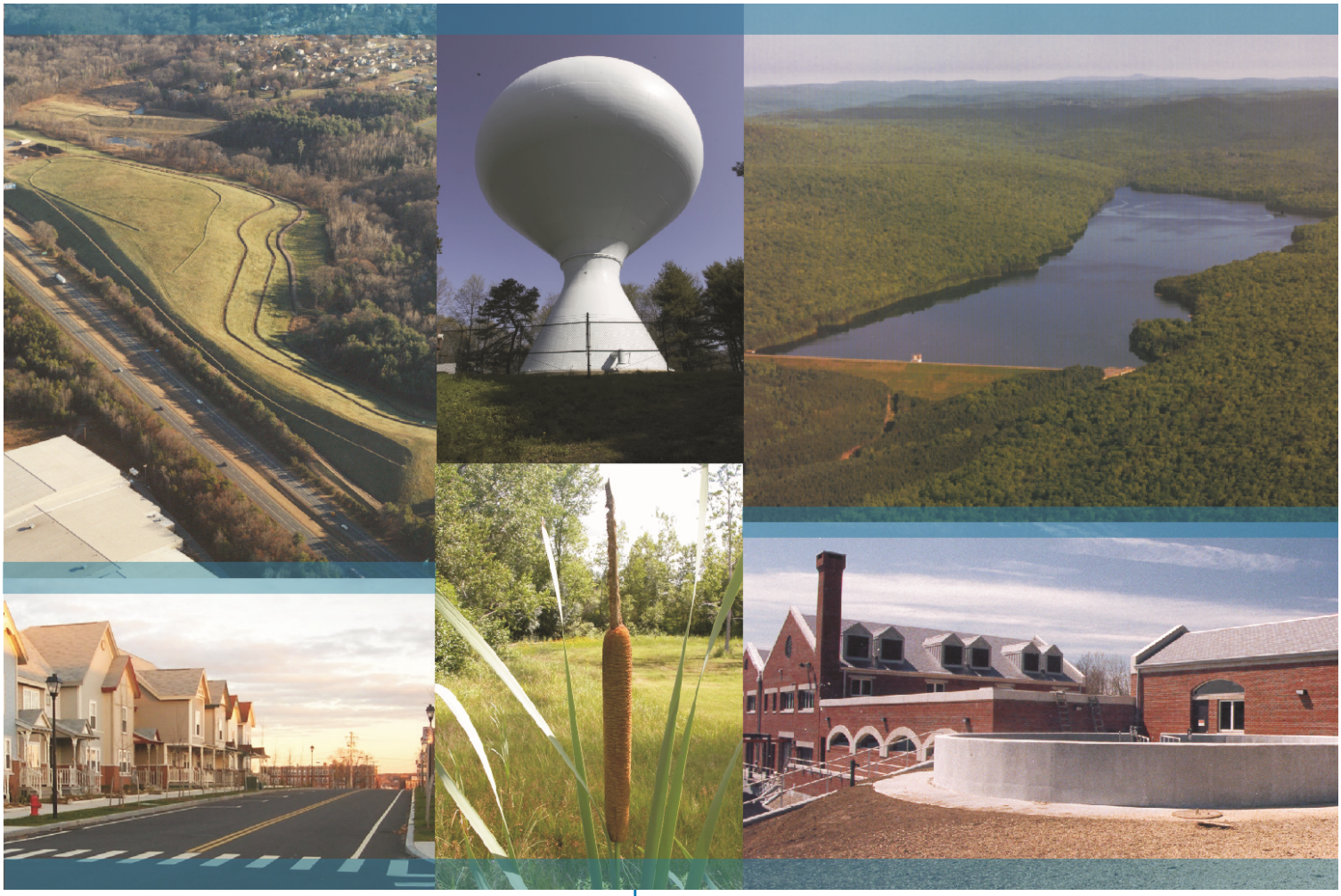


STATE OF CONNECTICUT
CHARLES J. CROCE
20374
LICENSED
PROFESSIONAL ENGINEER
11/16/2023

STATE OF CONNECTICUT
KEVIN MCCUTCHAN
PEN.0027217
LICENSED
PROFESSIONAL ENGINEER
11/16/2023

Tighe&Bond

Hotchkiss Dining Hall Renovation
11 Interlaken Road
Lakeville, Connecticut

Stormwater Management Report

Prepared For:

The Hotchkiss School

November 16, 2023

Executive Summary

Section 1 Introduction and Site Conditions

Section 2 Stormwater Management

Section 3 Soil Erosion and Sediment Control

Section 1
Introduction and Site Conditions

This report was prepared at the request of the owner/applicant, Hotchkiss School in connection with their application to the Town of Salisbury for proposed renovations and an addition to the existing campus Dining Hall. The project also includes the addition of an overhang in the loading area on the north side of the building, site utility upgrades, sidewalks and landscaping.

Tighe & Bond is familiar with the property and has reviewed and analyzed available utility and topographic information. Drainage calculations and stormwater management plans have been prepared in accordance with the Town of Salisbury's drainage requirements, the Connecticut Department of Transportation Drainage Manual (2000), and the Connecticut Department of Energy and Environmental Protection Stormwater Quality Manual (2004). The drainage calculations include a hydrologic and hydraulic analysis of the existing conditions and the proposed development.

1.1 Existing Conditions

The Hotchkiss School is divided amongst several parcels in the Town of Salisbury. The dining hall is on the section of campus bounded by Lake Rd to the north, Sharon Rd (Route 41) to the east and Interlaken Rd (Route 112) to the southwest.

The area is a mix of campus buildings, lawn, parking lots, driveways and sidewalks. Underground utilities on site include sanitary sewer, electric and communications services, domestic water and fire protection services, steam, and hot and chilled water services. Existing surface grades generally slope from south to north and range from an elevation of approximately 906 to 882.

1.2 Proposed Conditions

The proposed work to the Dining Hall will consist of renovations to the existing building and expansion on the north, east, and south sides. Overhangs are proposed on the north side of the building over the existing loading docks and trash areas. Site surface improvements include sidewalks and other amenities around the dining hall and new patio.

Site utility work to serve the existing building and additions include stormwater management, sanitary sewer, water, fire protection, gas, electric, steam, and hot and chilled water services.

Stormwater management will be accommodated on-site. Surface runoff will be collected and conveyed in a series of yard drains, catch basins and roof leaders. The stormwater collection system will utilize a "treatment train" approach to treat the Water Quality Volume, remove total suspended solids and reduce peak flow.

The dining hall's sanitary sewer lateral will tie into the existing on-site sewer main north of the building. The lateral will be routed through a grease trap. Drainage beneath the proposed trash area overhang will be collected in a catch basin, routed through an oil/grit separator, and discharge to the existing sanitary sewer main. Further upstream and east of the building, the existing sanitary sewer main conflicts with the proposed

building expansion. This section of sewer main will be shifted east to avoid conflicts with the building footprint.

1.3 Soils Identification

The U.S. Department of Agriculture's National Resource Conservation Service (NRCS) Web Soil Survey indicates the following soil types are present on the site:

Stockbridge Loam and Urban Land Complex
The Stockbridge series consists of very deep, well drained soils formed in loamy calcareous till. They are nearly level to very steep soils on till plains, smooth hills, low ridges and drumloidal landforms. Slopes range from roughly nearly level to very steep. Permeability is moderate in the surface layer and subsoil and moderately slow or slow in the substratum.

Others performed an infiltration test on site to confirm the physical properties of the soils and for sizing the on-site stormwater management system. See attached wetland and geotechnical reports in **Appendix B** of this report for additional information.

Section 2
Stormwater Management

2.1 Existing Conditions Hydrologic Analysis

The existing conditions hydrologic analysis includes both project site and portions of adjacent areas. The analysis areas are comprised of two watersheds, each draining to its own Point of Comparison. Both areas shed from southwest to northeast and drain into existing storm sewers. The watersheds consist of mostly pervious surfaces that include lawns and landscaped areas, and impervious areas that include buildings, walks, drives and parking areas.

Impervious and pervious areas, weighted curve numbers, and times of concentration were calculated for each watershed and inputted into a hydrologic model to determine the site's peak flow and volume as part of the comparative hydrology analysis.

A breakdown of exiting watershed areas, existing volumetric hydrographs, and existing watershed map are included in **Appendix C** of this report.

2.1.1 Floodplain Management

The Federal Emergency Management Agency's Flood Insurance Rate Map (FIRM) for the town of Salisbury, Connecticut effective on January 5, 1989 shows the project site well outside of any floodways or floodplains, as shown in **Figure 2** in **Appendix A**. Therefore, no floodplain is identified on this site.

2.2 Proposed Hydrologic and Hydraulic Analysis

The proposed condition hydrologic analysis mimics the existing conditions with the two main watersheds contributing runoff to the same two design points as the existing watersheds. The majority of the proposed work will contribute to Point of Concern A, Northeast of the proposed project, and a smaller portion of the proposed work contributing to Point of Concern B, Northwest of the project.

The proposed stormwater management systems will utilize a series of yard drains, catch basins, roof leaders, hydrodynamic separator, and underground infiltration chambers. The stormwater management system will maintain existing drainage patterns while treating stormwater runoff quality and reducing peak flow and runoff volume.

The drainage structures and pipes have been sized to convey the 10-year storm event per the Town of Salisbury requirements.

The hydrodynamic separators have been sized to treat the Water Quality Flows (WQF) as calculated using the Connecticut Department of Energy and Environmental Protection 2004 Stormwater Quality Manual. The WQF for WQS-01 was calculated at 1.072 cubic feet per second (cfs) and the WQF for WQS-02 was calculated at 0.067 cubic feet per second (cfs) and the proposed separator, a Contech CDS 2015-5-C, is rated to treat a flow up to 1.4 cfs.

Table 1 below shows the peak discharge from existing to proposed for the 2, 10, 50 and 100-year storm events.

Table 1

Discharge Location	Condition	2	10	50	100
Point of Comparison A	Existing	3.603	7.509	12.73	14.76
	Proposed	2.523	5.775	10.26	12.28
Point of Comparison B	Existing	0.816	1.689	2.667	3.093
	Proposed	0.498	1.100	1.790	2.093

The stormwater management systems discharges to existing storm sewers on site. The proposed stormwater management system has been designed to mitigate stormwater runoff and the proposed project will not increase peak flow or exacerbate flooding conditions downstream.

The underground infiltration system has been designed to reduce peak flow and provide ground water recharge. Pre-treatment is provided upstream of the infiltration system with a hydrodynamic separator. The hydrodynamic separator is designed to treat the water quality flow.

The proposed watershed maps, watershed areas, storm sewer calculations, hydrographs, Water Quality Volume and Flow calculations are included in **Appendix C & Appendix D** of this report.

2.3 Method of Hydrology and Hydraulic Analysis

The following storm drainage design criteria were used for the comparative hydrology analysis:

1. Design storm rainfall data was taken from NOAA Atlas 14 precipitation frequency estimates.
2. Infiltration system is designed for the 2, 10, 50, and 100-year storm events.
3. Piped storm drainage system and the outlets are designed for a 10-year storm event.
4. Minimum time of concentration = 5 minutes.
5. For rational peak flow calculations, runoff coefficients were as follows:
    a. Impervious (Pavement/Roof) areas = 98
    b. Landscaped areas = 69
6. For hydrograph calculations, SCS Curve Numbers were as follows:

a. Impervious (Pavement/Roof) areas = 98

b. Type B Pervious Soils = 69

7. Minimum diameter pipes, excluding roof leaders, underdrains and foundation drains = 12 inches

8. Minimum pipe slope = 0.5 percent

9. The storm water management Plan for the site is designed to treat the Water Quality Volume, remove Total Suspended Solids and promote groundwater recharge while reducing peak flow

10. Watershed areas delineated using polylines in AutoCAD Civil 3D 2018.

11. Comparative hydrology analyzed using AutoCAD Civil 3D 2018 Hydraflow Hydrographs Extension Version 10.40 by Autodesk software.

12. Storm drainage system analyzed using AutoCAD Civil 3D 2018 Hydraflow Storm Sewers Extension Version 10.40 by Autodesk software.

Runoff computations, storm sewer calculations, suspended solids removal rate and existing and proposed conditions are included in the **Appendix C & D** for review.

2.4 Low Impact Development and Best Management Practices

The stormwater management plan for the proposed site has been designed to remove a high percentage of sediments in accordance with the Connecticut Department of Energy and Environmental Protection Stormwater Quality Manual.

The stormwater management plan for this site uses "Best Management Practices ("BMPs")" to meet or exceed the Connecticut DEEP's goal of 80% removal of total suspended solids and other pollutants as described in section 2.5.

The BMPs include:

Yard Drains/Catch Basins with Sumps: Yard Drains and Catch Basins with sumps serve collect sediment and to prevent discharge of oil and other pollutants into the storm drainage system. All new yard drains and catch basins will have 24-inch sumps.

Hydrodynamic Separators: Hydrodynamic separators serve as pretreatment and to prevent transport of oils and sediment further downstream prior to connection to the campus storm sewer system. The proposed storm sewers utilize Contech CDS stormwater quality structures in an inline configuration prior to discharge into the campus storm sewers. The Contech CDS unit has been sized in accordance with the 2004 CTDEEP Stormwater Quality Manual. Sizing calculations are provided in **Appendix D**.

Underground Infiltration: Underground Infiltration serves as a primary treatment practice, reduces peak flow rates and promotes groundwater recharge. The proposed

stormwater management system utilizes four rows of plastic arches surrounded by stone and filter fabric and an outlet control structure designed to attenuate peak flows.

2.5 Stormwater Maintenance and Inspection Schedule

The initial inspection will be made during an intense rainfall to check the adequacy of the yard drains, catch basins, roof leaders, piping, hydrodynamic separator, infiltration system, system outlet and level spreader.

The following is a checklist of items that will be checked and maintained during scheduled maintenance operations.

Drainage Structures: The Owner will be responsible for cleaning the catch basins, yard drains, manholes, piping, and outlet protection on their property. A Connecticut licensed hauler shall clean the sumps, and legally dispose of removed sand at an off-site location. The road sand may not be reused or stored on-site. As part of the hauling contract, the hauler shall notify the Owner in writing where the material is being disposed.

Each catch basin and yard drain shall be inspected every four months, with one inspection occurring during the month of April. Any debris occurring within one foot from the bottom of each sump shall be removed by Vacuum "Vactor" type of maintenance equipment. Maintain a log of inspections. Remove organic matter, sand and debris from catch basins as necessary and dispose of legally.

Hydrodynamic Separator: The Contech CDS units (hydrodynamic separator) will be skimmed and oil and scum removed. In a separate operation, silt, sand and sediment will be removed. Once the structure is cleaned of debris, the chamber will be refilled with clean water to prevent wash through of debris and oil during next storm event.

Underground Infiltration: The underground infiltration system will be cleaned of all silt, debris and sediment from the inlet structure, outlet structure and the chamber lengths. The outlet control structure will be inspected and cleaned to make sure nothing is clogging the discharge pipe.

Pavement: Paved areas shall be swept periodically by the Owner to clean trash and other debris. The Owner will sweep paved areas on its property in the spring to remove winter accumulations of road sand.

Perform a visual inspection of paved areas four times per year with one inspection after the last snowfall, but no later than April 1. Sweep accumulated sediment and debris from the paved areas. Clean paved areas as necessary during the remainder of the year.

A Maintenance and Inspection Plan, including forms and checklists, for the proposed project can be found in **Appendix E**.

Section 3
Soil Erosion and Sediment Control

3.1 SESC Narrative

The Hotchkiss school is proposing the construction of a renovation and addition to the Dining Hall on their campus in Lakeville, CT.

The project will include the building addition, existing building renovation, new water main and fire protection service, underground chilled water services, sanitary laterals, drainage system, sidewalks, and landscaping.

The project is proposed to be constructed in a single phase. Approximately 1.5 acres will be disturbed.

Soil erosion and sedimentation control measures shall conform to the standards outlined in The Connecticut department of energy and environmental protection (CTDEEP), "2002 Connecticut Guidelines for Soil Erosion and Sediment Control", latest revision.

3.2 SESC Notes

1. Underground utility, structure and facility locations depicted hereon have been compiled, in part, from record mapping and other data supplied by the respective utility companies, governmental agencies and/or other sources. These locations must be considered approximate in nature. Additionally, other such data may exist on site, the existence of which are unknown to Tighe & Bond. The existence, size and location of all such features must be determined and verified in the field by appropriate authorities. Anyone using utility information and data provided herein shall contact "call before you dig", 1-800-922-4455 or www.cbyd.com, 72 hours in advance to verify the location of utilities prior to starting construction.

2. Reference is made to plan survey prepared for the Hotchkiss School and prepared by Allied Engineering Associates, Inc.

3. Reference is made to plan entitled "Existing Conditions Map" prepared for the Hotchkiss School and prepared by Kratzert, Jones & Associates, Inc. And Dated December 10, 2015.

4. All sedimentation and erosion control measures shall be in accordance with the standards and specifications of the "2002 Connecticut Guidelines for Soil Erosion and Sediment Control" DEEP bulletin no 34, and all amendments and addenda thereto as published by the Connecticut department of energy and environmental protection.

5. Land disturbance shall be kept to the minimum necessary for construction.

6. All erosion control measures shall be installed as shown on the plans and elsewhere as ordered by the owner's representative, or the Town of Salisbury.

7. All catch basins shall be protected with silt sacks, haybale ring, silt fence or block and stone inlet protection throughout the construction period and until all disturbed areas are thoroughly stabilized.

8. Wherever possible, erosion and sediment control measures shall be installed prior to construction.

9. Additional control measures shall be installed during construction period as ordered by the owner's representative, or the Town of Salisbury.

10. All sedimentation and erosion control measures shall be maintained in effective condition throughout the construction period.

11. Sediment removed shall be disposed of legally offsite.

12. The contractor shall be responsible for construction and maintenance of all erosion control measures throughout the construction period.

13. The contractor shall maintain a supply of silt fence/haybales and anti-tracking crushed stone on-site for emergency repairs.

14. The contractor shall utilize approved methods/materials for preventing the blowing and movement of dust from exposed soil surfaces onto adjacent properties and site areas.

15. All drainage structures shall be inspected weekly by the contractor and cleaned to prevent the build-up of silt.

16. The contractor shall carefully coordinate the placement of erosion control measures with the phasing of construction.

17. Keep all paved surfaces clean. Sweep before forecasted storms or weekly as necessary. Sweep impacted public roads of all dirt and debris at the end of each work day.

18. Treat all unpaved surfaces with 6" minimum of topsoil and seeding prior to final stabilization. Coordinate with project landscape drawings and specifications.

19. All trucks leaving the site must be covered.

20. All sedimentation and erosion controls shall be checked weekly and after each rainfall event. Necessary repairs shall be made without delay.

21. Prior to any forecasted rainfall, erosion and sediment controls shall be inspected and repaired as necessary.

22. After all disturbed areas have been stabilized, erosion controls may be removed once authorization to do so has been secured from the Town of Salisbury. Disturbed areas shall be seeded and mulched.

23. All embankment slopes 3:1 or greater to be stabilized with erosion control blanket, north American green sc150bn or approved equivalent, unless otherwise noted on the plans.

24. Coordinate with all tree protection measures identified in the project landscape drawings and specifications.

3.3 Construction Sequence

1. Flag the limits of construction, roadway base-line, right-of-way and tree protection zones.

2. Hold preconstruction meeting. (remember to call before you dig 1-800-922-4455).

3. Hold tree cutting meeting.

4. Install the construction entrance.

5. Install perimeter erosion and sediment controls and tree protection devices in accordance with the SESC plan.

6. Cut trees within the defined clearing limits and remove cut wood. Chip brush and slash, stockpile chips for future use or remove off site.

7. Excavate all stumps located in the building footprint, parking areas and roadway and remove to a disposal site or stockpile area to be chipped. Remaining stumps shall be ground in place.

8. Strip all topsoil within the limits of roadway construction, building footprint, parking areas and slope limits. Stockpile all topsoil in an approved area and secure with erosion and sediment controls.

9. Make all cuts and fills required. Establish the sub-grade for the topsoil areas, parking and roadway as required and bench the building to a subgrade. Allow a reasonable amount of area around the foot- print of the building for the construction activities.

10. Begin construction of the building.

11. Install all sanitary sewers and drainage facilities starting at the outfall and proceeding upgrade. Install remaining utilities (water, electric, cable, fiber optic, telephone). Ensure that the drainage outlet protection is in place prior to any flow being allowed to discharge.

12. Prior to installing surface water controls such as temporary diversions and stone dikes, inspect existing conditions to ensure discharge locations are stable. If not stable, review discharge conditions with the design engineer and implement additional stabilization measures prior to installing water surface controls.

13. Prepare sub-base, slopes, parking areas, shoulder areas, and any other area of disturbance for final grading.

14. Install process aggregate in driveway and parking areas.

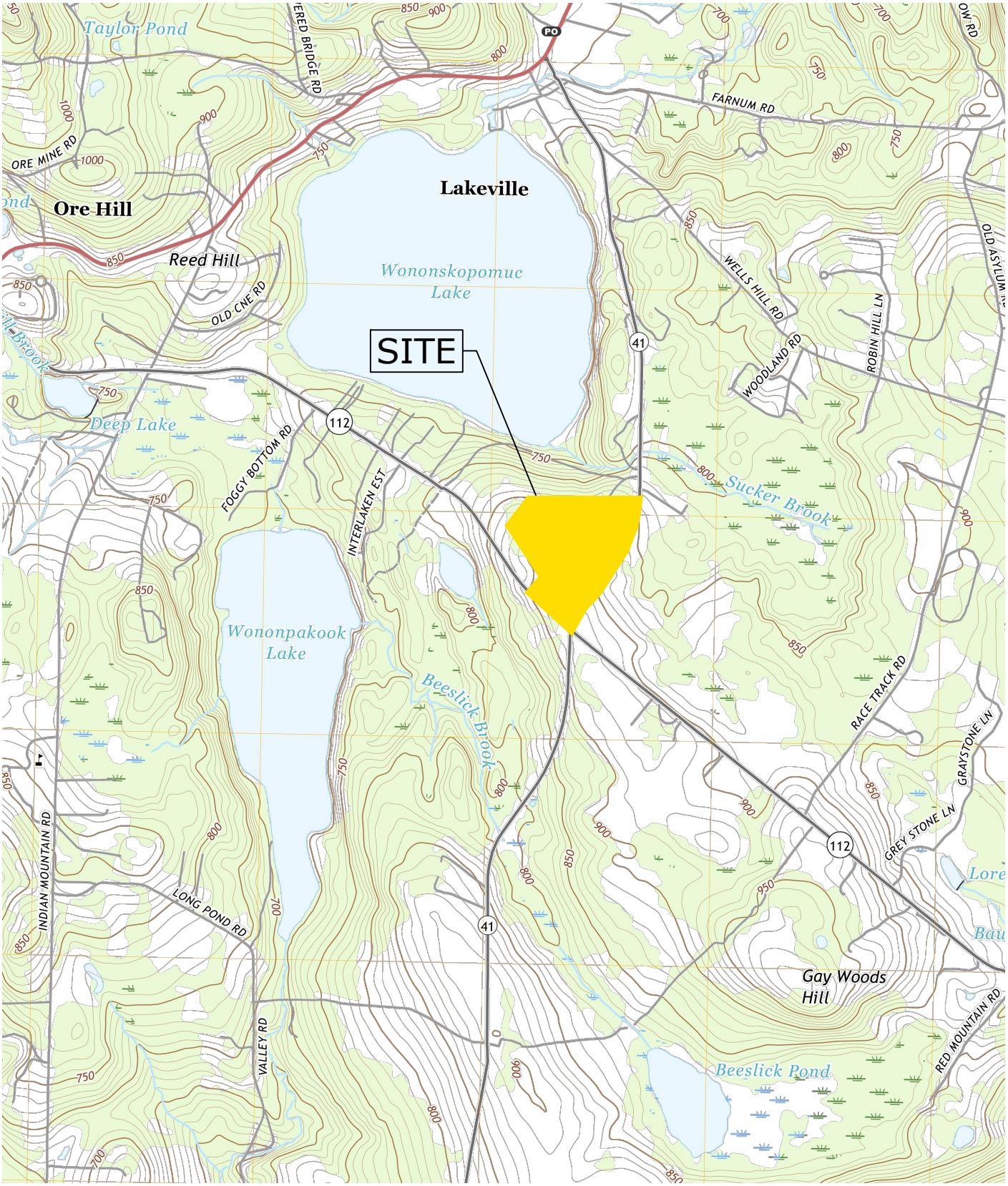
15. Place topsoil where required. Complete the perimeter landscape plantings.

16. Fine grade, rake, seed and mulch to within 2 feet of the curbing.

17. Upon substantial completion of the buildings, complete the balance of site work and stabilization of all other disturbed areas.

18. After site is stabilized remove temporary erosion and sediment controls (e.g. geotextile silt fences and haybales).

APPENDIX A



HOTCHKISS SCHOOL
SALISBURY, CT

SITE LOCATION MAP

NORTH

1" = 2000'

FIGURE 1

Tighe&Bond
Engineers | Environmental Specialists

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- **ZONE A** — No base flood elevations determined.
- **ZONE AE** — Base flood elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE A99** — To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.
- **ZONE V** — Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- **ZONE VE** — Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- **ZONE X** — Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside 500-year flood plain.
- **ZONE D** — Areas in which flood hazards are undetermined.

Flood Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 — Base Flood Elevation Line; Elevation in Feet*

(D)—(D) — Cross Section Line

(EL 987) — Base Flood Elevation in Feet Where Uniform Within Zone*

RM7 — Elevation Reference Mark

•M1.5 — River Mile

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside special flood hazard areas. The coastal flooding elevations shown may differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

Elevation reference marks are described in the Flood Insurance Study Report.

Coastal base flood elevations apply only landward of 0.0 NGVD.

Coastal base flood elevations shown on this map include the effects of wave action.

For adjoining map panels see separately printed Map Index.

MAP REPOSITORY

Town Clerk's Vault, Town Hall, Main Street, Salisbury, Connecticut 06068
(Maps available for reference only, not for distribution).

INITIAL IDENTIFICATION:
JUNE 28, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
OCTOBER 8, 1976

FLOOD INSURANCE RATE MAP EFFECTIVE:
JANUARY 5, 1989

FLOOD INSURANCE RATE MAP REVISIONS:

Refer to Flood Insurance Rate Map Effective date shown below to determine when actuarial rates apply to structures in zones where elevations or depths have been established.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

TOWN OF
SALISBURY,
CONNECTICUT
LITCHFIELD COUNTY

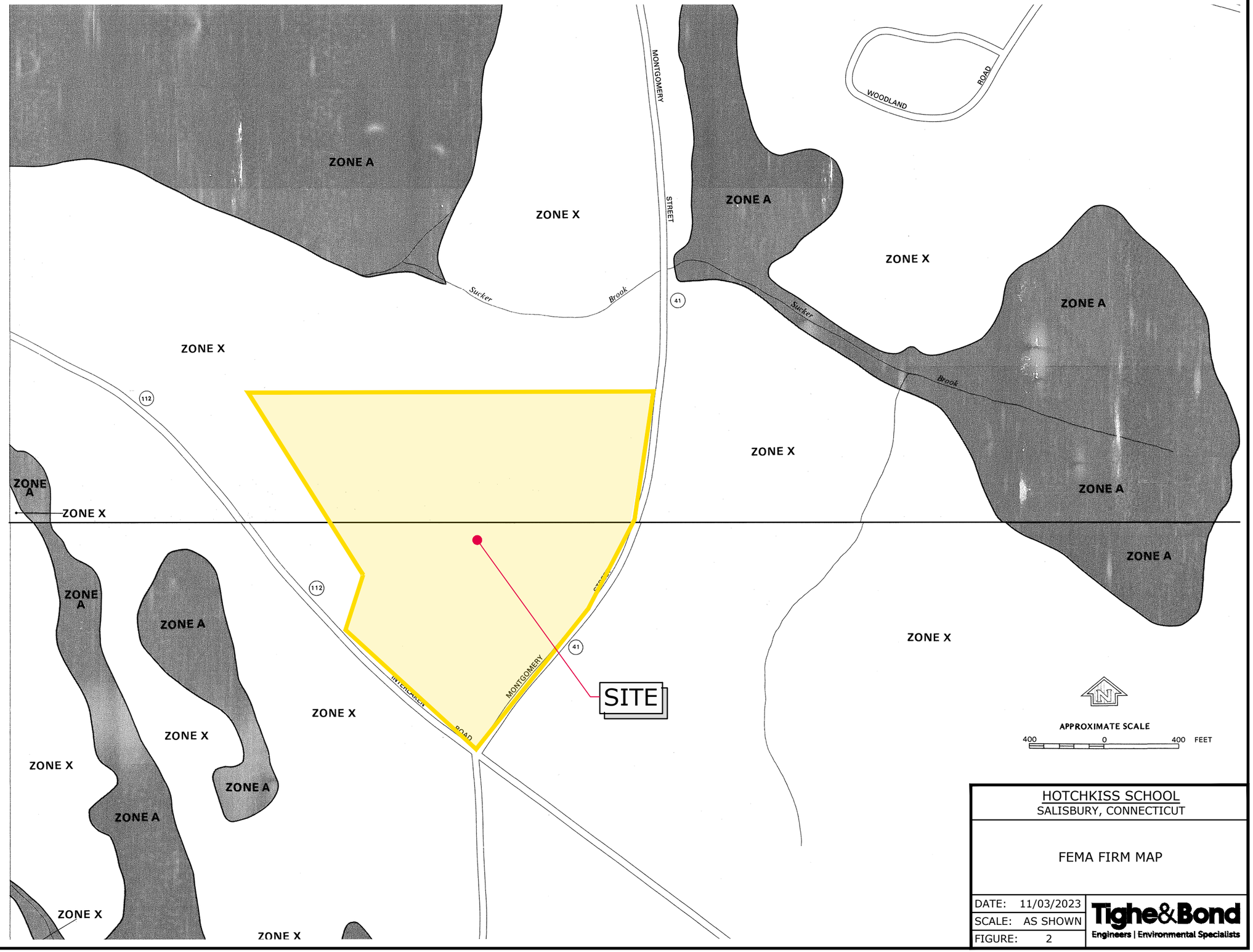
PANEL 26 OF 30
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PANEL LOCATION

COMMUNITY-PANEL NUMBER
090052 0026 B

EFFECTIVE DATE:
JANUARY 5, 1989

Federal Emergency Management Agency



HOTCHKISS SCHOOL
SALISBURY, CONNECTICUT

FEMA FIRM MAP

DATE: 11/03/2023
SCALE: AS SHOWN
FIGURE: 2

Tighe&Bond
Engineers | Environmental Specialists

APPENDIX B

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for State of Connecticut, Western Part

Hotchkiss Dining Hall Renovation

November 2, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:4,740 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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

MAP LEGEND

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

Soils
- Soil 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
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

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

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

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

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
90B	Stockbridge loam, 3 to 8 percent slopes	18.9	36.1%
90C	Stockbridge loam, 8 to 15 percent slopes	2.9	5.5%
290B	Stockbridge-Urban land complex, 3 to 8 percent slopes	26.1	49.9%
307	Urban land	4.4	8.5%
Totals for Area of Interest		**52.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

State of Connecticut, Western Part

90B—Stockbridge loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9lrr
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Stockbridge and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stockbridge

Setting

Landform: Hills
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy till derived from limestone and dolomite and/or schist

Typical profile

Ap - 0 to 10 inches: loam
Bw1 - 10 to 20 inches: loam
Bw2 - 20 to 28 inches: loam
C1 - 28 to 42 inches: gravelly loam
C2 - 42 to 48 inches: gravelly loam
C3 - 48 to 65 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F144AY036NY - Semi-Rich Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Mudgepond
Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Georgia
Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Alden
Percent of map unit: 3 percent
Landform: Depressions, drainageways
Down-slope shape: Concave, linear
Across-slope shape: Concave
Hydric soil rating: Yes

Nellis
Percent of map unit: 3 percent
Landform: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Farmington
Percent of map unit: 2 percent
Landform: Hills, ridges
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Paxton
Percent of map unit: 2 percent
Landform: Drumlins, hills, till plains
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

90C—Stockbridge loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 9lrs
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F

Frost-free period: 140 to 185 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Stockbridge and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stockbridge

Setting

Landform: Hills
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy till derived from limestone and dolomite and/or schist

Typical profile

Ap - 0 to 10 inches: loam
Bw1 - 10 to 20 inches: loam
Bw2 - 20 to 28 inches: loam
C1 - 28 to 42 inches: gravelly loam
C2 - 42 to 48 inches: gravelly loam
C3 - 48 to 65 inches: gravelly loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F144AY036NY - Semi-Rich Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Georgia

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Mudgepond

Percent of map unit: 5 percent
Landform: Depressions, drainageways

Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Nellis

Percent of map unit: 3 percent
Landform: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Alden

Percent of map unit: 3 percent
Landform: Depressions, drainageways
Down-slope shape: Concave, linear
Across-slope shape: Concave
Hydric soil rating: Yes

Farmington

Percent of map unit: 2 percent
Landform: Hills, ridges
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Paxton

Percent of map unit: 2 percent
Landform: Drumlins, hills, till plains
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

290B—Stockbridge-Urban land complex, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9lm2
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Stockbridge and similar soils: 40 percent
Urban land: 35 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stockbridge

Setting

Landform: Hills
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy till derived from limestone and dolomite and/or schist

Typical profile

Ap - 0 to 10 inches: loam
Bw1 - 10 to 20 inches: loam
Bw2 - 20 to 28 inches: loam
C1 - 28 to 42 inches: gravelly loam
C2 - 42 to 48 inches: gravelly loam
C3 - 48 to 65 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F144AY036NY - Semi-Rich Well Drained Till Uplands
Hydric soil rating: No

Description of Urban Land

Typical profile

H - 0 to 6 inches: material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Alden

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Concave, linear
Across-slope shape: Concave
Hydric soil rating: Yes

Georgia

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Nellis

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Mudgepond

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Farmington

Percent of map unit: 3 percent
Landform: Hills, ridges
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Paxton

Percent of map unit: 2 percent
Landform: Drumlins, hills, till plains
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

307—Urban land

Map Unit Setting

National map unit symbol: 9lmh
Elevation: 0 to 2,000 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Typical profile

H - 0 to 6 inches: material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Unnamed, undisturbed soils

Percent of map unit: 10 percent
Hydric soil rating: No

Udorthents, wet substratum

Percent of map unit: 10 percent
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Hotchkiss Dining Hall Renovation)

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

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

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

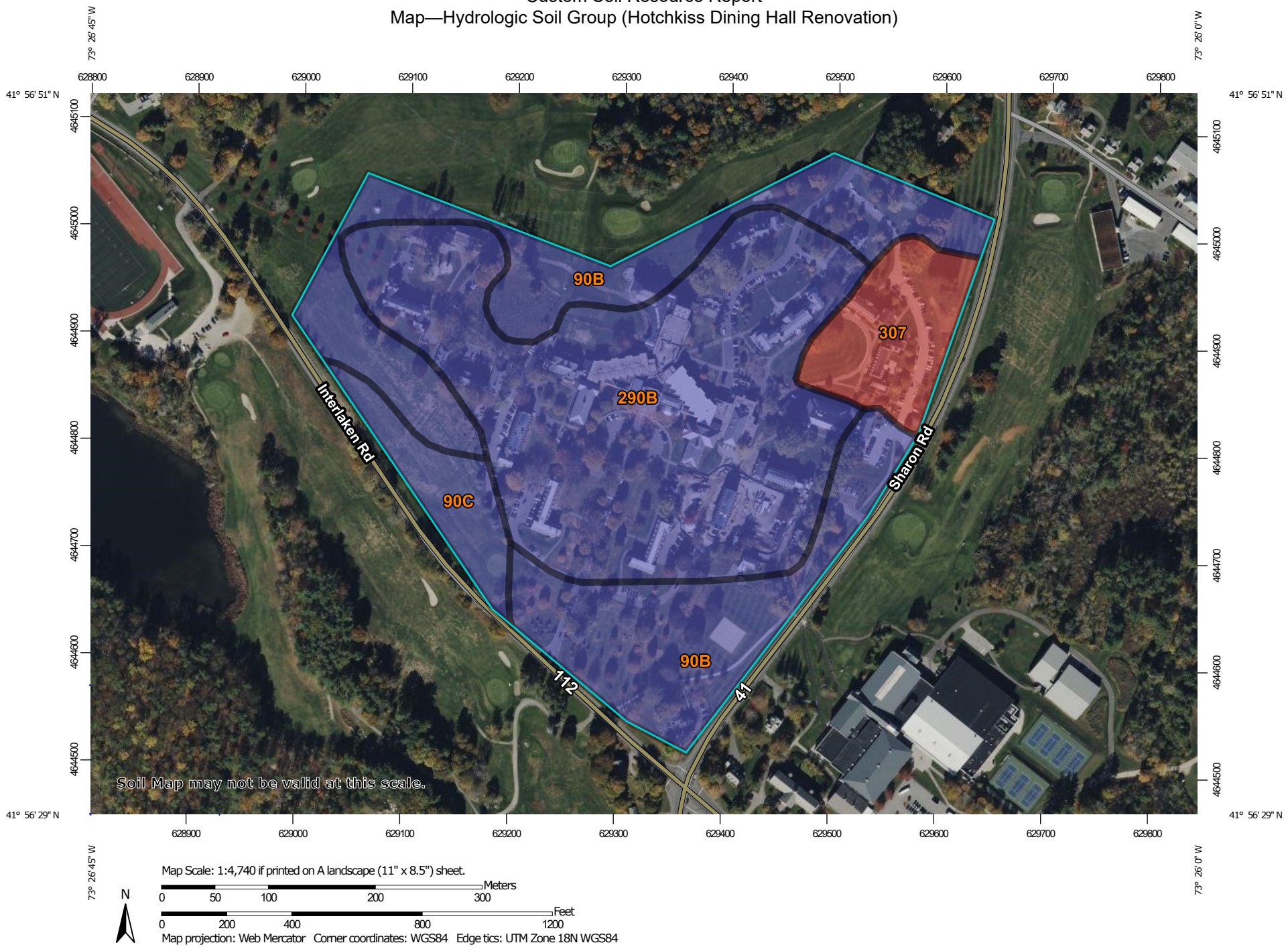
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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

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

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

Custom Soil Resource Report
Map—Hydrologic Soil Group (Hotchkiss Dining Hall Renovation)



Map Scale: 1:4,740 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

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

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

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

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

Table—Hydrologic Soil Group (Hotchkiss Dining Hall Renovation)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
90B	Stockbridge loam, 3 to 8 percent slopes	B	18.9	36.1%
90C	Stockbridge loam, 8 to 15 percent slopes	B	2.9	5.5%
290B	Stockbridge-Urban land complex, 3 to 8 percent slopes	B	26.1	49.9%
307	Urban land	D	4.4	8.5%
Totals for Area of Interest			**52.3**	**100.0%**

Rating Options—Hydrologic Soil Group (Hotchkiss Dining Hall Renovation)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

WELTI GEOTECHNICAL, P.C.

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August 28, 2019

Hotchkiss School
11 Interlaken Road
Lakeville, CT 06039
c/o Marc Sklenka, Managing Director
Colliers International

Re: Geotechnical Study for Proposed Additions and Renovations to at Hotchkiss School Dining Hall, 11 Interlaken Road, Lakeville, CT

Dear Mr. Sklenka:

1.0 Herewith are the test boring and test pit data pertaining to the above. Five borings were drilled at the proposed additions to a maximum depth of 51.5 feet below the existing grades. Data for boring B-1 was available from a prior project and is included with the recent boring data. Boring B-3 was not accessible due to on-going work by others in the area of that boring. Five test pits were taken to depth of 4.5 to 6 feet below the existing grades. The boring and test pit locations are shown on the attached plan. *The borings were drilled by Clarence Welti Associates, Inc. and sampling was conducted by this firm solely to obtain indications of subsurface conditions as part of a geotechnical exploration program. No services were performed to evaluate subsurface environmental conditions.*

1.1 Grain size gradation and water content tests were performed on seven soil samples taken from the borings. Three laboratory permeability tests were performed on soil samples taken from test pits TP-3 thru TP-5 at 4 feet below the existing grades. Three field percolation tests were performed in test pits TP-3 thru TP-5 at 4 feet below the existing grades. The results of the laboratory tests and field percolation tests are included in the Appendix.

2.0 The **Subject Project** will include the renovation and expansion of the existing two story Dining Hall with a total building area of approximately 45,000 sf. The total added footprint area appears to be about 7,000 sf. It is presumed the additions will have floor levels matching the existing building floor. The existing building has a ground floor levels at Elev.893.86 to Elev.896.88 and an upper floor level ranging from Elev.906.74 to Elev.908.24. The existing grades around the building range from about Elev.904 on the south side as low as Elev.891 on the north side. The ground floor level ranges from a full basement condition on the south side to fully above the exterior grade on the north side. The loading dock located at the northwest corner of the building will be designed to

accommodate full size tractor trailers. There will be site retaining wall around the additions that will contain decorative landscape plantings.

3.0 The **Geologic Origin** of the natural inorganic soils is from glacial moraine deposits atop the bedrock. These deposits consist generally of silt and fine sand, trace gravel. In general, it should be assumed that the upper few feet of soil profile includes artificial fills associated with backfill at the buildings and utilities. The bedrock from geologic mapping is Stockbridge Formation of gray dolomite marble.

3.1 The **Soil Cross Sections** from the borings and test pits are generally as follows:

Topsoil to 6" to 8"

FILL or possible FILL; SILT and fine SAND, trace Gravel; or fine to medium SAND and SILT., trace Gravel, Brick and Concrete to 2 to 7 feet, loose to medium compact

Fine to medium SAND, some Silt, trace Gravel to 10 to 15 feet, medium compact

Fine to medium SAND and SILT, trace Gravel to 51+ feet, dense to very dense

3.2 The **Water Table** was observed in the bore holes at 13 to 16 feet below the existing grades at the completion of the borings. The natural soils have low permeabilities and a low voids ratio. These properties allow the soils to become saturated with little water content. The soil samples taken from below about 10 feet were wet or close to saturation. It should be assumed that during wet periods the groundwater can be within 10 feet of existing grades. The capillary rise in the natural soils can be to 2 feet above the static water level.

4.0 The **Criteria for Foundation Type and Loading** are as follows:

1. The maximum total settlement should not exceed 3/4" and the maximum differential settlement should not exceed ½ the maximum settlement.

2. The Foundations and Structures should address the seismic section of the building code

3. The Slab at Grade floors should not settle differentially more than ½" in excess of the structural frame, nor more than 1/4" from the adjacent existing floors.

4.1 Regarding item 2 (above), the seismic site soil profile classification is **"D"**. The mapped MCE spectral response acceleration values for Salisbury (Lakeville), CT are $\mathbf{S_1 = 0.065}$ for one second period and $\mathbf{S_S = 0.173}$ for short period. For transfer of ground shear into the soil the ultimate friction factor can be **0.60.**

5.0 Regarding **Foundation Type,** the building additions can be supported on spread footings. The

footings should be placed on the natural inorganic soils, or on a controlled fill placed after the removal of any existing fills, topsoil and subsoils. The natural soils will be sensitive to remolding under equipment when wet. To address this condition there should be a minimum 8" layer of 3/8" crushed stone atop a geotextile (Mirafi 500X, or equal) beneath the footings on the natural soils and as an initial layer beneath controlled fills where placed over a wet sub grade. Controlled fill should conform to section 6.0 below and should extend horizontally outside the footings for a distance equal to at least the depth of fill beneath the footings.

5.1 The **Allowable Bearing Pressure** with the above preparation can be 4,000 psf. The allowable loading can be increased by 1/3 for seismic or wind loading. At retaining walls the maximum pressure on the toe can be 50% higher than the average pressure, cited above.

5.2 The **Static Lateral Soil Loading** on retaining walls that are part of the buildings (if any) should be based on at-rest pressure using the coefficient $K_O = 0.45$ as cited in the table below. Lateral soil loading on retaining walls apart from the building can be designed with active pressure using the coefficient $K_A = 0.28$. The backfill for the walls should conform to the material specification of section 6.0 above and should extend laterally behind the walls for a distance equal to at least the wall height measured from footing bottom to finished grade. The ultimate sliding coefficient for concrete on crushed stone or on controlled fill over the soil is **0.60.**

5.2.1 Seismic lateral loading for basement walls and retaining walls within the building should be with a total lateral force (seismic plus static at-rest pressure) equal to $24H^2$ lb/ft located at ½H above the bottom. Any requirements for the seismic analyses of retaining wall structures should be determined from the Building Code section 1805.5 and ASCE-7 section 9.14. This value is based on the Mononobe-Okabe solution for the case with level backfill, no wall friction and no hydrostatic pressure. It excludes the inertia of the soil and wall mass.

5.3 The **Frost Protection Depth** is 3.5 feet below finish grades in areas, which are exposed to weather.

5.4 Summary of Foundation Design Parameters:

Parameter	Value
Allowable Bearing Pressure for footings with preparation cited in section 5.0 above	4,000 psf
Soil Unit Weight (Backfill) *	125 pcf
Internal Friction Angle (Backfill) *	34°
At-Rest Pressure Coefficient, K_O	0.45
Active Pressure Coefficient, K_A (level backfill)	0.28

Ultimate Sliding Coefficient, concrete on crushed stone over soil	0.60
Seismic Soil Profile Site Classification	D
Mapped MCE Spectral Response Acceleration for one second period, S_1	0.065
Mapped MCE Spectral Response Acceleration for short period, S_S	0.173
Frost Protection Depth	3.5 feet

* Backfill material conforming to section 6.0 below

6.0 Regarding **Controlled Fill, Backfill for Retaining Walls and Excavations at Columns and Walls, plus Slab at Grade Underlayment** (to 4" below the slab bottom) the material should conform to the following or be 3/8" crushed stone:

Percent Passing	Sieve Size
100	3.5"
50 - 100	3/4"
25 - 75	No.4

The fraction, passing the No.4 sieve should have less than 15%, passing the No. 200 sieve.

All backfill and fill must be compacted to at least 95% of modified optimum density.

The on-site excavated soils will not conform to the above gradation.

6.1 All existing fills, topsoil and subsoils should be removed beneath the floor slabs and replaced with controlled fill conforming to section 6.0 above. There should be a minimum 18" of controlled fill beneath **slab on grade floors** placed to within 4" of the slab bottom. The final 4" beneath the slab should be with 3/8" crushed stone. A vapor retarder is required beneath the slab at grade floors.

6.1.1 In **basement areas** and where there are floor slabs below the finished exterior grades there should be (1) a minimum 10" layer of 3/8" crushed stone atop a geotextile beneath the floor slab, (2) a perimeter foundation drain, (3) an interior drain placed about 6 feet inside the basement walls and one thru the center of the building, (4) water stops at the footing/wall and floor/wall interfaces and (5) waterproofing beneath the floor and on the walls.

7.0 Regarding **Earthwork,** the excavations in the natural soils will generally fall in OSHA Class C.

This will require sloping excavations, which are unshored and exceed 5 feet in height, to be cut back to slopes less than 34° from the horizontal. *It is assumed by the writer that the excavations for new footings and utilities will not go below the levels of the existing foundations, so that underpinning or other shoring would not be required.*

8.0 The foundation recommendations and design parameters cited in section 5.0 above for the building addition would also apply to site retaining walls.

8.1 The on site soils are frost susceptible. There should be a minimum 24" of free draining material beneath the terrace, ramps and building entries. The recommended section would include 16" of gravel subbase atop 8" of 3/8" crushed stone on geotextile. The gravel subbase should conform to section 6.0 above or be with CTDOT gravel subbase. The preparation and underlayment directly beneath pavers should be as recommended by the paver supplier.

9.0 This report has been prepared for specific application to the subject project in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made. In the event that any changes in the nature, design and location of structures are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

The analyses and recommendations submitted in this report are based in part upon data obtained from referenced explorations. The extent of variations between explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

Welti Geotechnical, P.C., should perform a general review of the final design and specifications in order that geotechnical design recommendations may be properly interpreted and implemented as they were intended.

If you have any questions, please call our office.

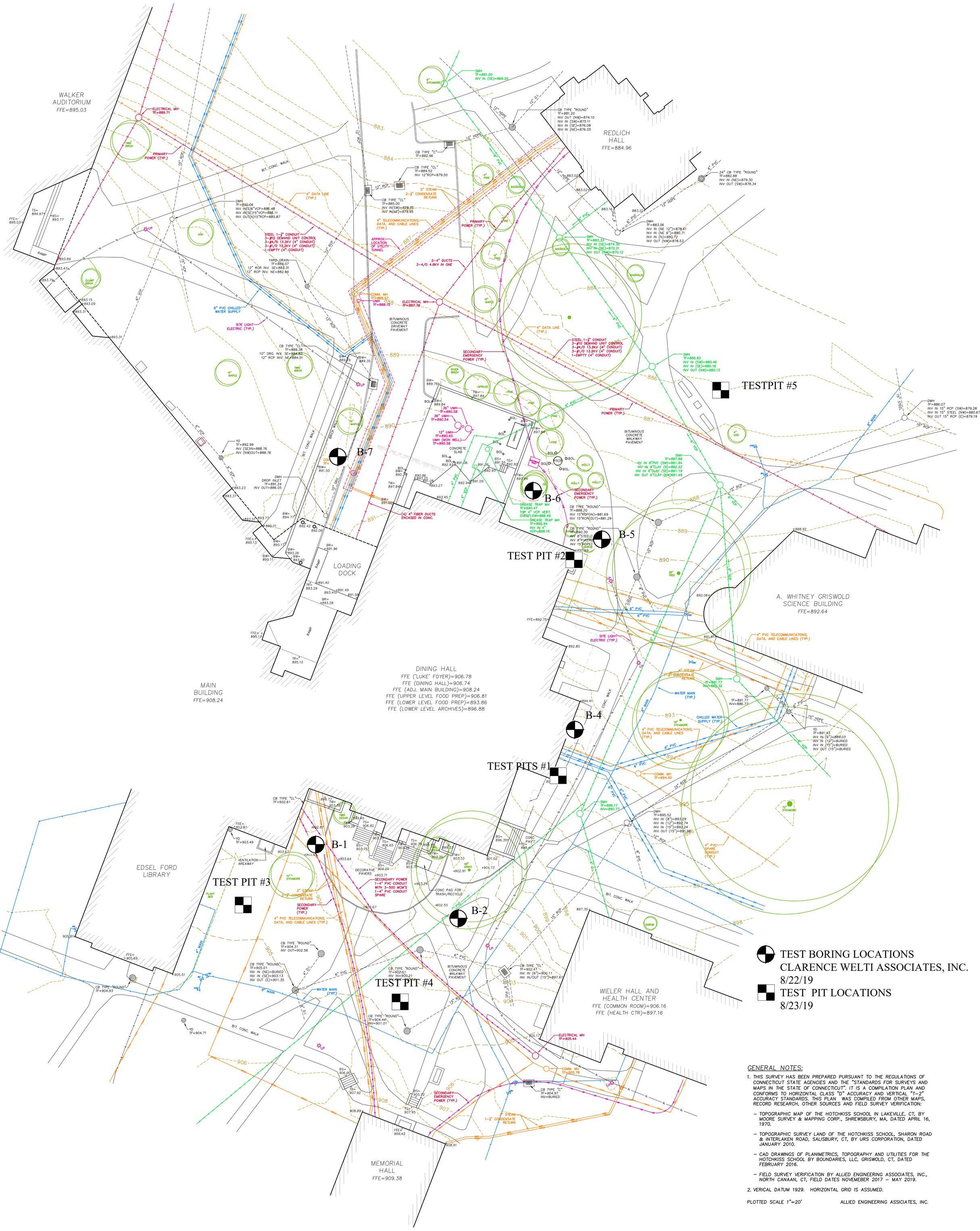
Very truly yours,

Max Welti, P.E.
President, Welti Geotechnical, P.C.

Clarence Welti Ph.D., P. E.
Vice President

APPENDIX

TEST BORING & TEST PIT LOCATION PLAN
+
TEST BORING & TEST PIT DATA
+
LABORATORY TEST REPORTS
+
FIELD PERCOLATION TEST REPORT



GENERAL NOTES:

1. THIS SURVEY HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT". IT IS A COMPILATION PLAN AND CONFORMS TO HORIZONTAL CLASS "D" ACCURACY AND VERTICAL "T–2" ACCURACY STANDARDS. THIS PLAN WAS COMPILED FROM OTHER MAPS, RECORD RESEARCH, OTHER SOURCES AND FIELD SURVEY VERIFICATION:
   - TOPOGRAPHIC MAP OF THE HOTCHKISS SCHOOL IN LAKEVILLE, CT, BY MOORE SURVEY & MAPPING CORP., SHREWSBURY, MA, DATED APRIL 16, 1970.
   - TOPOGRAPHIC SURVEY LAND OF THE HOTCHKISS SCHOOL, SHARON ROAD & INTERLAKEN ROAD, SALISBURY, CT, BY URS CORPORATION, DATED JANUARY 2010.
   - CAD DRAWINGS OF PLANIMETRICS, TOPOGRAPHY AND UTILITIES FOR THE HOTCHKISS SCHOOL BY BOUNDARIES, LLC, GRISWOLD, CT, DATED FEBRUARY 2016.
   - FIELD SURVEY VERIFICATION BY ALLIED ENGINEERING ASSOCIATES, INC., NORTH CANAAN, CT, FIELD DATES NOVEMEBER 2017 – MAY 2019.
2. VERICAL DATUM 1929. HORIZONTAL GRID IS ASSUMED.

PLOTTED SCALE 1"=20' ALLIED ENGINEERING ASSICIATES, INC.

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT THE HOTCHKISS SCHOOL	PROJECT NAME ADDITIONS TO MEMORIAL HALL & DINING hALL LOCATION 11 INTERLAKEN ROAD, LAKEVILLE, CT.

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140 lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.

HOLE NO. B-1

GROUND WATER OBSERVATIONS
AT 13.0 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 7/21/16
FINISH DATE 7/21/16

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	3-4-5-6	0.0'-2.0'		TOPSOIL 0.33 DARK GREY/BR. FINE-MED.SAND AND SILT, TRACE FINE GRAVEL - FILL	
	2	3-3-2-3	2.0'-4.0'			
	3	2-3-4-3	4.0'-6.0'			
5					LIGHT GREY/BR. FINE SAND, SOME SILT, TRACE GRAVEL 5.5	
10	4	8-10-12	10.0'-11.5'			
					GREY/BR.FINE SAND AND SILT, TRACE GRAVEL 13.0	
15	5	9-9-3	15.0'-16.5'			
20	6	10-11-14	20.0'-21.5'			
					GREY SILT AND FINE SAND, TRACE GRAVEL 23.0	
25	7	60	25.0'-25.3'			
					BOTTOM OF BORING @ 25.33' 25.33	
30						
35						

LEGEND: COL. A:

SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON

PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: K. CHRISTIANA
INSPECTOR:

SHEET 1 OF 1 | HOLE NO. B-1

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
HOTCHKISS SCHOOL

PROJECT NAME
ADDITION TO DINING HALL AT HOTCHKISS SCHOOL

LOCATION
11 INTERLAKEN ROAD, LAKEVILLE, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.

HOLE NO. B-2

GROUND WATER OBSERVATIONS
AT 16.0 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 8/21/19
FINISH DATE 8/21/19

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	4-4-3-3	0.0'-2.0'		TOPSOIL 0.50	
					BR.FINE-MED.SAND AND SILT, TRACE GRAVEL & ROOTS	
	2	3-3-4-5	2.0'-4.0'		3.0	
					GREY/BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL	
	3	3-4-3-4	4.0'-6.0'			
5						
10	4	4-6-6	10.0'-11.5'			
15	5	4-16-30	15.0'-16.5'			
					GREY FINE SAND AND SILT, TRACE GRAVEL 18.0	
20	6	10-25-30	20.0'-21.5'			
					BOTTOM OF BORING @ 21.5' 21.5	
25						
30						
35						

LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: K. CHRISTIANA
INSPECTOR:

SHEET 1 OF 1 | HOLE NO. **B-2**

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
HOTCHKISS SCHOOL

PROJECT NAME
ADDITION TO DINING HALL AT HOTCHKISS SCHOOL

LOCATION
11 INTERLAKEN ROAD, LAKEVILLE, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.

HOLE NO. B-4

GROUND WATER OBSERVATIONS
AT 16.0 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 8/22/19
FINISH DATE 8/22/19

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	3-2-1-2	0.0'-2.0'		TOPSOIL 0.66	
					BR.FINE-CRS.SAND, SOME SILT, TRACE GRAVEL, BRICK & CONCRETE - FILL	
	2	3-3-3-3	2.0'-4.0'			
5	3	2-1-2-2	4.0'-6.0'			
	4	3-3-6-10	6.0'-8.0'		7.0	
					BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL	
10	5	8-12-14	10.0'-11.5'		10.0	
					GRE/BR.FINE-CRS.SAND, SOME SILT, LITTLE GRAVEL	
					13.0	
15	6	12-19-29	15.0'-16.5'		LIGHT GREY/BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL	
20	7	15-25-35	20.0'-21.5'		21.5	
					BOTTOM OF BORING @ 21.5'	
25						
30						
35						

LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: K. CHRISTIANA
INSPECTOR:

SHEET 1 OF 1 | HOLE NO. **B-4**

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
HOTCHKISS SCHOOL

PROJECT NAME
ADDITION TO DINING HALL AT HOTCHKISS SCHOOL

LOCATION
11 INTERLAKEN ROAD, LAKEVILLE, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.

HOLE NO. B-5

GROUND WATER OBSERVATIONS
AT 15.0 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 8/21/19
FINISH DATE 8/21/19

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	5-7-6-3	0.0'-2.0'		TOPSOIL 0.50	
					BR.FINE-MED.SAND, SOME SILT, TRACE ROOTS & GRAVEL	
	2	3-3-4-3	2.0'-4.0'			
	3	2-3-4-7	4.0'-6.0'			
5					5.0	
					LIGHT GREY/BR.FINE-MED.SAND AND SILT, TRACE GRAVEL	
10	4	7-11-9	10.0'-11.5'			
15	5	9-21-30	15.0'-16.5'			
20	6	10-21-32	20.0'-21.5'			
25	7	11-21-36	25.0'-26.5'		25.0	
					GREY FINE SAND AND SILT, TRACE GRAVEL	
30	8	15-21-60	30.0'-31.5'			
35						

LEGEND: COL. A:

SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON

PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: K. CHRISTIANA
INSPECTOR:

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT HOTCHKISS SCHOOL	PROJECT NAME ADDITION TO DINING HALL AT HOTCHKISS SCHOOL LOCATION 11 INTERLAKEN ROAD, LAKEVILLE, CT

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
	9	33-60	35.0'-35.9'			
40	10	12-23-35	40.0'-41.5'			
45	18	13-25-30	45.0'-46.5'			
50	18	10-15-23	50.0'-52.0'			
					BOTTOM OF BORING @ 51.5'	51.5
55						
60						
65						
70						
75						

LEGEND: COL. A:

SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON

PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: K. CHRISTIANA

INSPECTOR:

SHEET 2 OF 2 | HOLE NO. **B-5**

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
HOTCHKISS SCHOOL

PROJECT NAME
ADDITION TO DINING HALL AT HOTCHKISS SCHOOL

LOCATION
11 INTERLAKEN ROAD, LAKEVILLE, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.

