STORMWATER MANAGEMENT REPORT

For:

YESHIVA NEW ACADEMY BUILDING

BLOCK 134, LOT 1
BOROUGH OF NORTH PLAINFIELD, SOMERSET COUNTY
NEW JERSEY

October 2022

Applicant/Owner:

Regency Development
315 Monmouth Avenue #208
Lakewood, NJ 08701

Prepared by:

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I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining and preparing the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment.

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1.0 Executive Summary

The purpose of this report is to document compliance with the stormwater management requirements promulgated under New Jersey Administrative Code (N.J.A.C.) 7:8 and Chapter 17, Article XII (§17:12-1) of the Borough of North Plainfield's land use ordinance. The proposed improvements are located at 21 Rockview Avenue on Block 134, Lot 1 in the Borough of North Plainfield, Somerset County, New Jersey. The site is already improved containing the existing Yeshiva Academy School. The project proposes to construct a new two-story 7,739 sf +/- in the southwest corner of the lot. The newly Yeshiva Academy Building is the primary point of discussion of this report.

1.1 Project Description

The proposed development of the New Yeshiva Academy Building will be constructed in the southwest corner of the 2.21-acre lot identified as Block 134, Lot 1 on the Borough of North Plainfield Tax Maps. The proposed project consists of a two-story 19,054 gross square foot educational center with a basement. The educational center will cater to approximately 79 students who already attend the existing Yeshiva Academy that functions on the site today. Other site improvements include fencing, sidewalks, landscaping, lighting, utility improvements, and a new perimeter wrought-iron fence around the entire Lot 1. The new Yeshiva Academy Building is anticipated to disturb approximately 0.66 acres.

The subject property is not located within a flood zone per FEMA preliminary flood map number 34035C0181E and based on a site visit no apparent wetland areas were identified on-site. Portions of the disturbed lawn areas will be revegetated and restored back to existing conditions upon completion of construction.

1.2 Stormwater Management Requirements

Per N.J.A.C. 7:8-1.2, a Major Development is defined, in general, as any development that individually or collectively disturbs one or more acres of land, creates one-quarter acre or more of impervious surface or creates one-quarter acre or more of regulated motor vehicle surface. The proposed development of the New Yeshiva Academy Building proposes the disturbance of 0.66 acres, the creation of 0.16 acres of impervious surface and the does not create any new regulated motor vehicle surface. Therefore, the project is not considered a major development and not subject to the groundwater recharge, runoff quantity, and water quality standards as outlined in N.J.A.C. 7:8.

The project will be designed to ensure that there is no increase, as compared to pre-construction condition, in the peak runoff rates of stormwater leaving the site for the two-, 10-, and 100-year storm events. To meet these standards, one (1) small-scale subsurface infiltration basin is proposed.

1.3 Pre-Construction Site Conditions

The overall property, Block 134, Lot 1, is 2.22 acres and is consists of the existing Yeshiva Academy School. The property contains a 3-story structure, a 1-story structure, a 1-story framed structure, and two accessory structures on site that support the functionality of the current school. The site is bound by Rockview Avenue to the north, Washington Avenue to the east, Linden Avenue to the south, and Sycamore Avenue to the west. Existing grades slope down from a high point of elevation 102.50 in the center of the lot and slope outwards to the property line frontages. See Figure 1 – Site Location Map. As mentioned previously, the proposed improvements result in 0.66 acres of disturbance. The analysis considers 0.50 acres of this disturbance area

in the analysis of this report as the remaining 0.16 acres of disturbance is temporary resulting from utility and landscaping disturbances. Based on the United Sates Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) web soil survey mapping, site soils meet the characteristics of Hydrologic Soil Group (HSG) A. Table 1-1 below contains the soil type within the site:

Table 1-1 – USDA NRCS Soil Types

Soil Map Symbol	Soil Map Unit	Hydrologic Soil Group
DunB	Dunellen sandy loam, 3 to 8 percent slopes	A

The existing topography of the subject portion of the site was analyzed, concluding that the subject portion of the site is comprised of only one (1) drainage area. Stormwater runoff from the existing watershed sheet flows from the northeast corner of the watershed down to the west/southwest portion of the site where it sheet flows in the northerly direction up Sycamore Avenue to an existing inlet located in the intersection of Sycamore Avenue and Rockview Avenue. This inlet is the point of analysis for the pre- and post-construction conditions. Figure 2 – Pre-Construction Drainage Area Map depicts the boundary, topography, and drainage patterns of the watershed.

Table 1-2 provides the breakdown of the different land coverages of the pre-construction drainage area:

Table 1-2 – Pre-construction Drainage Area

Sub-Drainage Area	Existing Pervious Area (Acres)	Existing Impervious Area (Acres)	Existing Total Area (Acres)	Composite CN Value
DA-1	0.42	0.08	0.50	49

1.4 Post-Construction Site Conditions

The post-construction drainage area emulates the pre-construction drainage area as shown in Figure 3 – Post-Construction Drainage Area Map and consists of one (1) drainage area. The drainage area has been divided into two (2) sub-drainage areas one of which is routed through the subsurface infiltration basin. The remaining sub-drainage area is conveyed off the site to the existing inlet located at the intersection of Sycamore and Rockview Avenue or naturally sheet flows off site into the existing inlet at the intersection. This sub-drainage area is not conveyed into the subsurface infiltration basin.

The proposed development is graded so that stormwater runoff is pitched away from the newly proposed two-story Yeshiva Academy building. The first sub-drainage area (DA-1A) sheet flows to the west and south away from the proposed two-story building into a newly proposed inlet or sheet flows off site into the surrounding rights-of-way where runoff eventually is conveyed into the existing inlet in the intersection of Sycamore and Rockview Avenue. The second sub-drainage area (DA-1B) consists entirely of the newly proposed building which is conveyed into the small-scale subsurface infiltration basin via a series of roof leaders. Sub-drainage area DA-1A has a total drainage area of 0.32 acres. The second sub-drainage area (DA-1B) has a total drainage area of 0.18 acres.

Runoff Curve numbers used for the TR-55 analysis are provided in Table 1-3:

Table 1-3 – Runoff Curve Number

Land Use Type	Runoff Curve Number (HSG A)
Open Space/Lawn good condition (grass cover > 75%)	39
Impervious Areas	98

The sub-drainage areas consist of lawn and impervious area. The breakdown of the post-construction drainage areas by land coverage is provided in Table 1-4 below:

Table 1-4 – Post-Construction Drainage Areas

Drainage Area	Proposed Total Pervious Lawn Area (Acres)	Proposed Total Impervious Area (Acres)	Proposed Total Area (Acres)	Composite CN Value
DA-1A	0.26	0.06	0.32	49
DA-1B	0.0	0.18	0.18	98

2.0 Hydrology and Hydraulics

Hydrologic computations were performed utilizing Hydraflow Hydrographs Extension for Autodesk Civil 3D, applying the NRCS/SCS TR-55 runoff curve method to calculate peak flow rates. Input values used in the software are illustrated in Tables 1-2 through 1-4 and Table 2-1 shown in the section below. A Type 'C' rainfall storm distribution is used for the hydrologic and hydraulic analysis in accordance with the New Jersey Rainfall Distribution Regions Map found in Chapter 2 of the Engineering Field Handbook, NJ Supplement and included in Appendix H for reference.

2.1 Rainfall Data

Rainfall depths for the site were obtained through historical rainfall data provided by National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 2, Version 3 based on parcel location. Table 2-1 provides the rainfall depth for the respective design storm events. The rainfall data obtained from NOAA is also included in Appendix H for reference.

Table 2-1 - NOAA Atlas 14 Rainfall Data 24-Hour Rainfall Depths

Return Frequency (year)	24 Hour Depth (in.)
2	3.38
10	5.15
100	8.61

2.2 Geotechnical Investigation

ANS Consultants, Inc. performed a geotechnical investigation for the project site that consisted of three (3) soil borings and two (2) test pits in which two (2) field percolation tests were performed on September 23, 2022. Percolation Test-1 at TP-1 recorded an infiltration rate of 32.7 inches per hour and Percolation Test-2 at TP-2 recorded an infiltration rate of 21 inches per hour. This far exceeds the minimum field-tested permeability rate of 1 inch per hour for small-scale infiltration basins as described in Chapter 9.8 of the New Jersey Department of Environmental Protection (NJDEP) Best Management Practices (BMP) Manual. In accordance with Chapter 9.8 of the NJDEP Manual, a factor of safety of 2 is applied to the lowest field measured infiltration result. However, the maximum design infiltration rate that is allowed per said chapter of the NJDPE BMP manual is 10 inches per hour, which is used in the stormwater analysis. The results of the geotechnical investigation and investigation map is included in Appendix G of the report.

2.3 Proposed Stormwater Management System

The HydraFlow Hydrographs program was used to determine the pre-construction and post-construction peak flow rates. Based on the post-construction rates generated by DA-1A and DA-1B, a proposed small-scale subsurface infiltration basin was designed in accordance with NJ BMP Manual. The bottom of the basin cross-section is located more than two (2) feet above the seasonal high groundwater table. The proposed subsurface infiltration basin consisted of two (2) 50 linear foot rows of 3-ft diameter perforated HDPE pipe encased in stone designed to infiltrate stormwater runoff into the subsoil. The stormwater management basin is design to reduce the peak flow rates leaving the site for proposed conditions so that they do not exceed pre-construction peak flow rates for the 2-, 10-, and 100-year storm events.

2.4 Stormwater Quantity

Per N.J.A.C. 7:8-1.2, a Major Development is defined, in general, as any development that individually or collectively disturbs one or more acres of land, creates one-quarter acre or more of impervious surface or creates one-quarter acre or more of regulated motor vehicle surface. The proposed development of the New Yeshiva Academy Building proposes the permanent disturbance of 0.66 acres, the creation of 0.17 acres of impervious surface and the does not create any new regulated motor vehicle surface. Therefore, stormwater management facilities are not considered a major development and not subject to the groundwater recharge, runoff quantity, and water quality standards as outlined in N.J.A.C. 7:8.

The project will be designed to ensure that there is no increase, as compared to pre-construction condition, in the peak runoff rates of stormwater leaving the site for the two-, 10-, and 100-year storm events. To meet these standards, one (1) small-scale subsurface infiltration basin is proposed. The pre- and post-construction rates of runoff have been calculated using the methodology described in the beginning of Section 2.0 to demonstrate compliance with one of the stipulations above.

Table 2-2 compares the pre-construction peak flow rates and the post-construction peak flow rates after routing stormwater through the small-scale infiltration basins.

Table 2-2 –Peak Flow Rates Comparison Table(1)

Drainage Area	Storm Event	Pre-Construction	Post-Construction Q_{post}
DA-1	2-Year	0.199 cfs	0.149 cfs
	10-Year	0.306 cfs	0.229 cfs
	100-Year	0.894 cfs	0.677 cfs

1. See Appendix C for detailed drainage area calculations.

As noted in Table 2-2, the proposed design reduces the post-construction peak flow rates for the 2-, 10-, 100-year storm events so that they are less than the pre-construction peak flow rates.

Stormwater Runoff Quality

The proposed development does not increase the regulated motor vehicle surface on site by one quarter acre, as such the project is not subject to any water quality requirements.

2.5 Groundwater Recharge

The project is located within an urban redevelopment area and as such is not subject to any groundwater recharge standards.

2.6 Stormwater Conveyance

The proposed stormwater conveyance system has been designed to collect and convey runoff generated on site by the 25-year storm event without surcharging. The drainage areas to individual catch basins were delineated as depicted on Figure 5 – Catchment Area Map. Pipe hydraulic computations were performed on the Storm Sewers Extension for Autodesk Civil 3D using the rational method to calculate peak flow rates (see Appendix E for detail calculations and results). Input values used in the software are illustrated in Tables 2-4 and 2-5:

Table 2-4 - NOAA Atlas 14 Rainfall Data for 25-Year Storm Event

Time of Concentration (minutes)	25-Year Storm Intensity (in/hr)
5	7.06
15	4.75
30	3.52
60	2.34

Table 2-5 – NJDOT Runoff Coefficients[1]

Land Use Type	Runoff Coefficient (HSG A)
Open Space/Lawn good condition (grass cover > 75%)	--
Impervious Areas	0.99

1. Per Table 10-4 of the NJDOT Roadway Design Manual lawn areas in HSG A do not generate runoff.

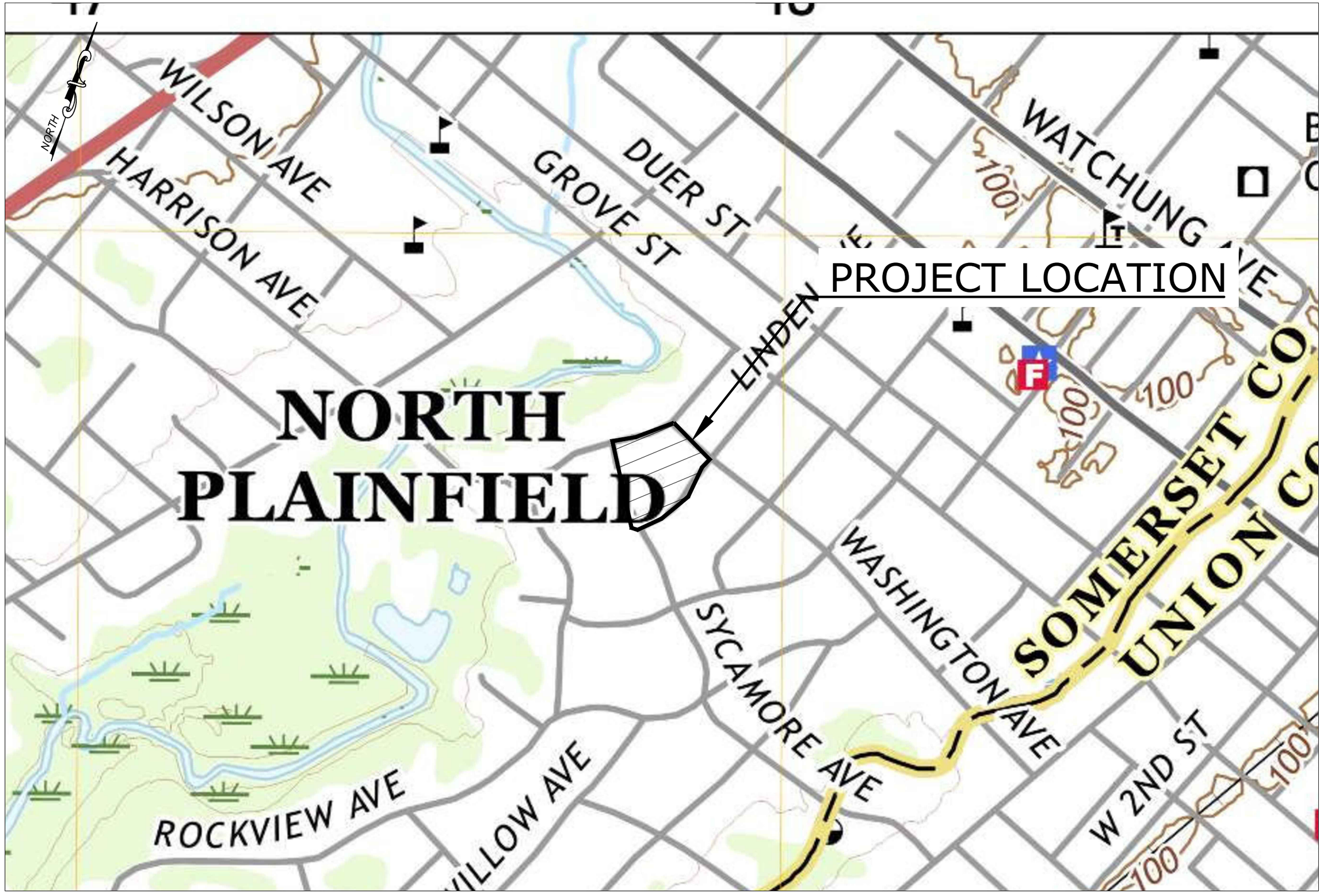
3.0 Soil Erosion Control

A soil erosion and sediment control plan and associated engineering details have been developed to control sediment during construction activities. Silt fence will be installed around the perimeter of the areas to be disturbed prior to start of construction. The project entrances will be stabilized with 1" to 2" stone tracking pads. Inlet protection will be provided at existing and proposed inlets as indicated on the soil erosion control drawings to minimize sediment from entering the subsurface storm drainage system. Tree protection fencing will be implemented around the trees on-site that are to be protected during construction.

4.0 Conclusions

The proposed development is not considered a Major Development because it does not result in more than an acre of disturbance area, it does not create more than a quarter-acre of new impervious surface, and it does not create more than a quarter-acre of new regulated motor vehicle surface. The project will utilize a small-scale subsurface infiltration basin to reduce the post-construction peak flow rates, so they are less than the pre-construction peak flow rates for the 2-, 10-, and 100-year storm events. The stormwater management conveyance system is sized to adequately convey the 25-year storm event and the project will comply with all erosion control requirements described in the Standards for Soil Erosion and Sediment Control in New Jersey, latest edition.

FIGURES



SCHEDULE OF REVISIONS

REV.	DATE	DESCRIPTION OF CHANGES	DRAWN BY	CHK BY

NOTES

E 2 PROJECT MANAGEMENT LLC

87 HIBERNIA AVENUE
ROCKAWAY, N.J. 07866
PHONE: (973) 299-5200
FAX: (973) 299-5059
www.E2PM.com

N.J. ENGINEERING CERTIFICATE OF AUTHORIZATION No. 24GA28118200

I CERTIFY THAT THESE PLANS HAVE BEEN PREPARED UNDER MY SUPERVISION

PROJECT NAME

YESHIVA NEW ACADEMY BUILDING

TAX LOT 1
BLOCK 134
21 ROCKVIEW AVENUE
BOROUGH OF NORTH PLAINFIELD
SOMERSET COUNTY, NJ

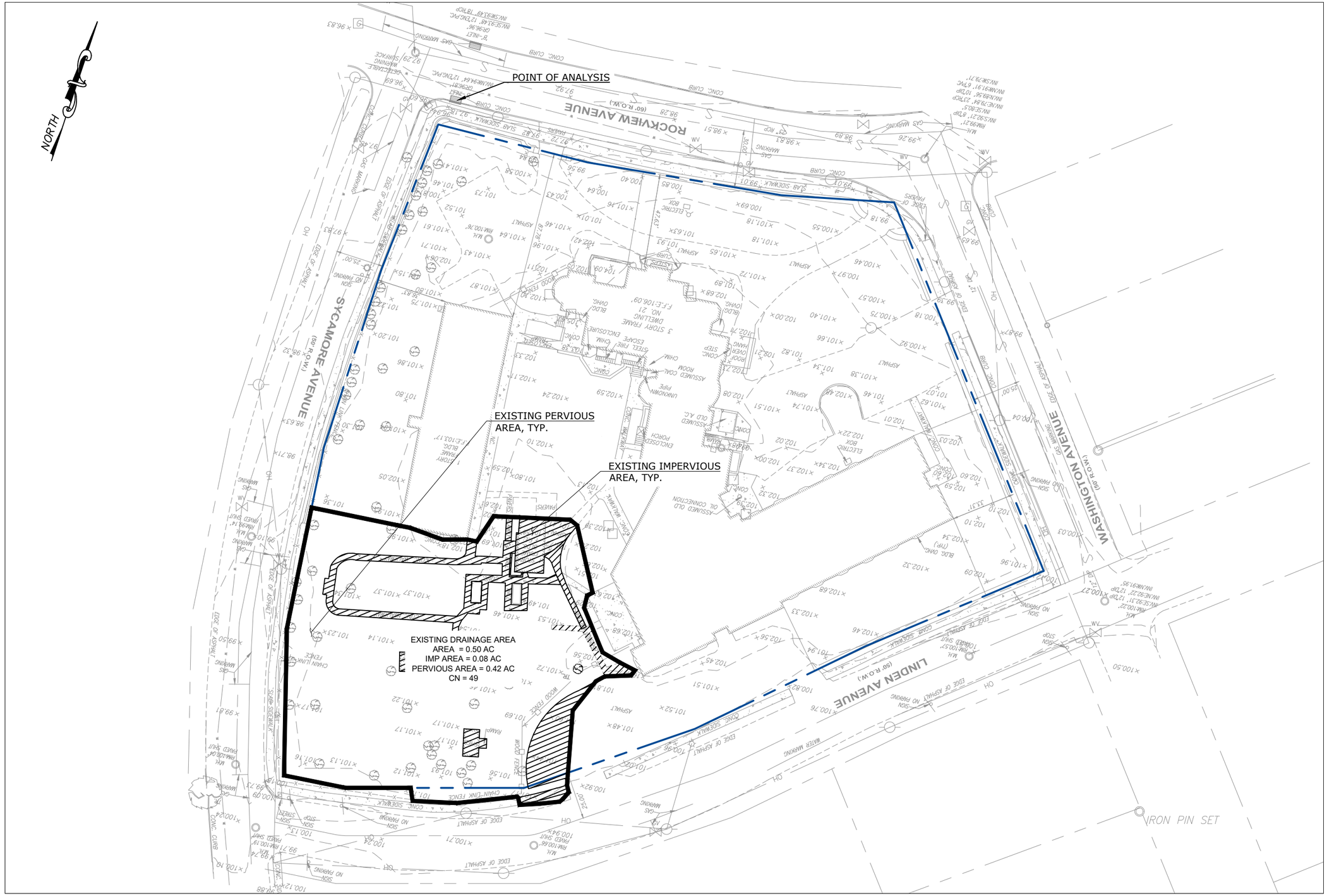
DRAWING TITLE

USGS SITE LOCATION MAP

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: NTS	
PROJECT #: P-21-58-01	FIRST ISSUE: 08/24/2022

DRAWING NO.

FIG 1



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BOROUGH OF NORTH PLAINFIELD
SOMERSET COUNTY, NJ

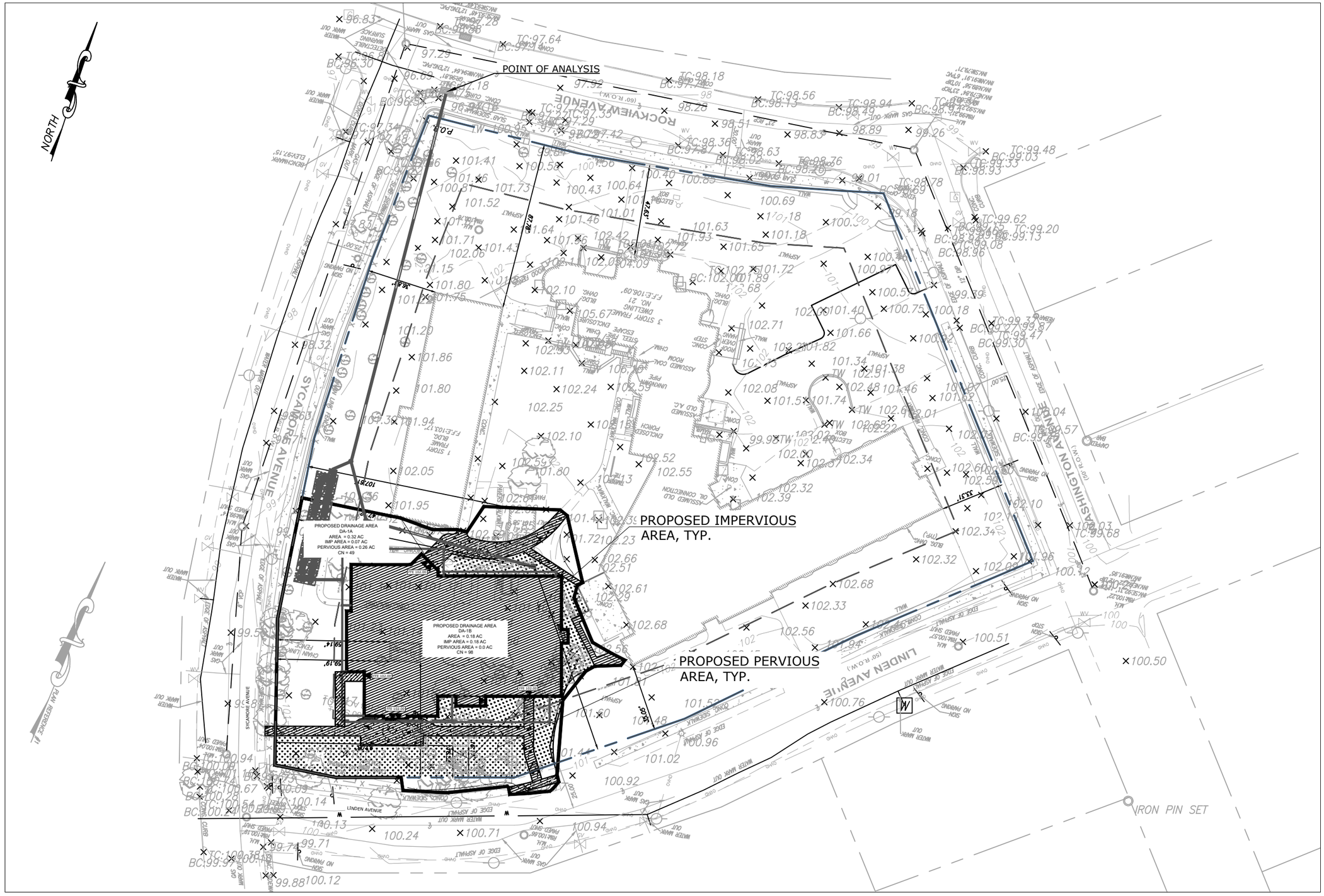
DRAWING TITLE

PRE-CONSTRUCTION DRAINAGE AREA

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: 1" = 50'	
PROJECT #: P-21-58-01	FIRST ISSUE: 08/24/2022

DRAWING NO.

FIG 2



SCHEDULE OF REVISIONS

REV.	DATE	DESCRIPTION OF CHANGES	DRAWN BY	CHK. BY

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PROJECT NAME

YESHIVA NEW ACADEMY BUILDING

TAX LOT 1
BLOCK 134
21 ROCKVIEW AVENUE
BOROUGH OF NORTH PLAINFIELD
SOMERSET COUNTY, NJ

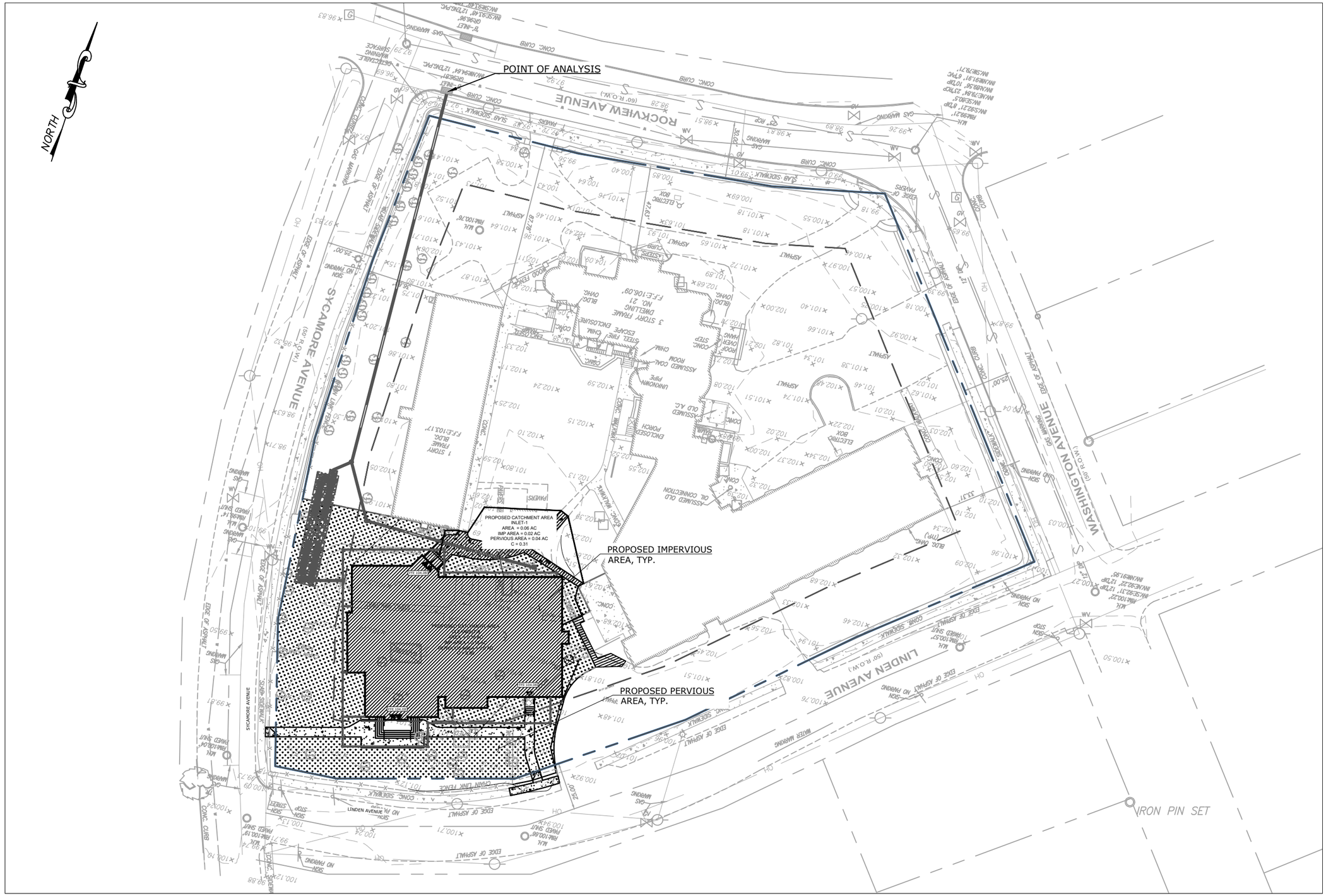
DRAWING TITLE

POST-CONSTRUCTION DRAINAGE AREA

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: 1" = 50'	
PROJECT #: P-21-58-01	FIRST ISSUE: 08/24/2022

DRAWING NO.

FIG 3



SCHEDULE OF REVISIONS

REV.	DATE	DESCRIPTION OF CHANGES	DRAWN BY	CHK. BY

NOTES

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I CERTIFY THAT THESE PLANS HAVE BEEN PREPARED UNDER MY SUPERVISION

PROJECT NAME

YESHIVA NEW ACADEMY BUILDING

TAX LOT 1
BLOCK 134
21 ROCKVIEW AVENUE
BOROUGH OF NORTH PLAINFIELD
SOMERSET COUNTY, NJ

DRAWING TITLE

CATCHMENT AREA PLAN

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: 1" = 50'	
PROJECT #: P-21-58-01	FIRST ISSUE: 08/24/2022

DRAWING NO.

FIG 4

APPENDIX A –NRCS SOIL MAP

Hydrologic Soil Group—Somerset County, New Jersey

Map Scale: 1:782 if printed on B portrait (11" x 17") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 35 70 140 210

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 1:24,000.

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: Somerset County, New Jersey
Survey Area Data: Version 19, Aug 31, 2021

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

Date(s) aerial images were photographed: Sep 14, 2020—Oct 3, 2020

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
DunB	Dunellen sandy loam, 3 to 8 percent slopes	A	3.0	100.0%
Totals for Area of Interest			**3.0**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX B – FEMA FLOOD MAP

NOTES TO USERS

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. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also shown in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

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 National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map was New Jersey State Plane, FIPSZONE 2900. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit their website at www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from digital orthophotography provided by the Somerset County GIS Department. This information was produced at a scale of 1:2,400 from aerial photography dated March 2000.

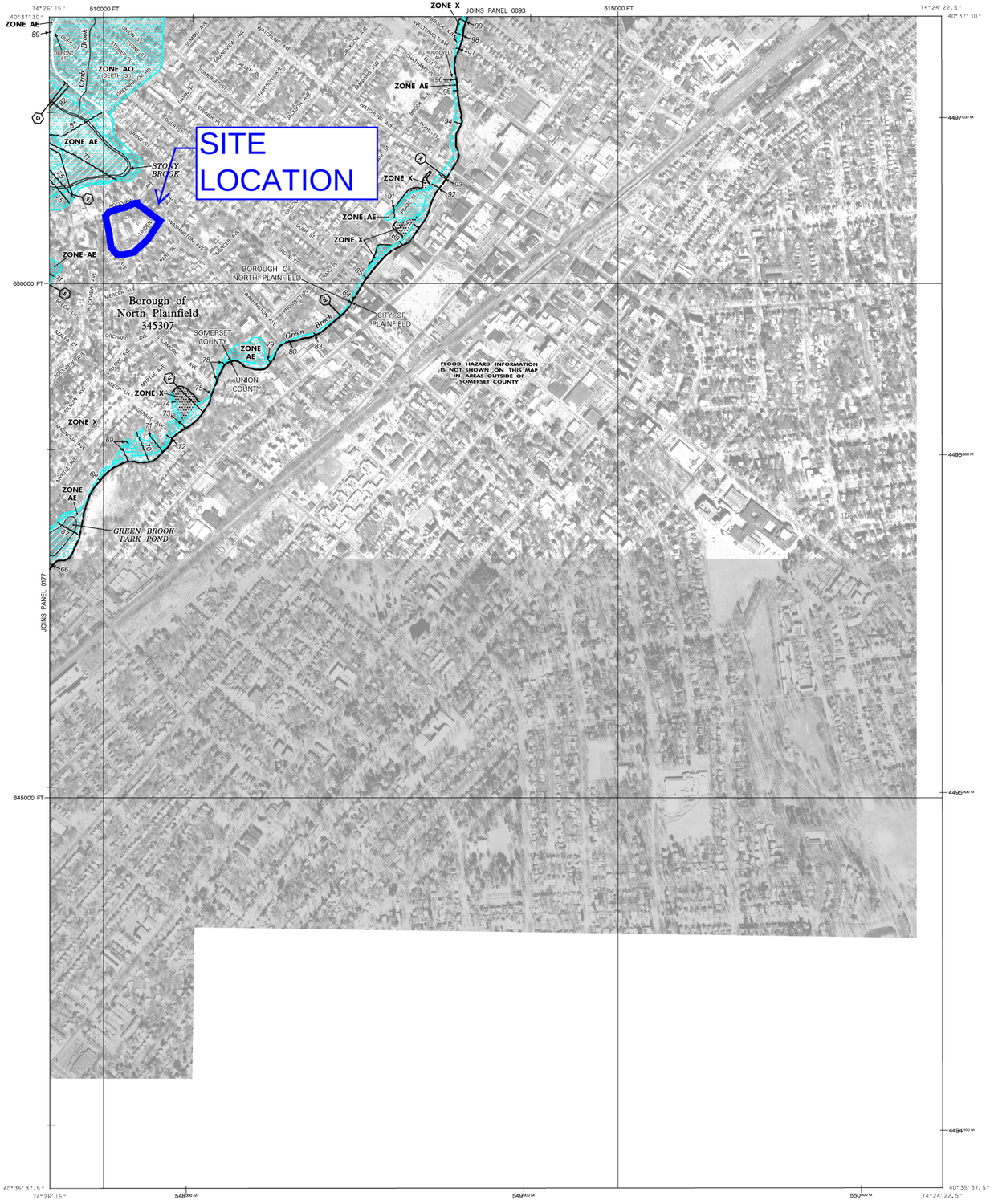
Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance 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 AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 Base Flood Elevation line and value; elevation in feet*
- (EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- (A)—(A) Cross section line
- (23)- - - -(23) Transect line
- 32°22' 30", 97°07' 30" Geographic coordinates referenced to the North American Datum 1983 (NAD 83), Western Hemisphere
- 4276000 M 1000-meter Universal Transverse Mercator grid ticks, zone 18
- 600000 FT 5000-foot grid values: New Jersey State Plane coordinate system, FIPSZONE 2900, Transverse Mercator projection
- DX5510 × Bench mark (see explanation in Notes to Users section of this FIRM panel)
- ● M1.5 River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
SEPTEMBER 28, 2007

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0181E

FIRM
FLOOD INSURANCE RATE MAP

SOMERSET COUNTY,
NEW JERSEY
(ALL JURISDICTIONS)

PANEL 181 OF 301

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
NORTH PLAINFIELD, BOROUGH OF	345307	0181	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
34035C0181E

EFFECTIVE DATE
SEPTEMBER 28, 2007

Federal Emergency Management Agency

APPENDIX C – HYDROLOGIC CALCULATIONS

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

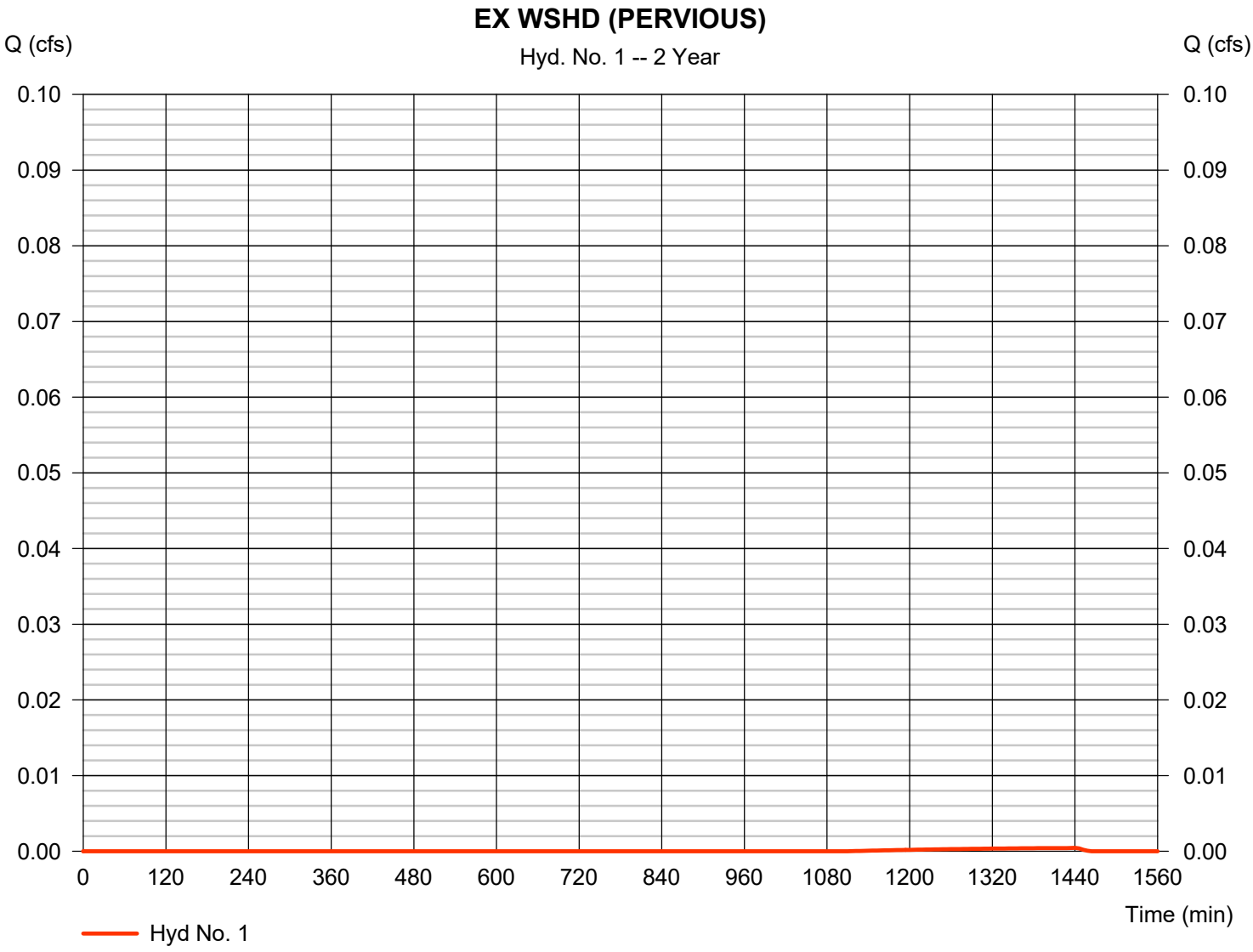
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.000	6	1440	6	------	------	------	EX WSHD (PERVIOUS)
2	SCS Runoff	0.199	6	732	857	------	------	------	EX WSHD (IMPERVIOUS)
4	Combine	0.199	6	732	862	1, 2,	------	------	EX WSHD
6	SCS Runoff	0.000	6	1440	4	------	------	------	PR WSHD UNDETAINED (PERVIOU
7	SCS Runoff	0.149	6	732	643	------	------	------	PR WSHD UNDETAINED(IMPERVIO
9	Combine	0.149	6	732	646	6, 7,	------	------	PR UNDETAINED
11	SCS Runoff	0.448	6	732	1,928	------	------	------	PR DETAINED
13	Reservoir	0.000	6	n/a	0	11	96.34	142	BASIN DISCHARGE
15	Combine	0.149	6	732	646	9, 13,	------	------	PR WSHD

Hydrograph Report

Hyd. No. 1

EX WSHD (PERVIOUS)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	1440 min
Time interval	=	6 min	Hyd. volume	=	6 cuft
Drainage area	=	0.420 ac	Curve number	=	39
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	3.38 in	Distribution	=	Custom
Storm duration	=	M:\Projects\A&E Services\Regional Development\P-22-4781_Springfield Yeshiva Shape Factor		=	484

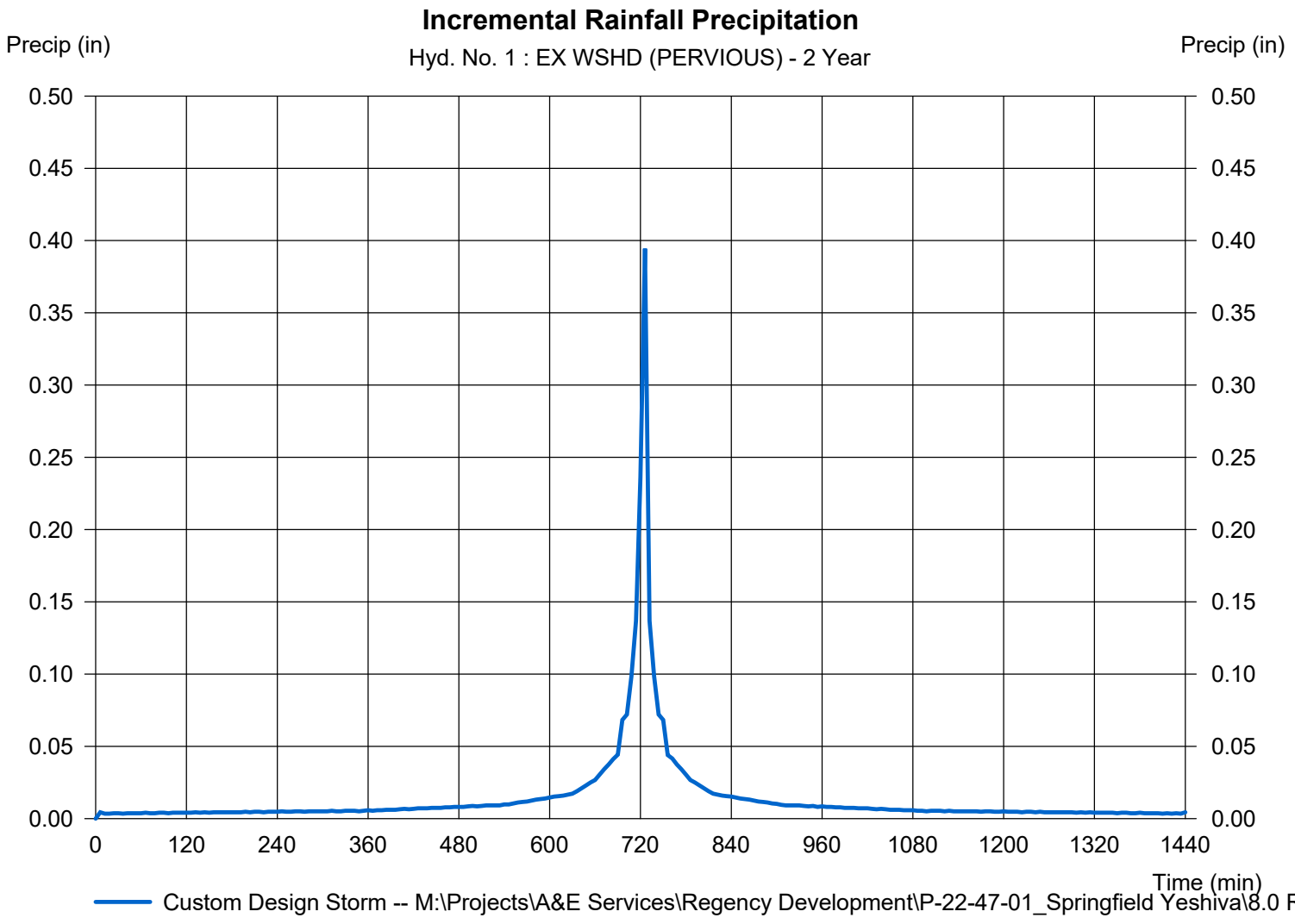


Precipitation Report

Hyd. No. 1

EX WSHD (PERVIOUS)

