

494 NORTH STREET ROAD “A” DRAINAGE REPORT

Definitive Subdivision

FOR

494 North Street, Road A ~ Map 18 Lot 24
Residential Development Project for
Two (2) Lots



Prepared for

**Oak Valley Development LLC
c/o James Ogden
32 Thurlow Street
Georgetown MA 01832**

Prepared by:

WGH Land Survey & Design and
ASB Design Group
83 West Main Street
Merrimac, MA 01860

June 2020

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1. EXECUTIVE SUMMARY

Oak Valley Development LLC c/o James Ogden proposes to develop the existing project site located at 494 North Street, on Tax Map 18 Lot 24 in Georgetown, MA, which currently is a developed site property with one two family dwelling and associated utilities and driveway access. The area is predominantly developed with a portion being manicured lawn with natural wooded perimeter. Oak Valley Development proposes to construct a 128' long access roadway to serve the one new single family residence, with associated driveways and lawn areas. The new home will have frontage on the new roadway to be named at a future date currently labeled as Road "A" located off North Street. The existing home will have 198' of frontage on North Street and its access will be located to the newly constructed road. The total existing watershed area is approximately 5.24 acres which includes offsite contributing areas.

The project site is located in the Residential B Zone. The watershed used in the study, models additional land which contributes runoff to the analysis points, which is developed with streets, homes, lawns, driveways. The existing topography is such that the existing conditions site analysis requires two (2) watershed subcatchments, that ultimately flow to two distinct design points, one to the front along North Street on the southeasterly corner of the property designated as Design Analysis Point A; and the other to the front along North Street on the northeasterly corner of the property near the intersection of Wells Ave designated as Design Analysis Point B.

Two drainage models were compiled, one for the area in its existing (pre-development) condition as shown on Sheet WS-1, and a second for its proposed (post-development) condition depicted on Sheet WS-2. The analysis was conducted using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment. The project consists of two distinct watershed subcatchments, which drain to two distinct Analysis points depicted as follows:

DAP-A is the roadside gutter located along North Street, at the front left side of the property (southwest corner), which drains offsite to North Street and ultimately to the Towns existing drainage system west of the property

DAP-B is the roadside gutter located along North Street, at the front right side of the property (north east corner), which drains offsite to North Street and ultimately to the Towns existing drainage system east of the property to an existing catch basin at Wells Ave.

A summary of the existing and proposed conditions peak rates of runoff is as follows:

Table A-1

Peak runoff rate to Analysis Point #A

Existing street gutter located in at the southeasterly side of site at North Street (Link AP-A):

Storm Event (24 Hour)	Pre-Development Flow Rate (cfs) Into AP-1	Post-Development Flow Rate (cfs) Into AP-1	Change Flow Rate (cfs)
2-yr	0.00 cfs	0.00 cfs	0.00 cfs
10-yr	0.08 cfs	0.04 cfs	-0.04 cfs
100-yr	1.63 cfs	1.40 cfs	-0.23 cfs

Table A-2

Peak runoff rate to Analysis Point #B

Existing low area located on easterly side of the site at a catch basin at Well Ave(Link AP-B):

Storm Event (24 Hour)	Pre-Development Flow Rate (cfs) Into L AP-1	Post-Development Flow Rate (cfs) Into L AP-1	Change Flow Rate (cfs)
2-yr	0.00 cfs	0.00 cfs	0.00 cfs
10-yr	0.10 cfs	0.07 cfs	-0.03 cfs
100-yr	1.04 cfs	0.91 cfs	-0.13 cfs

Table A-3

Peak runoff rate to Analysis Point #C

Existing Outfall 12" CMP between #481 & 483 North Street (Link 103L):

Storm Event (24 Hour)	Pre-Development Flow Rate (cfs) 103L	Post-Development Flow Rate (cfs) 103L	Change Flow Rate (cfs)
2-yr	0.63 cfs	0.63 cfs	0.00 cfs
10-yr	1.62 cfs	1.62 cfs	0.00 cfs
100-yr	2.79 cfs	2.76 cfs	-0.03 cfs

The drainage design intent for this site is to maintain the post-development peak flow to the predevelopment peak flow conditions, to the best extent practicable. This has been accomplished through the use of vegetated (grass) water quality swale with pea stone diaphragm acting as pretreatment, drain inlets, sediment forebays and infiltration basin designed to remove TSS for access roadway runoff, and roof runoff infiltration chamber beds for the proposed dwelling, to mitigate the peak flow exiting the site into the existing roadway gutter line along North Street.

The proposed project is NOT located within the following areas:

- Priority Habitat of Rare Species;
- 100 year Flood Zone area;

Construction materials stored on-site will be limited to clean aggregate for building & pavement foundations, stormwater structures, fencing materials, and structural building materials. All materials will be stored in areas upstream of all erosion & sediment control measures. No hazardous materials are permitted on-site.

Construction is expected to take 6-8 months from start of earthwork operations. The intended start date for earthwork is fall 2020, spring 2021, dependent upon receiving all necessary permits during Summer/Fall 2020.

2.0 DRAINAGE ANALYSIS:

2.1 INTRODUCTION

Oak Valley Development LLC, proposes to construct a new access drive to serve 1 new single family residences at 494 North Street located on Tax Map 18 Lot 24 in Georgetown, MA. The existing lot is approximately 2.0 +/- acres S.F. with frontage and access off North Street, a public right-of-way. The total increase in area developed is approximately 1.0 acres (new house, drive, roadway pave), the remainder will remain in its existing condition (lawn and wooded area).

2.2 METHODOLOGY

A peak rate of runoff has been determined using generally accepted engineering methods and techniques and standardized input data found in the following literature:

1. **Urban Hydrology for Small Watersheds – Technical Release 55** developed and published by the United States Department of Agriculture Soils Conservation Service, June 1986. Runoff curve numbers and 24-hour precipitation values were obtained from this reference.
2. **HydroCAD Stormwater Modeling System** by HydroCAD Software Solutions LLC, version 10.0, 2013. The HydroCAD program was used to generate the runoff hydrographs for the watershed areas, to determine discharge/stage/storage relationships and values for the stormwater BMPs, to perform drainage routing and to combine the results of the runoff hydrographs. HydroCAD uses the USDA TR-20 methodology of the SCS Unit Hydrograph procedure (SCS-UH).
3. **Rainfall Frequency Atlas of the United States – Technical Paper 40** developed and published by the United States Weather Bureau and United States Department of Agriculture Soils Conservation Service, Engineering Division May 1961 (Updated 2014). Provide precipitation values for durations from 30 minutes to 24 hours and return periods from 1 to 100 years. Regional based 24-hour precipitation values were obtained from this reference utilized by MA DEP, US Army Corps of Engineers and US EPA.
4. **Soil Suvery of Northern Essex County Massachusetts** by the United States Department of Agriculture NRCS. Soil types and boundaries were obtained from this reference, as well as the Web Soil Survey website, which presents the data in digital format. A copy of the Web Soil Survey soils map is included as EX-6 In the Exhibits section of this report.

The existing and proposed watersheds were modeled utilizing HydroCAD stormwater software, version 10.00. The watersheds were analyzed utilizing the SCS TR-20 methodology for hydrograph development and the TR-55 methodology for Time of Concentration (Tc) determination. The Dynamic-Storage-Indicating method for reach and pond routing was utilized. Type III, 24-hour hydrographs were developed for the 2-year, 10-year, and 100-year storm events corresponding to 3.1", 4.8", 7.0" rainfall storm events respectively as directed by the SCS Technical Paper 40 (TP-40) and the Hydrology Handbook for Conservation Commissioners, Appendix F, as published by the Massachusetts Department of Environmental Protection, Division of Watershed Management, March 2002. Existing topography and site features were obtained through on-ground topography completed by WGH Land Survey and Design.. Existing soil conditions were derived the Natural Resources Conservation Services (NRCS) Web Soil Service Mapping Tool and site specific soil testing performed by Alex Parker, CHO, SE#1083. The soil log locations are depicted on the Design plans, and the logs are included with this report in the Appendix.

2.3 EXISTING CONDITIONS ANALYSIS

The study area consists of the project area and some surrounding areas. The contributing area contains approximately 5.24 +/-acres. The study area is primarily a sub urban area developed with many residential lots which are characterized with residential homes, driveways, lawn areas and peripheral wooded boundaries. The study area watershed flows to a two distinct design points as noted above.

Existing soil conditions were obtained from the NRCS Soils Maps. The entire site is identified as Windsor and Deerfield loamy sands soil classification, which are characteristic of a Hydrologic Group "A" soil. Soil type was verified by soil testing performed by WGH Land Survey and Design (Alex Parker, SE). The results revealed that medium sands with gravels were present in all test holes, and were consistent with the soil mapping and are tabulated in the appendix and depicted on the design plans.

The two Design Points described previously are used for modeling purposes as the point of analysis to determine the effects of the proposed development on the surrounding area.

2.4 PROPOSED CONDITIONS ANALYSIS

The project proposes to develop the existing project by constructing 128 LF of access roadway (18' paved with 2' gravel shoulders on either side for a total width of 22') to serve the new and existing homes with paved driveways and residential lawn areas.

The addition of the proposed impervious paved areas and buildings causes an increase in the curve number (CN) and a decrease in the time of concentration (Tc), the net result being a potential increase in peak rates of runoff from the site. To mitigate the

potential increase in the peak rate of runoff and to effectively treat the subsequent stormwater runoff the following Best Management Practices (BMP's) have been employed within the watersheds for each of the two Analysis Point as follows:

The proposed site has been designed to sheet flow runoff to the proposed drainage system comprised of Water Quality Swales with peastone diaphragm treatment, drain inlets to sediment forebays (pre-treatment), and detention/infiltration basins, together with roof runoff infiltration chambers for the new dwelling.

The Water Quality Swale with sediment forebays, detention basin and roof runoff chambers are designed to encourage the infiltration of runoff from pavement & roof areas, and are capable of controlling the runoff from the various storm frequencies, reducing the rate and volumes to below the pre-development levels.

The intent of the HydroCAD model is to show that in all storm events, the total flow contributing to the existing street gutter southwesterly along North Street (Analysis Point A) and northeasterly along North Street to Wells Ave (Analysis Point B) is equal or reduced from the pre-development rates.

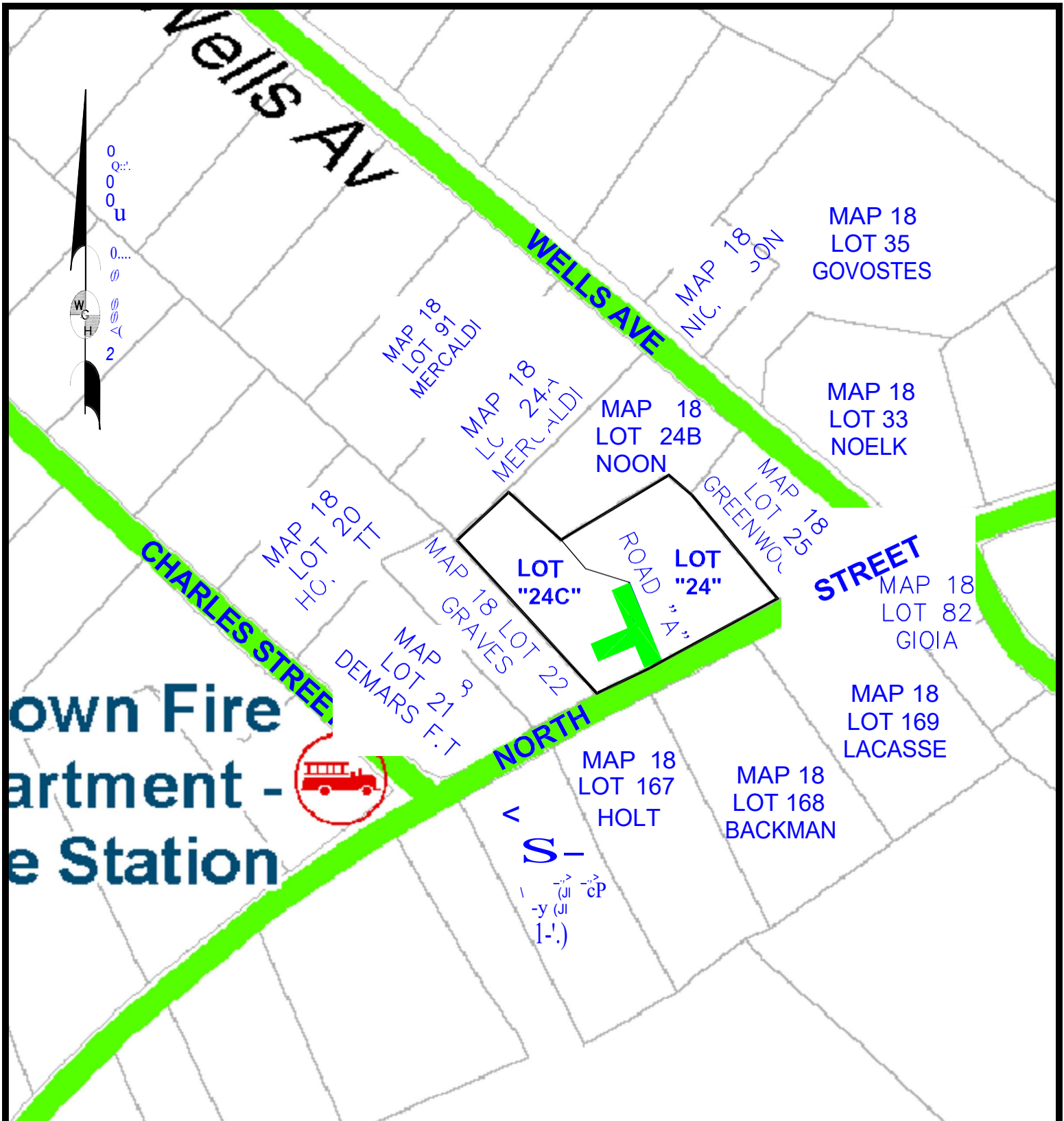
2.4 CONCLUSION

The results tabulated in Tables A-1, and A-2; demonstrates that the proposed project will not result in an increase in peak outflow for the given 2, 10, 25 and 100 year, 24-hour storm events because the project has mitigated the potential increase in runoff with infiltration (recharge) and infiltration/detention basins and therefore, is not contributing to any increase in stormwater runoff.

The project constructed as proposed, with the necessary temporary and long term construction Best Management Procedures (BMP's) in place, preservation of adequate vegetated buffers, and restoration of and stabilization of disturbed areas, will assure the continued stability of the site, and maintenance of the runoff water quality, thereby protecting the resource areas associated within the site.

