

STONEFIELD

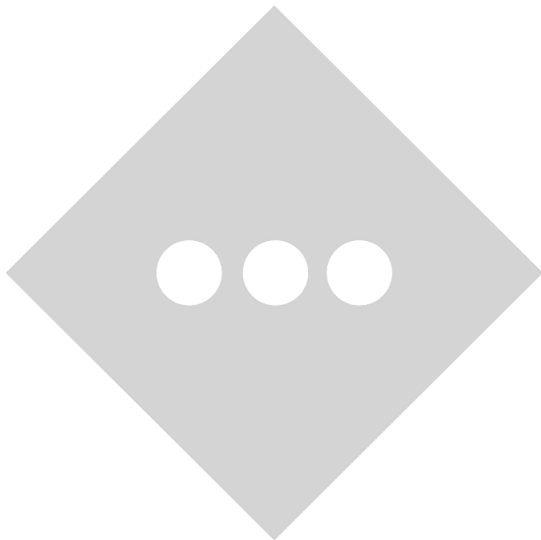
STORMWATER MANAGEMENT REPORT

**PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT
BLOCK 801, LOT 20
84-90 EAST MAIN STREET
BOROUGH OF MENDHAM
MORRIS COUNTY, NEW JERSEY**

**PREPARED FOR:
V-FEE MENDHAM APARTMENT, LLC**

**PREPARED BY:
STONEFIELD ENGINEERING & DESIGN, LLC
92 PARK AVENUE
RUTHERFORD, NEW JERSEY**

**REPORT DATE:
OCTOBER 20, 2022**



A handwritten signature in dark ink that reads "Chuck D. Olivo".

**CHUCK D. OLIVO, PE, PP, PTOE
NJ PE LICENSE #46719**

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 PROJECT DESCRIPTION

V-Fee Mendham Apartments, LLC is proposing to redevelop Block 801, Lot 20 (herein referred to as “project site”) to redevelop the rear portion of the site to accommodate a multi-family residential building, tenant premium parking, automotive sales & service, and recreational facilities. Additional site improvements are being provided to the lower portion of the site as well. Associated improvements throughout the entire lot include off-street parking areas, driveways, lighting fixtures, landscaping, stormwater infrastructure and other improvements as depicted on the accompanying site plan drawings. The subject property is located within the Borough of Mendham and is bounded by woods, wetland areas and a stream to the north, various commercial uses to the east, East Main Street (County Route 510) to the south, and residential dwellings to the west. Refer to **APPENDIX A** for project maps of the subject site.

The total project area is 577,865 SF (13.27 acres), the impervious surfaces have been reduced by 24,883 SF (0.57 acres), and the total area of disturbance is 224,928 SF (5.16 acres).

This Stormwater Management Report has been prepared to analyze the potential stormwater runoff impacts of the proposed project and discuss the measures proposed to conform to the stormwater management requirements set forth by the Borough of Mendham, Morris County Soil Conservation District, and the New Jersey Department of Environmental Protection (NJDEP).

2.0 EXISTING CONDITIONS

EXISTING SITE DEVELOPMENT

Under existing conditions, the northern portion on the project site is currently occupied by the Mendham Health & Racquet Club. The lower portion of the project site consists of a shopping center with various uses including a grocery store, drug store, laundromat, bank, and various restaurants. Access to the site is provided via three full-movement driveways along East Main Street and a parking lot that opens directly to the rear portion of the site. The subject property is bounded by woods, wetland areas and a stream to the north, various commercial uses to the east, East Main Street (County Route 510) to the south, and residential dwellings to the west. An Aerial Map depicting the existing site conditions can be found in **APPENDIX A**.

EXISTING TOPOGRAPHY

On-site topography averages between 1%-6% slopes. The high point of the subject site is at the southerly property area abutting East Main Street. Stormwater runoff from the site drains north through the parking lot and is collected by various inlets throughout the site. The runoff that is collected goes through the onsite conveyance system is ultimately released through one (1) discharge point to the stream/wetlands area to the north of the development.

PROJECT SITE SOILS

Soil mapping was obtained from the National Resource Conservation Service (NRCS) for the project site and immediate area. Generally, the project site is underlain with three (3) major soil groups: Gladstone gravelly loam, Cokesbury loam and Califon variant. Overall, the soils are assumed to have a generally slow infiltration rate, and runoff flows through the onsite conveyance system and overland directly to the wetlands/stream area to the rear of the site. The table below provide a summary of soils for the disturbed portion of the project site:

TABLE I: NRCS SOIL MAPPING RESULTS

Soil Unit Symbol	Soil Unit Description	Approximate Project Coverage	Hydrologic Soil Group
CapfB	Califon variant loam, 3 to 8 percent slopes	51.3%	C
CoaBc	Cokesbury loam, 0 to 8 percent slopes, extremely stony	48.6%	D
GkaoB	Gladstone, gravelly loam, 3 to 8 percent slopes	0.1%	B

Additional information regarding the NRCS soil mapping can be found in **APPENDIX B**.

3.0 PROPOSED CONDITIONS

PROPOSED SITE DEVELOPMENT

Under the proposed development plan, the northern portion of the project site will include a multi-family residential building consisting of 75 total units, tenant premium parking, automotive sales and service, and a recreational facility. Additional improvements include parking, landscaping, utilities, site lighting and stormwater management measures. Improvements to the lower portion of the project site include mill and overlay, full depth asphalt, landscaping, and stormwater management measures. Proposed stormwater onsite is being collected via the existing inlets and pipes, proposed inlets and pipes, proposed permeable pavers, and proposed roof leaders, and is being sent directly to the one discharge point at the wetlands/stream area to the north. Refer to **APPENDIX A** for a half-size Site Plan depicting the proposed project improvements.

PROPOSED TOPOGRAPHY

Project site topography and conveyance will generally maintain the predevelopment drainage patterns; however, to improve the accessibility and circulation the proposed topography will be more gradually sloped and will include the implementation of new catch basins, pipes and permeable pavers. The proposed conveyance system will divert runoff to the one existing discharge point accordingly to maintain existing drainage patterns to the maximum extent feasible.

4.0 STORMWATER MANAGEMENT METHODOLOGY & PARAMETERS

HYDROLOGIC METHODOLOGY

The analysis program “HydroCAD” Version 10.0 by HydroCAD Software Solutions was utilized to calculate and plot the runoff hydrographs. The program incorporates the time of concentration, C values, rainfall data, and project drainage areas to calculate the runoff characteristics. The existing and proposed drainage areas have been analyzed utilizing Intensity-Duration-Frequency data was obtained from NOAA for the project area; specifics of the rainfall distribution can be found in **APPENDIX C**. Additional key variables utilized in the analysis include:

TABLE 2: HYDROCAD DESIGN VARIABLES

Variable	Input	Variable	Input
Runoff Calculation Method	SCS TR-20	NRCS Rainfall Frequency Data Set	Morris County
Pervious/Impervious CN Calculations	Separate	Storm Intervals (Year Events)	2, 10, 100
Stage-Storage Relationship	Dynamic	Storm Duration	24 Hours
Minimum time of concentration	Calculated	Storm Curve	NOAA D

Additional information regarding the hydrologic calculations can be found in **APPENDIX C**.

HYDRAULIC METHODOLOGY

The analysis program “HydraFlow Storm Sewers” Version 2018 by Autodesk was utilized to generate hydraulic grade lines through the proposed conveyance system model based on various pipe / junction losses and the runoff tributary to each inlet or discharge structure. Additional key variables utilized in the analysis include:

TABLE 3: HYDRAFLOW DESIGN VARIABLES

Variable	Input	Variable	Input
Runoff Calculation Method	Rational	Pipe Conveyance Method	Std. Step
C-value for impervious surfaces	0.89	Initial Hydraulic Grade Line	Normalized
C-value for pervious surfaces	0.28	Inlet Drainage Area Delineation	Surveyed
Minimum time of concentration	Calculated	Inlet Geometry & Capacity	NJDOT Std.

Additional information regarding the hydrologic calculations can be found in **APPENDIX C**.

5.0 STORMWATER ANALYSIS

EXISTING DRAINAGE AREAS

Under existing conditions, the site is comprised of one (1) point of interest (POI). Point of Interest I (E-I) has been determined to be the northwesterly discharge point that leads to the stream/wetlands area. See below for a short summary of the area:

TABLE 4: SUMMARY OF EXISTING DRAINAGE AREAS

Drainage Area	Description	Area Extents (SF)	Impervious Area (SF)	TOC (MIN)
E-I	Existing Drainage to Stream	577,865	452,785	8.9

The existing drainage area was delineated based on field surveying data. Hydrologic calculations and parameters for each drainage area can be found in **APPENDIX C**; specific drainage area delineations and land cover can be found in **APPENDIX D**.

PROPOSED DRAINAGE AREAS

Under proposed conditions the site is also comprised of one (1) point of interest (POI). Point of Interest I (P-I) has been determined to be the northwesterly discharge point that leads to the stream/wetlands area. The primary change between existing and proposed conditions is the removal/installation of new pipes and catch basins, addition of permeable pavers, addition of roof leaders, and a change in overall land cover (impervious coverage reduction). See below for a short summary of the area:

TABLE 5: SUMMARY OF PROPOSED DRAINAGE AREAS

Drainage Area	Description	Area Extents (SF)	Impervious Area (SF)	TOC (MIN)
P-I	Proposed Drainage to Stream	577,865	427,902	8.9

All proposed drainage areas were delineated based on the proposed grading design overlain on field survey data. Hydrologic calculations and parameters for each drainage area can be found in **APPENDIX C**; specific drainage area delineations and land cover can be found in **APPENDIX D**.

STORMWATER MANAGEMENT DESIGN PARAMETERS

The proposed improvements will disturb 5.0 acres of land and will add 0.79 acres of new vehicular regulated surfaces; therefore, the project is defined as a “Major Development” per the Municipal Ordinance and NJDEP regulations. As such, the subject property is held to NJDEP standards for stormwater runoff quantity, groundwater recharge, and quality.

Quantity: The proposed development will meet the stormwater quantity requirements by demonstrating that at no point in time does the post-development hydrograph exceed the pre-development hydrograph; as the analysis area is the same and impervious surfaces have been decreased. Calculations can be found in **APPENDIX C**.

Groundwater Recharge: The proposed development will increase the amount of pervious surfaces throughout the site which will subsequently increase the total infiltration for the site.

Quality: Water quality across the site will be improved through the installation of permeable pavers to provide the required TSS removal and through the decrease of impervious surfaces.

STORMWATER RUNOFF QUANTITY

Runoff in post-construction conditions will be naturally reduced due to the increase in pervious surfaces. The proposed conveyance system will connect to existing stormwater infrastructure at two ultimate points (discharge point #1 to the northwest & discharge point #2 to the northeast). Both points ultimately discharge to the stream/wetlands area to the north. The peak flow rate to each existing system has been reduced. The tables below summarize hydraulics at each point of discharge during regulatory storm events:

TABLE 7: SUMMARY OF EXISTING DRAINAGE AREA FLOW RATE

Drainage Area	2-Year Flow Rate (CFS)	10-Year Flow Rate (CFS)	25-Year Flow Rate (CFS)	100-Year Flow Rate (CFS)
E-1	35.92	55.50	68.62	91.68

TABLE 8: SUMMARY OF PROPOSED DRAINAGE AREA FLOW RATE

Drainage Area	2-Year Flow Rate (CFS)	10-Year Flow Rate (CFS)	25-Year Flow Rate (CFS)	100-Year Flow Rate (CFS)
P-1	35.32	54.93	68.09	91.22

The development will reduce the overall stormwater runoff to the points of interest such that at no point in time does the proposed hydrograph exceed the existing hydrograph. Detailed diagrams and tables can be found in **APPENDIX C**. The table below outlines the reduction in peak flow for each regulated storm event (2, 10 & 100).

TABLE 9: STORMWATER RUNOFF QUANTITY COMPLIANCE SUMMARY AT POINT OF INTEREST I

Rainfall Event	Existing Flow Rate (CFS)	Proposed Flow Rate (CFS)	Proposed Reduction (%)
2-Year Storm	35.92	35.32	1.6
10-Year Storm	55.50	54.93	1.03
100-Year Storm	91.68	91.22	0.50

No adverse impacts are anticipated downstream of the project site. Detailed hydrologic calculations can be found in **APPENDIX C**.

WATER QUALITY

As the development proposes more than ¼ acre of new vehicular surfaces onsite, stormwater water quality measures apply. Given that the site was constructed/approved prior to 2004 and a majority of the existing vehicular surfaces are to remain, a water quality weighted average was considered. The overall site will require 14.69% TSS removal. In order to achieve same, pervious pavers are proposed to provide 95 % TSS removal for a portion of the proposed development, thereby proposing 16.59% TSS removal for the overall site. Water quality is also expected to be improved as there will be an overall decrease in impervious surfaces by 24,883 SF (0.57 AC). The table below outlines the TSS removal for the site.

TABLE 10: SUMMARY OF WEIGHTED TOTAL SUSPENDED SOLIDS REMOVAL RATES & PARAMETERS

TSS Removal	Required Impervious Area (to be treated)	Proposed Impervious Area	Weighted Required TSS Removal %	Weighted Proposed TSS Removal %
0%	4.32 ac	4.32	0	0
80%	0	1.06 ac	0	16.59
95%	0.79 ac	0	14.69	0
Total Area	5.11 ac	5.11 ac		
Weighted %			14.69	16.59

GROUNDWATER RECHARGE

As indicated in the Township Ordinances and NJAC 7:8-5.4, the project site shall demonstrate that the site and its stormwater management measures maintain 100 percent of the average annual pre-construction recharge volume for the site. As noted above, the proposed development will increase the amount of pervious surfaces throughout the site. This will subsequently reduce volumes in post-construction conditions, thereby increasing the total

infiltration for the site. Detailed diagrams and tables can be found in **APPENDIX C**. The table below outlines the reduction in volume for each regulated storm event.

TABLE I I: STORMWATER RUNOFF VOLUME REDUCTION SUMMARY AT POINT OF INTEREST I

Rainfall Event	Existing Runoff Volume (CF)	Proposed Runoff Volume (CF)	Proposed Reduction (%)
2-Year Storm	139,976	136,993	2.13
10-Year Storm	218,212	214,841	1.54
100-Year Storm	364,340	360,615	1.02

STORMWATER PIPE CONVEYANCE SYSTEM

The on-site stormwater conveyance system has been sized for the 25-year storm event and is able to safely convey runoff to the existing downstream infrastructure.

6.0 STORMWATER FACILITY OPERATIONS & MAINTENANCE

A Stormwater Operations & Maintenance Manual will be submitted for approval to the Borough of Mendham and Morris County Soil Conservation District prior to the start construction. Any required easements or covenants associated with the stormwater improvements will be recorded prior to the start of construction.

7.0 EROSION & SEDIMENT CONTROL

A Soil Erosion & Sediment Control Plan has been prepared in accordance with the latest edition of the Standards for Soil Erosion and Sediment Control in New Jersey. Proposed temporary measures during construction include silt fencing, hay bales, stabilized construction entrances, inlet filters, and cover for soil stabilization. No land disturbance will occur until a permit has been obtained from the Morris County Soil Conservation District.

8.0 CONCLUSIONS

The proposed project complies with all applicable stormwater management regulations and standards. As such, the project is not anticipated to have any adverse impacts on neighboring properties, downstream watercourses, or conveyance systems within the watershed.

9.0 REFERENCES

1. New Jersey Administrative Code Title 7, Chapter 8 Stormwater Management, last amended June 20, 2016
https://www.nj.gov/dep/rules/rules/njac7_8.pdf
2. New Jersey Stormwater Best Management Practices Manual, last revised November 2018

https://www.njstormwater.org/bmp_manual2.htm

3. Borough of Mendham Land Use Ordinance, last amended June 10, 2020

<https://ecode360.com/ME0530>

APPENDIX A PROJECT FIGURES

INVENTORY

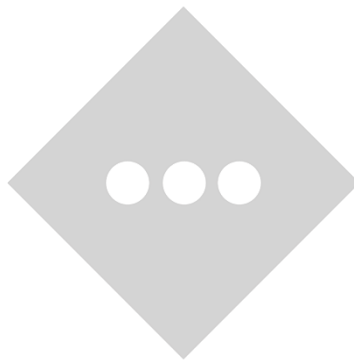
FIGURE 1: AERIAL MAP

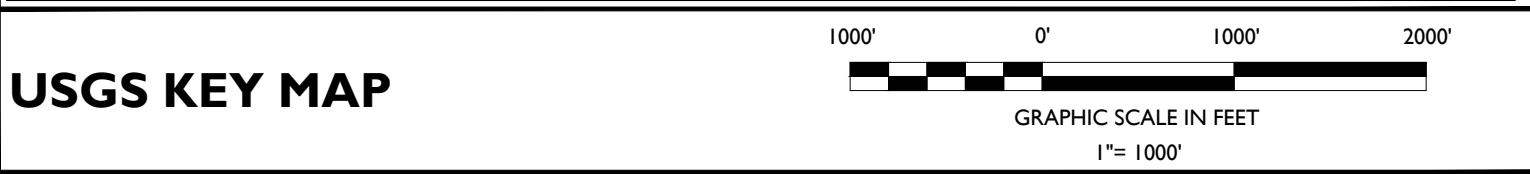
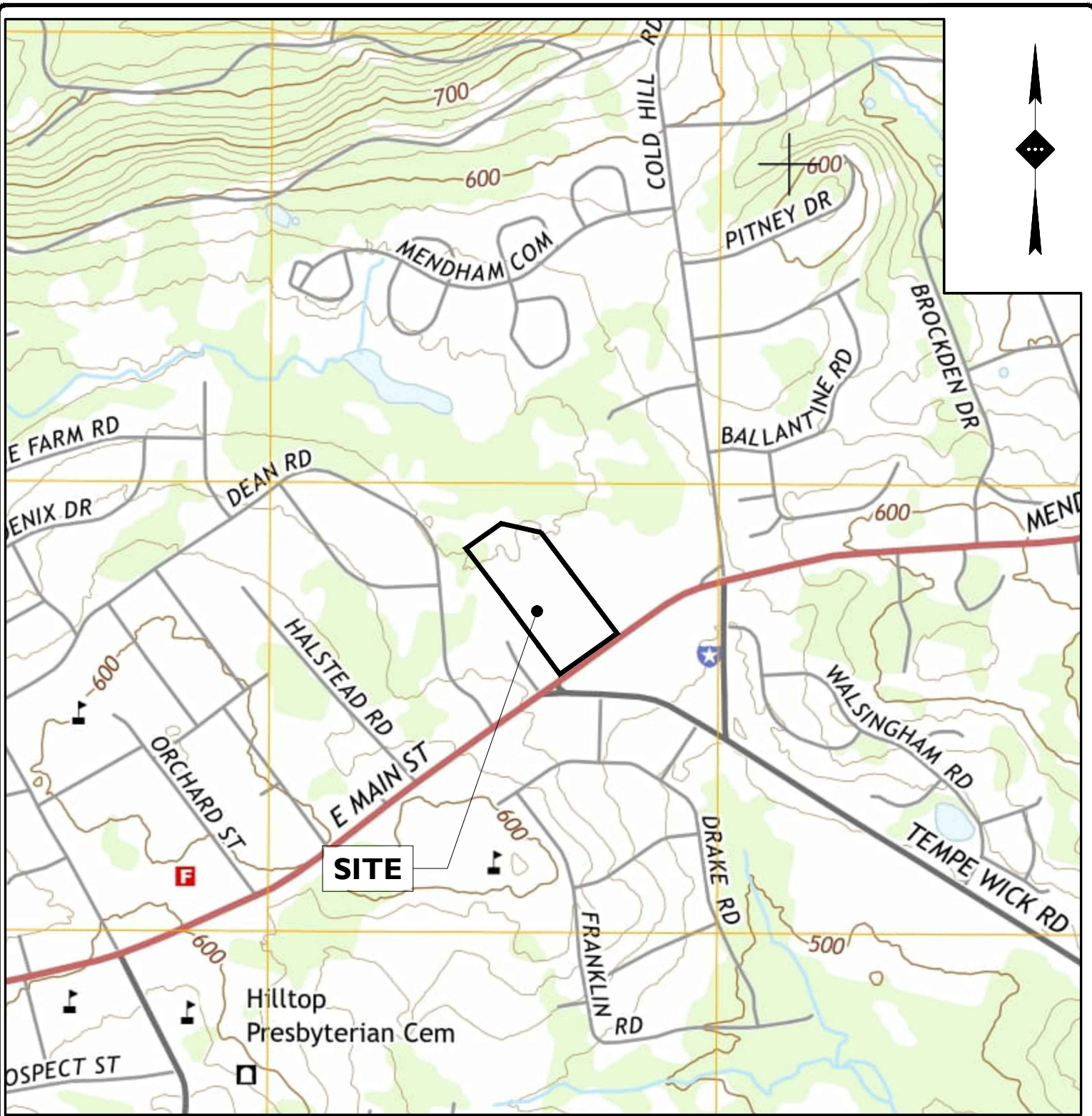
FIGURE 2: TAX & ZONING MAP


FIGURE 3: USGS LOCATION MAP

FIGURE 4: FEMA MAP

FIGURE 5: SITE PLAN (NOT TO SCALE)

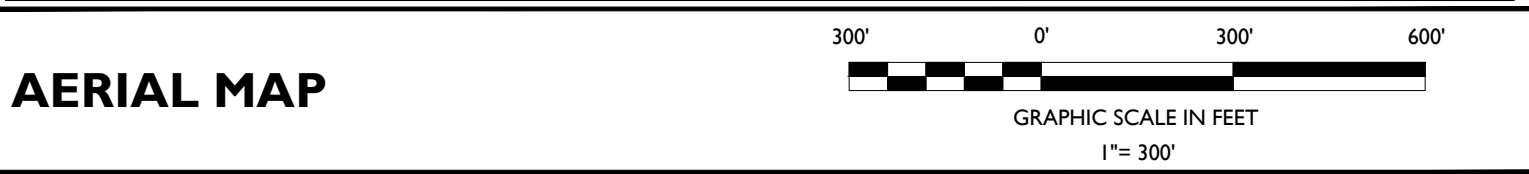
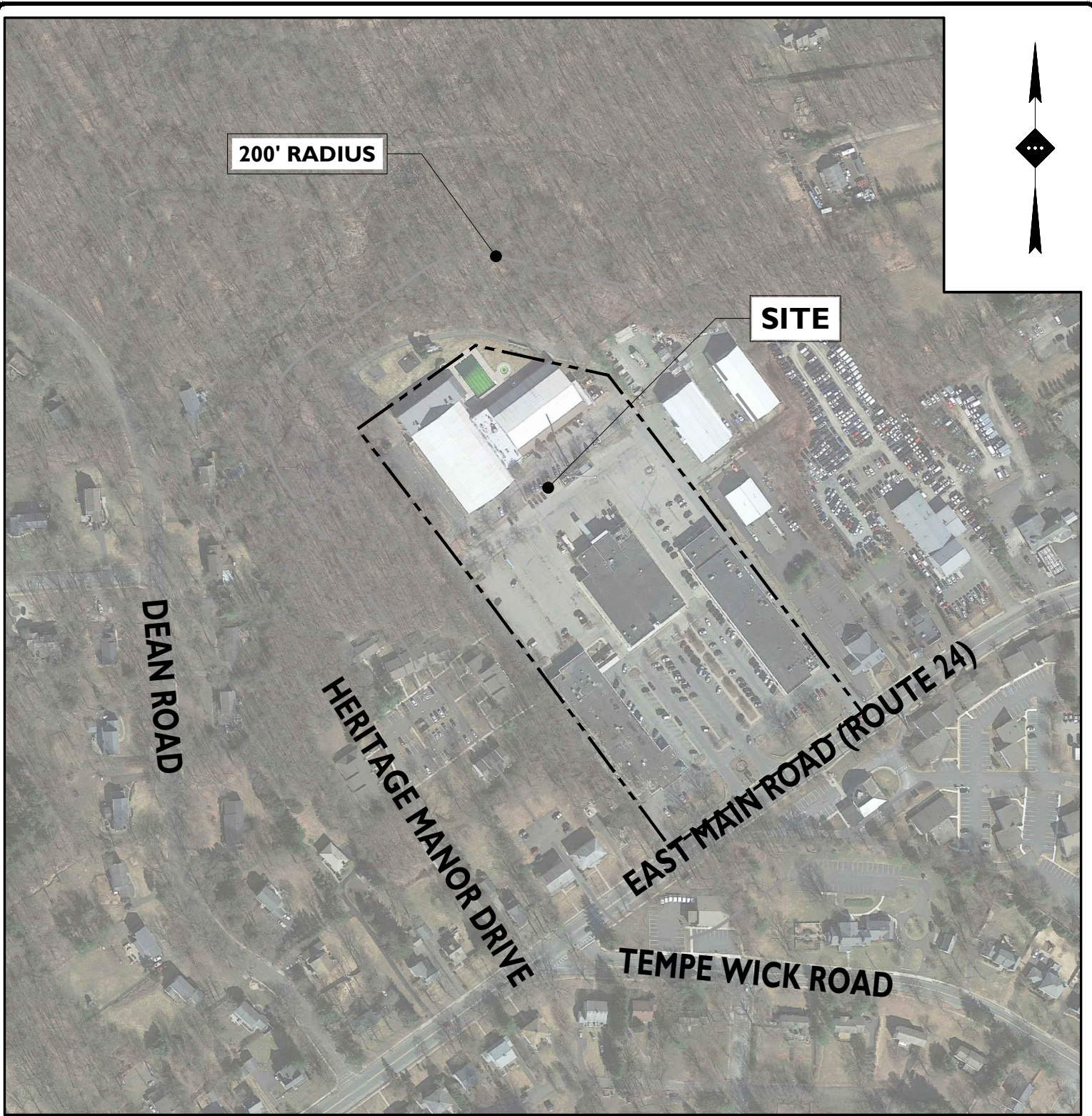




