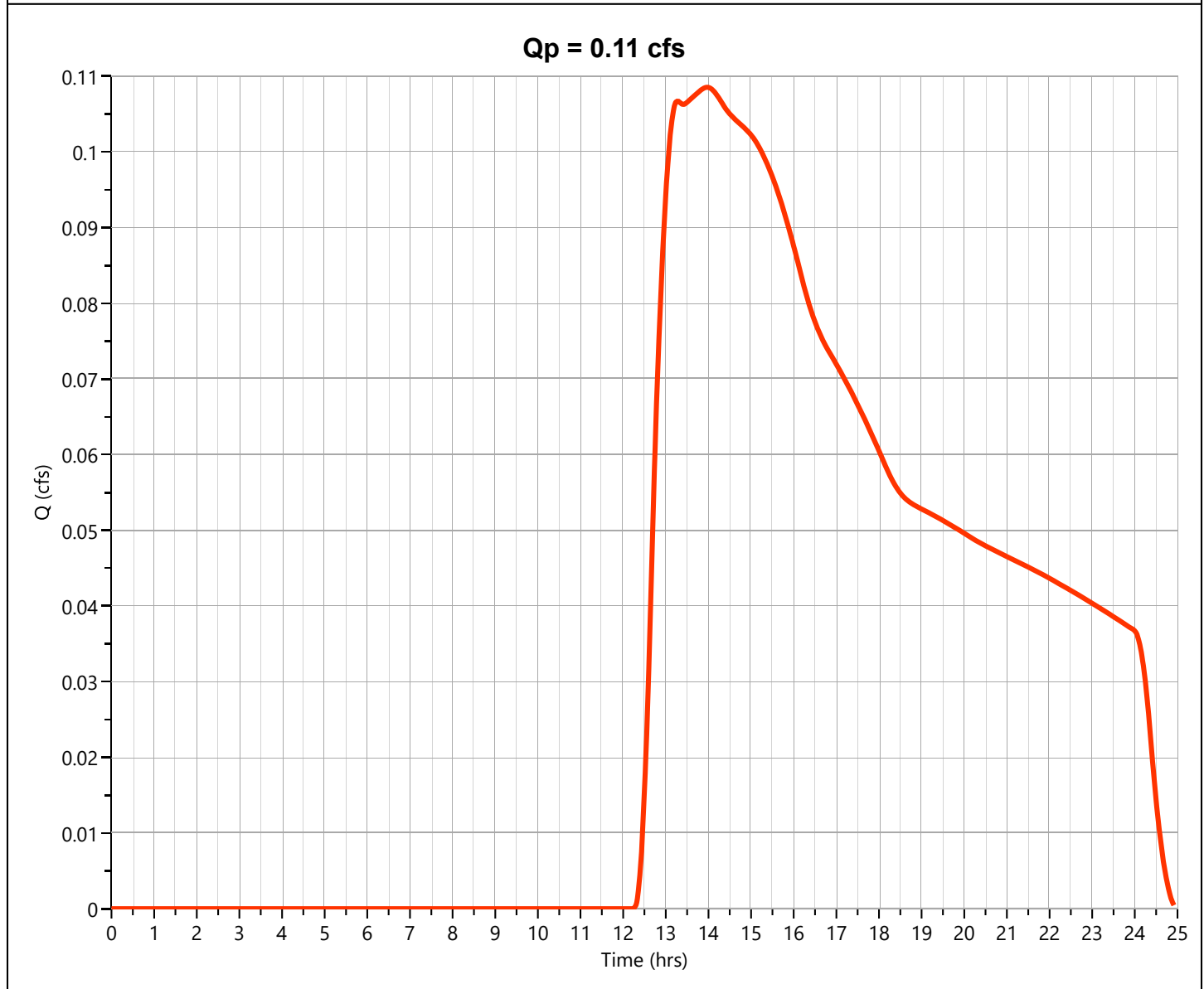
Post BYPASS TO N WETLAND

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.109 cfs
Storm Frequency	= 25-yr	Time to Peak	= 13.98 hrs
Time Interval	= 1 min	Runoff Volume	= 2,807 cuft
Drainage Area	= 3.364 ac	Curve Number	= 32.98*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 37.67 min
Total Rainfall	= 6.35 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.112	39	LAWN
2.252	30	WOODED
3.364	33	Weighted CN Method Employed

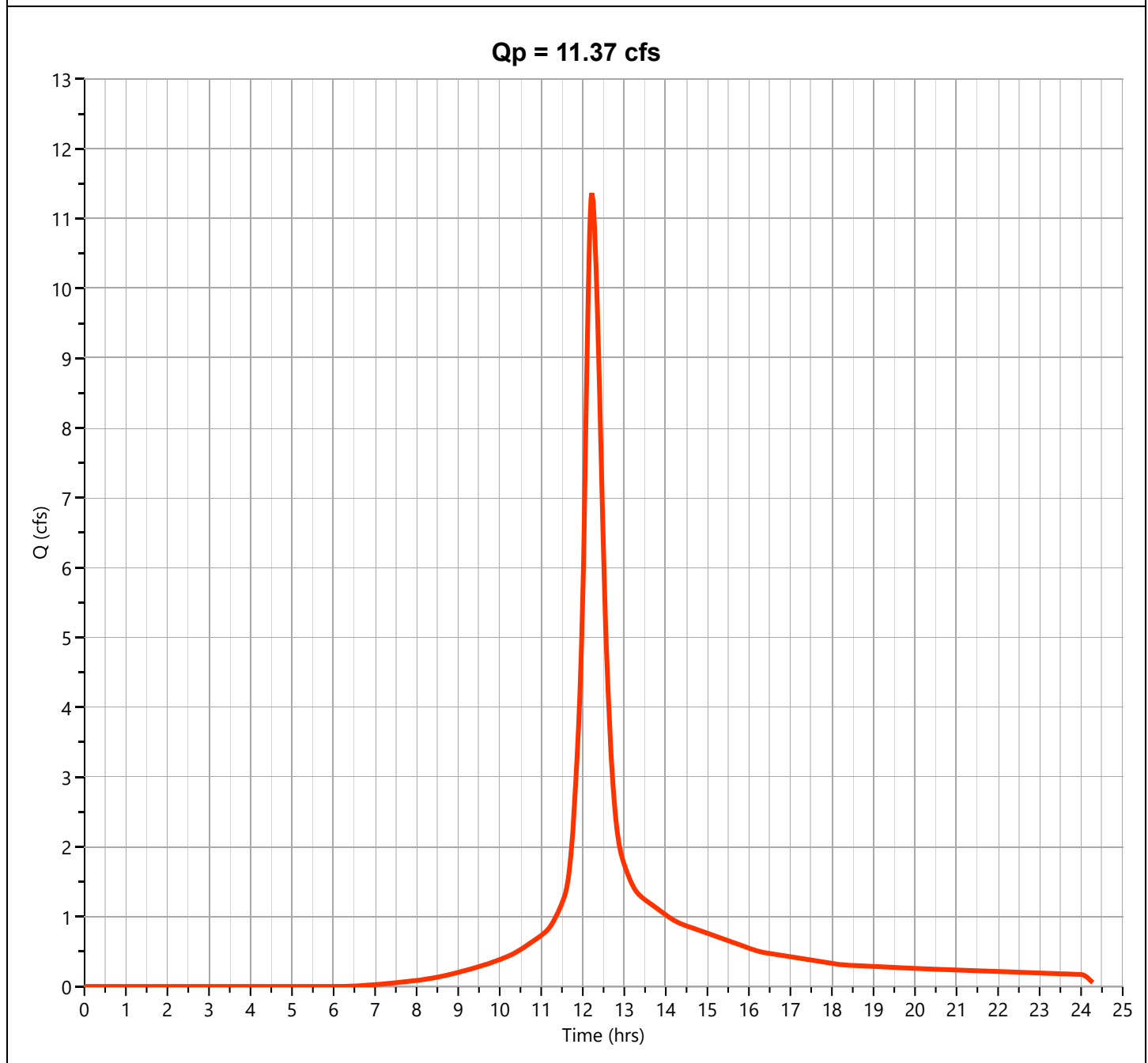


Hydrograph Report

Post INDUSTRIAL BYPASS

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 11.37 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.22 hrs
Time Interval	= 1 min	Runoff Volume	= 50,452 cuft
Drainage Area	= 3.306 ac	Curve Number	= 81
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 6.35 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484



Hydrograph Report

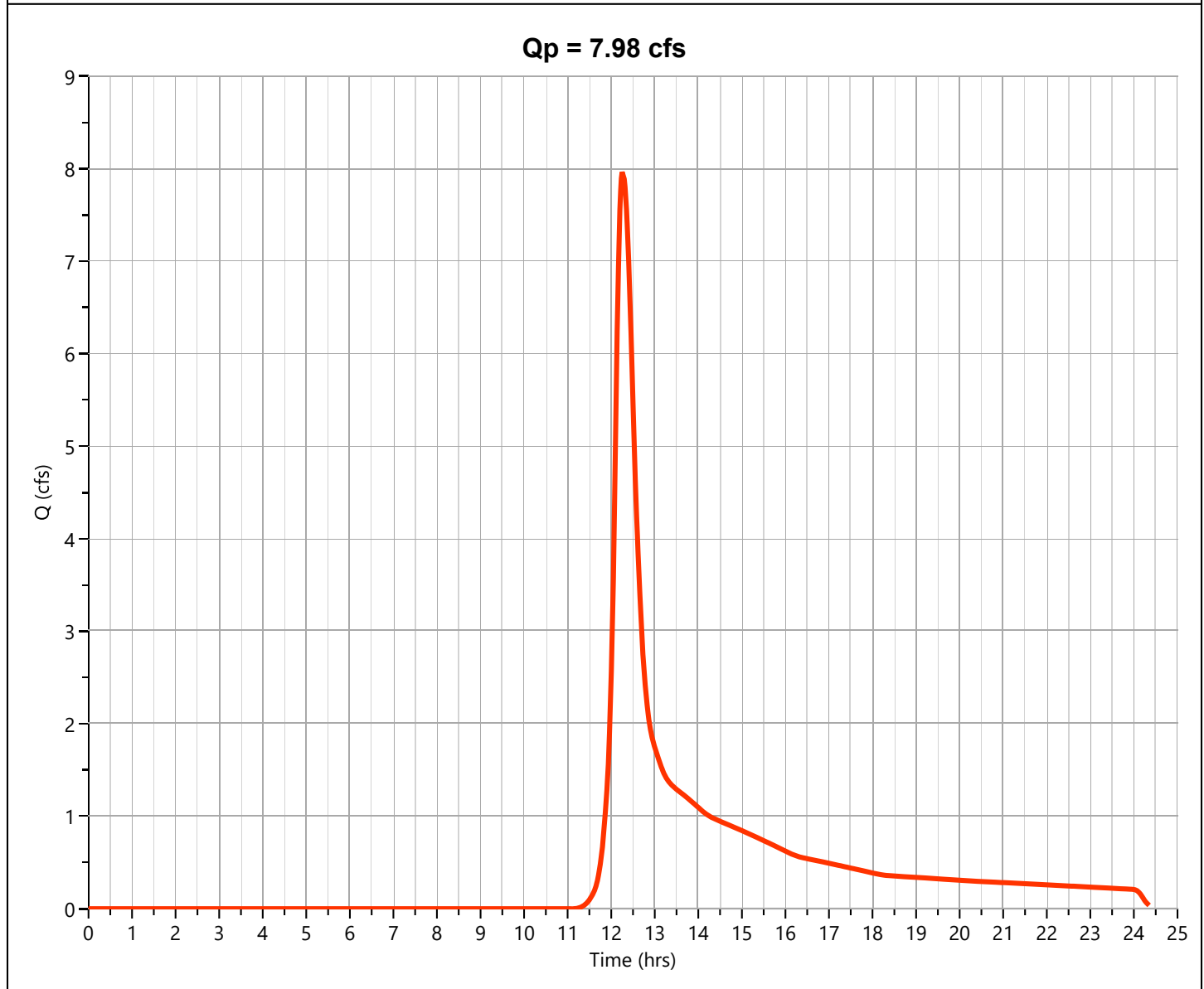
Post FLOW TO BASIN (OFF)

Hyd. No. 4

Hydrograph Type	= NRCS Runoff	Peak Flow	= 7.978 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.27 hrs
Time Interval	= 1 min	Runoff Volume	= 38,821 cuft
Drainage Area	= 6.207 ac	Curve Number	= 55*
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 6.35 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
2.617	61	1/4 ACRE RES
3.59	51	1 ACRE RES
6.207	55	Weighted CN Method Employed

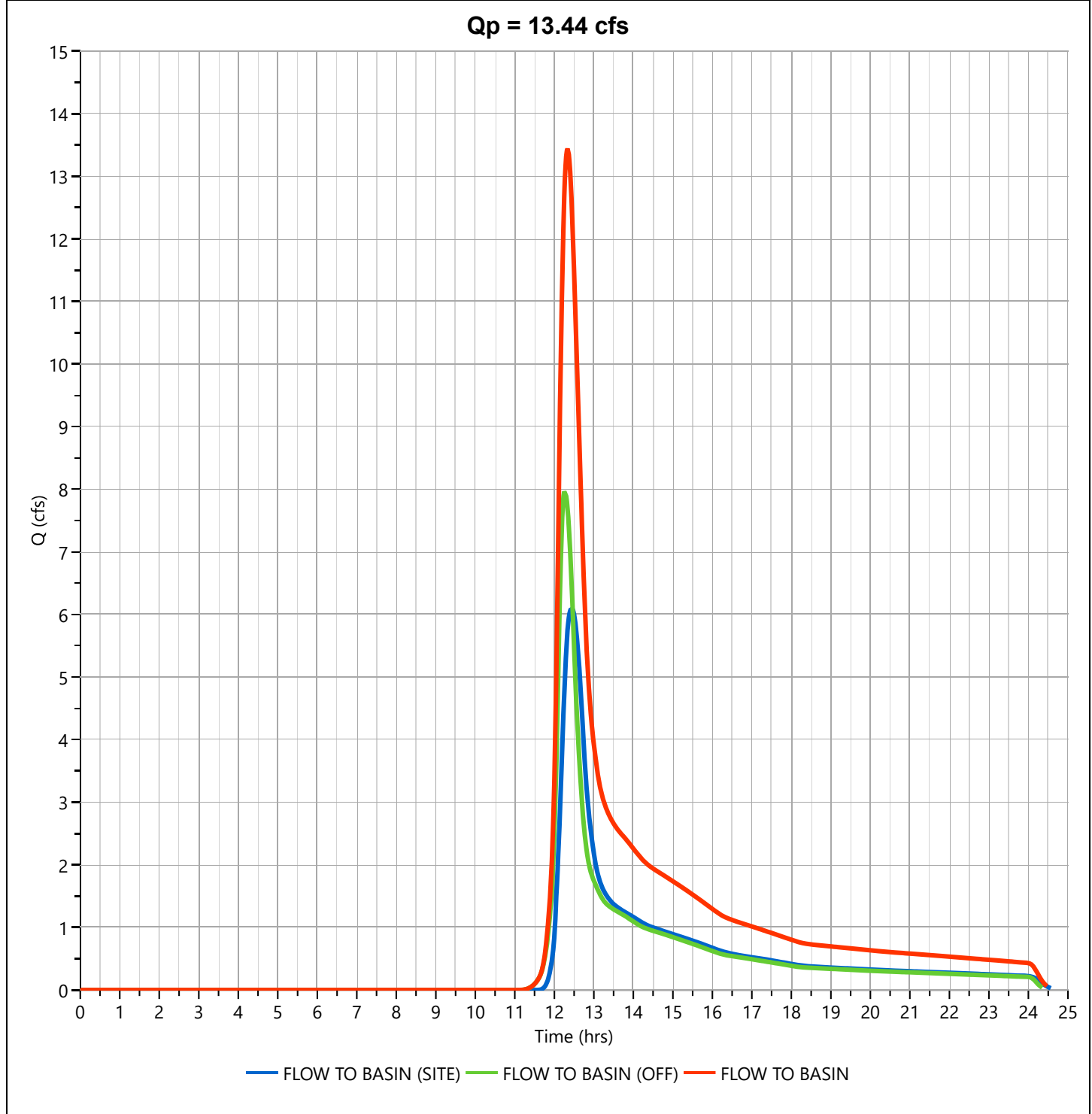


Hydrograph Report

Post FLOW TO BASIN

Hyd. No. 5

Hydrograph Type	= Junction	Peak Flow	= 13.44 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.33 hrs
Time Interval	= 1 min	Hydrograph Volume	= 76,184 cuft
Inflow Hydrographs	= 1, 4	Total Contrib. Area	= 13.574 ac