Respectfully Submitted,
WGH Land Survey and Design

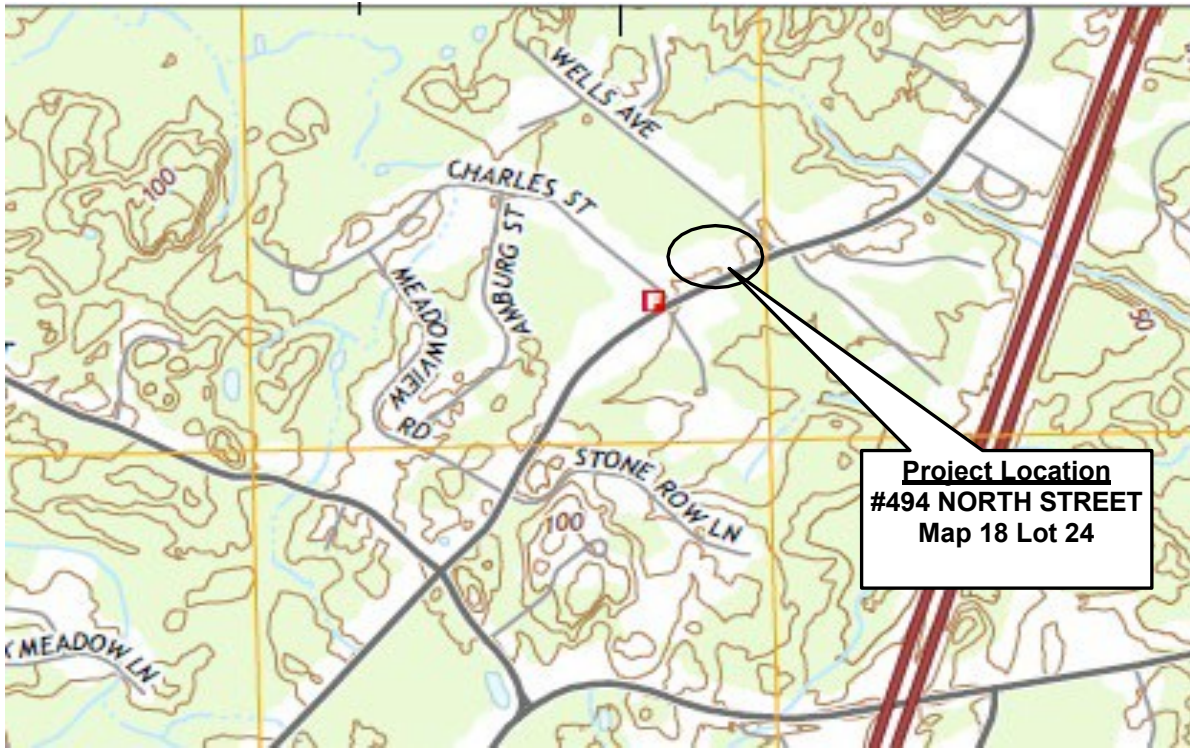
William G Holt, PLS, RS
Project Manager



ASSESSOR MAP 18
TOWN OF GEORGETOWN
494 NORTH STREET - ROAD "A"
SCALE 1=200'

USGS MAP

Georgetown - Quad



Locus Map

1=1000'

Lat: 42-44'-43.2" N

Long: 70-57'-21.9" W

USGS ~ Locus Map
Planning Board Preliminary Application
Road "A ~ at 494 North Street,
Georgetown, Map 18 Lot 24



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**OFFICIAL STREET MAP
TOWN OF GEORGETOWN
494 NORTH STREET ~ ROAD "A"
SCALE 1=750'**

National Flood Hazard Layer FIRMette



Legend

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		20.2	Cross Sections with 1% Annual Chance
		17.5	Water Surface Elevation
			Coastal Transect
			Base Flood Elevation Line (BFE)
			Limit of Study
			Jurisdiction Boundary
OTHER FEATURES			Coastal Transect Baseline
			Profile Baseline
			Hydrographic Feature

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

U



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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **1/29/2020 at 4:41:07 AM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

42°44'55.10"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

42°44'28.68"N

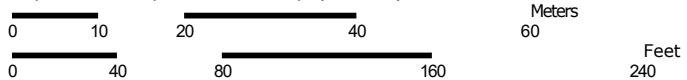
70°57'1.88"W

USGS The National Map: Orthoimagery. Data refreshed April, 2019.
USGS The National Map: Orthoimagery. Data refreshed April, 2019.

Hydrologic Soil Group—Essex County, Massachusetts, Northern Part (494 NORTH ST SOIL HSG RATE)



Map Scale: 1:878 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84



**Natural Resources
Conservation Service**


Web Soil Survey
National Cooperative Soil Survey

7/29/2019
Page 1 of 4

Hydrologic Soil Group—Essex County, Massachusetts, Northern Part
(494 NORTH ST SOIL HSG RATE)



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 1:15,800.

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: Essex County, Massachusetts, Northern Part
 Survey Area Data: Version 14, Sep 7, 2018

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

Date(s) aerial images were photographed: Dec 31, 2009—Sep 12, 2016

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
255A	Windsor loamy sand, 0 to 3 percent slopes	A	1.8	88.1%
256A	Deerfield loamy fine sand, 0 to 3 percent slopes	A	0.2	11.9%
Totals for Area of Interest			2.0	100.0%

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

PRE-DEVELOPMENT HYDROCAD CALCULATIONS

Definitive Subdivision Application Drainage Report

FOR

494 North Street, Road A ~ Map 18 Lot 24
Residential Development Project for
Two (2) Lots



Prepared for

**Oak Valley Development LLC
c/o James Ogden
32 Thurlow Street
Georgetown MA 01832**

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83 West Main Street
Merrimac, MA 01860

June 2020

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S PRE: Existing Condition Runoff Area=26,697 sf 12.50% Impervious Runoff Depth=0.01"
Flow Length=396' Slope=0.0100 '/ Tc=25.8 min CN=42 Runoff=0.00 cfs 0.000 af

Subcatchment2S PRE: Existing Condition Runoff Area=56,123 sf 10.51% Impervious Runoff Depth=0.01"
Flow Length=390' Slope=0.0100 '/ Tc=19.7 min CN=42 Runoff=0.00 cfs 0.001 af

Subcatchment3S PRE: Existing Condition Runoff Area=73,409 sf 9.35% Impervious Runoff Depth=0.00"
Flow Length=522' Slope=0.0100 '/ Tc=20.2 min CN=40 Runoff=0.00 cfs 0.000 af

Subcatchment4S PRE: Existing Condition Runoff Area=72,260 sf 13.12% Impervious Runoff Depth=0.02"
Flow Length=720' Slope=0.0100 '/ Tc=24.0 min UI Adjusted CN=44 Runoff=0.00 cfs 0.003 af

Subcatchment101S: Existing Condition Runoff Area=29,532 sf 17.00% Impervious Runoff Depth=0.01"
Flow Length=430' Tc=24.5 min UI Adjusted CN=42 Runoff=0.00 cfs 0.000 af

Subcatchment103S: Existing Condition Runoff Area=54,411 sf 14.23% Impervious Runoff Depth=0.01"
Flow Length=360' Tc=20.5 min UI Adjusted CN=42 Runoff=0.00 cfs 0.001 af

Subcatchment104S: Existing Condition Runoff Area=56,036 sf 56.50% Impervious Runoff Depth=0.72"
Flow Length=360' Tc=20.2 min CN=69 Runoff=0.63 cfs 0.078 af

Subcatchment105S: Existing Condition Runoff Area=70,815 sf 16.95% Impervious Runoff Depth=0.02"
Flow Length=456' Tc=21.8 min UI Adjusted CN=44 Runoff=0.00 cfs 0.003 af

Subcatchment106S: Existing Condition Runoff Area=55,680 sf 21.19% Impervious Runoff Depth=0.03"
Flow Length=424' Tc=20.0 min UI Adjusted CN=45 Runoff=0.01 cfs 0.004 af

Pond 100P: Ex CB A Peak Elev=66.54' Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.001 af

Pond 101P: Ex CB B Peak Elev=66.32' Inflow=0.63 cfs 0.087 af
Primary=0.63 cfs 0.087 af Secondary=0.00 cfs 0.000 af Outflow=0.63 cfs 0.087 af

Pond 102P: Ex DMH A Peak Elev=66.91' Inflow=0.63 cfs 0.085 af
12.0" Round Culvert n=0.025 L=139.0' S=0.0013 '/ Outflow=0.63 cfs 0.085 af

Pond 103P: Ex CB C Peak Elev=66.97' Inflow=0.63 cfs 0.085 af
Primary=0.63 cfs 0.085 af Secondary=0.00 cfs 0.000 af Outflow=0.63 cfs 0.085 af

Pond 104P: Ex CB D Peak Elev=67.10' Inflow=0.63 cfs 0.078 af
Primary=0.63 cfs 0.078 af Secondary=0.00 cfs 0.000 af Outflow=0.63 cfs 0.078 af

Pond 105P: Ex CB E Peak Elev=67.07' Inflow=0.01 cfs 0.007 af
Primary=0.01 cfs 0.007 af Secondary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.007 af

Pond 106P: Ex CB F Peak Elev=67.84' Inflow=0.01 cfs 0.004 af
Primary=0.01 cfs 0.004 af Secondary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.004 af

Link 103L: Design Point C Exist 12" CMP to BVW

Inflow=0.63 cfs 0.087 af
Primary=0.63 cfs 0.087 af

Link AP-A PRE: Design Point A Ex St gutter to CB A

Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Link AP-B PRE: Design Analysis Point B Exist CB AT Wells Ave

Inflow=0.00 cfs 0.003 af
Primary=0.00 cfs 0.003 af

Total Runoff Area = 11.363 ac Runoff Volume = 0.090 af Average Runoff Depth = 0.10"
81.05% Pervious = 9.209 ac 18.95% Impervious = 2.153 ac

Summary for Subcatchment 1S PRE: Existing Condition

Runoff = 0.00 cfs @ 22.73 hrs, Volume= 0.000 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
* 3,337	98	Impervious Pave drivewa, roofs, HSG A
13,348	30	Woods, Good, HSG A
10,012	39	>75% Grass cover, Good, HSG A
26,697	42	Weighted Average
23,360		87.50% Pervious Area
3,337		12.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	50	0.0100	0.05		Sheet Flow, woodland flow Woods: Light underbrush n= 0.400 P2= 3.10"
5.3	158	0.0100	0.50		Shallow Concentrated Flow, woodland flow Woodland Kv= 5.0 fps
3.8	158	0.0100	0.70		Shallow Concentrated Flow, grass lawn Short Grass Pasture Kv= 7.0 fps
0.2	30	0.0100	2.03		Shallow Concentrated Flow, North Stree gutter Paved Kv= 20.3 fps
25.8	396	Total			

Summary for Subcatchment 2S PRE: Existing Condition

Runoff = 0.00 cfs @ 22.61 hrs, Volume= 0.001 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
* 3,571	98	Paved driveway, exist, HSG A
18,859	30	Woods, Good, HSG A
1,809	98	Paved roads w/curbs & sewers, HSG A
31,364	39	>75% Grass cover, Good, HSG A
520	98	Unconnected roofs, HSG A
56,123	42	Weighted Average
50,223		89.49% Pervious Area
5,900		10.51% Impervious Area
520		8.81% Unconnected

494 North Street PRE FINAL rev 8-19

Type III 24-hr 2 Year Rainfall=3.10"

Prepared by WGH Design, ASB

Printed 8/24/2020

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	50	0.0100	0.05		Sheet Flow, woodland flow Woods: Light underbrush n= 0.400 P2= 3.10"
1.7	150	0.0100	1.50		Shallow Concentrated Flow, grass flow Grassed Waterway Kv= 15.0 fps
0.7	90	0.0100	2.03		Shallow Concentrated Flow, paved surface Paved Kv= 20.3 fps
0.8	100	0.0100	2.03		Shallow Concentrated Flow, paved roadway gutter to DP A Paved Kv= 20.3 fps
19.7	390	Total			

Summary for Subcatchment 3S PRE: Existing Condition

Runoff = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
* 2,968	98	Paved driveway, exist, HSG A
33,240	30	Woods, Good, HSG A
2,395	98	Paved roads w/curbs & sewers, HSG A
33,306	39	>75% Grass cover, Good, HSG A
1,500	98	Unconnected roofs, HSG A
73,409	40	Weighted Average
66,546		90.65% Pervious Area
6,863		9.35% Impervious Area
1,500		21.86% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		Sheet Flow, grass area flow Grass: Short n= 0.150 P2= 3.10"
0.2	22	0.0100	1.50		Shallow Concentrated Flow, grass flow Grassed Waterway Kv= 15.0 fps
11.7	350	0.0100	0.50		Shallow Concentrated Flow, woodland area Woodland Kv= 5.0 fps
0.8	100	0.0100	2.03		Shallow Concentrated Flow, paved roadway gutter to DP A Paved Kv= 20.3 fps
20.2	522	Total			

Summary for Subcatchment 4S PRE: Existing Condition

Runoff = 0.00 cfs @ 17.36 hrs, Volume= 0.003 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

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Type III 24-hr 2 Year Rainfall=3.10"

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Area (sf)	CN	Adj	Description
* 1,200	98		Paved driveway, exist, HSG A
10,530	30		Woods, Good, HSG A
5,070	98		Paved roads w/curbs & sewers, HSG A
52,250	39		>75% Grass cover, Good, HSG A
3,210	98		Unconnected roofs, HSG A
72,260	45	44	Weighted Average, UI Adjusted
62,780			86.88% Pervious Area
9,480			13.12% Impervious Area
3,210			33.86% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	50	0.0100	0.05		Sheet Flow, woodland area flow Woods: Light underbrush n= 0.400 P2= 3.10"
1.9	168	0.0100	1.50		Shallow Concentrated Flow, grass flow Grassed Waterway Kv= 15.0 fps
2.0	60	0.0100	0.50		Shallow Concentrated Flow, woodland area Woodland Kv= 5.0 fps
1.7	205	0.0100	2.03		Shallow Concentrated Flow, paved surface road way gutter Paved Kv= 20.3 fps
1.9	237	0.0100	2.03		Shallow Concentrated Flow, paved roadway gutter to DP A Paved Kv= 20.3 fps
24.0	720	Total			

Summary for Subcatchment 101S: Existing Condition

Runoff = 0.00 cfs @ 22.73 hrs, Volume= 0.000 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Adj	Description
* 1,470	98		Impervious Pave drivewa, roofs, HSG A
15,170	30		Woods, Good, HSG A
9,342	39		>75% Grass cover, Good, HSG A
* 1,400	98		Paved roads w/swales & sewers, HSG A
2,150	98		Unconnected roofs, HSG A
29,532	44	42	Weighted Average, UI Adjusted
24,512			83.00% Pervious Area
5,020			17.00% Impervious Area
2,150			42.83% Unconnected

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Type III 24-hr 2 Year Rainfall=3.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	50	0.0125	0.06		Sheet Flow, woodland flow Woods: Light underbrush n= 0.400 P2= 3.10"
2.6	95	0.0150	0.61		Shallow Concentrated Flow, woodland flow Woodland Kv= 5.0 fps
4.0	167	0.0100	0.70		Shallow Concentrated Flow, grass lawn Short Grass Pasture Kv= 7.0 fps
2.6	88	0.0125	0.56		Shallow Concentrated Flow, woods Woodland Kv= 5.0 fps
0.2	30	0.0100	2.03		Shallow Concentrated Flow, North Stree gutter Paved Kv= 20.3 fps
24.5	430	Total			

Summary for Subcatchment 103S: Existing Condition

Runoff = 0.00 cfs @ 22.62 hrs, Volume= 0.001 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

	Area (sf)	CN	Adj	Description
*	2,500	98		Impervious Pave driveway, HSG A
	28,786	30		Woods, Good, HSG A
	17,885	39		>75% Grass cover, Good, HSG A
*	3,840	98		Paved roads w/swales & sewers, HSG A
	1,400	98		Unconnected roofs, HSG A
	54,411	43	42	Weighted Average, UI Adjusted
	46,671			85.77% Pervious Area
	7,740			14.23% Impervious Area
	1,400			18.09% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	50	0.0150	0.06		Sheet Flow, woodland flow Woods: Light underbrush n= 0.400 P2= 3.10"
4.9	180	0.0150	0.61		Shallow Concentrated Flow, woodland flow Woodland Kv= 5.0 fps
0.8	40	0.0150	0.86		Shallow Concentrated Flow, grass lawn Short Grass Pasture Kv= 7.0 fps
0.7	90	0.0100	2.03		Shallow Concentrated Flow, Charles Stree gutter Paved Kv= 20.3 fps
20.5	360	Total			