Storm Frequency	= 2 yrs	Time interval	= 6 min
Total precip.	= 3.3800 in	Distribution	= Custom
Storm duration	= M:\Projects\A&E Services\Regency Development\P-22-47-01_Springfield Yeshi		

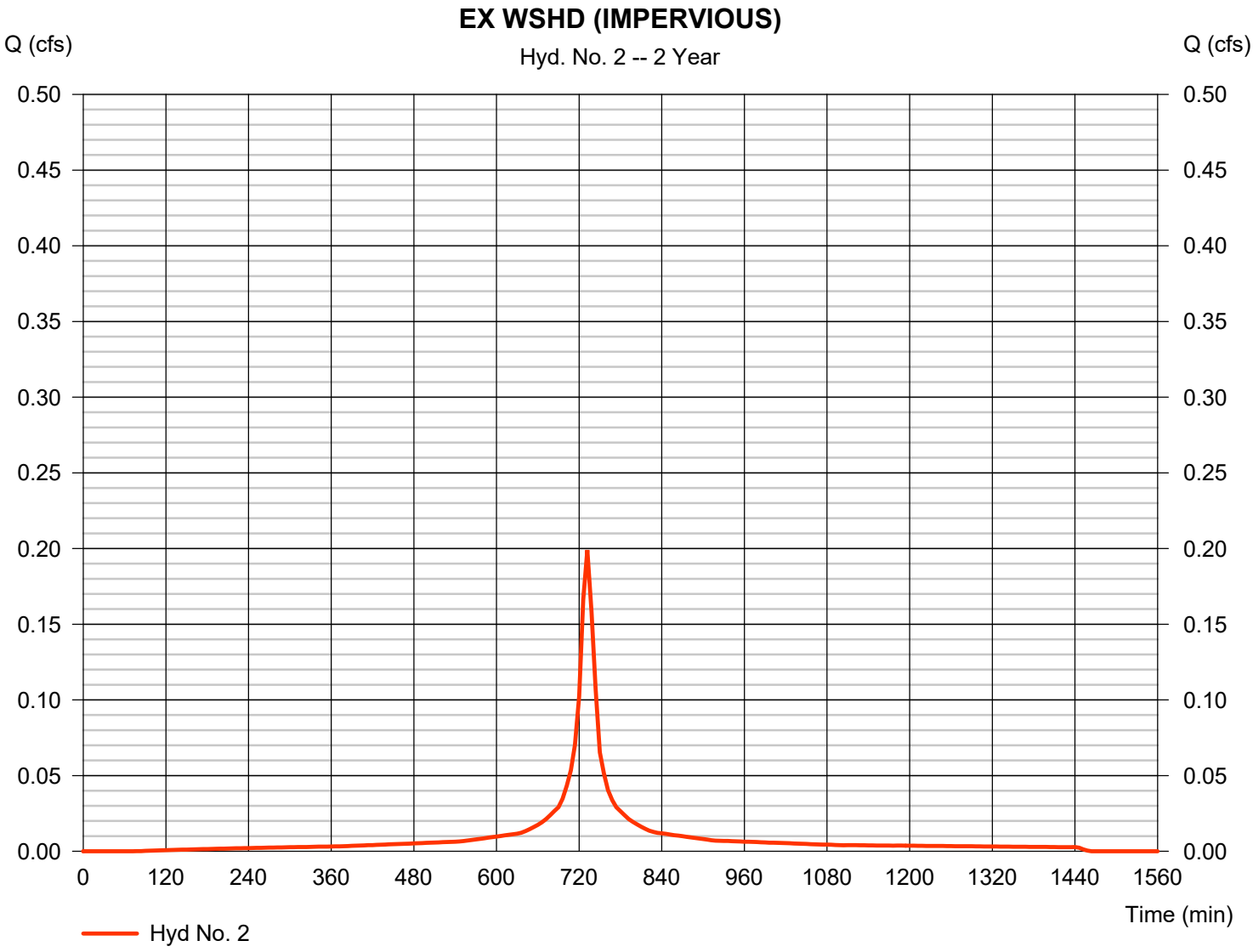


Hydrograph Report

Hyd. No. 2

EX WSHD (IMPERVIOUS)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.199 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	857 cuft
Drainage area	=	0.080 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	3.38 in	Distribution	=	Custom
Storm duration	=	M:\Projects\A&E Services\Regency Development\P-22-4781_Springfield Yeshiva	Shape Factor	=	484

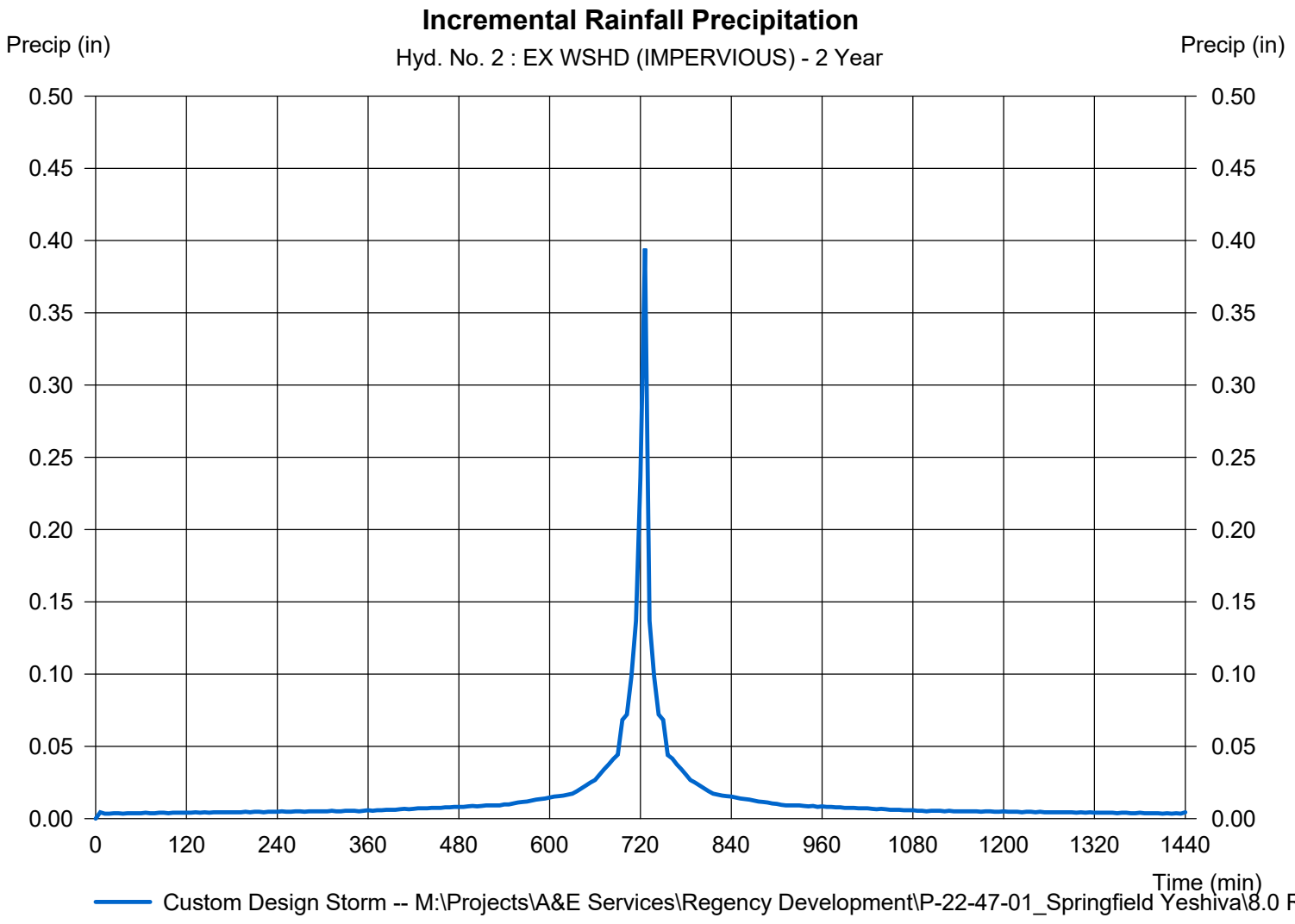


Precipitation Report

Hyd. No. 2

EX WSHD (IMPERVIOUS)

Storm Frequency	= 2 yrs	Time interval	= 6 min
Total precip.	= 3.3800 in	Distribution	= Custom
Storm duration	= M:\Projects\A&E Services\Regency Development\P-22-47-01_Springfield Yeshi		

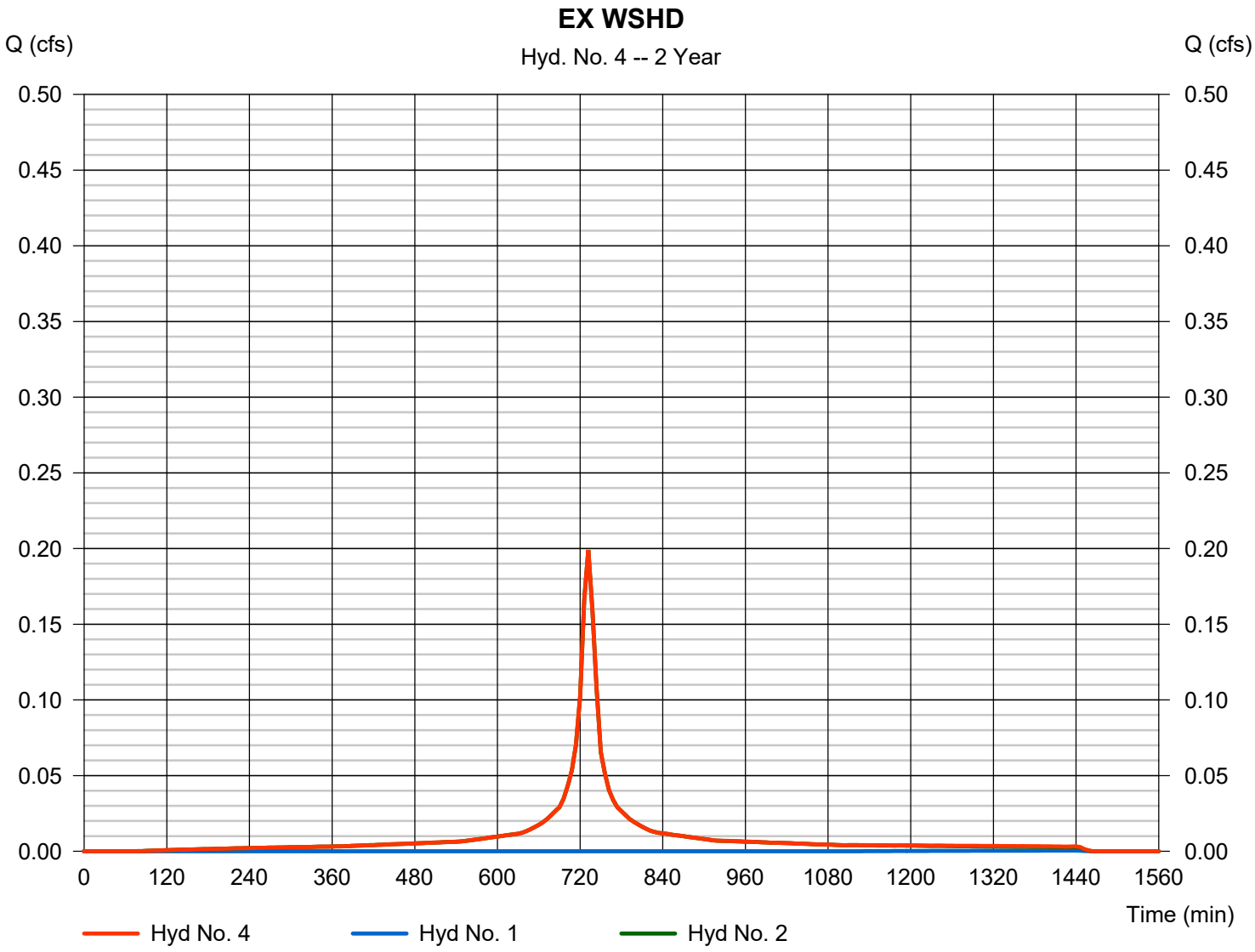


Hydrograph Report

Hyd. No. 4

EX WSHD

Hydrograph type	=	Combine	Peak discharge	=	0.199 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	862 cuft
Inflow hyds.	=	1, 2	Contrib. drain. area	=	0.500 ac

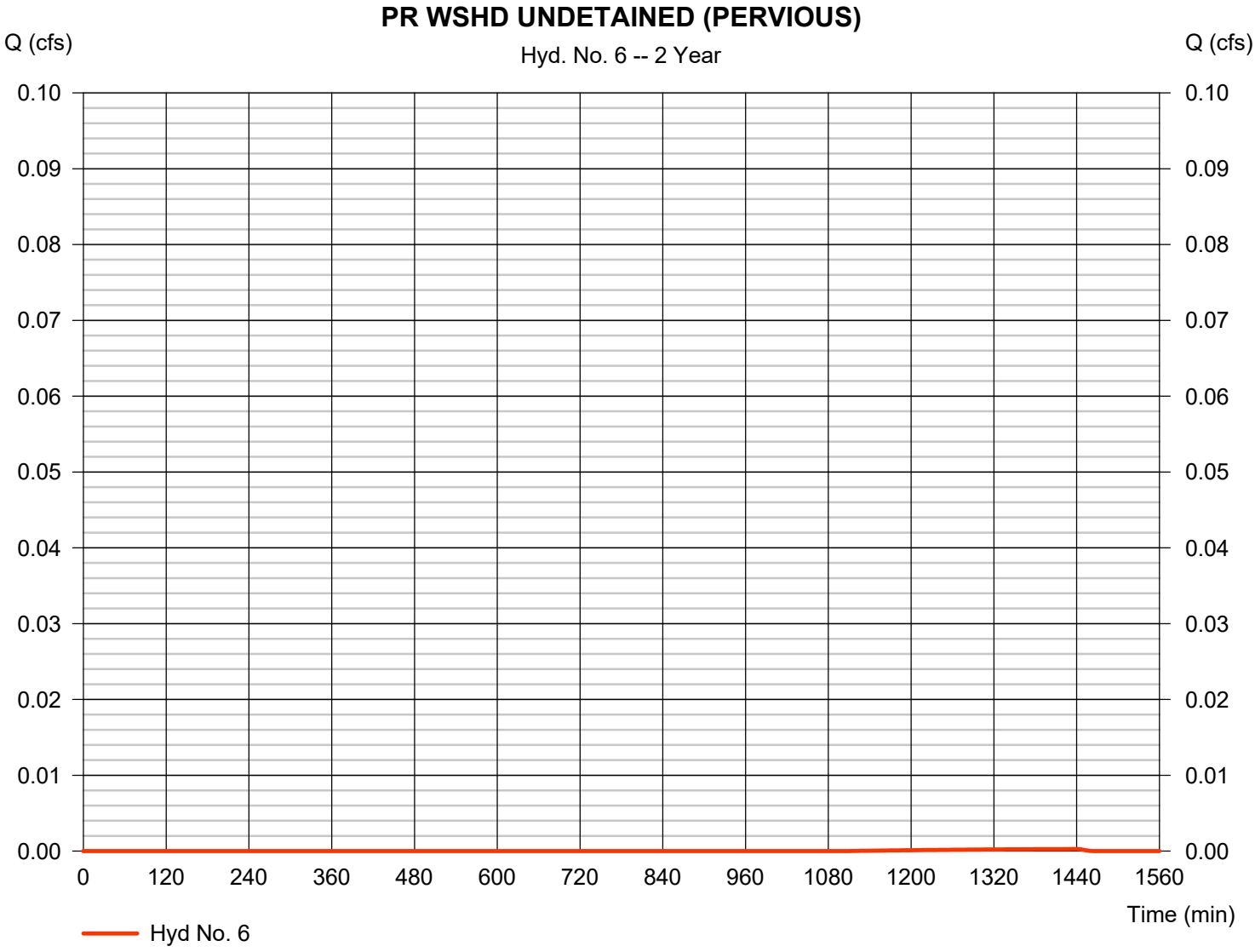


Hydrograph Report

Hyd. No. 6

PR WSHD UNDETAINED (PERVIOUS)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	1440 min
Time interval	=	6 min	Hyd. volume	=	4 cuft
Drainage area	=	0.260 ac	Curve number	=	39
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	3.38 in	Distribution	=	Custom
Storm duration	=	M:\Projects\A&E Services\Regency Development\P-22-4781_Springfield Yeshiva	Shape factor	=	484

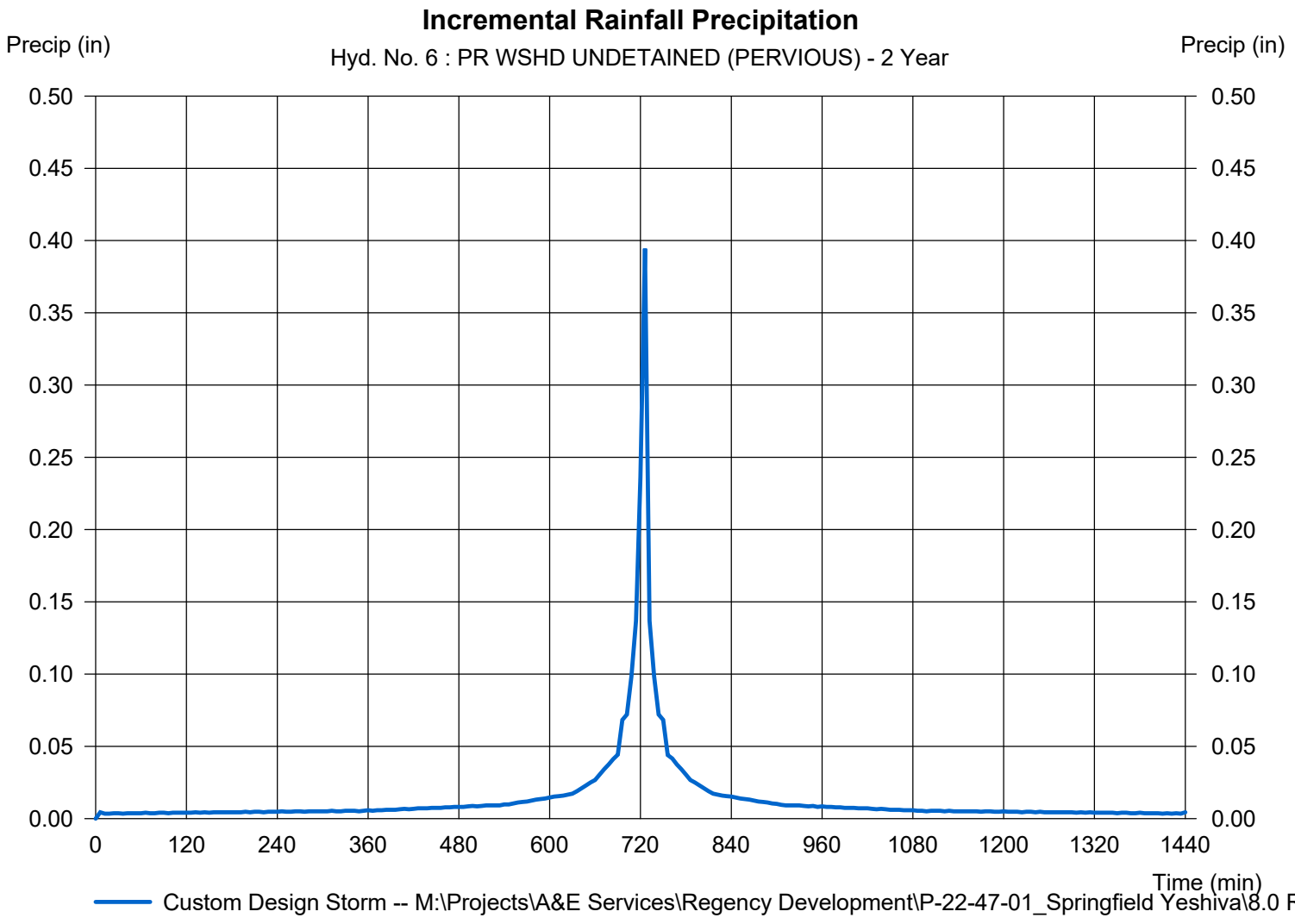


Precipitation Report

Hyd. No. 6

PR WSHD UNDETAINED (PERVIOUS)

Storm Frequency	= 2 yrs	Time interval	= 6 min
Total precip.	= 3.3800 in	Distribution	= Custom
Storm duration	= M:\Projects\A&E Services\Regency Development\P-22-47-01_Springfield Yeshi		

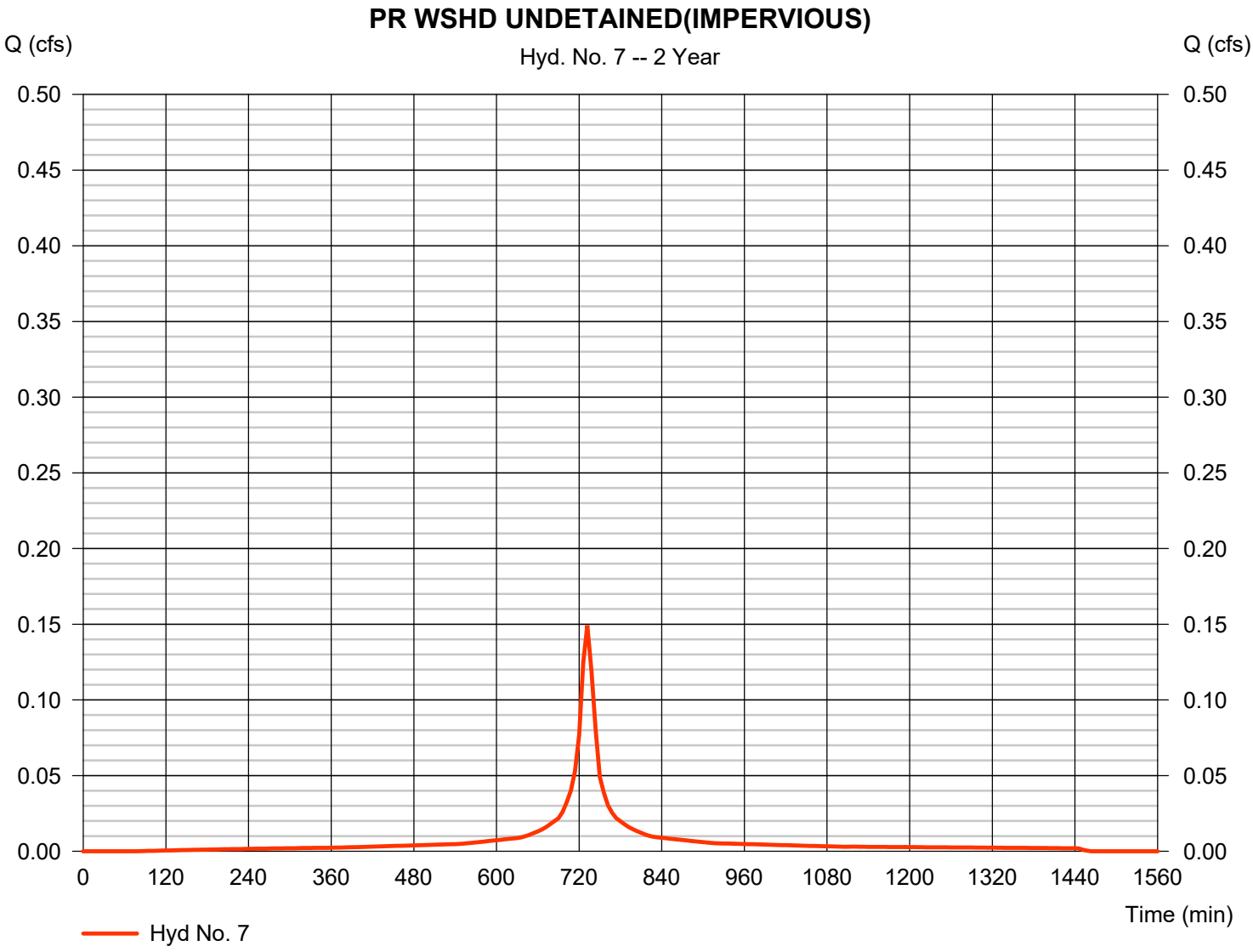


Hydrograph Report

Hyd. No. 7

PR WSHD UNDETAINED(IMPERVIOUS)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.149 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	643 cuft
Drainage area	=	0.060 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	3.38 in	Distribution	=	Custom
Storm duration	=	M:\Projects\A&E Services\Regency Development\P-22-4781_Springfield Yeshiva Shape Factor		=	484

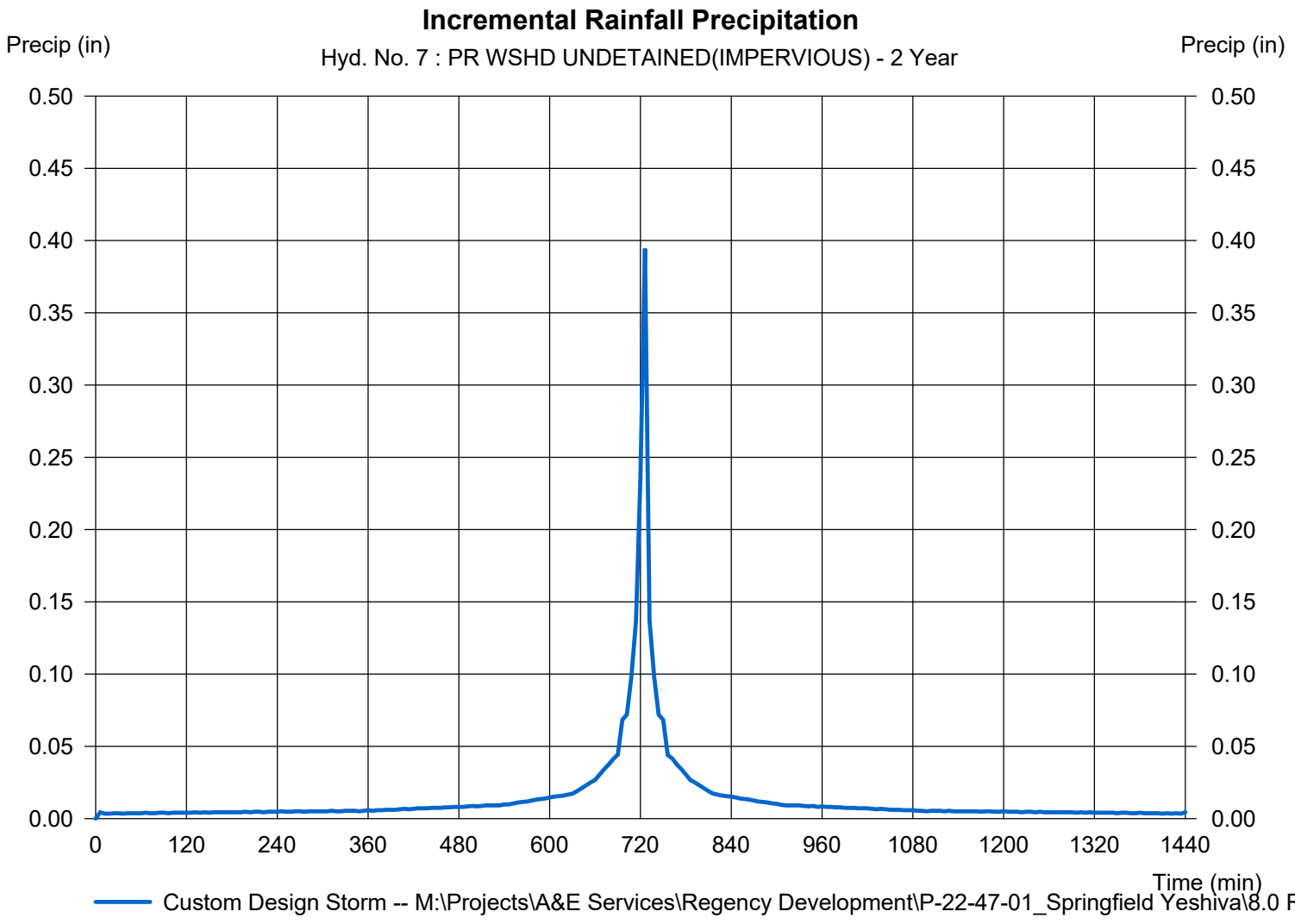


Precipitation Report

Hyd. No. 7

PR WSHD UNDETAINED(IMPERVIOUS)

Storm Frequency	= 2 yrs	Time interval	= 6 min
Total precip.	= 3.3800 in	Distribution	= Custom
Storm duration	= M:\Projects\A&E Services\Regency Development\P-22-47-01_Springfield Yeshi		

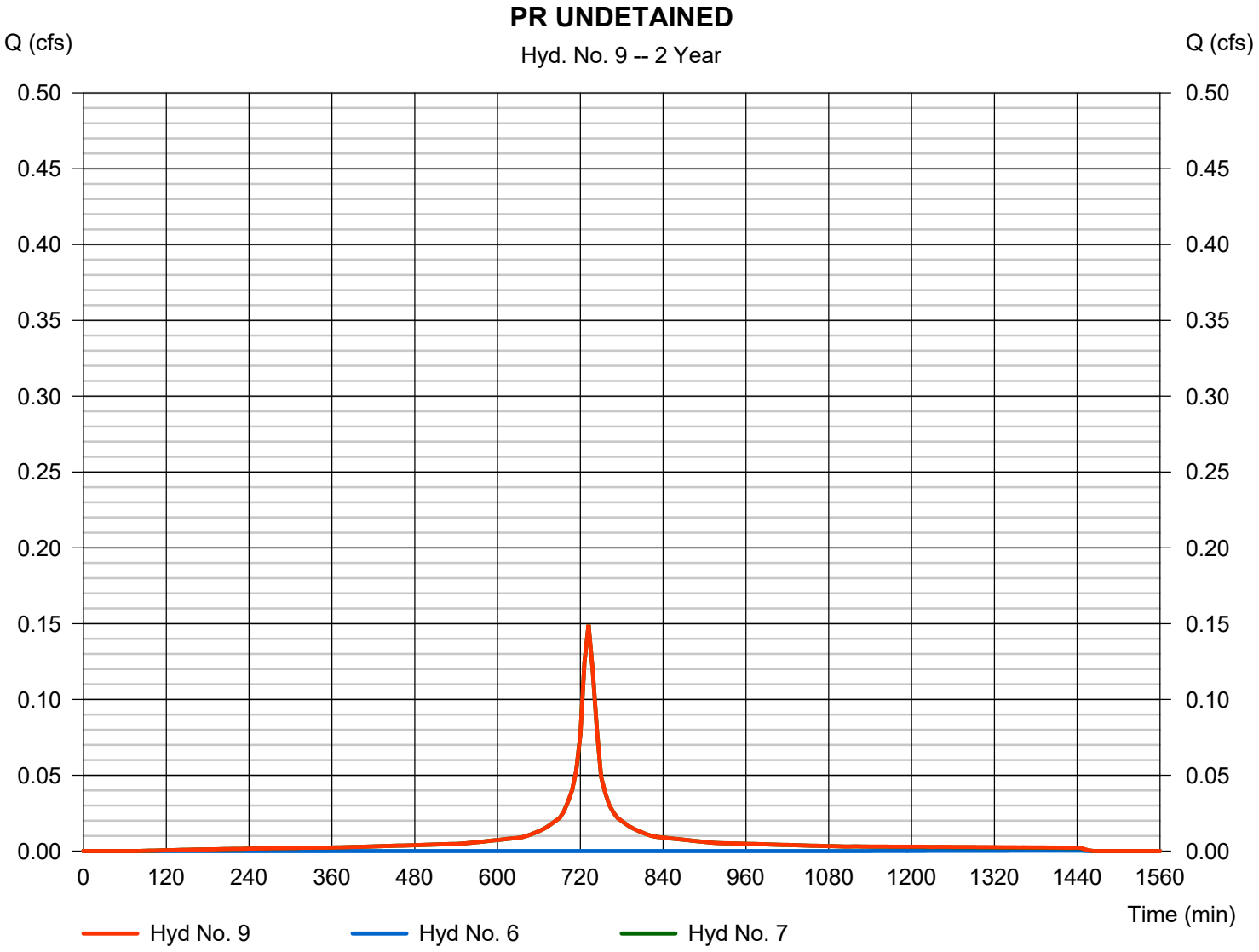


Hydrograph Report

Hyd. No. 9

PR UNDETAINED

Hydrograph type	=	Combine	Peak discharge	=	0.149 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	646 cuft
Inflow hyds.	=	6, 7	Contrib. drain. area	=	0.320 ac

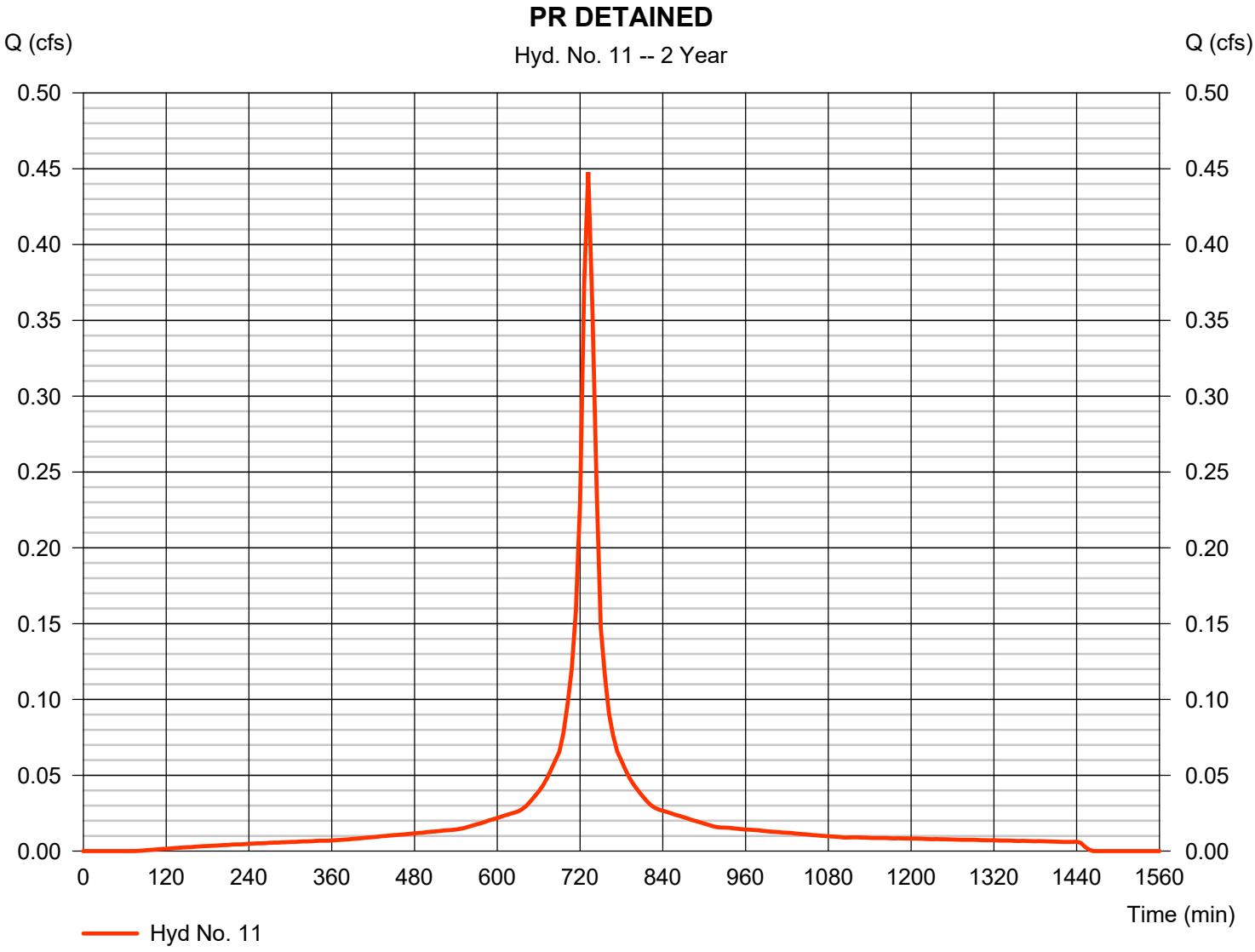


Hydrograph Report

Hyd. No. 11

PR DETAINED

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.448 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	1,928 cuft
Drainage area	=	0.180 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	3.38 in	Distribution	=	Custom
Storm duration	=	M:\Projects\A&E Services\Regency Development\P-22-4781_Springfield Yeshiva	Shape factor	=	484

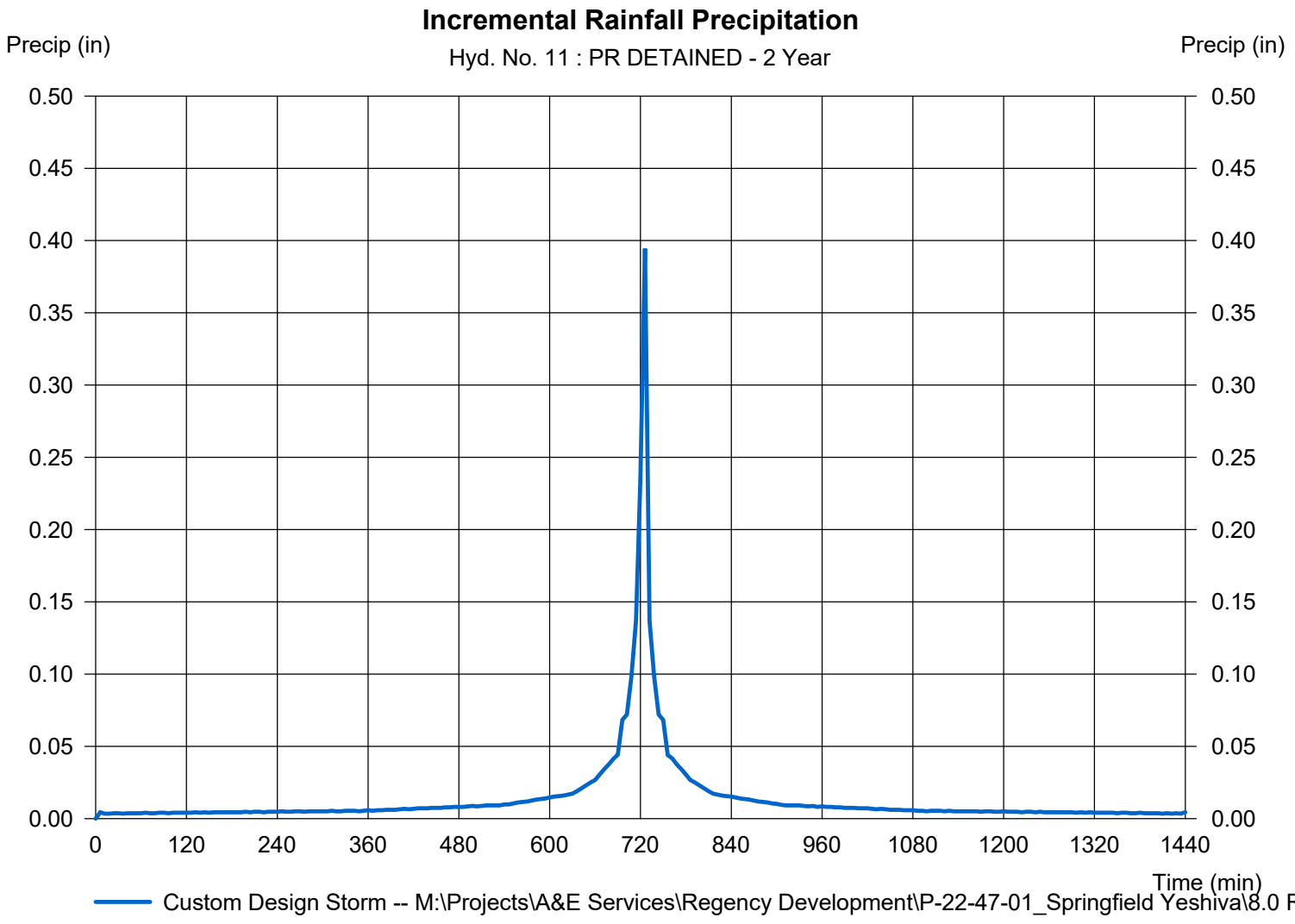


Precipitation Report

Hyd. No. 11

PR DETAINED

Storm Frequency	= 2 yrs	Time interval	= 6 min
Total precip.	= 3.3800 in	Distribution	= Custom
Storm duration	= M:\Projects\A&E Services\Regency Development\P-22-47-01_Springfield Yeshi		



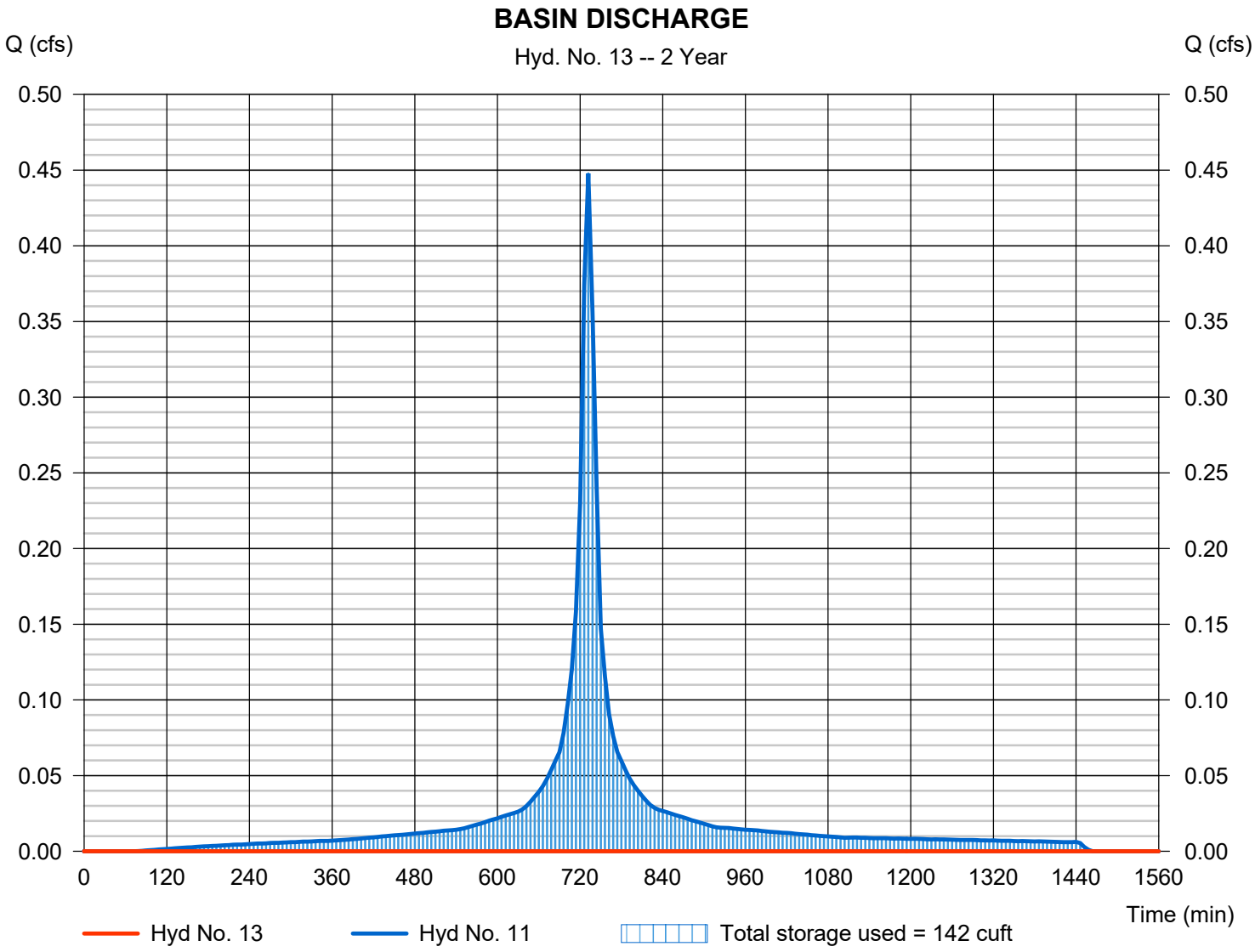
Hydrograph Report

Hyd. No. 13

BASIN DISCHARGE

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	6 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	11 - PR DETAINED	Max. Elevation	=	96.34 ft
Reservoir name	=	BASIN	Max. Storage	=	142 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 1 - BASIN

