STORMWATER MANAGEMENT PLAN

Sunrise Cove
Windham, Maine

The following Stormwater Management Plan has been prepared for the Sunrise Cove Project to evaluate stormwater runoff and erosion control for the proposed 60 unit retirement community & 6 unit mixed development units located at 19 Roosevelt Trail, in Windham, Maine.

Site Calculations

Total Property Area	38.3 Ac (+/-)
Total Project Impervious Area	5.07 Ac
Total Developed Area	10.40 Ac

Existing Conditions

The development parcel is located on the north side of Route 302 at 19 Roosevelt Trail, just west of the Town of Windham/Town of Falmouth & Town of Windham/City of Westbrook town lines. The site contains the remnants of an old RV campground. There are a series of paved and gravel roads that run through the site. There are numerous camp sites throughout. The site is located just upstream of Highland Lake. Highland Lake is identified as a lake watershed most at risk by the Maine DEP. A copy of the composite U.S.G.S. Quadrangle Map is attached to this submittal.

The developed area generally drains into a large forested wetland that lies between the site & Highland Lake. The onsite slopes are generally between 3%-5%. There is a man-made ditch that runs along the outer edge of the park that diverts offsite runoff around the developed area and to Highland Lake. The outlet of the man-made ditch and the forested wetland are modeled as Study Point #1 and Study Point #2, respectively in the attached stormwater calculations.

Flooding

The development area is not located within an area of flood hazard according to the Federal Insurance Rate Maps 230045 0006 B, 230045 0010 B, 230054 0001 B & 230189 0030 B. See attached map.

Modeling Assumptions

The onsite stormwater facilities were sized utilizing the USDA Soil Conservation Service (SCS) TR-20 Runoff Simulation Model, as contained in the HydroCAD computer software program (Version 9.0). Runoff curve numbers were determined for each direct watershed by measuring the area of each hydrologic soil group within each type of land cover. Weighted curve numbers were then

calculated using curve numbers for various cover types and hydrologic soil groups, assuming "good" conditions as defined in U.S Soil Conservation Service (SCS) publications. Times of concentration and travel times were determined from site topographic maps in accordance with SCS procedures. A maximum length of 150 feet was used for sheet flow.

All of the watersheds' peak runoff rates were analyzed for the 2, 10, and 25-year frequency, 24-hour duration storm events. A Type III rainfall distribution was applied to these storms. The rainfall amounts for Cumberland County are as follows:

Storm Frequency Precipitation (in./24 hr)	
2-year	3.1
10-year	4.6
25-year	5.8

Onsite Soils

The soils were delineated by Mark Hampton of Mark Hampton Associates. His Class B High Intensity Soil Survey is attached to this submission.

Water Quantity (Flooding Standard)

The following table summarizes the results of stormwater calculations for the design storm events for the project areas. Calculations and computer modeling sheets are provided with this report.

Table 1 - Stormwater Runoff Summary Table
Pre-Development vs. Post-Development

Study Point #	2Yr/24Hr (cfs)		10Yr/24Hr (cfs)		25Yr/24Hr (cfs)	
	Pre	Post	Pre	Post	Pre	Post
1	22.9	19.3	50.2	50.1	74.2	74.1
2	8.3	6.8	19.0	17.9	28.6	28.6

As the above result table shows, the post-development flow rates for the 2, 10, and 25-year/24 hour design storm events do not exceed the pre-development conditions.

Water Quality (Phosphorus Export Calculations)

Existing Conditions:
The site contains the remnants of an old RV campground. There are a series of paved and gravel roads that run through the site. The former owner of the property & founder of the campground created a large ditch that directs runoff around the campground. The ditch receives runoff from the Route 302 drainage system.

We walked the site with representatives from the MDEP & Town of Windham Engineering staff prior to snowfall in November of 2018. The site walk was conducted during the rain and drainage patterns were easily observed.

The existing phosphorus export from the existing site can be broken into two primary sections: an evaluation of the onsite sources of phosphorus export and an evaluation of the offsite sources of phosphorus export that flow through the site.

Phosphorus Export from On-Site Sources

The development parcel is home to a recreational vehicle campground that was established many decades ago (more than 50 years). The site contained at least 34 RV sites, a bath house, a series of access roads and a house/office. The house was in disrepair and was demolished sometime in 2016/2017. The property has not been in heavy use as a campground for quite some time. It appears that the campground converted to long term rentals in its later years. The campsites are shown on D-1.0.

Engineers from our office have taken a careful accounting of the existing site, particularly in relation to existing drainage patterns from the developed portion of the property. The campsite locations & sizes are shown on the attached plan. We observed the site on multiple occasions when raining to ensure that we had an accurate understanding of the characteristics of the site. The following is a list of what we found:

1. All sites were located & measured from a series of site visits done in the summer & fall of 2018. The sites are shown on D-1.0.

2. Shallow test pits on several of the sites indicated that most were entirely located upon an old gravel pad. Some of the sites are growing back in so all areas were not tested. It appears that when in operation, each site was approximately 50% gravel & 50% grass.

3. The sites closer to Route 302 – particularly on the north side of the road, from the intersection with Route 302 to the bathhouse- contained no signs of woody vegetation. We believe that this area experienced heavy usage more recently than the remainder of the site. The remainder of the sites and road were in various stages of reverting to a natural condition.

4. Almost all of the internal roadway system is lower in elevation than the surrounding campsites. Runoff generally flows down the road and outlets to one of the defined stormwater channels.

5. The property generally drains to the south (toward Highland Lake). The sites on the northerly side of the road drain into the road. The sites on the southerly side of the road generally drain away from the road.

6. We moved some of the leaves off the road and determined that the first portion of access road typically features between 14’-16’ of pavement. For the purposes of calculation, we have used an assumed width of 14’ in this section.

7. Beyond the bathhouse, the road narrows to 10’ and is comprised of either broken asphalt or gravel.

8. We believe that there are three distinct use patterns with the old campground.

- *Use Pattern 1*: Sites 1 & 2 and the access road from Route 302 to those sites have had been subject to regular use from the development of the campground to current day. This area would produce the highest level of phosphorus export so we are modeling the export coefficients for the access road to be 50% of a road (0.875) and the sites to be 0.925 (half impervious/half grass).

- *Use Pattern 2*: Sites 3, 6, 8, 10, 12 & 14 and the access road to the bathhouse experienced regular use within the last decade. The road was serving as an 8 lot private way. The site 1 tenant stated that there were 7 or 8 trailers using these sites within two or three years of the applicant's purchase of the property. However, around the time of purchase, there were no more than 3 lots being used. All of the sites in this pattern area are free of woody vegetation and were obviously in use in recent years, but in order to be conservative, we are modeling Site 3 with an export coefficient of 0.50 and the rest at 0.30. The access road hasn't experience regular usage so we believe it to be appropriate to use a coefficient that has a value of 50% of that of a driveway.

- *Use Pattern 3*: The remainder of the access roads and sites are in various stages of becoming naturalized. At the peak of the campground operations, these sites were likely a major source of phosphorus, but their impact has significantly decreased over the years. We are using an export coefficient of 0.3 for all of this area.

  We discussed our approach to phosphorus modeling for this project with the Maine DEP. They provided guidance on appropriate export coefficients based upon the condition of the site.

  We have prepared an evaluation of the phosphorus export using MDEP methodology & published spreadsheets. Those worksheets are attached. According to our calculations, the developed portion of the site lies on approximately 6.1 acres of the overall 38.3 acre parcel and currently exports approximately 0.79 lbs of phosphorus per year. The remainder of the site has an associated budget of approximately 0.64 lbs of phosphorus per year (0.02 lbs/yr x 32.19 acres). Therefore, the total phosphorus budget for the 19 Roosevelt Trail property is approximately **1.43 lbs** of phosphorus per year. This assumes that the existing development will be entirely removed and replaced or revegetated.

  It should be noted that the large ditch that flows around the project area is currently un-stabilized and has been identified by the Highland Lake Association as chronic problem area. Improvements to the ditch could provide a significant, albeit unquantifiable, reduction in phosphorus export/sediment transport to the lake.

  Phosphorus Export from Off-Site Sources

  The former owner of the property & founder of the campground created a large ditch that directs runoff around the campground. The ditch receives runoff from the Route 302 drainage system and several adjacent lots. The ditch grows in size a bit further into the site and is up to 5' deep in some sections. We believe that a stormwater pond could be constructed in-line with the ditch that could remove some of the phosphorus that is exported to Highland Lake from the Route 302 drainage system.

D-1.1 shows the area that drains into the onsite ditch. We used MDOT right of way maps to determine the layout of the existing stormwater system & to aid in the evaluation of the contributing watershed. Our analysis showed that the onsite ditch drains approximately 620' of the full width of the Route 302 right of way as well as the full or partial runoff from eight nearby lots. Much of this area is getting no treatment. Attached sheet D-1.1 shows the areas that are flowing into the beginning of the ditch. It also shows the areas that are receiving no treatment vs those that are getting some informal buffer treatment.

We prepared an evaluation of the phosphorus export that comes from the MDOT right of way. According to our calculations, the ditch conveys approximately 2.65 lbs of phosphorus to Highland Lake per year.

Onsite Soils

The onsite soils are shown on D-1.0 and were obtained from a Class A High Intensity Soil Survey performed by Mark Hampton Associates. Mark delineated the onsite soils during the summer/fall of 2018. The onsite wetlands were delineated in 2016 & verified/updated in 2017 by Mark Cenci Geologic. MDEP staff performed a series of site visits in 2017 to confirm that the wetlands were accurately delineated. They determined that the current plan accurately shows the onsite wetlands.

Existing Forested Buffers Adjacent to Campsites

We evaluated the slope, flow length and underlying soils to determine approximate treatment values associated with the informal onsite & offsite buffers. The assumed buffer flow path locations can be seen on D-1.0 & D-1.1. Additionally, we've added a table to each sheet that outlines the necessary inputs and the corresponding calculated treatment values.

Proposed Development:

Best Management Practices (BMPs) will be implemented to reduce the impacts of site development on downstream water quality. The property is located in the Highland Lake Watershed. Highland Lake is identified by the MDEP as a lake most at risk from development.

Highland Lake Watershed

The allowable per acre allocation of phosphorus export for the portion of the site that is within the Highland Lake Watershed is 0.020 lbs/acre of developable land. There are approximately 38.3 developable acres within the Town of Windham that have an associated allocation of 0.644 lbs/year of allowable phosphorus export. See attached NWI Map.

Phosphorus export will be reduced by the implementation of a variety of BMPs. First, a large gravel wetland will be constructws in-line with the large drainage swale. This pond is oversized to attain the maximum removal efficiency of 75%. According to our calculations, the ponds water quality volume is equal to the watershed runoff that is produced from a 2.2" storm event.

Almost all of the proposed developed area drains to one of two gravel wetlands that are located on the downstream end of the property. Those ponds area also oversized to remove as much phosphorus as practicable.

Most of the proposed roof areas will drain to roof drain filter strips.

A worksheet that summarizes the phosphorus export has been included in the calculations. The oversized gravel wetlands & extensive use of roof drain were used to reduce the total expected phosphorus of onsite & offsite runoff to a level that is 1.24 lbs/year **BELOW** the allocation. Calculations have been provided detailing the water quality volume derivations for the gravel wetlands. To put this in even clearer terms, the existing site & untreated runoff that passes through the large drainage swale exports approximately 3.44 lbs/year of phosphorus. Our proposed site will export approximately 2.84 lbs/year. **This development will result in an approximate reduction of 0.6 lbs of phosphorus per year.**

Housekeeping and Maintenance & Inspection guidelines are attached to this report.

BMP Sizing

Roof Dripline Filter Bed
We propose to provide treatment for the roof runoff for each of the proposed buildings homes. The bed is required to provide volume for 1" of runoff from the contributing area and store it within a reservoir bed. The bed sizing is as follows:

Area of Watershed: = 700 SF
Treatment Volume Required: Area x runoff depth: 700 SF x 1/12 FT = 58.33 CF
Bed Sizing:
Porosity = 40% Bed Length = 45' Bed Width = 3' Bed Depth = 1.5
Available Volume= 45' x 3' x 1.5' x 0.40 = 81 CF.

> The design is adequate since the available volume exceeds the required volume. The filter strips meet the standard sizing criteria and will have a corresponding treatment factor of 0.4.

Gravel Wetland #1

Forebay

STAGE (FT)	AREA (SF)	STORAGE (CF)
194.5	270	0
195	430	175
196	750	765

Cell #1

STAGE (FT)	AREA (SF)	STORAGE (CF)
194.5	3170	0
195	3530	1730
196	4250	5565

Cell #2

STAGE (FT)	AREA (SF)	STORAGE (CF)
194.5	3170	0
195	3530	1675
196	4250	5565

Total Pond

STAGE (FT)	AREA (SF)	STORAGE (CF)
194.5	6610	0
195	7490	3525
196	9250	11895
196.01	9500	11895
197	10400	21746
198	10700	30810
198.8	11700	39986

WATERSHED IMPERVIOUS AREA=	75243	SF
WATERSHED LANDSCAPED AREA=	61639	SF
REQUIRED WATER QUALITY VOLUME=	8325	CF
PROVIDED WATER QUALITY VOLUME=	11895	CF
TREATMENT FACTOR=	0.28	(0.25 Max)

The required water quality volume was calculated by multiplying the impervious area by 1.0” and the landscaped area by 0.4”.

Gravel Wetland #2

Forebay

STAGE (FT)	AREA (SF)	STORAGE (CF)
194.5	615	0
195	785	350
196	1125	1305

Cell #1

STAGE (FT)	AREA (SF)	STORAGE (CF)
194.5	3300	0
195	3733	1758
196	4600	5925

Cell #2

STAGE (FT)	AREA (SF)	STORAGE (CF)
194.5	3300	0
195	3733	1758
196	4600	5925

Total Pond

STAGE (FT)	AREA (SF)	STORAGE (CF)
194.5	7215	0
195	8252	3867
196	10325	13155
196.01	10600	13155
197	12150	24416
198	14100	37394
198.8	15100	48235

WATERSHED IMPERVIOUS AREA=	53397	SF
WATERSHED LANDSCAPED AREA=	110319	SF
REQUIRED WATER QUALITY VOLUME=	8127	CF
PROVIDED WATER QUALITY VOLUME=	13155	CF
TREATMENT FACTOR=	0.25	(0.25 Max)

The required water quality volume was calculated by multiplying the impervious area by 1.0” and the landscaped area by 0.4”.

Gravel Wetland #3

Forebay

STAGE (FT)	AREA (SF)	STORAGE (CF)
223	850	0
224	1217	1033
224.5	1400	1688

Cell #1

STAGE (FT)	AREA (SF)	STORAGE (CF)
223	6400	0
224	7133	6767
224.5	7500	10425

Cell #2

STAGE (FT)	AREA (SF)	STORAGE (CF)
223	6400	0
224	7133	6767
224.5	7500	10425

Total Pond

STAGE (FT)	AREA (SF)	STORAGE (CF)
223	13650	0
224	15483	14567
224.5	16400	22538
224.51	17000	22538
225	17600	31015
226.3	19500	54798

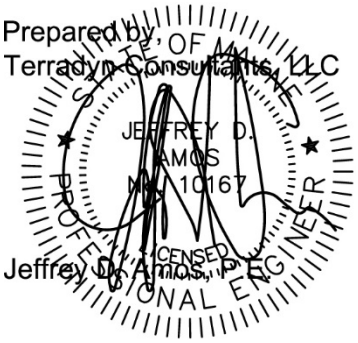
WATERSHED IMPERVIOUS AREA=	76588	SF
WATERSHED LANDSCAPED AREA=	98250	SF
WATERSHED FORESTED AREA=	500,000	SF
REQUIRED WATER QUALITY VOLUME=	13824	CF
PROVIDED WATER QUALITY VOLUME=	22538	CF
TREATMENT FACTOR=	0.25	(0.25 Max)

The required water quality volume was calculated by multiplying the impervious area by 1.0", the landscaped area by 0.4" and the forested area by 0.1" Our calculations showed that the water quality volume was equivalent to the entire runoff from the 2.2"/24 hour storm event.

Summary

Based on the results of this evaluation, the proposed stormwater design is not expected to cause flooding, erosion or other significant adverse effects downstream of the site.

Prepared by,
Terradyn Consultants, LLC

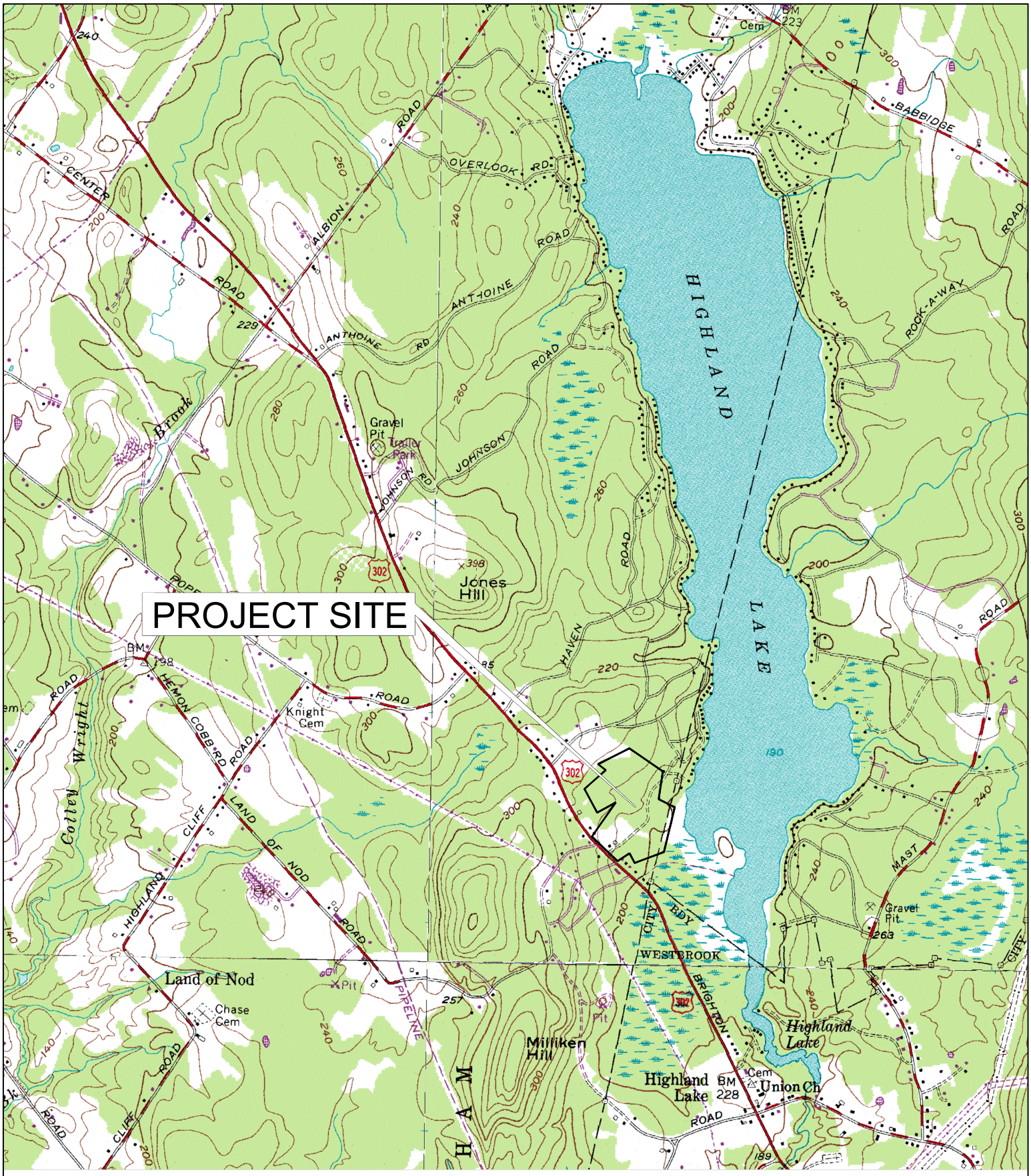


Jeffrey D. Amos, P.E.

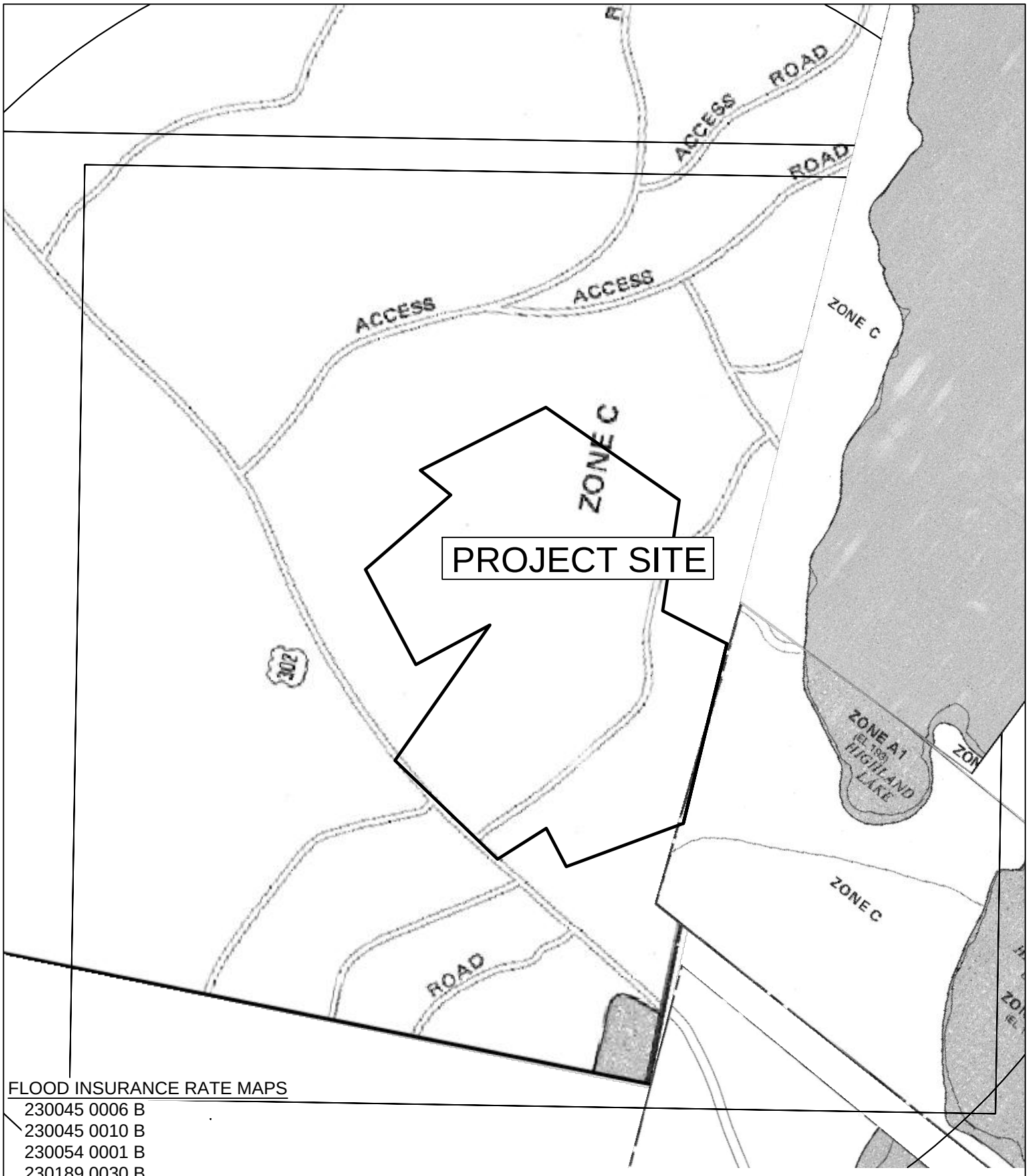
Attached:

Phosphorus Export Worksheets
Pre Development Hydrocad Calculations
Post Development Hydrocad Calculations
Pond Spillway Check – 25 Year
Pond Spillway Check – 100 Year
First Flush Calculation
Pipe Sizing Calculations
Maintenance & Inspection of Stormwater Facilities
Housekeeping Plan
D-1.0 Existing Campground with Contours
D-1.1 Offsite Untreated Area Map
Pre Development Watershed Maps
Post Development Watershed Maps
Stormwater Treatment Map

SHEET DESCRIPTION AERIAL PHOTO ADRESS, WINDHAM ME		JOB NO. 1636	FIGURE 3
PREPARED FOR CHASE CUSTOM HOME AND FINANCE 19 ROOSEVELT TRAIL WINDHAM, ME 04062	TERRADYN CONSULTANTS, LLC P.O. Box 339 111 Elderberry Lane New Gloucester, ME 04260 Office: (207) 926-5111 Fax: (207) 221-1317 www.terradynconsultants.com Civil Engineering - Land Planning - Stormwater Design - Environmental Permitting	DATE 9/12/16 SCALE 1"=300'	OF 5



SHEET DESCRIPTION U.S.G.S. QUADRANGLE MAP 19 ROOSEVELT TRAIL, WINDHAM	TERRADYN CONSULTANTS, LLC Civil Engineering - Land Planning - Stormwater Design - Environmental Permitting	JOB NO. 1817	FIGURE 1
PREPARED FOR CHASE CUSTOM HOME & FINANCE 290 BRIDGTON ROAD WESTBRROK, ME 04092	P.O. Box 339 111 Elderberry Lane New Gloucester, ME 04260 Office: (207) 926-5111 Fax: (207) 221-1317 www.terradynconsultants.com	DATE 8/2/2019	OF 1
		SCALE 1"=2000'	



FLOOD INSURANCE RATE MAPS

230045 0006 B
230045 0010 B
230054 0001 B
230189 0030 B

SHEET DESCRIPTION FEMA FLOOD INSURANCE RATE MAP 290 BRIDGTON RD., WIDHAM ME	TERRADYN CONSULTANTS, LLC Civil Engineering - Land Planning - Stormwater Design - Environmental Permitting	JOB NO. 1636	FIGURE 5
PREPARED FOR CHASE CUSTOM HOME AND FINANCE 290 BRIDGTON ROAD WESTBROOK, ME 04092	P.O. Box 339 111 Elderberry Lane New Gloucester, ME 04260 Office: (207) 926-5111 Fax: (207) 221-1317 www.terradynconsultants.com	DATE 9/12/16	OF 5
		SCALE 1"=500'	

Soil Information for All Uses

Soil Properties and Qualities

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

Soil Qualities and Features

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

Hydrologic Soil Group

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.


70° 22' 27" W
70° 21' 24" W
43° 45' 42" N
43° 45' 12" N
389400
389500
389600
389700
389800
389900
390000
390100
390200
390300
390400
390500
390600
390700
4846300
4846200
4846100
4846000
4845900
4845800
4845700
4845600
4845500
4845400
HrB
RbA
Percy Hawkes Rd
WsB
WrB
PfC
DeB
RgA
Sp
RbA
PfC
PfB
WsB
WsB
W
PfC
WrB
PfB
PbB
RbA
HsC
PfB
PfB
WrB
302
Sz
Sn
Sp
Cu
PfC
Soil Map may not be valid at this scale.
Map Scale: 1:6,440 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 50 100 200 300
Feet
0 300 600 1200 1800
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

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

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

Soil Survey Area: Cumberland County and Part of Oxford County, Maine
Survey Area Data: Version 15, Sep 6, 2018

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

Date(s) aerial images were photographed: Sep 5, 2013—Oct 22, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Cu	Cut and fill land		1.6	0.7%
DeB	Deerfield loamy fine sand, 3 to 8 percent slopes	A	0.2	0.1%
HrB	Lyman-Tunbridge complex, 0 to 8 percent slopes, rocky	D	2.1	1.0%
HsC	Lyman-Abram complex, 8 to 15 percent slopes, very rocky	D	5.7	2.7%
PbB	Paxton fine sandy loam, 3 to 8 percent slopes	C	21.8	10.2%
PfB	Paxton very stony fine sandy loam, 3 to 8 percent slopes	C	58.0	27.2%
PfC	Paxton very stony fine sandy loam, 8 to 15 percent slopes	C	28.2	13.2%
RbA	Ridgebury fine sandy loam, 0 to 3 percent slopes	C/D	25.1	11.8%
RgA	Ridgebury very stony fine sandy loam, 0 to 3 percent slopes	C/D	17.4	8.2%
Sn	Scantic silt loam, 0 to 3 percent slopes	D	2.7	1.3%
Sp	Sebago mucky peat	A/D	9.7	4.5%
Sz	Swanton fine sandy loam	C/D	2.9	1.4%
W	Water		5.3	2.5%
WrB	Woodbridge fine sandy loam, 0 to 8 percent slopes	C	14.0	6.5%
WsB	Woodbridge very stony fine sandy loam, 0 to 8 percent slopes	C	18.5	8.7%
Totals for Area of Interest			**213.1**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Existing Conditions of 19 Roosevelt Trail
Pre-PPE and Post-PPE Calculations

Calculate phosphorus export from development for before and after treatment
Use as many sheets as needed for each development type (commercial, roads, residential lots, etc.)

Project name:_____ **Development type**: _____ Sheet # _____

Land Surface Type or Lot #(s) with description	Area (SF)	Acres or # of lots	Export Coefficient from Table 3.1 Table 3.2	Pre-treatment Algal Av. P Export (lbs P/year)	Treatment Factor for BMP(s) from Chapter 6	% Credit Taken	Post-treatment Algal Av. P Export (lbs P/year)	Notes
House Roof	5122	0.1176	0.5	0.0588	1	1	0.0588	
House Lawn	20000	0.4591	0.3	0.1377	1	1	0.1377	
Bathhouse Roof (front half)	165	0.0038	0.5	0.0019	1	1	0.0019	
Bathhouse Roof (Rear Half)	165	0.0038	0.5	0.0019	0.2	1	0.0004	150' Wooded Buffer
Access Road (To Site 3)	10942	0.2512	1.75	0.4396	1	0.5	0.2198	Untreated
Access Road (Buffer treated)	1206	0.0277	1.75	0.0485	0.2	0.5	0.0048	Area #1
Access Road (Site 3 to bathhouse)	4339	0.0996	1.25	0.1245	1	0.5	0.0623	Untreated
Access Road (bathhouse to end)	13050	0.2996	0.3	0.0899	1	1	0.0899	
Campsites								
1	1500	0.0344	0.925	0.0319	1	1	0.0319	Conservatively 50% Impervious/50% Lawn (0.925)
2	1000	0.0230	0.925	0.0212	1	1	0.0212	
3	1500	0.0344	0.5	0.0172	1	1	0.0172	
4	800	0.0184	0.3	0.0055	1	1	0.0055	
5	450	0.0103	0.3	0.0031	1.00	1	0.0031	40' Buffer (C&D)
6	1500	0.0344	0.3	0.0103	1	1	0.0103	
7	450	0.0103	0.3	0.0031	0.68	1	0.0021	70' Buffer (C&D)
8	1000	0.0230	0.3	0.0069	1	1	0.0069	
9	450	0.0103	0.3	0.0031	1.00	1	0.0031	40' Buffer (C&D)
10	990	0.0227	0.3	0.0068	1	1	0.0068	
11	450	0.0103	0.3	0.0031	1	1	0.0031	30' Buffer (C&D)
12	900	0.0207	0.3	0.0062	1	1	0.0062	
13	450	0.0103	0.3	0.0031	0.56	1	0.0017	66' Buffer (C&D)
14	800	0.0184	0.3	0.0055	1	1	0.0055	
15	800	0.0184	0.3	0.0055	1	1	0.0055	
16	800	0.0184	0.3	0.0055	0.23	1	0.0013	150' Buffer (C&D)
17	600	0.0138	0.3	0.0041	1	1	0.0041	
18	600	0.0138	0.3	0.0041	1	1	0.0041	
19	800	0.0184	0.3	0.0055	1.00	1	0.0055	32' Buffer (D)
20	450	0.0103	0.3	0.0031	1	1	0.0031	25' Buffer (C&D)
21	800	0.0184	0.3	0.0055	1	1	0.0055	
22	600	0.0138	0.3	0.0041	0.40	1	0.0017	83' Buffer (C&D)
23	750	0.0172	0.3	0.0052	1	1	0.0052	
24	1200	0.0275	0.3	0.0083	0.20	1	0.0017	150' Buffer C
25	900	0.0207	0.3	0.0062	0.27	1	0.0017	150' Buffer C
26	600	0.0138	0.3	0.0041	1	1	0.0041	
27	450	0.0103	0.3	0.0031	1	1	0.0031	30' Buffer (D)
28	650	0.0149	0.3	0.0045	1	1	0.0045	
29	1000	0.0230	0.3	0.0069	1	1	0.0069	
30	1500	0.0344	0.3	0.0103	0.79	1	0.0082	57' Buffer (C&D)
31	900	0.0207	0.3	0.0062	0.79	1	0.0049	57' Buffer (C&D)
32	800	0.0184	0.3	0.0055	1	1	0.0055	
33	800	0.0184	0.3	0.0055	0.46	1	0.0025	
34	900	0.0207	0.3	0.0062	1	1	0.0062	
			Total Pre-PPE (lbs P/year)	1.1393	**Total PostPPE (lbs P/year)**		0.7855	

Existing Conditions of 19 Roosevelt Trail
PPB calculations

Project name: 19 Roosevelt Trail

Lake name: Highland Lake

Town name: Windham

Standard Calculation

Watershed per acre phosphorus budget (Appendix C):	**PAPB**	0.02	lbs P/acre/year
Total acreage of development parcel:	**TA**	38.3	acres
NWI wetland acreage:	**WA**	0	acres
Steep slope acreage:	**SA**	0	acres
Existing developed area		6.11	acres
Project acreage: A = TA - (WA + SA)	**A**	32.19	acres
Project Phosphorus Budget: PPB = P x A	**PPB**	0.6438	**lbs P/year**
Existing Phosphorus Export From Site		0.785	
Total Budget		1.429	**lbs P/year**

Worksheet 2
Pre-PPE and Post-PPE Calculations

Calculate phosphorus export from development for before and after treatment
Use as many sheets as needed for each development type (commercial, roads, residential lots, etc.)