Summary for Subcatchment 104S: Existing Condition

Runoff = 0.63 cfs @ 12.32 hrs, Volume= 0.078 af, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

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Type III 24-hr 2 Year Rainfall=3.10"

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	Area (sf)	CN	Description
*	24,700	98	Impervious Pave driveway HSG A
	20,990	30	Woods, Good, HSG A
	3,386	39	>75% Grass cover, Good, HSG A
*	3,840	98	Paved roads w/swales & sewers, HSG A
	3,120	98	Unconnected roofs, HSG A
	56,036	69	Weighted Average
	24,376		43.50% Pervious Area
	31,660		56.50% Impervious Area
	3,120		9.85% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	50	0.0125	0.06		Sheet Flow, woodland flow Woods: Light underbrush n= 0.400 P2= 3.10"
2.4	90	0.0150	0.61		Shallow Concentrated Flow, woodland flow Woodland Kv= 5.0 fps
1.4	60	0.0100	0.70		Shallow Concentrated Flow, grass lawn Short Grass Pasture Kv= 7.0 fps
1.3	160	0.0100	2.03		Shallow Concentrated Flow, Charles Street gutter Paved Kv= 20.3 fps
20.2	360	Total			

Summary for Subcatchment 105S: Existing Condition

Runoff = 0.00 cfs @ 17.27 hrs, Volume= 0.003 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

	Area (sf)	CN	Adj	Description
*	1,300	98		Impervious Pave drivewa, roofs, HSG A
	17,509	30		Woods, Good, HSG A
	41,306	39		>75% Grass cover, Good, HSG A
*	4,400	98		Paved roads w/swales & sewers, HSG A
	6,300	98		Unconnected roofs, HSG A
	70,815	47	44	Weighted Average, UI Adjusted
	58,815			83.05% Pervious Area
	12,000			16.95% Impervious Area
	6,300			52.50% Unconnected

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	50	0.0125	0.06		Sheet Flow, woodland flow Woods: Light underbrush n= 0.400 P2= 3.10"
1.9	69	0.0150	0.61		Shallow Concentrated Flow, woodland flow Woodland Kv= 5.0 fps
3.1	131	0.0100	0.70		Shallow Concentrated Flow, grass lawn Short Grass Pasture Kv= 7.0 fps
1.7	206	0.0100	2.03		Shallow Concentrated Flow, Charles Street gutter Paved Kv= 20.3 fps
21.8	456	Total			

Summary for Subcatchment 106S: Existing Condition

Runoff = 0.01 cfs @ 15.84 hrs, Volume= 0.004 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Adj	Description
* 2,600	98		Impervious Pave driveway, HSG A
24,704	30		Woods, Good, HSG A
19,176	39		>75% Grass cover, Good, HSG A
* 4,400	98		Paved roads w/swales & sewers, HSG A
4,800	98		Unconnected roofs, HSG A
55,680	48	45	Weighted Average, UI Adjusted
43,880			78.81% Pervious Area
11,800			21.19% Impervious Area
4,800			40.68% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	50	0.0125	0.06		Sheet Flow, woodland flow Woods: Light underbrush n= 0.400 P2= 3.10"
0.4	15	0.0150	0.61		Shallow Concentrated Flow, woodland flow Woodland Kv= 5.0 fps
2.3	95	0.0100	0.70		Shallow Concentrated Flow, grass lawn Short Grass Pasture Kv= 7.0 fps
2.2	264	0.0100	2.03		Shallow Concentrated Flow, Charles Street gutter Paved Kv= 20.3 fps
20.0	424	Total			

Summary for Pond 100P: Ex CB A

Inflow Area = 3.587 ac, 10.31% Impervious, Inflow Depth = 0.00" for 2 Year event
 Inflow = 0.00 cfs @ 23.88 hrs, Volume= 0.001 af
 Outflow = 0.00 cfs @ 23.88 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.00 cfs @ 23.88 hrs, Volume= 0.001 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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Type III 24-hr 2 Year Rainfall=3.10"

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Peak Elev= 66.54' @ 23.88 hrs

Flood Elev= 68.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.49'	12.0" Round Culvert L= 86.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 66.49' / 66.08' S= 0.0048 ' / Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	68.25'	1.5" x 1.5" Horiz. Orifice/Grate X 36.00 C= 0.600 in 30.0" x 30.0" Grate (9% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 23.88 hrs HW=66.54' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.00 cfs @ 0.33 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=66.49' (Free Discharge)↑**2=Orifice/Grate** (Controls 0.00 cfs)**Summary for Pond 101P: Ex CB B**

[79] Warning: Submerged Pond 100P Primary device # 1 OUTLET by 0.24'

[79] Warning: Submerged Pond 102P Primary device # 1 INLET by 0.22'

Inflow Area = 9.704 ac, 19.95% Impervious, Inflow Depth = 0.11" for 2 Year event
Inflow = 0.63 cfs @ 12.32 hrs, Volume= 0.087 af
Outflow = 0.63 cfs @ 12.32 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.32 hrs, Volume= 0.087 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 66.32' @ 12.32 hrs

Flood Elev= 67.94'

Device	Routing	Invert	Outlet Devices
#1	Primary	65.84'	12.0" Round Culvert L= 427.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 65.84' / 59.38' S= 0.0151 ' / Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	67.84'	1.5" x 1.5" Horiz. Orifice/Grate X 36.00 C= 0.600 in 30.0" x 30.0" Grate (9% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.63 cfs @ 12.32 hrs HW=66.32' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.63 cfs @ 2.47 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=65.84' (Free Discharge)↑**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 102P: Ex DMH A

[79] Warning: Submerged Pond 103P Primary device # 1 INLET by 0.34'

Inflow Area = 5.439 ac, 26.67% Impervious, Inflow Depth = 0.19" for 2 Year event
 Inflow = 0.63 cfs @ 12.32 hrs, Volume= 0.085 af
 Outflow = 0.63 cfs @ 12.32 hrs, Volume= 0.085 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.63 cfs @ 12.32 hrs, Volume= 0.085 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 66.91' @ 12.32 hrs

Flood Elev= 70.39'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.10'	12.0" Round Culvert L= 139.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 66.10' / 65.92' S= 0.0013 ' / ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=0.63 cfs @ 12.32 hrs HW=66.91' (Free Discharge)

↑**1=Culvert** (Barrel Controls 0.63 cfs @ 1.26 fps)

Summary for Pond 103P: Ex CB C

[79] Warning: Submerged Pond 104P Primary device # 1 INLET by 0.27'

[79] Warning: Submerged Pond 105P Primary device # 1 OUTLET by 0.66'

Inflow Area = 5.439 ac, 26.67% Impervious, Inflow Depth = 0.19" for 2 Year event
 Inflow = 0.63 cfs @ 12.32 hrs, Volume= 0.085 af
 Outflow = 0.63 cfs @ 12.32 hrs, Volume= 0.085 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.63 cfs @ 12.32 hrs, Volume= 0.085 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 66.97' @ 12.32 hrs

Flood Elev= 68.99'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.57'	12.0" Round Culvert L= 38.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 66.57' / 66.10' S= 0.0124 ' / ' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Secondary	68.89'	1.5" x 1.5" Horiz. Orifice/Grate X 36.00 C= 0.600 in 30.0" x 30.0" Grate (9% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.63 cfs @ 12.32 hrs HW=66.97' (Free Discharge)

↑**1=Culvert** (Inlet Controls 0.63 cfs @ 2.15 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.57' (Free Discharge)

↑**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 104P: Ex CB D

Inflow Area = 1.286 ac, 56.50% Impervious, Inflow Depth = 0.72" for 2 Year event
 Inflow = 0.63 cfs @ 12.32 hrs, Volume= 0.078 af
 Outflow = 0.63 cfs @ 12.32 hrs, Volume= 0.078 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.63 cfs @ 12.32 hrs, Volume= 0.078 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 67.10' @ 12.32 hrs

Flood Elev= 70.03'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.70'	12.0" Round Culvert L= 21.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 66.70' / 65.89' S= 0.0386 ' S= 0.0386 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	69.03'	1.5" x 1.5" Horiz. Orifice/Grate X 36.00 C= 0.600 in 30.0" x 30.0" Grate (9% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.63 cfs @ 12.32 hrs HW=67.10' (Free Discharge)

↑1=Culvert (Inlet Controls 0.63 cfs @ 2.15 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.70' (Free Discharge)

↑2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 105P: Ex CB E

Inflow Area = 2.904 ac, 18.81% Impervious, Inflow Depth = 0.03" for 2 Year event
 Inflow = 0.01 cfs @ 17.04 hrs, Volume= 0.007 af
 Outflow = 0.01 cfs @ 17.04 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.01 cfs @ 17.04 hrs, Volume= 0.007 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 67.07' @ 17.04 hrs

Flood Elev= 71.62'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.01'	12.0" Round Culvert L= 220.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 67.01' / 66.31' S= 0.0032 ' S= 0.0032 ' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Secondary	71.52'	1.5" x 1.5" Horiz. Orifice/Grate X 36.00 C= 0.600 in 30.0" x 30.0" Grate (9% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.01 cfs @ 17.04 hrs HW=67.07' (Free Discharge)

↑**1=Culvert** (Barrel Controls 0.01 cfs @ 0.63 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.01' (Free Discharge)

↑**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 106P: Ex CB F

Inflow Area = 1.278 ac, 21.19% Impervious, Inflow Depth = 0.03" for 2 Year event
 Inflow = 0.01 cfs @ 15.84 hrs, Volume= 0.004 af
 Outflow = 0.01 cfs @ 15.84 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.01 cfs @ 15.84 hrs, Volume= 0.004 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 67.84' @ 15.84 hrs

Flood Elev= 71.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.80'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 67.80' / 67.70' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	71.80'	1.5" x 1.5" Horiz. Orifice/Grate X 36.00 C= 0.600 in 30.0" x 30.0" Grate (9% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 15.84 hrs HW=67.84' (Free Discharge)

↑**1=Culvert** (Barrel Controls 0.00 cfs @ 0.63 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.80' (Free Discharge)

↑**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link 103L: Design Point C Exist 12" CMP to BVW

Inflow Area = 9.704 ac, 19.95% Impervious, Inflow Depth = 0.11" for 2 Year event
 Inflow = 0.63 cfs @ 12.32 hrs, Volume= 0.087 af
 Primary = 0.63 cfs @ 12.32 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link AP-A PRE: Design Point A Ex St gutter to CB A

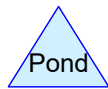
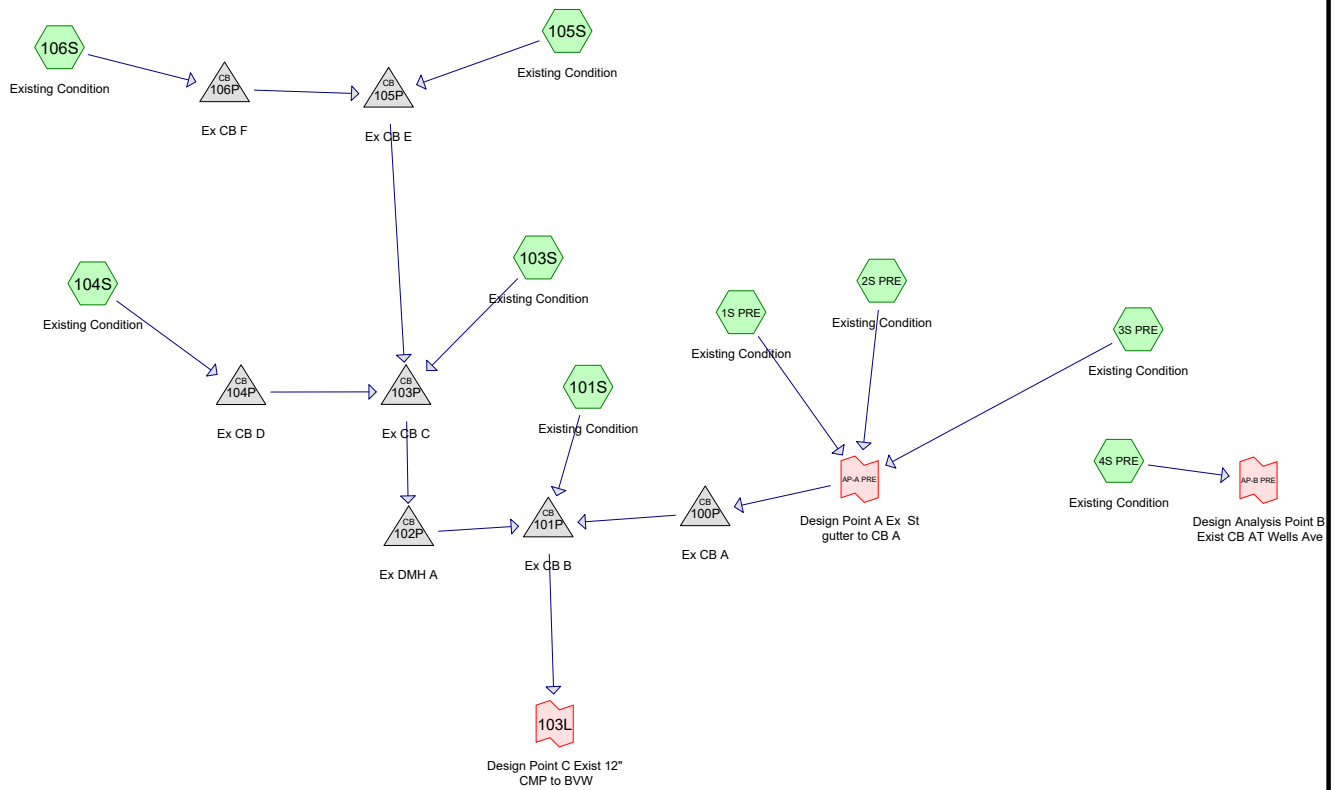
Inflow Area = 3.587 ac, 10.31% Impervious, Inflow Depth = 0.00" for 2 Year event
 Inflow = 0.00 cfs @ 23.88 hrs, Volume= 0.001 af
 Primary = 0.00 cfs @ 23.88 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link AP-B PRE: Design Analysis Point B Exist CB AT Wells Ave

Inflow Area = 1.659 ac, 13.12% Impervious, Inflow Depth = 0.02" for 2 Year event
Inflow = 0.00 cfs @ 17.36 hrs, Volume= 0.003 af
Primary = 0.00 cfs @ 17.36 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs



Routing Diagram for 494 North Street PRE FINAL rev 8-19
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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S PRE: Existing Condition Runoff Area=26,697 sf 12.50% Impervious Runoff Depth=0.19"
Flow Length=396' Slope=0.0100 '/ Tc=25.8 min CN=42 Runoff=0.02 cfs 0.010 af

Subcatchment2S PRE: Existing Condition Runoff Area=56,123 sf 10.51% Impervious Runoff Depth=0.19"
Flow Length=390' Slope=0.0100 '/ Tc=19.7 min CN=42 Runoff=0.04 cfs 0.021 af

Subcatchment3S PRE: Existing Condition Runoff Area=73,409 sf 9.35% Impervious Runoff Depth=0.14"
Flow Length=522' Slope=0.0100 '/ Tc=20.2 min CN=40 Runoff=0.03 cfs 0.019 af