Pond Data

UG Chambers -Invert elev. = 97.30 ft, Rise x Span = 3.00 x 3.00 ft, Barrel Len = 50.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 96.30 ft, Width = 11.75 ft, Height = 4.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	96.30	n/a	0	0
0.40	96.70	n/a	188	188
0.80	97.10	n/a	188	376
1.20	97.50	n/a	200	576
1.60	97.90	n/a	236	813
2.00	98.30	n/a	251	1,064
2.40	98.70	n/a	258	1,322
2.80	99.10	n/a	260	1,582
3.20	99.50	n/a	256	1,838
3.60	99.90	n/a	245	2,083
4.00	100.30	n/a	222	2,305

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	2.50	0.00	0.00
Span (in)	= 12.00	2.50	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 97.30	97.30	0.00	0.00
Length (ft)	= 15.00	0.50	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	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.00	0.00	0.00	0.00
Crest El. (ft)	= 100.00	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) = 10.000 (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

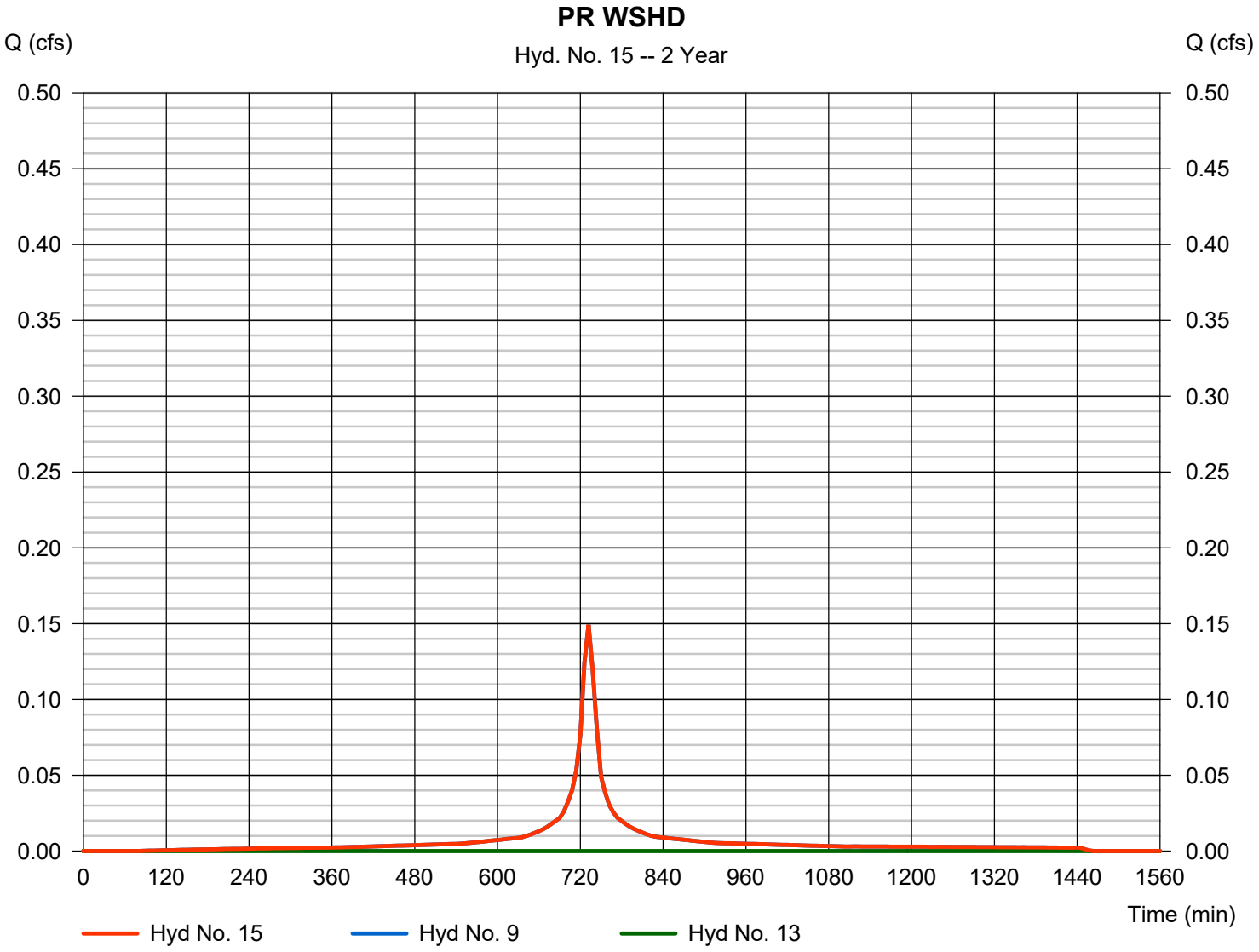
Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	96.30	0.00	0.00	---	---	0.00	---	---	---	0.000	---	0.000
0.40	188	96.70	0.00	0.00	---	---	0.00	---	---	---	0.272	---	0.272
0.80	376	97.10	0.00	0.00	---	---	0.00	---	---	---	0.272	---	0.272
1.20	576	97.50	0.05 ic	0.05 ic	---	---	0.00	---	---	---	0.272	---	0.322
1.60	813	97.90	0.11 ic	0.11 ic	---	---	0.00	---	---	---	0.272	---	0.381
2.00	1,064	98.30	0.15 ic	0.15 ic	---	---	0.00	---	---	---	0.272	---	0.420
2.40	1,322	98.70	0.18 ic	0.18 ic	---	---	0.00	---	---	---	0.272	---	0.451
2.80	1,582	99.10	0.21 ic	0.21 ic	---	---	0.00	---	---	---	0.272	---	0.478
3.20	1,838	99.50	0.24 ic	0.23 ic	---	---	0.00	---	---	---	0.272	---	0.502
3.60	2,083	99.90	0.25 ic	0.25 ic	---	---	0.00	---	---	---	0.272	---	0.524
4.00	2,305	100.30	2.41 oc	0.22 ic	---	---	2.19	---	---	---	0.272	---	2.685

Hydrograph Report

Hyd. No. 15

PR WSHD

Hydrograph type	=	Combine	Peak discharge	=	0.149 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	646 cuft
Inflow hyds.	=	9, 13	Contrib. drain. area	=	0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

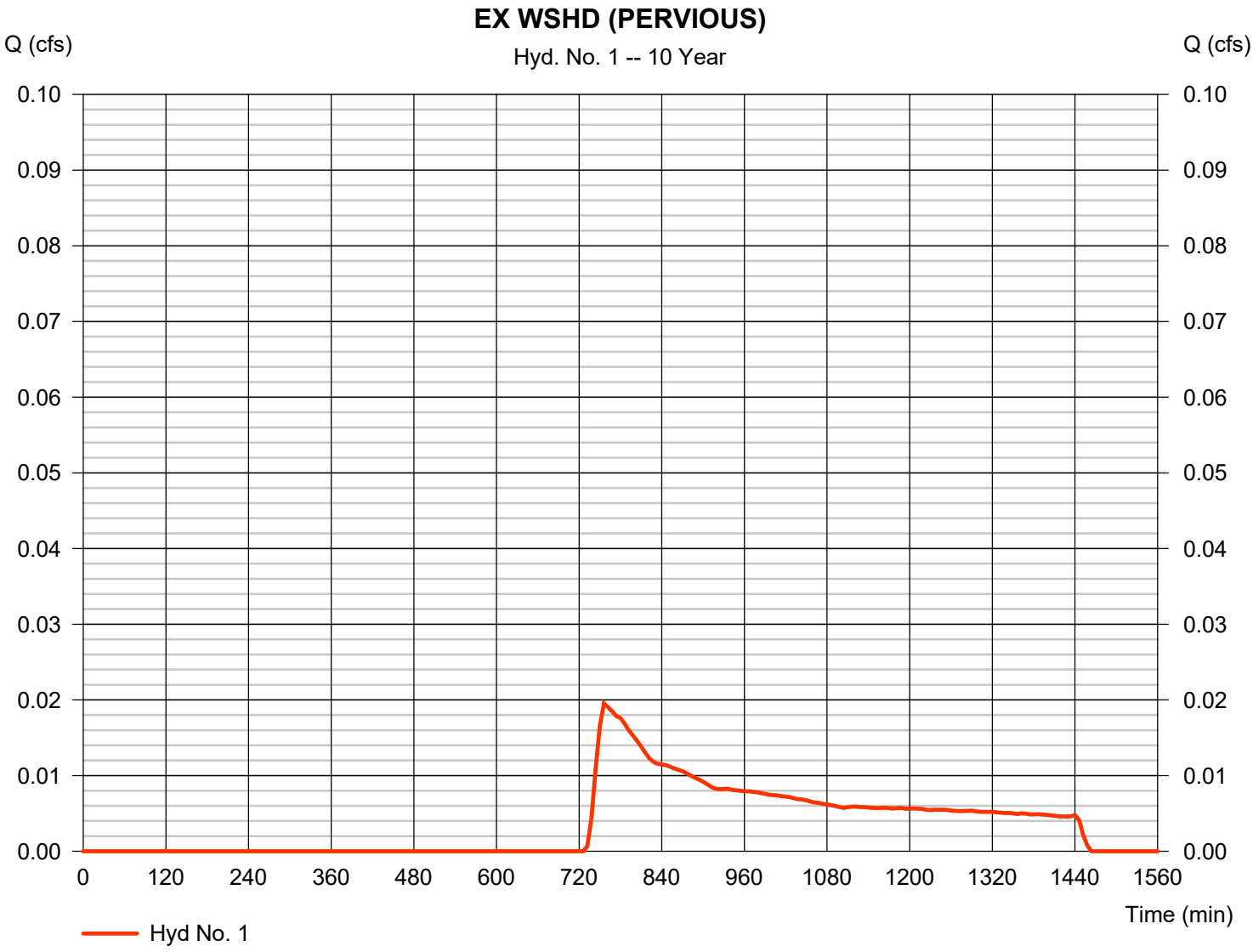
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.020	6	756	330	------	------	------	EX WSHD (PERVIOUS)
2	SCS Runoff	0.305	6	732	1,338	------	------	------	EX WSHD (IMPERVIOUS)
4	Combine	0.306	6	732	1,668	1, 2,	------	------	EX WSHD
6	SCS Runoff	0.012	6	756	204	------	------	------	PR WSHD UNDETAINED (PERVIOU
7	SCS Runoff	0.229	6	732	1,003	------	------	------	PR WSHD UNDETAINED(IMPERVIO
9	Combine	0.229	6	732	1,208	6, 7,	------	------	PR UNDETAINED
11	SCS Runoff	0.687	6	732	3,009	------	------	------	PR DETAINED
13	Reservoir	0.000	6	n/a	0	11	96.34	431	BASIN DISCHARGE
15	Combine	0.229	6	732	1,208	9, 13,	------	------	PR WSHD

Hydrograph Report

Hyd. No. 1

EX WSHD (PERVIOUS)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.020 cfs
Storm frequency	=	10 yrs	Time to peak	=	756 min
Time interval	=	6 min	Hyd. volume	=	330 cuft
Drainage area	=	0.420 ac	Curve number	=	39
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	5.15 in	Distribution	=	Custom
Storm duration	=	M:\Projects\A&E Services\Regional Development\P-22-4701_Springfield Yeshiva Shape Elevation		=	24h

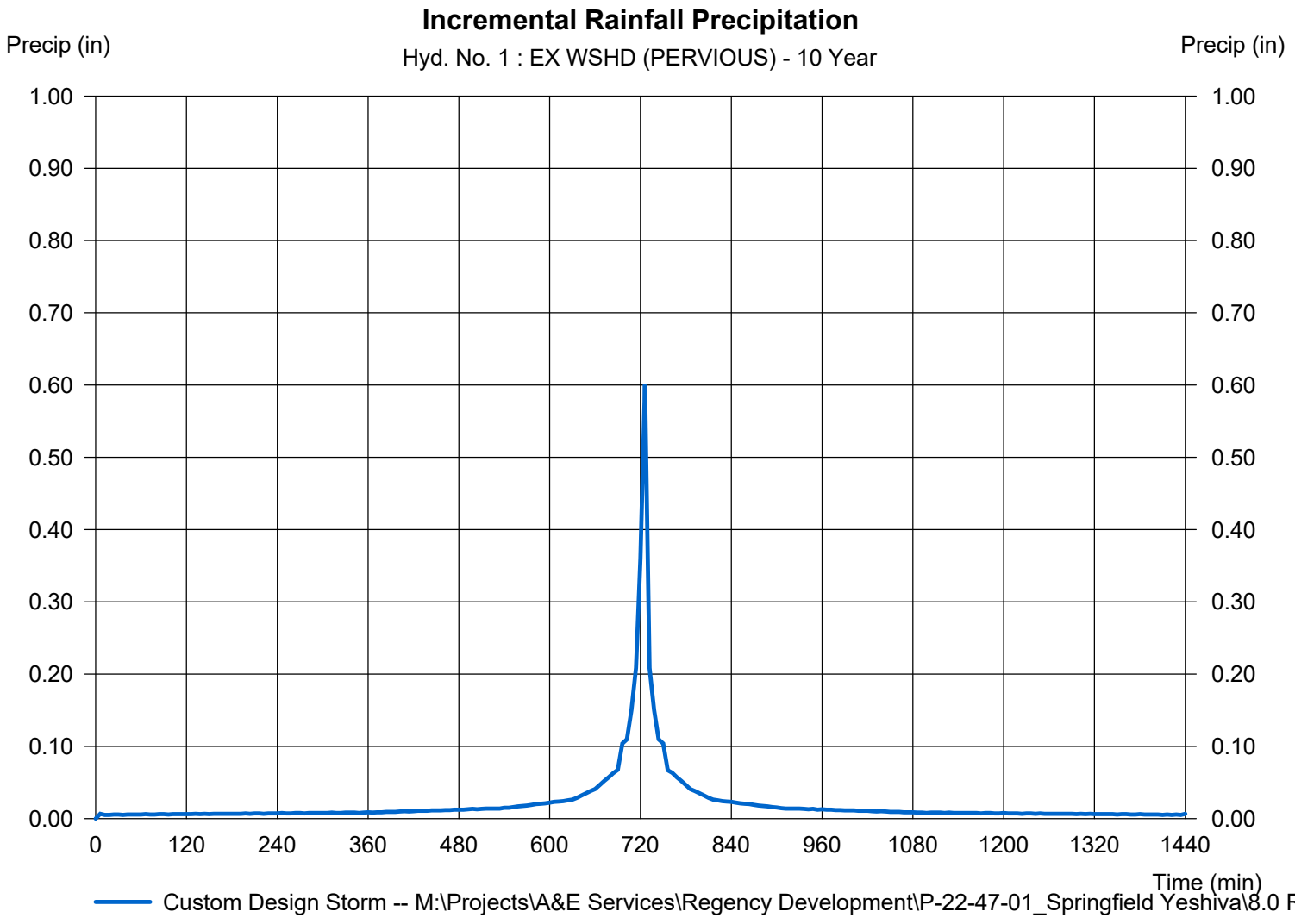


Precipitation Report

Hyd. No. 1

EX WSHD (PERVIOUS)

Storm Frequency	= 10 yrs	Time interval	= 6 min
Total precip.	= 5.1500 in	Distribution	= Custom
Storm duration	= M:\Projects\A&E Services\Regency Development\P-22-47-01_Springfield Yeshi		

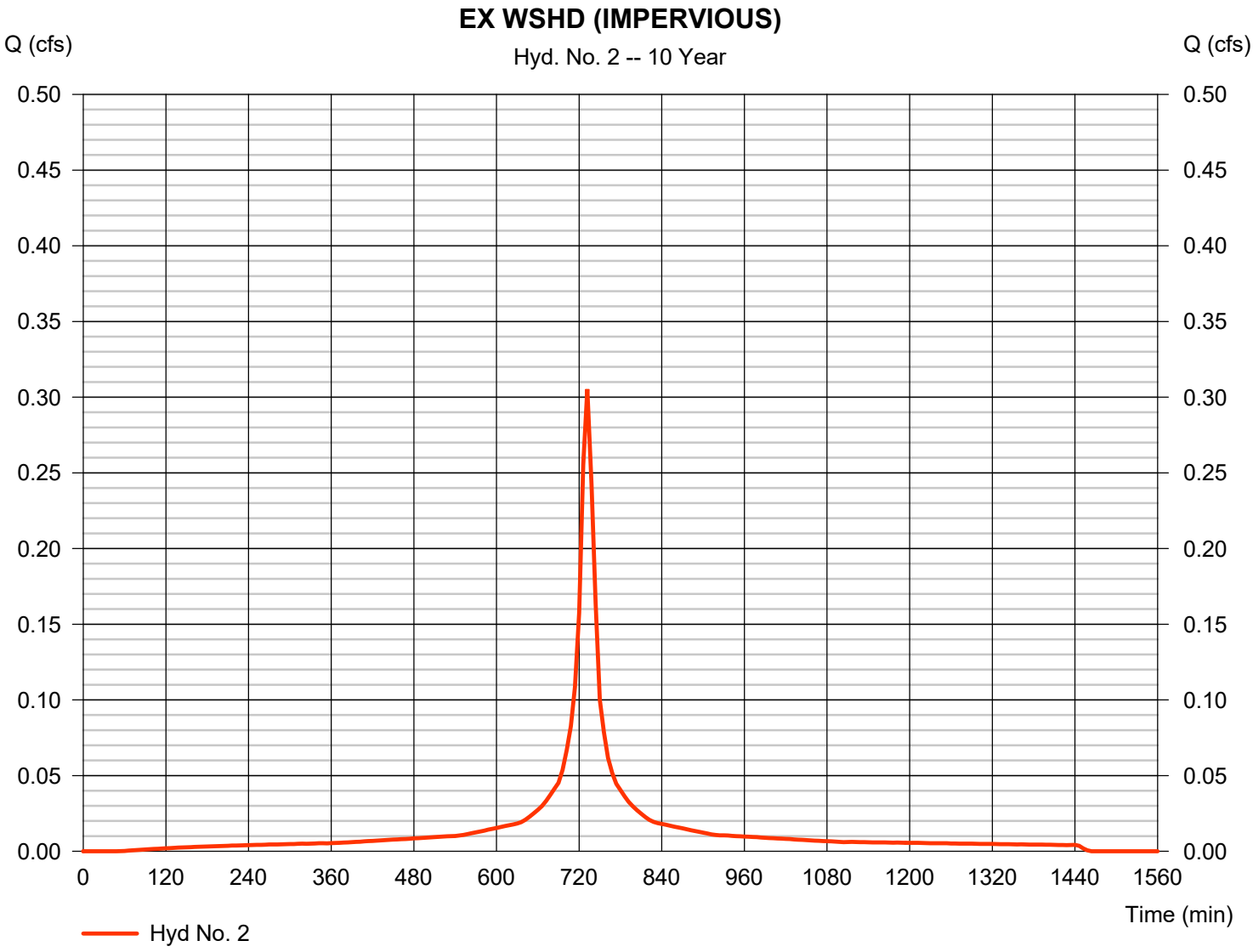


Hydrograph Report

Hyd. No. 2

EX WSHD (IMPERVIOUS)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.305 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	1,338 cuft
Drainage area	=	0.080 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	5.15 in	Distribution	=	Custom
Storm duration	=	M:\Projects\A&E Services\Regency Development\P-22-4781_Springfield Yeshiva Shape Factor		=	484

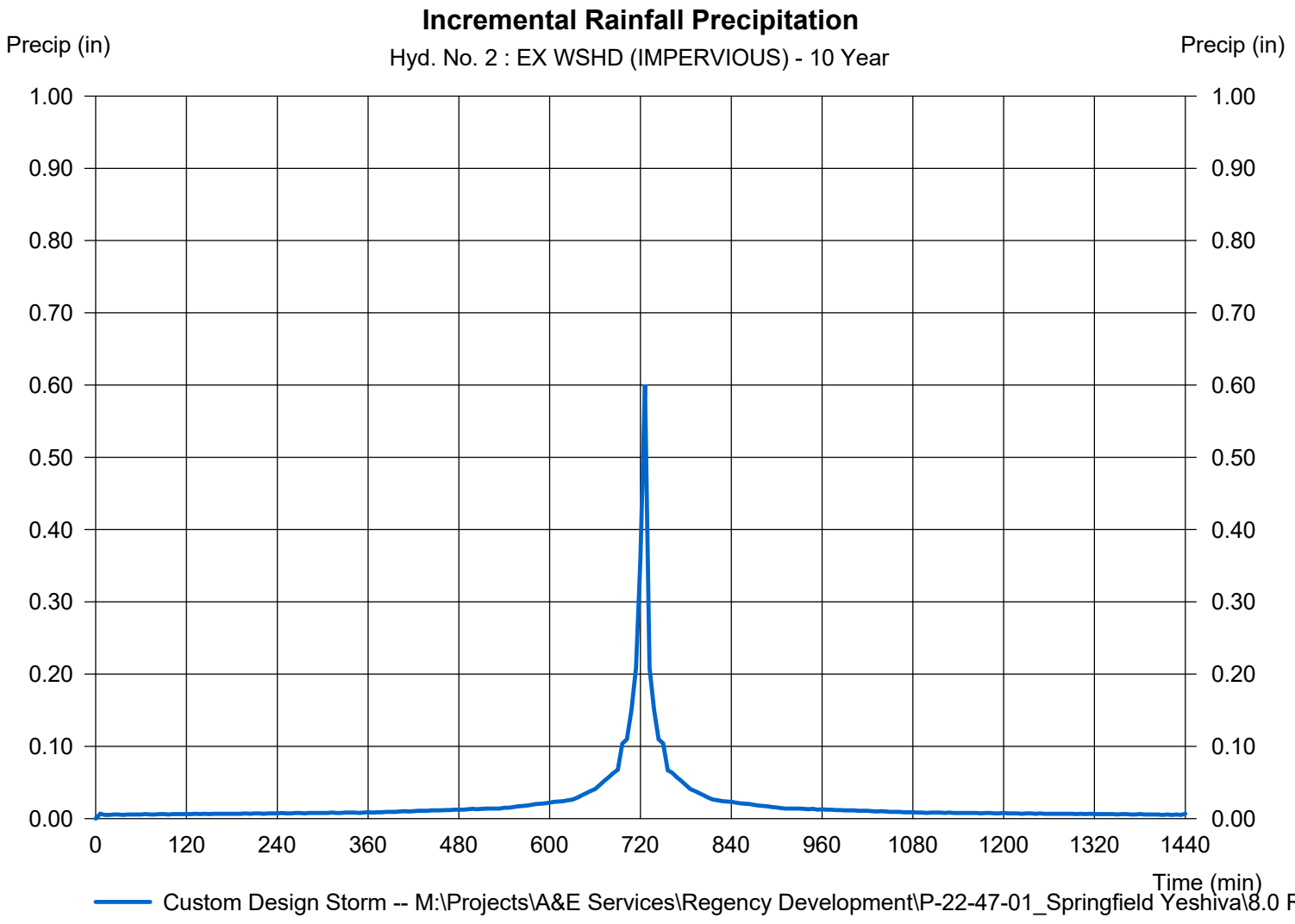


Precipitation Report

Hyd. No. 2

EX WSHD (IMPERVIOUS)

Storm Frequency	= 10 yrs	Time interval	= 6 min
Total precip.	= 5.1500 in	Distribution	= Custom
Storm duration	= M:\Projects\A&E Services\Regency Development\P-22-47-01_Springfield Yeshi		

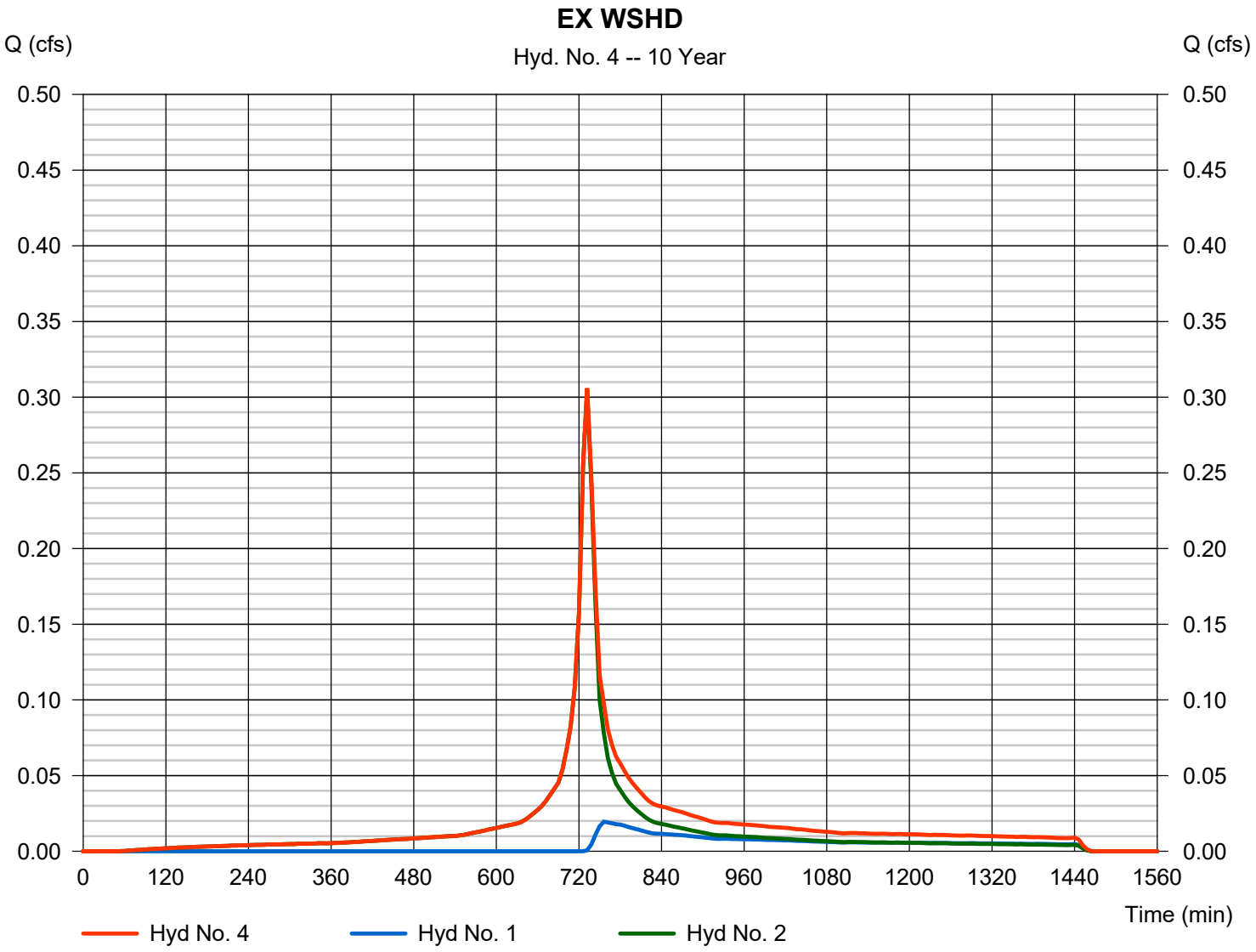


Hydrograph Report

Hyd. No. 4

EX WSHD

Hydrograph type	=	Combine	Peak discharge	=	0.306 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	1,668 cuft
Inflow hyds.	=	1, 2	Contrib. drain. area	=	0.500 ac

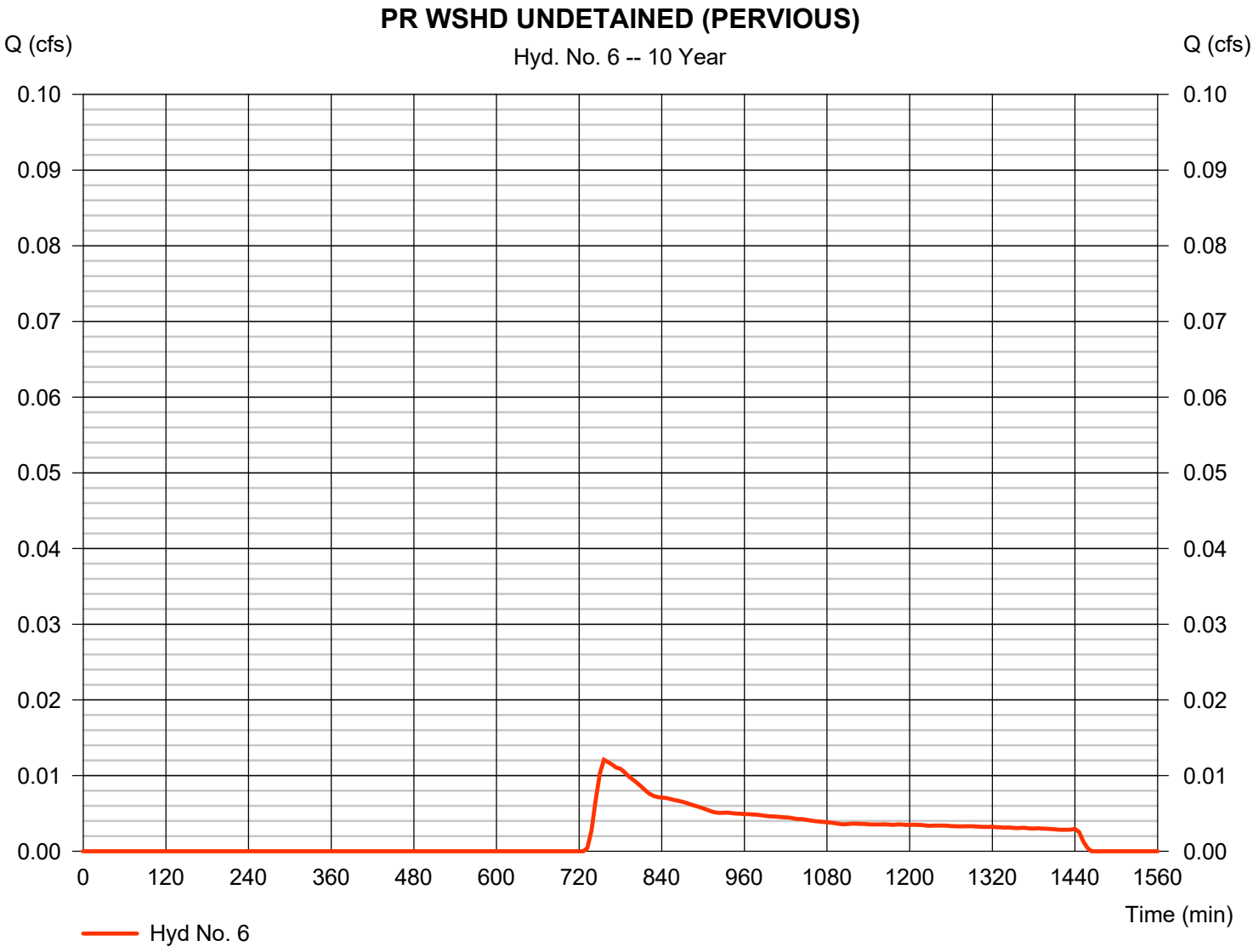


Hydrograph Report

Hyd. No. 6

PR WSHD UNDETAINED (PERVIOUS)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.012 cfs
Storm frequency	=	10 yrs	Time to peak	=	756 min
Time interval	=	6 min	Hyd. volume	=	204 cuft
Drainage area	=	0.260 ac	Curve number	=	39
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	5.15 in	Distribution	=	Custom
Storm duration	=	M:\Projects\A&E Services\Regency Development\P-22-4781_Springfield Yeshiva	Shape factor	=	484

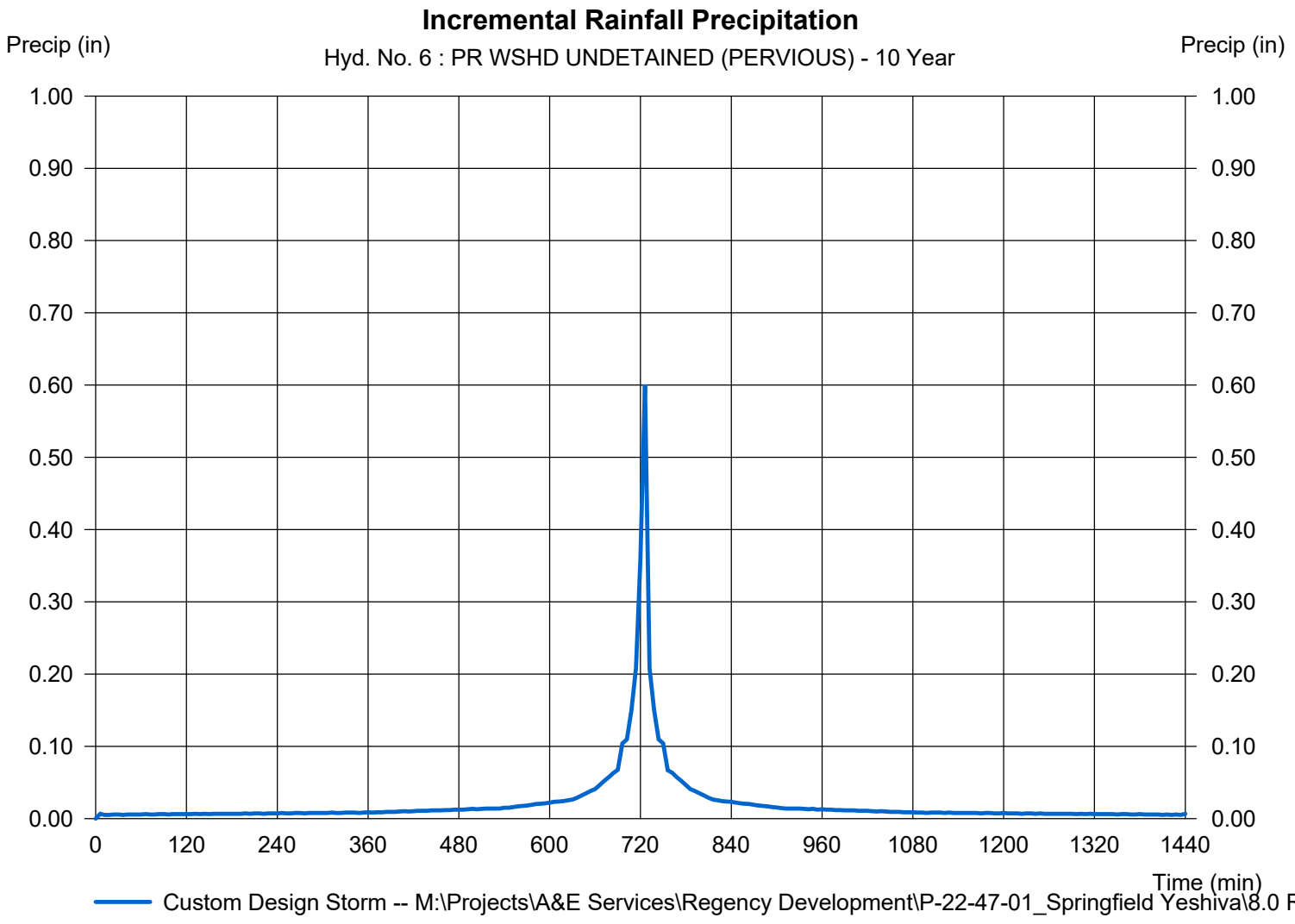


Precipitation Report

Hyd. No. 6

PR WSHD UNDETAINED (PERVIOUS)

Storm Frequency	= 10 yrs	Time interval	= 6 min
Total precip.	= 5.1500 in	Distribution	= Custom
Storm duration	= M:\Projects\A&E Services\Regency Development\P-22-47-01_Springfield Yeshi		

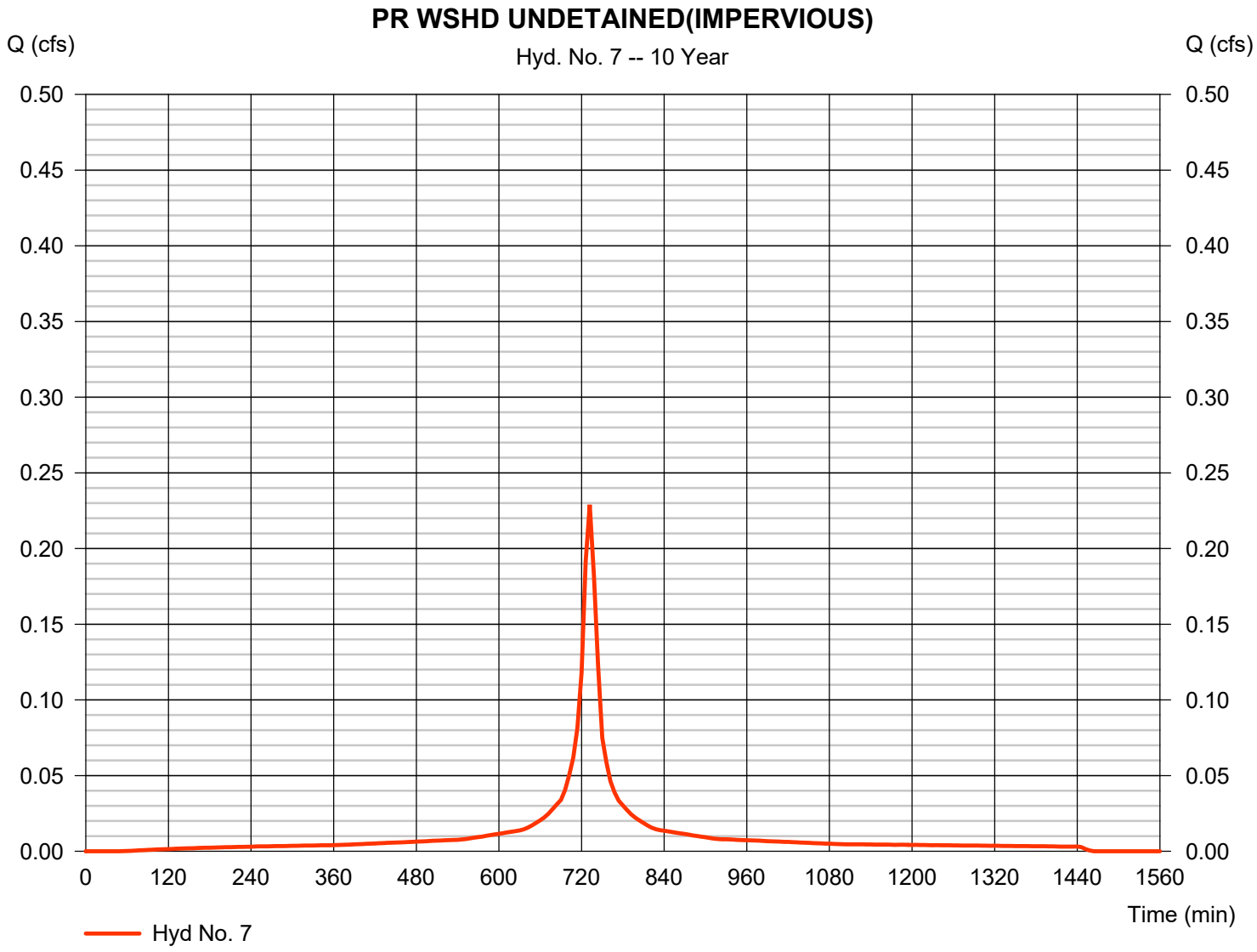


Hydrograph Report

Hyd. No. 7

PR WSHD UNDETAINED(IMPERVIOUS)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.229 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	1,003 cuft
Drainage area	=	0.060 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	5.15 in	Distribution	=	Custom
Storm duration	=	M:\Projects\A&E Services\Regency Development\P-22-4781_Springfield Yeshiva	Shape factor	=	484

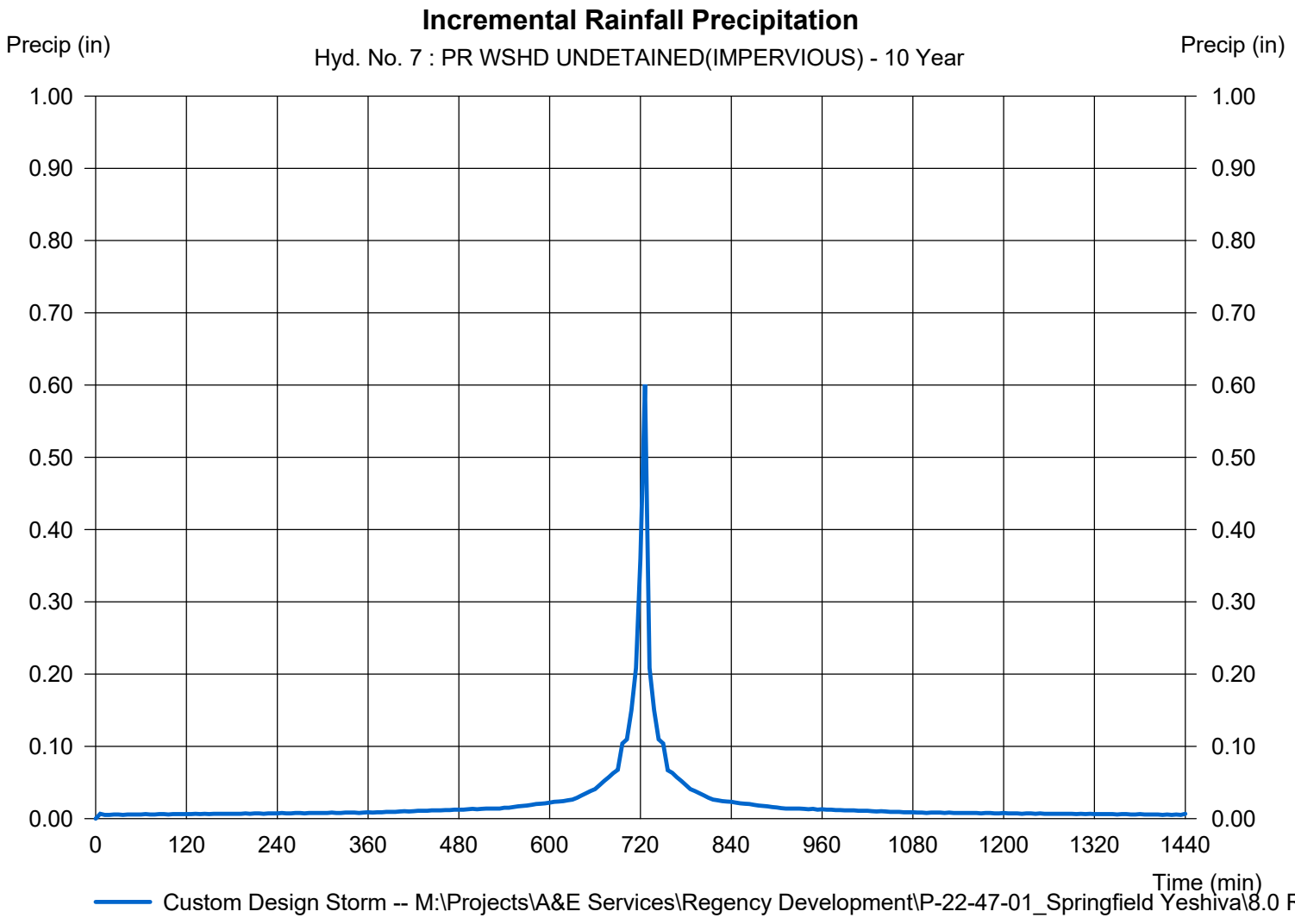


Precipitation Report

Hyd. No. 7

PR WSHD UNDETAINED(IMPERVIOUS)

Storm Frequency	= 10 yrs	Time interval	= 6 min
Total precip.	= 5.1500 in	Distribution	= Custom
Storm duration	= M:\Projects\A&E Services\Regency Development\P-22-47-01_Springfield Yeshi		