HOLE NO. B-6

GROUND WATER OBSERVATIONS
AT 15.0 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 8/22/19
FINISH DATE 8/22/19

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	1-3-3-1	0.0'-2.0'		TOPSOIL	
					DARK BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL	0.66
	2	1-1-1-1	2.0'-4.0'		GREY/BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL	2.5
	3	1-1-3-6	4.0'-6.0'			
5						
10	4	3-3-14	10.0'-11.5'			
15	6	8-12-13	15.0'-16.5'		LIGHT GREY/BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL	15.0
20	7	6-14-18	20.0'-21.5'			
					BOTTOM OF BORING @ 21.5'	21.5
25						
30						
35						

LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: K. CHRISTIANA
INSPECTOR:

SHEET 1 OF 1 | HOLE NO. **B-6**

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
HOTCHKISS SCHOOL

PROJECT NAME
ADDITION TO DINING HALL AT HOTCHKISS SCHOOL

LOCATION
11 INTERLAKEN ROAD, LAKEVILLE, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.

HOLE NO. B-7

GROUND WATER OBSERVATIONS
AT 15.0 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 8/22/19
FINISH DATE 8/22/19

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	1-4-5-6	0.0'-2.0'		TOPSOIL	
					BR.FINE-CRS.SAND, LITTLE SILT & GRAVEL - FILL	0.66
	2	5-5-3-3	2.0'-4.0'			
	3	2-2-5-6	4.0'-6.0'		LIGHT GREY/BR.FINE-MED.SAND AND SILT, TRACE GRAVEL	4.0
5						
10	4	7-10-14	10.0'-11.5'			
15	6	19-23-25	15.0'-16.5'			
20	7	25-28-23	20.0'-21.5'			
					BOTTOM OF BORING @ 21.5'	21.5
25						
30						
35						

LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: K. CHRISTIANA
INSPECTOR:

SHEET 1 OF 1

HOLE NO. **B-7**

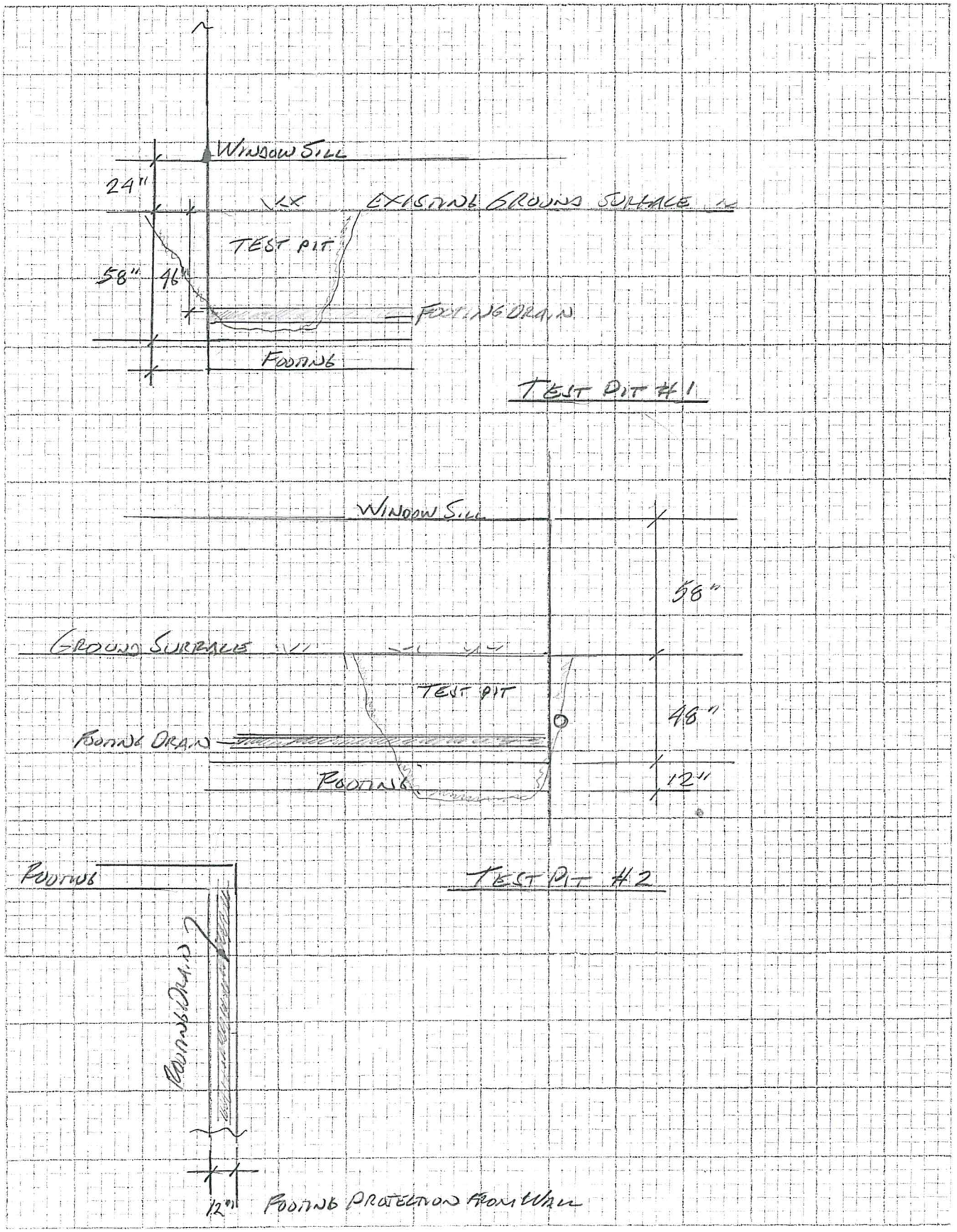
Hotchkiss Dining Hall Additions and Renovations
100 Interlaken Road, Lakeville, CT
Test Pits to foundation depths and dimensions
M. Welti - 8/23/19

TEST PIT #2

TEST PIT #1

DR. CLARENCE WELTI, PE, PC
P.O. BOX 397
GLASTONBURY, CONNECTICUT 06033 • (860) 633-4623

CLIENT Hotchkiss School
PROJECT Dining Hall Addition
SUBJECT Test Pits
BY MW DATE 8/23/19 SHEET NO.



CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
HOTCHKISS SCHOOL

PROJECT NAME
ADDITION TO DINING HALL AT HOTCHKISS SCHOOL

LOCATION
11 INTERLAKEN ROAD, LAKEVILLE, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE				
SIZE I.D.				
HAMMER WT.				
HAMMER FALL				

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.

HOLE NO. TP-3

GROUND WATER OBSERVATIONS
AT none FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 8/23/19
FINISH DATE 8/23/19

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0					TOPSOIL 0.66	
					DARK BR.FINE SAND AND SILT	
					2.5	
					BR.FINE SAND, SOME SILT	
					3.5	
					BR.FINE-MED.SAND,SOME SILT, TRACE GRAVEL	
5					5.0	
					BOTTOM OF TEST PIT @ 5.0'	
10						
15						
20						
25						
30						
35						

LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER:
INSPECTOR: K. CHRISTIANA

SHEET 1 OF 1

HOLE NO. **TP-3**

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
HOTCHKISS SCHOOL

PROJECT NAME
ADDITION TO DINING HALL AT HOTCHKISS SCHOOL

LOCATION
11 INTERLAKEN ROAD, LAKEVILLE, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE				
SIZE I.D.				
HAMMER WT.				
HAMMER FALL				

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.

HOLE NO. TP-4

GROUND WATER OBSERVATIONS
AT none FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 8/23/19
FINISH DATE 8/23/19

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0					TOPSOIL 0.66	
					BR.FINE-MED.SAND, LITTLE SILT, GRAVEL & BRICKS - FILL 1.8	
					BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL & COBBLES	
5					BOTTOM OF TEST PIT @ 5.0' 4.5	
10						
15						
20						
25						
30						
35						

LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER:
INSPECTOR: K. CHRISTIANA

SHEET 1 OF 1

HOLE NO. **TP-4**

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
HOTCHKISS SCHOOL

PROJECT NAME
ADDITION TO DINING HALL AT HOTCHKISS SCHOOL

LOCATION
11 INTERLAKEN ROAD, LAKEVILLE, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE				
SIZE I.D.				
HAMMER WT.				
HAMMER FALL				

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.

HOLE NO. TP-5

GROUND WATER OBSERVATIONS
AT none FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 8/23/19
FINISH DATE 8/23/19

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0					TOPSOIL 0.56	
					DARK BR.FINE SAND AND SILT 1.0	
					LIGHT BR.FINE-MED.SAND, SOME SILT, LITTLE GRAVEL 1.5	
					BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL & COBBLES	
5					BOTTOM OF TEST PIT @ 5.0' 4.5	
10						
15						
20						
25						
30						
35						

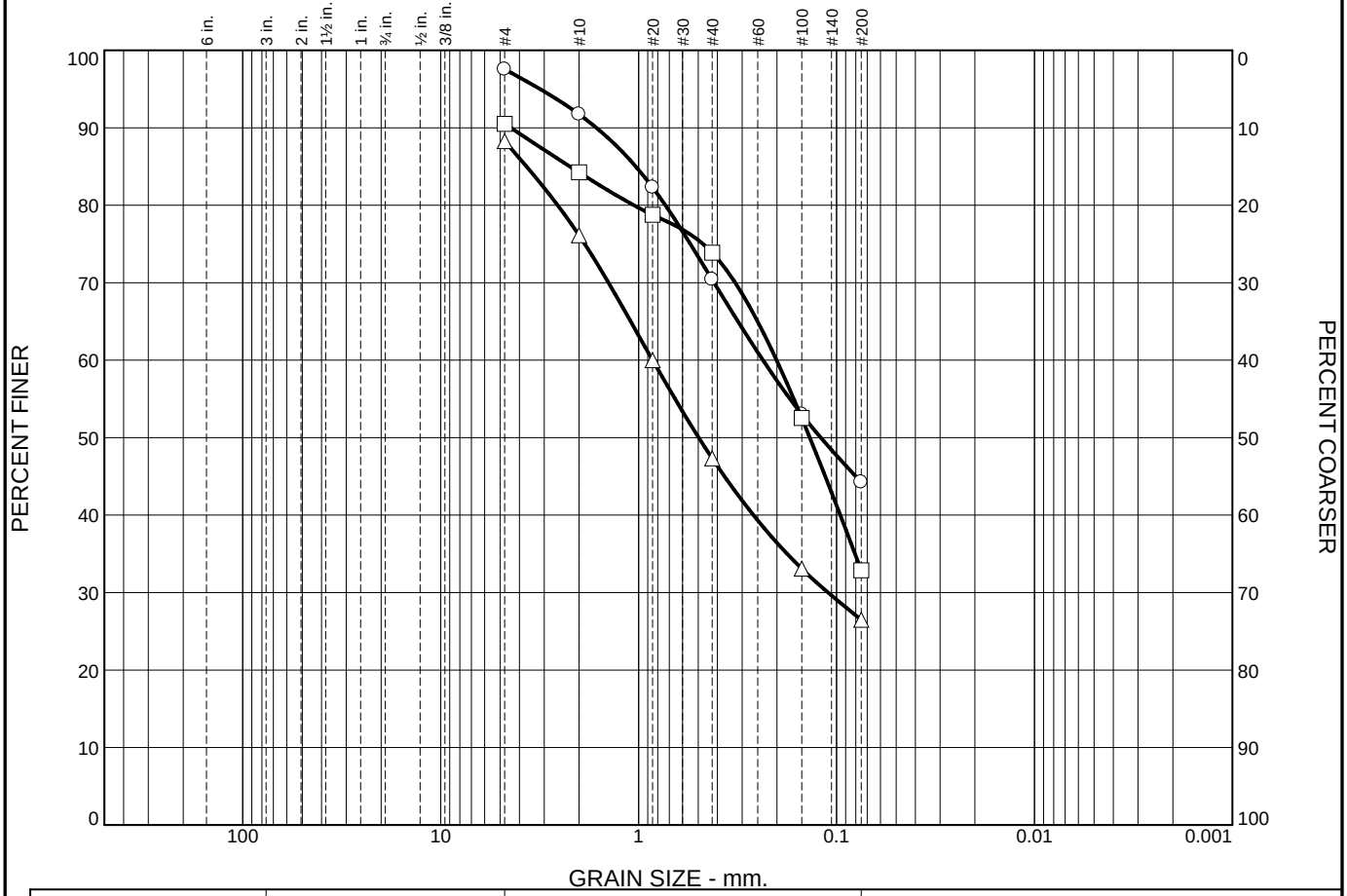
LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER:
INSPECTOR: K. CHRISTIANA

SHEET 1 OF 1

HOLE NO. **TP-5**

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○				5.8	21.3	26.2	44.2	
□				6.3	10.3	41.0	32.9	
△				12.2	28.8	20.8	26.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.0339	0.2354	0.1202					
□			2.2240	0.2010	0.1365					
△			3.6833	0.8500	0.4968	0.1103				

	Material Description	USCS	AASHTO
○			
□			
△			

Project No. **Client:** HOTCHKISS SCHOOL

Project: ADDITION TO DINING HALL AT HOTCHKISS SCHOOL

○ **Source of Sample:** B-2 **Depth:** 1.0

□ **Source of Sample:** B-2 **Depth:** 10.0

△ **Source of Sample:** B-4 **Depth:** 1.0

Remarks:

○water content = 9.6%

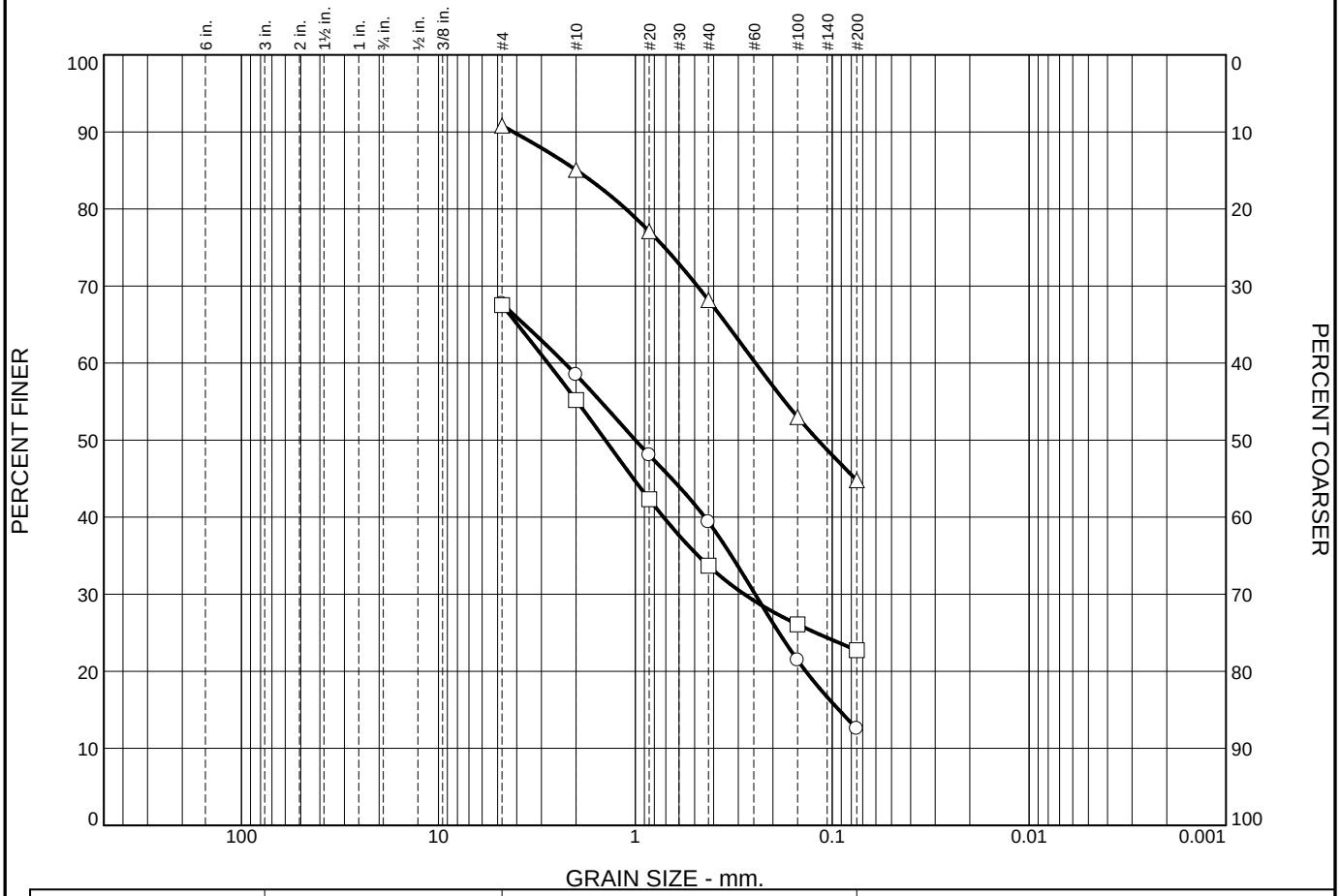
□water content = 11.1%

△water content = 14.1%

CLARENCE WELTI ASSOCIATES, INC.

Figure

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○				9.2	19.1	26.8	12.6	
□				12.3	21.5	11.0	22.7	
△				5.7	16.9	23.4	44.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○				2.2853	0.9986	0.2461	0.0926			
□				2.7777	1.4200	0.2794				
△			1.9824	0.2452	0.1181					

	Material Description	USCS	AASHTO
○			
□			
△			

Project No. **Client:** HOTCHKISS SCHOOL

Project: ADDITION TO DINING HALL AT HOTCHKISS SCHOOL

○ **Source of Sample:** B-4 **Depth:** 10.0

□ **Source of Sample:** B-6 **Depth:** 1.0

△ **Source of Sample:** B-6 **Depth:** 4.0 **Sample Number:** 3

Remarks:

○water content = 4.8%

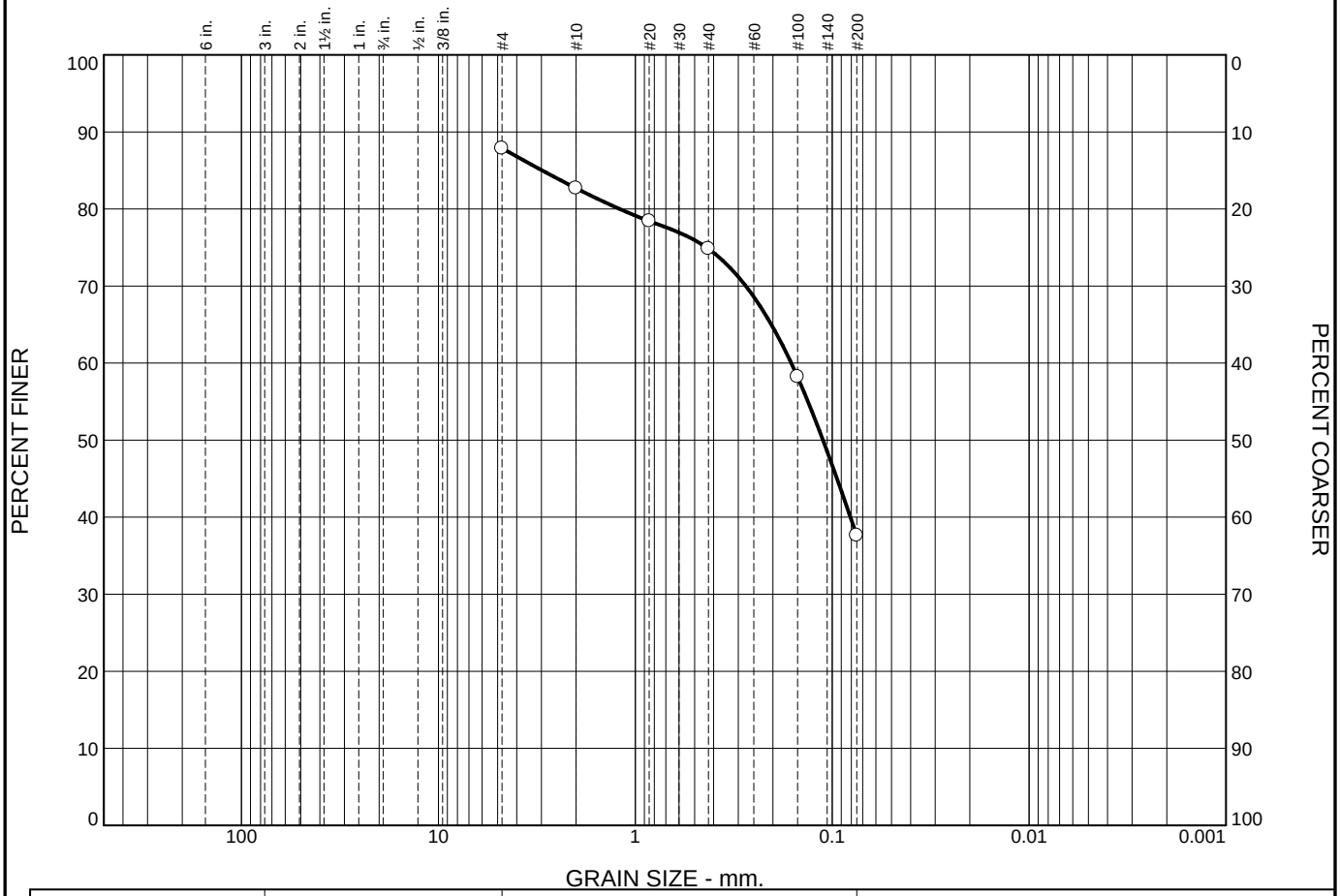
□water content = 10.5%

△water content = 17.2%

CLARENCE WELTI ASSOCIATES, INC.

Figure

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○				5.2	7.9	37.2	37.6	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			2.9681	0.1615	0.1115					

	Material Description	USCS	AASHTO
○			

Project No. **Client:** HOTCHKISS SCHOOL

Project: ADDITION TO DINING HALL AT HOTCHKISS SCHOOL

○ **Source of Sample:** B-7 **Depth:** 4.0

Remarks:

○water content = 12.2%

CLARENCE WELTI ASSOCIATES, INC.

Figure

Hotchkiss School
100 Interlaken Road, Lakeville, CT
Addition to Dining Hall

8/27/19

Laboratory Permeability Tests

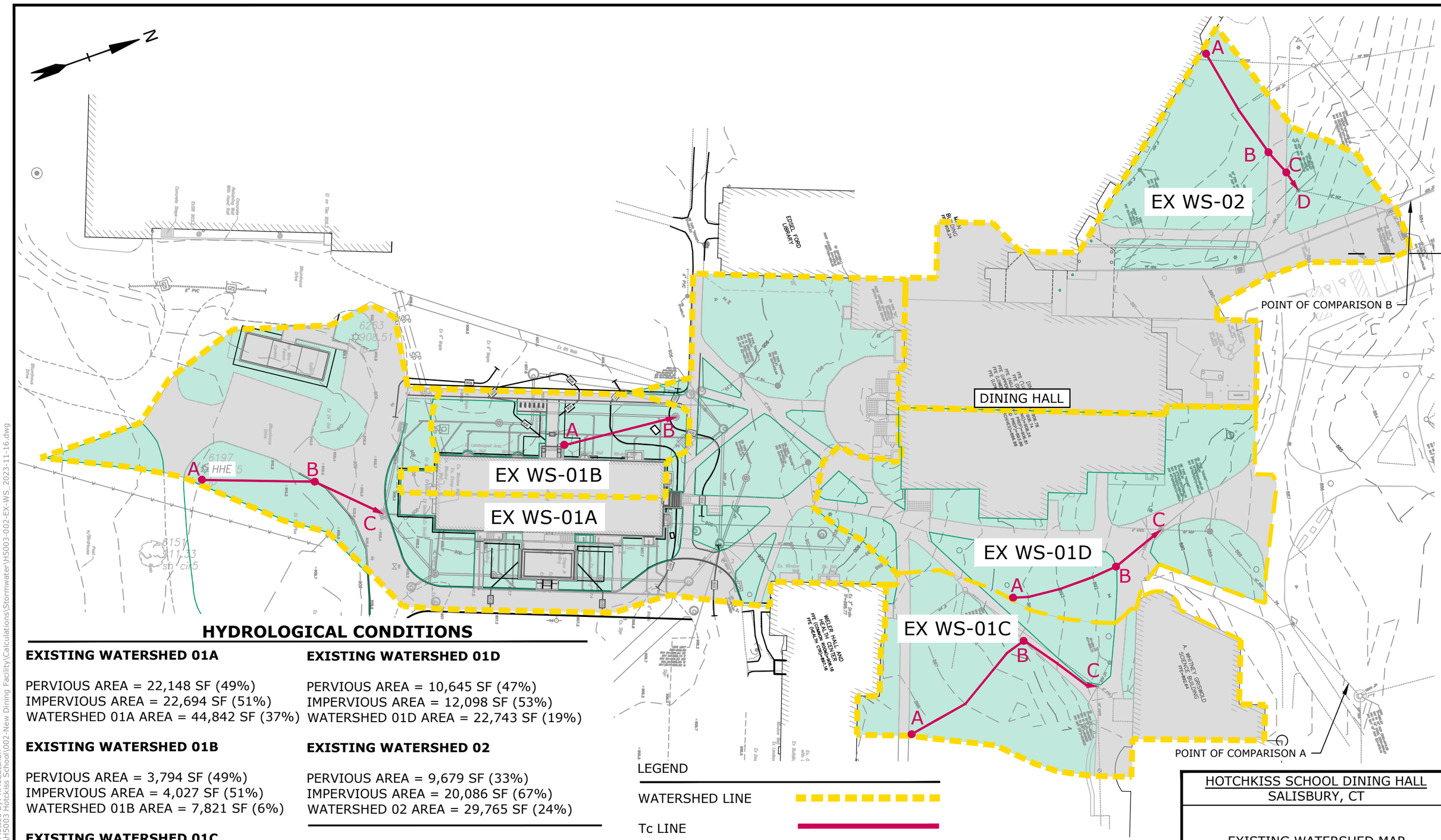
Sample #	Permeability (feet/day)
TP-3, 4'-4.5'	4.4
TP-4, 4-4.5'	3.1
TP-5, 4'-4.5'	1.8

Field Percolation Tests
8/27/19

Test Pit #	Percolation (minutes/inch)
TP-3 @ 4' - 4.5'	28
TP-4 @ 4'-4.5'	35
TP-5 @ 4'-4.5'	60+

Note: Percolation tests were performed in 8" diameter x 12" deep hole at 4 feet below existing grades

APPENDIX C



HYDROLOGICAL CONDITIONS

EXISTING WATERSHED 01A

PERVIOUS AREA = 22,148 SF (49%)
IMPERVIOUS AREA = 22,694 SF (51%)
WATERSHED 01A AREA = 44,842 SF (37%)

EXISTING WATERSHED 01B

PERVIOUS AREA = 3,794 SF (49%)
IMPERVIOUS AREA = 4,027 SF (51%)
WATERSHED 01B AREA = 7,821 SF (6%)

EXISTING WATERSHED 01C

PERVIOUS AREA = 10,050 SF (60%)
IMPERVIOUS AREA = 6,837 SF (40%)
WATERSHED 01C AREA = 16,887 SF (14%)

EXISTING WATERSHED 01D

PERVIOUS AREA = 10,645 SF (47%)
IMPERVIOUS AREA = 12,098 SF (53%)
WATERSHED 01D AREA = 22,743 SF (19%)

EXISTING WATERSHED 02

PERVIOUS AREA = 9,679 SF (33%)
IMPERVIOUS AREA = 20,086 SF (67%)
WATERSHED 02 AREA = 29,765 SF (24%)

TOTAL PERVIOUS AREA = 56,316 SF (46%)
TOTAL IMPERVIOUS AREA = 65,742 SF (54%)
TOTAL WATERSHED AREA: 122,058 SF

LEGEND

WATERSHED LINE

Tc LINE

Pervious Surface

Impervious Surface

0 50' 100'
SCALE: 1" = 50'

HOTCHKISS SCHOOL DINING HALL
SALISBURY, CT

EXISTING WATERSHED MAP

DATE:	11/16/2023
SCALE:	1" = 50'
FIGURE:	WM-01

Tighe&Bond
Engineers | Environmental Specialists

Tighe&Bond
Engineers | Environmental Specialists

Project Name:	**Hotchkiss School Dining Hall**
Project Number:	**H5003-002**
Project Location:	**Salisbury, CT**
Description:	**Existing CN & Tc Calculations**
Prepared By:	**JCB** Checked By: **KM**
Date:	**November 16, 2023**

SCS Curve Number (CN)

Designation: **EX WS-01A**
Location:

Cover Type	Area (ac)	CN	A x CN
Pavement	0.521	98	51.0580
Wooded	0.000	80	0.0000
Landscaped and Lawns	0.508	69	35.0829
	1.029		86.1409

Weighted CN: 84

Time of Concentration (Tc)

Overland				
Segment	**Surface "n"**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min.**
Segment A - B	0.24	63	0.024	9.0
Segment B - C	0.015	42	0.036	0.6

Total Tc = 9.6 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Curve number computed in accordance with USDA TR-55
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

SCS Curve Number (CN)

Designation: **EX WS-01B**
Location:

Cover Type	Area (ac)	CN	A x CN
Pavement	0.092	98	9.0598
Wooded	0.000	80	0.0000
Landscaped and Lawns	0.087	69	6.0098
	0.180		15.0696

Weighted CN: 84

Time of Concentration (Tc)

Overland				
Segment	**Surface "n"**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min.**
Segment A - B	0.24	65	0.03	8.5

Total Tc = 8.5 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Curve number computed in accordance with USDA TR-55
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Tighe&Bond
Engineers | Environmental Specialists

Project Name:	**Hotchkiss School Dining Hall**
Project Number:	**H5003-002**
Project Location:	**Salisbury, CT**
Description:	**Existing CN & Tc Calculations**
Prepared By:	**JCB** Checked By: **KM**
Date:	**November 16, 2023**

SCS Curve Number (CN)

Designation: **EX WS-01C**
Location:

Cover Type	Area (ac)	CN	A x CN
Pavement	0.388	98	38.0240
Wooded	0.000	80	0.0000
Landscaped and Lawns	0.231	69	15.9390
	0.619		53.9630

Weighted CN: 87

Time of Concentration (Tc)

Overland				
Segment	**Surface "n"**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min.**
Segment A - B	0.24	85	0.054	8.3
Segment B - C	0.015	49	0.053	0.6

Total Tc = 8.9 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Curve number computed in accordance with USDA TR-55
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

SCS Curve Number (CN)

Designation: **EX WS-01D**
Location:

Cover Type	Area (ac)	CN	A x CN
Pavement	0.206	98	20.1880
Wooded	0.000	80	0.0000
Landscaped and Lawns	0.244	69	16.8360
	0.450		37.0240

Weighted CN: 82

Time of Concentration (Tc)

Overland				
Segment	**Surface "n"**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min.**
Segment A - B	0.24	60	0.054	6.3
Segment B - C	0.015	32	0.04	0.5

Total Tc = 6.7 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Curve number computed in accordance with USDA TR-55
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Tighe&Bond
Engineers | Environmental Specialists

Project Name:	**Hotchkiss School Dining Hall**
Project Number:	**H5003-002**
Project Location:	**Salisbury, CT**
Description:	**Existing CN & Tc Calculations**
Prepared By:	**JCB** Checked By: **KM**
Date:	**November 16, 2023**

SCS Curve Number (CN)

Designation: **EX WS-02**
Location:

Cover Type	Area (ac)	CN	A x CN
Pavement	0.283	98	27.7340
Wooded	0.000	80	0.0000
Landscaped and Lawns	0.222	69	15.3180
	0.505		43.0520

Weighted CN: 85

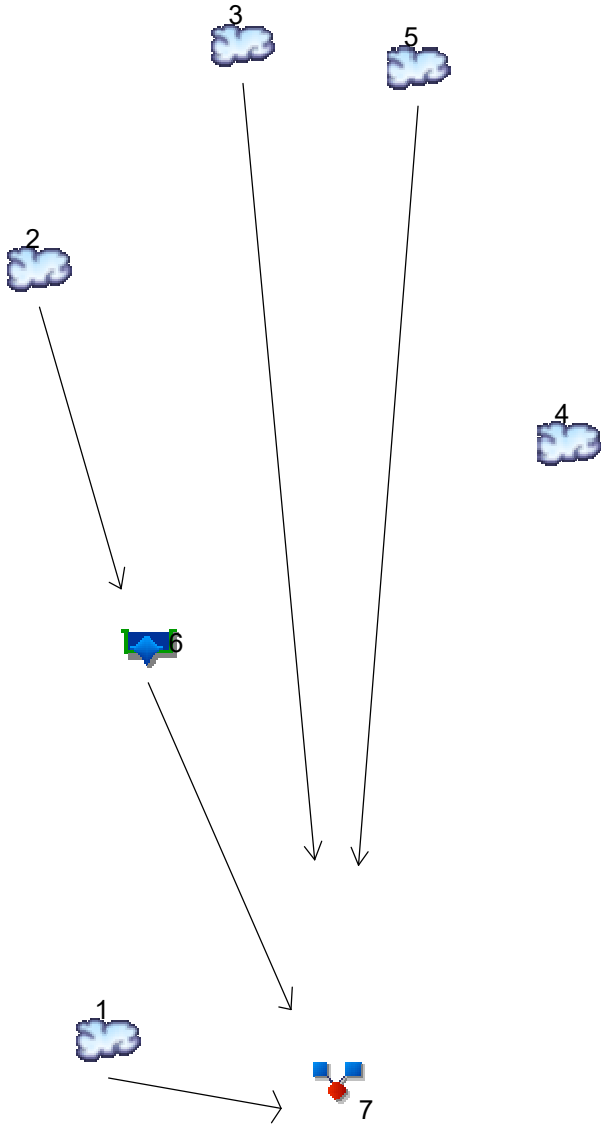
Time of Concentration (Tc)

Overland				
Segment	**Surface "n"**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min.**
Segment A - B	0.24	68	0.019	10.5
Segment B - C	0.015	15	0.07	0.2
Segment C - D	0.24	12	0.17	1.1

Total Tc = 11.8 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Curve number computed in accordance with USDA TR-55
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Watershed Model Schematic



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.728	2	726	5,911	------	------	------	EX WS-01A
2	SCS Runoff	0.302	2	726	1,034	------	------	------	EX WS-01B
3	SCS Runoff	1.190	2	726	4,065	------	------	------	EX WS-01C
4	SCS Runoff	0.816	2	728	3,130	------	------	------	EX WS-02 - POC B
5	SCS Runoff	0.685	2	726	2,356	------	------	------	EX WS-01D
6	Reservoir	0.005	2	1034	48	2	902.03	758	Stormtech - 2
7	Combine	3.603	2	726	12,379	1, 3, 5, 6	------	------	Point of Comparision A

Hydrograph Report

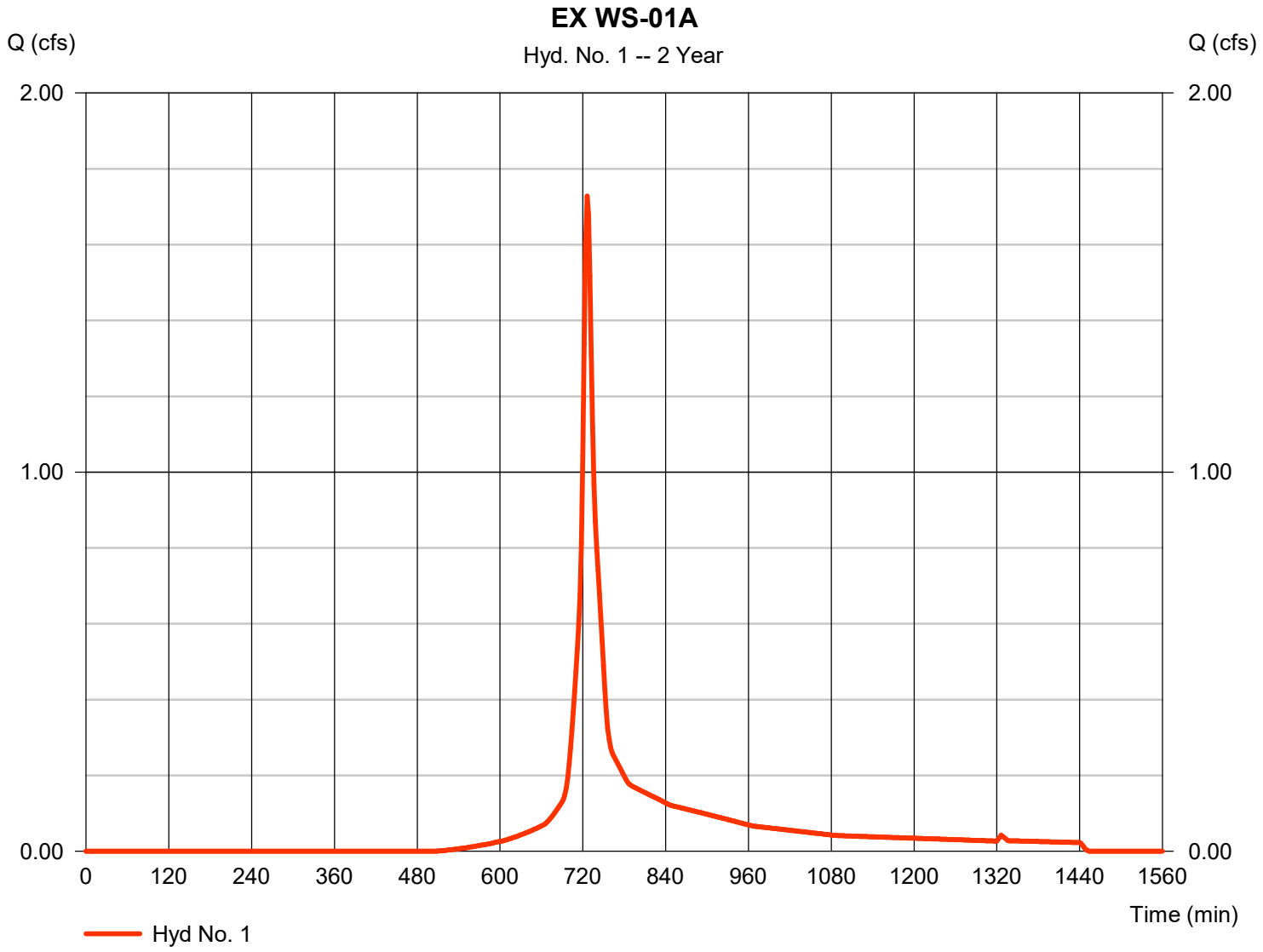
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 Thursday, 11 / 16 / 2023

Hyd. No. 1

EX WS-01A

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.728 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	5,911 cuft
Drainage area	=	1.029 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.60 min
Total precip.	=	3.08 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.500 x 98) + (0.502 x 69)] / 1.029



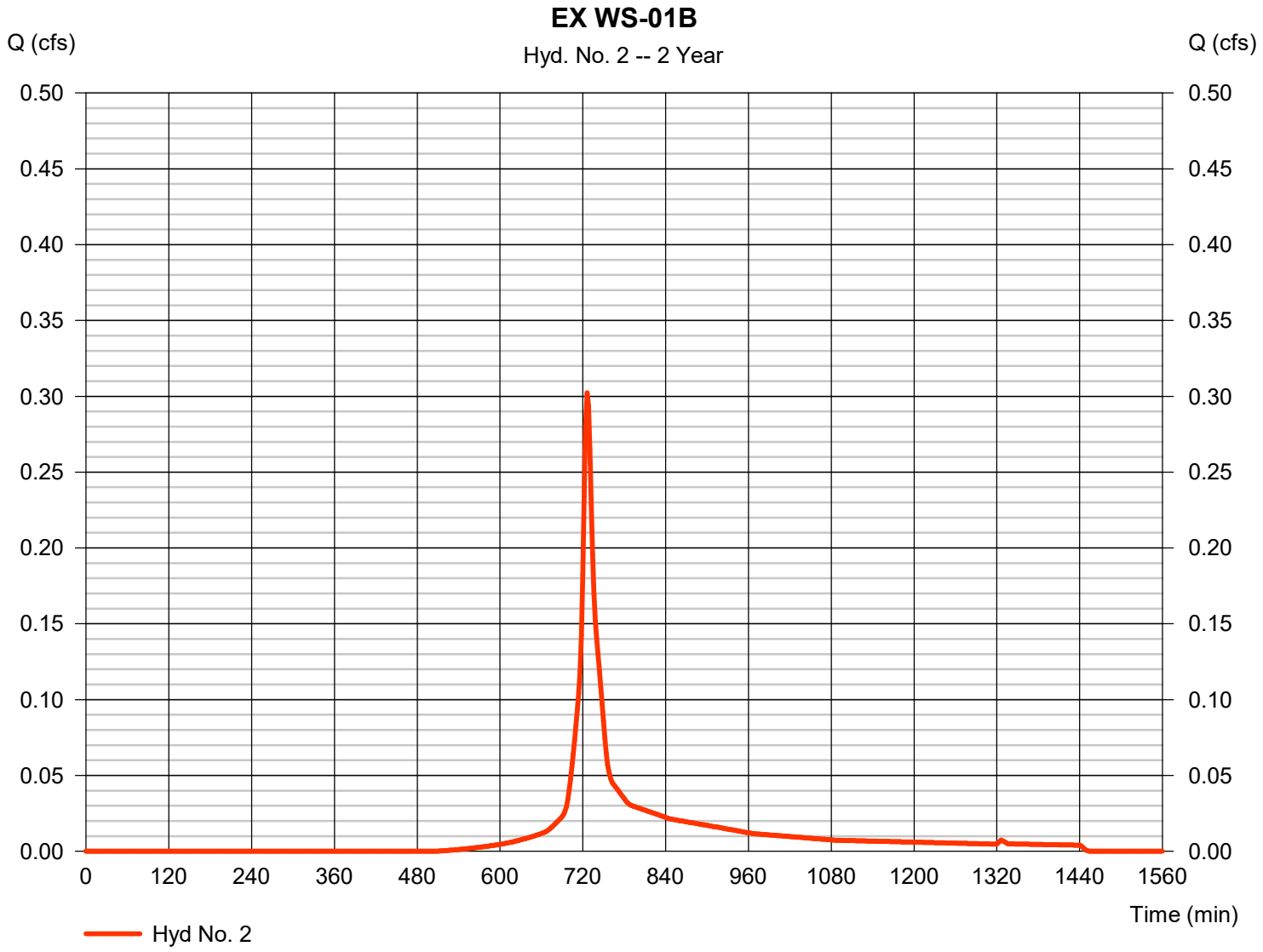
Hydrograph Report

Hyd. No. 2

EX WS-01B

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.302 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	1,034 cuft
Drainage area	=	0.180 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.50 min
Total precip.	=	3.08 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.069 x 98)] / 0.180

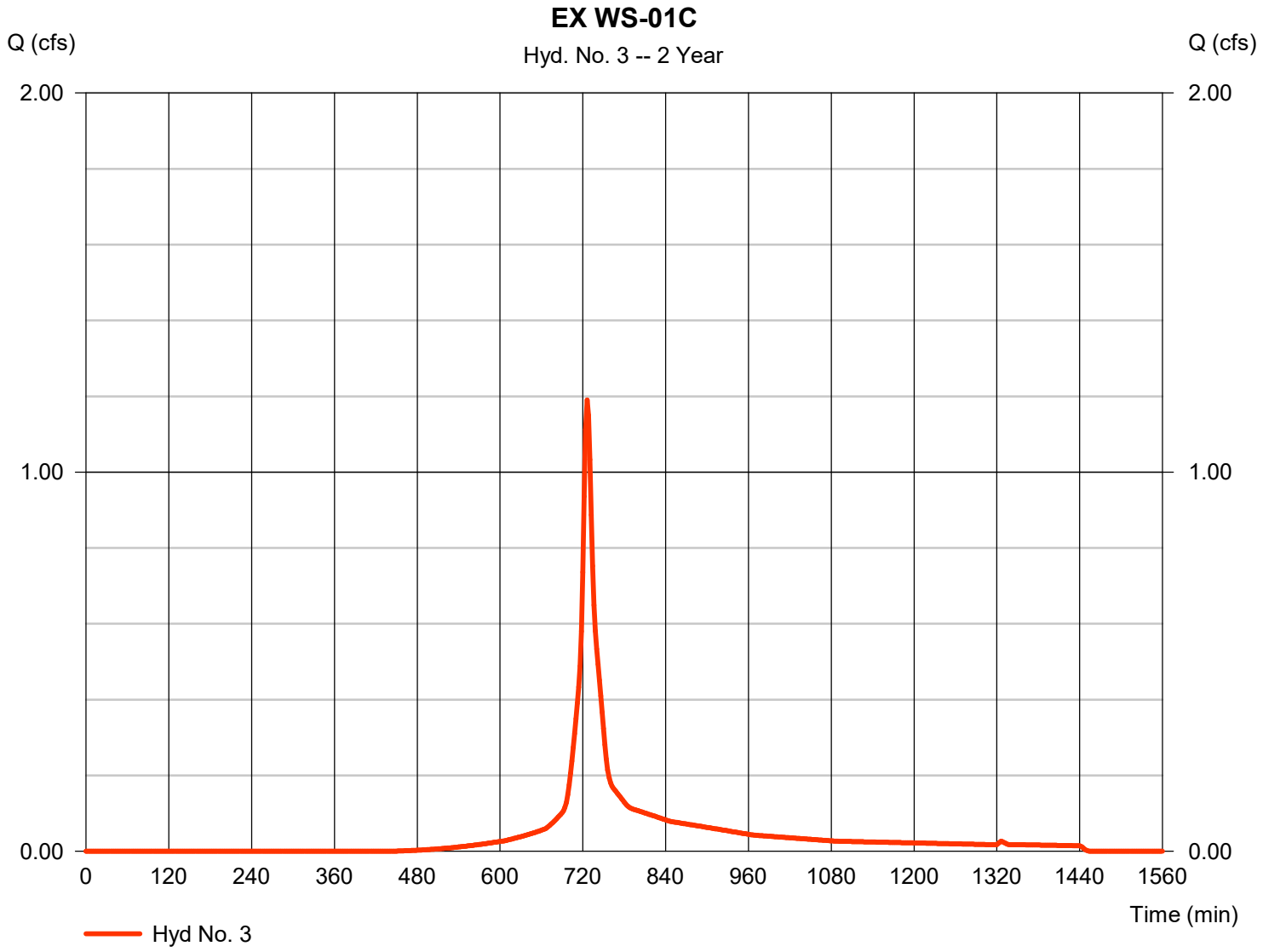


Hydrograph Report

Hyd. No. 3

EX WS-01C

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.190 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	4,065 cuft
Drainage area	=	0.619 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.90 min
Total precip.	=	3.08 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

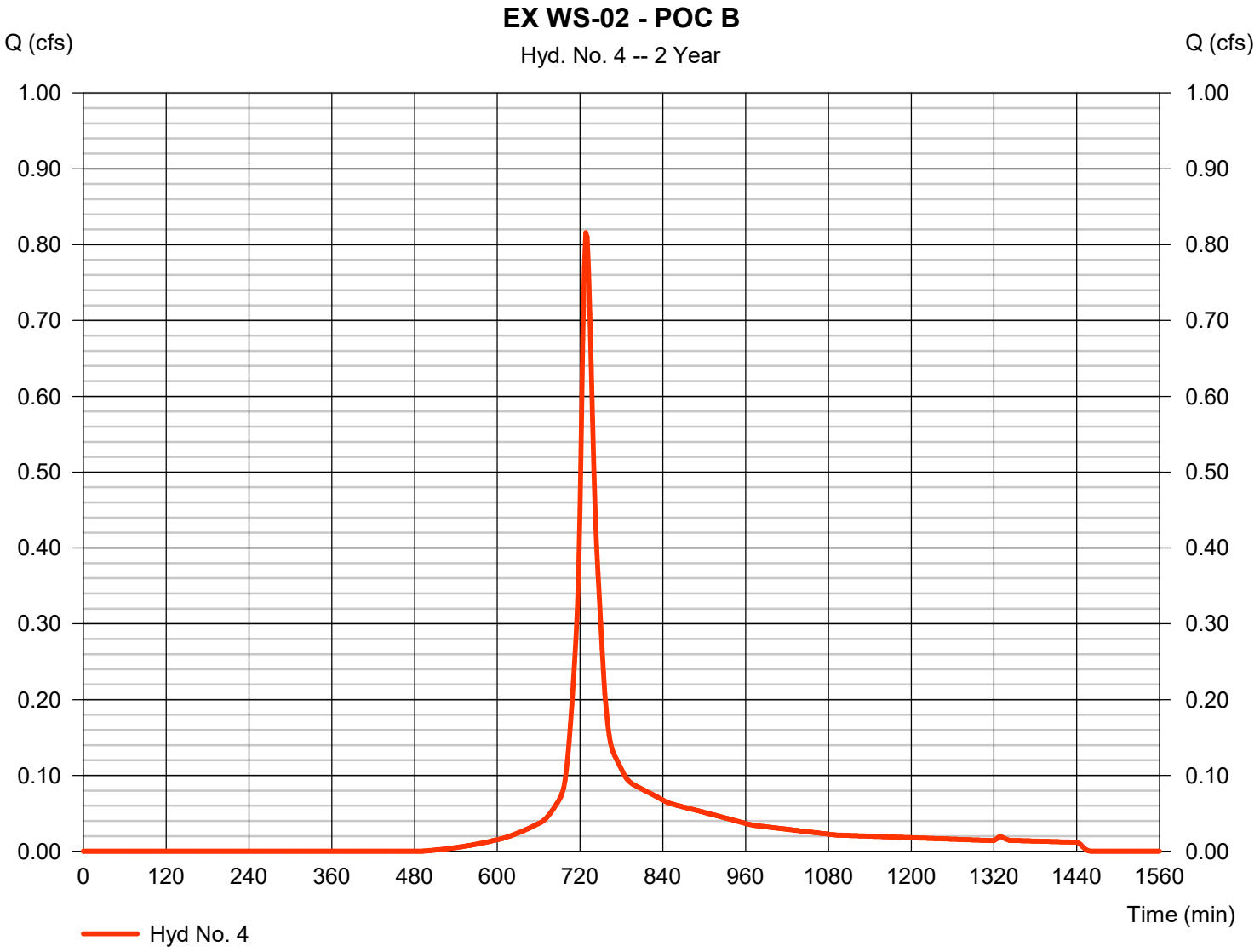


Hydrograph Report

Hyd. No. 4

EX WS-02 - POC B

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.816 cfs
Storm frequency	=	2 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	3,130 cuft
Drainage area	=	0.505 ac	Curve number	=	85
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	11.80 min
Total precip.	=	3.08 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

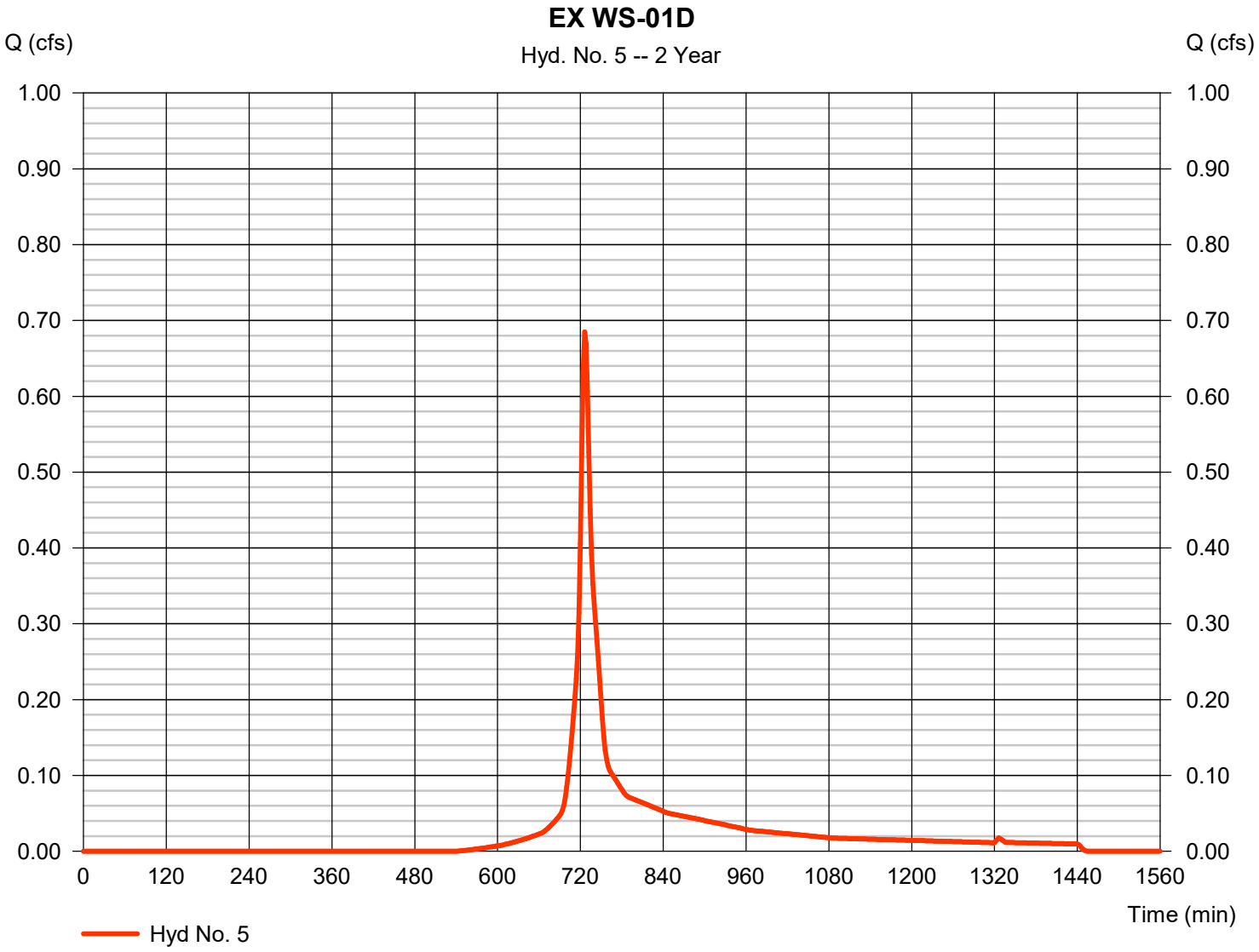


Hydrograph Report

Hyd. No. 5

EX WS-01D

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.685 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	2,356 cuft
Drainage area	=	0.450 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.70 min
Total precip.	=	3.08 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



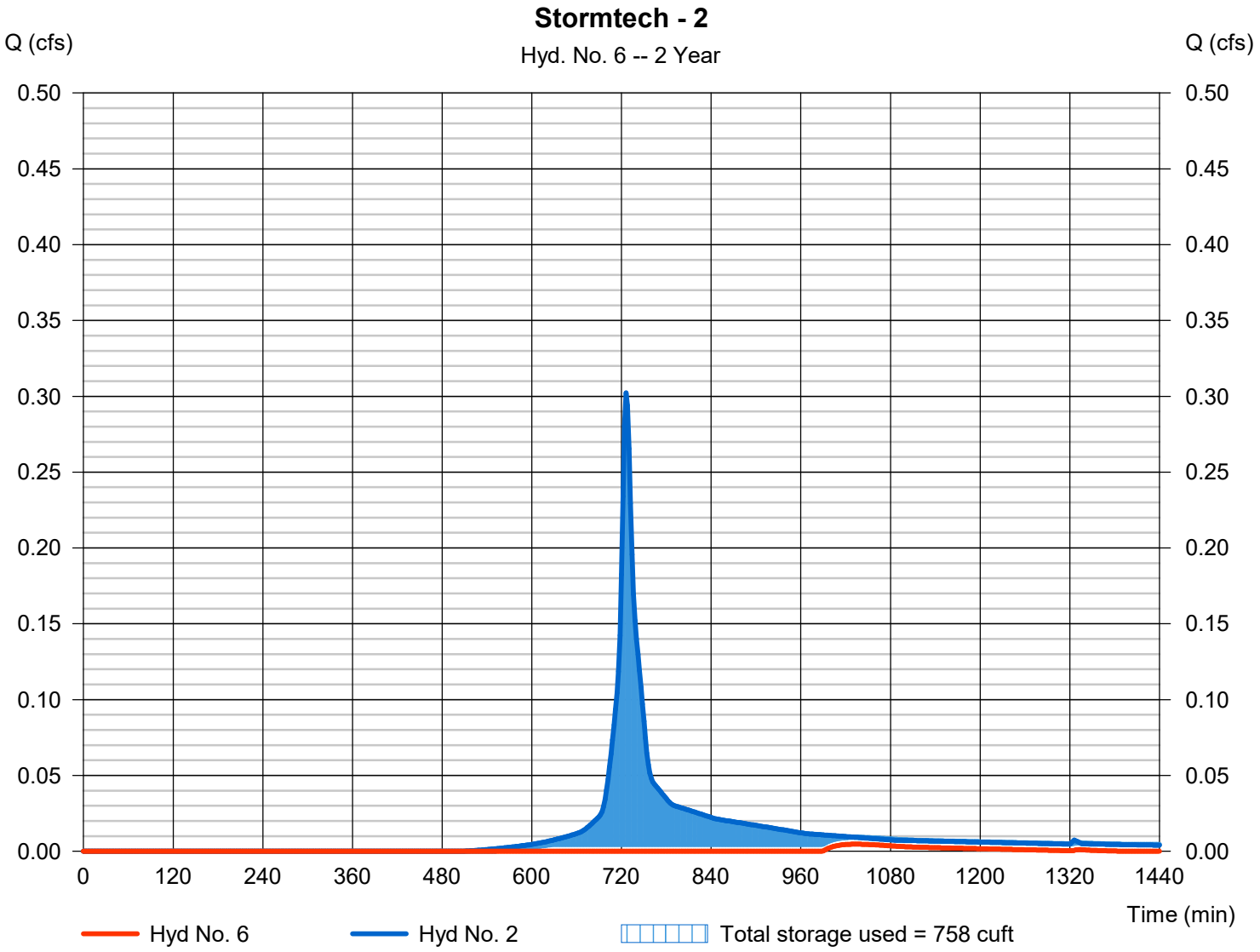
Hydrograph Report

Hyd. No. 6

Stormtech - 2

Hydrograph type	=	Reservoir	Peak discharge	=	0.005 cfs
Storm frequency	=	2 yrs	Time to peak	=	1034 min
Time interval	=	2 min	Hyd. volume	=	48 cuft
Inflow hyd. No.	=	2 - EX WS-01B	Max. Elevation	=	902.03 ft
Reservoir name	=	Stormtech -2	Max. Storage	=	758 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 1 - Stormtech -2