Subcatchment4S PRE: Existing Condition Runoff Area=72,260 sf 13.12% Impervious Runoff Depth=0.26"
Flow Length=720' Slope=0.0100 '/ Tc=24.0 min UI Adjusted CN=44 Runoff=0.10 cfs 0.036 af

Subcatchment101S: Existing Condition Runoff Area=29,532 sf 17.00% Impervious Runoff Depth=0.19"
Flow Length=430' Tc=24.5 min UI Adjusted CN=42 Runoff=0.02 cfs 0.011 af

Subcatchment103S: Existing Condition Runoff Area=54,411 sf 14.23% Impervious Runoff Depth=0.19"
Flow Length=360' Tc=20.5 min UI Adjusted CN=42 Runoff=0.04 cfs 0.020 af

Subcatchment104S: Existing Condition Runoff Area=56,036 sf 56.50% Impervious Runoff Depth=1.60"
Flow Length=360' Tc=20.2 min CN=69 Runoff=1.55 cfs 0.172 af

Subcatchment105S: Existing Condition Runoff Area=70,815 sf 16.95% Impervious Runoff Depth=0.26"
Flow Length=456' Tc=21.8 min UI Adjusted CN=44 Runoff=0.11 cfs 0.035 af

Subcatchment106S: Existing Condition Runoff Area=55,680 sf 21.19% Impervious Runoff Depth=0.30"
Flow Length=424' Tc=20.0 min UI Adjusted CN=45 Runoff=0.11 cfs 0.032 af

Pond 100P: Ex CB A Peak Elev=66.72' Inflow=0.08 cfs 0.050 af
Primary=0.08 cfs 0.050 af Secondary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.050 af

Pond 101P: Ex CB B Peak Elev=66.67' Inflow=1.62 cfs 0.320 af
Primary=1.62 cfs 0.320 af Secondary=0.00 cfs 0.000 af Outflow=1.62 cfs 0.320 af

Pond 102P: Ex DMH A Peak Elev=68.08' Inflow=1.61 cfs 0.259 af
12.0" Round Culvert n=0.025 L=139.0' S=0.0013 '/ Outflow=1.61 cfs 0.259 af

Pond 103P: Ex CB C Peak Elev=67.26' Inflow=1.61 cfs 0.259 af
Primary=1.61 cfs 0.259 af Secondary=0.00 cfs 0.000 af Outflow=1.61 cfs 0.259 af

Pond 104P: Ex CB D Peak Elev=67.37' Inflow=1.55 cfs 0.172 af
Primary=1.55 cfs 0.172 af Secondary=0.00 cfs 0.000 af Outflow=1.55 cfs 0.172 af

Pond 105P: Ex CB E Peak Elev=67.30' Inflow=0.22 cfs 0.067 af
Primary=0.22 cfs 0.067 af Secondary=0.00 cfs 0.000 af Outflow=0.22 cfs 0.067 af

Pond 106P: Ex CB F Peak Elev=67.99' Inflow=0.11 cfs 0.032 af
Primary=0.11 cfs 0.032 af Secondary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.032 af

Link 103L: Design Point C Exist 12" CMP to BVW

Inflow=1.62 cfs 0.320 af

Primary=1.62 cfs 0.320 af

Link AP-A PRE: Design Point A Ex St gutter to CB A

Inflow=0.08 cfs 0.050 af

Primary=0.08 cfs 0.050 af

Link AP-B PRE: Design Analysis Point B Exist CB AT Wells Ave

Inflow=0.10 cfs 0.036 af

Primary=0.10 cfs 0.036 af

Total Runoff Area = 11.363 ac Runoff Volume = 0.356 af Average Runoff Depth = 0.38"
81.05% Pervious = 9.209 ac 18.95% Impervious = 2.153 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S PRE: Existing Condition Runoff Area=26,697 sf 12.50% Impervious Runoff Depth=1.00"
Flow Length=396' Slope=0.0100 '/ Tc=25.8 min CN=42 Runoff=0.30 cfs 0.051 af

Subcatchment2S PRE: Existing Condition Runoff Area=56,123 sf 10.51% Impervious Runoff Depth=1.00"
Flow Length=390' Slope=0.0100 '/ Tc=19.7 min CN=42 Runoff=0.68 cfs 0.107 af

Subcatchment3S PRE: Existing Condition Runoff Area=73,409 sf 9.35% Impervious Runoff Depth=0.84"
Flow Length=522' Slope=0.0100 '/ Tc=20.2 min CN=40 Runoff=0.67 cfs 0.118 af

Subcatchment4S PRE: Existing Condition Runoff Area=72,260 sf 13.12% Impervious Runoff Depth=1.15"
Flow Length=720' Slope=0.0100 '/ Tc=24.0 min UI Adjusted CN=44 Runoff=1.04 cfs 0.160 af

Subcatchment101S: Existing Condition Runoff Area=29,532 sf 17.00% Impervious Runoff Depth=1.00"
Flow Length=430' Tc=24.5 min UI Adjusted CN=42 Runoff=0.33 cfs 0.056 af

Subcatchment103S: Existing Condition Runoff Area=54,411 sf 14.23% Impervious Runoff Depth=1.00"
Flow Length=360' Tc=20.5 min UI Adjusted CN=42 Runoff=0.65 cfs 0.104 af

Subcatchment104S: Existing Condition Runoff Area=56,036 sf 56.50% Impervious Runoff Depth=3.51"
Flow Length=360' Tc=20.2 min CN=69 Runoff=3.55 cfs 0.377 af

Subcatchment105S: Existing Condition Runoff Area=70,815 sf 16.95% Impervious Runoff Depth=1.15"
Flow Length=456' Tc=21.8 min UI Adjusted CN=44 Runoff=1.05 cfs 0.156 af

Subcatchment106S: Existing Condition Runoff Area=55,680 sf 21.19% Impervious Runoff Depth=1.24"
Flow Length=424' Tc=20.0 min UI Adjusted CN=45 Runoff=0.94 cfs 0.132 af

Pond 100P: Ex CB A Peak Elev=67.67' Inflow=1.63 cfs 0.276 af
Primary=1.63 cfs 0.276 af Secondary=0.00 cfs 0.000 af Outflow=1.63 cfs 0.276 af

Pond 101P: Ex CB B Peak Elev=70.40' Inflow=7.13 cfs 1.090 af
Primary=2.79 cfs 0.898 af Secondary=4.34 cfs 0.192 af Outflow=7.13 cfs 1.090 af

Pond 102P: Ex DMH A Peak Elev=79.06' Inflow=5.23 cfs 0.758 af
12.0" Round Culvert n=0.025 L=139.0' S=0.0013 '/ Outflow=5.23 cfs 0.758 af

Pond 103P: Ex CB C Peak Elev=68.98' Inflow=6.03 cfs 0.769 af
Primary=5.23 cfs 0.758 af Secondary=0.80 cfs 0.011 af Outflow=6.03 cfs 0.769 af

Pond 104P: Ex CB D Peak Elev=68.08' Inflow=3.55 cfs 0.377 af
Primary=3.55 cfs 0.377 af Secondary=0.00 cfs 0.000 af Outflow=3.55 cfs 0.377 af

Pond 105P: Ex CB E Peak Elev=68.06' Inflow=1.99 cfs 0.288 af
Primary=1.99 cfs 0.288 af Secondary=0.00 cfs 0.000 af Outflow=1.99 cfs 0.288 af

Pond 106P: Ex CB F Peak Elev=68.41' Inflow=0.94 cfs 0.132 af
Primary=0.94 cfs 0.132 af Secondary=0.00 cfs 0.000 af Outflow=0.94 cfs 0.132 af

Link 103L: Design Point C Exist 12" CMP to BVW

Inflow=2.79 cfs 0.898 af
Primary=2.79 cfs 0.898 af

Link AP-A PRE: Design Point A Ex St gutter to CB A

Inflow=1.63 cfs 0.276 af
Primary=1.63 cfs 0.276 af

Link AP-B PRE: Design Analysis Point B Exist CB AT Wells Ave

Inflow=1.04 cfs 0.160 af
Primary=1.04 cfs 0.160 af

Total Runoff Area = 11.363 ac Runoff Volume = 1.260 af Average Runoff Depth = 1.33"
81.05% Pervious = 9.209 ac 18.95% Impervious = 2.153 ac

POST-DEVELOPMENT HYDROCAD CALCULATIONS

Definitive Subdivision Application Drainage Report

FOR

494 North Street, Road A ~ Map 18 Lot 24
Residential Development Project for
Two (2) Lots



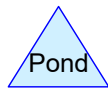
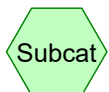
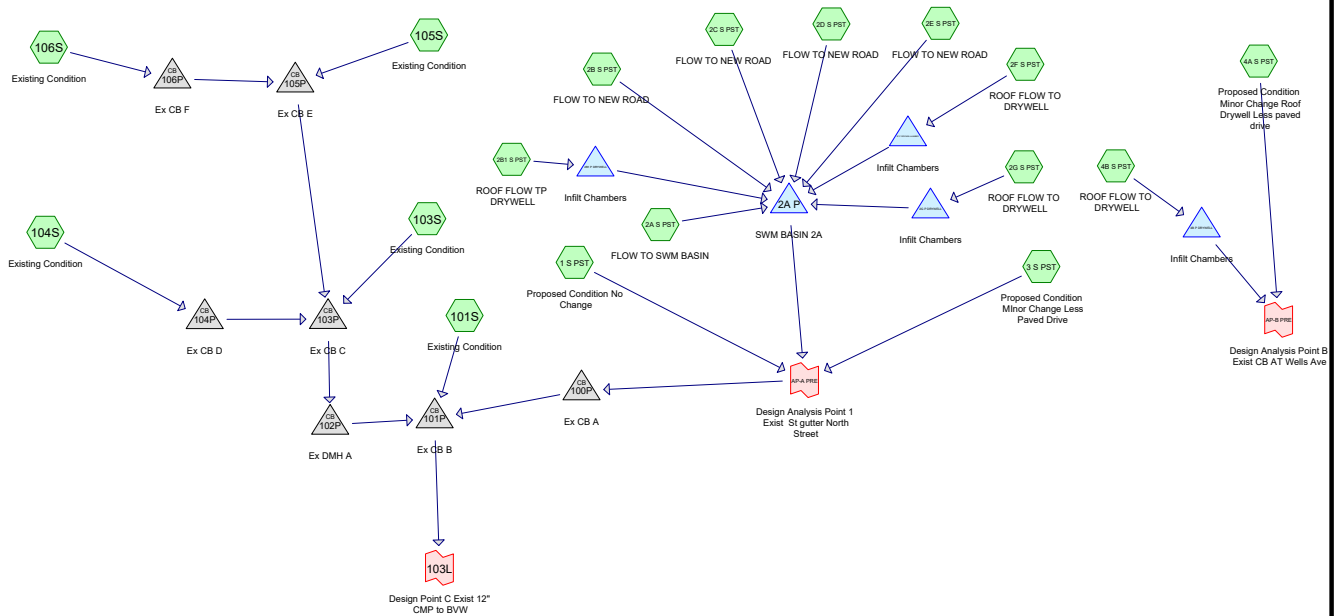
Prepared for

**Oak Valley Development LLC
c/o James Ogden
32 Thurlow Street
Georgetown MA 01832**

Prepared by:

WGH Land Survey & Design and
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June 2020



Routing Diagram for 494 North Street POST FINAL rev 8-19
 Prepared by WGH Design, ASB, Printed 8/24/2020
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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1 S PST: Proposed	Runoff Area=26,697 sf 12.50% Impervious Runoff Depth=0.01"
Flow Length=396'	Slope=0.0100 '/' Tc=25.8 min CN=42 Runoff=0.00 cfs 0.000 af
Subcatchment2A S PST: FLOW TO SWM	Runoff Area=10,805 sf 32.50% Impervious Runoff Depth=0.34"
Flow Length=290'	Slope=0.0100 '/' Tc=9.5 min CN=59 Runoff=0.04 cfs 0.007 af
Subcatchment2B S PST: FLOW TO NEW	Runoff Area=23,615 sf 7.61% Impervious Runoff Depth=0.00"
Flow Length=248'	Slope=0.0100 '/' Tc=18.9 min CN=41 Runoff=0.00 cfs 0.000 af
Subcatchment2B1 S PST: ROOF FLOW TP	Runoff Area=1,640 sf 100.00% Impervious Runoff Depth=2.87"
	Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af
Subcatchment2C S PST: FLOW TO NEW	Runoff Area=8,938 sf 10.02% Impervious Runoff Depth=0.05"
Flow Length=143'	Slope=0.0100 '/' Tc=8.5 min CN=46 Runoff=0.00 cfs 0.001 af
Subcatchment2D S PST: FLOW TO NEW	Runoff Area=6,889 sf 29.69% Impervious Runoff Depth=0.28"
Flow Length=102'	Slope=0.0100 '/' Tc=8.0 min CN=57 Runoff=0.02 cfs 0.004 af
Subcatchment2E S PST: FLOW TO NEW	Runoff Area=3,392 sf 19.93% Impervious Runoff Depth=0.22"
Flow Length=62'	Slope=0.0100 '/' Tc=7.6 min CN=55 Runoff=0.01 cfs 0.001 af
Subcatchment2F S PST: ROOF FLOW TO	Runoff Area=367 sf 100.00% Impervious Runoff Depth=2.87"
	Tc=6.0 min CN=98 Runoff=0.03 cfs 0.002 af
Subcatchment2G S PST: ROOF FLOW TO	Runoff Area=342 sf 100.00% Impervious Runoff Depth=2.87"
	Tc=6.0 min CN=98 Runoff=0.02 cfs 0.002 af
Subcatchment3 S PST: Proposed	Runoff Area=73,409 sf 8.28% Impervious Runoff Depth=0.00"
Flow Length=522'	Slope=0.0100 '/' Tc=20.2 min UI Adjusted CN=39 Runoff=0.00 cfs 0.000 af
Subcatchment4A S PST: Proposed	Runoff Area=71,210 sf 10.48% Impervious Runoff Depth=0.01"
Flow Length=720'	Slope=0.0100 '/' Tc=24.0 min UI Adjusted CN=43 Runoff=0.00 cfs 0.002 af
Subcatchment4B S PST: ROOF FLOW TO	Runoff Area=1,050 sf 100.00% Impervious Runoff Depth=2.87"
	Tc=6.0 min CN=98 Runoff=0.07 cfs 0.006 af
Subcatchment101S: Existing Condition	Runoff Area=29,532 sf 17.00% Impervious Runoff Depth=0.01"
Flow Length=430'	Tc=24.5 min UI Adjusted CN=42 Runoff=0.00 cfs 0.000 af
Subcatchment103S: Existing Condition	Runoff Area=54,411 sf 14.23% Impervious Runoff Depth=0.01"
Flow Length=360'	Tc=20.5 min UI Adjusted CN=42 Runoff=0.00 cfs 0.001 af
Subcatchment104S: Existing Condition	Runoff Area=56,036 sf 56.50% Impervious Runoff Depth=0.72"
Flow Length=360'	Tc=20.2 min CN=69 Runoff=0.63 cfs 0.078 af
Subcatchment105S: Existing Condition	Runoff Area=70,815 sf 16.95% Impervious Runoff Depth=0.02"
Flow Length=456'	Tc=21.8 min UI Adjusted CN=44 Runoff=0.00 cfs 0.003 af