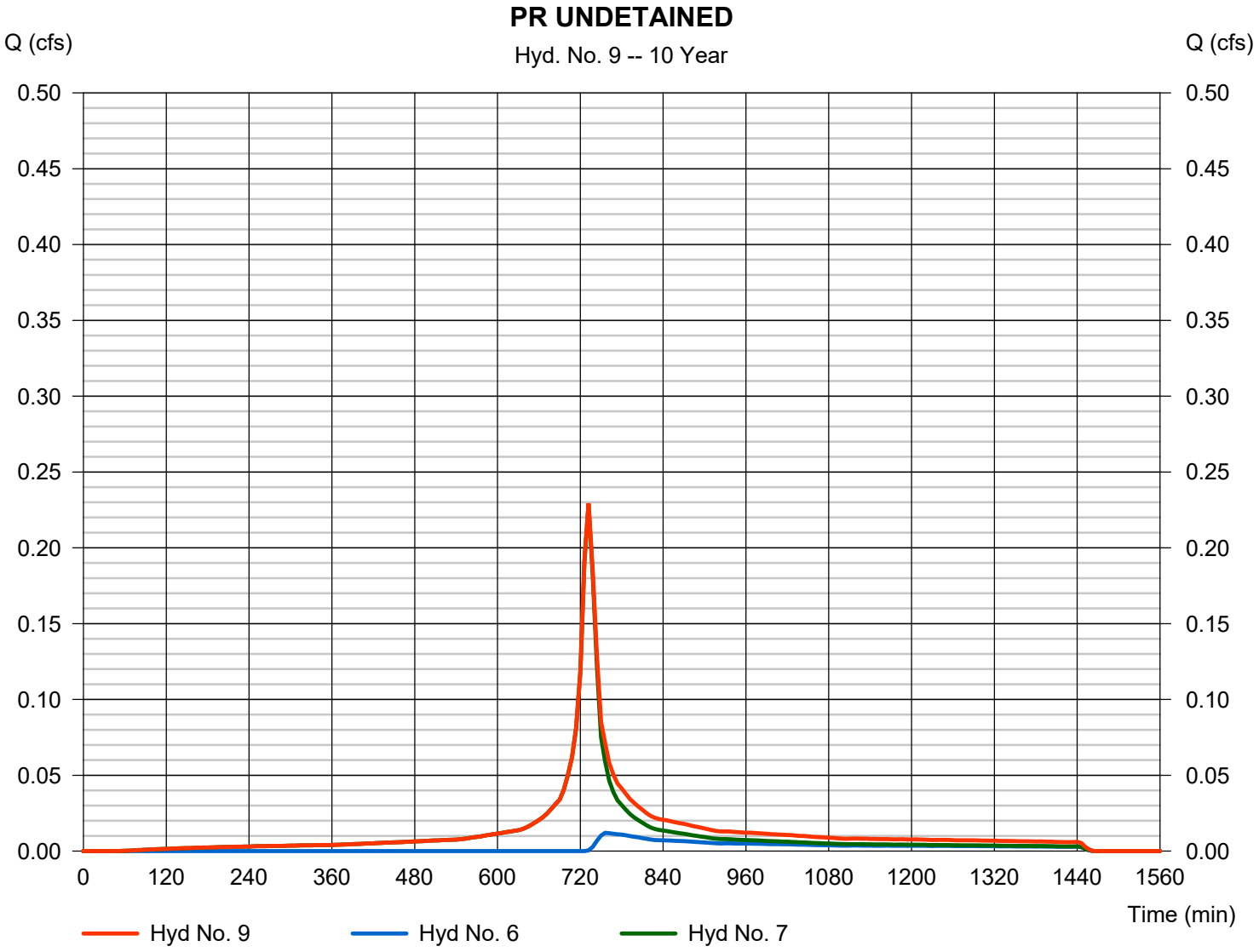


Hydrograph Report

Hyd. No. 9

PR UNDETAINED

Hydrograph type	=	Combine	Peak discharge	=	0.229 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	1,208 cuft
Inflow hyds.	=	6, 7	Contrib. drain. area	=	0.320 ac

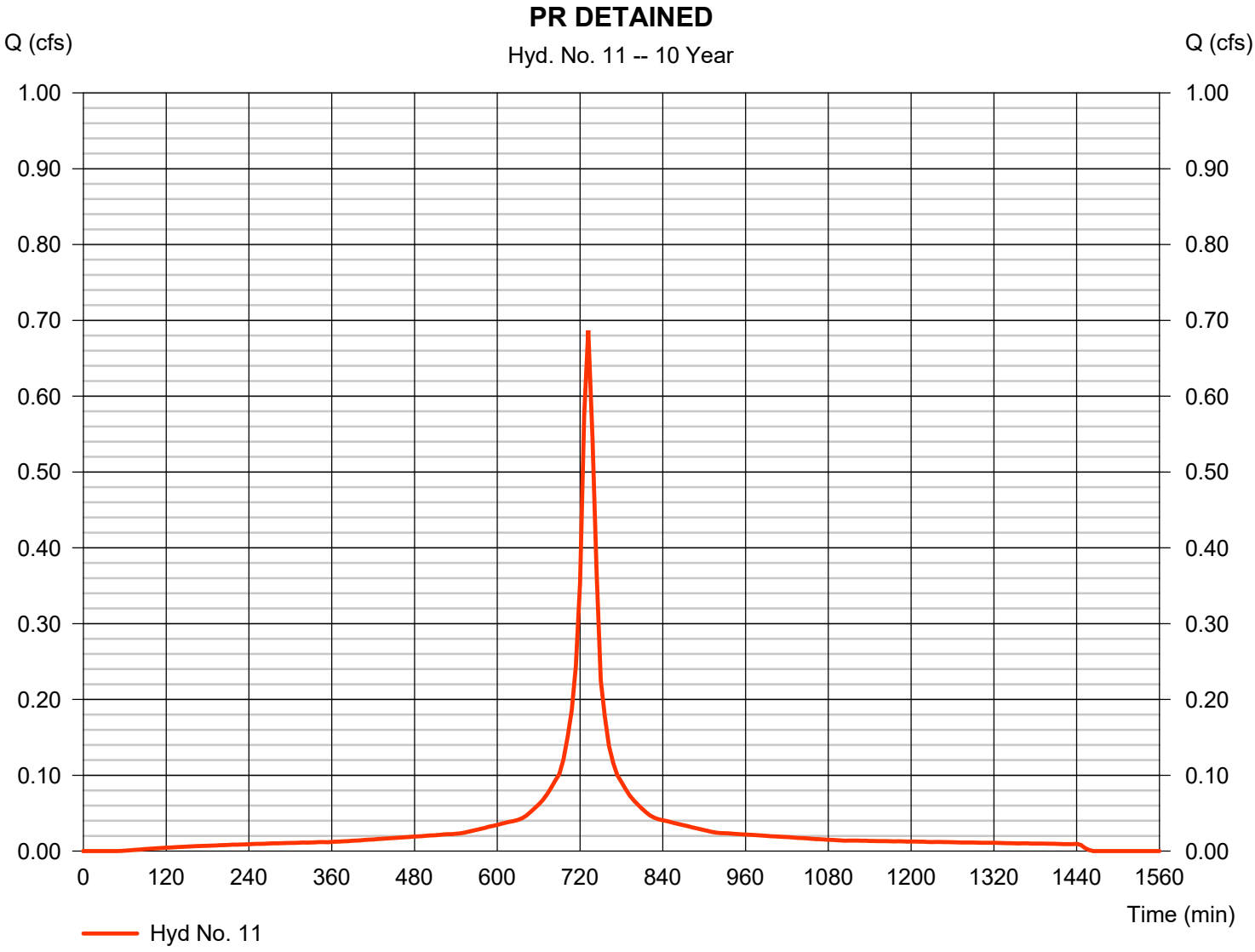


Hydrograph Report

Hyd. No. 11

PR DETAINED

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.687 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	3,009 cuft
Drainage area	=	0.180 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	5.15 in	Distribution	=	Custom
Storm duration	=	M:\Projects\A&E Services\Regency Development\P-22-4781_Springfield Yeshiva Shape Factor		=	484

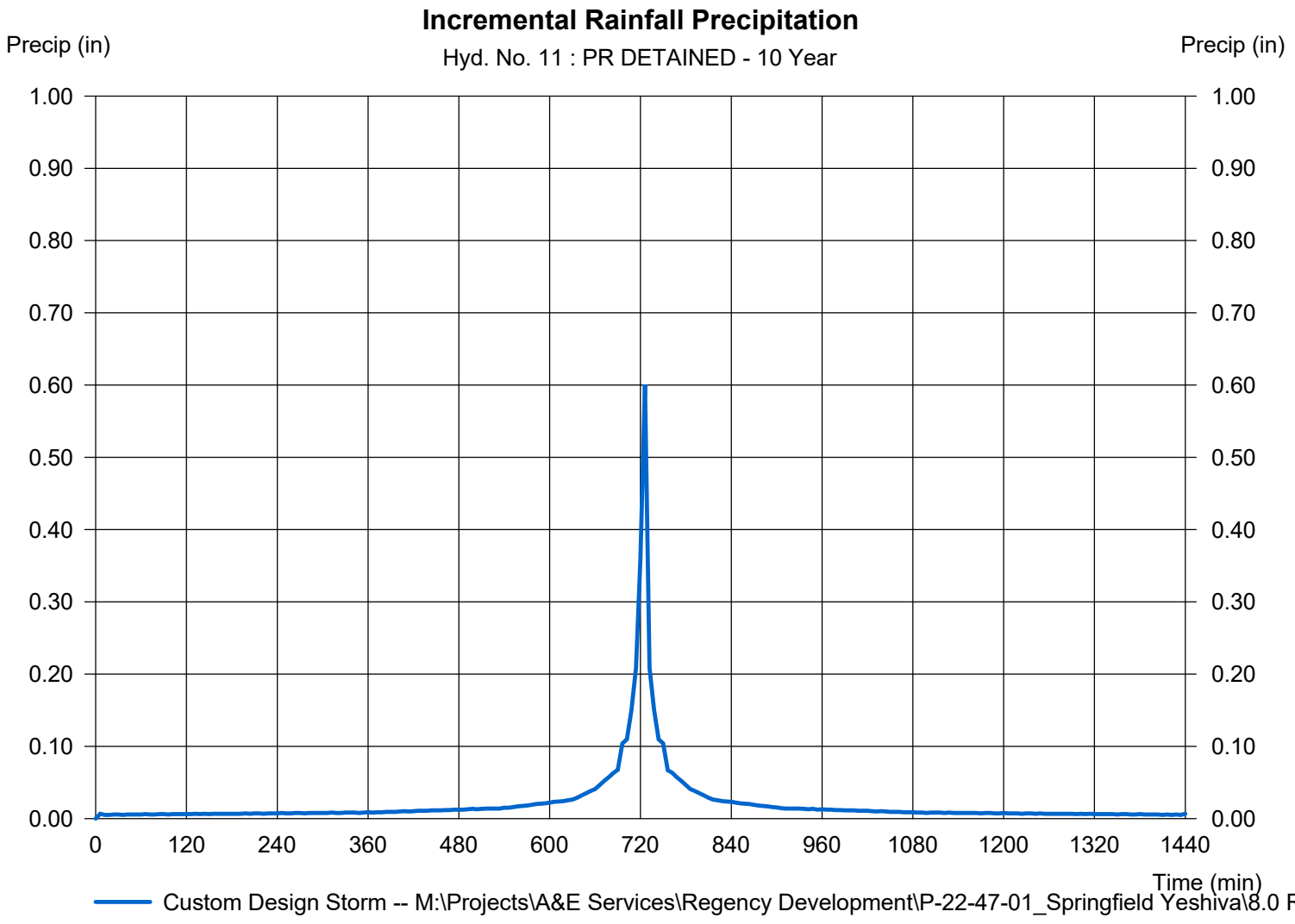


Precipitation Report

Hyd. No. 11

PR DETAINED

Storm Frequency	= 10 yrs	Time interval	= 6 min
Total precip.	= 5.1500 in	Distribution	= Custom
Storm duration	= M:\Projects\A&E Services\Regency Development\P-22-47-01_Springfield Yeshi		



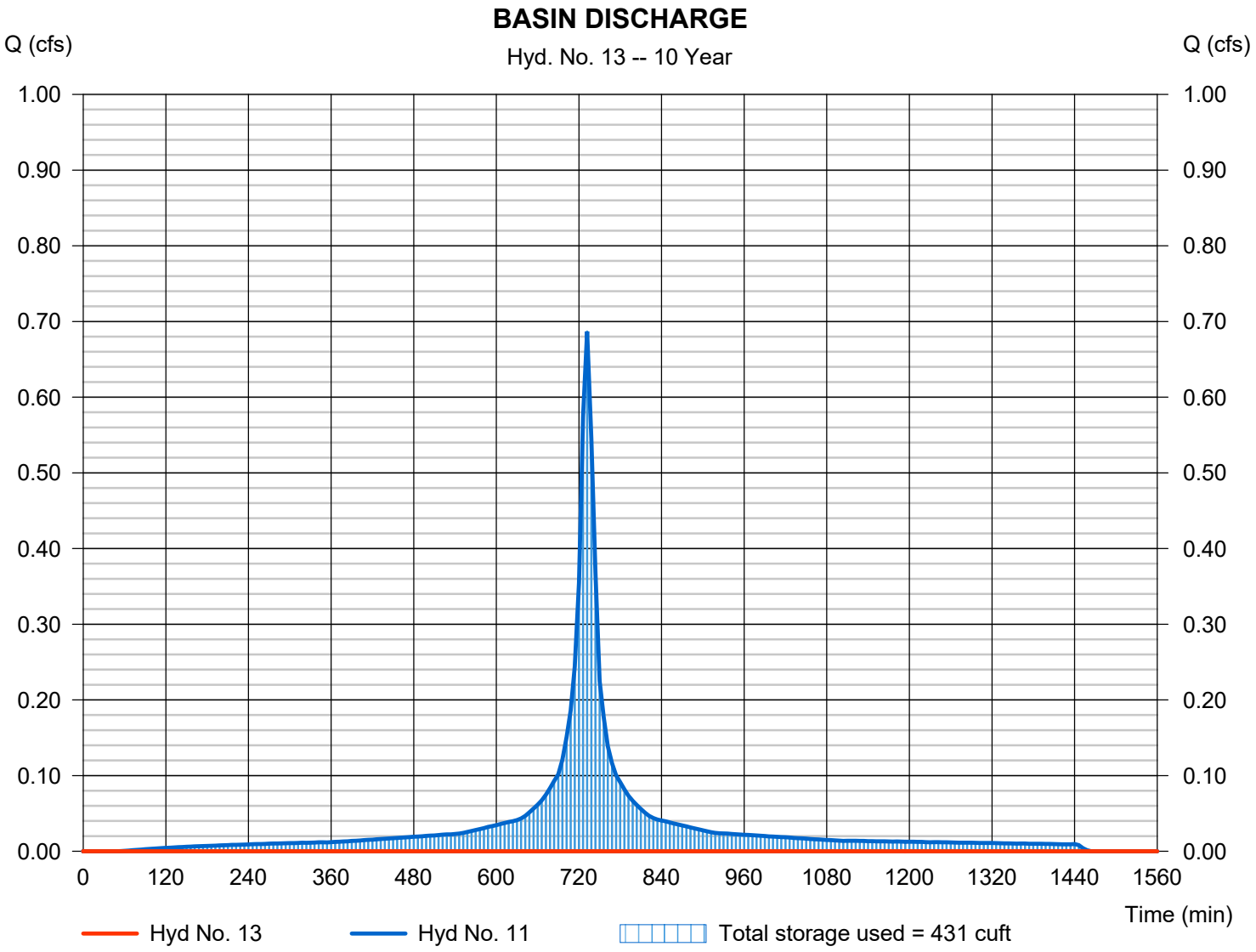
Hydrograph Report

Hyd. No. 13

BASIN DISCHARGE

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	6 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	11 - PR DETAINED	Max. Elevation	=	96.34 ft
Reservoir name	=	BASIN	Max. Storage	=	431 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

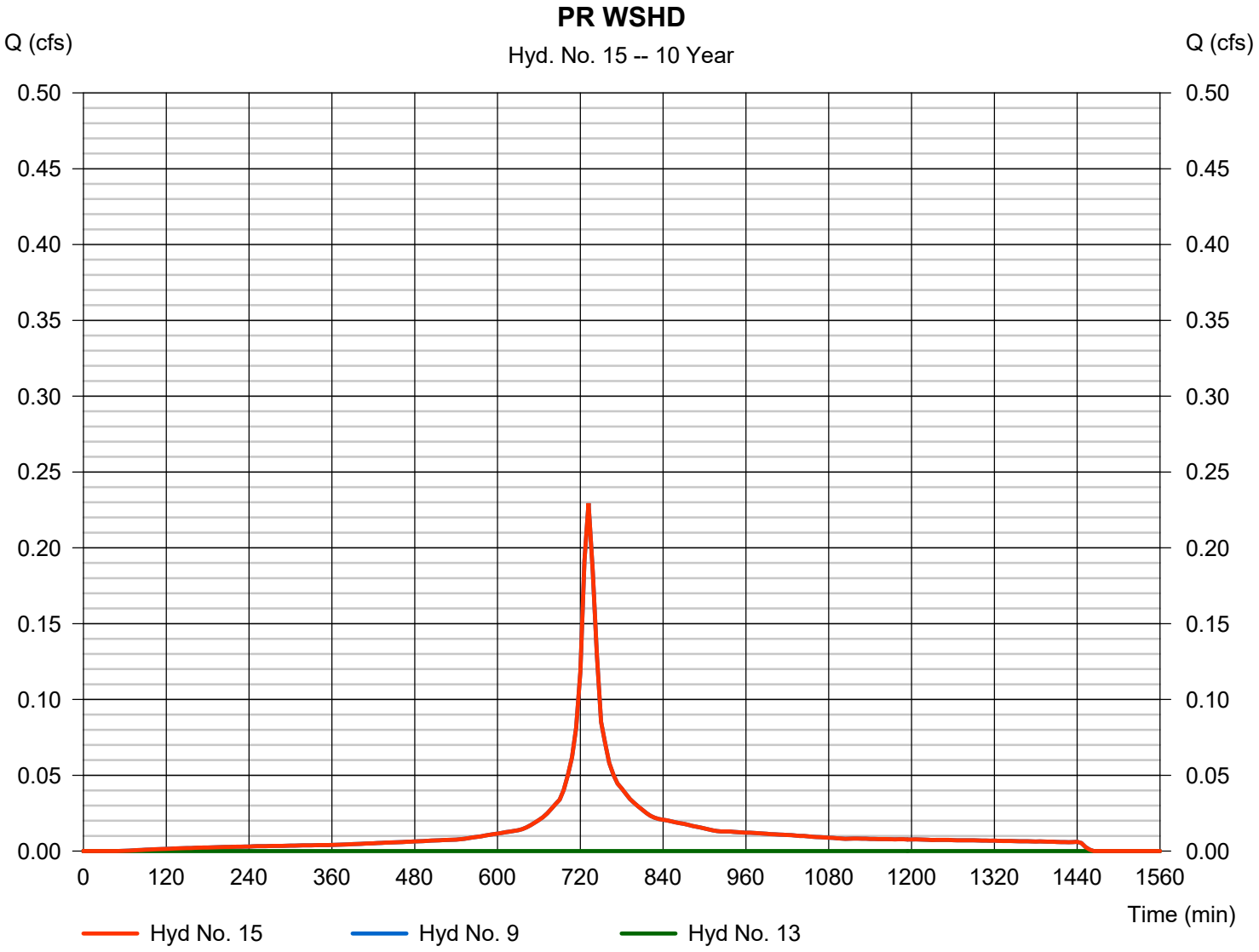


Hydrograph Report

Hyd. No. 15

PR WSHD

Hydrograph type	=	Combine	Peak discharge	=	0.229 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	1,208 cuft
Inflow hyds.	=	9, 13	Contrib. drain. area	=	0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

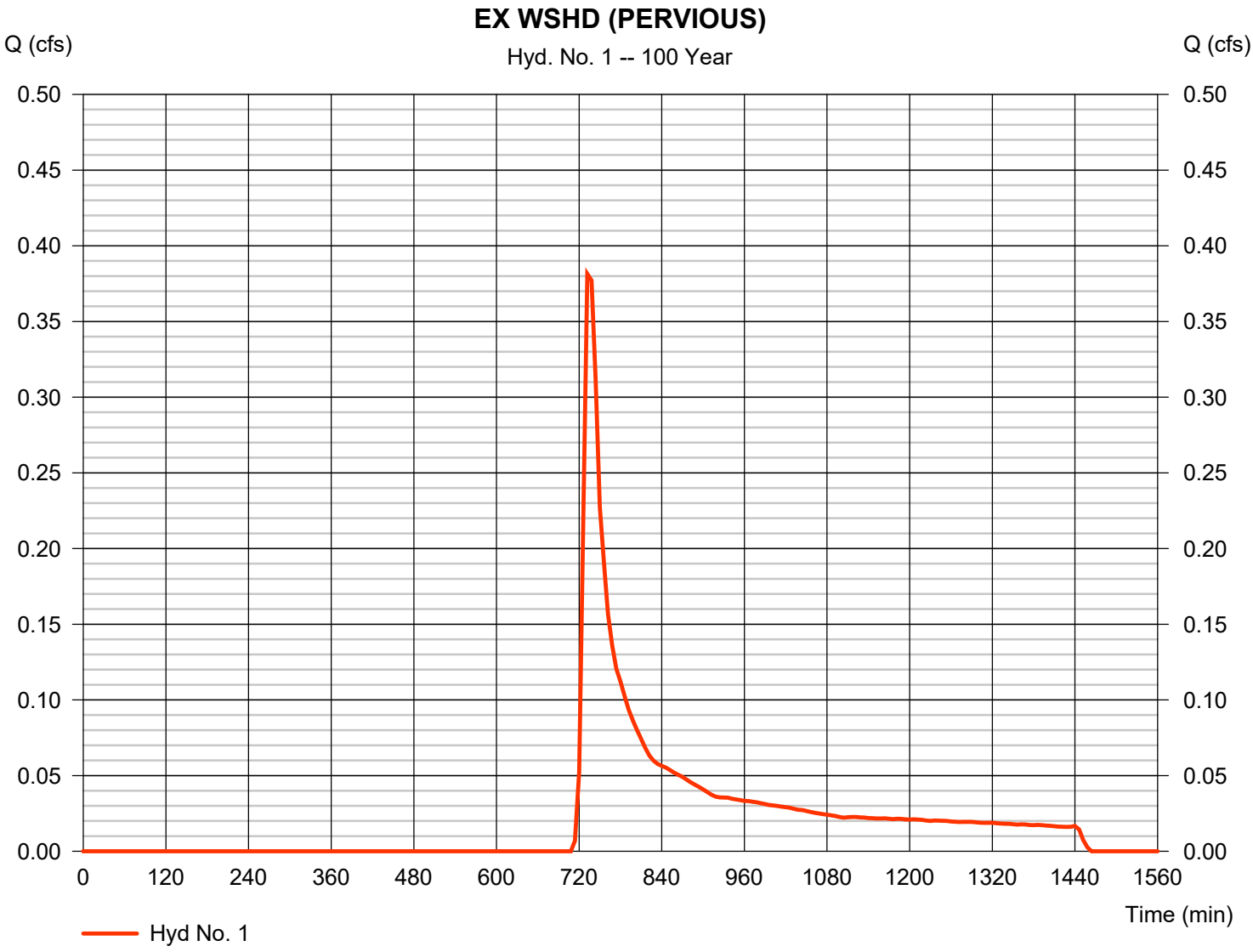
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.381	6	732	2,033	------	------	------	EX WSHD (PERVIOUS)
2	SCS Runoff	0.512	6	732	2,279	------	------	------	EX WSHD (IMPERVIOUS)
4	Combine	0.894	6	732	4,312	1, 2,	------	------	EX WSHD
6	SCS Runoff	0.236	6	732	1,259	------	------	------	PR WSHD UNDETAINED (PERVIOU
7	SCS Runoff	0.384	6	732	1,709	------	------	------	PR WSHD UNDETAINED(IMPERVIO
9	Combine	0.620	6	732	2,968	6, 7,	------	------	PR UNDETAINED
11	SCS Runoff	1.152	6	732	5,127	------	------	------	PR DETAINED
13	Reservoir	0.140	6	750	412	11	98.21	1,005	BASIN DISCHARGE
15	Combine	0.677	6	732	3,380	9, 13,	------	------	PR WSHD

Hydrograph Report

Hyd. No. 1

EX WSHD (PERVIOUS)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.381 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	2,033 cuft
Drainage area	=	0.420 ac	Curve number	=	39
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	8.61 in	Distribution	=	Custom
Storm duration	=	M:\Projects\A&E Services\Regional Development\P-22-4781_Springfield Yeshiva Shape Factor		=	484

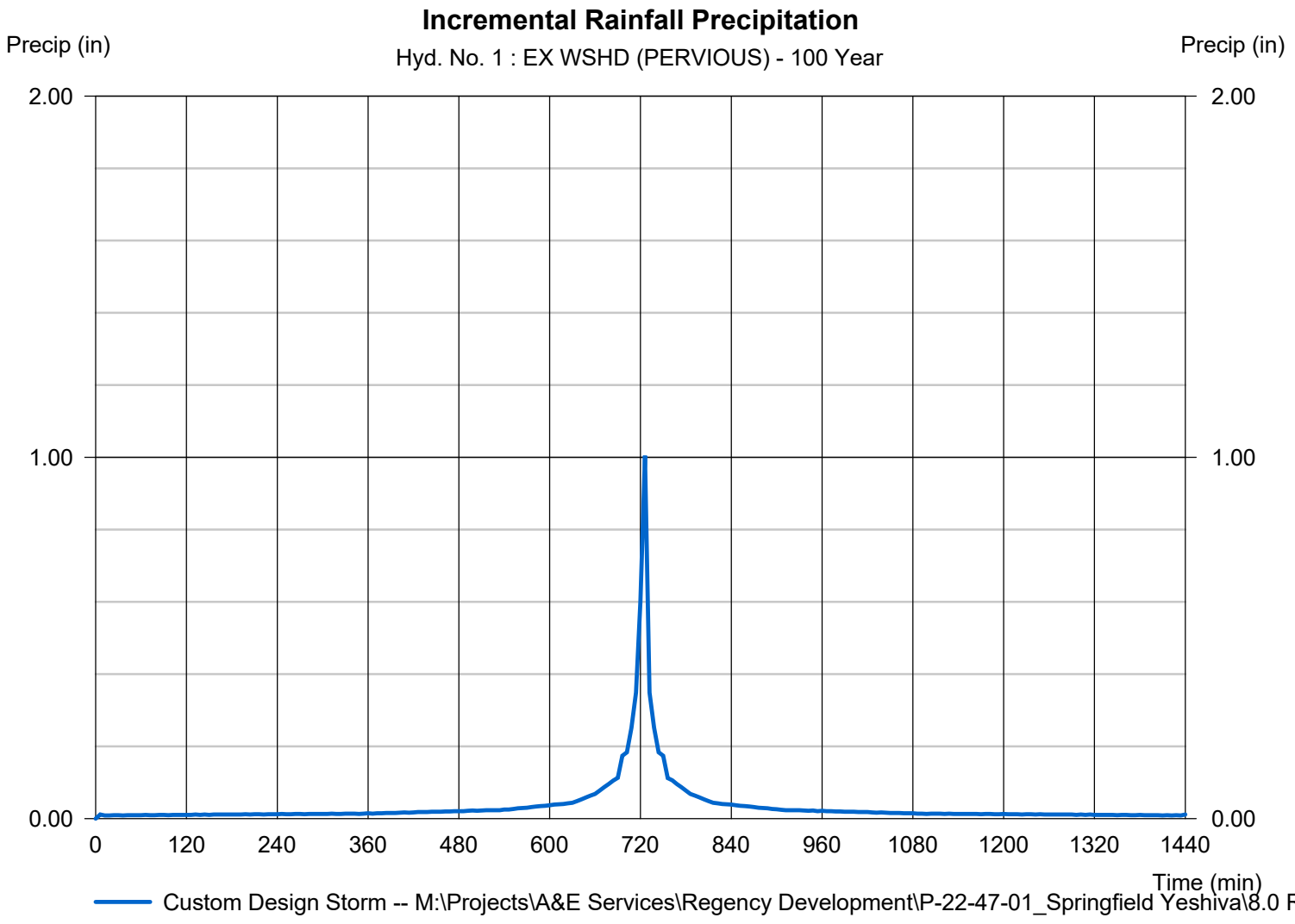


Precipitation Report

Hyd. No. 1

EX WSHD (PERVIOUS)

Storm Frequency	= 100 yrs	Time interval	= 6 min
Total precip.	= 8.6100 in	Distribution	= Custom
Storm duration	= M:\Projects\A&E Services\Regency Development\P-22-47-01_Springfield Yeshi		

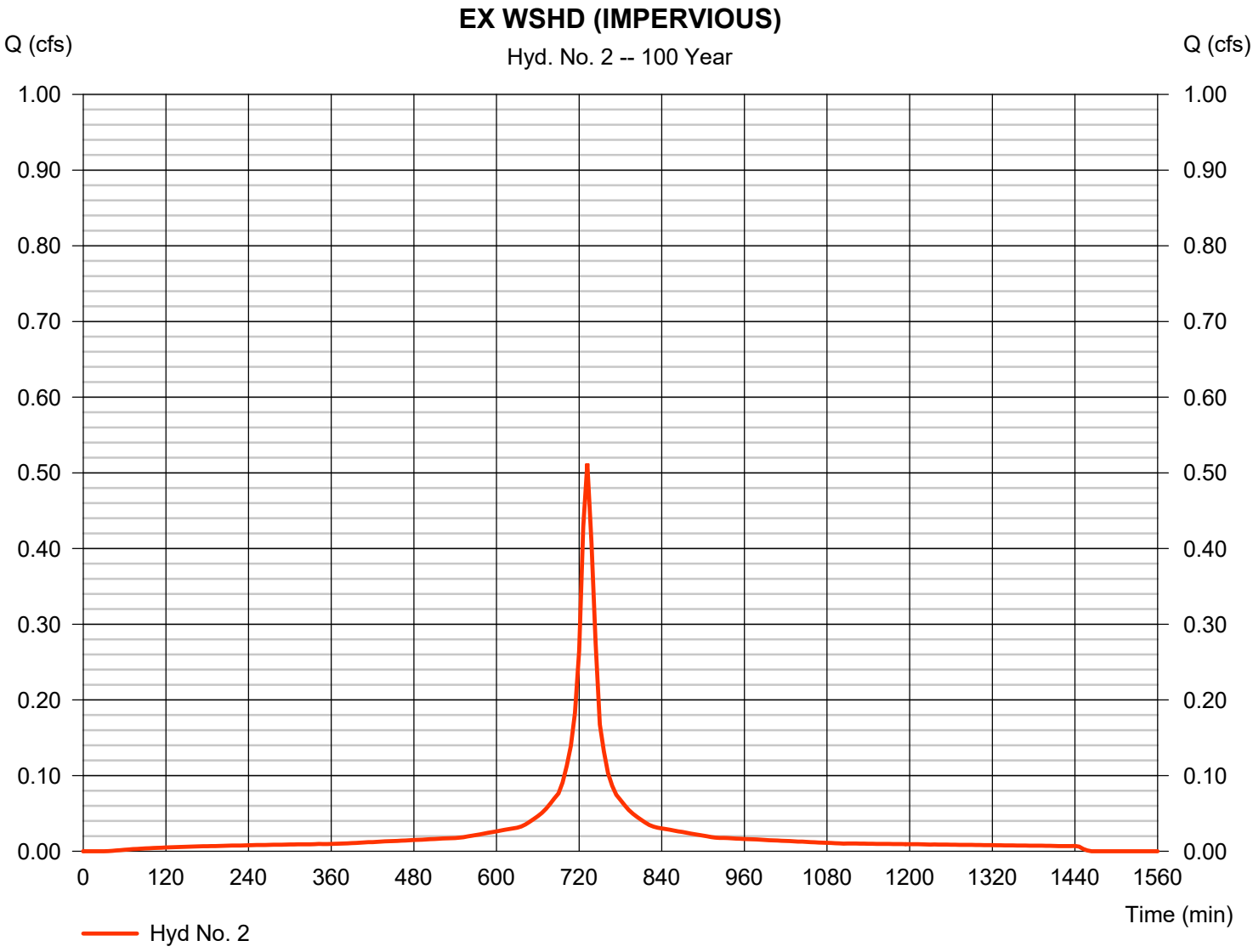


Hydrograph Report

Hyd. No. 2

EX WSHD (IMPERVIOUS)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.512 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	2,279 cuft
Drainage area	=	0.080 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	8.61 in	Distribution	=	Custom
Storm duration	=	M:\Projects\A&E Services\Regional Development\P-22-4781_Springfield Yeshiva	Shape Factor	=	484

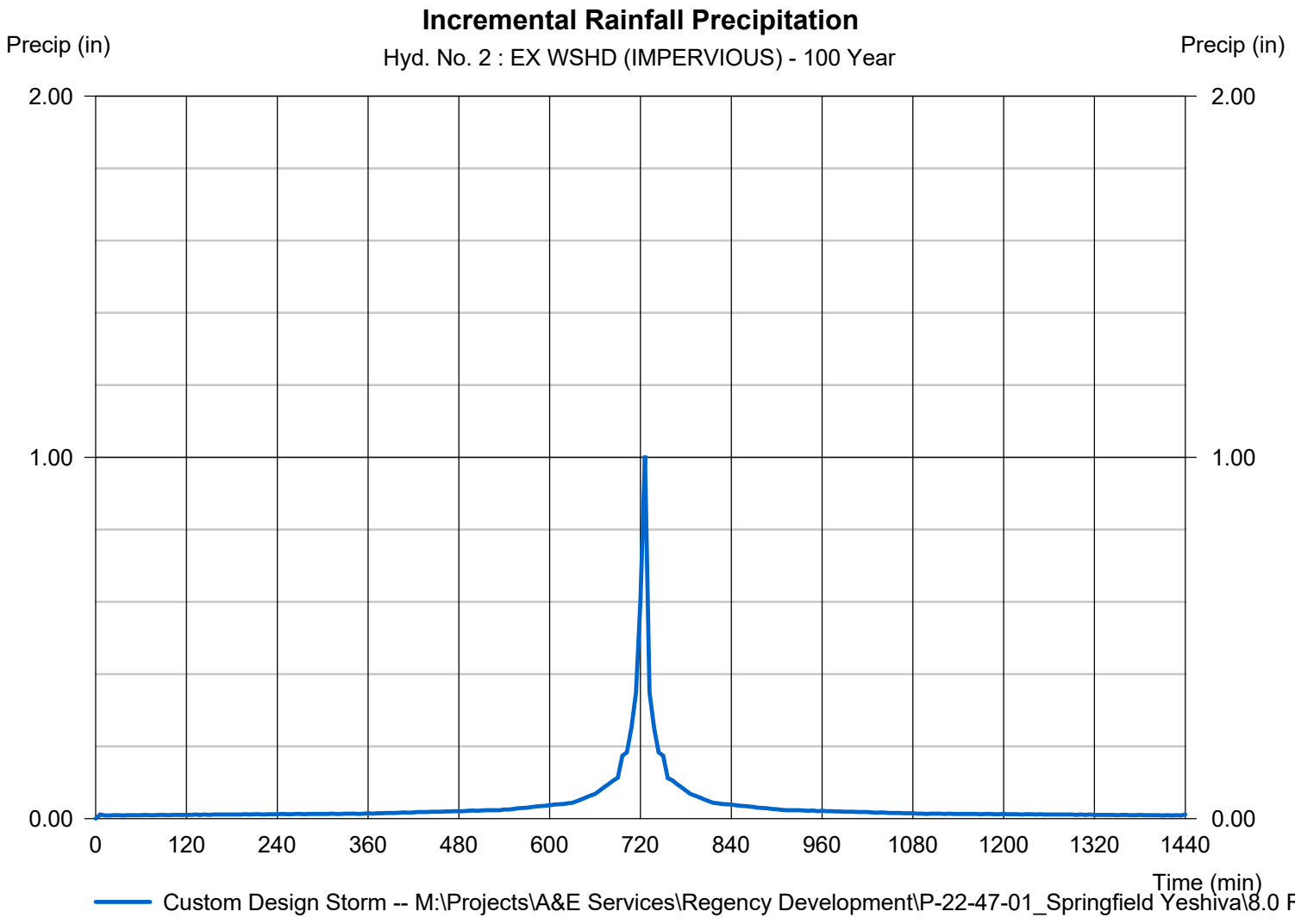


Precipitation Report

Hyd. No. 2

EX WSHD (IMPERVIOUS)

Storm Frequency	= 100 yrs	Time interval	= 6 min
Total precip.	= 8.6100 in	Distribution	= Custom
Storm duration	= M:\Projects\A&E Services\Regency Development\P-22-47-01_Springfield Yeshi		

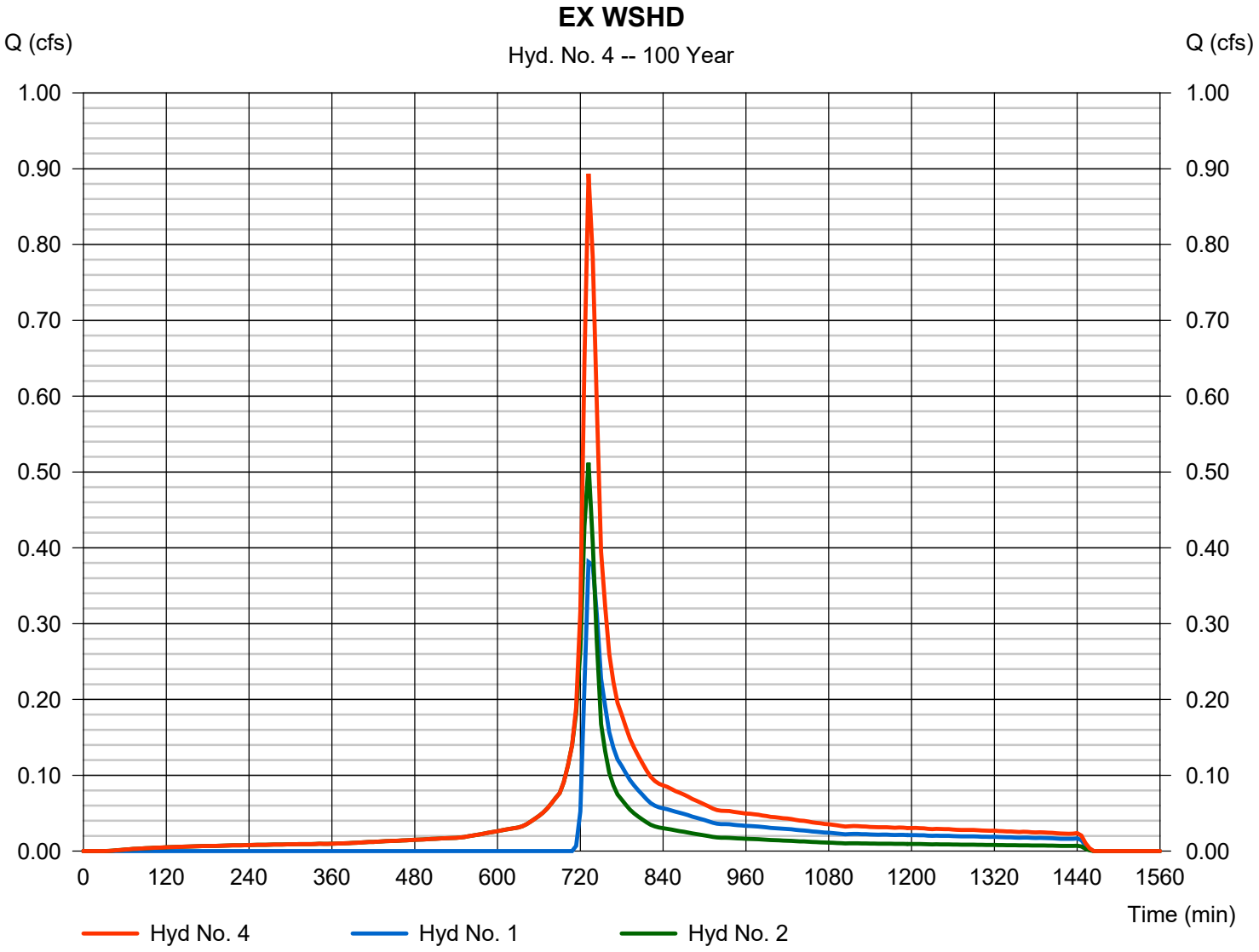


Hydrograph Report

Hyd. No. 4

EX WSHD

Hydrograph type	=	Combine	Peak discharge	=	0.894 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	4,312 cuft
Inflow hyds.	=	1, 2	Contrib. drain. area	=	0.500 ac

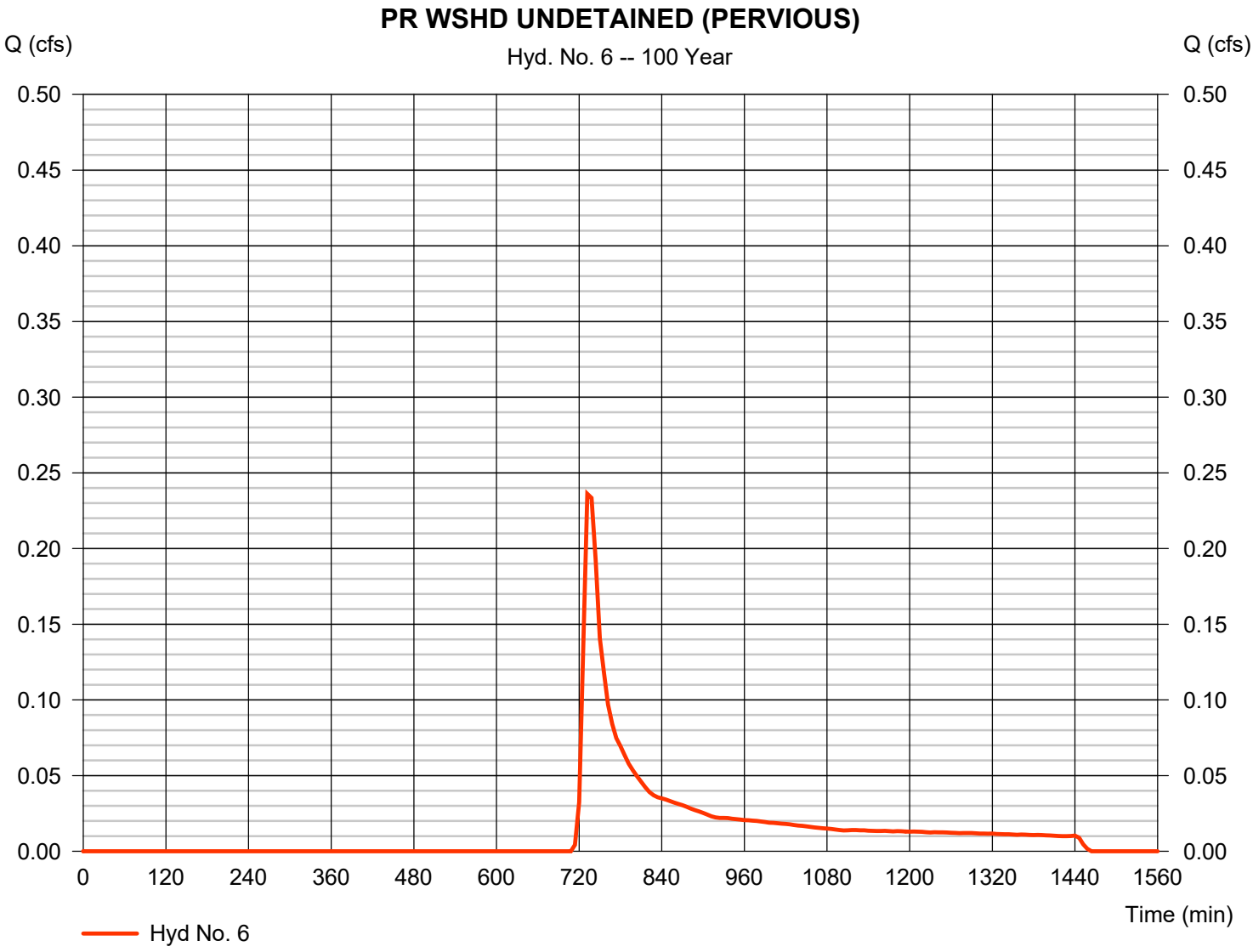


Hydrograph Report

Hyd. No. 6

PR WSHD UNDETAINED (PERVIOUS)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.236 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	1,259 cuft
Drainage area	=	0.260 ac	Curve number	=	39
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	8.61 in	Distribution	=	Custom
Storm duration	=	M:\Projects\A&E Services\Regency Development\P-22-4781_Springfield Yeshiva	Shape factor	=	484

