FLYNN ENGINEERING

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8601 SUNRISE BLVD PROJECT
FES #20-1564.00

Drainage Calculations Summary:

This project is 13.72 acres redevelopment project. The site is currently an existing commercial office site and is proposed to be redeveloped into a mixed use multi-family residential/commercial office/retail project with associated parking garage and site parking.

The site is located at 8601 West Sunrise Blvd, Plantation, Fl
(North side of Sunrise Boulevard & just East of Pine Island Road)

Site is located in the Old Plantation Water Control District (OPWCD).

The OPWCD control water elevation for this site is 2.50' NAVD.

Water quality required (1.80 ac-ft) will be provided in exfiltration trench.

Water quantity is provided in exfiltration trench and the existing on site lake.

This design and will result in the following stages:

	Post Development	Pre Development
100-yr - 3 day	8.39' NAVD	8.54' NAVD
(Minimum FFE=8.5 NAVD)		
25-yr - 3 day	8.03' NAVD	8.18' NAVD
(Minimum Perimeter Berm= Not Required)		
10-yr-1 day	7.32' NAVD	7.59' NAVD
(Minimum Road Elevation=7.0 NAVD)		

8601 W SUNRISE BLVD

FES Project No. 20-1564.00

I. GENERAL INFORMATION

Overall Site Analysis

PROPOSED LAND USAGE

A. TOTAL ACREAGE =	597,755 SF =	13.72 AC		
B. BUILDING COVERAGE =	103,131 SF =	2.37 AC	17%	
C. PARKING GARAGE =	34,571 SF=	0.79 AC	6%	
D. TOTAL ASPHALT & WALKS =	258,528 SF =	5.93 AC	43%	
E. LAKE=	19,063 SF =	0.44 AC	18%	
F. TOTAL IMPERVIOUS =	415,293 SF =	9.53 AC		69%
G. % WATER QUALITY IMPERVIOUS =			63%	
H. PERVIOUS AREA =	182,462 SF=	4.19 AC		31%
				100%

EXISTING LAND USAGE

A. TOTAL ACREAGE =	597,755 SF =	13.72 AC		
B. BUILDING COVERAGE =	107,935 SF =	2.48 AC	18%	
C. TOTAL ASPHALT & WALKS =	293,047 SF =	6.73 AC	49%	
D. TOTAL IMPERVIOUS =	400,982 SF =	9.21 AC		67%
E. % WATER QUALITY IMPERVIOUS =			60%	
F. PERVIOUS AREA =	196,774 SF=	4.52 AC		33%
				100%

II. WATER QUALITY CRITERIA

A. COMPUTE FIRST INCH OF RUNOFF FROM TOTAL SITE

1"/12 Total Acreage = 1.14 AC-FT= 13.72 AC-IN

B. COMPUTE 2.5 TIMES THE % OF "WATER QUALITY" IMPERVIOUS

2.5" x % Imperv. = 1.80 AC-FT= 21.65 AC-IN

III. WATER QUANTITY CRITERIA

A. COMPUTE 3.2 INCHES OF RUNOFF FROM TOTAL SITE

3.2"/12 Total Acreage = 3.66 AC-FT= 43.91 AC-IN

Prepared: 4/29/2021

8601 W SUNRISE BLVD

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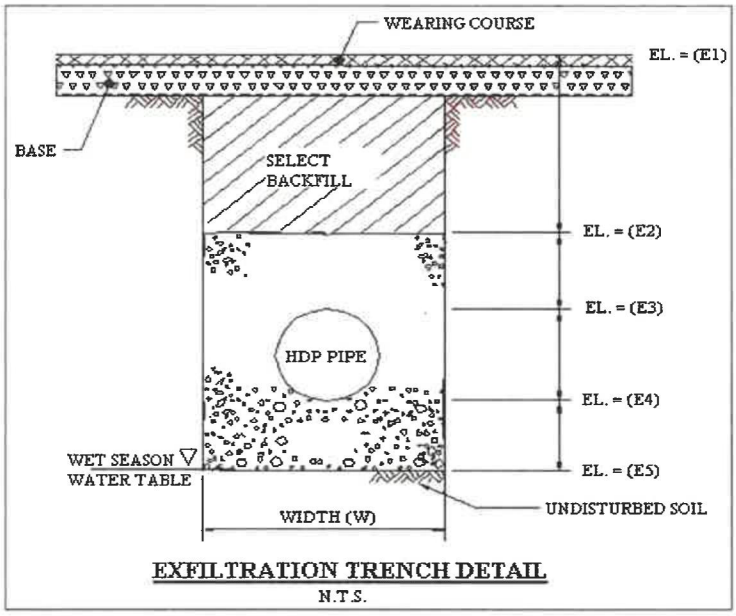

EXFILTRATION TRENCH DETAIL

N.T.S.

E1 =	6.50	ft. NAVD	k_1 =	1.30E-04	cfs / ft² - ft. head (Hydraulic Conductivity)
E2 =	5.00	ft. NAVD	k_2 =	1.53E-04	cfs / ft² - ft. head (Hydraulic Conductivity)
E3 =	4.00	ft. NAVD	$K = (k_1 + k_2)/2$	= 1.42E-04	cfs / ft² - ft. head
E4 =	2.50	ft. NAVD			
E5 =	0.00	ft. NAVD			
Water Table =	2.50	ft. NAVD			
Width (W) =	10.00	ft.			