Hydrograph Report

Post STORMWATER BASIN

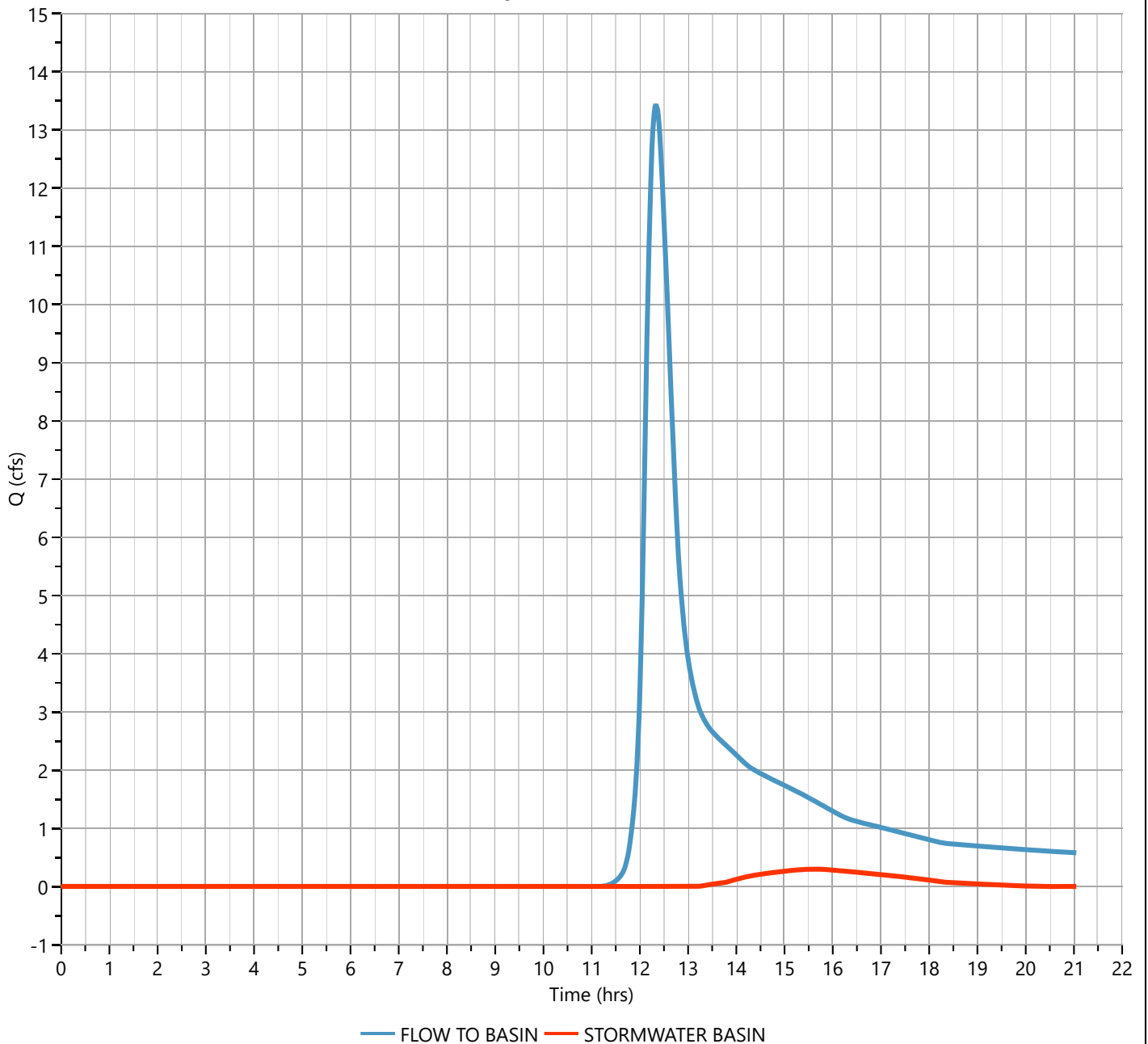
Hyd. No. 6

Hydrograph Type	= Pond Route	Peak Flow	= 0.298 cfs
Storm Frequency	= 25-yr	Time to Peak	= 15.60 hrs
Time Interval	= 1 min	Hydrograph Volume	= 3,733 cuft
Inflow Hydrograph	= 5 - FLOW TO BASIN	Max. Elevation	= 195.02 ft
Pond Name	= STORMWATER BASIN	Max. Storage	= 37,602 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 1.22 hrs

Qp = 0.30 cfs

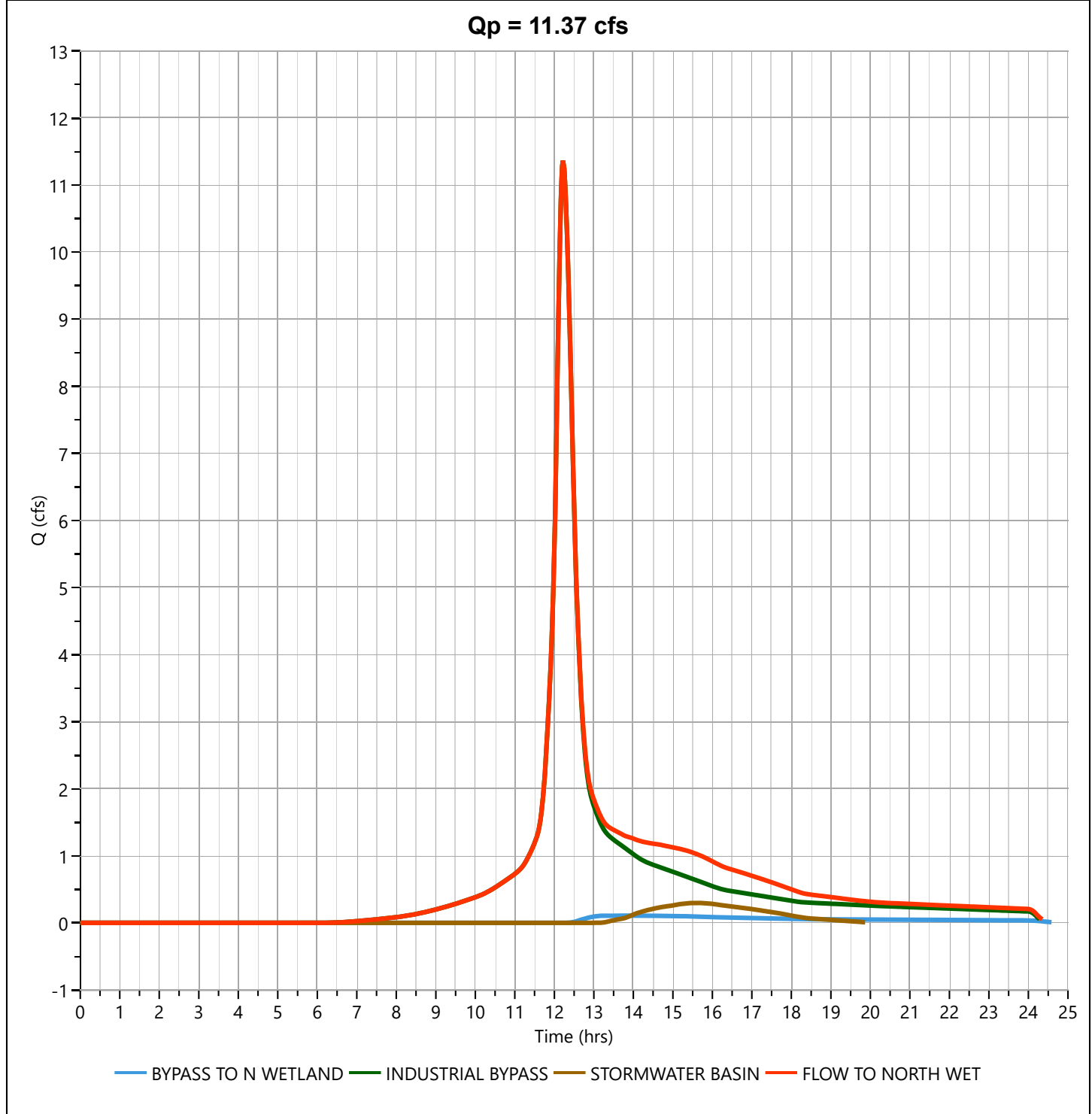


Hydrograph Report

Post FLOW TO NORTH WET

Hyd. No. 7

Hydrograph Type	= Junction	Peak Flow	= 11.37 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.22 hrs
Time Interval	= 1 min	Hydrograph Volume	= 56,991 cuft
Inflow Hydrographs	= 2, 3, 6	Total Contrib. Area	= 6.67 ac



Design Storm Report

Custom Storm filename:

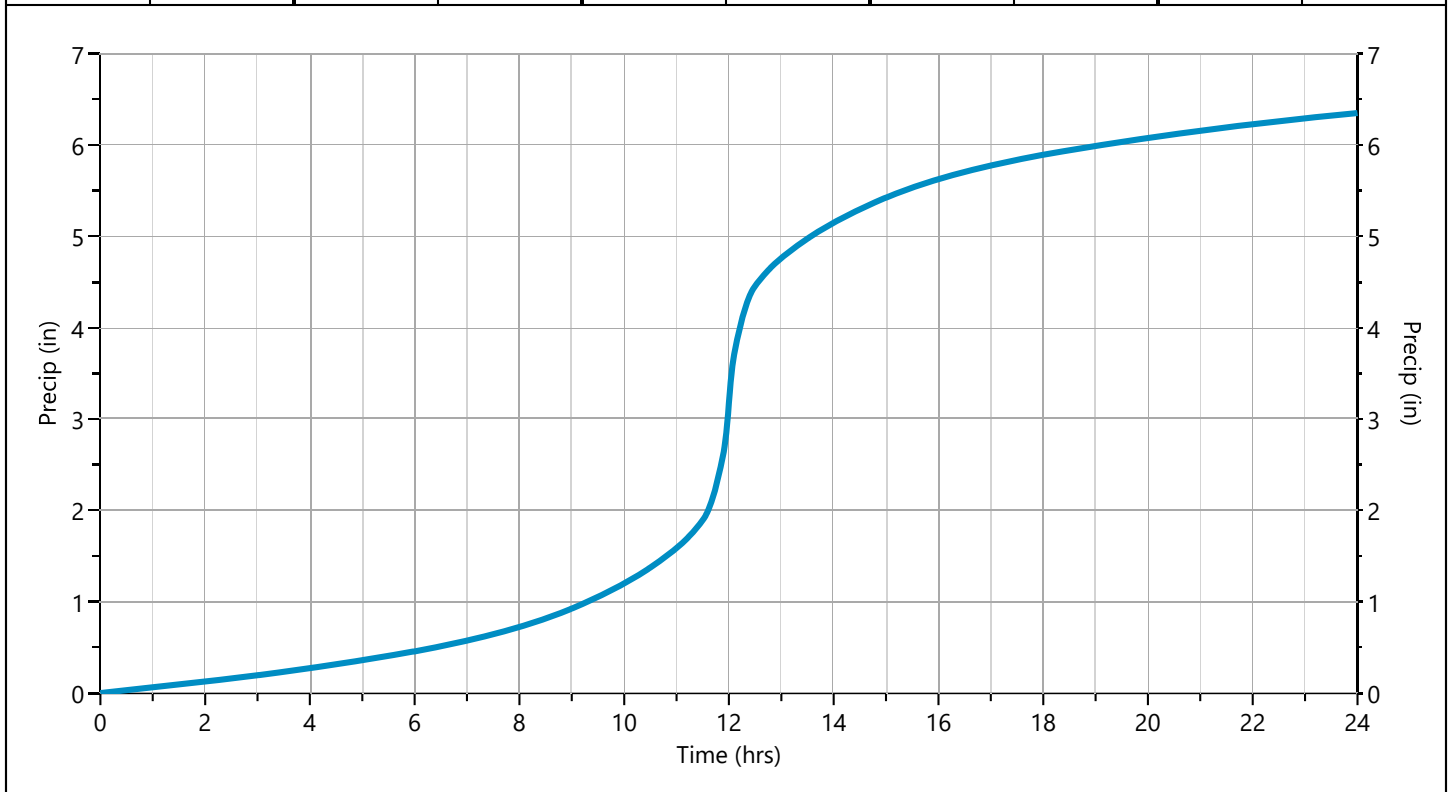
Hydrology Studio v 3.0.0.26

08-11-2022

Storm Distribution: NRCS/SCS - Type III, 24-hr

Storm Duration	Total Rainfall Volume (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	✓ 25-yr	50-yr	100-yr
24 hrs	2.66	3.29	0.00	4.32	5.18	6.35	7.26	8.17

Incremental Rainfall Distribution, 25-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.50	0.012513	11.68	0.028893	11.87	0.045967	12.05	0.095408	12.23	0.038206
11.52	0.013334	11.70	0.030445	11.88	0.047519	12.07	0.082391	12.25	0.036654
11.53	0.014922	11.72	0.031997	11.90	0.049071	12.08	0.069373	12.27	0.035101
11.55	0.016475	11.73	0.033549	11.92	0.056537	12.10	0.056356	12.28	0.033549
11.57	0.018027	11.75	0.035101	11.93	0.069374	12.12	0.049258	12.30	0.031997
11.58	0.019579	11.77	0.036654	11.95	0.082392	12.13	0.047519	12.32	0.030445
11.60	0.021131	11.78	0.038206	11.97	0.095409	12.15	0.045967	12.33	0.028893
11.62	0.022684	11.80	0.039758	11.98	0.108427	12.17	0.044415	12.35	0.027340
11.63	0.024236	11.82	0.041310	12.00	0.121444	12.18	0.042862	12.37	0.025788
11.65	0.025788	11.83	0.042862	12.02	0.121153	12.20	0.041310	12.38	0.024236
11.67	0.027340	11.85	0.044415	12.03	0.108426	12.22	0.039758	12.40	0.022684



Hydrograph 50-yr Summary

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Post FLOW TO BASIN (SITE)	8.780	12.42	50,991	---		
2	NRCS Runoff	Post BYPASS TO N WETLAND	0.326	12.87	5,274	---		
3	NRCS Runoff	Post INDUSTRIAL BYPASS	13.58	12.22	60,573	---		
4	NRCS Runoff	Post FLOW TO BASIN (OFF)	11.00	12.25	51,615	---		
5	Junction	Post FLOW TO BASIN	18.96	12.32	102,605	1, 4		
6	Pond Route	Post STORMWATER BASIN	1.725	13.93	22,986	5	195.56	45,435
7	Junction	Post FLOW TO NORTH WET	13.59	12.22	88,832	2, 3, 6		

Hydrograph Report

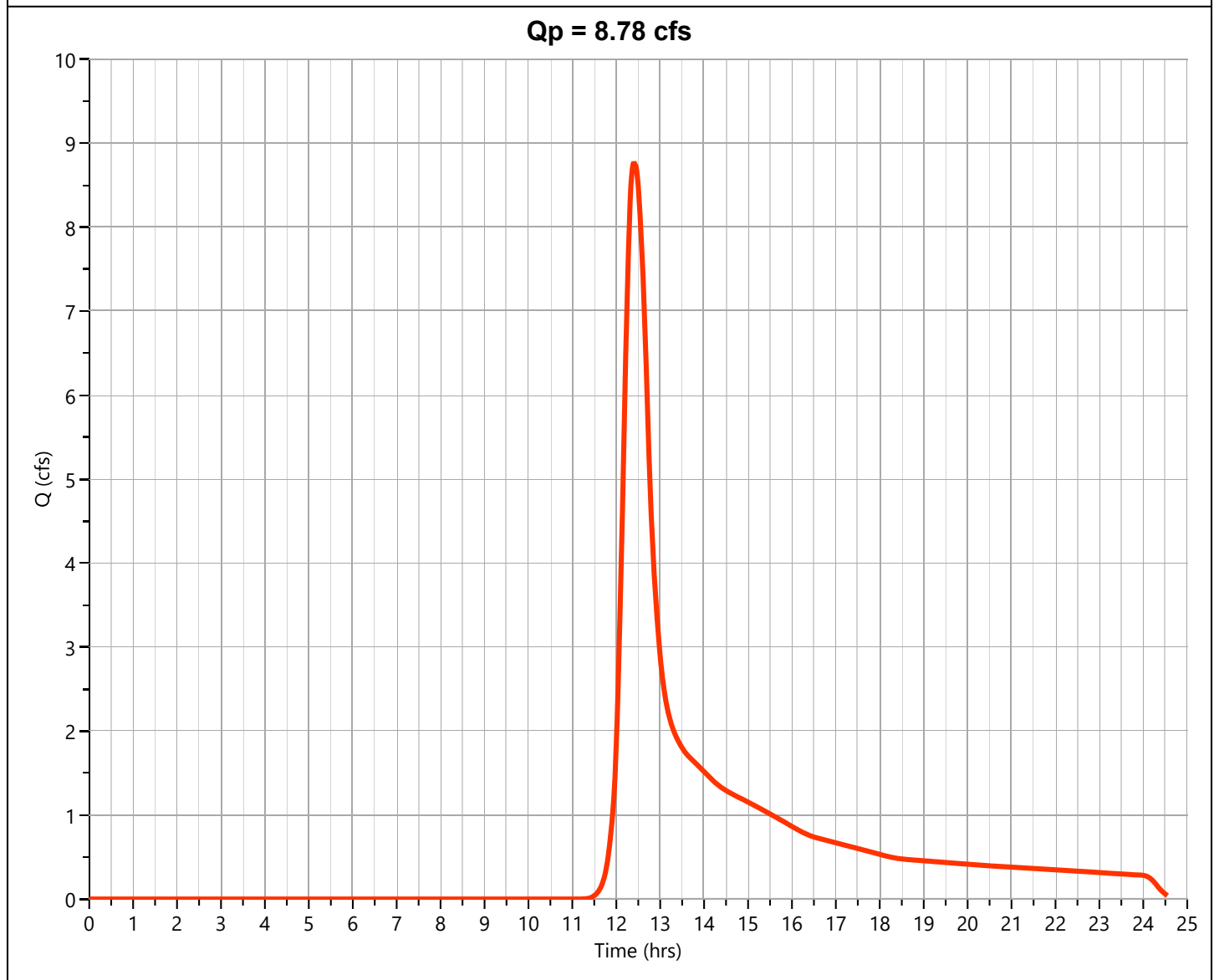
Post FLOW TO BASIN (SITE)

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 8.780 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.42 hrs
Time Interval	= 1 min	Runoff Volume	= 50,991 cuft
Drainage Area	= 7.367 ac	Curve Number	= 51*
Tc Method	= User	Time of Conc. (Tc)	= 30.0 min
Total Rainfall	= 7.26 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.598	98	PAVE
4.975	39	LAWN
0.794	30	WOODED
7.367	51	Weighted CN Method Employed