Pond Data

UG Chambers -Invert elev. = 900.00 ft, Rise x Span = 2.50 x 4.17 ft, Barrel Len = 63.75 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 899.00 ft, Width = 6.17 ft, Height = 6.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	899.00	n/a	0	0
0.60	899.60	n/a	94	94
1.20	900.20	n/a	126	221
1.80	900.80	n/a	188	409
2.40	901.40	n/a	180	589
3.00	902.00	n/a	164	753
3.60	902.60	n/a	127	880
4.20	903.20	n/a	94	974
4.80	903.80	n/a	94	1,069
5.40	904.40	n/a	94	1,163
6.00	905.00	n/a	94	1,257

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 6.00	0.00	0.00	0.00
Span (in)	= 6.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 902.00	0.00	0.00	0.00
Length (ft)	= 10.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.500 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

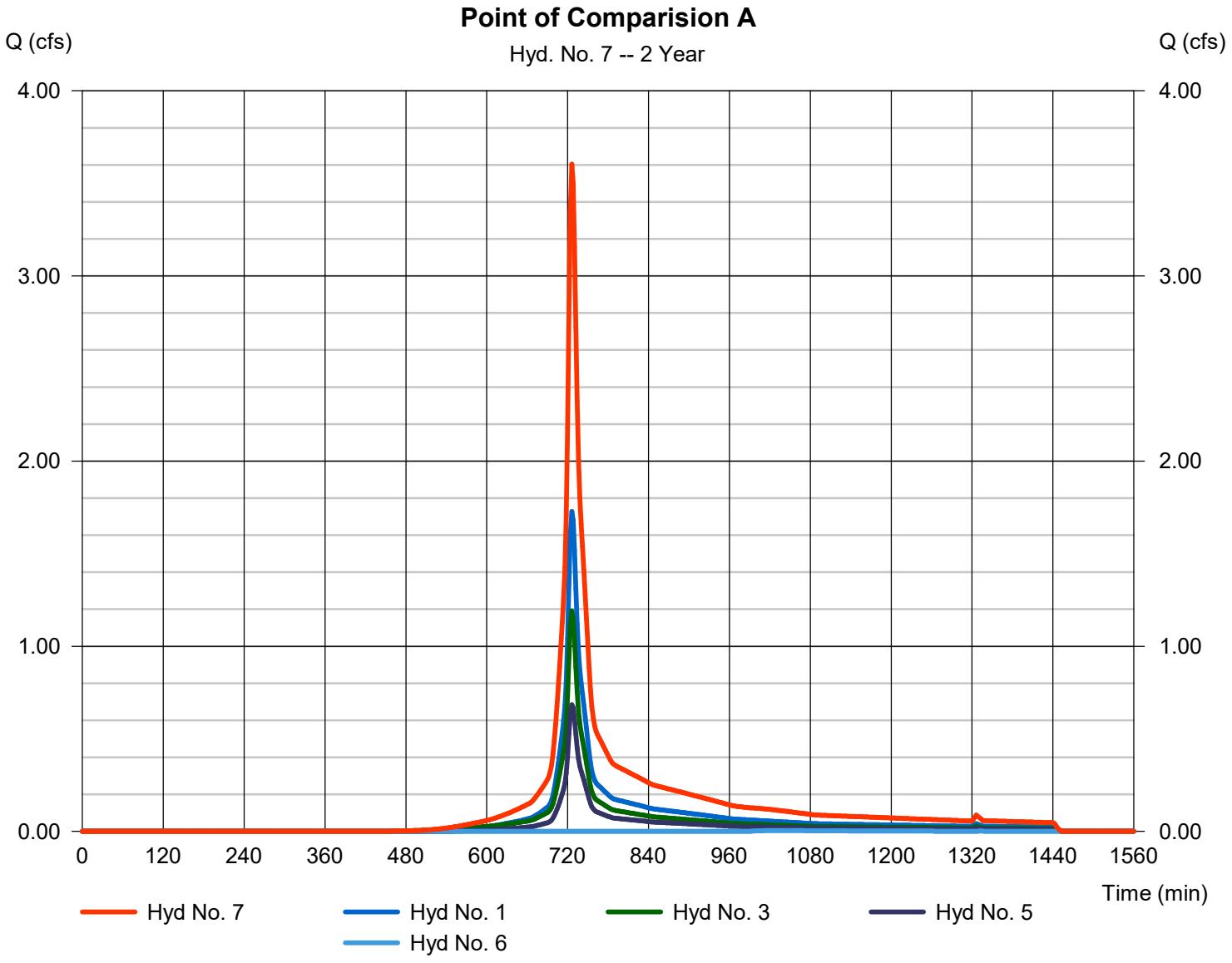
Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	899.00	0.00	---	---	---	---	---	---	---	0.000	---	0.000
0.60	94	899.60	0.00	---	---	---	---	---	---	---	0.005	---	0.005
1.20	221	900.20	0.00	---	---	---	---	---	---	---	0.005	---	0.005
1.80	409	900.80	0.00	---	---	---	---	---	---	---	0.005	---	0.005
2.40	589	901.40	0.00	---	---	---	---	---	---	---	0.005	---	0.005
3.00	753	902.00	0.00	---	---	---	---	---	---	---	0.005	---	0.005
3.60	880	902.60	0.47 oc	---	---	---	---	---	---	---	0.005	---	0.471
4.20	974	903.20	0.92 ic	---	---	---	---	---	---	---	0.005	---	0.926
4.80	1,069	903.80	1.18 ic	---	---	---	---	---	---	---	0.005	---	1.181
5.40	1,163	904.40	1.39 ic	---	---	---	---	---	---	---	0.005	---	1.391
6.00	1,257	905.00	1.57 ic	---	---	---	---	---	---	---	0.005	---	1.572

Hydrograph Report

Hyd. No. 7

Point of Comparision A

Hydrograph type	=	Combine	Peak discharge	=	3.603 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	12,379 cuft
Inflow hyds.	=	1, 3, 5, 6	Contrib. drain. area	=	2.098 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	3.642	2	726	12,524	------	------	------	EX WS-01A
2	SCS Runoff	0.637	2	726	2,191	------	------	------	EX WS-01B
3	SCS Runoff	2.360	2	726	8,206	------	------	------	EX WS-01C
4	SCS Runoff	1.689	2	728	6,525	------	------	------	EX WS-02 - POC B
5	SCS Runoff	1.508	2	726	5,161	------	------	------	EX WS-01D
6	Reservoir	0.341	2	736	1,168	2	902.49	856	Stormtech - 2
7	Combine	7.509	2	726	27,060	1, 3, 5, 6	------	------	Point of Comparision A

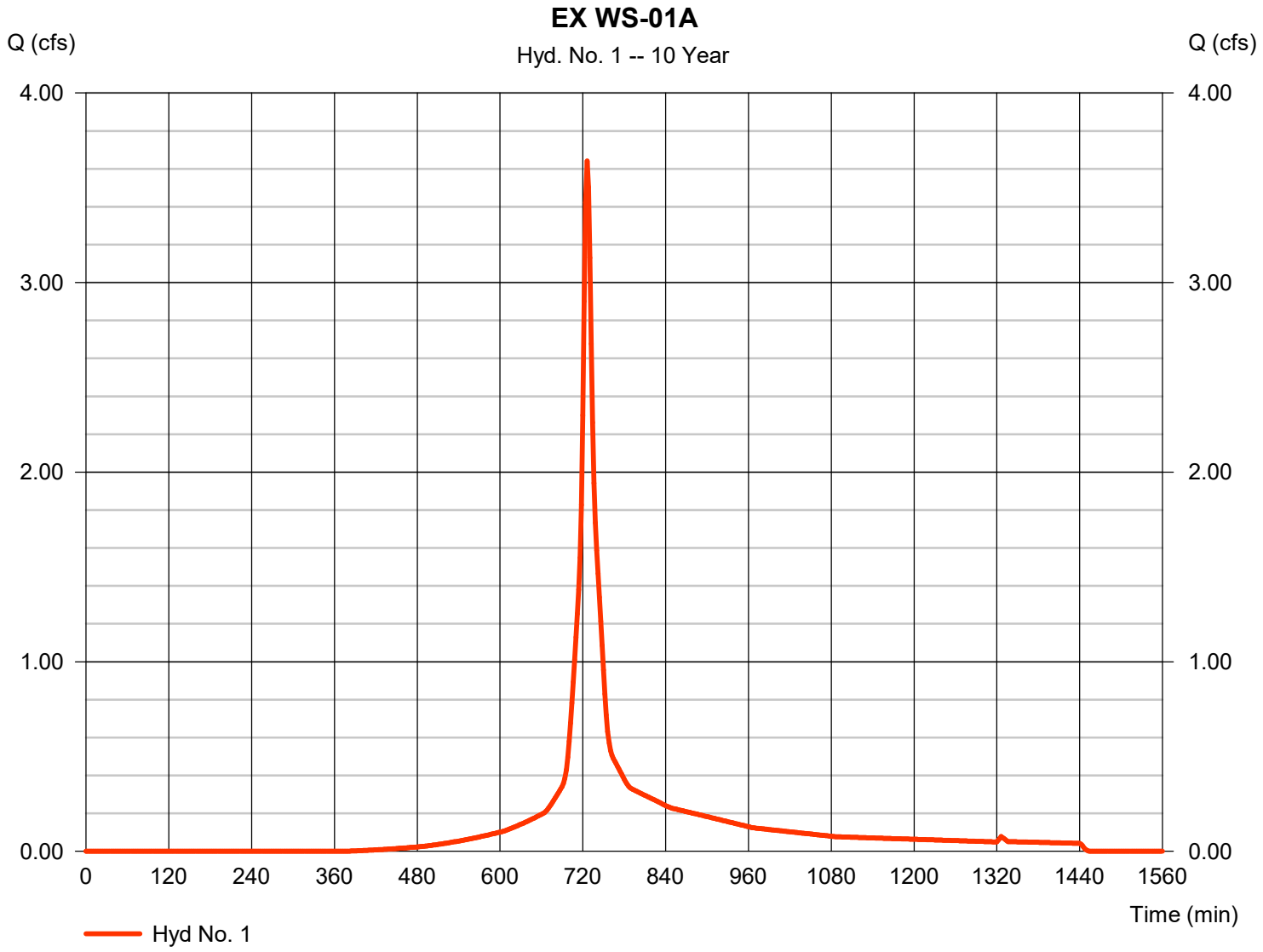
Hydrograph Report

Hyd. No. 1

EX WS-01A

Hydrograph type	= SCS Runoff	Peak discharge	= 3.642 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 12,524 cuft
Drainage area	= 1.029 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.60 min
Total precip.	= 5.09 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.500 x 98) + (0.502 x 69)] / 1.029



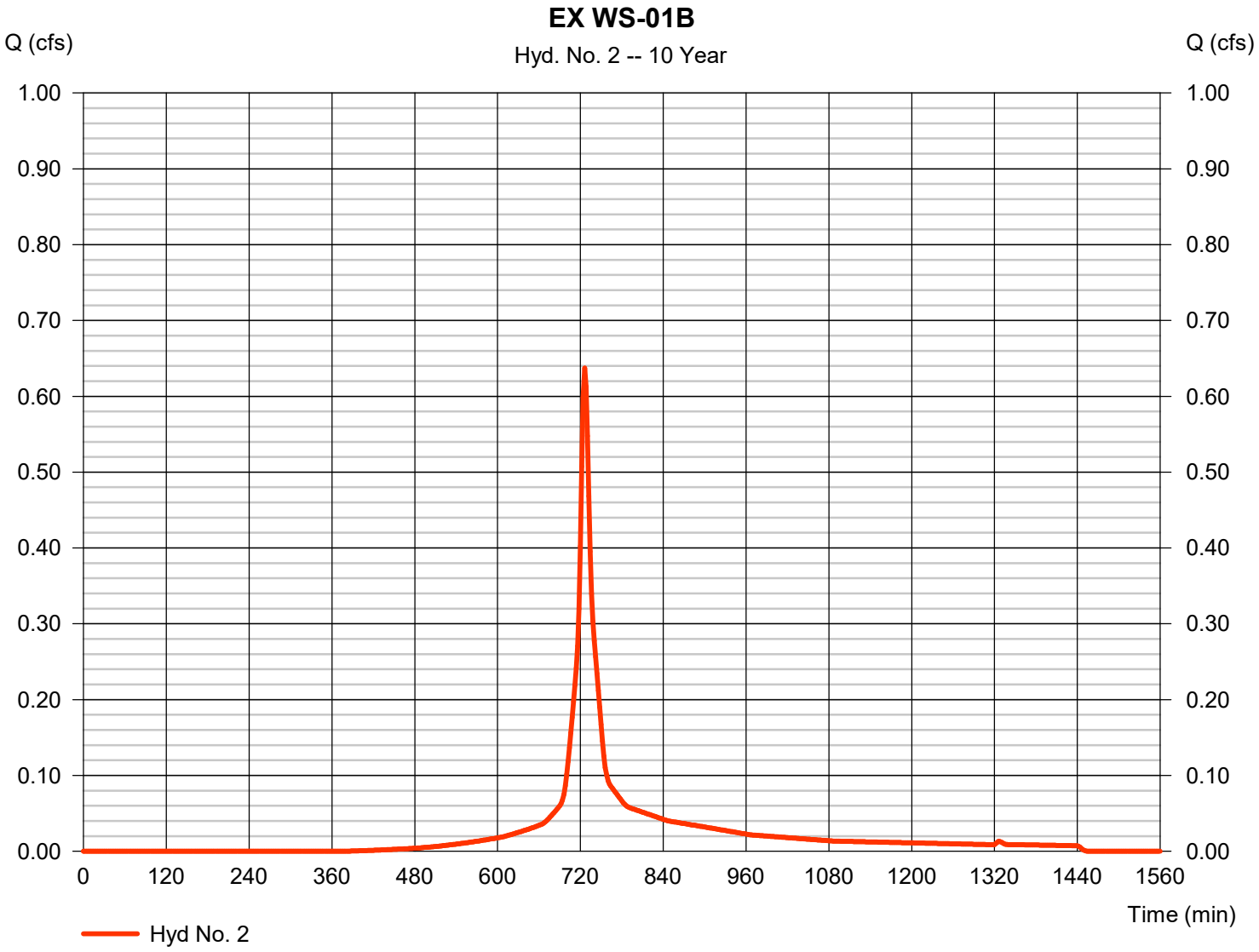
Hydrograph Report

Hyd. No. 2

EX WS-01B

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.637 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	2,191 cuft
Drainage area	=	0.180 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.50 min
Total precip.	=	5.09 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.069 x 98)] / 0.180

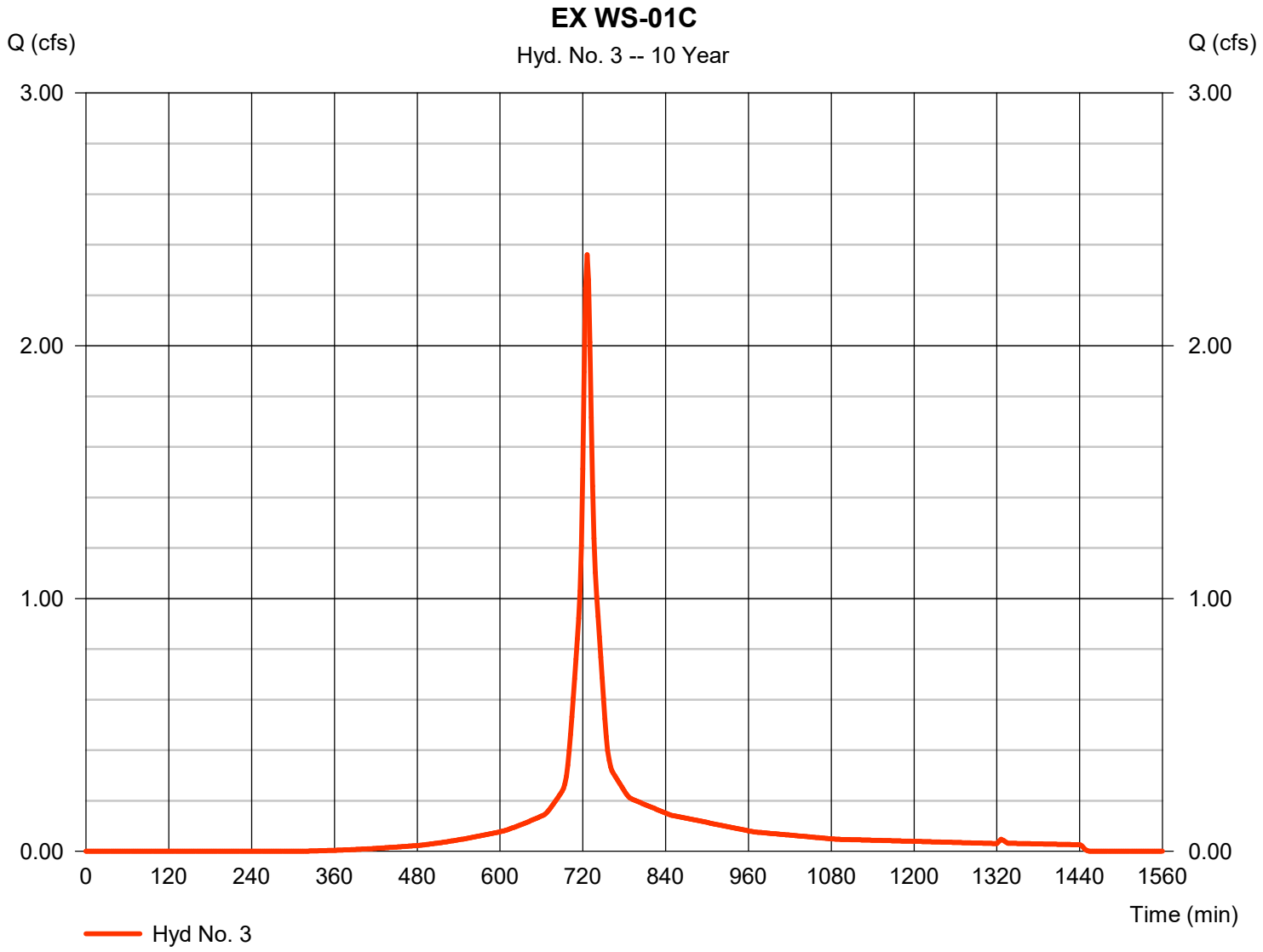


Hydrograph Report

Hyd. No. 3

EX WS-01C

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.360 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	8,206 cuft
Drainage area	=	0.619 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.90 min
Total precip.	=	5.09 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

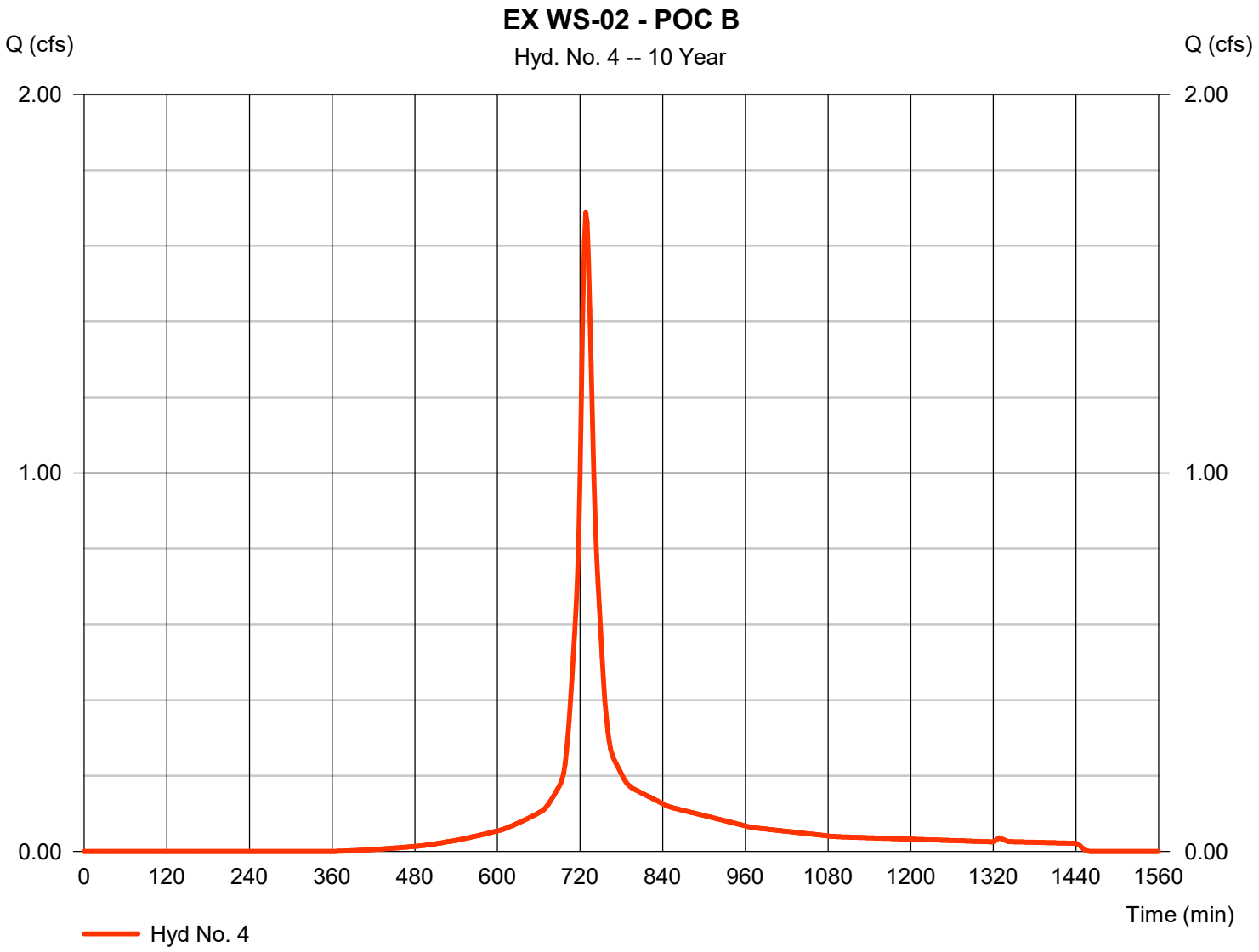


Hydrograph Report

Hyd. No. 4

EX WS-02 - POC B

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.689 cfs
Storm frequency	=	10 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	6,525 cuft
Drainage area	=	0.505 ac	Curve number	=	85
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	11.80 min
Total precip.	=	5.09 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

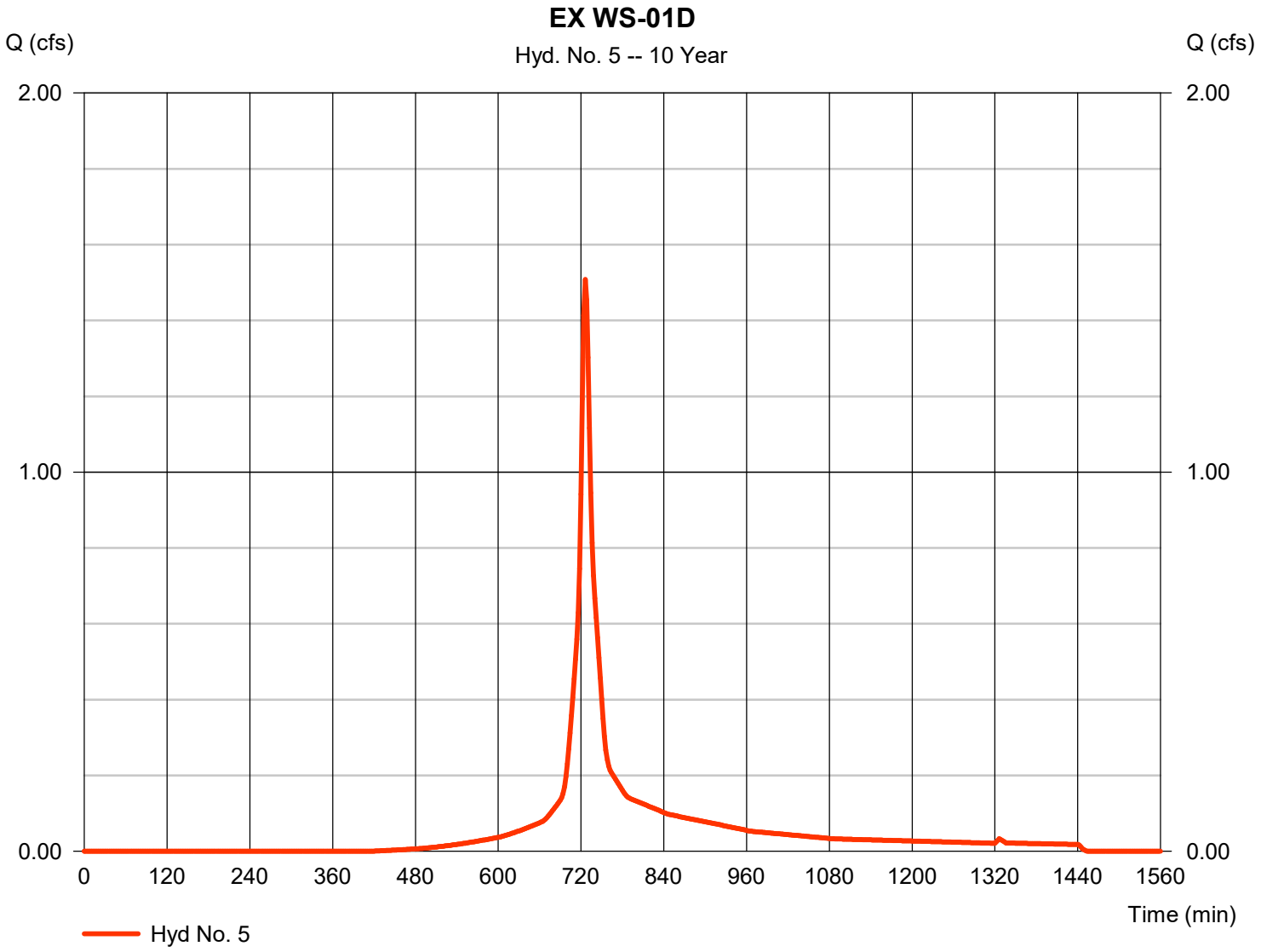


Hydrograph Report

Hyd. No. 5

EX WS-01D

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.508 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	5,161 cuft
Drainage area	=	0.450 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.70 min
Total precip.	=	5.09 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



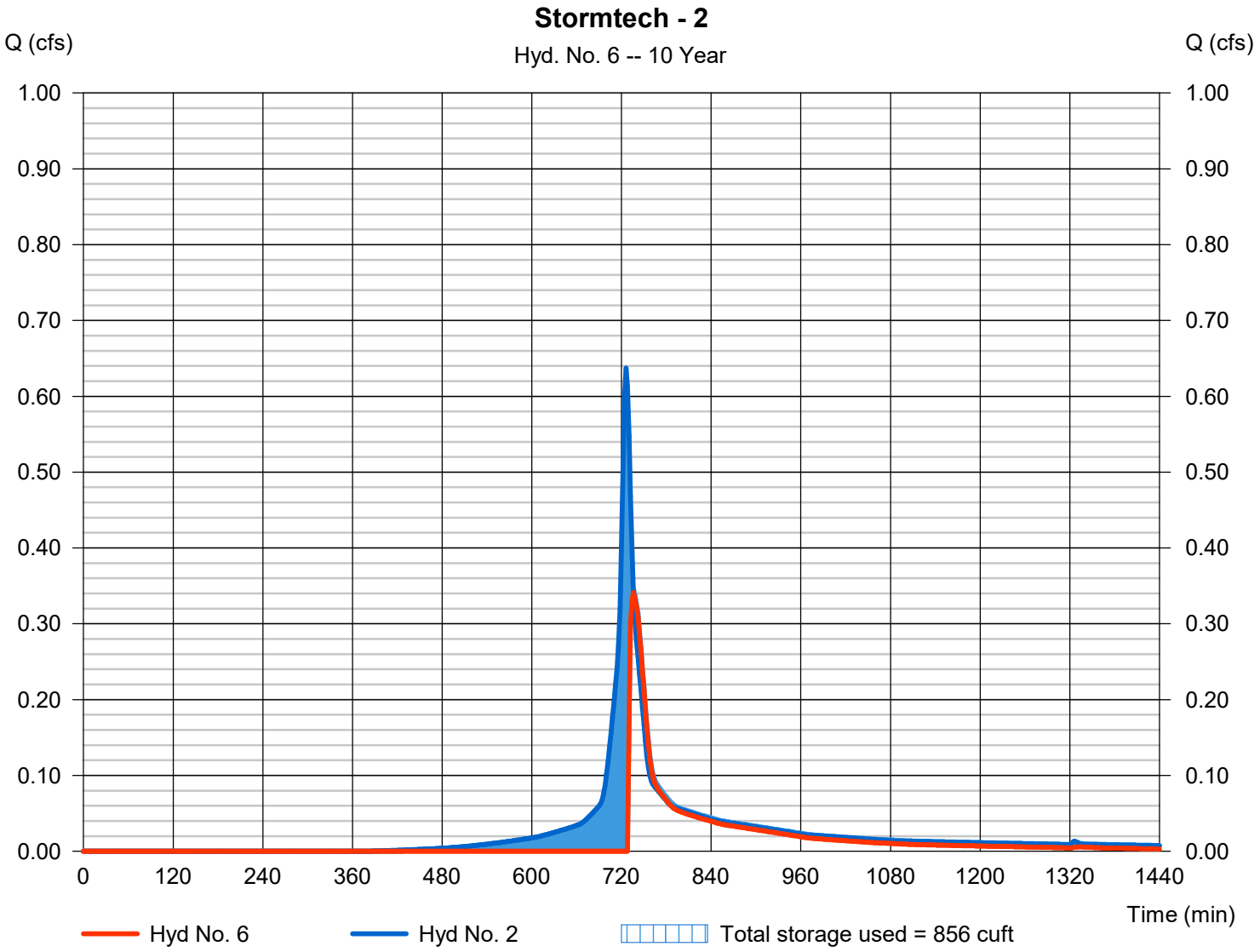
Hydrograph Report

Hyd. No. 6

Stormtech - 2

Hydrograph type	=	Reservoir	Peak discharge	=	0.341 cfs
Storm frequency	=	10 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	1,168 cuft
Inflow hyd. No.	=	2 - EX WS-01B	Max. Elevation	=	902.49 ft
Reservoir name	=	Stormtech -2	Max. Storage	=	856 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

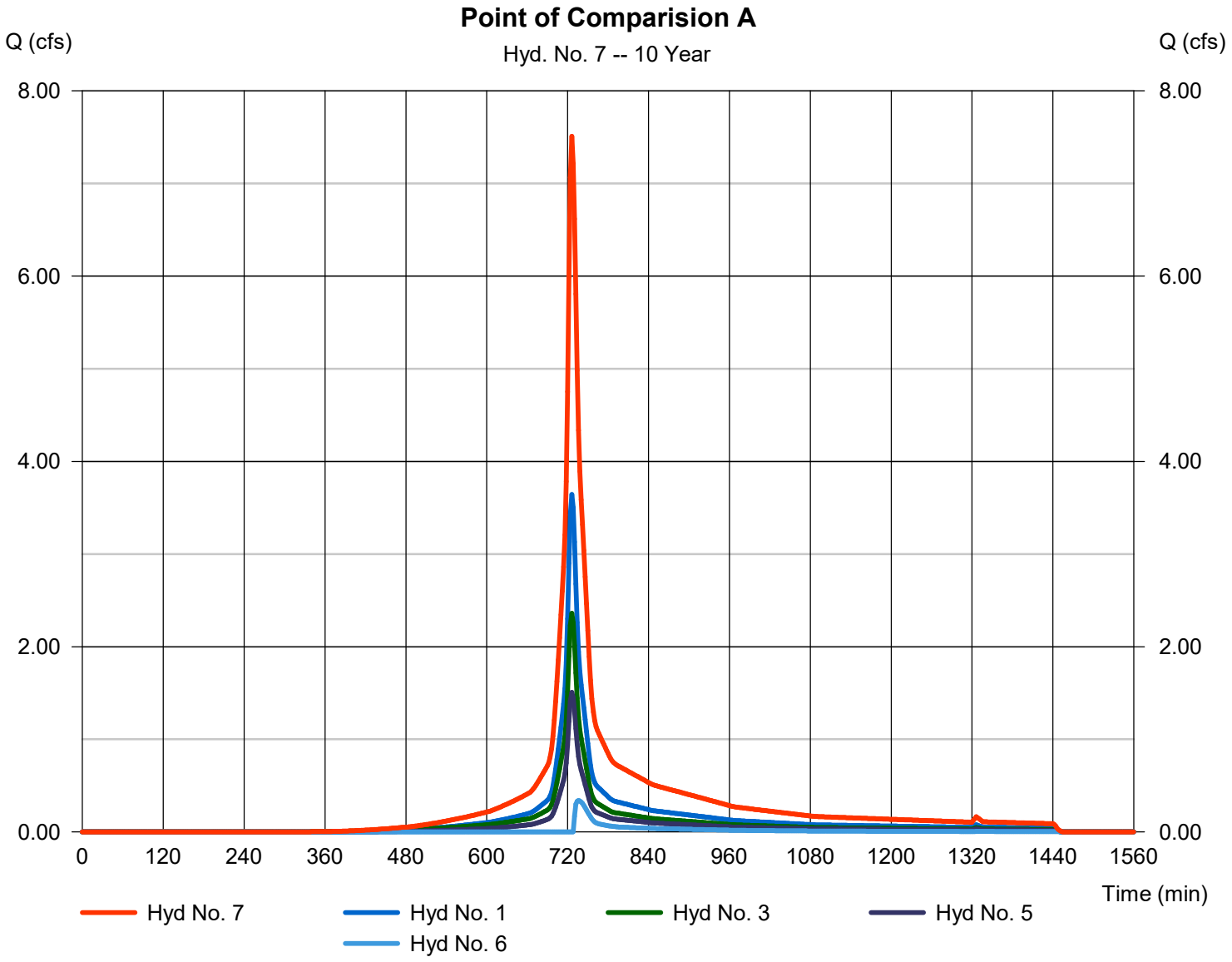


Hydrograph Report

Hyd. No. 7

Point of Comparision A

Hydrograph type	= Combine	Peak discharge	= 7.509 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 27,060 cuft
Inflow hyds.	= 1, 3, 5, 6	Contrib. drain. area	= 2.098 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	5.798	2	726	20,301	------	------	------	EX WS-01A
2	SCS Runoff	1.014	2	726	3,551	------	------	------	EX WS-01B
3	SCS Runoff	3.653	2	726	12,986	------	------	------	EX WS-01C
4	SCS Runoff	2.667	2	728	10,491	------	------	------	EX WS-02 - POC B
5	SCS Runoff	2.449	2	726	8,506	------	------	------	EX WS-01D
6	Reservoir	0.896	2	730	2,501	2	903.15	966	Stormtech - 2
7	Combine	12.73	2	726	44,295	1, 3, 5, 6	------	------	Point of Comparision A

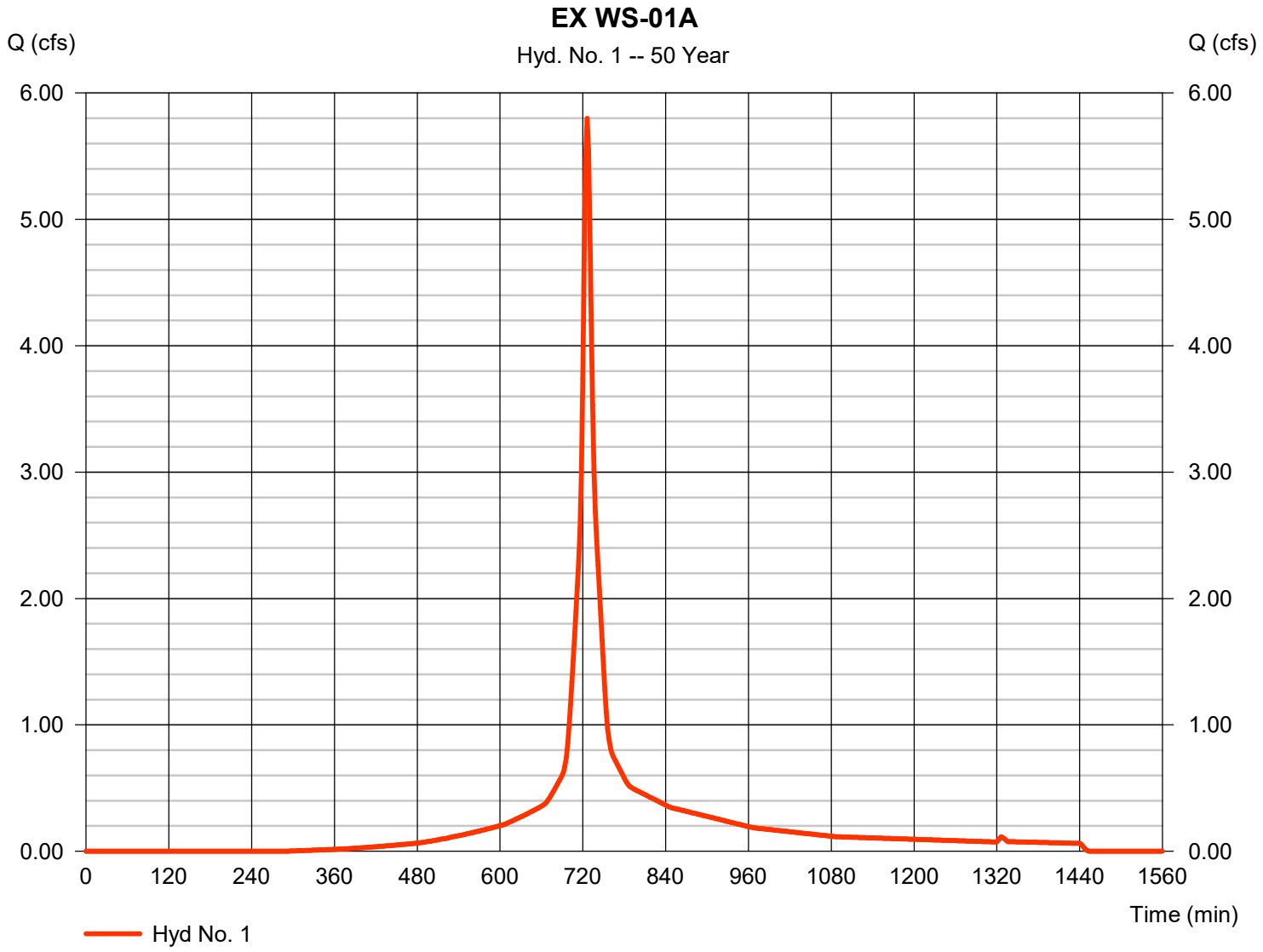
Hydrograph Report

Hyd. No. 1

EX WS-01A

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.798 cfs
Storm frequency	=	50 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	20,301 cuft
Drainage area	=	1.029 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.60 min
Total precip.	=	7.31 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.500 x 98) + (0.502 x 69)] / 1.029



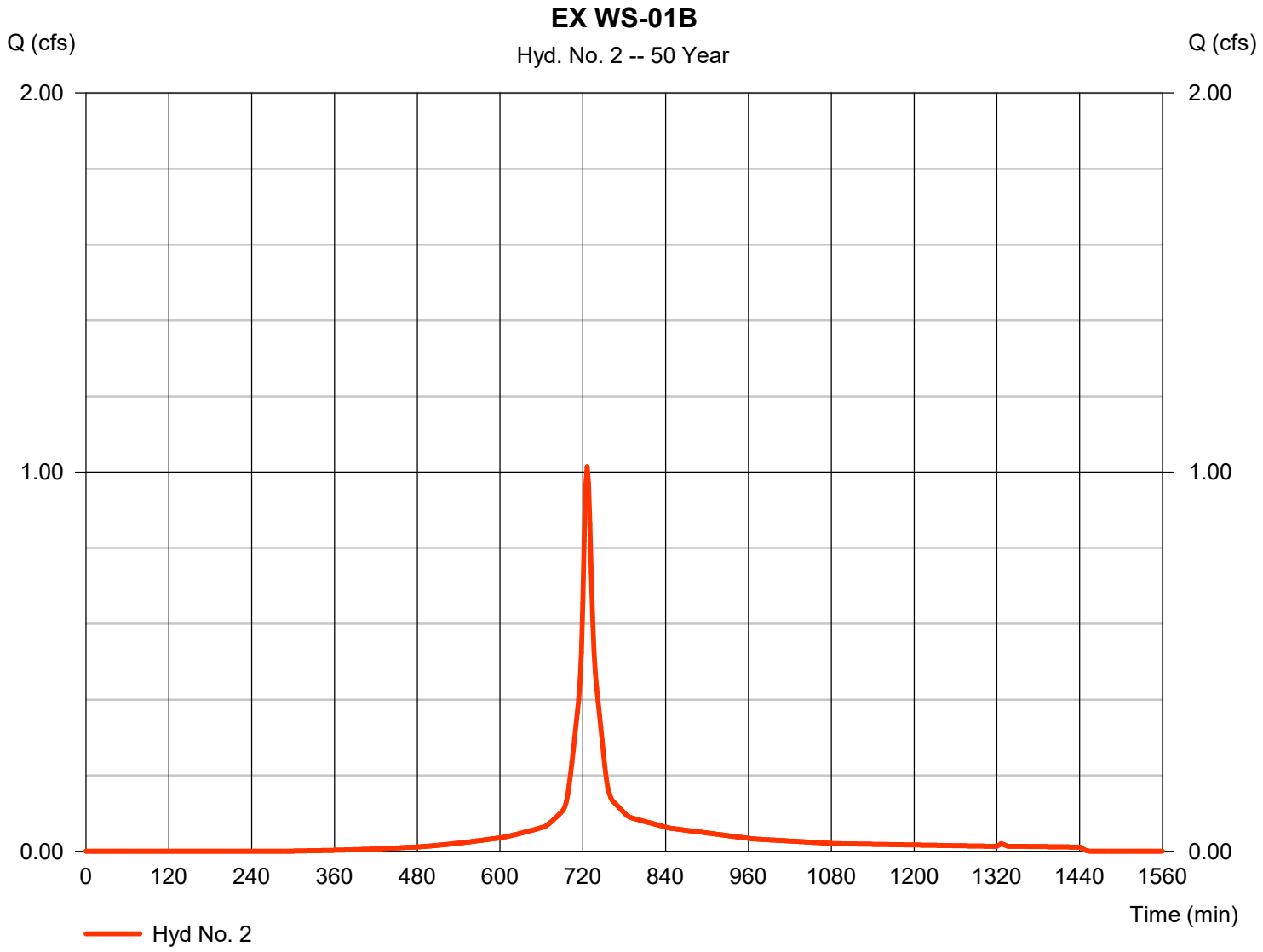
Hydrograph Report

Hyd. No. 2

EX WS-01B

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.014 cfs
Storm frequency	=	50 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	3,551 cuft
Drainage area	=	0.180 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.50 min
Total precip.	=	7.31 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.069 x 98)] / 0.180

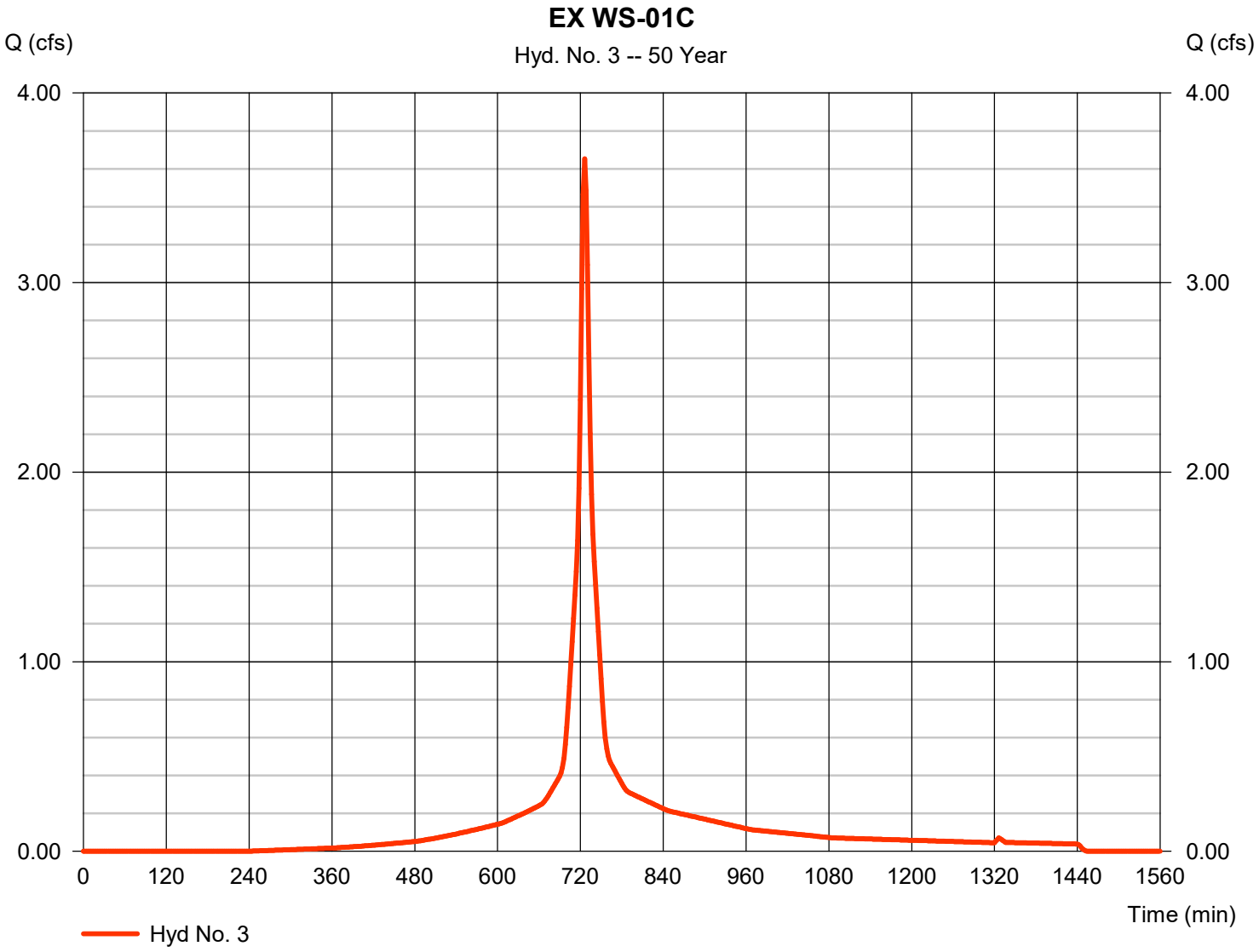


Hydrograph Report

Hyd. No. 3

EX WS-01C

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.653 cfs
Storm frequency	=	50 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	12,986 cuft
Drainage area	=	0.619 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.90 min
Total precip.	=	7.31 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

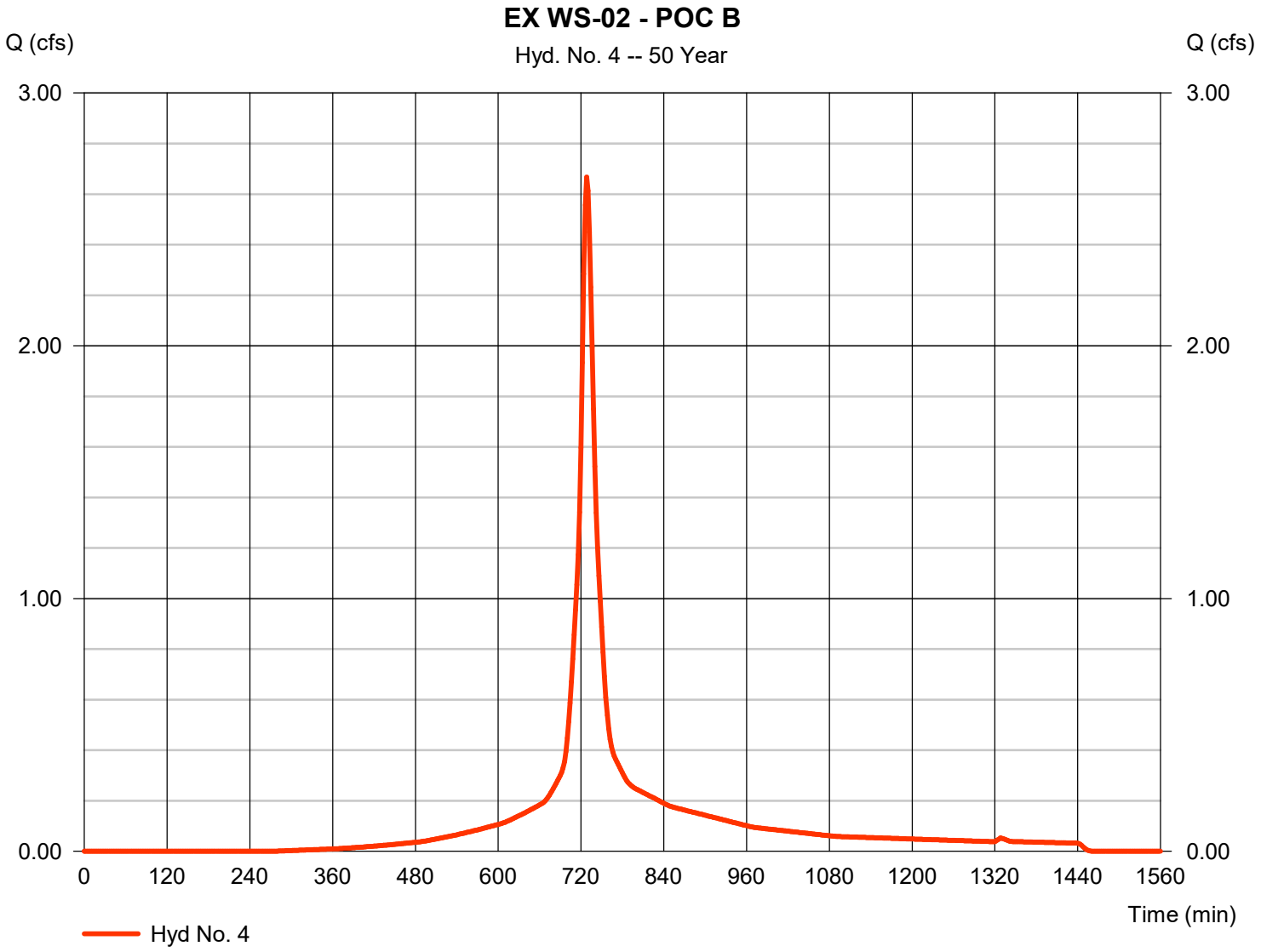


Hydrograph Report

Hyd. No. 4

EX WS-02 - POC B

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.667 cfs
Storm frequency	=	50 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	10,491 cuft
Drainage area	=	0.505 ac	Curve number	=	85
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	11.80 min
Total precip.	=	7.31 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

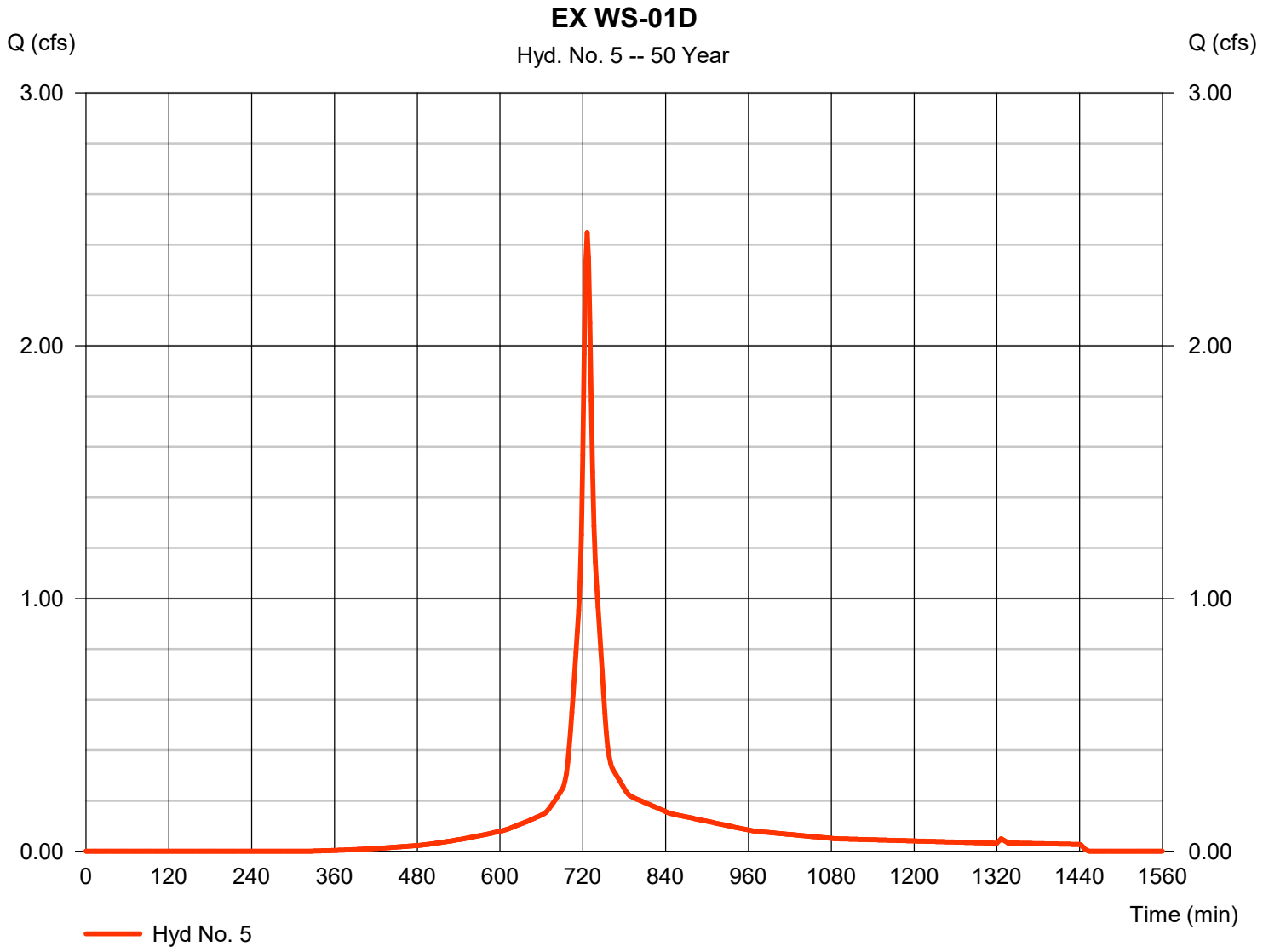


Hydrograph Report

Hyd. No. 5

EX WS-01D

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.449 cfs
Storm frequency	=	50 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	8,506 cuft
Drainage area	=	0.450 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.70 min
Total precip.	=	7.31 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



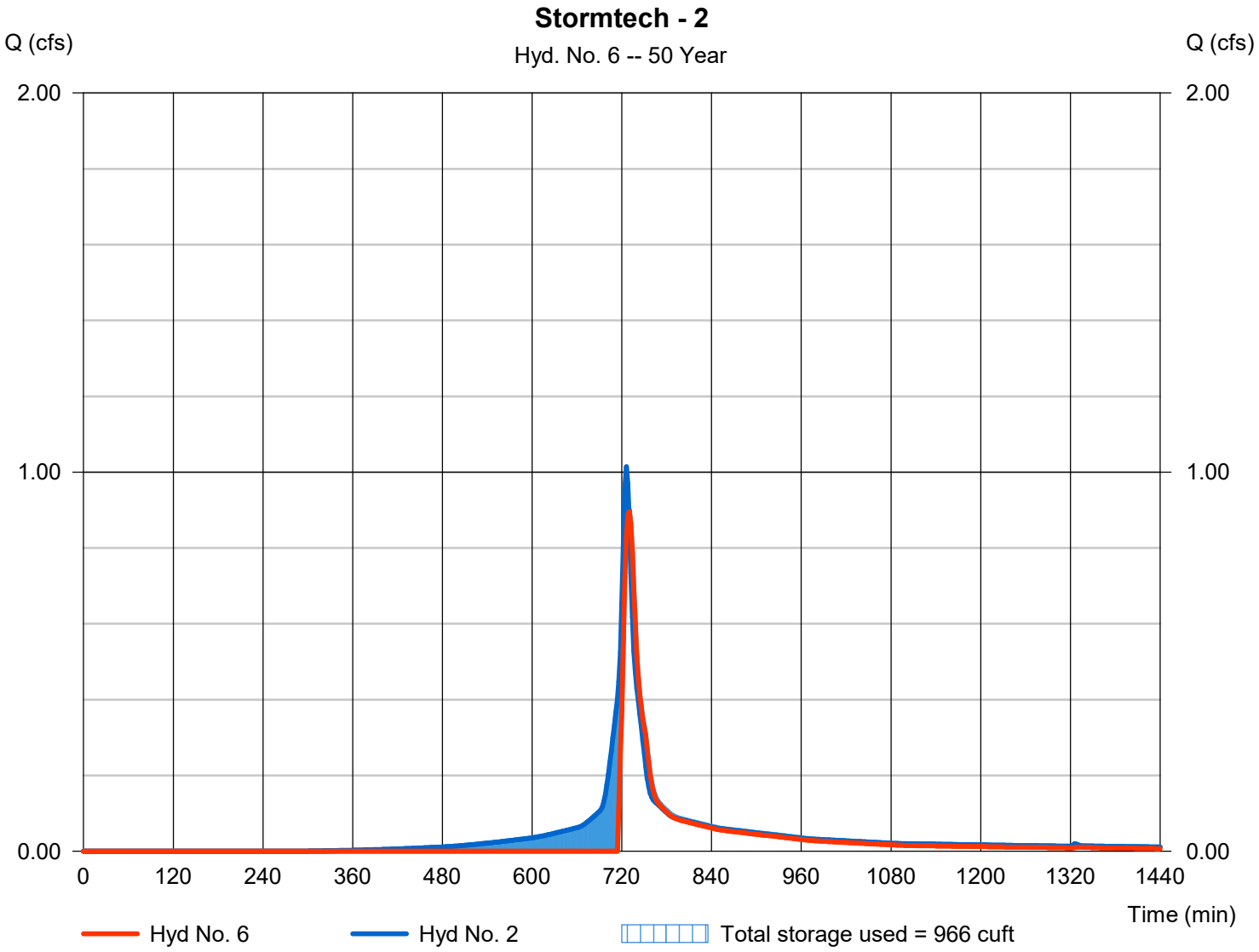
Hydrograph Report

Hyd. No. 6

Stormtech - 2

Hydrograph type	=	Reservoir	Peak discharge	=	0.896 cfs
Storm frequency	=	50 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	2,501 cuft
Inflow hyd. No.	=	2 - EX WS-01B	Max. Elevation	=	903.15 ft
Reservoir name	=	Stormtech -2	Max. Storage	=	966 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