L =	3710	lineal feet of trench provided	
K =	1.42E-04	cfs / ft² - ft. head (Hydraulic Conductivity)	
D_U =	2.50	ft. (Non-Saturated Trench Depth)	D_U = E2 - (The Shallower of Water Table or E5)
D_S =	2.50	ft. (Saturated Trench Depth)	D_S = (The Shallower of Water Table or E5) - E5
H_2 =	4.00	ft. (Depth to water table)	H_2 = E1 - (The Shallower of Water Table or E5)
W =	10.00	ft. (Width of Trench)	
V_{wq} =	21.65	ac-in (Volume to be treated for water quality)	
%WQ =	0.50		
FS =	2.00		

$$L_{wq} = \frac{FS[(\%WQ)(V_{wq})]}{K(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (0.000139)WD_U} = \frac{21.65}{0.0104 + 0.0035} = 1556 \text{ LF}$$

L_{wq} = 1556 lineal feet of trench required for water quality

$V_{total} = V_{wq} + V_{qn}$ = 43.91 ac-in (Total Volume required to be treated for water quantity)

$V_{qn} = V_{total} - V_{wq}$ = 22.26 ac-in (Volume to be treated in addition to water quality for water quantity)

$$L_{qn} = \frac{FS[(\%WQ)(V_{wq}) + V_{qn}]}{K(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (0.000139)WD_U} = \frac{66.17}{0.0104 + 0.0035} = 4757 \text{ LF}$$

L_{qn} = 4757 lineal feet of trench required for water quantity

$$V_{add} = \frac{[L \times (K(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (0.000139)WD_U)] - V_{wq}}{FS} = \frac{[\ 3710 \times (\ 0.0104 + 0.0035\ )\ ] - 21.65}{2.00}$$

V_{add} = 14.98 ac-in (Volume provided in addition to V_{wq})

$V = V_{wq} + V_{add}$ = 36.63 acre-inches treated (Total volume treated)

= 3.05 acre-feet treated

Prepared: 5/18/2021

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Civil Engineering Services
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Santa Barbara Urban Hydrograph Flood Routing, based on South Florida Water Management District Program
Project: 8601 W SUNRISE BLVD
Date : 5/3/21

Job Number : 20-1564.00
Design Engineer :NAH

Project Location : PLANTATION, FL

Section / Township (S)/ Range (E): 33/49/41 Plat Book / Page: ____ City: Plantation County: Broward State: Florida

Project Description : Existing site.

PRE-CONDITION

*All elevations referenced are in NAVI

Total Project Acreage : 13.720 Acres
Total Drainage Basin(with offsite): 13.720 Acres

Federal Insurance Rate Map Information : Map No. 12011C0: Date: 12-31-19 Zone X Elev. N/A NAVD
Hydrogeologic Information :

RAINFALL DATA from SFWMD Tech. Pub. 81-3 May, 1981	1 Day Storm Event			3 Day Storm Event			Less
	Rainfall Inches	Runoff Inches	Runoff Ac-Ft	Rainfall Inches	Runoff Inches	Runoff Ac-Ft	Trench Ac-Ft
100 Year Return Period	13.20	10.86	12.42	17.94	15.52	17.75	17.75
25 Year Return Period	10.50	8.23	9.41	14.27	11.91	13.62	13.62
10 Year Return Period	9.50	7.27	8.31	12.91	10.58	12.09	12.09
5 Year Return Period							
3 Year Return Period							

For Runoff estimation use USDA SCS formula
Runoff (in.) $Q = \frac{(P-0.2S)^2}{P+0.8S}$
Where: P = accumulated rainfall (in.)
S = Soil Storage Value

SUMMARY OF FLOOD ROUTING	Broward County maps	Calculated 1 Day Storm Event		Calculated 3 Day Storm Event	
		Peak Stage	Peak Discharge	Peak Stage	Peak Discharge
100 Year Return Period	8.00			8.54	0.00
25 Year Return Period				8.18	0.00
10 Year Return Period	6.00	7.59	0.00		
5 Year Return Period					
3 Year Return Period					

Water Table Elevation (ft)= 2.50

Compacted Ground storage table

Depth to water table (Ft)	1.00	2.00	3.00	4.00
Ground storage(In)	0.45	1.88	4.05	6.75

Mean depth to ground water table (ft)= 4.65 (Pervious Area)
Soil Storage (S) Value = 2.22
Soil Storage Value (S) = Storage under pervious area / Total Area
Soil Storage under pavement and bldgs. is not considered, per SFWMD.
Time of Conc. (hr.) = 0.25

STORAGE SOURCE	Basin Storage (Ac-Ft)	Equivalent Wet Detention (Ac-Ft)	Project Storage (Ac-Ft)	Equivalent Wet Detention (Ac-Ft)
Retention				
Dry Detention				
Wet Detention				
Total Less Trench	0.00	0.00	0.00	0.00
Exfiltration Trench	0	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00

Storage from ___ to ___

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Date : 5/3/21

Table 1 - Site Acreage Information

	Input Information												
	LAND USES	Acres	High Elev.	Low Elev.	% Imperv. Paved	% Bldgs.	% Water	Imperv. Paved Acres	Perv. Acres	Bldgs. Acres	Non Bldgs. Acres	Water Lake Acres	Perv. Area Avg. El.
1	BUILDINGS	2.48	8.50	8.50	0.00	100.00	0.00	0.00	0.00	2.48	0.00	0.00	0.00
2	PAVEMENT/WALKS	6.28	8.00	6.30	100.00	0.00	0.00	6.28	0.00	0.00	6.28	0.00	0.00
3	LANDSCAPE	4.52	8.00	6.30	0.00	0.00	0.00	0.00	4.52	0.00	4.52	0.00	7.15
4	EXISTING RETENTION POND	0.44	2.50	2.50	0.00	0.00	100.00	0.00	0.00	0.00	0.44	0.44	0.00
5													
6													
7													
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22													
23													
24													
25													
26													
27													
28													
	PROJECT TOTALS / AVERAGE	13.72	8.50	2.50	45.77	18.08	3.21	6.28	4.52	2.48	11.24	0.44	0.00
	OFFSITE AREAS IN THIS BASIN												
29	NONE	0.000	10.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													
41													
	OFFSITE TOTALS / AVERAGE	0.00	10.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	EXFILTRATION TRENCH												
	BASIN TOTALS / AVERAGE	13.72	10.00	2.00	45.77	18.08	3.21	6.28	4.52	2.48	11.24	0.44	7.15