Hydrograph Report

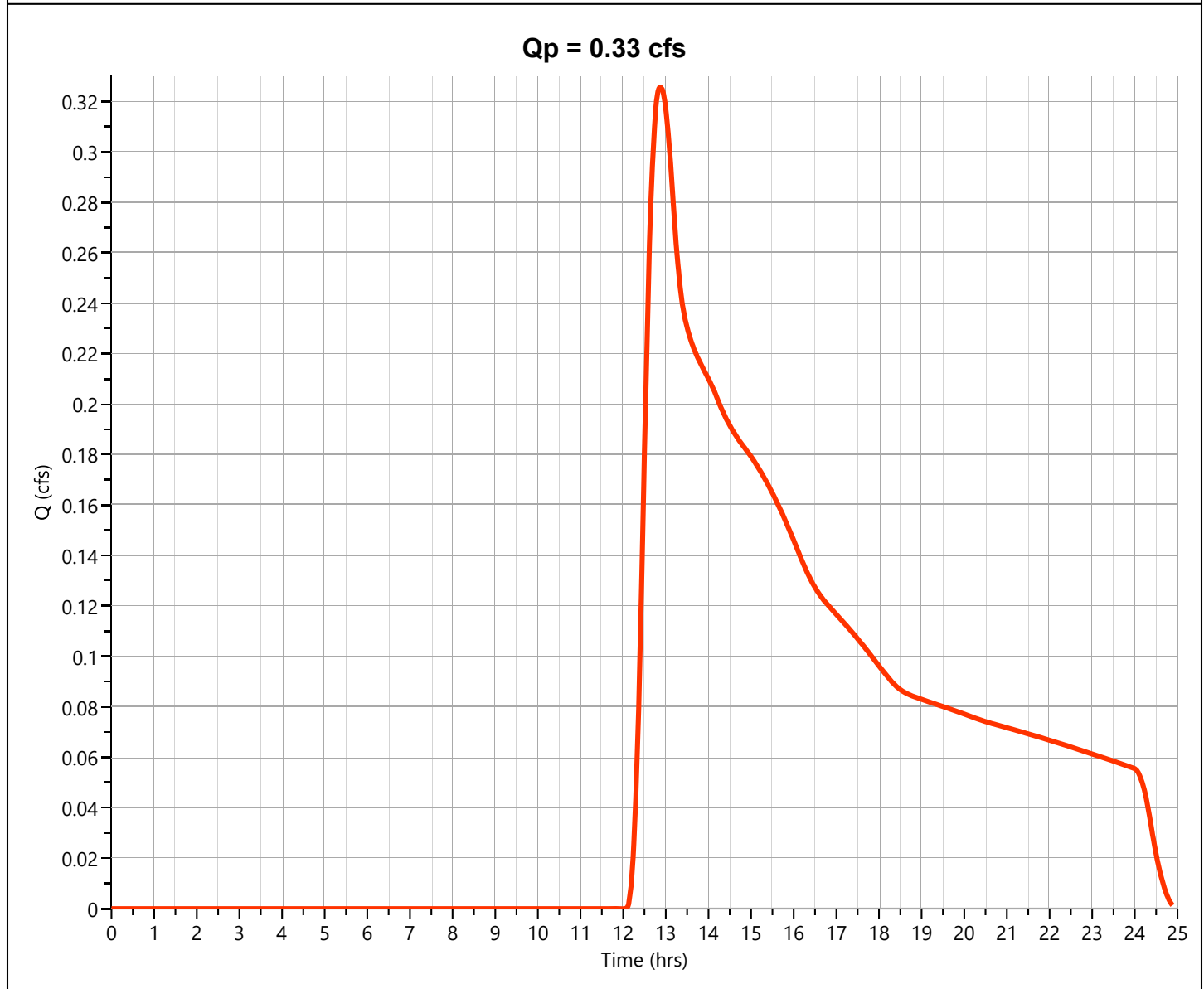
Post BYPASS TO N WETLAND

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.326 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.87 hrs
Time Interval	= 1 min	Runoff Volume	= 5,274 cuft
Drainage Area	= 3.364 ac	Curve Number	= 32.98*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 37.67 min
Total Rainfall	= 7.26 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.112	39	LAWN
2.252	30	WOODED
3.364	33	Weighted CN Method Employed

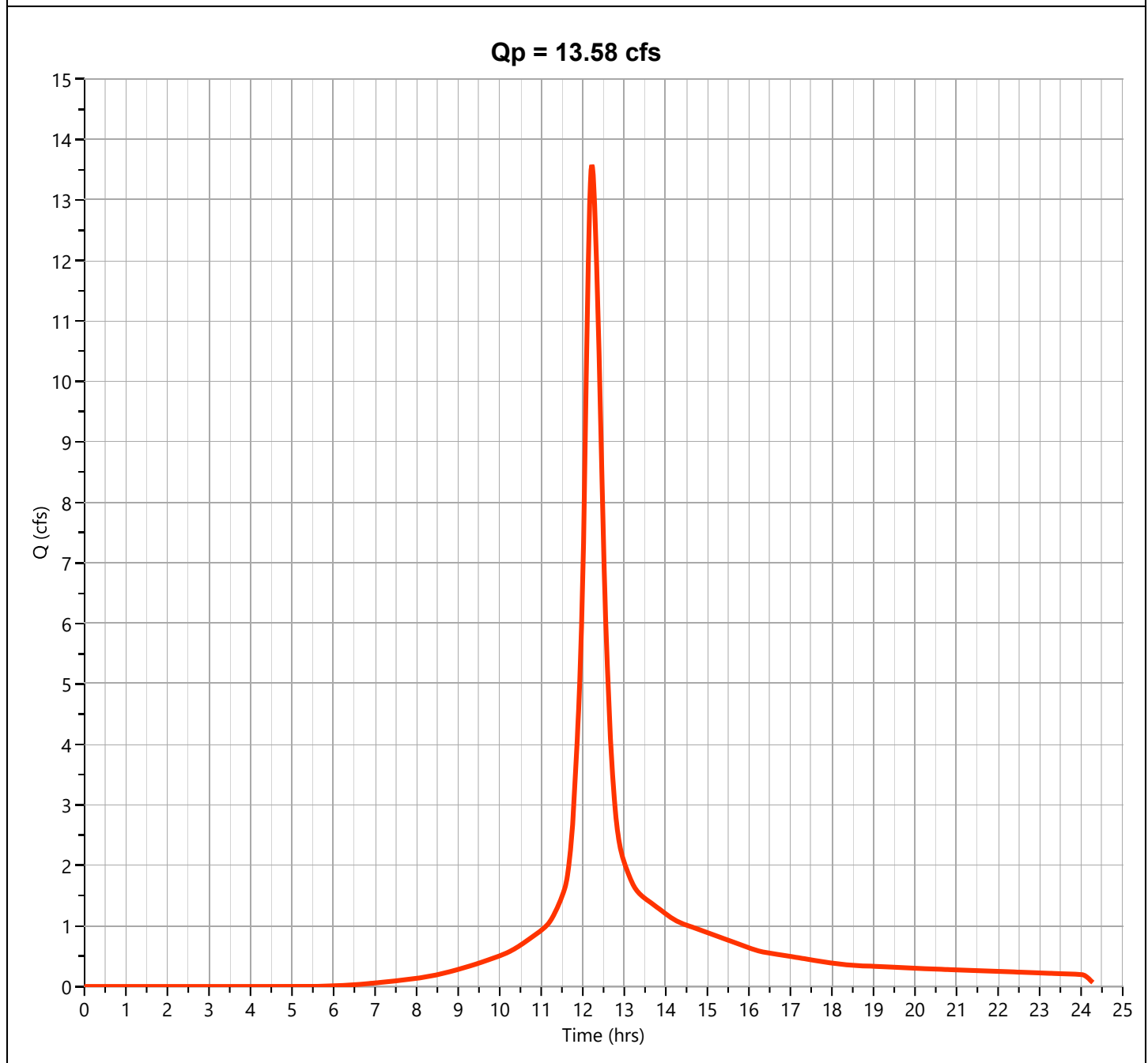


Hydrograph Report

Post INDUSTRIAL BYPASS

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 13.58 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.22 hrs
Time Interval	= 1 min	Runoff Volume	= 60,573 cuft
Drainage Area	= 3.306 ac	Curve Number	= 81
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 7.26 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484



Hydrograph Report

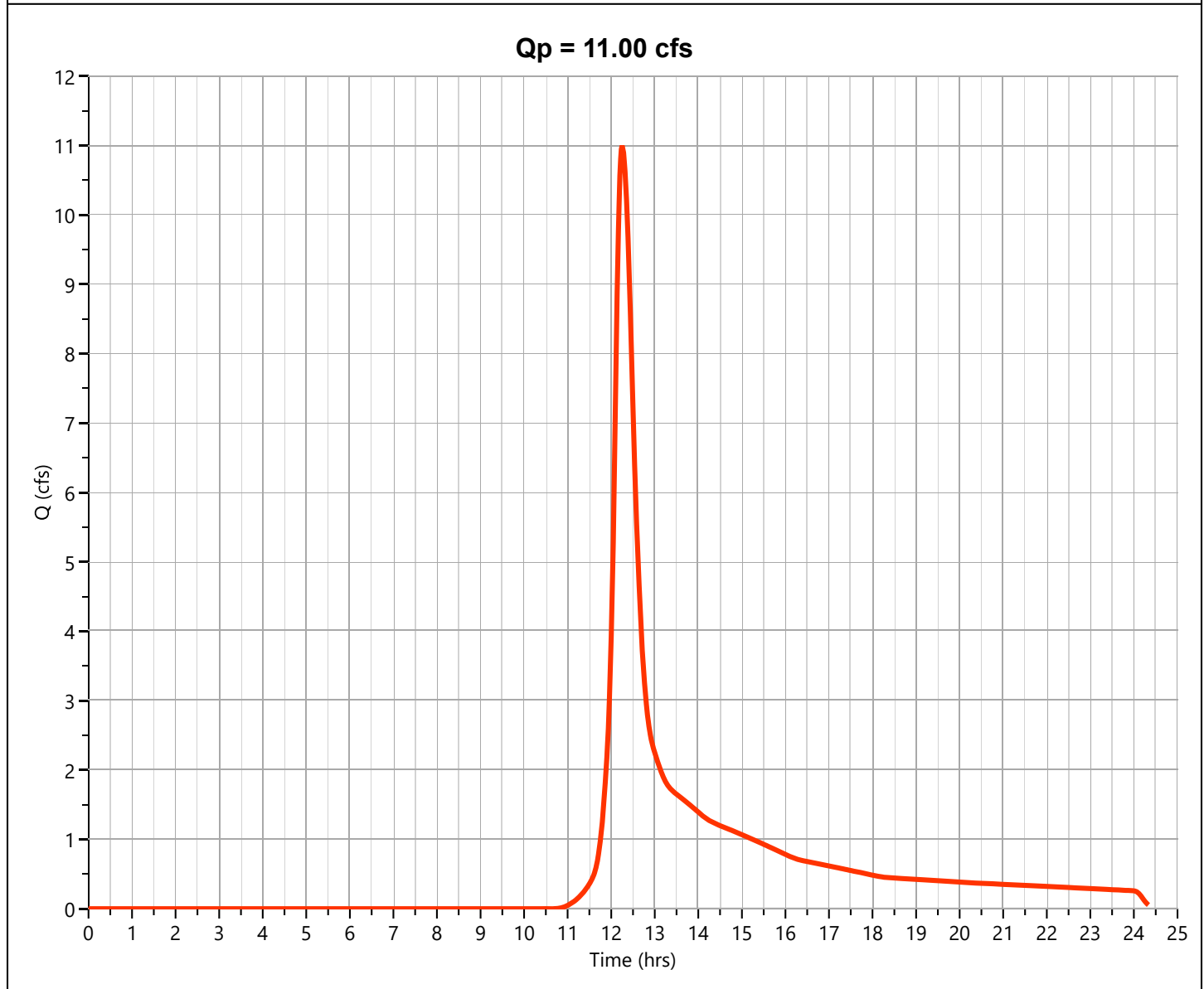
Post FLOW TO BASIN (OFF)

Hyd. No. 4

Hydrograph Type	= NRCS Runoff	Peak Flow	= 11.00 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.25 hrs
Time Interval	= 1 min	Runoff Volume	= 51,615 cuft
Drainage Area	= 6.207 ac	Curve Number	= 55*
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 7.26 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
2.617	61	1/4 ACRE RES
3.59	51	1 ACRE RES
6.207	55	Weighted CN Method Employed

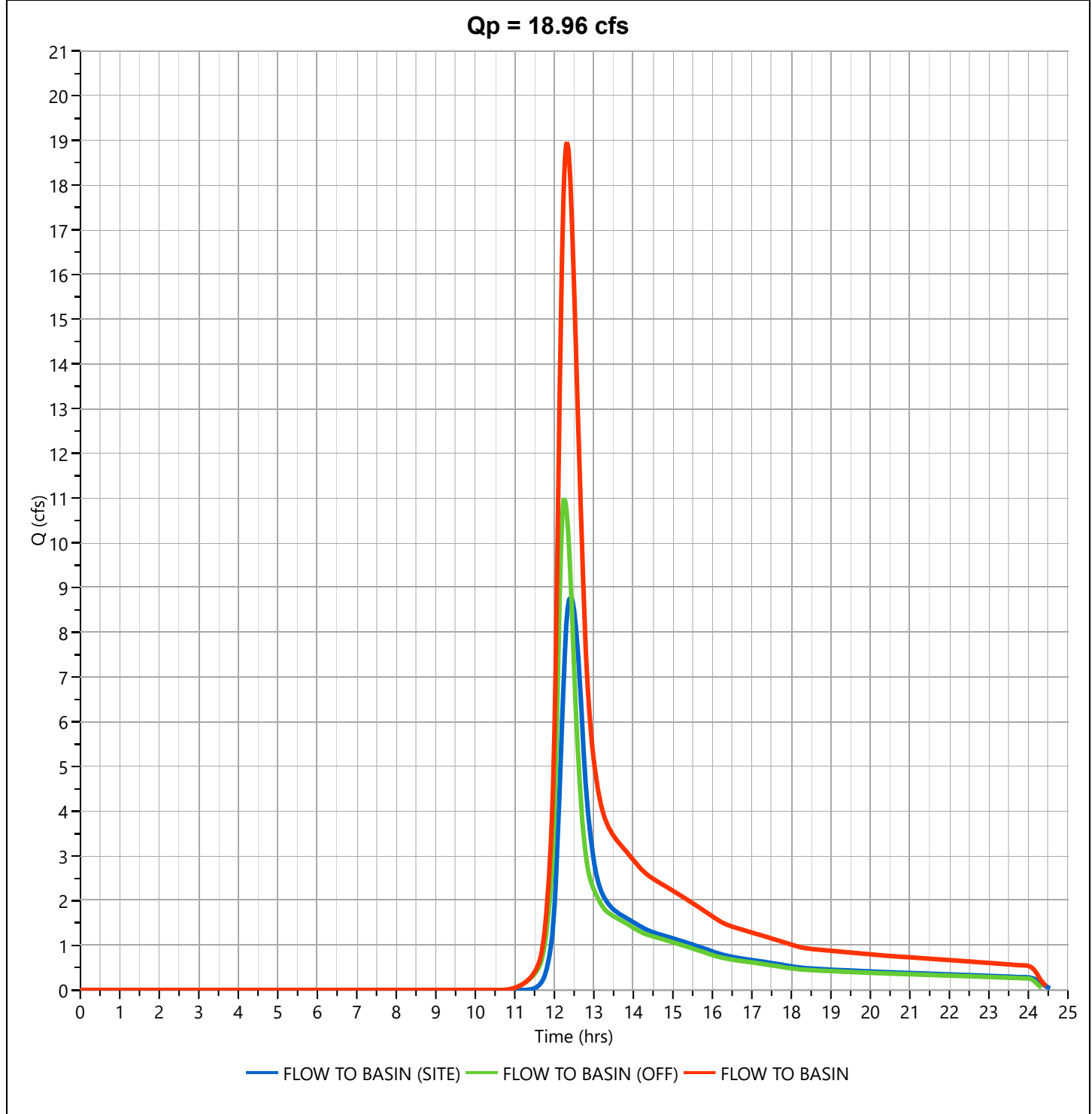


Hydrograph Report

Post FLOW TO BASIN

Hyd. No. 5

Hydrograph Type	= Junction	Peak Flow	= 18.96 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.32 hrs
Time Interval	= 1 min	Hydrograph Volume	= 102,605 cuft
Inflow Hydrographs	= 1, 4	Total Contrib. Area	= 13.574 ac



Hydrograph Report

Post STORMWATER BASIN

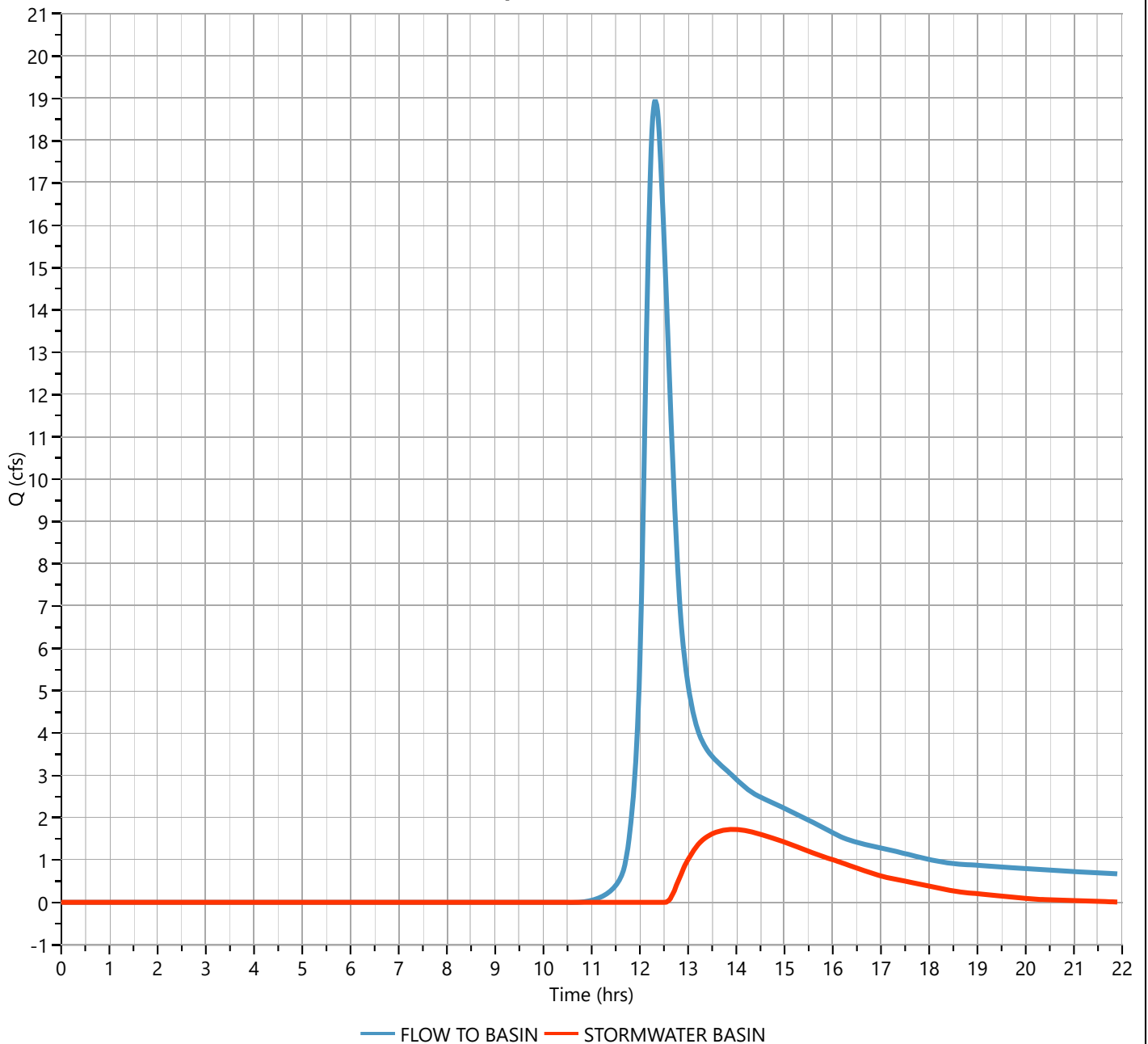
Hyd. No. 6

Hydrograph Type	= Pond Route	Peak Flow	= 1.725 cfs
Storm Frequency	= 50-yr	Time to Peak	= 13.93 hrs
Time Interval	= 1 min	Hydrograph Volume	= 22,986 cuft
Inflow Hydrograph	= 5 - FLOW TO BASIN	Max. Elevation	= 195.56 ft
Pond Name	= STORMWATER BASIN	Max. Storage	= 45,435 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 34 min