<p>SOURCE: MENDHAM QUADRANGLE NJ 7.5 MINUTE SERIES USGS MAP. DATED 2019</p>	<p>DRAWN BY: GT</p>	 <p>STONEFIELD engineering & design</p> <p>Rutherford, NJ · New York, NY · Boston, MA Princeton, NJ · Tampa, FL · Detroit, MI www.stonefielddeng.com</p> <p>Headquarters: 92 Park Avenue, Rutherford, NJ 07070 Phone 201.340.4468 · Fax 201.340.4472</p>
<p>V-FEE MENDHAM APARTMENTS, LLC</p>	<p>CHECKED BY: PK</p>	
<p>PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT</p>	<p>DATE: 07/28/2022</p>	
<p>BLOCK 801, LOT 20 84-90 EAST MAIN STREET BOROUGH OF MENDHAM, MORRIS COUNTY, NEW JERSEY</p>	<p>SCALE: 1"=1000'</p>	
	<p>PROJECT ID: RUT-200218</p>	

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SOURCE: GOOGLE EARTH PRO DATED 02/22/2020

V-FEE MENDHAM APARTMENTS, LLC
PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT

BLOCK 801, LOT 20
 84-90 EAST MAIN STREET
 BOROUGH OF MENDHAM, MORRIS COUNTY, NEW JERSEY

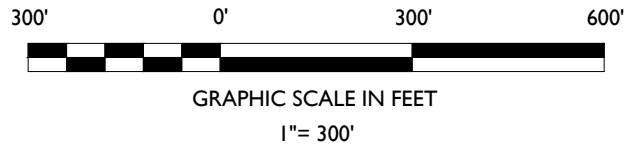
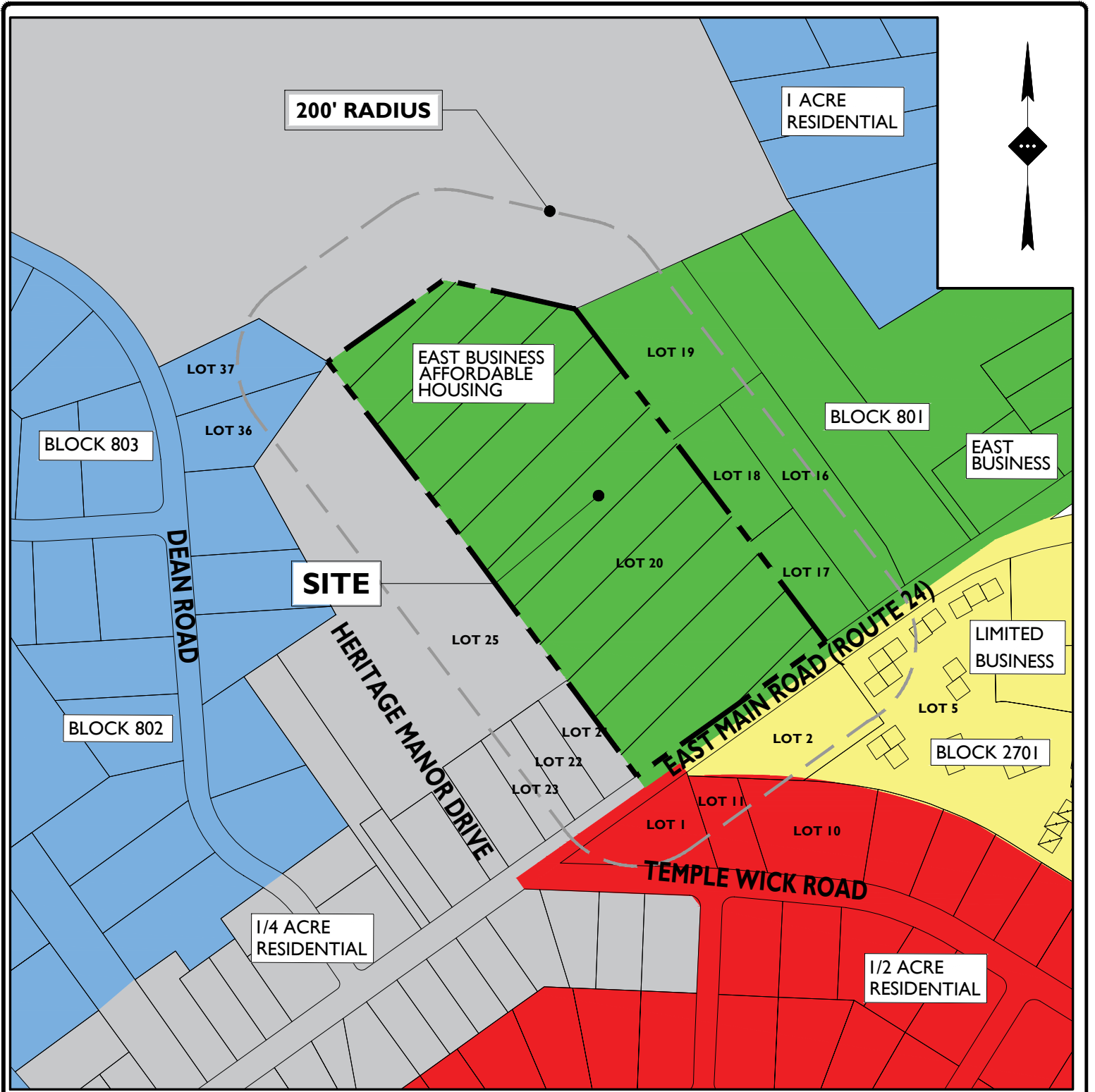
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DATE:	07/28/2022
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TAX & ZONING MAP

SOURCE: TAX MAP: BOROUGH OF MENDHAM'S TAX MAP, SHEET 8. DATED JULY 2010. ZONING MAP: THE BOROUGH OF MENDHAM'S ZONING MAP. DATED: 01/18/2012

V-FEE MENDHAM APARTMENTS, LLC PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT

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BOROUGH OF MENDHAM, MORRIS COUNTY, NEW JERSEY

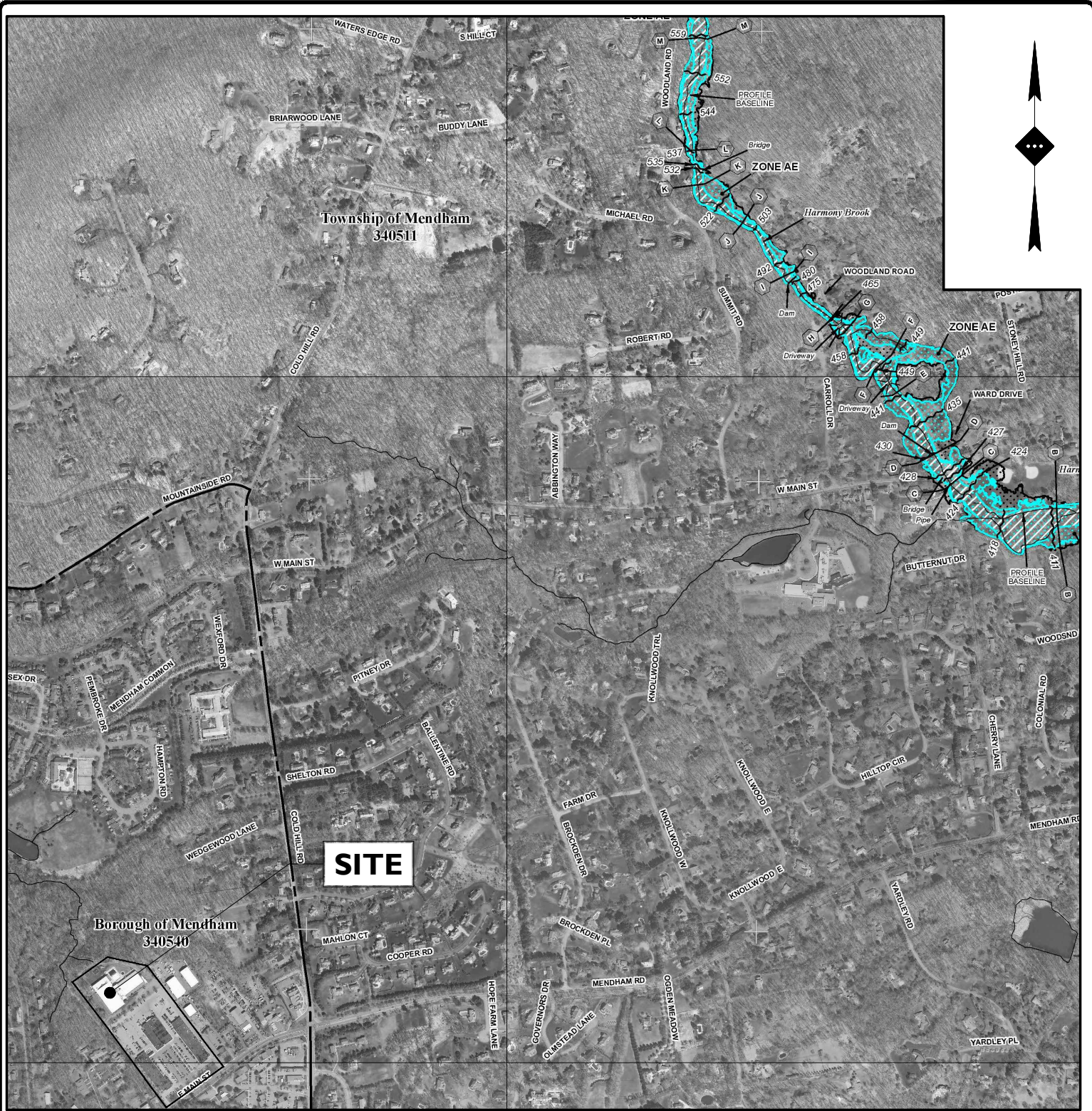
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EFFECTIVE FEMA FLOOD INSURANCE RATE MAP



GRAPHIC SCALE IN FEET

1" = 1000'

SOURCE: PRELIMINARY FLOOD INSURANCE RATE MAP, MORRIS COUNTY, NEW JERSEY, MAP NUMBER 34027C0287F DATED FEBRUARY 6, 2016

V-FEE MENDHAM APARTMENTS, LLC PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT

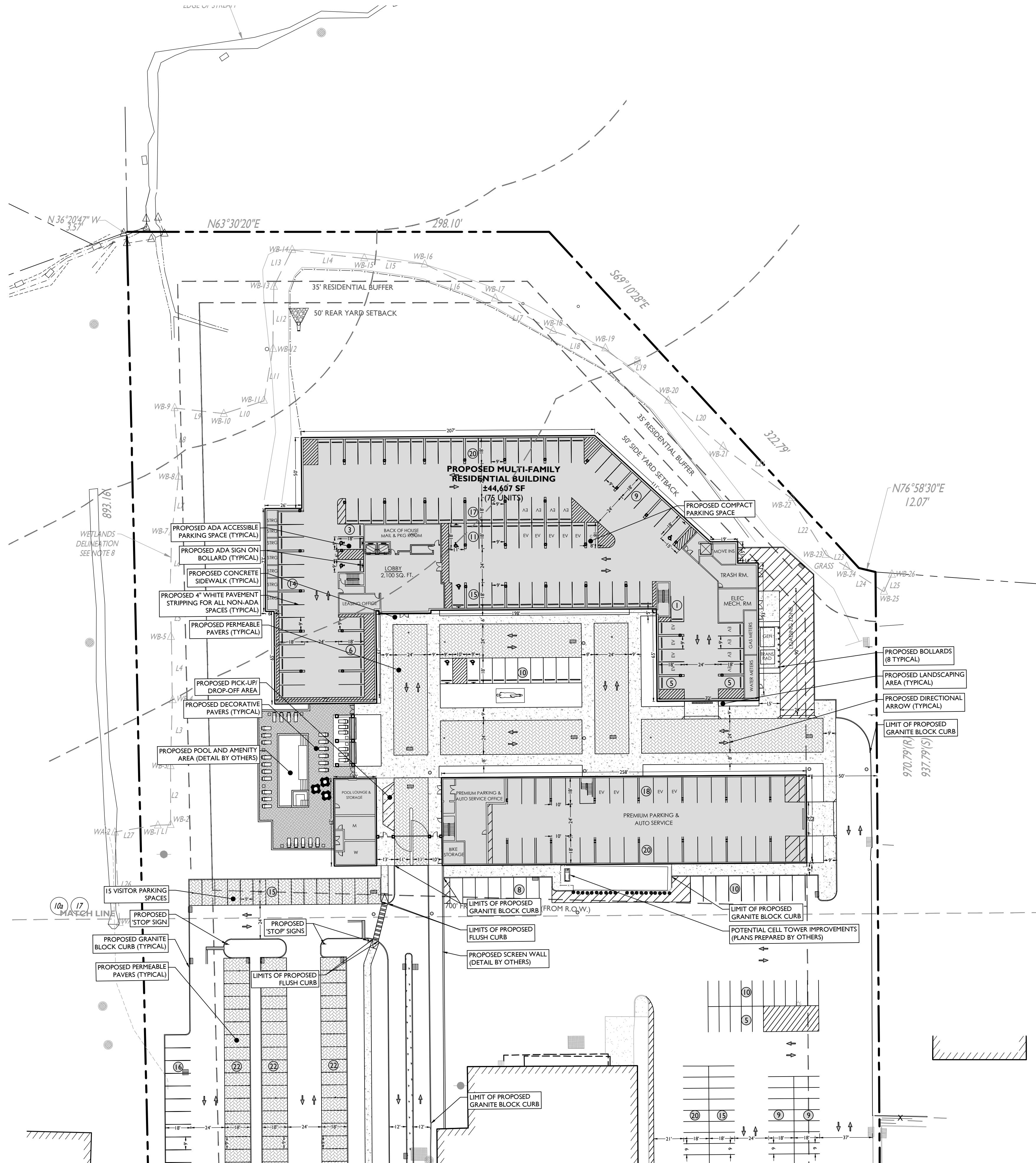
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BOROUGH OF MENDHAM, MORRIS COUNTY, NEW JERSEY

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SYMBOL	DESCRIPTION
---	PROPERTY LINE
- - - -	SETBACK LINE
- . - . - .	SAWCUT LINE
====	PROPOSED FLUSH CURB
=====	PROPOSED CURB
○ ○ ○	PROPOSED SIGNS / BOLLARDS
■	PROPOSED BUILDING
□	PROPOSED CONCRETE
▨	PROPOSED DECORATIVE PAVERS
▩	PROPOSED DECORATIVE PAVERS

NOT APPROVED FOR CONSTRUCTION

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PRELIMINARY AND FINAL SITE PLAN

V-FEE MENDHAM APARTMENTS, LLC

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MORRIS COUNTY, NEW JERSEY

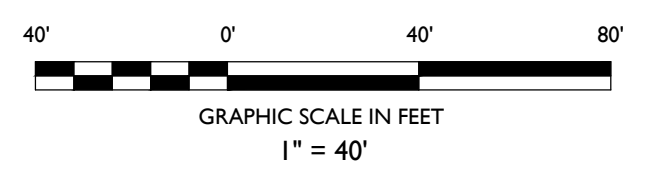
MATTHEW J. SECKLER, P.E.
NEW JERSEY LICENSE No. 48721
LICENSED PROFESSIONAL ENGINEER

STONEFIELD
engineering & design

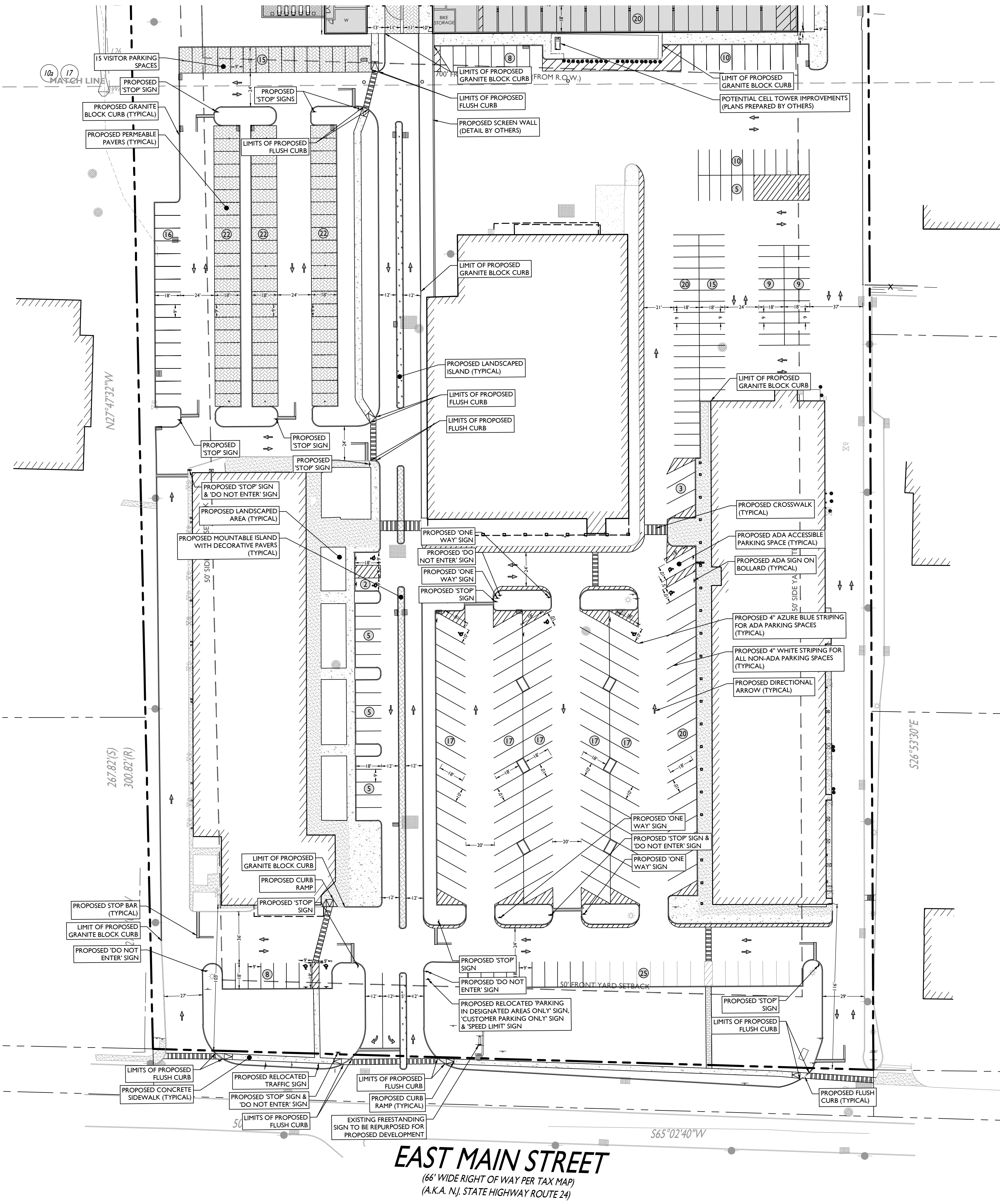
SCALE: 1" = 40' PROJECT ID: RUT-200218

TITLE: **SITE PLAN**

DRAWING: **C-6**

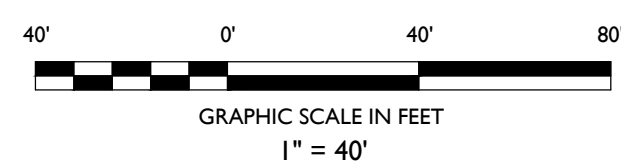


2:18 P:\PROJ\2002\200218\100 DEVELOPMENT - V-FEE EAST MAIN STREET - MENDHAM, NJ\CD\200218\6-25 SITE PLAN



EAST MAIN STREET
 (66' WIDE RIGHT OF WAY PER TAX MAP)
 (A.K.A. N.J. STATE HIGHWAY ROUTE 24)

SYMBOL	DESCRIPTION
---	PROPERTY LINE
- - -	SETBACK LINE
- . - . -	SAWCUT LINE
==	PROPOSED FLUSH CURB
---	PROPOSED CURB
○	PROPOSED SIGNS / BOLLARDS
▒	PROPOSED BUILDING
▒	PROPOSED CONCRETE
▒	PROPOSED DECORATIVE PAVERS
▒	PROPOSED DECORATIVE PAVERS



PK	BY	DATE	ISSUE	DESCRIPTION
1		10/07/2023		FOR MUNICIPAL SUBMISSION

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PRELIMINARY AND FINAL SITE PLAN

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 MORRIS COUNTY, NEW JERSEY

MATTHEW J. SECKLER, P.E.
 NEW JERSEY LICENSE No. 48731
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SCALE: 1" = 40' PROJECT ID: RUT-200218

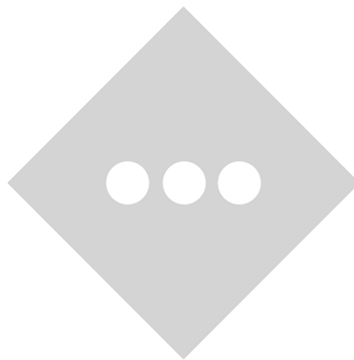
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APPENDIX B

NRCS SOILS REPORT



Hydrologic Soil Group—Morris County, New Jersey



Map Scale: 1:2,810 if printed on A landscape (11" x 8.5") sheet.