Basin % Imper. for Water Quality Purposes = 58.15
Drainage Basin % Impervious (incl. Bldg., No lakes)= 65.96

Project % Imper. for Water Quality Purposes = 58.15
Project % Impervious (incl. Bldg., No lakes)= 65.96

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Table 2 - Stage - Storage Information

	LAND USES	Surface storage (Ac-Ft)											
		Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.
		2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	12.50
1	BUILDINGS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	PAVEMENT/WALKS	0.00	0.00	0.00	0.00	0.00	0.91	5.34	11.62	17.90	24.18	30.46	33.60
3	LANDSCAPE	0.00	0.00	0.00	0.00	0.00	0.65	3.84	8.36	12.88	17.40	21.92	24.18
4	EXISTING RETENTION POND	0.00	0.22	0.66	1.10	1.54	1.98	2.42	2.86	3.30	3.74	4.18	4.40
5													
6													
7													
8													
9													
10													
11													
12													
13													
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15													
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22													
23													
24													
25													
26													
27													
28													
	PROJECT TOTALS / AVERAGE	0.00	0.22	0.66	1.10	1.54	3.54	11.60	22.84	34.08	45.32	56.56	62.18
	OFFSITE AREAS IN THIS BASIN												
29	NONE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													
41													
	OFFSITE TOTALS / AVERAGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	EXFILTRATION TRENCH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL	0.00	0.22	0.66	1.10	1.54	3.54	11.60	22.84	34.08	45.32	56.56	62.18

Drainage Basin:
Recieving Water Body:
Runoff Formula: Q=[(72/

SFWMD allowable discharge: 11.83 CFS
Project Acreage : 13.72

Q=Allowable runoff (CFS)
A=Drainage Area (Square Miles)

Table 3 - Stage / Discharge Data	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.
Stage (feet)	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	12.50
Discharge (Cfs)												

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Table 4 - Soil Storage Information

	LAND USES	Depth to Water Table	Ground Storage Under Pervious	
			Inches	Ac-Ft
1	BUILDINGS	0.00	0.00	0.00
2	PAVEMENT/WALKS	0.00	0.00	0.00
3	LANDSCAPE	4.65	6.75	2.54
4	EXISTING RETENTION POND	0.00	0.00	0.00
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
	PROJECT TOTALS / AVERAGE		6.75	2.54
	OFFSITE AREAS IN THIS BASIN			
29	NONE	0.00	0.00	0.00
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
	OFFSITE TOTALS / AVERAGE		0.00	0.00
42				
	TOTAL/AVERAGE		6.75	2.54

Soil Storage Value (S) = Storage under pervious area / Total Area S= 2.22

Soil Storage under pavement and buildings is not considered in computations

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Date : 5/3/21

Exfiltration Trench Design Information :

Hydraulic Conductivity Determination :

FALLING HEAD OPEN HOLE	Test 1	Test 2	Test 3	Test 4
Diameter of test hole (Ft)				
Height of water @ T1 (Ft)				
Height of water @ T2 (Ft)				
Saturated hole depth (Ft)				
Time , T2 - T1 (Sec)				
Hydraulic conductivity (Cfs/Ft^2)				

Avg.

USUAL OPEN HOLE	Test 1	Test 2	Test 3	Test 4
Diameter of test hole (Ft)				
Depth to water table (Ft)				
Saturated hole depth (Ft)				
Stabilized flow rate (Gpm)				
Hydraulic conductivity (Cfs/Ft^2)				

Avg.

Exfiltration Trench Information :

INPUT INFORMATION		
Depth To Top Of Trench (Ft)		
Trench Width (Ft)		
Trench Height (Ft)		
Low Pavement Elevation		
Avg. Hydraulic Conductivity (Cfs/Ft^2)		

Saturated Trench Depth	
Non-Saturated Trench Depth	
Volume Required (Ac-Ft)	
Depth To Water Table or Trench Bottom (Ft)	

Length Required (Ft)		
Length Provided (Ft)		

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Project: 8601 W SUNRISE BLVD
Date : 5/3/21