Qp = 1.72 cfs

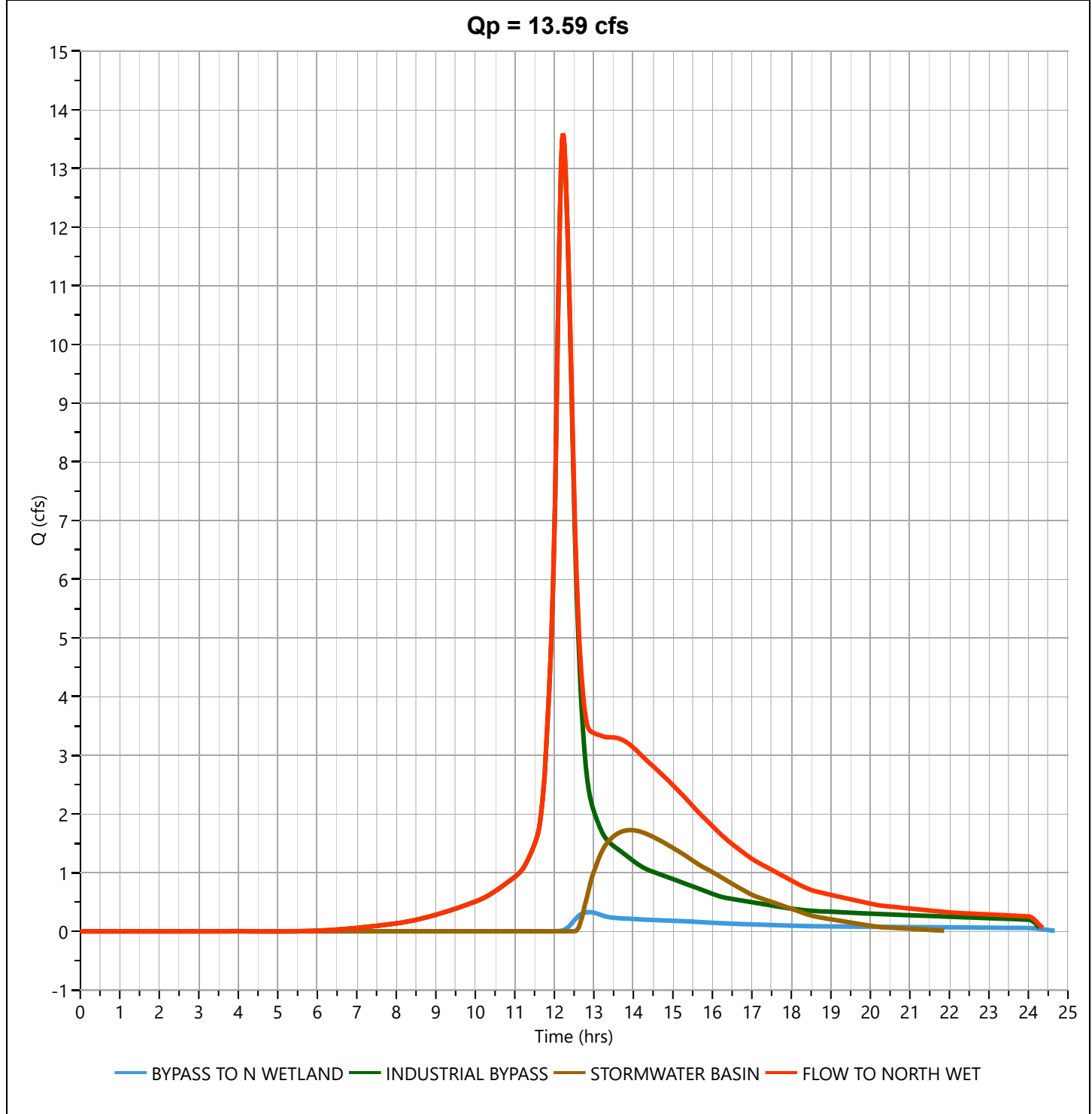


Hydrograph Report

Post FLOW TO NORTH WET

Hyd. No. 7

Hydrograph Type	= Junction	Peak Flow	= 13.59 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.22 hrs
Time Interval	= 1 min	Hydrograph Volume	= 88,832 cuft
Inflow Hydrographs	= 2, 3, 6	Total Contrib. Area	= 6.67 ac



Design Storm Report

Custom Storm filename:

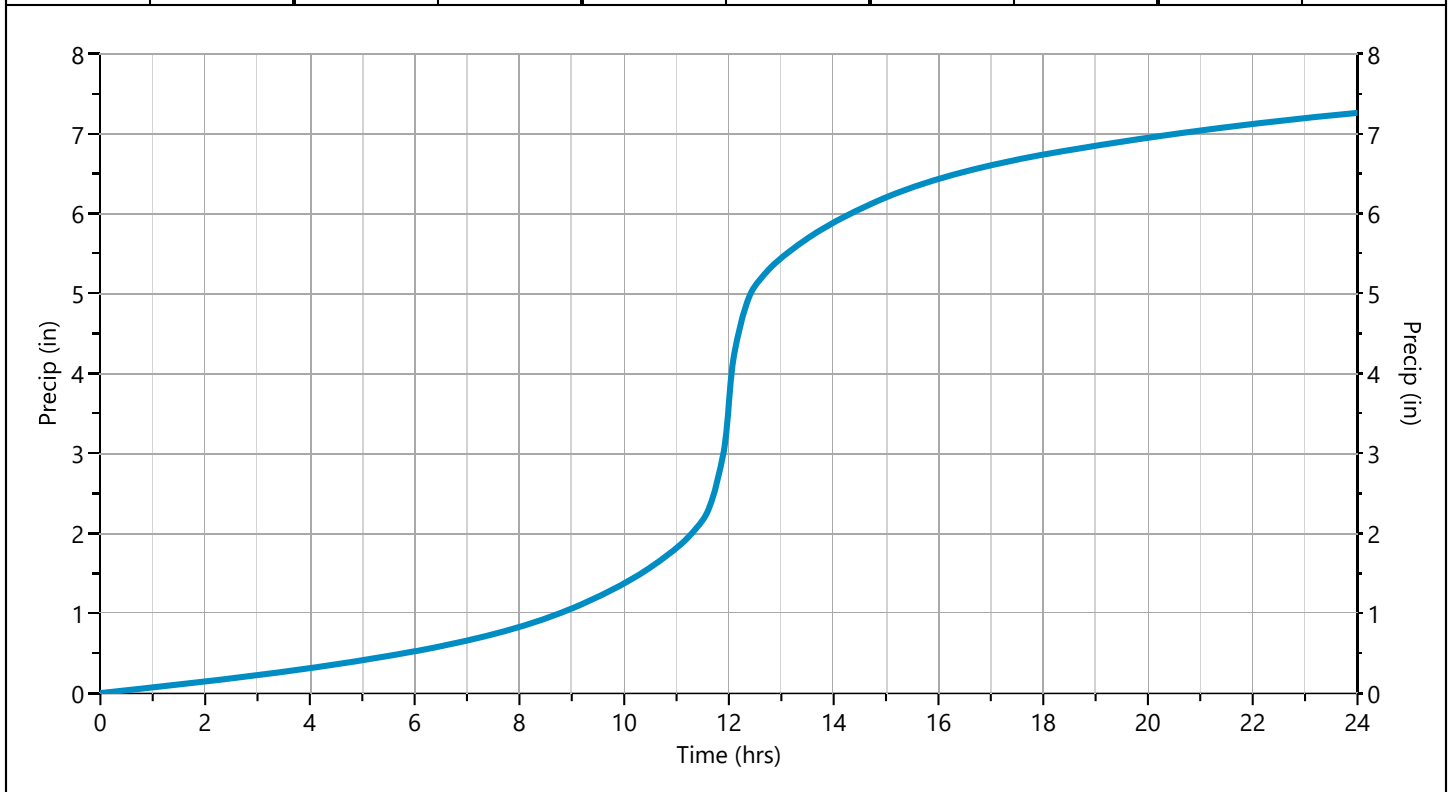
Hydrology Studio v 3.0.0.26

08-11-2022

Storm Distribution: NRCS/SCS - Type III, 24-hr

Storm Duration	Total Rainfall Volume (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	✓ 50-yr	100-yr
24 hrs	2.66	3.29	0.00	4.32	5.18	6.35	7.26	8.17

Incremental Rainfall Distribution, 50-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.50	0.014306	11.68	0.033033	11.87	0.052554	12.05	0.109081	12.23	0.043681
11.52	0.015245	11.70	0.034808	11.88	0.054329	12.07	0.094198	12.25	0.041906
11.53	0.017061	11.72	0.036582	11.90	0.056104	12.08	0.079315	12.27	0.040132
11.55	0.018836	11.73	0.038357	11.92	0.064640	12.10	0.064432	12.28	0.038357
11.57	0.020610	11.75	0.040132	11.93	0.079316	12.12	0.056317	12.30	0.036582
11.58	0.022385	11.77	0.041906	11.95	0.094199	12.13	0.054329	12.32	0.034808
11.60	0.024160	11.78	0.043681	11.97	0.109082	12.15	0.052555	12.33	0.033033
11.62	0.025934	11.80	0.045455	11.98	0.123965	12.17	0.050780	12.35	0.031259
11.63	0.027709	11.82	0.047230	12.00	0.138848	12.18	0.049005	12.37	0.029483
11.65	0.029484	11.83	0.049005	12.02	0.138515	12.20	0.047230	12.38	0.027709
11.67	0.031258	11.85	0.050780	12.03	0.123964	12.22	0.045456	12.40	0.025935



Hydrograph 100-yr Summary

Project Name: MARION AVENUE POST DEVELOPMENT

Hydrology Studio v 3.0.0.26

08-11-2022

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Post FLOW TO BASIN (SITE)	11.72	12.40	65,847	---		
2	NRCS Runoff	Post BYPASS TO N WETLAND	0.705	12.75	8,381	---		
3	NRCS Runoff	Post INDUSTRIAL BYPASS	15.79	12.22	70,839	---		
4	NRCS Runoff	Post FLOW TO BASIN (OFF)	14.24	12.25	65,362	---		
5	Junction	Post FLOW TO BASIN	24.93	12.32	131,209	1, 4		
6	Pond Route	Post STORMWATER BASIN	5.700	12.95	46,872	5	196.00	51,777
7	Junction	Post FLOW TO NORTH WET	15.90	12.22	126,092	2, 3, 6		

Hydrograph Report

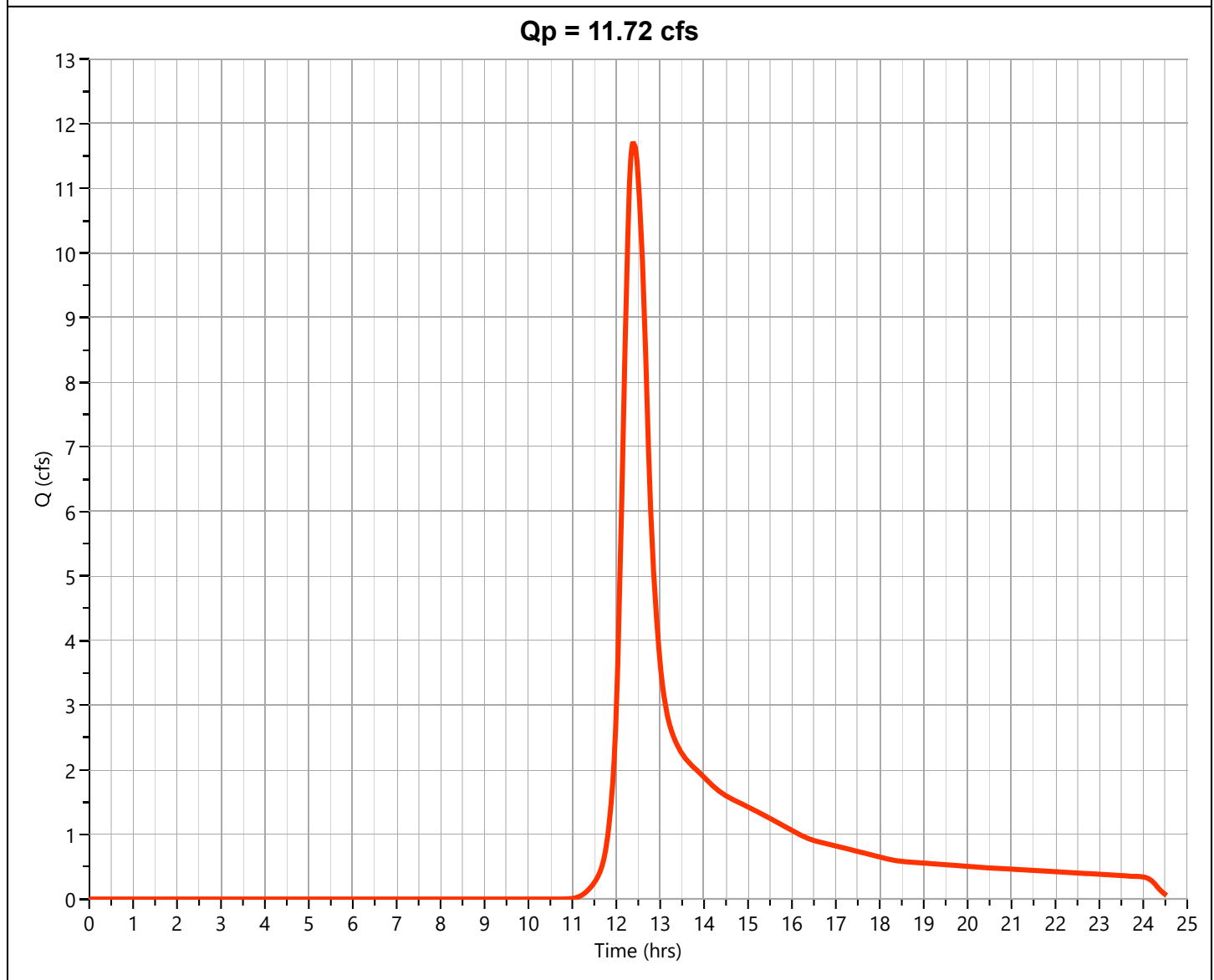
Post FLOW TO BASIN (SITE)

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 11.72 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.40 hrs
Time Interval	= 1 min	Runoff Volume	= 65,847 cuft
Drainage Area	= 7.367 ac	Curve Number	= 51*
Tc Method	= User	Time of Conc. (Tc)	= 30.0 min
Total Rainfall	= 8.17 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.598	98	PAVE
4.975	39	LAWN
0.794	30	WOODED
7.367	51	Weighted CN Method Employed



Hydrograph Report

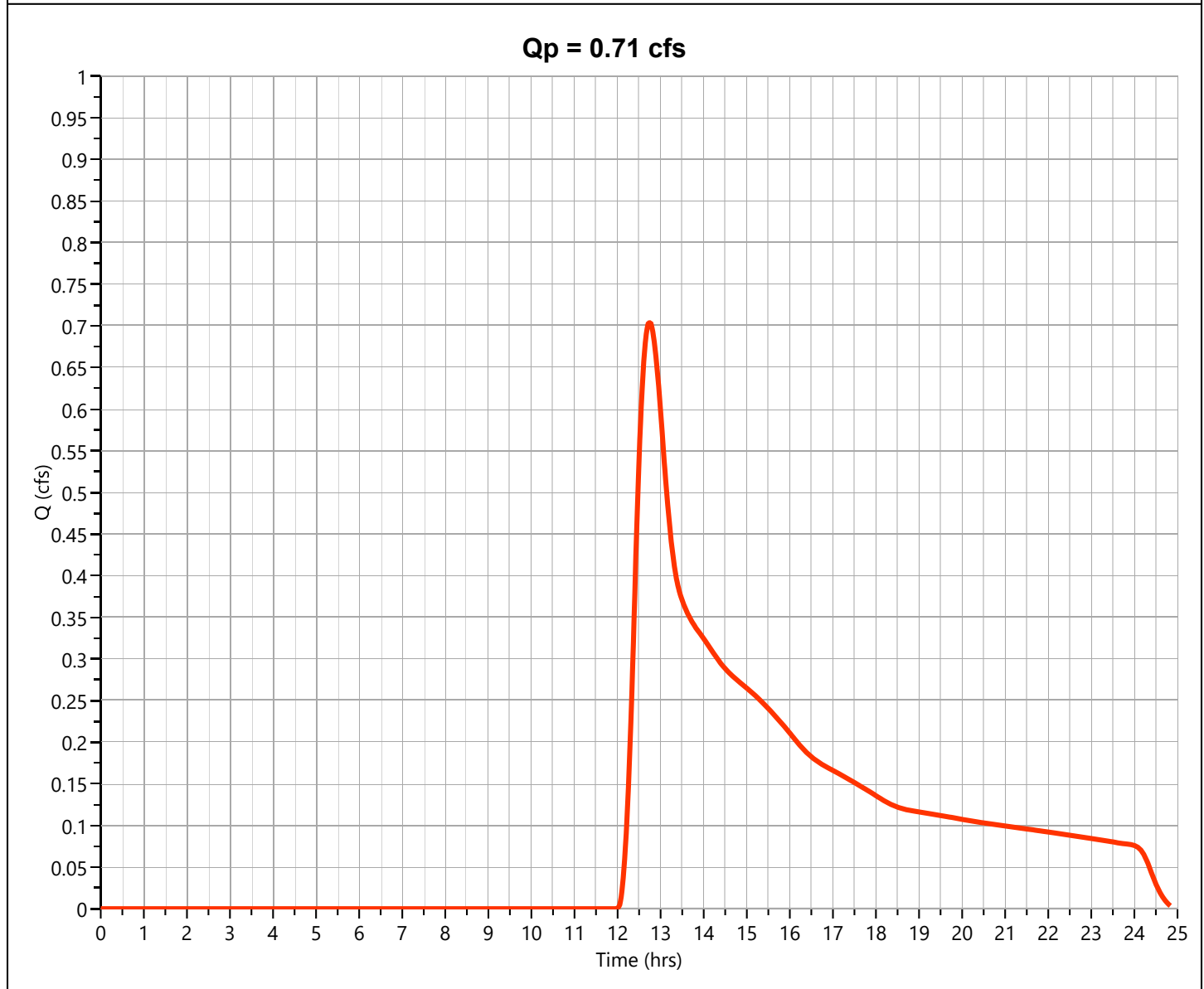
Post BYPASS TO N WETLAND

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.705 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.75 hrs
Time Interval	= 1 min	Runoff Volume	= 8,381 cuft
Drainage Area	= 3.364 ac	Curve Number	= 32.98*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 37.67 min
Total Rainfall	= 8.17 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.112	39	LAWN
2.252	30	WOODED
3.364	33	Weighted CN Method Employed