Project name:_____ **Development type**: _____ Sheet # _____

Land Surface Type or Lot #(s) with description	SF	Acres or # of lots	Export Coefficient from Table 3.1 Table 3.2	Pre-treatment Algal Av. P Export (lbs P/year)	Treatment Factor for BMP(s) from Chapter 6	Post-treatment Algal Av. P Export (lbs P/year)	Description of BMPs
WS-1							
Roof	23364	0.536	0.5	0.268	0.4	0.107	Roof Drain Filter Strip
Road, Parking Lots & Sidewalks	75243	1.727	1.25	2.159	0.28	0.605	Gravel Wetland #1
Grass	61639	1.415	0.3	0.425	0.28	0.119	Gravel Wetland #1
WS-2							
Roof	43488	0.998	0.5	0.499	0.4	0.200	Gravel Wetland #2
Road, Parking Lots & Sidewalks	53397	1.226	1.25	1.532	0.25	0.383	Gravel Wetland #2
Grass	110319	2.533	0.3	0.760	0.25	0.190	Gravel Wetland #2
WS-10							
Roof	9288	0.213	0.5	0.107	0.4	0.043	Roof Drain Filter Strip
Road, Parking Lots & Sidewalks	0	0.000	1.25	0.000	1	0.000	None
Grass	21000	0.482	0.3	0.145	1	0.145	None
WS-11							
Roof	7300	0.168	0.5	0.084	0.4	0.034	Roof Drain Filter Strip
Road, Parking Lots & Sidewalks	1899	0.044	1.25	0.054	1	0.054	None
Grass	19500	0.448	0.3	0.134	1	0.134	None
WS-12							
Roof	6750	0.155	0.5	0.077	0.4	0.031	Roof Drain Filter Strip
Road, Parking Lots & Sidewalks	0	0.000	1.25	0.000	1	0.000	None
Grass	20000	0.459	0.3	0.138	1	0.138	None
			Total Pre-PPE (lbs P/year)	6.382	**Total PostPPE (lbs P/year)**	2.182	

Existing Conditions of 19 Roosevelt Trail

Project name: _____ **Development type**: _____ Sheet # _____

Mitigation credit when a pre-existing source is being eliminated

Mitigation Source Area Land Use	Area (SF)	Acres	Export Coefficient (lbs P/acre/year)	Modifier	Pre-treatment Historical P Export (lbs P/year)	Treatment Factor for Historical BMP(s) (1.0 if no BMPs)	Historical P Export (lbs P/year)			Mitigation Credit (lbs P/year)	Comments
				0.5	0.0000	1	0.0000			0.0000	
				0.5	0.0000	1	0.0000			0.0000	
				0.5	0.0000	1	0.0000			0.0000	
					Total source elimination mitiagion credit (SEC)					**0.0000**	**lbs P/year**

Mitigation credit when a pre-existing source is treated by a new BMP

Mitigation Source Area Land Use	Area (SF)	Acres	Export Coefficient (lbs P/acre/year)	Modifier	Pre-treatment Historical P Export (lbs P/year)	Treatment Factor for Historical BMP(s) (1.0 if no BMPs)	Historical P Export (lbs P/year)		Treatment Factor for New BMP(s) Chapter 6	Mitigation Credit (lbs P/year)	Comments
Route 302 Pavement	22818	0.5238	1.75	1	0.9167	1	0.9167	1 -	0.25	0.6875	
Route 302 Grass & Ditch	19965	0.4583	0.6	1	0.2750	1	0.2750	1 -	0.25	0.2063	
7/65 Roof	3990	0.0916	0.5	1	0.0458	1	0.0458	1 -	0.25	0.0343	
7/65 Driveway	6000	0.1377	1.25	1	0.1722	1	0.1722	1 -	0.25	0.1291	
7/65 Lawn	21780	0.5	0.6	1	0.3000	1	0.3000	1 -	0.25	0.2250	
7/64 Roof	461	0.0106	0.5	1	0.0053	1	0.0053	1 -	0.25	0.0040	
7/64 Driveway	2410	0.0553	1.25	1	0.0692	1	0.0692	1 -	0.25	0.0519	
7/64 Lawn	11000	0.2525	0.6	1	0.1515	1	0.1515	1 -	0.25	0.1136	
7/63-1 Roof	1335	0.0306	0.5	1	0.0153	0.21	0.0032	1 -	0.25	0.0024	
24/18-1 Roof	4195	0.0963	0.5	1	0.0482	1	0.0482	1 -	0.25	0.0361	
24/18-1 Driveway	11660	0.2677	1.25	1	0.3346	1	0.3346	1 -	0.25	0.2509	
24/18-1 Lawn	2815	0.0646	0.6	1	0.0388	1	0.0388	1 -	0.25	0.0291	
24/18 Roof	2390	0.0549	0.5	1	0.0274	0.2	0.0055	1 -	0.25	0.0041	
24/18 Driveway	2216	0.0509	1.25	1	0.0636	1	0.0636	1 -	0.25	0.0477	
24/18 Driveway	6212	0.1426	1.25	1	0.1783	0.2	0.0357	1 -	0.25	0.0267	
24/18 Lawn	0	0	0.6	1	0.0000	1	0.0000	1 -	0.25	0.0000	
24/19 Roof	1345	0.0309	1.25	1	0.0386	1	0.0386	1 -	0.25	0.0289	
24/19 Driveway	2017	0.0463	1.25	1	0.0579	1	0.0579	1 -	0.25	0.0434	
24/19 Lawn	3343	0.0767	0.6	1	0.0460	1	0.0460	1 -	0.25	0.0345	
24/20 Roof	2910	0.0668	0.5	1	0.0334	0.27	0.0090	1 -	0.25	0.0068	
24/20 Driveway	6610	0.1517	1.25	1	0.1897	0.2	0.0379	1 -	0.25	0.0285	
						Subtotal	2.6546				
						Total source treatment mitiagion credit (STC)				**1.9909**	**lbs P/year**

TOTAL MITIGATION CREDIT (SEC + STC)	**1.9909**	**lbs P/year**

Existing Conditions of 19 Roosevelt Trail
Project Phosphorus Export Summary

Summarizing the project's algal available phosphorus export (PPE)

19 Roosevelt Trail

Project Phosphorus Budget - Worksheet 1	**PPB**	1.4293	lbs P / year
Total Pre-Treatment Phosphorus Export - Worksheet 2	**Pre-PPE**	6.3821	lbs P / year
Total Post-Treatment Phosphorus Export - Worksheet 2	**Post-PPE**	2.1817	lbs P / year
Total Phosphorus Mitigation Credit - Worksheet 3	**TMC**	1.9909	lbs P / year
Project Phosphorus Export (Post-PPE - TMC)	**PPE**	0.1908	lbs P / year

Is the Project Phosphorus Export sufficiently reduced? (PPE< PPB)	-1.2385	lbs P / year

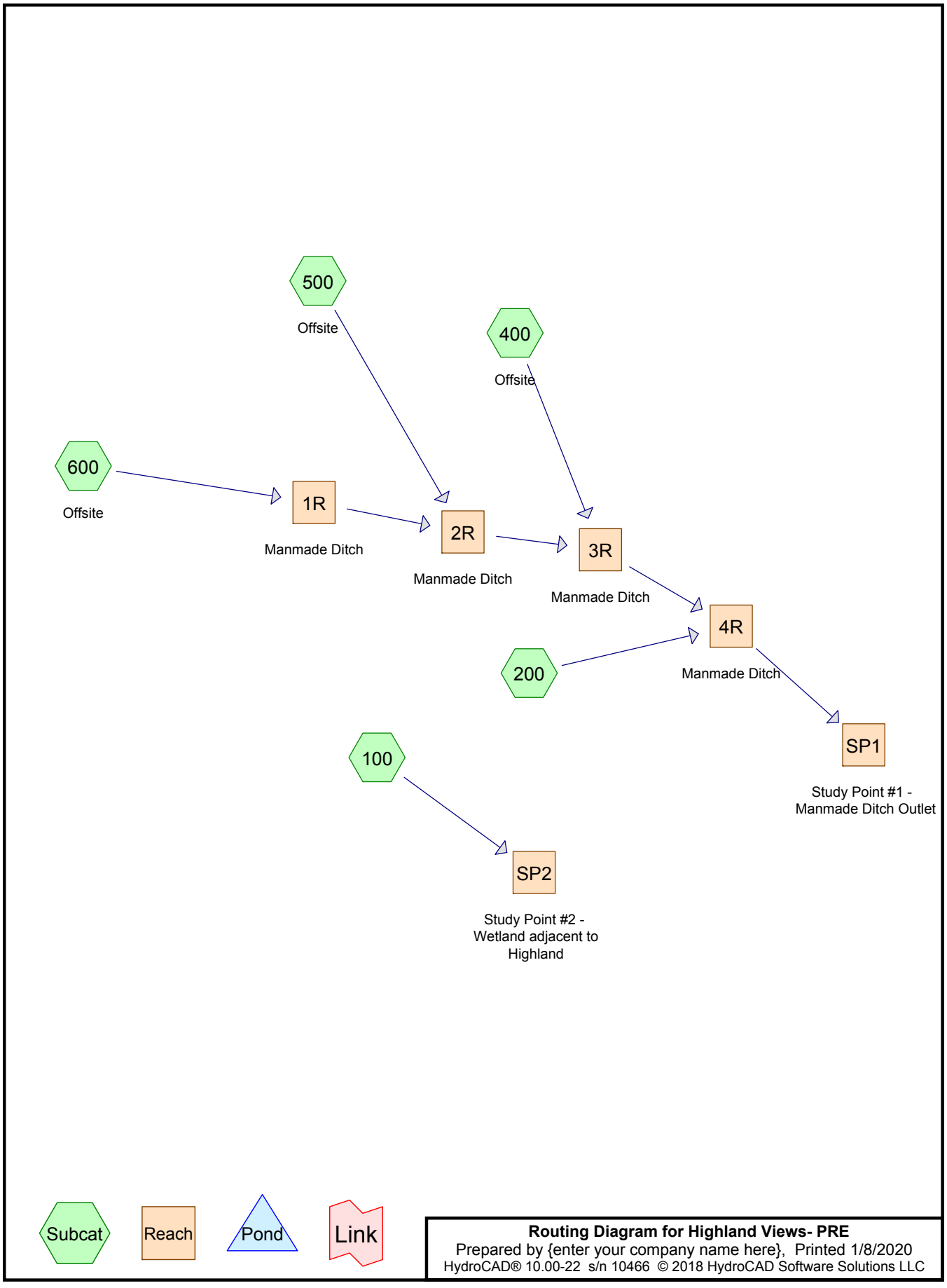
If PPE is less than or equal to PPB, the project meets its phosphorus budget (neg. #)
If PPE is more than PPB, more reduction in phosphorus export may be required (pos. #)

OTHERWISE:

Is the Post-Treatment Phosphorus Export less than 40% of the Pre-Treatment Export? It is equivalent to more than 60% removal efficiency. (Post-PPE < 40% Pre-PPE)	34.18%

If Post-PPE is less than 40% of Pre-PPE, a compensation fee may be appropriate at the cost of $22,733 per pound of phosphorus over budget. (see table 3 Phosphorus Compensation Fee in updated phosphorus manual) The compensation fee option is only available in some lake watersheds. Check with the DEP project manager or with the DEP Division of Watershed Management to see if the watershed in which the project is located is eligible before proposing a project that incorporates a compensation fee.

The following compensation fee must be paid $13,9*(PPE-PPB)	**N/A**



Routing Diagram for Highland Views- PRE

Prepared by {enter your company name here}, Printed 1/8/2020

HydroCAD® 10.00-22 s/n 10466 © 2018 HydroCAD Software Solutions LLC

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 100: Runoff Area=877,720 sf 3.16% Impervious Runoff Depth>0.82"
Flow Length=1,300' Tc=54.5 min CN=73 Runoff=8.34 cfs 1.370 af

Subcatchment 200: Runoff Area=200,485 sf 0.00% Impervious Runoff Depth>0.71"
Flow Length=751' Tc=81.3 min CN=71 Runoff=1.27 cfs 0.273 af

Subcatchment 400: Offsite Runoff Area=1,986,138 sf 9.10% Impervious Runoff Depth>0.91"
Flow Length=1,230' Tc=76.0 min CN=75 Runoff=17.53 cfs 3.445 af

Subcatchment 500: Offsite Runoff Area=188,669 sf 13.29% Impervious Runoff Depth>0.93"
Flow Length=570' Tc=29.7 min CN=75 Runoff=2.80 cfs 0.335 af

Subcatchment 600: Offsite Runoff Area=472,025 sf 7.69% Impervious Runoff Depth>0.93"
Flow Length=1,608' Tc=30.7 min CN=75 Runoff=6.91 cfs 0.837 af

Reach 1R: Manmade Ditch Avg. Flow Depth=0.65' Max Vel=4.01 fps Inflow=6.91 cfs 0.837 af
n=0.035 L=460.0' S=0.0261 '/' Capacity=130.60 cfs Outflow=6.89 cfs 0.835 af

Reach 2R: Manmade Ditch Avg. Flow Depth=0.62' Max Vel=3.36 fps Inflow=9.67 cfs 1.170 af
n=0.035 L=380.0' S=0.0158 '/' Capacity=158.45 cfs Outflow=9.65 cfs 1.166 af

Reach 3R: Manmade Ditch Avg. Flow Depth=1.03' Max Vel=4.18 fps Inflow=21.79 cfs 4.611 af
n=0.040 L=647.0' S=0.0185 '/' Capacity=150.27 cfs Outflow=21.76 cfs 4.596 af

Reach 4R: Manmade Ditch Avg. Flow Depth=0.83' Max Vel=5.73 fps Inflow=22.92 cfs 4.869 af
n=0.040 L=250.0' S=0.0440 '/' Capacity=231.45 cfs Outflow=22.92 cfs 4.864 af

Reach SP1: Study Point #1 - Manmade Ditch Outlet Inflow=22.92 cfs 4.864 af
Outflow=22.92 cfs 4.864 af

Reach SP2: Study Point #2 - Wetland adjacent to Highland Inflow=8.34 cfs 1.370 af
Outflow=8.34 cfs 1.370 af

Total Runoff Area = 85.515 ac Runoff Volume = 6.259 af Average Runoff Depth = 0.88"
92.76% Pervious = 79.320 ac 7.24% Impervious = 6.195 ac

Summary for Subcatchment 100:

Runoff = 8.34 cfs @ 12.81 hrs, Volume= 1.370 af, Depth> 0.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

Area (sf)	CN	Description
19,472	80	1/2 acre lots, 25% imp, HSG C
33,728	79	1 acre lots, 20% imp, HSG C
52,259	74	>75% Grass cover, Good, HSG C
28,552	74	>75% Grass cover, Good, HSG C
47,225	89	Gravel roads, HSG C
16,488	92	Paved roads w/open ditches, 50% imp, HSG C
515	98	Paved parking, HSG C
7,329	98	Unconnected roofs, HSG C
570,601	70	Woods, Good, HSG C
101,551	77	Woods, Good, HSG D
877,720	73	Weighted Average
850,018		96.84% Pervious Area
27,702		3.16% Impervious Area
7,329		26.46% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.9	150	0.0600	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
8.4	460	0.0330	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	30	0.0100	4.91	3.86	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
12.1	660	0.0330	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
54.5	1,300	Total			

Summary for Subcatchment 200:

Runoff = 1.27 cfs @ 13.20 hrs, Volume= 0.273 af, Depth> 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

Area (sf)	CN	Description
186,138	70	Woods, Good, HSG C
14,347	79	50-75% Grass cover, Fair, HSG C
200,485	71	Weighted Average
200,485		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
9.0	380	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	20	0.0100	5.70	7.00	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
2.9	201	0.0550	1.17		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
81.3	751	Total			

Summary for Subcatchment 400: Offsite

Runoff = 17.53 cfs @ 13.09 hrs, Volume= 3.445 af, Depth> 0.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

Area (sf)	CN	Description
688,135	77	2 acre lots, 12% imp, HSG C
14,079	81	1/3 acre lots, 30% imp, HSG C
17,232	80	1/2 acre lots, 25% imp, HSG C
14,149	98	Roofs, HSG C
15,384	98	Paved parking, HSG C
4,235	89	Gravel roads, HSG C
48,311	86	<50% Grass cover, Poor, HSG C
25,364	74	>75% Grass cover, Good, HSG C
120,250	92	Paved roads w/open ditches, 50% imp, HSG C
902,162	70	Woods, Good, HSG C
136,837	77	Woods, Good, HSG D
1,986,138	75	Weighted Average
1,805,372		90.90% Pervious Area
180,766		9.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	150	0.0600	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
4.4	380	0.0840	1.45		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
52.2	700	0.0020	0.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
76.0	1,230	Total			

Summary for Subcatchment 500: Offsite

Runoff = 2.80 cfs @ 12.45 hrs, Volume= 0.335 af, Depth> 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

Area (sf)	CN	Description
38,042	74	>75% Grass cover, Good, HSG C
5,785	98	Roofs, HSG C
118,887	70	Woods, Good, HSG C
19,294	98	Paved parking, HSG C
6,661	77	Woods, Good, HSG D
188,669	75	Weighted Average
163,590		86.71% Pervious Area
25,079		13.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	150	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
6.8	420	0.0430	1.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
29.7	570	Total			

Summary for Subcatchment 600: Offsite

Runoff = 6.91 cfs @ 12.46 hrs, Volume= 0.837 af, Depth> 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

	Area (sf)	CN	Description
	12,875	89	Gravel roads, HSG C
*	27,862	98	Paved roads w curbs
	60,234	74	>75% Grass cover, Good, HSG C
	8,436	98	Roofs, HSG C
	362,618	73	Woods, Fair, HSG C
	472,025	75	Weighted Average
	435,727		92.31% Pervious Area
	36,298		7.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	150	0.0470	0.12		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.10"
6.0	420	0.0550	1.17		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
2.2	471	0.0490	3.56		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	140	0.0360	10.82	13.28	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.7	257	0.0310	6.26	28.17	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.00' Z= 3.0 & 2.0 '/' Top.W=7.00' n= 0.030
0.2	170	0.0350	14.59	45.85	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
30.7	1,608	Total			

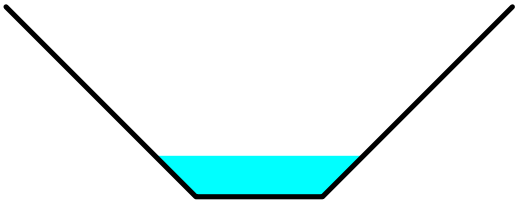
Summary for Reach 1R: Manmade Ditch

Inflow Area = 10.836 ac, 7.69% Impervious, Inflow Depth > 0.93" for 2-yr event
Inflow = 6.91 cfs @ 12.46 hrs, Volume= 0.837 af
Outflow = 6.89 cfs @ 12.49 hrs, Volume= 0.835 af, Atten= 0%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.01 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.92 fps, Avg. Travel Time= 4.0 min

Peak Storage= 789 cf @ 12.49 hrs
Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 3.00' Flow Area= 15.0 sf, Capacity= 130.60 cfs

2.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 1.0 '/' Top Width= 8.00'
Length= 460.0' Slope= 0.0261 '/'
Inlet Invert= 240.00', Outlet Invert= 228.00'



Summary for Reach 2R: Manmade Ditch

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 0.93" for 2-yr event
Inflow = 9.67 cfs @ 12.48 hrs, Volume= 1.170 af
Outflow = 9.65 cfs @ 12.50 hrs, Volume= 1.166 af, Atten= 0%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.36 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 4.2 min

Peak Storage= 1,092 cf @ 12.50 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 3.00' Flow Area= 21.0 sf, Capacity= 158.45 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 1.0 '/' Top Width= 10.00'
Length= 380.0' Slope= 0.0158 '/'
Inlet Invert= 228.00', Outlet Invert= 222.00'

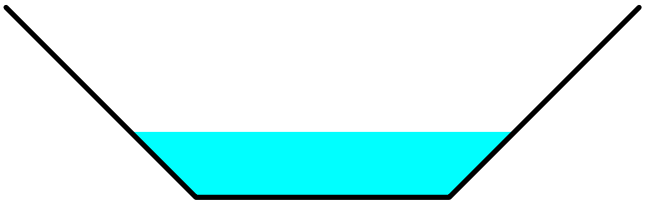
Summary for Reach 3R: Manmade Ditch

Inflow Area = 60.763 ac, 9.15% Impervious, Inflow Depth > 0.91" for 2-yr event
Inflow = 21.79 cfs @ 12.92 hrs, Volume= 4.611 af
Outflow = 21.76 cfs @ 12.95 hrs, Volume= 4.596 af, Atten= 0%, Lag= 2.1 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.18 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 2.41 fps, Avg. Travel Time= 4.5 min

Peak Storage= 3,367 cf @ 12.95 hrs
Average Depth at Peak Storage= 1.03'
Bank-Full Depth= 3.00' Flow Area= 21.0 sf, Capacity= 150.27 cfs

4.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 10.00'
Length= 647.0' Slope= 0.0185 '/'
Inlet Invert= 222.00', Outlet Invert= 210.00'



Summary for Reach 4R: Manmade Ditch

Inflow Area = 65.365 ac, 8.50% Impervious, Inflow Depth > 0.89" for 2-yr event
Inflow = 22.92 cfs @ 12.97 hrs, Volume= 4.869 af
Outflow = 22.92 cfs @ 12.98 hrs, Volume= 4.864 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.73 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 3.28 fps, Avg. Travel Time= 1.3 min

Peak Storage= 1,000 cf @ 12.98 hrs
Average Depth at Peak Storage= 0.83'
Bank-Full Depth= 3.00' Flow Area= 21.0 sf, Capacity= 231.45 cfs

4.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 10.00'
Length= 250.0' Slope= 0.0440 '/'
Inlet Invert= 210.00', Outlet Invert= 199.00'

Summary for Reach SP1: Study Point #1 - Manmade Ditch Outlet

Inflow Area = 65.365 ac, 8.50% Impervious, Inflow Depth > 0.89" for 2-yr event
Inflow = 22.92 cfs @ 12.98 hrs, Volume= 4.864 af
Outflow = 22.92 cfs @ 12.98 hrs, Volume= 4.864 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP2: Study Point #2 - Wetland adjacent to Highland

Inflow Area = 20.150 ac, 3.16% Impervious, Inflow Depth > 0.82" for 2-yr event
Inflow = 8.34 cfs @ 12.81 hrs, Volume= 1.370 af
Outflow = 8.34 cfs @ 12.81 hrs, Volume= 1.370 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 100: Runoff Area=877,720 sf 3.16% Impervious Runoff Depth>1.78"
Flow Length=1,300' Tc=54.5 min CN=73 Runoff=19.04 cfs 2.995 af

Subcatchment 200: Runoff Area=200,485 sf 0.00% Impervious Runoff Depth>1.62"
Flow Length=751' Tc=81.3 min CN=71 Runoff=3.10 cfs 0.621 af

Subcatchment 400: Offsite Runoff Area=1,986,138 sf 9.10% Impervious Runoff Depth>1.92"
Flow Length=1,230' Tc=76.0 min CN=75 Runoff=38.12 cfs 7.281 af

Subcatchment 500: Offsite Runoff Area=188,669 sf 13.29% Impervious Runoff Depth>1.95"
Flow Length=570' Tc=29.7 min CN=75 Runoff=6.08 cfs 0.705 af

Subcatchment 600: Offsite Runoff Area=472,025 sf 7.69% Impervious Runoff Depth>1.95"
Flow Length=1,608' Tc=30.7 min CN=75 Runoff=14.98 cfs 1.763 af

Reach 1R: Manmade Ditch Avg. Flow Depth=1.00' Max Vel=4.99 fps Inflow=14.98 cfs 1.763 af
n=0.035 L=460.0' S=0.0261 '/' Capacity=130.60 cfs Outflow=14.95 cfs 1.760 af

Reach 2R: Manmade Ditch Avg. Flow Depth=0.98' Max Vel=4.29 fps Inflow=21.00 cfs 2.465 af
n=0.035 L=380.0' S=0.0158 '/' Capacity=158.45 cfs Outflow=20.96 cfs 2.460 af

Reach 3R: Manmade Ditch Avg. Flow Depth=1.61' Max Vel=5.24 fps Inflow=47.38 cfs 9.741 af
n=0.040 L=647.0' S=0.0185 '/' Capacity=150.27 cfs Outflow=47.34 cfs 9.719 af

Reach 4R: Manmade Ditch Avg. Flow Depth=1.30' Max Vel=7.26 fps Inflow=50.18 cfs 10.340 af
n=0.040 L=250.0' S=0.0440 '/' Capacity=231.45 cfs Outflow=50.17 cfs 10.334 af

Reach SP1: Study Point #1 - Manmade Ditch Outlet Inflow=50.17 cfs 10.334 af
Outflow=50.17 cfs 10.334 af

Reach SP2: Study Point #2 - Wetland adjacent to Highland Inflow=19.04 cfs 2.995 af
Outflow=19.04 cfs 2.995 af

Total Runoff Area = 85.515 ac Runoff Volume = 13.365 af Average Runoff Depth = 1.88"
92.76% Pervious = 79.320 ac 7.24% Impervious = 6.195 ac

Summary for Subcatchment 100:

Runoff = 19.04 cfs @ 12.77 hrs, Volume= 2.995 af, Depth> 1.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.60"

Area (sf)	CN	Description
19,472	80	1/2 acre lots, 25% imp, HSG C
33,728	79	1 acre lots, 20% imp, HSG C
52,259	74	>75% Grass cover, Good, HSG C
28,552	74	>75% Grass cover, Good, HSG C
47,225	89	Gravel roads, HSG C
16,488	92	Paved roads w/open ditches, 50% imp, HSG C
515	98	Paved parking, HSG C
7,329	98	Unconnected roofs, HSG C
570,601	70	Woods, Good, HSG C
101,551	77	Woods, Good, HSG D
877,720	73	Weighted Average
850,018		96.84% Pervious Area
27,702		3.16% Impervious Area
7,329		26.46% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.9	150	0.0600	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
8.4	460	0.0330	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	30	0.0100	4.91	3.86	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
12.1	660	0.0330	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
54.5	1,300	Total			

Summary for Subcatchment 200:

Runoff = 3.10 cfs @ 13.12 hrs, Volume= 0.621 af, Depth> 1.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.60"

Area (sf)	CN	Description
186,138	70	Woods, Good, HSG C
14,347	79	50-75% Grass cover, Fair, HSG C
200,485	71	Weighted Average
200,485		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
9.0	380	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	20	0.0100	5.70	7.00	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
2.9	201	0.0550	1.17		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
81.3	751	Total			

Summary for Subcatchment 400: Offsite

Runoff = 38.12 cfs @ 13.06 hrs, Volume= 7.281 af, Depth> 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.60"

Area (sf)	CN	Description
688,135	77	2 acre lots, 12% imp, HSG C
14,079	81	1/3 acre lots, 30% imp, HSG C
17,232	80	1/2 acre lots, 25% imp, HSG C
14,149	98	Roofs, HSG C
15,384	98	Paved parking, HSG C
4,235	89	Gravel roads, HSG C
48,311	86	<50% Grass cover, Poor, HSG C
25,364	74	>75% Grass cover, Good, HSG C
120,250	92	Paved roads w/open ditches, 50% imp, HSG C
902,162	70	Woods, Good, HSG C
136,837	77	Woods, Good, HSG D
1,986,138	75	Weighted Average
1,805,372		90.90% Pervious Area
180,766		9.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	150	0.0600	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
4.4	380	0.0840	1.45		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
52.2	700	0.0020	0.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
76.0	1,230	Total			

Summary for Subcatchment 500: Offsite

Runoff = 6.08 cfs @ 12.43 hrs, Volume= 0.705 af, Depth> 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.60"

Area (sf)	CN	Description
38,042	74	>75% Grass cover, Good, HSG C
5,785	98	Roofs, HSG C
118,887	70	Woods, Good, HSG C
19,294	98	Paved parking, HSG C
6,661	77	Woods, Good, HSG D
188,669	75	Weighted Average
163,590		86.71% Pervious Area
25,079		13.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	150	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
6.8	420	0.0430	1.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
29.7	570	Total			

Summary for Subcatchment 600: Offsite

Runoff = 14.98 cfs @ 12.44 hrs, Volume= 1.763 af, Depth> 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.60"

	Area (sf)	CN	Description
	12,875	89	Gravel roads, HSG C
*	27,862	98	Paved roads w curbs
	60,234	74	>75% Grass cover, Good, HSG C
	8,436	98	Roofs, HSG C
	362,618	73	Woods, Fair, HSG C
	472,025	75	Weighted Average
	435,727		92.31% Pervious Area
	36,298		7.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	150	0.0470	0.12		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.10"
6.0	420	0.0550	1.17		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
2.2	471	0.0490	3.56		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	140	0.0360	10.82	13.28	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.7	257	0.0310	6.26	28.17	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.00' Z= 3.0 & 2.0 '/' Top.W=7.00' n= 0.030
0.2	170	0.0350	14.59	45.85	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
30.7	1,608	Total			