Subcatchment 106S: Existing Condition Runoff Area=55,680 sf 21.19% Impervious Runoff Depth=0.03"
Flow Length=424' Tc=20.0 min UI Adjusted CN=45 Runoff=0.01 cfs 0.004 af

Pond 2A P: SWM BASIN 2A Peak Elev=67.17' Storage=55 cf Inflow=0.07 cfs 0.013 af
Discarded=0.04 cfs 0.013 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.013 af

Pond 2B1 P DRYWELL: Infil Chambers Peak Elev=67.52' Storage=44 cf Inflow=0.11 cfs 0.009 af
Discarded=0.05 cfs 0.009 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.009 af

Pond 2F P DRYWELLHAMBER: Infil Chambers Peak Elev=69.02' Storage=1 cf Inflow=0.03 cfs 0.002 af
Discarded=0.02 cfs 0.002 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.002 af

Pond 2G P DRYWELL: Infil Chambers Peak Elev=69.02' Storage=1 cf Inflow=0.02 cfs 0.002 af
Discarded=0.02 cfs 0.002 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.002 af

Pond 4B P DRYWELL: Infil Chambers Peak Elev=69.41' Storage=24 cf Inflow=0.07 cfs 0.006 af
Discarded=0.03 cfs 0.006 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.006 af

Pond 100P: Ex CB A Peak Elev=66.51' Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 101P: Ex CB B Peak Elev=66.32' Inflow=0.63 cfs 0.086 af
Primary=0.63 cfs 0.086 af Secondary=0.00 cfs 0.000 af Outflow=0.63 cfs 0.086 af

Pond 102P: Ex DMH A Peak Elev=66.91' Inflow=0.63 cfs 0.085 af
12.0" Round Culvert n=0.025 L=139.0' S=0.0013 ' Outflow=0.63 cfs 0.085 af

Pond 103P: Ex CB C Peak Elev=66.97' Inflow=0.63 cfs 0.085 af
Primary=0.63 cfs 0.085 af Secondary=0.00 cfs 0.000 af Outflow=0.63 cfs 0.085 af

Pond 104P: Ex CB D Peak Elev=67.10' Inflow=0.63 cfs 0.078 af
Primary=0.63 cfs 0.078 af Secondary=0.00 cfs 0.000 af Outflow=0.63 cfs 0.078 af

Pond 105P: Ex CB E Peak Elev=67.07' Inflow=0.01 cfs 0.007 af
Primary=0.01 cfs 0.007 af Secondary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.007 af

Pond 106P: Ex CB F Peak Elev=67.84' Inflow=0.01 cfs 0.004 af
Primary=0.01 cfs 0.004 af Secondary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.004 af

Link 103L: Design Point C Exist 12" CMP to BVW Inflow=0.63 cfs 0.086 af
Primary=0.63 cfs 0.086 af

Link AP-A PRE: Design Analysis Point 1 Exist St gutter North Street Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link AP-B PRE: Design Analysis Point B Exist CB AT Wells Ave Inflow=0.00 cfs 0.002 af
Primary=0.00 cfs 0.002 af

Total Runoff Area = 11.360 ac Runoff Volume = 0.120 af Average Runoff Depth = 0.13"
80.31% Pervious = 9.123 ac 19.69% Impervious = 2.236 ac

Summary for Subcatchment 1 S PST: Proposed Condition No Change

Runoff = 0.00 cfs @ 22.73 hrs, Volume= 0.000 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

	Area (sf)	CN	Description
*	3,337	98	Impervious Pave drivewa, roofs, HSG A
	13,348	30	Woods, Good, HSG A
	10,012	39	>75% Grass cover, Good, HSG A
	26,697	42	Weighted Average
	23,360		87.50% Pervious Area
	3,337		12.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	50	0.0100	0.05		Sheet Flow, woodland flow Woods: Light underbrush n= 0.400 P2= 3.10"
5.3	158	0.0100	0.50		Shallow Concentrated Flow, woodland flow Woodland Kv= 5.0 fps
3.8	158	0.0100	0.70		Shallow Concentrated Flow, grass lawn Short Grass Pasture Kv= 7.0 fps
0.2	30	0.0100	2.03		Shallow Concentrated Flow, North Stree gutter Paved Kv= 20.3 fps
25.8	396	Total			

Summary for Subcatchment 2A S PST: FLOW TO SWM BASIN

Runoff = 0.04 cfs @ 12.28 hrs, Volume= 0.007 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

	Area (sf)	CN	Description
	1,151	30	Woods, Good, HSG A
*	1,703	98	Paved roads NEW Road area, HSG A
*	1,809	98	Paved roads North Street, HSG A
	5,777	39	>75% Grass cover, Good, HSG A
*	185	96	Gravel road surface, HSG A
*	180	76	Gravel stone trench, HSG A
	10,805	59	Weighted Average
	7,293		67.50% Pervious Area
	3,512		32.50% Impervious Area

494 North Street POST FINAL rev 8-19

Type III 24-hr 2 Year Rainfall=3.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		Sheet Flow, grass lawn flow Grass: Short n= 0.150 P2= 3.10"
2.0	240	0.0100	2.03		Shallow Concentrated Flow, paved gutter Paved Kv= 20.3 fps
9.5	290	Total			

Summary for Subcatchment 2B S PST: FLOW TO NEW ROAD

Runoff = 0.00 cfs @ 23.96 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
7,282	30	Woods, Good, HSG A
* 970	98	Paved roads NEW Road area, HSG A
826	98	Paved parking, HSG A
* 82	96	Gravel road surface, HSG A
* 74	76	Stone Gravel trench, HSG A
14,381	39	>75% Grass cover, Good, HSG A
23,615	41	Weighted Average
21,819		92.39% Pervious Area
1,796		7.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	50	0.0100	0.05		Sheet Flow, WOODLAND Woods: Light underbrush n= 0.400 P2= 3.10"
0.3	10	0.0100	0.50		Shallow Concentrated Flow, WOODLAND Woodland Kv= 5.0 fps
2.1	188	0.0100	1.50		Shallow Concentrated Flow, GRASS LAWN Grassed Waterway Kv= 15.0 fps
18.9	248	Total			

Summary for Subcatchment 2B1 S PST: ROOF FLOW TP DRYWELL

Runoff = 0.11 cfs @ 12.08 hrs, Volume= 0.009 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
1,640	98	Unconnected roofs, HSG A
1,640		100.00% Impervious Area
1,640		100.00% Unconnected

494 North Street POST FINAL rev 8-19

Type III 24-hr 2 Year Rainfall=3.10"

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

Summary for Subcatchment 2C S PST: FLOW TO NEW ROAD

Runoff = 0.00 cfs @ 15.31 hrs, Volume= 0.001 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
* 896	98	Paved roads NEW Road area, HSG A
* 98	96	Gravel road surface, HSG A
* 98	76	Stone Gravel trench, HSG A
7,846	39	>75% Grass cover, Good, HSG A
8,938	46	Weighted Average
8,042		89.98% Pervious Area
896		10.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		Sheet Flow, GRASS LAWN FLOW
					Grass: Short n= 0.150 P2= 3.10"
1.0	93	0.0100	1.50		Shallow Concentrated Flow, GRASS LAWN
					Grassed Waterway Kv= 15.0 fps
8.5	143	Total			

Summary for Subcatchment 2D S PST: FLOW TO NEW ROAD

Runoff = 0.02 cfs @ 12.33 hrs, Volume= 0.004 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
* 365	98	Paved roads NEW Road area, HSG A
1,680	98	Paved parking, HSG A
* 56	96	Gravel road surface, HSG A
* 58	76	Stone Gravel trench, HSG A
4,730	39	>75% Grass cover, Good, HSG A
6,889	57	Weighted Average
4,844		70.31% Pervious Area
2,045		29.69% Impervious Area

494 North Street POST FINAL rev 8-19

Type III 24-hr 2 Year Rainfall=3.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		Sheet Flow, GRASS LAWN FLOW Grass: Short n= 0.150 P2= 3.10"
0.4	40	0.0100	1.50		Shallow Concentrated Flow, GRASS LAWN Grassed Waterway Kv= 15.0 fps
0.1	12	0.0100	2.03		Shallow Concentrated Flow, PAVED DRIVE Paved Kv= 20.3 fps
8.0	102	Total			

Summary for Subcatchment 2E S PST: FLOW TO NEW ROAD

Runoff = 0.01 cfs @ 12.37 hrs, Volume= 0.001 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
* 676	98	Paved roads NEW Road area, HSG A
* 162	96	Gravel road surface, HSG A
* 164	76	Stone Gravel trench, HSG A
2,390	39	>75% Grass cover, Good, HSG A
3,392	55	Weighted Average
2,716		80.07% Pervious Area
676		19.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		Sheet Flow, GRASS LAWN FLOW Grass: Short n= 0.150 P2= 3.10"
0.1	12	0.0100	1.50		Shallow Concentrated Flow, GRASS LAWN Grassed Waterway Kv= 15.0 fps
7.6	62	Total			

Summary for Subcatchment 2F S PST: ROOF FLOW TO DRYWELL

Runoff = 0.03 cfs @ 12.08 hrs, Volume= 0.002 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
367	98	Unconnected roofs, HSG A
367		100.00% Impervious Area
367		100.00% Unconnected

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

Summary for Subcatchment 2G S PST: ROOF FLOW TO DRYWELL

Runoff = 0.02 cfs @ 12.08 hrs, Volume= 0.002 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
342	98	Unconnected roofs, HSG A
342		100.00% Impervious Area
342		100.00% Unconnected

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

Summary for Subcatchment 3 S PST: Proposed Condition Minor Change Less Paved Drive

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Adj	Description
* 2,181	98		Paved driveway, exist, HSG A
33,240	30		Woods, Good, HSG A
2,395	98		Paved roads w/curbs & sewers, HSG A
34,093	39		>75% Grass cover, Good, HSG A
1,500	98		Unconnected roofs, HSG A
73,409	40	39	Weighted Average, UI Adjusted
67,333			91.72% Pervious Area
6,076			8.28% Impervious Area
1,500			24.69% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		Sheet Flow, grass area floww Grass: Short n= 0.150 P2= 3.10"
0.2	22	0.0100	1.50		Shallow Concentrated Flow, grass flow Grassed Waterway Kv= 15.0 fps
11.7	350	0.0100	0.50		Shallow Concentrated Flow, woodland area Woodland Kv= 5.0 fps
0.8	100	0.0100	2.03		Shallow Concentrated Flow, paved roadway gutter to DP A Paved Kv= 20.3 fps
20.2	522	Total			

Summary for Subcatchment 4A S PST: Proposed Condition Minor Change Roof Drywell Less paved dri

Runoff = 0.00 cfs @ 21.52 hrs, Volume= 0.002 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Adj	Description
* 231	98		Paved driveway, exist, HSG A
10,530	30		Woods, Good, HSG A
5,070	98		Paved roads w/curbs & sewers, HSG A
53,219	39		>75% Grass cover, Good, HSG A
2,160	98		Unconnected roofs, HSG A
71,210	44	43	Weighted Average, UI Adjusted
63,749			89.52% Pervious Area
7,461			10.48% Impervious Area
2,160			28.95% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	50	0.0100	0.05		Sheet Flow, woodland area flow Woods: Light underbrush n= 0.400 P2= 3.10"
1.9	168	0.0100	1.50		Shallow Concentrated Flow, grass flow Grassed Waterway Kv= 15.0 fps
2.0	60	0.0100	0.50		Shallow Concentrated Flow, woodland area Woodland Kv= 5.0 fps
1.7	205	0.0100	2.03		Shallow Concentrated Flow, paved surface road way gutter Paved Kv= 20.3 fps
1.9	237	0.0100	2.03		Shallow Concentrated Flow, paved roadway gutter to DP A Paved Kv= 20.3 fps
24.0	720	Total			

Summary for Subcatchment 4B S PST: ROOF FLOW TO DRYWELL

Runoff = 0.07 cfs @ 12.08 hrs, Volume= 0.006 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
1,050	98	Unconnected roofs, HSG A
1,050		100.00% Impervious Area
1,050		100.00% Unconnected

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

Summary for Subcatchment 101S: Existing Condition

Runoff = 0.00 cfs @ 22.73 hrs, Volume= 0.000 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

	Area (sf)	CN	Adj	Description	
*	1,470	98		Impervious Pave drivewa, roofs, HSG A	
	15,170	30		Woods, Good, HSG A	
	9,342	39		>75% Grass cover, Good, HSG A	
*	1,400	98		Paved roads w/swales & sewers, HSG A	
	2,150	98		Unconnected roofs, HSG A	
	29,532	44	42	Weighted Average, UI Adjusted	
	24,512			83.00% Pervious Area	
	5,020			17.00% Impervious Area	
	2,150			42.83% Unconnected	
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
15.1	50	0.0125	0.06		Sheet Flow, woodland flow Woods: Light underbrush n= 0.400 P2= 3.10"
2.6	95	0.0150	0.61		Shallow Concentrated Flow, woodland flow Woodland Kv= 5.0 fps
4.0	167	0.0100	0.70		Shallow Concentrated Flow, grass lawn Short Grass Pasture Kv= 7.0 fps
2.6	88	0.0125	0.56		Shallow Concentrated Flow, woods Woodland Kv= 5.0 fps
0.2	30	0.0100	2.03		Shallow Concentrated Flow, North Stree gutter Paved Kv= 20.3 fps
24.5	430	Total			

Summary for Subcatchment 103S: Existing Condition

Runoff = 0.00 cfs @ 22.62 hrs, Volume= 0.001 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

	Area (sf)	CN	Adj	Description
*	2,500	98		Impervious Pave driveway, HSG A
	28,786	30		Woods, Good, HSG A
	17,885	39		>75% Grass cover, Good, HSG A
*	3,840	98		Paved roads w/swales & sewers, HSG A
	1,400	98		Unconnected roofs, HSG A
	54,411	43	42	Weighted Average, UI Adjusted
	46,671			85.77% Pervious Area
	7,740			14.23% Impervious Area
	1,400			18.09% Unconnected

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Type III 24-hr 2 Year Rainfall=3.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	50	0.0150	0.06		Sheet Flow, woodland flow Woods: Light underbrush n= 0.400 P2= 3.10"
4.9	180	0.0150	0.61		Shallow Concentrated Flow, woodland flow Woodland Kv= 5.0 fps
0.8	40	0.0150	0.86		Shallow Concentrated Flow, grass lawn Short Grass Pasture Kv= 7.0 fps
0.7	90	0.0100	2.03		Shallow Concentrated Flow, Charles Stree gutter Paved Kv= 20.3 fps
20.5	360	Total			

Summary for Subcatchment 104S: Existing Condition

Runoff = 0.63 cfs @ 12.32 hrs, Volume= 0.078 af, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

	Area (sf)	CN	Description
*	24,700	98	Impervious Pave driveway HSG A
	20,990	30	Woods, Good, HSG A
	3,386	39	>75% Grass cover, Good, HSG A
*	3,840	98	Paved roads w/swales & sewers, HSG A
	3,120	98	Unconnected roofs, HSG A
	56,036	69	Weighted Average
	24,376		43.50% Pervious Area
	31,660		56.50% Impervious Area
	3,120		9.85% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	50	0.0125	0.06		Sheet Flow, woodland flow Woods: Light underbrush n= 0.400 P2= 3.10"
2.4	90	0.0150	0.61		Shallow Concentrated Flow, woodland flow Woodland Kv= 5.0 fps
1.4	60	0.0100	0.70		Shallow Concentrated Flow, grass lawn Short Grass Pasture Kv= 7.0 fps
1.3	160	0.0100	2.03		Shallow Concentrated Flow, Charles Street gutter Paved Kv= 20.3 fps
20.2	360	Total			