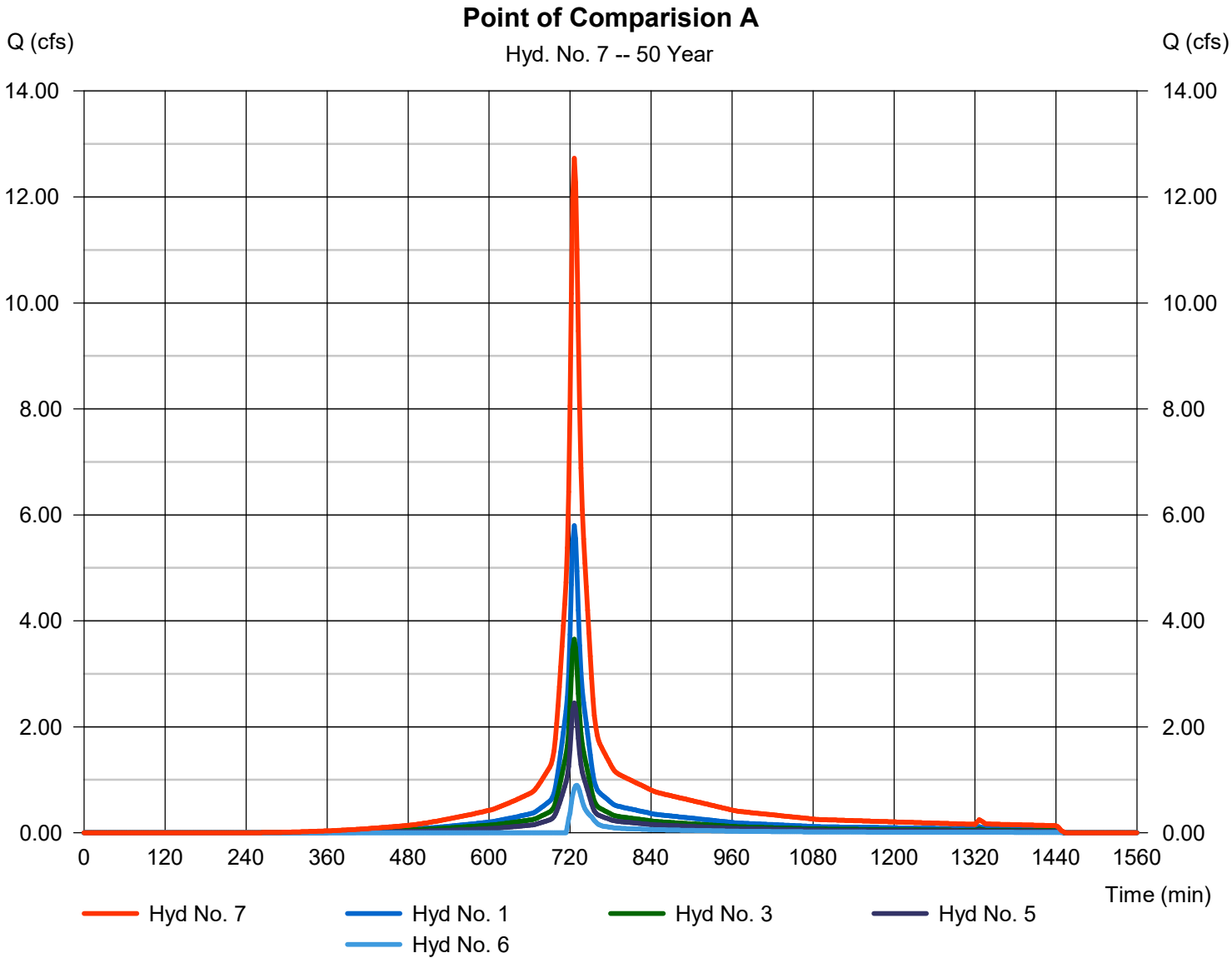


Hydrograph Report

Hyd. No. 7

Point of Comparision A

Hydrograph type	=	Combine	Peak discharge	=	12.73 cfs
Storm frequency	=	50 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	44,295 cuft
Inflow hyds.	=	1, 3, 5, 6	Contrib. drain. area	=	2.098 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	6.738	2	726	23,773	------	------	------	EX WS-01A
2	SCS Runoff	1.179	2	726	4,158	------	------	------	EX WS-01B
3	SCS Runoff	4.214	2	726	15,105	------	------	------	EX WS-01C
4	SCS Runoff	3.093	2	728	12,257	------	------	------	EX WS-02 - POC B
5	SCS Runoff	2.861	2	726	10,007	------	------	------	EX WS-01D
6	Reservoir	1.021	2	730	3,099	2	903.42	1,008	Stormtech - 2
7	Combine	14.76	2	726	51,983	1, 3, 5, 6	------	------	Point of Comparision A

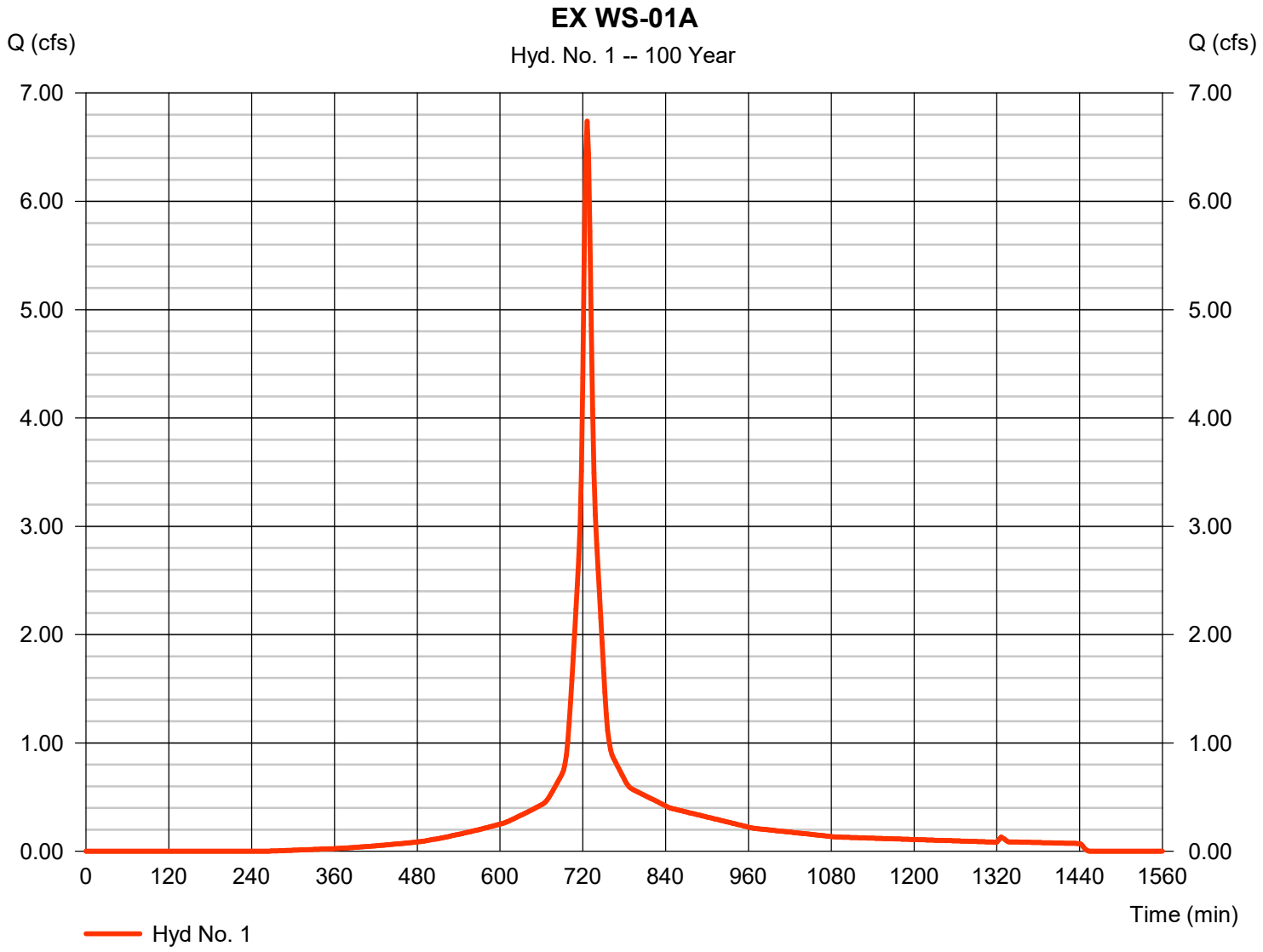
Hydrograph Report

Hyd. No. 1

EX WS-01A

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.738 cfs
Storm frequency	=	100 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	23,773 cuft
Drainage area	=	1.029 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.60 min
Total precip.	=	8.28 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.500 x 98) + (0.502 x 69)] / 1.029



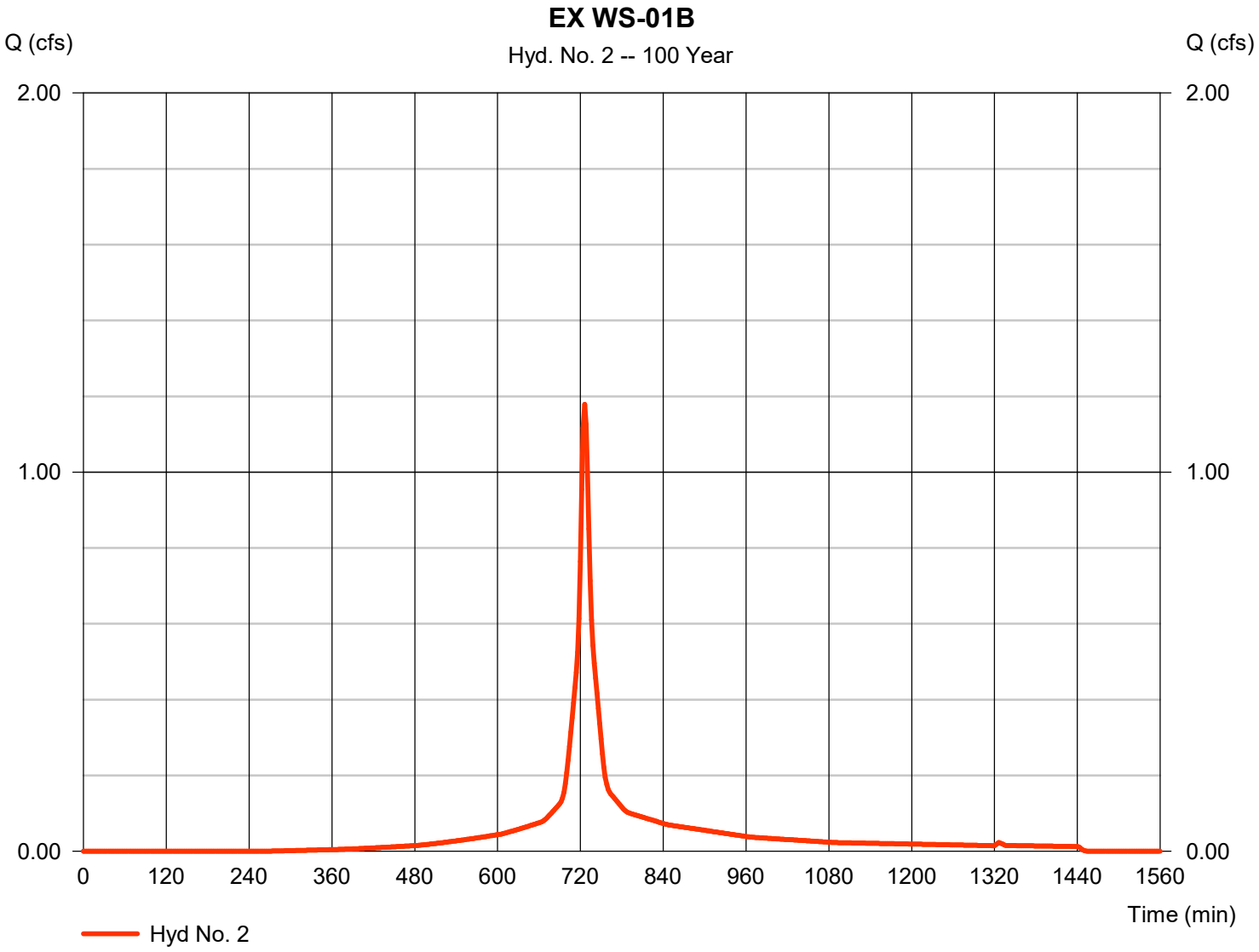
Hydrograph Report

Hyd. No. 2

EX WS-01B

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.179 cfs
Storm frequency	=	100 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	4,158 cuft
Drainage area	=	0.180 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.50 min
Total precip.	=	8.28 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.069 x 98)] / 0.180

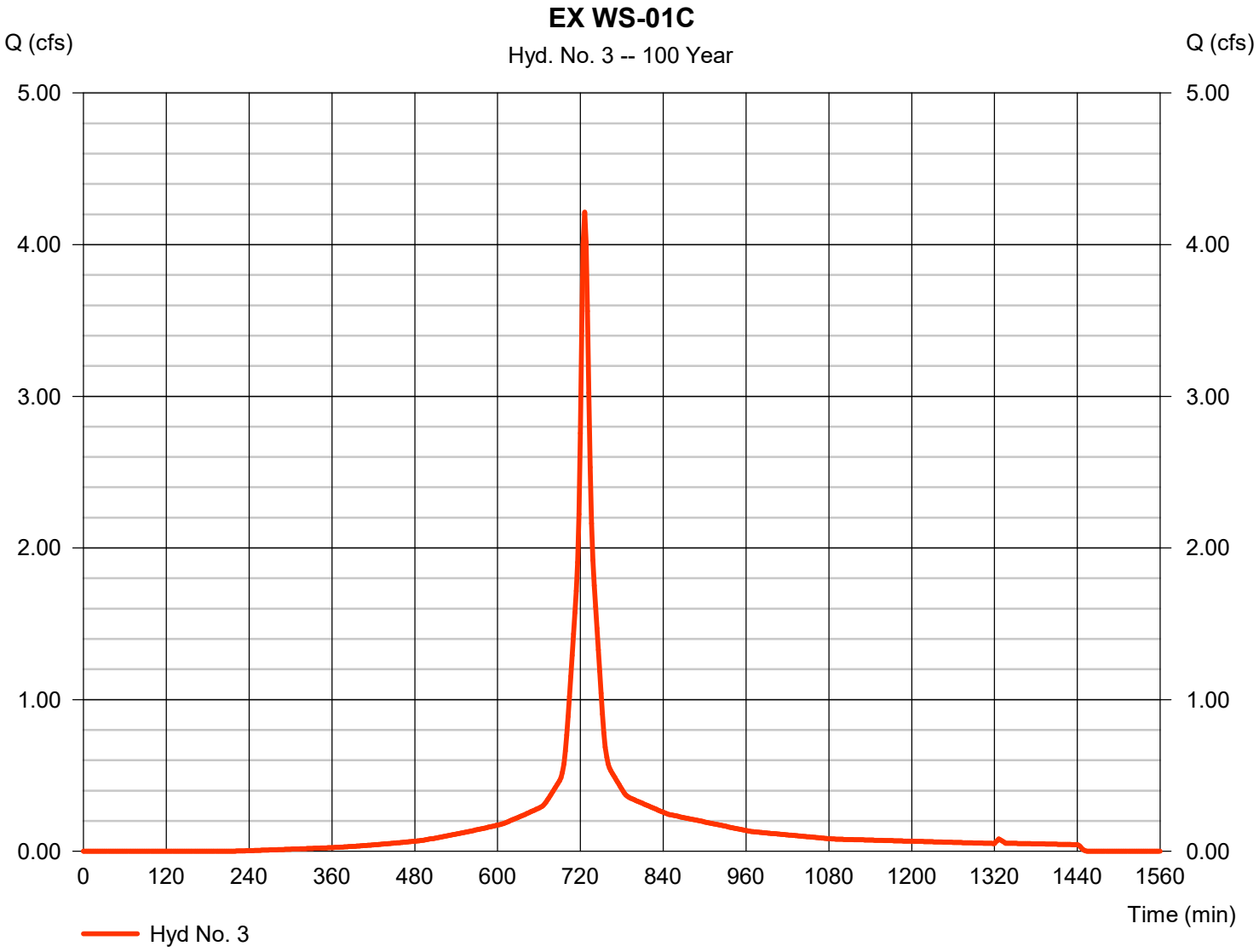


Hydrograph Report

Hyd. No. 3

EX WS-01C

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.214 cfs
Storm frequency	=	100 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	15,105 cuft
Drainage area	=	0.619 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.90 min
Total precip.	=	8.28 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

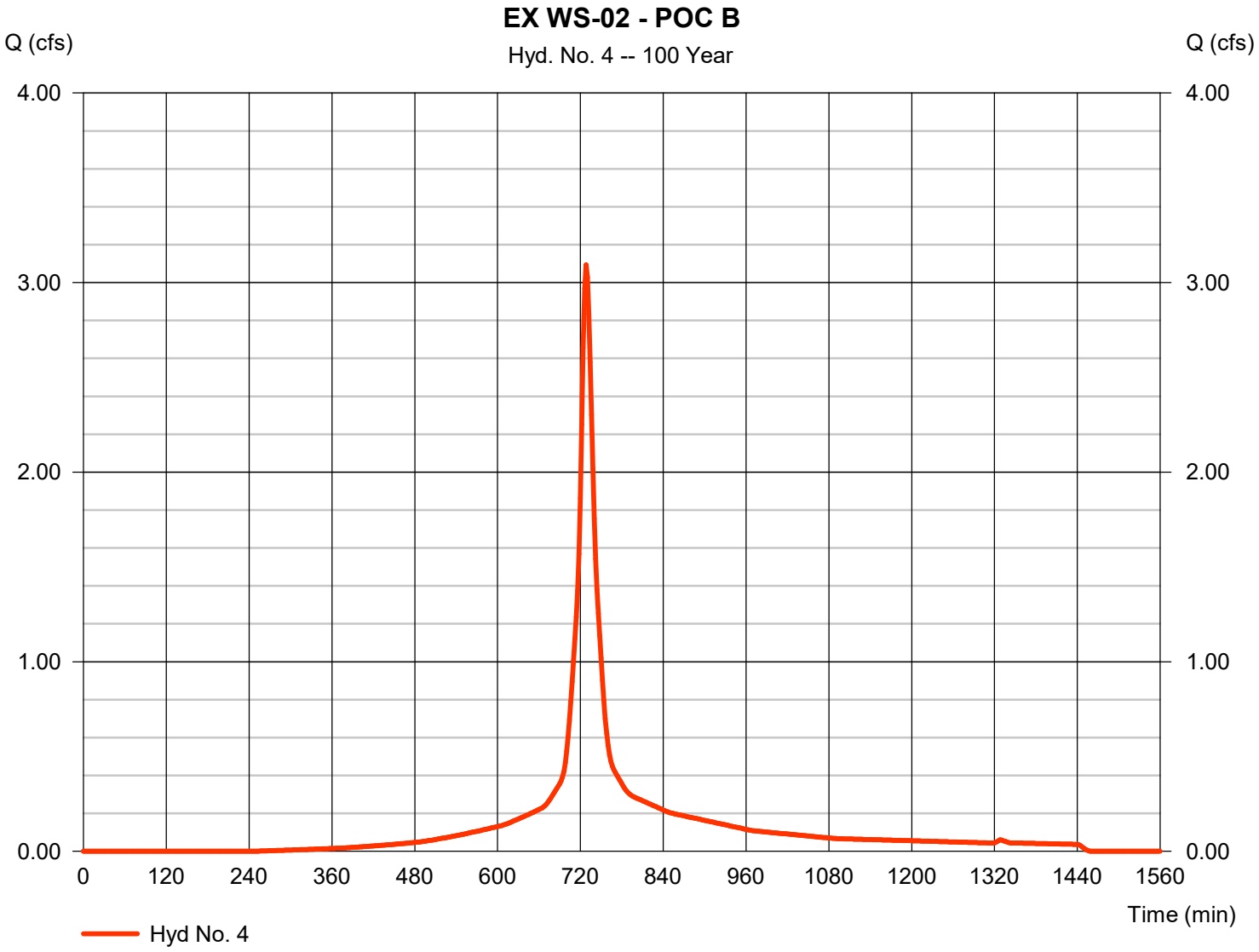


Hydrograph Report

Hyd. No. 4

EX WS-02 - POC B

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.093 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	12,257 cuft
Drainage area	=	0.505 ac	Curve number	=	85
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	11.80 min
Total precip.	=	8.28 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

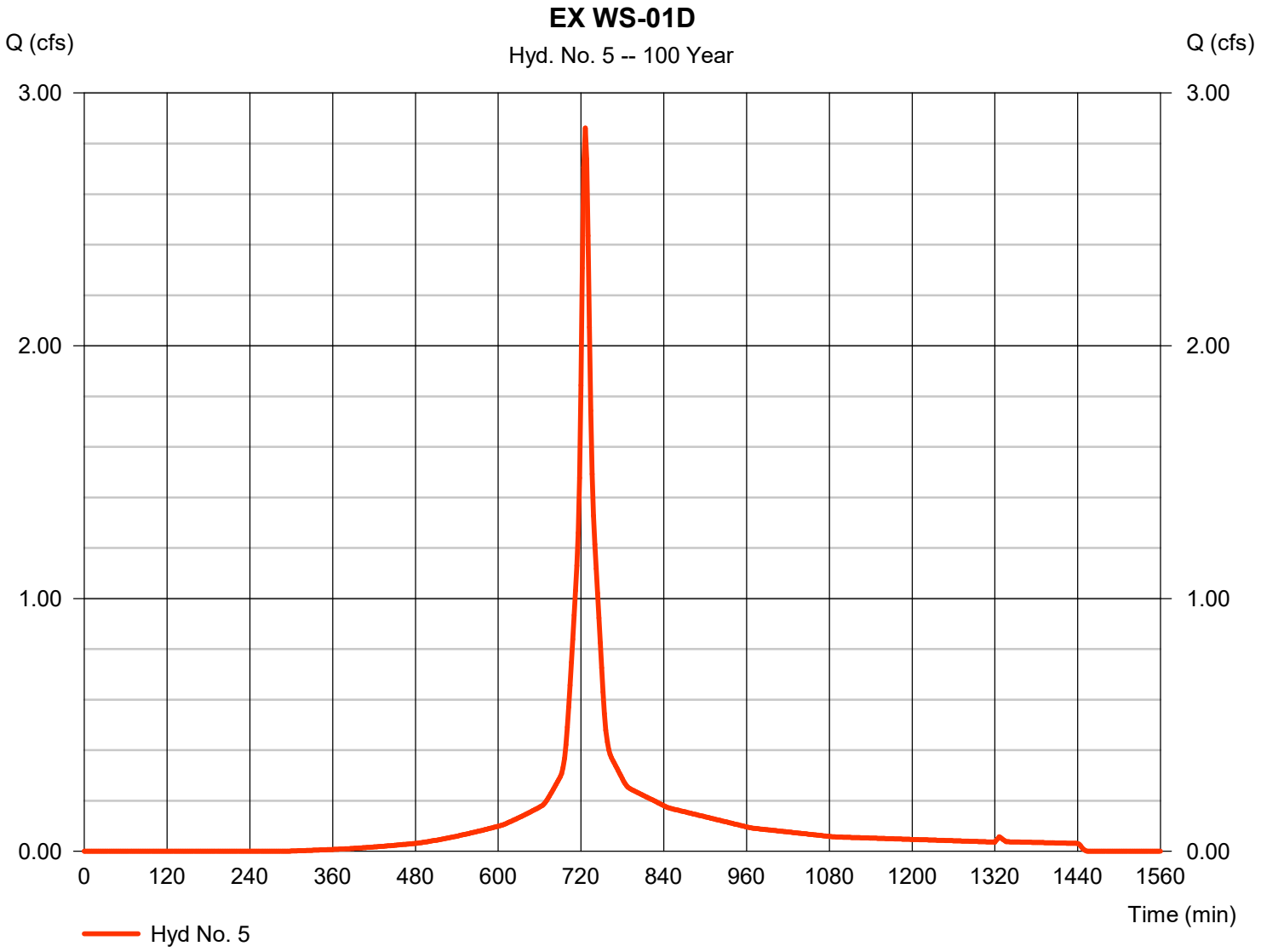


Hydrograph Report

Hyd. No. 5

EX WS-01D

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.861 cfs
Storm frequency	=	100 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	10,007 cuft
Drainage area	=	0.450 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.70 min
Total precip.	=	8.28 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



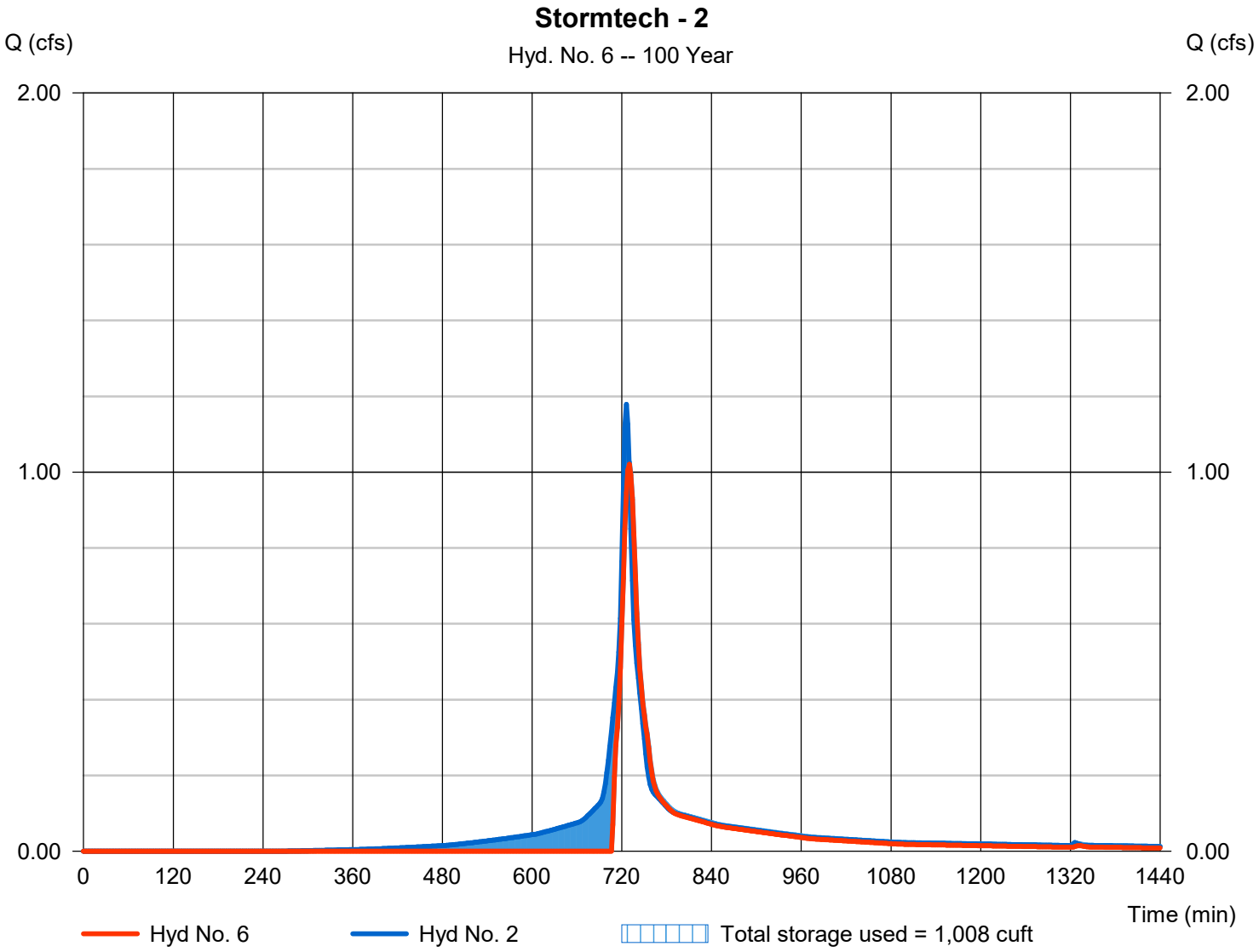
Hydrograph Report

Hyd. No. 6

Stormtech - 2

Hydrograph type	=	Reservoir	Peak discharge	=	1.021 cfs
Storm frequency	=	100 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	3,099 cuft
Inflow hyd. No.	=	2 - EX WS-01B	Max. Elevation	=	903.42 ft
Reservoir name	=	Stormtech -2	Max. Storage	=	1,008 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

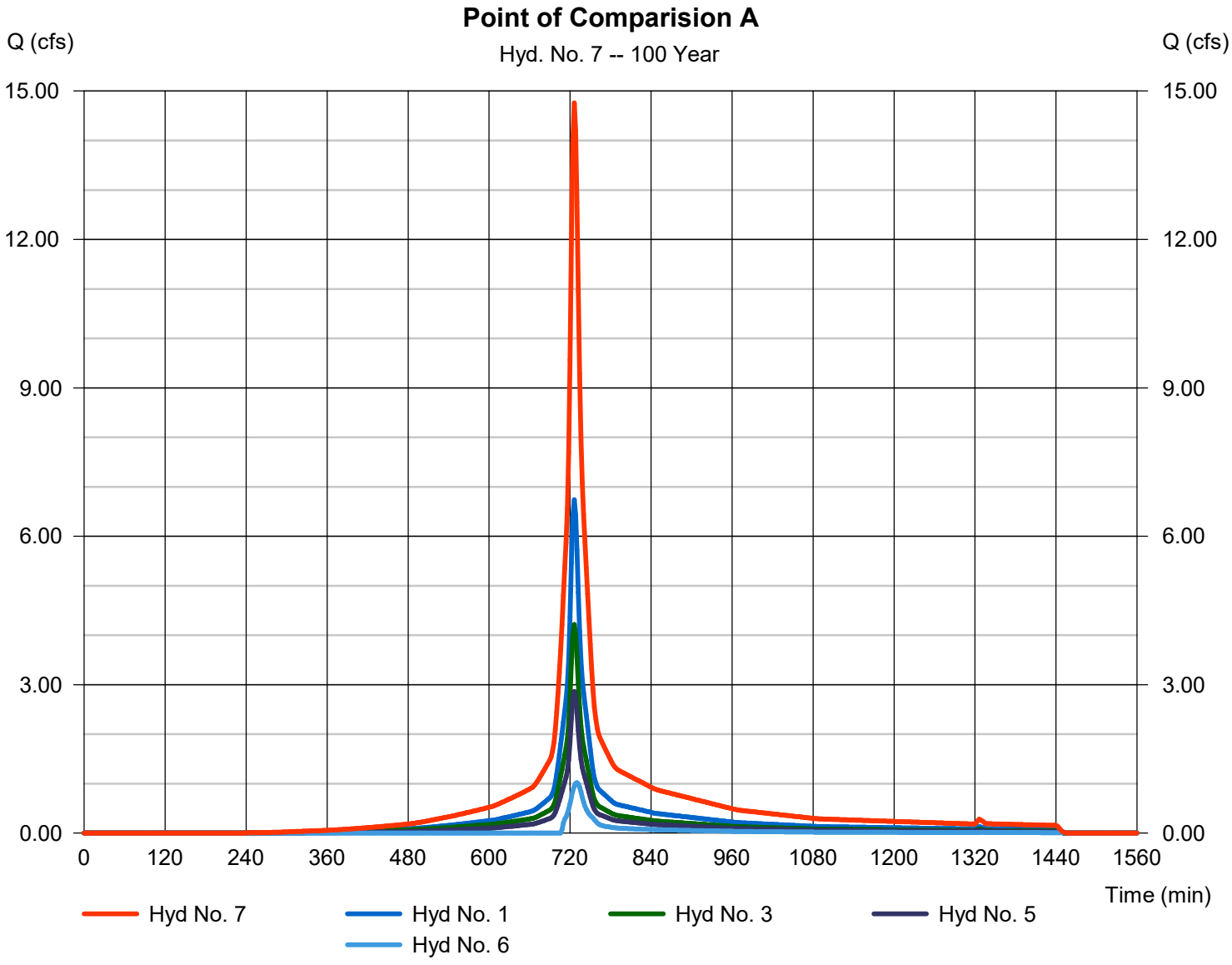


Hydrograph Report

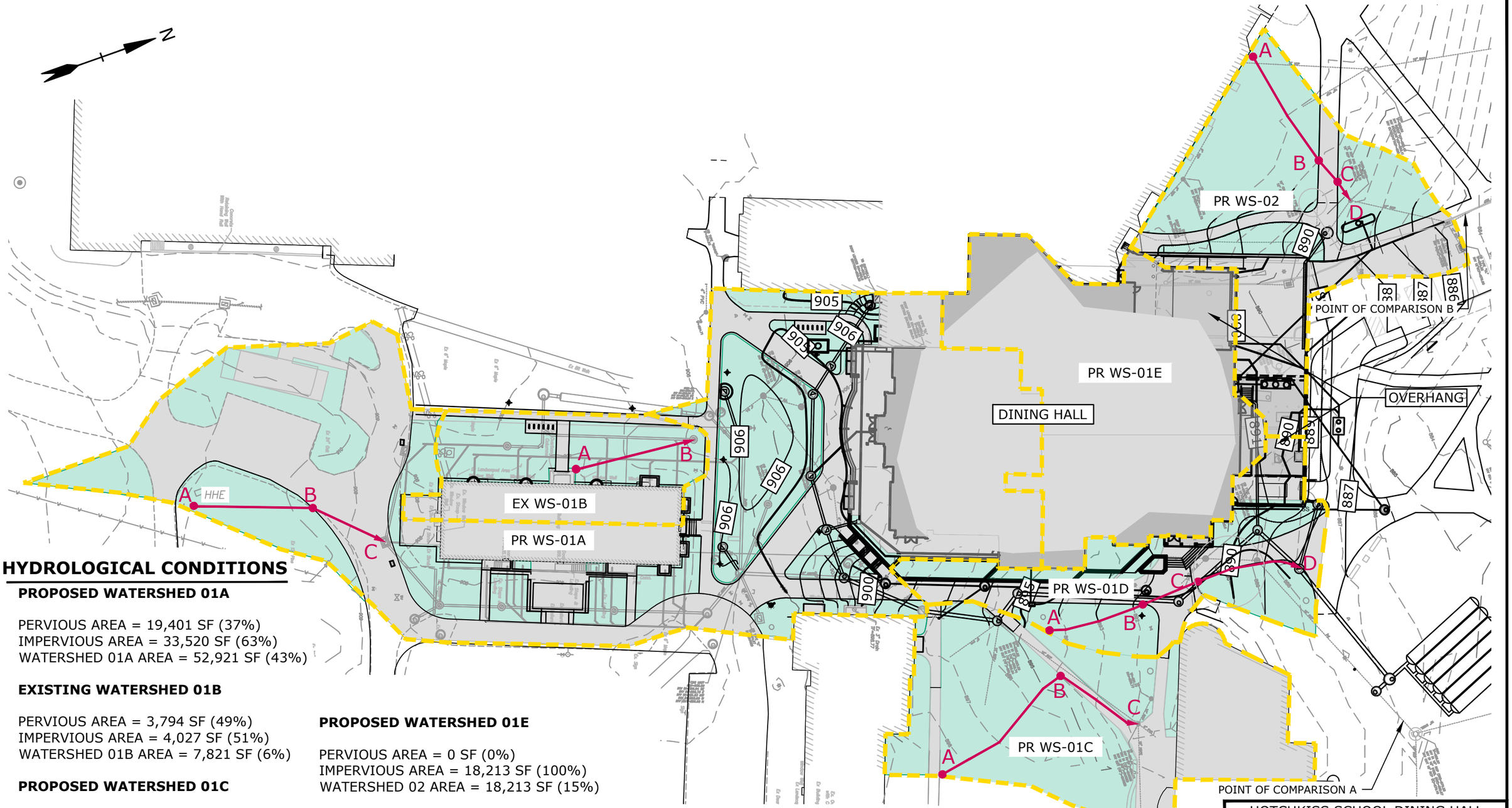
Hyd. No. 7

Point of Comparision A

Hydrograph type	= Combine	Peak discharge	= 14.76 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 51,983 cuft
Inflow hyds.	= 1, 3, 5, 6	Contrib. drain. area	= 2.098 ac



APPENDIX D



HYDROLOGICAL CONDITIONS

PROPOSED WATERSHED 01A

PERVIOUS AREA = 19,401 SF (37%)
IMPERVIOUS AREA = 33,520 SF (63%)
WATERSHED 01A AREA = 52,921 SF (43%)

EXISTING WATERSHED 01B

PERVIOUS AREA = 3,794 SF (49%)
IMPERVIOUS AREA = 4,027 SF (51%)
WATERSHED 01B AREA = 7,821 SF (6%)

PROPOSED WATERSHED 01C

PERVIOUS AREA = 10,035 SF (59%)
IMPERVIOUS AREA = 6,905 SF (41%)
WATERSHED 01C AREA = 16,940 SF (14%)

PROPOSED WATERSHED 01D

PERVIOUS AREA = 5,700 SF (54%)
IMPERVIOUS AREA = 4,925 SF (46%)
WATERSHED 02 AREA = 10,625 SF (9%)

PROPOSED WATERSHED 01E

PERVIOUS AREA = 0 SF (0%)
IMPERVIOUS AREA = 18,213 SF (100%)
WATERSHED 02 AREA = 18,213 SF (15%)

PROPOSED WATERSHED 02

PERVIOUS AREA = 8,567 SF (55%)
IMPERVIOUS AREA = 6,998 SF (45%)
WATERSHED 03 AREA = 15,656 SF (13%)

TOTAL PERVIOUS AREA = 47,497 SF (39%)
TOTAL IMPERVIOUS AREA = 74,588 SF (61%)
TOTAL WATERSHED AREA: 122,085 SF

LEGEND

- WATERSHED LINE
- Tc LINE
- Pervious Surface
- Impervious Surface

0 50' 100'
SCALE: 1" = 50'

HOTCHKISS SCHOOL DINING HALL
SALISBURY, CT

PROPOSED WATERSHED MAP

DATE: 11/16/2023
SCALE: 1" = 50'
FIGURE: WM-02

Tighe&Bond
Engineers | Environmental Specialists

Tighe&Bond
Engineers | Environmental Specialists

Project Name:	**Hotchkiss School Dining Hall**
Project Number:	**H5003-002**
Project Location:	**Salisbury, CT**
Description:	**Proposed CN & Tc Calculations**
Prepared By:	**AC** Checked By: **KM**
Date:	**November 16, 2023**

SCS Curve Number (CN)

Designation: **PR WS-01A**
Location:

Cover Type	Area (ac)	CN	A x CN
Pavement	0.770	98	75.4123
Landscaped and Lawns	0.445	69	30.7316
	1.215		106.1439

Weighted CN: 87

Time of Concentration (Tc)

Overland				
Segment	**Surface "n"**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min.**
Segment A - B	0.24	63	0.024	9.0
Segment B - C	0.015	42	0.036	0.6

Total Tc = 9.6 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Curve number computed in accordance with USDA TR-55
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

SCS Curve Number (CN)

Designation: **EX WS-01B**
Location:

Cover Type	Area (ac)	CN	A x CN
Pavement	0.092	98	9.0598
Landscaped and Lawns	0.087	69	6.0098
	0.180		15.0696

Weighted CN: 84

Time of Concentration (Tc)

Overland				
Segment	**Surface "n"**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min.**
Segment A - B	0.24	65	0.03	8.5

Total Tc = 8.5 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Curve number computed in accordance with USDA TR-55
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Tighe&Bond
Engineers | Environmental Specialists

Project Name:	**Hotchkiss School Dining Hall**
Project Number:	**H5003-002**
Project Location:	**Salisbury, CT**
Description:	**Proposed CN & Tc Calculations**
Prepared By:	**AC** Checked By: **KM**
Date:	**November 16, 2023**

SCS Curve Number (CN)

Designation: **PR WS-01C**
Location:

Cover Type	Area (ac)	CN	A x CN
Pavement	0.159	98	15.5347
Landscaped and Lawns	0.230	69	15.8957
	0.389		31.4303

Weighted CN: 81

Time of Concentration (Tc)

Overland				
Segment	**Surface "n"**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.24	85	0.054	8.3
Segment B - C	0.015	49	0.053	0.6

Total Tc = 8.9 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Curve number computed in accordance with USDA TR-55
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

SCS Curve Number (CN)

Designation: **PR WS-01D**
Location:

Cover Type	Area (ac)	CN	A x CN
Pavement	0.113	98	11.0801
Landscaped and Lawns	0.131	69	9.0289
	0.244		20.1090

Weighted CN: 82

Time of Concentration (Tc)

Overland				
Segment	**Surface "n"**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.24	52	0.054	5.6
Segment B - C	0.015	32	0.03	0.5
Segment C - D	0.015	55	0.055	0.6

Total Tc = 6.8 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Curve number computed in accordance with USDA TR-55
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Tighe&Bond
Engineers | Environmental Specialists

Project Name:	**Hotchkiss School Dining Hall**
Project Number:	**H5003-002**
Project Location:	**Salisbury, CT**
Description:	**Proposed CN & Tc Calculations**
Prepared By:	**AC** Checked By: **KM**
Date:	**November 16, 2023**

SCS Curve Number (CN)

Designation: **PR WS-01E**
Location:

Cover Type	Area (ac)	CN	A x CN
Pavement	0.418	98	40.9751
Landscaped and Lawns	0.000	69	0.0000
	0.418		40.9751

Weighted CN: 98

Time of Concentration (Tc)

Overland				
Segment	**Surface "n"**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.015	154	0.01	2.9

Total Tc = 2.9 Min
Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Curve number computed in accordance with USDA TR-55
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

SCS Curve Number (CN)

Designation: **PR WS-02**
Location:

Cover Type	Area (ac)	CN	A x CN
Pavement	0.161	98	15.7439
Landscaped and Lawns	0.197	69	13.5703
	0.357		29.3142

Weighted CN: 82

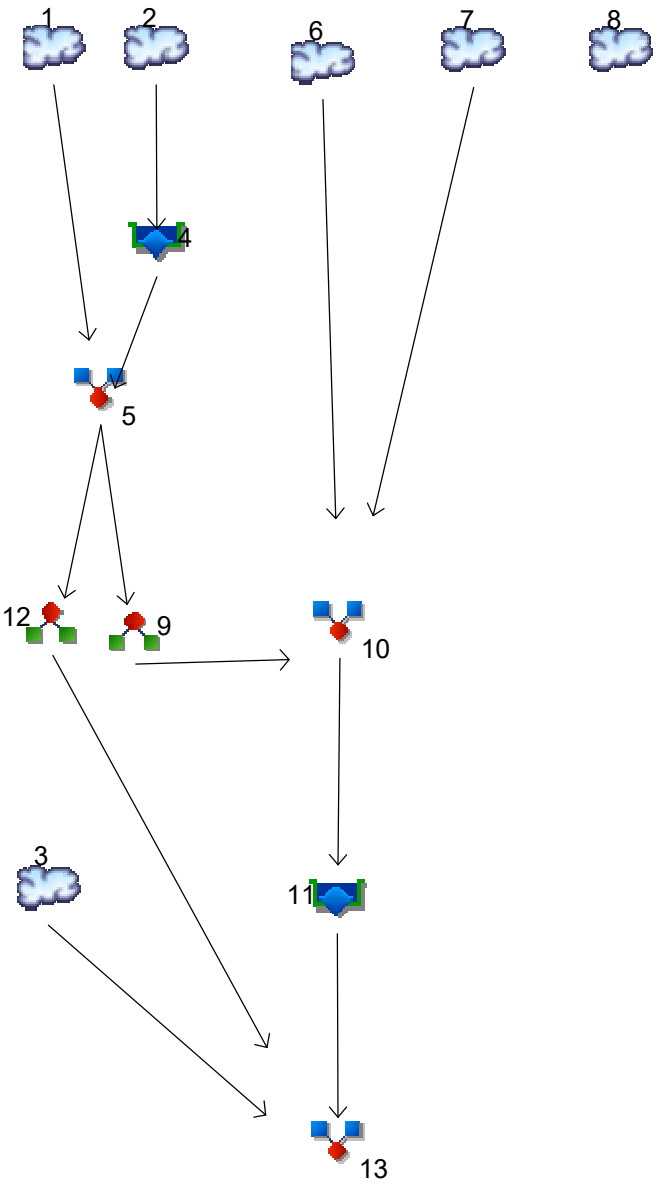
Time of Concentration (Tc)

Overland				
Segment	**Surface "n"**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.24	68	0.019	10.5
Segment B - C	0.015	15	0.07	0.2
Segment C - D	0.24	12	0.17	1.1

Total Tc = 11.8 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Curve number computed in accordance with USDA TR-55
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Watershed Model Schematic



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.336	2	726	7,979	------	------	------	PR WS-01A
2	SCS Runoff	0.302	2	726	1,034	------	------	------	EX WS-01B
3	SCS Runoff	0.562	2	726	1,942	------	------	------	PR WS-01C
4	Reservoir	0.005	2	1034	48	2	902.03	758	Stormtech - 2
5	Combine	2.336	2	726	8,027	1, 4	------	------	Flow Diversion
6	SCS Runoff	0.371	2	726	1,277	------	------	------	PR WS-01D
7	SCS Runoff	1.204	2	724	4,051	------	------	------	PR WS-01E
8	SCS Runoff	0.498	2	728	1,927	------	------	------	PR WS-02 - POC B
9	Diversion1	0.584	2	726	2,007	5	------	------	To UG infiltration
10	Combine	2.092	2	724	7,335	6, 7, 9	------	------	Combine 1
11	Reservoir	0.489	2	750	4,389	10	880.89	3,235	Design Point 3
12	Diversion2	1.752	2	726	6,020	5	------	------	Bypass Flow
13	Combine	2.523	2	726	12,351	3, 11, 12	------	------	Point of Comparision A

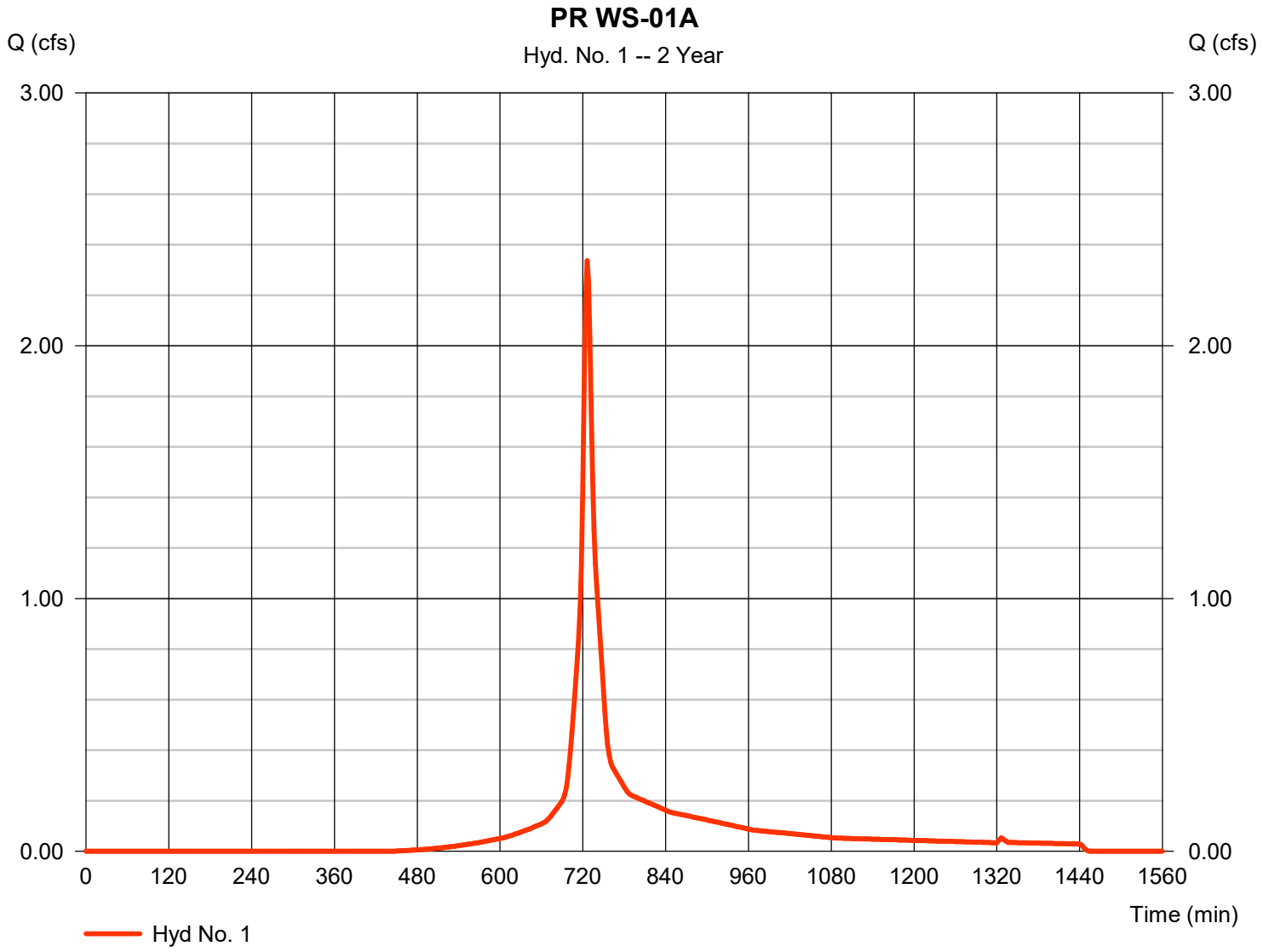
Hydrograph Report

Hyd. No. 1

PR WS-01A

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.336 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	7,979 cuft
Drainage area	=	1.215 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.60 min
Total precip.	=	3.08 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.500 x 98) + (0.502 x 69)] / 1.215



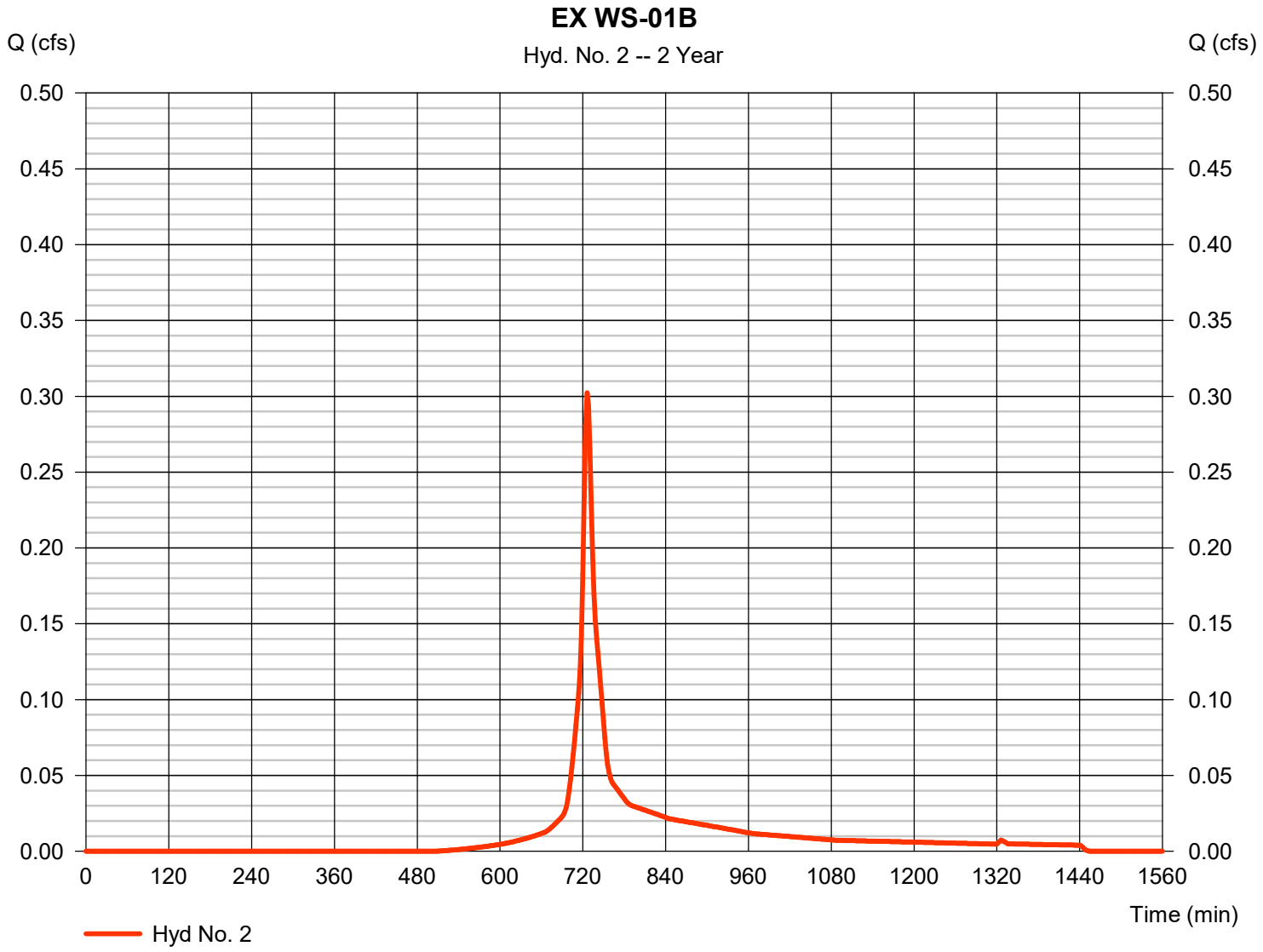
Hydrograph Report

Hyd. No. 2

EX WS-01B

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.302 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	1,034 cuft
Drainage area	=	0.180 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.50 min
Total precip.	=	3.08 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.069 x 98)] / 0.180

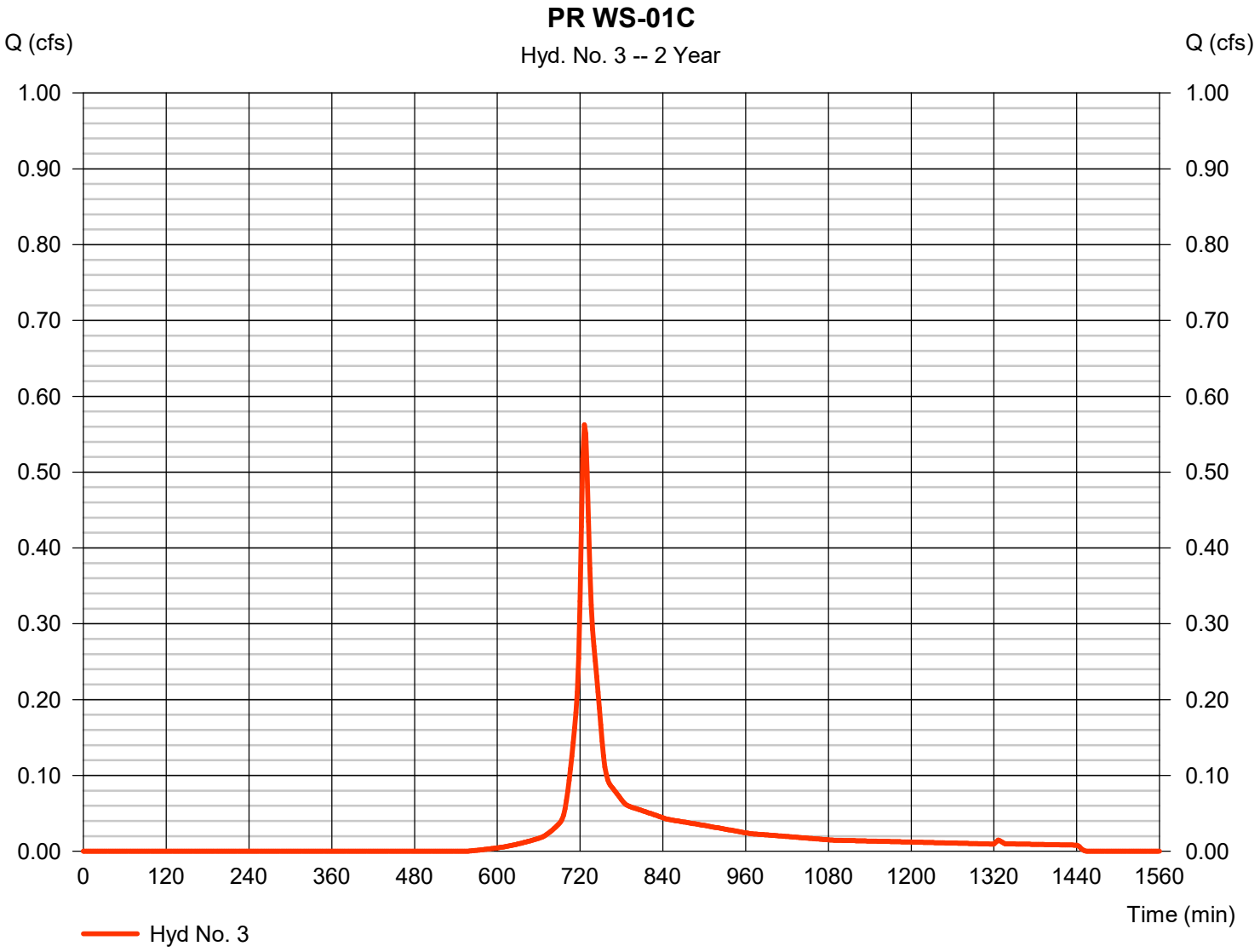


Hydrograph Report

Hyd. No. 3

PR WS-01C

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.562 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	1,942 cuft
Drainage area	=	0.389 ac	Curve number	=	81
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.90 min
Total precip.	=	3.08 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