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: Morris County, New Jersey
 Survey Area Data: Version 16, 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: Mar 13, 2021—Sep 14, 2021

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
CapfB	Califon variant loam, 3 to 8 percent slopes	C	7.3	56.2%
CoaBc	Cokesbury loam, 0 to 8 percent slopes, extremely stony	D	5.6	43.2%
GkaoB	Gladstone gravelly loam, 3 to 8 percent slopes	B	0.1	0.6%
Totals for Area of Interest			12.9	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

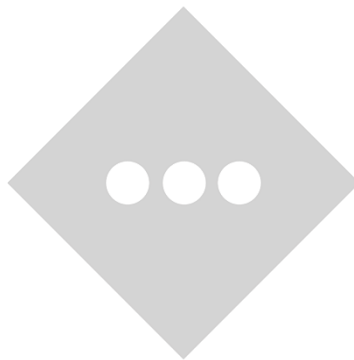
Tie-break Rule: Higher

APPENDIX C HYDROLOGIC & HYDRAULIC CALCULATIONS

INVENTORY

C-1: NOAA RAINFALL FREQUENCY DATA

C-2: HYDROCAD HYDROLOGIC CALCULATIONS





NOAA Atlas 14, Volume 2, Version 3
Location name: Mendham, New Jersey, USA*
Latitude: 40.7823°, Longitude: -74.5892°
Elevation: 549.77 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	0.338 (0.308-0.373)	0.403 (0.367-0.445)	0.478 (0.434-0.527)	0.531 (0.481-0.584)	0.595 (0.537-0.654)	0.640 (0.576-0.704)	0.685 (0.612-0.752)	0.728 (0.647-0.800)	0.778 (0.686-0.857)	0.815 (0.714-0.899)
10-min	0.539 (0.491-0.595)	0.644 (0.586-0.710)	0.762 (0.691-0.839)	0.844 (0.764-0.929)	0.943 (0.851-1.04)	1.01 (0.911-1.11)	1.08 (0.967-1.19)	1.14 (1.02-1.26)	1.22 (1.08-1.34)	1.27 (1.12-1.40)
15-min	0.673 (0.613-0.743)	0.807 (0.734-0.890)	0.962 (0.873-1.06)	1.07 (0.965-1.17)	1.19 (1.08-1.31)	1.28 (1.15-1.41)	1.37 (1.22-1.50)	1.44 (1.28-1.58)	1.53 (1.35-1.69)	1.59 (1.40-1.76)
30-min	0.919 (0.836-1.01)	1.11 (1.01-1.23)	1.36 (1.23-1.50)	1.54 (1.39-1.69)	1.76 (1.59-1.93)	1.92 (1.72-2.11)	2.08 (1.86-2.28)	2.23 (1.98-2.45)	2.42 (2.14-2.67)	2.56 (2.24-2.82)
60-min	1.14 (1.04-1.26)	1.39 (1.27-1.53)	1.74 (1.58-1.92)	2.00 (1.81-2.20)	2.33 (2.11-2.57)	2.59 (2.33-2.85)	2.85 (2.55-3.14)	3.11 (2.77-3.42)	3.46 (3.05-3.81)	3.72 (3.26-4.10)
2-hr	1.40 (1.27-1.54)	1.70 (1.55-1.88)	2.16 (1.95-2.38)	2.51 (2.26-2.76)	3.00 (2.69-3.29)	3.39 (3.03-3.73)	3.80 (3.37-4.17)	4.23 (3.73-4.64)	4.84 (4.21-5.32)	5.32 (4.59-5.85)
3-hr	1.57 (1.43-1.74)	1.91 (1.74-2.12)	2.42 (2.20-2.68)	2.82 (2.55-3.11)	3.37 (3.03-3.71)	3.82 (3.41-4.19)	4.27 (3.80-4.70)	4.75 (4.19-5.23)	5.42 (4.73-5.97)	5.96 (5.15-6.57)
6-hr	2.03 (1.85-2.25)	2.47 (2.25-2.72)	3.12 (2.84-3.44)	3.65 (3.31-4.01)	4.41 (3.96-4.83)	5.04 (4.50-5.51)	5.72 (5.06-6.25)	6.45 (5.65-7.04)	7.50 (6.48-8.20)	8.38 (7.15-9.17)
12-hr	2.55 (2.32-2.83)	3.10 (2.82-3.43)	3.94 (3.58-4.36)	4.65 (4.20-5.12)	5.69 (5.09-6.24)	6.59 (5.85-7.21)	7.57 (6.64-8.27)	8.65 (7.50-9.46)	10.3 (8.73-11.2)	11.7 (9.75-12.7)
24-hr	2.93 (2.70-3.20)	3.53 (3.26-3.86)	4.46 (4.11-4.87)	5.23 (4.81-5.71)	6.38 (5.83-6.94)	7.35 (6.68-7.98)	8.40 (7.59-9.13)	9.56 (8.55-10.4)	11.3 (9.94-12.3)	12.7 (11.1-13.8)
2-day	3.45 (3.18-3.76)	4.17 (3.85-4.55)	5.26 (4.85-5.74)	6.15 (5.66-6.71)	7.44 (6.81-8.10)	8.52 (7.75-9.26)	9.67 (8.74-10.5)	10.9 (9.78-11.9)	12.7 (11.2-13.9)	14.2 (12.4-15.5)
3-day	3.62 (3.35-3.93)	4.37 (4.04-4.75)	5.50 (5.08-5.97)	6.42 (5.91-6.96)	7.74 (7.09-8.38)	8.83 (8.06-9.56)	10.0 (9.07-10.8)	11.3 (10.1-12.2)	13.1 (11.6-14.2)	14.5 (12.8-15.9)
4-day	3.79 (3.51-4.10)	4.57 (4.24-4.94)	5.73 (5.31-6.20)	6.68 (6.17-7.22)	8.03 (7.38-8.67)	9.15 (8.37-9.87)	10.3 (9.40-11.2)	11.6 (10.5-12.5)	13.4 (12.0-14.5)	14.9 (13.2-16.2)
7-day	4.47 (4.15-4.84)	5.36 (4.98-5.80)	6.63 (6.15-7.17)	7.68 (7.10-8.29)	9.17 (8.44-9.90)	10.4 (9.53-11.2)	11.7 (10.7-12.7)	13.1 (11.9-14.2)	15.1 (13.5-16.4)	16.8 (14.8-18.2)
10-day	5.15 (4.80-5.53)	6.15 (5.74-6.61)	7.50 (6.99-8.05)	8.60 (7.99-9.23)	10.1 (9.37-10.9)	11.4 (10.5-12.2)	12.7 (11.6-13.6)	14.0 (12.8-15.1)	15.9 (14.3-17.1)	17.4 (15.6-18.8)
20-day	6.95 (6.52-7.41)	8.24 (7.73-8.80)	9.83 (9.22-10.5)	11.1 (10.4-11.8)	12.8 (11.9-13.6)	14.1 (13.1-15.0)	15.4 (14.3-16.4)	16.7 (15.5-17.9)	18.5 (17.0-19.9)	19.9 (18.2-21.4)
30-day	8.64 (8.17-9.15)	10.2 (9.63-10.8)	11.9 (11.2-12.6)	13.2 (12.5-14.0)	14.9 (14.0-15.8)	16.2 (15.2-17.2)	17.5 (16.4-18.5)	18.7 (17.5-19.9)	20.3 (18.9-21.7)	21.5 (19.9-23.0)
45-day	11.0 (10.4-11.6)	12.9 (12.2-13.6)	14.9 (14.1-15.7)	16.3 (15.5-17.2)	18.2 (17.2-19.2)	19.6 (18.5-20.7)	20.9 (19.7-22.0)	22.1 (20.8-23.4)	23.7 (22.2-25.1)	24.8 (23.2-26.3)
60-day	13.2 (12.5-13.9)	15.4 (14.6-16.3)	17.6 (16.7-18.6)	19.2 (18.3-20.3)	21.3 (20.2-22.4)	22.7 (21.5-24.0)	24.1 (22.8-25.5)	25.4 (24.0-26.8)	27.0 (25.4-28.5)	28.1 (26.3-29.8)

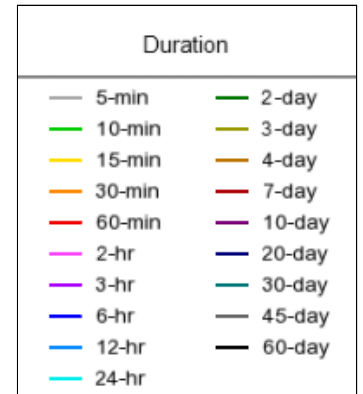
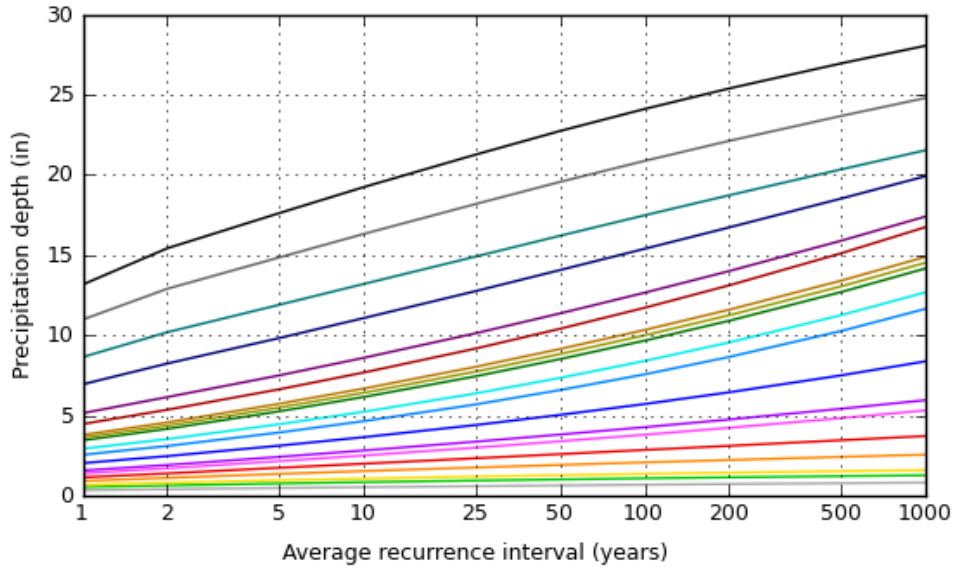
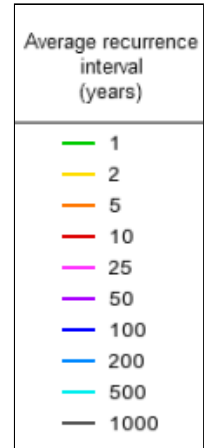
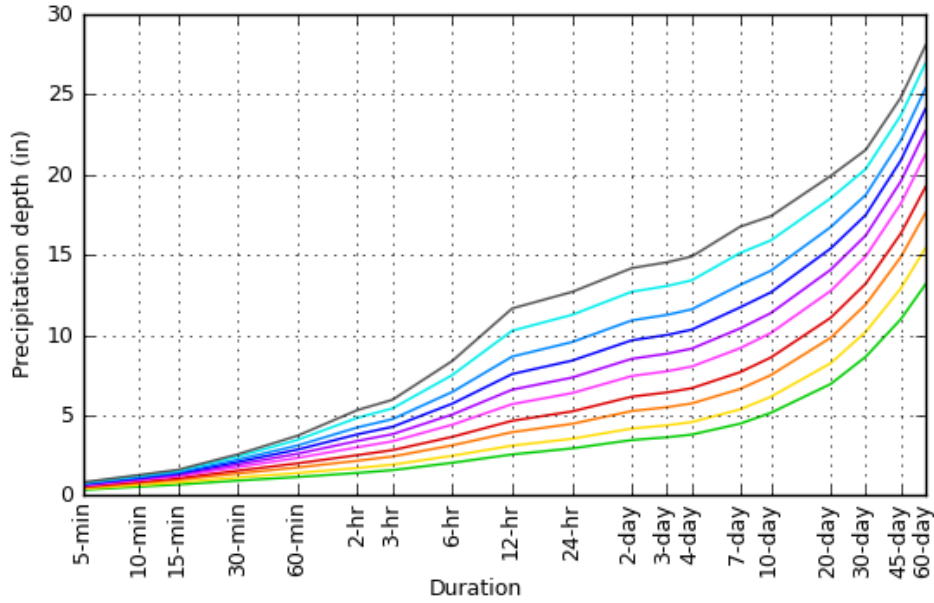
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average 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

PDS-based depth-duration-frequency (DDF) curves

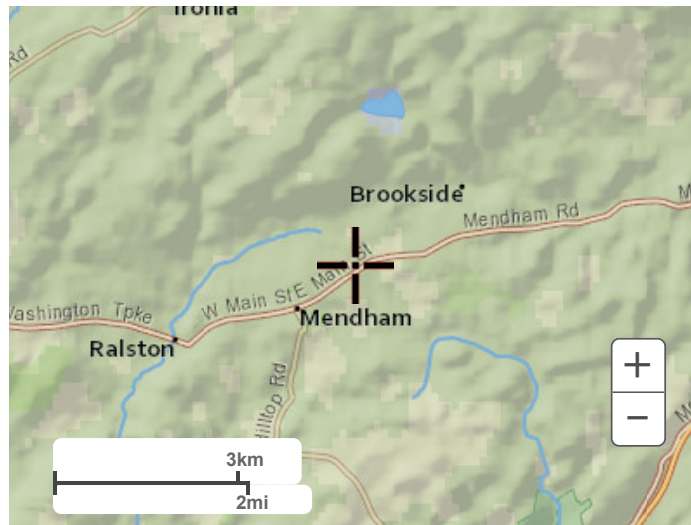
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Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



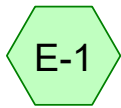
Large scale aerial



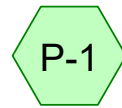
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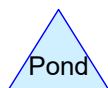
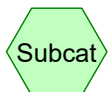
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Existing



Proposed



Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 6613 NJ Morris-D

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
241	61	Grass, Good (HSG B) (E-1, P-1)
68,346	74	Grass, Good (HSG C) (E-1, P-1)
97,536	80	Grass, Good (HSG D) (E-1, P-1)
427,902	98	Impervios (P-1)
452,785	98	Impervious (E-1)
108,920	77	Woods, Good (HSG D) (E-1, P-1)
1,155,730	93	TOTAL AREA

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
241	HSG B	E-1, P-1
68,346	HSG C	E-1, P-1
206,456	HSG D	E-1, P-1
880,687	Other	E-1, P-1
1,155,730		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchment Numbers
0	241	68,346	97,536	0	166,123	Grass, Good (E - 1 , P - 1
0	0	0	0	427,902	427,902	Impervios	P - 1
0	0	0	0	452,785	452,785	Impervious	E - 1
0	0	0	108,920	0	108,920	Woods, Good (E - 1 , P - 1
0	241	68,346	206,456	880,687	1,155,730	TOTAL AREA	

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: Existing

Runoff Area=577,865 sf 78.35% Impervious Runoff Depth=2.91"
Flow Length=338' Tc=8.9 min CN=77/98 Runoff=35.92 cfs 139,976 cf

Subcatchment P-1: Proposed

Runoff Area=577,865 sf 74.05% Impervious Runoff Depth=2.84"
Flow Length=338' Tc=8.9 min CN=78/98 Runoff=35.32 cfs 136,993 cf

Total Runoff Area = 1,155,730 sf Runoff Volume = 276,969 cf Average Runoff Depth = 2.88"
23.80% Pervious = 275,043 sf 76.20% Impervious = 880,687 sf

Summary for Subcatchment E-1: Existing

Runoff = 35.92 cfs @ 12.16 hrs, Volume= 139,976 cf, Depth= 2.91"

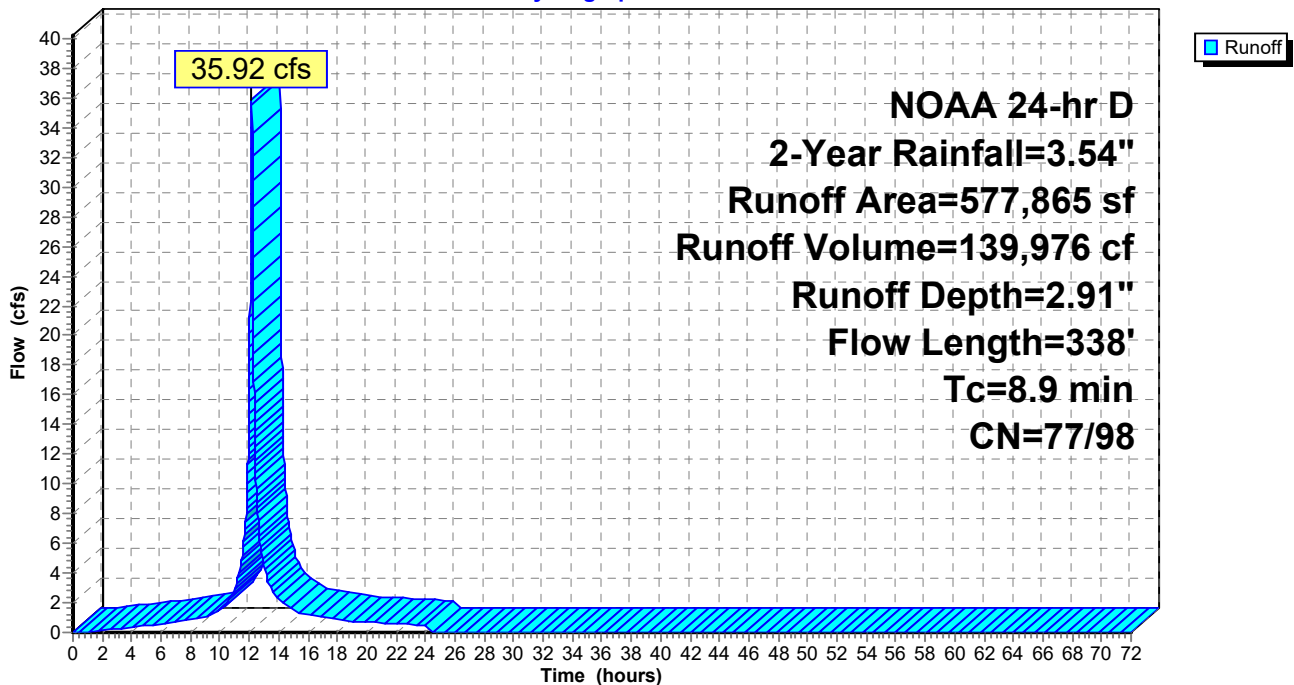
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 2-Year Rainfall=3.54"

	Area (sf)	CN	Description
*	452,785	98	Impervious
*	57	61	Grass, Good (HSG B)
*	35,138	74	Grass, Good (HSG C)
*	35,425	80	Grass, Good (HSG D)
*	54,460	77	Woods, Good (HSG D)
	577,865	93	Weighted Average
	125,080	77	21.65% Pervious Area
	452,785	98	78.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0202	0.22		Sheet Flow, 100 LF Sheet Flow (1-2) Grass: Short n= 0.150 P2= 5.34"
1.3	238	0.0335	2.95		Shallow Concentrated Flow, 238 LF SCF (2-3) Unpaved Kv= 16.1 fps
8.9	338	Total			

Subcatchment E-1: Existing

Hydrograph



Hydrograph for Subcatchment E-1: Existing

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
0.20	0.01	0.00	0.00	0.00
0.40	0.02	0.00	0.00	0.00
0.60	0.02	0.00	0.00	0.00
0.80	0.03	0.00	0.00	0.00
1.00	0.04	0.00	0.00	0.00
1.20	0.05	0.00	0.00	0.01
1.40	0.06	0.00	0.00	0.05
1.60	0.07	0.00	0.00	0.08
1.80	0.08	0.00	0.01	0.11
2.00	0.08	0.00	0.01	0.14
2.20	0.09	0.00	0.01	0.17
2.40	0.10	0.00	0.01	0.19
2.60	0.11	0.00	0.02	0.22
2.80	0.12	0.00	0.02	0.24
3.00	0.13	0.00	0.03	0.26
3.20	0.14	0.00	0.03	0.28
3.40	0.15	0.00	0.04	0.30
3.60	0.16	0.00	0.05	0.33
3.80	0.17	0.00	0.05	0.34
4.00	0.19	0.00	0.06	0.36
4.20	0.20	0.00	0.07	0.38
4.40	0.21	0.00	0.08	0.40
4.60	0.22	0.00	0.08	0.41
4.80	0.23	0.00	0.09	0.43
5.00	0.24	0.00	0.10	0.45
5.20	0.25	0.00	0.11	0.46
5.40	0.27	0.00	0.12	0.48
5.60	0.28	0.00	0.13	0.49
5.80	0.29	0.00	0.14	0.50
6.00	0.30	0.00	0.15	0.52
6.20	0.32	0.00	0.16	0.54
6.40	0.33	0.00	0.17	0.58
6.60	0.34	0.00	0.18	0.61
6.80	0.36	0.00	0.19	0.64
7.00	0.37	0.00	0.21	0.68
7.20	0.39	0.00	0.22	0.72
7.40	0.41	0.00	0.23	0.75
7.60	0.42	0.00	0.25	0.79
7.80	0.44	0.00	0.26	0.82
8.00	0.46	0.00	0.28	0.86
8.20	0.48	0.00	0.30	0.89
8.40	0.50	0.00	0.32	0.93
8.60	0.52	0.00	0.33	0.96
8.80	0.54	0.00	0.35	1.00
9.00	0.56	0.00	0.37	1.04
9.20	0.59	0.00	0.40	1.12
9.40	0.61	0.00	0.42	1.23
9.60	0.64	0.00	0.45	1.36
9.80	0.67	0.00	0.47	1.48
10.00	0.70	0.00	0.51	1.61
10.20	0.74	0.01	0.54	1.74
10.40	0.77	0.01	0.57	1.87

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
10.60	0.81	0.01	0.61	2.05
10.80	0.86	0.02	0.66	2.47
11.00	0.92	0.03	0.71	2.94
11.20	0.99	0.05	0.78	3.60
11.40	1.07	0.07	0.86	4.43
11.60	1.19	0.10	0.97	5.72
11.80	1.35	0.15	1.13	8.30
12.00	1.70	0.30	1.47	17.32
12.20	2.19	0.56	1.97	32.09
12.40	2.35	0.65	2.13	11.59
12.60	2.47	0.72	2.24	7.34
12.80	2.55	0.77	2.32	5.36
13.00	2.62	0.82	2.39	4.46
13.20	2.68	0.85	2.45	3.64
13.40	2.73	0.89	2.50	3.11
13.60	2.77	0.91	2.54	2.61
13.80	2.80	0.94	2.57	2.32
14.00	2.84	0.96	2.61	2.17
14.20	2.87	0.98	2.64	2.04
14.40	2.90	1.00	2.67	1.90
14.60	2.93	1.02	2.70	1.76
14.80	2.95	1.04	2.72	1.63
15.00	2.98	1.06	2.75	1.49
15.20	3.00	1.07	2.77	1.37
15.40	3.02	1.09	2.79	1.32
15.60	3.04	1.10	2.81	1.28
15.80	3.06	1.11	2.83	1.24
16.00	3.08	1.13	2.85	1.20
16.20	3.10	1.14	2.87	1.16
16.40	3.12	1.15	2.88	1.13
16.60	3.13	1.17	2.90	1.09
16.80	3.15	1.18	2.92	1.05
17.00	3.17	1.19	2.93	1.01
17.20	3.18	1.20	2.95	0.97
17.40	3.20	1.21	2.96	0.93
17.60	3.21	1.22	2.98	0.89
17.80	3.22	1.23	2.99	0.85
18.00	3.24	1.24	3.01	0.81
18.20	3.25	1.25	3.02	0.78
18.40	3.26	1.26	3.03	0.77
18.60	3.27	1.27	3.04	0.76
18.80	3.29	1.27	3.05	0.75
19.00	3.30	1.28	3.07	0.74
19.20	3.31	1.29	3.08	0.73
19.40	3.32	1.30	3.09	0.72
19.60	3.33	1.31	3.10	0.71
19.80	3.34	1.32	3.11	0.70
20.00	3.35	1.32	3.12	0.69
20.20	3.37	1.33	3.13	0.68
20.40	3.38	1.34	3.14	0.67
20.60	3.39	1.35	3.15	0.66
20.80	3.40	1.35	3.16	0.65
21.00	3.41	1.36	3.17	0.64

