Appendix H

Preliminary Drainage Design Study

Preliminary Drainage Design for Goleta Business Park

Preliminary drainage evaluation of major drainage features.

Stantec

Prepared for:
Sywest Development

Project Engineer:
Buddy Hain, PE

June 21, 2024

Sign-off Sheet

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Prepared by _____

(signature)

Jesus Corona-Perez, E.I.T.



Reviewed by _____

(signature)

Buddy Hain, P.E.

June 21, 2024

1.0 PURPOSE OF THE REPORT

The purpose of this report is to evaluate the major drainage features of the proposed project at 907 South Kellogg Avenue to verify that they meet the standard grading requirements for development.

2.0 LOCATION

The project site is located at the lower limits of South Kellogg Avenue at 907 S. Kellogg Avenue. It is the former location of the Twin Screen Drive-In Theater. See Figure A.

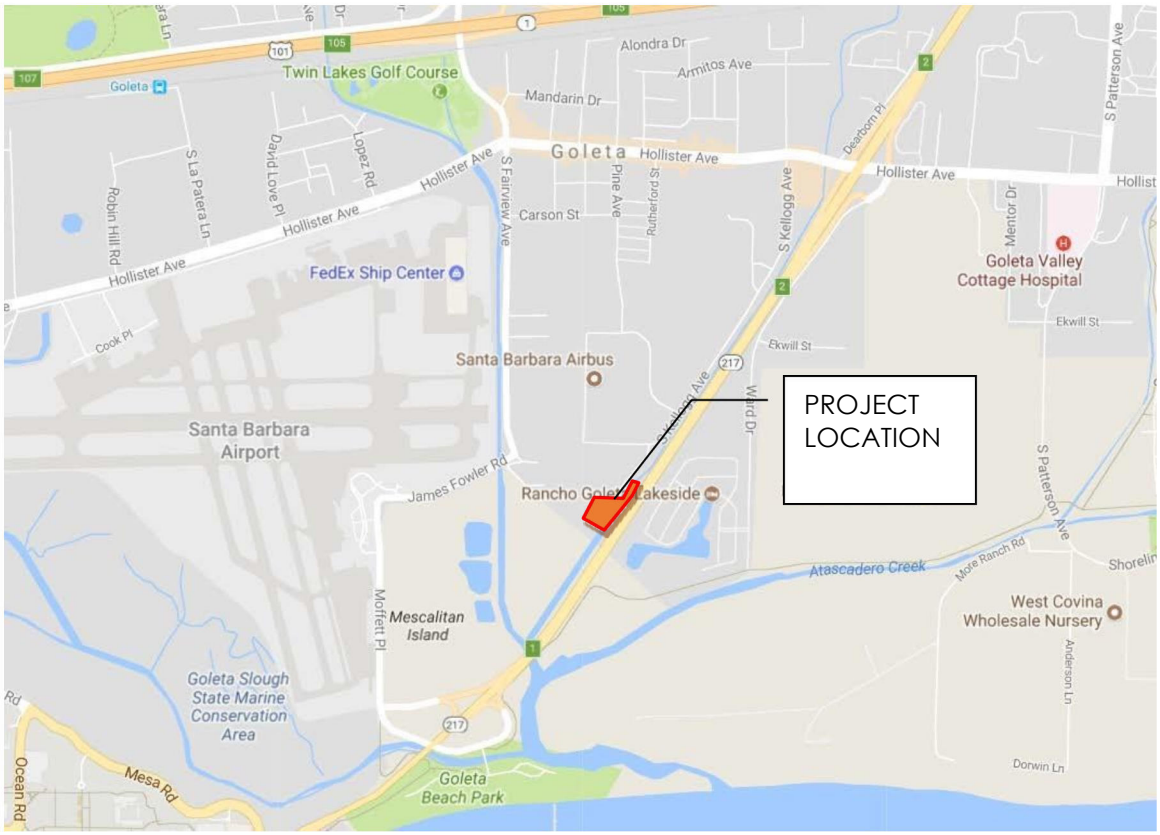


Figure A - Location Map

3.0 BACKGROUND

The more southerly half of the property is currently being used as miscellaneous storage and as a place for the weekly swap meet. The northerly portion is being used as a drive-in theater. The

northerly portion will be developed as an industrial storage facility. The southerly portion will remain as-is. No additional parcel development is planned at this time.

The existing project site area is generally covered with degraded asphalt with a few scattered buildings and is located in an area generally occupied by commercial/industrial uses. The soils are HSG Type C and groundwater is very high. The proposed project site is currently configured like a bowl with drainage flows directed to a stormwater pump which discharges through the San Jose Creek Channel levee into the San Jose Creek channel. The ground elevations range from 7 feet at the stormwater pump to 15 feet on the San Jose Creek levee. The site will be filled so that drainage flows can be discharged to the San Jose Creek Channel in a storm drain by gravity.

Improvements on the project site will be consistent with M-1 zoning designation. It is also within the Coastal Development Zone. Setbacks from San Jose Creek vary from 50 feet to 100 feet and will be under review as a consideration of this project approval. A metal warehouse of 70,594 square feet will be constructed and served by approximately 103 parking spaces and sufficient driving and loading area to accommodate semi-tractor-trailer movements.

San Jose Creek is located immediately adjacent and to the east of the proposed project. Flows in the channel run generally from north to south out to the Pacific Ocean. Old San Jose Creek is located a short distance to the west of the project and wraps around the end of the southerly parcel to discharge into San Jose Creek via two 48 inch culverts with flap gates.
The site is located within the 100-year floodplain (Zone A – 100-year flood elevation not determined) but not within the Regulatory Floodway. See Figure B for the floodplain delineation. It is potentially affected by the floodplains of San Jose Creek, Old San Jose Creek, Atascadero Creek, San Pedro Creek, and Tecolotito Creek as well as being influenced by the Pacific Ocean tidal movements. The site has historically been a part of the Goleta Slough and so an exemption from the retention will be requested from the Central Coast Regional Water Quality Control Board.

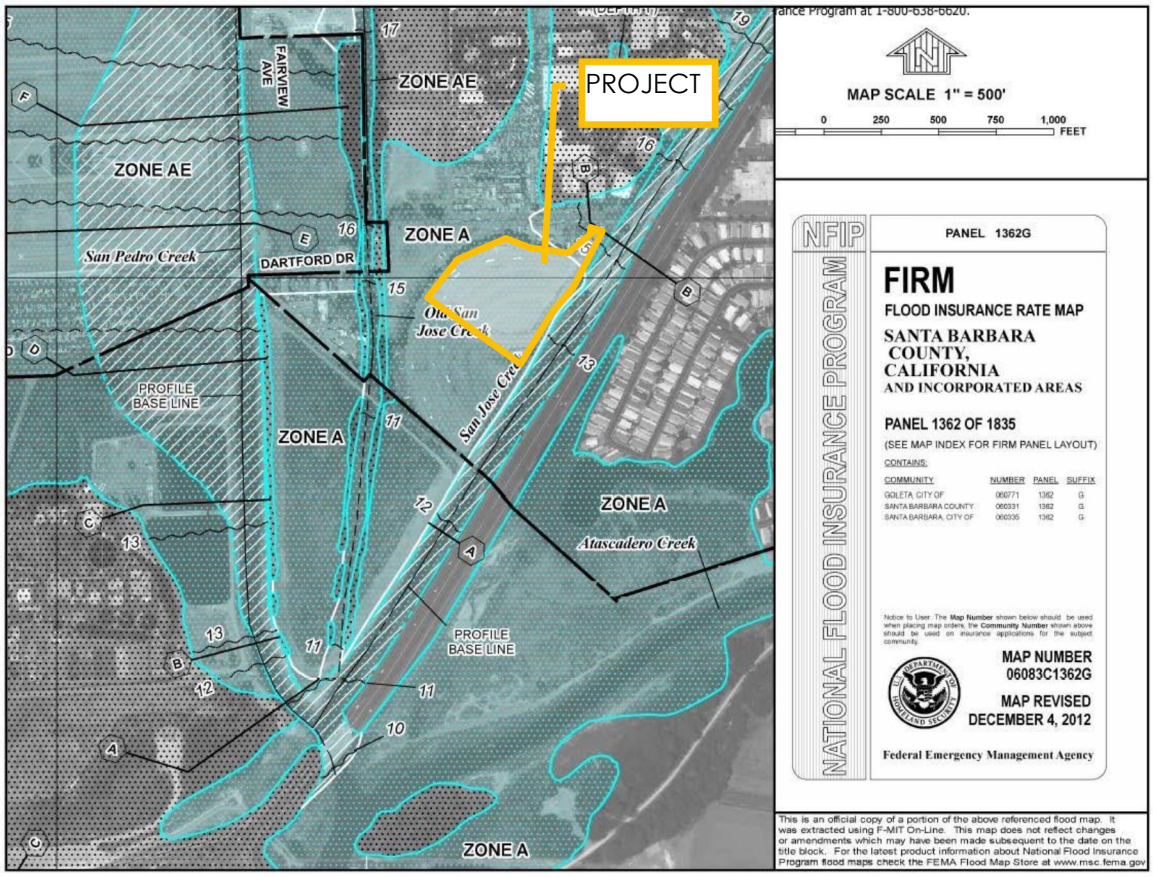


Figure B - FEMA Flood Map

4.0 METHODS OF ANALYSIS

The design evaluation encompasses the following areas:

- Floodplain safety
- Detention basin analysis
- On-site storm drain sizing
- Overland escape evaluation

As indicated on Figure B, the site is located within the Zone A (100-year flood elevation not determined). However, the adjacent San Jose Creek channel does have a 100-year flood elevation determined. That elevation is being used to determine the Base Flood Elevation (BFE or 100-year water surface elevation) and consequently the finish floor elevation of the proposed building. The building may either be floodproofed up to an elevation 2 feet above the BFE or

the site can be filled such that the finish floor is 2 feet above the BFE. The latter approach has been selected. The BFE was determined by locating the most upstream portion of the proposed building on the Federal Emergency Management Agency Flood Insurance Study floodplain profiles and scaling the 100-year flood elevation from the profile.