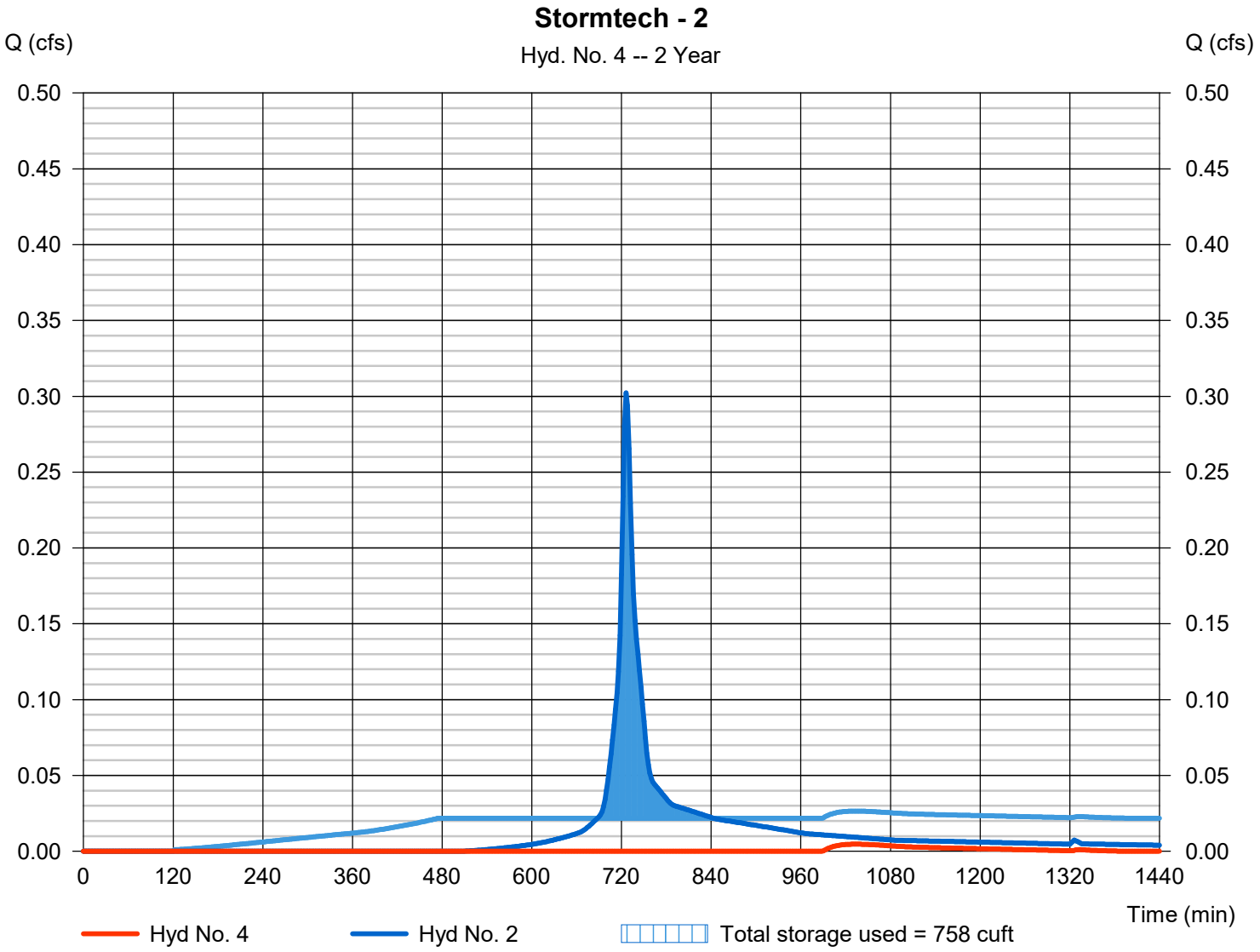
Hydrograph Report

Hyd. No. 4

Stormtech - 2

Hydrograph type	=	Reservoir	Peak discharge	=	0.005 cfs
Storm frequency	=	2 yrs	Time to peak	=	1034 min
Time interval	=	2 min	Hyd. volume	=	48 cuft
Inflow hyd. No.	=	2 - EX WS-01B	Max. Elevation	=	902.03 ft
Reservoir name	=	Stormtech -2	Max. Storage	=	758 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 1 - Stormtech -2

Pond Data

UG Chambers -Invert elev. = 900.00 ft, Rise x Span = 2.50 x 4.17 ft, Barrel Len = 63.75 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 899.00 ft, Width = 6.17 ft, Height = 6.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	899.00	n/a	0	0
0.60	899.60	n/a	94	94
1.20	900.20	n/a	126	221
1.80	900.80	n/a	188	409
2.40	901.40	n/a	180	589
3.00	902.00	n/a	164	753
3.60	902.60	n/a	127	880
4.20	903.20	n/a	94	974
4.80	903.80	n/a	94	1,069
5.40	904.40	n/a	94	1,163
6.00	905.00	n/a	94	1,257

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 6.00	0.00	0.00	0.00
Span (in)	= 6.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 902.00	0.00	0.00	0.00
Length (ft)	= 10.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.500 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

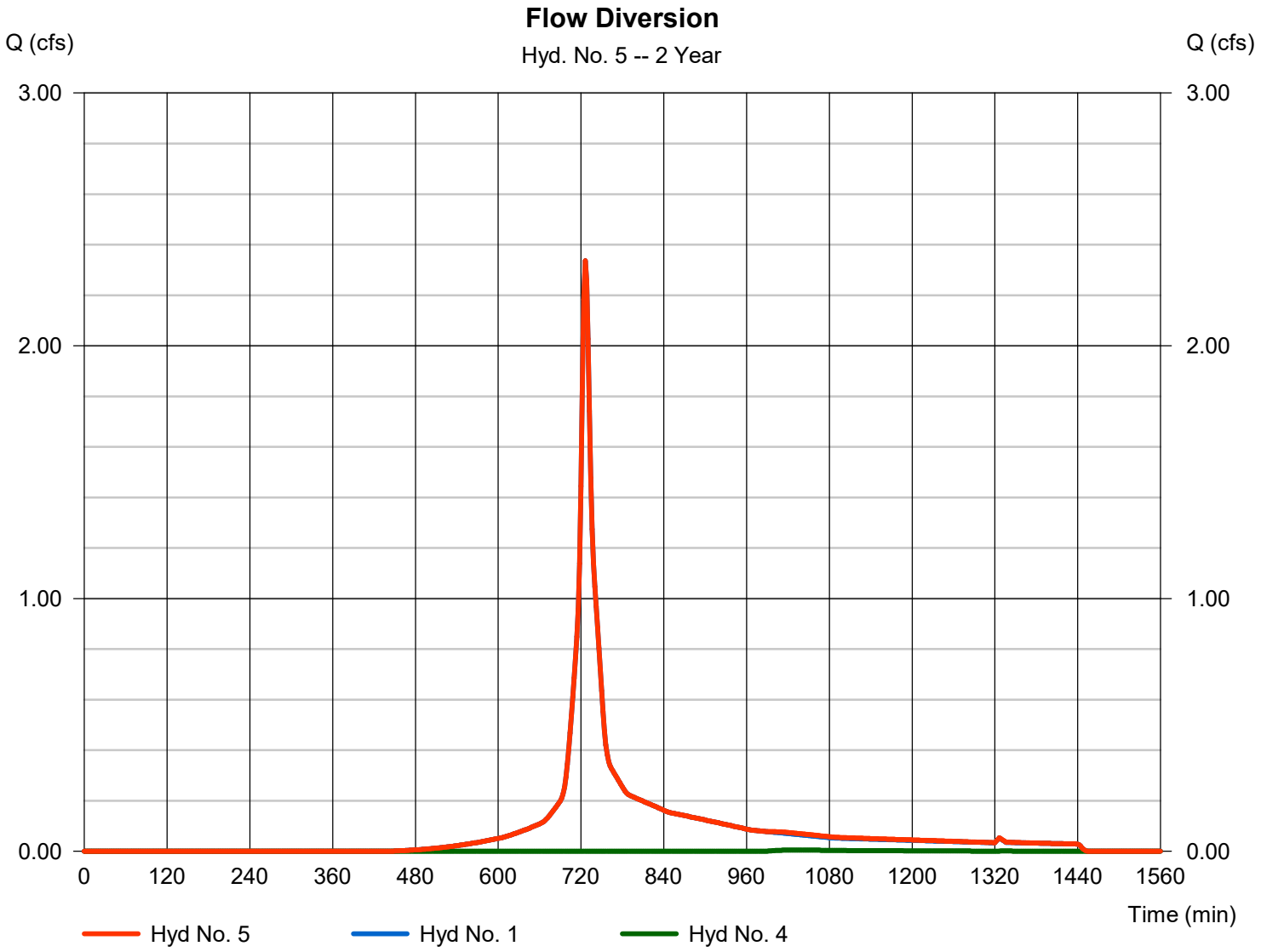
Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	899.00	0.00	---	---	---	---	---	---	---	0.000	---	0.000
0.60	94	899.60	0.00	---	---	---	---	---	---	---	0.005	---	0.005
1.20	221	900.20	0.00	---	---	---	---	---	---	---	0.005	---	0.005
1.80	409	900.80	0.00	---	---	---	---	---	---	---	0.005	---	0.005
2.40	589	901.40	0.00	---	---	---	---	---	---	---	0.005	---	0.005
3.00	753	902.00	0.00	---	---	---	---	---	---	---	0.005	---	0.005
3.60	880	902.60	0.47 oc	---	---	---	---	---	---	---	0.005	---	0.471
4.20	974	903.20	0.92 ic	---	---	---	---	---	---	---	0.005	---	0.926
4.80	1,069	903.80	1.18 ic	---	---	---	---	---	---	---	0.005	---	1.181
5.40	1,163	904.40	1.39 ic	---	---	---	---	---	---	---	0.005	---	1.391
6.00	1,257	905.00	1.57 ic	---	---	---	---	---	---	---	0.005	---	1.572

Hydrograph Report

Hyd. No. 5

Flow Diversion

Hydrograph type	= Combine	Peak discharge	= 2.336 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 8,027 cuft
Inflow hyds.	= 1, 4	Contrib. drain. area	= 1.215 ac

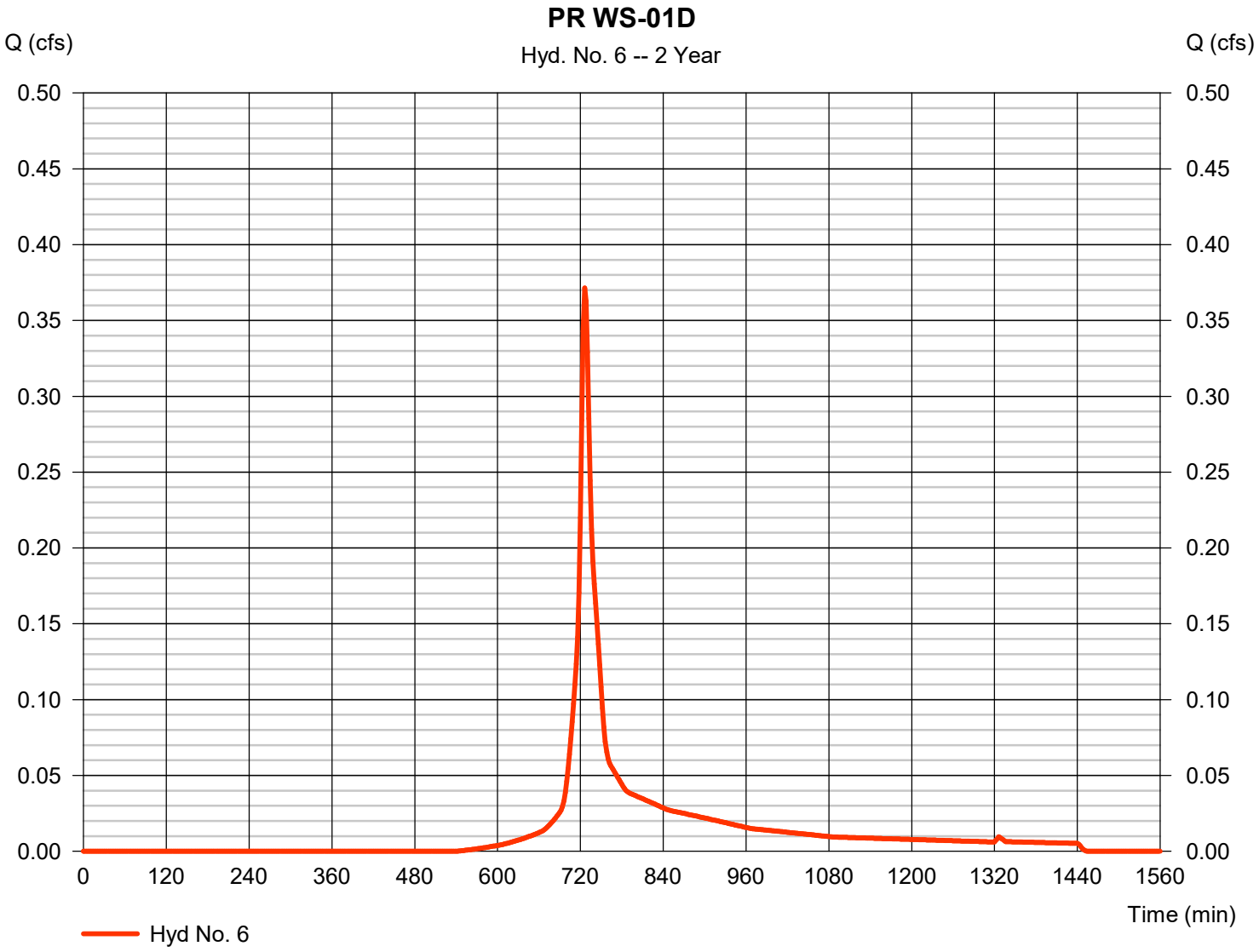


Hydrograph Report

Hyd. No. 6

PR WS-01D

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.371 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	1,277 cuft
Drainage area	=	0.244 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.80 min
Total precip.	=	3.08 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

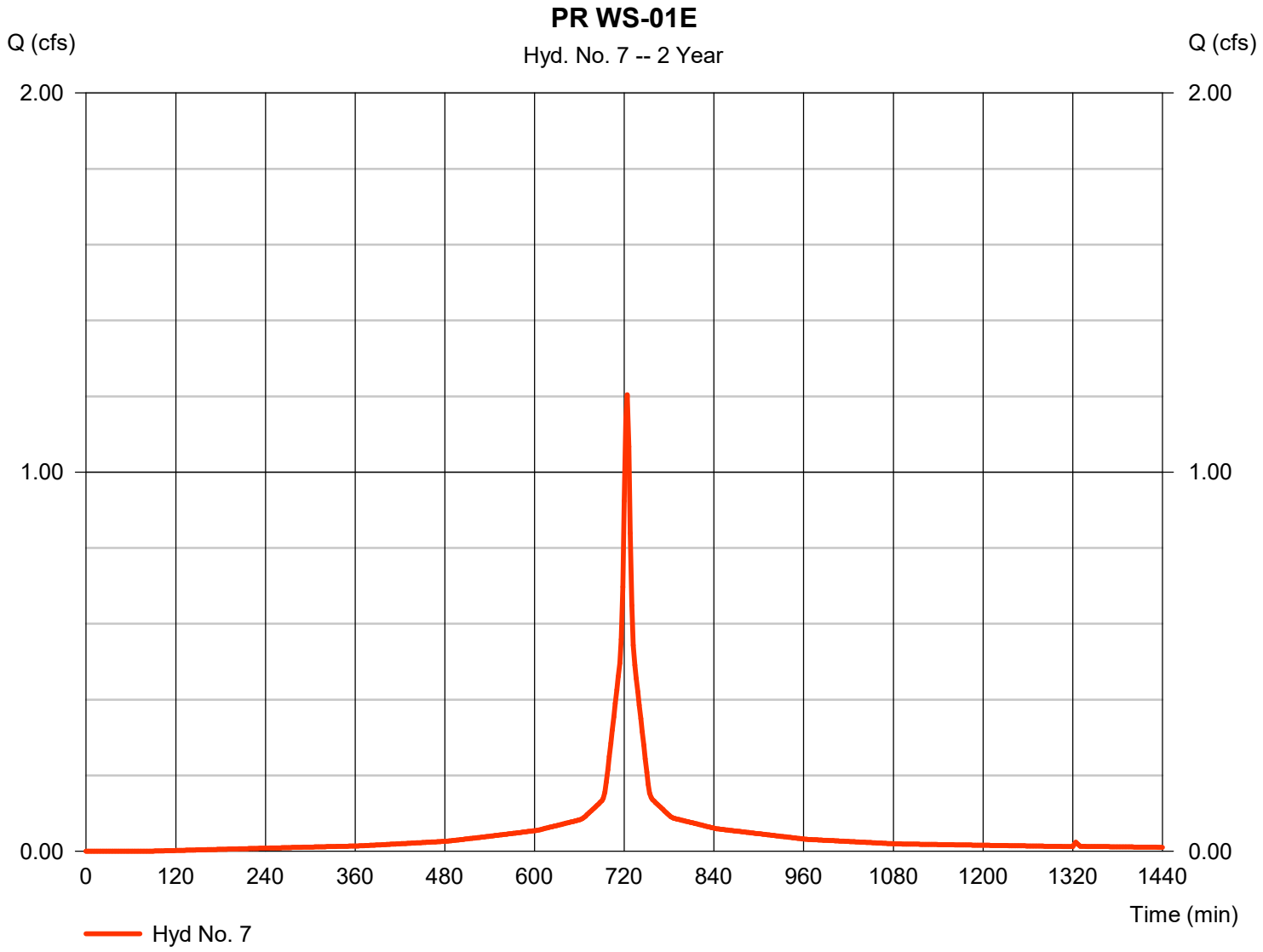


Hydrograph Report

Hyd. No. 7

PR WS-01E

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.204 cfs
Storm frequency	=	2 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	4,051 cuft
Drainage area	=	0.418 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.08 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

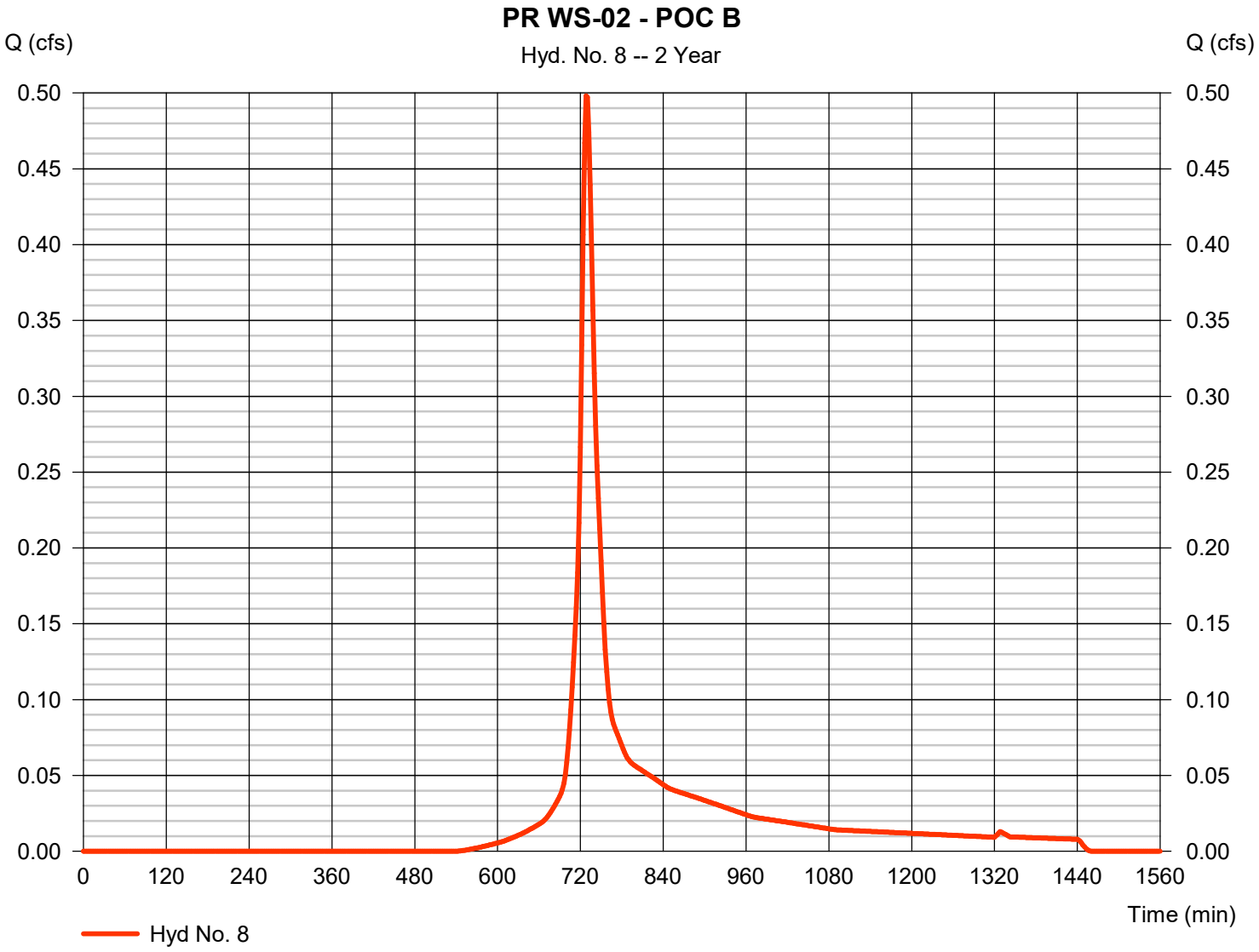


Hydrograph Report

Hyd. No. 8

PR WS-02 - POC B

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.498 cfs
Storm frequency	=	2 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	1,927 cuft
Drainage area	=	0.357 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	11.80 min
Total precip.	=	3.08 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

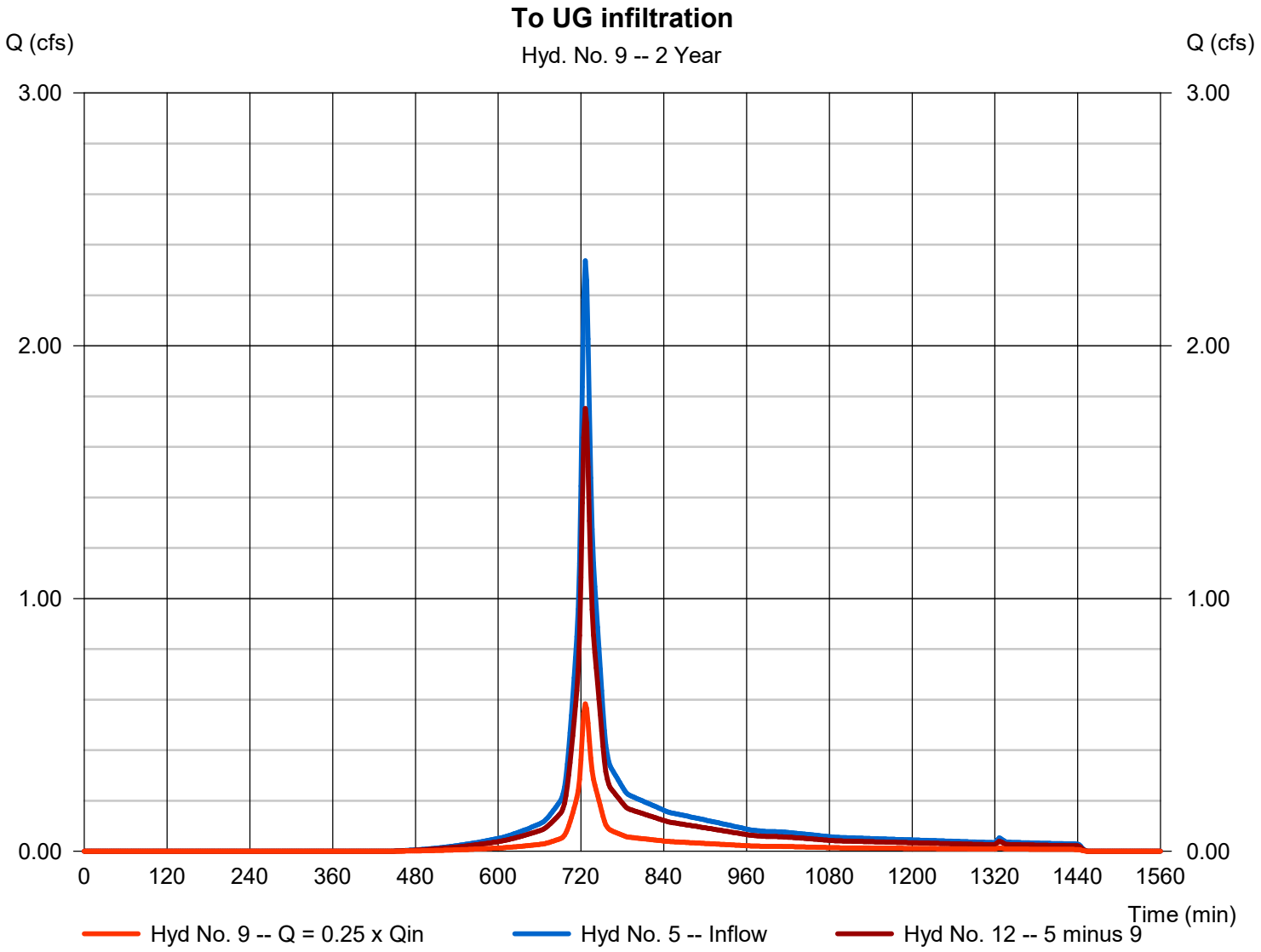


Hydrograph Report

Hyd. No. 9

To UG infiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.584 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 2,007 cuft
Inflow hydrograph	= 5 - Flow Diversion	2nd diverted hyd.	= 12
Diversion method	= Flow Ratio	Flow ratio	= 0.25

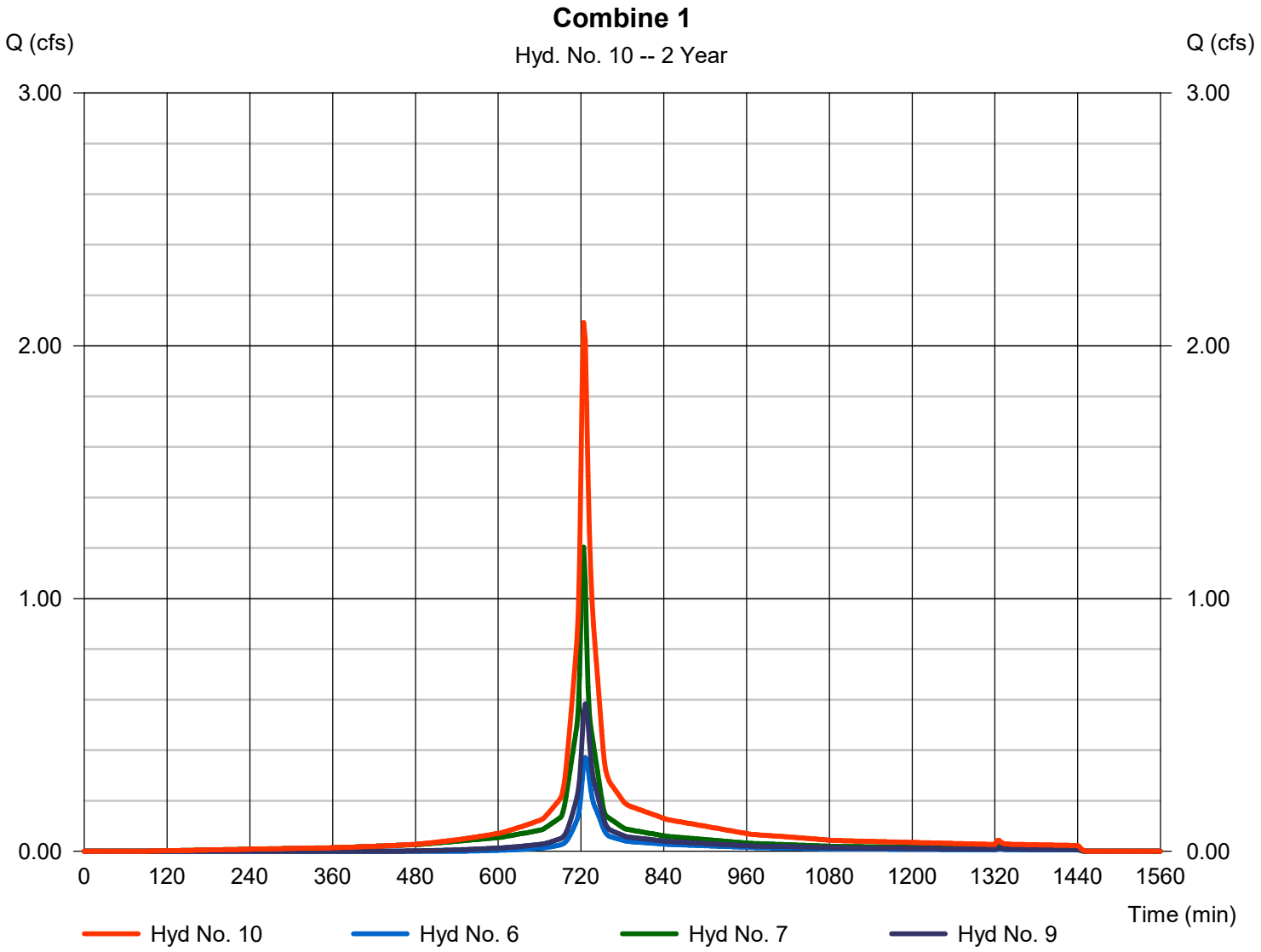


Hydrograph Report

Hyd. No. 10

Combine 1

Hydrograph type	= Combine	Peak discharge	= 2.092 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 7,335 cuft
Inflow hyds.	= 6, 7, 9	Contrib. drain. area	= 0.662 ac



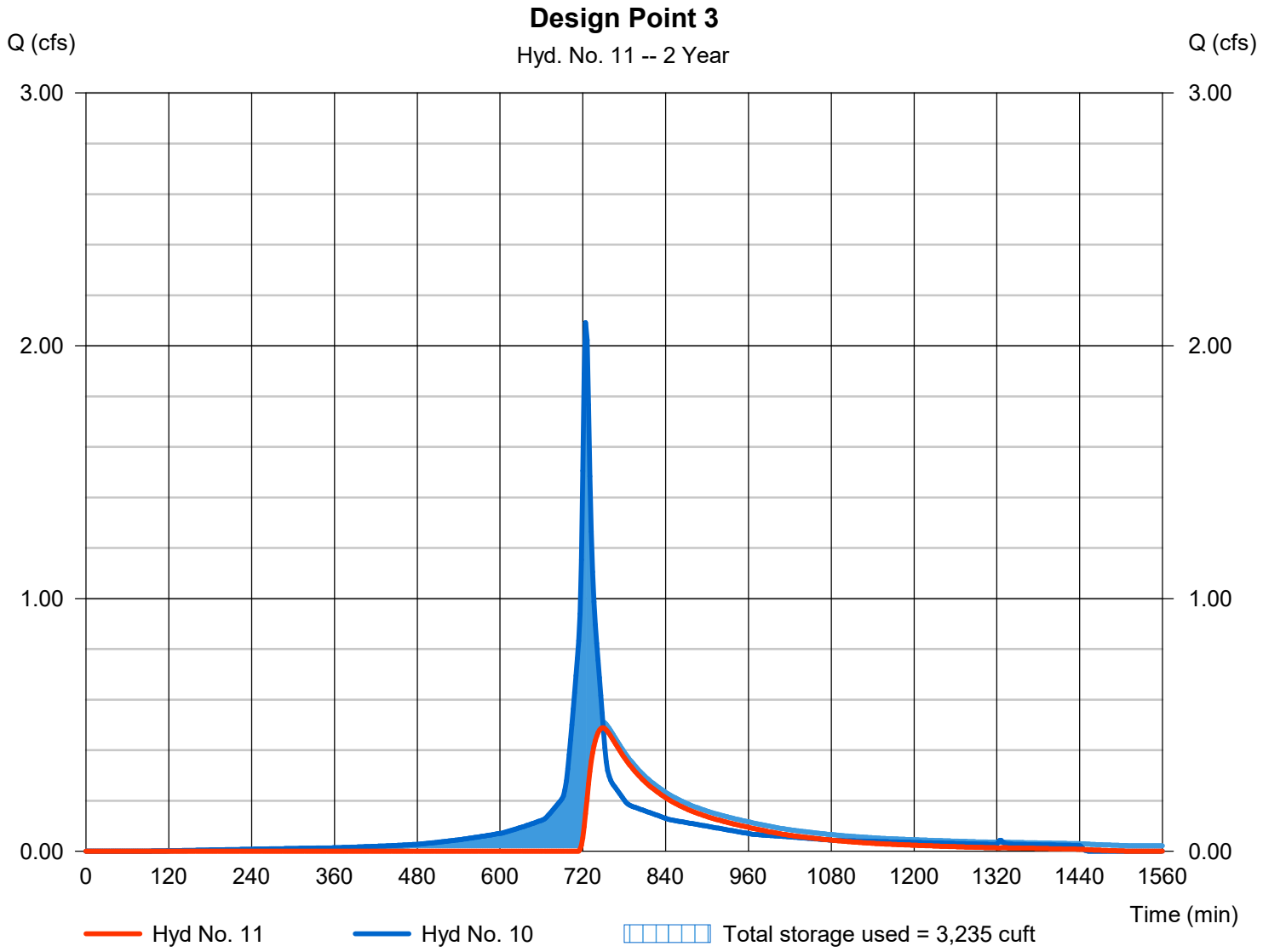
Hydrograph Report

Hyd. No. 11

Design Point 3

Hydrograph type	=	Reservoir	Peak discharge	=	0.489 cfs
Storm frequency	=	2 yrs	Time to peak	=	750 min
Time interval	=	2 min	Hyd. volume	=	4,389 cuft
Inflow hyd. No.	=	10 - Combine 1	Max. Elevation	=	880.89 ft
Reservoir name	=	Detention Pipe 1	Max. Storage	=	3,235 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 2 - Detention Pipe 1

Pond Data

UG Chambers -Invert elev. = 879.70 ft, Rise x Span = 3.75 x 4.79 ft, Barrel Len = 48.72 ft, No. Barrels = 6, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 878.20 ft, Width = 7.17 ft, Height = 6.25 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	878.20	n/a	0	0
0.63	878.83	n/a	524	524
1.25	879.45	n/a	524	1,048
1.88	880.08	n/a	839	1,887
2.50	880.70	n/a	1,040	2,927
3.13	881.33	n/a	1,015	3,942
3.75	881.95	n/a	973	4,915
4.38	882.58	n/a	906	5,821
5.00	883.20	n/a	796	6,617
5.63	883.83	n/a	575	7,192
6.25	884.45	n/a	524	7,716

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	Inactive	Inactive	0.00
Span (in)	= 15.00	0.00	0.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 879.70	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.12	0.00	0.00	0.00
Crest El. (ft)	= 879.70	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.450 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

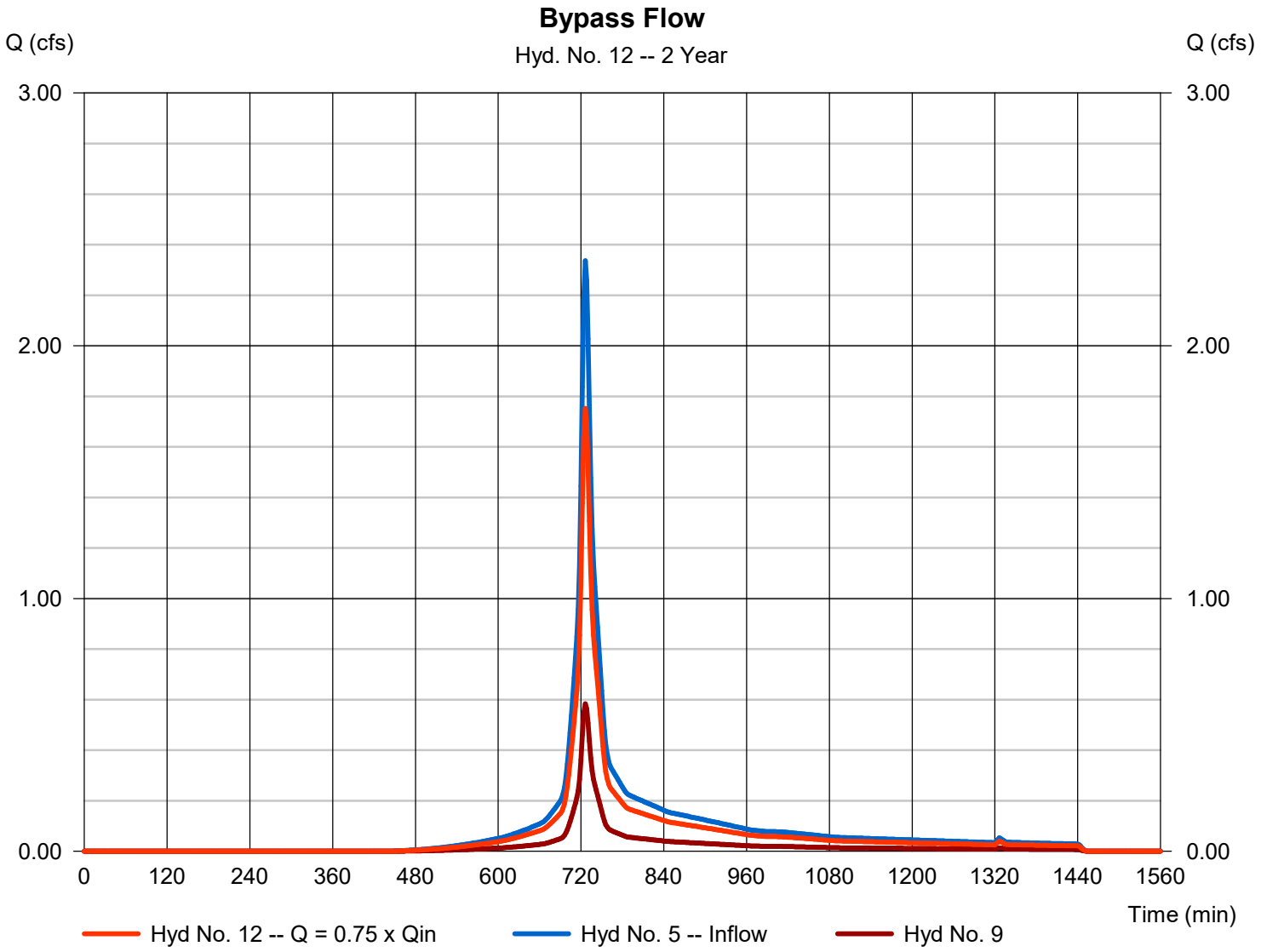
Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	878.20	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.63	524	878.83	0.00	---	---	---	0.00	---	---	---	0.022	---	0.022
1.25	1,048	879.45	0.00	---	---	---	0.00	---	---	---	0.022	---	0.022
1.88	1,887	880.08	0.08 ic	---	---	---	0.08 s	---	---	---	0.022	---	0.106
2.50	2,927	880.70	0.39 ic	---	---	---	0.38 s	---	---	---	0.022	---	0.397
3.13	3,942	881.33	0.80 ic	---	---	---	0.79 s	---	---	---	0.022	---	0.807
3.75	4,915	881.95	1.29 ic	---	---	---	1.29 s	---	---	---	0.022	---	1.308
4.38	5,821	882.58	1.87 ic	---	---	---	1.86 s	---	---	---	0.022	---	1.883
5.00	6,617	883.20	2.51 ic	---	---	---	2.50 s	---	---	---	0.022	---	2.527
5.63	7,192	883.83	3.22 ic	---	---	---	3.21 s	---	---	---	0.022	---	3.228
6.25	7,716	884.45	3.98 ic	---	---	---	3.96 s	---	---	---	0.022	---	3.981

Hydrograph Report

Hyd. No. 12

Bypass Flow

Hydrograph type	= Diversion2	Peak discharge	= 1.752 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 6,020 cuft
Inflow hydrograph	= 5 - Flow Diversion	2nd diverted hyd.	= 9
Diversion method	= Flow Ratio	Flow ratio	= 0.25

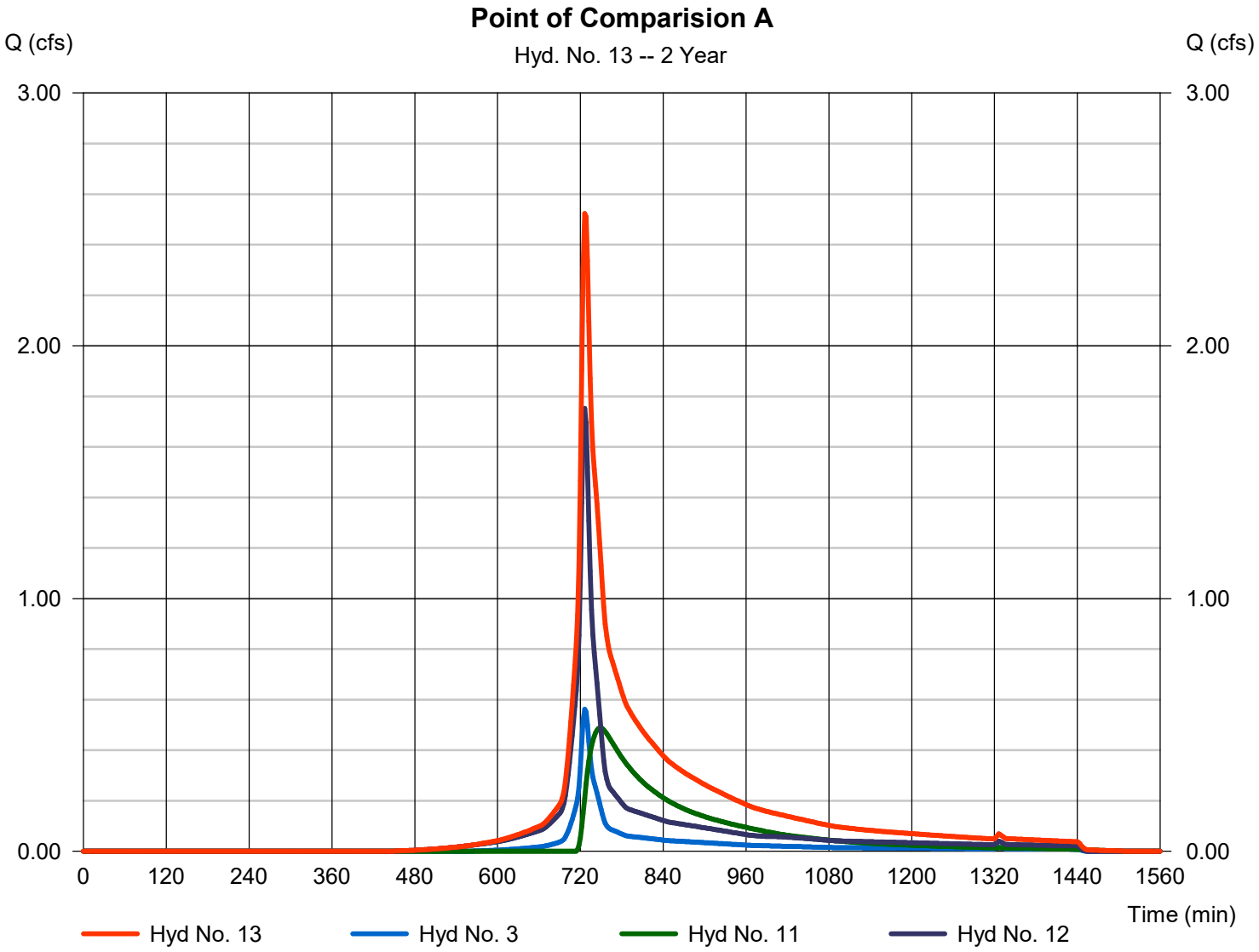


Hydrograph Report

Hyd. No. 13

Point of Comparision A

Hydrograph type	= Combine	Peak discharge	= 2.523 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 12,351 cuft
Inflow hyds.	= 3, 11, 12	Contrib. drain. area	= 0.389 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	4.632	2	726	16,108	------	------	------	PR WS-01A
2	SCS Runoff	0.637	2	726	2,191	------	------	------	EX WS-01B
3	SCS Runoff	1.266	2	726	4,328	------	------	------	PR WS-01C
4	Reservoir	0.341	2	736	1,168	2	902.49	856	Stormtech - 2
5	Combine	4.632	2	726	17,276	1, 4	------	------	Flow Diversion
6	SCS Runoff	0.817	2	726	2,799	------	------	------	PR WS-01D
7	SCS Runoff	2.007	2	724	6,903	------	------	------	PR WS-01E
8	SCS Runoff	1.100	2	728	4,223	------	------	------	PR WS-02 - POC B
9	Diversion1	1.158	2	726	4,319	5	------	------	To UG infiltration
10	Combine	3.866	2	724	14,021	6, 7, 9	------	------	Combine 1
11	Reservoir	1.525	2	740	10,830	10	882.22	5,305	Design Point 3
12	Diversion2	3.474	2	726	12,957	5	------	------	Bypass Flow
13	Combine	5.775	2	726	28,115	3, 11, 12	------	------	Point of Comparision A

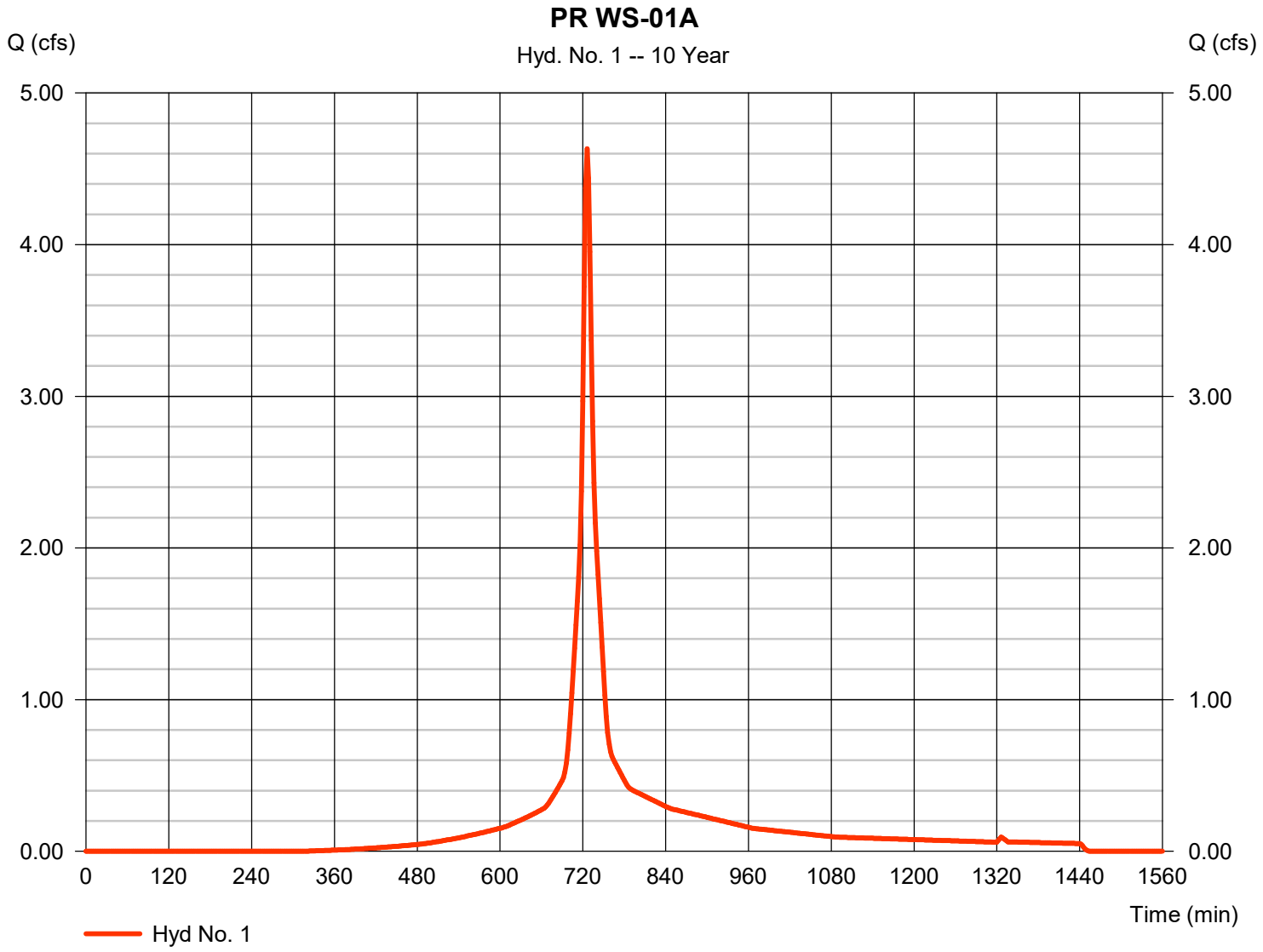
Hydrograph Report

Hyd. No. 1

PR WS-01A

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.632 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	16,108 cuft
Drainage area	=	1.215 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.60 min
Total precip.	=	5.09 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.500 x 98) + (0.502 x 69)] / 1.215



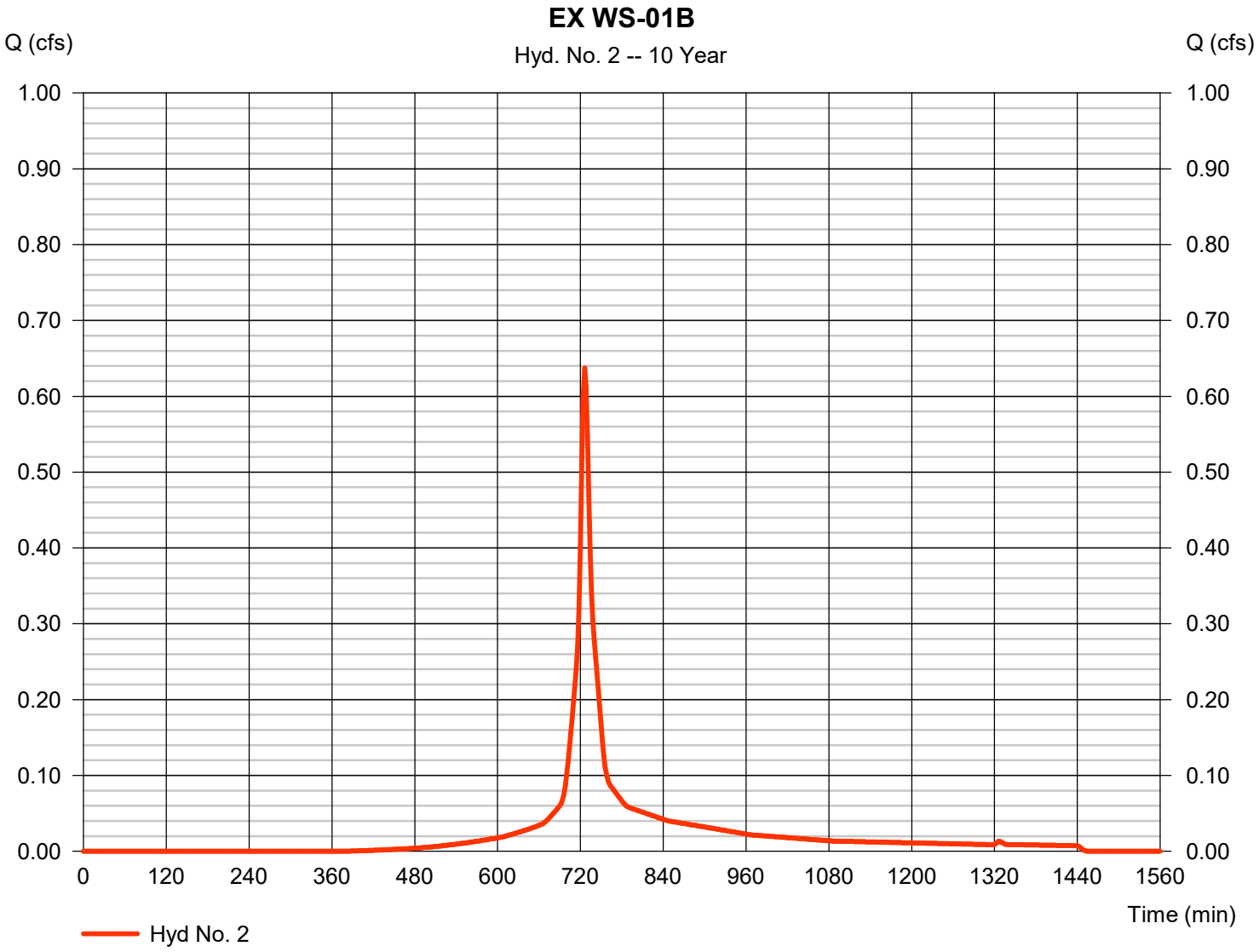
Hydrograph Report

Hyd. No. 2

EX WS-01B

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.637 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	2,191 cuft
Drainage area	=	0.180 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.50 min
Total precip.	=	5.09 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.069 x 98)] / 0.180

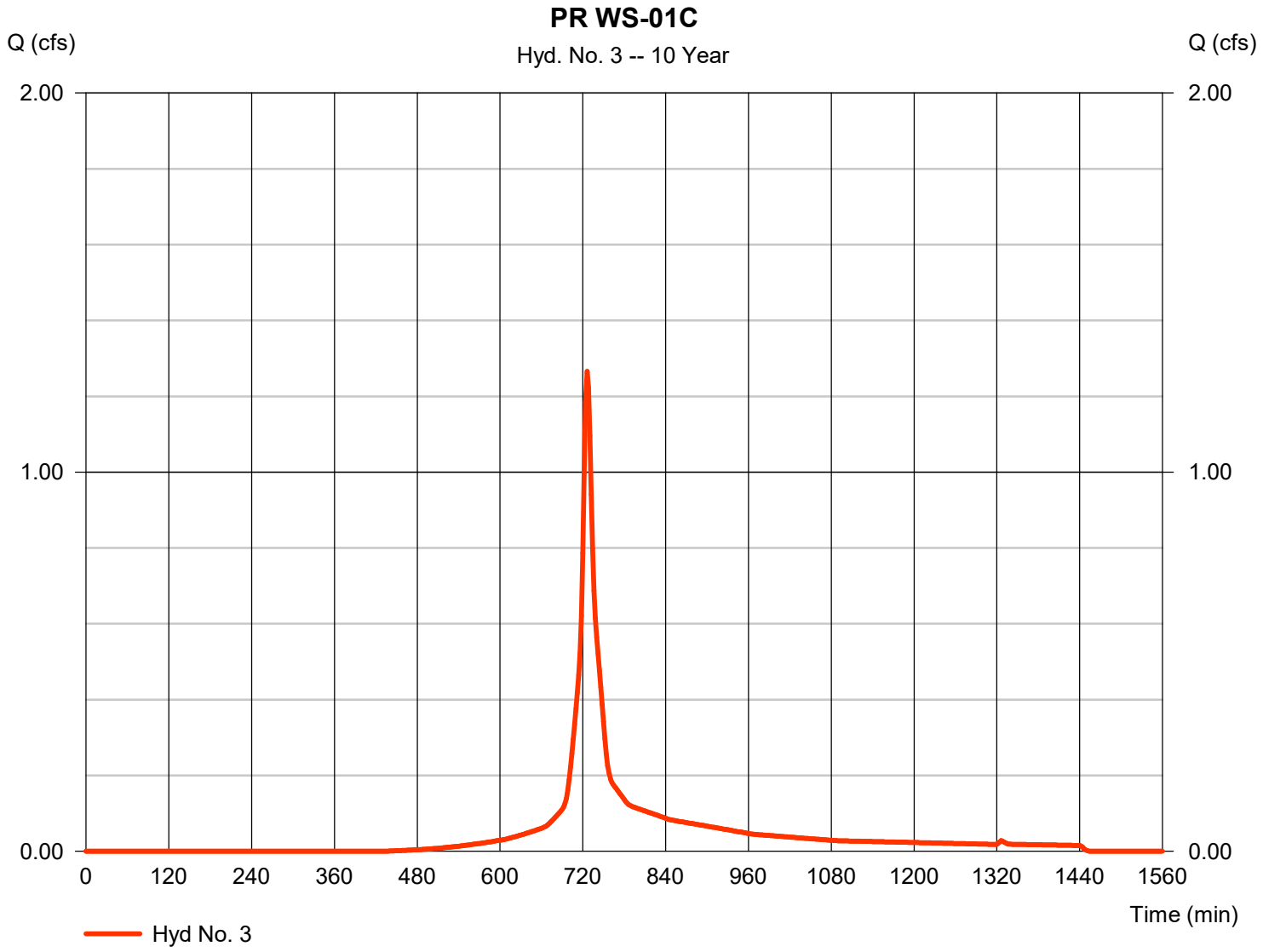


Hydrograph Report

Hyd. No. 3

PR WS-01C

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.266 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	4,328 cuft
Drainage area	=	0.389 ac	Curve number	=	81
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.90 min
Total precip.	=	5.09 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