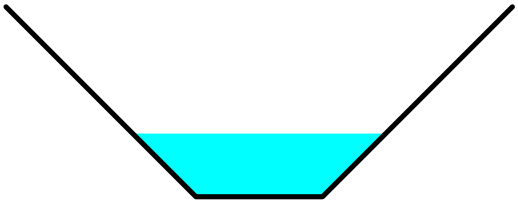
Summary for Reach 1R: Manmade Ditch

Inflow Area = 10.836 ac, 7.69% Impervious, Inflow Depth > 1.95" for 10-yr event
Inflow = 14.98 cfs @ 12.44 hrs, Volume= 1.763 af
Outflow = 14.95 cfs @ 12.46 hrs, Volume= 1.760 af, Atten= 0%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.99 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 3.4 min

Peak Storage= 1,378 cf @ 12.46 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 3.00' Flow Area= 15.0 sf, Capacity= 130.60 cfs

2.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 1.0 '/' Top Width= 8.00'
Length= 460.0' Slope= 0.0261 '/'
Inlet Invert= 240.00', Outlet Invert= 228.00'



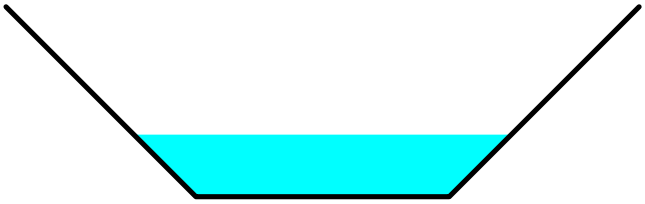
Summary for Reach 2R: Manmade Ditch

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 1.95" for 10-yr event
Inflow = 21.00 cfs @ 12.45 hrs, Volume= 2.465 af
Outflow = 20.96 cfs @ 12.47 hrs, Volume= 2.460 af, Atten= 0%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.29 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.82 fps, Avg. Travel Time= 3.5 min

Peak Storage= 1,856 cf @ 12.47 hrs
Average Depth at Peak Storage= 0.98'
Bank-Full Depth= 3.00' Flow Area= 21.0 sf, Capacity= 158.45 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 1.0 '/' Top Width= 10.00'
Length= 380.0' Slope= 0.0158 '/'
Inlet Invert= 228.00', Outlet Invert= 222.00'



Summary for Reach 3R: Manmade Ditch

Inflow Area = 60.763 ac, 9.15% Impervious, Inflow Depth > 1.92" for 10-yr event
Inflow = 47.38 cfs @ 12.88 hrs, Volume= 9.741 af
Outflow = 47.34 cfs @ 12.90 hrs, Volume= 9.719 af, Atten= 0%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.24 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 2.83 fps, Avg. Travel Time= 3.8 min

Peak Storage= 5,839 cf @ 12.90 hrs
Average Depth at Peak Storage= 1.61'
Bank-Full Depth= 3.00' Flow Area= 21.0 sf, Capacity= 150.27 cfs

4.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 10.00'
Length= 647.0' Slope= 0.0185 '/'
Inlet Invert= 222.00', Outlet Invert= 210.00'

Summary for Reach 4R: Manmade Ditch

Inflow Area = 65.365 ac, 8.50% Impervious, Inflow Depth > 1.90" for 10-yr event
Inflow = 50.18 cfs @ 12.92 hrs, Volume= 10.340 af
Outflow = 50.17 cfs @ 12.93 hrs, Volume= 10.334 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.26 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 3.88 fps, Avg. Travel Time= 1.1 min

Peak Storage= 1,728 cf @ 12.93 hrs
Average Depth at Peak Storage= 1.30'
Bank-Full Depth= 3.00' Flow Area= 21.0 sf, Capacity= 231.45 cfs

4.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 10.00'
Length= 250.0' Slope= 0.0440 '/'
Inlet Invert= 210.00', Outlet Invert= 199.00'

Summary for Reach SP1: Study Point #1 - Manmade Ditch Outlet

Inflow Area = 65.365 ac, 8.50% Impervious, Inflow Depth > 1.90" for 10-yr event
Inflow = 50.17 cfs @ 12.93 hrs, Volume= 10.334 af
Outflow = 50.17 cfs @ 12.93 hrs, Volume= 10.334 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP2: Study Point #2 - Wetland adjacent to Highland

Inflow Area = 20.150 ac, 3.16% Impervious, Inflow Depth > 1.78" for 10-yr event
Inflow = 19.04 cfs @ 12.77 hrs, Volume= 2.995 af
Outflow = 19.04 cfs @ 12.77 hrs, Volume= 2.995 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 100: Runoff Area=877,720 sf 3.16% Impervious Runoff Depth>2.67"
Flow Length=1,300' Tc=54.5 min CN=73 Runoff=28.61 cfs 4.478 af

Subcatchment 200: Runoff Area=200,485 sf 0.00% Impervious Runoff Depth>2.46"
Flow Length=751' Tc=81.3 min CN=71 Runoff=4.77 cfs 0.944 af

Subcatchment 400: Offsite Runoff Area=1,986,138 sf 9.10% Impervious Runoff Depth>2.82"
Flow Length=1,230' Tc=76.0 min CN=75 Runoff=56.29 cfs 10.731 af

Subcatchment 500: Offsite Runoff Area=188,669 sf 13.29% Impervious Runoff Depth>2.87"
Flow Length=570' Tc=29.7 min CN=75 Runoff=8.95 cfs 1.038 af

Subcatchment 600: Offsite Runoff Area=472,025 sf 7.69% Impervious Runoff Depth>2.87"
Flow Length=1,608' Tc=30.7 min CN=75 Runoff=22.06 cfs 2.595 af

Reach 1R: Manmade Ditch Avg. Flow Depth=1.23' Max Vel=5.54 fps Inflow=22.06 cfs 2.595 af
n=0.035 L=460.0' S=0.0261 '/' Capacity=130.60 cfs Outflow=22.03 cfs 2.591 af

Reach 2R: Manmade Ditch Avg. Flow Depth=1.23' Max Vel=4.82 fps Inflow=30.94 cfs 3.628 af
n=0.035 L=380.0' S=0.0158 '/' Capacity=158.45 cfs Outflow=30.90 cfs 3.623 af

Reach 3R: Manmade Ditch Avg. Flow Depth=1.99' Max Vel=5.84 fps Inflow=69.88 cfs 14.354 af
n=0.040 L=647.0' S=0.0185 '/' Capacity=150.27 cfs Outflow=69.85 cfs 14.328 af

Reach 4R: Manmade Ditch Avg. Flow Depth=1.63' Max Vel=8.12 fps Inflow=74.23 cfs 15.272 af
n=0.040 L=250.0' S=0.0440 '/' Capacity=231.45 cfs Outflow=74.22 cfs 15.264 af

Reach SP1: Study Point #1 - Manmade Ditch Outlet Inflow=74.22 cfs 15.264 af
Outflow=74.22 cfs 15.264 af

Reach SP2: Study Point #2 - Wetland adjacent to Highland Inflow=28.61 cfs 4.478 af
Outflow=28.61 cfs 4.478 af

Total Runoff Area = 85.515 ac Runoff Volume = 19.786 af Average Runoff Depth = 2.78"
92.76% Pervious = 79.320 ac 7.24% Impervious = 6.195 ac

Summary for Subcatchment 100:

Runoff = 28.61 cfs @ 12.76 hrs, Volume= 4.478 af, Depth> 2.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
19,472	80	1/2 acre lots, 25% imp, HSG C
33,728	79	1 acre lots, 20% imp, HSG C
52,259	74	>75% Grass cover, Good, HSG C
28,552	74	>75% Grass cover, Good, HSG C
47,225	89	Gravel roads, HSG C
16,488	92	Paved roads w/open ditches, 50% imp, HSG C
515	98	Paved parking, HSG C
7,329	98	Unconnected roofs, HSG C
570,601	70	Woods, Good, HSG C
101,551	77	Woods, Good, HSG D
877,720	73	Weighted Average
850,018		96.84% Pervious Area
27,702		3.16% Impervious Area
7,329		26.46% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.9	150	0.0600	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
8.4	460	0.0330	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	30	0.0100	4.91	3.86	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
12.1	660	0.0330	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
54.5	1,300	Total			

Summary for Subcatchment 200:

Runoff = 4.77 cfs @ 13.11 hrs, Volume= 0.944 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
186,138	70	Woods, Good, HSG C
14,347	79	50-75% Grass cover, Fair, HSG C
200,485	71	Weighted Average
200,485		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
9.0	380	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	20	0.0100	5.70	7.00	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
2.9	201	0.0550	1.17		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
81.3	751	Total			

Summary for Subcatchment 400: Offsite

Runoff = 56.29 cfs @ 13.03 hrs, Volume= 10.731 af, Depth> 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
688,135	77	2 acre lots, 12% imp, HSG C
14,079	81	1/3 acre lots, 30% imp, HSG C
17,232	80	1/2 acre lots, 25% imp, HSG C
14,149	98	Roofs, HSG C
15,384	98	Paved parking, HSG C
4,235	89	Gravel roads, HSG C
48,311	86	<50% Grass cover, Poor, HSG C
25,364	74	>75% Grass cover, Good, HSG C
120,250	92	Paved roads w/open ditches, 50% imp, HSG C
902,162	70	Woods, Good, HSG C
136,837	77	Woods, Good, HSG D
1,986,138	75	Weighted Average
1,805,372		90.90% Pervious Area
180,766		9.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	150	0.0600	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
4.4	380	0.0840	1.45		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
52.2	700	0.0020	0.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
76.0	1,230	Total			

Summary for Subcatchment 500: Offsite

Runoff = 8.95 cfs @ 12.42 hrs, Volume= 1.038 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
38,042	74	>75% Grass cover, Good, HSG C
5,785	98	Roofs, HSG C
118,887	70	Woods, Good, HSG C
19,294	98	Paved parking, HSG C
6,661	77	Woods, Good, HSG D
188,669	75	Weighted Average
163,590		86.71% Pervious Area
25,079		13.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	150	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
6.8	420	0.0430	1.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
29.7	570	Total			

Summary for Subcatchment 600: Offsite

Runoff = 22.06 cfs @ 12.43 hrs, Volume= 2.595 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

	Area (sf)	CN	Description
	12,875	89	Gravel roads, HSG C
*	27,862	98	Paved roads w curbs
	60,234	74	>75% Grass cover, Good, HSG C
	8,436	98	Roofs, HSG C
	362,618	73	Woods, Fair, HSG C
	472,025	75	Weighted Average
	435,727		92.31% Pervious Area
	36,298		7.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	150	0.0470	0.12		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.10"
6.0	420	0.0550	1.17		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
2.2	471	0.0490	3.56		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	140	0.0360	10.82	13.28	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.7	257	0.0310	6.26	28.17	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.00' Z= 3.0 & 2.0 '/' Top.W=7.00' n= 0.030
0.2	170	0.0350	14.59	45.85	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
30.7	1,608	Total			

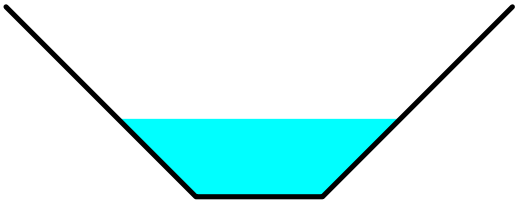
Summary for Reach 1R: Manmade Ditch

Inflow Area = 10.836 ac, 7.69% Impervious, Inflow Depth > 2.87" for 25-yr event
Inflow = 22.06 cfs @ 12.43 hrs, Volume= 2.595 af
Outflow = 22.03 cfs @ 12.45 hrs, Volume= 2.591 af, Atten= 0%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.54 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 2.48 fps, Avg. Travel Time= 3.1 min

Peak Storage= 1,830 cf @ 12.45 hrs
Average Depth at Peak Storage= 1.23'
Bank-Full Depth= 3.00' Flow Area= 15.0 sf, Capacity= 130.60 cfs

2.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 1.0 '/' Top Width= 8.00'
Length= 460.0' Slope= 0.0261 '/'
Inlet Invert= 240.00', Outlet Invert= 228.00'



Summary for Reach 2R: Manmade Ditch

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 2.87" for 25-yr event
Inflow = 30.94 cfs @ 12.44 hrs, Volume= 3.628 af
Outflow = 30.90 cfs @ 12.46 hrs, Volume= 3.623 af, Atten= 0%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.82 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 2.00 fps, Avg. Travel Time= 3.2 min

Peak Storage= 2,437 cf @ 12.46 hrs
Average Depth at Peak Storage= 1.23'
Bank-Full Depth= 3.00' Flow Area= 21.0 sf, Capacity= 158.45 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 1.0 '/' Top Width= 10.00'
Length= 380.0' Slope= 0.0158 '/'
Inlet Invert= 228.00', Outlet Invert= 222.00'

Summary for Reach 3R: Manmade Ditch

Inflow Area = 60.763 ac, 9.15% Impervious, Inflow Depth > 2.83" for 25-yr event
Inflow = 69.88 cfs @ 12.85 hrs, Volume= 14.354 af
Outflow = 69.85 cfs @ 12.88 hrs, Volume= 14.328 af, Atten= 0%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.84 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 3.07 fps, Avg. Travel Time= 3.5 min

Peak Storage= 7,738 cf @ 12.88 hrs
Average Depth at Peak Storage= 1.99'
Bank-Full Depth= 3.00' Flow Area= 21.0 sf, Capacity= 150.27 cfs

4.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 10.00'
Length= 647.0' Slope= 0.0185 '/'
Inlet Invert= 222.00', Outlet Invert= 210.00'

Summary for Reach 4R: Manmade Ditch

Inflow Area = 65.365 ac, 8.50% Impervious, Inflow Depth > 2.80" for 25-yr event
Inflow = 74.23 cfs @ 12.90 hrs, Volume= 15.272 af
Outflow = 74.22 cfs @ 12.90 hrs, Volume= 15.264 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.12 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 4.23 fps, Avg. Travel Time= 1.0 min

Peak Storage= 2,285 cf @ 12.90 hrs
Average Depth at Peak Storage= 1.63'
Bank-Full Depth= 3.00' Flow Area= 21.0 sf, Capacity= 231.45 cfs

4.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 10.00'
Length= 250.0' Slope= 0.0440 '/'
Inlet Invert= 210.00', Outlet Invert= 199.00'

Summary for Reach SP1: Study Point #1 - Manmade Ditch Outlet

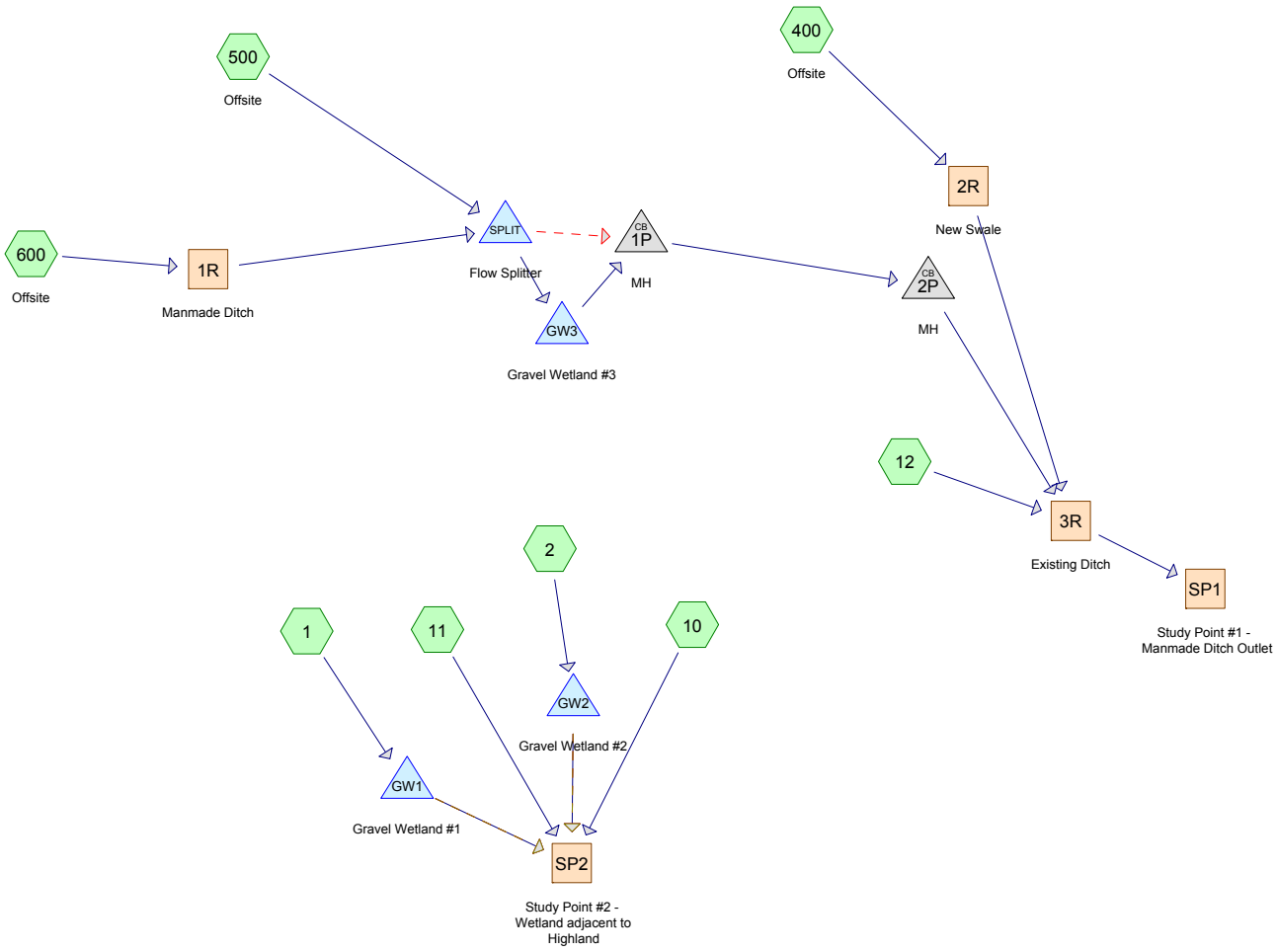
Inflow Area = 65.365 ac, 8.50% Impervious, Inflow Depth > 2.80" for 25-yr event
Inflow = 74.22 cfs @ 12.90 hrs, Volume= 15.264 af
Outflow = 74.22 cfs @ 12.90 hrs, Volume= 15.264 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP2: Study Point #2 - Wetland adjacent to Highland

Inflow Area = 20.150 ac, 3.16% Impervious, Inflow Depth > 2.67" for 25-yr event
Inflow = 28.61 cfs @ 12.76 hrs, Volume= 4.478 af
Outflow = 28.61 cfs @ 12.76 hrs, Volume= 4.478 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Subcat Reach Pond Link

Routing Diagram for Highland Views- Post
Prepared by {enter your company name here}, Printed 1/8/2020
HydroCAD® 10.00-22 s/n 10466 © 2018 HydroCAD Software Solutions LLC

Time span=2.00-20.00 hrs, dt=0.05 hrs, 361 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Runoff Area=147,582 sf 58.23% Impervious Runoff Depth>1.78"
Flow Length=1,090' Tc=16.7 min CN=88 Runoff=5.46 cfs 0.503 af

Subcatchment 2: Runoff Area=201,343 sf 33.47% Impervious Runoff Depth>1.34"
Flow Length=710' Tc=25.9 min CN=82 Runoff=4.73 cfs 0.516 af

Subcatchment 10: Runoff Area=236,519 sf 3.93% Impervious Runoff Depth>0.87"
Flow Length=1,320' Tc=54.6 min CN=74 Runoff=2.40 cfs 0.392 af

Subcatchment 11: Runoff Area=318,504 sf 9.75% Impervious Runoff Depth>1.03"
Flow Length=560' Tc=42.9 min CN=77 Runoff=4.48 cfs 0.627 af

Subcatchment 12: Runoff Area=182,865 sf 3.69% Impervious Runoff Depth>0.73"
Flow Length=410' Tc=36.9 min CN=71 Runoff=1.86 cfs 0.255 af

Subcatchment 400: Offsite Runoff Area=1,986,138 sf 9.10% Impervious Runoff Depth>0.91"
Flow Length=1,230' Tc=76.0 min CN=75 Runoff=17.53 cfs 3.445 af

Subcatchment 500: Offsite Runoff Area=188,669 sf 13.29% Impervious Runoff Depth>0.93"
Flow Length=570' Tc=29.7 min CN=75 Runoff=2.80 cfs 0.335 af

Subcatchment 600: Offsite Runoff Area=472,025 sf 7.69% Impervious Runoff Depth>0.93"
Flow Length=1,608' Tc=30.7 min CN=75 Runoff=6.91 cfs 0.837 af

Reach 1R: Manmade Ditch Avg. Flow Depth=0.66' Max Vel=3.95 fps Inflow=6.91 cfs 0.837 af
n=0.035 L=400.0' S=0.0250 '/' Capacity=127.85 cfs Outflow=6.89 cfs 0.835 af

Reach 2R: New Swale Avg. Flow Depth=0.72' Max Vel=3.76 fps Inflow=17.53 cfs 3.445 af
n=0.040 L=660.0' S=0.0220 '/' Capacity=117.51 cfs Outflow=17.47 cfs 3.431 af

Reach 3R: Existing Ditch Avg. Flow Depth=0.69' Max Vel=5.96 fps Inflow=19.33 cfs 4.308 af
n=0.040 L=190.0' S=0.0579 '/' Capacity=265.49 cfs Outflow=19.33 cfs 4.305 af

Reach SP1: Study Point #1 - Manmade Ditch Outlet Inflow=19.33 cfs 4.305 af
Outflow=19.33 cfs 4.305 af

Reach SP2: Study Point #2 - Wetland adjacent to Highland Inflow=6.81 cfs 1.368 af
Outflow=6.81 cfs 1.368 af

Pond 1P: MH Peak Elev=220.07' Inflow=2.12 cfs 0.622 af
30.0" Round Culvert n=0.012 L=400.0' S=0.0063 '/' Outflow=2.12 cfs 0.622 af

Pond 2P: MH Peak Elev=217.56' Inflow=2.12 cfs 0.622 af
30.0" Round Culvert n=0.012 L=258.0' S=0.0271 '/' Outflow=2.12 cfs 0.622 af

Pond GW1: Gravel Wetland #1 Peak Elev=196.32' Storage=15,010 cf Inflow=5.46 cfs 0.503 af
Primary=0.43 cfs 0.187 af Secondary=0.00 cfs 0.000 af Outflow=0.43 cfs 0.187 af

Pond GW2: Gravel Wetland #2 Peak Elev=196.30' Storage=16,398 cf Inflow=4.73 cfs 0.516 af
Primary=0.37 cfs 0.162 af Secondary=0.00 cfs 0.000 af Outflow=0.37 cfs 0.162 af

Pond GW3: Gravel Wetland #3 Peak Elev=224.59' Storage=24,866 cf Inflow=7.99 cfs 0.962 af
Outflow=1.48 cfs 0.415 af

Pond SPLIT: Flow Splitter Peak Elev=224.72' Storage=17 cf Inflow=9.69 cfs 1.170 af
Primary=7.99 cfs 0.962 af Secondary=1.69 cfs 0.207 af Outflow=9.69 cfs 1.169 af

Total Runoff Area = 85.713 ac Runoff Volume = 6.909 af Average Runoff Depth = 0.97"
88.15% Pervious = 75.553 ac 11.85% Impervious = 10.160 ac

Summary for Subcatchment 1:

Runoff = 5.46 cfs @ 12.23 hrs, Volume= 0.503 af, Depth> 1.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

	Area (sf)	CN	Description
*	75,243	98	Project roads, driveways & sidewalks
	61,639	74	>75% Grass cover, Good, HSG C
*	10,700	98	Pond
	147,582	88	Weighted Average
	61,639		41.77% Pervious Area
	85,943		58.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	100	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
0.7	70	0.0570	1.67		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	920	0.0320	10.20	12.52	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
16.7	1,090	Total			

Summary for Subcatchment 2:

Runoff = 4.73 cfs @ 12.37 hrs, Volume= 0.516 af, Depth> 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

	Area (sf)	CN	Description
*	53,397	98	Project roads, driveways & sidewalks
	110,319	74	>75% Grass cover, Good, HSG C
*	14,000	98	Pond
	23,627	70	Woods, Good, HSG C
	201,343	82	Weighted Average
	133,946		66.53% Pervious Area
	67,397		33.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	110	0.0820	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
1.7	110	0.0450	1.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	400	0.0200	8.06	9.90	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.1	90	0.0500	16.06	192.72	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.022 Earth, clean & straight
25.9	710	Total			

Summary for Subcatchment 10:

Runoff = 2.40 cfs @ 12.80 hrs, Volume= 0.392 af, Depth> 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

Area (sf)	CN	Description
21,000	74	>75% Grass cover, Good, HSG C
9,288	98	Unconnected roofs, HSG C
104,680	70	Woods, Good, HSG C
101,551	77	Woods, Good, HSG D
236,519	74	Weighted Average
227,231		96.07% Pervious Area
9,288		3.93% Impervious Area
9,288		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.9	150	0.0600	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
8.4	460	0.0330	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	50	0.0200	4.20	21.02	**Pipe Channel,** 36.0" Round w/ 12.0" inside fill Area= 5.0 sf Perim= 8.6' r= 0.58' n= 0.035
12.1	660	0.0330	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
54.6	1,320	Total			

Summary for Subcatchment 11:

Runoff = 4.48 cfs @ 12.63 hrs, Volume= 0.627 af, Depth> 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

	Area (sf)	CN	Description
	19,472	80	1/2 acre lots, 25% imp, HSG C
	33,728	79	1 acre lots, 20% imp, HSG C
	21,000	74	>75% Grass cover, Good, HSG C
	11,344	89	Gravel roads, HSG C
	16,488	92	Paved roads w/open ditches, 50% imp, HSG C
*	1,899	98	Driveway connection to 302
	9,288	98	Unconnected roofs, HSG C
	103,734	70	Woods, Good, HSG C
	101,551	77	Woods, Good, HSG D
	318,504	77	Weighted Average
	287,459		90.25% Pervious Area
	31,045		9.75% Impervious Area
	9,288		29.92% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.9	150	0.0600	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
4.6	260	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.4	150	0.0130	0.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
42.9	560	Total			

Summary for Subcatchment 12:

Runoff = 1.86 cfs @ 12.58 hrs, Volume= 0.255 af, Depth> 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

	Area (sf)	CN	Description
*	6,750	98	Roof
	20,000	74	>75% Grass cover, Good, HSG C
	156,115	70	Woods, Good, HSG C
	182,865	71	Weighted Average
	176,115		96.31% Pervious Area
	6,750		3.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.9	150	0.0600	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
3.0	260	0.0850	1.46		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
36.9	410	Total			

Summary for Subcatchment 400: Offsite

Runoff = 17.53 cfs @ 13.09 hrs, Volume= 3.445 af, Depth> 0.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

Area (sf)	CN	Description
688,135	77	2 acre lots, 12% imp, HSG C
14,079	81	1/3 acre lots, 30% imp, HSG C
17,232	80	1/2 acre lots, 25% imp, HSG C
14,149	98	Roofs, HSG C
15,384	98	Paved parking, HSG C
4,235	89	Gravel roads, HSG C
48,311	86	<50% Grass cover, Poor, HSG C
25,364	74	>75% Grass cover, Good, HSG C
120,250	92	Paved roads w/open ditches, 50% imp, HSG C
902,162	70	Woods, Good, HSG C
136,837	77	Woods, Good, HSG D
1,986,138	75	Weighted Average
1,805,372		90.90% Pervious Area
180,766		9.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	150	0.0600	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
4.4	380	0.0840	1.45		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
52.2	700	0.0020	0.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
76.0	1,230	Total			

Summary for Subcatchment 500: Offsite

Runoff = 2.80 cfs @ 12.45 hrs, Volume= 0.335 af, Depth> 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

Area (sf)	CN	Description
38,042	74	>75% Grass cover, Good, HSG C
5,785	98	Roofs, HSG C
118,887	70	Woods, Good, HSG C
19,294	98	Paved parking, HSG C
6,661	77	Woods, Good, HSG D
188,669	75	Weighted Average
163,590		86.71% Pervious Area
25,079		13.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	150	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
6.8	420	0.0430	1.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
29.7	570	Total			

Summary for Subcatchment 600: Offsite

Runoff = 6.91 cfs @ 12.46 hrs, Volume= 0.837 af, Depth> 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

	Area (sf)	CN	Description
	12,875	89	Gravel roads, HSG C
*	27,862	98	Paved roads w curbs
	60,234	74	>75% Grass cover, Good, HSG C
	8,436	98	Roofs, HSG C
	362,618	73	Woods, Fair, HSG C
	472,025	75	Weighted Average
	435,727		92.31% Pervious Area
	36,298		7.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	150	0.0470	0.12		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.10"
6.0	420	0.0550	1.17		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
2.2	471	0.0490	3.56		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	140	0.0360	10.82	13.28	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.7	257	0.0310	6.26	28.17	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.00' Z= 3.0 & 2.0 '/' Top.W=7.00' n= 0.030
0.2	170	0.0350	14.59	45.85	**Pipe Channel,**

24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
n= 0.012

30.7 1,608 Total

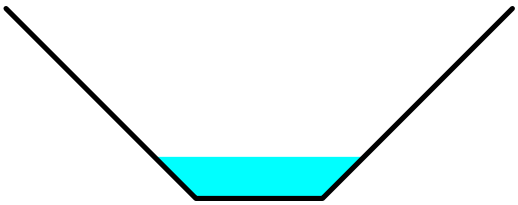
Summary for Reach 1R: Manmade Ditch

Inflow Area = 10.836 ac, 7.69% Impervious, Inflow Depth > 0.93" for 2-yr event
Inflow = 6.91 cfs @ 12.46 hrs, Volume= 0.837 af
Outflow = 6.89 cfs @ 12.48 hrs, Volume= 0.835 af, Atten= 0%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.95 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.90 fps, Avg. Travel Time= 3.5 min

Peak Storage= 697 cf @ 12.48 hrs
Average Depth at Peak Storage= 0.66'
Bank-Full Depth= 3.00' Flow Area= 15.0 sf, Capacity= 127.85 cfs

2.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 1.0 '/' Top Width= 8.00'
Length= 400.0' Slope= 0.0250 '/'
Inlet Invert= 240.00', Outlet Invert= 230.00'



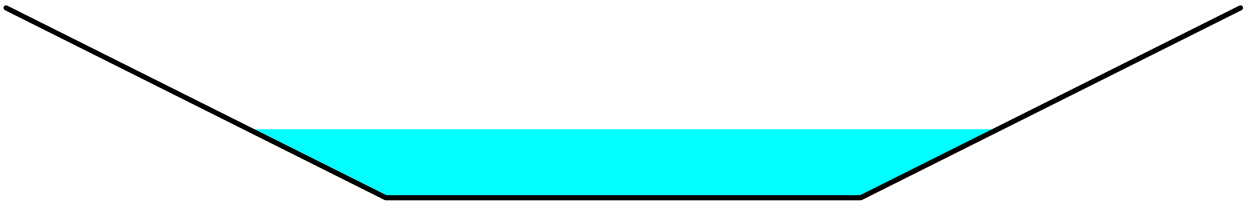
Summary for Reach 2R: New Swale

Inflow Area = 45.595 ac, 9.10% Impervious, Inflow Depth > 0.91" for 2-yr event
Inflow = 17.53 cfs @ 13.09 hrs, Volume= 3.445 af
Outflow = 17.47 cfs @ 13.13 hrs, Volume= 3.431 af, Atten= 0%, Lag= 1.9 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.76 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 2.08 fps, Avg. Travel Time= 5.3 min

Peak Storage= 3,066 cf @ 13.13 hrs
Average Depth at Peak Storage= 0.72'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 117.51 cfs

5.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 13.00'
Length= 660.0' Slope= 0.0220 '/'
Inlet Invert= 224.50', Outlet Invert= 210.00'