Summary for Subcatchment 105S: Existing Condition

Runoff = 0.00 cfs @ 17.27 hrs, Volume= 0.003 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

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Type III 24-hr 2 Year Rainfall=3.10"

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	Area (sf)	CN	Adj	Description
*	1,300	98		Impervious Pave drivewa, roofs, HSG A
	17,509	30		Woods, Good, HSG A
	41,306	39		>75% Grass cover, Good, HSG A
*	4,400	98		Paved roads w/swales & sewers, HSG A
	6,300	98		Unconnected roofs, HSG A
	70,815	47	44	Weighted Average, UI Adjusted
	58,815			83.05% Pervious Area
	12,000			16.95% Impervious Area
	6,300			52.50% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	50	0.0125	0.06		Sheet Flow, woodland flow Woods: Light underbrush n= 0.400 P2= 3.10"
1.9	69	0.0150	0.61		Shallow Concentrated Flow, woodland flow Woodland Kv= 5.0 fps
3.1	131	0.0100	0.70		Shallow Concentrated Flow, grass lawn Short Grass Pasture Kv= 7.0 fps
1.7	206	0.0100	2.03		Shallow Concentrated Flow, Charles Street gutter Paved Kv= 20.3 fps
21.8	456	Total			

Summary for Subcatchment 106S: Existing Condition

Runoff = 0.01 cfs @ 15.84 hrs, Volume= 0.004 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

	Area (sf)	CN	Adj	Description
*	2,600	98		Impervious Pave driveway, HSG A
	24,704	30		Woods, Good, HSG A
	19,176	39		>75% Grass cover, Good, HSG A
*	4,400	98		Paved roads w/swales & sewers, HSG A
	4,800	98		Unconnected roofs, HSG A
	55,680	48	45	Weighted Average, UI Adjusted
	43,880			78.81% Pervious Area
	11,800			21.19% Impervious Area
	4,800			40.68% Unconnected

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	50	0.0125	0.06		Sheet Flow, woodland flow Woods: Light underbrush n= 0.400 P2= 3.10"
0.4	15	0.0150	0.61		Shallow Concentrated Flow, woodland flow Woodland Kv= 5.0 fps
2.3	95	0.0100	0.70		Shallow Concentrated Flow, grass lawn Short Grass Pasture Kv= 7.0 fps
2.2	264	0.0100	2.03		Shallow Concentrated Flow, Charles Street gutter Paved Kv= 20.3 fps
20.0	424	Total			

Summary for Pond 2A P: SWM BASIN 2A

Inflow Area = 1.285 ac, 20.14% Impervious, Inflow Depth = 0.12" for 2 Year event
 Inflow = 0.07 cfs @ 12.32 hrs, Volume= 0.013 af
 Outflow = 0.04 cfs @ 12.59 hrs, Volume= 0.013 af, Atten= 42%, Lag= 16.5 min
 Discarded = 0.04 cfs @ 12.59 hrs, Volume= 0.013 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 67.17' @ 12.59 hrs Surf.Area= 176 sf Storage= 55 cf

Plug-Flow detention time= 13.5 min calculated for 0.013 af (100% of inflow)
 Center-of-Mass det. time= 13.5 min (969.5 - 956.0)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	1,986 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.50	0	0	0
67.00	120	30	30
68.00	450	285	315
69.00	960	705	1,020
69.25	1,100	258	1,278
69.75	1,735	709	1,986

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.50'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 65.00'
#2	Primary	69.25'	4.0' long x 9.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69

Discarded OutFlow Max=0.04 cfs @ 12.59 hrs HW=67.17' (Free Discharge)
 ↑1=Exfiltration (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.50' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 2B1 P DRYWELL: Infiltr Chambers

Inflow Area = 0.038 ac, 100.00% Impervious, Inflow Depth = 2.87" for 2 Year event
 Inflow = 0.11 cfs @ 12.08 hrs, Volume= 0.009 af
 Outflow = 0.05 cfs @ 12.27 hrs, Volume= 0.009 af, Atten= 57%, Lag= 10.9 min
 Discarded = 0.05 cfs @ 12.27 hrs, Volume= 0.009 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 67.52' @ 12.27 hrs Surf.Area= 204 sf Storage= 44 cf

Plug-Flow detention time= 4.4 min calculated for 0.009 af (100% of inflow)
 Center-of-Mass det. time= 4.5 min (761.5 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	132 cf	11.67'W x 17.50'L x 2.04'H Field A 417 cf Overall - 87 cf Embedded = 330 cf x 40.0% Voids
#2A	67.50'	87 cf	Cultec C-100HD x 6 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 3 rows
		219 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 65.00'
#2	Primary	71.00'	4.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 12.27 hrs HW=67.52' (Free Discharge)
 ↑ **1=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.00' (Free Discharge)
 ↑ **2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 2F P DRYWELLHAMBER: Infiltr Chambers

Inflow Area = 0.008 ac, 100.00% Impervious, Inflow Depth = 2.87" for 2 Year event
 Inflow = 0.03 cfs @ 12.08 hrs, Volume= 0.002 af
 Outflow = 0.02 cfs @ 12.10 hrs, Volume= 0.002 af, Atten= 2%, Lag= 0.8 min
 Discarded = 0.02 cfs @ 12.10 hrs, Volume= 0.002 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 69.02' @ 12.10 hrs Surf.Area= 146 sf Storage= 1 cf

Plug-Flow detention time= 0.9 min calculated for 0.002 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (757.9 - 757.1)

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Volume	Invert	Avail.Storage	Storage Description
#1A	69.00'	96 cf	8.33'W x 17.50'L x 2.04'H Field A 298 cf Overall - 58 cf Embedded = 240 cf x 40.0% Voids
#2A	69.50'	58 cf	Cultec C-100HD x 4 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 2 rows
		154 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	69.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 67.00'
#2	Primary	71.50'	4.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 12.10 hrs HW=69.02' (Free Discharge)
 ↑**1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.00' (Free Discharge)
 ↑**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 2G P DRYWELL: Infil Chambers

Inflow Area = 0.008 ac, 100.00% Impervious, Inflow Depth = 2.87" for 2 Year event
 Inflow = 0.02 cfs @ 12.08 hrs, Volume= 0.002 af
 Outflow = 0.02 cfs @ 12.10 hrs, Volume= 0.002 af, Atten= 2%, Lag= 0.8 min
 Discarded = 0.02 cfs @ 12.10 hrs, Volume= 0.002 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 69.02' @ 12.10 hrs Surf.Area= 146 sf Storage= 1 cf

Plug-Flow detention time= 0.9 min calculated for 0.002 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (757.9 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	69.00'	96 cf	8.33'W x 17.50'L x 2.04'H Field A 298 cf Overall - 58 cf Embedded = 240 cf x 40.0% Voids
#2A	69.50'	58 cf	Cultec C-100HD x 4 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 2 rows
		154 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	69.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 67.00'

#2 Primary 71.50' **4.0" Horiz. Orifice/Grate** C= 0.600
Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 12.10 hrs HW=69.02' (Free Discharge)

↑**1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.00' (Free Discharge)

↑**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 4B P DRYWELL: Infiltr Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 2.87" for 2 Year event
Inflow = 0.07 cfs @ 12.08 hrs, Volume= 0.006 af
Outflow = 0.03 cfs @ 12.24 hrs, Volume= 0.006 af, Atten= 54%, Lag= 9.6 min
Discarded = 0.03 cfs @ 12.24 hrs, Volume= 0.006 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 69.41' @ 12.24 hrs Surf.Area= 146 sf Storage= 24 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 3.3 min (760.3 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	69.00'	96 cf	8.33'W x 17.50'L x 2.04'H Field A 298 cf Overall - 58 cf Embedded = 240 cf x 40.0% Voids
#2A	69.50'	58 cf	Cultec C-100HD x 4 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 2 rows
		154 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	69.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 67.00'
#2	Primary	71.50'	4.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 12.24 hrs HW=69.41' (Free Discharge)

↑**1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.00' (Free Discharge)

↑**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 100P: Ex CB A

Inflow Area = 3.583 ac, 13.25% Impervious, Inflow Depth = 0.00" for 2 Year event
 Inflow = 0.00 cfs @ 22.73 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 22.73 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.00 cfs @ 22.73 hrs, Volume= 0.000 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 66.51' @ 22.73 hrs

Flood Elev= 68.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.49'	12.0" Round Culvert L= 86.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 66.49' / 66.08' S= 0.0048 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	68.25'	1.5" x 1.5" Horiz. Orifice/Grate X 36.00 C= 0.600 in 30.0" x 30.0" Grate (9% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 22.73 hrs HW=66.51' (Free Discharge)

↑1=Culvert (Barrel Controls 0.00 cfs @ 0.22 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.49' (Free Discharge)

↑2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 101P: Ex CB B

Inflow Area = 9.701 ac, 21.04% Impervious, Inflow Depth = 0.11" for 2 Year event
 Inflow = 0.63 cfs @ 12.32 hrs, Volume= 0.086 af
 Outflow = 0.63 cfs @ 12.32 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.63 cfs @ 12.32 hrs, Volume= 0.086 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 66.32' @ 12.32 hrs

Flood Elev= 67.94'

Device	Routing	Invert	Outlet Devices
#1	Primary	65.84'	12.0" Round Culvert L= 427.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 65.84' / 59.38' S= 0.0151 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	67.84'	1.5" x 1.5" Horiz. Orifice/Grate X 36.00 C= 0.600 in 30.0" x 30.0" Grate (9% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.63 cfs @ 12.32 hrs HW=66.32' (Free Discharge)

↑**1=Culvert** (Barrel Controls 0.63 cfs @ 2.47 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=65.84' (Free Discharge)

↑**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 102P: Ex DMH A

Inflow Area = 5.439 ac, 26.67% Impervious, Inflow Depth = 0.19" for 2 Year event
 Inflow = 0.63 cfs @ 12.32 hrs, Volume= 0.085 af
 Outflow = 0.63 cfs @ 12.32 hrs, Volume= 0.085 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.63 cfs @ 12.32 hrs, Volume= 0.085 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 66.91' @ 12.32 hrs

Flood Elev= 70.39'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.10'	12.0" Round Culvert L= 139.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 66.10' / 65.92' S= 0.0013 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=0.63 cfs @ 12.32 hrs HW=66.91' (Free Discharge)

↑**1=Culvert** (Barrel Controls 0.63 cfs @ 1.26 fps)

Summary for Pond 103P: Ex CB C

Inflow Area = 5.439 ac, 26.67% Impervious, Inflow Depth = 0.19" for 2 Year event
 Inflow = 0.63 cfs @ 12.32 hrs, Volume= 0.085 af
 Outflow = 0.63 cfs @ 12.32 hrs, Volume= 0.085 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.63 cfs @ 12.32 hrs, Volume= 0.085 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 66.97' @ 12.32 hrs

Flood Elev= 68.99'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.57'	12.0" Round Culvert L= 38.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 66.57' / 66.10' S= 0.0124 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Secondary	68.89'	1.5" x 1.5" Horiz. Orifice/Grate X 36.00 C= 0.600 in 30.0" x 30.0" Grate (9% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.63 cfs @ 12.32 hrs HW=66.97' (Free Discharge)

↑**1=Culvert** (Inlet Controls 0.63 cfs @ 2.15 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.57' (Free Discharge)

↑**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 104P: Ex CB D

Inflow Area = 1.286 ac, 56.50% Impervious, Inflow Depth = 0.72" for 2 Year event
 Inflow = 0.63 cfs @ 12.32 hrs, Volume= 0.078 af
 Outflow = 0.63 cfs @ 12.32 hrs, Volume= 0.078 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.63 cfs @ 12.32 hrs, Volume= 0.078 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 67.10' @ 12.32 hrs

Flood Elev= 70.03'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.70'	12.0" Round Culvert L= 21.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 66.70' / 65.89' S= 0.0386 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	69.03'	1.5" x 1.5" Horiz. Orifice/Grate X 36.00 C= 0.600 in 30.0" x 30.0" Grate (9% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.63 cfs @ 12.32 hrs HW=67.10' (Free Discharge)

↑**1=Culvert** (Inlet Controls 0.63 cfs @ 2.15 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.70' (Free Discharge)

↑**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 105P: Ex CB E

Inflow Area = 2.904 ac, 18.81% Impervious, Inflow Depth = 0.03" for 2 Year event
 Inflow = 0.01 cfs @ 17.04 hrs, Volume= 0.007 af
 Outflow = 0.01 cfs @ 17.04 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.01 cfs @ 17.04 hrs, Volume= 0.007 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 67.07' @ 17.04 hrs

Flood Elev= 71.62'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.01'	12.0" Round Culvert L= 220.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 67.01' / 66.31' S= 0.0032 ' /' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Secondary	71.52'	1.5" x 1.5" Horiz. Orifice/Grate X 36.00

C= 0.600 in 30.0" x 30.0" Grate (9% open area)
Limited to weir flow at low heads

Primary OutFlow Max=0.01 cfs @ 17.04 hrs HW=67.07' (Free Discharge)

↑1=Culvert (Barrel Controls 0.01 cfs @ 0.63 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.01' (Free Discharge)

↑2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 106P: Ex CB F

Inflow Area = 1.278 ac, 21.19% Impervious, Inflow Depth = 0.03" for 2 Year event
Inflow = 0.01 cfs @ 15.84 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 15.84 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min
Primary = 0.01 cfs @ 15.84 hrs, Volume= 0.004 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 67.84' @ 15.84 hrs

Flood Elev= 71.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.80'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 67.80' / 67.70' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	71.80'	1.5" x 1.5" Horiz. Orifice/Grate X 36.00 C= 0.600 in 30.0" x 30.0" Grate (9% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 15.84 hrs HW=67.84' (Free Discharge)

↑1=Culvert (Barrel Controls 0.00 cfs @ 0.63 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.80' (Free Discharge)

↑2=Orifice/Grate (Controls 0.00 cfs)

Summary for Link 103L: Design Point C Exist 12" CMP to BVW

Inflow Area = 9.701 ac, 21.04% Impervious, Inflow Depth = 0.11" for 2 Year event
Inflow = 0.63 cfs @ 12.32 hrs, Volume= 0.086 af
Primary = 0.63 cfs @ 12.32 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link AP-A PRE: Design Analysis Point 1 Exist St gutter North Street

Inflow Area = 3.583 ac, 13.25% Impervious, Inflow Depth = 0.00" for 2 Year event
Inflow = 0.00 cfs @ 22.73 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 22.73 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link AP-B PRE: Design Analysis Point B Exist CB AT Wells Ave