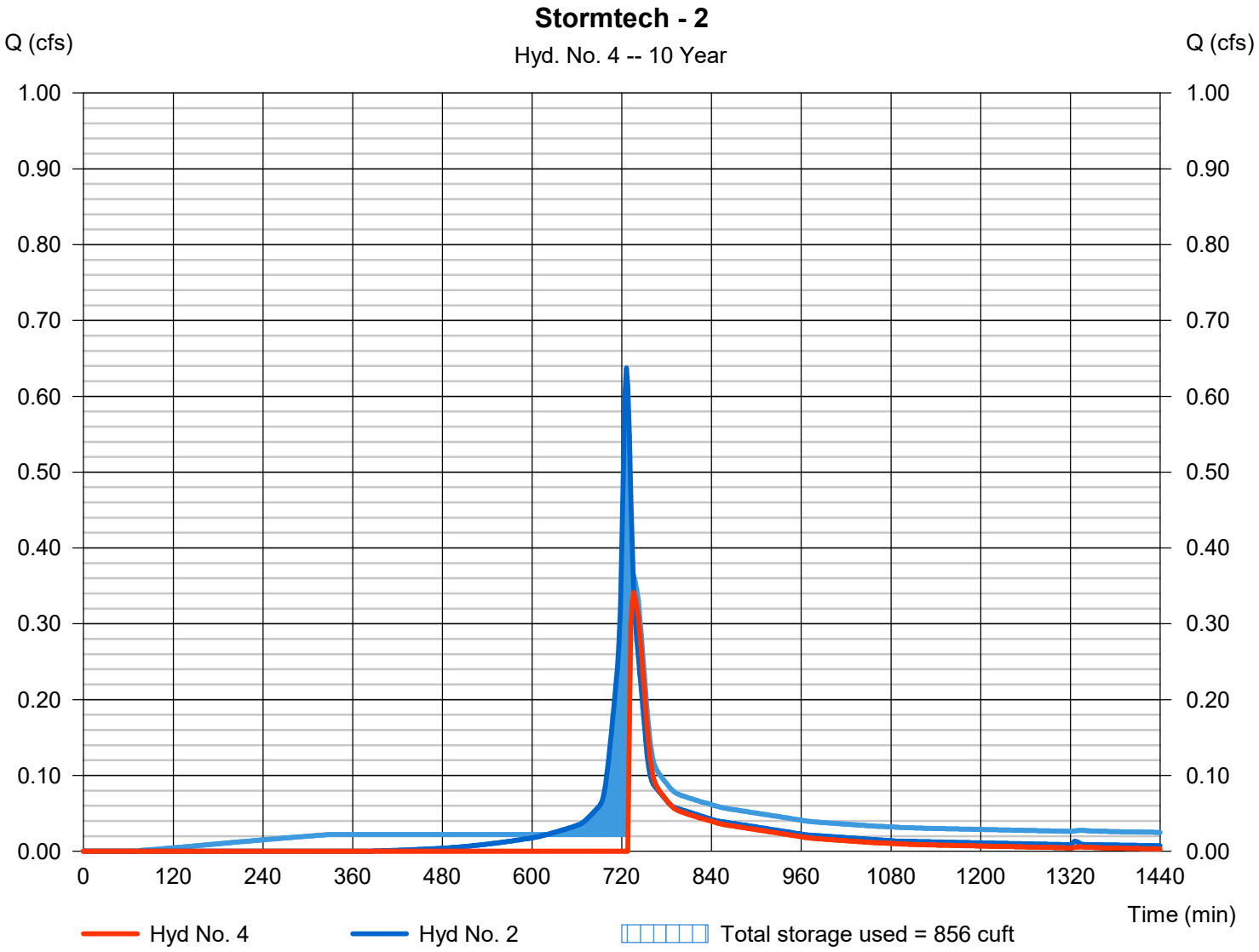
Hydrograph Report

Hyd. No. 4

Stormtech - 2

Hydrograph type	=	Reservoir	Peak discharge	=	0.341 cfs
Storm frequency	=	10 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	1,168 cuft
Inflow hyd. No.	=	2 - EX WS-01B	Max. Elevation	=	902.49 ft
Reservoir name	=	Stormtech -2	Max. Storage	=	856 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

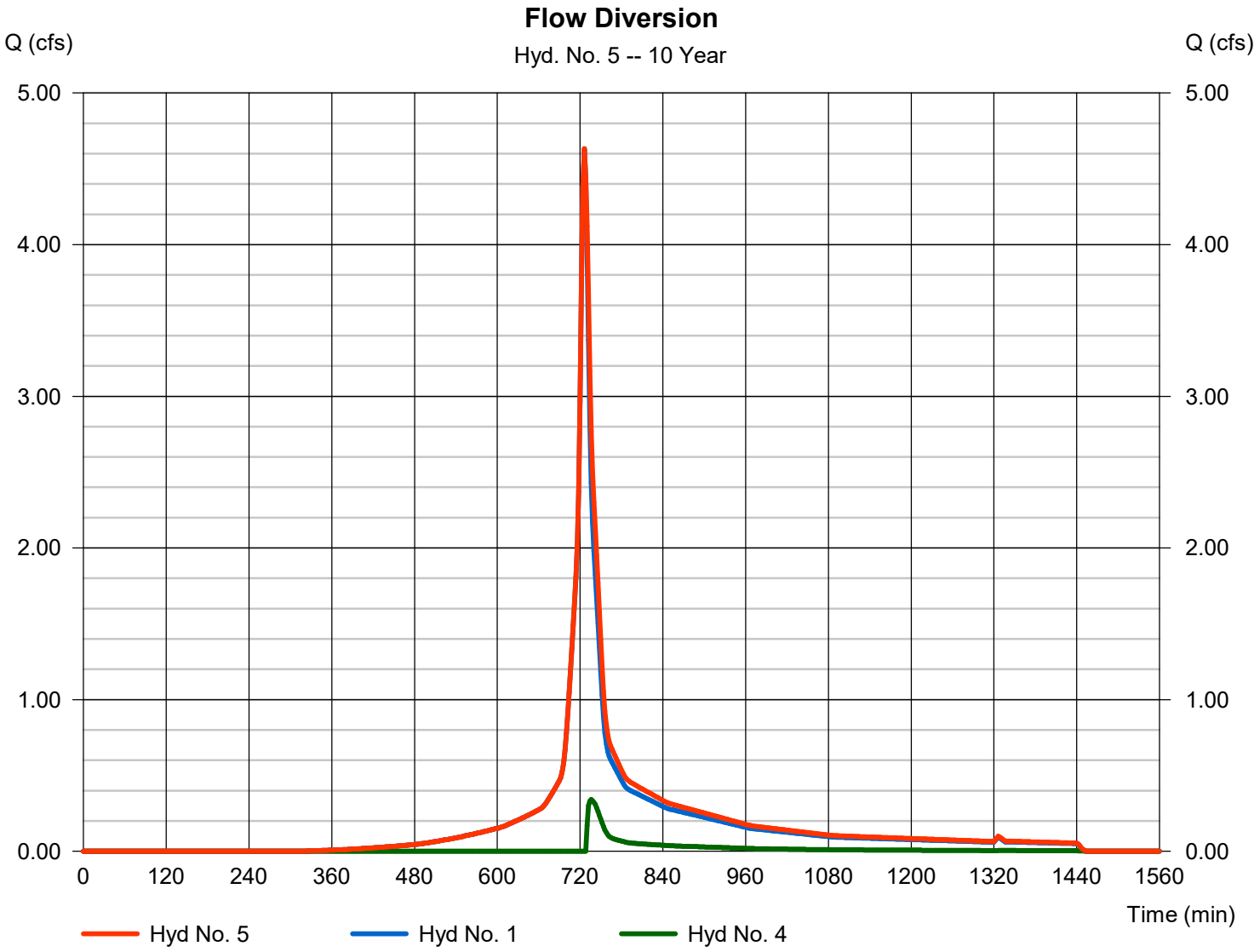


Hydrograph Report

Hyd. No. 5

Flow Diversion

Hydrograph type	= Combine	Peak discharge	= 4.632 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 17,276 cuft
Inflow hyds.	= 1, 4	Contrib. drain. area	= 1.215 ac

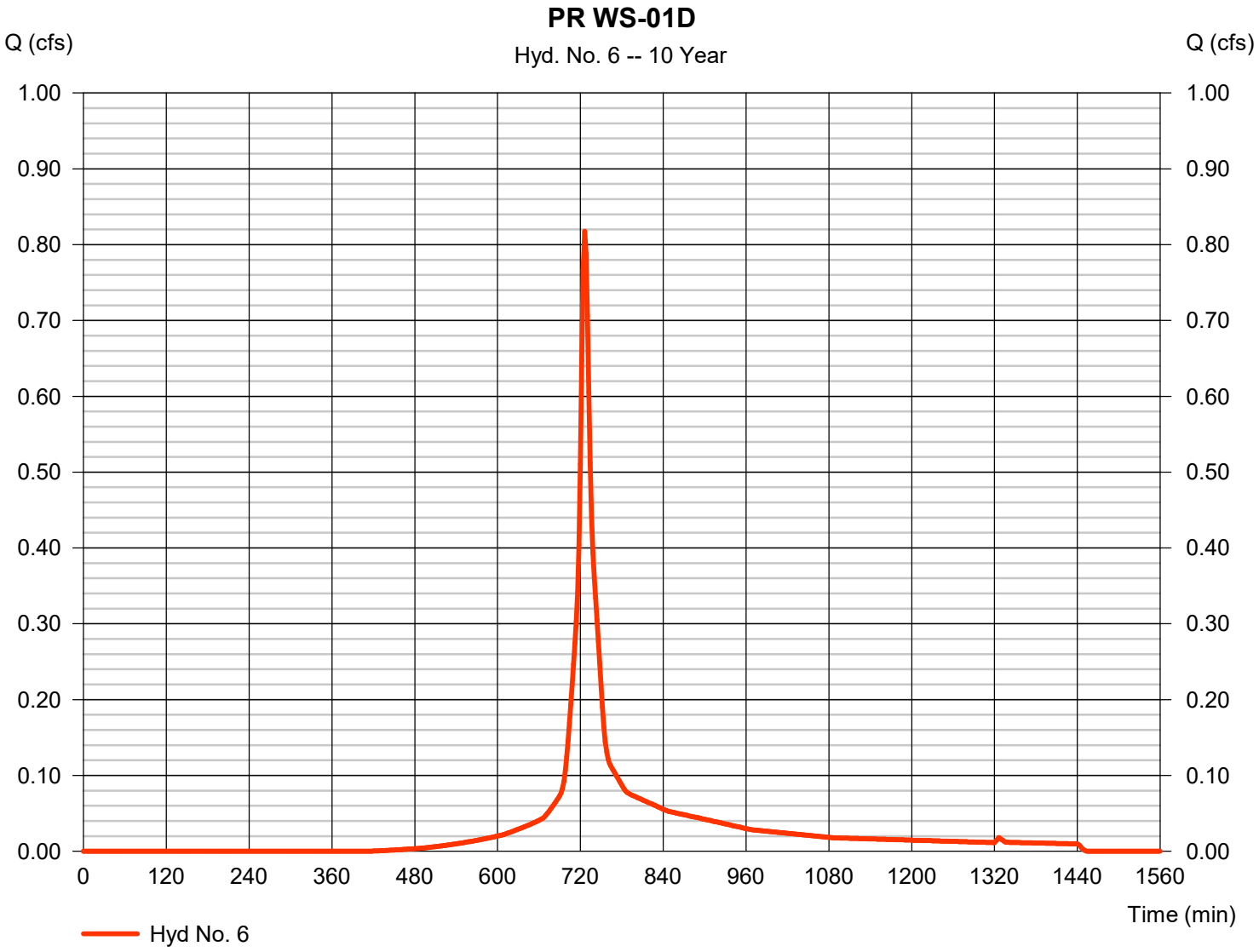


Hydrograph Report

Hyd. No. 6

PR WS-01D

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.817 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	2,799 cuft
Drainage area	=	0.244 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.80 min
Total precip.	=	5.09 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

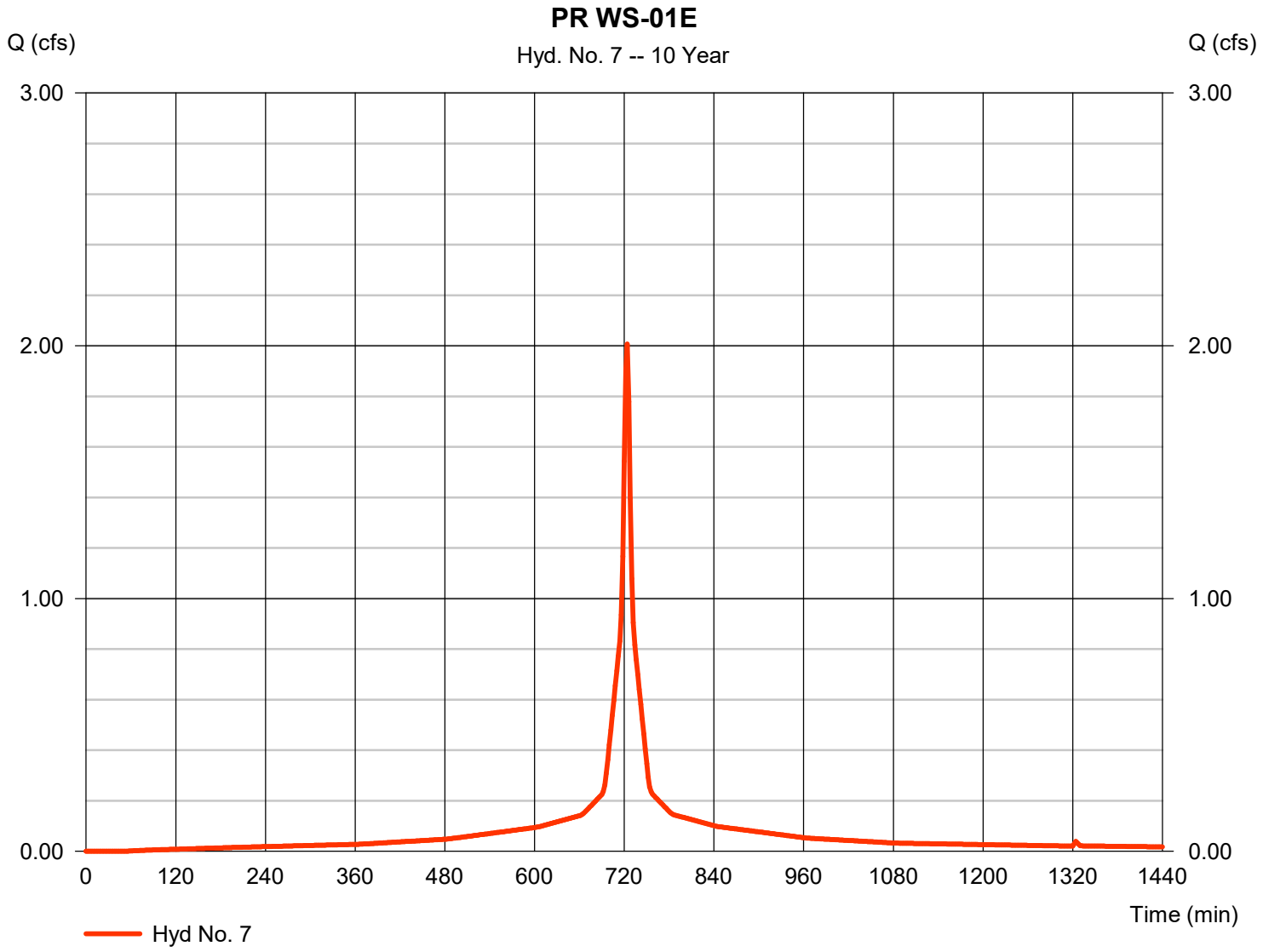


Hydrograph Report

Hyd. No. 7

PR WS-01E

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.007 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	6,903 cuft
Drainage area	=	0.418 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.09 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

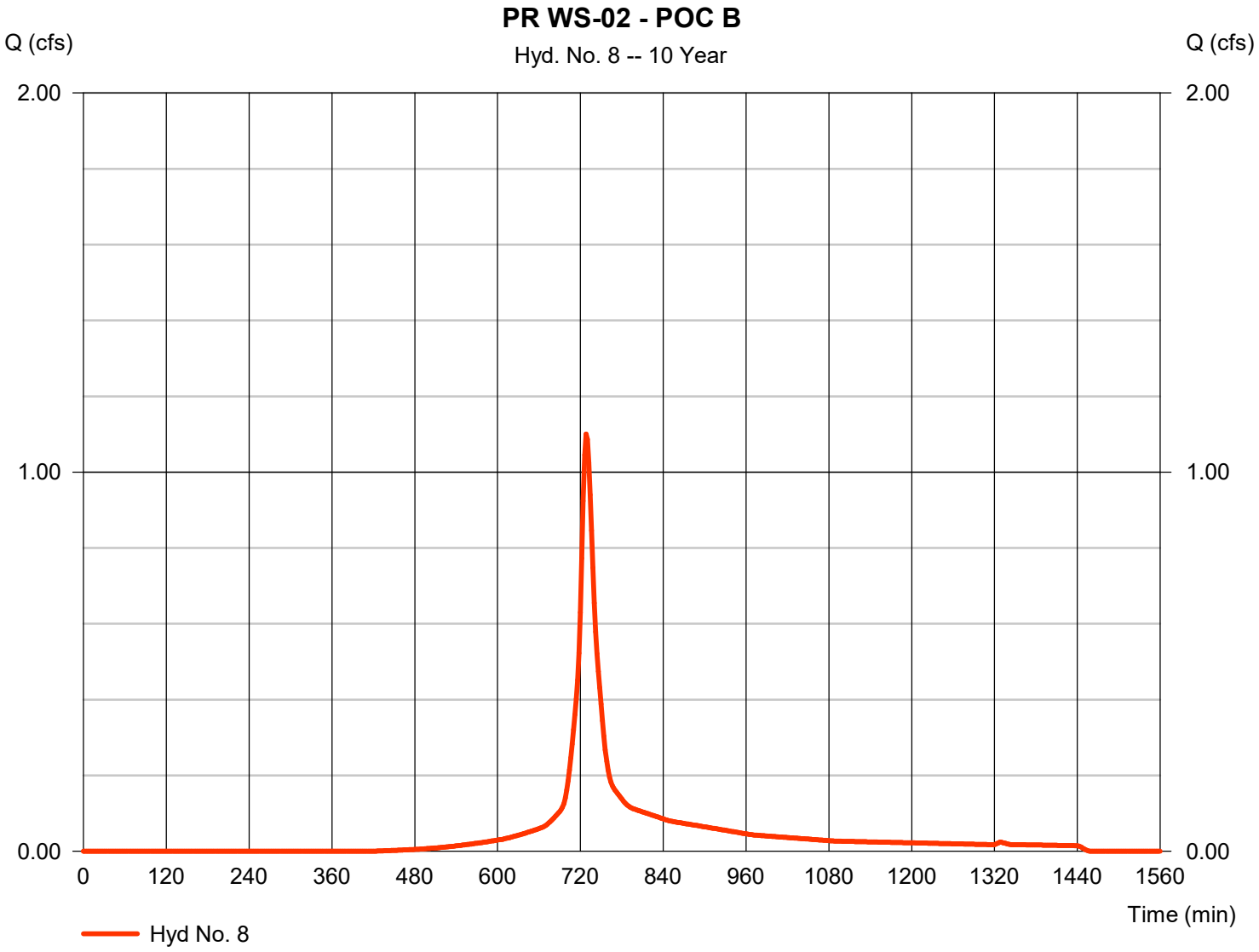


Hydrograph Report

Hyd. No. 8

PR WS-02 - POC B

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.100 cfs
Storm frequency	=	10 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	4,223 cuft
Drainage area	=	0.357 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	11.80 min
Total precip.	=	5.09 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

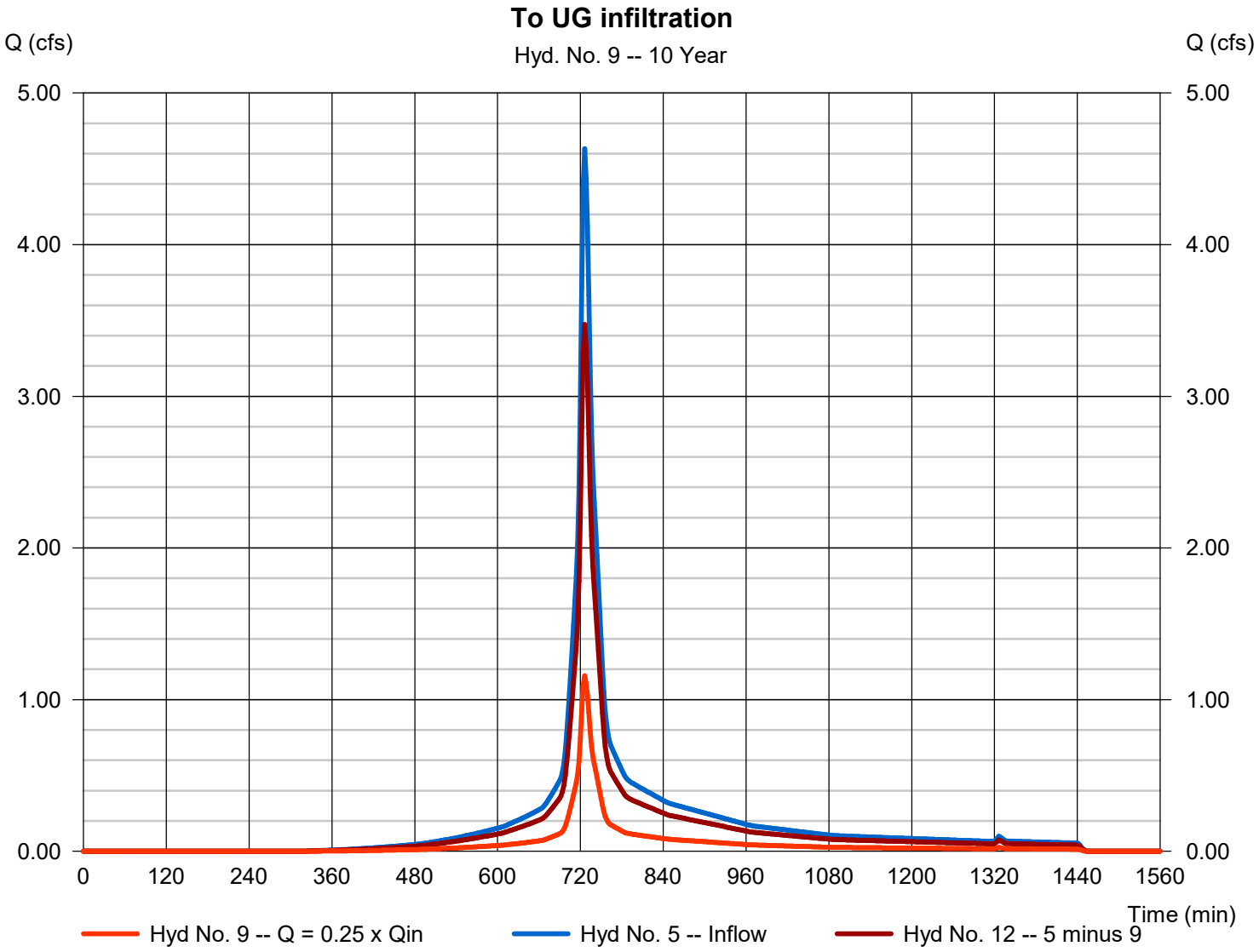


Hydrograph Report

Hyd. No. 9

To UG infiltration

Hydrograph type	= Diversion1	Peak discharge	= 1.158 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 4,319 cuft
Inflow hydrograph	= 5 - Flow Diversion	2nd diverted hyd.	= 12
Diversion method	= Flow Ratio	Flow ratio	= 0.25

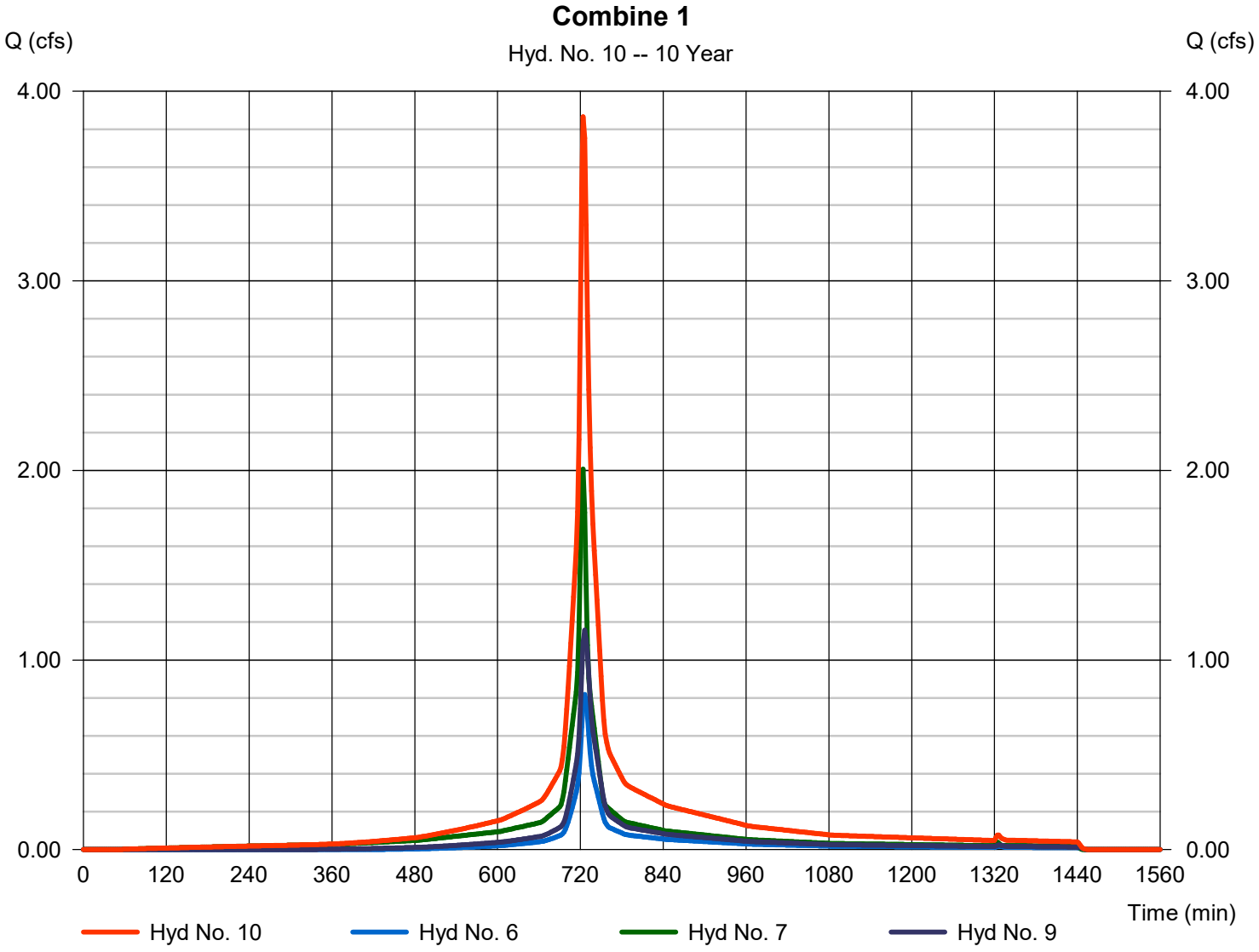


Hydrograph Report

Hyd. No. 10

Combine 1

Hydrograph type	= Combine	Peak discharge	= 3.866 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 14,021 cuft
Inflow hyds.	= 6, 7, 9	Contrib. drain. area	= 0.662 ac



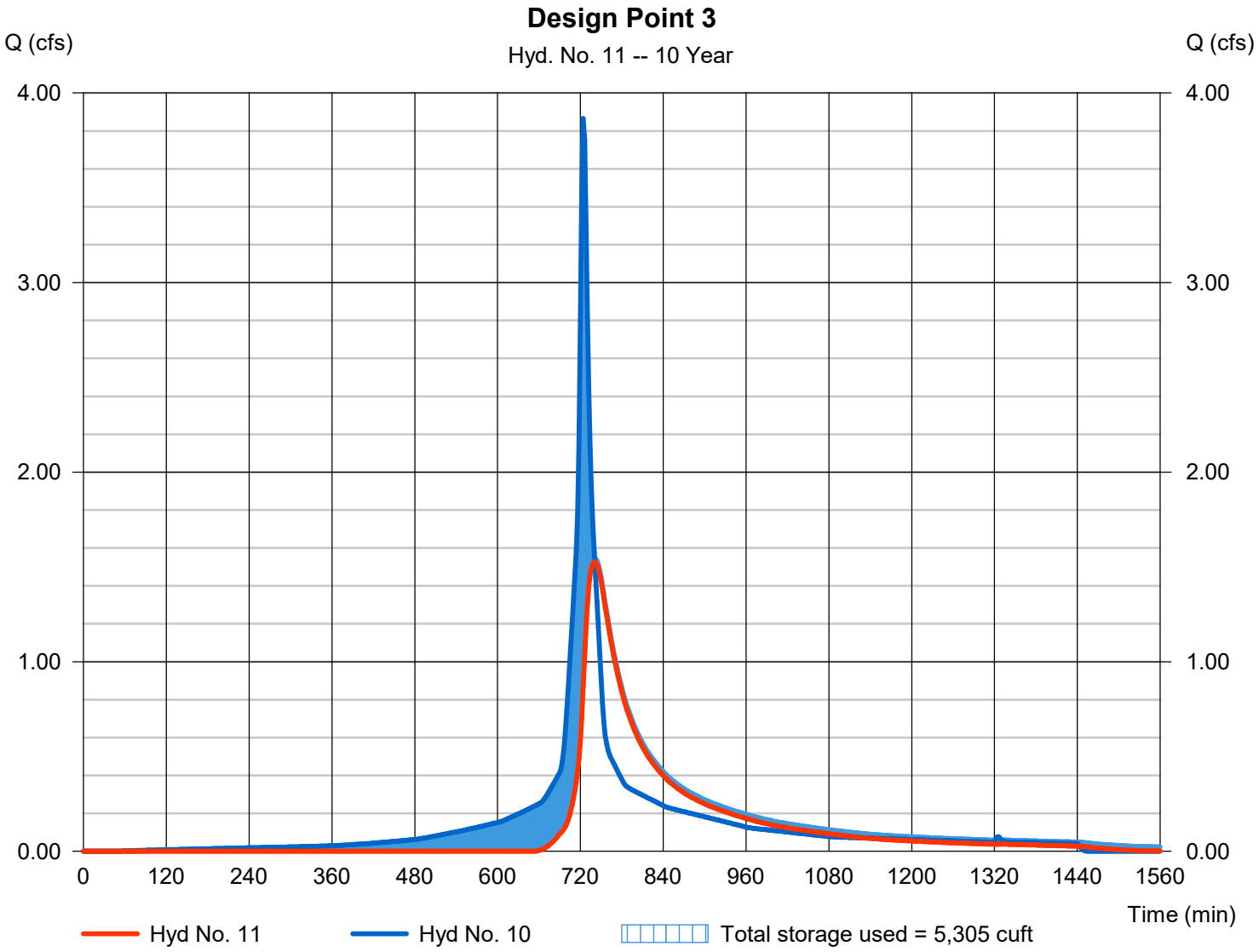
Hydrograph Report

Hyd. No. 11

Design Point 3

Hydrograph type	=	Reservoir	Peak discharge	=	1.525 cfs
Storm frequency	=	10 yrs	Time to peak	=	740 min
Time interval	=	2 min	Hyd. volume	=	10,830 cuft
Inflow hyd. No.	=	10 - Combine 1	Max. Elevation	=	882.22 ft
Reservoir name	=	Detention Pipe 1	Max. Storage	=	5,305 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

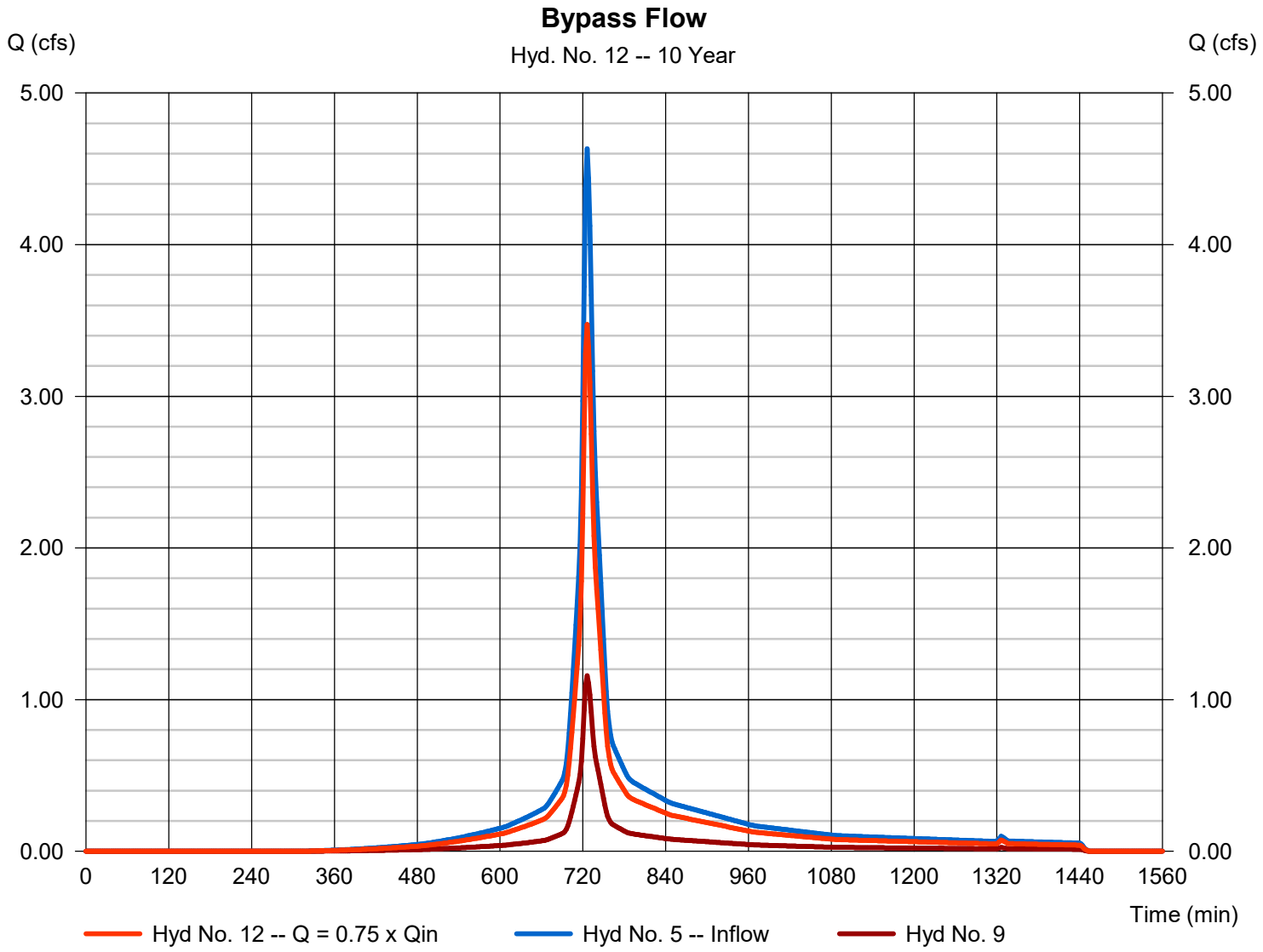


Hydrograph Report

Hyd. No. 12

Bypass Flow

Hydrograph type	= Diversion2	Peak discharge	= 3.474 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 12,957 cuft
Inflow hydrograph	= 5 - Flow Diversion	2nd diverted hyd.	= 9
Diversion method	= Flow Ratio	Flow ratio	= 0.25

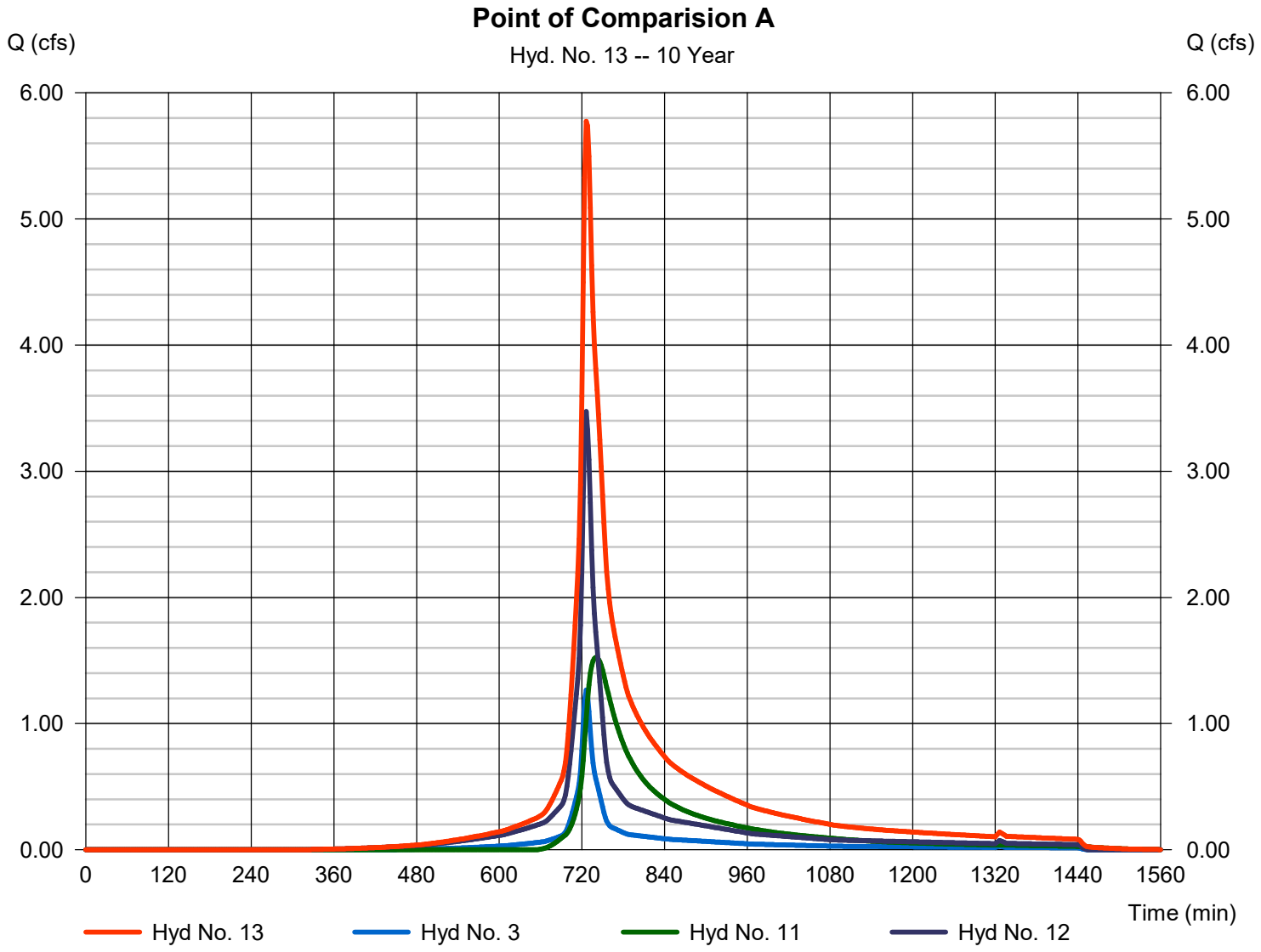


Hydrograph Report

Hyd. No. 13

Point of Comparision A

Hydrograph type	=	Combine	Peak discharge	=	5.775 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	28,115 cuft
Inflow hyds.	=	3, 11, 12	Contrib. drain. area	=	0.389 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	7.170	2	726	25,490	------	------	------	PR WS-01A
2	SCS Runoff	1.014	2	726	3,551	------	------	------	EX WS-01B
3	SCS Runoff	2.078	2	726	7,193	------	------	------	PR WS-01C
4	Reservoir	0.896	2	730	2,501	2	903.15	966	Stormtech - 2
5	Combine	8.001	2	726	27,991	1, 4	------	------	Flow Diversion
6	SCS Runoff	1.328	2	726	4,612	------	------	------	PR WS-01D
7	SCS Runoff	2.890	2	724	10,058	------	------	------	PR WS-01E
8	SCS Runoff	1.790	2	728	6,959	------	------	------	PR WS-02 - POC B
9	Diversion1	2.000	2	726	6,998	5	------	------	To UG infiltration
10	Combine	6.023	2	724	21,668	6, 7, 9	------	------	Combine 1
11	Reservoir	3.026	2	736	18,346	10	883.67	7,048	Design Point 3
12	Diversion2	6.001	2	726	20,993	5	------	------	Bypass Flow
13	Combine	10.26	2	728	46,532	3, 11, 12	------	------	Point of Comparision A

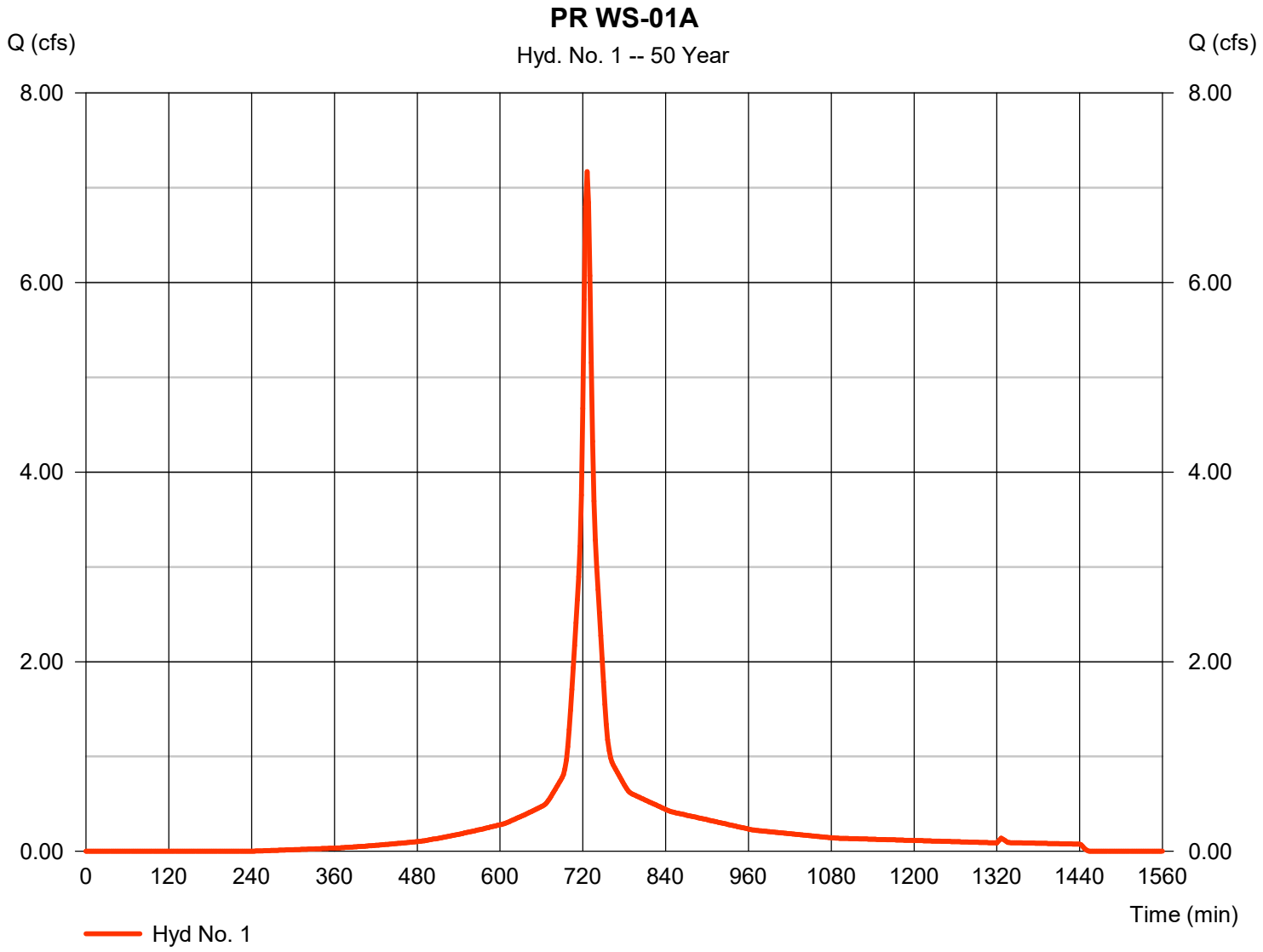
Hydrograph Report

Hyd. No. 1

PR WS-01A

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.170 cfs
Storm frequency	=	50 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	25,490 cuft
Drainage area	=	1.215 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.60 min
Total precip.	=	7.31 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.500 x 98) + (0.502 x 69)] / 1.215



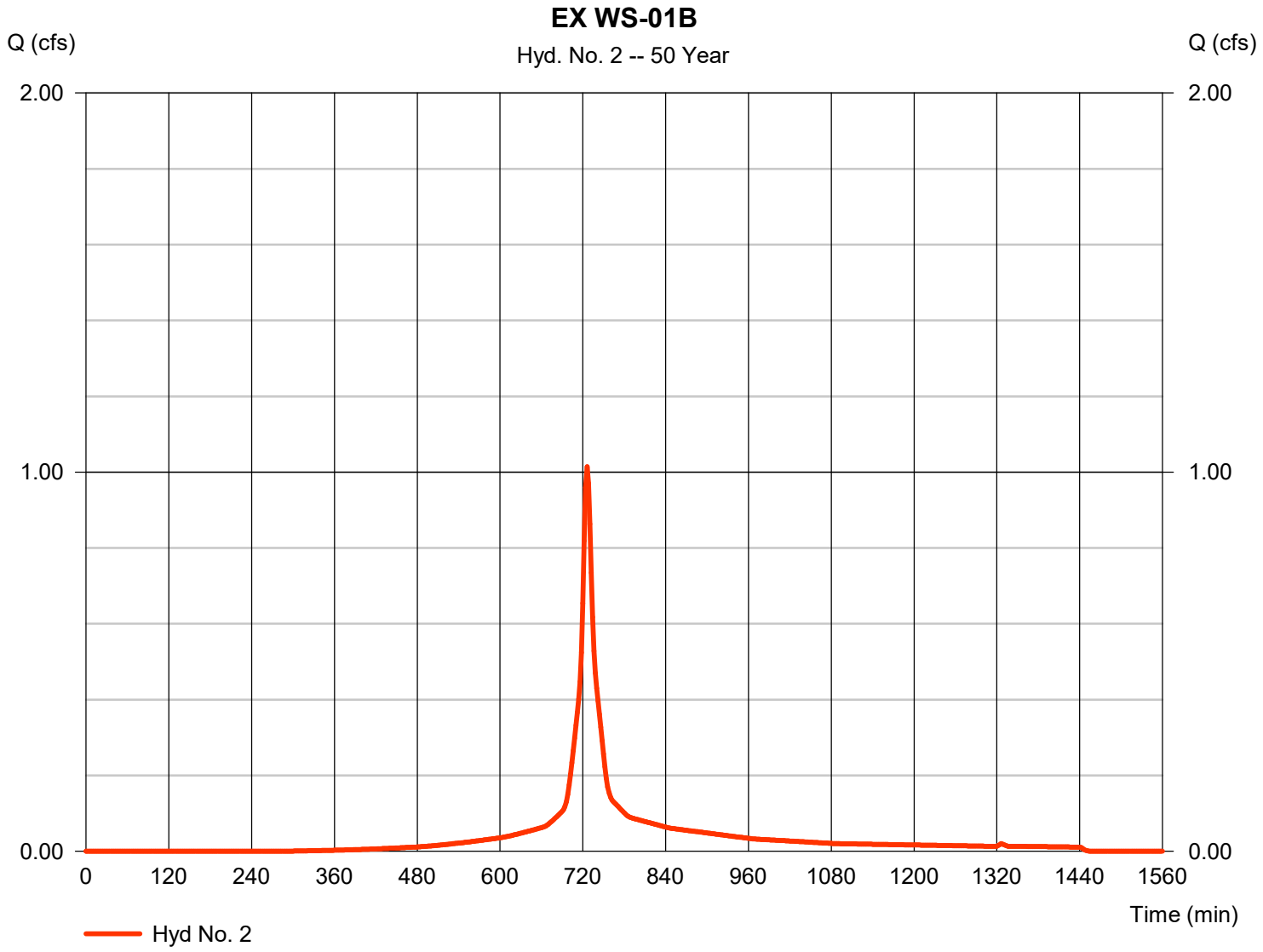
Hydrograph Report

Hyd. No. 2

EX WS-01B

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.014 cfs
Storm frequency	=	50 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	3,551 cuft
Drainage area	=	0.180 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.50 min
Total precip.	=	7.31 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.069 x 98)] / 0.180

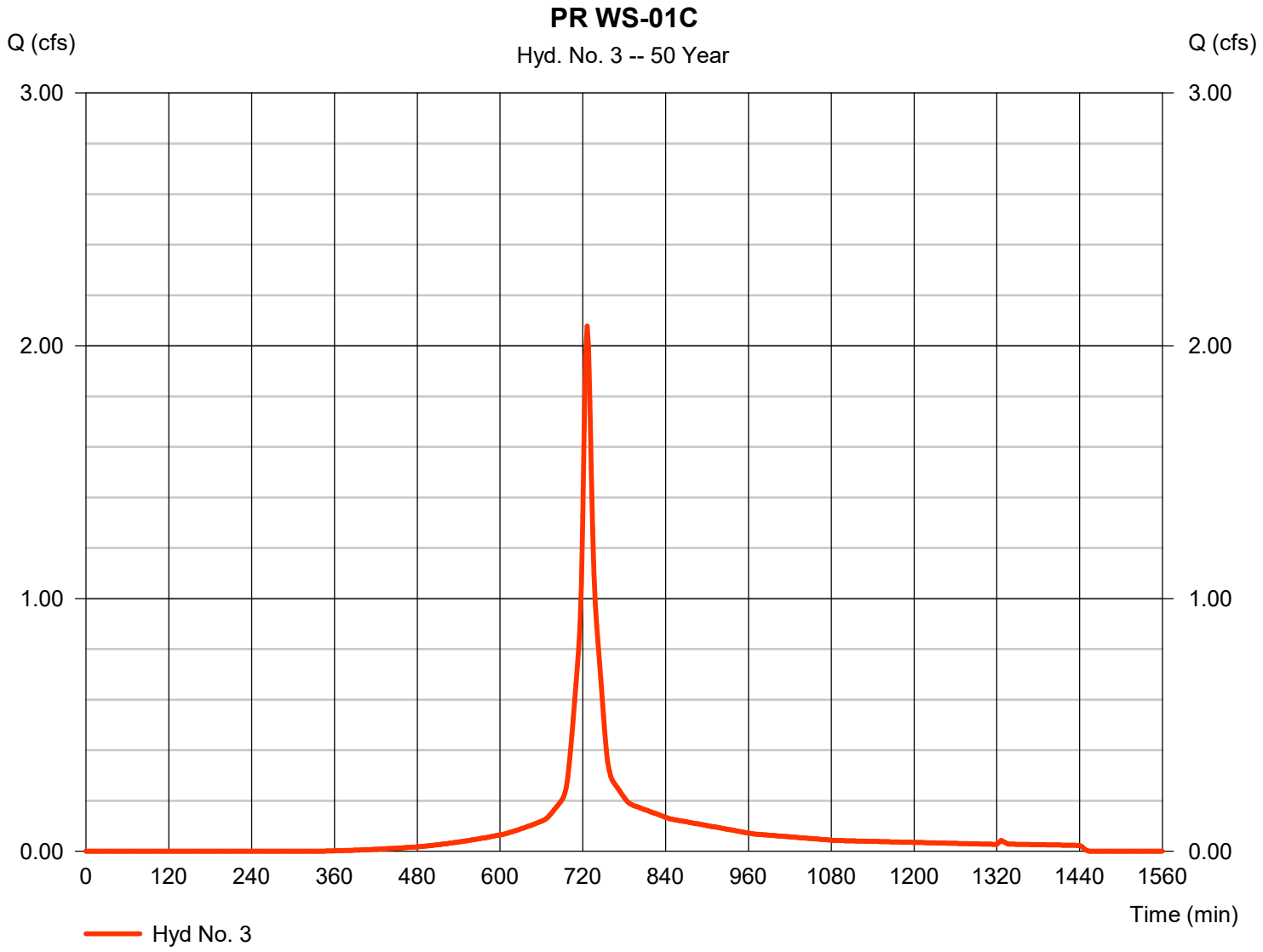


Hydrograph Report

Hyd. No. 3

PR WS-01C

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.078 cfs
Storm frequency	=	50 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	7,193 cuft
Drainage area	=	0.389 ac	Curve number	=	81
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.90 min
Total precip.	=	7.31 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



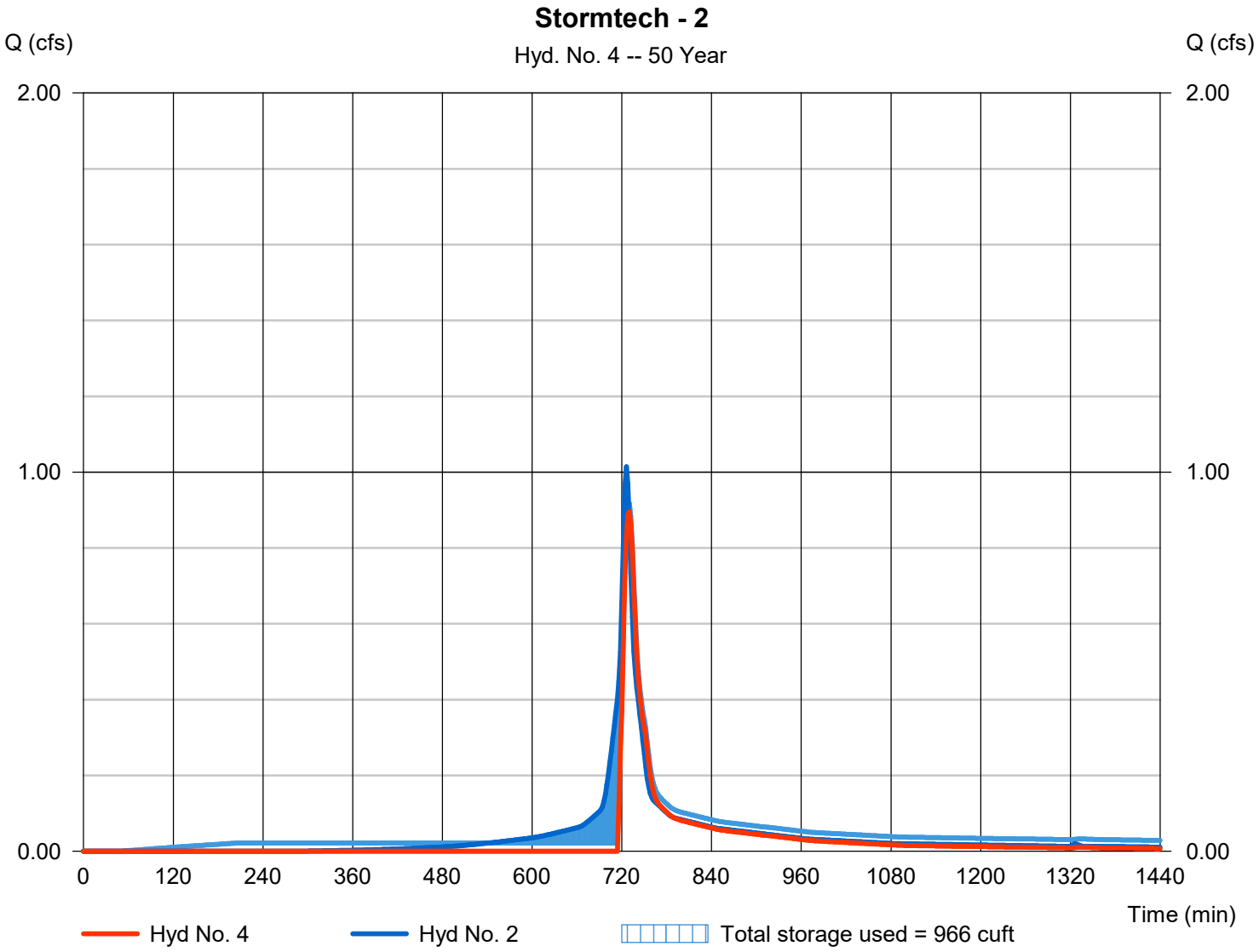
Hydrograph Report

Hyd. No. 4

Stormtech - 2

Hydrograph type	=	Reservoir	Peak discharge	=	0.896 cfs
Storm frequency	=	50 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	2,501 cuft
Inflow hyd. No.	=	2 - EX WS-01B	Max. Elevation	=	903.15 ft
Reservoir name	=	Stormtech -2	Max. Storage	=	966 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

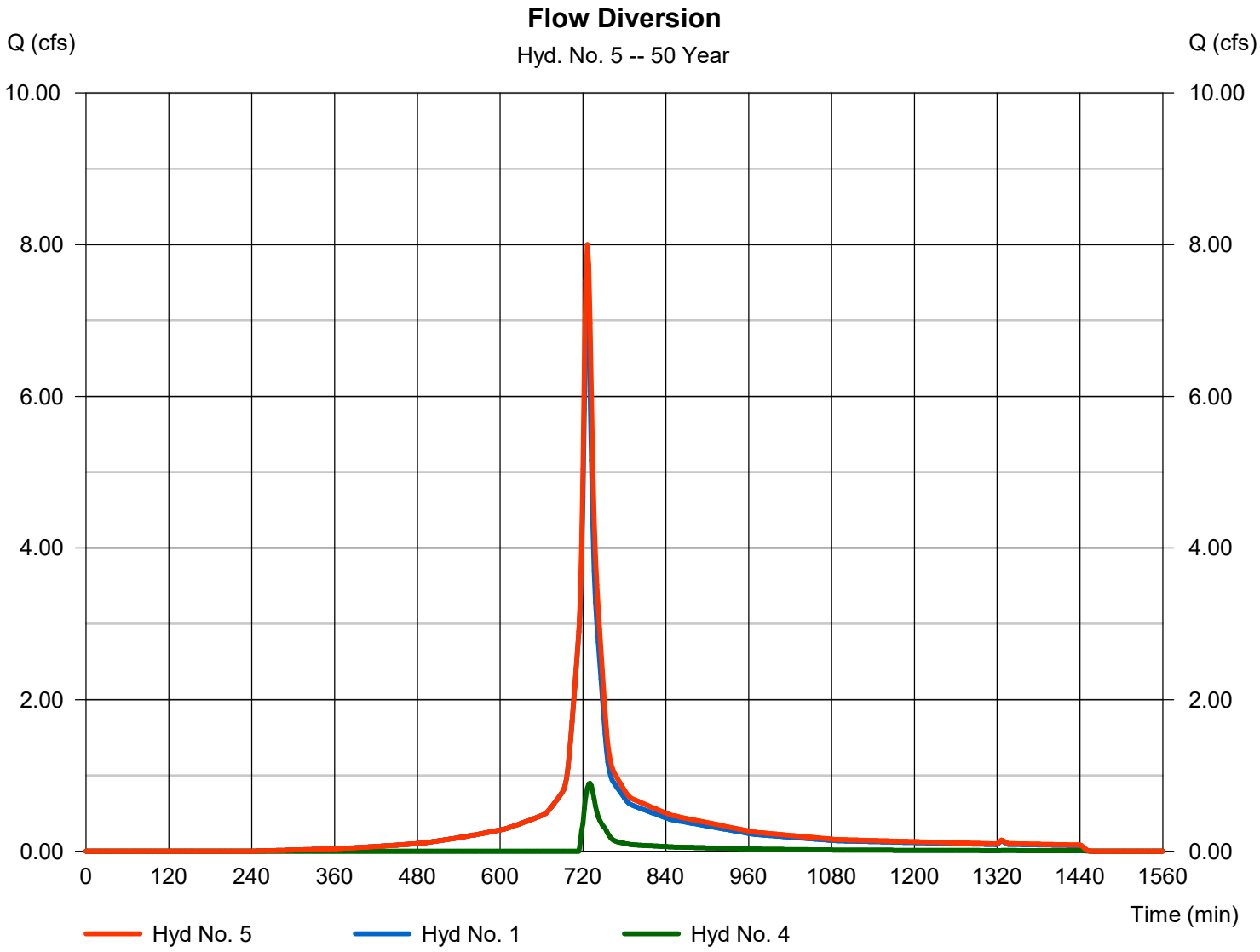


Hydrograph Report

Hyd. No. 5

Flow Diversion

Hydrograph type	= Combine	Peak discharge	= 8.001 cfs
Storm frequency	= 50 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 27,991 cuft
Inflow hyds.	= 1, 4	Contrib. drain. area	= 1.215 ac