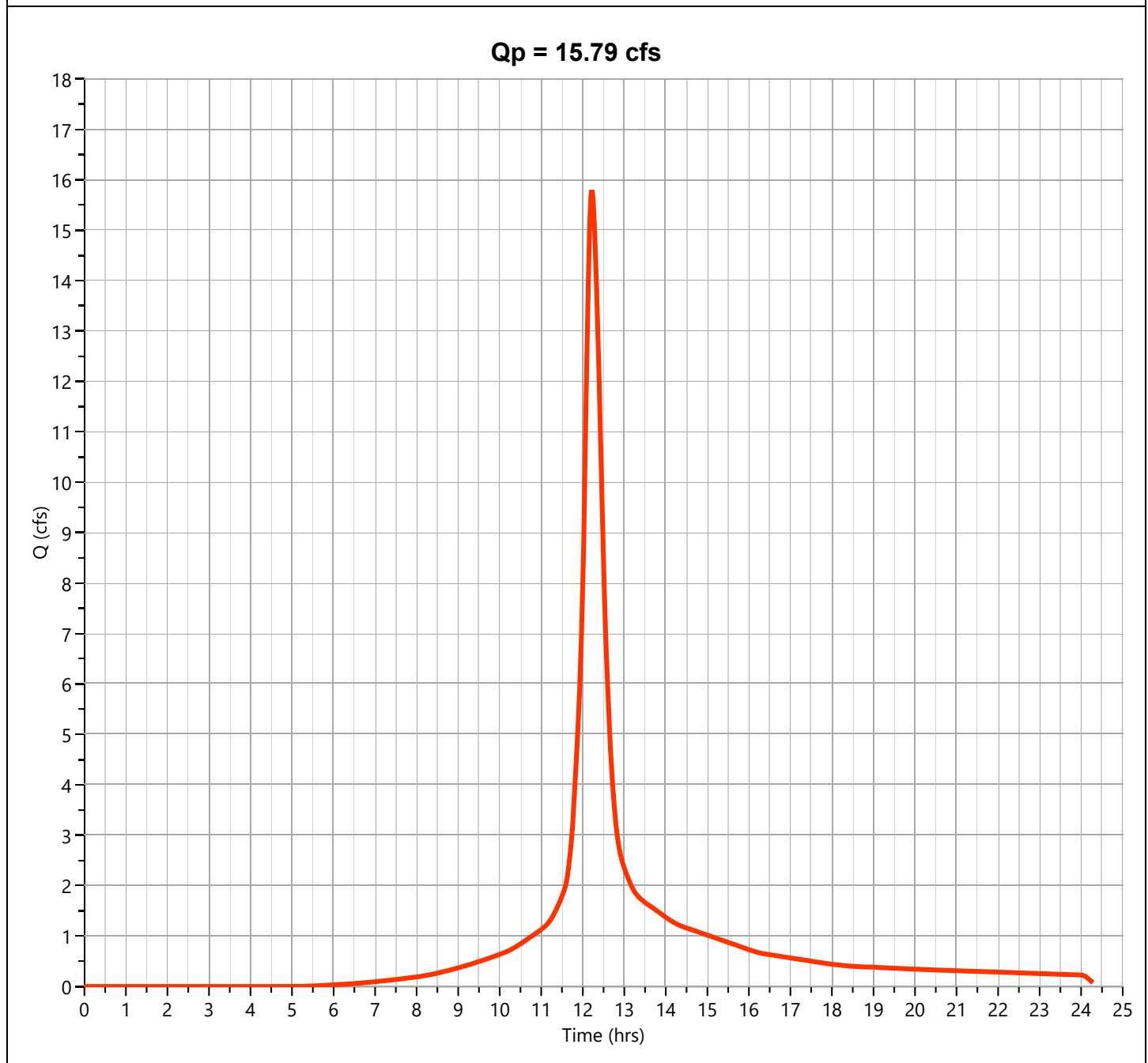


Hydrograph Report

Post INDUSTRIAL BYPASS

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 15.79 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.22 hrs
Time Interval	= 1 min	Runoff Volume	= 70,839 cuft
Drainage Area	= 3.306 ac	Curve Number	= 81
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 8.17 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484



Hydrograph Report

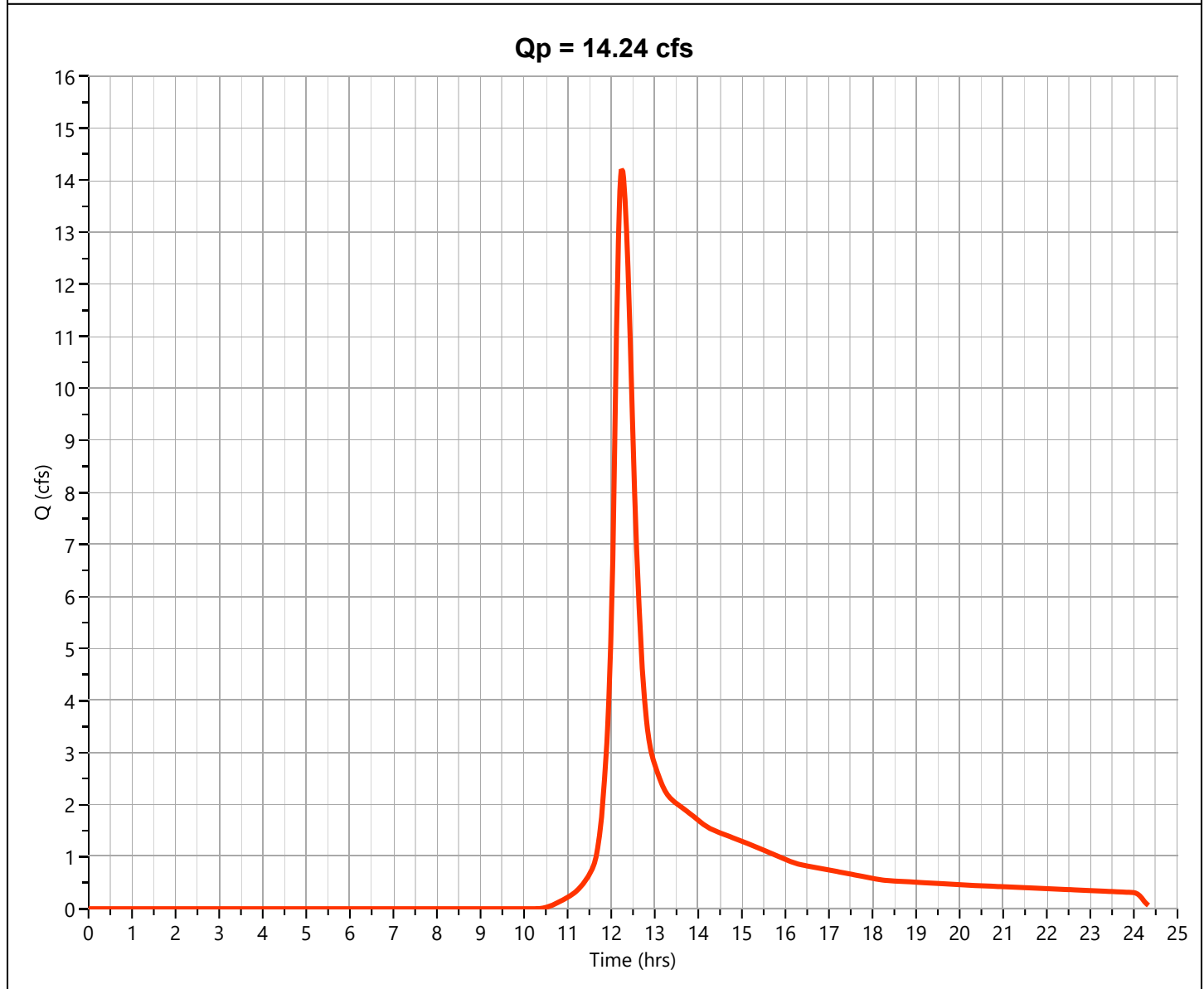
Post FLOW TO BASIN (OFF)

Hyd. No. 4

Hydrograph Type	= NRCS Runoff	Peak Flow	= 14.24 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.25 hrs
Time Interval	= 1 min	Runoff Volume	= 65,362 cuft
Drainage Area	= 6.207 ac	Curve Number	= 55*
Tc Method	= User	Time of Conc. (Tc)	= 20.0 min
Total Rainfall	= 8.17 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
2.617	61	1/4 ACRE RES
3.59	51	1 ACRE RES
6.207	55	Weighted CN Method Employed

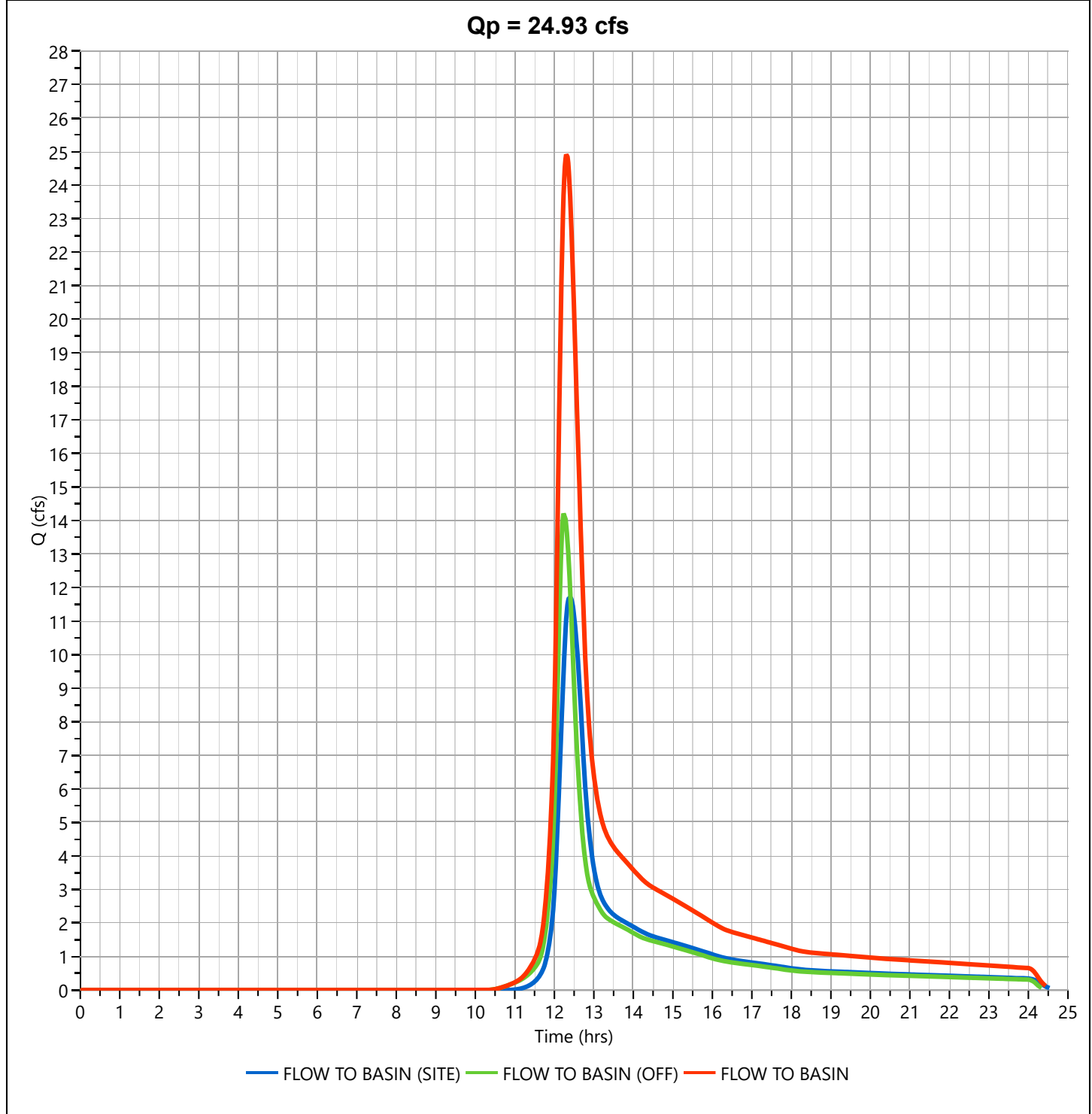


Hydrograph Report

Post FLOW TO BASIN

Hyd. No. 5

Hydrograph Type	= Junction	Peak Flow	= 24.93 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.32 hrs
Time Interval	= 1 min	Hydrograph Volume	= 131,209 cuft
Inflow Hydrographs	= 1, 4	Total Contrib. Area	= 13.574 ac



Hydrograph Report

Post STORMWATER BASIN

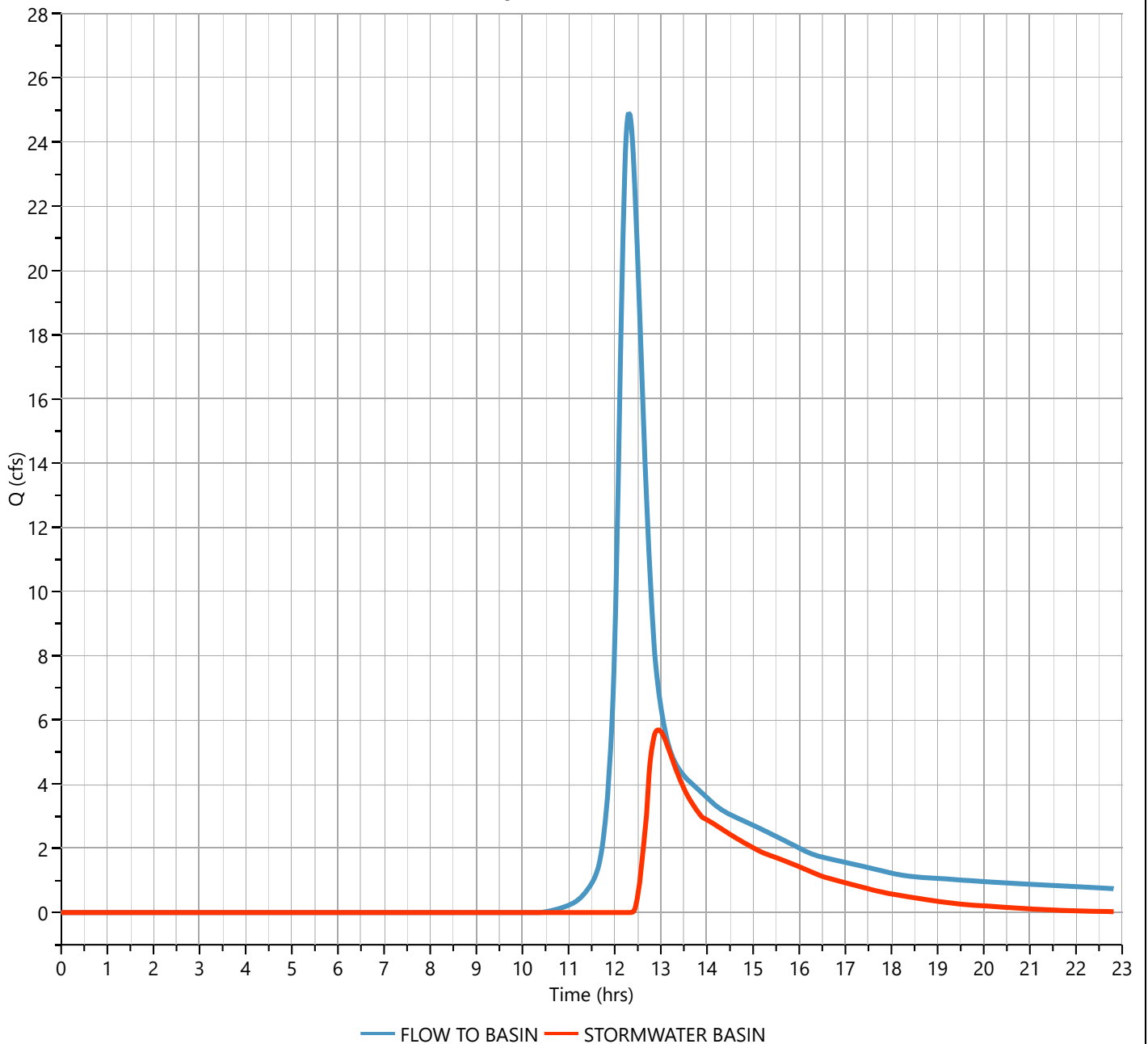
Hyd. No. 6

Hydrograph Type	= Pond Route	Peak Flow	= 5.700 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.95 hrs
Time Interval	= 1 min	Hydrograph Volume	= 46,872 cuft
Inflow Hydrograph	= 5 - FLOW TO BASIN	Max. Elevation	= 196.00 ft
Pond Name	= STORMWATER BASIN	Max. Storage	= 51,777 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 12 min