Inflow Area = 1.659 ac, 11.78% Impervious, Inflow Depth = 0.01" for 2 Year event
Inflow = 0.00 cfs @ 21.52 hrs, Volume= 0.002 af
Primary = 0.00 cfs @ 21.52 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1 S PST: Proposed	Runoff Area=26,697 sf 12.50% Impervious Runoff Depth=0.19"
Flow Length=396'	Slope=0.0100 '/' Tc=25.8 min CN=42 Runoff=0.02 cfs 0.010 af
Subcatchment2A S PST: FLOW TO SWM	Runoff Area=10,805 sf 32.50% Impervious Runoff Depth=0.96"
Flow Length=290'	Slope=0.0100 '/' Tc=9.5 min CN=59 Runoff=0.20 cfs 0.020 af
Subcatchment2B S PST: FLOW TO NEW	Runoff Area=23,615 sf 7.61% Impervious Runoff Depth=0.16"
Flow Length=248'	Slope=0.0100 '/' Tc=18.9 min CN=41 Runoff=0.01 cfs 0.007 af
Subcatchment2B1 S PST: ROOF FLOW TP	Runoff Area=1,640 sf 100.00% Impervious Runoff Depth=4.26"
	Tc=6.0 min CN=98 Runoff=0.17 cfs 0.013 af
Subcatchment2C S PST: FLOW TO NEW	Runoff Area=8,938 sf 10.02% Impervious Runoff Depth=0.33"
Flow Length=143'	Slope=0.0100 '/' Tc=8.5 min CN=46 Runoff=0.03 cfs 0.006 af
Subcatchment2D S PST: FLOW TO NEW	Runoff Area=6,889 sf 29.69% Impervious Runoff Depth=0.85"
Flow Length=102'	Slope=0.0100 '/' Tc=8.0 min CN=57 Runoff=0.11 cfs 0.011 af
Subcatchment2E S PST: FLOW TO NEW	Runoff Area=3,392 sf 19.93% Impervious Runoff Depth=0.74"
Flow Length=62'	Slope=0.0100 '/' Tc=7.6 min CN=55 Runoff=0.05 cfs 0.005 af
Subcatchment2F S PST: ROOF FLOW TO	Runoff Area=367 sf 100.00% Impervious Runoff Depth=4.26"
	Tc=6.0 min CN=98 Runoff=0.04 cfs 0.003 af
Subcatchment2G S PST: ROOF FLOW TO	Runoff Area=342 sf 100.00% Impervious Runoff Depth=4.26"
	Tc=6.0 min CN=98 Runoff=0.03 cfs 0.003 af
Subcatchment3 S PST: Proposed	Runoff Area=73,409 sf 8.28% Impervious Runoff Depth=0.11"
Flow Length=522'	Slope=0.0100 '/' Tc=20.2 min UI Adjusted CN=39 Runoff=0.02 cfs 0.016 af
Subcatchment4A S PST: Proposed	Runoff Area=71,210 sf 10.48% Impervious Runoff Depth=0.23"
Flow Length=720'	Slope=0.0100 '/' Tc=24.0 min UI Adjusted CN=43 Runoff=0.07 cfs 0.031 af
Subcatchment4B S PST: ROOF FLOW TO	Runoff Area=1,050 sf 100.00% Impervious Runoff Depth=4.26"
	Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af
Subcatchment101S: Existing Condition	Runoff Area=29,532 sf 17.00% Impervious Runoff Depth=0.19"
Flow Length=430'	Tc=24.5 min UI Adjusted CN=42 Runoff=0.02 cfs 0.011 af
Subcatchment103S: Existing Condition	Runoff Area=54,411 sf 14.23% Impervious Runoff Depth=0.19"
Flow Length=360'	Tc=20.5 min UI Adjusted CN=42 Runoff=0.04 cfs 0.020 af
Subcatchment104S: Existing Condition	Runoff Area=56,036 sf 56.50% Impervious Runoff Depth=1.60"
Flow Length=360'	Tc=20.2 min CN=69 Runoff=1.55 cfs 0.172 af
Subcatchment105S: Existing Condition	Runoff Area=70,815 sf 16.95% Impervious Runoff Depth=0.26"
Flow Length=456'	Tc=21.8 min UI Adjusted CN=44 Runoff=0.11 cfs 0.035 af

Subcatchment 106S: Existing Condition Runoff Area=55,680 sf 21.19% Impervious Runoff Depth=0.30"
Flow Length=424' Tc=20.0 min UI Adjusted CN=45 Runoff=0.11 cfs 0.032 af

Pond 2A P: SWM BASIN 2A Peak Elev=68.12' Storage=371 cf Inflow=0.37 cfs 0.049 af
Discarded=0.13 cfs 0.049 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.049 af

Pond 2B1 P DRYWELL: Infil Chambers Peak Elev=67.85' Storage=93 cf Inflow=0.17 cfs 0.013 af
Discarded=0.06 cfs 0.013 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.013 af

Pond 2F P DRYWELLHAMBER: Infil Chambers Peak Elev=69.06' Storage=4 cf Inflow=0.04 cfs 0.003 af
Discarded=0.03 cfs 0.003 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.003 af

Pond 2G P DRYWELL: Infil Chambers Peak Elev=69.05' Storage=3 cf Inflow=0.03 cfs 0.003 af
Discarded=0.03 cfs 0.003 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.003 af

Pond 4B P DRYWELL: Infil Chambers Peak Elev=69.73' Storage=54 cf Inflow=0.11 cfs 0.009 af
Discarded=0.04 cfs 0.009 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.009 af

Pond 100P: Ex CB A Peak Elev=66.65' Inflow=0.04 cfs 0.025 af
Primary=0.04 cfs 0.025 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.025 af

Pond 101P: Ex CB B Peak Elev=66.67' Inflow=1.62 cfs 0.295 af
Primary=1.62 cfs 0.295 af Secondary=0.00 cfs 0.000 af Outflow=1.62 cfs 0.295 af

Pond 102P: Ex DMH A Peak Elev=68.08' Inflow=1.61 cfs 0.259 af
12.0" Round Culvert n=0.025 L=139.0' S=0.0013 '/' Outflow=1.61 cfs 0.259 af

Pond 103P: Ex CB C Peak Elev=67.26' Inflow=1.61 cfs 0.259 af
Primary=1.61 cfs 0.259 af Secondary=0.00 cfs 0.000 af Outflow=1.61 cfs 0.259 af

Pond 104P: Ex CB D Peak Elev=67.37' Inflow=1.55 cfs 0.172 af
Primary=1.55 cfs 0.172 af Secondary=0.00 cfs 0.000 af Outflow=1.55 cfs 0.172 af

Pond 105P: Ex CB E Peak Elev=67.30' Inflow=0.22 cfs 0.067 af
Primary=0.22 cfs 0.067 af Secondary=0.00 cfs 0.000 af Outflow=0.22 cfs 0.067 af

Pond 106P: Ex CB F Peak Elev=67.99' Inflow=0.11 cfs 0.032 af
Primary=0.11 cfs 0.032 af Secondary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.032 af

Link 103L: Design Point C Exist 12" CMP to BVW Inflow=1.62 cfs 0.295 af
Primary=1.62 cfs 0.295 af

Link AP-A PRE: Design Analysis Point 1 Exist St gutter North Street Inflow=0.04 cfs 0.025 af
Primary=0.04 cfs 0.025 af

Link AP-B PRE: Design Analysis Point B Exist CB AT Wells Ave Inflow=0.07 cfs 0.031 af
Primary=0.07 cfs 0.031 af

Total Runoff Area = 11.360 ac Runoff Volume = 0.403 af Average Runoff Depth = 0.43"
80.31% Pervious = 9.123 ac 19.69% Impervious = 2.236 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1 S PST: Proposed	Runoff Area=26,697 sf	12.50% Impervious	Runoff Depth=1.00"
Flow Length=396'	Slope=0.0100 '/	Tc=25.8 min	CN=42
	Runoff=0.30 cfs	0.051 af	
Subcatchment2A S PST: FLOW TO SWM	Runoff Area=10,805 sf	32.50% Impervious	Runoff Depth=2.51"
Flow Length=290'	Slope=0.0100 '/	Tc=9.5 min	CN=59
	Runoff=0.62 cfs	0.052 af	
Subcatchment2B S PST: FLOW TO NEW	Runoff Area=23,615 sf	7.61% Impervious	Runoff Depth=0.92"
Flow Length=248'	Slope=0.0100 '/	Tc=18.9 min	CN=41
	Runoff=0.25 cfs	0.041 af	
Subcatchment2B1 S PST: ROOF FLOW TP	Runoff Area=1,640 sf	100.00% Impervious	Runoff Depth=6.76"
	Tc=6.0 min	CN=98	Runoff=0.26 cfs
			0.021 af
Subcatchment2C S PST: FLOW TO NEW	Runoff Area=8,938 sf	10.02% Impervious	Runoff Depth=1.32"
Flow Length=143'	Slope=0.0100 '/	Tc=8.5 min	CN=46
	Runoff=0.23 cfs	0.023 af	
Subcatchment2D S PST: FLOW TO NEW	Runoff Area=6,889 sf	29.69% Impervious	Runoff Depth=2.31"
Flow Length=102'	Slope=0.0100 '/	Tc=8.0 min	CN=57
	Runoff=0.38 cfs	0.030 af	
Subcatchment2E S PST: FLOW TO NEW	Runoff Area=3,392 sf	19.93% Impervious	Runoff Depth=2.12"
Flow Length=62'	Slope=0.0100 '/	Tc=7.6 min	CN=55
	Runoff=0.17 cfs	0.014 af	
Subcatchment2F S PST: ROOF FLOW TO	Runoff Area=367 sf	100.00% Impervious	Runoff Depth=6.76"
	Tc=6.0 min	CN=98	Runoff=0.06 cfs
			0.005 af
Subcatchment2G S PST: ROOF FLOW TO	Runoff Area=342 sf	100.00% Impervious	Runoff Depth=6.76"
	Tc=6.0 min	CN=98	Runoff=0.05 cfs
			0.004 af
Subcatchment3 S PST: Proposed	Runoff Area=73,409 sf	8.28% Impervious	Runoff Depth=0.77"
Flow Length=522'	Slope=0.0100 '/	Tc=20.2 min	UI Adjusted CN=39
	Runoff=0.57 cfs	0.108 af	
Subcatchment4A S PST: Proposed	Runoff Area=71,210 sf	10.48% Impervious	Runoff Depth=1.07"
Flow Length=720'	Slope=0.0100 '/	Tc=24.0 min	UI Adjusted CN=43
	Runoff=0.91 cfs	0.146 af	
Subcatchment4B S PST: ROOF FLOW TO	Runoff Area=1,050 sf	100.00% Impervious	Runoff Depth=6.76"
	Tc=6.0 min	CN=98	Runoff=0.17 cfs
			0.014 af
Subcatchment101S: Existing Condition	Runoff Area=29,532 sf	17.00% Impervious	Runoff Depth=1.00"
Flow Length=430'	Tc=24.5 min	UI Adjusted CN=42	Runoff=0.33 cfs
			0.056 af
Subcatchment103S: Existing Condition	Runoff Area=54,411 sf	14.23% Impervious	Runoff Depth=1.00"
Flow Length=360'	Tc=20.5 min	UI Adjusted CN=42	Runoff=0.65 cfs
			0.104 af
Subcatchment104S: Existing Condition	Runoff Area=56,036 sf	56.50% Impervious	Runoff Depth=3.51"
Flow Length=360'	Tc=20.2 min	CN=69	Runoff=3.55 cfs
			0.377 af
Subcatchment105S: Existing Condition	Runoff Area=70,815 sf	16.95% Impervious	Runoff Depth=1.15"
Flow Length=456'	Tc=21.8 min	UI Adjusted CN=44	Runoff=1.05 cfs
			0.156 af

Subcatchment 106S: Existing Condition Runoff Area=55,680 sf 21.19% Impervious Runoff Depth=1.24"
Flow Length=424' Tc=20.0 min UI Adjusted CN=45 Runoff=0.94 cfs 0.132 af

Pond 2A P: SWM BASIN 2A Peak Elev=69.39' Storage=1,448 cf Inflow=1.46 cfs 0.160 af
Discarded=0.36 cfs 0.145 af Primary=0.53 cfs 0.015 af Outflow=0.89 cfs 0.160 af

Pond 2B1 P DRYWELL: Infil Chambers Peak Elev=68.72' Storage=192 cf Inflow=0.26 cfs 0.021 af
Discarded=0.07 cfs 0.021 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.021 af

Pond 2F P DRYWELLHAMBER: Infil Chambers Peak Elev=69.25' Storage=14 cf Inflow=0.06 cfs 0.005 af
Discarded=0.03 cfs 0.005 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.005 af

Pond 2G P DRYWELL: Infil Chambers Peak Elev=69.21' Storage=12 cf Inflow=0.05 cfs 0.004 af
Discarded=0.03 cfs 0.004 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.004 af

Pond 4B P DRYWELL: Infil Chambers Peak Elev=70.41' Storage=116 cf Inflow=0.17 cfs 0.014 af
Discarded=0.05 cfs 0.014 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.014 af

Pond 100P: Ex CB A Peak Elev=67.51' Inflow=1.40 cfs 0.174 af
Primary=1.40 cfs 0.174 af Secondary=0.00 cfs 0.000 af Outflow=1.40 cfs 0.174 af

Pond 101P: Ex CB B Peak Elev=70.16' Inflow=6.88 cfs 0.988 af
Primary=2.76 cfs 0.819 af Secondary=4.12 cfs 0.169 af Outflow=6.88 cfs 0.988 af

Pond 102P: Ex DMH A Peak Elev=79.06' Inflow=5.23 cfs 0.758 af
12.0" Round Culvert n=0.025 L=139.0' S=0.0013 ' Outflow=5.23 cfs 0.758 af

Pond 103P: Ex CB C Peak Elev=68.98' Inflow=6.03 cfs 0.769 af
Primary=5.23 cfs 0.758 af Secondary=0.80 cfs 0.011 af Outflow=6.03 cfs 0.769 af

Pond 104P: Ex CB D Peak Elev=68.08' Inflow=3.55 cfs 0.377 af
Primary=3.55 cfs 0.377 af Secondary=0.00 cfs 0.000 af Outflow=3.55 cfs 0.377 af

Pond 105P: Ex CB E Peak Elev=68.06' Inflow=1.99 cfs 0.288 af
Primary=1.99 cfs 0.288 af Secondary=0.00 cfs 0.000 af Outflow=1.99 cfs 0.288 af