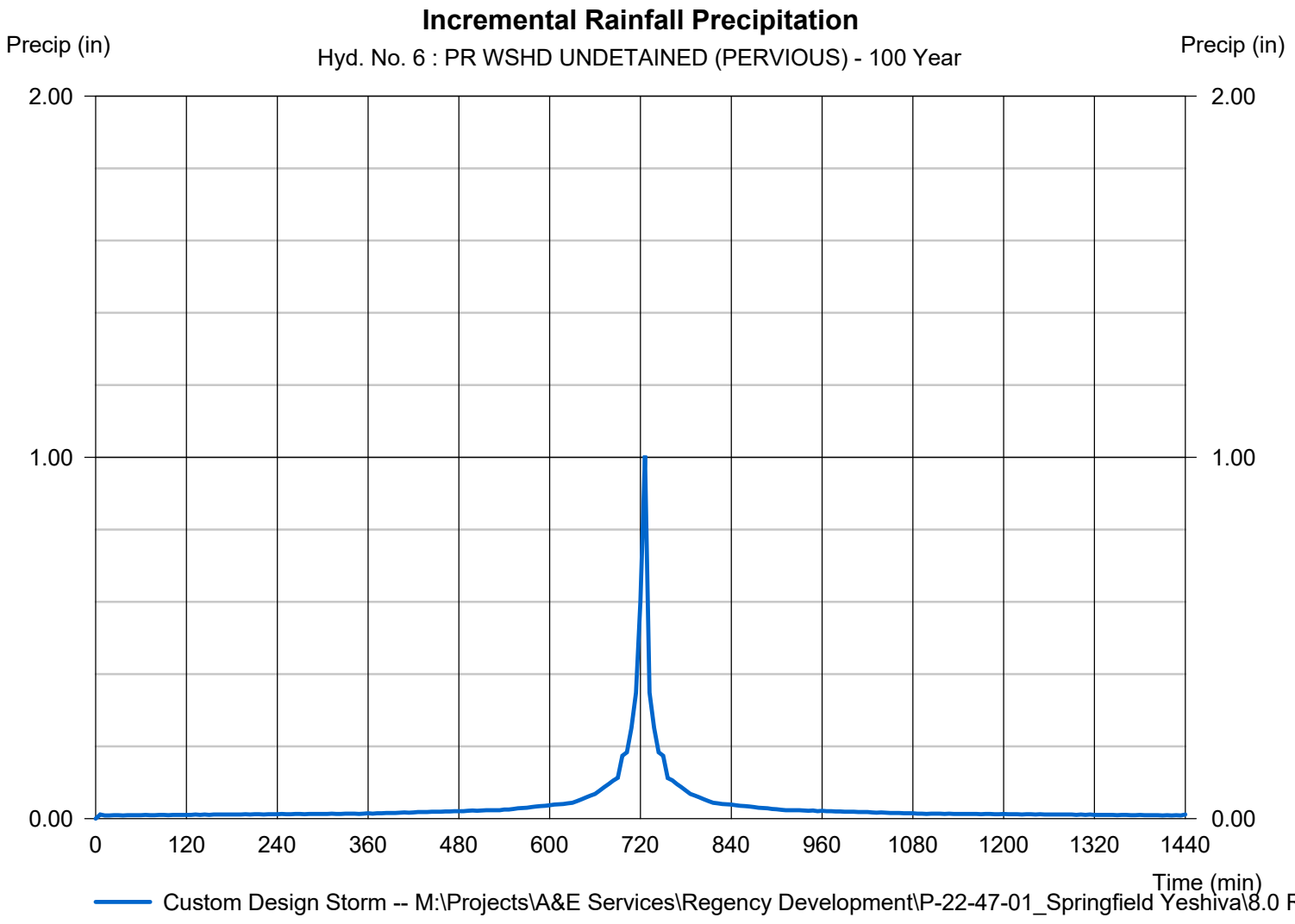


Precipitation Report

Hyd. No. 6

PR WSHD UNDETAINED (PERVIOUS)

Storm Frequency	= 100 yrs	Time interval	= 6 min
Total precip.	= 8.6100 in	Distribution	= Custom
Storm duration	= M:\Projects\A&E Services\Regency Development\P-22-47-01_Springfield Yeshi		

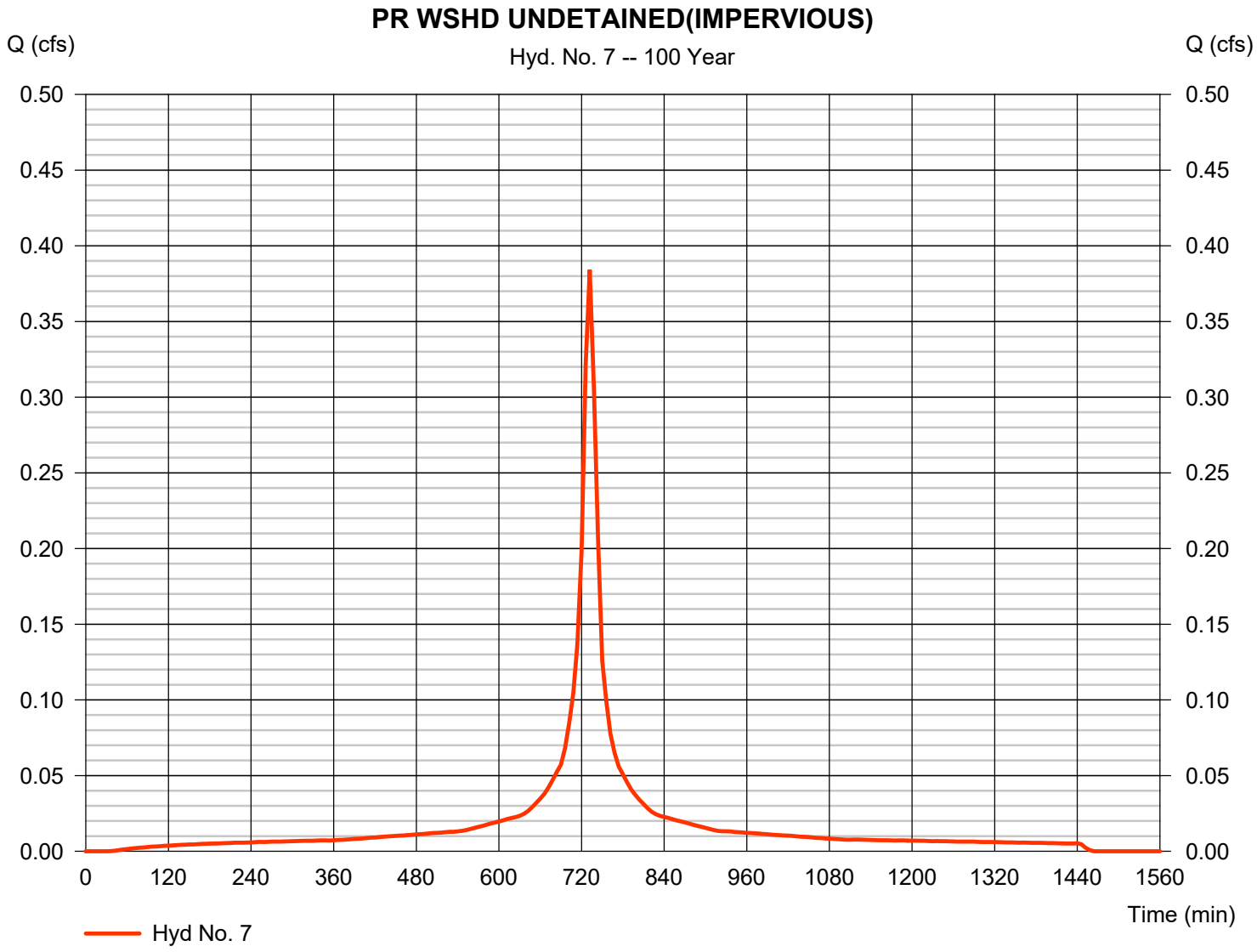


Hydrograph Report

Hyd. No. 7

PR WSHD UNDETAINED(IMPERVIOUS)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.384 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	1,709 cuft
Drainage area	=	0.060 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	8.61 in	Distribution	=	Custom
Storm duration	=	M:\Projects\A&E Services\Regency Development\P-22-4781_Springfield Yeshiva Shape Factor		=	484

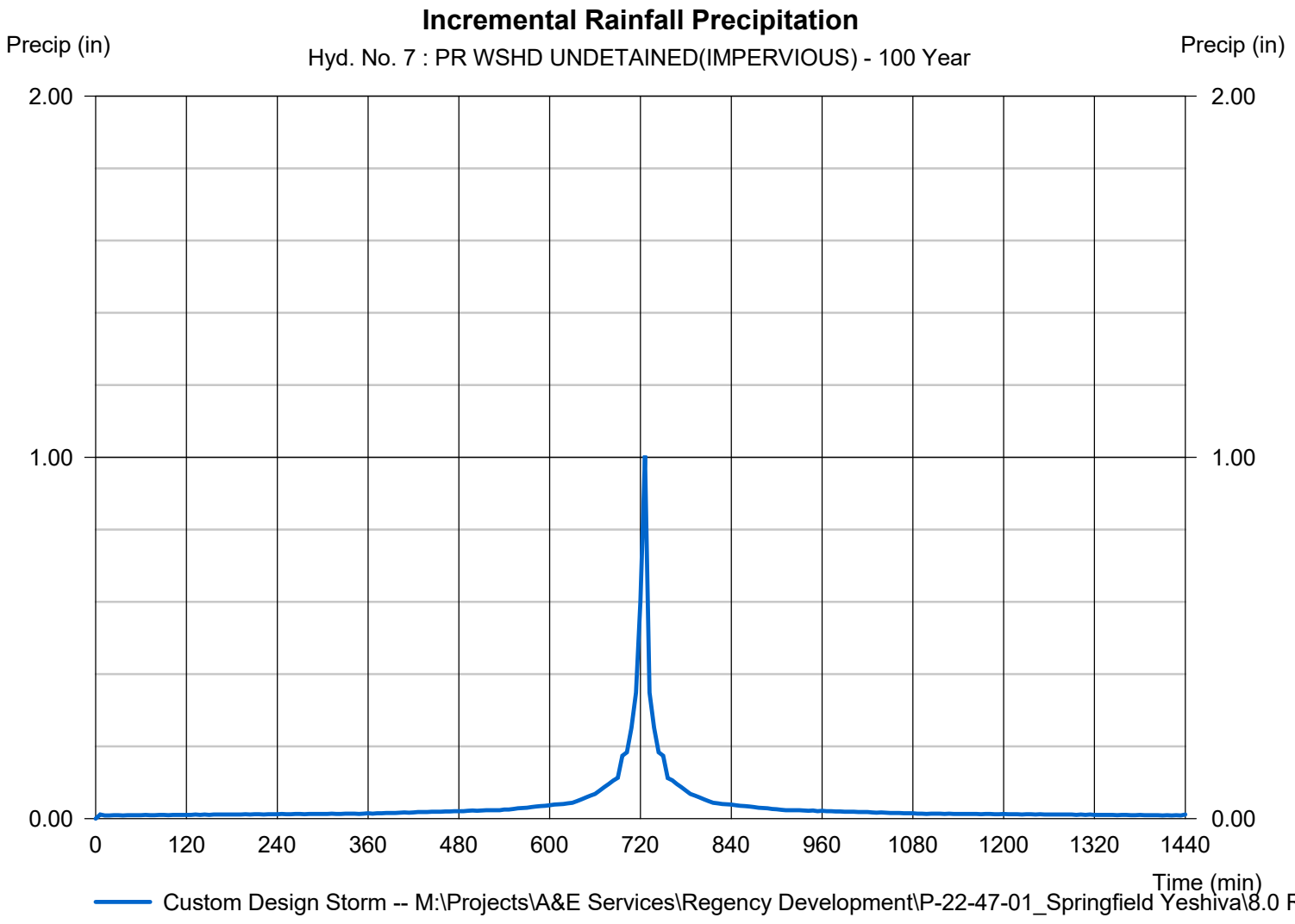


Precipitation Report

Hyd. No. 7

PR WSHD UNDETAINED(IMPERVIOUS)

Storm Frequency	= 100 yrs	Time interval	= 6 min
Total precip.	= 8.6100 in	Distribution	= Custom
Storm duration	= M:\Projects\A&E Services\Regency Development\P-22-47-01_Springfield Yeshi		

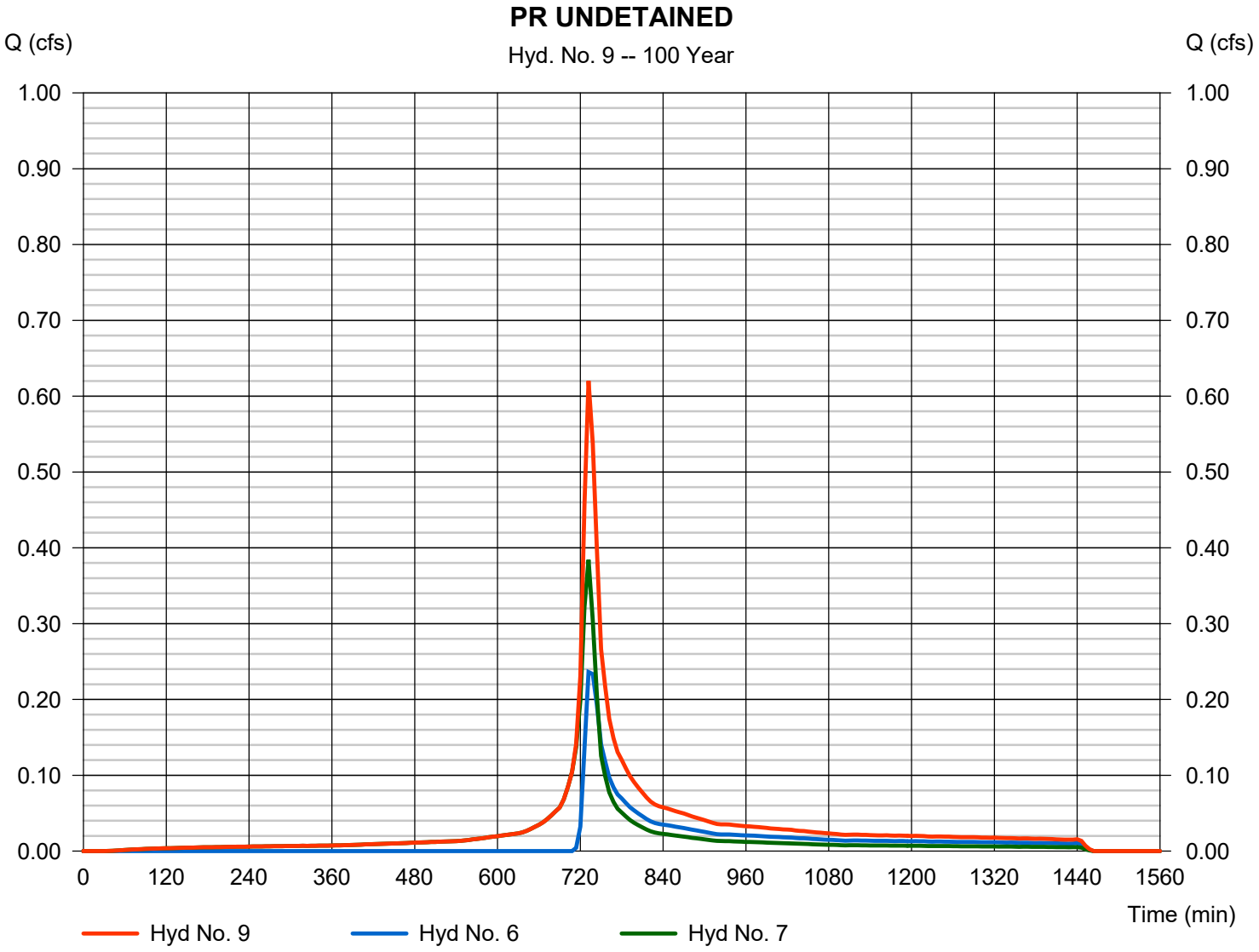


Hydrograph Report

Hyd. No. 9

PR UNDETAINED

Hydrograph type	=	Combine	Peak discharge	=	0.620 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	2,968 cuft
Inflow hyds.	=	6, 7	Contrib. drain. area	=	0.320 ac

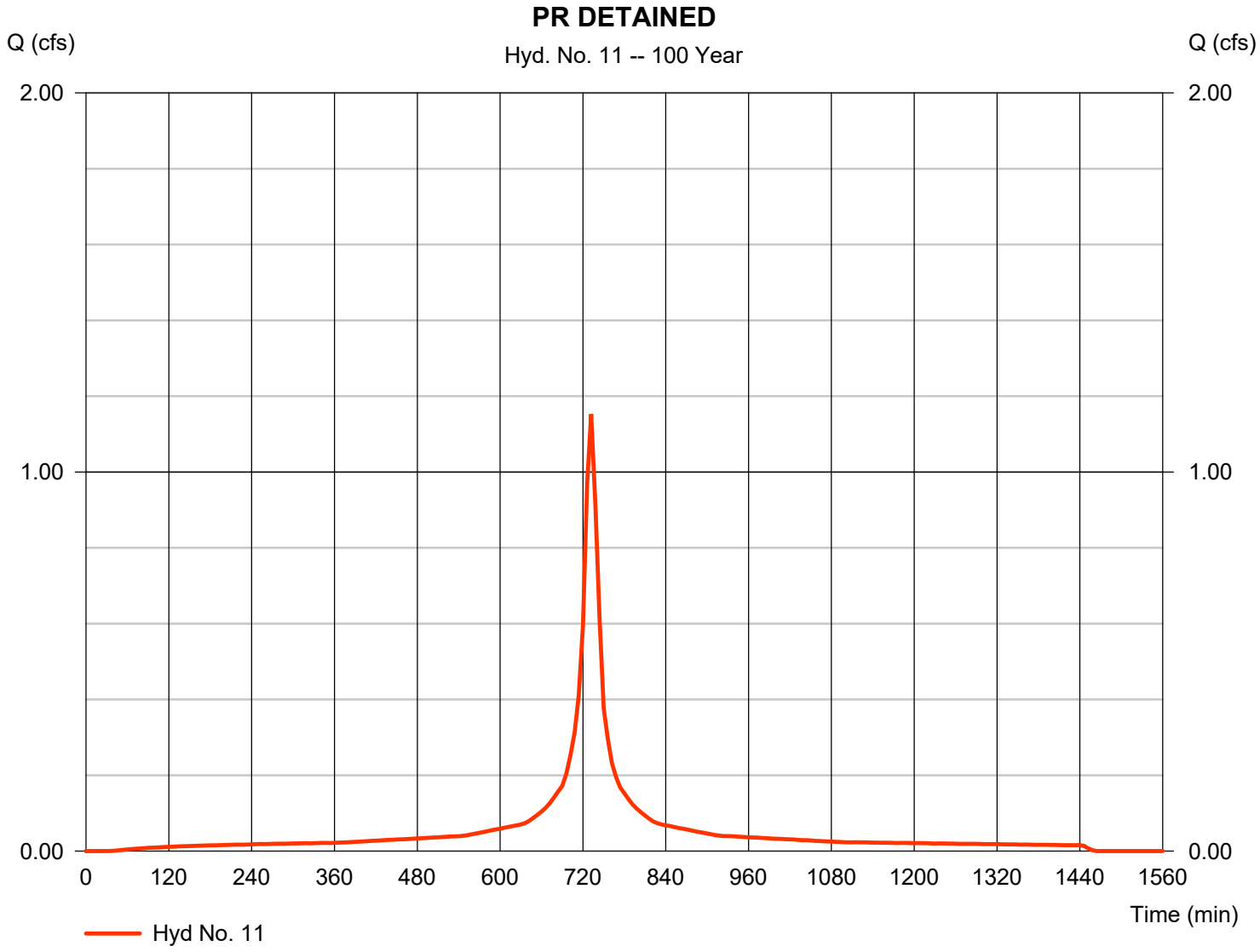


Hydrograph Report

Hyd. No. 11

PR DETAINED

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.152 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	5,127 cuft
Drainage area	=	0.180 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	8.61 in	Distribution	=	Custom
Storm duration	=	M:\Projects\A&E Services\Regency Development\P-22-4781_Springfield Yeshiva\Engineering\Hydraflow\Shape Factor			

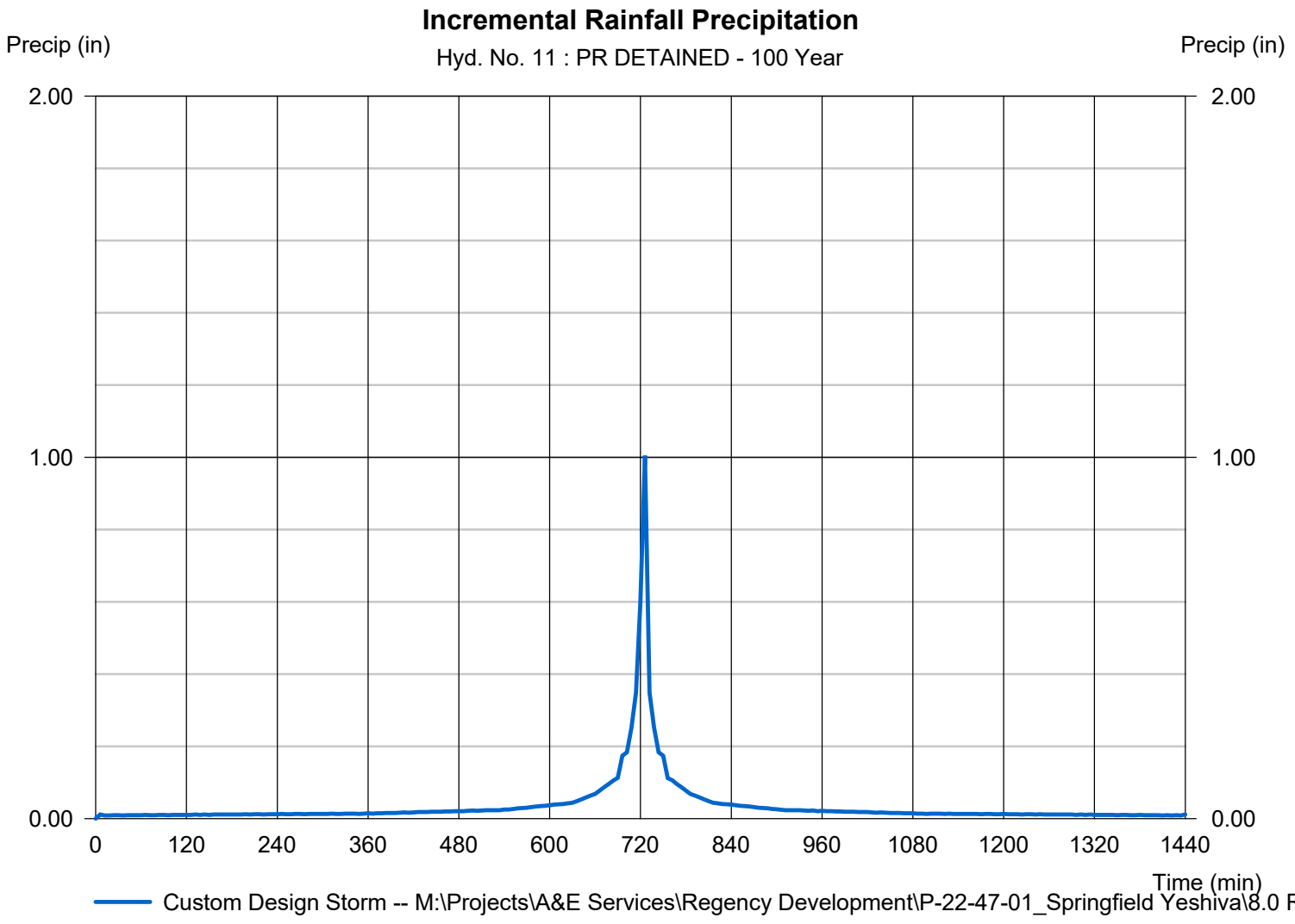


Precipitation Report

Hyd. No. 11

PR DETAINED

Storm Frequency	= 100 yrs	Time interval	= 6 min
Total precip.	= 8.6100 in	Distribution	= Custom
Storm duration	= M:\Projects\A&E Services\Regency Development\P-22-47-01_Springfield Yeshi		



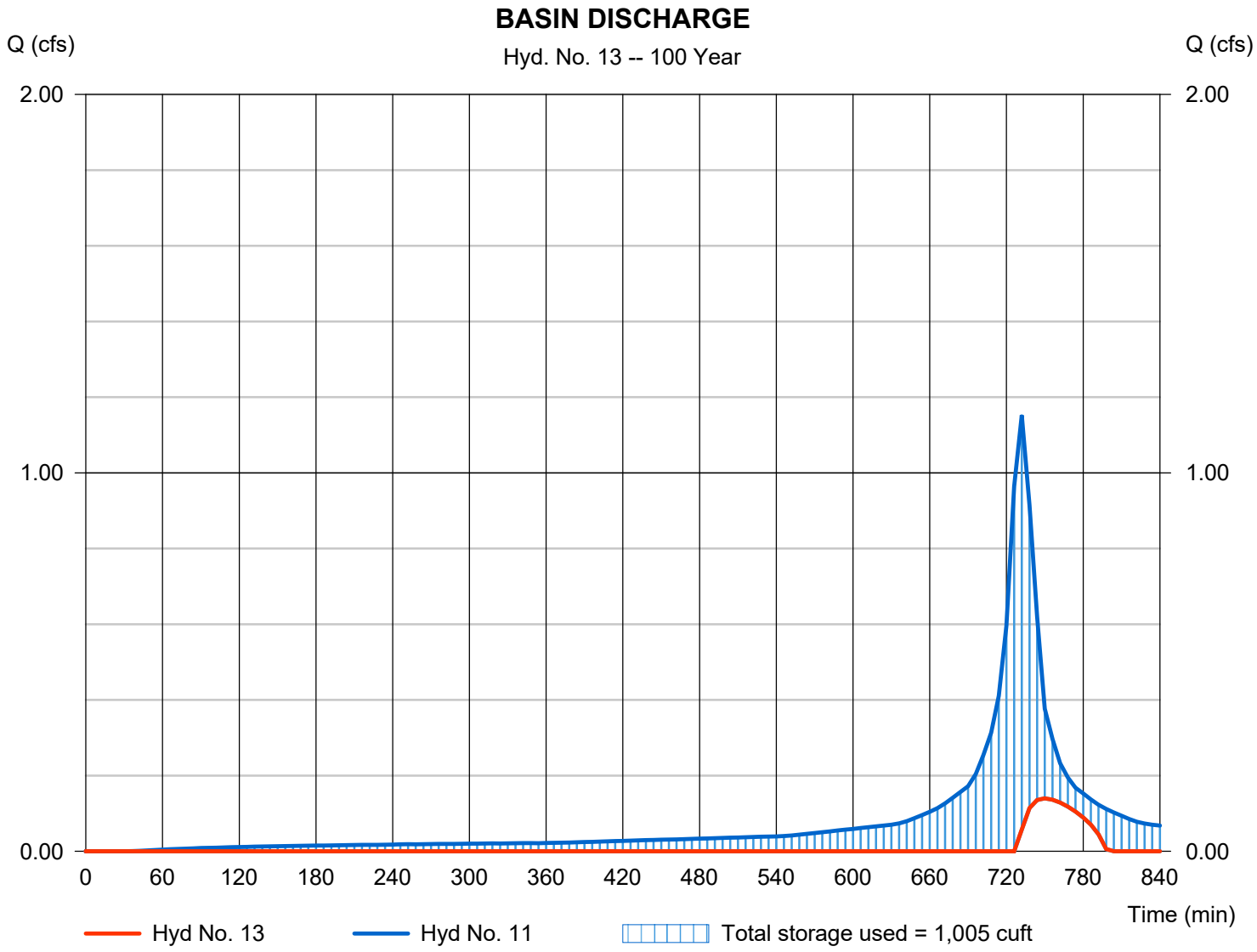
Hydrograph Report

Hyd. No. 13

BASIN DISCHARGE

Hydrograph type	=	Reservoir	Peak discharge	=	0.140 cfs
Storm frequency	=	100 yrs	Time to peak	=	750 min
Time interval	=	6 min	Hyd. volume	=	412 cuft
Inflow hyd. No.	=	11 - PR DETAINED	Max. Elevation	=	98.21 ft
Reservoir name	=	BASIN	Max. Storage	=	1,005 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

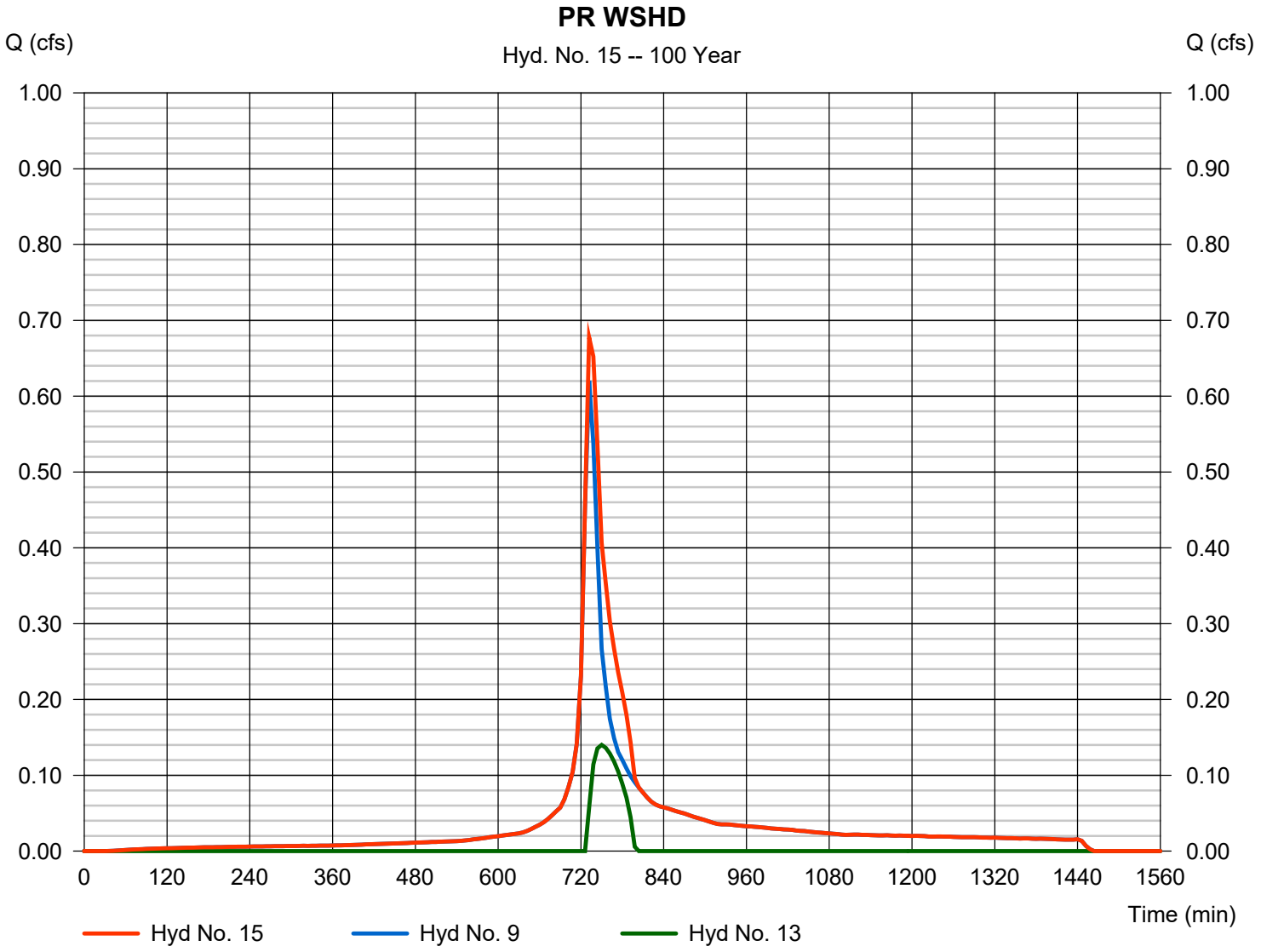


Hydrograph Report

Hyd. No. 15

PR WSHD

Hydrograph type	=	Combine	Peak discharge	=	0.677 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	3,380 cuft
Inflow hyds.	=	9, 13	Contrib. drain. area	=	0.000 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	69.8703	13.1000	0.8658	--------
3	0.0000	0.0000	0.0000	--------
5	79.2597	14.6000	0.8369	--------
10	88.2351	15.5000	0.8279	--------
25	102.6072	16.5000	0.8217	--------
50	114.8193	17.2000	0.8199	--------
100	127.1596	17.8000	0.8186	--------

File name: SampleFHA.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	3.47	0.00	3.30	5.42	6.79	6.80	9.36
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	1.25	3.38	0.00	2.80	5.15	6.38	6.00	8.61

APPENDIX D – PIPE CONVEYANCE CALCULATIONS

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	15.000	-0.567	MH	0.00	0.18	0.99	10.0	97.80	1.00	97.95	12	Cir	0.011	1.00	101.35	CO9-BASIN

Project File: CO9 TO BASIN.stm | Number of lines: 1 | Date: 8/12/2022

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	-------	-------	-------	-------	0.089	-------	-------	EX WSHD (PERVIOUS)
2	SCS Runoff	------	-------	-------	-------	-------	-------	0.379	-------	-------	EX WSHD (IMPERVIOUS)
4	Combine	1, 2,	-------	-------	-------	-------	-------	0.439	-------	-------	EX WSHD
6	SCS Runoff	------	-------	-------	-------	-------	-------	0.055	-------	-------	PR WSHD UNDETAINED (PERVIOU
7	SCS Runoff	------	-------	-------	-------	-------	-------	0.284	-------	-------	PR WSHD UNDETAINED(IMPERVIO
9	Combine	6, 7,	-------	-------	-------	-------	-------	0.322	-------	-------	PR UNDETAINED
11	SCS Runoff	------	-------	-------	-------	-------	-------	0.852	-------	-------	PR DETAINED
13	Reservoir	11	-------	-------	-------	-------	-------	0.067	-------	-------	BASIN DISCHARGE
15	Combine	9, 13,	-------	-------	-------	-------	-------	0.322	-------	-------	PR WSHD

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

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	0.089	6	744	799	------	------	------	EX WSHD (PERVIOUS)
2	SCS Runoff	0.379	6	732	1,672	------	------	------	EX WSHD (IMPERVIOUS)
4	Combine	0.439	6	732	2,471	1, 2,	------	------	EX WSHD
6	SCS Runoff	0.055	6	744	495	------	------	------	PR WSHD UNDETAINED (PERVIOU
7	SCS Runoff	0.284	6	732	1,254	------	------	------	PR WSHD UNDETAINED(IMPERVIO
9	Combine	0.322	6	732	1,749	6, 7,	------	------	PR UNDETAINED
11	SCS Runoff	0.852	6	732	3,762	------	------	------	PR DETAINED
13	Reservoir	0.067	6	750	89	11	97.59	629	BASIN DISCHARGE
15	Combine	0.322	6	732	1,838	9, 13,	------	------	PR WSHD

Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	69.8703	13.1000	0.8658	--------
3	0.0000	0.0000	0.0000	--------
5	79.2597	14.6000	0.8369	--------
10	88.2351	15.5000	0.8279	--------
25	102.6072	16.5000	0.8217	--------
50	114.8193	17.2000	0.8199	--------
100	127.1596	17.8000	0.8186	--------

File name: SampleFHA.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	3.47	0.00	3.30	5.42	6.79	6.80	9.36
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	1.25	3.38	0.00	2.80	5.15	6.38	6.00	8.61

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	15.000	0.18	0.18	0.99	0.18	0.18	10.0	10.0	5.8	1.03	4.21	3.83	12	1.00	97.80	97.95	98.14	98.38	101.25	101.35	CO9-BASIN

Project File: CO9 TO BASIN.stm | Number of lines: 1 | Run Date: 8/12/2022

NOTES:Intensity = 56.87 / (Inlet time + 11.30) ^ 0.75; Return period =Yrs. 25 ; c = cir e = ellip b = box

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	198.000	104.163	MH	0.00	0.00	0.00	0.0	94.64	1.05	96.72	12	Cir	0.010	0.75	101.50	MH3-EXINLET
2	1	9.000	45.015	MH	0.07	0.00	0.00	0.0	97.26	0.44	97.30	12	Cir	0.011	1.00	101.30	OCS1-MH3
3	1	30.000	-36.160	MH	0.00	0.00	0.00	0.0	98.41	0.50	98.56	12	Cir	0.010	0.86	101.75	MH4-MH3
4	3	89.000	-56.610	Curb	0.00	0.06	0.31	10.0	98.56	0.49	99.00	12	Cir	0.010	1.00	101.25	INLET1-MH4

Project File: INLET-1 TO DISCHARGE.stm

Number of lines: 4

Date: 10/7/2022

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	198.000	0.00	0.06	0.00	0.00	0.02	0.0	11.1	5.6	0.17	4.75	2.39	12	1.05	94.64	96.72	94.77	96.89	96.81	101.50	MH3-EXINLET
2	1	9.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.07	2.81	1.49	12	0.44	97.26	97.30	97.37	97.41	101.50	101.30	OCS1-MH3
3	1	30.000	0.00	0.06	0.00	0.00	0.02	0.0	10.9	5.6	0.10	3.27	1.80	12	0.50	98.41	98.56	98.53	98.69	101.50	101.75	MH4-MH3
4	3	89.000	0.06	0.06	0.31	0.02	0.02	10.0	10.0	5.8	0.11	3.26	1.74	12	0.49	98.56	99.00	98.69	99.13	101.75	101.25	INLET1-MH4

Project File: INLET-1 TO DISCHARGE.stm

Number of lines: 4

Run Date: 10/7/2022

NOTES:Intensity = 56.87 / (Inlet time + 11.30) ^ 0.75; Return period =Yrs. 25 ; c = cir e = ellip b = box

APPENDIX E – REFERENCE DATA

CONSULTANTS, INC.
4405 South Clinton Avenue
South Plainfield, NJ 07080

Tel: (800) 545-ATUL
(908) 754-8383
Fax: (908) 754-8633

NJ EDA Approved Testing Laboratory • MBE/DBE Certified • NJ DEP Certified
www.ANSConsultants.net

October 4, 2022

Regency Development
315 Monmouth Ave., Suite # 208
Lakewood, NJ 08701

Attn.: Mr. Yehuda Applebaum

Re: **Sub-surface Soil Investigation & Foundation Recommendation Report**
Proposed 2-story School Building
Yeshiva New Academy Building
21 Rockview Avenue
North Plainfield, NJ 07060
Somerset County
Block # 134, Lot # 1

Dear Mr. Applebaum,

Enclosed, please find three (3) copies of the Subsurface Soil Investigation & Foundation Recommendation Report for the three (3) Soil Borings and two (2) test pits & two (2) field percolation tests performed on September 23, 2022 at the project referenced above.

Soil samples collected during soil boring program will be discarded after thirty (30) days from the date of this report, if not requested in advance to do otherwise. We thank you very much for providing us an opportunity to service you on this project.

Should you have any questions or require additional information, please do not hesitate to contact the undersigned at (908)754-8383.

Sincerely,
ANS Consultants, Inc.

Atulkumar N. Shah, PE, PP, F. ASCE
President
NJ PE License #24GE03443900
ANS/RM

Reported: Regency Development– (3); File – (1)

File: AQD-4413_01.SB

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CONSULTANTS, INC.
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October 4, 2022

Regency Development
315 Monmouth Ave., Suite # 208
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Attn.: Mr. Yehuda Applebaum

Re: **Sub-surface Soil Investigation & Foundation Recommendation Report**
Proposed 2-story School Building
Yeshiva New Academy Building
21 Rockview Avenue
North Plainfield, NJ 07060
Somerset County
Block # 134, Lot # 1

Dear Mr. Applebaum,

Enclosed, please find three (3) copies of the Subsurface Soil Investigation & Foundation Recommendation Report for the three (3) Soil Borings and two (2) test pits & two (2) field percolation tests performed on September 23, 2022 at the project referenced above. The soil boring work was performed in accordance with our signed proposal dated September 07, 2022.

Our **Scope of Services** included the following:

1. Drilling and full-time inspection of three (3) test borings, down to maximum 32'-0" depth or to refusal, whichever comes first, recording of groundwater level or depth to bedrock if encountered in the contracted depth.
2. To perform two (2) test pits & two (2) field percolation tests.
3. Performance of engineering evaluation to determine the stratification and physical properties of the subsurface materials and to develop and recommend appropriate type of foundation systems.
4. Preparation of a written report summarizing all findings and recommendations.

PROPOSED CONSTRUCTION:

The project site is located at 21 Rockview Avenue, Borough of North Plainfield, NJ in Somerset County. At the present time, the subject site consists of a school building in the front and wooded area in the rear of the building. We understand that 2-story school building is proposed at the subject site.

Since, detailed construction drawings were not provided, our recommendations are based upon NJ IBC-2021 ASCE 7-22 and construction material loads for the Building Construction based upon American National Standards. Please see soil boring location plan in Appendix-A for the exact location and photographs in Appendix-C for the existing site conditions.

SITE CONDITIONS:

The subject site is located towards southeast side of the Rock view Avenue. The site was noted to be fairly leveled during soil boring activities. The subject site is noted to be primarily surrounded mainly by residential properties. The subject property is located at approximately Latitude N 40° 37' 09.75", Longitude W 74° 26' 03.74'' on the USGS Digital elevation Model. It is at an approximate elevation of 95' above mean sea level. See the site location plan in Appendix-A for more details.

FIELD INVESTIGATION:

SOIL BORING:

The soil boring locations were selected and marked by an ANS field representative based upon the equipment access. Surface utility mark-out was performed by New Jersey One-Call System. Once cleared, the soil boring work began on September 23, 2022.

A total of three (3) soil borings, B-1 to B-3 were drilled during the geo-technical investigation at the site on September 23, 2022. The soil boring locations are shown in the Soil Boring Location Plan which is included in Appendix-A. Soil boring work was performed under the direction and supervision of field Engineer Mr. Syed Abbas and Mr. Aakash Patel. The borings were drilled using a 3" diameter hollow stem auger. Soil encountered was sampled continuously down to a depth of 12'-0" and then at 5'-0" interval down to 32'-0'' in all the three borings B-1 to B-3. Soil samples were extracted using a 2" diameter split spoon sampler as per the procedure specified in ASTM 1586-99.

Samples for the boring were obtained by the Standard Penetration Test (SPT) Method (ASTM D 1586), which consists of driving a 2-inch outside-diameter split-spoon sampler into the soil with a 140-pound weight falling freely from a distance of 30 inches. The samplers were driven in four successive 6-inch increments, with the number of blows per increment being recorded. The number of blows required to advance the sampler in the middle 12 inches is termed as the Standard Penetration Resistance (N-value) and is presented on the Field Test Boring Logs in Appendix-A.

During drilling operations, extracted soil samples were visually examined and classified by our Field Engineer. The soil sample description, Standard penetration test (SPT) blow counts and locations, strata changes, groundwater depth and other pertinent information were recorded on a detailed field log. Soil samples obtained from the split spoon sampler were visually classified according to the Unified Soil Classification System (USCS). Samples were later returned to our laboratory for further review and testing.

TEST PITS AND FIELD PERCOLATION TEST:

Two (2) test pits TP-1 and TP-2 were excavated initially to 5' and 6' depths below existing ground level to perform Field Percolation Tests. After completion of percolation tests, test pits were further excavated to 10' depth. The test pits locations are shown in the soil boring location plan which is included in Appendix-A. Test pits and field percolation tests were performed under the direction and supervision of field Engineer Mr. Syed Abbas. Detailed report of the test pits & field percolation tests are included in Appendix-A.

Two Field Percolation Tests one in each test pit at 5' (TP-1) and 6' (TP-2) were performed as per NJ Stormwater BMP Manual. To perform tests, test holes of 10" diameter

and 14" depth was prepared at bottom of each test pit by using hand tools. An 8" internal diameter PVC perforated pipe was then lowered into test holes after placing a thin layer of P-Pebbles at bottom of test holes. Top of PVC pipe was levelled and sides were filled with P-Pebbles to secure PVC perforated pipe. Water was then filled into PVC pipe upto 12" mark on inside vertical surface of PVC pipe. It was noted that all 12" water drained out quickly (in less than 60 minutes). Water was again filled to 12" mark. This time again water drained out in less

than 60 minutes. Now water was filled to 7" mark and drops in water level were recorded at 1 minute interval until difference of last 3 consecutive drops was recorded less than 1/10 of an inch. At this point water was filled to 7" mark and time for 6" drop was recorded for percolation rate calculations in minutes per inch.

Percolation Test-1 at TP-1:

1. Depth of test: 5'-3" to 6'-5".
2. Water was filled into PVC pipe to 12" mark at 12:02 PM.
3. All 12" water was drained out at 12:11 PM, in 9 minutes.
4. Water was again filled to 12" mark at 12:12 PM.
5. This time all 12" water was drained out at 12:25 PM in 13 minutes (less than 60 minutes).
6. Since 2nd time water was drained out in less than 60 minutes, water was filled to 7" mark and drops in water level were recorded at 1 minute interval.