Summary for Reach 3R: Existing Ditch

Inflow Area = 64.961 ac, 8.80% Impervious, Inflow Depth > 0.80" for 2-yr event
Inflow = 19.33 cfs @ 13.23 hrs, Volume= 4.308 af
Outflow = 19.33 cfs @ 13.24 hrs, Volume= 4.305 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 5.96 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.44 fps, Avg. Travel Time= 0.9 min

Peak Storage= 616 cf @ 13.24 hrs
Average Depth at Peak Storage= 0.69'
Bank-Full Depth= 3.00' Flow Area= 21.0 sf, Capacity= 265.49 cfs

4.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 10.00'
Length= 190.0' Slope= 0.0579 '/'
Inlet Invert= 210.00', Outlet Invert= 199.00'

Summary for Reach SP1: Study Point #1 - Manmade Ditch Outlet

Inflow Area = 64.961 ac, 8.80% Impervious, Inflow Depth > 0.80" for 2-yr event
Inflow = 19.33 cfs @ 13.24 hrs, Volume= 4.305 af
Outflow = 19.33 cfs @ 13.24 hrs, Volume= 4.305 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3

Summary for Reach SP2: Study Point #2 - Wetland adjacent to Highland

Inflow Area = 20.752 ac, 21.43% Impervious, Inflow Depth > 0.79" for 2-yr event
Inflow = 6.81 cfs @ 12.69 hrs, Volume= 1.368 af
Outflow = 6.81 cfs @ 12.69 hrs, Volume= 1.368 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: MH

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 0.49" for 2-yr event
Inflow = 2.12 cfs @ 13.50 hrs, Volume= 0.622 af
Outflow = 2.12 cfs @ 13.50 hrs, Volume= 0.622 af, Atten= 0%, Lag= 0.0 min
Primary = 2.12 cfs @ 13.50 hrs, Volume= 0.622 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 220.07' @ 13.50 hrs
Flood Elev= 226.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	219.50'	**30.0" Round Culvert** L= 400.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 219.50' / 217.00' S= 0.0063 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Primary OutFlow Max=2.12 cfs @ 13.50 hrs HW=220.07' TW=217.56' (Dynamic Tailwater)
1=Culvert (Outlet Controls 2.12 cfs @ 3.75 fps)

Summary for Pond 2P: MH

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 0.49" for 2-yr event
Inflow = 2.12 cfs @ 13.50 hrs, Volume= 0.622 af
Outflow = 2.12 cfs @ 13.50 hrs, Volume= 0.622 af, Atten= 0%, Lag= 0.0 min
Primary = 2.12 cfs @ 13.50 hrs, Volume= 0.622 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 217.56' @ 13.50 hrs
Flood Elev= 224.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	217.00'	**30.0" Round Culvert** L= 258.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 217.00' / 210.00' S= 0.0271 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Primary OutFlow Max=2.12 cfs @ 13.50 hrs HW=217.56' TW=210.65' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.12 cfs @ 2.56 fps)

Summary for Pond GW1: Gravel Wetland #1

Inflow Area = 3.388 ac, 58.23% Impervious, Inflow Depth > 1.78" for 2-yr event
Inflow = 5.46 cfs @ 12.23 hrs, Volume= 0.503 af
Outflow = 0.43 cfs @ 14.46 hrs, Volume= 0.187 af, Atten= 92%, Lag= 134.0 min
Primary = 0.43 cfs @ 14.46 hrs, Volume= 0.187 af
Secondary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 196.32' @ 14.46 hrs Surf.Area= 9,785 sf Storage= 15,010 cf

Plug-Flow detention time= 241.7 min calculated for 0.187 af (37% of inflow)
Center-of-Mass det. time= 149.7 min (940.7 - 791.0)

Volume	Invert	Avail.Storage	Storage Description
#1	194.50'	41,549 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
194.50	6,610	0	0
196.00	9,250	11,895	11,895
196.01	9,500	94	11,989
197.00	10,400	9,851	21,839
198.80	11,500	19,710	41,549

Device	Routing	Invert	Outlet Devices
#1	Primary	194.17'	**15.0" Round Culvert** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	196.00'	**0.7' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 2	196.00'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 196.00' / 195.00' S= 0.0333 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#4	Primary	193.90'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	194.17'	**6.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#6	Device 5	191.75'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 191.75' / 191.75' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#7	Device 6	194.50'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 194.17'
#8	Secondary	197.50'	**20.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=0.43 cfs @ 14.46 hrs HW=196.32' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.38 cfs of 7.30 cfs potential flow)
  - **2=Sharp-Crested Vee/Trap Weir** (Passes 0.38 cfs of 0.42 cfs potential flow)
    - **3=Culvert** (Inlet Controls 0.38 cfs @ 1.53 fps)
- **4=Orifice/Grate** (Orifice Controls 0.04 cfs @ 7.43 fps)
  - **5=Culvert** (Passes 0.04 cfs of 1.03 cfs potential flow)
    - **6=Culvert** (Passes 0.04 cfs of 0.79 cfs potential flow)
      - **7=Exfiltration** (Passes 0.04 cfs of 2.78 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 2.00 hrs HW=194.50' TW=0.00' (Dynamic Tailwater)
- **8=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond GW2: Gravel Wetland #2

Inflow Area = 4.622 ac, 33.47% Impervious, Inflow Depth > 1.34" for 2-yr event
Inflow = 4.73 cfs @ 12.37 hrs, Volume= 0.516 af
Outflow = 0.37 cfs @ 15.68 hrs, Volume= 0.162 af, Atten= 92%, Lag= 198.8 min
Primary = 0.37 cfs @ 15.68 hrs, Volume= 0.162 af
Secondary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 196.30' @ 15.68 hrs Surf.Area= 11,054 sf Storage= 16,398 cf

Plug-Flow detention time= 263.5 min calculated for 0.161 af (31% of inflow)
Center-of-Mass det. time= 169.0 min (984.4 - 815.3)

Volume	Invert	Avail.Storage	Storage Description
#1	194.50'	49,046 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
194.50	7,215	0	0
196.00	10,325	13,155	13,155
196.01	10,600	105	13,260
197.00	12,150	11,261	24,521
198.80	15,100	24,525	49,046

Device	Routing	Invert	Outlet Devices
#1	Primary	194.17'	**15.0" Round Culvert** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	196.00'	**0.7' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 2	196.00'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 196.00' / 195.00' S= 0.0333 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#4	Primary	193.90'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	194.17'	**6.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900

			Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#6	Device 5	191.75'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 191.75' / 191.75' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#7	Device 6	194.50'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 194.17'
#8	Secondary	197.50'	**15.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=0.37 cfs @ 15.68 hrs HW=196.30' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.33 cfs of 7.25 cfs potential flow)
  - **2=Sharp-Crested Vee/Trap Weir** (Passes 0.33 cfs of 0.38 cfs potential flow)
    - **3=Culvert** (Inlet Controls 0.33 cfs @ 1.47 fps)
- **4=Orifice/Grate** (Orifice Controls 0.04 cfs @ 7.39 fps)
  - **5=Culvert** (Passes 0.04 cfs of 1.02 cfs potential flow)
    - **6=Culvert** (Passes 0.04 cfs of 0.78 cfs potential flow)
      - **7=Exfiltration** (Passes 0.04 cfs of 3.04 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 2.00 hrs HW=194.50' TW=0.00' (Dynamic Tailwater)
- **8=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond GW3: Gravel Wetland #3

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 0.76" for 2-yr event
Inflow = 7.99 cfs @ 12.47 hrs, Volume= 0.962 af
Outflow = 1.48 cfs @ 13.54 hrs, Volume= 0.415 af, Atten= 81%, Lag= 63.7 min
Primary = 1.48 cfs @ 13.54 hrs, Volume= 0.415 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 224.59' @ 13.54 hrs Surf.Area= 17,099 sf Storage= 24,866 cf

Plug-Flow detention time= 195.2 min calculated for 0.414 af (43% of inflow)
Center-of-Mass det. time= 110.1 min (938.9 - 828.8)

Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	109,720 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.00	14,400	0	0
224.00	15,933	15,167	15,167
224.50	16,700	8,158	23,325
224.51	17,000	168	23,493
225.00	17,600	8,477	31,970
226.00	18,950	18,275	50,245
227.00	100,000	59,475	109,720

Device	Routing	Invert	Outlet Devices
#1	Primary	225.00'	**5.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63
#2	Primary	220.00'	**24.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 220.00' / 219.50' S= 0.0250 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#3	Device 2	224.50'	**16.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Device 2	220.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	220.25'	**6.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 220.25' / 200.00' S= 0.6750 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#6	Device 5	220.25'	**6.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 220.25' / 200.25' S= 0.4000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#7	Device 6	223.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 202.67'

Primary OutFlow Max=1.48 cfs @ 13.54 hrs HW=224.59' TW=220.07' (Dynamic Tailwater)
- **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **2=Culvert** (Passes 1.48 cfs of 28.66 cfs potential flow)
  - **3=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.43 cfs @ 0.98 fps)
  - **4=Orifice/Grate** (Orifice Controls 0.06 cfs @ 10.23 fps)
    - **5=Culvert** (Passes 0.06 cfs of 1.78 cfs potential flow)
      - **6=Culvert** (Passes 0.06 cfs of 1.43 cfs potential flow)
        - **7=Exfiltration** (Passes 0.06 cfs of 1.02 cfs potential flow)

Summary for Pond SPLIT: Flow Splitter

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 0.93" for 2-yr event
Inflow = 9.69 cfs @ 12.47 hrs, Volume= 1.170 af
Outflow = 9.69 cfs @ 12.47 hrs, Volume= 1.169 af, Atten= 0%, Lag= 0.1 min
Primary = 7.99 cfs @ 12.47 hrs, Volume= 0.962 af
Secondary = 1.69 cfs @ 12.47 hrs, Volume= 0.207 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 224.72' @ 12.47 hrs Surf.Area= 12 sf Storage= 17 cf

Plug-Flow detention time= 0.1 min calculated for 1.166 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (837.2 - 837.1)

Volume	Invert	Avail.Storage	Storage Description
#1	223.30'	19,383 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.30	12	0	0
225.99	12	32	32
226.00	50	0	33
230.00	700	1,500	1,533
231.00	2,500	1,600	3,133
232.00	30,000	16,250	19,383

Device	Routing	Invert	Outlet Devices
#1	Secondary	223.30'	**30.0" Round Overflow Culvert** L= 250.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 223.30' / 220.00' S= 0.0132 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Device 1	224.50'	**5.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Primary	223.30'	**24.0" Round Low Flow Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 223.30' / 223.10' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=7.97 cfs @ 12.47 hrs HW=224.72' TW=223.69' (Dynamic Tailwater)
└─**3=Low Flow Culvert** (Barrel Controls 7.97 cfs @ 4.69 fps)

Secondary OutFlow Max=1.67 cfs @ 12.47 hrs HW=224.72' TW=220.02' (Dynamic Tailwater)
└─**1=Overflow Culvert** (Passes 1.67 cfs of 11.66 cfs potential flow)
└─**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.67 cfs @ 1.53 fps)

Time span=2.00-20.00 hrs, dt=0.05 hrs, 361 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Runoff Area=147,582 sf 58.23% Impervious Runoff Depth>3.09"
Flow Length=1,090' Tc=16.7 min CN=88 Runoff=9.32 cfs 0.873 af

Subcatchment 2: Runoff Area=201,343 sf 33.47% Impervious Runoff Depth>2.53"
Flow Length=710' Tc=25.9 min CN=82 Runoff=8.90 cfs 0.975 af

Subcatchment 10: Runoff Area=236,519 sf 3.93% Impervious Runoff Depth>1.86"
Flow Length=1,320' Tc=54.6 min CN=74 Runoff=5.34 cfs 0.841 af

Subcatchment 11: Runoff Area=318,504 sf 9.75% Impervious Runoff Depth>2.10"
Flow Length=560' Tc=42.9 min CN=77 Runoff=9.28 cfs 1.279 af

Subcatchment 12: Runoff Area=182,865 sf 3.69% Impervious Runoff Depth>1.65"
Flow Length=410' Tc=36.9 min CN=71 Runoff=4.47 cfs 0.578 af

Subcatchment 400: Offsite Runoff Area=1,986,138 sf 9.10% Impervious Runoff Depth>1.92"
Flow Length=1,230' Tc=76.0 min CN=75 Runoff=38.12 cfs 7.281 af

Subcatchment 500: Offsite Runoff Area=188,669 sf 13.29% Impervious Runoff Depth>1.95"
Flow Length=570' Tc=29.7 min CN=75 Runoff=6.08 cfs 0.705 af

Subcatchment 600: Offsite Runoff Area=472,025 sf 7.69% Impervious Runoff Depth>1.95"
Flow Length=1,608' Tc=30.7 min CN=75 Runoff=14.98 cfs 1.763 af

Reach 1R: Manmade Ditch Avg. Flow Depth=1.01' Max Vel=4.91 fps Inflow=14.98 cfs 1.763 af
n=0.035 L=400.0' S=0.0250 '/' Capacity=127.85 cfs Outflow=14.96 cfs 1.760 af

Reach 2R: New Swale Avg. Flow Depth=1.11' Max Vel=4.76 fps Inflow=38.12 cfs 7.281 af
n=0.040 L=660.0' S=0.0220 '/' Capacity=117.51 cfs Outflow=38.10 cfs 7.262 af

Reach 3R: Existing Ditch Avg. Flow Depth=1.20' Max Vel=7.99 fps Inflow=50.06 cfs 9.751 af
n=0.040 L=190.0' S=0.0579 '/' Capacity=265.49 cfs Outflow=50.06 cfs 9.746 af

Reach SP1: Study Point #1 - Manmade Ditch Outlet Inflow=50.06 cfs 9.746 af
Outflow=50.06 cfs 9.746 af

Reach SP2: Study Point #2 - Wetland adjacent to Highland Inflow=17.85 cfs 3.270 af
Outflow=17.85 cfs 3.270 af

Pond 1P: MH Peak Elev=221.19' Inflow=14.92 cfs 1.911 af
30.0" Round Culvert n=0.012 L=400.0' S=0.0063 '/' Outflow=14.92 cfs 1.911 af

Pond 2P: MH Peak Elev=218.64' Inflow=14.92 cfs 1.911 af
30.0" Round Culvert n=0.012 L=258.0' S=0.0271 '/' Outflow=14.92 cfs 1.911 af

Pond GW1: Gravel Wetland #1 Peak Elev=196.94' Storage=21,236 cf Inflow=9.32 cfs 0.873 af
Primary=2.14 cfs 0.547 af Secondary=0.00 cfs 0.000 af Outflow=2.14 cfs 0.547 af

Pond GW2: Gravel Wetland #2 Peak Elev=196.90' Storage=23,320 cf Inflow=8.90 cfs 0.975 af
Primary=2.00 cfs 0.604 af Secondary=0.00 cfs 0.000 af Outflow=2.00 cfs 0.604 af

Pond GW3: Gravel Wetland #3 Peak Elev=224.77' Storage=27,980 cf Inflow=12.18 cfs 1.635 af
Outflow=7.46 cfs 1.082 af

Pond SPLIT: Flow Splitter Peak Elev=225.18' Storage=23 cf Inflow=21.01 cfs 2.465 af
Primary=12.18 cfs 1.635 af Secondary=9.18 cfs 0.830 af Outflow=21.00 cfs 2.465 af

Total Runoff Area = 85.713 ac Runoff Volume = 14.294 af Average Runoff Depth = 2.00"
88.15% Pervious = 75.553 ac 11.85% Impervious = 10.160 ac

Summary for Subcatchment 1:

Runoff = 9.32 cfs @ 12.22 hrs, Volume= 0.873 af, Depth> 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
*	75,243	98	Project roads, driveways & sidewalks
	61,639	74	>75% Grass cover, Good, HSG C
*	10,700	98	Pond
	147,582	88	Weighted Average
	61,639		41.77% Pervious Area
	85,943		58.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	100	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
0.7	70	0.0570	1.67		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	920	0.0320	10.20	12.52	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
16.7	1,090	Total			

Summary for Subcatchment 2:

Runoff = 8.90 cfs @ 12.36 hrs, Volume= 0.975 af, Depth> 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
*	53,397	98	Project roads, driveways & sidewalks
	110,319	74	>75% Grass cover, Good, HSG C
*	14,000	98	Pond
	23,627	70	Woods, Good, HSG C
	201,343	82	Weighted Average
	133,946		66.53% Pervious Area
	67,397		33.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	110	0.0820	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
1.7	110	0.0450	1.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	400	0.0200	8.06	9.90	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.1	90	0.0500	16.06	192.72	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.022 Earth, clean & straight
25.9	710	Total			

Summary for Subcatchment 10:

Runoff = 5.34 cfs @ 12.77 hrs, Volume= 0.841 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
21,000	74	>75% Grass cover, Good, HSG C
9,288	98	Unconnected roofs, HSG C
104,680	70	Woods, Good, HSG C
101,551	77	Woods, Good, HSG D
236,519	74	Weighted Average
227,231		96.07% Pervious Area
9,288		3.93% Impervious Area
9,288		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.9	150	0.0600	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
8.4	460	0.0330	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	50	0.0200	4.20	21.02	**Pipe Channel,** 36.0" Round w/ 12.0" inside fill Area= 5.0 sf Perim= 8.6' r= 0.58' n= 0.035
12.1	660	0.0330	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
54.6	1,320	Total			

Summary for Subcatchment 11:

Runoff = 9.28 cfs @ 12.60 hrs, Volume= 1.279 af, Depth> 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	19,472	80	1/2 acre lots, 25% imp, HSG C
	33,728	79	1 acre lots, 20% imp, HSG C
	21,000	74	>75% Grass cover, Good, HSG C
	11,344	89	Gravel roads, HSG C
	16,488	92	Paved roads w/open ditches, 50% imp, HSG C
*	1,899	98	Driveway connection to 302
	9,288	98	Unconnected roofs, HSG C
	103,734	70	Woods, Good, HSG C
	101,551	77	Woods, Good, HSG D
	318,504	77	Weighted Average
	287,459		90.25% Pervious Area
	31,045		9.75% Impervious Area
	9,288		29.92% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.9	150	0.0600	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
4.6	260	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.4	150	0.0130	0.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
42.9	560	Total			

Summary for Subcatchment 12:

Runoff = 4.47 cfs @ 12.54 hrs, Volume= 0.578 af, Depth> 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
*	6,750	98	Roof
	20,000	74	>75% Grass cover, Good, HSG C
	156,115	70	Woods, Good, HSG C
	182,865	71	Weighted Average
	176,115		96.31% Pervious Area
	6,750		3.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.9	150	0.0600	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
3.0	260	0.0850	1.46		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
36.9	410	Total			

Summary for Subcatchment 400: Offsite

Runoff = 38.12 cfs @ 13.06 hrs, Volume= 7.281 af, Depth> 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
688,135	77	2 acre lots, 12% imp, HSG C
14,079	81	1/3 acre lots, 30% imp, HSG C
17,232	80	1/2 acre lots, 25% imp, HSG C
14,149	98	Roofs, HSG C
15,384	98	Paved parking, HSG C
4,235	89	Gravel roads, HSG C
48,311	86	<50% Grass cover, Poor, HSG C
25,364	74	>75% Grass cover, Good, HSG C
120,250	92	Paved roads w/open ditches, 50% imp, HSG C
902,162	70	Woods, Good, HSG C
136,837	77	Woods, Good, HSG D
1,986,138	75	Weighted Average
1,805,372		90.90% Pervious Area
180,766		9.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	150	0.0600	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
4.4	380	0.0840	1.45		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
52.2	700	0.0020	0.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
76.0	1,230	Total			

Summary for Subcatchment 500: Offsite

Runoff = 6.08 cfs @ 12.43 hrs, Volume= 0.705 af, Depth> 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
38,042	74	>75% Grass cover, Good, HSG C
5,785	98	Roofs, HSG C
118,887	70	Woods, Good, HSG C
19,294	98	Paved parking, HSG C
6,661	77	Woods, Good, HSG D
188,669	75	Weighted Average
163,590		86.71% Pervious Area
25,079		13.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	150	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
6.8	420	0.0430	1.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
29.7	570	Total			

Summary for Subcatchment 600: Offsite

Runoff = 14.98 cfs @ 12.44 hrs, Volume= 1.763 af, Depth> 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	12,875	89	Gravel roads, HSG C
*	27,862	98	Paved roads w curbs
	60,234	74	>75% Grass cover, Good, HSG C
	8,436	98	Roofs, HSG C
	362,618	73	Woods, Fair, HSG C
	472,025	75	Weighted Average
	435,727		92.31% Pervious Area
	36,298		7.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	150	0.0470	0.12		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.10"
6.0	420	0.0550	1.17		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
2.2	471	0.0490	3.56		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	140	0.0360	10.82	13.28	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.7	257	0.0310	6.26	28.17	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.00' Z= 3.0 & 2.0 '/' Top.W=7.00' n= 0.030
0.2	170	0.0350	14.59	45.85	**Pipe Channel,**

24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
n= 0.012

30.7 1,608 Total

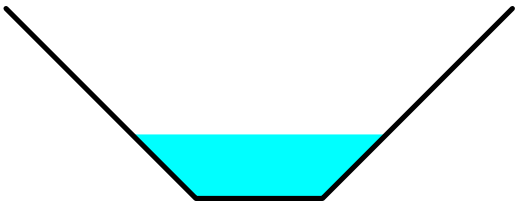
Summary for Reach 1R: Manmade Ditch

Inflow Area = 10.836 ac, 7.69% Impervious, Inflow Depth > 1.95" for 10 Year event
Inflow = 14.98 cfs @ 12.44 hrs, Volume= 1.763 af
Outflow = 14.96 cfs @ 12.46 hrs, Volume= 1.760 af, Atten= 0%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 4.91 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 2.25 fps, Avg. Travel Time= 3.0 min

Peak Storage= 1,217 cf @ 12.46 hrs
Average Depth at Peak Storage= 1.01'
Bank-Full Depth= 3.00' Flow Area= 15.0 sf, Capacity= 127.85 cfs

2.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 1.0 '/' Top Width= 8.00'
Length= 400.0' Slope= 0.0250 '/'
Inlet Invert= 240.00', Outlet Invert= 230.00'



Summary for Reach 2R: New Swale

Inflow Area = 45.595 ac, 9.10% Impervious, Inflow Depth > 1.92" for 10 Year event
Inflow = 38.12 cfs @ 13.06 hrs, Volume= 7.281 af
Outflow = 38.10 cfs @ 13.08 hrs, Volume= 7.262 af, Atten= 0%, Lag= 1.5 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 4.76 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 2.45 fps, Avg. Travel Time= 4.5 min

Peak Storage= 5,282 cf @ 13.08 hrs
Average Depth at Peak Storage= 1.11'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 117.51 cfs

5.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 13.00'
Length= 660.0' Slope= 0.0220 '/'
Inlet Invert= 224.50', Outlet Invert= 210.00'

Summary for Reach 3R: Existing Ditch

Inflow Area = 64.961 ac, 8.80% Impervious, Inflow Depth > 1.80" for 10 Year event
Inflow = 50.06 cfs @ 12.89 hrs, Volume= 9.751 af
Outflow = 50.06 cfs @ 12.90 hrs, Volume= 9.746 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 7.99 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 4.12 fps, Avg. Travel Time= 0.8 min

Peak Storage= 1,190 cf @ 12.90 hrs
Average Depth at Peak Storage= 1.20'
Bank-Full Depth= 3.00' Flow Area= 21.0 sf, Capacity= 265.49 cfs

4.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 10.00'
Length= 190.0' Slope= 0.0579 '/'
Inlet Invert= 210.00', Outlet Invert= 199.00'

Summary for Reach SP1: Study Point #1 - Manmade Ditch Outlet

Inflow Area = 64.961 ac, 8.80% Impervious, Inflow Depth > 1.80" for 10 Year event
Inflow = 50.06 cfs @ 12.90 hrs, Volume= 9.746 af
Outflow = 50.06 cfs @ 12.90 hrs, Volume= 9.746 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3

Summary for Reach SP2: Study Point #2 - Wetland adjacent to Highland

Inflow Area = 20.752 ac, 21.43% Impervious, Inflow Depth > 1.89" for 10 Year event
Inflow = 17.85 cfs @ 12.69 hrs, Volume= 3.270 af
Outflow = 17.85 cfs @ 12.69 hrs, Volume= 3.270 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: MH

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 1.51" for 10 Year event
Inflow = 14.92 cfs @ 12.67 hrs, Volume= 1.911 af
Outflow = 14.92 cfs @ 12.67 hrs, Volume= 1.911 af, Atten= 0%, Lag= 0.0 min
Primary = 14.92 cfs @ 12.67 hrs, Volume= 1.911 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 221.19' @ 12.67 hrs
Flood Elev= 226.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	219.50'	**30.0" Round Culvert** L= 400.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 219.50' / 217.00' S= 0.0063 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Primary OutFlow Max=14.83 cfs @ 12.67 hrs HW=221.19' TW=218.64' (Dynamic Tailwater)
1=Culvert (Outlet Controls 14.83 cfs @ 5.96 fps)

Summary for Pond 2P: MH

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 1.51" for 10 Year event
Inflow = 14.92 cfs @ 12.67 hrs, Volume= 1.911 af
Outflow = 14.92 cfs @ 12.67 hrs, Volume= 1.911 af, Atten= 0%, Lag= 0.0 min
Primary = 14.92 cfs @ 12.67 hrs, Volume= 1.911 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 218.64' @ 12.67 hrs
Flood Elev= 224.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	217.00'	**30.0" Round Culvert** L= 258.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 217.00' / 210.00' S= 0.0271 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Primary OutFlow Max=14.83 cfs @ 12.67 hrs HW=218.64' TW=211.14' (Dynamic Tailwater)
1=Culvert (Inlet Controls 14.83 cfs @ 4.36 fps)

Summary for Pond GW1: Gravel Wetland #1

Inflow Area = 3.388 ac, 58.23% Impervious, Inflow Depth > 3.09" for 10 Year event
Inflow = 9.32 cfs @ 12.22 hrs, Volume= 0.873 af
Outflow = 2.14 cfs @ 12.78 hrs, Volume= 0.547 af, Atten= 77%, Lag= 33.1 min
Primary = 2.14 cfs @ 12.78 hrs, Volume= 0.547 af
Secondary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 196.94' @ 12.78 hrs Surf.Area= 10,347 sf Storage= 21,236 cf

Plug-Flow detention time= 172.0 min calculated for 0.545 af (62% of inflow)
Center-of-Mass det. time= 100.6 min (878.7 - 778.1)

Volume	Invert	Avail.Storage	Storage Description
#1	194.50'	41,549 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
194.50	6,610	0	0
196.00	9,250	11,895	11,895
196.01	9,500	94	11,989
197.00	10,400	9,851	21,839
198.80	11,500	19,710	41,549

Device	Routing	Invert	Outlet Devices
#1	Primary	194.17'	**15.0" Round Culvert** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	196.00'	**0.7' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 2	196.00'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 196.00' / 195.00' S= 0.0333 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#4	Primary	193.90'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	194.17'	**6.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#6	Device 5	191.75'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 191.75' / 191.75' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#7	Device 6	194.50'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 194.17'
#8	Secondary	197.50'	**20.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=2.14 cfs @ 12.78 hrs HW=196.94' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 2.09 cfs of 8.66 cfs potential flow)
  - **2=Sharp-Crested Vee/Trap Weir** (Weir Controls 2.09 cfs @ 3.18 fps)
    - **3=Culvert** (Passes 2.09 cfs of 2.59 cfs potential flow)
- **4=Orifice/Grate** (Orifice Controls 0.05 cfs @ 8.34 fps)
  - **5=Culvert** (Passes 0.05 cfs of 1.19 cfs potential flow)
    - **6=Culvert** (Passes 0.05 cfs of 0.89 cfs potential flow)
      - **7=Exfiltration** (Passes 0.05 cfs of 3.61 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 2.00 hrs HW=194.50' TW=0.00' (Dynamic Tailwater)
- **8=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond GW2: Gravel Wetland #2

Inflow Area = 4.622 ac, 33.47% Impervious, Inflow Depth > 2.53" for 10 Year event
Inflow = 8.90 cfs @ 12.36 hrs, Volume= 0.975 af
Outflow = 2.00 cfs @ 13.12 hrs, Volume= 0.604 af, Atten= 77%, Lag= 45.7 min
Primary = 2.00 cfs @ 13.12 hrs, Volume= 0.604 af
Secondary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 196.90' @ 13.12 hrs Surf.Area= 11,994 sf Storage= 23,320 cf

Plug-Flow detention time= 174.9 min calculated for 0.604 af (62% of inflow)
Center-of-Mass det. time= 102.6 min (903.7 - 801.1)

Volume	Invert	Avail.Storage	Storage Description
#1	194.50'	49,046 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
194.50	7,215	0	0
196.00	10,325	13,155	13,155
196.01	10,600	105	13,260
197.00	12,150	11,261	24,521
198.80	15,100	24,525	49,046

Device	Routing	Invert	Outlet Devices
#1	Primary	194.17'	**15.0" Round Culvert** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	196.00'	**0.7' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 2	196.00'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 196.00' / 195.00' S= 0.0333 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#4	Primary	193.90'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	194.17'	**6.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900

			Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#6	Device 5	191.75'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 191.75' / 191.75' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#7	Device 6	194.50'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 194.17'
#8	Secondary	197.50'	**15.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=2.00 cfs @ 13.12 hrs HW=196.90' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.96 cfs of 8.57 cfs potential flow)
  - **2=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.96 cfs @ 3.11 fps)
    - **3=Culvert** (Passes 1.96 cfs of 2.41 cfs potential flow)
- **4=Orifice/Grate** (Orifice Controls 0.05 cfs @ 8.28 fps)
  - **5=Culvert** (Passes 0.05 cfs of 1.18 cfs potential flow)
    - **6=Culvert** (Passes 0.05 cfs of 0.89 cfs potential flow)
      - **7=Exfiltration** (Passes 0.05 cfs of 3.95 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 2.00 hrs HW=194.50' TW=0.00' (Dynamic Tailwater)
- **8=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond GW3: Gravel Wetland #3

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 1.29" for 10 Year event
Inflow = 12.18 cfs @ 12.43 hrs, Volume= 1.635 af
Outflow = 7.46 cfs @ 12.75 hrs, Volume= 1.082 af, Atten= 39%, Lag= 18.9 min
Primary = 7.46 cfs @ 12.75 hrs, Volume= 1.082 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 224.77' @ 12.75 hrs Surf.Area= 17,320 sf Storage= 27,980 cf

Plug-Flow detention time= 134.4 min calculated for 1.079 af (66% of inflow)
Center-of-Mass det. time= 59.6 min (882.2 - 822.7)

Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	109,720 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.00	14,400	0	0
224.00	15,933	15,167	15,167
224.50	16,700	8,158	23,325
224.51	17,000	168	23,493
225.00	17,600	8,477	31,970
226.00	18,950	18,275	50,245
227.00	100,000	59,475	109,720

Device	Routing	Invert	Outlet Devices
#1	Primary	225.00'	**5.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63
#2	Primary	220.00'	**24.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 220.00' / 219.50' S= 0.0250 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#3	Device 2	224.50'	**16.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Device 2	220.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	220.25'	**6.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 220.25' / 200.00' S= 0.6750 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#6	Device 5	220.25'	**6.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 220.25' / 200.25' S= 0.4000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#7	Device 6	223.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 202.67'