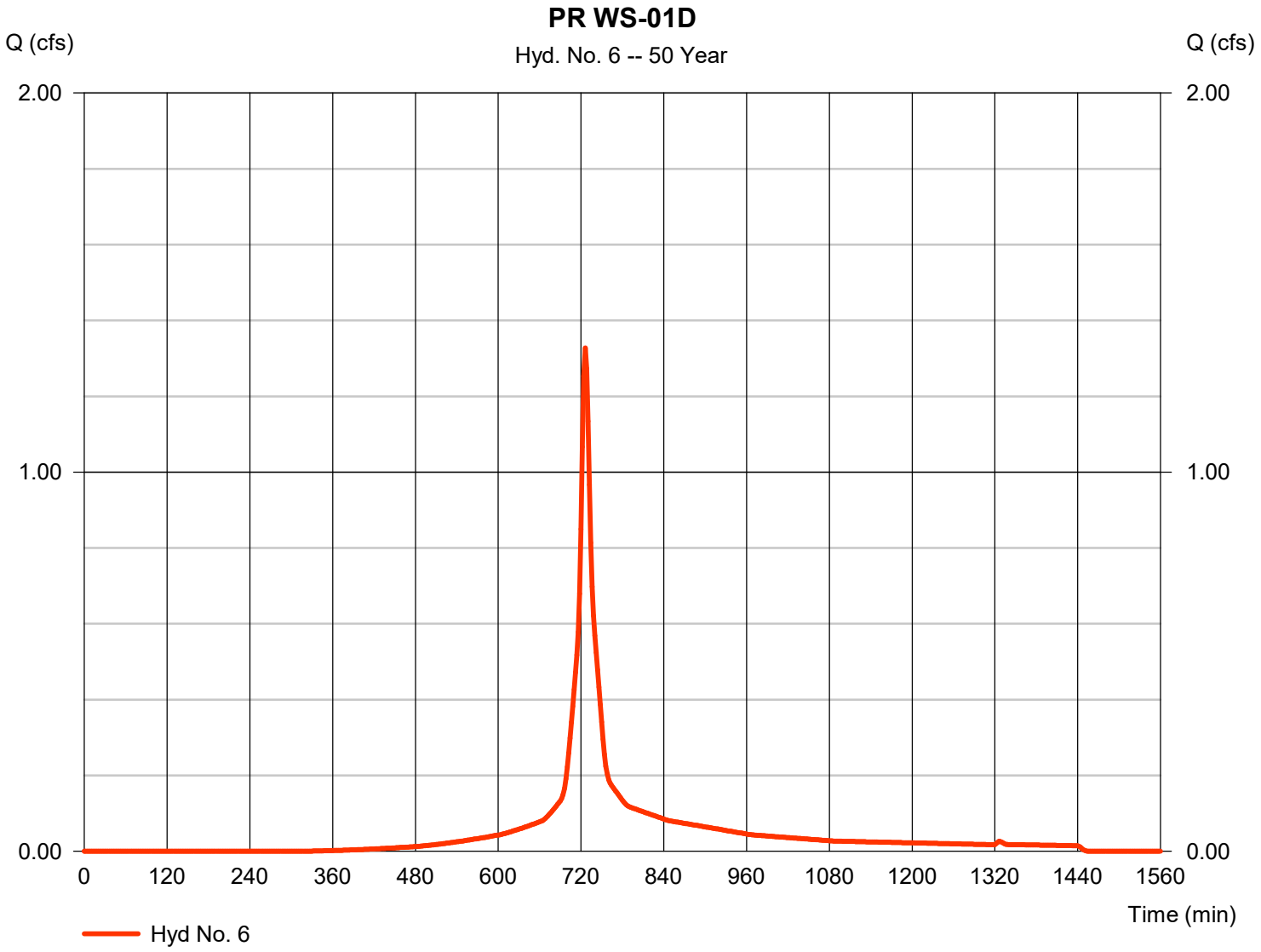


Hydrograph Report

Hyd. No. 6

PR WS-01D

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.328 cfs
Storm frequency	=	50 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	4,612 cuft
Drainage area	=	0.244 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.80 min
Total precip.	=	7.31 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

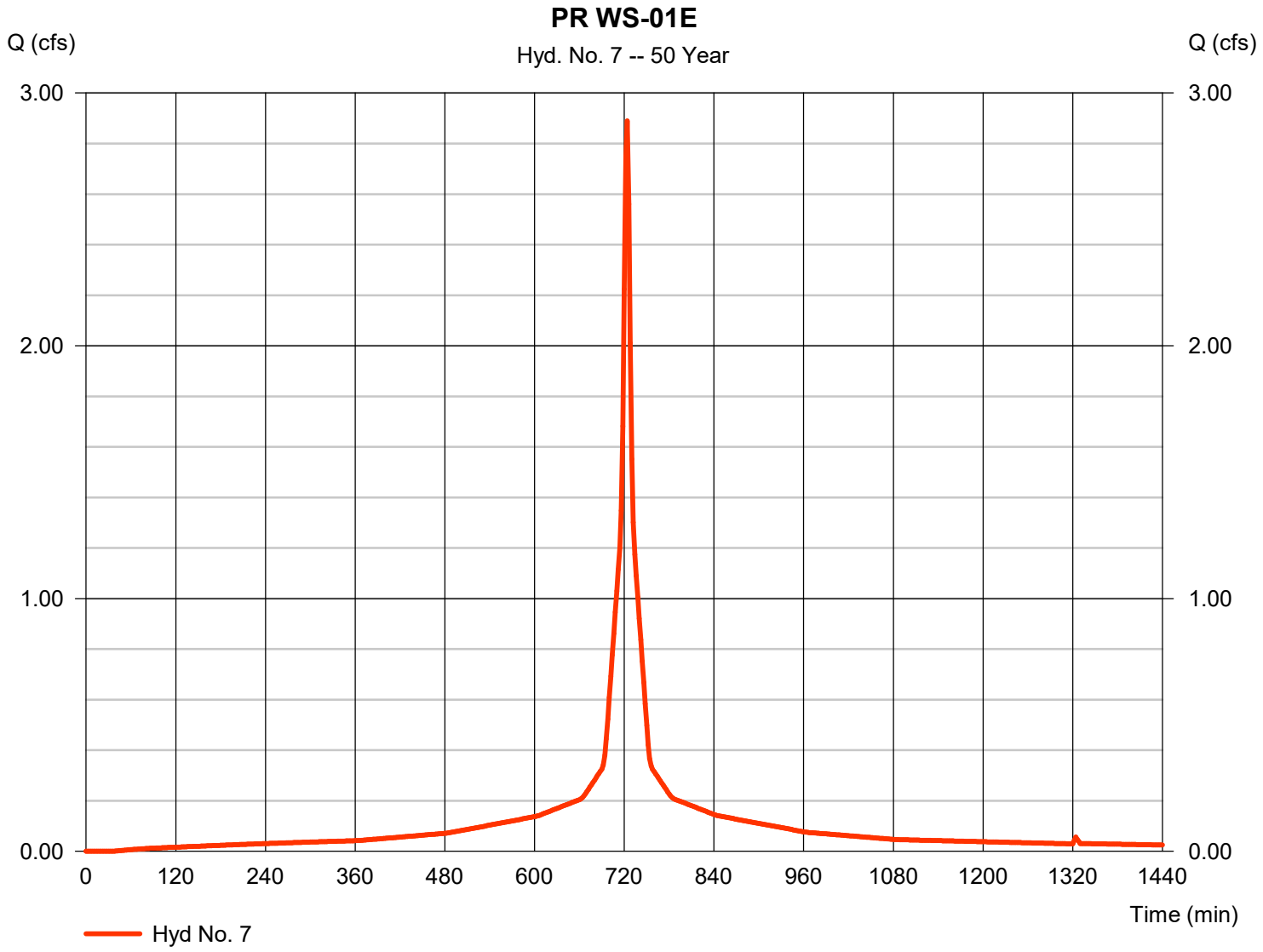


Hydrograph Report

Hyd. No. 7

PR WS-01E

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.890 cfs
Storm frequency	=	50 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	10,058 cuft
Drainage area	=	0.418 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.31 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

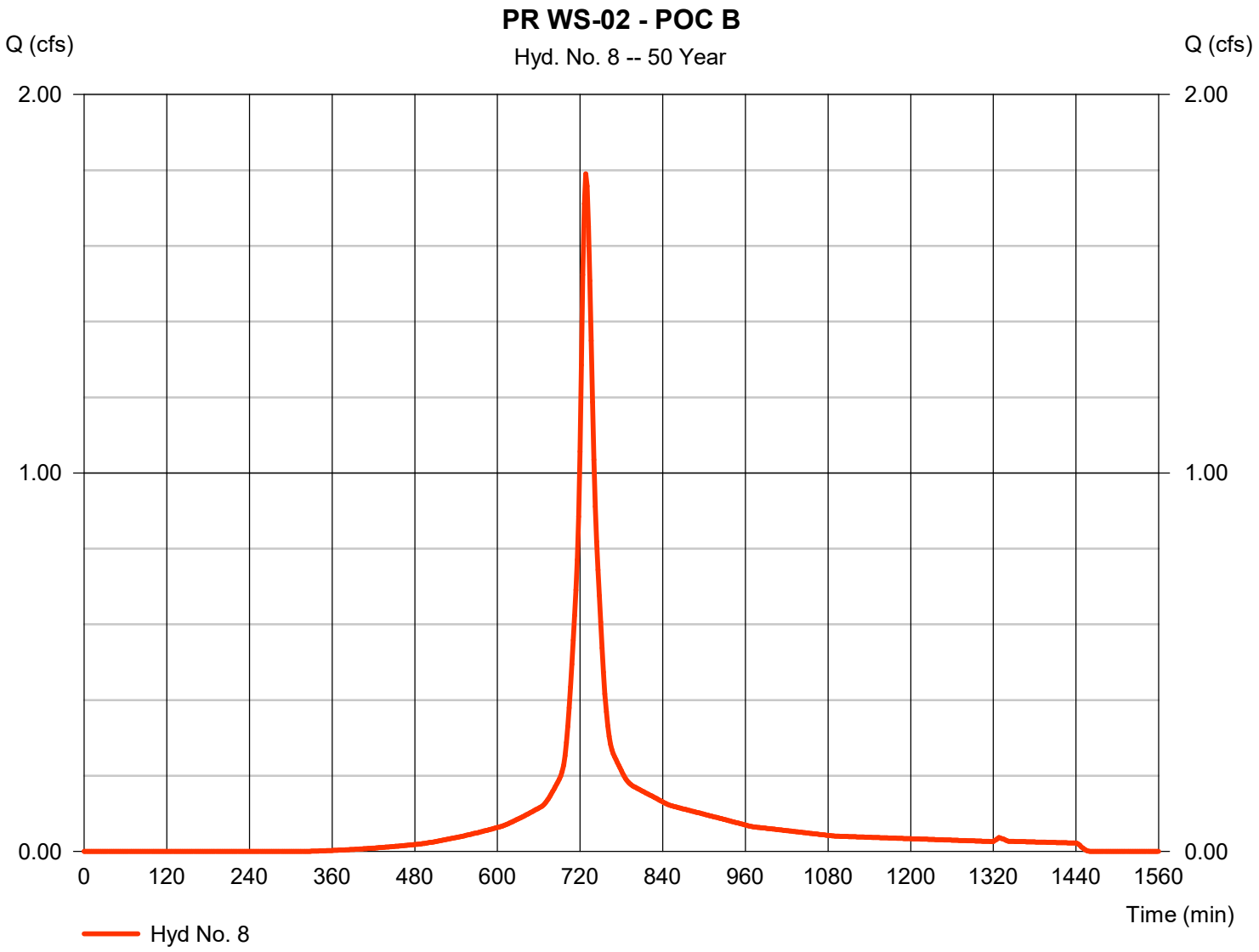


Hydrograph Report

Hyd. No. 8

PR WS-02 - POC B

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.790 cfs
Storm frequency	=	50 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	6,959 cuft
Drainage area	=	0.357 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	11.80 min
Total precip.	=	7.31 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

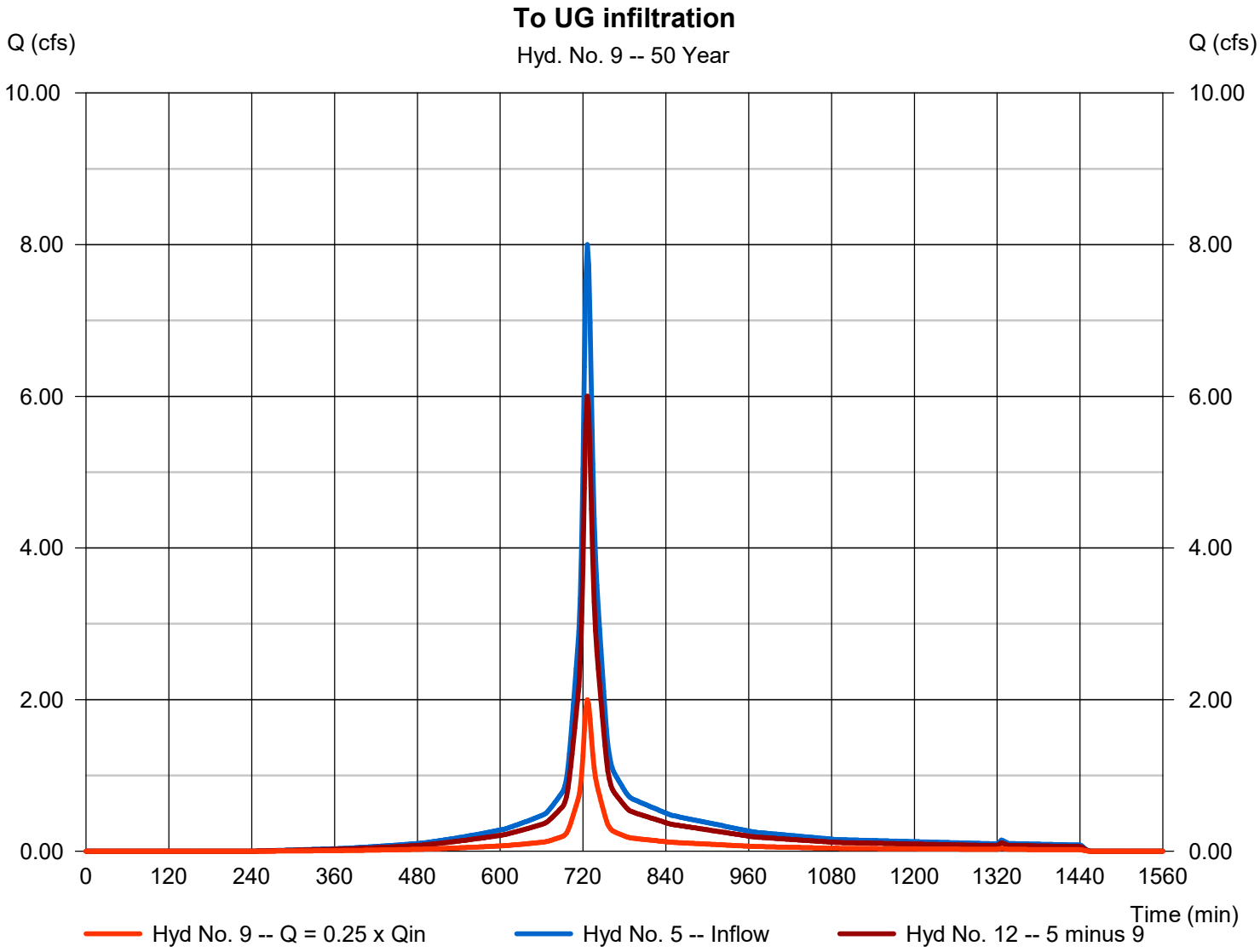


Hydrograph Report

Hyd. No. 9

To UG infiltration

Hydrograph type	= Diversion1	Peak discharge	= 2.000 cfs
Storm frequency	= 50 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 6,998 cuft
Inflow hydrograph	= 5 - Flow Diversion	2nd diverted hyd.	= 12
Diversion method	= Flow Ratio	Flow ratio	= 0.25

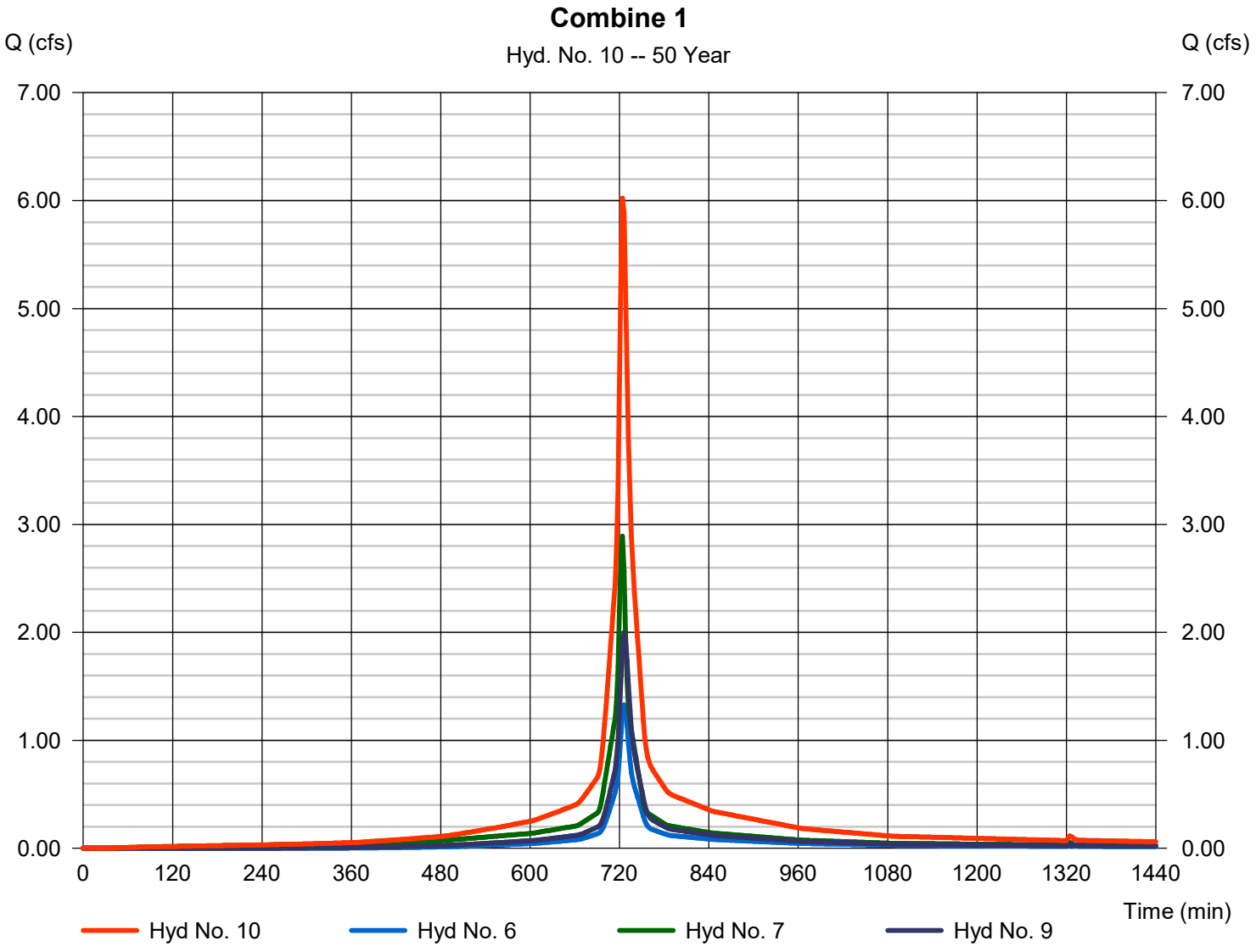


Hydrograph Report

Hyd. No. 10

Combine 1

Hydrograph type	= Combine	Peak discharge	= 6.023 cfs
Storm frequency	= 50 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 21,668 cuft
Inflow hyds.	= 6, 7, 9	Contrib. drain. area	= 0.662 ac



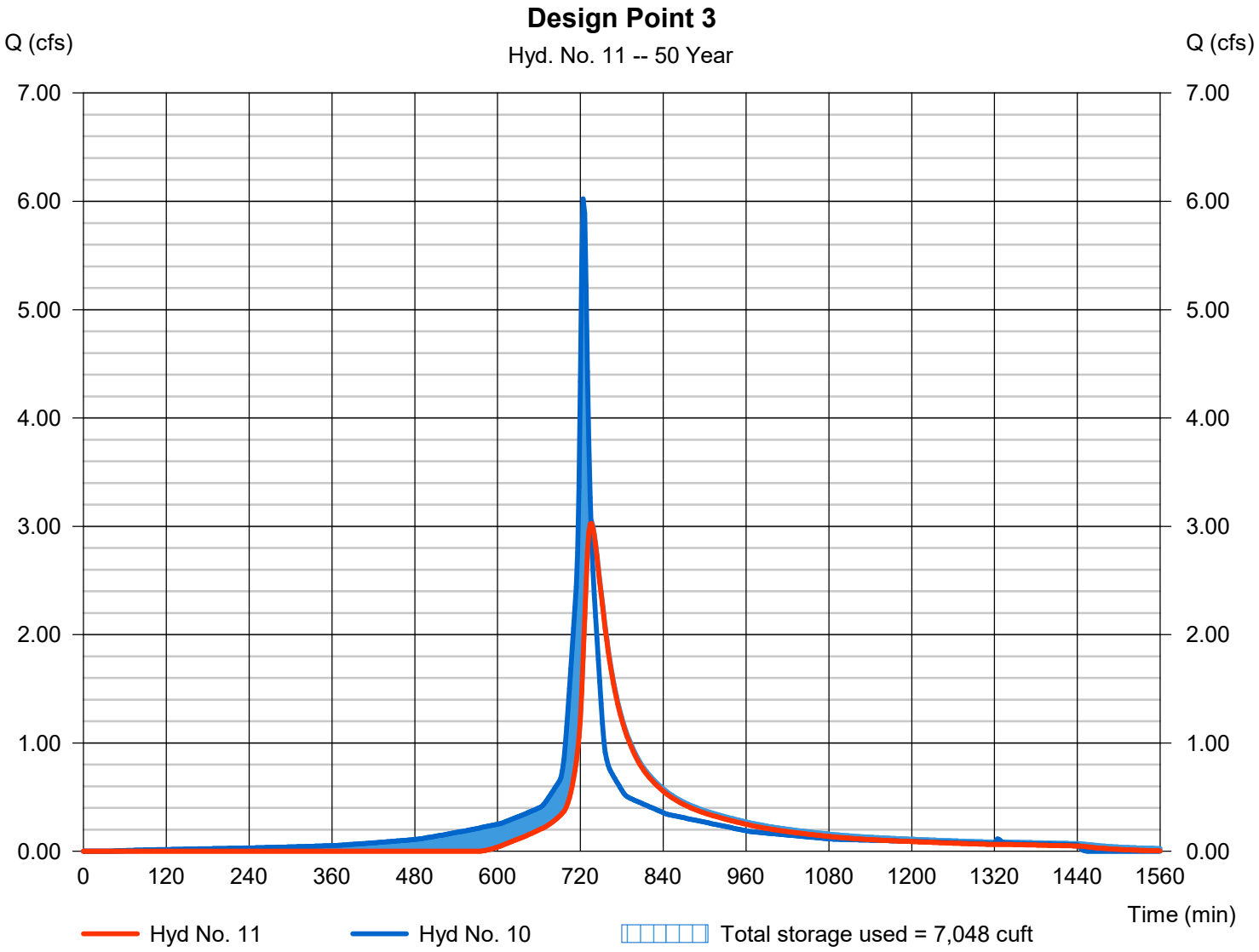
Hydrograph Report

Hyd. No. 11

Design Point 3

Hydrograph type	=	Reservoir	Peak discharge	=	3.026 cfs
Storm frequency	=	50 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	18,346 cuft
Inflow hyd. No.	=	10 - Combine 1	Max. Elevation	=	883.67 ft
Reservoir name	=	Detention Pipe 1	Max. Storage	=	7,048 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

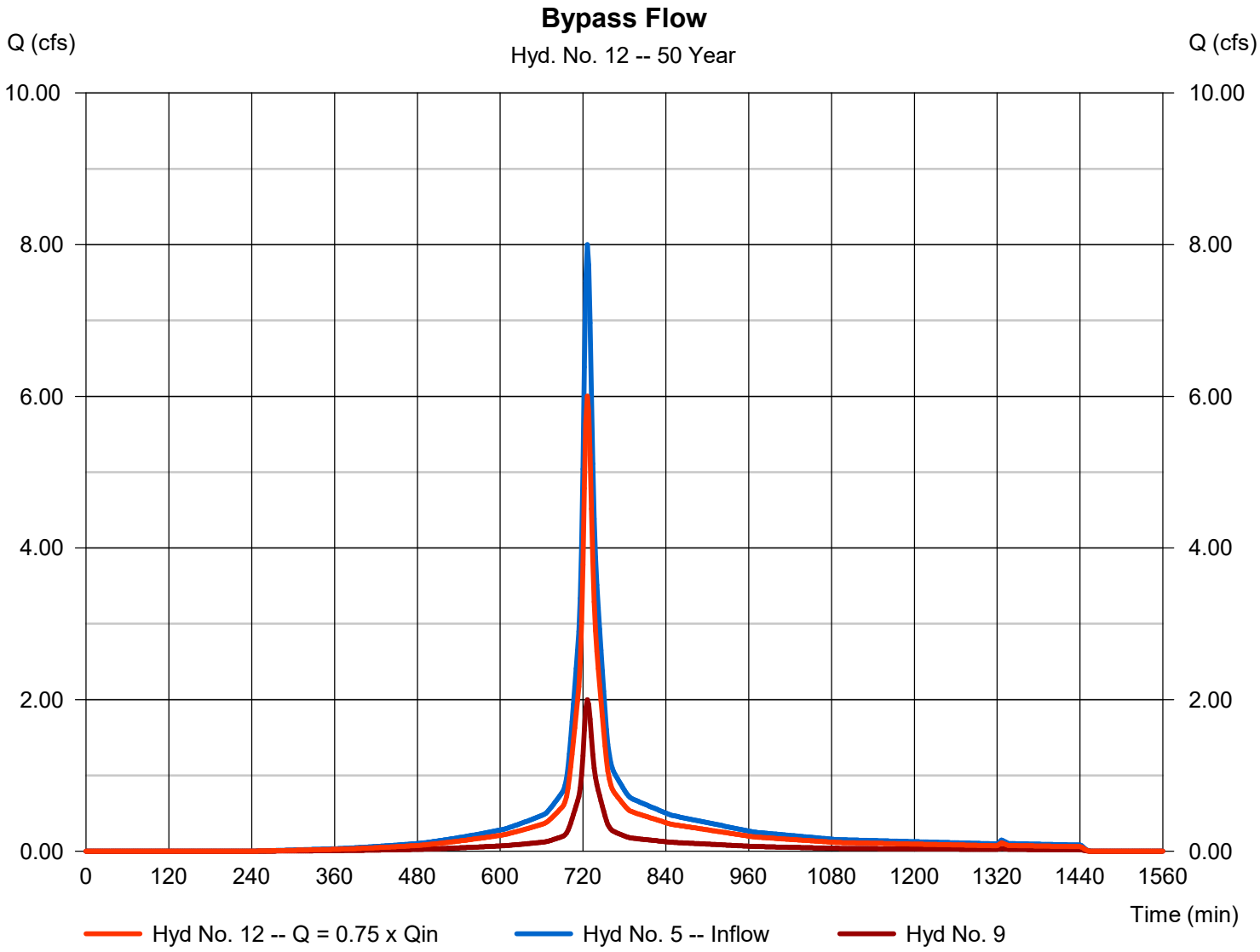


Hydrograph Report

Hyd. No. 12

Bypass Flow

Hydrograph type	= Diversion2	Peak discharge	= 6.001 cfs
Storm frequency	= 50 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 20,993 cuft
Inflow hydrograph	= 5 - Flow Diversion	2nd diverted hyd.	= 9
Diversion method	= Flow Ratio	Flow ratio	= 0.25

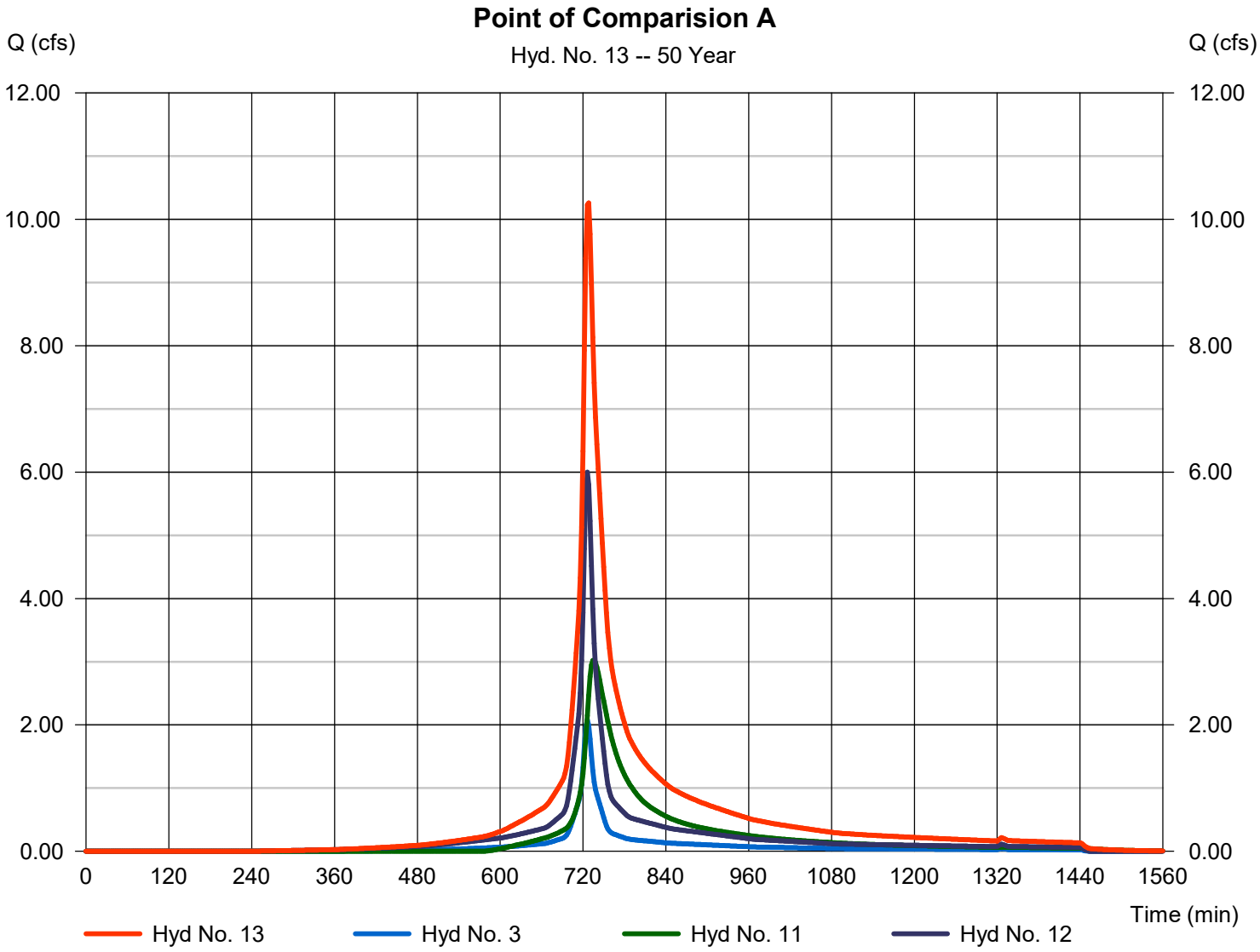


Hydrograph Report

Hyd. No. 13

Point of Comparision A

Hydrograph type	= Combine	Peak discharge	= 10.26 cfs
Storm frequency	= 50 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 46,532 cuft
Inflow hyds.	= 3, 11, 12	Contrib. drain. area	= 0.389 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	8.272	2	726	29,649	------	------	------	PR WS-01A
2	SCS Runoff	1.179	2	726	4,158	------	------	------	EX WS-01B
3	SCS Runoff	2.434	2	726	8,482	------	------	------	PR WS-01C
4	Reservoir	1.021	2	730	3,099	2	903.42	1,008	Stormtech - 2
5	Combine	9.218	2	726	32,748	1, 4	------	------	Flow Diversion
6	SCS Runoff	1.551	2	726	5,426	------	------	------	PR WS-01D
7	SCS Runoff	3.275	2	724	11,437	------	------	------	PR WS-01E
8	SCS Runoff	2.093	2	728	8,187	------	------	------	PR WS-02 - POC B
9	Diversion1	2.304	2	726	8,187	5	------	------	To UG infiltration
10	Combine	6.918	2	724	25,050	6, 7, 9	------	------	Combine 1
11	Reservoir	3.837	2	734	21,691	10	884.35	7,632	Design Point 3
12	Diversion2	6.913	2	726	24,561	5	------	------	Bypass Flow
13	Combine	12.28	2	728	54,735	3, 11, 12	------	------	Point of Comparision A

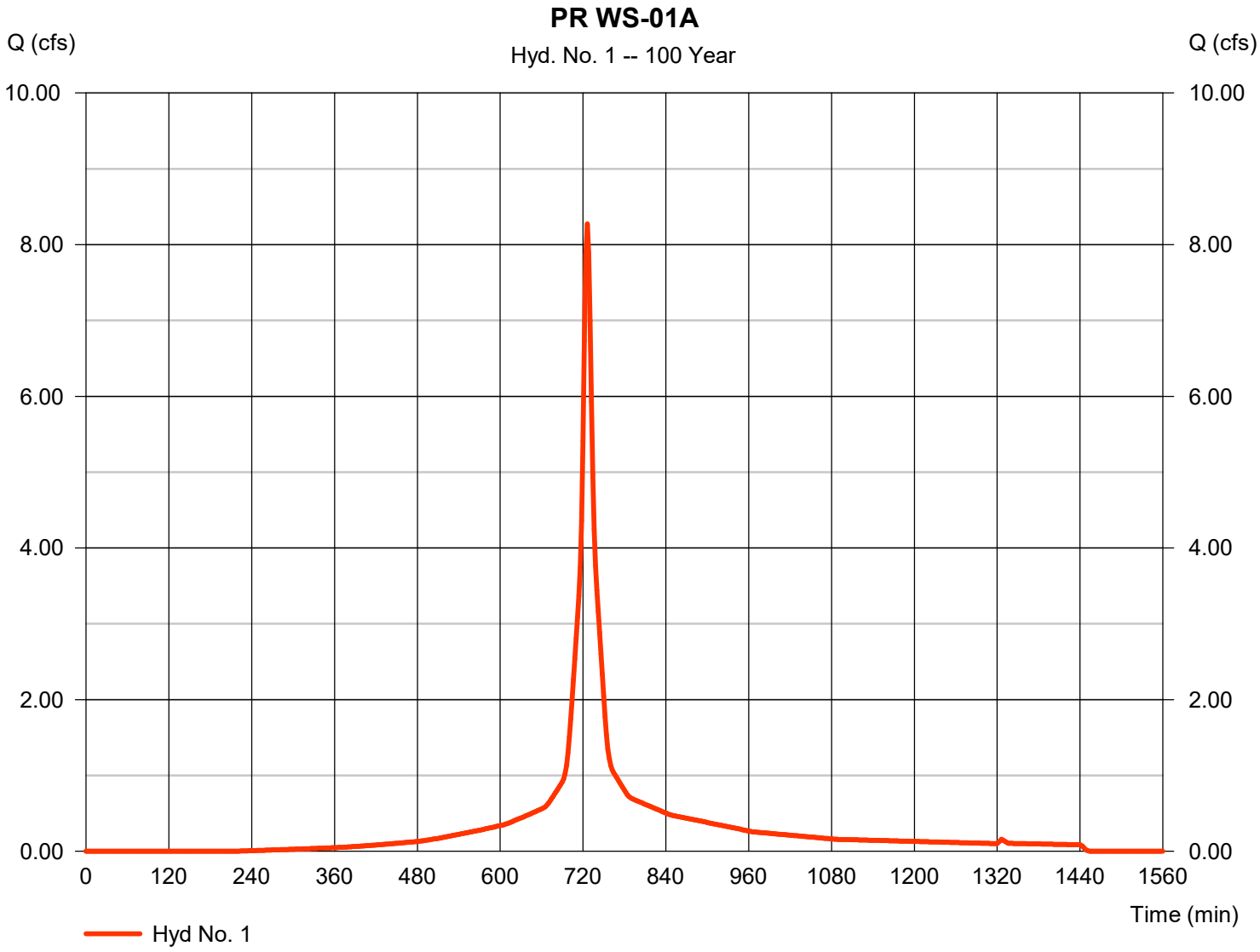
Hydrograph Report

Hyd. No. 1

PR WS-01A

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.272 cfs
Storm frequency	=	100 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	29,649 cuft
Drainage area	=	1.215 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.60 min
Total precip.	=	8.28 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.500 x 98) + (0.502 x 69)] / 1.215



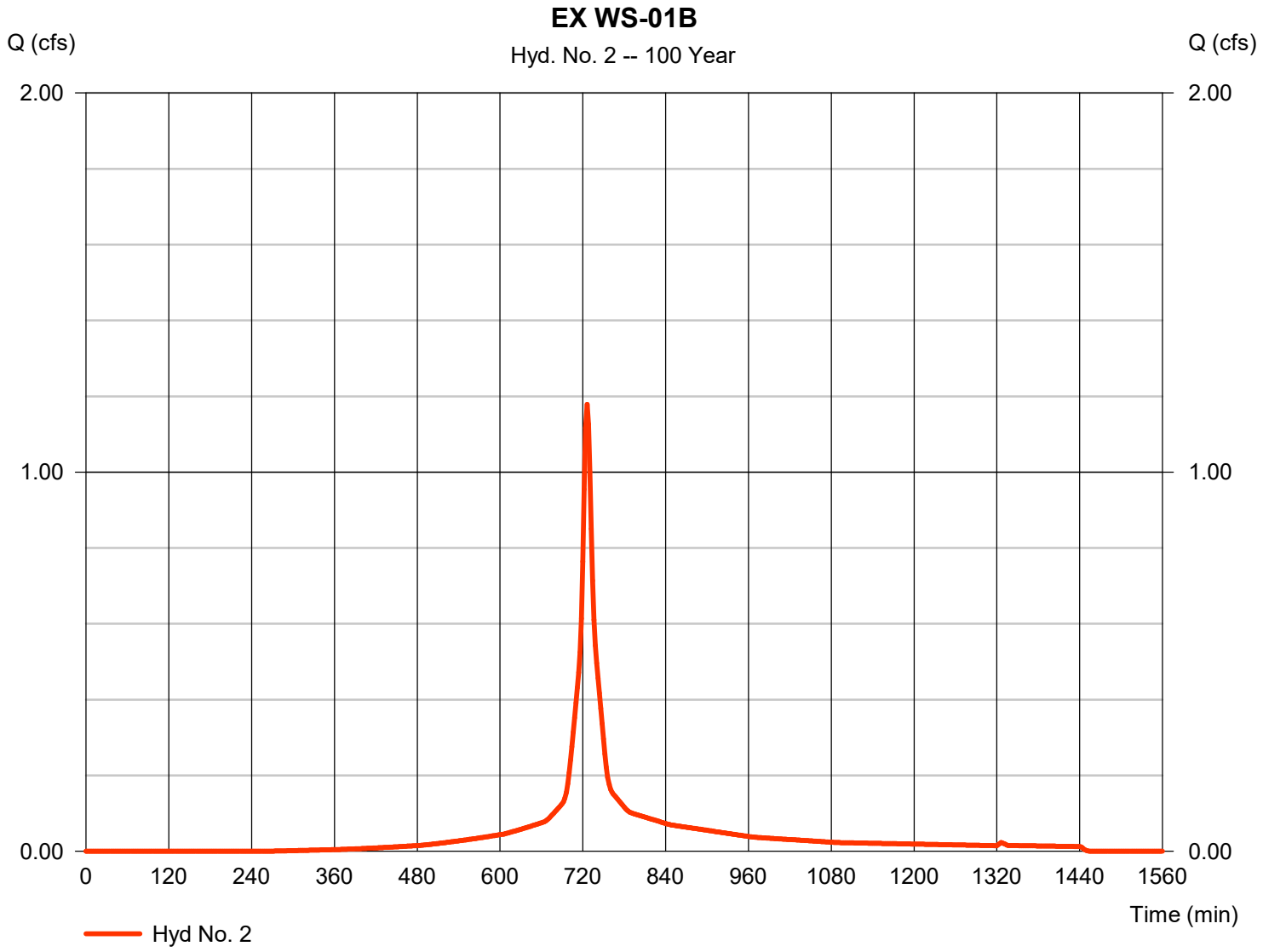
Hydrograph Report

Hyd. No. 2

EX WS-01B

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.179 cfs
Storm frequency	=	100 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	4,158 cuft
Drainage area	=	0.180 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.50 min
Total precip.	=	8.28 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.069 x 98)] / 0.180

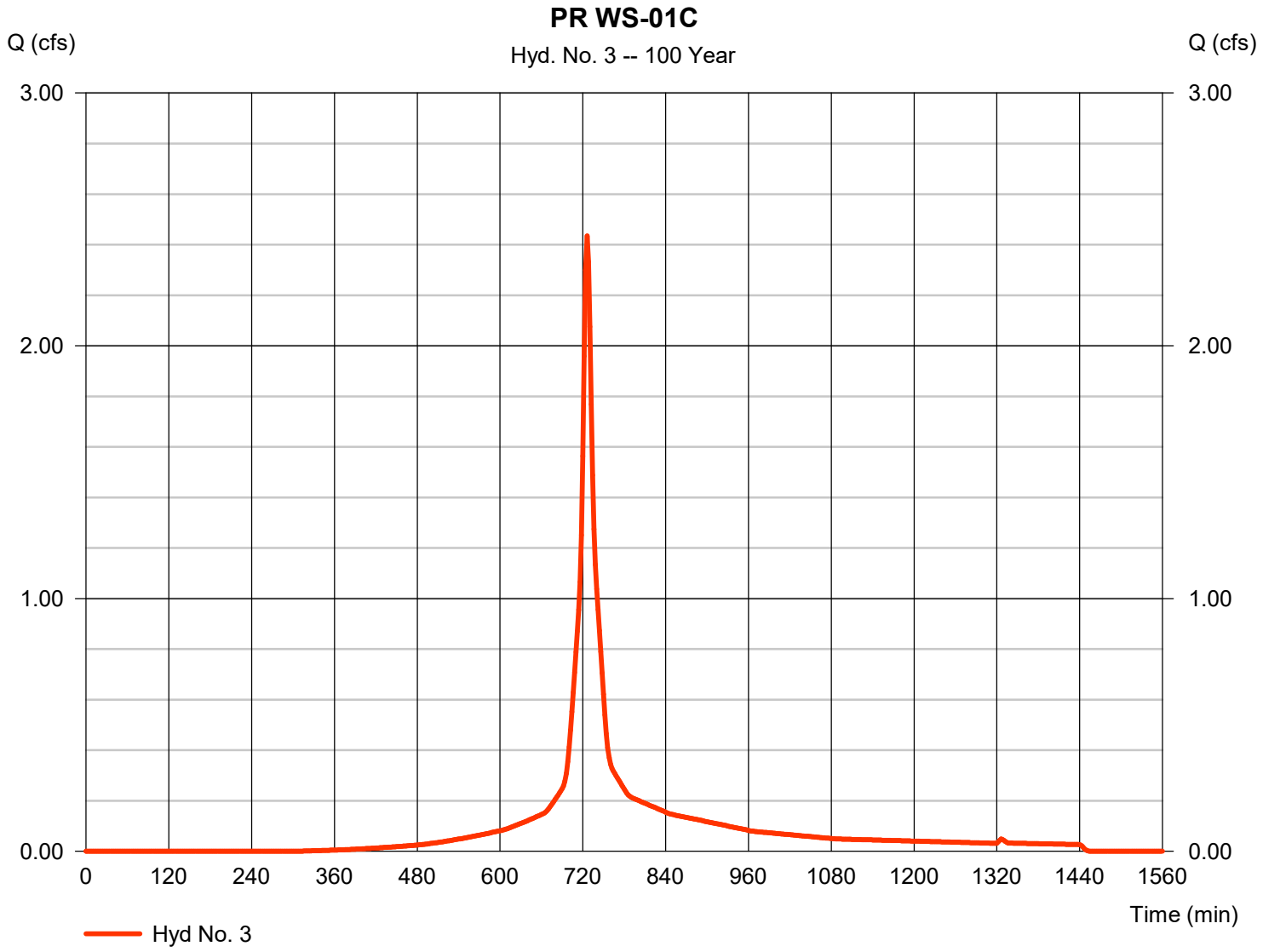


Hydrograph Report

Hyd. No. 3

PR WS-01C

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.434 cfs
Storm frequency	=	100 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	8,482 cuft
Drainage area	=	0.389 ac	Curve number	=	81
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.90 min
Total precip.	=	8.28 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



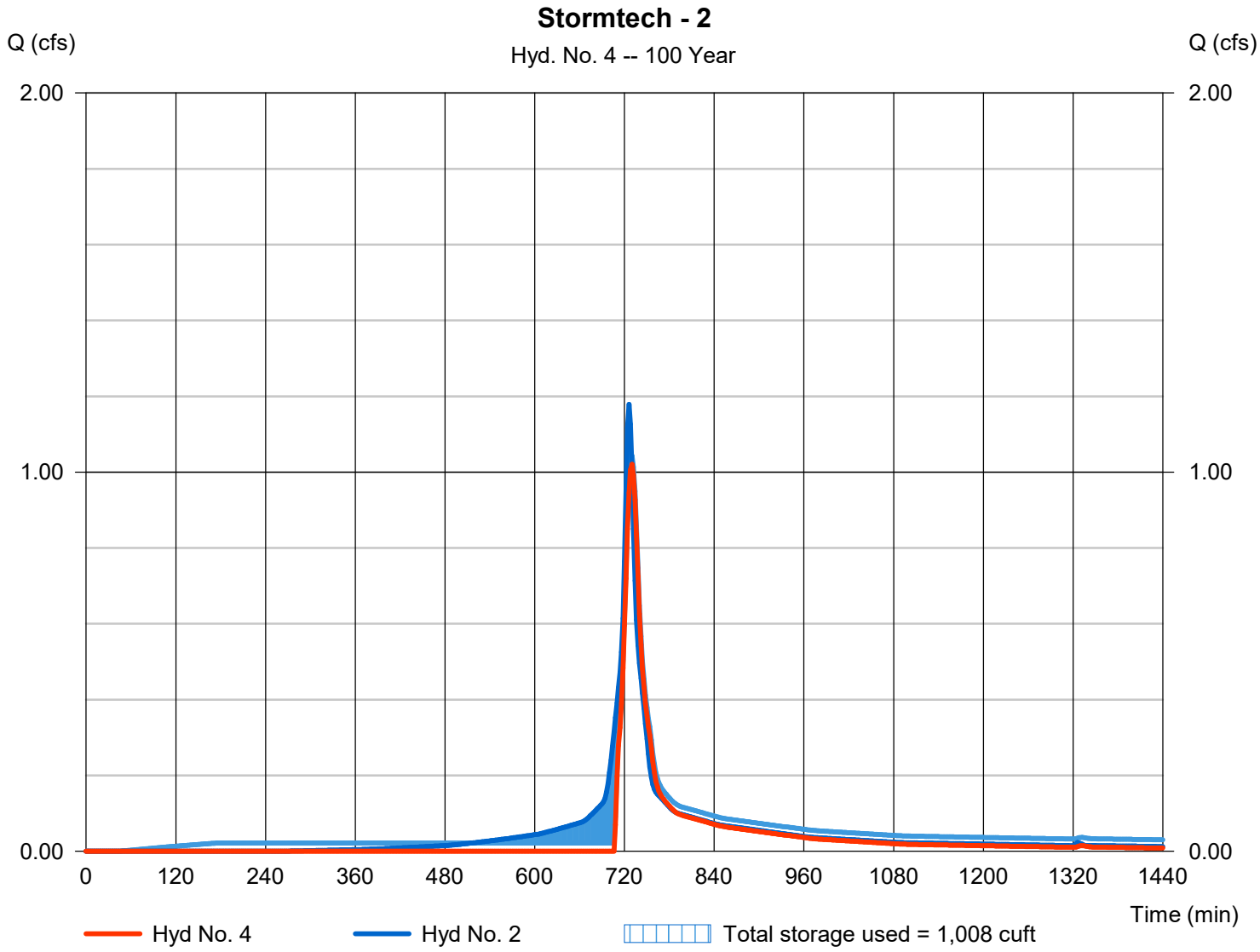
Hydrograph Report

Hyd. No. 4

Stormtech - 2

Hydrograph type	=	Reservoir	Peak discharge	=	1.021 cfs
Storm frequency	=	100 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	3,099 cuft
Inflow hyd. No.	=	2 - EX WS-01B	Max. Elevation	=	903.42 ft
Reservoir name	=	Stormtech -2	Max. Storage	=	1,008 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

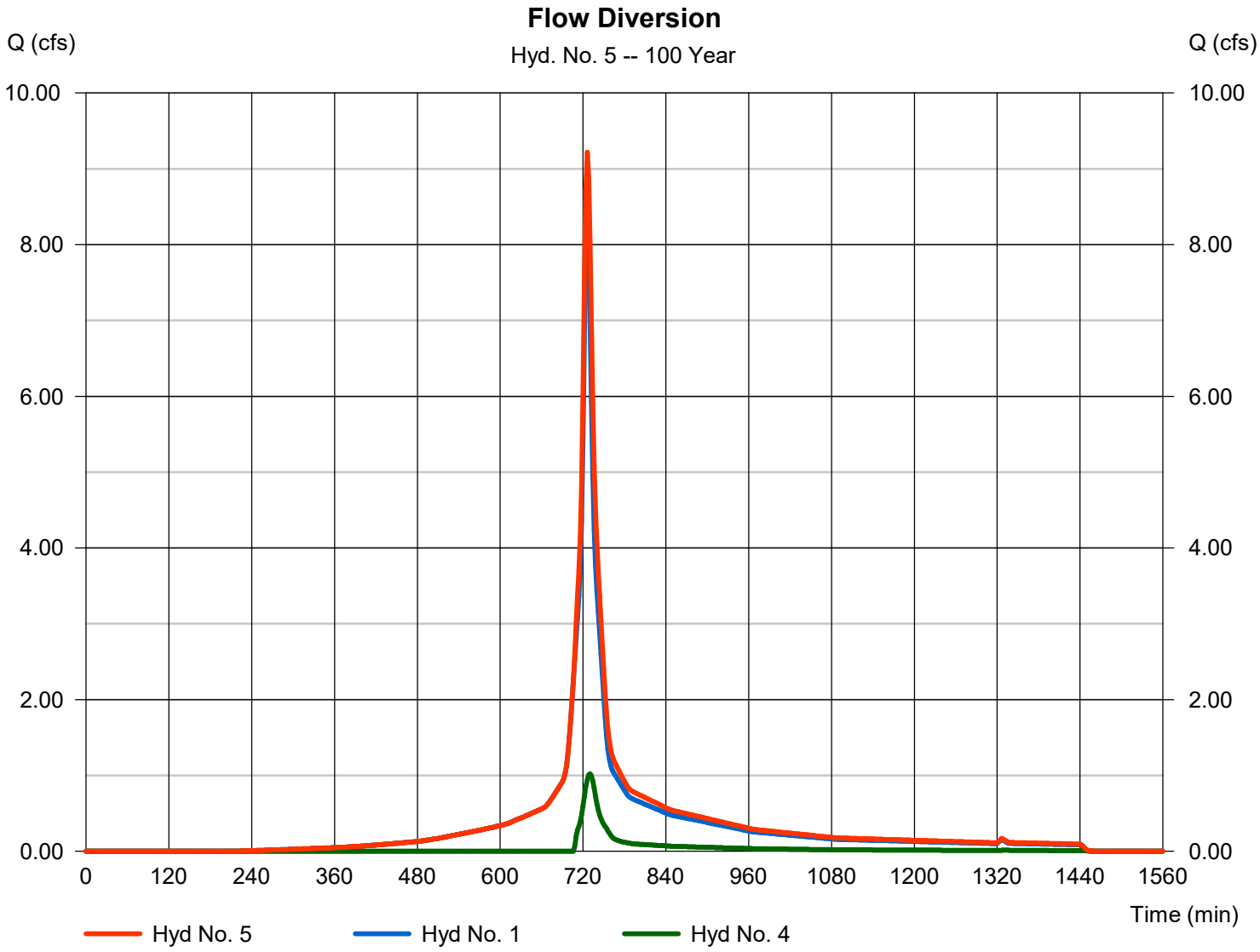


Hydrograph Report

Hyd. No. 5

Flow Diversion

Hydrograph type	= Combine	Peak discharge	= 9.218 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 32,748 cuft
Inflow hyds.	= 1, 4	Contrib. drain. area	= 1.215 ac

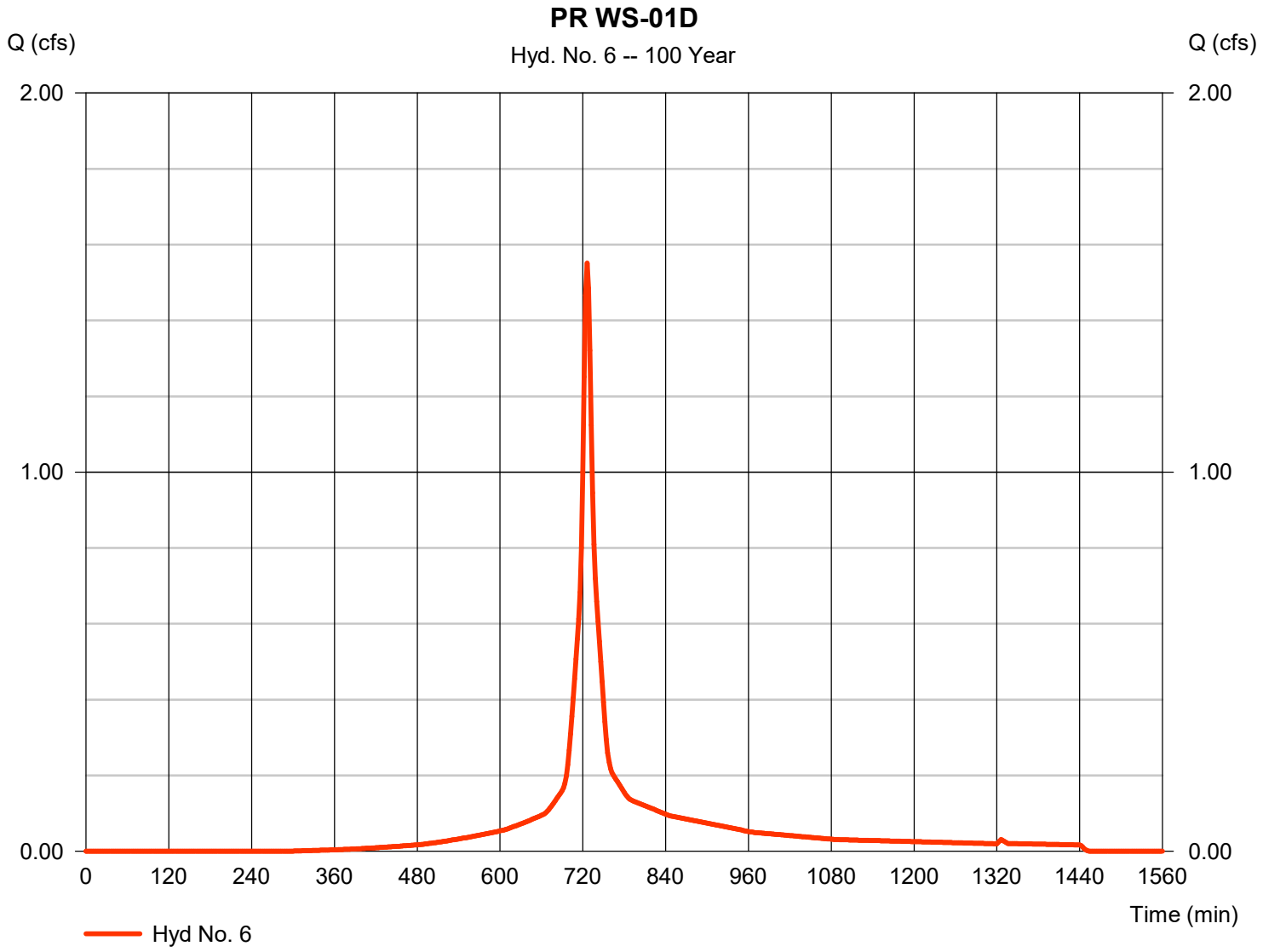


Hydrograph Report

Hyd. No. 6

PR WS-01D

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.551 cfs
Storm frequency	=	100 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	5,426 cuft
Drainage area	=	0.244 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.80 min
Total precip.	=	8.28 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