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
21.20	3.42	1.37	3.18	0.63
21.40	3.43	1.38	3.19	0.62
21.60	3.44	1.38	3.20	0.61
21.80	3.45	1.39	3.21	0.60
22.00	3.46	1.40	3.22	0.59
22.20	3.46	1.40	3.23	0.58
22.40	3.47	1.41	3.24	0.57
22.60	3.48	1.42	3.25	0.56
22.80	3.49	1.42	3.26	0.55
23.00	3.50	1.43	3.27	0.54
23.20	3.51	1.44	3.27	0.53
23.40	3.52	1.44	3.28	0.52
23.60	3.52	1.45	3.29	0.51
23.80	3.53	1.45	3.30	0.50
24.00	3.54	1.46	3.31	0.49
24.20	3.54	1.46	3.31	0.07
24.40	3.54	1.46	3.31	0.00
24.60	3.54	1.46	3.31	0.00
24.80	3.54	1.46	3.31	0.00
25.00	3.54	1.46	3.31	0.00
25.20	3.54	1.46	3.31	0.00
25.40	3.54	1.46	3.31	0.00
25.60	3.54	1.46	3.31	0.00
25.80	3.54	1.46	3.31	0.00
26.00	3.54	1.46	3.31	0.00
26.20	3.54	1.46	3.31	0.00
26.40	3.54	1.46	3.31	0.00
26.60	3.54	1.46	3.31	0.00
26.80	3.54	1.46	3.31	0.00
27.00	3.54	1.46	3.31	0.00
27.20	3.54	1.46	3.31	0.00
27.40	3.54	1.46	3.31	0.00
27.60	3.54	1.46	3.31	0.00
27.80	3.54	1.46	3.31	0.00
28.00	3.54	1.46	3.31	0.00
28.20	3.54	1.46	3.31	0.00
28.40	3.54	1.46	3.31	0.00
28.60	3.54	1.46	3.31	0.00
28.80	3.54	1.46	3.31	0.00
29.00	3.54	1.46	3.31	0.00
29.20	3.54	1.46	3.31	0.00
29.40	3.54	1.46	3.31	0.00
29.60	3.54	1.46	3.31	0.00
29.80	3.54	1.46	3.31	0.00
30.00	3.54	1.46	3.31	0.00
30.20	3.54	1.46	3.31	0.00
30.40	3.54	1.46	3.31	0.00
30.60	3.54	1.46	3.31	0.00
30.80	3.54	1.46	3.31	0.00
31.00	3.54	1.46	3.31	0.00
31.20	3.54	1.46	3.31	0.00
31.40	3.54	1.46	3.31	0.00
31.60	3.54	1.46	3.31	0.00

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
31.80	3.54	1.46	3.31	0.00
32.00	3.54	1.46	3.31	0.00
32.20	3.54	1.46	3.31	0.00
32.40	3.54	1.46	3.31	0.00
32.60	3.54	1.46	3.31	0.00
32.80	3.54	1.46	3.31	0.00
33.00	3.54	1.46	3.31	0.00
33.20	3.54	1.46	3.31	0.00
33.40	3.54	1.46	3.31	0.00
33.60	3.54	1.46	3.31	0.00
33.80	3.54	1.46	3.31	0.00
34.00	3.54	1.46	3.31	0.00
34.20	3.54	1.46	3.31	0.00
34.40	3.54	1.46	3.31	0.00
34.60	3.54	1.46	3.31	0.00
34.80	3.54	1.46	3.31	0.00
35.00	3.54	1.46	3.31	0.00
35.20	3.54	1.46	3.31	0.00
35.40	3.54	1.46	3.31	0.00
35.60	3.54	1.46	3.31	0.00
35.80	3.54	1.46	3.31	0.00
36.00	3.54	1.46	3.31	0.00
36.20	3.54	1.46	3.31	0.00
36.40	3.54	1.46	3.31	0.00
36.60	3.54	1.46	3.31	0.00
36.80	3.54	1.46	3.31	0.00
37.00	3.54	1.46	3.31	0.00
37.20	3.54	1.46	3.31	0.00
37.40	3.54	1.46	3.31	0.00
37.60	3.54	1.46	3.31	0.00
37.80	3.54	1.46	3.31	0.00
38.00	3.54	1.46	3.31	0.00
38.20	3.54	1.46	3.31	0.00
38.40	3.54	1.46	3.31	0.00
38.60	3.54	1.46	3.31	0.00
38.80	3.54	1.46	3.31	0.00
39.00	3.54	1.46	3.31	0.00
39.20	3.54	1.46	3.31	0.00
39.40	3.54	1.46	3.31	0.00
39.60	3.54	1.46	3.31	0.00
39.80	3.54	1.46	3.31	0.00
40.00	3.54	1.46	3.31	0.00
40.20	3.54	1.46	3.31	0.00
40.40	3.54	1.46	3.31	0.00
40.60	3.54	1.46	3.31	0.00
40.80	3.54	1.46	3.31	0.00
41.00	3.54	1.46	3.31	0.00
41.20	3.54	1.46	3.31	0.00
41.40	3.54	1.46	3.31	0.00
41.60	3.54	1.46	3.31	0.00
41.80	3.54	1.46	3.31	0.00
42.00	3.54	1.46	3.31	0.00
42.20	3.54	1.46	3.31	0.00

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
42.40	3.54	1.46	3.31	0.00
42.60	3.54	1.46	3.31	0.00
42.80	3.54	1.46	3.31	0.00
43.00	3.54	1.46	3.31	0.00
43.20	3.54	1.46	3.31	0.00
43.40	3.54	1.46	3.31	0.00
43.60	3.54	1.46	3.31	0.00
43.80	3.54	1.46	3.31	0.00
44.00	3.54	1.46	3.31	0.00
44.20	3.54	1.46	3.31	0.00
44.40	3.54	1.46	3.31	0.00
44.60	3.54	1.46	3.31	0.00
44.80	3.54	1.46	3.31	0.00
45.00	3.54	1.46	3.31	0.00
45.20	3.54	1.46	3.31	0.00
45.40	3.54	1.46	3.31	0.00
45.60	3.54	1.46	3.31	0.00
45.80	3.54	1.46	3.31	0.00
46.00	3.54	1.46	3.31	0.00
46.20	3.54	1.46	3.31	0.00
46.40	3.54	1.46	3.31	0.00
46.60	3.54	1.46	3.31	0.00
46.80	3.54	1.46	3.31	0.00
47.00	3.54	1.46	3.31	0.00
47.20	3.54	1.46	3.31	0.00
47.40	3.54	1.46	3.31	0.00
47.60	3.54	1.46	3.31	0.00
47.80	3.54	1.46	3.31	0.00
48.00	3.54	1.46	3.31	0.00
48.20	3.54	1.46	3.31	0.00
48.40	3.54	1.46	3.31	0.00
48.60	3.54	1.46	3.31	0.00
48.80	3.54	1.46	3.31	0.00
49.00	3.54	1.46	3.31	0.00
49.20	3.54	1.46	3.31	0.00
49.40	3.54	1.46	3.31	0.00
49.60	3.54	1.46	3.31	0.00
49.80	3.54	1.46	3.31	0.00
50.00	3.54	1.46	3.31	0.00
50.20	3.54	1.46	3.31	0.00
50.40	3.54	1.46	3.31	0.00
50.60	3.54	1.46	3.31	0.00
50.80	3.54	1.46	3.31	0.00
51.00	3.54	1.46	3.31	0.00
51.20	3.54	1.46	3.31	0.00
51.40	3.54	1.46	3.31	0.00
51.60	3.54	1.46	3.31	0.00
51.80	3.54	1.46	3.31	0.00
52.00	3.54	1.46	3.31	0.00
52.20	3.54	1.46	3.31	0.00
52.40	3.54	1.46	3.31	0.00
52.60	3.54	1.46	3.31	0.00
52.80	3.54	1.46	3.31	0.00

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
53.00	3.54	1.46	3.31	0.00
53.20	3.54	1.46	3.31	0.00
53.40	3.54	1.46	3.31	0.00
53.60	3.54	1.46	3.31	0.00
53.80	3.54	1.46	3.31	0.00
54.00	3.54	1.46	3.31	0.00
54.20	3.54	1.46	3.31	0.00
54.40	3.54	1.46	3.31	0.00
54.60	3.54	1.46	3.31	0.00
54.80	3.54	1.46	3.31	0.00
55.00	3.54	1.46	3.31	0.00
55.20	3.54	1.46	3.31	0.00
55.40	3.54	1.46	3.31	0.00
55.60	3.54	1.46	3.31	0.00
55.80	3.54	1.46	3.31	0.00
56.00	3.54	1.46	3.31	0.00
56.20	3.54	1.46	3.31	0.00
56.40	3.54	1.46	3.31	0.00
56.60	3.54	1.46	3.31	0.00
56.80	3.54	1.46	3.31	0.00
57.00	3.54	1.46	3.31	0.00
57.20	3.54	1.46	3.31	0.00
57.40	3.54	1.46	3.31	0.00
57.60	3.54	1.46	3.31	0.00
57.80	3.54	1.46	3.31	0.00
58.00	3.54	1.46	3.31	0.00
58.20	3.54	1.46	3.31	0.00
58.40	3.54	1.46	3.31	0.00
58.60	3.54	1.46	3.31	0.00
58.80	3.54	1.46	3.31	0.00
59.00	3.54	1.46	3.31	0.00
59.20	3.54	1.46	3.31	0.00
59.40	3.54	1.46	3.31	0.00
59.60	3.54	1.46	3.31	0.00
59.80	3.54	1.46	3.31	0.00
60.00	3.54	1.46	3.31	0.00
60.20	3.54	1.46	3.31	0.00
60.40	3.54	1.46	3.31	0.00
60.60	3.54	1.46	3.31	0.00
60.80	3.54	1.46	3.31	0.00
61.00	3.54	1.46	3.31	0.00
61.20	3.54	1.46	3.31	0.00
61.40	3.54	1.46	3.31	0.00
61.60	3.54	1.46	3.31	0.00
61.80	3.54	1.46	3.31	0.00
62.00	3.54	1.46	3.31	0.00
62.20	3.54	1.46	3.31	0.00
62.40	3.54	1.46	3.31	0.00
62.60	3.54	1.46	3.31	0.00
62.80	3.54	1.46	3.31	0.00
63.00	3.54	1.46	3.31	0.00
63.20	3.54	1.46	3.31	0.00
63.40	3.54	1.46	3.31	0.00

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
63.60	3.54	1.46	3.31	0.00
63.80	3.54	1.46	3.31	0.00
64.00	3.54	1.46	3.31	0.00
64.20	3.54	1.46	3.31	0.00
64.40	3.54	1.46	3.31	0.00
64.60	3.54	1.46	3.31	0.00
64.80	3.54	1.46	3.31	0.00
65.00	3.54	1.46	3.31	0.00
65.20	3.54	1.46	3.31	0.00
65.40	3.54	1.46	3.31	0.00
65.60	3.54	1.46	3.31	0.00
65.80	3.54	1.46	3.31	0.00
66.00	3.54	1.46	3.31	0.00
66.20	3.54	1.46	3.31	0.00
66.40	3.54	1.46	3.31	0.00
66.60	3.54	1.46	3.31	0.00
66.80	3.54	1.46	3.31	0.00
67.00	3.54	1.46	3.31	0.00
67.20	3.54	1.46	3.31	0.00
67.40	3.54	1.46	3.31	0.00
67.60	3.54	1.46	3.31	0.00
67.80	3.54	1.46	3.31	0.00
68.00	3.54	1.46	3.31	0.00
68.20	3.54	1.46	3.31	0.00
68.40	3.54	1.46	3.31	0.00
68.60	3.54	1.46	3.31	0.00
68.80	3.54	1.46	3.31	0.00
69.00	3.54	1.46	3.31	0.00
69.20	3.54	1.46	3.31	0.00
69.40	3.54	1.46	3.31	0.00
69.60	3.54	1.46	3.31	0.00
69.80	3.54	1.46	3.31	0.00
70.00	3.54	1.46	3.31	0.00
70.20	3.54	1.46	3.31	0.00
70.40	3.54	1.46	3.31	0.00
70.60	3.54	1.46	3.31	0.00
70.80	3.54	1.46	3.31	0.00
71.00	3.54	1.46	3.31	0.00
71.20	3.54	1.46	3.31	0.00
71.40	3.54	1.46	3.31	0.00
71.60	3.54	1.46	3.31	0.00
71.80	3.54	1.46	3.31	0.00
72.00	3.54	1.46	3.31	0.00

Summary for Subcatchment P-1: Proposed

Runoff = 35.32 cfs @ 12.16 hrs, Volume= 136,993 cf, Depth= 2.84"

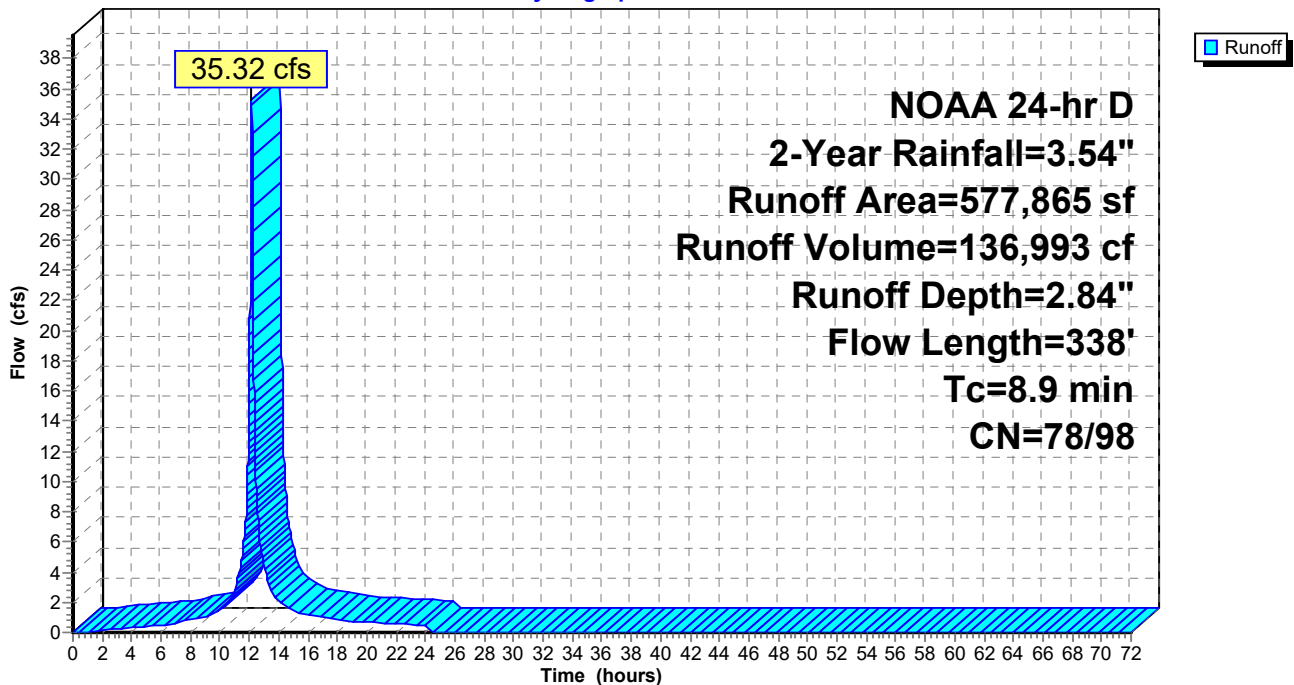
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 2-Year Rainfall=3.54"

	Area (sf)	CN	Description
*	427,902	98	Impervios
*	54,460	77	Woods, Good (HSG D)
*	184	61	Grass, Good (HSG B)
*	33,208	74	Grass, Good (HSG C)
*	62,111	80	Grass, Good (HSG D)
	577,865	93	Weighted Average
	149,963	78	25.95% Pervious Area
	427,902	98	74.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0202	0.22		Sheet Flow, 100 LF Sheet Flow (1-2) Grass: Short n= 0.150 P2= 5.34"
1.3	238	0.0335	2.95		Shallow Concentrated Flow, 238 LF SCF Unpaved Kv= 16.1 fps
8.9	338	Total			

Subcatchment P-1: Proposed

Hydrograph



Hydrograph for Subcatchment P-1: Proposed

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
0.20	0.01	0.00	0.00	0.00
0.40	0.02	0.00	0.00	0.00
0.60	0.02	0.00	0.00	0.00
0.80	0.03	0.00	0.00	0.00
1.00	0.04	0.00	0.00	0.00
1.20	0.05	0.00	0.00	0.01
1.40	0.06	0.00	0.00	0.04
1.60	0.07	0.00	0.00	0.07
1.80	0.08	0.00	0.01	0.10
2.00	0.08	0.00	0.01	0.13
2.20	0.09	0.00	0.01	0.16
2.40	0.10	0.00	0.01	0.18
2.60	0.11	0.00	0.02	0.20
2.80	0.12	0.00	0.02	0.23
3.00	0.13	0.00	0.03	0.25
3.20	0.14	0.00	0.03	0.27
3.40	0.15	0.00	0.04	0.29
3.60	0.16	0.00	0.05	0.31
3.80	0.17	0.00	0.05	0.33
4.00	0.19	0.00	0.06	0.34
4.20	0.20	0.00	0.07	0.36
4.40	0.21	0.00	0.08	0.38
4.60	0.22	0.00	0.08	0.39
4.80	0.23	0.00	0.09	0.41
5.00	0.24	0.00	0.10	0.42
5.20	0.25	0.00	0.11	0.43
5.40	0.27	0.00	0.12	0.45
5.60	0.28	0.00	0.13	0.46
5.80	0.29	0.00	0.14	0.48
6.00	0.30	0.00	0.15	0.49
6.20	0.32	0.00	0.16	0.51
6.40	0.33	0.00	0.17	0.55
6.60	0.34	0.00	0.18	0.58
6.80	0.36	0.00	0.19	0.61
7.00	0.37	0.00	0.21	0.64
7.20	0.39	0.00	0.22	0.68
7.40	0.41	0.00	0.23	0.71
7.60	0.42	0.00	0.25	0.74
7.80	0.44	0.00	0.26	0.78
8.00	0.46	0.00	0.28	0.81
8.20	0.48	0.00	0.30	0.85
8.40	0.50	0.00	0.32	0.88
8.60	0.52	0.00	0.33	0.91
8.80	0.54	0.00	0.35	0.95
9.00	0.56	0.00	0.37	0.98
9.20	0.59	0.00	0.40	1.06
9.40	0.61	0.00	0.42	1.18
9.60	0.64	0.00	0.45	1.29
9.80	0.67	0.00	0.47	1.41
10.00	0.70	0.01	0.51	1.54
10.20	0.74	0.01	0.54	1.67
10.40	0.77	0.01	0.57	1.80

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
10.60	0.81	0.02	0.61	1.97
10.80	0.86	0.03	0.66	2.38
11.00	0.92	0.04	0.71	2.83
11.20	0.99	0.06	0.78	3.49
11.40	1.07	0.08	0.86	4.29
11.60	1.19	0.11	0.97	5.56
11.80	1.35	0.17	1.13	8.09
12.00	1.70	0.32	1.47	16.95
12.20	2.19	0.60	1.97	31.58
12.40	2.35	0.69	2.13	11.44
12.60	2.47	0.77	2.24	7.25
12.80	2.55	0.82	2.32	5.30
13.00	2.62	0.87	2.39	4.41
13.20	2.68	0.90	2.45	3.60
13.40	2.73	0.94	2.50	3.08
13.60	2.77	0.97	2.54	2.58
13.80	2.80	0.99	2.57	2.29
14.00	2.84	1.02	2.61	2.15
14.20	2.87	1.04	2.64	2.02
14.40	2.90	1.06	2.67	1.88
14.60	2.93	1.08	2.70	1.75
14.80	2.95	1.10	2.72	1.61
15.00	2.98	1.11	2.75	1.48
15.20	3.00	1.13	2.77	1.35
15.40	3.02	1.14	2.79	1.31
15.60	3.04	1.16	2.81	1.27
15.80	3.06	1.17	2.83	1.23
16.00	3.08	1.19	2.85	1.19
16.20	3.10	1.20	2.87	1.16
16.40	3.12	1.21	2.88	1.12
16.60	3.13	1.23	2.90	1.08
16.80	3.15	1.24	2.92	1.04
17.00	3.17	1.25	2.93	1.00
17.20	3.18	1.26	2.95	0.96
17.40	3.20	1.27	2.96	0.92
17.60	3.21	1.28	2.98	0.88
17.80	3.22	1.29	2.99	0.85
18.00	3.24	1.30	3.01	0.81
18.20	3.25	1.31	3.02	0.77
18.40	3.26	1.32	3.03	0.76
18.60	3.27	1.33	3.04	0.75
18.80	3.29	1.34	3.05	0.74
19.00	3.30	1.35	3.07	0.73
19.20	3.31	1.35	3.08	0.72
19.40	3.32	1.36	3.09	0.71
19.60	3.33	1.37	3.10	0.70
19.80	3.34	1.38	3.11	0.69
20.00	3.35	1.39	3.12	0.68
20.20	3.37	1.40	3.13	0.67
20.40	3.38	1.40	3.14	0.66
20.60	3.39	1.41	3.15	0.66
20.80	3.40	1.42	3.16	0.64
21.00	3.41	1.43	3.17	0.64

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
21.20	3.42	1.43	3.18	0.62
21.40	3.43	1.44	3.19	0.62
21.60	3.44	1.45	3.20	0.61
21.80	3.45	1.46	3.21	0.60
22.00	3.46	1.46	3.22	0.59
22.20	3.46	1.47	3.23	0.58
22.40	3.47	1.48	3.24	0.57
22.60	3.48	1.48	3.25	0.56
22.80	3.49	1.49	3.26	0.55
23.00	3.50	1.50	3.27	0.54
23.20	3.51	1.50	3.27	0.53
23.40	3.52	1.51	3.28	0.52
23.60	3.52	1.52	3.29	0.51
23.80	3.53	1.52	3.30	0.50
24.00	3.54	1.53	3.31	0.49
24.20	3.54	1.53	3.31	0.07
24.40	3.54	1.53	3.31	0.00
24.60	3.54	1.53	3.31	0.00
24.80	3.54	1.53	3.31	0.00
25.00	3.54	1.53	3.31	0.00
25.20	3.54	1.53	3.31	0.00
25.40	3.54	1.53	3.31	0.00
25.60	3.54	1.53	3.31	0.00
25.80	3.54	1.53	3.31	0.00
26.00	3.54	1.53	3.31	0.00
26.20	3.54	1.53	3.31	0.00
26.40	3.54	1.53	3.31	0.00
26.60	3.54	1.53	3.31	0.00
26.80	3.54	1.53	3.31	0.00
27.00	3.54	1.53	3.31	0.00
27.20	3.54	1.53	3.31	0.00
27.40	3.54	1.53	3.31	0.00
27.60	3.54	1.53	3.31	0.00
27.80	3.54	1.53	3.31	0.00
28.00	3.54	1.53	3.31	0.00
28.20	3.54	1.53	3.31	0.00
28.40	3.54	1.53	3.31	0.00
28.60	3.54	1.53	3.31	0.00
28.80	3.54	1.53	3.31	0.00
29.00	3.54	1.53	3.31	0.00
29.20	3.54	1.53	3.31	0.00
29.40	3.54	1.53	3.31	0.00
29.60	3.54	1.53	3.31	0.00
29.80	3.54	1.53	3.31	0.00
30.00	3.54	1.53	3.31	0.00
30.20	3.54	1.53	3.31	0.00
30.40	3.54	1.53	3.31	0.00
30.60	3.54	1.53	3.31	0.00
30.80	3.54	1.53	3.31	0.00
31.00	3.54	1.53	3.31	0.00
31.20	3.54	1.53	3.31	0.00
31.40	3.54	1.53	3.31	0.00
31.60	3.54	1.53	3.31	0.00