S. No.	Time	Drop in Water Level	Remarks	Percolation Rate per Hour
1.	12:26 pm	Water was filled to 7" mark		
2.	12:27 pm	7/8"		
3.	12:27 pm		Refilled	
4.	12:28 pm	7/8"		Difference of S. No. 14 & 18 = 3/4" – 11/16" = 1/16" < 1/10"
5.	12:28 pm		Refilled	
6.	12:29 pm	13/16"		
7.	12:29 pm		Refilled	
8.	12:30 pm	13/16"		
9.	12:30 pm		Refilled	Water was refilled into PVC pipe upto 7" mark at 12:35 PM and left for 6" drop.
10.	12:31 pm	13/16"		
11.	12:31 pm		Refilled	6" drop was achieved at 12:46 PM, in 11 minutes.
12.	12:32 pm	¾"		
13.	12:32 pm		Refilled	
14.	12:33 pm	¾""		Perc Rate: 11/6= 1.83 minutes per inch Or 0.545 inch/min or 32.72 inch/hour
15.	12:33 pm		Refilled	
16.	12:34 pm	¾"		
17.	12:34 pm		Refilled	
18.	12:35 pm	11/16"		
19.	12:35 pm		Refilled	

Percolation Test-2 @ TP-2:

1. Depth of test: 6'-0"' to 7'-2".
2. Water was filled into PVC pipe to 12" mark at 2:07 PM.
3. All 12" water was drained out at 2:18 PM, in 11 minutes.
4. Water was again filled to 12" mark at 2:19 PM.
5. This time all 12" water was drained out at 2:34 PM in 15 minutes (less than 60 minutes).
6. Since 2nd time water was drained out in less than 60 minutes, water was filled to 7" mark and drops in water level were recorded at 1 minute interval.

S. No.	Time	Drop in Water Level	Remarks	Percolation Rate per Hour
1.	2:35 pm	Water was filled to 7" mark		Difference of S. No. 18 & 22 = 7/16" – 3/8" = 1/16" < 1/10" Water was refilled into PVC pipe upto 7" mark at 2:46 PM and left for 6" drop. 6" drop was achieved at 3:03 PM, in 17 minutes. Perc Rate: 17/6= 2.83 minutes per inch or 0.35 inch/min or 21 inch/hour
2.	2:36 pm	¾"	
3.	2:36 pm		Refilled
4.	2:37 pm	11/16"	
5.	2:37 pm		Refilled
6.	2:38 pm	11/16"	
7.	2:38 pm		Refilled
8.	2:39 pm	5/8"	
9.	2:39 pm		Refilled
10.	2:40 pm	5/8"	
11.	2:40 pm		Refilled
12.	2:41 pm	5/8"	
13.	2:41 pm		Refilled
14.	2:42 pm	½"	
15.	2:42 pm		Refilled
16.	2:43 pm	½"	
17.	2:43 pm		Refilled
18.	2:44 pm	7/16"	
19.	2:44 pm		Refilled
20.	2:45 pm	3/8"	
21.	2:45 pm		Refilled
22.	2:46 pm	3/8"	
23.	2:46 pm		Refilled

LABORATORY TESTING:

Three (3) soil samples, one each from borings B-1 to B-3 and two (2) samples from test pits were laboratory tested to determine in-place moisture content and to classify the soil as per Unified Soil Classification System, ASTM-D2487-93. The findings are summarized below. Laboratory test report are enclosed in Appendix –B.

Soil Boring No.	Soil Sample No.	Depth collected	Moisture Content (%)	Fines thru #200 Sieve	USCS Symbol
B-1	S-1	4'- 6'	6.9	17.2	SM
B-2	S-2	6'- 8'	5.9	14.9	SM
B-3	S-3	8'- 10'	5.8	13.6	SM
Test Pit	S-4	8" – 9"	5.1	6.3	SP-SM
Test Pit	S-5	6" – 32"	10.2	65.2	ML

SM: Silty sands SP-SM: A mixture of poorly graded sand and silty sands ML: Silty loam

SUBSURFACE CONDITIONS:

Detailed description of the soil encountered in the test boring is documented in the boring log which is presented in Appendix-A. The following gives a general description of the subsurface conditions encountered at the borings. While the borings may indicate that the subsurface conditions appear to be relatively uniform across the site, it should be recognized that the size of borings was small compared to the size of the site, and that the existence of anomalies cannot be precluded.

According to NJ Geoweb website, the geological formation for the subject site is late wisconsinan glaciofluvial plain deposits and geologic age is late Pleistocene, late Wisconsinan. Sand, pebble-to-cobble gravel, minor silt; yellowish brown to reddish brown. As much as 80 feet thick. Based on the results of soil borings and our geo-technical laboratory testing, we estimate the general stratigraphy of the site to consist of the following major units, in an increasing order of depth.

Stratum-1: Fill material containing orange-brown silty f/c sand, some bricks fragments, trace concrete fragments, trace roots and dark gray silt, trace fine sand, trace asphalt fragments was noted under this stratum in top 24" in boring B-1 and in top 8" in boring B-3. No Fill was noted in boring B-2. The relative density of this material was noted to be in medium dense condition. The relative stiffness of this material was noted to be in very soft condition.

Stratum-2: Reddish brown f/c sand & f/c gravel, little silt was noted under this stratum between 2 feet to 6 feet & between 10 feet to 12 feet in B-1, between 6 feet to 8 feet in B-2. The relative density of this material varied between medium dense to dense conditions.

Stratum-3: Reddish brown f/m sand, trace silt, trace f/m gravel was noted under this stratum between 6 feet to 10 feet & between 15 feet to 27 feet in boring B-1, between 4 feet to 6 feet & between 8 feet to 27 feet in B-2, between 4 feet to 27 feet in B-3. The relative density of this material varied between loose to medium dense condition.

Stratum-4: Reddish brown silt, trace fine sand and reddish-brown silty f/c sand, some f/c gravel and gray, brown silt, trace roots was noted under this stratum between 30 feet to 32 feet in boring B-1, in top 2 feet & between 30 feet to 32 feet in B-2, between 2 feet to 4 feet & between 30 feet to 32 feet in B-3. The relative density of this material varied between loose to dense condition. The relative stiffness of this material varied between very soft to medium stiff condition.

SUMMARY OF FINDINGS:

Boring Number	Depth in (feet)	Penetration Resistance N-Value	Soil Type	In-Place Soil Bearing Capacity (PSF)	Recommended Soil Bearing Capacity (PSF)
B-1	0 – 2	18	FILL	3600	2000
B-1	2 – 4	12	SP/GP	2400	2000
B-1	4 – 6	20	SP/GP	4000	2000
B-1	6 – 8	17	SP-SM	3400	2000
B-1	8 – 10	9	SP-SM	1800	2000
B-1	10 – 12	18	SP/GP	3600	2000
B-1	15 – 17	9	SP-SM	1800	2000
B-1	20 – 22	9	SP-SM	1800	2000
B-1	25 – 27	7	SP-SM	1400	2000
B-1	30 – 32	13	SM-ML	2600	2000

Boring Number	Depth in (feet)	Penetration Resistance N-Value	Soil Type	In-Place Soil Bearing Capacity (PSF)	Recommended Soil Bearing Capacity (PSF)
B-2	0 – 2	4	ML	800	1000
B-2	2 – 4	31	SM-ML	+5000	2000
B-2	4 – 6	22	SP-SM	4400	2000
B-2	6 – 8	34	SP/GP	+5000	2000
B-2	8 – 10	10	SP-SM	2000	2000
B-2	10 – 12	11	SP-SM	2200	2000
B-2	15 – 17	10	SP-SM	2000	2000
B-2	20 – 22	9	SP-SM	1800	2000
B-2	25 – 27	9	SP-SM	1800	2000
B-2	30 – 32	13	SM-ML	2600	2500

Boring Number	Depth in (feet)	Penetration Resistance N-Value	Soil Type	In-Place Soil Bearing Capacity (PSF)	Recommended Soil Bearing Capacity (PSF)
B-3	0 – 2	4	FILL	800	1000
B-3	2 – 4	33	SM-ML	+5000	2000
B-3	4 – 6	15	SP-SM	3000	2000
B-3	6 – 8	16	SP-SM	3200	2000
B-3	8 – 10	13	SP-SM	2600	2000
B-3	10 – 12	9	SP-SM	1800	2000
B-3	15 – 17	10	SP-SM	2000	2000
B-3	20 – 22	6	SP-SM	1200	2000
B-3	25 – 27	8	SP-SM	1600	2000
B-3	30 – 32	9	SM-ML	1800	2000

GROUNDWATER:

Groundwater was encountered at 21'-9" in boring B-1, at 22'-5" in boring B-2 and at 21'-2" in boring B-3 below existing grade surface. It should be noted that groundwater level will fluctuate due to variations in rainfall or other factors not evident at the time of our investigation.

CONCLUSIONS:

1. Groundwater was encountered between 21'-2" to 22'-5" in all the three borings B-1 to B-3 below existing grade surface. Consequently, we anticipate that groundwater management during construction will be minimal.

2. Fill was noted in top 24 inches in boring B-1 and in top 8 inches in boring B-3. The majority of the on-site soils consists of f/m sand with trace silt & trace f/m gravel. Except the fill, the onsite soil will be suitable as structural fill. Depending upon the time of the year when the actual construction takes place, drying of excavated sandy soil and aeration may be required to reduce the moisture content. In-situ moisture content of soil varied between 5.1 % to 10.2 % which is generally considered moist.

3. The following parameters should be used for seismic design of the building in accordance with **NJ IBC-2021 ASCE 7-22**:

Description	Parameter	Recommended value
Mapped Spectral Acceleration for short periods:	Ss	0.26
Mapped Spectral Acceleration for 1-sec period:	S_1	0.049
Site Class:	D	Stiff Soil
5 percent damped Design spectral response acceleration at short periods:	S_{DS}	0.19
5 percent damped Design spectral response acceleration at 1-sec periods:	S_{D1}	0.069

The following parameters should be used for seismic design of the building in accordance with **NJ IBC-2018- ASCE 7-16**:

Description	Parameter	Recommended Value
Mapped Spectral Acceleration for short periods:	Ss	0.266
Mapped Spectral Acceleration for 1-sec period:	S_1	0.057
Site Class:	D	Stiff Soil
Site Coefficient:	Fa	1.587
Site Coefficient:	Fv	2.4
5 percent damped Design spectral response acceleration at short periods:	S_{DS}	0.282
5 percent damped Design spectral response acceleration at 1-sec periods:	S_{D1}	0.091

4. Any fill used as backfill material within the building and pavement areas should consist of approved portions of the on-site granular soils, which have been maintained at moisture contents suitable for compaction or select fill should be imported. All fill should be placed in lift in the order of twelve (12) inches in loose thickness and be uniformly compacted to at least 95% of its maximum dry density as determined by the modified proctor density values derived based upon ASTM D-1557-98 test procedure.

In addition, we recommend that backfill soil placed in confined areas, such as foundation or utility excavations, should be spread in lifts in the order of six (6) to eight (8) inches in loose thickens and it should be compacted to the same degree using manually operated vibratory compaction equipment. We recommend that temporary construction slopes be established at one vertical to two horizontal, or flatter, or as required by the governing safety codes.

FOUNDATION DESIGN CRITERIA:

Fill was noted in top 24 inches in boring B-1 and in top 8 inches in boring B-3. Uneven soil bearing capacity was noted down to 32 feet in borings B-1 to B-3. We recommend that the foundation for the proposed 2-story school building shall be supported by spread footings established on the medium dense soil noted at 4'-0" below grade. Foundation shall be designed to impose maximum allowable net bearing pressure of up to 2,000 pounds per square foot.

Over excavation and backfilling using ¾" clean crushed stones will be required if any soft areas are encountered. Any pockets of localized unsuitable soil encountered during foundation excavation should be completely removed. The over excavated area should be backfilled utilizing either controlled compacted fill or ¾" size clean gravels. Any footing or slab placed in this area will require over excavation, removal of unsuitable material and backfilling with ¾" size stones or controlled compacted fill. Placing additional reinforcing steel to strength the footing over soft soil may be required.

We recommend that exterior foundations be established at least three feet six inches below the adjacent exterior grade, or as required by local ordinance, to provide protection from frost penetration. The maximum post-construction settlements of foundations designed and constructed in accordance with our recommendations will be in the order of ¾" or less.

FLOOR SLAB DESIGN CRITERIA:

Removal of fill from top 24 inches from boring B-1 and from top 8 inches from boring B-3 is recommended. To minimize cracking due to settlement of the soft sub-grade soil, the floor slab must be supported on compacted fill. To minimize dampness, we recommend that the floor should be underlain by a six (6) mil polyethylene moisture barrier and six (6) inch thick layer of clean ¾ inch crushed stone to provide a stable working area during construction and serve as a capillary break between the base of the slab and the underlying silty sub-grade soils. It may be desirable to install footing drains so that any water which accumulates in the stone drainage layer could be removed by pumping.

Any back fill required for the structural area to be off site or ¾" clean crushed stones may be utilized to minimize the influence of moisture on the first fill layer. All off-site fill should composed of relatively well graded sand and gravel containing less than 15% by weight passing U.S. Standard #200 sieve and having a maximum particle size of six inches.

Acceptable soil materials for backfill and fill should be free of clay, rock or gravel larger than six (6) inches in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter and it should comply with ASTM D-2487-91 soil classification groups GW, GP, SM, SW and SP.

All fill should be placed in lifts in the order of twelve (12) inches in loose thickness and it should be uniformly compacted to at least 95% of its maximum dry density as determined by the modified proctor density values derived based upon ASTM D-1557-93 test procedure. In addition, we recommend that backfill soils placed in confined areas, such as foundation or utility excavations, should be spread in lifts in the order of six to eight inches in loose thickness and be compacted to the same degree using manually operated vibratory compaction equipment.

BELOW GRADE WALLS:

We recommend that the exterior building walls should be constructed with a continuous perimeter foundation drain to convey localized groundwater seepage away from the building and prevent the hydrostatic pressures built-up against the walls. The drain could

consist of a 6-to-8-inch diameter PVC pipe surrounded on all sides by a minimum of six (6) inches of clean 3/8" crushed gravel. The pipe should drain by gravity to the site storm water system, if feasible, or should be connected to a sump pit where any water could be removed by pumping.

Soil Unit weight (total):	120 pcf
Angle of Internal Friction:	31 degrees
Coefficient of sliding friction:	0.4
Coefficient of active earth pressure:	0.28
Coefficient of passive earth pressure:	3.57

RECOMMENDATIONS FOR THE EARTHWORK FOUNDATION CONSTRUCTION:

Clearing and Stripping: Clearing and stripping would include removing vegetation and any boulders or any loose or unsuitable soil at the distance of 5 feet beyond the limits of the proposed building excavation, structure and paved areas. Limits of stripping should conform to construction permit limitations.

Soil Erosion and Sediment Control: Clearing and stripping should be performed in accordance with the requirements of the soil erosion and sediment control plan and environment permits.

Protection of Utilities: Existing utilities, in the area of construction should be marked to protect from damage during excavation and foundation construction. Excavations should be stopped if they could potentially undermine existing utilities.

Excavation & side slope: An unbraced excavation slope of 2.0 horizontal to 1 vertical or flatter may be considered in the planning for construction. Sheeting and bracing, and or slope stabilization systems should be used wherever the unbraced slope pass beneath utilities or structures, the active roadway arrears and/or where it is found to be necessary or more cost effective to use sheeting in order to limit the size of the excavations and maintain traffic. Sheeting and bracing systems and excavation slopes may be designed using the soil properties presented in summary table provided earlier.

Proof rolling and compaction of Pavement and Fill Subgrades: Following stripping or excavation to plan elevations, all subgrades for placement of new foundation or parking lot pavement should be proof rolled using a vibratory roller with minimum 1 ton static weight in confined areas along side walls and 10 tons static weight in the footprint of the building and general roadway paved areas. Footing subgrades should be compacted with small area vibratory plate compactors. Proof rolling should be observed and evaluated by a qualified Geotechnical engineer or technician familiar with site conditions.

MINIMUM PAVEMENT DESIGN SECTIONS:

ACCESS ROAD AND TRUCK TRAFFIC AREAS

Bituminous Concrete Surface Course (NJDOT I-5)	2 inches
Bituminous Concrete Base Course (NJDOT I-2)	4 inches
Quarry Process Sub-Base Course (NJ DOT DGA)	6 inches
TOTAL SECTION THICKNESS	**12 inches**

AUTOMOBILE PARKING AREAS

Bituminous Concrete Surface Course (NJDOT I-5)	2 inches
Bituminous Concrete Base Course (NJDOT I-2)	3 inches
Quarry Process Sub-Base Course (NJ DOT DGA)	4 inches
TOTAL SECTION THICKNESS	**9 inches**

As previously discussed, it is recommended that the loose soils at the surface should be proof rolled and densified with a heavy vibratory compactor. With this recommended compaction, a CBR value of six (6) would be appropriate for use in the design of flexible pavements over site soils with imported granular fill, the CBR could be about eight (8).

RECOMMENDED SERVICES:

It is recommended that we should be retained to provide continuous observation and Soil engineering services during the excavation and foundation construction phases of the work. This is to observe compliance with the design concepts, specifications and recommendations, and to allow design charges in the event that subsurface conditions differ from those anticipated prior to start of construction.

LIMITATIONS:

The recommendations contained in this report are our best professional judgment as to be followed in the design and construction of the proposed project. There may be subsurface conditions not disclosed by the explorations adequately identify subsurface conditions for the purpose of this study. If during construction any differences are found between the report of the explorations and the actual subsurface conditions, they should be brought to our attention immediately so that the effect in our recommendations can be evaluated.

This report has been prepared in accordance with generally accepted Geo-technical Engineering practices for the exclusive use of our client, Regency Development and their designated representative(s). No other warranty, express or implied is made. Contractor's wishes to use the soil boring information may do at their own risk. Unless specifically indicated to the contrary in this report, this report does not address environmental considerations, which may affect the site development. The conclusions and recommendations of this report are not intended to supersede or overlook any N.J.D.E.P. Environmental conditions, which should be reflected in the site planning.

Should you have any questions or require additional information, please do not hesitate to contact the undersigned at (908)754-8383.

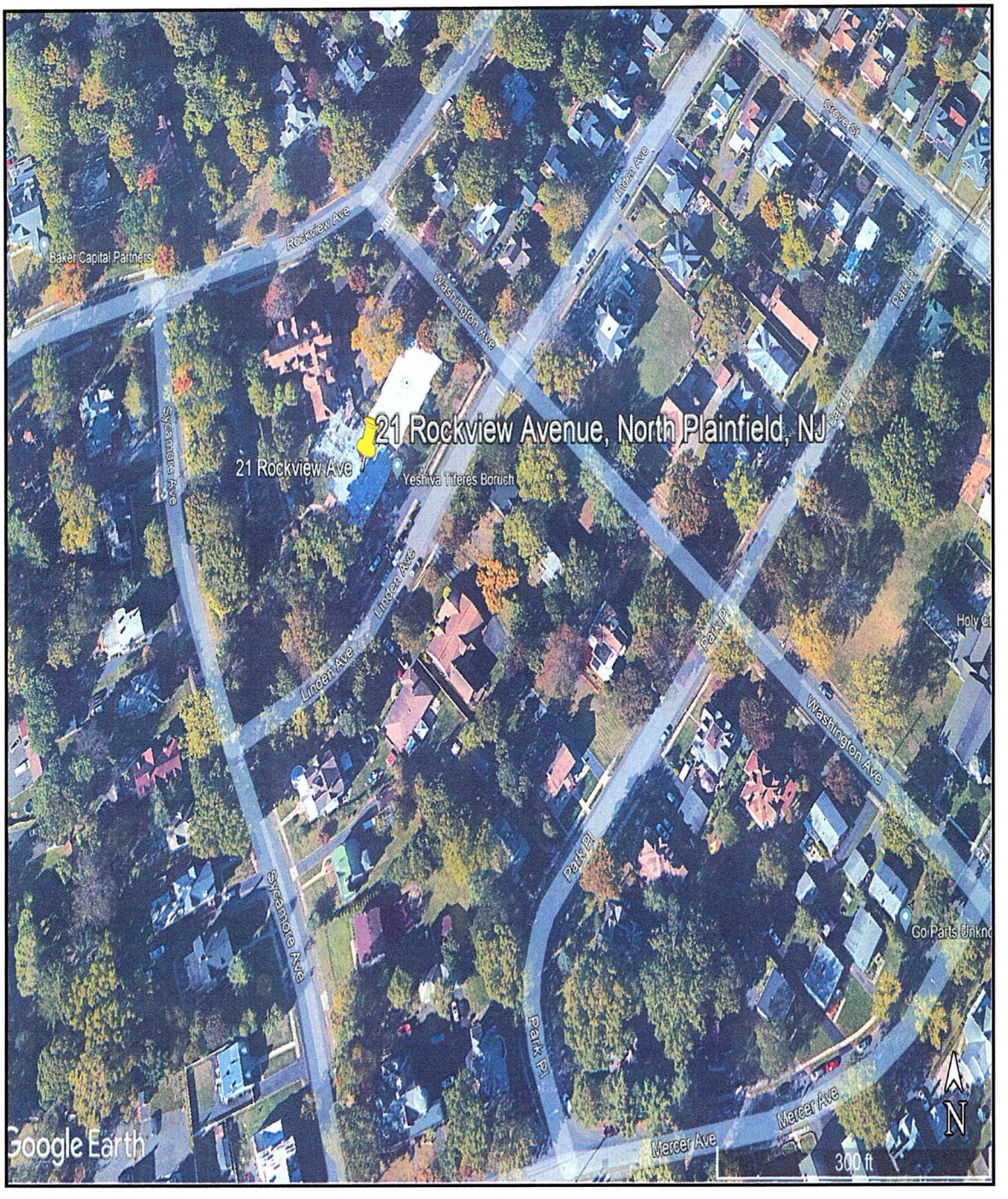
Sincerely,
ANS Consultants, Inc.

Atulkumar N. Shah, PE, PP, F. ASCE
President
NJ PE License #24GE03443900
ANS/RM

Reported: Regency Development– (3); File – (1)

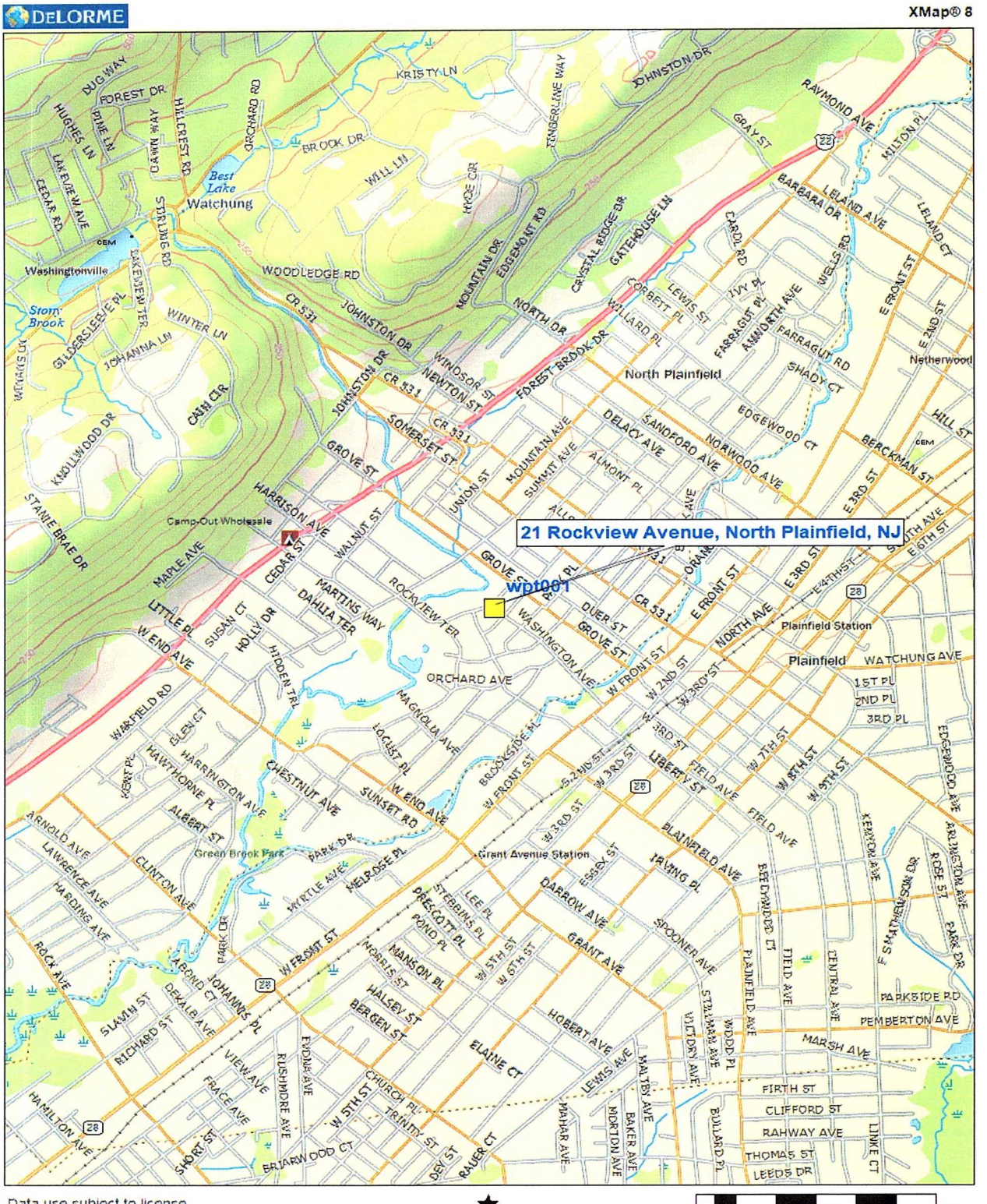
Appendix-A

GOOGLE MAP



Client: Regency Development
Project: 21 Rockview Avenue,
North Plainfield, NJ

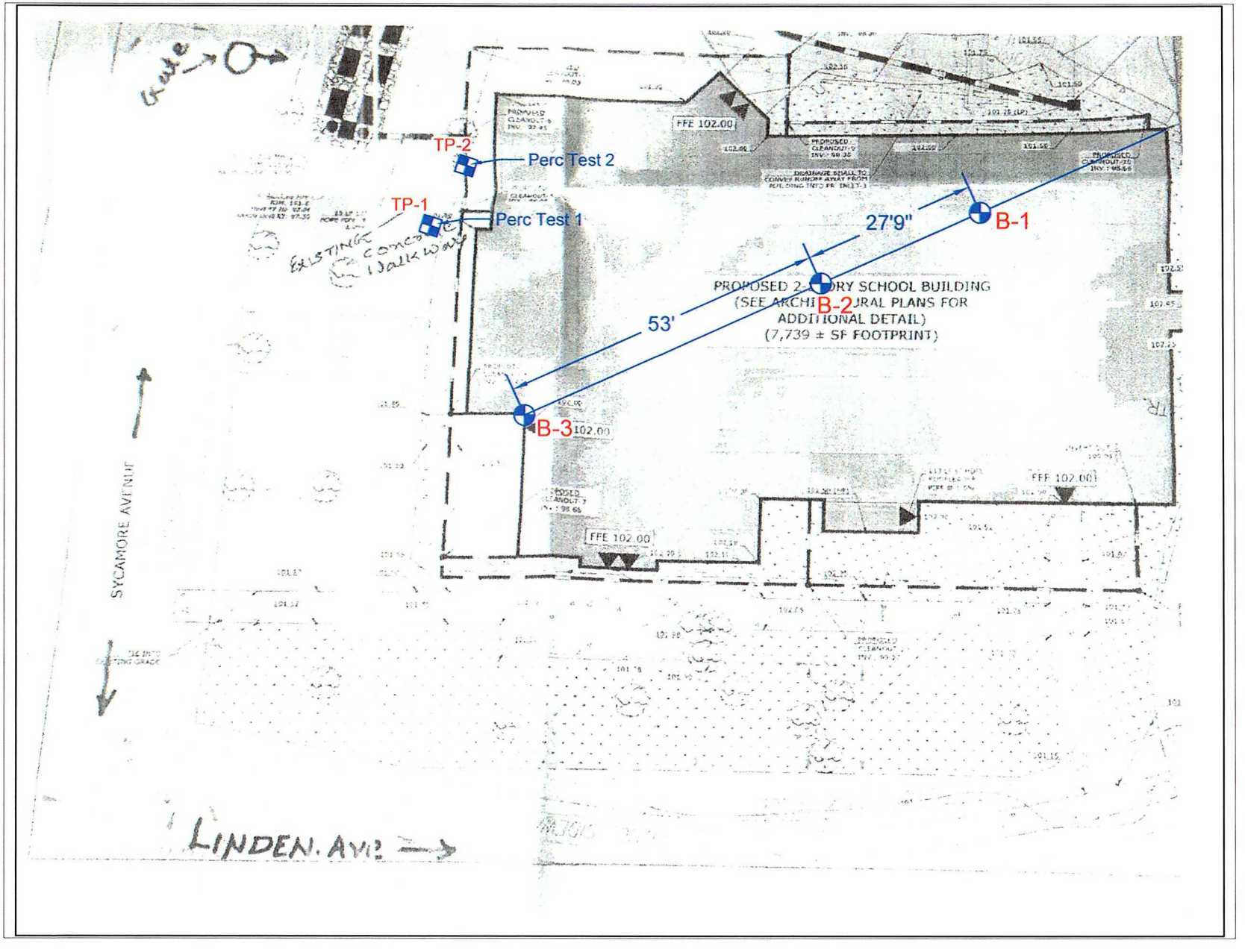
ANS CONSULTANTS, INC.
4405 South Clinton Avenue
South Plainfield, NJ 07080



SITE LOCATION MAP

21 Rockview Ave, North Plainfield, NJ

ANS CONSULTANTS, INC.
4405 South Clinton Avenue
South Plainfield, NJ 07080



LEGEND:

- Soil boring location
- Test pit location

SOIL BORING & TEST PIT LOCATION PLAN

SCALE: N.T.S

CLIENT: Regency Development	
PROJECT: 21 Rockview Ave, North Plainfield, NJ	
ANS CONSULTANTS INC. 4405 SOUTH CLINTON AVE SO. PLAINFIELD, NJ, O7080 PHONE: (908) 754 8383 FAX: (908) 754 8633	
BY: Dharmin Parekh	DATE: 10/4/2022
	Project No: AQD-4413

DRILL HOLE LOG
BORING NO.: B-1

PROJECT: Proposed 2-story School Building
CLIENT: Regency Development
LOCATION: 21 Rockview Ave, Borough of North Plainfield, NJ
DRILLER: JESUS, David & A. SHAH
DRILL RIG: ACKER XLS
DEPTH TO WATER> INITIAL ▽ : 21'-9" AT COMPLETION ▽ :

PROJECT NO.: AQD-4413
DATE: 9-23-2022
ELEVATION: N/A
LOGGED BY: Akash Patel

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST DEPTH	N	CURVE
0		5-12-6-5	FILL	Fill material containing orange-brown silty f/c sand, some bricks fragments, trace concrete fragments, trace roots, moist, medium dense.			0'-2'	18	
		8-6-6-10	SP/GP	Reddish brown f/m sand & f/c gravel, little silt, moist, s/compact.			2'-4'	12	
4		12-12-8-12	SP/GP	Reddish brown f/m sand, little f/c gravel, moist, medium dense.			4'-6'	20	
		12-11-6-7	SP-SM	Reddish brown fine sand, trace silt, trace f/m gravel, moist, medium dense.			6'-8'	17	
8		4-5-4-4	SP-SM	Reddish brown fine sand, trace silt, trace fine gravel, moist, loose.			8'-10'	9	
		9-9-9-7	SP/GP	Reddish brown f/c sand & f/c gravel, s/ moist, medium dense.			10'-12'	18	
12				Augured down to 15 feet.					
		4-5-4-5	SP-SM	Reddish brown f/m sand, trace silt, trace fine gravel, moist, loose.			15'-17'	9	
16				Augured down to 20 feet.					
20	▽	3-4-5-4	SP-SM	Reddish brown f/m sand, trace silt, trace fine gravel, moist to wet, loose.			20'-22'	9	
				Augured down to 25 feet.					
24		4-3-4-6	SP-SM	Reddish brown f/m sand, trace silt, trace fine gravel, wet, loose.			25'-27'	7	
28				Augured down to 30 feet.					

CURVE: 10 30 50

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

DRILL HOLE LOG
BORING NO.: B-1

PROJECT: Proposed 2-story School Building

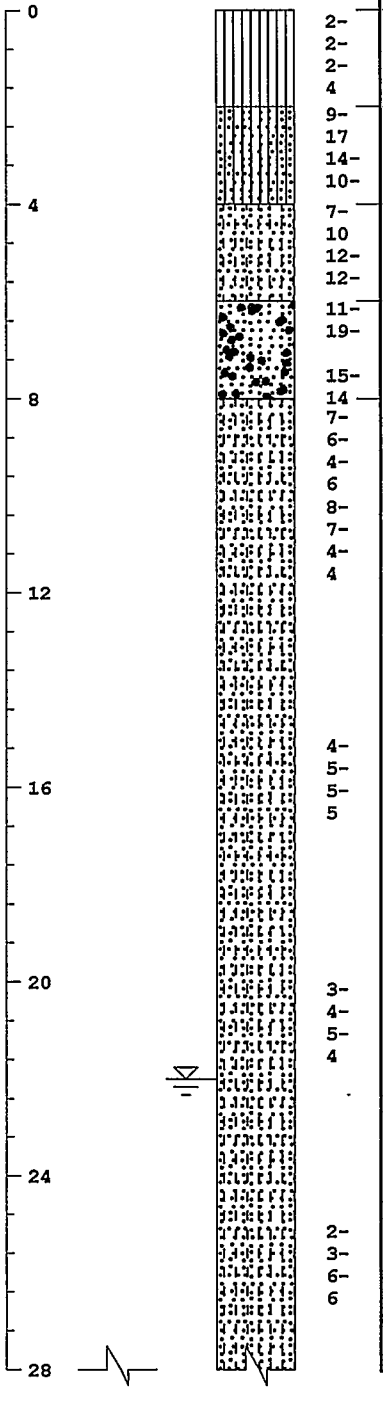
PROJECT NO.: AQD-4413

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST DEPTH	STANDARD PENETRATION TEST N	STANDARD PENETRATION TEST CURVE (10 30 50)
28									
		5-6-7-8	SM-ML	Reddish brown silt, trace fine sand, wet, medium stiff.			30'-32'	13	
32				End of boring.					
36									
40									
44									
48									
52									
56									
60									

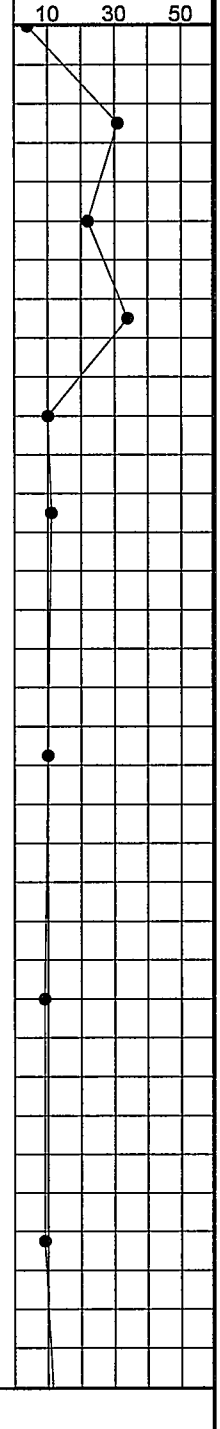
DRILL HOLE LOG
BORING NO.: B-2

PROJECT: Proposed 2-story School Building
CLIENT: Regency Development
LOCATION: 21 Rockview Ave, Borough of North Plainfield, NJ
DRILLER: JESUS, David & A. SHAH
DRILL RIG: ACKER XLS
DEPTH TO WATER> INITIAL ▽ : 22'-5" AT COMPLETION ▽ :

PROJECT NO.: AQD-4413
DATE: 9-23-2022
ELEVATION: N/A
LOGGED BY: Akash Patel



ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST DEPTH	N
		2-2-2-4	ML	Gray, brown silt, trace roots, moist, very soft.			0'-2'	4
		9-17 14-10-	SM-ML	Reddish brown silty f/c sand, some f/c gravel, moist, dense.			2'-4'	31
		7-10 12-12-	SP-SM	Reddish brown fine sand, little silt, some f/c gravel, moist, medium dense.			4'-6'	22
		11-19- 15-14	SP/GP	Reddish brown f/c sand & f/c gravel, moist, dense.			6'-8'	34
		7-6-4-6	SP-SM	Reddish brown f/m sand, trace silt, trace f/m gravel, moist, loose.			8'-10'	10
		8-7-4-4	SP-SM	Reddish brown f/m sand, trace silt, little f/m gravel, moist, s/compact.			10'-12'	11
				Augured down to 15 feet.				
		4-5-5-5	SP-SM	Reddish brown f/m sand, trace silt, trace fine gravel, moist, loose.			15'-17'	10
				Augured down to 20 feet.				
		3-4-5-4	SP-SM	Reddish brown f/m sand, little silt, trace fine gravel, moist to s/wet, loose.			20'-22'	9
				Augured down to 25 feet.				
		2-3-6-6	SP-SM	Reddish brown f/m sand, trace silt, trace fine gravel, wet, loose.			25'-27'	9
				Augured down to 30 feet.				



This information pertains only to this boring and should not be interpreted as being indicitive of the site.

DRILL HOLE LOG
BORING NO.: B-2

PROJECT: Proposed 2-story School Building

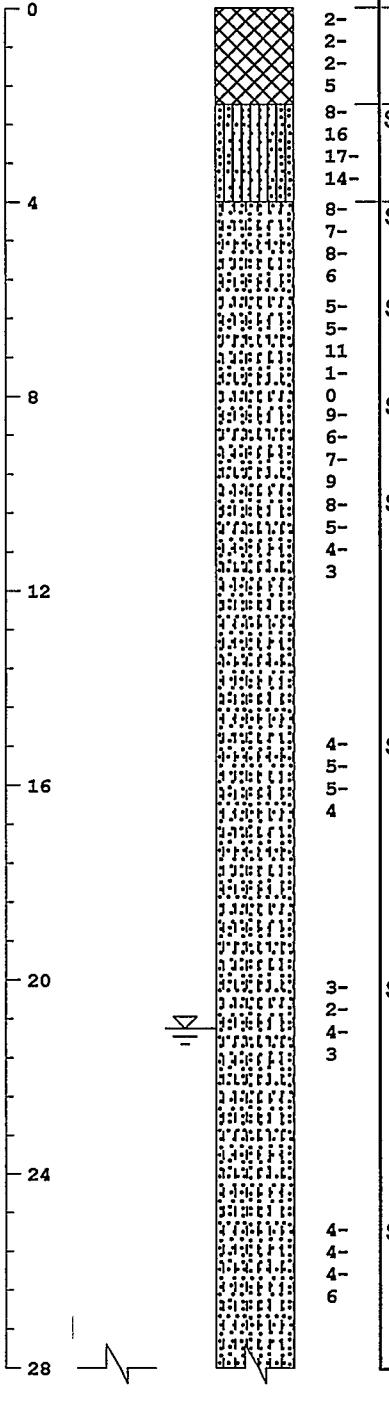
PROJECT NO.: AQD-4413

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST DEPTH	STANDARD PENETRATION TEST N	STANDARD PENETRATION TEST CURVE (10 30 50)
28									
		2-5-8-8	SM-ML	Reddish brown silt, trace fine sand, wet, medium stiff.			30'-32'	13	
32				End of boring.					
36									
40									
44									
48									
52									
56									
60									

DRILL HOLE LOG
BORING NO.: B-3

PROJECT: Proposed 2-story School Building
CLIENT: Regency Development
LOCATION: 21 Rockview Ave, Borough of North Plainfield, NJ
DRILLER: JESUS, David & A. SHAH
DRILL RIG: ACKER XLS
DEPTH TO WATER> INITIAL ▽ : 21'-2" AT COMPLETION ▽ :

PROJECT NO.: AQD-4413
DATE: 9-23-2022
ELEVATION: N/A
LOGGED BY: Akash Patel



ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST DEPTH	STANDARD PENETRATION TEST N	CURVE (10 30 50)
		2-2-2-5	FILL	Top 8": Fill material containing dark gray silt, trace fine sand, trace asphalt fragments, moist, very soft.			0'-2'	4	
		8-16 17-14-	SM-ML	Bottom 12": Orange brown silt, trace fine sand, trace fine gravel, moist, very soft.			2'-4'	33	
		8-7-8-6	SP-SM	Reddish brown silty f/m sand, some f/c gravel, moist, dense.			4'-6'	15	
		5-5-11	SP-SM	Reddish brown f/m sand, trace silt, trace f/m gravel, s/moist, s/compact.			6'-8'	16	
		1-0 9-6-7-9	SP-SM	Reddish brown f/m sand, trace silt, little f/c gravel, moist, s/compact. Reddish brown f/c sand, trace silt, some f/c gravel, moist, s/compact.			8'-10'	13	
		8-5-4-3	SP-SM	Reddish brown f/m sand, trace silt, trace fine gravel, moist, loose. Augured down to 15 feet.			10'-12'	9	
		4-5-5-4	SP-SM	Reddish brown f/m sand, trace silt, trace fine gravel, moist, loose. Augured down to 20 feet.			15'-17'	10	
		3-2-4-3	SP-SM	Reddish brown f/m sand, trace silt, trace fine gravel, moist to s/wet, loose. Augured down to 25 feet.			20'-22'	6	
		4-4-4-6	SP-SM	Reddish brown f/m sand, trace silt, trace fine gravel, wet, loose. Augured down to 30 feet.			25'-27'	8	

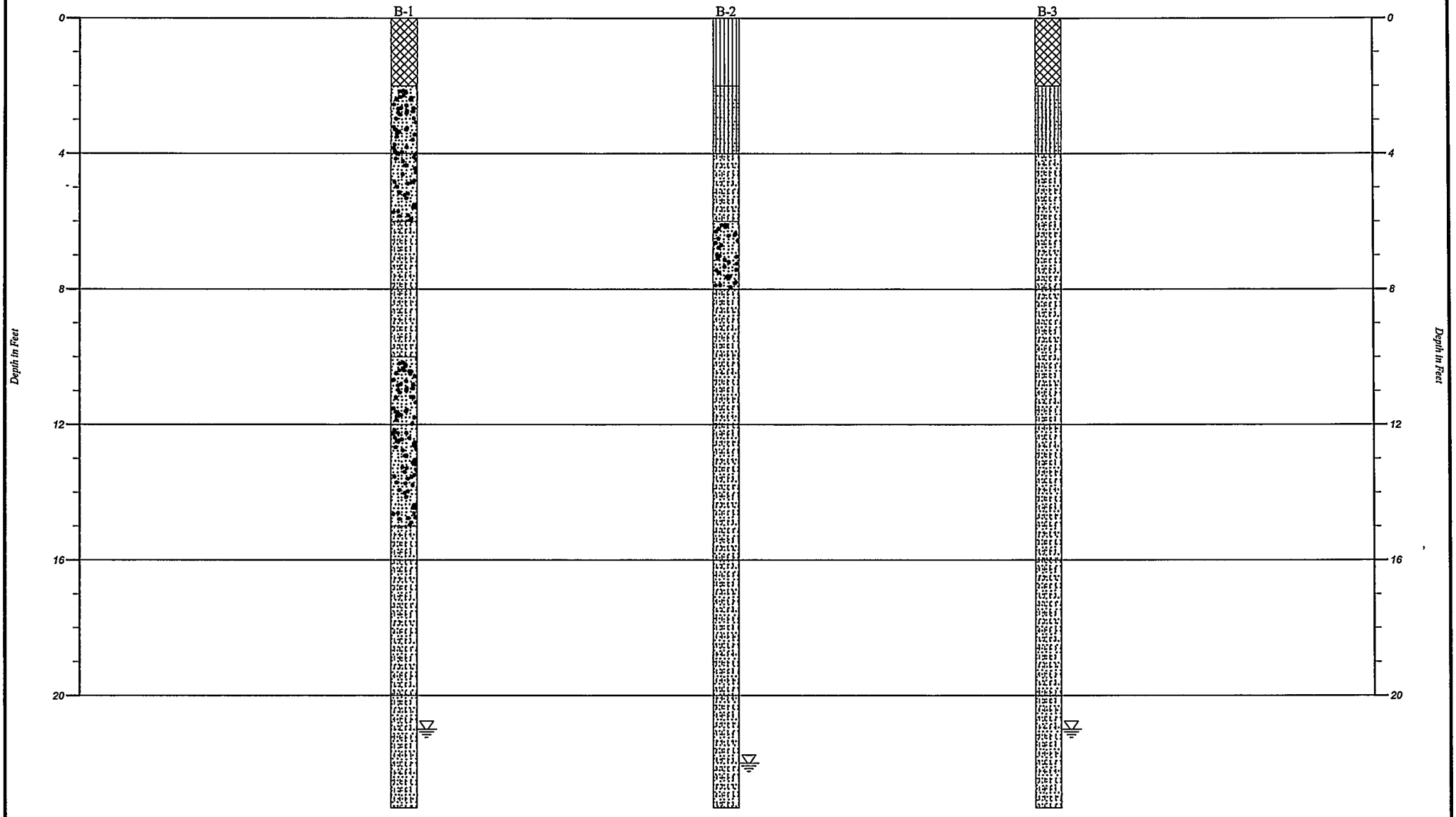
This information pertains only to this boring and should not be interpreted as being indicitive of the site.