Table 5 - Stage - Discharge Information 100 - YEAR STORM EVENT

TIME STEP (HOUR)	Rain Fall Ratio	Rain C*P (In)	Q Scs (In)	Inst Q In (Cfs)	Sbuh Q (Cfs)	Tot Q In (Ac-Ft)	Sumq Out (Ac-Ft)	Stored Vol (Ac-Ft)	Stage Lk-Up (Feet)	Inst Q Lkup (Cfs)	Avg. Q Out (Cfs)	Step Qout (Ac-Ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
4.00	0.02	0.32	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
8.00	0.05	0.65	0.02	0.22	0.15	0.02	0.00	0.02	2.07	0.00	0.00	0.00
12.00	0.07	0.96	0.10	0.49	0.36	0.10	0.00	0.10	2.47	0.00	0.00	0.00
16.00	0.10	1.28	0.23	0.34	0.51	0.25	0.00	0.25	3.07	0.00	0.00	0.00
20.00	0.12	1.61	0.40	0.83	0.62	0.44	0.00	0.44	3.51	0.00	0.00	0.00
24.00	0.15	1.93	0.59	0.93	0.69	0.66	0.00	0.66	4.00	0.00	0.00	0.00
28.00	0.18	2.40	0.92	1.57	1.22	1.02	0.00	1.02	4.82	0.00	0.00	0.00
32.00	0.22	2.86	1.26	1.12	1.20	1.42	0.00	1.42	5.72	0.00	0.00	0.00
36.00	0.25	3.33	1.63	1.18	1.19	1.84	0.00	1.84	6.15	0.00	0.00	0.00
40.00	0.29	3.80	2.02	1.23	1.32	2.28	0.00	2.28	6.37	0.00	0.00	0.00
44.00	0.32	4.28	2.43	1.89	1.48	2.74	0.00	2.74	6.60	0.00	0.00	0.00
48.00	0.36	4.74	2.83	1.29	1.39	3.21	0.00	3.21	6.83	0.00	0.00	0.00
52.00	0.40	5.33	3.36	2.63	2.19	3.79	0.00	3.79	7.03	0.00	0.00	0.00
56.00	0.50	6.55	4.47	5.42	4.95	5.01	0.00	5.01	7.18	0.00	0.00	0.00
58.00	0.57	7.55	5.41	7.57	7.39	6.03	0.00	6.03	7.31	0.00	0.00	0.00
59.00	0.63	8.29	6.11	11.11	10.45	6.77	0.00	6.77	7.40	0.00	0.00	0.00
59.50	0.68	8.95	6.74	17.45	15.95	7.36	0.00	7.36	7.47	0.00	0.00	0.00
59.75	0.85	11.18	8.89	119.06	50.82	8.41	0.00	8.41	7.60	0.00	0.00	0.00
60.00	1.02	13.40	11.06	119.64	96.51	10.41	0.00	10.41	7.85	0.00	0.00	0.00
60.50	1.09	14.36	12.00	25.78	44.37	12.99	0.00	12.99	8.12	0.00	0.00	0.00
61.00	1.13	14.86	12.49	13.63	18.39	13.95	0.00	13.95	8.21	0.00	0.00	0.00
62.00	1.18	15.54	13.15	7.90	8.84	14.87	0.00	14.87	8.29	0.00	0.00	0.00
64.00	1.24	16.36	13.96	5.04	5.40	15.85	0.00	15.85	8.38	0.00	0.00	0.00
68.00	1.31	17.31	14.90	2.88	3.24	16.97	0.00	16.97	8.48	0.00	0.00	0.00
72.00	1.36	17.94	15.52	2.16	2.16	17.70	0.00	17.70	8.54	0.00	0.00	0.00
				Peak stage		8.54	At hour	72.00				
				Peak discharge		0.00	At hour	0.00				

Table 6 - Stage - Discharge Information 25 - YEAR STORM EVENT

TIME STEP (HOUR)	Rain Fall Ratio	Rain C*P (In)	Q Scs (In)	Inst Q In (Cfs)	Sbuh Q (Cfs)	Tot Q In (Ac-Ft)	Sumq Out (Ac-Ft)	Stored Vol (Ac-Ft)	Stage Lk-Up (Feet)	Inst Q Lkup (Cfs)	Avg. Q Out (Cfs)	Step Qout (Ac-Ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
4.00	0.02	0.25	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
8.00	0.05	0.51	0.00	0.06	0.03	0.00	0.00	0.00	2.01	0.00	0.00	0.00
12.00	0.07	0.77	0.04	0.27	0.19	0.04	0.00	0.04	2.19	0.00	0.00	0.00
16.00	0.10	1.02	0.12	0.21	0.31	0.13	0.00	0.13	2.59	0.00	0.00	0.00
20.00	0.12	1.28	0.23	0.54	0.40	0.25	0.00	0.25	3.07	0.00	0.00	0.00
24.00	0.15	1.53	0.36	0.63	0.47	0.40	0.00	0.40	3.40	0.00	0.00	0.00
28.00	0.18	1.91	0.58	1.10	0.86	0.65	0.00	0.65	3.97	0.00	0.00	0.00
32.00	0.22	2.28	0.83	0.81	0.87	0.93	0.00	0.93	4.61	0.00	0.00	0.00
36.00	0.25	2.65	1.10	0.87	0.87	1.23	0.00	1.23	5.30	0.00	0.00	0.00
40.00	0.29	3.02	1.39	0.91	0.98	1.56	0.00	1.56	6.01	0.00	0.00	0.00
44.00	0.32	3.40	1.69	1.42	1.11	1.90	0.00	1.90	6.18	0.00	0.00	0.00
48.00	0.36	3.77	1.99	0.97	1.05	2.26	0.00	2.26	6.36	0.00	0.00	0.00
52.00	0.40	4.24	2.39	2.00	1.67	2.70	0.00	2.70	6.58	0.00	0.00	0.00
56.00	0.50	5.21	3.25	4.17	3.80	3.63	0.00	3.63	7.01	0.00	0.00	0.00
58.00	0.57	6.01	3.97	5.86	5.71	4.42	0.00	4.42	7.11	0.00	0.00	0.00
59.00	0.63	6.59	4.52	8.63	8.11	4.99	0.00	4.99	7.18	0.00	0.00	0.00
59.50	0.68	7.12	5.01	13.59	12.41	5.46	0.00	5.46	7.24	0.00	0.00	0.00
59.75	0.85	8.89	6.69	93.09	39.69	6.28	0.00	6.28	7.34	0.00	0.00	0.00
60.00	1.02	10.66	8.39	93.98	75.59	7.84	0.00	7.84	7.53	0.00	0.00	0.00
60.50	1.09	11.42	9.13	20.31	34.87	9.87	0.00	9.87	7.79	0.00	0.00	0.00
61.00	1.13	11.82	9.52	10.74	14.48	10.62	0.00	10.62	7.88	0.00	0.00	0.00
62.00	1.18	12.36	10.04	6.23	6.97	11.34	0.00	11.34	7.97	0.00	0.00	0.00
64.00	1.24	13.01	10.68	3.97	4.26	12.12	0.00	12.12	8.05	0.00	0.00	0.00
68.00	1.31	13.77	11.42	2.28	2.56	13.00	0.00	13.00	8.12	0.00	0.00	0.00
72.00	1.36	14.27	11.91	1.71	1.71	13.58	0.00	13.58	8.18	0.00	0.00	0.00
				Peak stage		8.18	At hour	72.00				
				Peak discharge		0.00	At hour	0.00				