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
31.80	3.54	1.53	3.31	0.00
32.00	3.54	1.53	3.31	0.00
32.20	3.54	1.53	3.31	0.00
32.40	3.54	1.53	3.31	0.00
32.60	3.54	1.53	3.31	0.00
32.80	3.54	1.53	3.31	0.00
33.00	3.54	1.53	3.31	0.00
33.20	3.54	1.53	3.31	0.00
33.40	3.54	1.53	3.31	0.00
33.60	3.54	1.53	3.31	0.00
33.80	3.54	1.53	3.31	0.00
34.00	3.54	1.53	3.31	0.00
34.20	3.54	1.53	3.31	0.00
34.40	3.54	1.53	3.31	0.00
34.60	3.54	1.53	3.31	0.00
34.80	3.54	1.53	3.31	0.00
35.00	3.54	1.53	3.31	0.00
35.20	3.54	1.53	3.31	0.00
35.40	3.54	1.53	3.31	0.00
35.60	3.54	1.53	3.31	0.00
35.80	3.54	1.53	3.31	0.00
36.00	3.54	1.53	3.31	0.00
36.20	3.54	1.53	3.31	0.00
36.40	3.54	1.53	3.31	0.00
36.60	3.54	1.53	3.31	0.00
36.80	3.54	1.53	3.31	0.00
37.00	3.54	1.53	3.31	0.00
37.20	3.54	1.53	3.31	0.00
37.40	3.54	1.53	3.31	0.00
37.60	3.54	1.53	3.31	0.00
37.80	3.54	1.53	3.31	0.00
38.00	3.54	1.53	3.31	0.00
38.20	3.54	1.53	3.31	0.00
38.40	3.54	1.53	3.31	0.00
38.60	3.54	1.53	3.31	0.00
38.80	3.54	1.53	3.31	0.00
39.00	3.54	1.53	3.31	0.00
39.20	3.54	1.53	3.31	0.00
39.40	3.54	1.53	3.31	0.00
39.60	3.54	1.53	3.31	0.00
39.80	3.54	1.53	3.31	0.00
40.00	3.54	1.53	3.31	0.00
40.20	3.54	1.53	3.31	0.00
40.40	3.54	1.53	3.31	0.00
40.60	3.54	1.53	3.31	0.00
40.80	3.54	1.53	3.31	0.00
41.00	3.54	1.53	3.31	0.00
41.20	3.54	1.53	3.31	0.00
41.40	3.54	1.53	3.31	0.00
41.60	3.54	1.53	3.31	0.00
41.80	3.54	1.53	3.31	0.00
42.00	3.54	1.53	3.31	0.00
42.20	3.54	1.53	3.31	0.00

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
42.40	3.54	1.53	3.31	0.00
42.60	3.54	1.53	3.31	0.00
42.80	3.54	1.53	3.31	0.00
43.00	3.54	1.53	3.31	0.00
43.20	3.54	1.53	3.31	0.00
43.40	3.54	1.53	3.31	0.00
43.60	3.54	1.53	3.31	0.00
43.80	3.54	1.53	3.31	0.00
44.00	3.54	1.53	3.31	0.00
44.20	3.54	1.53	3.31	0.00
44.40	3.54	1.53	3.31	0.00
44.60	3.54	1.53	3.31	0.00
44.80	3.54	1.53	3.31	0.00
45.00	3.54	1.53	3.31	0.00
45.20	3.54	1.53	3.31	0.00
45.40	3.54	1.53	3.31	0.00
45.60	3.54	1.53	3.31	0.00
45.80	3.54	1.53	3.31	0.00
46.00	3.54	1.53	3.31	0.00
46.20	3.54	1.53	3.31	0.00
46.40	3.54	1.53	3.31	0.00
46.60	3.54	1.53	3.31	0.00
46.80	3.54	1.53	3.31	0.00
47.00	3.54	1.53	3.31	0.00
47.20	3.54	1.53	3.31	0.00
47.40	3.54	1.53	3.31	0.00
47.60	3.54	1.53	3.31	0.00
47.80	3.54	1.53	3.31	0.00
48.00	3.54	1.53	3.31	0.00
48.20	3.54	1.53	3.31	0.00
48.40	3.54	1.53	3.31	0.00
48.60	3.54	1.53	3.31	0.00
48.80	3.54	1.53	3.31	0.00
49.00	3.54	1.53	3.31	0.00
49.20	3.54	1.53	3.31	0.00
49.40	3.54	1.53	3.31	0.00
49.60	3.54	1.53	3.31	0.00
49.80	3.54	1.53	3.31	0.00
50.00	3.54	1.53	3.31	0.00
50.20	3.54	1.53	3.31	0.00
50.40	3.54	1.53	3.31	0.00
50.60	3.54	1.53	3.31	0.00
50.80	3.54	1.53	3.31	0.00
51.00	3.54	1.53	3.31	0.00
51.20	3.54	1.53	3.31	0.00
51.40	3.54	1.53	3.31	0.00
51.60	3.54	1.53	3.31	0.00
51.80	3.54	1.53	3.31	0.00
52.00	3.54	1.53	3.31	0.00
52.20	3.54	1.53	3.31	0.00
52.40	3.54	1.53	3.31	0.00
52.60	3.54	1.53	3.31	0.00
52.80	3.54	1.53	3.31	0.00

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
53.00	3.54	1.53	3.31	0.00
53.20	3.54	1.53	3.31	0.00
53.40	3.54	1.53	3.31	0.00
53.60	3.54	1.53	3.31	0.00
53.80	3.54	1.53	3.31	0.00
54.00	3.54	1.53	3.31	0.00
54.20	3.54	1.53	3.31	0.00
54.40	3.54	1.53	3.31	0.00
54.60	3.54	1.53	3.31	0.00
54.80	3.54	1.53	3.31	0.00
55.00	3.54	1.53	3.31	0.00
55.20	3.54	1.53	3.31	0.00
55.40	3.54	1.53	3.31	0.00
55.60	3.54	1.53	3.31	0.00
55.80	3.54	1.53	3.31	0.00
56.00	3.54	1.53	3.31	0.00
56.20	3.54	1.53	3.31	0.00
56.40	3.54	1.53	3.31	0.00
56.60	3.54	1.53	3.31	0.00
56.80	3.54	1.53	3.31	0.00
57.00	3.54	1.53	3.31	0.00
57.20	3.54	1.53	3.31	0.00
57.40	3.54	1.53	3.31	0.00
57.60	3.54	1.53	3.31	0.00
57.80	3.54	1.53	3.31	0.00
58.00	3.54	1.53	3.31	0.00
58.20	3.54	1.53	3.31	0.00
58.40	3.54	1.53	3.31	0.00
58.60	3.54	1.53	3.31	0.00
58.80	3.54	1.53	3.31	0.00
59.00	3.54	1.53	3.31	0.00
59.20	3.54	1.53	3.31	0.00
59.40	3.54	1.53	3.31	0.00
59.60	3.54	1.53	3.31	0.00
59.80	3.54	1.53	3.31	0.00
60.00	3.54	1.53	3.31	0.00
60.20	3.54	1.53	3.31	0.00
60.40	3.54	1.53	3.31	0.00
60.60	3.54	1.53	3.31	0.00
60.80	3.54	1.53	3.31	0.00
61.00	3.54	1.53	3.31	0.00
61.20	3.54	1.53	3.31	0.00
61.40	3.54	1.53	3.31	0.00
61.60	3.54	1.53	3.31	0.00
61.80	3.54	1.53	3.31	0.00
62.00	3.54	1.53	3.31	0.00
62.20	3.54	1.53	3.31	0.00
62.40	3.54	1.53	3.31	0.00
62.60	3.54	1.53	3.31	0.00
62.80	3.54	1.53	3.31	0.00
63.00	3.54	1.53	3.31	0.00
63.20	3.54	1.53	3.31	0.00
63.40	3.54	1.53	3.31	0.00

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
63.60	3.54	1.53	3.31	0.00
63.80	3.54	1.53	3.31	0.00
64.00	3.54	1.53	3.31	0.00
64.20	3.54	1.53	3.31	0.00
64.40	3.54	1.53	3.31	0.00
64.60	3.54	1.53	3.31	0.00
64.80	3.54	1.53	3.31	0.00
65.00	3.54	1.53	3.31	0.00
65.20	3.54	1.53	3.31	0.00
65.40	3.54	1.53	3.31	0.00
65.60	3.54	1.53	3.31	0.00
65.80	3.54	1.53	3.31	0.00
66.00	3.54	1.53	3.31	0.00
66.20	3.54	1.53	3.31	0.00
66.40	3.54	1.53	3.31	0.00
66.60	3.54	1.53	3.31	0.00
66.80	3.54	1.53	3.31	0.00
67.00	3.54	1.53	3.31	0.00
67.20	3.54	1.53	3.31	0.00
67.40	3.54	1.53	3.31	0.00
67.60	3.54	1.53	3.31	0.00
67.80	3.54	1.53	3.31	0.00
68.00	3.54	1.53	3.31	0.00
68.20	3.54	1.53	3.31	0.00
68.40	3.54	1.53	3.31	0.00
68.60	3.54	1.53	3.31	0.00
68.80	3.54	1.53	3.31	0.00
69.00	3.54	1.53	3.31	0.00
69.20	3.54	1.53	3.31	0.00
69.40	3.54	1.53	3.31	0.00
69.60	3.54	1.53	3.31	0.00
69.80	3.54	1.53	3.31	0.00
70.00	3.54	1.53	3.31	0.00
70.20	3.54	1.53	3.31	0.00
70.40	3.54	1.53	3.31	0.00
70.60	3.54	1.53	3.31	0.00
70.80	3.54	1.53	3.31	0.00
71.00	3.54	1.53	3.31	0.00
71.20	3.54	1.53	3.31	0.00
71.40	3.54	1.53	3.31	0.00
71.60	3.54	1.53	3.31	0.00
71.80	3.54	1.53	3.31	0.00
72.00	3.54	1.53	3.31	0.00

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: Existing

Runoff Area=577,865 sf 78.35% Impervious Runoff Depth=4.53"
Flow Length=338' Tc=8.9 min CN=77/98 Runoff=55.50 cfs 218,212 cf

Subcatchment P-1: Proposed

Runoff Area=577,865 sf 74.05% Impervious Runoff Depth=4.46"
Flow Length=338' Tc=8.9 min CN=78/98 Runoff=54.93 cfs 214,841 cf

Total Runoff Area = 1,155,730 sf Runoff Volume = 433,054 cf Average Runoff Depth = 4.50"
23.80% Pervious = 275,043 sf 76.20% Impervious = 880,687 sf

Summary for Subcatchment E-1: Existing

Runoff = 55.50 cfs @ 12.16 hrs, Volume= 218,212 cf, Depth= 4.53"

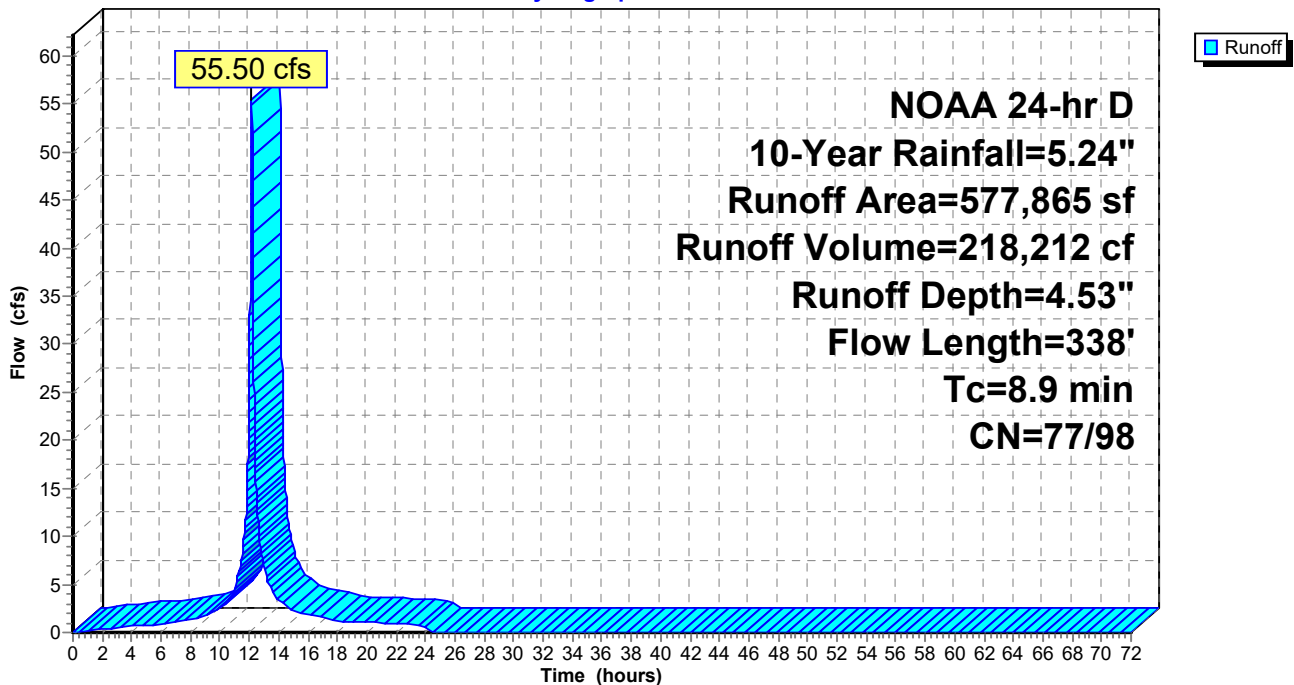
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 10-Year Rainfall=5.24"

	Area (sf)	CN	Description
*	452,785	98	Impervious
*	57	61	Grass, Good (HSG B)
*	35,138	74	Grass, Good (HSG C)
*	35,425	80	Grass, Good (HSG D)
*	54,460	77	Woods, Good (HSG D)
	577,865	93	Weighted Average
	125,080	77	21.65% Pervious Area
	452,785	98	78.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0202	0.22		Sheet Flow, 100 LF Sheet Flow (1-2) Grass: Short n= 0.150 P2= 5.34"
1.3	238	0.0335	2.95		Shallow Concentrated Flow, 238 LF SCF (2-3) Unpaved Kv= 16.1 fps
8.9	338	Total			

Subcatchment E-1: Existing

Hydrograph



Hydrograph for Subcatchment E-1: Existing

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
0.20	0.01	0.00	0.00	0.00
0.40	0.02	0.00	0.00	0.00
0.60	0.04	0.00	0.00	0.00
0.80	0.05	0.00	0.00	0.00
1.00	0.06	0.00	0.00	0.06
1.20	0.07	0.00	0.00	0.13
1.40	0.09	0.00	0.01	0.19
1.60	0.10	0.00	0.01	0.24
1.80	0.11	0.00	0.02	0.29
2.00	0.13	0.00	0.02	0.33
2.20	0.14	0.00	0.03	0.37
2.40	0.15	0.00	0.04	0.41
2.60	0.17	0.00	0.05	0.45
2.80	0.18	0.00	0.06	0.48
3.00	0.20	0.00	0.07	0.51
3.20	0.21	0.00	0.08	0.54
3.40	0.23	0.00	0.09	0.57
3.60	0.24	0.00	0.10	0.60
3.80	0.26	0.00	0.11	0.62
4.00	0.27	0.00	0.13	0.64
4.20	0.29	0.00	0.14	0.67
4.40	0.31	0.00	0.15	0.69
4.60	0.32	0.00	0.16	0.71
4.80	0.34	0.00	0.18	0.73
5.00	0.36	0.00	0.19	0.75
5.20	0.38	0.00	0.21	0.77
5.40	0.39	0.00	0.22	0.79
5.60	0.41	0.00	0.24	0.81
5.80	0.43	0.00	0.25	0.83
6.00	0.45	0.00	0.27	0.85
6.20	0.47	0.00	0.29	0.88
6.40	0.49	0.00	0.31	0.93
6.60	0.51	0.00	0.32	0.98
6.80	0.53	0.00	0.34	1.03
7.00	0.55	0.00	0.37	1.08
7.20	0.58	0.00	0.39	1.14
7.40	0.60	0.00	0.41	1.19
7.60	0.63	0.00	0.43	1.24
7.80	0.65	0.00	0.46	1.30
8.00	0.68	0.00	0.48	1.36
8.20	0.71	0.00	0.51	1.42
8.40	0.74	0.01	0.54	1.48
8.60	0.77	0.01	0.57	1.54
8.80	0.80	0.01	0.60	1.60
9.00	0.83	0.02	0.63	1.66
9.20	0.87	0.02	0.66	1.79
9.40	0.90	0.03	0.70	1.98
9.60	0.95	0.04	0.74	2.18
9.80	0.99	0.05	0.78	2.37
10.00	1.04	0.06	0.83	2.57
10.20	1.09	0.07	0.88	2.77
10.40	1.14	0.08	0.93	2.98

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
10.60	1.21	0.10	0.99	3.26
10.80	1.28	0.13	1.06	3.92
11.00	1.36	0.16	1.14	4.64
11.20	1.47	0.20	1.25	5.69
11.40	1.59	0.25	1.37	6.97
11.60	1.76	0.32	1.53	8.98
11.80	1.99	0.44	1.77	12.98
12.00	2.51	0.75	2.28	26.94
12.20	3.25	1.25	3.01	49.51
12.40	3.48	1.42	3.25	17.80
12.60	3.65	1.54	3.42	11.25
12.80	3.77	1.64	3.54	8.21
13.00	3.88	1.72	3.64	6.82
13.20	3.96	1.78	3.73	5.56
13.40	4.03	1.84	3.80	4.75
13.60	4.10	1.89	3.86	3.98
13.80	4.15	1.93	3.91	3.54
14.00	4.20	1.97	3.97	3.32
14.20	4.25	2.01	4.01	3.11
14.40	4.29	2.04	4.06	2.90
14.60	4.34	2.08	4.10	2.69
14.80	4.37	2.11	4.14	2.48
15.00	4.41	2.14	4.17	2.27
15.20	4.44	2.16	4.20	2.08
15.40	4.47	2.19	4.24	2.01
15.60	4.50	2.21	4.27	1.95
15.80	4.53	2.24	4.30	1.89
16.00	4.56	2.26	4.32	1.83
16.20	4.59	2.28	4.35	1.77
16.40	4.61	2.30	4.38	1.71
16.60	4.64	2.32	4.40	1.65
16.80	4.66	2.34	4.43	1.60
17.00	4.69	2.36	4.45	1.54
17.20	4.71	2.38	4.47	1.48
17.40	4.73	2.40	4.50	1.41
17.60	4.75	2.42	4.52	1.35
17.80	4.77	2.43	4.54	1.30
18.00	4.79	2.45	4.56	1.24
18.20	4.81	2.47	4.57	1.18
18.40	4.83	2.48	4.59	1.17
18.60	4.85	2.50	4.61	1.15
18.80	4.86	2.51	4.63	1.14
19.00	4.88	2.52	4.65	1.12
19.20	4.90	2.54	4.66	1.11
19.40	4.92	2.55	4.68	1.09
19.60	4.93	2.57	4.70	1.08
19.80	4.95	2.58	4.71	1.06
20.00	4.97	2.59	4.73	1.05
20.20	4.98	2.61	4.74	1.03
20.40	5.00	2.62	4.76	1.02
20.60	5.01	2.63	4.78	1.00
20.80	5.03	2.65	4.79	0.99
21.00	5.04	2.66	4.81	0.97

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
21.20	5.06	2.67	4.82	0.95
21.40	5.07	2.68	4.84	0.94
21.60	5.09	2.70	4.85	0.93
21.80	5.10	2.71	4.86	0.91
22.00	5.11	2.72	4.88	0.90
22.20	5.13	2.73	4.89	0.88
22.40	5.14	2.74	4.90	0.87
22.60	5.15	2.75	4.92	0.85
22.80	5.17	2.76	4.93	0.84
23.00	5.18	2.77	4.94	0.82
23.20	5.19	2.78	4.96	0.81
23.40	5.20	2.80	4.97	0.79
23.60	5.22	2.81	4.98	0.78
23.80	5.23	2.82	4.99	0.76
24.00	5.24	2.83	5.00	0.75
24.20	5.24	2.83	5.00	0.11
24.40	5.24	2.83	5.00	0.00
24.60	5.24	2.83	5.00	0.00
24.80	5.24	2.83	5.00	0.00
25.00	5.24	2.83	5.00	0.00
25.20	5.24	2.83	5.00	0.00
25.40	5.24	2.83	5.00	0.00
25.60	5.24	2.83	5.00	0.00
25.80	5.24	2.83	5.00	0.00
26.00	5.24	2.83	5.00	0.00
26.20	5.24	2.83	5.00	0.00
26.40	5.24	2.83	5.00	0.00
26.60	5.24	2.83	5.00	0.00
26.80	5.24	2.83	5.00	0.00
27.00	5.24	2.83	5.00	0.00
27.20	5.24	2.83	5.00	0.00
27.40	5.24	2.83	5.00	0.00
27.60	5.24	2.83	5.00	0.00
27.80	5.24	2.83	5.00	0.00
28.00	5.24	2.83	5.00	0.00
28.20	5.24	2.83	5.00	0.00
28.40	5.24	2.83	5.00	0.00
28.60	5.24	2.83	5.00	0.00
28.80	5.24	2.83	5.00	0.00
29.00	5.24	2.83	5.00	0.00
29.20	5.24	2.83	5.00	0.00
29.40	5.24	2.83	5.00	0.00
29.60	5.24	2.83	5.00	0.00
29.80	5.24	2.83	5.00	0.00
30.00	5.24	2.83	5.00	0.00
30.20	5.24	2.83	5.00	0.00
30.40	5.24	2.83	5.00	0.00
30.60	5.24	2.83	5.00	0.00
30.80	5.24	2.83	5.00	0.00
31.00	5.24	2.83	5.00	0.00
31.20	5.24	2.83	5.00	0.00
31.40	5.24	2.83	5.00	0.00
31.60	5.24	2.83	5.00	0.00

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
31.80	5.24	2.83	5.00	0.00
32.00	5.24	2.83	5.00	0.00
32.20	5.24	2.83	5.00	0.00
32.40	5.24	2.83	5.00	0.00
32.60	5.24	2.83	5.00	0.00
32.80	5.24	2.83	5.00	0.00
33.00	5.24	2.83	5.00	0.00
33.20	5.24	2.83	5.00	0.00
33.40	5.24	2.83	5.00	0.00
33.60	5.24	2.83	5.00	0.00
33.80	5.24	2.83	5.00	0.00
34.00	5.24	2.83	5.00	0.00
34.20	5.24	2.83	5.00	0.00
34.40	5.24	2.83	5.00	0.00
34.60	5.24	2.83	5.00	0.00
34.80	5.24	2.83	5.00	0.00
35.00	5.24	2.83	5.00	0.00
35.20	5.24	2.83	5.00	0.00
35.40	5.24	2.83	5.00	0.00
35.60	5.24	2.83	5.00	0.00
35.80	5.24	2.83	5.00	0.00
36.00	5.24	2.83	5.00	0.00
36.20	5.24	2.83	5.00	0.00
36.40	5.24	2.83	5.00	0.00
36.60	5.24	2.83	5.00	0.00
36.80	5.24	2.83	5.00	0.00
37.00	5.24	2.83	5.00	0.00
37.20	5.24	2.83	5.00	0.00
37.40	5.24	2.83	5.00	0.00
37.60	5.24	2.83	5.00	0.00
37.80	5.24	2.83	5.00	0.00
38.00	5.24	2.83	5.00	0.00
38.20	5.24	2.83	5.00	0.00
38.40	5.24	2.83	5.00	0.00
38.60	5.24	2.83	5.00	0.00
38.80	5.24	2.83	5.00	0.00
39.00	5.24	2.83	5.00	0.00
39.20	5.24	2.83	5.00	0.00
39.40	5.24	2.83	5.00	0.00
39.60	5.24	2.83	5.00	0.00
39.80	5.24	2.83	5.00	0.00
40.00	5.24	2.83	5.00	0.00
40.20	5.24	2.83	5.00	0.00
40.40	5.24	2.83	5.00	0.00
40.60	5.24	2.83	5.00	0.00
40.80	5.24	2.83	5.00	0.00
41.00	5.24	2.83	5.00	0.00
41.20	5.24	2.83	5.00	0.00
41.40	5.24	2.83	5.00	0.00
41.60	5.24	2.83	5.00	0.00
41.80	5.24	2.83	5.00	0.00
42.00	5.24	2.83	5.00	0.00
42.20	5.24	2.83	5.00	0.00