The existing project surface cover has a very high proportion of imperviousness. Therefore, the difference in runoff between the pre-project condition and the post-project condition is not anticipated to be very large. The evaluation is prepared by calculating the pre-project peak runoff using HydroCAD v 10.0. The entire parking area of the old drive-in had previously been paved, but it has degraded over the years. Because it is difficult to estimate the exact percent of imperviousness of the pre-project condition, it was conservatively estimated that the site is 25 percent pervious. The post-project condition is then evaluated using the same methods and calculating the landscape areas and detention basin area as pervious. The detention basin was then evaluated and designed to meet the target criteria of less post-project peak flow rate than pre-project peak flow rate for the 2-year, 5-year, 10-year, 25-year, 50-year, and 100-year rainfall events. For the detention analysis, all subsoil storage and soil infiltration was ignored.

The peak flow 100-year flow rates developed in HydroCAD were used to size the on-site storm drains. The sizes were preliminarily designed so that the 100-year water surface elevation (or hydraulic grade line) would not exceed the ground elevation at the entry point of the stormwater (inlet or catchbasin).

Finally, the size was designed so that should all the storm drain systems fail, water can exist the site over the ground surface without damaging the building. This is called overland escape.

5.0 FINDINGS

The BFE for the proposed structure was found to be elevation 14.4 feet NAVD1988. Based on this elevation, the finish floor elevation of the structure was set at 16.5 feet. Documentation is attached.

A detention basin is proposed and shown on the grading plan. Table 1 summarizes the results. The 100-year ponding elevation within the basin was calculated to be 12.72 feet NAVD1988.

Table 1 - Detention Basin Results

Return Period	Pre-Project	Post-Project	Difference
year	cfs	cfs	cfs
2x85th%	11.55	4.01	-7.54
2	14.32	5.11	-9.21
5	20.80	7.12	-13.68
10	25.11	8.27	-16.84
25	30.42	9.88	-20.54
50	34.30	12.43	-21.87
100	38.05	13.49	-24.56

Storm drain pipes on the site were found to range from 18" in diameter to 30" in diameter.

A weir has been proposed in the detention/biofiltration basin. The overflow elevation has been set at 13.75 feet which allows more than 1 foot of freeboard between the emergency overflow elevation and the ponded 100-year water surface elevation.

6.0 CONCLUSIONS

The project drainage design meets the basic requirements of reducing the post-project peak flow rates from the project to less than the pre-project levels. It also provides a 100-year flood and drainage design for on-site facilities.

The proposed project anticipates a storm drain outlet through an existing concrete wall of San Jose Creek improvements. This along with improvements abutting the San Jose Creek levee will require coordination with the Santa Barbara County Flood Control and Water Conservation District.

ATTACHMENTS

- BFE Determination Analysis
- Detention Basin Analysis
- Storm Drain Analysis
- Storm Drain and Watershed Exhibit

ELEVATION IN FEET (NAVD 88)

70
60
50
40
30
20
10
0
-10
-20

CONFLUENCE OF OLD SAN JOSE CREEK

CONFLUENCE WITH SAN PEDRO CREEK

Most upstream portion of building is 245 feet downstream of FEMA Section B

BFE = 14.4 FT NAVD88

FEMA Section B

A
B
C
D

LEGEND
*0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
*2% ANNUAL CHANCE FLOOD
*10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION

0 400 800 1200 1600 2000 2400 2800 3200 3600 4000 4400 4800 5200

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH SAN PEDRO CREEK

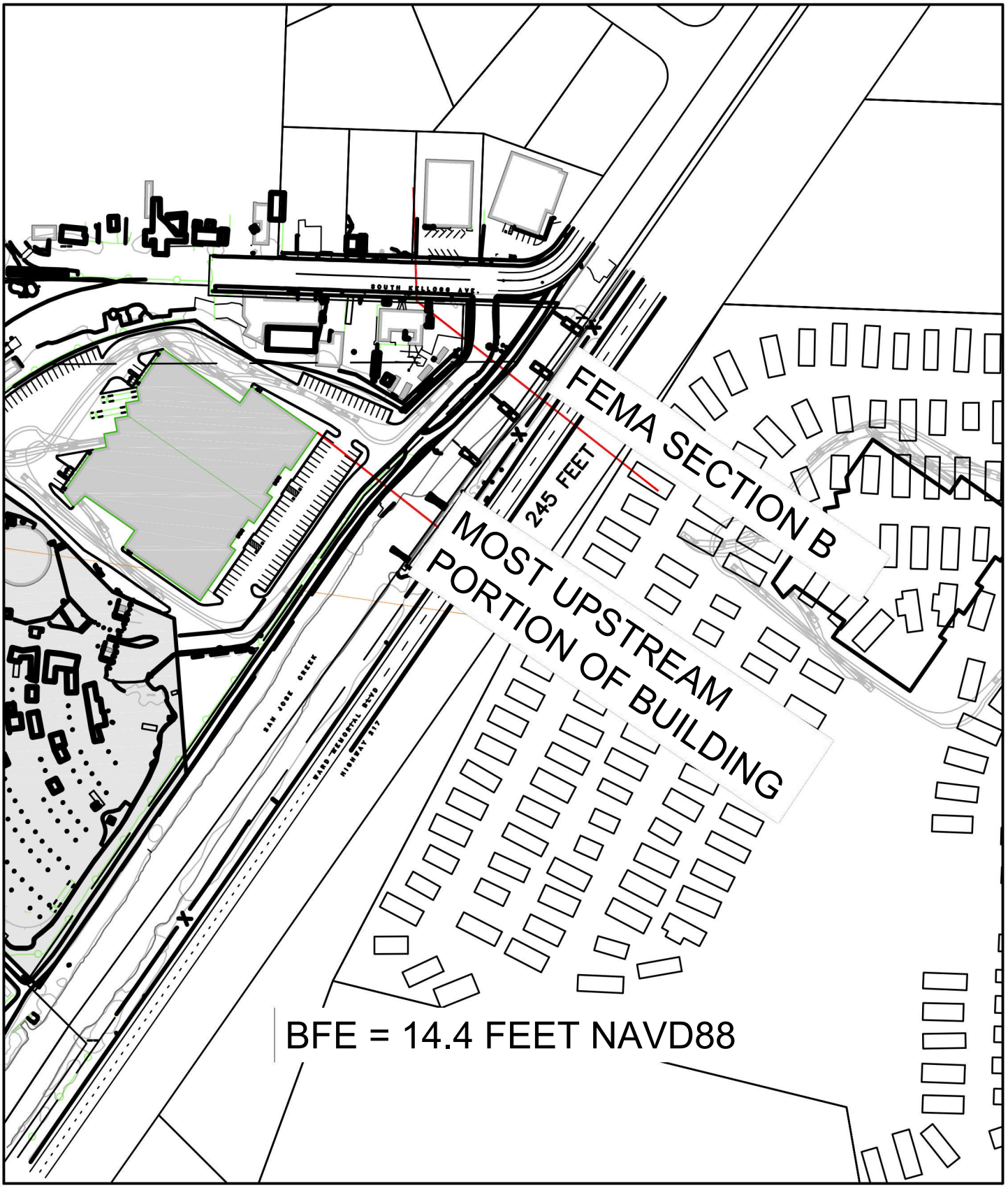
*DATA NOT AVAILABLE

FLOOD PROFILES

SAN JOSE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
SANTA BARBARA COUNTY, CA
AND INCORPORATED AREAS

141P



PRELIMINARY BFE DETERMINATION

Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

N

1"=200'

SYWEST
CITY OF GOLETA, CALIFORNIA
JUNE 2022

DRAWING: v: \2064\active\2064021500\acad\bfe exhibit.dwg

DMA SUMMARY

DMA-1

Total Area	14555	sf
Pavement	9813	sf
Landscape	4742	sf

DMA-2

Total Area	217812	sf
Pavement	174730	sf
Landscape	43082	sf

DMA-3

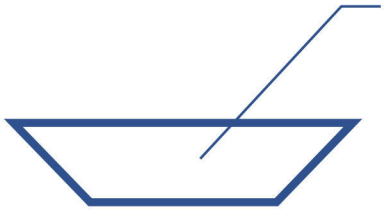
Total Area	19584	sf
Permeable Pavement	7990	sf
Pavement	0	sf
Landscape	11594	sf