Qp = 5.70 cfs

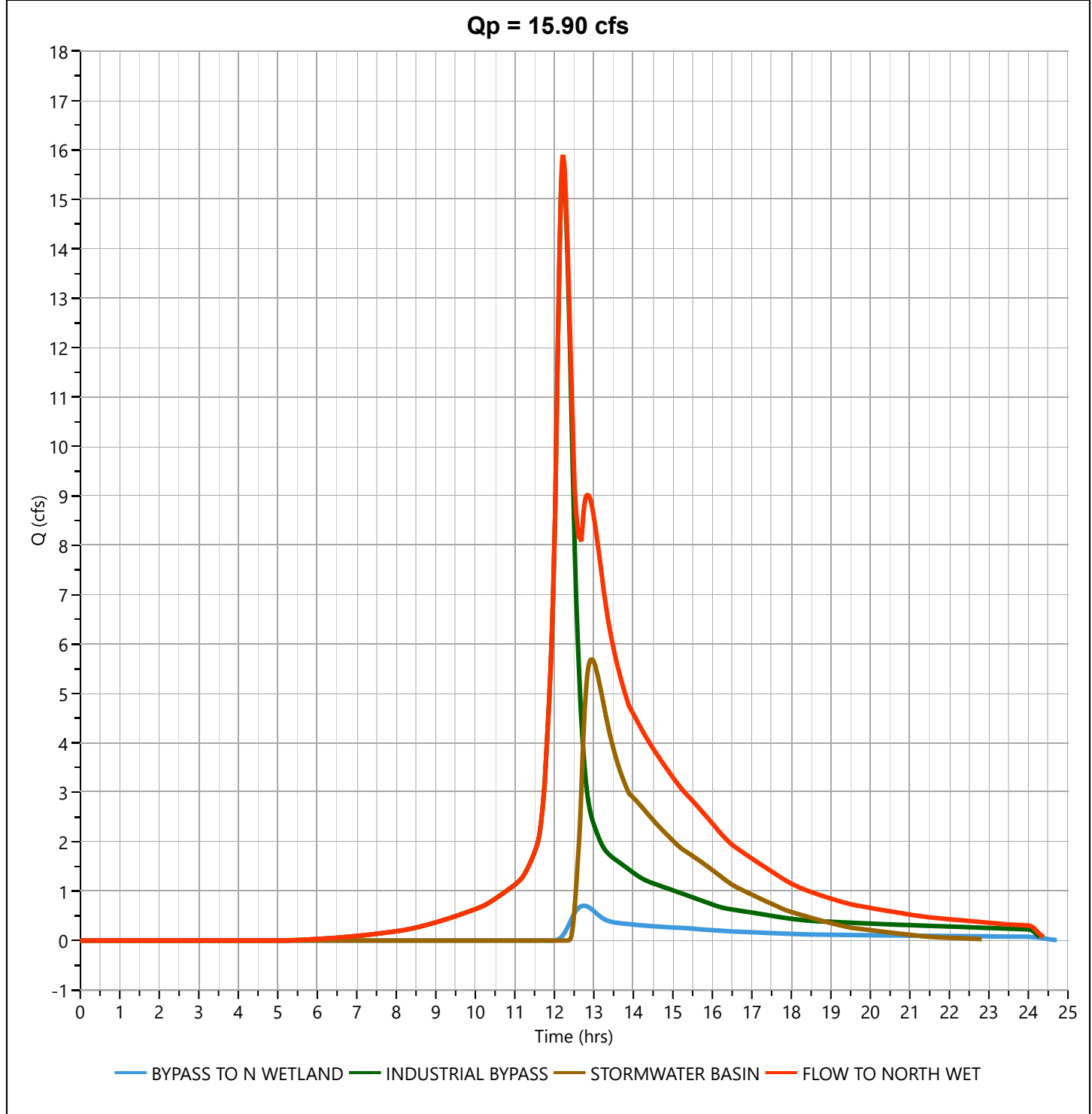


Hydrograph Report

Post FLOW TO NORTH WET

Hyd. No. 7

Hydrograph Type	= Junction	Peak Flow	= 15.90 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.22 hrs
Time Interval	= 1 min	Hydrograph Volume	= 126,092 cuft
Inflow Hydrographs	= 2, 3, 6	Total Contrib. Area	= 6.67 ac



Design Storm Report

Custom Storm filename:

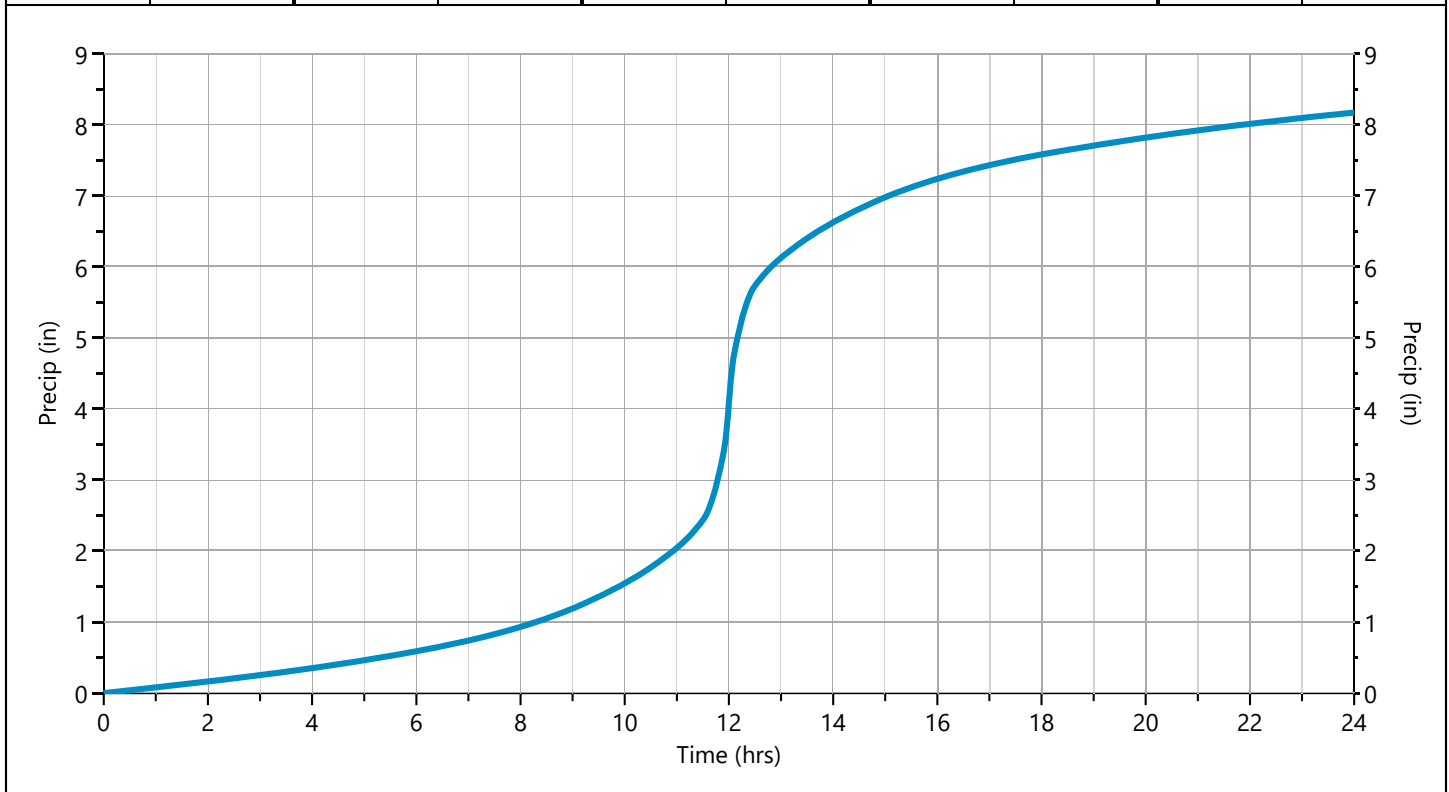
Hydrology Studio v 3.0.0.26

08-11-2022

Storm Distribution: NRCS/SCS - Type III, 24-hr

Storm Duration	Total Rainfall Volume (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	✓ 100-yr
24 hrs	2.66	3.29	0.00	4.32	5.18	6.35	7.26	8.17

Incremental Rainfall Distribution, 100-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.50	0.016099	11.68	0.037174	11.87	0.059142	12.05	0.122754	12.23	0.049157
11.52	0.017156	11.70	0.039171	11.88	0.061139	12.07	0.106005	12.25	0.047159
11.53	0.019199	11.72	0.041168	11.90	0.063136	12.08	0.089256	12.27	0.045162
11.55	0.021197	11.73	0.043165	11.92	0.072742	12.10	0.072508	12.28	0.043165
11.57	0.023194	11.75	0.045162	11.93	0.089258	12.12	0.063376	12.30	0.041168
11.58	0.025191	11.77	0.047159	11.95	0.106006	12.13	0.061139	12.32	0.039170
11.60	0.027188	11.78	0.049156	11.97	0.122755	12.15	0.059142	12.33	0.037174
11.62	0.029185	11.80	0.051153	11.98	0.139503	12.17	0.057145	12.35	0.035176
11.63	0.031182	11.82	0.053150	12.00	0.156252	12.18	0.055148	12.37	0.033180
11.65	0.033179	11.83	0.055147	12.02	0.155877	12.20	0.053150	12.38	0.031182
11.67	0.035176	11.85	0.057145	12.03	0.139503	12.22	0.051153	12.40	0.029185



IDF Report

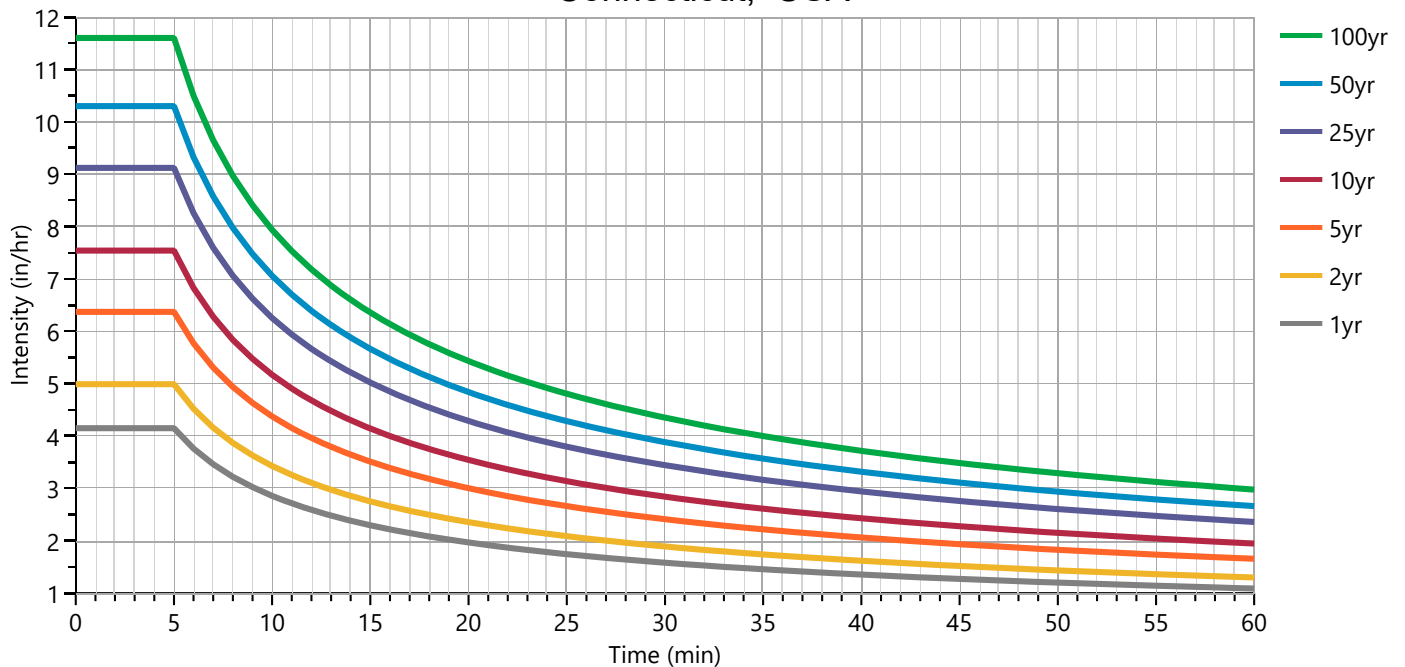
Equation Coefficients	Intensity = B / (Tc + D)^E (in/hr)								
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
B	9.8802	11.9354	0.0000	15.2514	18.1249	21.8950	24.7570	27.9951	
D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
E	0.5390	0.5418	0.0000	0.5425	0.5449	0.5442	0.5449	0.5474	

Minimum Tc = 5 minutes

Tc (min)	Intensity Values (in/hr)								
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
Cf	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
5	4.15	4.99	0	6.37	7.54	9.12	10.30	11.60	
10	2.86	3.43	0	4.37	5.17	6.25	7.06	7.94	
15	2.30	2.75	0	3.51	4.14	5.02	5.66	6.36	
20	1.97	2.35	0	3.00	3.54	4.29	4.84	5.43	
25	1.74	2.09	0	2.66	3.14	3.80	4.29	4.81	
30	1.58	1.89	0	2.41	2.84	3.44	3.88	4.35	
35	1.45	1.74	0	2.22	2.61	3.16	3.57	4.00	
40	1.35	1.62	0	2.06	2.43	2.94	3.32	3.72	
45	1.27	1.52	0	1.93	2.28	2.76	3.11	3.48	
50	1.20	1.43	0	1.83	2.15	2.61	2.94	3.29	
55	1.14	1.36	0	1.73	2.04	2.47	2.79	3.12	
60	1.09	1.30	0	1.65	1.95	2.36	2.66	2.98	

Cf = Correction Factor applied to Rational Method runoff coefficient.

Connecticut, USA



Precipitation Report

Precipitation filename: SamplePrecip.pcp

Hydrology Studio v 3.0.0.26 (Rainfall totals in Inches)

08-11-2022

	Active	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Active		✓	✓		✓	✓	✓	✓	✓
SCS Storms	> SCS Dimensionless Storms								
SCS 6hr		1.20	1.50	0	1.86	2.18	2.64	3.01	3.41
Type I, 24-hr		0	0	0	0	0	0	0	0
Type IA, 24-hr		0	0	0	0	0	0	0	0
Type II, 24-hr		1.82	2.28	0	2.85	3.31	3.94	4.43	4.94
Type II FL, 24-hr		0	0	0	0	0	0	0	0
Type III, 24-hr	✓	2.66	3.29	0	4.32	5.18	6.35	7.26	8.17
Synthetic Storms	> IDF-Based Synthetic Storms								
1-hr		1.09	1.30	0	1.65	1.95	2.36	2.66	2.98
2-hr		1.50	1.78	0	2.27	2.67	3.24	3.65	4.07
3-hr		1.80	2.15	0	2.74	3.21	3.89	4.38	4.89
6-hr		2.48	2.95	0	3.76	4.40	5.34	6.01	6.70
12-hr		3.42	4.05	0	5.16	6.03	7.32	8.24	9.16
24-hr		4.71	5.57	0	7.08	8.27	10.04	11.30	12.54
Huff Distribution	> 1st Quartile (0 to 6 hrs)								
1-hr		0.76	0.98	0	1.33	1.61	2.01	2.34	2.69
2-hr		0.89	1.14	0	1.50	1.80	2.24	2.60	2.99
3-hr		0.98	1.24	0	1.59	1.90	2.33	2.68	3.07
6-hr		1.20	1.50	0	1.86	2.18	2.64	3.01	3.41
Huff Distribution	> 2nd Quartile (>6 to 12 hrs)								
8-hr		0	0	0	0	0	0	0	0
12-hr		0	0	0	0	0	0	0	0
Huff Distribution	> 3rd Quartile (>12 to 24 hrs)								
18-hr		0	0	0	0	0	0	0	0
24-hr		0	0	0	0	0	0	0	0
Custom Storms	> Custom Storm Distributions								
My Custom Storm 1		0	0	0	0	0	0	0	0
My Custom Storm 2		0	0	0	0	0	0	0	0
My Custom Storm 3		0	0	0	0	0	0	0	0
My Custom Storm 4		0	0	0	0	0	0	0	0
My Custom Storm 5		0	0	0	0	0	0	0	0
My Custom Storm 6		0	0	0	0	0	0	0	0
My Custom Storm 7		0	0	0	0	0	0	0	0
My Custom Storm 8		0	0	0	0	0	0	0	0
My Custom Storm 9		0	0	0	0	0	0	0	0
My Custom Storm 10		0	0	0	0	0	0	0	0

Precipitation Report Cont'd

Precipitation filename: SamplePrecip.pcp

Rainfall totals in Inches

08-11-2022

	Active	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Active		✓	✓		✓	✓	✓	✓	✓
Huff Indiana	> Indianapolis								
30-min		0	0	0	0	0	0	0	0
1-hr		0	0	0	0	0	0	0	0
2-hr		0	0	0	0	0	0	0	0
3-hr		0	0	0	0	0	0	0	0
6-hr		0	0	0	0	0	0	0	0
12-hr		0	0	0	0	0	0	0	0
24-hr		0	0	0	0	0	0	0	0
Huff Indiana	> Evansville								
30-min		0	0	0	0	0	0	0	0
1-hr		0	0	0	0	0	0	0	0
2-hr		0	0	0	0	0	0	0	0
3-hr		0	0	0	0	0	0	0	0
6-hr		0	0	0	0	0	0	0	0
12-hr		0	0	0	0	0	0	0	0
24-hr		0	0	0	0	0	0	0	0
Huff Indiana	> Fort Wayne								
30-min		0	0	0	0	0	0	0	0
1-hr		0	0	0	0	0	0	0	0
2-hr		0	0	0	0	0	0	0	0
3-hr		0	0	0	0	0	0	0	0
6-hr		0	0	0	0	0	0	0	0
12-hr		0	0	0	0	0	0	0	0
24-hr		0	0	0	0	0	0	0	0
Huff Indiana	> South Bend								
30-min		0	0	0	0	0	0	0	0
1-hr		0	0	0	0	0	0	0	0
2-hr		0	0	0	0	0	0	0	0
3-hr		0	0	0	0	0	0	0	0
6-hr		0	0	0	0	0	0	0	0
12-hr		0	0	0	0	0	0	0	0
24-hr		0	0	0	0	0	0	0	0