DRILL HOLE LOG
BORING NO.: B-3

PROJECT: Proposed 2-story School Building

PROJECT NO.: AQD-4413

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST DEPTH	STANDARD PENETRATION TEST N	STANDARD PENETRATION TEST CURVE (10 30 50)
28									
		4- 4- 5- 5	SM-ML	Reddish brown silty fine sand, wet, loose.			30'-32'	9	
32				End of boring.					
36									
40									
44									
48									
52									
56									
60									



Plan View

Strata symbols

- Fill
- Poorly graded sand and gravel
- Poorly graded sand with silt
- Silt
- Poorly graded silty fine sand

ANS CONSULTANTS, INC.

GENERALIZED SOIL PROFILE

HORIZONTAL SCALE:	DRAWN BY/APPROVED BY	DATE DRAWN
VERTICAL SCALE: 1"=4'	PPP	10/4/2022

Proposed 2-story School Building

PROJECT NO. AQD-4413	FIGURE NUMBER

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Fill
	Poorly graded sand and gravel
	Poorly graded sand with silt
	Silt
	Poorly graded silty fine sand
Misc. Symbols	
⏚	Water table during drilling

Notes:

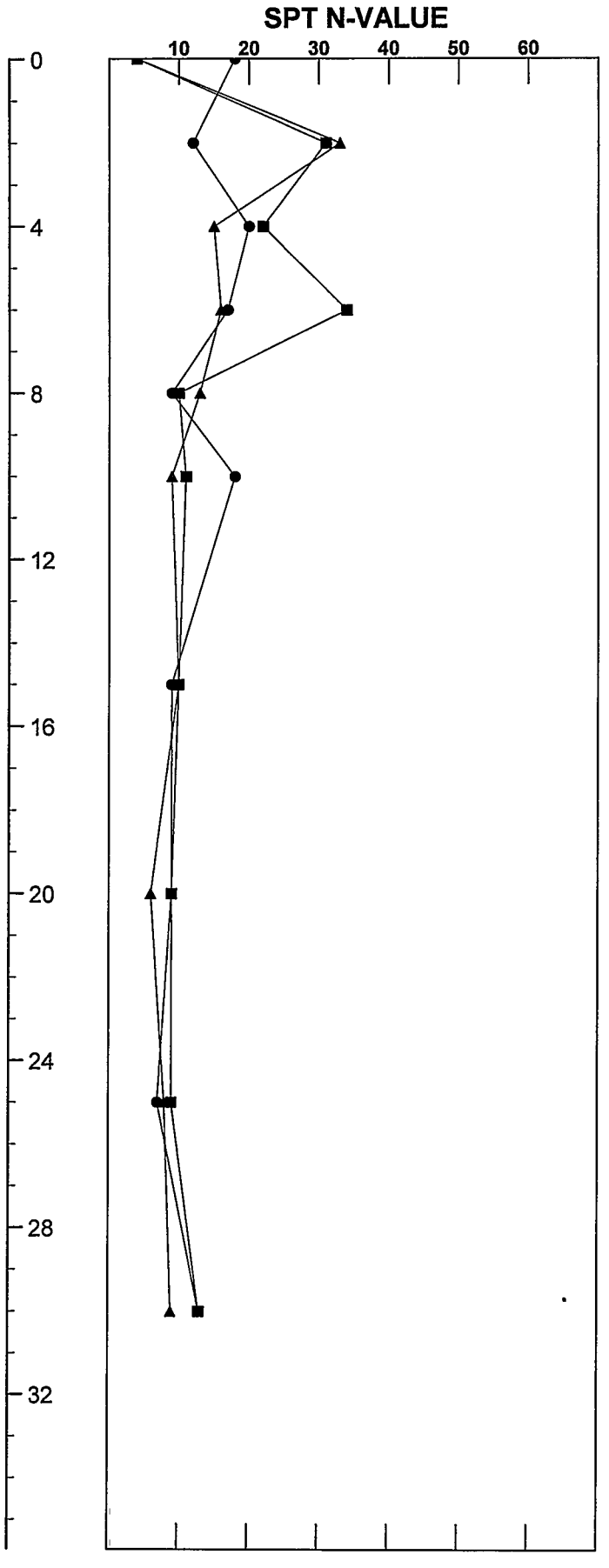
1. Exploratory borings were drilled on 9-23-2022 using a 4-inch diameter continuous flight power auger.

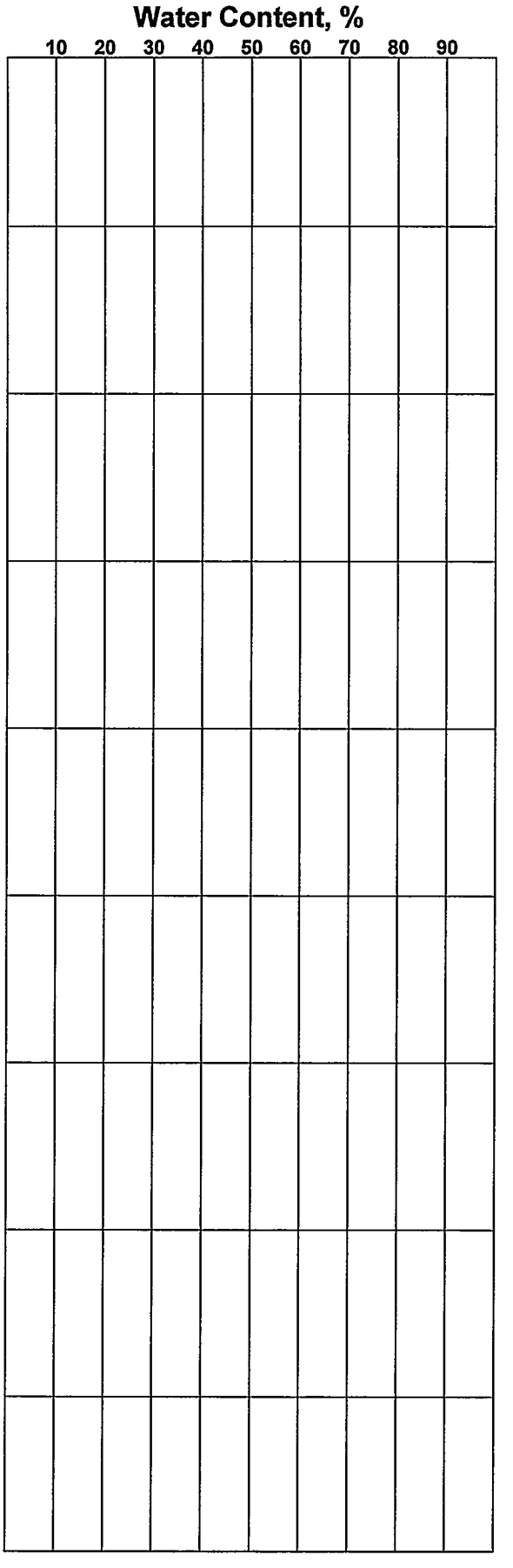
2. No free water was encountered at the time of drilling or when re-checked the following day.

3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.

4. These logs are subject to the limitations, conclusions, and recommendations in this report.

5. Results of tests conducted on samples recovered are reported on the logs.





Key to Borings

- ● B-1
- ▲ B-3
- ■ B-2

ANS CONSULTANTS, INC.

Proposed 2-story School Building

Vertical Scale: 1 to 4	Figure:

Client: Regency Development

Project: 21 Rockview Ave, North Plainfield, NJ

Report of Test Pits and Field Percolation Tests

Two (2) testpits TP-1 & TP-2 were excavated initially to 5' and 6' depths below existing ground level to perform Field Percolation Tests. After completion of percolation tests, testpits were further excavated to 10' depth.

Testpits:

Testpit ID	Depth	Description of Soil
TP-1	0 – 6"	Top Soil: Grayish brown silt, trace fine sand, trace f/c gravel, lots of roots, s/moist.
	6" – 32"	Yellowish brown silt, trace fine sand, trace f/c gravel, trace roots, s/moist.
	32" – 48"	Brown f/m sand, trace silt, some f/c gravel, trace roots, s/moist.
	48" – 105"	Reddish brown f/c sand and f/c gravel, trace silt, s/moist
	105" – 120"	Reddish brown f/c sand, some f/c gravel, moist. End of TP @ 120" (10').
TP-2	0 – 7"	Top Soil: Grayish brown silt, trace fine sand, trace f/c gravel, lots of roots, s/moist.
	7" – 36"	Yellowish brown silt, trace fine sand, little f/c gravel,, trace roots, s/moist.
	36" – 56"	Brown f/m sand, trace silt, some f/c gravel, trace roots, s/moist.
	56" – 120"	Reddish brown f/c sand and f/c gravel, trace silt, s/moist to moist. End of TP @ 120" (10').

Percolation Tests:

Two Field Percolation Tests; one in each tetspit at 5' (TP-1) and 6' (TP-2) were performed as per NJ Stormwater BMP Manual. To perform tests, tetst holes of 10" diameter and 14" depth were prepared at bottom of each testpit by using hand tools. An 8" internal diameter PVC perforated pipe was then lowered into test holes after placing a thin layer of P-Pebbles at bottom of test holes, top of PVC pipe was levelled and sides were filled with P-Pebbles to secure PVC perforated pipe. Water was then filled into pVC pipe upto 12" mark on inside vertical surface of PVC pipe. It was noted that all 12" water drained out quickly (in less than 60 minutes). Water was again filled to 12" mark. This time again water drained out in less than 60 minutes. Now water filled to 7" mark and drops in water level were recorded at 1 minute interval until difference of last 3 consecutive drops was recorded less than 1/10 of an inch. At this point water was filled to 7" mark and time for 6" drop was recorded for percolation rate calculation in minutes per inch.

Percolation Test-1 @ TP-1:

1. Depth of test: 5'-3" to 6'-5".
2. Water was filled into PVC pipe to 12" mark at 12:02 PM.
3. All 12" water was drained out at 12:11 PM, in 9 minutes.
4. Water was again filled to 12" mark at 12:12 PM.
5. This time all 12" water was drained out at 12:25 PM in 13 minutes (less than 60 minutes).
6. Since 2nd time water was drained out in less than 60 minutes, water was filled to 7" mark and drops in water level were recorded at 1 minute interval.

S. No.	Time	Drop in Water Level	Remarks	Percolation Rate per Hour
1.	12:26 pm	Water was filled to 7" mark		
2.	12:27 pm	7/8"		
3.	12:27 pm		Refilled	Difference of S. No. 14 & 18 = 3/4" – 11/16" = 1/16" < 1/10"
4.	12:28 pm	7/8"		
5.	12:28 pm		Refilled	Water was refilled into PVC pipe upto 7" mark at 12:35 PM and left for 6" drop.
6.	12:29 pm	13/16"		
7.	12:29 pm		Refilled	6" drop was achieved at 12:46 PM, in 11 minutes.
8.	12:30 pm	13/16"		
9.	12:30 pm		Refilled	Perc Rate: 11/6= 1.83 minutes per inch
10.	12:31 pm	13/16"		
11.	12:31 pm		Refilled	

12.	12:32 pm	¾"		
13.	12:32 pm		Refilled	
14.	12:33 pm	¾""		
15.	12:33 pm		Refilled	
16.	12:34 pm	¾"		
17.	12:34 pm		Refilled	
18.	12:35 pm	11/16"		
19.	12:35 pm		Refilled	

Percolation Test-2 @ TP-2:

1. Depth of test: 6'-0"' to 7'-2".
2. Water was filled into PVC pipe to 12" mark at 2:07 PM.
3. All 12" water was drained out at 2:18 PM, in 11 minutes.
4. Water was again filled to 12" mark at 2:19 PM.
5. This time all 12" water was drained out at 2:34 PM in 15 minutes (less than 60 minutes).
6. Since 2nd time water was drained out in less than 60 minutes, water was filled to 7" mark and drops in water level were recorded at 1 minute interval.

S. No.	Time	Drop in Water Level	Remarks	Percolation Rate per Hour
1.	2:35 pm	Water was filled to 7" mark		
2.	2:36 pm	¾"		
3.	2:36 pm		Refilled	Difference of S. No. 18 & 22 = 7/16" – 3/8" = 1/16" < 1/10"
4.	2:37 pm	11/16"		
5.	2:37 pm		Refilled	Water was refilled into PVC pipe upto 7" mark at 2:46 PM and left for 6" drop.
6.	2:38 pm	11/16"		
7.	2:38 pm		Refilled	6" drop was achieved at 3:03 PM, in 17 minutes.
8.	2:39 pm	5/8"		
9.	2:39 pm		Refilled	Perc Rate: 17/6= 2.83 minutes per inch
10.	2:40 pm	5/8"		

Client: Regency Development

Project: 21 Rockview Ave, North Plainfield, NJ

11.	2:40 pm		Refilled	
12.	2:41 pm	5/8"		
13.	2:41 pm		Refilled	
14.	2:42 pm	½"		
15.	2:42 pm		Refilled	
16.	2:43 pm	½"		
17.	2:43 pm		Refilled	
18.	2:44 pm	7/16"		
19.	2:44 pm		Refilled	
20.	2:45 pm	3/8"		
21.	2:45 pm		Refilled	
22.	2:46 pm	3/8"		
23.	2:46 pm		Refilled	

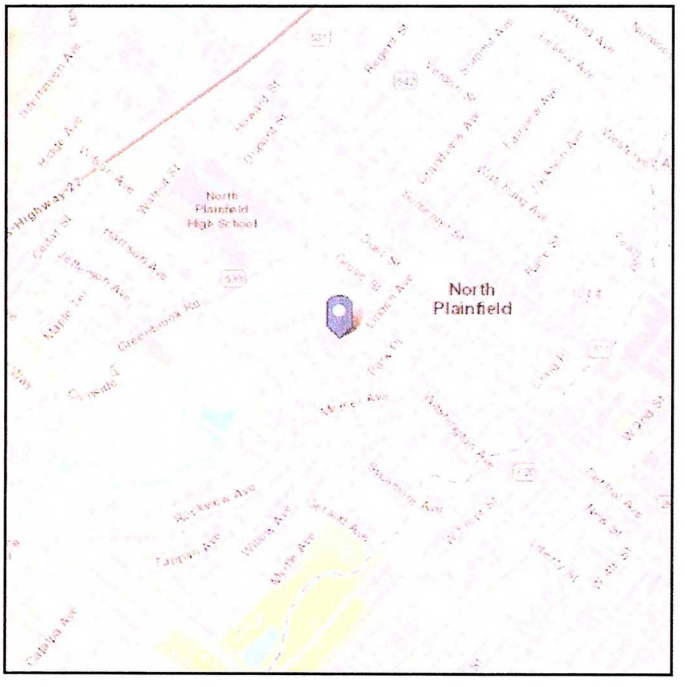
File: ANS.NP_01

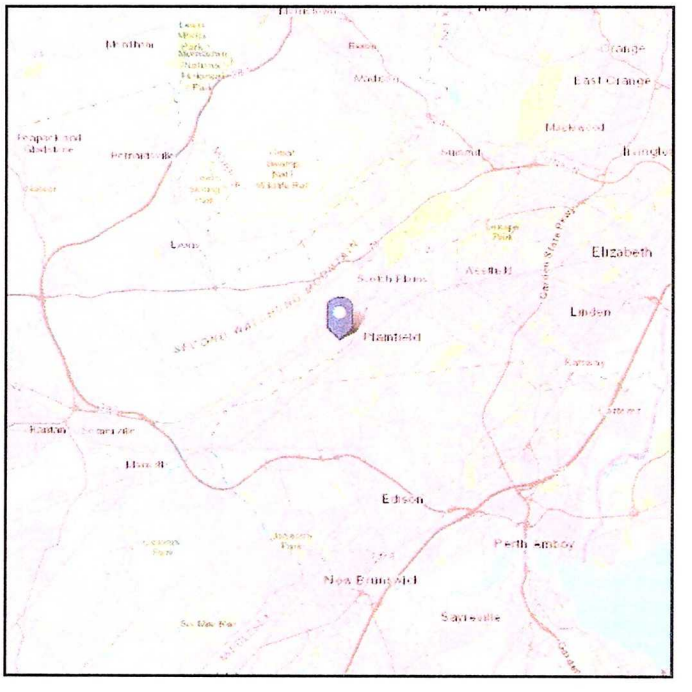
ASCE 7 Hazards Report

Address:
21 Rockview Ave
Plainfield, New Jersey
07060

Standard: ASCE/SEI 7-22
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 95.41 ft (NAVD 88)
Latitude: 40.619475
Longitude: -74.434426





ASCE
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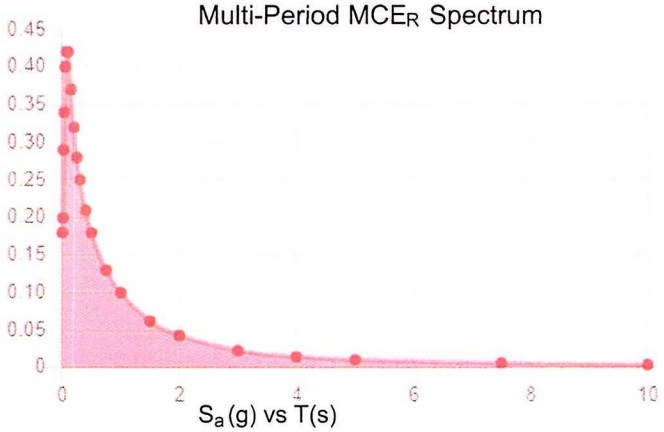
Seismic

Site Soil Class:

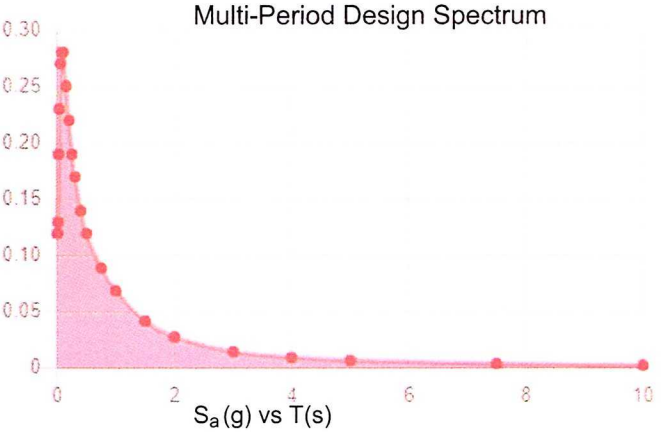
Results:

PGA_M :	0.16	T_L :	6
S_{MS} :	0.29	S_S :	0.26
S_{M1} :	0.1	S_1 :	0.049
S_{DS} :	0.19	S_{DC} :	
S_{D1} :	0.069	V_{S30} :	260

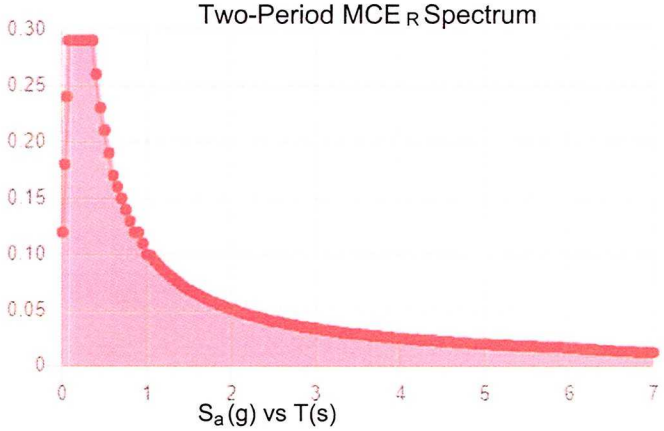
Multi-Period MCE_R Spectrum



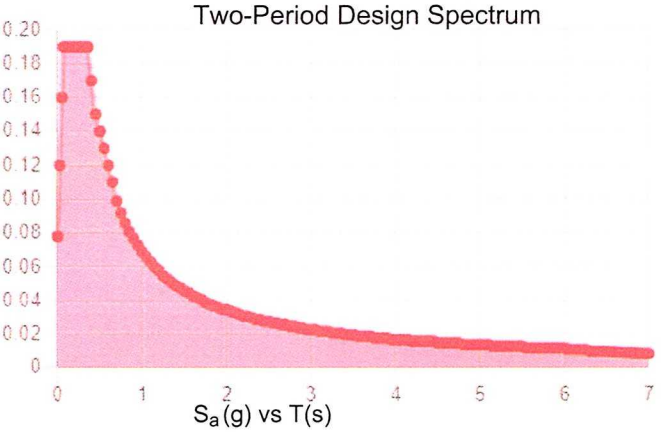
Multi-Period Design Spectrum



Two-Period MCE_R Spectrum



Two-Period Design Spectrum



MCE_R Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Design Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

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Data Accessed: Tue Oct 04 2022

Date Source:
USGS Seismic Design Maps based on ASCE/SEI 7-22 and ASCE/SEI 7-22 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-22 Ch. 21 are available from USGS.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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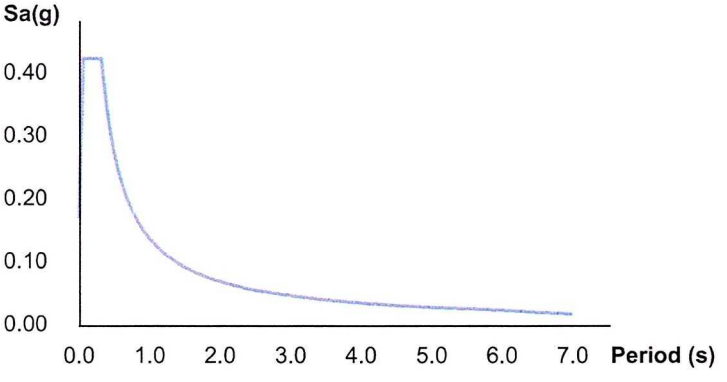
Hazards by Location

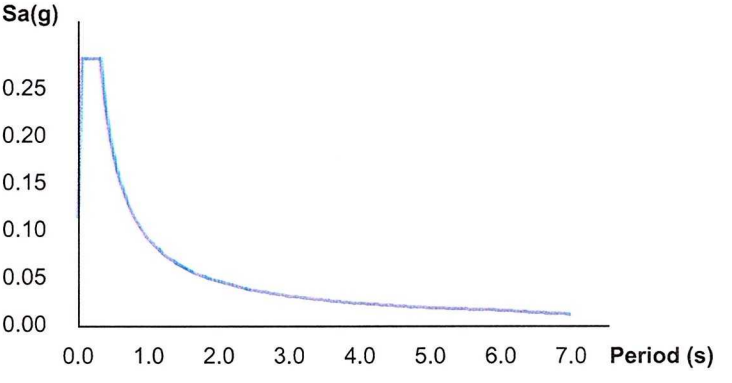
Search Information

Address:	21 Rockview Ave, North Plainfield, NJ 07060, USA
Coordinates:	40.6193441, -74.43438069999999
Elevation:	96 ft
Timestamp:	2022-10-04T17:24:44.976Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	II
Site Class:	D

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	0.266	MCE_R ground motion (period=0.2s)
S_1	0.057	MCE_R ground motion (period=1.0s)
S_{MS}	0.423	Site-modified spectral acceleration value
S_{M1}	0.137	Site-modified spectral acceleration value
S_{DS}	0.282	Numeric seismic design value at 0.2s SA
S_{D1}	0.091	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	B	Seismic design category

F_a	1.587	Site amplification factor at 0.2s
F_v	2.4	Site amplification factor at 1.0s
CR_S	0.939	Coefficient of risk (0.2s)
CR_1	0.944	Coefficient of risk (1.0s)
PGA	0.161	MCE_G peak ground acceleration
F_{PGA}	1.477	Site amplification factor at PGA
PGA_M	0.238	Site modified peak ground acceleration
T_L	6	Long-period transition period (s)
SsRT	0.266	Probabilistic risk-targeted ground motion (0.2s)
SsUH	0.284	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.057	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.061	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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FIELD SOIL CLASSIFICATION SYSTEM

PARTICLE SIZE IDENTIFICATION

Boulders.....8 inch diameter or greater
Cobbles.....3 to 8 inch diameter
Gravel ..... Coarse -- 1 to 3 inch
Medium -- 1/2 to 1 inch
Fine -- 4.75 mm to 1/2 inch
Sand..... Coarse -- 2.0 mm to 4.75 mm
(dia. of pencil lead)
Medium -- 0.425 mm to 2.0 mm
(dia. of broom straw)
Fine -- 0.075 mm to 0.425 mm
(dia. of human hair)
Silt & Clay. . . Smaller than 0.075 mm

RELATIVE PORTIONS

Descriptive Term	Percent
Trace - tr	1 - 10
Some - sm	11 - 20
Adjective - ly	21 - 35
And - &	36 - 50

ABBREVIATIONS

Bn - Brown
Gy - Gray
Blk - Black
Rd - Red
Or - Orange
Bl - Blue
Lt - Light
Dk - Dark
Multi - Multi colored

Coarse grained - c
Medium grained - m
Fine grained- f

HSA - Hollow Stem Auger
SS- Split Spoon Sampler
WOR - Weight of Rods
WOH - Weight of Hammer
NR - No Recovery of Sample

COHESIONLESS SOIL

(Gravel, Sand, Silt and Combinations)

DENSITY

Very Loose ..... 05 blows I ft or less
Loose .....06 to 10 blows / ft
Medium Dense .....11 to 30 blows / ft
Dense ..... 31 to 50 blows / ft
Very Dense .....51 blows / ft or more

COHESIVE SOIL

(Clay Silt and Combinations)

CONSISTENCY

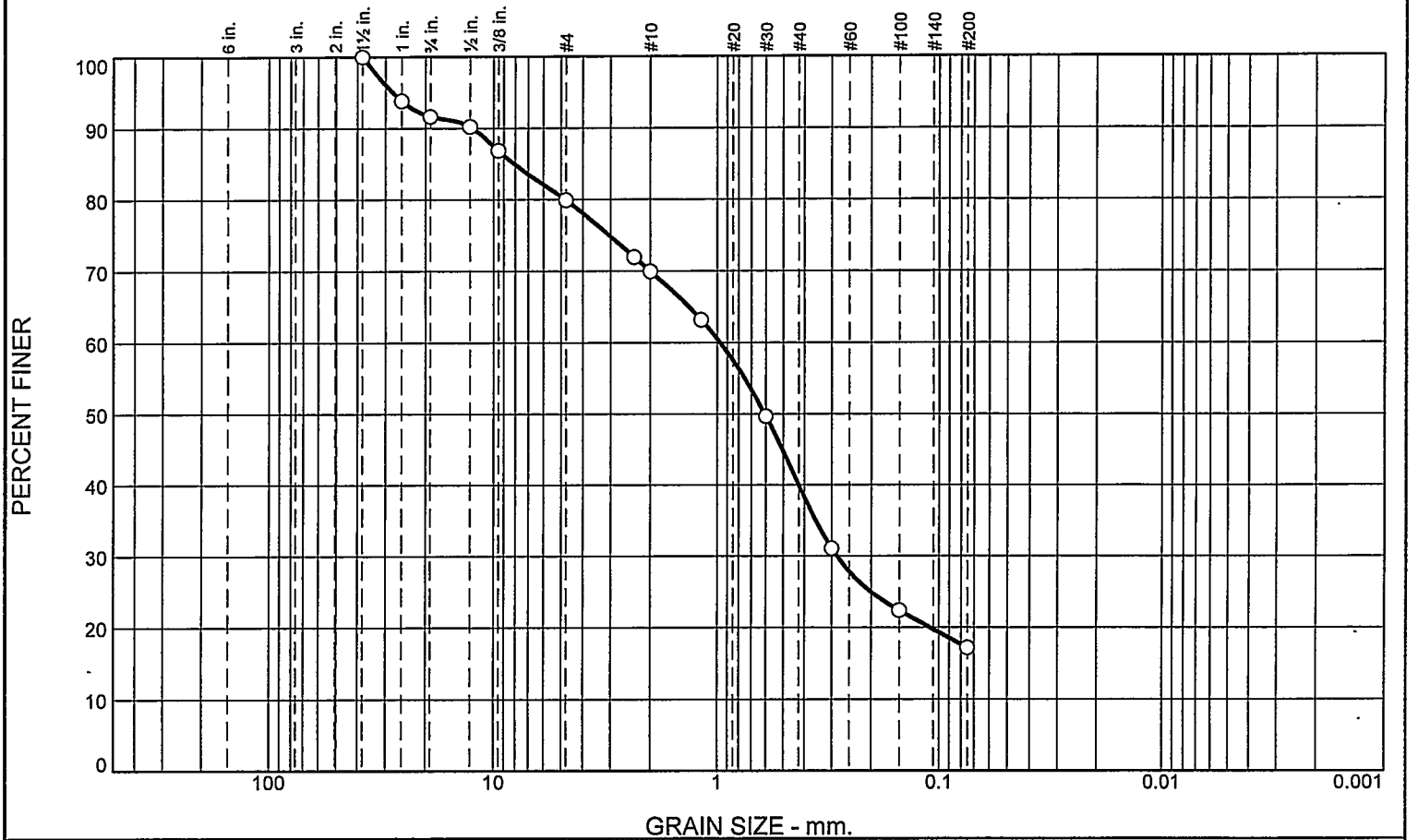
Very Soft ..... 01 blow / ft or less
Soft..... 02 to 4 blows / ft
Medium Stiff .....05 to 8 blows / ft
Stiff..... 09 to 15 blows / ft
Very Stiff ..... 16 to 30 blows / ft
Hard .....31 blows / ft or greater

ROCK

R.Q.D.	Rock Quality
00 – 25.....	Very Poor
25 - 50%	.....Poor
50 - 75%	.....Fair
75 - 90%	.....Good
90 - 100%	.....Excellent

Appendix-B

Particle Size Distribution Report As per ASTM D-6913 & 7928



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	8.3	11.8	9.9	30.0	22.8	17.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	93.8		
3/4	91.7		
1/2	90.2		
3/8	86.9		
#4	79.9		
#8	71.9		
#10	70.0		
#16	63.2		
#30	49.7		
#50	31.1		
#100	22.4		
#200	17.2		

* (no specification provided)

Material Description

Brown in color. silty sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 12.3648 D_{85}= 8.0995 D_{60}= 0.9702
D_{50}= 0.6080 D_{30}= 0.2841 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Sample was collected on 09/23/22 and tested on 9/29/22. In-Situ %MC=6.9
F.M.=3.03

Location: B-1
Sample Number: S-1 **Depth:** 4'-6' **Date:** 10/01/2022

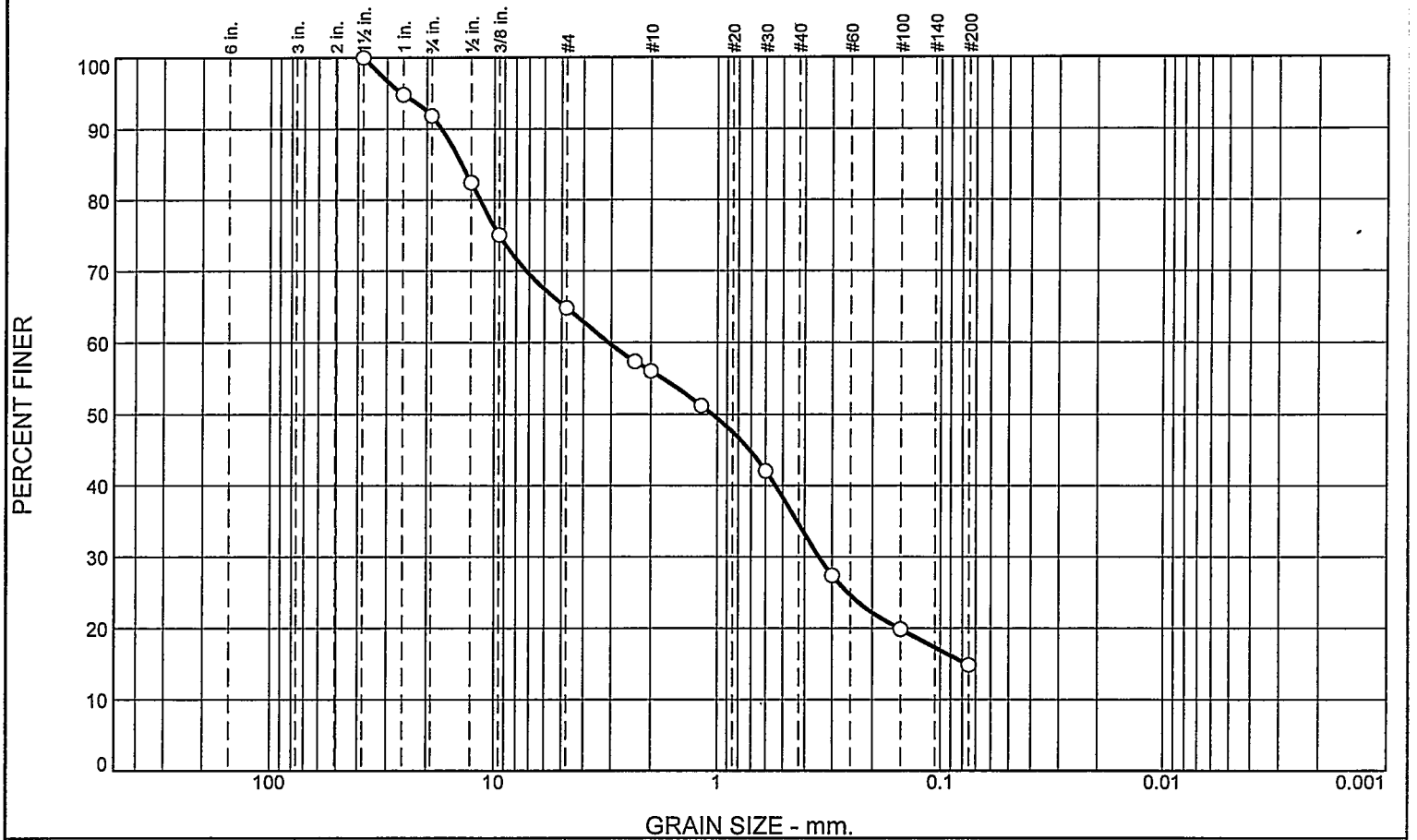
ANS CONSULTANTS, INC.

South Plainfield, New Jersey

Client: Regency Devolpment
Project: 21 Rockview Avenue, N. Plainfield, NJ

Project No: AQD-443 **Figure 1 F 1**

Particle Size Distribution Report As per ASTM D-6913 & 7928



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	8.1	27.1	8.8	21.4	19.7	14.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	94.8		
3/4	91.9		
1/2	82.5		
3/8	75.1		
#4	64.8		
#8	57.4		
#10	56.0		
#16	51.2		
#30	42.1		
#50	27.4		
#100	19.9		
#200	14.9		

* (no specification provided)

Material Description

Brown in color. silty sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 17.1622 D_{85}= 13.9491 D_{60}= 3.0993
D_{50}= 1.0536 D_{30}= 0.3440 D_{15}= 0.0763
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Sample was collected on 09/23/22 and tested on 09/29/22. In-Situ %MC=5.9
F.M.=3.70

Location: B-2
Sample Number: S-2 **Depth:** 6'-8' **Date:** 10/01/2022

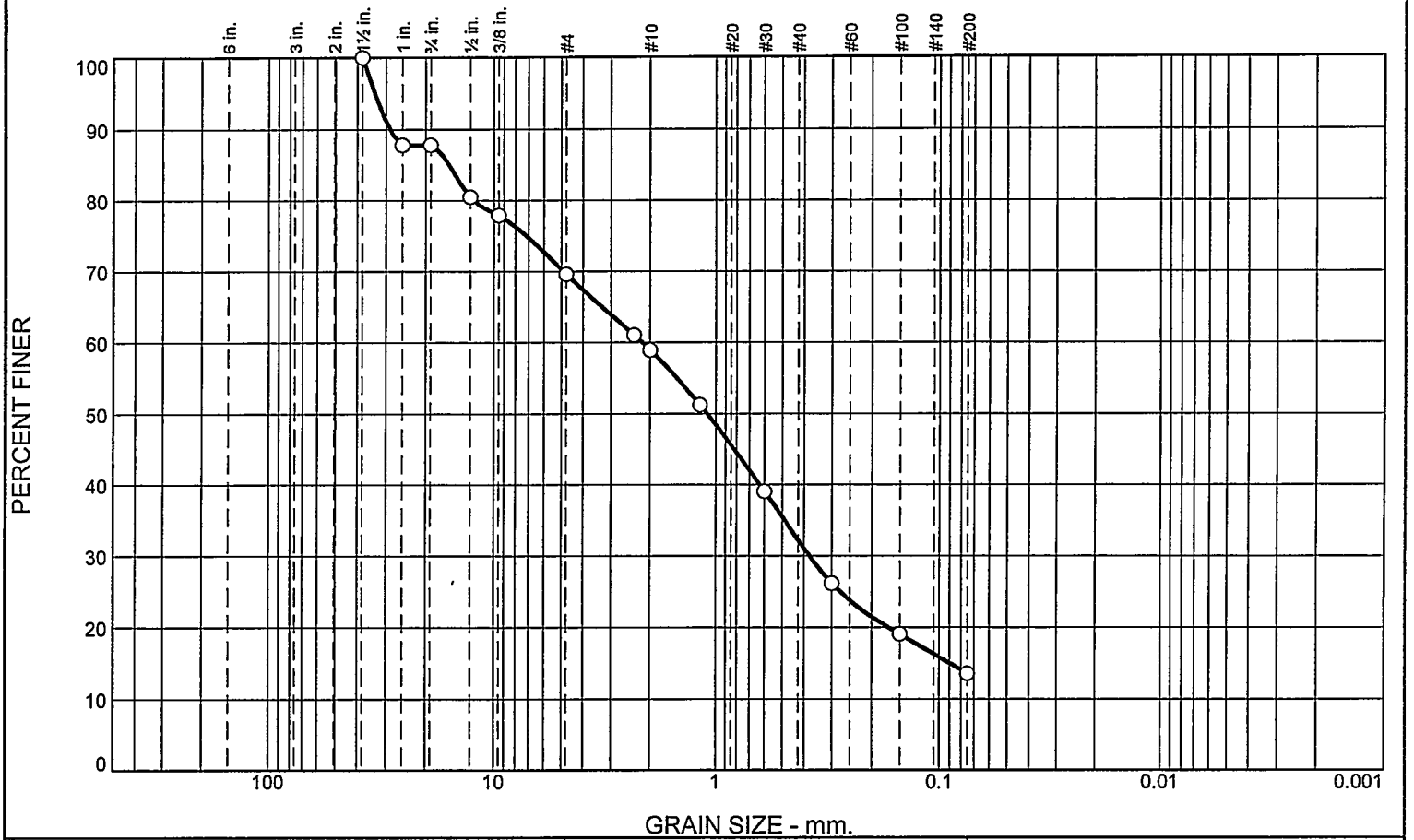
ANS CONSULTANTS, INC.

South Plainfield, New Jersey

Client: Regency Devolpment
Project: 21 Rockview Avenue, N. Plainfield, NJ

Project No: AQD-443 **Figure 2 F 1**

Particle Size Distribution Report As per ASTM D-6913 & 7928



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.2	18.2	10.7	26.7	18.6	13.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	87.8		
3/4	87.8		
1/2	80.5		
3/8	77.9		
#4	69.6		
#8	61.0		
#10	58.9		
#16	51.2		
#30	39.1		
#50	26.2		
#100	19.1		
#200	13.6		

* (no specification provided)

Material Description

Brown in color. silty sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 28.7865 D_{85}= 15.7773 D_{60}= 2.1744
D_{50}= 1.0957 D_{30}= 0.3776 D_{15}= 0.0897
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Sample was collected on 09/23/22 and tested on 09/29/22. In-Situ
%MC=5.8
F.M.=3.68

Location: B-3
Sample Number: S-3 **Depth:** 8'-10' **Date:** 10/01/2022

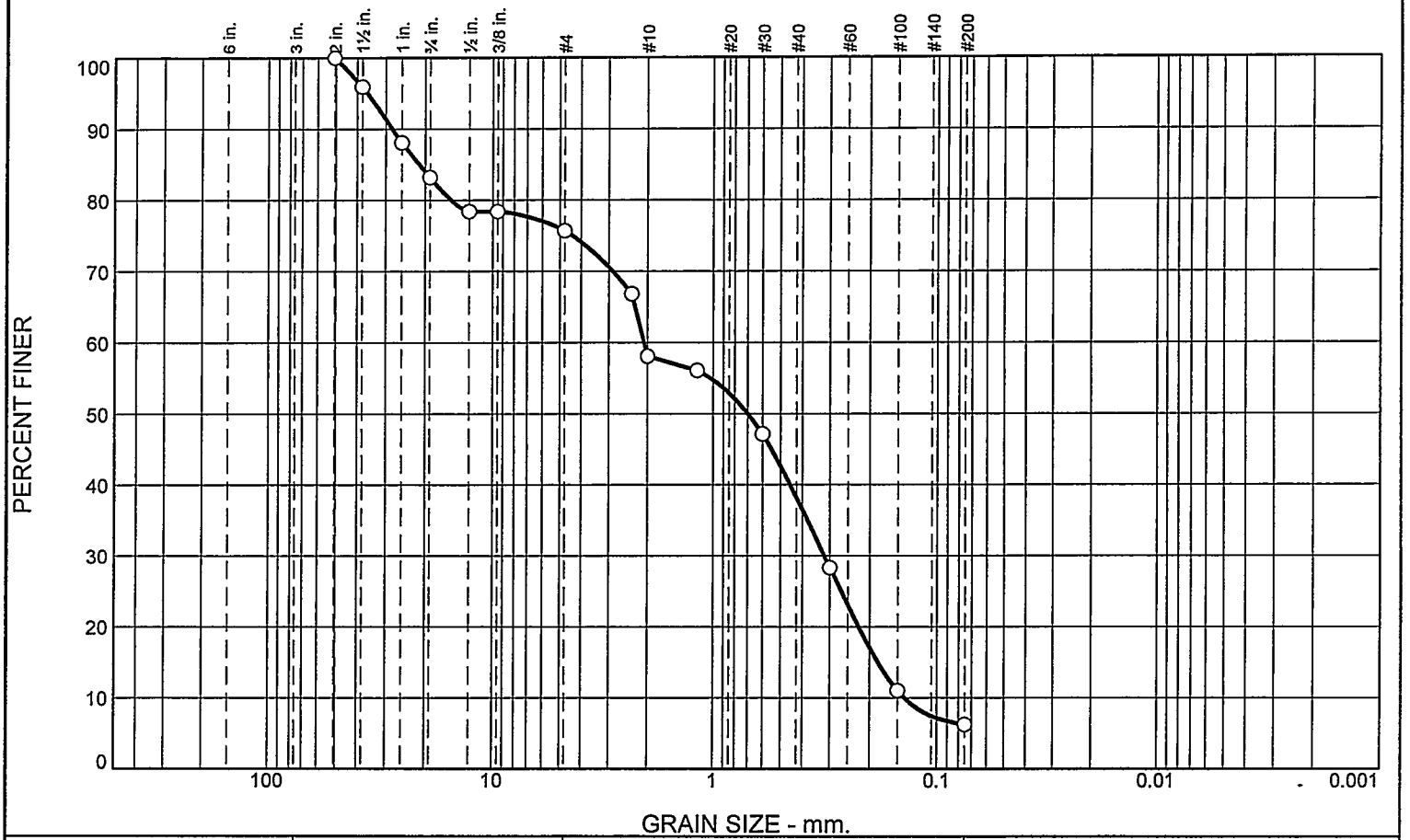
ANS CONSULTANTS, INC.