Percent Impervious - 73%

DETENTION DESIGN

Assumes no infiltration or volume below bottom of basin

Return Period	Pre-Project	Post-Project	Difference
year	cfs	cfs	cfs
2x85th%	11.55	4.01	-7.54
2	14.32	5.11	-9.21
5	20.80	7.12	-13.68
10	25.11	8.27	-16.84
25	30.42	9.88	-20.54
50	34.30	12.43	-21.87
100	38.05	13.49	-24.56



Basin Top Elev = 15.0 ft
Weir Overflow Elev = 13.75 ft
100-yr Ponding Elev = 12.13 ft
Basin Bottom Elev = 10.25 ft

STORM DRAIN DESIGN

North and East Storm Drain to Basin

Q_{100} =	9.58	cfs	
Dia =	30	inches	
K =	410		
s_o =	0.000547	ft/ft	
L =	664	ft	
Δh =	0.362888	ft	
TG =	15.16	ft	
HGL @ TG =	14.99	ft	OK

Need 30" storm drain at least to end of first run.

South and West Storm Drain to Basin

Q_{100} =	8.22	cfs	
Dia =	24	inches	
K =	226.2		
s_o =	0.00132	ft/ft	
L =	467	ft	
Δh =	0.62	ft	
TG =	14.75	ft	
HGL @ TG =	14.75	ft	OK

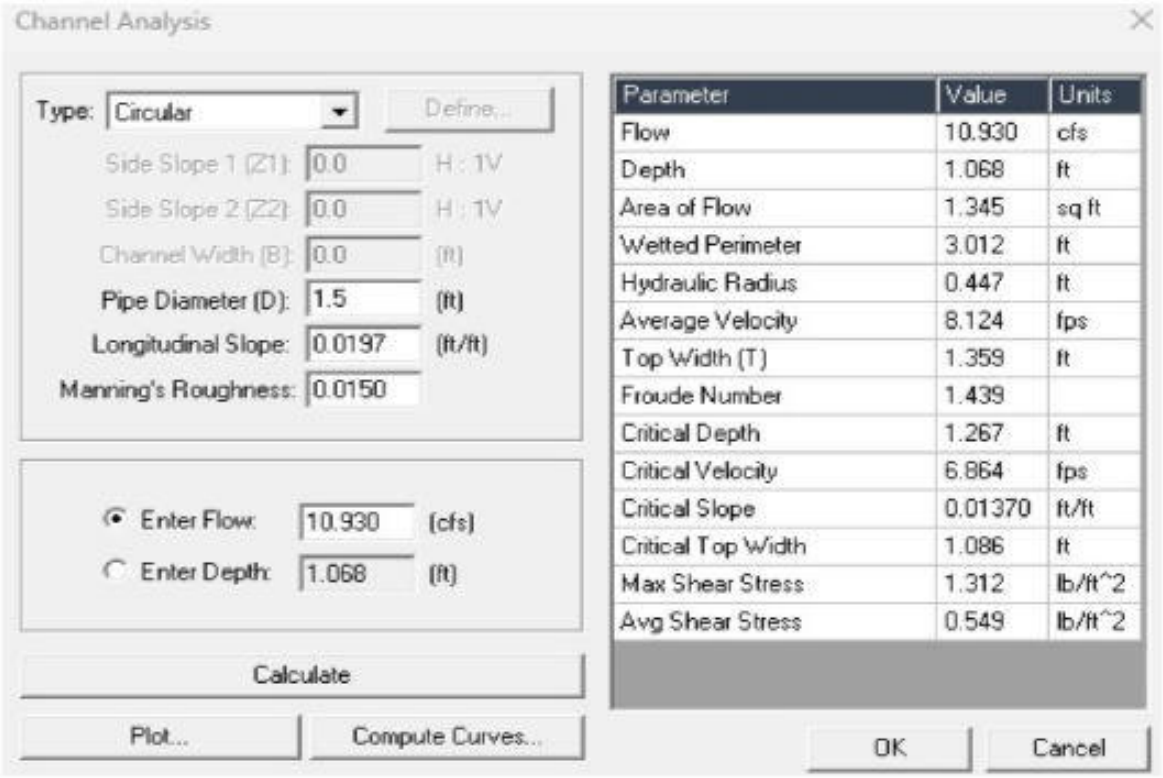
Need 24" storm drain at least to end of first run.

Outlet to Channel

$Q_{into\ basin}$ = 19.65 cfs (Q100)

$Q_{out\ basin}$ = 10.93 cfs (Q100)

Ponding Elevation = 12.13 ft



Parameter	Value	Units
Flow	10.930	cfs
Depth	1.068	ft
Area of Flow	1.345	sq ft
Wetted Perimeter	3.012	ft
Hydraulic Radius	0.447	ft
Average Velocity	8.124	fps
Top Width (T)	1.359	ft
Froude Number	1.439	
Critical Depth	1.267	ft
Critical Velocity	6.864	fps
Critical Slope	0.01370	ft/ft
Critical Top Width	1.086	ft
Max Shear Stress	1.312	lb/ft^2
Avg Shear Stress	0.549	lb/ft^2

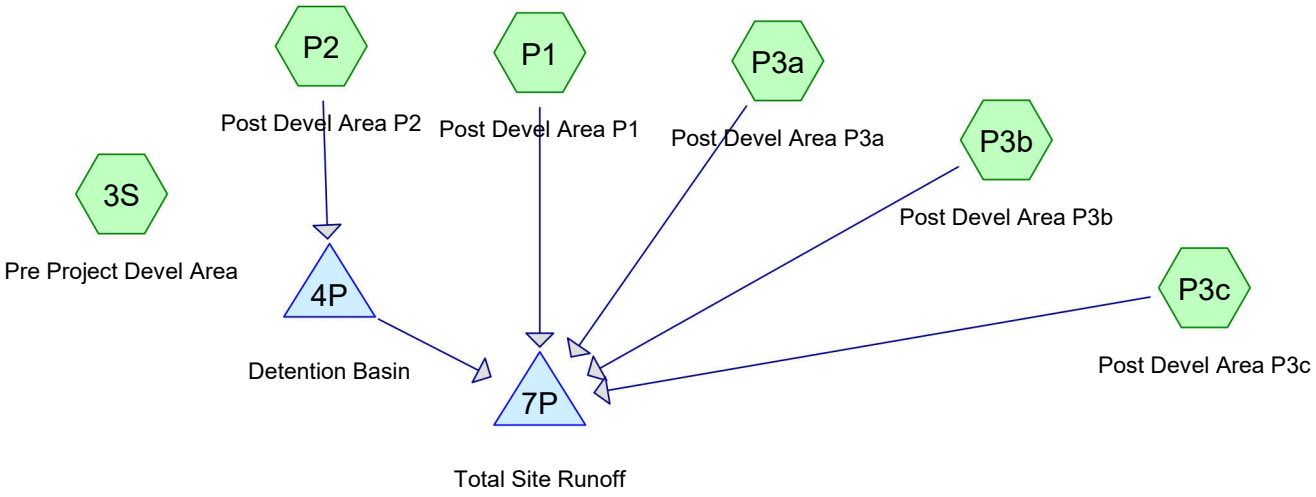
L = 412 ft

$Inv_{channel}$ = 5.5 ft

Inv_{basin} = 7.6 ft

So = (Ponding elev- Top of Pipe /Length of pipe
0.019733 ft/ft

Conclusion: 18" pipe is OK for outlet.