Precipitation Report Cont'd

Precipitation filename: SamplePrecip.pcp

Rainfall totals in Inches

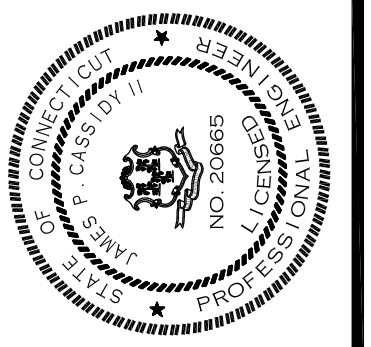
08-11-2022

	Active	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Active		✓	✓		✓	✓	✓	✓	✓
NRCS Storms	> NRCS Dimensionless Storms								
NRCS MSE1, 24-hr		0	0	0	0	0	0	0	0
NRCS MSE2, 24-hr		0	0	0	0	0	0	0	0
NRCS MSE3, 24-hr		0	0	0	0	0	0	0	0
NRCS MSE4, 24-hr		0	0	0	0	0	0	0	0
NRCS MSE5, 24-hr		0	0	0	0	0	0	0	0
NRCS MSE6, 24-hr		0	0	0	0	0	0	0	0
NOAA-A, 24-hr		0	0	0	0	0	0	0	0
NOAA-B, 24-hr		0	0	0	0	0	0	0	0
NOAA-C, 24-hr		0	0	0	0	0	0	0	0
NOAA-D, 24-hr		0	0	0	0	0	0	0	0
NRCC-A, 24-hr		0	0	0	0	0	0	0	0
NRCC-B, 24-hr		0	0	0	0	0	0	0	0
NRCC-C, 24-hr		0	0	0	0	0	0	0	0
NRCC-D, 24-hr		0	0	0	0	0	0	0	0
CA-1, 24-hr		0	0	0	0	0	0	0	0
CA-2, 24-hr		0	0	0	0	0	0	0	0
CA-3, 24-hr		0	0	0	0	0	0	0	0
CA-4, 24-hr		0	0	0	0	0	0	0	0
CA-5, 24-hr		0	0	0	0	0	0	0	0
CA-6, 24-hr		0	0	0	0	0	0	0	0
FDOT Storms	> Florida DOT Storms								
FDOT, 1-hr		0	0	0	0	0	0	0	0
FDOT, 2-hr		0	0	0	0	0	0	0	0
FDOT, 4-hr		0	0	0	0	0	0	0	0
FDOT, 8-hr		0	0	0	0	0	0	0	0
FDOT, 24-hr		0	0	0	0	0	0	0	0
FDOT, 72-hr		0	0	0	0	0	0	0	0
SFWMD, 72-hr		0	0	0	0	0	0	0	0
Austin Storms	> Austin Frequency Storms								
Austin Zone 1, 24-hr		0	0	0	0	0	0	0	0
Austin Zone 2, 24-hr		0	0	0	0	0	0	0	0

Appendix G

Onsite Drainage Subarea Map

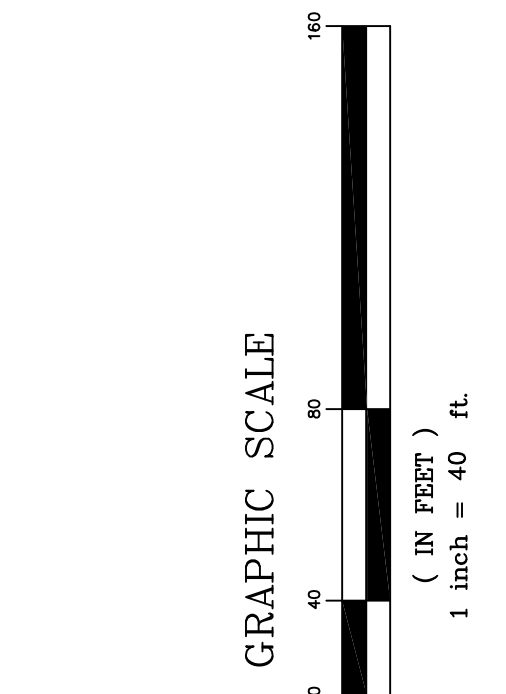
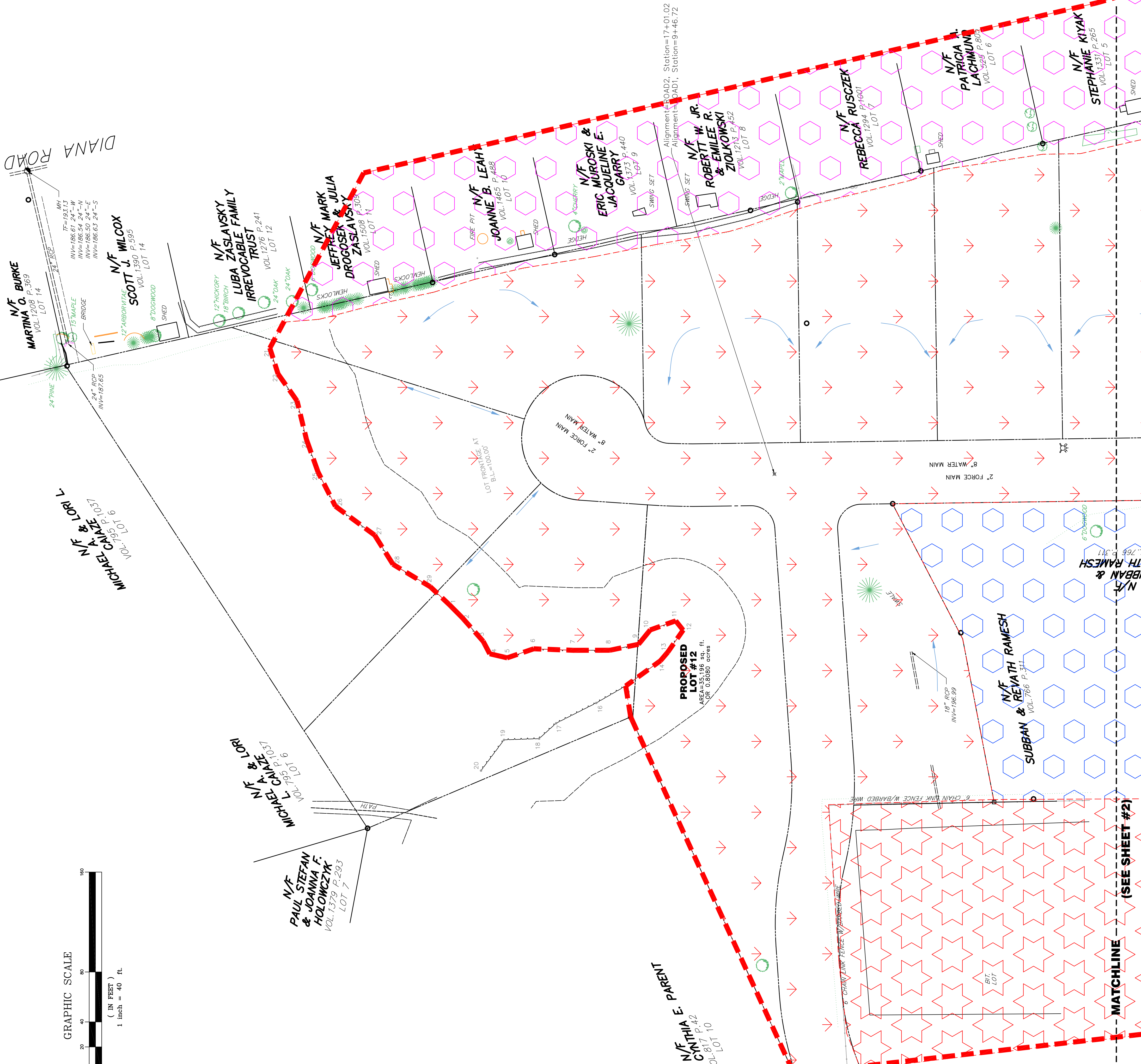
Overall Drainage Subarea Map - Pre & Post Drainage Area



PRE-DEVELOPMENT DRAINAGE MAP
 PREPARED FOR:
THE BONGIANNI GROUP, INC.
 PROPERTY LOCATED AT:
PINE STREET & MARION AVENUE
 SOUTHWINGTON, CONNECTICUT

HALLISEY, PEARSON & CASSIDY
 CIVIL ENGINEERS & LAND SURVEYORS
 630 MAIN STREET, UNIT #1A
 GROMWELL, CONNECTICUT 06416
 PHONE: (860)-529-6812, FAX: (860)-721-7709

CHECKED BY: JPC	DATE: MAY 26, 2022	DRAWN BY: JWP	JOB NO.: 3309	ACAD FILE: 3309-PRE-R3
SCALE: 1"=40'	SHEET: 1	OF: 2	REVISIONS:	

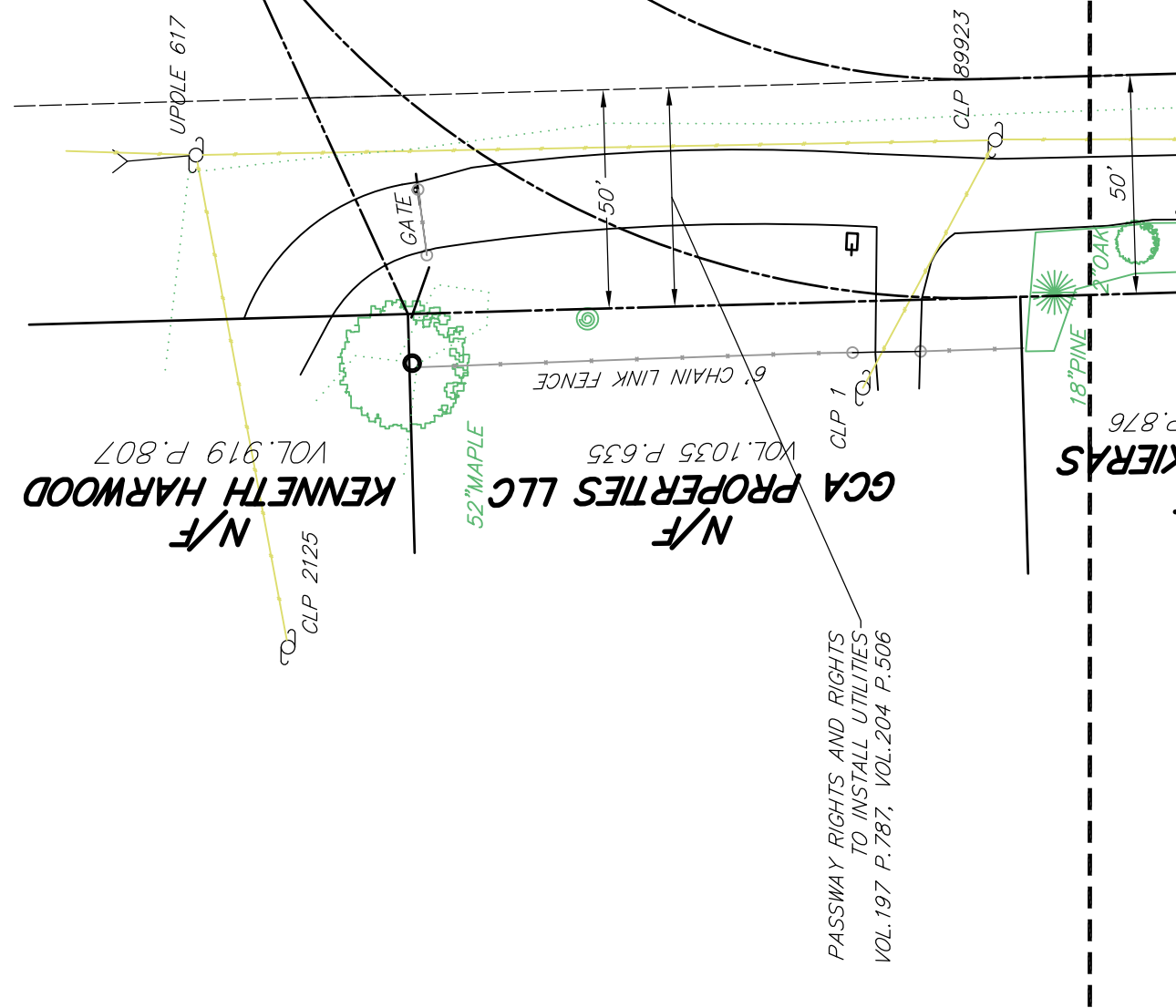
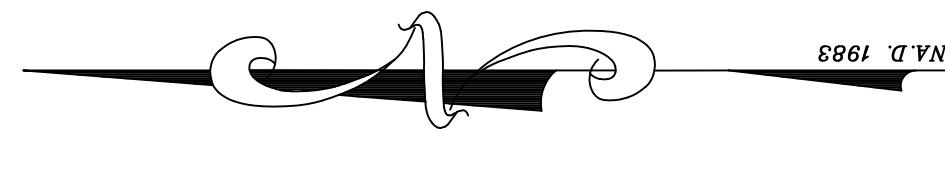


LEGEND

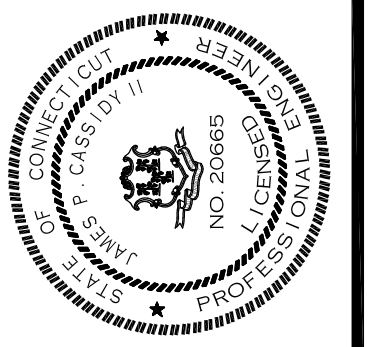
—	EXISTING PROPERTY LINE	—	PROPOSED BIT CURB
—	EXISTING EDGE OF PAVEMENT	—	PROPOSED STORM DRAINAGE SYSTEM
—	UP (IN)	—	PROPOSED WATER MAIN
—	IRON PIN OR IRON PIPE FOUND	—	PROPOSED SANITARY SEWER
—	EXISTING TREE LINE	—	PROPOSED GAS SERVICE
—	EXISTING CONTOUR	—	PROPOSED ELEC. SERVICE
—	EXISTING SPOT GRADE	—	PROPOSED CONTOUR
—	EXISTING TELEPHONE POLE	—	PROPOSED SPOT GRADE
—	EXISTING BIT CURB	—	PROPOSED TREE LINE
—	EXISTING STORM DRAINAGE SYSTEM		
—	EXISTING WATER MAIN		
—	EXISTING SANITARY SEWER		
—	LIMITS OF TOWN WETLANDS		
—	LIMITS OF FLAGGED WETLANDS		

DRAINAGE SUBAREA - LEGEND

—	LIMITS OF EXIST DEVELOPMENT DRAINAGE SUBAREA
—	TIME OF CONCENTRATION FLOW LINE
—	1/4 ACRE RESIDENTIAL
—	1/2 ACRE RESIDENTIAL
—	1 ACRE RESIDENTIAL
—	INDUSTRIAL AREA
—	WOODED AREA