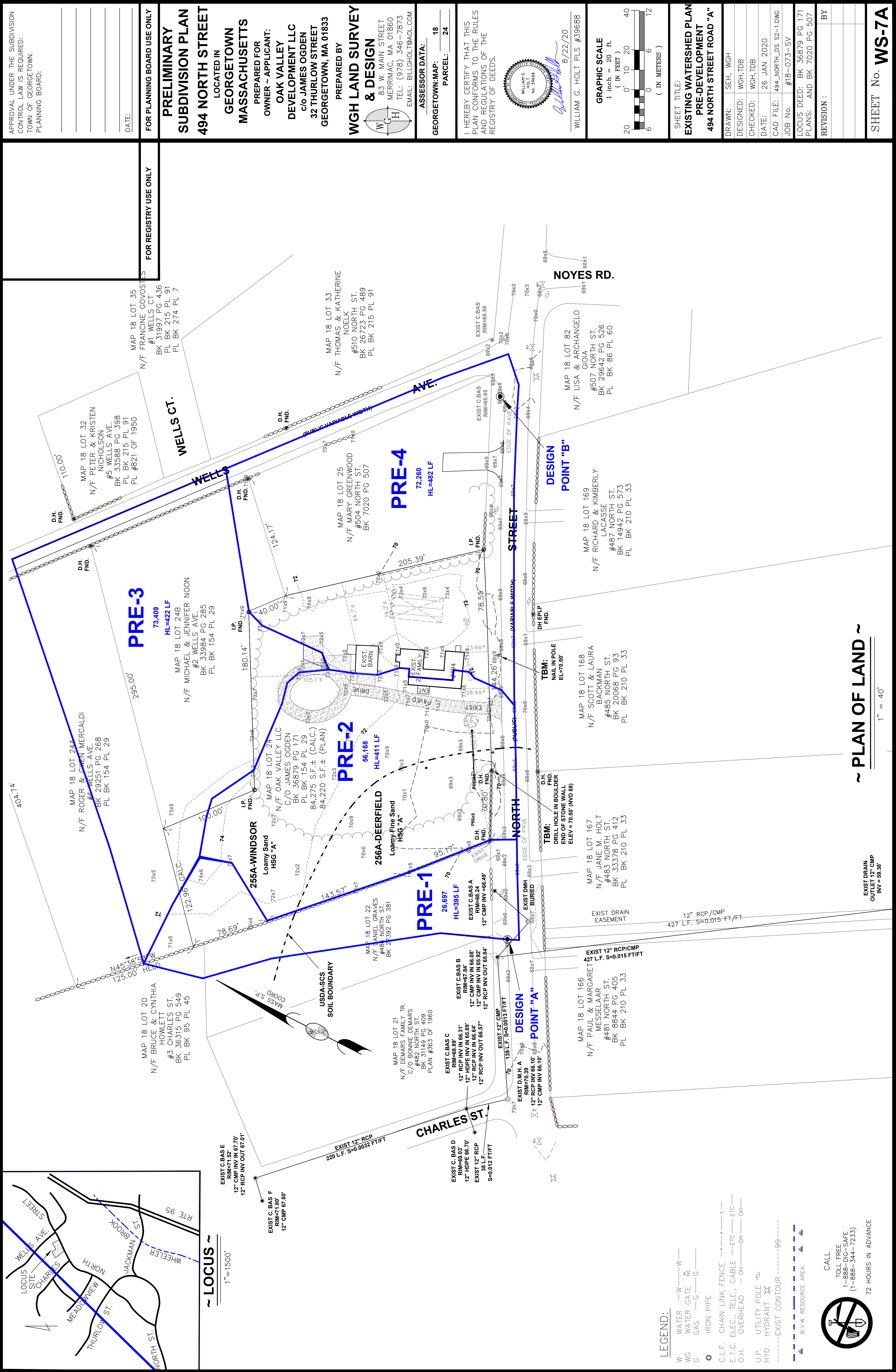
Pond 106P: Ex CB F Peak Elev=68.41' Inflow=0.94 cfs 0.132 af
Primary=0.94 cfs 0.132 af Secondary=0.00 cfs 0.000 af Outflow=0.94 cfs 0.132 af

Link 103L: Design Point C Exist 12" CMP to BVW Inflow=2.76 cfs 0.819 af
Primary=2.76 cfs 0.819 af

Link AP-A PRE: Design Analysis Point 1 Exist St gutter North Street Inflow=1.40 cfs 0.174 af
Primary=1.40 cfs 0.174 af

Link AP-B PRE: Design Analysis Point B Exist CB AT Wells Ave Inflow=0.91 cfs 0.146 af
Primary=0.91 cfs 0.146 af

Total Runoff Area = 11.360 ac Runoff Volume = 1.334 af Average Runoff Depth = 1.41"
80.31% Pervious = 9.123 ac 19.69% Impervious = 2.236 ac



APPROVAL UNDER THE SUBDIVISION CONTROL LAW IS REQUIRED:
TOWN OF GEORGETOWN.
PLANNING BOARD:

PRELIMINARY SUBDIVISION PLAN
494 NORTH STREET
LOCATED IN
GEORGETOWN MASSACHUSETTS
PREPARED FOR
OWNER ~ APPLICANT:
OAK VALLEY DEVELOPMENT LLC
c/o JAMES OGDEN
32 THURLOW STREET
GEORGETOWN, MA 01833

PREPARED BY
WGH LAND SURVEY & DESIGN
83 W. MAIN STREET
MERRIMAC, MA 01860
TEL: (978) 346-7873
EMAIL: BILLGHOLT@AOL.COM

ASSESSOR DATA:
GEORGETOWN: MAP: 18
PARCEL: 24

I HEREBY CERTIFY THAT THIS PLAN CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTRY OF DEEDS.

WILLIAM G. HOLT
No. 39688
8/22/20
WILLIAM G. HOLT PLS #39688

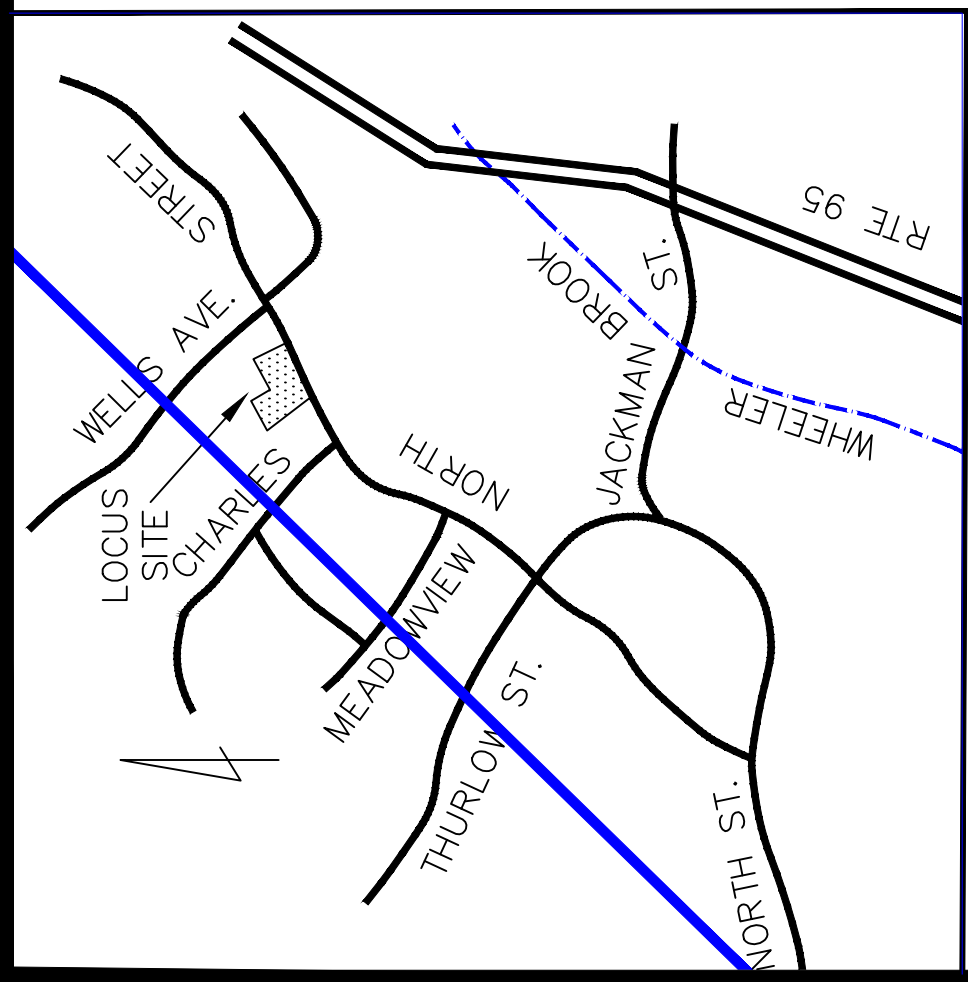
GRAPHIC SCALE
1 inch = 20 ft.
(IN FEET)
20 0 10 20 40
6 0 6 12
(IN METERS)

SHEET TITLE:
EXISTING WATERSHED PLAN
PRE-DEVELOPMENT
494 NORTH STREET ROAD "A"

DRAWN: SEH, WGH
DESIGNED: WGH, TDB
CHECKED: WGH, TDB
DATE: 26 JAN 2020
CAD FILE: 494_NORTH_DS S2-1.DWG
JOB No.: #18-073-SV

LOCUS DEED: BK 36879 PG 171
PLANS: AND BK 7020 PG 507
REVISION :
BY

SHEET No. WS-7A



~ LOCUS ~
1" = 1500'

LEGEND:

- W WATER —W—W—
- WG WATER GATE —W—
- G GAS —G—G—
- IRON PIPE
- C.L.F. CHAIN LINK FENCE —x—x—x—
- E.T.C. ELEC., TELE., CABLE —ETC—ETC—
- O.H. OVERHEAD —OH—OH—OH—
- UTILITY POLE
- HYD. HYDRANT
- EXIST CONTOUR —99—
- B.V.W. RESOURCE AREA


CALL
TOLL FREE
1-888-DIG-SAFE
(1-888-344-7233)
72 HOURS IN ADVANCE

~ PLAN OF LAND ~
1" = 40'

EXIST DRAIN
OUTLET 12" CMP
INV = 66.38'

DATE: _____

**PRELIMINARY
SUBDIVISION PLAN
494 NORTH STREET**

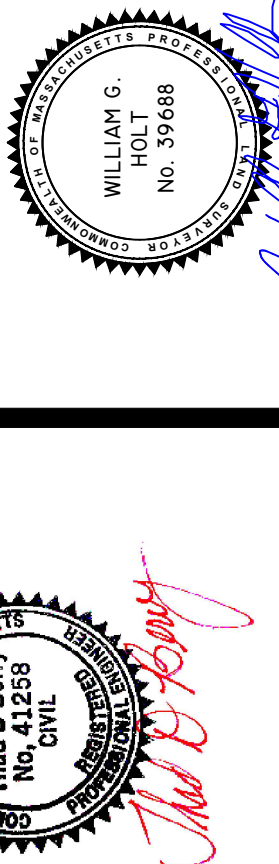


PREPARED BY
**WGH LAND SURVEY
& DESIGN**

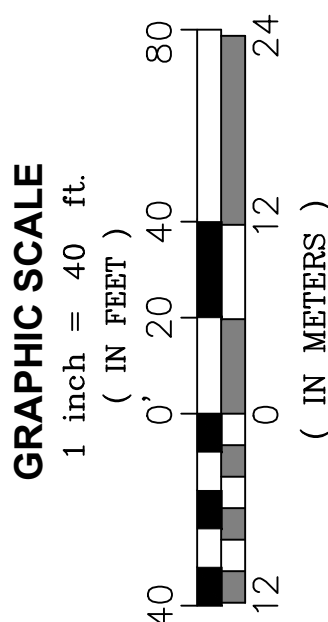
83 W. MAIN STREET
MERRIMAC, MA 01860
TEL: (978) 346-7873
EMAIL: BILLGHOLT@AOL.COM

ASSESSOR DATA: 18 24

HEREBY CERTIFY THAT THIS PLAN CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTRY OF DEEDS.



8/22/2020
WILLIAM G. HOLT PLS #39688



SHEET TITLE:
**WATERSHED PLAN
POST-DEVELOPMENT
494 NORTH STREET ROAD "A"**

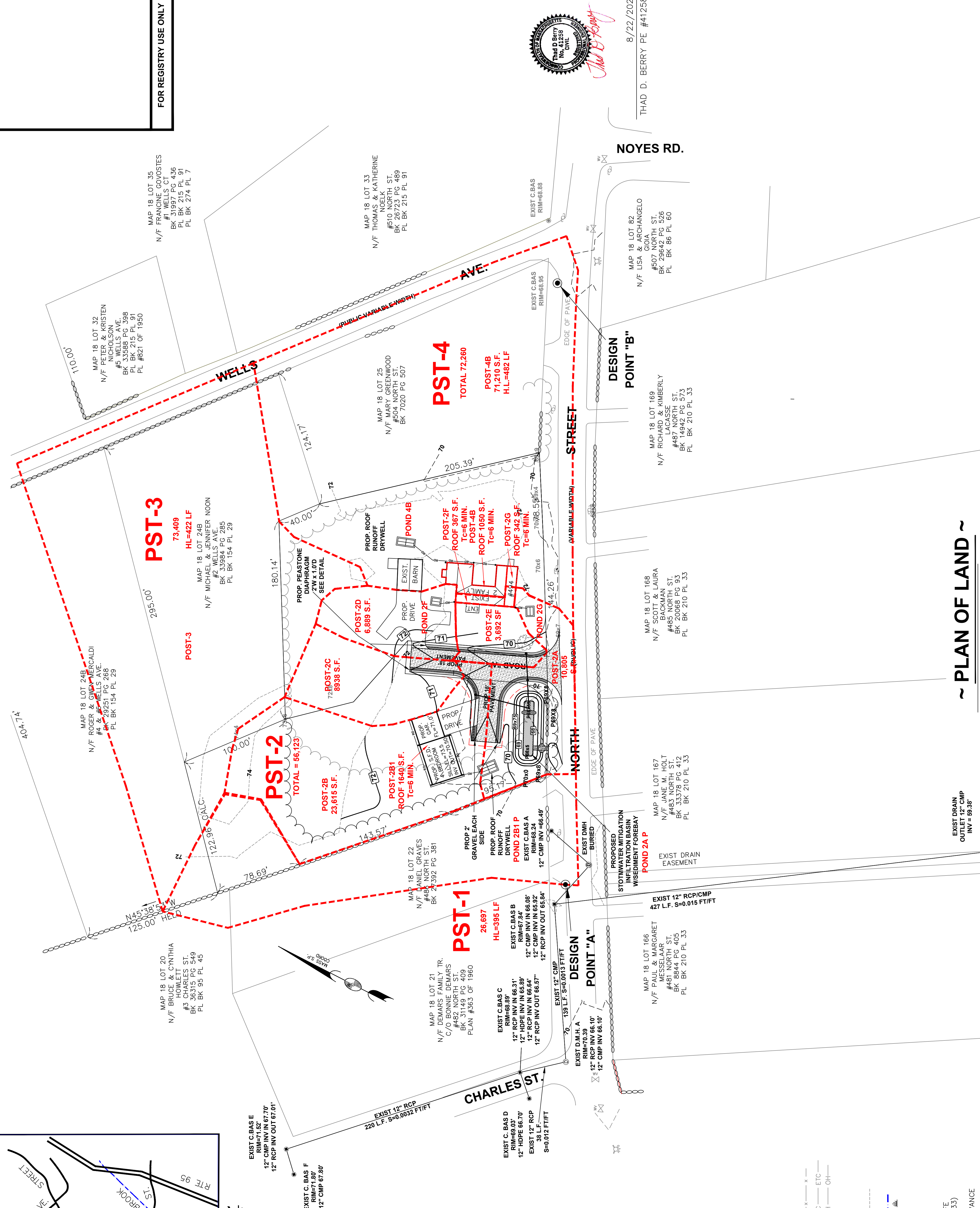
DRAWN:	SEH, WGH
DESIGNED:	WGH, TDB
CHECKED:	WGH, TDB
DATE:	26 JAN 2020
LOAD FILE:	494_NORTH_DS S2-1.DWG
JOB No.	#18-073-SV

OCUS DEED: BK 36879 PG 171
PLANS: AND BK 7020 PG 507

REVISION :	BY

SHEET No. **WS 7B**

FOR REGISTRY USE ONLY



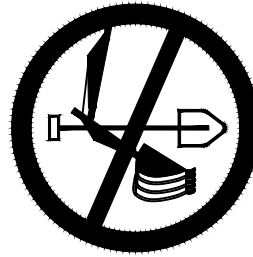
~ PLAN OF LAND ~

$$\boxed{1'' = 40'}$$

EXIST DRAIN
OUTLET 12" CMP
INV = 59.38'

LEGEND:

WATER —W—W—
WATER GATE \overline{W}
GAS —G—G—
IRON PIPE
L.F. CHAIN LINK FENCE —x—x—x—
T.C. ELEC., TELE., CABLE —ETC—ETC—
H. OVERHEAD —OH—OH—OH—
P. UTILITY POLE \cap
HYD. HYDRANT $\frac{3}{4}$
EXIST CONTOUR -----99-----



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