Subcat Reach Pond Link

Routing Diagram for Prelim Design June 2024 Detention Submittal
Prepared by Stantec Consulting Ltd., Printed 6/21/2024
HydroCAD® 10.10-6a s/n 03040 © 2020 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
59,418	84	50-75% Grass cover, Fair, HSG D (P1, P2, P3a, P3c)
7,990	89	<50% Grass cover, Poor, HSG D (P3b)
251,951	98	Paved parking, HSG D (3S)
184,543	98	Paved roads w/curbs & sewers, HSG D (P1, P2)

Summary for Subcatchment 3S: Pre Project Devel Area

Runoff = 3.88 cfs @ 9.91 hrs, Volume= 16,606 cf, Depth= 0.79"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr 1" Rainfall=1.00"

Area (sf)	CN	Description
251,951	98	Paved parking, HSG D
251,951	98	100.00% Impervious Area

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

Summary for Subcatchment P1: Post Devel Area P1

Runoff = 0.10 cfs @ 10.02 hrs, Volume= 707 cf, Depth= 0.58"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr 1" Rainfall=1.00"

Area (sf)	CN	Description
9,813	98	Paved roads w/curbs & sewers, HSG D
4,742	84	50-75% Grass cover, Fair, HSG D
14,555	93	Weighted Average
4,742	84	32.58% Pervious Area
9,813	98	67.42% Impervious Area

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

Summary for Subcatchment P2: Post Devel Area P2

Runoff = 1.72 cfs @ 10.02 hrs, Volume= 12,061 cf, Depth= 0.66"
Routed to Pond 4P : Detention Basin

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr 1" Rainfall=1.00"

Area (sf)	CN	Description
174,730	98	Paved roads w/curbs & sewers, HSG D
43,082	84	50-75% Grass cover, Fair, HSG D
217,812	95	Weighted Average
43,082	84	19.78% Pervious Area
174,730	98	80.22% Impervious Area

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

Summary for Subcatchment P3a: Post Devel Area P3a

Runoff = 0.00 cfs @ 10.13 hrs, Volume= 59 cf, Depth= 0.15"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr 1" Rainfall=1.00"

Area (sf)	CN	Description
4,695	84	50-75% Grass cover, Fair, HSG D
4,695	84	100.00% Pervious Area

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

Summary for Subcatchment P3b: Post Devel Area P3b

Runoff = 0.02 cfs @ 10.05 hrs, Volume= 190 cf, Depth= 0.28"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr 1" Rainfall=1.00"

Area (sf)	CN	Description
7,990	89	<50% Grass cover, Poor, HSG D
7,990	89	100.00% Pervious Area

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

Summary for Subcatchment P3c: Post Devel Area P3c

Runoff = 0.00 cfs @ 10.13 hrs, Volume= 87 cf, Depth= 0.15"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr 1" Rainfall=1.00"

Area (sf)	CN	Description
6,899	84	50-75% Grass cover, Fair, HSG D
6,899	84	100.00% Pervious Area

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

Summary for Pond 4P: Detention Basin

Inflow Area = 217,812 sf, 80.22% Impervious, Inflow Depth = 0.66" for 1" event
Inflow = 1.72 cfs @ 10.02 hrs, Volume= 12,061 cf
Outflow = 0.81 cfs @ 10.38 hrs, Volume= 12,061 cf, Atten= 53%, Lag= 21.4 min
Primary = 0.81 cfs @ 10.38 hrs, Volume= 12,061 cf
Routed to Pond 7P : Total Site Runoff
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 10.56' @ 10.38 hrs Surf.Area= 8,929 sf Storage= 2,671 cf

Plug-Flow detention time= 90.0 min calculated for 12,045 cf (100% of inflow)
Center-of-Mass det. time= 90.8 min (852.9 - 762.1)

Volume	Invert	Avail.Storage	Storage Description
#1	10.25'	64,075 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
10.25	8,304	0	0	8,304
11.00	9,855	6,801	6,801	9,876
12.00	12,007	10,913	17,715	12,059
13.00	14,259	13,117	30,832	14,347
14.00	16,611	15,420	46,252	16,740
15.00	19,064	17,823	64,075	19,238

Device	Routing	Invert	Outlet Devices
#1	Primary	7.60'	**18.0" Round Culvert** L= 412.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 7.60' / 5.50' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	10.25'	**16.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.50'	**16.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.75'	**20.0" x 20.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	13.75'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.80 cfs @ 10.38 hrs HW=10.56' (Free Discharge)
└**1=Culvert** (Passes 0.80 cfs of 9.11 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.74 cfs @ 1.79 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.06 cfs @ 0.78 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=10.25' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: Total Site Runoff

Inflow Area = 251,951 sf, 73.25% Impervious, Inflow Depth = 0.62" for 1" event
Inflow = 0.88 cfs @ 10.34 hrs, Volume= 13,105 cf
Primary = 0.88 cfs @ 10.34 hrs, Volume= 13,105 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Summary for Subcatchment 3S: Pre Project Devel Area

Runoff = 11.16 cfs @ 9.91 hrs, Volume= 49,764 cf, Depth= 2.37"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr 85% Rainfall=2.60"

Area (sf)	CN	Description
251,951	98	Paved parking, HSG D
251,951	98	100.00% Impervious Area

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

Summary for Subcatchment P1: Post Devel Area P1

Runoff = 0.34 cfs @ 10.02 hrs, Volume= 2,410 cf, Depth= 1.99"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr 85% Rainfall=2.60"

Area (sf)	CN	Description
9,813	98	Paved roads w/curbs & sewers, HSG D
4,742	84	50-75% Grass cover, Fair, HSG D
14,555	93	Weighted Average
4,742	84	32.58% Pervious Area
9,813	98	67.42% Impervious Area

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

Summary for Subcatchment P2: Post Devel Area P2

Runoff = 5.49 cfs @ 10.02 hrs, Volume= 38,799 cf, Depth= 2.14"
Routed to Pond 4P : Detention Basin

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr 85% Rainfall=2.60"

Area (sf)	CN	Description
174,730	98	Paved roads w/curbs & sewers, HSG D
43,082	84	50-75% Grass cover, Fair, HSG D
217,812	95	Weighted Average
43,082	84	19.78% Pervious Area
174,730	98	80.22% Impervious Area

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

Summary for Subcatchment P3a: Post Devel Area P3a

Runoff = 0.06 cfs @ 10.03 hrs, Volume= 467 cf, Depth= 1.19"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr 85% Rainfall=2.60"

Area (sf)	CN	Description
4,695	84	50-75% Grass cover, Fair, HSG D
4,695	84	100.00% Pervious Area

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

Summary for Subcatchment P3b: Post Devel Area P3b

Runoff = 0.15 cfs @ 10.03 hrs, Volume= 1,027 cf, Depth= 1.54"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr 85% Rainfall=2.60"

Area (sf)	CN	Description
7,990	89	<50% Grass cover, Poor, HSG D
7,990	89	100.00% Pervious Area

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

Summary for Subcatchment P3c: Post Devel Area P3c

Runoff = 0.09 cfs @ 10.03 hrs, Volume= 686 cf, Depth= 1.19"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr 85% Rainfall=2.60"

Area (sf)	CN	Description
6,899	84	50-75% Grass cover, Fair, HSG D
6,899	84	100.00% Pervious Area

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

Summary for Pond 4P: Detention Basin

Inflow Area = 217,812 sf, 80.22% Impervious, Inflow Depth = 2.14" for 85% event
Inflow = 5.49 cfs @ 10.02 hrs, Volume= 38,799 cf
Outflow = 3.58 cfs @ 10.23 hrs, Volume= 38,799 cf, Atten= 35%, Lag= 12.7 min
Primary = 3.58 cfs @ 10.23 hrs, Volume= 38,799 cf
Routed to Pond 7P : Total Site Runoff
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 10.93' @ 10.23 hrs Surf.Area= 9,700 sf Storage= 6,096 cf

Plug-Flow detention time= 60.5 min calculated for 38,745 cf (100% of inflow)
Center-of-Mass det. time= 61.2 min (792.1 - 730.9)

Volume	Invert	Avail.Storage	Storage Description
#1	10.25'	64,075 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
10.25	8,304	0	0	8,304
11.00	9,855	6,801	6,801	9,876
12.00	12,007	10,913	17,715	12,059
13.00	14,259	13,117	30,832	14,347
14.00	16,611	15,420	46,252	16,740
15.00	19,064	17,823	64,075	19,238

Device	Routing	Invert	Outlet Devices
#1	Primary	7.60'	**18.0" Round Culvert** L= 412.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 7.60' / 5.50' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	10.25'	**16.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.50'	**16.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.75'	**20.0" x 20.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	13.75'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.54 cfs @ 10.23 hrs HW=10.92' (Free Discharge)
└─**1=Culvert** (Passes 3.54 cfs of 9.56 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 2.36 cfs @ 2.66 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 1.18 cfs @ 2.09 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=10.25' (Free Discharge)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: Total Site Runoff

Inflow Area = 251,951 sf, 73.25% Impervious, Inflow Depth = 2.07" for 85% event
Inflow = 4.01 cfs @ 10.20 hrs, Volume= 43,389 cf
Primary = 4.01 cfs @ 10.20 hrs, Volume= 43,389 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Summary for Subcatchment 3S: Pre Project Devel Area

Runoff = 13.84 cfs @ 9.91 hrs, Volume= 62,305 cf, Depth= 2.97"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-002yr Rainfall=3.20"

Area (sf)	CN	Description
251,951	98	Paved parking, HSG D
251,951	98	100.00% Impervious Area

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

Summary for Subcatchment P1: Post Devel Area P1

Runoff = 0.44 cfs @ 10.02 hrs, Volume= 3,091 cf, Depth= 2.55"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-002yr Rainfall=3.20"

Area (sf)	CN	Description
9,813	98	Paved roads w/curbs & sewers, HSG D
4,742	84	50-75% Grass cover, Fair, HSG D
14,555	93	Weighted Average
4,742	84	32.58% Pervious Area
9,813	98	67.42% Impervious Area

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

Summary for Subcatchment P2: Post Devel Area P2

Runoff = 6.95 cfs @ 10.02 hrs, Volume= 49,249 cf, Depth= 2.71"
Routed to Pond 4P : Detention Basin