South Plainfield, New Jersey

Client: Regency Devolpment
Project: 21 Rockview Avenue, N. Plainfield, NJ

Project No: AQD-443 **Figure** 3 F 1

Particle Size Distribution Report As per ASTM D-6913 & 7928



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	16.8	7.5	17.6	19.9	31.9	6.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2	100.0		
1.5	95.9		
1	88.1		
3/4	83.2		
1/2	78.4		
3/8	78.4		
#4	75.7		
#8	66.8		
#10	58.1		
#16	56.1		
#30	47.2		
#50	28.3		
#100	11.0		
#200	6.3		

* (no specification provided)

Material Description

Brown in color. poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 28.0254 D_{85}= 21.2825 D_{60}= 2.0818
D_{50}= 0.6989 D_{30}= 0.3178 D_{15}= 0.1837
D_{10}= 0.1401 C_u= 14.86 C_c= 0.35

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Sample was collected on 09/23/22 and tested on 09/30/22. In-Situ %MC=5.1
F.M.=3.57

Location: Test Pit
Sample Number: S-4 **Depth:** 8"-9" **Date:** 10/01/2022

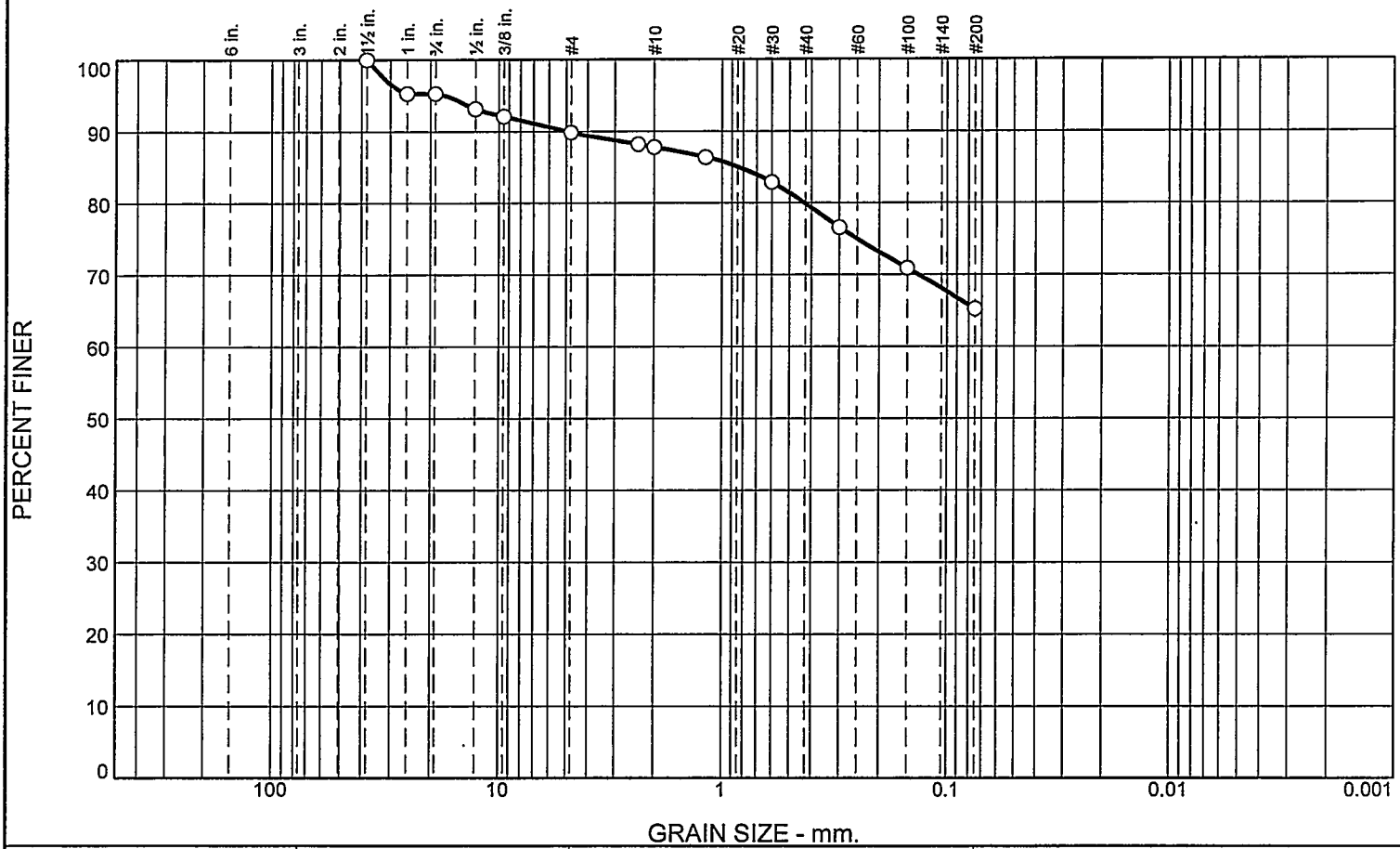
ANS CONSULTANTS, INC.

South Plainfield, New Jersey

Client: Regency Devolpment
Project: 21 Rockview Avenue, N. Plainfield, NJ

Project No: AQD-443 **Figure 4 F 1**

Particle Size Distribution Report As per ASTM D-6913 & 7928



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.8	5.3	2.1	7.9	14.7	65.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	95.2		
3/4	95.2		
1/2	93.1		
3/8	92.1		
#4	89.9		
#8	88.2		
#10	87.8		
#16	86.4		
#30	82.9		
#50	76.6		
#100	70.9		
#200	65.2		

* (no specification provided)

Material Description

Brown in color. sandy silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 4.9863 D_{85}= 0.8388 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

Sample was collected on 09/23/22 and tested on 09//30/22. In-Situ %MC=10.2
F.M.=1.18

Location: Test Pit
Sample Number: S-5 **Depth:** 6"-32" **Date:** 10/01/2022

ANS CONSULTANTS, INC.

South Plainfield, New Jersey

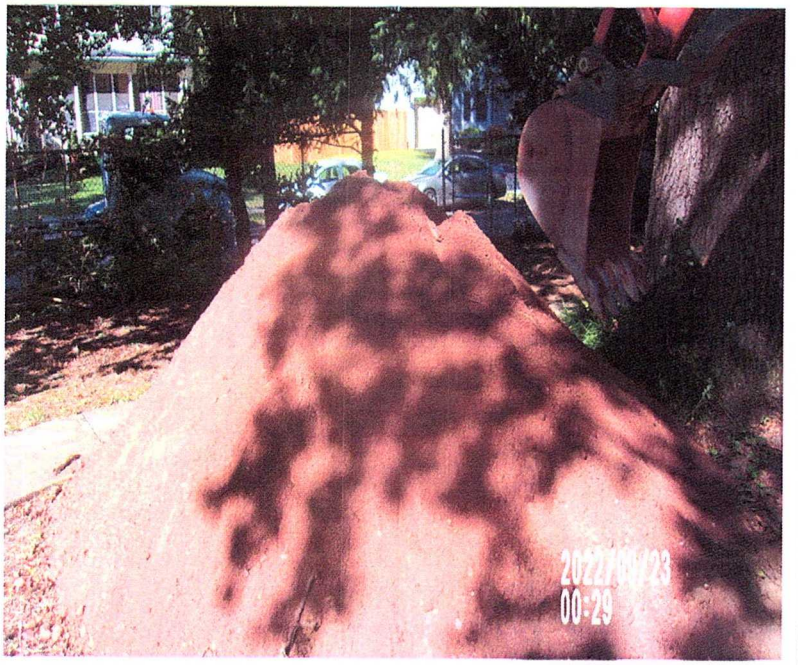
Client: Regency Devolpment
Project: 21 Rockview Avenue, N. Plainfield, NJ
Project No: AQD-443 **Figure 5 F 1**

Appendix-C

ANS CONSULTANTS, INC.
4405 South Clinton Avenue
South Plainfield, NJ 07080

Client: Regency Development

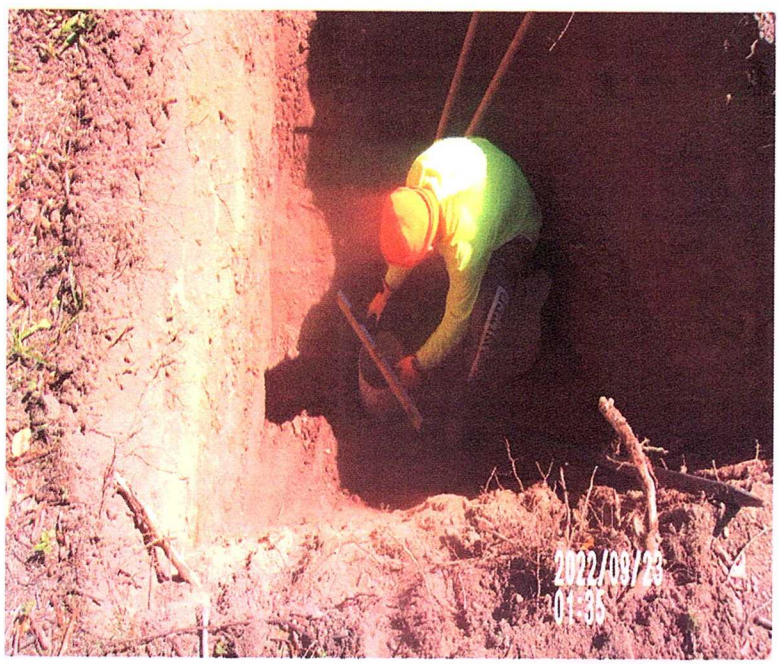
Project: 21 Rockview Ave, North Plainfield, NJ

	Testpit Excavation
	Stockpile of excavated soil

ANS CONSULTANTS, INC.
4405 South Clinton Avenue
South Plainfield, NJ 07080

Client: Regency Development

Project: 21 Rockview Ave, North Plainfield, NJ

	Field Percolation Test
	Field Percolation Test

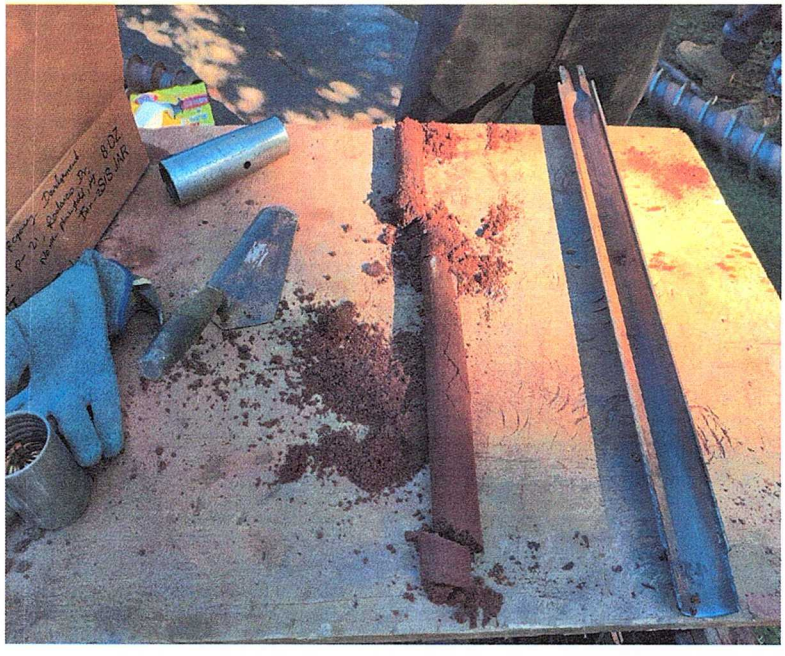
Client: Regency Development

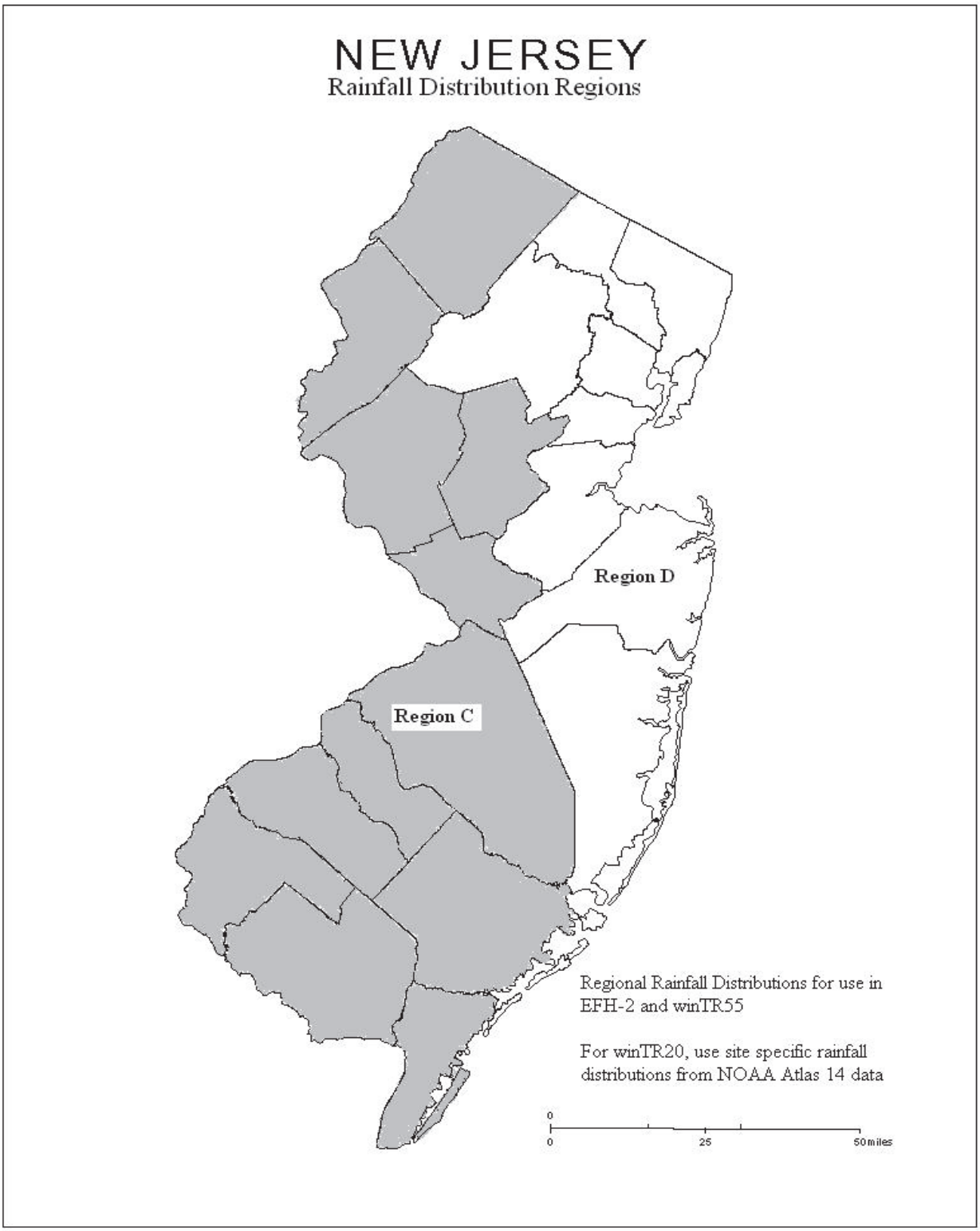
Project: 21 Rockview Ave, North Plainfield, NJ

	Sample recovery from split spoon samplers
	Sample procurement using split spoon samplers and augurs

Client: Regency Development

Project: 21 Rockview Ave, North Plainfield, NJ

	Sample recovery from split spoon samplers
	Sample procurement using split spoon samplers and augurs


NEW JERSEY
Rainfall Distribution Regions
Region D
Region C
Regional Rainfall Distributions for use in EFH-2 and winTR55
For winTR20, use site specific rainfall distributions from NOAA Atlas 14 data
0
0
25
50 miles

NOAA Atlas 14, Volume 2, Version 3
Location name: Plainfield, New Jersey, USA*
Latitude: 40.6195°, Longitude: -74.4344°
Elevation: 95.41 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.334** (0.305-0.368)	**0.398** (0.363-0.438)	**0.471** (0.428-0.518)	**0.524** (0.476-0.576)	**0.588** (0.532-0.646)	**0.634** (0.570-0.695)	**0.678** (0.607-0.744)	**0.717** (0.639-0.788)	**0.767** (0.677-0.844)	**0.803** (0.704-0.886)
10-min	**0.534** (0.487-0.587)	**0.637** (0.581-0.700)	**0.755** (0.686-0.830)	**0.838** (0.760-0.921)	**0.938** (0.848-1.03)	**1.01** (0.908-1.11)	**1.08** (0.964-1.18)	**1.14** (1.01-1.25)	**1.21** (1.07-1.34)	**1.26** (1.11-1.40)
15-min	**0.667** (0.609-0.734)	**0.800** (0.730-0.881)	**0.955** (0.867-1.05)	**1.06** (0.962-1.17)	**1.19** (1.07-1.31)	**1.28** (1.15-1.40)	**1.36** (1.22-1.50)	**1.44** (1.28-1.58)	**1.53** (1.35-1.68)	**1.59** (1.39-1.75)
30-min	**0.915** (0.835-1.01)	**1.11** (1.01-1.22)	**1.36** (1.23-1.49)	**1.54** (1.39-1.69)	**1.76** (1.59-1.93)	**1.92** (1.73-2.11)	**2.09** (1.87-2.29)	**2.23** (1.99-2.45)	**2.43** (2.14-2.67)	**2.57** (2.25-2.84)
60-min	**1.14** (1.04-1.25)	**1.39** (1.27-1.53)	**1.74** (1.58-1.91)	**2.00** (1.82-2.20)	**2.34** (2.12-2.57)	**2.61** (2.35-2.86)	**2.87** (2.57-3.15)	**3.13** (2.79-3.44)	**3.49** (3.08-3.84)	**3.75** (3.29-4.14)
2-hr	**1.39** (1.26-1.55)	**1.70** (1.54-1.88)	**2.16** (1.95-2.39)	**2.51** (2.26-2.78)	**3.00** (2.69-3.32)	**3.41** (3.04-3.76)	**3.82** (3.38-4.22)	**4.25** (3.74-4.70)	**4.86** (4.22-5.38)	**5.34** (4.59-5.93)
3-hr	**1.56** (1.41-1.73)	**1.90** (1.72-2.11)	**2.41** (2.18-2.68)	**2.81** (2.54-3.12)	**3.36** (3.02-3.73)	**3.81** (3.40-4.22)	**4.28** (3.79-4.74)	**4.76** (4.19-5.28)	**5.44** (4.73-6.04)	**5.98** (5.14-6.65)
6-hr	**2.00** (1.81-2.23)	**2.43** (2.20-2.70)	**3.08** (2.78-3.41)	**3.61** (3.25-3.99)	**4.37** (3.89-4.81)	**5.00** (4.43-5.50)	**5.68** (4.98-6.24)	**6.40** (5.57-7.04)	**7.46** (6.39-8.20)	**8.32** (7.05-9.17)
12-hr	**2.47** (2.24-2.75)	**3.00** (2.72-3.34)	**3.82** (3.45-4.24)	**4.52** (4.06-5.00)	**5.54** (4.94-6.11)	**6.43** (5.68-7.07)	**7.39** (6.46-8.12)	**8.46** (7.30-9.30)	**10.0** (8.51-11.0)	**11.4** (9.50-12.5)
24-hr	**2.80** (2.59-3.04)	**3.38** (3.13-3.69)	**4.34** (4.01-4.72)	**5.15** (4.74-5.60)	**6.38** (5.83-6.92)	**7.44** (6.74-8.06)	**8.61** (7.74-9.34)	**9.93** (8.81-10.8)	**11.9** (10.4-13.0)	**13.6** (11.7-14.9)
2-day	**3.28** (3.02-3.59)	**3.97** (3.66-4.35)	**5.07** (4.66-5.54)	**5.99** (5.48-6.54)	**7.33** (6.67-8.01)	**8.48** (7.66-9.25)	**9.72** (8.72-10.6)	**11.1** (9.83-12.2)	**13.1** (11.4-14.4)	**14.8** (12.7-16.4)
3-day	**3.46** (3.19-3.78)	**4.19** (3.86-4.58)	**5.33** (4.90-5.81)	**6.27** (5.75-6.83)	**7.64** (6.96-8.32)	**8.79** (7.96-9.57)	**10.0** (9.01-10.9)	**11.4** (10.1-12.5)	**13.3** (11.7-14.7)	**15.0** (13.0-16.6)
4-day	**3.65** (3.37-3.98)	**4.41** (4.07-4.81)	**5.59** (5.15-6.08)	**6.55** (6.01-7.13)	**7.94** (7.25-8.63)	**9.10** (8.26-9.90)	**10.3** (9.31-11.3)	**11.7** (10.4-12.7)	**13.6** (12.0-14.9)	**15.2** (13.2-16.8)
7-day	**4.30** (4.00-4.65)	**5.16** (4.80-5.59)	**6.42** (5.95-6.94)	**7.45** (6.89-8.05)	**8.92** (8.20-9.65)	**10.1** (9.26-11.0)	**11.5** (10.4-12.4)	**12.8** (11.5-13.9)	**14.8** (13.1-16.2)	**16.5** (14.4-18.1)
10-day	**4.92** (4.59-5.30)	**5.88** (5.49-6.33)	**7.20** (6.70-7.75)	**8.27** (7.68-8.90)	**9.80** (9.05-10.5)	**11.0** (10.1-11.9)	**12.4** (11.3-13.3)	**13.7** (12.4-14.9)	**15.7** (14.0-17.0)	**17.2** (15.2-18.9)
20-day	**6.65** (6.25-7.09)	**7.89** (7.42-8.41)	**9.41** (8.84-10.0)	**10.6** (9.95-11.3)	**12.2** (11.4-13.0)	**13.5** (12.6-14.4)	**14.8** (13.7-15.8)	**16.1** (14.8-17.2)	**17.8** (16.2-19.1)	**19.1** (17.3-20.7)
30-day	**8.28** (7.85-8.74)	**9.79** (9.27-10.3)	**11.4** (10.8-12.1)	**12.7** (12.0-13.4)	**14.3** (13.5-15.1)	**15.6** (14.6-16.5)	**16.8** (15.7-17.8)	**18.0** (16.8-19.0)	**19.5** (18.1-20.7)	**20.6** (19.0-22.0)
45-day	**10.5** (10.0-11.1)	**12.4** (11.8-13.0)	**14.3** (13.6-15.0)	**15.7** (14.9-16.5)	**17.6** (16.6-18.5)	**18.9** (17.9-19.9)	**20.2** (19.1-21.3)	**21.5** (20.2-22.7)	**23.1** (21.6-24.5)	**24.2** (22.5-25.8)
60-day	**12.6** (12.0-13.2)	**14.8** (14.1-15.5)	**16.9** (16.1-17.7)	**18.5** (17.6-19.4)	**20.4** (19.4-21.4)	**21.9** (20.7-23.0)	**23.2** (22.0-24.4)	**24.4** (23.1-25.7)	**25.9** (24.4-27.4)	**27.0** (25.3-28.6)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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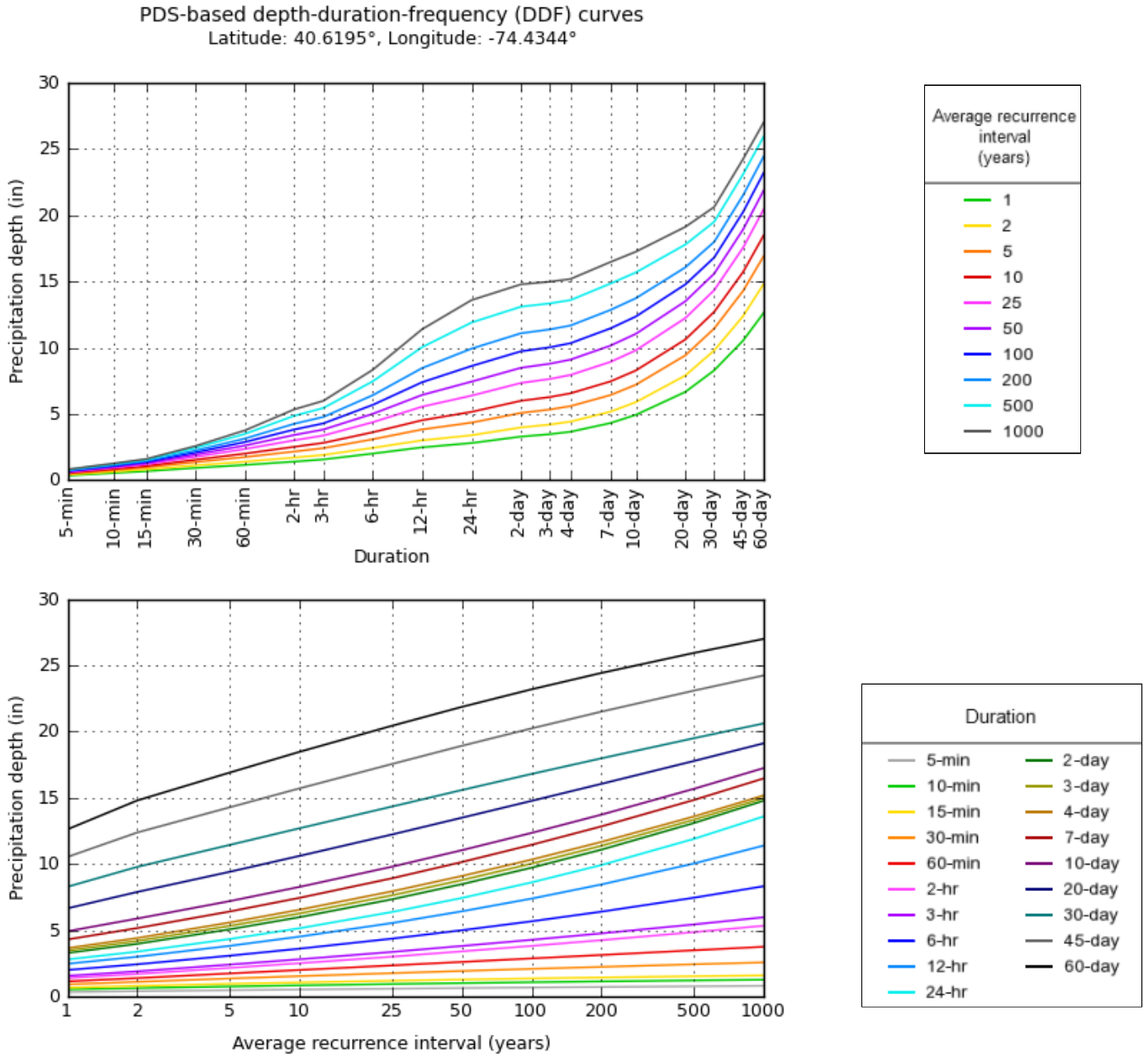
PF graphical



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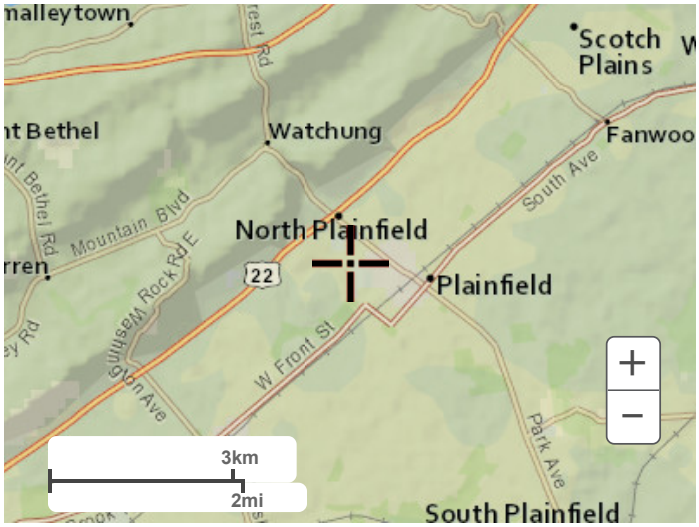
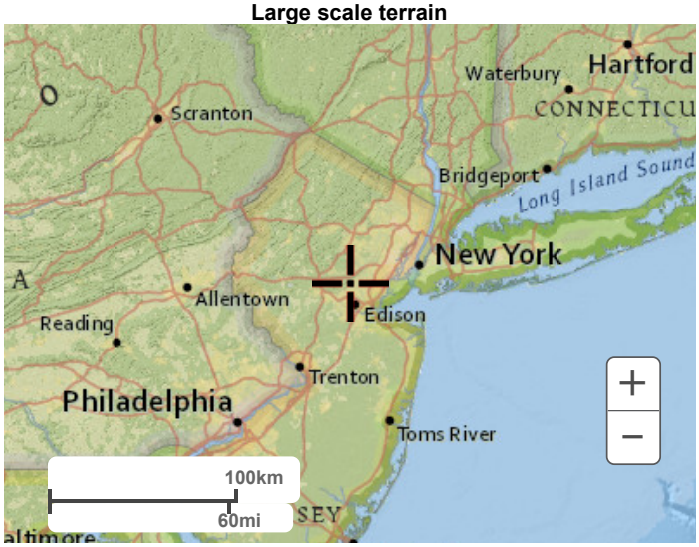
Maps & aerials

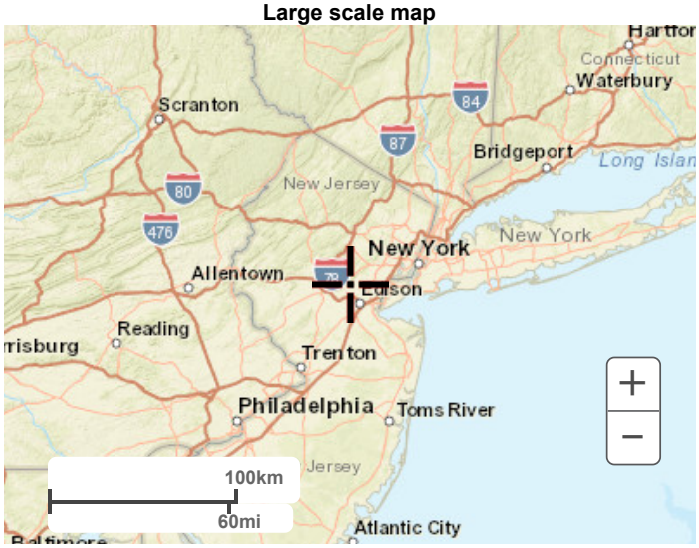
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

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National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

NOAA Atlas 14, Volume 2, Version 3
Location name: Plainfield, New Jersey, USA*
Latitude: 40.6195°, Longitude: -74.4344°
Elevation: 95.41 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**4.01** (3.66-4.42)	**4.78** (4.36-5.26)	**5.65** (5.14-6.22)	**6.29** (5.71-6.91)	**7.06** (6.38-7.75)	**7.61** (6.84-8.34)	**8.14** (7.28-8.93)	**8.60** (7.67-9.46)	**9.20** (8.12-10.1)	**9.64** (8.45-10.6)
10-min	**3.20** (2.92-3.52)	**3.82** (3.49-4.20)	**4.53** (4.12-4.98)	**5.03** (4.56-5.53)	**5.63** (5.09-6.17)	**6.05** (5.45-6.64)	**6.46** (5.78-7.09)	**6.82** (6.07-7.49)	**7.28** (6.42-8.01)	**7.59** (6.65-8.37)
15-min	**2.67** (2.44-2.94)	**3.20** (2.92-3.52)	**3.82** (3.47-4.20)	**4.24** (3.85-4.66)	**4.75** (4.30-5.22)	**5.11** (4.60-5.60)	**5.44** (4.88-5.98)	**5.74** (5.11-6.30)	**6.11** (5.39-6.72)	**6.35** (5.57-7.00)
30-min	**1.83** (1.67-2.01)	**2.21** (2.02-2.43)	**2.71** (2.46-2.98)	**3.07** (2.79-3.38)	**3.52** (3.18-3.86)	**3.85** (3.46-4.22)	**4.17** (3.73-4.58)	**4.47** (3.98-4.91)	**4.86** (4.29-5.35)	**5.14** (4.51-5.67)
60-min	**1.14** (1.04-1.25)	**1.39** (1.27-1.53)	**1.74** (1.58-1.91)	**2.00** (1.82-2.20)	**2.34** (2.12-2.57)	**2.61** (2.35-2.86)	**2.87** (2.57-3.15)	**3.13** (2.79-3.44)	**3.49** (3.08-3.84)	**3.75** (3.29-4.14)
2-hr	**0.697** (0.630-0.774)	**0.850** (0.770-0.942)	**1.08** (0.974-1.20)	**1.26** (1.13-1.39)	**1.50** (1.35-1.66)	**1.70** (1.52-1.88)	**1.91** (1.69-2.11)	**2.13** (1.87-2.35)	**2.43** (2.11-2.69)	**2.67** (2.30-2.96)
3-hr	**0.518** (0.470-0.577)	**0.631** (0.573-0.703)	**0.802** (0.726-0.892)	**0.935** (0.844-1.04)	**1.12** (1.00-1.24)	**1.27** (1.13-1.41)	**1.42** (1.26-1.58)	**1.59** (1.40-1.76)	**1.81** (1.57-2.01)	**1.99** (1.71-2.22)
6-hr	**0.334** (0.302-0.372)	**0.406** (0.368-0.450)	**0.514** (0.464-0.569)	**0.603** (0.542-0.666)	**0.729** (0.650-0.803)	**0.835** (0.739-0.918)	**0.948** (0.832-1.04)	**1.07** (0.930-1.18)	**1.25** (1.07-1.37)	**1.39** (1.18-1.53)
12-hr	**0.205** (0.186-0.228)	**0.249** (0.226-0.277)	**0.317** (0.287-0.352)	**0.375** (0.337-0.415)	**0.460** (0.410-0.507)	**0.534** (0.472-0.587)	**0.613** (0.536-0.674)	**0.702** (0.606-0.772)	**0.833** (0.706-0.916)	**0.946** (0.789-1.04)
24-hr	**0.117** (0.108-0.127)	**0.141** (0.131-0.154)	**0.181** (0.167-0.197)	**0.215** (0.198-0.233)	**0.266** (0.243-0.288)	**0.310** (0.281-0.336)	**0.359** (0.323-0.389)	**0.414** (0.367-0.449)	**0.496** (0.433-0.540)	**0.566** (0.488-0.619)
2-day	**0.068** (0.063-0.075)	**0.083** (0.076-0.091)	**0.106** (0.097-0.115)	**0.125** (0.114-0.136)	**0.153** (0.139-0.167)	**0.177** (0.160-0.193)	**0.203** (0.182-0.221)	**0.231** (0.205-0.253)	**0.273** (0.238-0.300)	**0.308** (0.265-0.341)
3-day	**0.048** (0.044-0.053)	**0.058** (0.054-0.064)	**0.074** (0.068-0.081)	**0.087** (0.080-0.095)	**0.106** (0.097-0.116)	**0.122** (0.111-0.133)	**0.139** (0.125-0.152)	**0.158** (0.141-0.173)	**0.185** (0.162-0.204)	**0.208** (0.180-0.230)
4-day	**0.038** (0.035-0.041)	**0.046** (0.042-0.050)	**0.058** (0.054-0.063)	**0.068** (0.063-0.074)	**0.083** (0.076-0.090)	**0.095** (0.086-0.103)	**0.108** (0.097-0.117)	**0.122** (0.109-0.133)	**0.142** (0.125-0.155)	**0.158** (0.138-0.175)
7-day	**0.026** (0.024-0.028)	**0.031** (0.029-0.033)	**0.038** (0.035-0.041)	**0.044** (0.041-0.048)	**0.053** (0.049-0.057)	**0.060** (0.055-0.065)	**0.068** (0.062-0.074)	**0.076** (0.069-0.083)	**0.088** (0.078-0.096)	**0.098** (0.086-0.108)
10-day	**0.021** (0.019-0.022)	**0.025** (0.023-0.026)	**0.030** (0.028-0.032)	**0.034** (0.032-0.037)	**0.041** (0.038-0.044)	**0.046** (0.042-0.050)	**0.051** (0.047-0.056)	**0.057** (0.052-0.062)	**0.065** (0.058-0.071)	**0.072** (0.063-0.079)
20-day	**0.014** (0.013-0.015)	**0.016** (0.015-0.018)	**0.020** (0.018-0.021)	**0.022** (0.021-0.024)	**0.025** (0.024-0.027)	**0.028** (0.026-0.030)	**0.031** (0.028-0.033)	**0.033** (0.031-0.036)	**0.037** (0.034-0.040)	**0.040** (0.036-0.043)
30-day	**0.011** (0.011-0.012)	**0.014** (0.013-0.014)	**0.016** (0.015-0.017)	**0.018** (0.017-0.019)	**0.020** (0.019-0.021)	**0.022** (0.020-0.023)	**0.023** (0.022-0.025)	**0.025** (0.023-0.026)	**0.027** (0.025-0.029)	**0.029** (0.026-0.031)
45-day	**0.010** (0.009-0.010)	**0.011** (0.011-0.012)	**0.013** (0.013-0.014)	**0.015** (0.014-0.015)	**0.016** (0.015-0.017)	**0.018** (0.017-0.018)	**0.019** (0.018-0.020)	**0.020** (0.019-0.021)	**0.021** (0.020-0.023)	**0.022** (0.021-0.024)
60-day	**0.009** (0.008-0.009)	**0.010** (0.010-0.011)	**0.012** (0.011-0.012)	**0.013** (0.012-0.013)	**0.014** (0.013-0.015)	**0.015** (0.014-0.016)	**0.016** (0.015-0.017)	**0.017** (0.016-0.018)	**0.018** (0.017-0.019)	**0.019** (0.018-0.020)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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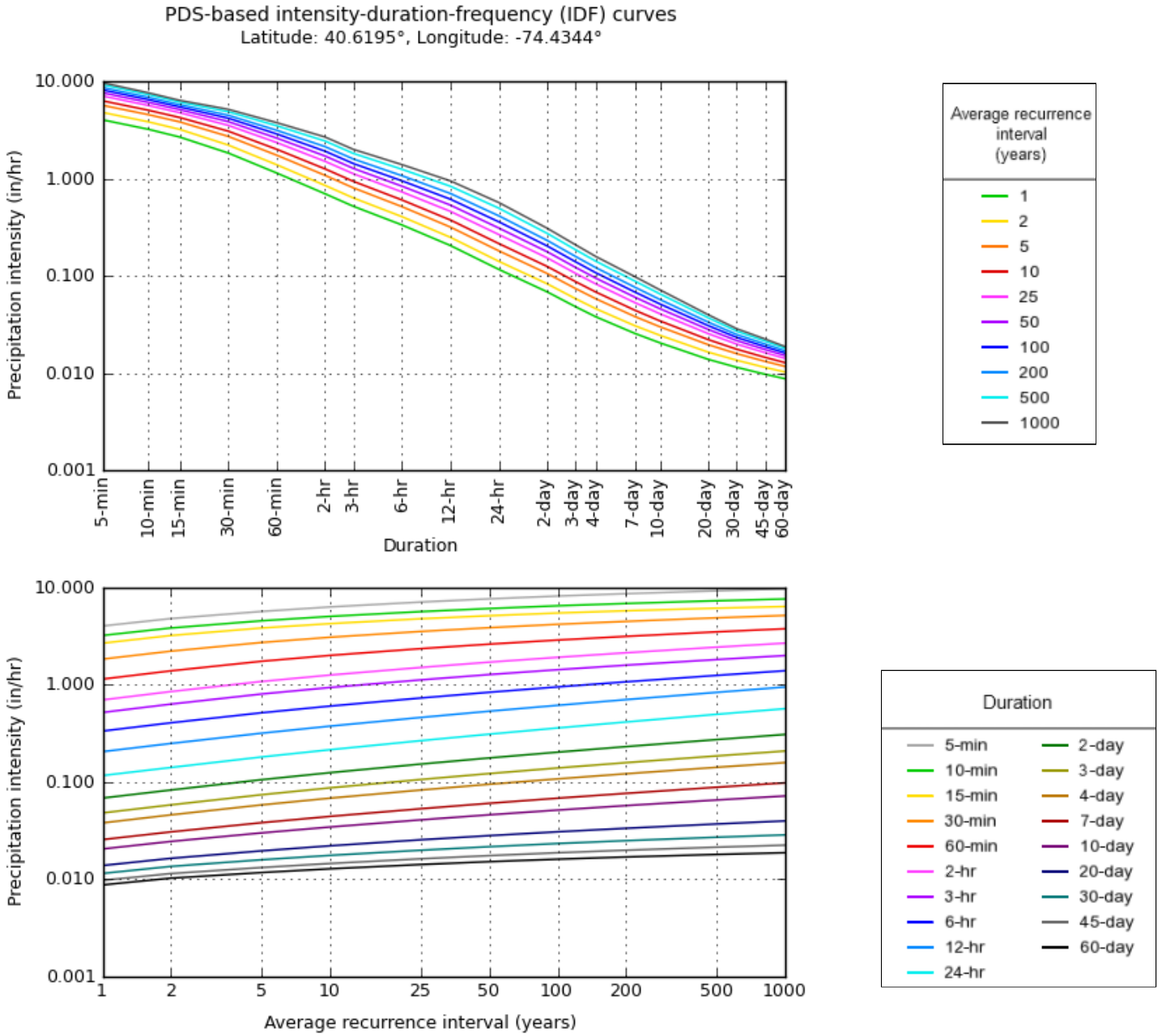
PF graphical



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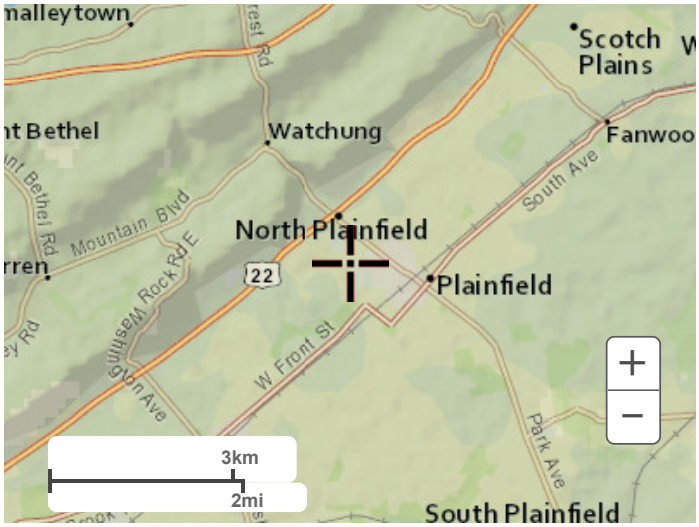
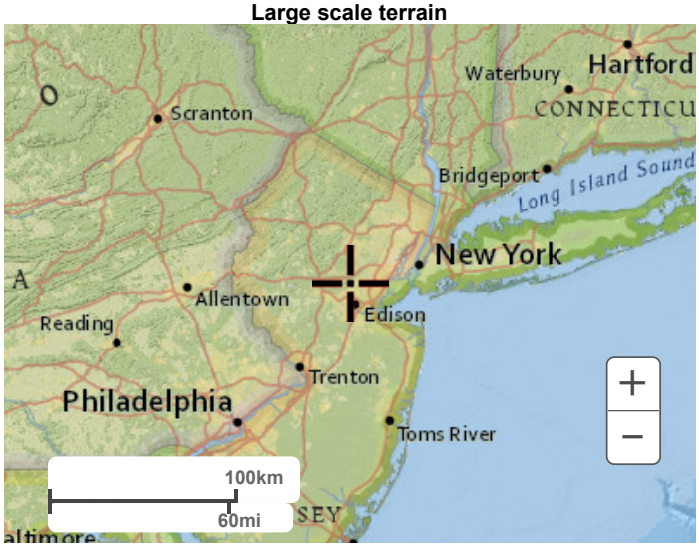
Maps & aerials

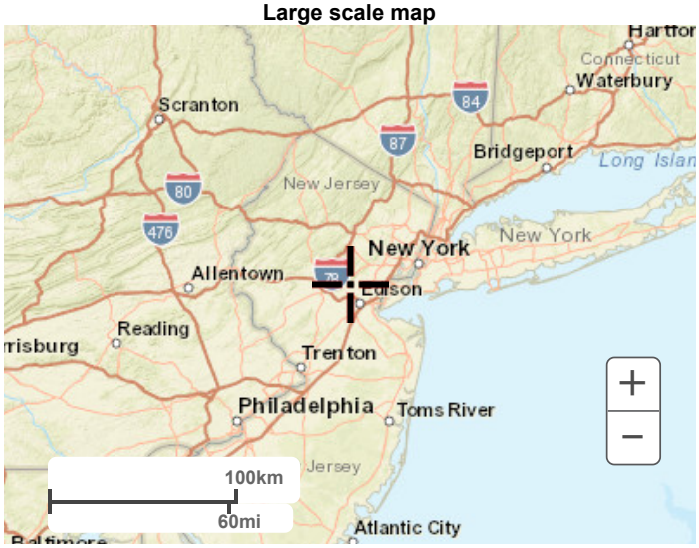
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

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