Flynn Engineering
Civil Engineering Services
Ft. Lauderdale, FL; (954) 522-1004

Santa Barbara Urban Hydrograph Flood Routing, based on South Florida Water Management District Program
Project: 8601 W SUNRISE BLVD

Date : 5/3/21

Table 7 - Stage - Discharge Information 10 - YEAR STORM EVENT

TIME STEP (HOUR)	Rain Fall Ratio	Rain C*P (In)	Q Scs (In)	Inst Q In (Cfs)	Sbuh Q (Cfs)	Tot Q In (Ac-Ft)	Sumq Out (Ac-Ft)	Stored Vol (Ac-Ft)	Stage Lk-Up (Feet)	Inst Q Lkup (Cfs)	Avg. Q Out (Cfs)	Step Qout (Ac-Ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
4.00	0.02	0.23	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
8.00	0.05	0.47	0.00	0.01	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
12.00	0.07	0.69	0.03	0.19	0.14	0.03	0.00	0.03	2.11	0.00	0.00	0.00
16.00	0.10	0.92	0.08	0.17	0.25	0.09	0.00	0.09	2.42	0.00	0.00	0.00
20.00	0.12	1.16	0.17	0.45	0.33	0.19	0.00	0.19	2.87	0.00	0.00	0.00
24.00	0.15	1.39	0.28	0.53	0.39	0.31	0.00	0.31	3.21	0.00	0.00	0.00
28.00	0.18	1.73	0.47	0.94	0.73	0.52	0.00	0.52	3.68	0.00	0.00	0.00
32.00	0.22	2.06	0.68	0.70	0.74	0.76	0.00	0.76	4.23	0.00	0.00	0.00
36.00	0.25	2.39	0.91	0.75	0.75	1.03	0.00	1.03	4.83	0.00	0.00	0.00
40.00	0.29	2.74	1.16	0.80	0.85	1.31	0.00	1.31	5.48	0.00	0.00	0.00
44.00	0.32	3.08	1.43	1.24	0.97	1.61	0.00	1.61	6.03	0.00	0.00	0.00
48.00	0.36	3.41	1.69	0.86	0.92	1.92	0.00	1.92	6.19	0.00	0.00	0.00
52.00	0.40	3.84	2.05	1.77	1.47	2.31	0.00	2.31	6.39	0.00	0.00	0.00
56.00	0.50	4.71	2.81	3.71	3.38	3.13	0.00	3.13	6.80	0.00	0.00	0.00
58.00	0.57	5.43	3.45	5.22	5.09	3.84	0.00	3.84	7.04	0.00	0.00	0.00
59.00	0.63	5.97	3.94	7.70	7.24	4.35	0.00	4.35	7.10	0.00	0.00	0.00
59.50	0.68	6.44	4.37	12.15	11.08	4.76	0.00	4.76	7.15	0.00	0.00	0.00
59.75	0.85	8.05	5.88	83.40	35.55	5.49	0.00	5.49	7.24	0.00	0.00	0.00
60.00	1.02	9.64	7.41	84.42	67.79	6.90	0.00	6.90	7.42	0.00	0.00	0.00
60.50	1.09	10.34	8.08	18.27	31.33	8.72	0.00	8.72	7.64	0.00	0.00	0.00
61.00	1.13	10.70	8.42	9.67	13.02	9.40	0.00	9.40	7.73	0.00	0.00	0.00
62.00	1.18	11.18	8.89	5.61	6.28	10.05	0.00	10.05	7.81	0.00	0.00	0.00
64.00	1.24	11.77	9.47	3.58	3.84	10.75	0.00	10.75	7.89	0.00	0.00	0.00
68.00	1.31	12.45	10.13	2.05	2.31	11.54	0.00	11.54	7.99	0.00	0.00	0.00
72.00	1.36	12.91	10.58	1.54	1.54	12.06	0.00	12.06	8.04	0.00	0.00	0.00
				Peak stage		8.04	At hour	72.00				
				Peak discharge		0.00	At hour	0.00				

Table 8 - Stage - Discharge Information 5 - YEAR STORM EVENT

TIME STEP (HOUR)	Rain Fall Ratio	Rain C*P (In)	Q Scs (In)	Inst Q In (Cfs)	Sbuh Q (Cfs)	Tot Q In (Ac-Ft)	Sumq Out (Ac-Ft)	Stored Vol (Ac-Ft)	Stage Lk-Up (Feet)	Inst Q Lkup (Cfs)	Avg. Q Out (Cfs)	Step Qout (Ac-Ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
4.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
8.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
12.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
16.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
20.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
24.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
28.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
32.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
36.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
40.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
44.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
48.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
52.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
56.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
58.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
59.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
59.50	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
59.75	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
60.00	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
60.50	1.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
61.00	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
62.00	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
64.00	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
68.00	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
72.00	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
				Peak stage		2.00	At hour	0.00				
				Peak discharge		0.00	At hour	0.00				