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
42.40	5.24	2.83	5.00	0.00
42.60	5.24	2.83	5.00	0.00
42.80	5.24	2.83	5.00	0.00
43.00	5.24	2.83	5.00	0.00
43.20	5.24	2.83	5.00	0.00
43.40	5.24	2.83	5.00	0.00
43.60	5.24	2.83	5.00	0.00
43.80	5.24	2.83	5.00	0.00
44.00	5.24	2.83	5.00	0.00
44.20	5.24	2.83	5.00	0.00
44.40	5.24	2.83	5.00	0.00
44.60	5.24	2.83	5.00	0.00
44.80	5.24	2.83	5.00	0.00
45.00	5.24	2.83	5.00	0.00
45.20	5.24	2.83	5.00	0.00
45.40	5.24	2.83	5.00	0.00
45.60	5.24	2.83	5.00	0.00
45.80	5.24	2.83	5.00	0.00
46.00	5.24	2.83	5.00	0.00
46.20	5.24	2.83	5.00	0.00
46.40	5.24	2.83	5.00	0.00
46.60	5.24	2.83	5.00	0.00
46.80	5.24	2.83	5.00	0.00
47.00	5.24	2.83	5.00	0.00
47.20	5.24	2.83	5.00	0.00
47.40	5.24	2.83	5.00	0.00
47.60	5.24	2.83	5.00	0.00
47.80	5.24	2.83	5.00	0.00
48.00	5.24	2.83	5.00	0.00
48.20	5.24	2.83	5.00	0.00
48.40	5.24	2.83	5.00	0.00
48.60	5.24	2.83	5.00	0.00
48.80	5.24	2.83	5.00	0.00
49.00	5.24	2.83	5.00	0.00
49.20	5.24	2.83	5.00	0.00
49.40	5.24	2.83	5.00	0.00
49.60	5.24	2.83	5.00	0.00
49.80	5.24	2.83	5.00	0.00
50.00	5.24	2.83	5.00	0.00
50.20	5.24	2.83	5.00	0.00
50.40	5.24	2.83	5.00	0.00
50.60	5.24	2.83	5.00	0.00
50.80	5.24	2.83	5.00	0.00
51.00	5.24	2.83	5.00	0.00
51.20	5.24	2.83	5.00	0.00
51.40	5.24	2.83	5.00	0.00
51.60	5.24	2.83	5.00	0.00
51.80	5.24	2.83	5.00	0.00
52.00	5.24	2.83	5.00	0.00
52.20	5.24	2.83	5.00	0.00
52.40	5.24	2.83	5.00	0.00
52.60	5.24	2.83	5.00	0.00
52.80	5.24	2.83	5.00	0.00

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
53.00	5.24	2.83	5.00	0.00
53.20	5.24	2.83	5.00	0.00
53.40	5.24	2.83	5.00	0.00
53.60	5.24	2.83	5.00	0.00
53.80	5.24	2.83	5.00	0.00
54.00	5.24	2.83	5.00	0.00
54.20	5.24	2.83	5.00	0.00
54.40	5.24	2.83	5.00	0.00
54.60	5.24	2.83	5.00	0.00
54.80	5.24	2.83	5.00	0.00
55.00	5.24	2.83	5.00	0.00
55.20	5.24	2.83	5.00	0.00
55.40	5.24	2.83	5.00	0.00
55.60	5.24	2.83	5.00	0.00
55.80	5.24	2.83	5.00	0.00
56.00	5.24	2.83	5.00	0.00
56.20	5.24	2.83	5.00	0.00
56.40	5.24	2.83	5.00	0.00
56.60	5.24	2.83	5.00	0.00
56.80	5.24	2.83	5.00	0.00
57.00	5.24	2.83	5.00	0.00
57.20	5.24	2.83	5.00	0.00
57.40	5.24	2.83	5.00	0.00
57.60	5.24	2.83	5.00	0.00
57.80	5.24	2.83	5.00	0.00
58.00	5.24	2.83	5.00	0.00
58.20	5.24	2.83	5.00	0.00
58.40	5.24	2.83	5.00	0.00
58.60	5.24	2.83	5.00	0.00
58.80	5.24	2.83	5.00	0.00
59.00	5.24	2.83	5.00	0.00
59.20	5.24	2.83	5.00	0.00
59.40	5.24	2.83	5.00	0.00
59.60	5.24	2.83	5.00	0.00
59.80	5.24	2.83	5.00	0.00
60.00	5.24	2.83	5.00	0.00
60.20	5.24	2.83	5.00	0.00
60.40	5.24	2.83	5.00	0.00
60.60	5.24	2.83	5.00	0.00
60.80	5.24	2.83	5.00	0.00
61.00	5.24	2.83	5.00	0.00
61.20	5.24	2.83	5.00	0.00
61.40	5.24	2.83	5.00	0.00
61.60	5.24	2.83	5.00	0.00
61.80	5.24	2.83	5.00	0.00
62.00	5.24	2.83	5.00	0.00
62.20	5.24	2.83	5.00	0.00
62.40	5.24	2.83	5.00	0.00
62.60	5.24	2.83	5.00	0.00
62.80	5.24	2.83	5.00	0.00
63.00	5.24	2.83	5.00	0.00
63.20	5.24	2.83	5.00	0.00
63.40	5.24	2.83	5.00	0.00

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
63.60	5.24	2.83	5.00	0.00
63.80	5.24	2.83	5.00	0.00
64.00	5.24	2.83	5.00	0.00
64.20	5.24	2.83	5.00	0.00
64.40	5.24	2.83	5.00	0.00
64.60	5.24	2.83	5.00	0.00
64.80	5.24	2.83	5.00	0.00
65.00	5.24	2.83	5.00	0.00
65.20	5.24	2.83	5.00	0.00
65.40	5.24	2.83	5.00	0.00
65.60	5.24	2.83	5.00	0.00
65.80	5.24	2.83	5.00	0.00
66.00	5.24	2.83	5.00	0.00
66.20	5.24	2.83	5.00	0.00
66.40	5.24	2.83	5.00	0.00
66.60	5.24	2.83	5.00	0.00
66.80	5.24	2.83	5.00	0.00
67.00	5.24	2.83	5.00	0.00
67.20	5.24	2.83	5.00	0.00
67.40	5.24	2.83	5.00	0.00
67.60	5.24	2.83	5.00	0.00
67.80	5.24	2.83	5.00	0.00
68.00	5.24	2.83	5.00	0.00
68.20	5.24	2.83	5.00	0.00
68.40	5.24	2.83	5.00	0.00
68.60	5.24	2.83	5.00	0.00
68.80	5.24	2.83	5.00	0.00
69.00	5.24	2.83	5.00	0.00
69.20	5.24	2.83	5.00	0.00
69.40	5.24	2.83	5.00	0.00
69.60	5.24	2.83	5.00	0.00
69.80	5.24	2.83	5.00	0.00
70.00	5.24	2.83	5.00	0.00
70.20	5.24	2.83	5.00	0.00
70.40	5.24	2.83	5.00	0.00
70.60	5.24	2.83	5.00	0.00
70.80	5.24	2.83	5.00	0.00
71.00	5.24	2.83	5.00	0.00
71.20	5.24	2.83	5.00	0.00
71.40	5.24	2.83	5.00	0.00
71.60	5.24	2.83	5.00	0.00
71.80	5.24	2.83	5.00	0.00
72.00	5.24	2.83	5.00	0.00

Summary for Subcatchment P-1: Proposed

Runoff = 54.93 cfs @ 12.16 hrs, Volume= 214,841 cf, Depth= 4.46"

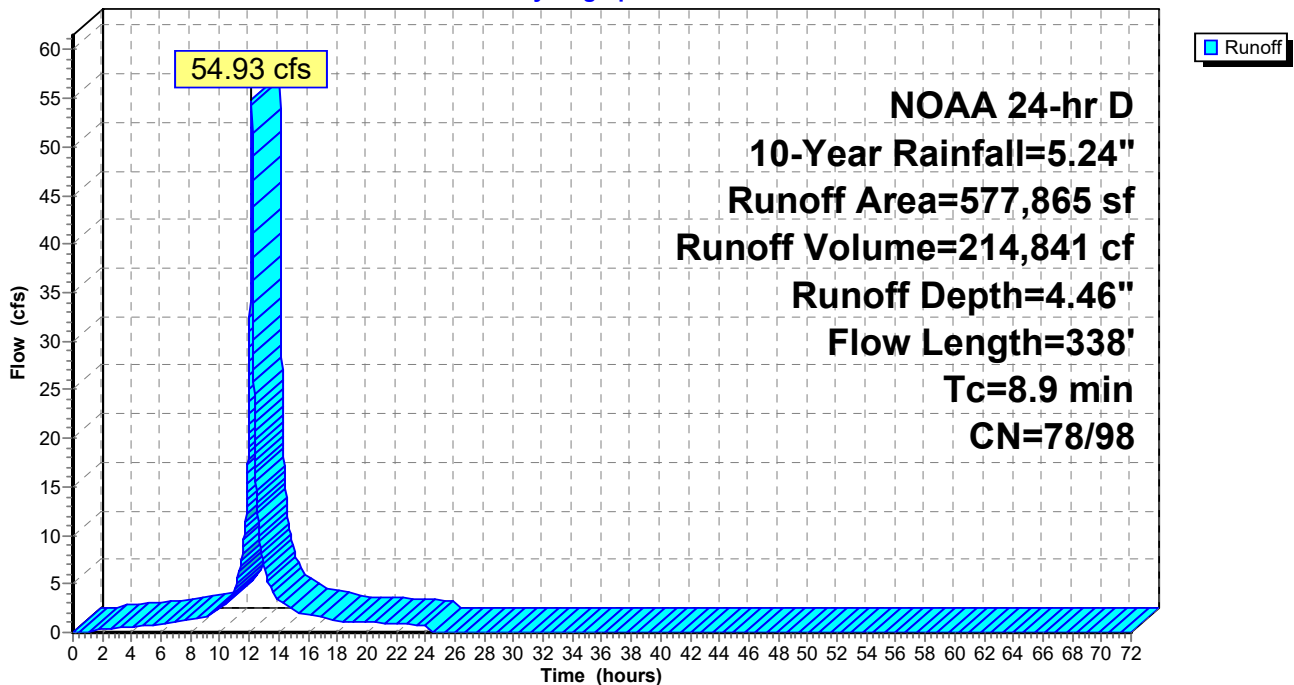
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 10-Year Rainfall=5.24"

Area (sf)	CN	Description
* 427,902	98	Impervios
* 54,460	77	Woods, Good (HSG D)
* 184	61	Grass, Good (HSG B)
* 33,208	74	Grass, Good (HSG C)
* 62,111	80	Grass, Good (HSG D)
577,865	93	Weighted Average
149,963	78	25.95% Pervious Area
427,902	98	74.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0202	0.22		Sheet Flow, 100 LF Sheet Flow (1-2) Grass: Short n= 0.150 P2= 5.34"
1.3	238	0.0335	2.95		Shallow Concentrated Flow, 238 LF SCF Unpaved Kv= 16.1 fps
8.9	338	Total			

Subcatchment P-1: Proposed

Hydrograph



Hydrograph for Subcatchment P-1: Proposed

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
0.20	0.01	0.00	0.00	0.00
0.40	0.02	0.00	0.00	0.00
0.60	0.04	0.00	0.00	0.00
0.80	0.05	0.00	0.00	0.00
1.00	0.06	0.00	0.00	0.06
1.20	0.07	0.00	0.00	0.12
1.40	0.09	0.00	0.01	0.18
1.60	0.10	0.00	0.01	0.23
1.80	0.11	0.00	0.02	0.27
2.00	0.13	0.00	0.02	0.31
2.20	0.14	0.00	0.03	0.35
2.40	0.15	0.00	0.04	0.39
2.60	0.17	0.00	0.05	0.42
2.80	0.18	0.00	0.06	0.45
3.00	0.20	0.00	0.07	0.48
3.20	0.21	0.00	0.08	0.51
3.40	0.23	0.00	0.09	0.54
3.60	0.24	0.00	0.10	0.56
3.80	0.26	0.00	0.11	0.59
4.00	0.27	0.00	0.13	0.61
4.20	0.29	0.00	0.14	0.63
4.40	0.31	0.00	0.15	0.65
4.60	0.32	0.00	0.16	0.67
4.80	0.34	0.00	0.18	0.69
5.00	0.36	0.00	0.19	0.71
5.20	0.38	0.00	0.21	0.73
5.40	0.39	0.00	0.22	0.75
5.60	0.41	0.00	0.24	0.76
5.80	0.43	0.00	0.25	0.78
6.00	0.45	0.00	0.27	0.80
6.20	0.47	0.00	0.29	0.83
6.40	0.49	0.00	0.31	0.88
6.60	0.51	0.00	0.32	0.93
6.80	0.53	0.00	0.34	0.98
7.00	0.55	0.00	0.37	1.02
7.20	0.58	0.00	0.39	1.07
7.40	0.60	0.00	0.41	1.13
7.60	0.63	0.00	0.43	1.18
7.80	0.65	0.00	0.46	1.24
8.00	0.68	0.00	0.48	1.30
8.20	0.71	0.01	0.51	1.36
8.40	0.74	0.01	0.54	1.42
8.60	0.77	0.01	0.57	1.48
8.80	0.80	0.02	0.60	1.54
9.00	0.83	0.02	0.63	1.60
9.20	0.87	0.03	0.66	1.73
9.40	0.90	0.04	0.70	1.91
9.60	0.95	0.05	0.74	2.10
9.80	0.99	0.06	0.78	2.29
10.00	1.04	0.07	0.83	2.49
10.20	1.09	0.08	0.88	2.69
10.40	1.14	0.10	0.93	2.89

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
10.60	1.21	0.12	0.99	3.17
10.80	1.28	0.14	1.06	3.82
11.00	1.36	0.18	1.14	4.53
11.20	1.47	0.22	1.25	5.56
11.40	1.59	0.27	1.37	6.82
11.60	1.76	0.35	1.53	8.81
11.80	1.99	0.48	1.77	12.77
12.00	2.51	0.79	2.28	26.57
12.20	3.25	1.31	3.01	49.04
12.40	3.48	1.49	3.25	17.67
12.60	3.65	1.61	3.42	11.18
12.80	3.77	1.71	3.54	8.16
13.00	3.88	1.79	3.64	6.77
13.20	3.96	1.86	3.73	5.53
13.40	4.03	1.91	3.80	4.72
13.60	4.10	1.96	3.86	3.96
13.80	4.15	2.01	3.91	3.52
14.00	4.20	2.05	3.97	3.30
14.20	4.25	2.09	4.01	3.09
14.40	4.29	2.12	4.06	2.88
14.60	4.34	2.16	4.10	2.68
14.80	4.37	2.19	4.14	2.47
15.00	4.41	2.22	4.17	2.26
15.20	4.44	2.24	4.20	2.07
15.40	4.47	2.27	4.24	2.00
15.60	4.50	2.29	4.27	1.94
15.80	4.53	2.32	4.30	1.88
16.00	4.56	2.34	4.32	1.82
16.20	4.59	2.37	4.35	1.76
16.40	4.61	2.39	4.38	1.71
16.60	4.64	2.41	4.40	1.64
16.80	4.66	2.43	4.43	1.59
17.00	4.69	2.45	4.45	1.53
17.20	4.71	2.47	4.47	1.47
17.40	4.73	2.49	4.50	1.41
17.60	4.75	2.50	4.52	1.35
17.80	4.77	2.52	4.54	1.29
18.00	4.79	2.54	4.56	1.23
18.20	4.81	2.55	4.57	1.18
18.40	4.83	2.57	4.59	1.16
18.60	4.85	2.58	4.61	1.14
18.80	4.86	2.60	4.63	1.13
19.00	4.88	2.61	4.65	1.12
19.20	4.90	2.63	4.66	1.10
19.40	4.92	2.64	4.68	1.09
19.60	4.93	2.65	4.70	1.07
19.80	4.95	2.67	4.71	1.06
20.00	4.97	2.68	4.73	1.04
20.20	4.98	2.70	4.74	1.03
20.40	5.00	2.71	4.76	1.01
20.60	5.01	2.72	4.78	1.00
20.80	5.03	2.74	4.79	0.98
21.00	5.04	2.75	4.81	0.97

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
21.20	5.06	2.76	4.82	0.95
21.40	5.07	2.77	4.84	0.94
21.60	5.09	2.79	4.85	0.92
21.80	5.10	2.80	4.86	0.91
22.00	5.11	2.81	4.88	0.90
22.20	5.13	2.82	4.89	0.88
22.40	5.14	2.83	4.90	0.86
22.60	5.15	2.84	4.92	0.85
22.80	5.17	2.85	4.93	0.83
23.00	5.18	2.87	4.94	0.82
23.20	5.19	2.88	4.96	0.80
23.40	5.20	2.89	4.97	0.79
23.60	5.22	2.90	4.98	0.77
23.80	5.23	2.91	4.99	0.76
24.00	5.24	2.92	5.00	0.75
24.20	5.24	2.92	5.00	0.11
24.40	5.24	2.92	5.00	0.00
24.60	5.24	2.92	5.00	0.00
24.80	5.24	2.92	5.00	0.00
25.00	5.24	2.92	5.00	0.00
25.20	5.24	2.92	5.00	0.00
25.40	5.24	2.92	5.00	0.00
25.60	5.24	2.92	5.00	0.00
25.80	5.24	2.92	5.00	0.00
26.00	5.24	2.92	5.00	0.00
26.20	5.24	2.92	5.00	0.00
26.40	5.24	2.92	5.00	0.00
26.60	5.24	2.92	5.00	0.00
26.80	5.24	2.92	5.00	0.00
27.00	5.24	2.92	5.00	0.00
27.20	5.24	2.92	5.00	0.00
27.40	5.24	2.92	5.00	0.00
27.60	5.24	2.92	5.00	0.00
27.80	5.24	2.92	5.00	0.00
28.00	5.24	2.92	5.00	0.00
28.20	5.24	2.92	5.00	0.00
28.40	5.24	2.92	5.00	0.00
28.60	5.24	2.92	5.00	0.00
28.80	5.24	2.92	5.00	0.00
29.00	5.24	2.92	5.00	0.00
29.20	5.24	2.92	5.00	0.00
29.40	5.24	2.92	5.00	0.00
29.60	5.24	2.92	5.00	0.00
29.80	5.24	2.92	5.00	0.00
30.00	5.24	2.92	5.00	0.00
30.20	5.24	2.92	5.00	0.00
30.40	5.24	2.92	5.00	0.00
30.60	5.24	2.92	5.00	0.00
30.80	5.24	2.92	5.00	0.00
31.00	5.24	2.92	5.00	0.00
31.20	5.24	2.92	5.00	0.00
31.40	5.24	2.92	5.00	0.00
31.60	5.24	2.92	5.00	0.00

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
31.80	5.24	2.92	5.00	0.00
32.00	5.24	2.92	5.00	0.00
32.20	5.24	2.92	5.00	0.00
32.40	5.24	2.92	5.00	0.00
32.60	5.24	2.92	5.00	0.00
32.80	5.24	2.92	5.00	0.00
33.00	5.24	2.92	5.00	0.00
33.20	5.24	2.92	5.00	0.00
33.40	5.24	2.92	5.00	0.00
33.60	5.24	2.92	5.00	0.00
33.80	5.24	2.92	5.00	0.00
34.00	5.24	2.92	5.00	0.00
34.20	5.24	2.92	5.00	0.00
34.40	5.24	2.92	5.00	0.00
34.60	5.24	2.92	5.00	0.00
34.80	5.24	2.92	5.00	0.00
35.00	5.24	2.92	5.00	0.00
35.20	5.24	2.92	5.00	0.00
35.40	5.24	2.92	5.00	0.00
35.60	5.24	2.92	5.00	0.00
35.80	5.24	2.92	5.00	0.00
36.00	5.24	2.92	5.00	0.00
36.20	5.24	2.92	5.00	0.00
36.40	5.24	2.92	5.00	0.00
36.60	5.24	2.92	5.00	0.00
36.80	5.24	2.92	5.00	0.00
37.00	5.24	2.92	5.00	0.00
37.20	5.24	2.92	5.00	0.00
37.40	5.24	2.92	5.00	0.00
37.60	5.24	2.92	5.00	0.00
37.80	5.24	2.92	5.00	0.00
38.00	5.24	2.92	5.00	0.00
38.20	5.24	2.92	5.00	0.00
38.40	5.24	2.92	5.00	0.00
38.60	5.24	2.92	5.00	0.00
38.80	5.24	2.92	5.00	0.00
39.00	5.24	2.92	5.00	0.00
39.20	5.24	2.92	5.00	0.00
39.40	5.24	2.92	5.00	0.00
39.60	5.24	2.92	5.00	0.00
39.80	5.24	2.92	5.00	0.00
40.00	5.24	2.92	5.00	0.00
40.20	5.24	2.92	5.00	0.00
40.40	5.24	2.92	5.00	0.00
40.60	5.24	2.92	5.00	0.00
40.80	5.24	2.92	5.00	0.00
41.00	5.24	2.92	5.00	0.00
41.20	5.24	2.92	5.00	0.00
41.40	5.24	2.92	5.00	0.00
41.60	5.24	2.92	5.00	0.00
41.80	5.24	2.92	5.00	0.00
42.00	5.24	2.92	5.00	0.00
42.20	5.24	2.92	5.00	0.00

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
42.40	5.24	2.92	5.00	0.00
42.60	5.24	2.92	5.00	0.00
42.80	5.24	2.92	5.00	0.00
43.00	5.24	2.92	5.00	0.00
43.20	5.24	2.92	5.00	0.00
43.40	5.24	2.92	5.00	0.00
43.60	5.24	2.92	5.00	0.00
43.80	5.24	2.92	5.00	0.00
44.00	5.24	2.92	5.00	0.00
44.20	5.24	2.92	5.00	0.00
44.40	5.24	2.92	5.00	0.00
44.60	5.24	2.92	5.00	0.00
44.80	5.24	2.92	5.00	0.00
45.00	5.24	2.92	5.00	0.00
45.20	5.24	2.92	5.00	0.00
45.40	5.24	2.92	5.00	0.00
45.60	5.24	2.92	5.00	0.00
45.80	5.24	2.92	5.00	0.00
46.00	5.24	2.92	5.00	0.00
46.20	5.24	2.92	5.00	0.00
46.40	5.24	2.92	5.00	0.00
46.60	5.24	2.92	5.00	0.00
46.80	5.24	2.92	5.00	0.00
47.00	5.24	2.92	5.00	0.00
47.20	5.24	2.92	5.00	0.00
47.40	5.24	2.92	5.00	0.00
47.60	5.24	2.92	5.00	0.00
47.80	5.24	2.92	5.00	0.00
48.00	5.24	2.92	5.00	0.00
48.20	5.24	2.92	5.00	0.00
48.40	5.24	2.92	5.00	0.00
48.60	5.24	2.92	5.00	0.00
48.80	5.24	2.92	5.00	0.00
49.00	5.24	2.92	5.00	0.00
49.20	5.24	2.92	5.00	0.00
49.40	5.24	2.92	5.00	0.00
49.60	5.24	2.92	5.00	0.00
49.80	5.24	2.92	5.00	0.00
50.00	5.24	2.92	5.00	0.00
50.20	5.24	2.92	5.00	0.00
50.40	5.24	2.92	5.00	0.00
50.60	5.24	2.92	5.00	0.00
50.80	5.24	2.92	5.00	0.00
51.00	5.24	2.92	5.00	0.00
51.20	5.24	2.92	5.00	0.00
51.40	5.24	2.92	5.00	0.00
51.60	5.24	2.92	5.00	0.00
51.80	5.24	2.92	5.00	0.00
52.00	5.24	2.92	5.00	0.00
52.20	5.24	2.92	5.00	0.00
52.40	5.24	2.92	5.00	0.00
52.60	5.24	2.92	5.00	0.00
52.80	5.24	2.92	5.00	0.00