Primary OutFlow Max=7.45 cfs @ 12.75 hrs HW=224.77' TW=221.14' (Dynamic Tailwater)
- **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **2=Culvert** (Passes 7.45 cfs of 28.83 cfs potential flow)
  - **3=Sharp-Crested Vee/Trap Weir** (Weir Controls 7.40 cfs @ 1.71 fps)
  - **4=Orifice/Grate** (Orifice Controls 0.05 cfs @ 9.18 fps)
    - **5=Culvert** (Passes 0.05 cfs of 1.60 cfs potential flow)
      - **6=Culvert** (Passes 0.05 cfs of 1.31 cfs potential flow)
        - **7=Exfiltration** (Passes 0.05 cfs of 1.04 cfs potential flow)

Summary for Pond SPLIT: Flow Splitter

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 1.95" for 10 Year event
Inflow = 21.01 cfs @ 12.45 hrs, Volume= 2.465 af
Outflow = 21.00 cfs @ 12.45 hrs, Volume= 2.465 af, Atten= 0%, Lag= 0.0 min
Primary = 12.18 cfs @ 12.43 hrs, Volume= 1.635 af
Secondary = 9.18 cfs @ 12.53 hrs, Volume= 0.830 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 225.18' @ 12.53 hrs Surf.Area= 12 sf Storage= 23 cf

Plug-Flow detention time= 0.1 min calculated for 2.465 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (820.8 - 820.8)

Volume	Invert	Avail.Storage	Storage Description
#1	223.30'	19,383 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.30	12	0	0
225.99	12	32	32
226.00	50	0	33
230.00	700	1,500	1,533
231.00	2,500	1,600	3,133
232.00	30,000	16,250	19,383

Device	Routing	Invert	Outlet Devices
#1	Secondary	223.30'	**30.0" Round Overflow Culvert** L= 250.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 223.30' / 220.00' S= 0.0132 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Device 1	224.50'	**5.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Primary	223.30'	**24.0" Round Low Flow Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 223.30' / 223.10' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=12.10 cfs @ 12.43 hrs HW=225.16' TW=224.40' (Dynamic Tailwater)
└─**3=Low Flow Culvert** (Barrel Controls 12.10 cfs @ 5.17 fps)

Secondary OutFlow Max=9.13 cfs @ 12.53 hrs HW=225.18' TW=220.93' (Dynamic Tailwater)
└─**1=Overflow Culvert** (Passes 9.13 cfs of 18.45 cfs potential flow)
└─**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 9.13 cfs @ 2.70 fps)

Time span=2.00-20.00 hrs, dt=0.05 hrs, 361 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Runoff Area=147,582 sf 58.23% Impervious Runoff Depth>4.18"
Flow Length=1,090' Tc=16.7 min CN=88 Runoff=12.41 cfs 1.179 af

Subcatchment 2: Runoff Area=201,343 sf 33.47% Impervious Runoff Depth>3.55"
Flow Length=710' Tc=25.9 min CN=82 Runoff=12.38 cfs 1.367 af

Subcatchment 10: Runoff Area=236,519 sf 3.93% Impervious Runoff Depth>2.76"
Flow Length=1,320' Tc=54.6 min CN=74 Runoff=7.95 cfs 1.248 af

Subcatchment 11: Runoff Area=318,504 sf 9.75% Impervious Runoff Depth>3.05"
Flow Length=560' Tc=42.9 min CN=77 Runoff=13.44 cfs 1.856 af

Subcatchment 12: Runoff Area=182,865 sf 3.69% Impervious Runoff Depth>2.51"
Flow Length=410' Tc=36.9 min CN=71 Runoff=6.86 cfs 0.877 af

Subcatchment 400: Offsite Runoff Area=1,986,138 sf 9.10% Impervious Runoff Depth>2.82"
Flow Length=1,230' Tc=76.0 min CN=75 Runoff=56.29 cfs 10.731 af

Subcatchment 500: Offsite Runoff Area=188,669 sf 13.29% Impervious Runoff Depth>2.87"
Flow Length=570' Tc=29.7 min CN=75 Runoff=8.95 cfs 1.038 af

Subcatchment 600: Offsite Runoff Area=472,025 sf 7.69% Impervious Runoff Depth>2.87"
Flow Length=1,608' Tc=30.7 min CN=75 Runoff=22.06 cfs 2.595 af

Reach 1R: Manmade Ditch Avg. Flow Depth=1.25' Max Vel=5.45 fps Inflow=22.06 cfs 2.595 af
n=0.035 L=400.0' S=0.0250 '/' Capacity=127.85 cfs Outflow=22.04 cfs 2.591 af

Reach 2R: New Swale Avg. Flow Depth=1.37' Max Vel=5.32 fps Inflow=56.29 cfs 10.731 af
n=0.040 L=660.0' S=0.0220 '/' Capacity=117.51 cfs Outflow=56.25 cfs 10.708 af

Reach 3R: Existing Ditch Avg. Flow Depth=1.50' Max Vel=8.96 fps Inflow=74.13 cfs 14.656 af
n=0.040 L=190.0' S=0.0579 '/' Capacity=265.49 cfs Outflow=74.13 cfs 14.651 af

Reach SP1: Study Point #1 - Manmade Ditch Outlet Inflow=74.13 cfs 14.651 af
Outflow=74.13 cfs 14.651 af

Reach SP2: Study Point #2 - Wetland adjacent to Highland Inflow=28.64 cfs 4.935 af
Outflow=28.64 cfs 4.935 af

Pond 1P: MH Peak Elev=222.33' Inflow=28.85 cfs 3.071 af
30.0" Round Culvert n=0.012 L=400.0' S=0.0063 '/' Outflow=28.85 cfs 3.071 af

Pond 2P: MH Peak Elev=219.74' Inflow=28.85 cfs 3.071 af
30.0" Round Culvert n=0.012 L=258.0' S=0.0271 '/' Outflow=28.85 cfs 3.071 af

Pond GW1: Gravel Wetland #1 Peak Elev=197.46' Storage=26,660 cf Inflow=12.41 cfs 1.179 af
Primary=4.08 cfs 0.846 af Secondary=0.00 cfs 0.000 af Outflow=4.08 cfs 0.846 af

Pond GW2: Gravel Wetland #2 Peak Elev=197.45' Storage=30,139 cf Inflow=12.38 cfs 1.367 af
Primary=4.05 cfs 0.985 af Secondary=0.00 cfs 0.000 af Outflow=4.05 cfs 0.985 af

Pond GW3: Gravel Wetland #3 Peak Elev=224.87' Storage=29,659 cf Inflow=13.12 cfs 2.215 af
Outflow=11.74 cfs 1.657 af

Pond SPLIT: Flow Splitter Peak Elev=225.57' Storage=27 cf Inflow=30.95 cfs 3.629 af
Primary=13.12 cfs 2.215 af Secondary=18.01 cfs 1.414 af Outflow=30.95 cfs 3.629 af

Total Runoff Area = 85.713 ac Runoff Volume = 20.892 af Average Runoff Depth = 2.92"
88.15% Pervious = 75.553 ac 11.85% Impervious = 10.160 ac

Summary for Subcatchment 1:

Runoff = 12.41 cfs @ 12.22 hrs, Volume= 1.179 af, Depth> 4.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

	Area (sf)	CN	Description
*	75,243	98	Project roads, driveways & sidewalks
	61,639	74	>75% Grass cover, Good, HSG C
*	10,700	98	Pond
	147,582	88	Weighted Average
	61,639		41.77% Pervious Area
	85,943		58.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	100	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
0.7	70	0.0570	1.67		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	920	0.0320	10.20	12.52	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
16.7	1,090	Total			

Summary for Subcatchment 2:

Runoff = 12.38 cfs @ 12.35 hrs, Volume= 1.367 af, Depth> 3.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

	Area (sf)	CN	Description
*	53,397	98	Project roads, driveways & sidewalks
	110,319	74	>75% Grass cover, Good, HSG C
*	14,000	98	Pond
	23,627	70	Woods, Good, HSG C
	201,343	82	Weighted Average
	133,946		66.53% Pervious Area
	67,397		33.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	110	0.0820	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
1.7	110	0.0450	1.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	400	0.0200	8.06	9.90	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.1	90	0.0500	16.06	192.72	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.022 Earth, clean & straight
25.9	710	Total			

Summary for Subcatchment 10:

Runoff = 7.95 cfs @ 12.75 hrs, Volume= 1.248 af, Depth> 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
21,000	74	>75% Grass cover, Good, HSG C
9,288	98	Unconnected roofs, HSG C
104,680	70	Woods, Good, HSG C
101,551	77	Woods, Good, HSG D
236,519	74	Weighted Average
227,231		96.07% Pervious Area
9,288		3.93% Impervious Area
9,288		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.9	150	0.0600	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
8.4	460	0.0330	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	50	0.0200	4.20	21.02	**Pipe Channel,** 36.0" Round w/ 12.0" inside fill Area= 5.0 sf Perim= 8.6' r= 0.58' n= 0.035
12.1	660	0.0330	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
54.6	1,320	Total			

Summary for Subcatchment 11:

Runoff = 13.44 cfs @ 12.59 hrs, Volume= 1.856 af, Depth> 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

	Area (sf)	CN	Description
	19,472	80	1/2 acre lots, 25% imp, HSG C
	33,728	79	1 acre lots, 20% imp, HSG C
	21,000	74	>75% Grass cover, Good, HSG C
	11,344	89	Gravel roads, HSG C
	16,488	92	Paved roads w/open ditches, 50% imp, HSG C
*	1,899	98	Driveway connection to 302
	9,288	98	Unconnected roofs, HSG C
	103,734	70	Woods, Good, HSG C
	101,551	77	Woods, Good, HSG D
	318,504	77	Weighted Average
	287,459		90.25% Pervious Area
	31,045		9.75% Impervious Area
	9,288		29.92% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.9	150	0.0600	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
4.6	260	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.4	150	0.0130	0.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
42.9	560	Total			

Summary for Subcatchment 12:

Runoff = 6.86 cfs @ 12.52 hrs, Volume= 0.877 af, Depth> 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

	Area (sf)	CN	Description
*	6,750	98	Roof
	20,000	74	>75% Grass cover, Good, HSG C
	156,115	70	Woods, Good, HSG C
	182,865	71	Weighted Average
	176,115		96.31% Pervious Area
	6,750		3.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.9	150	0.0600	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
3.0	260	0.0850	1.46		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
36.9	410	Total			

Summary for Subcatchment 400: Offsite

Runoff = 56.29 cfs @ 13.03 hrs, Volume= 10.731 af, Depth> 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
688,135	77	2 acre lots, 12% imp, HSG C
14,079	81	1/3 acre lots, 30% imp, HSG C
17,232	80	1/2 acre lots, 25% imp, HSG C
14,149	98	Roofs, HSG C
15,384	98	Paved parking, HSG C
4,235	89	Gravel roads, HSG C
48,311	86	<50% Grass cover, Poor, HSG C
25,364	74	>75% Grass cover, Good, HSG C
120,250	92	Paved roads w/open ditches, 50% imp, HSG C
902,162	70	Woods, Good, HSG C
136,837	77	Woods, Good, HSG D
1,986,138	75	Weighted Average
1,805,372		90.90% Pervious Area
180,766		9.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	150	0.0600	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
4.4	380	0.0840	1.45		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
52.2	700	0.0020	0.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
76.0	1,230	Total			

Summary for Subcatchment 500: Offsite

Runoff = 8.95 cfs @ 12.42 hrs, Volume= 1.038 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
38,042	74	>75% Grass cover, Good, HSG C
5,785	98	Roofs, HSG C
118,887	70	Woods, Good, HSG C
19,294	98	Paved parking, HSG C
6,661	77	Woods, Good, HSG D
188,669	75	Weighted Average
163,590		86.71% Pervious Area
25,079		13.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	150	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
6.8	420	0.0430	1.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
29.7	570	Total			

Summary for Subcatchment 600: Offsite

Runoff = 22.06 cfs @ 12.43 hrs, Volume= 2.595 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

	Area (sf)	CN	Description
	12,875	89	Gravel roads, HSG C
*	27,862	98	Paved roads w curbs
	60,234	74	>75% Grass cover, Good, HSG C
	8,436	98	Roofs, HSG C
	362,618	73	Woods, Fair, HSG C
	472,025	75	Weighted Average
	435,727		92.31% Pervious Area
	36,298		7.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	150	0.0470	0.12		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.10"
6.0	420	0.0550	1.17		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
2.2	471	0.0490	3.56		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	140	0.0360	10.82	13.28	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.7	257	0.0310	6.26	28.17	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.00' Z= 3.0 & 2.0 '/' Top.W=7.00' n= 0.030
0.2	170	0.0350	14.59	45.85	**Pipe Channel,**

24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
n= 0.012

30.7 1,608 Total

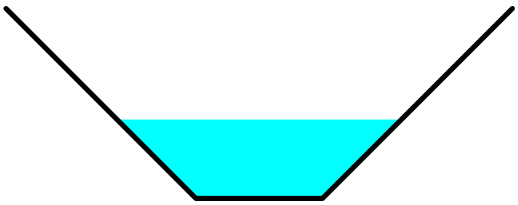
Summary for Reach 1R: Manmade Ditch

Inflow Area = 10.836 ac, 7.69% Impervious, Inflow Depth > 2.87" for 25-yr event
Inflow = 22.06 cfs @ 12.43 hrs, Volume= 2.595 af
Outflow = 22.04 cfs @ 12.45 hrs, Volume= 2.591 af, Atten= 0%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 5.45 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 2.45 fps, Avg. Travel Time= 2.7 min

Peak Storage= 1,617 cf @ 12.45 hrs
Average Depth at Peak Storage= 1.25'
Bank-Full Depth= 3.00' Flow Area= 15.0 sf, Capacity= 127.85 cfs

2.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 1.0 '/' Top Width= 8.00'
Length= 400.0' Slope= 0.0250 '/'
Inlet Invert= 240.00', Outlet Invert= 230.00'



Summary for Reach 2R: New Swale

Inflow Area = 45.595 ac, 9.10% Impervious, Inflow Depth > 2.82" for 25-yr event
Inflow = 56.29 cfs @ 13.03 hrs, Volume= 10.731 af
Outflow = 56.25 cfs @ 13.06 hrs, Volume= 10.708 af, Atten= 0%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 5.32 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 2.68 fps, Avg. Travel Time= 4.1 min

Peak Storage= 6,972 cf @ 13.06 hrs
Average Depth at Peak Storage= 1.37'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 117.51 cfs

5.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 13.00'
Length= 660.0' Slope= 0.0220 '/'
Inlet Invert= 224.50', Outlet Invert= 210.00'

Summary for Reach 3R: Existing Ditch

Inflow Area = 64.961 ac, 8.80% Impervious, Inflow Depth > 2.71" for 25-yr event
Inflow = 74.13 cfs @ 12.84 hrs, Volume= 14.656 af
Outflow = 74.13 cfs @ 12.84 hrs, Volume= 14.651 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 8.96 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 4.48 fps, Avg. Travel Time= 0.7 min

Peak Storage= 1,573 cf @ 12.84 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 3.00' Flow Area= 21.0 sf, Capacity= 265.49 cfs

4.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 10.00'
Length= 190.0' Slope= 0.0579 '/'
Inlet Invert= 210.00', Outlet Invert= 199.00'

Summary for Reach SP1: Study Point #1 - Manmade Ditch Outlet

Inflow Area = 64.961 ac, 8.80% Impervious, Inflow Depth > 2.71" for 25-yr event
Inflow = 74.13 cfs @ 12.84 hrs, Volume= 14.651 af
Outflow = 74.13 cfs @ 12.84 hrs, Volume= 14.651 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3

Summary for Reach SP2: Study Point #2 - Wetland adjacent to Highland

Inflow Area = 20.752 ac, 21.43% Impervious, Inflow Depth > 2.85" for 25-yr event
Inflow = 28.64 cfs @ 12.67 hrs, Volume= 4.935 af
Outflow = 28.64 cfs @ 12.67 hrs, Volume= 4.935 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: MH

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 2.43" for 25-yr event
Inflow = 28.85 cfs @ 12.50 hrs, Volume= 3.071 af
Outflow = 28.85 cfs @ 12.50 hrs, Volume= 3.071 af, Atten= 0%, Lag= 0.0 min
Primary = 28.85 cfs @ 12.50 hrs, Volume= 3.071 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 222.33' @ 12.50 hrs
Flood Elev= 226.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	219.50'	**30.0" Round Culvert** L= 400.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 219.50' / 217.00' S= 0.0063 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Primary OutFlow Max=28.85 cfs @ 12.50 hrs HW=222.33' TW=219.74' (Dynamic Tailwater)
1=Culvert (Outlet Controls 28.85 cfs @ 6.50 fps)

Summary for Pond 2P: MH

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 2.43" for 25-yr event
Inflow = 28.85 cfs @ 12.50 hrs, Volume= 3.071 af
Outflow = 28.85 cfs @ 12.50 hrs, Volume= 3.071 af, Atten= 0%, Lag= 0.0 min
Primary = 28.85 cfs @ 12.50 hrs, Volume= 3.071 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 219.74' @ 12.50 hrs
Flood Elev= 224.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	217.00'	**30.0" Round Culvert** L= 258.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 217.00' / 210.00' S= 0.0271 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Primary OutFlow Max=28.85 cfs @ 12.50 hrs HW=219.74' TW=211.38' (Dynamic Tailwater)
1=Culvert (Inlet Controls 28.85 cfs @ 5.88 fps)

Summary for Pond GW1: Gravel Wetland #1

Inflow Area = 3.388 ac, 58.23% Impervious, Inflow Depth > 4.18" for 25-yr event
Inflow = 12.41 cfs @ 12.22 hrs, Volume= 1.179 af
Outflow = 4.08 cfs @ 12.66 hrs, Volume= 0.846 af, Atten= 67%, Lag= 26.0 min
Primary = 4.08 cfs @ 12.66 hrs, Volume= 0.846 af
Secondary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 197.46' @ 12.66 hrs Surf.Area= 10,679 sf Storage= 26,660 cf

Plug-Flow detention time= 152.7 min calculated for 0.844 af (72% of inflow)
Center-of-Mass det. time= 89.8 min (860.6 - 770.9)

Volume	Invert	Avail.Storage	Storage Description
#1	194.50'	41,549 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
194.50	6,610	0	0
196.00	9,250	11,895	11,895
196.01	9,500	94	11,989
197.00	10,400	9,851	21,839
198.80	11,500	19,710	41,549

Device	Routing	Invert	Outlet Devices
#1	Primary	194.17'	**15.0" Round Culvert** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	196.00'	**0.7' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 2	196.00'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 196.00' / 195.00' S= 0.0333 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#4	Primary	193.90'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	194.17'	**6.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#6	Device 5	191.75'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 191.75' / 191.75' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#7	Device 6	194.50'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 194.17'
#8	Secondary	197.50'	**20.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=4.08 cfs @ 12.66 hrs HW=197.46' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 4.03 cfs of 9.64 cfs potential flow)
  - **2=Sharp-Crested Vee/Trap Weir** (Weir Controls 4.03 cfs @ 3.95 fps)
    - **3=Culvert** (Passes 4.03 cfs of 4.25 cfs potential flow)
- **4=Orifice/Grate** (Orifice Controls 0.05 cfs @ 9.03 fps)
  - **5=Culvert** (Passes 0.05 cfs of 1.30 cfs potential flow)
    - **6=Culvert** (Passes 0.05 cfs of 0.97 cfs potential flow)
      - **7=Exfiltration** (Passes 0.05 cfs of 4.30 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 2.00 hrs HW=194.50' TW=0.00' (Dynamic Tailwater)
- **8=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond GW2: Gravel Wetland #2

Inflow Area = 4.622 ac, 33.47% Impervious, Inflow Depth > 3.55" for 25-yr event
Inflow = 12.38 cfs @ 12.35 hrs, Volume= 1.367 af
Outflow = 4.05 cfs @ 12.91 hrs, Volume= 0.985 af, Atten= 67%, Lag= 33.1 min
Primary = 4.05 cfs @ 12.91 hrs, Volume= 0.985 af
Secondary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 197.45' @ 12.91 hrs Surf.Area= 12,886 sf Storage= 30,139 cf

Plug-Flow detention time= 151.1 min calculated for 0.985 af (72% of inflow)
Center-of-Mass det. time= 88.8 min (882.2 - 793.3)

Volume	Invert	Avail.Storage	Storage Description
#1	194.50'	49,046 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
194.50	7,215	0	0
196.00	10,325	13,155	13,155
196.01	10,600	105	13,260
197.00	12,150	11,261	24,521
198.80	15,100	24,525	49,046

Device	Routing	Invert	Outlet Devices
#1	Primary	194.17'	**15.0" Round Culvert** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	196.00'	**0.7' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 2	196.00'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 196.00' / 195.00' S= 0.0333 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#4	Primary	193.90'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	194.17'	**6.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900

			Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#6	Device 5	191.75'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 191.75' / 191.75' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#7	Device 6	194.50'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 194.17'
#8	Secondary	197.50'	**15.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=4.05 cfs @ 12.91 hrs HW=197.45' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 4.00 cfs of 9.63 cfs potential flow)
  - **2=Sharp-Crested Vee/Trap Weir** (Weir Controls 4.00 cfs @ 3.94 fps)
    - **3=Culvert** (Passes 4.00 cfs of 4.23 cfs potential flow)
- **4=Orifice/Grate** (Orifice Controls 0.05 cfs @ 9.02 fps)
  - **5=Culvert** (Passes 0.05 cfs of 1.30 cfs potential flow)
    - **6=Culvert** (Passes 0.05 cfs of 0.97 cfs potential flow)
      - **7=Exfiltration** (Passes 0.05 cfs of 4.80 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 2.00 hrs HW=194.50' TW=0.00' (Dynamic Tailwater)
- **8=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond GW3: Gravel Wetland #3

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 1.75" for 25-yr event
Inflow = 13.12 cfs @ 12.37 hrs, Volume= 2.215 af
Outflow = 11.74 cfs @ 12.59 hrs, Volume= 1.657 af, Atten= 10%, Lag= 13.2 min
Primary = 11.74 cfs @ 12.59 hrs, Volume= 1.657 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 224.87' @ 12.59 hrs Surf.Area= 17,438 sf Storage= 29,659 cf

Plug-Flow detention time= 112.6 min calculated for 1.657 af (75% of inflow)
Center-of-Mass det. time= 47.8 min (863.7 - 815.8)

Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	109,720 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.00	14,400	0	0
224.00	15,933	15,167	15,167
224.50	16,700	8,158	23,325
224.51	17,000	168	23,493
225.00	17,600	8,477	31,970
226.00	18,950	18,275	50,245
227.00	100,000	59,475	109,720

Device	Routing	Invert	Outlet Devices
#1	Primary	225.00'	**5.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63
#2	Primary	220.00'	**24.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 220.00' / 219.50' S= 0.0250 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#3	Device 2	224.50'	**16.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Device 2	220.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	220.25'	**6.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 220.25' / 200.00' S= 0.6750 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#6	Device 5	220.25'	**6.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 220.25' / 200.25' S= 0.4000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#7	Device 6	223.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 202.67'

Primary OutFlow Max=11.72 cfs @ 12.59 hrs HW=224.87' TW=222.16' (Dynamic Tailwater)
- **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **2=Culvert** (Passes 11.72 cfs of 24.90 cfs potential flow)
  - **3=Sharp-Crested Vee/Trap Weir** (Weir Controls 11.68 cfs @ 1.99 fps)
  - **4=Orifice/Grate** (Orifice Controls 0.04 cfs @ 7.93 fps)
    - **5=Culvert** (Passes 0.04 cfs of 1.38 cfs potential flow)
      - **6=Culvert** (Passes 0.04 cfs of 1.13 cfs potential flow)
        - **7=Exfiltration** (Passes 0.04 cfs of 1.05 cfs potential flow)

Summary for Pond SPLIT: Flow Splitter

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 2.87" for 25-yr event
Inflow = 30.95 cfs @ 12.44 hrs, Volume= 3.629 af
Outflow = 30.95 cfs @ 12.44 hrs, Volume= 3.629 af, Atten= 0%, Lag= 0.0 min
Primary = 13.12 cfs @ 12.37 hrs, Volume= 2.215 af
Secondary = 18.01 cfs @ 12.45 hrs, Volume= 1.414 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 225.57' @ 12.45 hrs Surf.Area= 12 sf Storage= 27 cf

Plug-Flow detention time= 0.1 min calculated for 3.629 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (812.2 - 812.2)

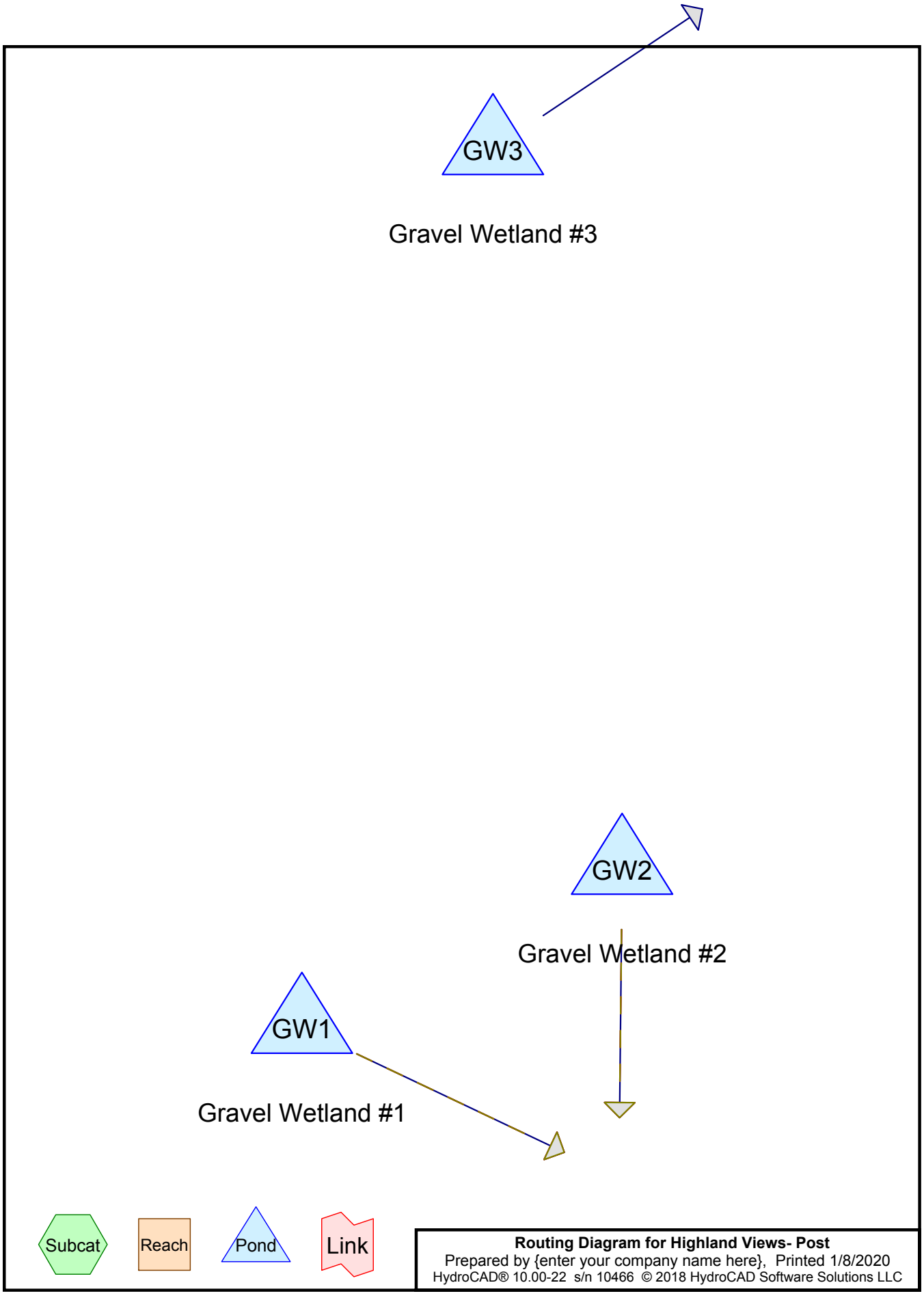
Volume	Invert	Avail.Storage	Storage Description
#1	223.30'	19,383 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.30	12	0	0
225.99	12	32	32
226.00	50	0	33
230.00	700	1,500	1,533
231.00	2,500	1,600	3,133
232.00	30,000	16,250	19,383

Device	Routing	Invert	Outlet Devices
#1	Secondary	223.30'	**30.0" Round Overflow Culvert** L= 250.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 223.30' / 220.00' S= 0.0132 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Device 1	224.50'	**5.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Primary	223.30'	**24.0" Round Low Flow Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 223.30' / 223.10' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=13.10 cfs @ 12.37 hrs HW=225.51' TW=224.76' (Dynamic Tailwater)
└─**3=Low Flow Culvert** (Inlet Controls 13.10 cfs @ 4.17 fps)

Secondary OutFlow Max=18.00 cfs @ 12.45 hrs HW=225.56' TW=222.26' (Dynamic Tailwater)
└─**1=Overflow Culvert** (Passes 18.00 cfs of 23.96 cfs potential flow)
└─**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 18.00 cfs @ 3.38 fps)



Routing Diagram for Highland Views- Post
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Summary for Pond GW1: Gravel Wetland #1

Inflow Area = 3.388 ac, 58.23% Impervious, Inflow Depth > 4.18" for 25-yr event
Inflow = 12.41 cfs @ 12.22 hrs, Volume= 1.179 af
Outflow = 5.16 cfs @ 12.59 hrs, Volume= 0.550 af, Atten= 58%, Lag= 22.0 min
Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af
Secondary = 5.16 cfs @ 12.59 hrs, Volume= 0.550 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 197.71' @ 12.59 hrs Surf.Area= 10,837 sf Storage= 29,424 cf

Plug-Flow detention time= 187.9 min calculated for 0.548 af (46% of inflow)
Center-of-Mass det. time= 100.0 min (870.8 - 770.9)

Volume	Invert	Avail.Storage	Storage Description
#1	194.50'	41,549 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
194.50	6,610	0	0
196.00	9,250	11,895	11,895
196.01	9,500	94	11,989
197.00	10,400	9,851	21,839
198.80	11,500	19,710	41,549

Device	Routing	Invert	Outlet Devices
#1	Primary	194.17'	**15.0" Round Culvert X 0.00** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	196.00'	**0.7' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 2	196.00'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 196.00' / 195.00' S= 0.0333 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#4	Primary	193.90'	**1.0" Vert. Orifice/Grate X 0.00** C= 0.600
#5	Device 4	194.17'	**6.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#6	Device 5	191.75'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 191.75' / 191.75' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#7	Device 6	194.50'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 194.17'
#8	Secondary	197.50'	**20.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=194.50' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
  - **2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)
    - **3=Culvert** (Controls 0.00 cfs)
- **4=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Culvert** (Passes 0.00 cfs of 0.21 cfs potential flow)
    - **6=Culvert** (Passes 0.00 cfs of 0.31 cfs potential flow)
      - **7=Exfiltration** (Passes 0.00 cfs of 0.37 cfs potential flow)

Secondary OutFlow Max=5.13 cfs @ 12.59 hrs HW=197.71' TW=0.00' (Dynamic Tailwater)
- **8=Broad-Crested Rectangular Weir** (Weir Controls 5.13 cfs @ 1.20 fps)

Summary for Pond GW2: Gravel Wetland #2

Inflow Area = 4.622 ac, 33.47% Impervious, Inflow Depth > 3.55" for 25-yr event
Inflow = 12.38 cfs @ 12.35 hrs, Volume= 1.367 af
Outflow = 4.44 cfs @ 12.87 hrs, Volume= 0.647 af, Atten= 64%, Lag= 30.9 min
Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af
Secondary = 4.44 cfs @ 12.87 hrs, Volume= 0.647 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 197.73' @ 12.87 hrs Surf.Area= 13,354 sf Storage= 33,888 cf