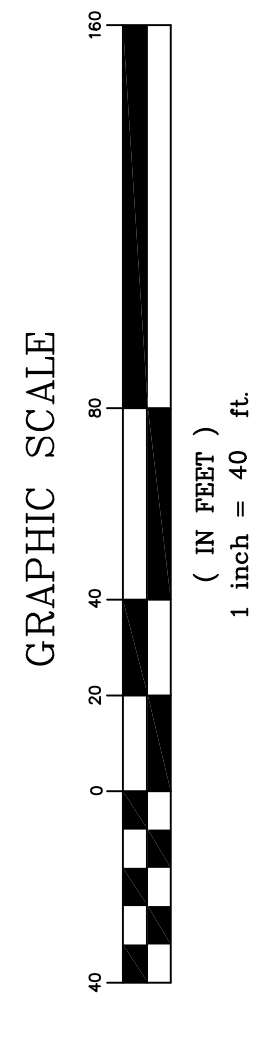
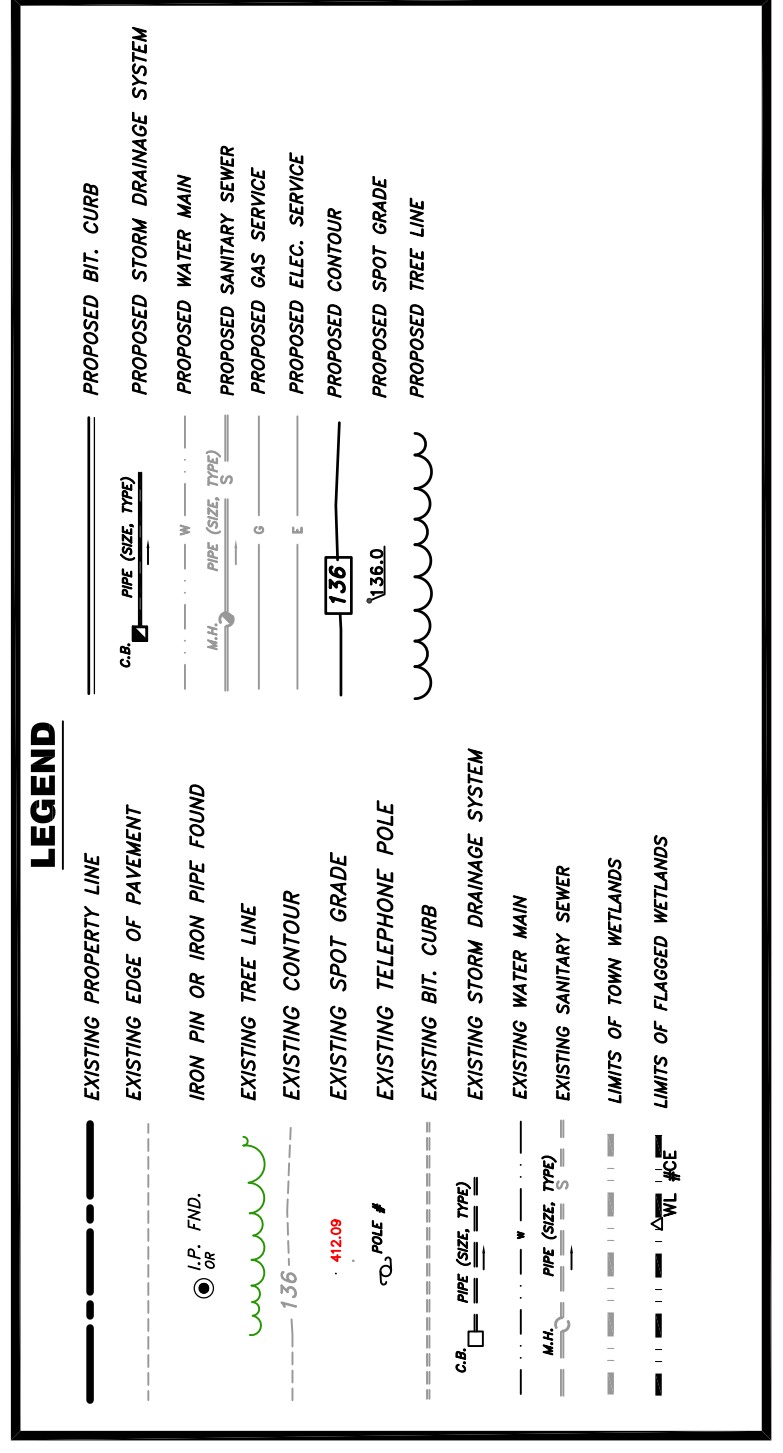
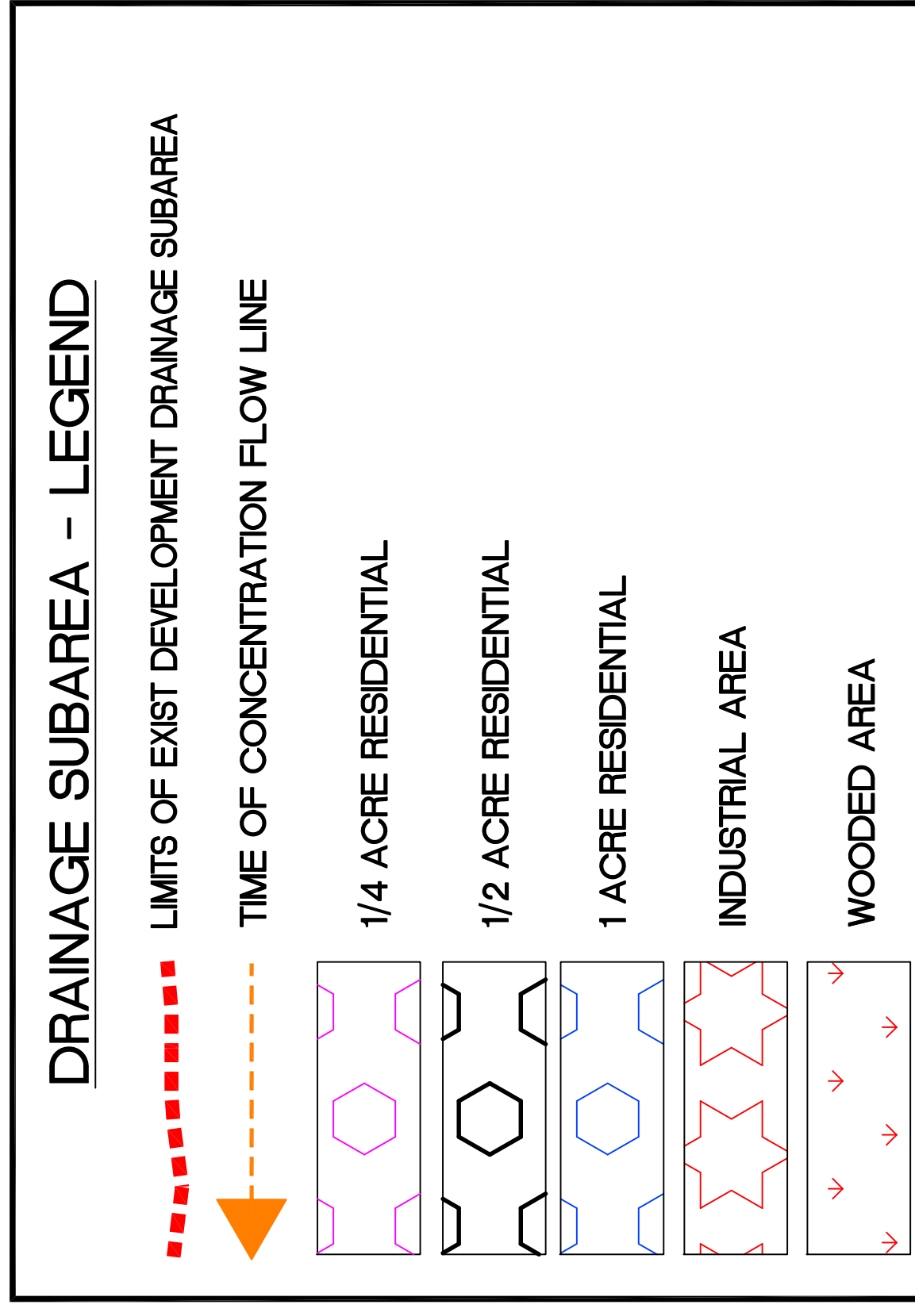
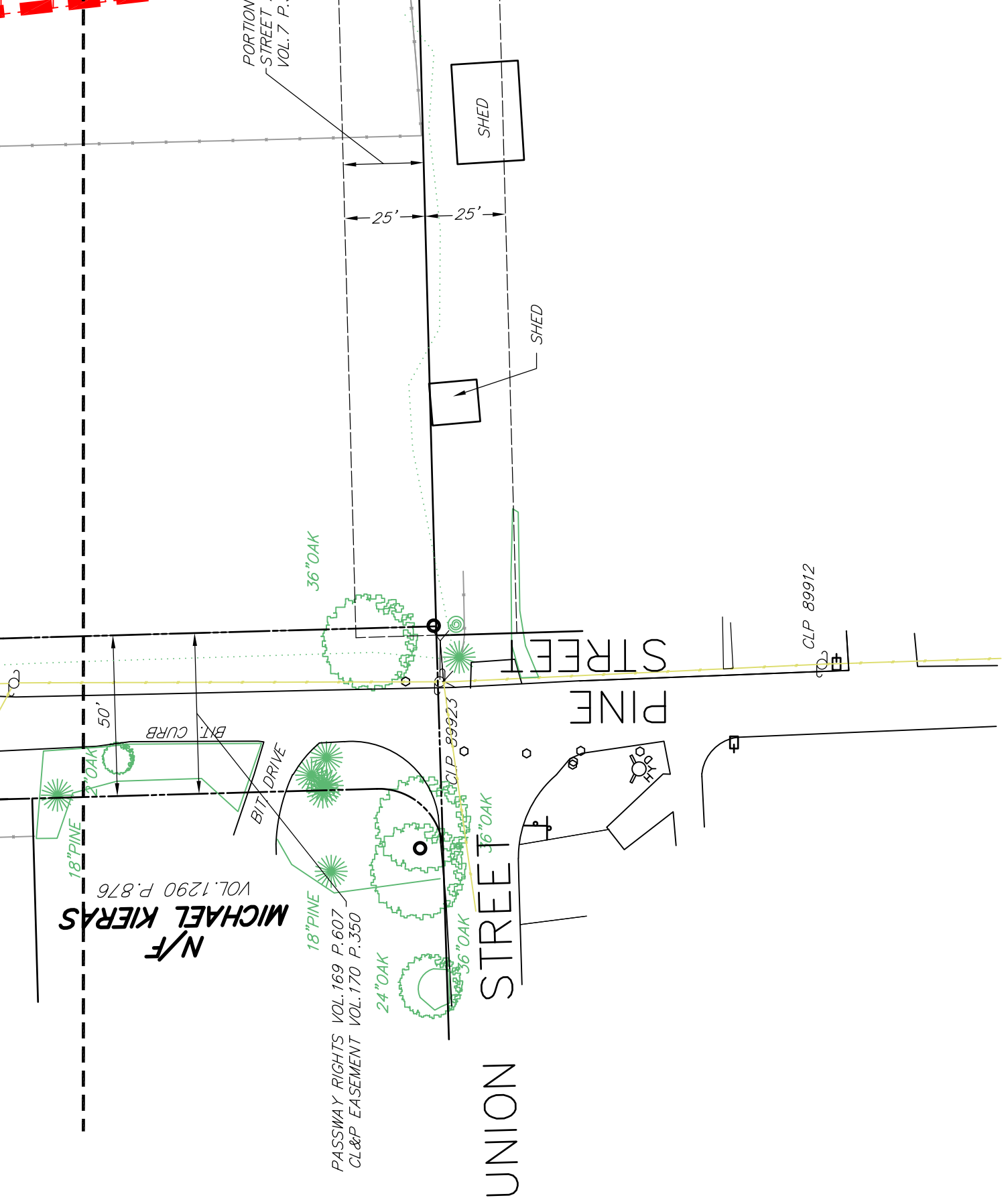
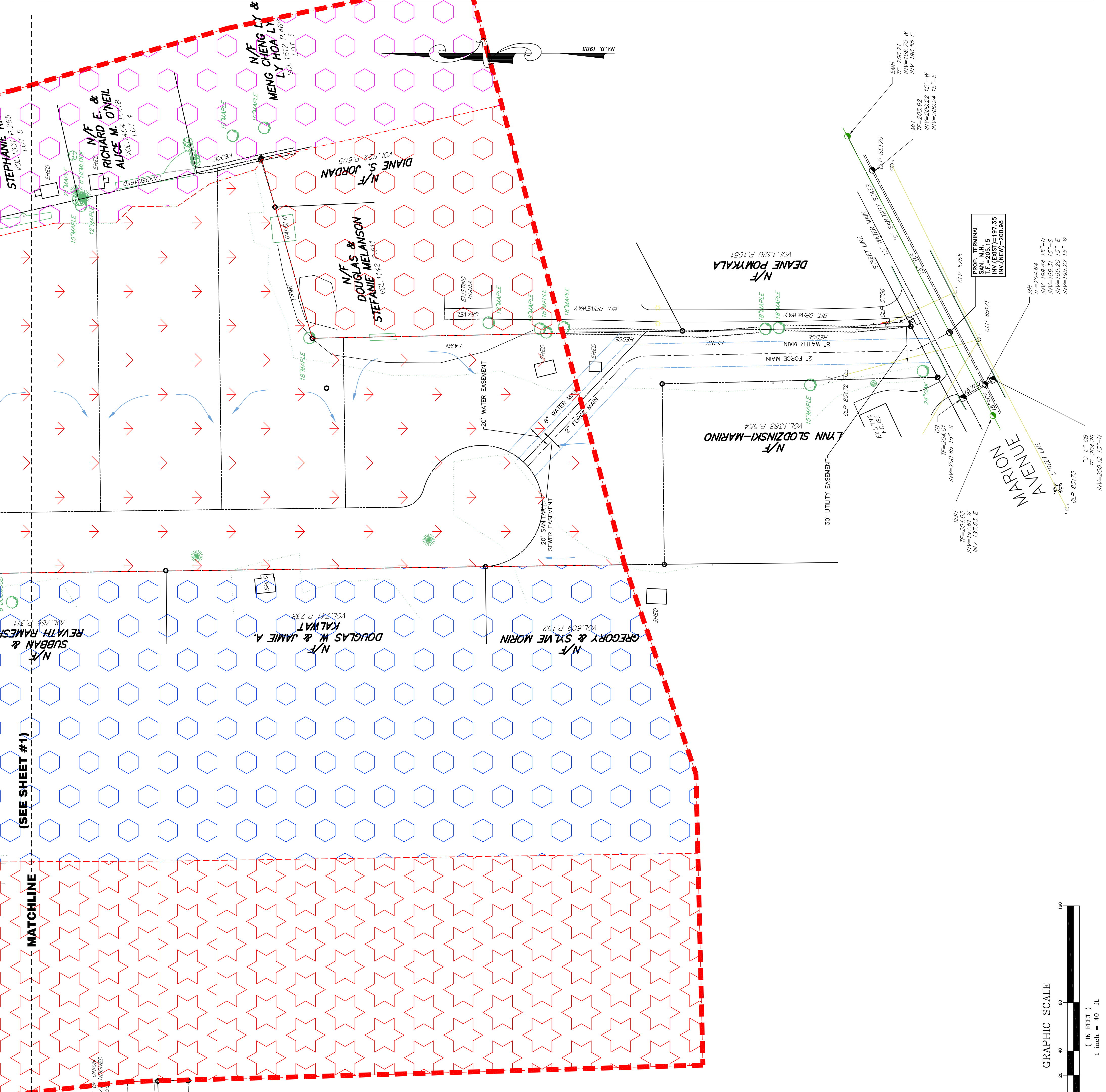
MATCHLINE (SEE SHEET #2)

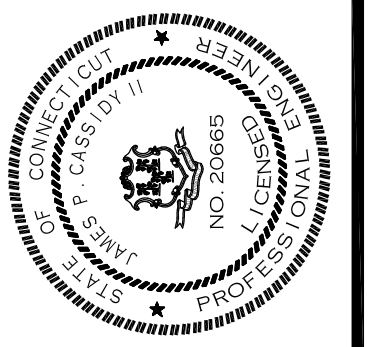


PRE-DEVELOPMENT DRAINAGE MAP
PREPARED FOR:
THE BONGIANNI GROUP, INC.
PROPERTY LOCATED AT:
PINE STREET & MARION AVENUE
SOUTHINGTON, CONNECTICUT

HALLISEY, PEARSON & CASSIDY
CIVIL ENGINEERS & LAND SURVEYORS
 630 MAIN STREET, UNIT #1A
 CROMWELL, CONNECTICUT 06416
 PHONE: (860)-529-6812, FAX: (860)-721-7709

SCALE: 1"=40'	CHECKED BY: JPC
DATE: MAY 26, 2022	DRAWN BY: JMF
JOB NO.: 3309	ACAD FILE: 3309-PRF
SHEET: 2	OF: 2
REVISIONS:	

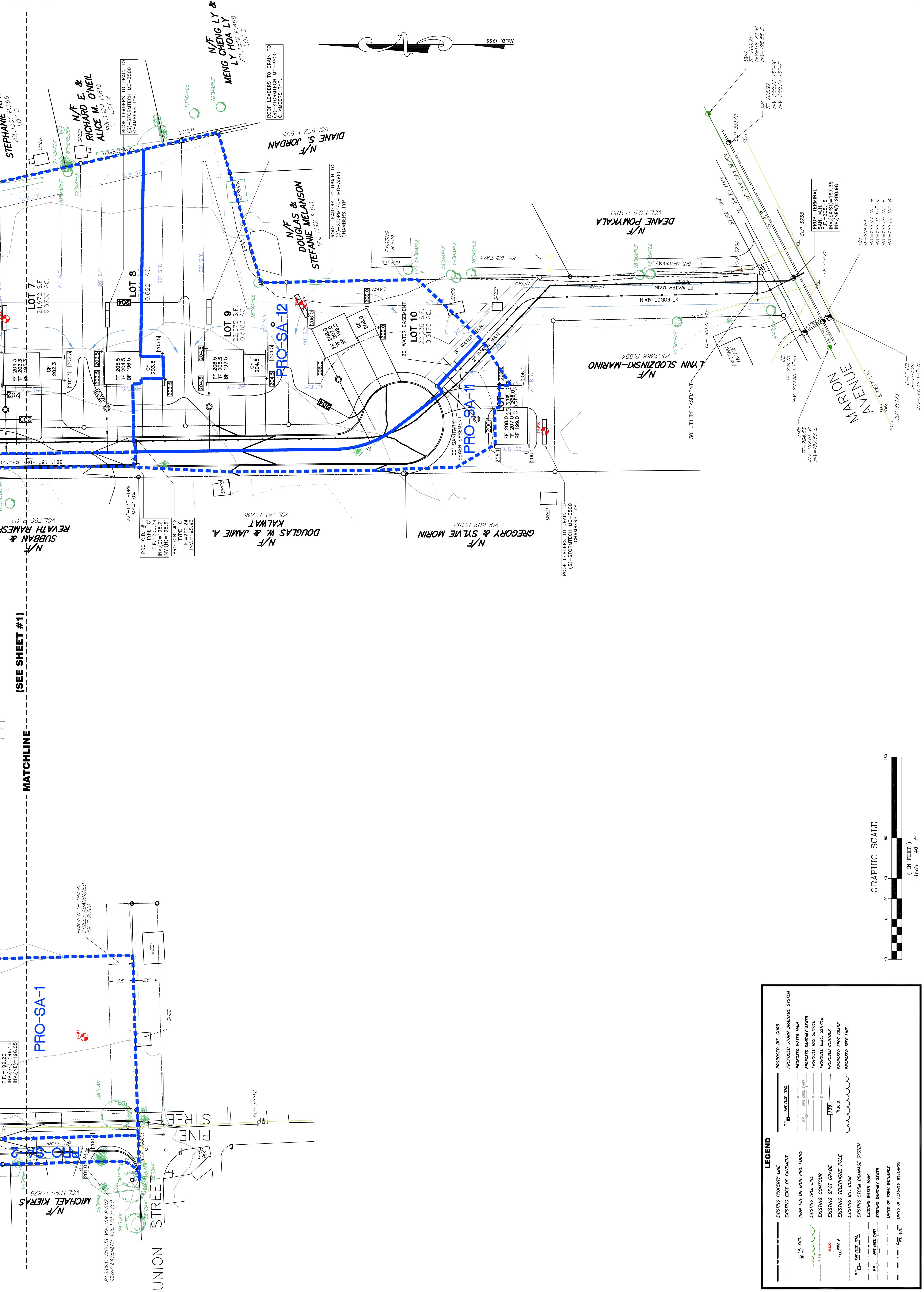




POST-DEVELOPMENT DRAINAGE MAP
 PREPARED FOR:
THE BONGIANNI GROUP, INC.
 PROPERTY LOCATED AT:
PINE STREET & MARION AVENUE
 SOUTHINGTON, CONNECTICUT

CIVIL ENGINEERS & LAND SURVEYORS
HALLISEY, PEARSON & CASSIDY
 630 MAIN STREET, UNIT #1A
 CROMWELL, CONNECTICUT 06416
 PHONE: (860)-529-6812, FAX: (860)-721-7709

DATE: MAY 26, 2022	DRAWN BY: JMF	CHECKED BY: JPC
JOB NO.: 3309	ACAD FILE: 3309-PRO	
SHEET: 2	OF: 2	
REVISIONS:		



MATCHLINE (SEE SHEET #1)