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-002yr Rainfall=3.20"

Area (sf)	CN	Description
174,730	98	Paved roads w/curbs & sewers, HSG D
43,082	84	50-75% Grass cover, Fair, HSG D
217,812	95	Weighted Average
43,082	84	19.78% Pervious Area
174,730	98	80.22% Impervious Area

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

Summary for Subcatchment P3a: Post Devel Area P3a

Runoff = 0.09 cfs @ 10.03 hrs, Volume= 658 cf, Depth= 1.68"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-002yr Rainfall=3.20"

Area (sf)	CN	Description
4,695	84	50-75% Grass cover, Fair, HSG D
4,695	84	100.00% Pervious Area

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

Summary for Subcatchment P3b: Post Devel Area P3b

Runoff = 0.20 cfs @ 10.02 hrs, Volume= 1,386 cf, Depth= 2.08"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-002yr Rainfall=3.20"

Area (sf)	CN	Description
7,990	89	<50% Grass cover, Poor, HSG D
7,990	89	100.00% Pervious Area

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

Summary for Subcatchment P3c: Post Devel Area P3c

Runoff = 0.14 cfs @ 10.03 hrs, Volume= 967 cf, Depth= 1.68"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-002yr Rainfall=3.20"

Area (sf)	CN	Description
6,899	84	50-75% Grass cover, Fair, HSG D
6,899	84	100.00% Pervious Area

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

Summary for Pond 4P: Detention Basin

Inflow Area = 217,812 sf, 80.22% Impervious, Inflow Depth = 2.71" for SC-002yr event
Inflow = 6.95 cfs @ 10.02 hrs, Volume= 49,249 cf
Outflow = 4.52 cfs @ 10.23 hrs, Volume= 49,249 cf, Atten= 35%, Lag= 12.6 min
Primary = 4.52 cfs @ 10.23 hrs, Volume= 49,249 cf
Routed to Pond 7P : Total Site Runoff
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 11.05' @ 10.23 hrs Surf.Area= 9,948 sf Storage= 7,251 cf

Plug-Flow detention time= 55.6 min calculated for 49,181 cf (100% of inflow)
Center-of-Mass det. time= 56.2 min (781.8 - 725.5)

Volume	Invert	Avail.Storage	Storage Description
#1	10.25'	64,075 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
10.25	8,304	0	0	8,304
11.00	9,855	6,801	6,801	9,876
12.00	12,007	10,913	17,715	12,059
13.00	14,259	13,117	30,832	14,347
14.00	16,611	15,420	46,252	16,740
15.00	19,064	17,823	64,075	19,238

Device	Routing	Invert	Outlet Devices
#1	Primary	7.60'	**18.0" Round Culvert** L= 412.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 7.60' / 5.50' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	10.25'	**16.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.50'	**16.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.75'	**20.0" x 20.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	13.75'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.49 cfs @ 10.23 hrs HW=11.04' (Free Discharge)
└**1=Culvert** (Passes 4.49 cfs of 9.70 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 2.82 cfs @ 3.17 fps)
  ├**3=Orifice/Grate** (Orifice Controls 1.67 cfs @ 2.50 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=10.25' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: Total Site Runoff

Inflow Area = 251,951 sf, 73.25% Impervious, Inflow Depth = 2.64" for SC-002yr event
Inflow = 5.11 cfs @ 10.18 hrs, Volume= 55,352 cf
Primary = 5.11 cfs @ 10.18 hrs, Volume= 55,352 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Summary for Subcatchment 3S: Pre Project Devel Area

Runoff = 20.12 cfs @ 9.91 hrs, Volume= 91,833 cf, Depth= 4.37"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-005yr Rainfall=4.61"

Area (sf)	CN	Description
251,951	98	Paved parking, HSG D
251,951	98	100.00% Impervious Area

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

Summary for Subcatchment P1: Post Devel Area P1

Runoff = 0.67 cfs @ 10.02 hrs, Volume= 4,729 cf, Depth= 3.90"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-005yr Rainfall=4.61"

Area (sf)	CN	Description
9,813	98	Paved roads w/curbs & sewers, HSG D
4,742	84	50-75% Grass cover, Fair, HSG D
14,555	93	Weighted Average
4,742	84	32.58% Pervious Area
9,813	98	67.42% Impervious Area

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

Summary for Subcatchment P2: Post Devel Area P2

Runoff = 10.40 cfs @ 10.02 hrs, Volume= 74,155 cf, Depth= 4.09"
Routed to Pond 4P : Detention Basin

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-005yr Rainfall=4.61"

Area (sf)	CN	Description
174,730	98	Paved roads w/curbs & sewers, HSG D
43,082	84	50-75% Grass cover, Fair, HSG D
217,812	95	Weighted Average
43,082	84	19.78% Pervious Area
174,730	98	80.22% Impervious Area

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

Summary for Subcatchment P3a: Post Devel Area P3a

Runoff = 0.17 cfs @ 10.03 hrs, Volume= 1,141 cf, Depth= 2.92"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-005yr Rainfall=4.61"

Area (sf)	CN	Description
4,695	84	50-75% Grass cover, Fair, HSG D
4,695	84	100.00% Pervious Area

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

Summary for Subcatchment P3b: Post Devel Area P3b

Runoff = 0.34 cfs @ 10.02 hrs, Volume= 2,264 cf, Depth= 3.40"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-005yr Rainfall=4.61"

Area (sf)	CN	Description
7,990	89	<50% Grass cover, Poor, HSG D
7,990	89	100.00% Pervious Area

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

Summary for Subcatchment P3c: Post Devel Area P3c

Runoff = 0.25 cfs @ 10.03 hrs, Volume= 1,676 cf, Depth= 2.92"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-005yr Rainfall=4.61"

Area (sf)	CN	Description
6,899	84	50-75% Grass cover, Fair, HSG D
6,899	84	100.00% Pervious Area

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

Summary for Pond 4P: Detention Basin

Inflow Area = 217,812 sf, 80.22% Impervious, Inflow Depth = 4.09" for SC-005yr event
Inflow = 10.40 cfs @ 10.02 hrs, Volume= 74,155 cf
Outflow = 6.18 cfs @ 10.26 hrs, Volume= 74,155 cf, Atten= 41%, Lag= 14.3 min
Primary = 6.18 cfs @ 10.26 hrs, Volume= 74,155 cf
Routed to Pond 7P : Total Site Runoff
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 11.35' @ 10.26 hrs Surf.Area= 10,582 sf Storage= 10,365 cf

Plug-Flow detention time= 50.4 min calculated for 74,155 cf (100% of inflow)
Center-of-Mass det. time= 49.0 min (766.0 - 717.0)

Volume	Invert	Avail.Storage	Storage Description
#1	10.25'	64,075 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
10.25	8,304	0	0	8,304
11.00	9,855	6,801	6,801	9,876
12.00	12,007	10,913	17,715	12,059
13.00	14,259	13,117	30,832	14,347
14.00	16,611	15,420	46,252	16,740
15.00	19,064	17,823	64,075	19,238

Device	Routing	Invert	Outlet Devices
#1	Primary	7.60'	**18.0" Round Culvert** L= 412.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 7.60' / 5.50' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	10.25'	**16.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.50'	**16.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.75'	**20.0" x 20.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	13.75'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=6.16 cfs @ 10.26 hrs HW=11.34' (Free Discharge)
└**1=Culvert** (Passes 6.16 cfs of 10.06 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 3.70 cfs @ 4.16 fps)
  ├**3=Orifice/Grate** (Orifice Controls 2.45 cfs @ 3.68 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=10.25' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: Total Site Runoff

Inflow Area = 251,951 sf, 73.25% Impervious, Inflow Depth = 4.00" for SC-005yr event
Inflow = 7.12 cfs @ 10.17 hrs, Volume= 83,964 cf
Primary = 7.12 cfs @ 10.17 hrs, Volume= 83,964 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Summary for Subcatchment 3S: Pre Project Devel Area

Runoff = 24.28 cfs @ 9.91 hrs, Volume= 111,539 cf, Depth= 5.31"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-010yr Rainfall=5.55"

Area (sf)	CN	Description
251,951	98	Paved parking, HSG D
251,951	98	100.00% Impervious Area

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

Summary for Subcatchment P1: Post Devel Area P1

Runoff = 0.82 cfs @ 10.02 hrs, Volume= 5,837 cf, Depth= 4.81"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-010yr Rainfall=5.55"

Area (sf)	CN	Description
9,813	98	Paved roads w/curbs & sewers, HSG D
4,742	84	50-75% Grass cover, Fair, HSG D
14,555	93	Weighted Average
4,742	84	32.58% Pervious Area
9,813	98	67.42% Impervious Area

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

Summary for Subcatchment P2: Post Devel Area P2

Runoff = 12.70 cfs @ 10.02 hrs, Volume= 90,914 cf, Depth= 5.01"
Routed to Pond 4P : Detention Basin

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-010yr Rainfall=5.55"