Plug-Flow detention time= 180.2 min calculated for 0.646 af (47% of inflow)
Center-of-Mass det. time= 97.2 min (890.5 - 793.3)

Volume	Invert	Avail.Storage	Storage Description
#1	194.50'	49,046 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
194.50	7,215	0	0
196.00	10,325	13,155	13,155
196.01	10,600	105	13,260
197.00	12,150	11,261	24,521
198.80	15,100	24,525	49,046

Device	Routing	Invert	Outlet Devices
#1	Primary	194.17'	**15.0" Round Culvert X 0.00** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	196.00'	**0.7' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 2	196.00'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 196.00' / 195.00' S= 0.0333 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#4	Primary	193.90'	**1.0" Vert. Orifice/Grate X 0.00** C= 0.600
#5	Device 4	194.17'	**6.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900

			Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#6	Device 5	191.75'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 191.75' / 191.75' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#7	Device 6	194.50'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 194.17'
#8	Secondary	197.50'	**15.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=194.50' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)
- **3=Culvert** (Controls 0.00 cfs)
- **4=Orifice/Grate** (Controls 0.00 cfs)
- **5=Culvert** (Passes 0.00 cfs of 0.21 cfs potential flow)
- **6=Culvert** (Passes 0.00 cfs of 0.31 cfs potential flow)
- **7=Exfiltration** (Passes 0.00 cfs of 0.40 cfs potential flow)

Secondary OutFlow Max=4.41 cfs @ 12.87 hrs HW=197.73' TW=0.00' (Dynamic Tailwater)
- **8=Broad-Crested Rectangular Weir** (Weir Controls 4.41 cfs @ 1.26 fps)

Summary for Pond GW3: Gravel Wetland #3

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 1.03" for 25-yr event
Inflow = 12.29 cfs @ 12.44 hrs, Volume= 1.300 af
Outflow = 1.79 cfs @ 13.50 hrs, Volume= 0.528 af, Atten= 85%, Lag= 63.5 min
Primary = 1.79 cfs @ 13.50 hrs, Volume= 0.528 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 225.27' @ 13.50 hrs Surf.Area= 17,959 sf Storage= 36,697 cf

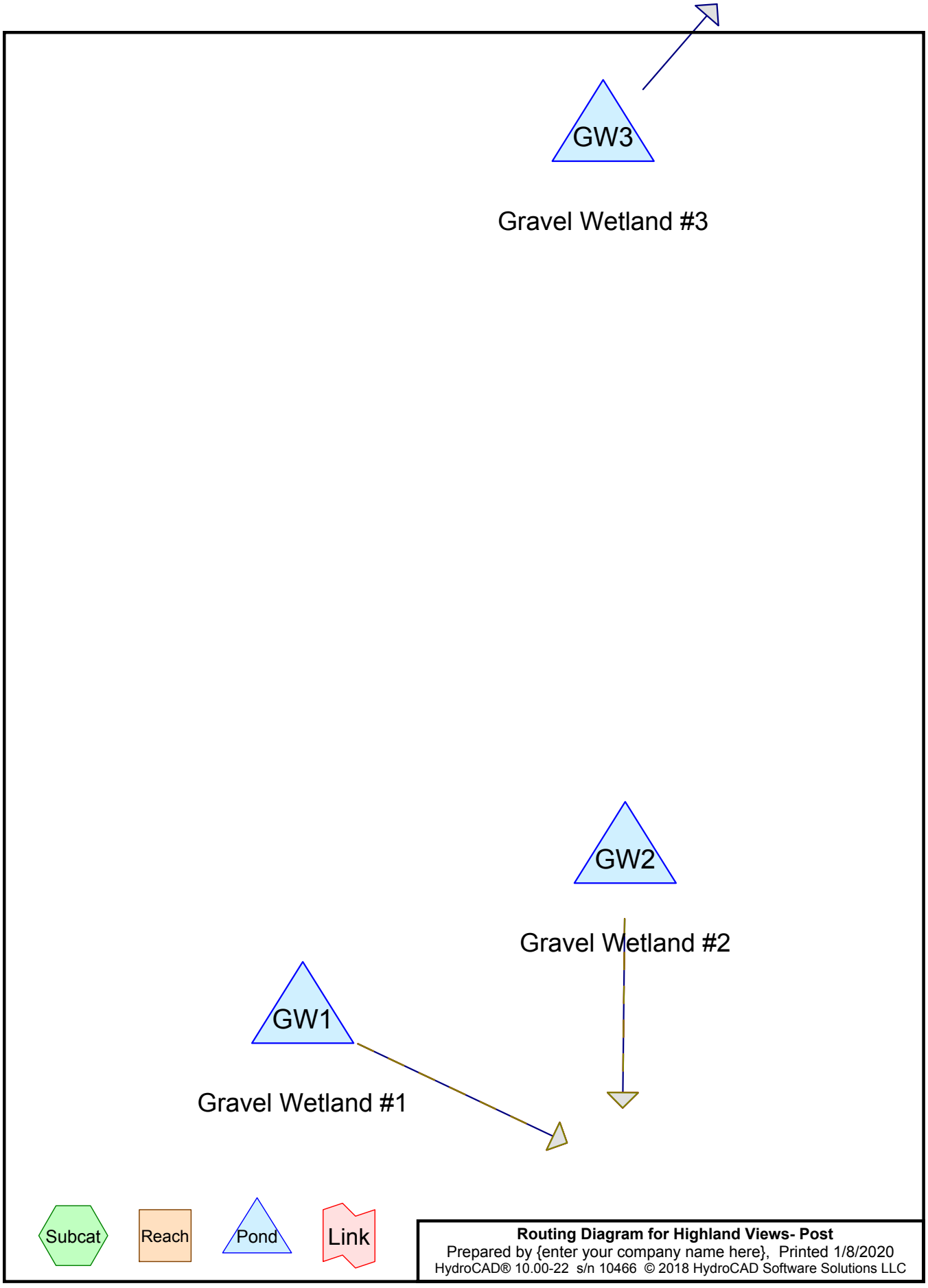
Plug-Flow detention time= 210.8 min calculated for 0.528 af (41% of inflow)
Center-of-Mass det. time= 127.1 min (932.0 - 804.9)

Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	109,720 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.00	14,400	0	0
224.00	15,933	15,167	15,167
224.50	16,700	8,158	23,325
224.51	17,000	168	23,493
225.00	17,600	8,477	31,970
226.00	18,950	18,275	50,245
227.00	100,000	59,475	109,720

Device	Routing	Invert	Outlet Devices
#1	Primary	225.00'	**5.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63
#2	Primary	220.00'	**24.0" Round Culvert X 0.00** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 220.00' / 219.50' S= 0.0250 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#3	Device 2	224.50'	**16.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Device 2	220.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	220.25'	**6.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 220.25' / 200.00' S= 0.6750 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#6	Device 5	220.25'	**6.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 220.25' / 200.25' S= 0.4000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#7	Device 6	223.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 202.67'

Primary OutFlow Max=1.79 cfs @ 13.50 hrs HW=225.27' TW=220.47' (Dynamic Tailwater)
- **1=Broad-Crested Rectangular Weir** (Weir Controls 1.79 cfs @ 1.35 fps)
- **2=Culvert** (Controls 0.00 cfs)
  - **3=Sharp-Crested Vee/Trap Weir** (Passes < 35.12 cfs potential flow)
  - **4=Orifice/Grate** (Passes < 0.06 cfs potential flow)
    - **5=Culvert** (Passes < 1.84 cfs potential flow)
      - **6=Culvert** (Passes < 1.50 cfs potential flow)
        - **7=Exfiltration** (Passes < 1.10 cfs potential flow)



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Summary for Pond GW1: Gravel Wetland #1

Inflow Area = 3.388 ac, 58.23% Impervious, Inflow Depth > 6.30" for 100-yr event
Inflow = 18.28 cfs @ 12.22 hrs, Volume= 1.779 af
Outflow = 14.54 cfs @ 12.36 hrs, Volume= 1.433 af, Atten= 20%, Lag= 8.3 min
Primary = 5.15 cfs @ 12.36 hrs, Volume= 1.174 af
Secondary = 9.40 cfs @ 12.36 hrs, Volume= 0.260 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 197.82' @ 12.36 hrs Surf.Area= 10,900 sf Storage= 30,548 cf

Plug-Flow detention time= 125.9 min calculated for 1.433 af (81% of inflow)
Center-of-Mass det. time= 73.8 min (834.9 - 761.1)

Volume	Invert	Avail.Storage	Storage Description
#1	194.50'	41,549 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
194.50	6,610	0	0
196.00	9,250	11,895	11,895
196.01	9,500	94	11,989
197.00	10,400	9,851	21,839
198.80	11,500	19,710	41,549

Device	Routing	Invert	Outlet Devices
#1	Primary	194.17'	**15.0" Round Culvert** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	196.00'	**0.7' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 2	196.00'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 196.00' / 195.00' S= 0.0333 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#4	Primary	193.90'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	194.17'	**6.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#6	Device 5	191.75'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 191.75' / 191.75' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#7	Device 6	194.50'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 194.17'
#8	Secondary	197.50'	**20.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=5.14 cfs @ 12.36 hrs HW=197.82' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 5.09 cfs of 10.27 cfs potential flow)
  - **2=Sharp-Crested Vee/Trap Weir** (Passes 5.09 cfs of 5.61 cfs potential flow)
    - **3=Culvert** (Inlet Controls 5.09 cfs @ 4.15 fps)
- **4=Orifice/Grate** (Orifice Controls 0.05 cfs @ 9.48 fps)
  - **5=Culvert** (Passes 0.05 cfs of 1.38 cfs potential flow)
    - **6=Culvert** (Passes 0.05 cfs of 1.02 cfs potential flow)
      - **7=Exfiltration** (Passes 0.05 cfs of 4.79 cfs potential flow)

Secondary OutFlow Max=9.28 cfs @ 12.36 hrs HW=197.82' TW=0.00' (Dynamic Tailwater)
- **8=Broad-Crested Rectangular Weir** (Weir Controls 9.28 cfs @ 1.47 fps)

Summary for Pond GW2: Gravel Wetland #2

Inflow Area = 4.622 ac, 33.47% Impervious, Inflow Depth > 5.59" for 100-yr event
Inflow = 19.11 cfs @ 12.35 hrs, Volume= 2.152 af
Outflow = 14.85 cfs @ 12.55 hrs, Volume= 1.750 af, Atten= 22%, Lag= 12.0 min
Primary = 5.29 cfs @ 12.55 hrs, Volume= 1.396 af
Secondary = 9.56 cfs @ 12.55 hrs, Volume= 0.353 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 197.89' @ 12.55 hrs Surf.Area= 13,605 sf Storage= 35,955 cf

Plug-Flow detention time= 118.7 min calculated for 1.750 af (81% of inflow)
Center-of-Mass det. time= 69.2 min (851.9 - 782.6)

Volume	Invert	Avail.Storage	Storage Description
#1	194.50'	49,046 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
194.50	7,215	0	0
196.00	10,325	13,155	13,155
196.01	10,600	105	13,260
197.00	12,150	11,261	24,521
198.80	15,100	24,525	49,046

Device	Routing	Invert	Outlet Devices
#1	Primary	194.17'	**15.0" Round Culvert** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	196.00'	**0.7' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 2	196.00'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 196.00' / 195.00' S= 0.0333 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#4	Primary	193.90'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	194.17'	**6.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900

			Inlet / Outlet Invert= 194.17' / 193.90' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#6	Device 5	191.75'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 191.75' / 191.75' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#7	Device 6	194.50'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 194.17'
#8	Secondary	197.50'	**15.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=5.29 cfs @ 12.55 hrs HW=197.89' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 5.24 cfs of 10.39 cfs potential flow)
  - **2=Sharp-Crested Vee/Trap Weir** (Passes 5.24 cfs of 5.95 cfs potential flow)
    - **3=Culvert** (Inlet Controls 5.24 cfs @ 4.27 fps)
- **4=Orifice/Grate** (Orifice Controls 0.05 cfs @ 9.56 fps)
  - **5=Culvert** (Passes 0.05 cfs of 1.39 cfs potential flow)
    - **6=Culvert** (Passes 0.05 cfs of 1.03 cfs potential flow)
      - **7=Exfiltration** (Passes 0.05 cfs of 5.49 cfs potential flow)

Secondary OutFlow Max=9.55 cfs @ 12.55 hrs HW=197.89' TW=0.00' (Dynamic Tailwater)
- **8=Broad-Crested Rectangular Weir** (Weir Controls 9.55 cfs @ 1.64 fps)

Summary for Pond GW3: Gravel Wetland #3

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 3.22" for 100-yr event
Inflow = 34.76 cfs @ 12.54 hrs, Volume= 4.073 af
Outflow = 58.41 cfs @ 13.00 hrs, Volume= 3.508 af, Atten= 0%, Lag= 27.6 min
Primary = 58.52 cfs @ 12.99 hrs, Volume= 10.793 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 226.53' @ 13.45 hrs Surf.Area= 61,655 sf Storage= 71,481 cf

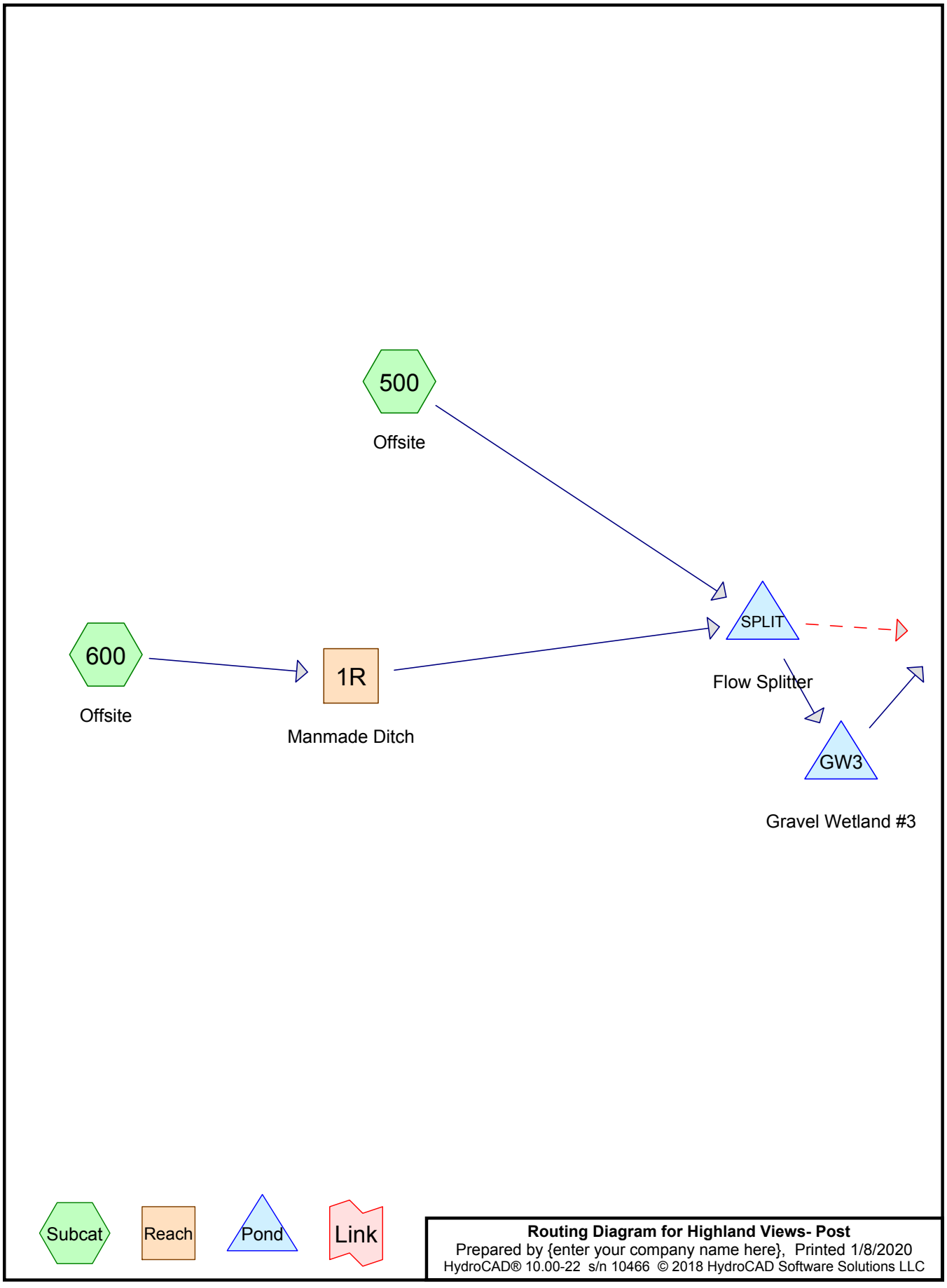
Plug-Flow detention time= 109.7 min calculated for 3.508 af (86% of inflow)
Center-of-Mass det. time= 68.9 min (867.0 - 798.1)

Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	109,720 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.00	14,400	0	0
224.00	15,933	15,167	15,167
224.50	16,700	8,158	23,325
224.51	17,000	168	23,493
225.00	17,600	8,477	31,970
226.00	18,950	18,275	50,245
227.00	100,000	59,475	109,720

Device	Routing	Invert	Outlet Devices
#1	Primary	225.00'	**5.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63
#2	Primary	220.00'	**24.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 220.00' / 219.50' S= 0.0250 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#3	Device 2	224.50'	**16.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Device 2	220.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	220.25'	**6.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 220.25' / 200.00' S= 0.6750 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#6	Device 5	220.25'	**6.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 220.25' / 200.25' S= 0.4000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#7	Device 6	223.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 202.67'

Primary OutFlow Max=0.00 cfs @ 12.99 hrs HW=226.46' TW=242.56' (Dynamic Tailwater)
- **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **2=Culvert** (Controls 0.00 cfs)
  - **3=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)
  - **4=Orifice/Grate** (Controls 0.00 cfs)
    - **5=Culvert** (Controls 0.00 cfs)
      - **6=Culvert** (Controls 0.00 cfs)
        - **7=Exfiltration** (Passes 0.00 cfs of 3.28 cfs potential flow)



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Summary for Subcatchment 500: Offsite

Runoff = 1.18 cfs @ 12.49 hrs, Volume= 0.154 af, Depth> 0.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr First Flush Rainfall=2.20"

Area (sf)	CN	Description
38,042	74	>75% Grass cover, Good, HSG C
5,785	98	Roofs, HSG C
118,887	70	Woods, Good, HSG C
19,294	98	Paved parking, HSG C
6,661	77	Woods, Good, HSG D
188,669	75	Weighted Average
163,590		86.71% Pervious Area
25,079		13.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	150	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
6.8	420	0.0430	1.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
29.7	570	Total			

Summary for Subcatchment 600: Offsite

Runoff = 2.91 cfs @ 12.50 hrs, Volume= 0.386 af, Depth> 0.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr First Flush Rainfall=2.20"

	Area (sf)	CN	Description
	12,875	89	Gravel roads, HSG C
*	27,862	98	Paved roads w curbs
	60,234	74	>75% Grass cover, Good, HSG C
	8,436	98	Roofs, HSG C
	362,618	73	Woods, Fair, HSG C
	472,025	75	Weighted Average
	435,727		92.31% Pervious Area
	36,298		7.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	150	0.0470	0.12		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.10"
6.0	420	0.0550	1.17		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
2.2	471	0.0490	3.56		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	140	0.0360	10.82	13.28	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.7	257	0.0310	6.26	28.17	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.00' Z= 3.0 & 2.0 '/' Top.W=7.00' n= 0.030
0.2	170	0.0350	14.59	45.85	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
30.7	1,608	Total			

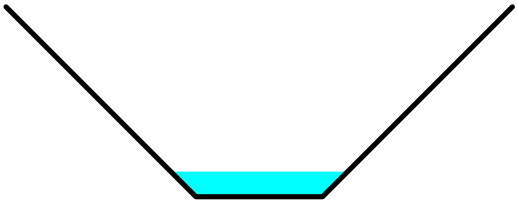
Summary for Reach 1R: Manmade Ditch

Inflow Area = 10.836 ac, 7.69% Impervious, Inflow Depth > 0.43" for First Flush event
Inflow = 2.91 cfs @ 12.50 hrs, Volume= 0.386 af
Outflow = 2.90 cfs @ 12.53 hrs, Volume= 0.384 af, Atten= 0%, Lag= 1.5 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.04 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.58 fps, Avg. Travel Time= 4.2 min

Peak Storage= 381 cf @ 12.53 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 3.00' Flow Area= 15.0 sf, Capacity= 127.85 cfs

2.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 1.0 '/' Top Width= 8.00'
Length= 400.0' Slope= 0.0250 '/'
Inlet Invert= 240.00', Outlet Invert= 230.00'



Summary for Pond GW3: Gravel Wetland #3

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 0.43" for First Flush event
Inflow = 4.07 cfs @ 12.52 hrs, Volume= 0.538 af
Outflow = 0.05 cfs @ 20.00 hrs, Volume= 0.035 af, Atten= 99%, Lag= 448.9 min
Primary = 0.05 cfs @ 20.00 hrs, Volume= 0.035 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 224.41' @ 20.00 hrs Surf.Area= 16,567 sf Storage= 21,880 cf

Plug-Flow detention time= 228.5 min calculated for 0.035 af (7% of inflow)
Center-of-Mass det. time= 107.2 min (962.3 - 855.1)

Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	109,720 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.00	14,400	0	0
224.00	15,933	15,167	15,167
224.50	16,700	8,158	23,325
224.51	17,000	168	23,493
225.00	17,600	8,477	31,970
226.00	18,950	18,275	50,245
227.00	100,000	59,475	109,720

Device	Routing	Invert	Outlet Devices
#1	Primary	225.00'	**5.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63
#2	Primary	220.00'	**24.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 220.00' / 219.50' S= 0.0250 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#3	Device 2	224.50'	**16.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Device 2	220.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	220.25'	**6.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 220.25' / 200.00' S= 0.6750 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#6	Device 5	220.25'	**6.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 220.25' / 200.25' S= 0.4000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#7	Device 6	223.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 202.67'

Primary OutFlow Max=0.05 cfs @ 20.00 hrs HW=224.41' TW=219.60' (Dynamic Tailwater)
- **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **2=Culvert** (Passes 0.05 cfs of 27.95 cfs potential flow)
  - **3=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)
  - **4=Orifice/Grate** (Orifice Controls 0.05 cfs @ 10.07 fps)
    - **5=Culvert** (Passes 0.05 cfs of 1.76 cfs potential flow)
      - **6=Culvert** (Passes 0.05 cfs of 1.40 cfs potential flow)
        - **7=Exfiltration** (Passes 0.05 cfs of 0.98 cfs potential flow)

Summary for Pond SPLIT: Flow Splitter

Inflow Area = 15.167 ac, 9.29% Impervious, Inflow Depth > 0.43" for First Flush event
Inflow = 4.07 cfs @ 12.52 hrs, Volume= 0.538 af
Outflow = 4.07 cfs @ 12.52 hrs, Volume= 0.538 af, Atten= 0%, Lag= 0.0 min
Primary = 4.07 cfs @ 12.52 hrs, Volume= 0.538 af
Secondary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 224.41' @ 20.00 hrs Surf.Area= 12 sf Storage= 13 cf

Plug-Flow detention time= 0.2 min calculated for 0.538 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (855.1 - 855.1)

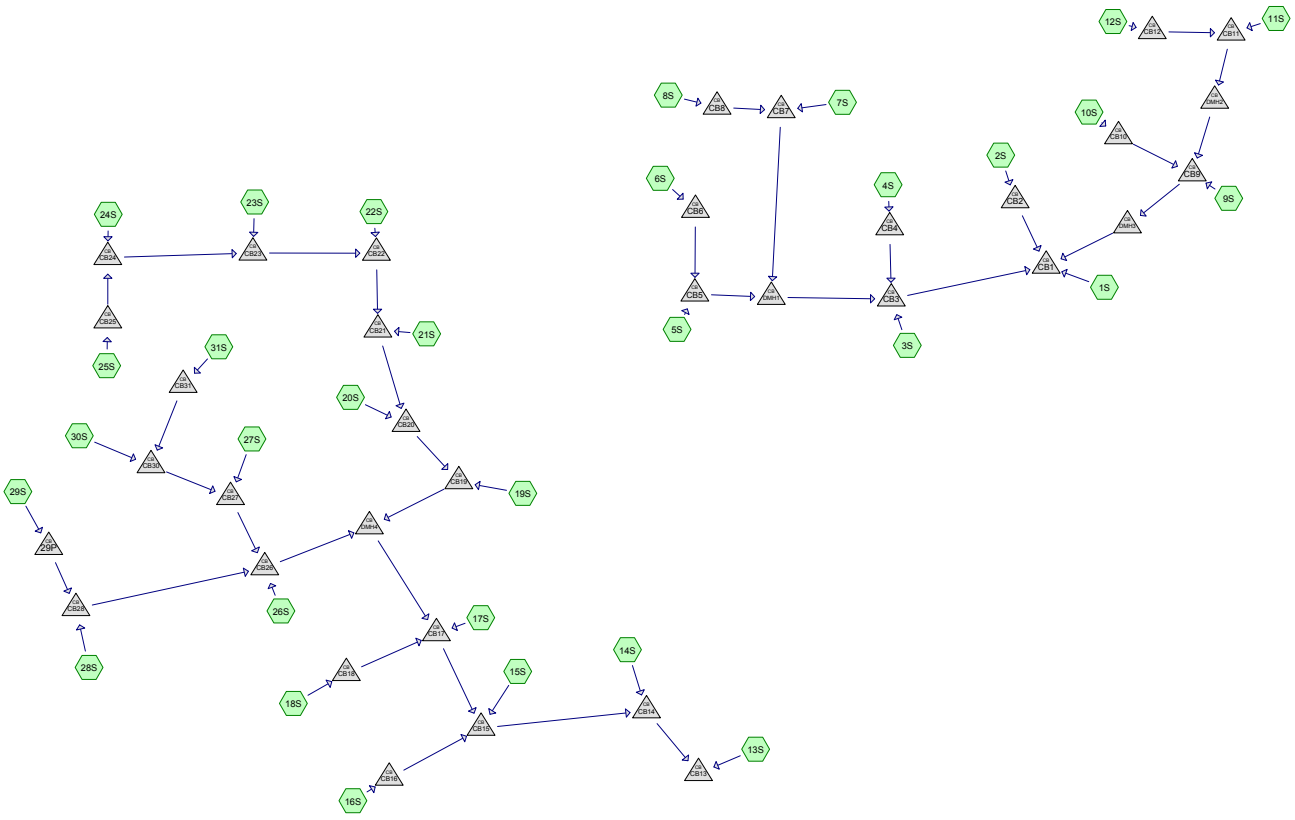
Volume	Invert	Avail.Storage	Storage Description
#1	223.30'	19,383 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.30	12	0	0
225.99	12	32	32
226.00	50	0	33
230.00	700	1,500	1,533
231.00	2,500	1,600	3,133
232.00	30,000	16,250	19,383

Device	Routing	Invert	Outlet Devices
#1	Secondary	223.30'	**30.0" Round Overflow Culvert** L= 250.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 223.30' / 220.00' S= 0.0132 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Device 1	224.50'	**5.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Primary	223.30'	**24.0" Round Low Flow Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 223.30' / 223.10' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=4.05 cfs @ 12.52 hrs HW=224.24' TW=223.27' (Dynamic Tailwater)
↑—**3=Low Flow Culvert** (Barrel Controls 4.05 cfs @ 4.09 fps)

Secondary OutFlow Max=0.00 cfs @ 2.00 hrs HW=223.30' TW=219.50' (Dynamic Tailwater)
↑—**1=Overflow Culvert** (Controls 0.00 cfs)
↑—**2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)



Subcat Reach Pond Link

Routing Diagram for 1817 Pipe Sizing

Prepared by {enter your company name here}, Printed 1/9/2020

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Summary for Subcatchment 1S:

Runoff = 2.13 cfs @ 12.10 hrs, Volume= 0.167 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	12,774	98	Impervious
	5,596	74	>75% Grass cover, Good, HSG C
	18,370	91	Weighted Average
	5,596		30.46% Pervious Area
	12,774		69.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	40	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"

Summary for Subcatchment 2S:

Runoff = 1.37 cfs @ 12.10 hrs, Volume= 0.107 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	7,804	98	Impervious
	4,226	74	>75% Grass cover, Good, HSG C
	12,030	90	Weighted Average
	4,226		35.13% Pervious Area
	7,804		64.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	40	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"

Summary for Subcatchment 3S:

Runoff = 0.67 cfs @ 12.07 hrs, Volume= 0.050 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	3,844	98	Impervious
	1,750	74	>75% Grass cover, Good, HSG C
	5,594	90	Weighted Average
	1,750		31.28% Pervious Area
	3,844		68.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 4S:

Runoff = 0.60 cfs @ 12.03 hrs, Volume= 0.042 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	3,471	98	Impervious
	1,032	74	>75% Grass cover, Good, HSG C
	4,503	92	Weighted Average
	1,032		22.92% Pervious Area
	3,471		77.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 5S:

Runoff = 0.62 cfs @ 12.03 hrs, Volume= 0.047 af, Depth> 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	4,382	98	Impervious
	0	74	>75% Grass cover, Good, HSG C
	4,382	98	Weighted Average
	4,382		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 6S:

Runoff = 0.38 cfs @ 12.03 hrs, Volume= 0.028 af, Depth> 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	2,651	98	Impervious
	0	74	>75% Grass cover, Good, HSG C
	2,651	98	Weighted Average
	2,651		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 7S:

Runoff = 1.68 cfs @ 12.10 hrs, Volume= 0.130 af, Depth= 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	9,484	98	Impervious
	5,513	74	>75% Grass cover, Good, HSG C
	14,997	89	Weighted Average
	5,513		36.76% Pervious Area
	9,484		63.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	40	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"

Summary for Subcatchment 8S:

Runoff = 1.85 cfs @ 12.10 hrs, Volume= 0.143 af, Depth= 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	10,190	98	Impervious
	6,293	74	>75% Grass cover, Good, HSG C
	16,483	89	Weighted Average
	6,293		38.18% Pervious Area
	10,190		61.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	40	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"

Summary for Subcatchment 9S:

Runoff = 1.40 cfs @ 12.10 hrs, Volume= 0.108 af, Depth= 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	7,567	98	Impervious
	4,900	74	>75% Grass cover, Good, HSG C
	12,467	89	Weighted Average
	4,900		39.30% Pervious Area
	7,567		60.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	40	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"

Summary for Subcatchment 10S:

Runoff = 0.91 cfs @ 12.10 hrs, Volume= 0.070 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	4,535	98	Impervious
	3,900	74	>75% Grass cover, Good, HSG C
	8,435	87	Weighted Average
	3,900		46.24% Pervious Area
	4,535		53.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	40	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"

Summary for Subcatchment 11S:

Runoff = 1.67 cfs @ 12.10 hrs, Volume= 0.129 af, Depth= 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	9,436	98	Impervious
	5,442	74	>75% Grass cover, Good, HSG C
	14,878	89	Weighted Average
	5,442		36.58% Pervious Area
	9,436		63.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 12S:

Runoff = 0.99 cfs @ 12.10 hrs, Volume= 0.075 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	4,621	98	Impervious
	4,702	74	>75% Grass cover, Good, HSG C
	9,323	86	Weighted Average
	4,702		50.43% Pervious Area
	4,621		49.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	40	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"

Summary for Subcatchment 13S:

Runoff = 1.50 cfs @ 12.14 hrs, Volume= 0.128 af, Depth= 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	9,136	98	Impervious
	5,590	74	>75% Grass cover, Good, HSG C
	14,726	89	Weighted Average
	5,590		37.96% Pervious Area
	9,136		62.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 14S:

Runoff = 0.47 cfs @ 12.10 hrs, Volume= 0.037 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	2,924	98	Impervious
	1,141	74	>75% Grass cover, Good, HSG C
	4,065	91	Weighted Average
	1,141		28.07% Pervious Area
	2,924		71.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 15S:

Runoff = 0.83 cfs @ 12.14 hrs, Volume= 0.070 af, Depth= 4.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	4,224	98	Impervious
	4,613	74	>75% Grass cover, Good, HSG C
	8,837	85	Weighted Average
	4,613		52.20% Pervious Area
	4,224		47.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 16S:

Runoff = 1.06 cfs @ 12.10 hrs, Volume= 0.083 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	6,321	98	Impervious
	2,837	74	>75% Grass cover, Good, HSG C
	9,158	91	Weighted Average
	2,837		30.98% Pervious Area
	6,321		69.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 17S:

Runoff = 1.24 cfs @ 12.14 hrs, Volume= 0.107 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	8,211	98	Impervious
	3,571	74	>75% Grass cover, Good, HSG C
	11,782	91	Weighted Average
	3,571		30.31% Pervious Area
	8,211		69.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 18S:

Runoff = 1.23 cfs @ 12.14 hrs, Volume= 0.106 af, Depth= 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	7,832	98	Impervious
	4,313	74	>75% Grass cover, Good, HSG C
	12,145	89	Weighted Average
	4,313		35.51% Pervious Area
	7,832		64.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 19S:

Runoff = 0.77 cfs @ 12.10 hrs, Volume= 0.059 af, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	4,091	98	Impervious
	2,872	74	>75% Grass cover, Good, HSG C
	6,963	88	Weighted Average
	2,872		41.25% Pervious Area
	4,091		58.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 20S:

Runoff = 1.55 cfs @ 12.21 hrs, Volume= 0.147 af, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	6,883	98	Impervious
	13,337	74	>75% Grass cover, Good, HSG C
	20,220	82	Weighted Average
	13,337		65.96% Pervious Area
	6,883		34.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 21S:

Runoff = 0.81 cfs @ 12.14 hrs, Volume= 0.069 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	4,391	98	Impervious
	3,905	74	>75% Grass cover, Good, HSG C
	8,296	87	Weighted Average
	3,905		47.07% Pervious Area
	4,391		52.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 22S:

Runoff = 0.28 cfs @ 12.03 hrs, Volume= 0.021 af, Depth> 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	1,964	98	Impervious
	0	74	>75% Grass cover, Good, HSG C
	1,964	98	Weighted Average
	1,964		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 23S:

Runoff = 0.28 cfs @ 12.03 hrs, Volume= 0.021 af, Depth> 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	1,978	98	Impervious
	0	74	>75% Grass cover, Good, HSG C
	1,978	98	Weighted Average
	1,978		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 24S:

Runoff = 0.22 cfs @ 12.03 hrs, Volume= 0.016 af, Depth> 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	1,529	98	Impervious
	0	74	>75% Grass cover, Good, HSG C
	1,529	98	Weighted Average
	1,529		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 25S:

Runoff = 0.22 cfs @ 12.03 hrs, Volume= 0.016 af, Depth> 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	1,529	98	Impervious
	0	74	>75% Grass cover, Good, HSG C
	1,529	98	Weighted Average
	1,529		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 26S:

Runoff = 0.21 cfs @ 12.03 hrs, Volume= 0.016 af, Depth> 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	1,467	98	Impervious
	0	74	>75% Grass cover, Good, HSG C
	1,467	98	Weighted Average
	1,467		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 27S:

Runoff = 1.15 cfs @ 12.07 hrs, Volume= 0.085 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	6,251	98	Impervious
	3,336	74	>75% Grass cover, Good, HSG C
	9,587	90	Weighted Average
	3,336		34.80% Pervious Area
	6,251		65.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 28S:

Runoff = 0.21 cfs @ 12.03 hrs, Volume= 0.016 af, Depth> 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	1,463	98	Impervious
	0	74	>75% Grass cover, Good, HSG C
	1,463	98	Weighted Average
	1,463		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 29S:

Runoff = 0.99 cfs @ 12.21 hrs, Volume= 0.093 af, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	2,030	98	Impervious
	12,725	74	>75% Grass cover, Good, HSG C
	14,755	77	Weighted Average
	12,725		86.24% Pervious Area
	2,030		13.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 30S:

Runoff = 1.25 cfs @ 12.07 hrs, Volume= 0.094 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	7,662	98	Impervious
	2,380	74	>75% Grass cover, Good, HSG C
	10,042	92	Weighted Average
	2,380		23.70% Pervious Area
	7,662		76.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment 31S:

Runoff = 1.89 cfs @ 12.07 hrs, Volume= 0.145 af, Depth= 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

	Area (sf)	CN	Description
*	12,160	98	Impervious
	2,740	74	>75% Grass cover, Good, HSG C
	14,900	94	Weighted Average
	2,740		18.39% Pervious Area
	12,160		81.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Assumed Tc**

Summary for Pond 29P:

Inflow Area = 0.339 ac, 13.76% Impervious, Inflow Depth = 3.31" for 25 Year event
Inflow = 0.99 cfs @ 12.21 hrs, Volume= 0.093 af
Outflow = 0.99 cfs @ 12.21 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.0 min
Primary = 0.99 cfs @ 12.21 hrs, Volume= 0.093 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 224.32' @ 12.21 hrs
Flood Elev= 227.83'

Device	Routing	Invert	Outlet Devices
#1	Primary	223.77'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 223.77' / 223.57' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.00 cfs @ 12.21 hrs HW=224.32' TW=224.06' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.00 cfs @ 2.82 fps)

Summary for Pond CB1:

Inflow Area = 2.849 ac, 65.07% Impervious, Inflow Depth > 4.62" for 25 Year event
Inflow = 13.73 cfs @ 12.09 hrs, Volume= 1.097 af
Outflow = 13.73 cfs @ 12.09 hrs, Volume= 1.097 af, Atten= 0%, Lag= 0.0 min
Primary = 13.73 cfs @ 12.09 hrs, Volume= 1.097 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 205.91' @ 12.09 hrs
Flood Elev= 207.26'

Device	Routing	Invert	Outlet Devices
#1	Primary	202.56'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 202.56' / 202.00' S= 0.0140 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=13.53 cfs @ 12.09 hrs HW=205.84' (Free Discharge)
1=Culvert (Inlet Controls 13.53 cfs @ 7.65 fps)

Summary for Pond CB10:

Inflow Area = 0.194 ac, 53.76% Impervious, Inflow Depth = 4.33" for 25 Year event
Inflow = 0.91 cfs @ 12.10 hrs, Volume= 0.070 af
Outflow = 0.91 cfs @ 12.10 hrs, Volume= 0.070 af, Atten= 0%, Lag= 0.0 min
Primary = 0.91 cfs @ 12.10 hrs, Volume= 0.070 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 210.85' @ 12.15 hrs
Flood Elev= 213.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	209.70'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 209.70' / 209.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 12.10 hrs HW=210.68' TW=210.83' (Dynamic Tailwater)
↑└**1=Culvert** (Controls 0.00 cfs)

Summary for Pond CB11:

Inflow Area = 0.556 ac, 58.08% Impervious, Inflow Depth = 4.42" for 25 Year event
Inflow = 2.66 cfs @ 12.10 hrs, Volume= 0.205 af
Outflow = 2.66 cfs @ 12.10 hrs, Volume= 0.205 af, Atten= 0%, Lag= 0.0 min
Primary = 2.66 cfs @ 12.10 hrs, Volume= 0.205 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 215.59' @ 12.10 hrs
Flood Elev= 219.22'

Device	Routing	Invert	Outlet Devices
#1	Primary	214.77'	**15.0" Round Culvert** L= 82.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 214.77' / 212.81' S= 0.0239 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.65 cfs @ 12.10 hrs HW=215.59' TW=213.63' (Dynamic Tailwater)
↑└**1=Culvert** (Inlet Controls 2.65 cfs @ 3.09 fps)

Summary for Pond CB12:

Inflow Area = 0.214 ac, 49.57% Impervious, Inflow Depth = 4.22" for 25 Year event
Inflow = 0.99 cfs @ 12.10 hrs, Volume= 0.075 af
Outflow = 0.99 cfs @ 12.10 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min
Primary = 0.99 cfs @ 12.10 hrs, Volume= 0.075 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 215.69' @ 12.14 hrs
Flood Elev= 219.22'

Device	Routing	Invert	Outlet Devices
#1	Primary	214.97'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 214.97' / 214.77' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.68 cfs @ 12.10 hrs HW=215.66' TW=215.59' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.68 cfs @ 1.42 fps)

Summary for Pond CB13:

Inflow Area = 3.568 ac, 59.23% Impervious, Inflow Depth > 4.47" for 25 Year event
Inflow = 14.52 cfs @ 12.10 hrs, Volume= 1.329 af
Outflow = 14.52 cfs @ 12.10 hrs, Volume= 1.329 af, Atten= 0%, Lag= 0.0 min
Primary = 14.52 cfs @ 12.10 hrs, Volume= 1.329 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 201.29' @ 12.10 hrs
Flood Elev= 204.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	199.26'	**24.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 199.26' / 198.90' S= 0.0120 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=14.42 cfs @ 12.10 hrs HW=201.28' (Free Discharge)
1=Culvert (Barrel Controls 14.42 cfs @ 5.65 fps)

Summary for Pond CB14:

Inflow Area = 3.230 ac, 58.94% Impervious, Inflow Depth > 4.46" for 25 Year event
Inflow = 13.09 cfs @ 12.10 hrs, Volume= 1.201 af
Outflow = 13.10 cfs @ 12.10 hrs, Volume= 1.201 af, Atten= 0%, Lag= 0.0 min
Primary = 13.10 cfs @ 12.10 hrs, Volume= 1.201 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 201.94' @ 12.13 hrs
Flood Elev= 205.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	198.99'	**24.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 198.99' / 198.79' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=11.69 cfs @ 12.10 hrs HW=201.89' TW=201.29' (Dynamic Tailwater)
1=Culvert (Inlet Controls 11.69 cfs @ 3.72 fps)

Summary for Pond CB15:

Inflow Area = 3.136 ac, 58.55% Impervious, Inflow Depth > 4.45" for 25 Year event
Inflow = 12.62 cfs @ 12.10 hrs, Volume= 1.164 af
Outflow = 12.62 cfs @ 12.10 hrs, Volume= 1.164 af, Atten= 0%, Lag= 0.0 min
Primary = 12.62 cfs @ 12.10 hrs, Volume= 1.164 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 202.49' @ 12.16 hrs
Flood Elev= 205.59'

Device	Routing	Invert	Outlet Devices
#1	Primary	199.89'	**24.0" Round Culvert** L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 199.89' / 199.46' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=7.35 cfs @ 12.10 hrs HW=202.12' TW=201.89' (Dynamic Tailwater)
1=Culvert (Inlet Controls 7.35 cfs @ 2.34 fps)

Summary for Pond CB16:

Inflow Area = 0.210 ac, 69.02% Impervious, Inflow Depth = 4.76" for 25 Year event
Inflow = 1.06 cfs @ 12.10 hrs, Volume= 0.083 af
Outflow = 1.06 cfs @ 12.10 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.0 min
Primary = 1.06 cfs @ 12.10 hrs, Volume= 0.083 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 202.50' @ 12.21 hrs
Flood Elev= 205.59'

Device	Routing	Invert	Outlet Devices
#1	Primary	201.34'	**15.0" Round Culvert** L= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 201.34' / 201.14' S= 0.0056 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 12.10 hrs HW=201.97' TW=202.11' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB17:

Inflow Area = 2.723 ac, 58.54% Impervious, Inflow Depth > 4.45" for 25 Year event
Inflow = 10.78 cfs @ 12.10 hrs, Volume= 1.011 af
Outflow = 10.78 cfs @ 12.10 hrs, Volume= 1.011 af, Atten= 0%, Lag= 0.0 min
Primary = 10.78 cfs @ 12.10 hrs, Volume= 1.011 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 210.86' @ 12.10 hrs
Flood Elev= 213.84'

Device	Routing	Invert	Outlet Devices
#1	Primary	208.50'	**18.0" Round Culvert** L= 164.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 208.50' / 199.89' S= 0.0525 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=10.75 cfs @ 12.10 hrs HW=210.85' TW=202.10' (Dynamic Tailwater)
1=Culvert (Inlet Controls 10.75 cfs @ 6.08 fps)

Summary for Pond CB18:

Inflow Area = 0.279 ac, 64.49% Impervious, Inflow Depth = 4.54" for 25 Year event
Inflow = 1.23 cfs @ 12.14 hrs, Volume= 0.106 af
Outflow = 1.23 cfs @ 12.14 hrs, Volume= 0.106 af, Atten= 0%, Lag= 0.0 min
Primary = 1.23 cfs @ 12.14 hrs, Volume= 0.106 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 210.90' @ 12.15 hrs
Flood Elev= 213.84'

Device	Routing	Invert	Outlet Devices
#1	Primary	209.59'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 209.59' / 209.39' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.61 cfs @ 12.14 hrs HW=210.85' TW=210.66' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.61 cfs @ 2.12 fps)

Summary for Pond CB19:

Inflow Area = 0.975 ac, 52.65% Impervious, Inflow Depth > 4.30" for 25 Year event
Inflow = 3.39 cfs @ 12.12 hrs, Volume= 0.349 af
Outflow = 3.39 cfs @ 12.12 hrs, Volume= 0.349 af, Atten= 0%, Lag= 0.0 min
Primary = 3.39 cfs @ 12.12 hrs, Volume= 0.349 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 219.30' @ 12.13 hrs
Flood Elev= 221.26'

Device	Routing	Invert	Outlet Devices
#1	Primary	216.81'	**15.0" Round Culvert** L= 142.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 216.81' / 216.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.86 cfs @ 12.12 hrs HW=219.21' TW=218.55' (Dynamic Tailwater)
1=Culvert (Outlet Controls 3.86 cfs @ 3.14 fps)

Summary for Pond CB2:

Inflow Area = 0.276 ac, 64.87% Impervious, Inflow Depth = 4.65" for 25 Year event
Inflow = 1.37 cfs @ 12.10 hrs, Volume= 0.107 af
Outflow = 1.37 cfs @ 12.10 hrs, Volume= 0.107 af, Atten= 0%, Lag= 0.0 min
Primary = 1.37 cfs @ 12.10 hrs, Volume= 0.107 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 205.95' @ 12.14 hrs
Flood Elev= 207.26'

Device	Routing	Invert	Outlet Devices
#1	Primary	203.01'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 203.01' / 202.81' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 12.10 hrs HW=205.53' TW=205.90' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB20:

Inflow Area = 0.815 ac, 51.45% Impervious, Inflow Depth > 4.27" for 25 Year event
Inflow = 2.69 cfs @ 12.16 hrs, Volume= 0.290 af
Outflow = 2.69 cfs @ 12.16 hrs, Volume= 0.290 af, Atten= 0%, Lag= 0.0 min
Primary = 2.69 cfs @ 12.16 hrs, Volume= 0.290 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 219.50' @ 12.18 hrs
Flood Elev= 221.26'

Device	Routing	Invert	Outlet Devices
#1	Primary	217.01'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 217.01' / 216.81' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.72 cfs @ 12.16 hrs HW=219.38' TW=219.17' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.72 cfs @ 2.22 fps)

Summary for Pond CB21:

Inflow Area = 0.351 ac, 74.47% Impervious, Inflow Depth > 4.89" for 25 Year event
Inflow = 1.56 cfs @ 12.06 hrs, Volume= 0.143 af
Outflow = 1.56 cfs @ 12.06 hrs, Volume= 0.143 af, Atten= 0%, Lag= 0.0 min
Primary = 1.56 cfs @ 12.06 hrs, Volume= 0.143 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 219.53' @ 12.23 hrs
Flood Elev= 222.01'

Device	Routing	Invert	Outlet Devices
#1	Primary	217.56'	**15.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 217.56' / 217.01' S= 0.0138 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.02 cfs @ 12.06 hrs HW=218.28' TW=218.14' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.02 cfs @ 1.99 fps)

Summary for Pond CB22:

Inflow Area = 0.161 ac,100.00% Impervious, Inflow Depth > 5.56" for 25 Year event
Inflow = 0.99 cfs @ 12.03 hrs, Volume= 0.074 af
Outflow = 0.99 cfs @ 12.03 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min
Primary = 0.99 cfs @ 12.03 hrs, Volume= 0.074 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 219.53' @ 12.28 hrs
Flood Elev= 222.01'

Device	Routing	Invert	Outlet Devices
#1	Primary	217.76'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 217.76' / 217.56' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.67 cfs @ 12.03 hrs HW=218.34' TW=218.24' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.67 cfs @ 1.76 fps)

Summary for Pond CB23:

Inflow Area = 0.116 ac,100.00% Impervious, Inflow Depth > 5.56" for 25 Year event
Inflow = 0.71 cfs @ 12.03 hrs, Volume= 0.054 af
Outflow = 0.71 cfs @ 12.03 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min
Primary = 0.71 cfs @ 12.03 hrs, Volume= 0.054 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 226.84' @ 12.03 hrs
Flood Elev= 230.69'

Device	Routing	Invert	Outlet Devices
#1	Primary	226.44'	**15.0" Round Culvert** L= 142.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 226.44' / 217.76' S= 0.0611 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.68 cfs @ 12.03 hrs HW=226.83' TW=218.34' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.68 cfs @ 2.12 fps)

Summary for Pond CB24:

Inflow Area = 0.070 ac,100.00% Impervious, Inflow Depth > 5.56" for 25 Year event
Inflow = 0.43 cfs @ 12.03 hrs, Volume= 0.033 af
Outflow = 0.43 cfs @ 12.03 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.03 hrs, Volume= 0.033 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 230.61' @ 12.03 hrs
Flood Elev= 234.76'

Device	Routing	Invert	Outlet Devices
#1	Primary	230.31'	**15.0" Round Culvert** L= 142.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 230.31' / 226.37' S= 0.0277 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.41 cfs @ 12.03 hrs HW=230.61' TW=226.83' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.41 cfs @ 1.86 fps)

Summary for Pond CB25:

Inflow Area = 0.035 ac,100.00% Impervious, Inflow Depth > 5.56" for 25 Year event
Inflow = 0.22 cfs @ 12.03 hrs, Volume= 0.016 af
Outflow = 0.22 cfs @ 12.03 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min
Primary = 0.22 cfs @ 12.03 hrs, Volume= 0.016 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 230.76' @ 12.05 hrs
Flood Elev= 234.76'

Device	Routing	Invert	Outlet Devices
#1	Primary	230.51'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 230.51' / 230.31' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.19 cfs @ 12.03 hrs HW=230.75' TW=230.61' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.19 cfs @ 1.74 fps)

Summary for Pond CB26:

Inflow Area = 1.199 ac, 59.43% Impervious, Inflow Depth > 4.49" for 25 Year event
Inflow = 5.28 cfs @ 12.07 hrs, Volume= 0.449 af
Outflow = 5.28 cfs @ 12.07 hrs, Volume= 0.449 af, Atten= 0%, Lag= 0.0 min
Primary = 5.28 cfs @ 12.07 hrs, Volume= 0.449 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 222.74' @ 12.07 hrs
Flood Elev= 226.81'

Device	Routing	Invert	Outlet Devices
#1	Primary	221.33'	**15.0" Round Culvert** L= 38.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 221.33' / 220.41' S= 0.0242 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=5.10 cfs @ 12.07 hrs HW=222.70' TW=218.71' (Dynamic Tailwater)
1=Culvert (Inlet Controls 5.10 cfs @ 4.16 fps)

Summary for Pond CB27:

Inflow Area = 0.793 ac, 75.51% Impervious, Inflow Depth = 4.91" for 25 Year event
Inflow = 4.29 cfs @ 12.07 hrs, Volume= 0.324 af
Outflow = 4.29 cfs @ 12.07 hrs, Volume= 0.324 af, Atten= 0%, Lag= 0.0 min
Primary = 4.29 cfs @ 12.07 hrs, Volume= 0.324 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 223.18' @ 12.10 hrs
Flood Elev= 226.81'

Device	Routing	Invert	Outlet Devices
#1	Primary	221.53'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 221.53' / 221.33' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.24 cfs @ 12.07 hrs HW=223.00' TW=222.70' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.24 cfs @ 2.64 fps)

Summary for Pond CB28:

Inflow Area = 0.372 ac, 21.54% Impervious, Inflow Depth > 3.51" for 25 Year event
Inflow = 1.07 cfs @ 12.20 hrs, Volume= 0.109 af
Outflow = 1.07 cfs @ 12.20 hrs, Volume= 0.109 af, Atten= 0%, Lag= 0.0 min
Primary = 1.07 cfs @ 12.20 hrs, Volume= 0.109 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 224.07' @ 12.17 hrs
Flood Elev= 227.83'

Device	Routing	Invert	Outlet Devices
#1	Primary	223.57'	**15.0" Round Culvert** L= 214.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 223.57' / 221.33' S= 0.0105 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.08 cfs @ 12.20 hrs HW=224.06' TW=222.28' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.08 cfs @ 2.39 fps)

Summary for Pond CB3:

Inflow Area = 1.116 ac, 69.99% Impervious, Inflow Depth > 4.73" for 25 Year event
Inflow = 5.40 cfs @ 12.07 hrs, Volume= 0.440 af
Outflow = 5.40 cfs @ 12.07 hrs, Volume= 0.440 af, Atten= 0%, Lag= 0.0 min
Primary = 5.40 cfs @ 12.07 hrs, Volume= 0.440 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 206.86' @ 12.12 hrs
Flood Elev= 208.97'

Device	Routing	Invert	Outlet Devices
#1	Primary	204.52'	**15.0" Round Culvert** L= 154.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 204.52' / 202.81' S= 0.0111 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.73 cfs @ 12.07 hrs HW=206.34' TW=205.68' (Dynamic Tailwater)
1=Culvert (Outlet Controls 3.73 cfs @ 3.04 fps)

Summary for Pond CB30:

Inflow Area = 0.573 ac, 79.47% Impervious, Inflow Depth = 5.01" for 25 Year event
Inflow = 3.14 cfs @ 12.07 hrs, Volume= 0.239 af
Outflow = 3.14 cfs @ 12.07 hrs, Volume= 0.239 af, Atten= 0%, Lag= 0.0 min
Primary = 3.14 cfs @ 12.07 hrs, Volume= 0.239 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 226.15' @ 12.07 hrs
Flood Elev= 231.07'

Device	Routing	Invert	Outlet Devices
#1	Primary	225.23'	**15.0" Round Culvert** L= 74.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 225.23' / 221.53' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.02 cfs @ 12.07 hrs HW=226.12' TW=223.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 3.02 cfs @ 3.22 fps)

Summary for Pond CB31:

Inflow Area = 0.342 ac, 81.61% Impervious, Inflow Depth = 5.10" for 25 Year event
Inflow = 1.89 cfs @ 12.07 hrs, Volume= 0.145 af
Outflow = 1.89 cfs @ 12.07 hrs, Volume= 0.145 af, Atten= 0%, Lag= 0.0 min
Primary = 1.89 cfs @ 12.07 hrs, Volume= 0.145 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 227.12' @ 12.08 hrs
Flood Elev= 230.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	226.43'	**15.0" Round Culvert** L= 120.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 226.43' / 225.23' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.75 cfs @ 12.07 hrs HW=227.10' TW=226.12' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 1.75 cfs @ 3.78 fps)

Summary for Pond CB4:

Inflow Area = 0.103 ac, 77.08% Impervious, Inflow Depth = 4.87" for 25 Year event
Inflow = 0.60 cfs @ 12.03 hrs, Volume= 0.042 af
Outflow = 0.60 cfs @ 12.03 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min
Primary = 0.60 cfs @ 12.03 hrs, Volume= 0.042 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 206.86' @ 12.17 hrs
Flood Elev= 208.97'

Device	Routing	Invert	Outlet Devices
#1	Primary	204.72'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 204.72' / 204.52' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 12.03 hrs HW=205.56' TW=205.83' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB5:

Inflow Area = 0.161 ac,100.00% Impervious, Inflow Depth > 5.56" for 25 Year event
Inflow = 1.00 cfs @ 12.03 hrs, Volume= 0.075 af
Outflow = 1.00 cfs @ 12.03 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min
Primary = 1.00 cfs @ 12.03 hrs, Volume= 0.075 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 212.15' @ 12.03 hrs
Flood Elev= 216.13'

Device	Routing	Invert	Outlet Devices
#1	Primary	211.68'	**15.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 211.68' / 209.96' S= 0.0287 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.95 cfs @ 12.03 hrs HW=212.14' TW=206.76' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.95 cfs @ 2.31 fps)

Summary for Pond CB6:

Inflow Area = 0.061 ac,100.00% Impervious, Inflow Depth > 5.56" for 25 Year event
Inflow = 0.38 cfs @ 12.03 hrs, Volume= 0.028 af
Outflow = 0.38 cfs @ 12.03 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min
Primary = 0.38 cfs @ 12.03 hrs, Volume= 0.028 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 212.25' @ 12.05 hrs
Flood Elev= 216.13'

Device	Routing	Invert	Outlet Devices
#1	Primary	211.88'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 211.88' / 211.68' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.30 cfs @ 12.03 hrs HW=212.24' TW=212.14' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.30 cfs @ 1.57 fps)

Summary for Pond CB7:

Inflow Area = 0.723 ac, 62.50% Impervious, Inflow Depth = 4.54" for 25 Year event
Inflow = 3.53 cfs @ 12.10 hrs, Volume= 0.274 af
Outflow = 3.53 cfs @ 12.10 hrs, Volume= 0.274 af, Atten= 0%, Lag= 0.0 min
Primary = 3.53 cfs @ 12.10 hrs, Volume= 0.274 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 211.80' @ 12.10 hrs
Flood Elev= 215.26'

Device	Routing	Invert	Outlet Devices
#1	Primary	210.81'	**15.0" Round Culvert** L= 42.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 210.81' / 209.96' S= 0.0202 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.53 cfs @ 12.10 hrs HW=211.80' TW=206.87' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.53 cfs @ 3.39 fps)

Summary for Pond CB8:

Inflow Area = 0.378 ac, 61.82% Impervious, Inflow Depth = 4.54" for 25 Year event
Inflow = 1.85 cfs @ 12.10 hrs, Volume= 0.143 af
Outflow = 1.85 cfs @ 12.10 hrs, Volume= 0.143 af, Atten= 0%, Lag= 0.0 min
Primary = 1.85 cfs @ 12.10 hrs, Volume= 0.143 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 211.95' @ 12.13 hrs
Flood Elev= 215.26'

Device	Routing	Invert	Outlet Devices
#1	Primary	211.01'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 211.01' / 210.81' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.38 cfs @ 12.10 hrs HW=211.92' TW=211.80' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.38 cfs @ 2.02 fps)

Summary for Pond CB9:

Inflow Area = 1.035 ac, 58.00% Impervious, Inflow Depth = 4.43" for 25 Year event
Inflow = 4.96 cfs @ 12.10 hrs, Volume= 0.383 af
Outflow = 4.96 cfs @ 12.10 hrs, Volume= 0.383 af, Atten= 0%, Lag= 0.0 min
Primary = 4.96 cfs @ 12.10 hrs, Volume= 0.383 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 210.83' @ 12.10 hrs
Flood Elev= 213.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	209.50'	**15.0" Round Culvert** L= 74.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 209.50' / 205.74' S= 0.0508 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=4.96 cfs @ 12.10 hrs HW=210.83' TW=207.07' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 4.96 cfs @ 4.04 fps)

Summary for Pond DMH1:

Inflow Area = 0.884 ac, 69.35% Impervious, Inflow Depth > 4.73" for 25 Year event
Inflow = 4.23 cfs @ 12.09 hrs, Volume= 0.348 af
Outflow = 4.23 cfs @ 12.09 hrs, Volume= 0.348 af, Atten= 0%, Lag= 0.0 min
Primary = 4.23 cfs @ 12.09 hrs, Volume= 0.348 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 207.17' @ 12.16 hrs
Flood Elev= 209.99'

Device	Routing	Invert	Outlet Devices
#1	Primary	205.74'	**15.0" Round Culvert** L= 74.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 205.74' / 202.81' S= 0.0396 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.48 cfs @ 12.09 hrs HW=206.86' TW=206.52' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 2.48 cfs @ 2.84 fps)

Summary for Pond DMH2:

Inflow Area = 0.556 ac, 58.08% Impervious, Inflow Depth = 4.42" for 25 Year event
Inflow = 2.66 cfs @ 12.10 hrs, Volume= 0.205 af
Outflow = 2.66 cfs @ 12.10 hrs, Volume= 0.205 af, Atten= 0%, Lag= 0.0 min
Primary = 2.66 cfs @ 12.10 hrs, Volume= 0.205 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 213.63' @ 12.10 hrs
Flood Elev= 217.06'

Device	Routing	Invert	Outlet Devices
#1	Primary	212.81'	**15.0" Round Culvert** L= 84.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 212.81' / 209.50' S= 0.0394 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.65 cfs @ 12.10 hrs HW=213.63' TW=210.83' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.65 cfs @ 3.09 fps)

Summary for Pond DMH3:

Inflow Area = 1.035 ac, 58.00% Impervious, Inflow Depth = 4.43" for 25 Year event
Inflow = 4.96 cfs @ 12.10 hrs, Volume= 0.383 af
Outflow = 4.96 cfs @ 12.10 hrs, Volume= 0.383 af, Atten= 0%, Lag= 0.0 min
Primary = 4.96 cfs @ 12.10 hrs, Volume= 0.383 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 207.07' @ 12.10 hrs
Flood Elev= 209.99'

Device	Routing	Invert	Outlet Devices
#1	Primary	205.74'	**15.0" Round Culvert** L= 74.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 205.74' / 202.81' S= 0.0396 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=4.96 cfs @ 12.10 hrs HW=207.07' TW=205.89' (Dynamic Tailwater)
1=Culvert (Inlet Controls 4.96 cfs @ 4.04 fps)

Summary for Pond DMH4:

Inflow Area = 2.174 ac, 56.39% Impervious, Inflow Depth > 4.41" for 25 Year event
Inflow = 8.50 cfs @ 12.08 hrs, Volume= 0.798 af
Outflow = 8.50 cfs @ 12.08 hrs, Volume= 0.798 af, Atten= 0%, Lag= 0.0 min
Primary = 8.50 cfs @ 12.08 hrs, Volume= 0.798 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 218.79' @ 12.08 hrs
Flood Elev= 225.18'

Device	Routing	Invert	Outlet Devices
#1	Primary	216.10'	**15.0" Round Culvert** L= 212.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 216.10' / 209.39' S= 0.0317 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=8.37 cfs @ 12.08 hrs HW=218.73' TW=210.79' (Dynamic Tailwater)
1=Culvert (Inlet Controls 8.37 cfs @ 6.82 fps)

MAINTENANCE PLAN OF STORMWATER MANAGEMENT FACILITIES
FOR:
SUNRISE COVE RETIREMENT COMMUNITY
WINDHAM, MAINE

Project Developer: Chase Custom Homes & Finance
290 Bridgton Road
Westbrook, ME 04092

Responsible Party: Sunrise Cove Condominium Association
290 Bridgton Road
Westbrook, ME 04092

Prepared By: Terradyn Consultants, LLC
PO Box 339
New Gloucester, ME 04260

LIST OF STORMWATER MEASURES:

Conveyance & Distribution System (Stormwater Channels & Culverts)
Roadways & Parking Surfaces
Level Spreaders
Catch Basin Systems
Gravel Wetland

INTRODUCTION:

The owner or operator of the proposed project will be responsible for the maintenance of all stormwater management structures except the rain gardens located on individual lots, the establishment of any contract services required to implement the program, and the keeping of records and maintenance log book. Records of all inspections and maintenance work accomplished must be kept on file and retained for a minimum 5 year time span. The maintenance log book will be made available to the DEP upon request. At a minimum, the appropriate and relevant activities for each of the stormwater management systems will be performed on the prescribed schedule.