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
53.00	5.24	2.92	5.00	0.00
53.20	5.24	2.92	5.00	0.00
53.40	5.24	2.92	5.00	0.00
53.60	5.24	2.92	5.00	0.00
53.80	5.24	2.92	5.00	0.00
54.00	5.24	2.92	5.00	0.00
54.20	5.24	2.92	5.00	0.00
54.40	5.24	2.92	5.00	0.00
54.60	5.24	2.92	5.00	0.00
54.80	5.24	2.92	5.00	0.00
55.00	5.24	2.92	5.00	0.00
55.20	5.24	2.92	5.00	0.00
55.40	5.24	2.92	5.00	0.00
55.60	5.24	2.92	5.00	0.00
55.80	5.24	2.92	5.00	0.00
56.00	5.24	2.92	5.00	0.00
56.20	5.24	2.92	5.00	0.00
56.40	5.24	2.92	5.00	0.00
56.60	5.24	2.92	5.00	0.00
56.80	5.24	2.92	5.00	0.00
57.00	5.24	2.92	5.00	0.00
57.20	5.24	2.92	5.00	0.00
57.40	5.24	2.92	5.00	0.00
57.60	5.24	2.92	5.00	0.00
57.80	5.24	2.92	5.00	0.00
58.00	5.24	2.92	5.00	0.00
58.20	5.24	2.92	5.00	0.00
58.40	5.24	2.92	5.00	0.00
58.60	5.24	2.92	5.00	0.00
58.80	5.24	2.92	5.00	0.00
59.00	5.24	2.92	5.00	0.00
59.20	5.24	2.92	5.00	0.00
59.40	5.24	2.92	5.00	0.00
59.60	5.24	2.92	5.00	0.00
59.80	5.24	2.92	5.00	0.00
60.00	5.24	2.92	5.00	0.00
60.20	5.24	2.92	5.00	0.00
60.40	5.24	2.92	5.00	0.00
60.60	5.24	2.92	5.00	0.00
60.80	5.24	2.92	5.00	0.00
61.00	5.24	2.92	5.00	0.00
61.20	5.24	2.92	5.00	0.00
61.40	5.24	2.92	5.00	0.00
61.60	5.24	2.92	5.00	0.00
61.80	5.24	2.92	5.00	0.00
62.00	5.24	2.92	5.00	0.00
62.20	5.24	2.92	5.00	0.00
62.40	5.24	2.92	5.00	0.00
62.60	5.24	2.92	5.00	0.00
62.80	5.24	2.92	5.00	0.00
63.00	5.24	2.92	5.00	0.00
63.20	5.24	2.92	5.00	0.00
63.40	5.24	2.92	5.00	0.00

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
63.60	5.24	2.92	5.00	0.00
63.80	5.24	2.92	5.00	0.00
64.00	5.24	2.92	5.00	0.00
64.20	5.24	2.92	5.00	0.00
64.40	5.24	2.92	5.00	0.00
64.60	5.24	2.92	5.00	0.00
64.80	5.24	2.92	5.00	0.00
65.00	5.24	2.92	5.00	0.00
65.20	5.24	2.92	5.00	0.00
65.40	5.24	2.92	5.00	0.00
65.60	5.24	2.92	5.00	0.00
65.80	5.24	2.92	5.00	0.00
66.00	5.24	2.92	5.00	0.00
66.20	5.24	2.92	5.00	0.00
66.40	5.24	2.92	5.00	0.00
66.60	5.24	2.92	5.00	0.00
66.80	5.24	2.92	5.00	0.00
67.00	5.24	2.92	5.00	0.00
67.20	5.24	2.92	5.00	0.00
67.40	5.24	2.92	5.00	0.00
67.60	5.24	2.92	5.00	0.00
67.80	5.24	2.92	5.00	0.00
68.00	5.24	2.92	5.00	0.00
68.20	5.24	2.92	5.00	0.00
68.40	5.24	2.92	5.00	0.00
68.60	5.24	2.92	5.00	0.00
68.80	5.24	2.92	5.00	0.00
69.00	5.24	2.92	5.00	0.00
69.20	5.24	2.92	5.00	0.00
69.40	5.24	2.92	5.00	0.00
69.60	5.24	2.92	5.00	0.00
69.80	5.24	2.92	5.00	0.00
70.00	5.24	2.92	5.00	0.00
70.20	5.24	2.92	5.00	0.00
70.40	5.24	2.92	5.00	0.00
70.60	5.24	2.92	5.00	0.00
70.80	5.24	2.92	5.00	0.00
71.00	5.24	2.92	5.00	0.00
71.20	5.24	2.92	5.00	0.00
71.40	5.24	2.92	5.00	0.00
71.60	5.24	2.92	5.00	0.00
71.80	5.24	2.92	5.00	0.00
72.00	5.24	2.92	5.00	0.00

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: Existing

Runoff Area=577,865 sf 78.35% Impervious Runoff Depth=7.57"
Flow Length=338' Tc=8.9 min CN=77/98 Runoff=91.68 cfs 364,340 cf

Subcatchment P-1: Proposed

Runoff Area=577,865 sf 74.05% Impervious Runoff Depth=7.49"
Flow Length=338' Tc=8.9 min CN=78/98 Runoff=91.22 cfs 360,615 cf

Total Runoff Area = 1,155,730 sf Runoff Volume = 724,955 cf Average Runoff Depth = 7.53"
23.80% Pervious = 275,043 sf 76.20% Impervious = 880,687 sf

Summary for Subcatchment E-1: Existing

Runoff = 91.68 cfs @ 12.16 hrs, Volume= 364,340 cf, Depth= 7.57"

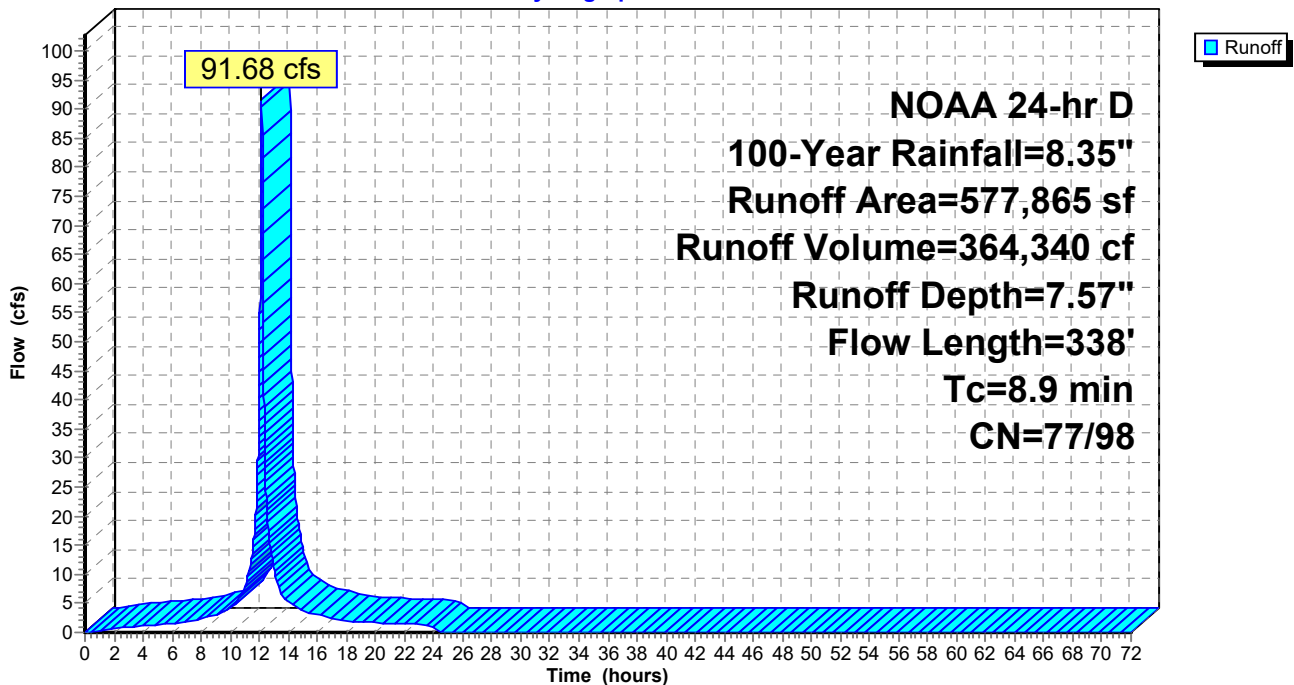
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 100-Year Rainfall=8.35"

	Area (sf)	CN	Description
*	452,785	98	Impervious
*	57	61	Grass, Good (HSG B)
*	35,138	74	Grass, Good (HSG C)
*	35,425	80	Grass, Good (HSG D)
*	54,460	77	Woods, Good (HSG D)
	577,865	93	Weighted Average
	125,080	77	21.65% Pervious Area
	452,785	98	78.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0202	0.22		Sheet Flow, 100 LF Sheet Flow (1-2) Grass: Short n= 0.150 P2= 5.34"
1.3	238	0.0335	2.95		Shallow Concentrated Flow, 238 LF SCF (2-3) Unpaved Kv= 16.1 fps
8.9	338	Total			

Subcatchment E-1: Existing

Hydrograph



Hydrograph for Subcatchment E-1: Existing

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
0.20	0.02	0.00	0.00	0.00
0.40	0.04	0.00	0.00	0.00
0.60	0.06	0.00	0.00	0.04
0.80	0.08	0.00	0.01	0.18
1.00	0.10	0.00	0.01	0.32
1.20	0.12	0.00	0.02	0.43
1.40	0.14	0.00	0.03	0.53
1.60	0.16	0.00	0.04	0.61
1.80	0.18	0.00	0.06	0.68
2.00	0.20	0.00	0.07	0.75
2.20	0.22	0.00	0.09	0.80
2.40	0.24	0.00	0.10	0.86
2.60	0.27	0.00	0.12	0.90
2.80	0.29	0.00	0.14	0.95
3.00	0.31	0.00	0.16	0.99
3.20	0.34	0.00	0.18	1.03
3.40	0.36	0.00	0.20	1.07
3.60	0.39	0.00	0.22	1.10
3.80	0.41	0.00	0.24	1.13
4.00	0.44	0.00	0.26	1.17
4.20	0.46	0.00	0.29	1.20
4.40	0.49	0.00	0.31	1.23
4.60	0.52	0.00	0.33	1.26
4.80	0.54	0.00	0.36	1.28
5.00	0.57	0.00	0.38	1.31
5.20	0.60	0.00	0.41	1.34
5.40	0.63	0.00	0.43	1.37
5.60	0.65	0.00	0.46	1.40
5.80	0.68	0.00	0.49	1.43
6.00	0.71	0.00	0.52	1.46
6.20	0.74	0.01	0.54	1.53
6.40	0.78	0.01	0.57	1.62
6.60	0.81	0.01	0.61	1.71
6.80	0.84	0.02	0.64	1.80
7.00	0.88	0.02	0.67	1.89
7.20	0.92	0.03	0.71	1.99
7.40	0.96	0.04	0.75	2.08
7.60	1.00	0.05	0.79	2.18
7.80	1.04	0.06	0.83	2.28
8.00	1.08	0.07	0.87	2.37
8.20	1.13	0.08	0.92	2.47
8.40	1.18	0.09	0.96	2.57
8.60	1.22	0.11	1.01	2.66
8.80	1.27	0.12	1.06	2.77
9.00	1.32	0.14	1.11	2.87
9.20	1.38	0.16	1.16	3.09
9.40	1.44	0.19	1.22	3.41
9.60	1.51	0.21	1.29	3.74
9.80	1.58	0.24	1.36	4.06
10.00	1.66	0.28	1.43	4.40
10.20	1.74	0.31	1.51	4.73
10.40	1.82	0.36	1.60	5.07

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
10.60	1.92	0.41	1.70	5.54
10.80	2.04	0.47	1.81	6.66
11.00	2.17	0.54	1.94	7.86
11.20	2.34	0.64	2.11	9.61
11.40	2.53	0.76	2.31	11.75
11.60	2.80	0.93	2.57	15.09
11.80	3.18	1.19	2.94	21.73
12.00	4.00	1.81	3.77	44.83
12.20	5.17	2.77	4.94	81.68
12.40	5.55	3.09	5.31	29.23
12.60	5.82	3.32	5.58	18.43
12.80	6.01	3.49	5.78	13.44
13.00	6.18	3.64	5.94	11.14
13.20	6.31	3.75	6.08	9.09
13.40	6.43	3.86	6.19	7.76
13.60	6.53	3.94	6.29	6.50
13.80	6.61	4.02	6.37	5.77
14.00	6.69	4.09	6.46	5.41
14.20	6.77	4.16	6.53	5.07
14.40	6.84	4.22	6.60	4.73
14.60	6.91	4.28	6.67	4.38
14.80	6.97	4.34	6.73	4.04
15.00	7.03	4.39	6.79	3.70
15.20	7.08	4.43	6.84	3.39
15.40	7.13	4.48	6.89	3.27
15.60	7.17	4.52	6.94	3.17
15.80	7.22	4.57	6.98	3.08
16.00	7.27	4.61	7.03	2.98
16.20	7.31	4.65	7.07	2.88
16.40	7.35	4.68	7.11	2.79
16.60	7.39	4.72	7.15	2.69
16.80	7.43	4.76	7.19	2.60
17.00	7.47	4.79	7.23	2.50
17.20	7.51	4.82	7.27	2.40
17.40	7.54	4.86	7.30	2.30
17.60	7.57	4.89	7.34	2.20
17.80	7.61	4.91	7.37	2.11
18.00	7.64	4.94	7.40	2.01
18.20	7.67	4.97	7.43	1.92
18.40	7.70	5.00	7.46	1.89
18.60	7.72	5.02	7.48	1.87
18.80	7.75	5.05	7.51	1.84
19.00	7.78	5.07	7.54	1.82
19.20	7.81	5.10	7.57	1.80
19.40	7.83	5.12	7.59	1.77
19.60	7.86	5.15	7.62	1.75
19.80	7.89	5.17	7.65	1.72
20.00	7.91	5.19	7.67	1.70
20.20	7.94	5.22	7.70	1.68
20.40	7.96	5.24	7.72	1.65
20.60	7.99	5.26	7.75	1.63
20.80	8.01	5.28	7.77	1.60
21.00	8.04	5.31	7.80	1.58

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
21.20	8.06	5.33	7.82	1.55
21.40	8.08	5.35	7.84	1.53
21.60	8.11	5.37	7.87	1.50
21.80	8.13	5.39	7.89	1.48
22.00	8.15	5.41	7.91	1.46
22.20	8.17	5.43	7.93	1.43
22.40	8.19	5.45	7.95	1.40
22.60	8.21	5.47	7.97	1.38
22.80	8.23	5.49	7.99	1.36
23.00	8.25	5.51	8.01	1.33
23.20	8.27	5.53	8.03	1.31
23.40	8.29	5.54	8.05	1.28
23.60	8.31	5.56	8.07	1.26
23.80	8.33	5.58	8.09	1.24
24.00	8.35	5.60	8.11	1.22
24.20	8.35	5.60	8.11	0.18
24.40	8.35	5.60	8.11	0.01
24.60	8.35	5.60	8.11	0.00
24.80	8.35	5.60	8.11	0.00
25.00	8.35	5.60	8.11	0.00
25.20	8.35	5.60	8.11	0.00
25.40	8.35	5.60	8.11	0.00
25.60	8.35	5.60	8.11	0.00
25.80	8.35	5.60	8.11	0.00
26.00	8.35	5.60	8.11	0.00
26.20	8.35	5.60	8.11	0.00
26.40	8.35	5.60	8.11	0.00
26.60	8.35	5.60	8.11	0.00
26.80	8.35	5.60	8.11	0.00
27.00	8.35	5.60	8.11	0.00
27.20	8.35	5.60	8.11	0.00
27.40	8.35	5.60	8.11	0.00
27.60	8.35	5.60	8.11	0.00
27.80	8.35	5.60	8.11	0.00
28.00	8.35	5.60	8.11	0.00
28.20	8.35	5.60	8.11	0.00
28.40	8.35	5.60	8.11	0.00
28.60	8.35	5.60	8.11	0.00
28.80	8.35	5.60	8.11	0.00
29.00	8.35	5.60	8.11	0.00
29.20	8.35	5.60	8.11	0.00
29.40	8.35	5.60	8.11	0.00
29.60	8.35	5.60	8.11	0.00
29.80	8.35	5.60	8.11	0.00
30.00	8.35	5.60	8.11	0.00
30.20	8.35	5.60	8.11	0.00
30.40	8.35	5.60	8.11	0.00
30.60	8.35	5.60	8.11	0.00
30.80	8.35	5.60	8.11	0.00
31.00	8.35	5.60	8.11	0.00
31.20	8.35	5.60	8.11	0.00
31.40	8.35	5.60	8.11	0.00
31.60	8.35	5.60	8.11	0.00

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
31.80	8.35	5.60	8.11	0.00
32.00	8.35	5.60	8.11	0.00
32.20	8.35	5.60	8.11	0.00
32.40	8.35	5.60	8.11	0.00
32.60	8.35	5.60	8.11	0.00
32.80	8.35	5.60	8.11	0.00
33.00	8.35	5.60	8.11	0.00
33.20	8.35	5.60	8.11	0.00
33.40	8.35	5.60	8.11	0.00
33.60	8.35	5.60	8.11	0.00
33.80	8.35	5.60	8.11	0.00
34.00	8.35	5.60	8.11	0.00
34.20	8.35	5.60	8.11	0.00
34.40	8.35	5.60	8.11	0.00
34.60	8.35	5.60	8.11	0.00
34.80	8.35	5.60	8.11	0.00
35.00	8.35	5.60	8.11	0.00
35.20	8.35	5.60	8.11	0.00
35.40	8.35	5.60	8.11	0.00
35.60	8.35	5.60	8.11	0.00
35.80	8.35	5.60	8.11	0.00
36.00	8.35	5.60	8.11	0.00
36.20	8.35	5.60	8.11	0.00
36.40	8.35	5.60	8.11	0.00
36.60	8.35	5.60	8.11	0.00
36.80	8.35	5.60	8.11	0.00
37.00	8.35	5.60	8.11	0.00
37.20	8.35	5.60	8.11	0.00
37.40	8.35	5.60	8.11	0.00
37.60	8.35	5.60	8.11	0.00
37.80	8.35	5.60	8.11	0.00
38.00	8.35	5.60	8.11	0.00
38.20	8.35	5.60	8.11	0.00
38.40	8.35	5.60	8.11	0.00
38.60	8.35	5.60	8.11	0.00
38.80	8.35	5.60	8.11	0.00
39.00	8.35	5.60	8.11	0.00
39.20	8.35	5.60	8.11	0.00
39.40	8.35	5.60	8.11	0.00
39.60	8.35	5.60	8.11	0.00
39.80	8.35	5.60	8.11	0.00
40.00	8.35	5.60	8.11	0.00
40.20	8.35	5.60	8.11	0.00
40.40	8.35	5.60	8.11	0.00
40.60	8.35	5.60	8.11	0.00
40.80	8.35	5.60	8.11	0.00
41.00	8.35	5.60	8.11	0.00
41.20	8.35	5.60	8.11	0.00
41.40	8.35	5.60	8.11	0.00
41.60	8.35	5.60	8.11	0.00
41.80	8.35	5.60	8.11	0.00
42.00	8.35	5.60	8.11	0.00
42.20	8.35	5.60	8.11	0.00

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
42.40	8.35	5.60	8.11	0.00
42.60	8.35	5.60	8.11	0.00
42.80	8.35	5.60	8.11	0.00
43.00	8.35	5.60	8.11	0.00
43.20	8.35	5.60	8.11	0.00
43.40	8.35	5.60	8.11	0.00
43.60	8.35	5.60	8.11	0.00
43.80	8.35	5.60	8.11	0.00
44.00	8.35	5.60	8.11	0.00
44.20	8.35	5.60	8.11	0.00
44.40	8.35	5.60	8.11	0.00
44.60	8.35	5.60	8.11	0.00
44.80	8.35	5.60	8.11	0.00
45.00	8.35	5.60	8.11	0.00
45.20	8.35	5.60	8.11	0.00
45.40	8.35	5.60	8.11	0.00
45.60	8.35	5.60	8.11	0.00
45.80	8.35	5.60	8.11	0.00
46.00	8.35	5.60	8.11	0.00
46.20	8.35	5.60	8.11	0.00
46.40	8.35	5.60	8.11	0.00
46.60	8.35	5.60	8.11	0.00
46.80	8.35	5.60	8.11	0.00
47.00	8.35	5.60	8.11	0.00
47.20	8.35	5.60	8.11	0.00
47.40	8.35	5.60	8.11	0.00
47.60	8.35	5.60	8.11	0.00
47.80	8.35	5.60	8.11	0.00
48.00	8.35	5.60	8.11	0.00
48.20	8.35	5.60	8.11	0.00
48.40	8.35	5.60	8.11	0.00
48.60	8.35	5.60	8.11	0.00
48.80	8.35	5.60	8.11	0.00
49.00	8.35	5.60	8.11	0.00
49.20	8.35	5.60	8.11	0.00
49.40	8.35	5.60	8.11	0.00
49.60	8.35	5.60	8.11	0.00
49.80	8.35	5.60	8.11	0.00
50.00	8.35	5.60	8.11	0.00
50.20	8.35	5.60	8.11	0.00
50.40	8.35	5.60	8.11	0.00
50.60	8.35	5.60	8.11	0.00
50.80	8.35	5.60	8.11	0.00
51.00	8.35	5.60	8.11	0.00
51.20	8.35	5.60	8.11	0.00
51.40	8.35	5.60	8.11	0.00
51.60	8.35	5.60	8.11	0.00
51.80	8.35	5.60	8.11	0.00
52.00	8.35	5.60	8.11	0.00
52.20	8.35	5.60	8.11	0.00
52.40	8.35	5.60	8.11	0.00
52.60	8.35	5.60	8.11	0.00
52.80	8.35	5.60	8.11	0.00

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
53.00	8.35	5.60	8.11	0.00
53.20	8.35	5.60	8.11	0.00
53.40	8.35	5.60	8.11	0.00
53.60	8.35	5.60	8.11	0.00
53.80	8.35	5.60	8.11	0.00
54.00	8.35	5.60	8.11	0.00
54.20	8.35	5.60	8.11	0.00
54.40	8.35	5.60	8.11	0.00
54.60	8.35	5.60	8.11	0.00
54.80	8.35	5.60	8.11	0.00
55.00	8.35	5.60	8.11	0.00
55.20	8.35	5.60	8.11	0.00
55.40	8.35	5.60	8.11	0.00
55.60	8.35	5.60	8.11	0.00
55.80	8.35	5.60	8.11	0.00
56.00	8.35	5.60	8.11	0.00
56.20	8.35	5.60	8.11	0.00
56.40	8.35	5.60	8.11	0.00
56.60	8.35	5.60	8.11	0.00
56.80	8.35	5.60	8.11	0.00
57.00	8.35	5.60	8.11	0.00
57.20	8.35	5.60	8.11	0.00
57.40	8.35	5.60	8.11	0.00
57.60	8.35	5.60	8.11	0.00
57.80	8.35	5.60	8.11	0.00
58.00	8.35	5.60	8.11	0.00
58.20	8.35	5.60	8.11	0.00
58.40	8.35	5.60	8.11	0.00
58.60	8.35	5.60	8.11	0.00
58.80	8.35	5.60	8.11	0.00
59.00	8.35	5.60	8.11	0.00
59.20	8.35	5.60	8.11	0.00
59.40	8.35	5.60	8.11	0.00
59.60	8.35	5.60	8.11	0.00
59.80	8.35	5.60	8.11	0.00
60.00	8.35	5.60	8.11	0.00
60.20	8.35	5.60	8.11	0.00
60.40	8.35	5.60	8.11	0.00
60.60	8.35	5.60	8.11	0.00
60.80	8.35	5.60	8.11	0.00
61.00	8.35	5.60	8.11	0.00
61.20	8.35	5.60	8.11	0.00
61.40	8.35	5.60	8.11	0.00
61.60	8.35	5.60	8.11	0.00
61.80	8.35	5.60	8.11	0.00
62.00	8.35	5.60	8.11	0.00
62.20	8.35	5.60	8.11	0.00
62.40	8.35	5.60	8.11	0.00
62.60	8.35	5.60	8.11	0.00
62.80	8.35	5.60	8.11	0.00
63.00	8.35	5.60	8.11	0.00
63.20	8.35	5.60	8.11	0.00
63.40	8.35	5.60	8.11	0.00