Area (sf)	CN	Description
174,730	98	Paved roads w/curbs & sewers, HSG D
43,082	84	50-75% Grass cover, Fair, HSG D
217,812	95	Weighted Average
43,082	84	19.78% Pervious Area
174,730	98	80.22% Impervious Area

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

Summary for Subcatchment P3a: Post Devel Area P3a

Runoff = 0.22 cfs @ 10.02 hrs, Volume= 1,478 cf, Depth= 3.78"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-010yr Rainfall=5.55"

Area (sf)	CN	Description
4,695	84	50-75% Grass cover, Fair, HSG D
4,695	84	100.00% Pervious Area

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

Summary for Subcatchment P3b: Post Devel Area P3b

Runoff = 0.42 cfs @ 10.02 hrs, Volume= 2,863 cf, Depth= 4.30"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-010yr Rainfall=5.55"

Area (sf)	CN	Description
7,990	89	<50% Grass cover, Poor, HSG D
7,990	89	100.00% Pervious Area

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

Summary for Subcatchment P3c: Post Devel Area P3c

Runoff = 0.32 cfs @ 10.02 hrs, Volume= 2,172 cf, Depth= 3.78"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-010yr Rainfall=5.55"

Area (sf)	CN	Description
6,899	84	50-75% Grass cover, Fair, HSG D
6,899	84	100.00% Pervious Area

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

Summary for Pond 4P: Detention Basin

Inflow Area = 217,812 sf, 80.22% Impervious, Inflow Depth = 5.01" for SC-010yr event
Inflow = 12.70 cfs @ 10.02 hrs, Volume= 90,914 cf
Outflow = 7.12 cfs @ 10.28 hrs, Volume= 90,914 cf, Atten= 44%, Lag= 15.9 min
Primary = 7.12 cfs @ 10.28 hrs, Volume= 90,914 cf
Routed to Pond 7P : Total Site Runoff
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 11.57' @ 10.28 hrs Surf.Area= 11,053 sf Storage= 12,745 cf

Plug-Flow detention time= 45.4 min calculated for 90,787 cf (100% of inflow)
Center-of-Mass det. time= 46.0 min (759.1 - 713.1)

Volume	Invert	Avail.Storage	Storage Description
#1	10.25'	64,075 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
10.25	8,304	0	0	8,304
11.00	9,855	6,801	6,801	9,876
12.00	12,007	10,913	17,715	12,059
13.00	14,259	13,117	30,832	14,347
14.00	16,611	15,420	46,252	16,740
15.00	19,064	17,823	64,075	19,238

Device	Routing	Invert	Outlet Devices
#1	Primary	7.60'	**18.0" Round Culvert** L= 412.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 7.60' / 5.50' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	10.25'	**16.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.50'	**16.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.75'	**20.0" x 20.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	13.75'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=7.11 cfs @ 10.28 hrs HW=11.57' (Free Discharge)
└**1=Culvert** (Passes 7.11 cfs of 10.31 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 4.22 cfs @ 4.75 fps)
  ├**3=Orifice/Grate** (Orifice Controls 2.89 cfs @ 4.33 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=10.25' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: Total Site Runoff

Inflow Area = 251,951 sf, 73.25% Impervious, Inflow Depth = 4.92" for SC-010yr event
Inflow = 8.27 cfs @ 10.17 hrs, Volume= 103,263 cf
Primary = 8.27 cfs @ 10.17 hrs, Volume= 103,263 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Summary for Subcatchment 3S: Pre Project Devel Area

Runoff = 29.42 cfs @ 9.91 hrs, Volume= 135,868 cf, Depth= 6.47"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-025yr Rainfall=6.71"

Area (sf)	CN	Description
251,951	98	Paved parking, HSG D
251,951	98	100.00% Impervious Area

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

Summary for Subcatchment P1: Post Devel Area P1

Runoff = 1.01 cfs @ 10.02 hrs, Volume= 7,214 cf, Depth= 5.95"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-025yr Rainfall=6.71"

Area (sf)	CN	Description
9,813	98	Paved roads w/curbs & sewers, HSG D
4,742	84	50-75% Grass cover, Fair, HSG D
14,555	93	Weighted Average
4,742	84	32.58% Pervious Area
9,813	98	67.42% Impervious Area

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

Summary for Subcatchment P2: Post Devel Area P2

Runoff = 15.55 cfs @ 10.02 hrs, Volume= 111,691 cf, Depth= 6.15"
Routed to Pond 4P : Detention Basin

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-025yr Rainfall=6.71"

Area (sf)	CN	Description
174,730	98	Paved roads w/curbs & sewers, HSG D
43,082	84	50-75% Grass cover, Fair, HSG D
217,812	95	Weighted Average
43,082	84	19.78% Pervious Area
174,730	98	80.22% Impervious Area

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

Summary for Subcatchment P3a: Post Devel Area P3a

Runoff = 0.28 cfs @ 10.02 hrs, Volume= 1,903 cf, Depth= 4.86"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-025yr Rainfall=6.71"

Area (sf)	CN	Description
4,695	84	50-75% Grass cover, Fair, HSG D
4,695	84	100.00% Pervious Area

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

Summary for Subcatchment P3b: Post Devel Area P3b

Runoff = 0.53 cfs @ 10.02 hrs, Volume= 3,612 cf, Depth= 5.43"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-025yr Rainfall=6.71"

Area (sf)	CN	Description
7,990	89	<50% Grass cover, Poor, HSG D
7,990	89	100.00% Pervious Area

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

Summary for Subcatchment P3c: Post Devel Area P3c

Runoff = 0.41 cfs @ 10.02 hrs, Volume= 2,797 cf, Depth= 4.86"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-025yr Rainfall=6.71"

Area (sf)	CN	Description
6,899	84	50-75% Grass cover, Fair, HSG D
6,899	84	100.00% Pervious Area

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

Summary for Pond 4P: Detention Basin

Inflow Area = 217,812 sf, 80.22% Impervious, Inflow Depth = 6.15" for SC-025yr event
Inflow = 15.55 cfs @ 10.02 hrs, Volume= 111,691 cf
Outflow = 8.64 cfs @ 10.29 hrs, Volume= 111,691 cf, Atten= 44%, Lag= 16.6 min
Primary = 8.64 cfs @ 10.29 hrs, Volume= 111,691 cf
Routed to Pond 7P : Total Site Runoff
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 11.83' @ 10.29 hrs Surf.Area= 11,633 sf Storage= 15,744 cf

Plug-Flow detention time= 44.6 min calculated for 111,691 cf (100% of inflow)
Center-of-Mass det. time= 43.2 min (752.6 - 709.4)

Volume	Invert	Avail.Storage	Storage Description
#1	10.25'	64,075 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
10.25	8,304	0	0	8,304
11.00	9,855	6,801	6,801	9,876
12.00	12,007	10,913	17,715	12,059
13.00	14,259	13,117	30,832	14,347
14.00	16,611	15,420	46,252	16,740
15.00	19,064	17,823	64,075	19,238

Device	Routing	Invert	Outlet Devices
#1	Primary	7.60'	**18.0" Round Culvert** L= 412.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 7.60' / 5.50' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	10.25'	**16.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.50'	**16.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.75'	**20.0" x 20.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	13.75'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=8.60 cfs @ 10.29 hrs HW=11.83' (Free Discharge)
└─**1=Culvert** (Passes 8.60 cfs of 10.61 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 4.77 cfs @ 5.36 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 3.33 cfs @ 5.00 fps)
  └─**4=Orifice/Grate** (Weir Controls 0.51 cfs @ 0.93 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=10.25' (Free Discharge)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: Total Site Runoff

Inflow Area = 251,951 sf, 73.25% Impervious, Inflow Depth = 6.06" for SC-025yr event
Inflow = 9.88 cfs @ 10.24 hrs, Volume= 127,218 cf
Primary = 9.88 cfs @ 10.24 hrs, Volume= 127,218 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Summary for Subcatchment 3S: Pre Project Devel Area

Runoff = 33.18 cfs @ 9.91 hrs, Volume= 153,700 cf, Depth= 7.32"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-050yr Rainfall=7.56"

Area (sf)	CN	Description
251,951	98	Paved parking, HSG D
251,951	98	100.00% Impervious Area

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

Summary for Subcatchment P1: Post Devel Area P1

Runoff = 1.15 cfs @ 10.02 hrs, Volume= 8,228 cf, Depth= 6.78"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-050yr Rainfall=7.56"

Area (sf)	CN	Description
9,813	98	Paved roads w/curbs & sewers, HSG D
4,742	84	50-75% Grass cover, Fair, HSG D
14,555	93	Weighted Average
4,742	84	32.58% Pervious Area
9,813	98	67.42% Impervious Area

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

Summary for Subcatchment P2: Post Devel Area P2

Runoff = 17.64 cfs @ 10.02 hrs, Volume= 126,962 cf, Depth= 6.99"
Routed to Pond 4P : Detention Basin

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-050yr Rainfall=7.56"