INSPECTION & MAINTENANCE TASKS:

Inspections should be performed by qualified erosion control professional. NOTE: The following instruction are excerpts from the Maine Department of Environmental Protection's *Stormwater Management for Maine, Volume III BMPs Technical Design Manual*, dated January 2006.

CONVEYANCE & DISTRIBUTION SYSTEMS: (STORMWATER CHANNELS & CULVERTS, ETC.)

1. **Inspection schedule:**
   - **1.1.** Inspect ditches, swales and other open stormwater channels in the spring, in late fall, and after heavy rains to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or

underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or side-slopes.

1.2. Inspect culverts in the spring, in late fall, and after heavy rains to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.

1.3. Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.

2. **Mowing:** Grass should not be trimmed extremely short, as this will reduce the filtering effect of the swale (MPCA, 1989). The cut vegetation should be removed to prevent the decaying organic litter from adding pollutants to the discharge from the swale. The mowed height of the grass should be 2-4 inches taller than the maximum flow depth of the design water quality storm. A minimum mow height of 6 inches is generally recommended (Galli, 1993).

3. **Erosion:** It is important to install erosion and sediment control measures to stabilize this area as soon as possible and to retain any organic matter in the bottom of the trench.

4. **Fertilization:** Routine fertilization and/or use of pesticides is strongly discouraged. If complete re-seeding is necessary, half the original recommended rate of fertilizer should be applied with a full rate of seed.

5. **Sediment Removal:** The level of sediment deposition in the channel should be monitored regularly, and removed from grassed channels before permanent damage is done to the grassed vegetation, or if infiltration times are longer than 12 hours. Sediment should be removed from riprap channels when it reduces the capacity of the channel.

ROADWAYS & PARKING SURFACES:

1. Paved surfaces shall be swept or vacuumed at least twice annually in the Spring to remove all Winter sand, and periodically during the year on an as-needed basis to minimize transportation of sediment during rainfall events.

LEVEL SPREADERS:

1. **Inspections:** At least once a year and following major storms, the level spreader pool should be inspected for sand accumulation and debris that may reduce its capacity.

2. **Sediment Removal:** Sediment build-up within the swale should be removed when it has accumulated to approximately 25% of design volume or channel capacity. Dispose of the sediments appropriately.

3. **Debris:** Remove debris such as leaf litter, branches and tree growth from the spreader.

4. **Mowing***:* Vegetated spreaders may require mowing.

5. **Snow Storage:** Do not store snow within the area of the level spreader.

6. **Level Spreader Replacement:** The reconstruction of the level spreader may be necessary when sheet flow from the spreader channelize into the buffer.

CATCH BASIN SYSTEMS:

1. Catch basins are designed with a deep sump to trap larger sediment. Catch basins shall be inspected for sediment depth in the spring and fall, and accumulated sediment shall be removed and disposed of lawfully when it reaches 50% of the design capacity of the sump.

GRAVEL WETLANDS:

1ST YEAR POST-CONSTRUCTION: Inspection frequency should be after every major storm in the first year following construction.

1. Inspect to be certain system drains within 24-48 hours.
2. Watering plants as necessary during the first growing season
3. Re-vegetating poorly established areas as necessary
4. Quarterly inspection of soil and repairing eroded areas, especially on slopes & make timely repairs.
5. Checking inlets, outlets, and overflow spillway for blockage, structural integrity, and evidence of erosion. Risers may need to be cleaned.

POST-CONSTRUCTION: Inspection frequency should be at least every 6 months and after every major storm. Activities are expected to include:

1. Check the basin for a dense root mat establishment of wetland vegetation.
2. Check and clean the risers if there is evidence of standing water, discolored water or accumulated sediments in the cells.
3. Check and clean the forebay for sediments, trash and debris. When sediments have accumulated to a depth of 12 inches, standing water is persistent or wetland vegetation become established, the forebay will need to be excavated and reformed.
4. Verify that the cells drain within 24-48 hours. Sediment will need to be removed when an accumulation of 4 inches is evident over the wetland surface.
5. Check and clean all outlets and overflow spillway if blocked or there is evidence of structural damage or erosion.
6. Remove decaying vegetation, litter and debris.
7. Check for foreign species. Particular care must be used to avoid the unintended introduction of invasive species such as purple loosestrife (Lythrum salicaria) and common reed (Phragmites australis). It is recommended that a qualified wetland biologist be consulted when these are found in the area of the gravel wetland.

CLEANING CRITERIA FOR SEDIMENTATION FOREBAY: Sediment should be removed from the sedimentation chamber (forebay) when it accumulates to a depth of more than 12 inches (30 cm) or 10 percent of the pretreatment volume. The sedimentation forebay should be cleaned of vegetation if persistent standing water and wetland vegetation becomes dominant. The cleaning interval is approximately every 4 years. A dry sedimentation forebay is the optimal condition while in practice this condition is rarely achieved. The sedimentation chamber, forebay, and treatment cell outlet devices should be cleaned when drawdown times exceed 60 to 72 hours. Materials can be removed with heavy construction equipment; however, this equipment should not track on the wetland surface. Revegetation of disturbed areas as necessary. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.

CLEANING CRITERIA FOR GRAVEL WETLAND TREATMENT CELLS: Sediment should be removed from the gravel wetland surface when it accumulates to a depth of several inches (>10 cm) across the wetland surface. Materials should be removed with rakes rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.

SAMPLE MAINTENANCE LOG SHEET:

Maintenance Log Sheet			
BMP's	**Date Inspected**	**Repairs Needed?**	**Date Repaired**
Example	8/17/2017	Y	8/27/2017
1. Conveyance & Distribution System			
2. Roadways & Parking			
3. Level Spreaders			
4. Catch Basin Systems			
5. Gravel Wetland			

Detailed Repair Notes:		
BMP Type	**Date**	**Description of Repair Made**
3	8/27/2017	Removed sediment from sump

Inspection & Maintenance Log

Gravel Wetland

Inspection Frequency Key: A=annually; B=biannually; S=after major storms (>1")

Inspection/Maintenance Task	Inspection Frequency	Date Inspected	Maintenance Needed?	Date Repaired	Date Inspected	Maintenance Needed?	Date Repaired
First Year Post Construction Phase							
Inspect that the system drains within 24-48 hours.	S						
Water plants, if necessary. Revegetate as necessary	S						
Identify areas of erosion & repair as necessary	S						
Check all inlets, outlets and subdrains for proper function. Clean risers as needed	S						
Post Construction Phase							
Check basin for dense root mat of wetland vegetation.	B/S						
Check and clean risers if there is evidence of standing or discolored water, or accumulated sediment	B/S						
Check & clean forebay for sediment, trash & debris. Excavate & reform forebay when sediment is >12", persisitant standing water or wetland vegetation becomes established	B/S						
Verify that cells drain within 24-48 hours. Sediment to be removed when >4"	B/S						
Check and clean all outlets and overflow spillway if blocked or there are signs of damage or erosion	B/S						
Remove decaying vegetation, litter & debris	B/S						
Check for foreign species & remove consult wetland biologist when invasive species are found	B/S						

Date	Description of Repair/Comments

HOUSEKEEPING PERFORMANCE STANDARDS
SUNRISE COVE RETIREMENT COMMUNITY
WINDHAM, MAINE

Project Developer: Chase Custom Homes & Finance
290 Bridgton Road
Westbrook, ME 04092

Responsible Party: Sunrise Cove Condominium Association
290 Bridgton Road
Westbrook, ME 04092

Introduction:
The contractor shall be responsible for maintaining proper housekeeping standards throughout the construction phase of the project. After the construction phase has been completed, the owner or operator of the project will be responsible.

Standards:
In accordance with the housekeeping performance standards required by MDEP chapter 500 stormwater regulations, the following standards shall be met:

1. **Spill prevention.** Controls must be used to prevent pollutants from being discharged from materials on site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.
2. **Groundwater protection.** During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.
3. **Fugitive sediment and dust.** Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.

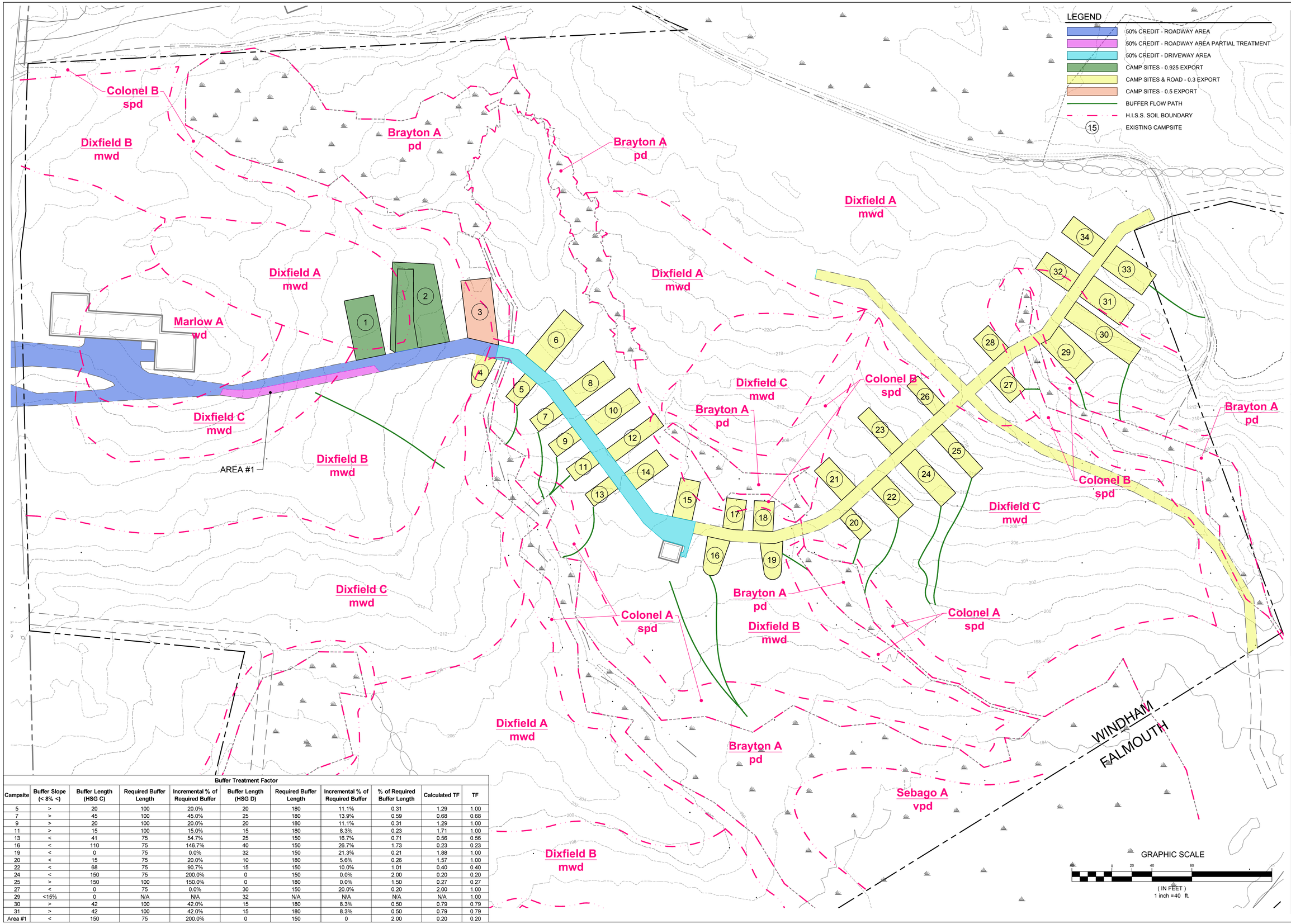
   Operations during wet months that experience tracking of mud off the site onto public roads should provide for sweeping of road areas at least once a week and prior to significant storm events. Where chronic mud tracking occurs, a stabilized construction entrance should be provided. Operations during dry months, that experience fugitive dust problems, should wet down the access roads once a week or more frequently as needed.
4. **Debris and other materials.** Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.

   To prevent these materials from becoming a source of pollutants, construction and post-construction activities related to a project may be required to comply with applicable provision of rules related to solid, universal, and hazardous waste, including, but not limited

to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements.

5. **Trench or foundation de-watering.** Trench de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the department.

6. **Non-stormwater discharges.** Identify and prevent contamination by non-stormwater discharges.



Buffer Treatment Factor

Campsite	Buffer Slope (< 8% <)	Buffer Length (HSG C)	Required Buffer Length	Incremental % of Required Buffer	Buffer Length (HSG D)	Required Buffer Length	Incremental % of Required Buffer	% of Required Buffer Length	Calculated TF	TF
5	>	20	100	20.0%	20	180	11.1%	0.31	1.29	1.00
7	>	45	100	45.0%	25	180	13.9%	0.59	0.68	0.68
9	>	20	100	20.0%	20	180	11.1%	0.31	1.29	1.00
11	>	15	100	15.0%	15	180	8.3%	0.23	1.71	1.00
13	<	41	75	54.7%	25	150	16.7%	0.71	0.56	0.56
16	<	110	75	146.7%	40	150	26.7%	1.73	0.23	0.23
19	<	0	75	0.0%	32	150	21.3%	0.21	1.88	1.00
20	<	15	75	20.0%	10	180	5.6%	0.26	1.57	1.00
22	<	68	75	90.7%	15	150	10.0%	1.01	0.40	0.40
24	<	150	75	200.0%	0	150	0.0%	2.00	0.20	0.20
25	>	150	100	150.0%	0	180	0.0%	1.50	0.27	0.27
27	<	0	75	0.0%	30	150	20.0%	0.20	2.00	1.00
29	<15%	0	N/A	N/A	32	N/A	N/A	N/A	N/A	1.00
30	>	42	100	42.0%	15	180	8.3%	0.50	0.79	0.79
31	>	42	100	42.0%	15	180	8.3%	0.50	0.79	0.79
Area #1	<	150	75	200.0%	0	150	0	2.00	0.20	0.20

STATE OF MAINE
JEFFREY D. AMES
10067
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REVISIONS	APP'D BY
1	3/13/2016	REVISED EXPORT COEFFICIENTS	

TERRADYN CONSULTANTS, LLC
P.O. Box 339
111 Elderberry Lane
New Gloucester, ME 04260
Office: (207) 926-5111
Fax: (207) 221-1317
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Civil Engineering - Land Planning - Stormwater Design - Environmental Permitting

SHEET DESCRIPTION
19 ROOSEVELT TRAIL
19 ROOSEVELT TRAIL, WINDHAM, ME
EXISTING CAMPGROUND w CONTOURS

PREPARED FOR
CHASE CUSTOM HOMES & FINANCE
280 BRIDGTON ROAD
WESTBROOK, MAINE,04092

DATE:	12/1/2018
SCALE:	AS SHOWN
DESIGNED:	JDA
JOB NO:	1817
FILE:	1817-OSPH
SHEET	D-1.0

Buffer Treatment Factor - Offsite Area

Lot	Buffer Slope (< 8% <)	Buffer Length (HSG C)	Required Buffer Length	Incremental % of Required Buffer	Calculated TF	TF	Notes
24/18	<	110	75	146.7%	0.27	0.27	Roof
24/18	<	150	75	200.0%	0.20	0.20	Driveway
24/20	<	150	75	200.0%	0.20	0.20	1.00
7/63-1	<	140	75	186.7%	0.21	0.21	Roof

GRAPHIC SCALE

50 0 25 50 100

(IN FEET)
1 inch = 50 ft.

STATE OF MAINE
JEFFREY D. JAMES
10067
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REVISIONS	APP'D BY

TERRADYN CONSULTANTS, LLC
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New Gloucester, ME 04260
Office: (207) 926-5111
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Civil Engineering - Land Planning - Stormwater Design - Environmental Permitting

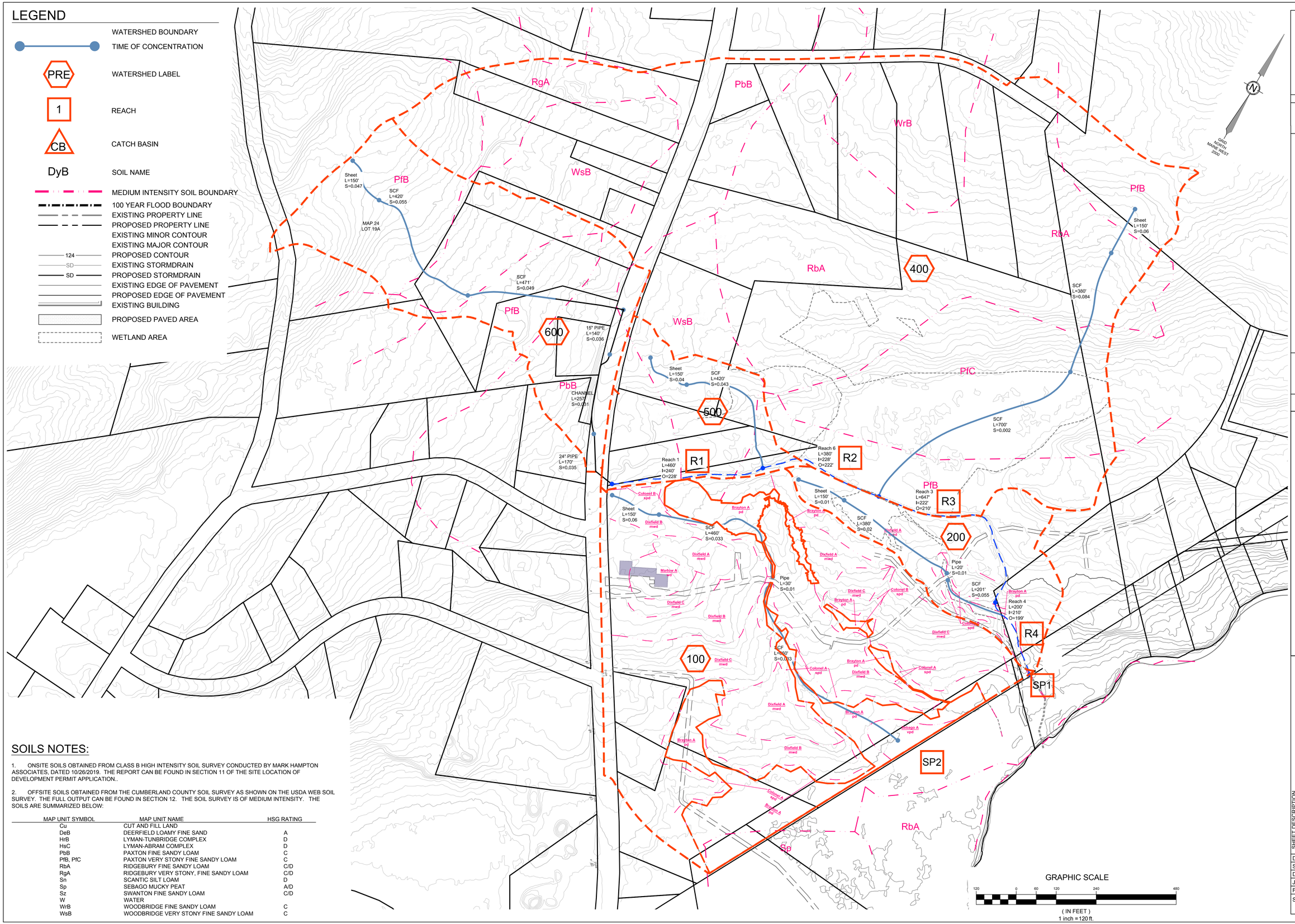
SHEET DESCRIPTION
19 ROOSEVELT TRAIL
19 ROOSEVELT TRAIL, WINDHAM, ME
OFFSITE AREA

PREPARED FOR
CHASE CUSTOM HOMES & FINANCE
200 BRIDGTON ROAD
WESTBROOK, MAINE 04092

DATE:	3/31/2017
SCALE:	AS SHOWN
DESIGNED:	JDA
JOB NO:	1636
FILE:	1636 B
SHEET	D-1.1

LEGEND

- WATERSHED BOUNDARY
- TIME OF CONCENTRATION
- PRE — WATERSHED LABEL
- 1 — REACH
- CB — CATCH BASIN
- DyB — SOIL NAME
- MEDIUM INTENSITY SOIL BOUNDARY
- 100 YEAR FLOOD BOUNDARY
- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- 124 — PROPOSED CONTOUR
- SD — EXISTING STORMDRAIN
- SD — PROPOSED STORMDRAIN
- EXISTING EDGE OF PAVEMENT
- PROPOSED EDGE OF PAVEMENT
- EXISTING BUILDING
- PROPOSED PAVED AREA
- WETLAND AREA



SOILS NOTES:

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MAP UNIT SYMBOL	MAP UNIT NAME	HSG RATING
Cu	CUT AND FILL LAND	
DeB	DEERFIELD LOAMY FINE SAND	A
HrB	LYMAN-TUNBRIDGE COMPLEX	D
HsC	LYMAN-ABRAM COMPLEX	D
PbB	PAXTON FINE SANDY LOAM	C
PfB, PfC	PAXTON VERY STONY FINE SANDY LOAM	C
RbA	RIDGEBURY FINE SANDY LOAM	C/D
RgA	RIDGEBURY VERY STONY, FINE SANDY LOAM	C/D
Sn	SCANTIC SILT LOAM	D
Sp	SEBAGO MUCKY PEAT	A/D
Sz	SWANTON FINE SANDY LOAM	C/D
W	WATER	
WrB	WOODBRIDGE FINE SANDY LOAM	C
WsB	WOODBRIDGE VERY STONY FINE SANDY LOAM	C

STATE OF MAINE — JEFFREY D. AMOS — 10161 — LICENSED PROFESSIONAL ENGINEER

NO.	DATE	REVISIONS	APP'D BY

TERRADYN CONSULTANTS, LLC
Civil Engineering - Land Planning - Stormwater Design - Environmental Permitting
P.O. Box 339
111 Elderberry Lane
New Gloucester, ME 04260
Office: (207) 926-5111
Fax: (207) 221-1317
www.terradynconsultants.com

SHEET DESCRIPTION
19 ROOSEVELT TRAIL
19 ROOSEVELT TRAIL, WINDHAM, ME
PRE DEVELOPMENT WATERSHED MAP

PREPARED FOR
CHASE CUSTOM HOMES & FINANCE
290 BRIGHTON ROAD
WESTBROOK, MAINE,04092

DATE:	3/31/2017
SCALE:	AS SHOWN
DESIGNED:	JDA
JOB NO:	1817
FILE: 1636 B	
SHEET	D-1.2

LEGEND

- WATERSHED BOUNDARY
- TIME OF CONCENTRATION
- PRE — WATERSHED LABEL
- 1 — REACH
- CB — CATCH BASIN
- Colonel — HIGH INTENSITY SOIL NAME
- HIGH INTENSITY SOIL BOUNDARY
- DyB — MEDIUM INTENSITY SOIL NAME
- MEDIUM INTENSITY SOIL BOUNDARY
- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- 124 — EXISTING MINOR CONTOUR
- 124 — EXISTING MAJOR CONTOUR
- 124 — PROPOSED CONTOUR
- SD — EXISTING STORMDRAIN
- SD — PROPOSED STORMDRAIN
- EXISTING EDGE OF PAVEMENT
- PROPOSED EDGE OF PAVEMENT
- EXISTING BUILDING
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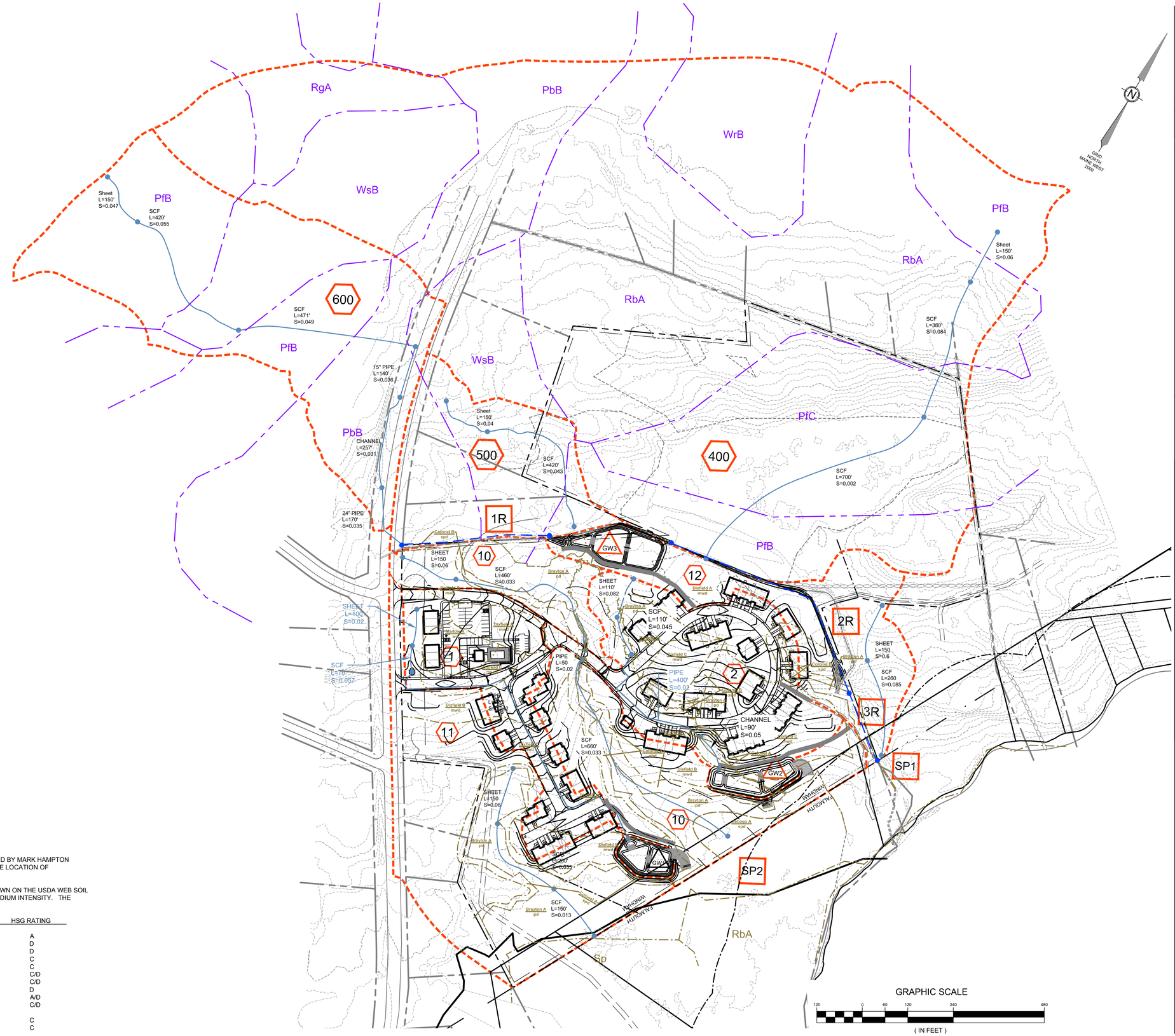

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Sp	SEBAGO MUCKY PEAT	A/D
Sz	SWANTON FINE SANDY LOAM	C/D
W	WATER	
WrB	WOODBRIDGE FINE SANDY LOAM	C
WsB	WOODBRIDGE VERY STONY FINE SANDY LOAM	C

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WESTBROOK, MAINE 04092

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JOB NO:	1817
FILE: 1636 B	
SHEET	D-1.3

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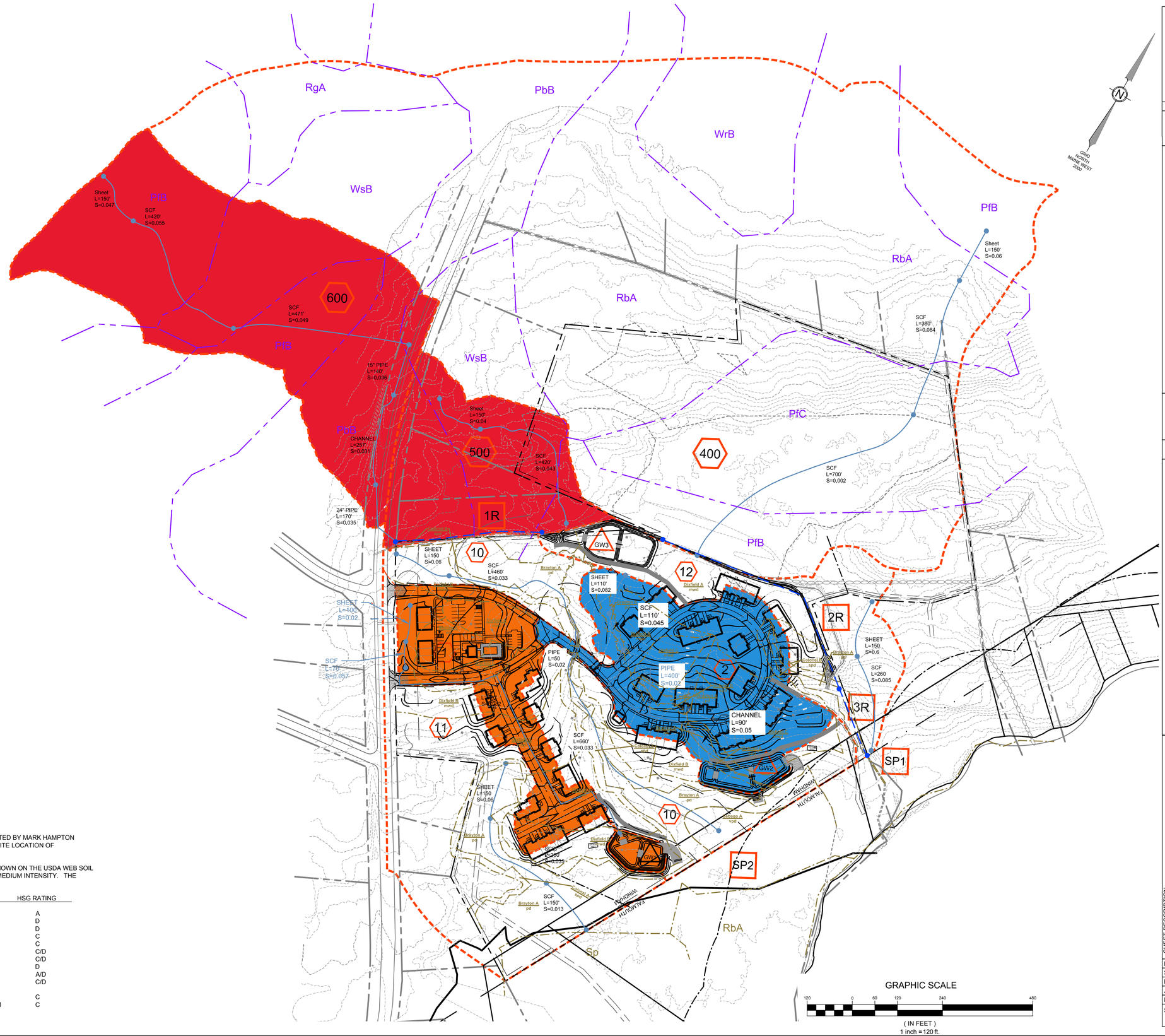
- EXISTING EDGE OF PAVEMENT
- PROPOSED EDGE OF PAVEMENT
- EXISTING BUILDING
- PROPOSED PAVED AREA
- WETLAND AREA
- GRAVEL WETLAND #1
- GRAVEL WETLAND #2
- GRAVEL WETLAND #3



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