Flynn Engineering

Civil Engineering Services

Ft. Lauderdale, FL; (954) 522-1004

Santa Barbara Urban Hydrograph Flood Routing, based on South Florida Water Management District Program

Project: 8601 W SUNRISE BLVD

Date : 5/3/21

Table 9 - Stage - Discharge Information 3 - YEAR STORM EVENT

TIME STEP (HOUR)	Rain Fall Ratio	Rain C*P (In)	Q Scs (In)	Inst Q In (Cfs)	Sbuh Q (Cfs)	Tot Q In (Ac-Ft)	Sumq Out (Ac-Ft)	Stored Vol (Ac-Ft)	Stage Lk-Up (Feet)	Inst Q Lkup (Cfs)	Avg. Q Out (Cfs)	Step Qout (Ac-Ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
4.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
8.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
12.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
16.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
20.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
24.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
28.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
32.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
36.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
40.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
44.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
48.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
52.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
56.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
58.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
59.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
59.50	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
59.75	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
60.00	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
60.50	1.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
61.00	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
62.00	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
64.00	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
68.00	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
72.00	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
				Peak stage		2.00	At hour	0.00				
				Peak discharge		0.00	At hour	0.00				

Flynn Engineering
Civil Engineering Services
Ft. Lauderdale, FL; (954) 522-1004

Santa Barbara Urban Hydrograph Flood Routing, based on South Florida Water Management District Program
Project: 8601 W SUNRISE BLVD
Date : 5/18/21

Job Number : 20-1564.00
Design Engineer :NAH

Project Location : PLANTATION, FL

Section / Township (S)/ Range (E): 33/49/41 Plat Book / Page: _____ City: Plantation County: Broward State: Florida

Project Description : Proposed site.

POST-CONDITION

*All elevations referenced are in NAVI

Total Project Acreage : 13.720 Acres
Total Drainage Basin(with offsite): 13.720 Acres

Federal Insurance Rate Map Information : Map No. 12011C0: Date: 12-31-19 Zone X Elev: N/A NAVD
Hydrogeologic Information :

RAINFALL DATA from SFWMD Tech. Pub. 81-3 May, 1981	1 Day Storm Event			3 Day Storm Event			Less
	Rainfall Inches	Runoff Inches	Runoff Ac-Ft	Rainfall Inches	Runoff Inches	Runoff Ac-Ft	Trench Ac-Ft
100 Year Return Period	13.20	11.01	12.59	17.94	15.68	17.93	14.88
25 Year Return Period	10.50	8.38	9.58	14.27	12.06	13.79	10.74
10 Year Return Period	9.50	7.41	8.47	12.91	10.73	12.27	9.22
5 Year Return Period							
3 Year Return Period							

For Runoff estimation use USDA SCS formula
Runoff (in.) $Q = \frac{(P-0.2S)^2}{P+0.8S}$
Where: P = accumulated rainfall (in.)
S = Soil Storage Value

SUMMARY OF FLOOD ROUTING	Design	Calculated 1 Day Storm Event		Calculated 3 Day Storm Event	
		Peak Stage	Peak Discharge	Peak Stage	Peak Discharge
100 Year Return Period	8.50	7.88	0.00	8.39	0.00
25 Year Return Period		7.47	0.00	8.03	0.00
10 Year Return Period	7.00	7.32	0.00		
5 Year Return Period					
3 Year Return Period					

Water Table Elevation (ft)= 2.50

Compacted Ground storage table

Depth to water table (Ft)	1.00	2.00	3.00	4.00
Ground storage(In)	0.45	1.88	4.05	6.75

Mean depth to ground water table (ft)= 4.50 (Pervious Area)
Soil Storage (S) Value = 2.06
Soil Storage Value (S) = Storage under pervious area / Total Area
Soil Storage under pavement and bldgs. is not considered, per SFWMD.
Time of Conc. (hr.) = 0.25

STORAGE SOURCE	Basin Storage (Ac-Ft)	Equivalent Wet Detention (Ac-Ft)	Project Storage (Ac-Ft)	Equivalent Wet Detention (Ac-Ft)
Retention				
Dry Detention				
Wet Detention				
Total Less Trench	0.00	0.00	0.00	0.00
Exfiltration Trench	3.05	3.05	0.00	0.00
Total	3.05	3.05	0.00	0.00

Storage from ___ to ___

Flynn Engineering

Civil Engineering Services

Ft. Lauderdale, FL; (954) 522-1004

Santa Barbara Urban Hydrograph Flood Routing, based on South Florida Water Management District Program

Project: 8601 W SUNRISE BLVD

Date : 5/18/21

Table 1 - Site Acreage Information

	Input Information												
	LAND USES	Acres	High Elev.	Low Elev.	% Imperv. Paved	% Bldgs.	% Water	Imperv. Paved Acres	Perv. Acres	Bldgs. Acres	Non Bldgs. Acres	Water Lake Acres	Perv. Area Avg. El.
1	BUILDINGS	2.37	8.50	8.50	0.00	100.00	0.00	0.00	0.00	2.37	0.00	0.00	0.00
2	PAVEMENT/WALKS	5.93	8.00	7.00	100.00	0.00	0.00	5.93	0.00	0.00	5.93	0.00	0.00
3	LANDSCAPE	4.19	8.00	6.00	0.00	0.00	0.00	0.00	4.19	0.00	4.19	0.00	7.00
4	GARAGE	0.79	7.00	7.00	100.00	0.00	0.00	0.79	0.00	0.00	0.79	0.00	0.00
5	EXISTING LAKE	0.44	2.50	2.50	0.00	0.00	100.00	0.00	0.00	0.00	0.44	0.44	0.00
6													
7													
8													
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27													
28													
	PROJECT TOTALS / AVERAGE	13.72	8.50	2.50	48.98	17.27	3.21	6.72	4.19	2.37	11.35	0.44	0.00
	OFFSITE AREAS IN THIS BASIN												
29	NONE	0.000	10.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													
41													
	OFFSITE TOTALS / AVERAGE	0.00	10.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	EXFILTRATION TRENCH												
	BASIN TOTALS / AVERAGE	13.72	10.00	2.00	48.98	17.27	3.21	6.72	4.19	2.37	11.35	0.44	7.00