Area (sf)	CN	Description
174,730	98	Paved roads w/curbs & sewers, HSG D
43,082	84	50-75% Grass cover, Fair, HSG D
217,812	95	Weighted Average
43,082	84	19.78% Pervious Area
174,730	98	80.22% Impervious Area

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

Summary for Subcatchment P3a: Post Devel Area P3a

Runoff = 0.33 cfs @ 10.02 hrs, Volume= 2,220 cf, Depth= 5.67"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-050yr Rainfall=7.56"

Area (sf)	CN	Description
4,695	84	50-75% Grass cover, Fair, HSG D
4,695	84	100.00% Pervious Area

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

Summary for Subcatchment P3b: Post Devel Area P3b

Runoff = 0.61 cfs @ 10.02 hrs, Volume= 4,165 cf, Depth= 6.26"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-050yr Rainfall=7.56"

Area (sf)	CN	Description
7,990	89	<50% Grass cover, Poor, HSG D
7,990	89	100.00% Pervious Area

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

Summary for Subcatchment P3c: Post Devel Area P3c

Runoff = 0.48 cfs @ 10.02 hrs, Volume= 3,262 cf, Depth= 5.67"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-050yr Rainfall=7.56"

Area (sf)	CN	Description
6,899	84	50-75% Grass cover, Fair, HSG D
6,899	84	100.00% Pervious Area

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

Summary for Pond 4P: Detention Basin

Inflow Area = 217,812 sf, 80.22% Impervious, Inflow Depth = 6.99" for SC-050yr event
Inflow = 17.64 cfs @ 10.02 hrs, Volume= 126,962 cf
Outflow = 10.86 cfs @ 10.25 hrs, Volume= 126,962 cf, Atten= 38%, Lag= 13.8 min
Primary = 10.86 cfs @ 10.25 hrs, Volume= 126,962 cf
Routed to Pond 7P : Total Site Runoff
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 11.97' @ 10.25 hrs Surf.Area= 11,949 sf Storage= 17,409 cf

Plug-Flow detention time= 40.6 min calculated for 126,786 cf (100% of inflow)
Center-of-Mass det. time= 41.2 min (748.5 - 707.3)

Volume	Invert	Avail.Storage	Storage Description
#1	10.25'	64,075 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
10.25	8,304	0	0	8,304
11.00	9,855	6,801	6,801	9,876
12.00	12,007	10,913	17,715	12,059
13.00	14,259	13,117	30,832	14,347
14.00	16,611	15,420	46,252	16,740
15.00	19,064	17,823	64,075	19,238

Device	Routing	Invert	Outlet Devices
#1	Primary	7.60'	**18.0" Round Culvert** L= 412.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 7.60' / 5.50' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	10.25'	**16.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.50'	**16.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.75'	**20.0" x 20.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	13.75'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=10.61 cfs @ 10.25 hrs HW=11.96' (Free Discharge)
└─**1=Culvert** (Passes 10.61 cfs of 10.75 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 5.01 cfs @ 5.63 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 3.52 cfs @ 5.28 fps)
  └─**4=Orifice/Grate** (Weir Controls 2.08 cfs @ 1.49 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=10.25' (Free Discharge)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: Total Site Runoff

Inflow Area = 251,951 sf, 73.25% Impervious, Inflow Depth = 6.90" for SC-050yr event
Inflow = 12.43 cfs @ 10.23 hrs, Volume= 144,837 cf
Primary = 12.43 cfs @ 10.23 hrs, Volume= 144,837 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Summary for Subcatchment 3S: Pre Project Devel Area

Runoff = 36.80 cfs @ 9.91 hrs, Volume= 170,906 cf, Depth= 8.14"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-100yr Rainfall=8.38"

Area (sf)	CN	Description
251,951	98	Paved parking, HSG D
251,951	98	100.00% Impervious Area

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

Summary for Subcatchment P1: Post Devel Area P1

Runoff = 1.29 cfs @ 10.02 hrs, Volume= 9,209 cf, Depth= 7.59"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-100yr Rainfall=8.38"

Area (sf)	CN	Description
9,813	98	Paved roads w/curbs & sewers, HSG D
4,742	84	50-75% Grass cover, Fair, HSG D
14,555	93	Weighted Average
4,742	84	32.58% Pervious Area
9,813	98	67.42% Impervious Area

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

Summary for Subcatchment P2: Post Devel Area P2

Runoff = 19.65 cfs @ 10.02 hrs, Volume= 141,720 cf, Depth= 7.81"
Routed to Pond 4P : Detention Basin

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-100yr Rainfall=8.38"

Area (sf)	CN	Description
174,730	98	Paved roads w/curbs & sewers, HSG D
43,082	84	50-75% Grass cover, Fair, HSG D
217,812	95	Weighted Average
43,082	84	19.78% Pervious Area
174,730	98	80.22% Impervious Area

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

Summary for Subcatchment P3a: Post Devel Area P3a

Runoff = 0.37 cfs @ 10.02 hrs, Volume= 2,528 cf, Depth= 6.46"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-100yr Rainfall=8.38"

Area (sf)	CN	Description
4,695	84	50-75% Grass cover, Fair, HSG D
4,695	84	100.00% Pervious Area

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

Summary for Subcatchment P3b: Post Devel Area P3b

Runoff = 0.69 cfs @ 10.02 hrs, Volume= 4,701 cf, Depth= 7.06"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-100yr Rainfall=8.38"

Area (sf)	CN	Description
7,990	89	<50% Grass cover, Poor, HSG D
7,990	89	100.00% Pervious Area

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

Summary for Subcatchment P3c: Post Devel Area P3c

Runoff = 0.55 cfs @ 10.02 hrs, Volume= 3,714 cf, Depth= 6.46"
Routed to Pond 7P : Total Site Runoff

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type I 24-hr SC-100yr Rainfall=8.38"

Area (sf)	CN	Description
6,899	84	50-75% Grass cover, Fair, HSG D
6,899	84	100.00% Pervious Area

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

Summary for Pond 4P: Detention Basin

Inflow Area = 217,812 sf, 80.22% Impervious, Inflow Depth = 7.81" for SC-100yr event
Inflow = 19.65 cfs @ 10.02 hrs, Volume= 141,720 cf
Outflow = 10.93 cfs @ 10.28 hrs, Volume= 141,720 cf, Atten= 44%, Lag= 15.9 min
Primary = 10.93 cfs @ 10.28 hrs, Volume= 141,720 cf
Routed to Pond 7P : Total Site Runoff
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 12.13' @ 10.28 hrs Surf.Area= 12,291 sf Storage= 19,308 cf

Plug-Flow detention time= 39.2 min calculated for 141,523 cf (100% of inflow)
Center-of-Mass det. time= 39.7 min (745.3 - 705.5)

Volume	Invert	Avail.Storage	Storage Description
#1	10.25'	64,075 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
10.25	8,304	0	0	8,304
11.00	9,855	6,801	6,801	9,876
12.00	12,007	10,913	17,715	12,059
13.00	14,259	13,117	30,832	14,347
14.00	16,611	15,420	46,252	16,740
15.00	19,064	17,823	64,075	19,238

Device	Routing	Invert	Outlet Devices
#1	Primary	7.60'	**18.0" Round Culvert** L= 412.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 7.60' / 5.50' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	10.25'	**16.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.50'	**16.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.75'	**20.0" x 20.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	13.75'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