Hydrograph for Subcatchment E-1: Existing (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
63.60	8.35	5.60	8.11	0.00
63.80	8.35	5.60	8.11	0.00
64.00	8.35	5.60	8.11	0.00
64.20	8.35	5.60	8.11	0.00
64.40	8.35	5.60	8.11	0.00
64.60	8.35	5.60	8.11	0.00
64.80	8.35	5.60	8.11	0.00
65.00	8.35	5.60	8.11	0.00
65.20	8.35	5.60	8.11	0.00
65.40	8.35	5.60	8.11	0.00
65.60	8.35	5.60	8.11	0.00
65.80	8.35	5.60	8.11	0.00
66.00	8.35	5.60	8.11	0.00
66.20	8.35	5.60	8.11	0.00
66.40	8.35	5.60	8.11	0.00
66.60	8.35	5.60	8.11	0.00
66.80	8.35	5.60	8.11	0.00
67.00	8.35	5.60	8.11	0.00
67.20	8.35	5.60	8.11	0.00
67.40	8.35	5.60	8.11	0.00
67.60	8.35	5.60	8.11	0.00
67.80	8.35	5.60	8.11	0.00
68.00	8.35	5.60	8.11	0.00
68.20	8.35	5.60	8.11	0.00
68.40	8.35	5.60	8.11	0.00
68.60	8.35	5.60	8.11	0.00
68.80	8.35	5.60	8.11	0.00
69.00	8.35	5.60	8.11	0.00
69.20	8.35	5.60	8.11	0.00
69.40	8.35	5.60	8.11	0.00
69.60	8.35	5.60	8.11	0.00
69.80	8.35	5.60	8.11	0.00
70.00	8.35	5.60	8.11	0.00
70.20	8.35	5.60	8.11	0.00
70.40	8.35	5.60	8.11	0.00
70.60	8.35	5.60	8.11	0.00
70.80	8.35	5.60	8.11	0.00
71.00	8.35	5.60	8.11	0.00
71.20	8.35	5.60	8.11	0.00
71.40	8.35	5.60	8.11	0.00
71.60	8.35	5.60	8.11	0.00
71.80	8.35	5.60	8.11	0.00
72.00	8.35	5.60	8.11	0.00

Summary for Subcatchment P-1: Proposed

Runoff = 91.22 cfs @ 12.16 hrs, Volume= 360,615 cf, Depth= 7.49"

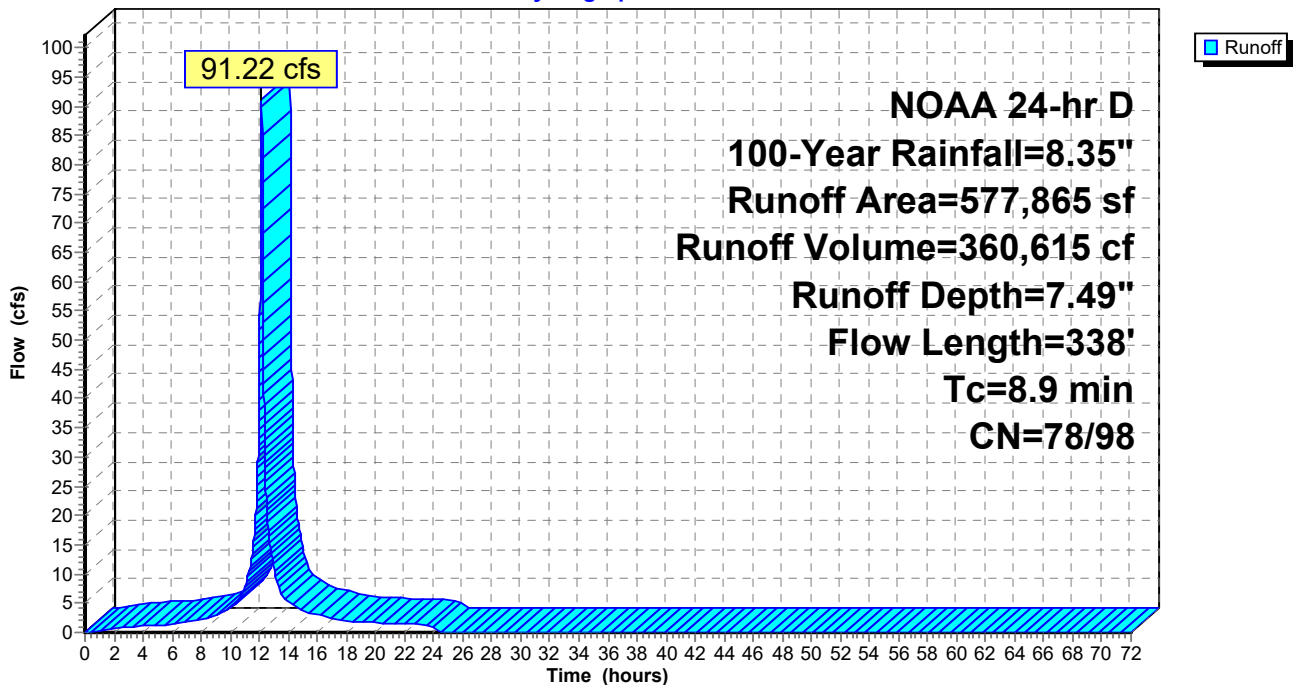
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 100-Year Rainfall=8.35"

	Area (sf)	CN	Description
*	427,902	98	Impervios
*	54,460	77	Woods, Good (HSG D)
*	184	61	Grass, Good (HSG B)
*	33,208	74	Grass, Good (HSG C)
*	62,111	80	Grass, Good (HSG D)
	577,865	93	Weighted Average
	149,963	78	25.95% Pervious Area
	427,902	98	74.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0202	0.22		Sheet Flow, 100 LF Sheet Flow (1-2) Grass: Short n= 0.150 P2= 5.34"
1.3	238	0.0335	2.95		Shallow Concentrated Flow, 238 LF SCF Unpaved Kv= 16.1 fps
8.9	338	Total			

Subcatchment P-1: Proposed

Hydrograph



Hydrograph for Subcatchment P-1: Proposed

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
0.20	0.02	0.00	0.00	0.00
0.40	0.04	0.00	0.00	0.00
0.60	0.06	0.00	0.00	0.03
0.80	0.08	0.00	0.01	0.17
1.00	0.10	0.00	0.01	0.30
1.20	0.12	0.00	0.02	0.41
1.40	0.14	0.00	0.03	0.50
1.60	0.16	0.00	0.04	0.57
1.80	0.18	0.00	0.06	0.64
2.00	0.20	0.00	0.07	0.70
2.20	0.22	0.00	0.09	0.76
2.40	0.24	0.00	0.10	0.81
2.60	0.27	0.00	0.12	0.85
2.80	0.29	0.00	0.14	0.90
3.00	0.31	0.00	0.16	0.94
3.20	0.34	0.00	0.18	0.97
3.40	0.36	0.00	0.20	1.01
3.60	0.39	0.00	0.22	1.04
3.80	0.41	0.00	0.24	1.07
4.00	0.44	0.00	0.26	1.10
4.20	0.46	0.00	0.29	1.13
4.40	0.49	0.00	0.31	1.16
4.60	0.52	0.00	0.33	1.19
4.80	0.54	0.00	0.36	1.21
5.00	0.57	0.00	0.38	1.24
5.20	0.60	0.00	0.41	1.27
5.40	0.63	0.00	0.43	1.30
5.60	0.65	0.00	0.46	1.34
5.80	0.68	0.00	0.49	1.37
6.00	0.71	0.01	0.52	1.40
6.20	0.74	0.01	0.54	1.47
6.40	0.78	0.01	0.57	1.56
6.60	0.81	0.02	0.61	1.64
6.80	0.84	0.03	0.64	1.73
7.00	0.88	0.03	0.67	1.82
7.20	0.92	0.04	0.71	1.92
7.40	0.96	0.05	0.75	2.01
7.60	1.00	0.06	0.79	2.11
7.80	1.04	0.07	0.83	2.21
8.00	1.08	0.08	0.87	2.30
8.20	1.13	0.09	0.92	2.40
8.40	1.18	0.11	0.96	2.50
8.60	1.22	0.13	1.01	2.59
8.80	1.27	0.14	1.06	2.70
9.00	1.32	0.16	1.11	2.79
9.20	1.38	0.18	1.16	3.02
9.40	1.44	0.21	1.22	3.34
9.60	1.51	0.24	1.29	3.66
9.80	1.58	0.27	1.36	3.98
10.00	1.66	0.30	1.43	4.31
10.20	1.74	0.34	1.51	4.64
10.40	1.82	0.39	1.60	4.98

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
10.60	1.92	0.44	1.70	5.45
10.80	2.04	0.50	1.81	6.56
11.00	2.17	0.58	1.94	7.75
11.20	2.34	0.68	2.11	9.49
11.40	2.53	0.81	2.31	11.61
11.60	2.80	0.99	2.57	14.93
11.80	3.18	1.26	2.94	21.54
12.00	4.00	1.89	3.77	44.51
12.20	5.17	2.86	4.94	81.29
12.40	5.55	3.19	5.31	29.13
12.60	5.82	3.42	5.58	18.37
12.80	6.01	3.59	5.78	13.40
13.00	6.18	3.74	5.94	11.11
13.20	6.31	3.86	6.08	9.06
13.40	6.43	3.96	6.19	7.74
13.60	6.53	4.05	6.29	6.48
13.80	6.61	4.13	6.37	5.75
14.00	6.69	4.20	6.46	5.39
14.20	6.77	4.27	6.53	5.05
14.40	6.84	4.33	6.60	4.71
14.60	6.91	4.39	6.67	4.37
14.80	6.97	4.45	6.73	4.03
15.00	7.03	4.50	6.79	3.69
15.20	7.08	4.54	6.84	3.38
15.40	7.13	4.59	6.89	3.27
15.60	7.17	4.63	6.94	3.16
15.80	7.22	4.68	6.98	3.07
16.00	7.27	4.72	7.03	2.97
16.20	7.31	4.76	7.07	2.88
16.40	7.35	4.80	7.11	2.78
16.60	7.39	4.83	7.15	2.68
16.80	7.43	4.87	7.19	2.59
17.00	7.47	4.90	7.23	2.49
17.20	7.51	4.94	7.27	2.39
17.40	7.54	4.97	7.30	2.30
17.60	7.57	5.00	7.34	2.20
17.80	7.61	5.03	7.37	2.10
18.00	7.64	5.06	7.40	2.01
18.20	7.67	5.08	7.43	1.92
18.40	7.70	5.11	7.46	1.89
18.60	7.72	5.14	7.48	1.86
18.80	7.75	5.16	7.51	1.84
19.00	7.78	5.19	7.54	1.82
19.20	7.81	5.21	7.57	1.79
19.40	7.83	5.24	7.59	1.77
19.60	7.86	5.26	7.62	1.74
19.80	7.89	5.29	7.65	1.72
20.00	7.91	5.31	7.67	1.69
20.20	7.94	5.33	7.70	1.67
20.40	7.96	5.36	7.72	1.65
20.60	7.99	5.38	7.75	1.62
20.80	8.01	5.40	7.77	1.60
21.00	8.04	5.42	7.80	1.57

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
21.20	8.06	5.45	7.82	1.55
21.40	8.08	5.47	7.84	1.52
21.60	8.11	5.49	7.87	1.50
21.80	8.13	5.51	7.89	1.48
22.00	8.15	5.53	7.91	1.46
22.20	8.17	5.55	7.93	1.43
22.40	8.19	5.57	7.95	1.40
22.60	8.21	5.59	7.97	1.38
22.80	8.23	5.61	7.99	1.36
23.00	8.25	5.63	8.01	1.33
23.20	8.27	5.65	8.03	1.31
23.40	8.29	5.66	8.05	1.28
23.60	8.31	5.68	8.07	1.26
23.80	8.33	5.70	8.09	1.23
24.00	8.35	5.72	8.11	1.21
24.20	8.35	5.72	8.11	0.18
24.40	8.35	5.72	8.11	0.01
24.60	8.35	5.72	8.11	0.00
24.80	8.35	5.72	8.11	0.00
25.00	8.35	5.72	8.11	0.00
25.20	8.35	5.72	8.11	0.00
25.40	8.35	5.72	8.11	0.00
25.60	8.35	5.72	8.11	0.00
25.80	8.35	5.72	8.11	0.00
26.00	8.35	5.72	8.11	0.00
26.20	8.35	5.72	8.11	0.00
26.40	8.35	5.72	8.11	0.00
26.60	8.35	5.72	8.11	0.00
26.80	8.35	5.72	8.11	0.00
27.00	8.35	5.72	8.11	0.00
27.20	8.35	5.72	8.11	0.00
27.40	8.35	5.72	8.11	0.00
27.60	8.35	5.72	8.11	0.00
27.80	8.35	5.72	8.11	0.00
28.00	8.35	5.72	8.11	0.00
28.20	8.35	5.72	8.11	0.00
28.40	8.35	5.72	8.11	0.00
28.60	8.35	5.72	8.11	0.00
28.80	8.35	5.72	8.11	0.00
29.00	8.35	5.72	8.11	0.00
29.20	8.35	5.72	8.11	0.00
29.40	8.35	5.72	8.11	0.00
29.60	8.35	5.72	8.11	0.00
29.80	8.35	5.72	8.11	0.00
30.00	8.35	5.72	8.11	0.00
30.20	8.35	5.72	8.11	0.00
30.40	8.35	5.72	8.11	0.00
30.60	8.35	5.72	8.11	0.00
30.80	8.35	5.72	8.11	0.00
31.00	8.35	5.72	8.11	0.00
31.20	8.35	5.72	8.11	0.00
31.40	8.35	5.72	8.11	0.00
31.60	8.35	5.72	8.11	0.00

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
31.80	8.35	5.72	8.11	0.00
32.00	8.35	5.72	8.11	0.00
32.20	8.35	5.72	8.11	0.00
32.40	8.35	5.72	8.11	0.00
32.60	8.35	5.72	8.11	0.00
32.80	8.35	5.72	8.11	0.00
33.00	8.35	5.72	8.11	0.00
33.20	8.35	5.72	8.11	0.00
33.40	8.35	5.72	8.11	0.00
33.60	8.35	5.72	8.11	0.00
33.80	8.35	5.72	8.11	0.00
34.00	8.35	5.72	8.11	0.00
34.20	8.35	5.72	8.11	0.00
34.40	8.35	5.72	8.11	0.00
34.60	8.35	5.72	8.11	0.00
34.80	8.35	5.72	8.11	0.00
35.00	8.35	5.72	8.11	0.00
35.20	8.35	5.72	8.11	0.00
35.40	8.35	5.72	8.11	0.00
35.60	8.35	5.72	8.11	0.00
35.80	8.35	5.72	8.11	0.00
36.00	8.35	5.72	8.11	0.00
36.20	8.35	5.72	8.11	0.00
36.40	8.35	5.72	8.11	0.00
36.60	8.35	5.72	8.11	0.00
36.80	8.35	5.72	8.11	0.00
37.00	8.35	5.72	8.11	0.00
37.20	8.35	5.72	8.11	0.00
37.40	8.35	5.72	8.11	0.00
37.60	8.35	5.72	8.11	0.00
37.80	8.35	5.72	8.11	0.00
38.00	8.35	5.72	8.11	0.00
38.20	8.35	5.72	8.11	0.00
38.40	8.35	5.72	8.11	0.00
38.60	8.35	5.72	8.11	0.00
38.80	8.35	5.72	8.11	0.00
39.00	8.35	5.72	8.11	0.00
39.20	8.35	5.72	8.11	0.00
39.40	8.35	5.72	8.11	0.00
39.60	8.35	5.72	8.11	0.00
39.80	8.35	5.72	8.11	0.00
40.00	8.35	5.72	8.11	0.00
40.20	8.35	5.72	8.11	0.00
40.40	8.35	5.72	8.11	0.00
40.60	8.35	5.72	8.11	0.00
40.80	8.35	5.72	8.11	0.00
41.00	8.35	5.72	8.11	0.00
41.20	8.35	5.72	8.11	0.00
41.40	8.35	5.72	8.11	0.00
41.60	8.35	5.72	8.11	0.00
41.80	8.35	5.72	8.11	0.00
42.00	8.35	5.72	8.11	0.00
42.20	8.35	5.72	8.11	0.00

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
42.40	8.35	5.72	8.11	0.00
42.60	8.35	5.72	8.11	0.00
42.80	8.35	5.72	8.11	0.00
43.00	8.35	5.72	8.11	0.00
43.20	8.35	5.72	8.11	0.00
43.40	8.35	5.72	8.11	0.00
43.60	8.35	5.72	8.11	0.00
43.80	8.35	5.72	8.11	0.00
44.00	8.35	5.72	8.11	0.00
44.20	8.35	5.72	8.11	0.00
44.40	8.35	5.72	8.11	0.00
44.60	8.35	5.72	8.11	0.00
44.80	8.35	5.72	8.11	0.00
45.00	8.35	5.72	8.11	0.00
45.20	8.35	5.72	8.11	0.00
45.40	8.35	5.72	8.11	0.00
45.60	8.35	5.72	8.11	0.00
45.80	8.35	5.72	8.11	0.00
46.00	8.35	5.72	8.11	0.00
46.20	8.35	5.72	8.11	0.00
46.40	8.35	5.72	8.11	0.00
46.60	8.35	5.72	8.11	0.00
46.80	8.35	5.72	8.11	0.00
47.00	8.35	5.72	8.11	0.00
47.20	8.35	5.72	8.11	0.00
47.40	8.35	5.72	8.11	0.00
47.60	8.35	5.72	8.11	0.00
47.80	8.35	5.72	8.11	0.00
48.00	8.35	5.72	8.11	0.00
48.20	8.35	5.72	8.11	0.00
48.40	8.35	5.72	8.11	0.00
48.60	8.35	5.72	8.11	0.00
48.80	8.35	5.72	8.11	0.00
49.00	8.35	5.72	8.11	0.00
49.20	8.35	5.72	8.11	0.00
49.40	8.35	5.72	8.11	0.00
49.60	8.35	5.72	8.11	0.00
49.80	8.35	5.72	8.11	0.00
50.00	8.35	5.72	8.11	0.00
50.20	8.35	5.72	8.11	0.00
50.40	8.35	5.72	8.11	0.00
50.60	8.35	5.72	8.11	0.00
50.80	8.35	5.72	8.11	0.00
51.00	8.35	5.72	8.11	0.00
51.20	8.35	5.72	8.11	0.00
51.40	8.35	5.72	8.11	0.00
51.60	8.35	5.72	8.11	0.00
51.80	8.35	5.72	8.11	0.00
52.00	8.35	5.72	8.11	0.00
52.20	8.35	5.72	8.11	0.00
52.40	8.35	5.72	8.11	0.00
52.60	8.35	5.72	8.11	0.00
52.80	8.35	5.72	8.11	0.00

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
53.00	8.35	5.72	8.11	0.00
53.20	8.35	5.72	8.11	0.00
53.40	8.35	5.72	8.11	0.00
53.60	8.35	5.72	8.11	0.00
53.80	8.35	5.72	8.11	0.00
54.00	8.35	5.72	8.11	0.00
54.20	8.35	5.72	8.11	0.00
54.40	8.35	5.72	8.11	0.00
54.60	8.35	5.72	8.11	0.00
54.80	8.35	5.72	8.11	0.00
55.00	8.35	5.72	8.11	0.00
55.20	8.35	5.72	8.11	0.00
55.40	8.35	5.72	8.11	0.00
55.60	8.35	5.72	8.11	0.00
55.80	8.35	5.72	8.11	0.00
56.00	8.35	5.72	8.11	0.00
56.20	8.35	5.72	8.11	0.00
56.40	8.35	5.72	8.11	0.00
56.60	8.35	5.72	8.11	0.00
56.80	8.35	5.72	8.11	0.00
57.00	8.35	5.72	8.11	0.00
57.20	8.35	5.72	8.11	0.00
57.40	8.35	5.72	8.11	0.00
57.60	8.35	5.72	8.11	0.00
57.80	8.35	5.72	8.11	0.00
58.00	8.35	5.72	8.11	0.00
58.20	8.35	5.72	8.11	0.00
58.40	8.35	5.72	8.11	0.00
58.60	8.35	5.72	8.11	0.00
58.80	8.35	5.72	8.11	0.00
59.00	8.35	5.72	8.11	0.00
59.20	8.35	5.72	8.11	0.00
59.40	8.35	5.72	8.11	0.00
59.60	8.35	5.72	8.11	0.00
59.80	8.35	5.72	8.11	0.00
60.00	8.35	5.72	8.11	0.00
60.20	8.35	5.72	8.11	0.00
60.40	8.35	5.72	8.11	0.00
60.60	8.35	5.72	8.11	0.00
60.80	8.35	5.72	8.11	0.00
61.00	8.35	5.72	8.11	0.00
61.20	8.35	5.72	8.11	0.00
61.40	8.35	5.72	8.11	0.00
61.60	8.35	5.72	8.11	0.00
61.80	8.35	5.72	8.11	0.00
62.00	8.35	5.72	8.11	0.00
62.20	8.35	5.72	8.11	0.00
62.40	8.35	5.72	8.11	0.00
62.60	8.35	5.72	8.11	0.00
62.80	8.35	5.72	8.11	0.00
63.00	8.35	5.72	8.11	0.00
63.20	8.35	5.72	8.11	0.00
63.40	8.35	5.72	8.11	0.00

Hydrograph for Subcatchment P-1: Proposed (continued)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
63.60	8.35	5.72	8.11	0.00
63.80	8.35	5.72	8.11	0.00
64.00	8.35	5.72	8.11	0.00
64.20	8.35	5.72	8.11	0.00
64.40	8.35	5.72	8.11	0.00
64.60	8.35	5.72	8.11	0.00
64.80	8.35	5.72	8.11	0.00
65.00	8.35	5.72	8.11	0.00
65.20	8.35	5.72	8.11	0.00
65.40	8.35	5.72	8.11	0.00
65.60	8.35	5.72	8.11	0.00
65.80	8.35	5.72	8.11	0.00
66.00	8.35	5.72	8.11	0.00
66.20	8.35	5.72	8.11	0.00
66.40	8.35	5.72	8.11	0.00
66.60	8.35	5.72	8.11	0.00
66.80	8.35	5.72	8.11	0.00
67.00	8.35	5.72	8.11	0.00
67.20	8.35	5.72	8.11	0.00
67.40	8.35	5.72	8.11	0.00
67.60	8.35	5.72	8.11	0.00
67.80	8.35	5.72	8.11	0.00
68.00	8.35	5.72	8.11	0.00
68.20	8.35	5.72	8.11	0.00
68.40	8.35	5.72	8.11	0.00
68.60	8.35	5.72	8.11	0.00
68.80	8.35	5.72	8.11	0.00
69.00	8.35	5.72	8.11	0.00
69.20	8.35	5.72	8.11	0.00
69.40	8.35	5.72	8.11	0.00
69.60	8.35	5.72	8.11	0.00
69.80	8.35	5.72	8.11	0.00
70.00	8.35	5.72	8.11	0.00
70.20	8.35	5.72	8.11	0.00
70.40	8.35	5.72	8.11	0.00
70.60	8.35	5.72	8.11	0.00
70.80	8.35	5.72	8.11	0.00
71.00	8.35	5.72	8.11	0.00
71.20	8.35	5.72	8.11	0.00
71.40	8.35	5.72	8.11	0.00
71.60	8.35	5.72	8.11	0.00
71.80	8.35	5.72	8.11	0.00
72.00	8.35	5.72	8.11	0.00

APPENDIX D

DRAINAGE AREA MAPS

INVENTORY

SHEET 1 OF 3: EXISTING DRAINAGE AREA MAP

SHEET 2 OF 3: PROPOSED DRAINAGE AREA MAP

SHEET 3 OF 3: WATER QUALITY EXHIBITS