Basin % Imper. for Water Quality Purposes = 61.59

Drainage Basin % Impervious (incl. Bldg., No lakes)= 68.45

Project % Imper. for Water Quality Purposes = 61.59

Project % Impervious (incl. Bldg., No lakes)= 68.45

Flynn Engineering
Civil Engineering Services
Ft. Lauderdale, FL; (954) 522-1004

Santa Barbara Urban Hydrograph Flood Routing, based on South Florida Water Management District Program
Project: 8601 W SUNRISE BLVD
Date : 5/18/21

Table 2 - Stage - Storage Information

	LAND USES	Surface storage (Ac-Ft)											
		Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.
		2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	12.50
1	BUILDINGS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	PAVEMENT/WALKS	0.00	0.00	0.00	0.00	0.00	0.00	2.97	8.90	14.83	20.76	26.69	29.65
3	LANDSCAPE	0.00	0.00	0.00	0.00	0.00	1.05	4.19	8.38	12.57	16.76	20.95	23.05
4	GARAGE	0.00	0.00	0.00	0.00	0.00	0.00	0.79	1.58	2.37	3.16	3.95	4.35
5	EXISTING LAKE	0.00	0.22	0.66	1.10	1.54	1.98	2.42	2.86	3.30	3.74	4.18	4.40
6													
7													
8													
9													
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27													
28													
	PROJECT TOTALS / AVERAGE	0.00	0.22	0.66	1.10	1.54	3.03	10.37	21.72	33.07	44.42	55.77	61.44
	OFFSITE AREAS IN THIS BASIN												
29	NONE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													
41													
	OFFSITE TOTALS / AVERAGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	EXFILTRATION TRENCH	0.00	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
	TOTAL	0.00	3.27	3.71	4.15	4.59	6.08	13.42	24.77	36.12	47.47	58.82	64.49

Drainage Basin: Recieving Water Body: Runoff Formula: Q=[(72/

SFWMD allowable discharge: 11.83 CFS Project Acreage : 13.72

Q=Allowable runoff (CFS)
A=Drainage Area (Square Miles)

Table 3 - Stage / Discharge Data	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.
Stage (feet)	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	12.50
Discharge (Cfs)												

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Table 4 - Soil Storage Information

	LAND USES	Depth to Water Table	Ground Storage Under Pervious	
			Inches	Ac-Ft
1	BUILDINGS	0.00	0.00	0.00
2	PAVEMENT/WALKS	0.00	0.00	0.00
3	LANDSCAPE	4.50	6.75	2.36
4	GARAGE	0.00	0.00	0.00
5	EXISTING LAKE	0.00	0.00	0.00
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
	PROJECT TOTALS / AVERAGE		6.75	2.36
	OFFSITE AREAS IN THIS BASIN			
29	NONE	0.00	0.00	0.00
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
	OFFSITE TOTALS / AVERAGE		0.00	0.00
42				
	TOTAL/AVERAGE		6.75	2.36

Soil Storage Value (S) = Storage under pervious area / Total Area S= 2.06
Soil Storage under pavement and buildings is not considered in computations

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Exfiltration Trench Design Information :

Hydraulic Conductivity Determination :

FALLING HEAD OPEN HOLE	Test 1	Test 2	Test 3	Test 4
Diameter of test hole (Ft)				
Height of water @ T1 (Ft)				
Height of water @ T2 (Ft)				
Saturated hole depth (Ft)				
Time , T2 - T1 (Sec)				
Hydraulic conductivity (Cfs/Ft^2)				

Avg.

USUAL OPEN HOLE	Test 1	Test 2	Test 3	Test 4
Diameter of test hole (Ft)				
Depth to water table (Ft)				
Saturated hole depth (Ft)				
Stabilized flow rate (Gpm)				
Hydraulic conductivity (Cfs/Ft^2)				

Avg.

Exfiltration Trench Information :

INPUT INFORMATION		
Depth To Top Of Trench (Ft)		
Trench Width (Ft)		
Trench Height (Ft)		
Low Pavement Elevation		
Avg. Hydraulic Conductivity (Cfs/Ft^2)		

Saturated Trench Depth	
Non-Saturated Trench Depth	
Volume Required (Ac-Ft)	
Depth To Water Table or Trench Bottom (Ft)	

Length Required (Ft)		
Length Provided (Ft)		

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Santa Barbara Urban Hydrograph Flood Routing, based on South Florida Water Management District Program
Project: 8601 W SUNRISE BLVD