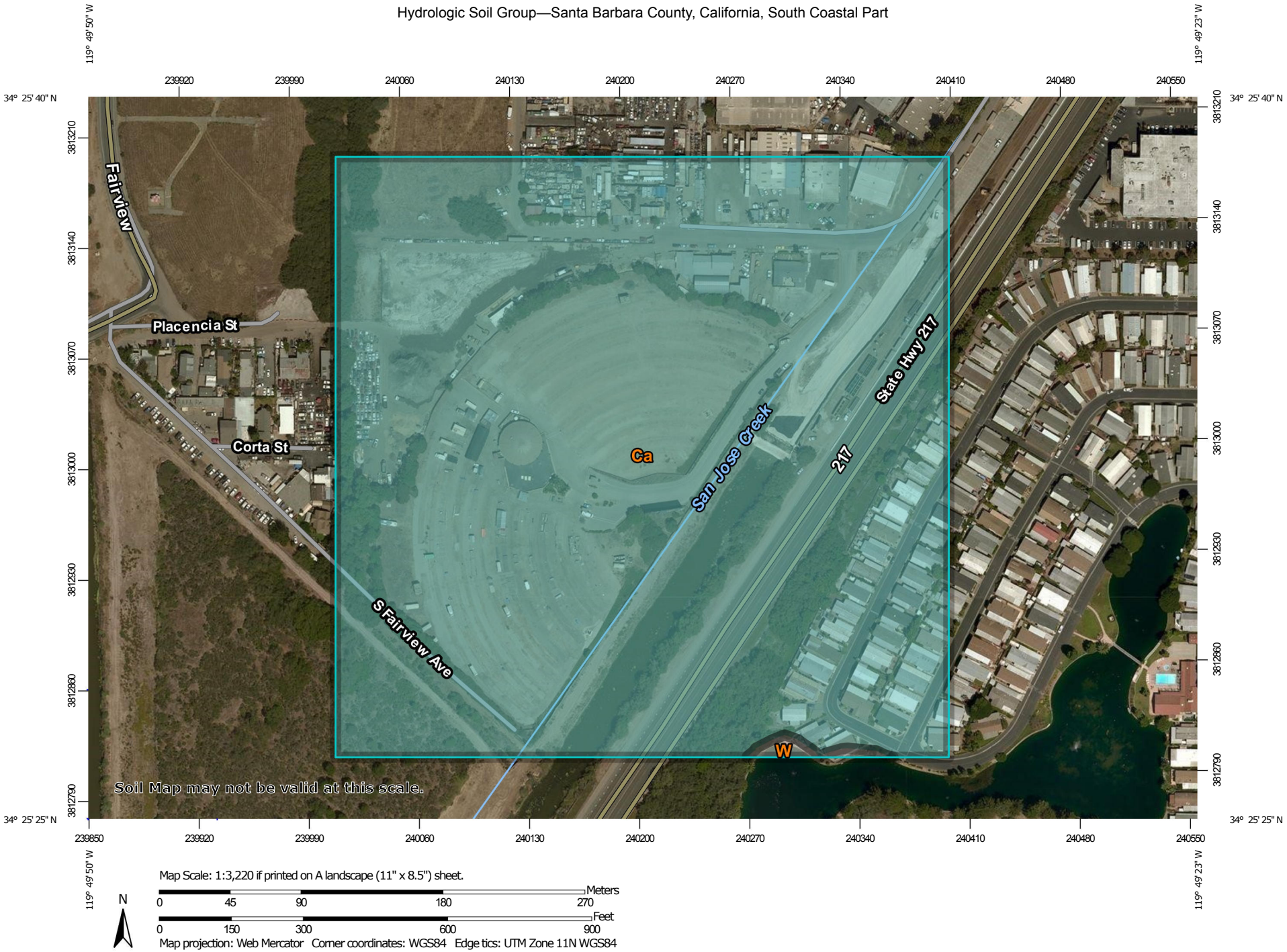
Primary OutFlow Max=10.93 cfs @ 10.28 hrs HW=12.13' (Free Discharge)
└**1=Culvert** (Barrel Controls 10.93 cfs @ 6.18 fps)
  ├**2=Orifice/Grate** (Passes < 5.31 cfs potential flow)
  ├**3=Orifice/Grate** (Passes < 3.76 cfs potential flow)
  └**4=Orifice/Grate** (Passes < 5.03 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=10.25' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: Total Site Runoff

Inflow Area = 251,951 sf, 73.25% Impervious, Inflow Depth = 7.71" for SC-100yr event
Inflow = 13.49 cfs @ 10.14 hrs, Volume= 161,872 cf
Primary = 13.49 cfs @ 10.14 hrs, Volume= 161,872 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs



Map Scale: 1:3,220 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N 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: Santa Barbara County, California, South Coastal Part
Survey Area Data: Version 9, Sep 12, 2016

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

Date(s) aerial images were photographed: Aug 28, 2013—Sep 14, 2013

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

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Santa Barbara County, California, South Coastal Part (CA673)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
Ca	Camarillo fine sandy loam	C	36.6	99.6%
W	Water		0.1	0.4%
Totals for Area of Interest			**36.7**	**100.0%**

Description

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

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

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

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

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

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

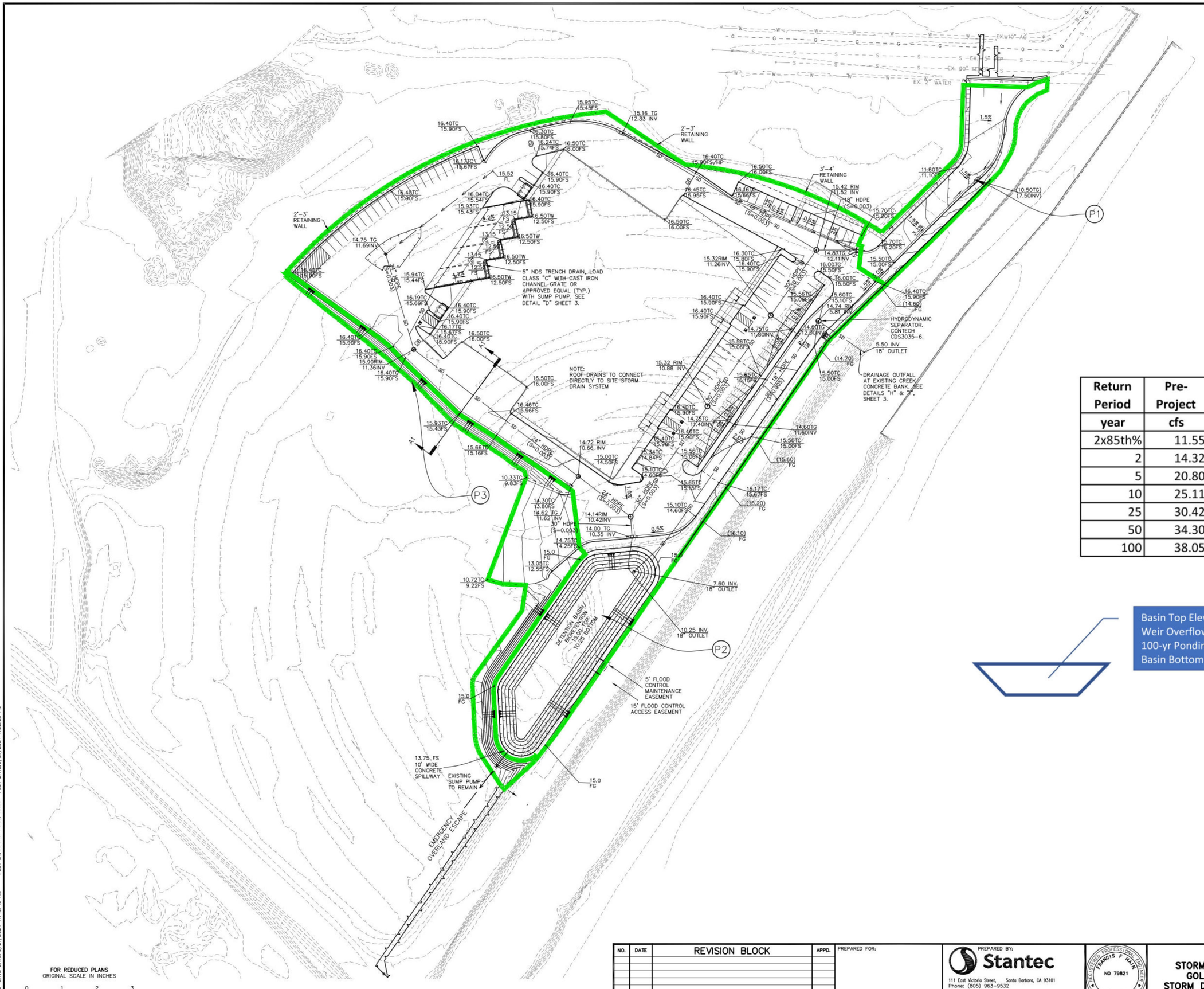
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

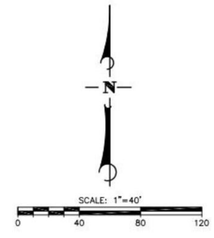
Component Percent Cutoff: None Specified

Tie-break Rule: Higher



Return Period	Pre-Project	Post-Project	Difference
year	cfs	cfs	cfs
2x85th%	11.55	4.01	-7.54
2	14.32	5.11	-9.21
5	20.80	7.12	-13.68
10	25.11	8.27	-16.84
25	30.42	9.88	-20.54
50	34.30	12.43	-21.87
100	38.05	13.49	-24.56

Basin Top Elev = 15.0 ft
Weir Overflow Elev = 13.75 ft
100-yr Ponding Elev = 12.13 ft
Basin Bottom Elev = 10.25 ft



FOR REDUCED PLANS
ORIGINAL SCALE IN INCHES
0 1 2 3

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

FRANCIS F. HAIN	79821	06/21/2024
PROJECT ENGINEER	R.C.E.	DATE

REGISTERED PROFESSIONAL ENGINEER FRANCIS F HAIN NO 79821 CIVIL STATE OF CALIFORNIA

PRELIMINARY STORMWATER CONTROL PLAN GOLETA BUSINESS PARK STORM DRAINS AND WATERSHEDS

GOLETA, CALIFORNIA

STANTEC PROJECT NO. 2064021500
SHEET 3 OF 3
PLAN DATE 06/21/2024

DESIGN ____ CHECKED ____
42-ENG SAVE DATE: 6/21/2024 11:49:49 AM PLOT BY:Corona-Perez, Jesus PLOT DATE:6/21/2024 1:22:26 PM
DRAWING: \\us0377-prfs01\workgroup\2064\active\2064021500\acad\drainage\sept2017 stormwater quality plan.dwg

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