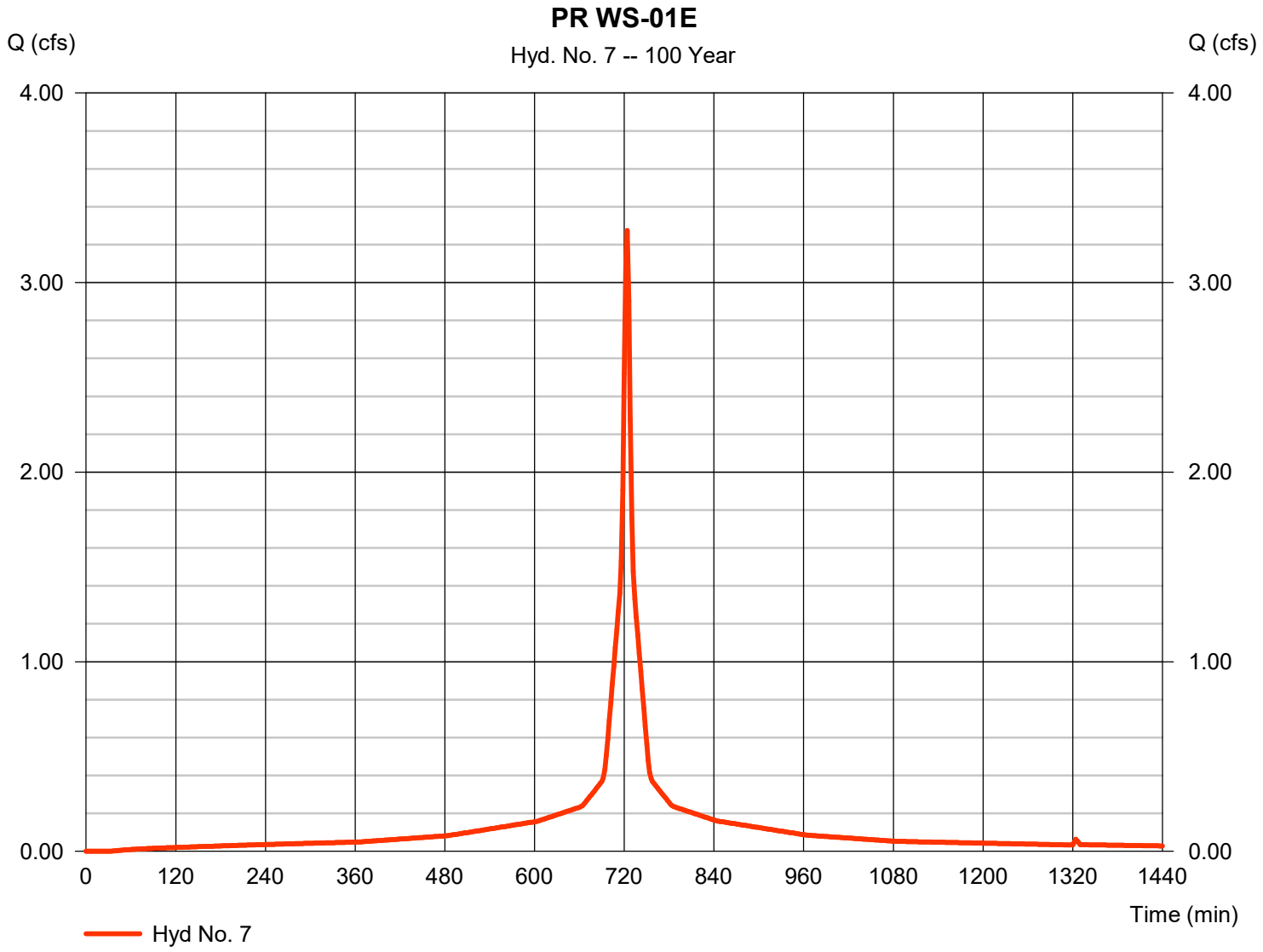


Hydrograph Report

Hyd. No. 7

PR WS-01E

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.275 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	11,437 cuft
Drainage area	=	0.418 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	8.28 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

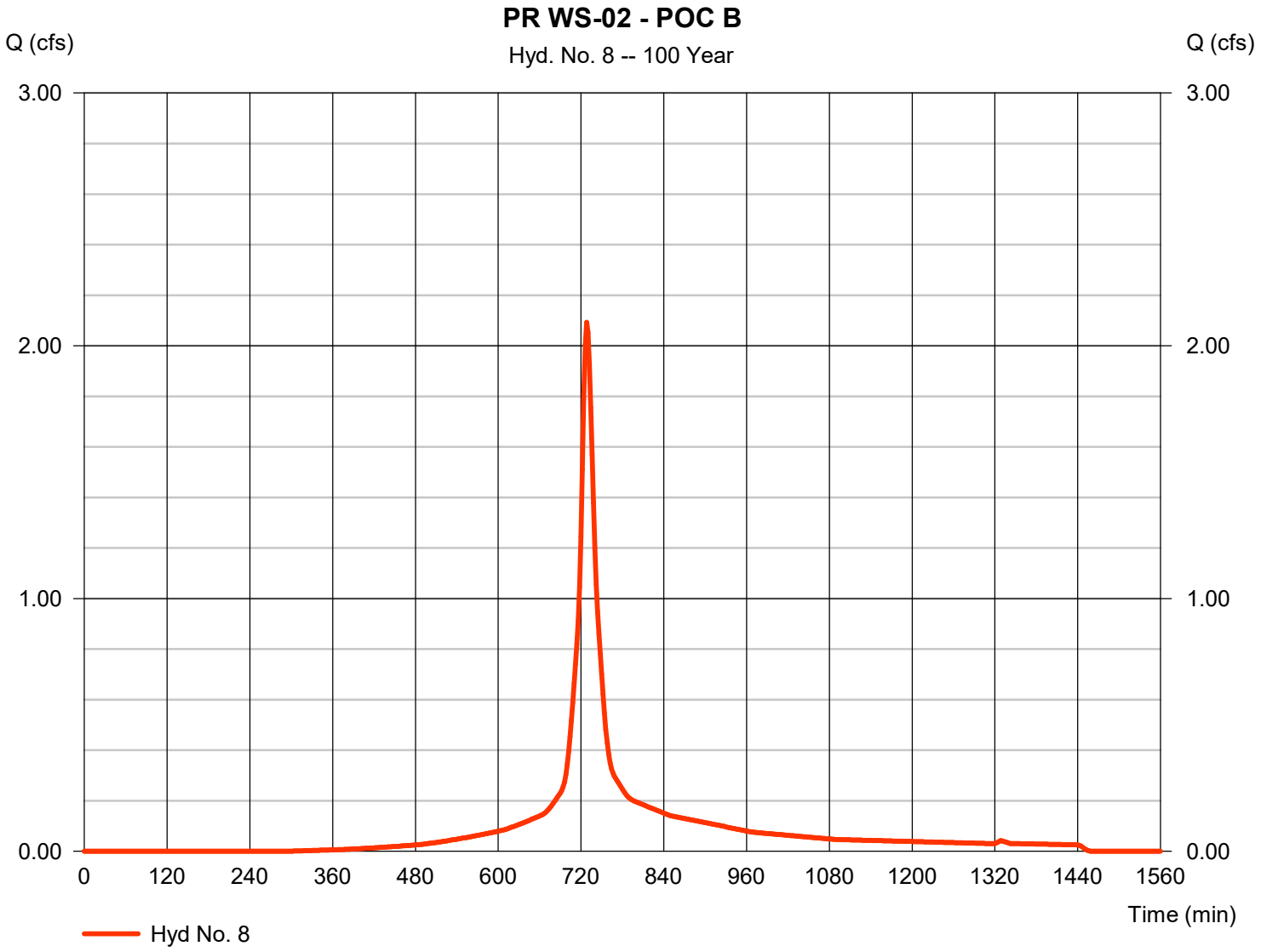


Hydrograph Report

Hyd. No. 8

PR WS-02 - POC B

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.093 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	8,187 cuft
Drainage area	=	0.357 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	11.80 min
Total precip.	=	8.28 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

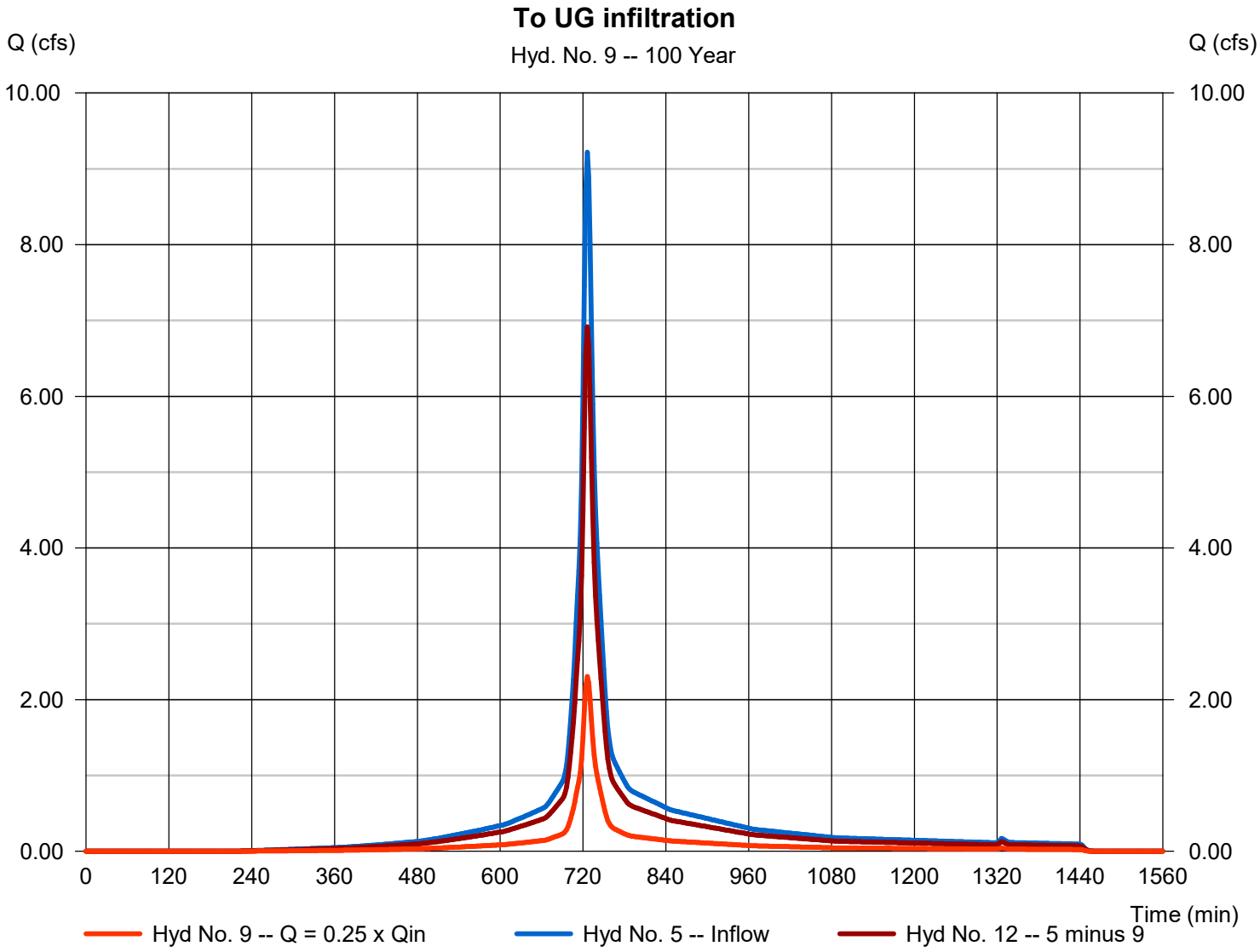


Hydrograph Report

Hyd. No. 9

To UG infiltration

Hydrograph type	= Diversion1	Peak discharge	= 2.304 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 8,187 cuft
Inflow hydrograph	= 5 - Flow Diversion	2nd diverted hyd.	= 12
Diversion method	= Flow Ratio	Flow ratio	= 0.25

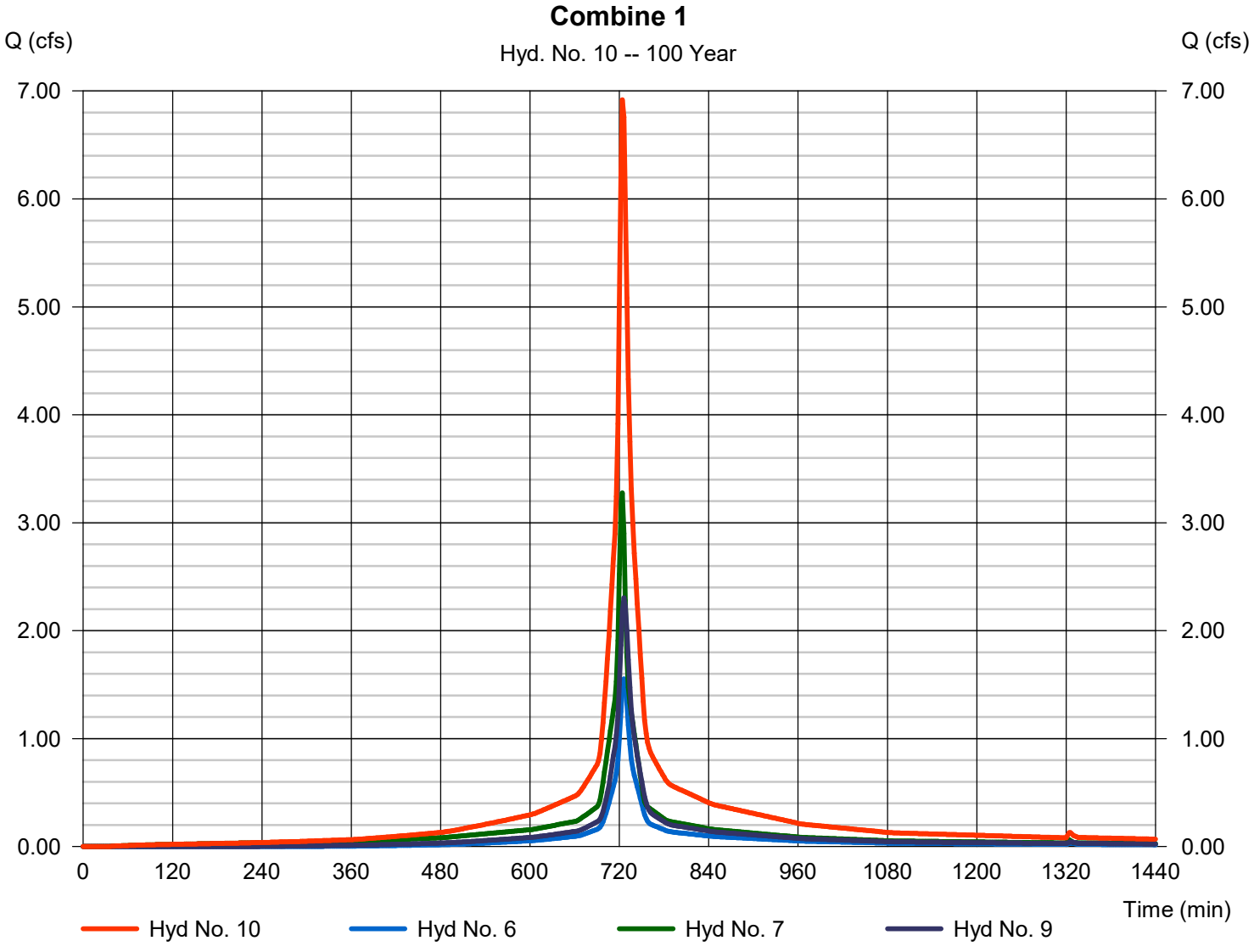


Hydrograph Report

Hyd. No. 10

Combine 1

Hydrograph type	= Combine	Peak discharge	= 6.918 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 25,050 cuft
Inflow hyds.	= 6, 7, 9	Contrib. drain. area	= 0.662 ac



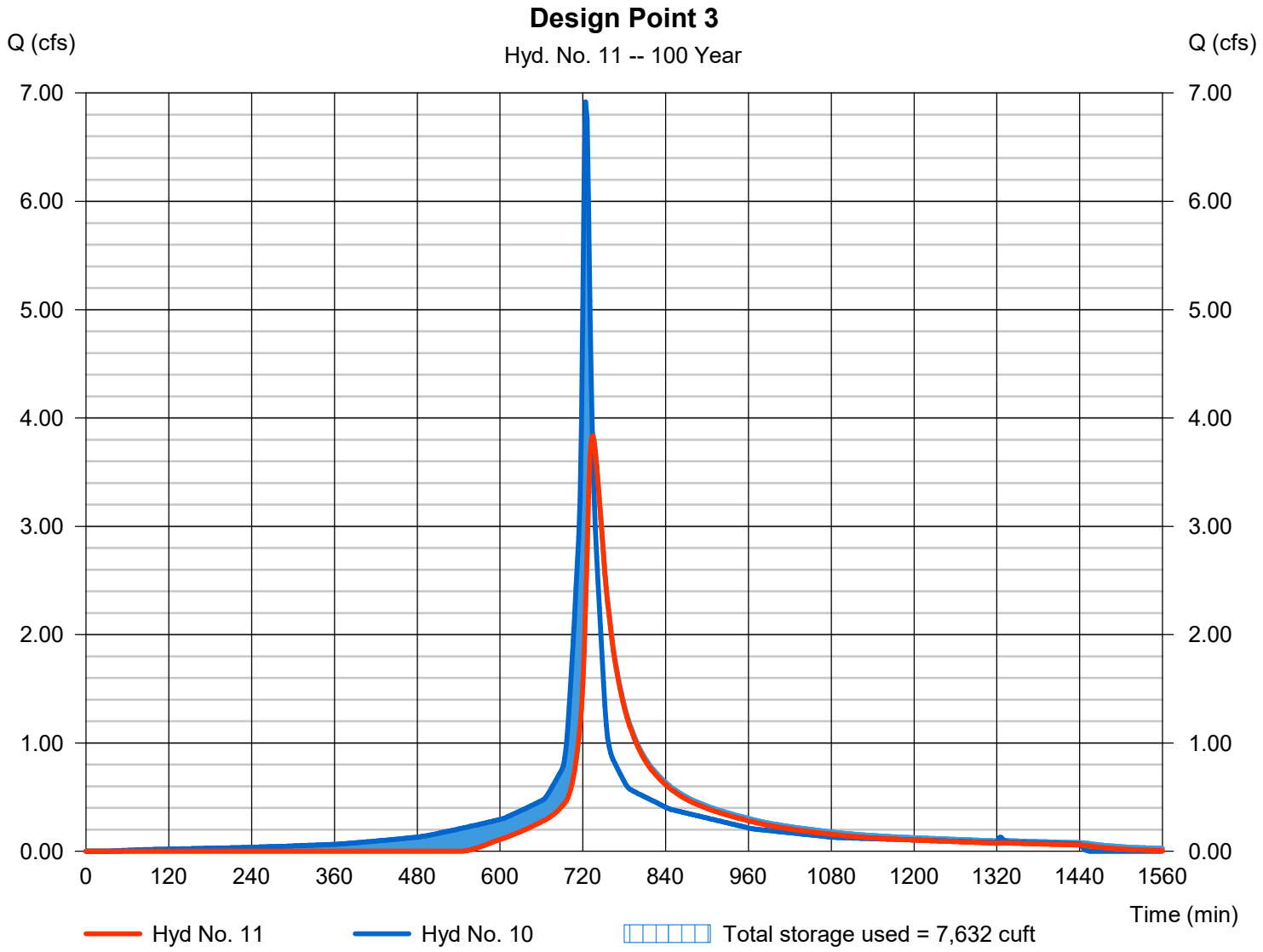
Hydrograph Report

Hyd. No. 11

Design Point 3

Hydrograph type	=	Reservoir	Peak discharge	=	3.837 cfs
Storm frequency	=	100 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	21,691 cuft
Inflow hyd. No.	=	10 - Combine 1	Max. Elevation	=	884.35 ft
Reservoir name	=	Detention Pipe 1	Max. Storage	=	7,632 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

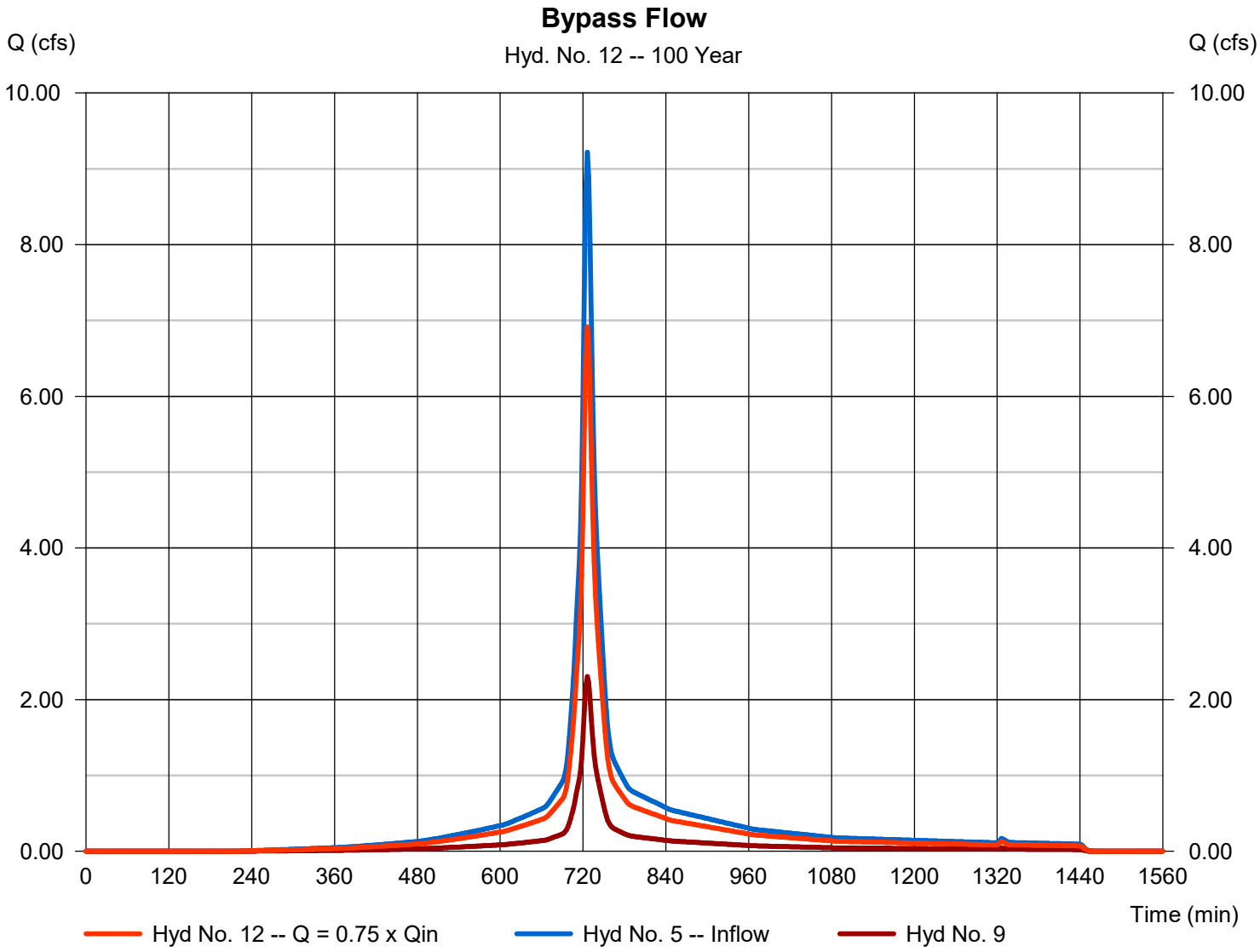


Hydrograph Report

Hyd. No. 12

Bypass Flow

Hydrograph type	= Diversion2	Peak discharge	= 6.913 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 24,561 cuft
Inflow hydrograph	= 5 - Flow Diversion	2nd diverted hyd.	= 9
Diversion method	= Flow Ratio	Flow ratio	= 0.25

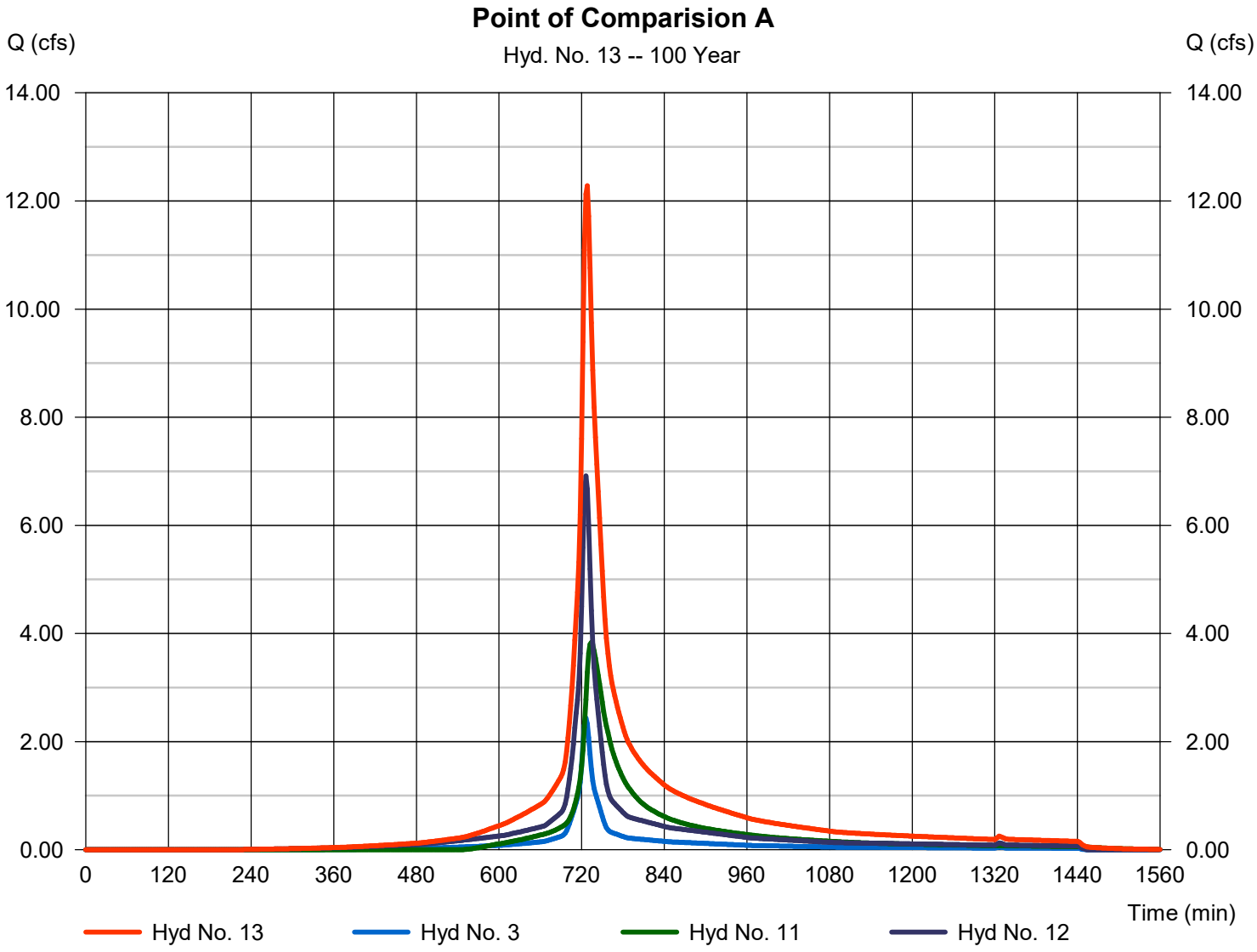


Hydrograph Report

Hyd. No. 13

Point of Comparision A

Hydrograph type	= Combine	Peak discharge	= 12.28 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 54,735 cuft
Inflow hyds.	= 3, 11, 12	Contrib. drain. area	= 0.389 ac



N

AREA DISCHARGES TO SANITARY SEWER

YD-08

RF-3

YD-09

YD-07

YD-06

YD-05

RF-2

RF-1

TD-1

TD-2

YD-02

YD-04

TD-3

EX WS-01B

YD-03

PR WS-01A

EX CB-01

YD-01

PR WS-01C

HHE

0 50' 100'

SCALE: 1" = 50'

HOTCHKISS SCHOOL DINING HALL
SALISBURY, CT

PROPOSED INLET
WATERSHED MAP

DATE:	11/03/2023
SCALE:	1" = 50'
FIGURE:	WM-03

Tighe&Bond
Engineers | Environmental Specialists

Nov 03, 2023-9:24am Plotted By: JCB1
Tighe & Bond, Inc. J:\H\H5003 Hotchkiss School\002-New Dining Facility\Calculations\Stormwater\H5003-002-PR-INLET.dwg

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **Hotchkiss School Dining Hall**
Project Number: **H5003-002**
Project Location: **Salisbury, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **JCB** Checked By: **APW**
Date: **November 3, 2023**

Designation: **YD-01**
Location:

Runoff Coefficient (C)

Cover Type	Area (ac)	C	A x C
Pavement	0.094	0.90	0.0844
Landscaped and Lawns	0.101	0.30	0.0304
	0.195		0.1148

Weighted C: 0.59

Time of Concentration (Tc)

Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Runoff Coefficient computed in accordance with ConnDOT Drainage Manual,Chapter 6.9
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Designation: **YD-02**
Location:

Runoff Coefficient (C)

Cover Type	Area (ac)	C	A x C
Pavement	0.000	0.90	0.0000
Landscaped and Lawns	0.024	0.30	0.0071
	0.024		0.0071

Weighted C: 0.30

Time of Concentration (Tc)

Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Runoff Coefficient computed in accordance with ConnDOT Drainage Manual,Chapter 6.9
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **Hotchkiss School Dining Hall**
Project Number: **H5003-002**
Project Location: **Salisbury, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **JCB** Checked By: **APW**
Date: **November 3, 2023**

Designation: **YD-03**
Location:

Runoff Coefficient (C)

Cover Type	Area (ac)	C	A x C
Pavement	0.015	0.90	0.0133
Landscaped and Lawns	0.033	0.30	0.0099
	0.048		0.0232

Weighted C: 0.49

Time of Concentration (Tc)

Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Runoff Coefficient computed in accordance with ConnDOT Drainage Manual,Chapter 6.9
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Designation: **YD-04**
Location:

Runoff Coefficient (C)

Cover Type	Area (ac)	C	A x C
Pavement	0.031	0.90	0.0277
Landscaped and Lawns	0.000	0.30	0.0000
	0.031		0.0277

Weighted C: 0.90

Time of Concentration (Tc)

Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Runoff Coefficient computed in accordance with ConnDOT Drainage Manual,Chapter 6.9
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **Hotchkiss School Dining Hall**
Project Number: **H5003-002**
Project Location: **Salisbury, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **JCB** Checked By: **APW**
Date: **November 3, 2023**

Designation: **YD-05**
Location:

Runoff Coefficient (C)

Cover Type	Area (ac)	C	A x C
Pavement	0.000	0.90	0.0000
Landscaped and Lawns	0.040	0.30	0.0121
	0.040		0.0121

Weighted C: 0.30

Time of Concentration (Tc)

Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Runoff Coefficient computed in accordance with ConnDOT Drainage Manual,Chapter 6.9
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Designation: **YD-06**
Location:

Runoff Coefficient (C)

Cover Type	Area (ac)	C	A x C
Pavement	0.000	0.90	0.0000
Landscaped and Lawns	0.029	0.30	0.0088
	0.029		0.0088

Weighted C: 0.30

Time of Concentration (Tc)

Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Runoff Coefficient computed in accordance with ConnDOT Drainage Manual,Chapter 6.9
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **Hotchkiss School Dining Hall**
Project Number: **H5003-002**
Project Location: **Salisbury, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **JCB** Checked By: **APW**
Date: **November 3, 2023**

Designation: **YD-07**
Location:

Runoff Coefficient (C)

Cover Type	Area (ac)	C	A x C
Pavement	0.035	0.90	0.0312
Landscaped and Lawns	0.016	0.30	0.0047
	0.050		0.0360

Weighted C: 0.71

Time of Concentration (Tc)

Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Runoff Coefficient computed in accordance with ConnDOT Drainage Manual,Chapter 6.9
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Designation: **YD-08**
Location:

Runoff Coefficient (C)

Cover Type	Area (ac)	C	A x C
Pavement	0.000	0.90	0.0000
Landscaped and Lawns	0.022	0.30	0.0067
	0.022		0.0067

Weighted C: 0.30

Time of Concentration (Tc)

Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Runoff Coefficient computed in accordance with ConnDOT Drainage Manual,Chapter 6.9
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **Hotchkiss School Dining Hall**
Project Number: **H5003-002**
Project Location: **Salisbury, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **JCB** Checked By: **APW**
Date: **November 3, 2023**

Designation: **YD-09**
Location:

Runoff Coefficient (C)

Cover Type	Area (ac)	C	A x C
Pavement	0.013	0.90	0.0118
Landscaped and Lawns	0.023	0.30	0.0070
	0.036		0.0188

Weighted C: 0.52

Time of Concentration (Tc)

Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Runoff Coefficient computed in accordance with ConnDOT Drainage Manual,Chapter 6.9
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Designation: **RF-1**
Location:

Runoff Coefficient (C)

Cover Type	Area (ac)	C	A x C
Roof	0.357	0.90	0.3217
	0.357		0.3217

Weighted C: 0.90

Time of Concentration (Tc)

Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Runoff Coefficient computed in accordance with ConnDOT Drainage Manual,Chapter 6.9
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **Hotchkiss School Dining Hall**
Project Number: **H5003-002**
Project Location: **Salisbury, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **JCB** Checked By: **APW**
Date: **November 3, 2023**

Designation: **RF-2**
Location:

Runoff Coefficient (C)

Cover Type	Area (ac)	C	A x C
Roof	0.182	0.90	0.1642
	0.182		0.1642

Weighted C: 0.90

Time of Concentration (Tc)

Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Runoff Coefficient computed in accordance with ConnDOT Drainage Manual,Chapter 6.9
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Designation: **RF-3**
Location:

Runoff Coefficient (C)

Cover Type	Area (ac)	C	A x C
Roof	0.021	0.90	0.0192
	0.021		0.0192

Weighted C: 0.90

Time of Concentration (Tc)

Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Runoff Coefficient computed in accordance with ConnDOT Drainage Manual,Chapter 6.9
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

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Engineers | Environmental Specialists

Project Name: **Hotchkiss School Dining Hall**
Project Number: **H5003-002**
Project Location: **Salisbury, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **JCB** Checked By: **APW**
Date: **November 3, 2023**

Designation: **TD-1**
Location:

Runoff Coefficient (C)

Cover Type	Area (ac)	C	A x C
Pavement	0.063	0.90	0.0570
	0.063		0.0570

Weighted C: 0.90

Time of Concentration (Tc)

Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Runoff Coefficient computed in accordance with ConnDOT Drainage Manual,Chapter 6.9
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Designation: **TD-2**
Location:

Runoff Coefficient (C)

Cover Type	Area (ac)	C	A x C
Pavement	0.011	0.90	0.0098
	0.011		0.0098

Weighted C: 0.90

Time of Concentration (Tc)

Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Runoff Coefficient computed in accordance with ConnDOT Drainage Manual,Chapter 6.9
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **Hotchkiss School Dining Hall**
Project Number: **H5003-002**
Project Location: **Salisbury, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **JCB** Checked By: **APW**
Date: **November 3, 2023**

Designation: **TD-3**
Location:

Runoff Coefficient (C)

Cover Type	Area (ac)	C	A x C
Pavement	0.064	0.90	0.0577
	0.064		0.0577

Weighted C: 0.90

Time of Concentration (Tc)

Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Runoff Coefficient computed in accordance with ConnDOT Drainage Manual,Chapter 6.9
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Designation: **EX-CB-1**
Location:

Runoff Coefficient (C)

Cover Type	Area (ac)	C	A x C
Pavement	0.039	0.90	0.0355
Lawn	0.035	0.30	0.0104
	0.074		0.0460

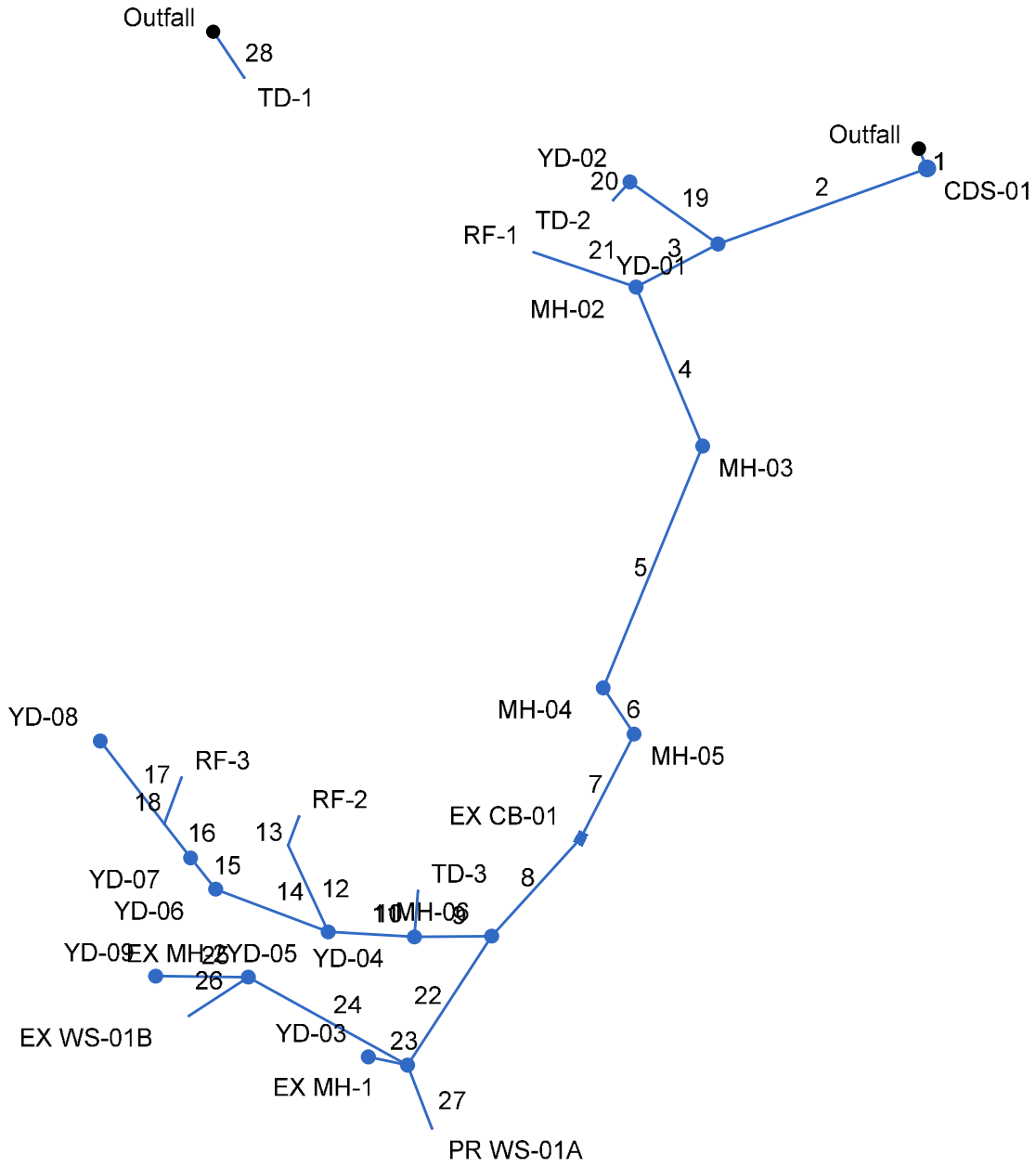
Weighted C: 0.62

Time of Concentration (Tc)

Minimum Tc = 5.0 Min

Notes: Time of Concentration computed in accordance with ConnDOT Drainage Manual, Chapter 6C.
Runoff Coefficient computed in accordance with ConnDOT Drainage Manual,Chapter 6.9
Overland time of concentration computed using "Kinematic Wave" equation.
Gutter and pipe time of concentration computed using Manning's equation.

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: Hotchkiss Proposed Storm.stm	Number of lines: 28	Date: 11/3/2023

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	7.000	0.00	1.14	0.00	0.00	0.86	0.0	7.3	5.9	9.95	0.00	5.63	18	0.00	879.70	879.70	881.20	881.25	889.90	886.90	1
2	1	72.000	0.20	1.14	0.59	0.12	0.86	5.0	7.1	6.0	10.02	8.16	5.67	18	0.51	879.95	880.32	881.75	882.31	886.90	887.90	2
3	2	30.000	0.00	0.91	0.00	0.00	0.72	0.0	7.0	6.0	9.25	11.38	6.70	18	1.00	882.45	882.75	883.48	883.92	887.90	906.29	3
4	3	56.000	0.00	0.55	0.00	0.00	0.40	0.0	6.9	6.1	7.33	7.24	6.31	15	1.07	882.75	883.35	883.92	884.43	906.29	891.35	4
5	4	85.000	0.00	0.55	0.00	0.00	0.40	0.0	6.6	6.2	7.37	23.57	5.50	18	4.29	883.35	887.00	884.43	888.05	891.35	895.15	5
6	5	18.000	0.00	0.55	0.00	0.00	0.40	0.0	6.6	6.2	7.38	11.99	5.58	18	1.11	887.00	887.20	888.05	888.25	895.15	895.95	6
7	6	38.000	0.07	0.55	0.62	0.04	0.40	5.0	6.5	6.2	7.40	33.52	5.59	18	8.68	887.20	890.50	888.25	891.55	895.95	897.50	7
8	7	43.000	0.00	0.48	0.00	0.00	0.36	0.0	6.3	6.3	7.15	32.46	5.45	18	8.14	890.50	894.00	891.55	895.03	897.50	901.50	8
9	8	25.000	0.03	0.39	0.90	0.03	0.31	5.0	6.2	6.3	1.98	3.86	4.48	12	1.00	896.87	897.12	897.38	897.72	901.50	904.16	9
10	9	15.000	0.06	0.06	0.90	0.05	0.05	5.0	5.0	7.0	0.38	3.86	2.76	12	1.00	902.85	903.00	903.06	903.25	904.16	906.65	10
11	9	28.000	0.00	0.30	0.00	0.00	0.23	0.0	6.1	6.4	1.47	5.46	4.76	12	2.00	897.67	898.23	898.03	898.74	904.16	904.40	11
12	11	31.000	0.00	0.18	0.00	0.00	0.16	0.0	5.0	7.0	1.13	0.86	5.74	6	2.00	901.58	902.20	902.08	903.15	904.40	906.65	12
13	12	10.000	0.18	0.18	0.90	0.16	0.16	5.0	5.0	7.0	1.13	0.86	5.75	6	2.00	902.20	902.40	903.53	903.88	906.65	906.65	13
14	11	39.000	0.03	0.12	0.30	0.01	0.07	5.0	5.9	6.5	0.45	5.46	2.32	12	2.00	898.43	899.21	898.74	899.49	904.40	904.40	14
15	14	13.000	0.05	0.09	0.71	0.04	0.06	5.0	5.8	6.6	0.39	4.54	2.32	12	1.38	899.21	899.39	899.49	899.65	904.40	904.50	15
16	15	14.000	0.00	0.04	0.00	0.00	0.02	0.0	5.6	6.6	0.16	5.83	1.45	12	2.29	899.39	899.71	899.65	899.87	904.50	905.00	16
17	16	34.000	0.02	0.02	0.30	0.01	0.01	5.0	5.0	7.0	0.04	3.86	0.92	12	1.00	899.71	900.05	899.87	900.13	905.00	903.49	17
18	16	16.000	0.02	0.02	0.90	0.02	0.02	5.0	5.0	7.0	0.13	0.89	2.15	6	2.12	899.71	900.05	899.87	900.23	905.00	906.65	18
19	2	35.000	0.02	0.03	0.30	0.01	0.02	5.0	5.1	6.9	0.10	3.86	1.91	12	1.00	882.90	883.25	883.01	883.38	887.90	889.00	19
20	19	8.000	0.01	0.01	0.90	0.01	0.01	5.0	5.0	7.0	0.06	1.31	1.76	8	1.00	885.00	885.08	885.10	885.19	889.00	889.15	20
21	3	35.000	0.36	0.36	0.90	0.32	0.32	5.0	5.0	7.0	2.26	3.36	5.70	10	2.00	883.58	884.28	884.08	884.95	906.29	891.00	21
22	8	50.000	0.00	0.09	0.00	0.00	0.05	0.0	5.5	6.7	5.20	2.79	2.94	18	0.06	896.87	896.90	898.37	898.47	901.50	906.00	22

Project File: Hotchkiss Proposed Storm.stm

Number of lines: 28

Run Date: 11/3/2023

NOTES:Intensity = 32.34 / (Inlet time + 3.70) ^ 0.71; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

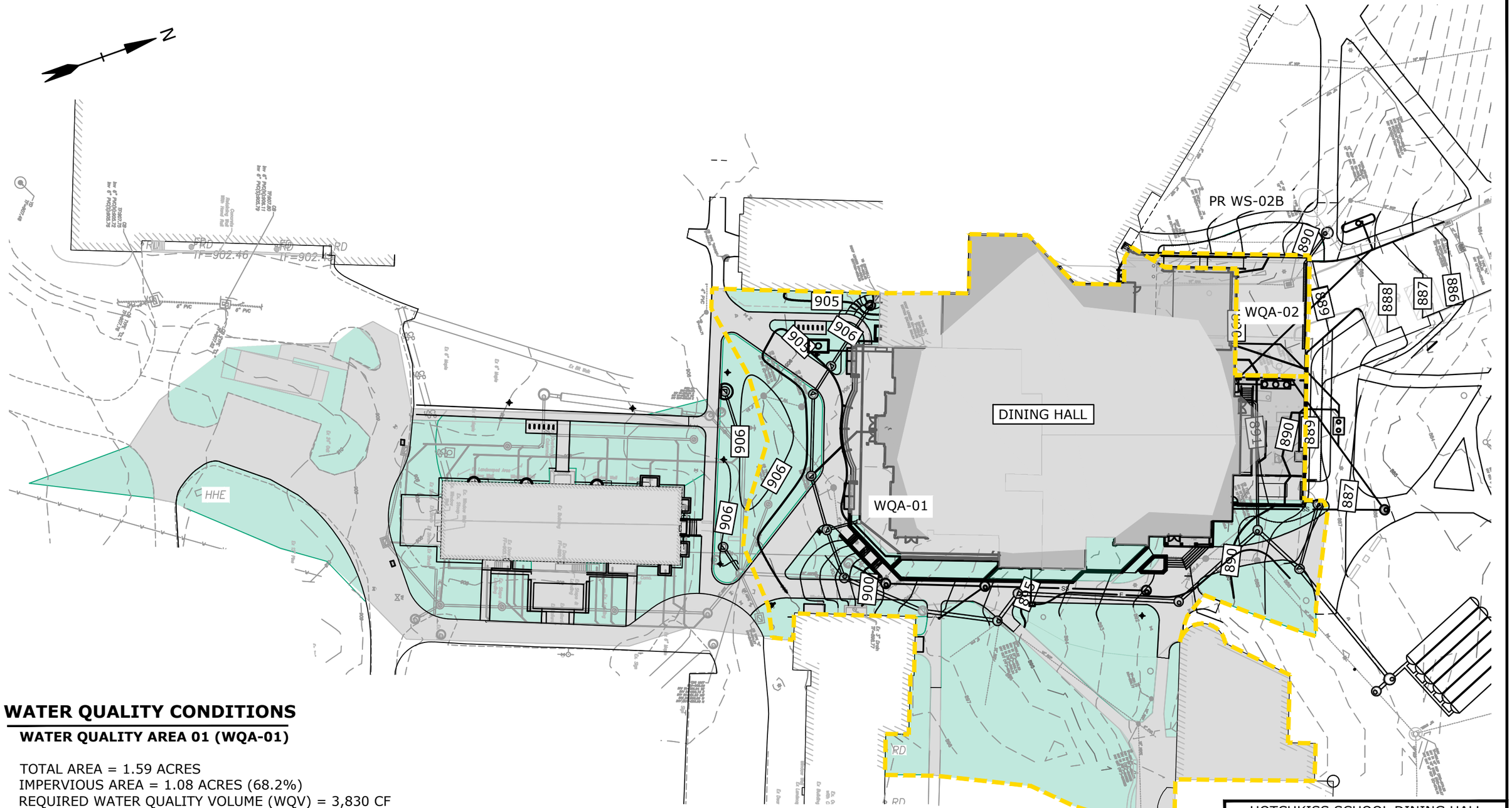
Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	22	13.000	0.05	0.05	0.49	0.02	0.02	5.0	5.0	7.0	0.17	5.46	2.55	12	2.00	901.74	902.00	901.86	902.17	906.00	905.50	23
24	22	59.000	0.00	0.04	0.00	0.00	0.02	0.0	5.2	6.8	0.78	7.00	3.30	15	1.00	898.60	899.19	898.88	899.54	906.00	906.40	24
25	24	30.000	0.04	0.04	0.52	0.02	0.02	5.0	5.0	7.0	0.15	3.86	2.10	12	1.00	900.73	901.03	900.86	901.19	906.40	904.75	25
26	24	23.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.64	3.86	3.22	12	1.00	899.94	900.17	900.22	900.50	906.40	906.00	26
27	22	22.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.26	7.00	3.47	15	1.00	896.94	897.16	898.61	898.69	906.00	906.00	27
28	End	18.000	0.06	0.06	0.90	0.05	0.05	5.0	5.0	7.0	0.38	6.10	0.67	12	2.50	883.75	884.20	884.75	884.74	889.88	889.88	28

Project File: Hotchkiss Proposed Storm.stm

Number of lines: 28

Run Date: 11/3/2023

NOTES:Intensity = 32.34 / (Inlet time + 3.70) ^ 0.71; Return period =Yrs. 10 ; c = cir e = ellip b = box



WATER QUALITY CONDITIONS

WATER QUALITY AREA 01 (WQA-01)

TOTAL AREA = 1.59 ACRES
IMPERVIOUS AREA = 1.08 ACRES (68.2%)
REQUIRED WATER QUALITY VOLUME (WQV) = 3,830 CF
REQUIRED WATER QUALITY FLOW (WQF) = 1.072 CFS

WATER QUALITY AREA 02 (WQA-02)

TOTAL AREA = 0.06 ACRES
IMPERVIOUS AREA = 0.06 ACRES (100%)
REQUIRED WATER QUALITY VOLUME (WQV) = 217 CF
REQUIRED WATER QUALITY FLOW (WQF) = 0.065 CFS

LEGEND

WATERSHED LINE

Pervious Surface

Impervious Surface

0 50' 100'

SCALE: 1" = 50'

HOTCHKISS SCHOOL DINING HALL
SALISBURY, CT

PROPOSED WATER QUALITY FIGURE

DATE:	11/03/2023
SCALE:	1" = 50'
FIGURE:	WM-04

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Consulting Engineers
Environmental Specialists

Project Name: **Hotchkiss Dining Hall**
Project Number: **H5003-002**
Project Location: **Lakeville, CT**
Description: **Total Suspended Solids Removal**
Prepared By: **PAR** Date: **November 03, 2023**

TOTAL SUSPENDED SOLIDS REMOVAL

WQA-01 = 2.470 acres

BMP	BMP DESCRIPTION	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Deep Sump Catch Basin	Deep Sump Catch Basin	25.00%	100.00%	25.00%	75.00%
Oil Grit Separator	CDS Unit	80.00%	75.00%	60.00%	15.00%
Underground Infiltration	Underground Infiltration	80.00%	15.00%	12.00%	3.00%
				Total weighted average TSS removal efficiency =	**97.00%**

WQA-02 = 0.060 acres

BMP	BMP DESCRIPTION	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Oil Grit Separator	CDS Unit	80.00%	100.00%	80.00%	20.00%
				Total weighted average TSS removal efficiency =	**80.00%**

Weighted Total Suspend Solids Removal

Area	Acres	TSS Removal Rate	Area x Rate
WQA-01	2.470	97.0%	2.396
WQA-02	0.060	80.0%	0.048
TOTAL	2.530		2.444

Weighted TSS Removal Rate= 96.60%

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Project Name:	**Hotchkiss Dining Hall**
Project Number:	**H5003-002**
Project Location:	**Lakeville, CT**
Description:	**Water Quality Volume and Flow**
Prepared By:	**PAR** Checked By: **APW**
Date:	**November 03, 2023**

Designation: **WQA-01**
Location:

Required Water Quality Volume (WQv)

Total Area in acres (A)	=	1.59	ac
Impervious Area in acres	=	1.08	
Percent of Impervious Area (I)	=	68.20	

Volumetric Runoff Coefficient (R)

$R = 0.05+0.009(I)$ = 0.664

Required Water Quality Volume (WQv)

$WQv = \frac{(1")(R)(A)}{12}$ = 0.0879 ac-ft

Required WQv = **3830** **cf**

Required Water Quality Flow (WQf)

WQv in ac-ft	=	0.0879	ac-ft
Total Area in Acres (A)	=	1.59	ac

Runoff Depth in inches (Q)

Q=WQv*12/A = 0.664 in

Design Precipitation in inches (P) = 1.0 in

Curve Number (CN)

$CN = \frac{1000}{[10+5P+10Q-10(Q^2+1.25QP)^{1/2}]}$ = 96

From Table 4-1 in Chapter 4, TR-55

$\mathbf{I_a}$ = 0.041 in

$\mathbf{I_a/P}$ = 0.041

From Exhibit 4-11 in Chapter 4, TR-55

Unit Peak Discharge, q_u = 650 csm/in

Area in Square miles (A) = 0.002 sq. mi

Required Water Quality Flow (WQf)

$WQf = q_u*A*Q$ = **1.072** **cfs**

Notes: Calculated in accordance with the 2004 Connecticut Stormwater Quality Manual Sections 7.4.1 and 7.4.2

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Engineers | Environmental Specialists

Project Name:	**Hotchkiss Dining Hall**
Project Number:	**H5003-002**
Project Location:	**Lakeville, CT**
Description:	**Water Quality Volume and Flow**
Prepared By:	**PAR** Checked By: **APW**
Date:	**November 03, 2023**

Designation: **WQA-02**
Location:

Required Water Quality Volume (WQv)

Total Area in acres (A)	=	0.06	ac
Impervious Area in acres	=	0.06	
Percent of Impervious Area (I)	=	100.00	

Volumetric Runoff Coefficient (R)

$R = 0.05+0.009(I)$ = 0.950

Required Water Quality Volume (WQv)

$$WQv = \frac{(1")(R)(A)}{12}$$ = 0.0050 ac-ft

Required WQv = **217** **cf**

Required Water Quality Flow (WQf)

WQv in ac-ft	=	0.0050	ac-ft
Total Area in Acres (A)	=	0.06	ac

Runoff Depth in inches (Q)

$Q=WQv*12/A$ = 0.950 in

Design Precipitation in inches (P) = 1.0 in

Curve Number (CN)

$$CN = \frac{1000}{[10+5P+10Q-10(Q^2+1.25QP)^{1/2}]}$$ = 100

From Table 4-1 in Chapter 4, TR-55

I_a	=	0.083	in
I_a/P	=	0.083	

From Exhibit 4-11 in Chapter 4, TR-55

Unit Peak Discharge, q_u	=	700	csm/in
Area in Square miles (A)	=	0.000	sq. mi

Required Water Quality Flow (WQf)

$WQf = q_u*A*Q$ = **0.065** **cfs**

Notes: Calculated in accordance with the 2004 Connecticut Stormwater Quality Manual Sections 7.4.1 and 7.4.2

APPENDIX E

The Hotchkiss School Dining Hall Renovation

Salisbury, Connecticut

Maintenance and Inspection Plan

November 3, 2023

The initial inspection will be made during an intense rainfall to check the adequacy of the yard drains, catch basins, roof leaders, piping, hydrodynamic separators, and infiltration systems.

The following is a checklist of items that will be checked and maintained during scheduled maintenance operations.

Drainage Structures: The Owner will be responsible for cleaning the catch basins, yard drains, manholes, piping, and outlet protection on their property. A Connecticut licensed hauler shall clean the sumps, and legally dispose of removed sand at an off-site location. The road sand may not be reused or stored on-site. As part of the hauling contract, the hauler shall notify the Owner in writing where the material is being disposed.

Each catch basin and yard drain shall be inspected every four months, with one inspection occurring during the month of April. Any debris occurring within one foot from the bottom of each sump shall be removed by Vacuum "Vactor" type of maintenance equipment. Maintain a log of inspections. Remove organic matter, sand and debris from catch basins as necessary and dispose of legally.

Hydrodynamic Separator: The Contech CDS units (hydrodynamic separators) will be skimmed and oil and scum removed. In a separate operation, silt, sand and sediment will be removed. Once the structure is cleaned of debris, the chamber will be refilled with clean water to prevent wash through of debris and oil during next storm event.

Underground Infiltration: The underground infiltration systems will be cleaned of all silt, debris and sediment from the inlet structure, outlet structure and the chamber lengths. The outlet control structure will be inspected and cleaned to make sure nothing is clogging the discharge pipe.

Pavement: Paved areas shall be swept periodically by the Owner to clean trash and other debris. The Owner will sweep paved areas on its property in the spring to remove winter accumulations of road sand. Perform a visual inspection of paved areas four times per year with one inspection after the last snowfall, but no later than April 1. Sweep accumulated sediment and debris from the paved areas. Clean paved areas as necessary during the remainder of the year.

Drainage Structures Inspection

Each catch basin and yard drain shall be inspected every four months, with one inspection occurring during the month of April. Any debris occurring within one foot from the bottom of each sump shall be removed by Vacuum "Vactor" type of maintenance equipment. Maintain a log of inspections. Remove organic matter, sand and debris from catch basins as necessary and dispose of legally.

Date (MM/DD/YY)	Company/Person	Supervising Team Member	Comments

Underground Infiltration

The underground infiltration systems shall be inspected annually and will be cleaned of all silt, debris and sediment from the inlet structures, outlet structures and the chamber lengths. The outlet control structures will be inspected and cleaned to make sure nothing is clogging the discharge pipes.

Date (MM/DD/YY)	Company/Person	Supervising Team Member	Comments

Pavement Inspection

Perform a visual inspection of paved areas four times per year with one inspection after the last snowfall, but no later than April 1. Sweep accumulated sediment and debris from the paved areas. Clean paved areas as necessary during the remainder of the year.

Date (MM/DD/YY)	Company/Person	Supervising Team Member	Comments

CONTECH®
ENGINEERED SOLUTIONS

CDS® Inspection and Maintenance Guide

CDS TECHNOLOGIES

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allows both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine weather the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.

CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	y^3	m^3
CDS1515	3	0.9	3.0	0.9	0.5	0.4
CDS2015	4	1.2	3.0	0.9	0.9	0.7
CDS2015	5	1.3	3.0	0.9	1.3	1.0
CDS2020	5	1.3	3.5	1.1	1.3	1.0
CDS2025	5	1.3	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3025	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3
CDS5640	10	3.0	6.3	1.9	8.7	6.7
CDS5653	10	3.0	7.7	2.3	8.7	6.7
CDS5668	10	3.0	9.3	2.8	8.7	6.7
CDS5678	10	3.0	10.3	3.1	8.7	6.7

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater, earth stabilization and wastewater treament products. For information, visit www.ContechES.com or call 800.338.1122

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CDS Inspection & Maintenance Log

CDS Model: _____ Location: _____

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.**

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.