Date : 5/18/21

Table 5 - Stage - Discharge Information 100 - YEAR STORM EVENT

TIME STEP (HOUR)	Rain Fall Ratio	Rain C*P (In)	Q Scs (In)	Inst Q In (Cfs)	Sbuh Q (Cfs)	Tot Q In (Ac-Ft)	Sumq Out (Ac-Ft)	Stored Vol (Ac-Ft)	Stage Lk-Up (Feet)	Inst Q Lkup (Cfs)	Avg. Q Out (Cfs)	Step Qout (Ac-Ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
4.00	0.02	0.32	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
8.00	0.05	0.65	0.02	0.27	0.19	0.02	0.00	0.02	2.01	0.00	0.00	0.00
12.00	0.07	0.96	0.12	0.54	0.40	0.12	0.00	0.12	2.04	0.00	0.00	0.00
16.00	0.10	1.28	0.26	0.37	0.54	0.28	0.00	0.28	2.09	0.00	0.00	0.00
20.00	0.12	1.61	0.44	0.87	0.65	0.49	0.00	0.49	2.26	0.00	0.00	0.00
24.00	0.15	1.93	0.64	0.97	0.73	0.72	0.00	0.72	2.39	0.00	0.00	0.00
28.00	0.18	2.40	0.98	1.62	1.26	1.09	0.00	1.09	2.79	0.00	0.00	0.00
32.00	0.22	2.86	1.33	1.15	1.24	1.50	0.00	1.50	3.31	0.00	0.00	0.00
36.00	0.25	3.33	1.71	1.21	1.22	1.93	0.00	1.93	3.68	0.00	0.00	0.00
40.00	0.29	3.80	2.11	1.25	1.34	2.38	0.00	2.38	4.08	0.00	0.00	0.00
44.00	0.32	4.28	2.52	1.92	1.51	2.85	0.00	2.85	4.34	0.00	0.00	0.00
48.00	0.36	4.74	2.93	1.31	1.40	3.32	0.00	3.32	3.12	0.00	0.00	0.00
52.00	0.40	5.33	3.47	2.67	2.22	3.91	0.00	3.91	4.46	0.00	0.00	0.00
56.00	0.50	6.55	4.59	5.47	4.99	5.14	0.00	5.14	6.37	0.00	0.00	0.00
58.00	0.57	7.55	5.54	7.63	7.44	6.18	0.00	6.18	7.01	0.00	0.00	0.00
59.00	0.63	8.29	6.24	11.17	10.52	6.91	0.00	6.91	7.11	0.00	0.00	0.00
59.50	0.68	8.95	6.88	17.55	16.04	7.52	0.00	7.52	7.20	0.00	0.00	0.00
59.75	0.85	11.18	9.04	119.60	51.06	8.57	0.00	8.57	7.34	0.00	0.00	0.00
60.00	1.02	13.40	11.21	120.02	96.89	10.57	0.00	10.57	7.61	0.00	0.00	0.00
60.50	1.09	14.36	12.15	25.85	44.51	13.17	0.00	13.17	7.97	0.00	0.00	0.00
61.00	1.13	14.86	12.65	13.66	18.44	14.13	0.00	14.13	8.06	0.00	0.00	0.00
62.00	1.18	15.54	13.31	7.92	8.86	15.04	0.00	15.04	8.14	0.00	0.00	0.00
64.00	1.24	16.36	14.12	5.05	5.41	16.03	0.00	16.03	8.23	0.00	0.00	0.00
68.00	1.31	17.31	15.06	2.89	3.25	17.15	0.00	17.15	8.33	0.00	0.00	0.00
72.00	1.36	17.94	15.68	2.17	2.17	17.89	0.00	17.89	8.39	0.00	0.00	0.00
				Peak stage		8.39	At hour	72.00				
				Peak discharge		0.00	At hour	0.00				

Table 6 - Stage - Discharge Information 25 - YEAR STORM EVENT

TIME STEP (HOUR)	Rain Fall Ratio	Rain C*P (In)	Q Scs (In)	Inst Q In (Cfs)	Sbuh Q (Cfs)	Tot Q In (Ac-Ft)	Sumq Out (Ac-Ft)	Stored Vol (Ac-Ft)	Stage Lk-Up (Feet)	Inst Q Lkup (Cfs)	Avg. Q Out (Cfs)	Step Qout (Ac-Ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
4.00	0.02	0.25	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
8.00	0.05	0.51	0.00	0.10	0.06	0.00	0.00	0.00	2.00	0.00	0.00	0.00
12.00	0.07	0.77	0.05	0.31	0.22	0.05	0.00	0.05	2.02	0.00	0.00	0.00
16.00	0.10	1.02	0.14	0.23	0.34	0.15	0.00	0.15	2.05	0.00	0.00	0.00
20.00	0.12	1.28	0.26	0.58	0.43	0.28	0.00	0.28	2.09	0.00	0.00	0.00
24.00	0.15	1.53	0.39	0.67	0.50	0.44	0.00	0.44	2.13	0.00	0.00	0.00
28.00	0.18	1.91	0.63	1.15	0.90	0.70	0.00	0.70	2.38	0.00	0.00	0.00
32.00	0.22	2.28	0.89	0.84	0.90	1.00	0.00	1.00	2.72	0.00	0.00	0.00
36.00	0.25	2.65	1.16	0.89	0.90	1.31	0.00	1.31	2.95	0.00	0.00	0.00
40.00	0.29	3.02	1.46	0.93	1.00	1.65	0.00	1.65	3.44	0.00	0.00	0.00
44.00	0.32	3.40	1.77	1.45	1.13	2.00	0.00	2.00	3.74	0.00	0.00	0.00
48.00	0.36	3.77	2.08	0.99	1.07	2.36	0.00	2.36	4.05	0.00	0.00	0.00
52.00	0.40	4.24	2.49	2.04	1.70	2.81	0.00	2.81	4.31	0.00	0.00	0.00
56.00	0.50	5.21	3.35	4.22	3.85	3.75	0.00	3.75	4.09	0.00	0.00	0.00
58.00	0.57	6.01	4.09	5.92	5.77	4.55	0.00	4.55	5.91	0.00	0.00	0.00
59.00	0.63	6.59	4.64	8.70	8.18	5.13	0.00	5.13	6.36	0.00	0.00	0.00
59.50	0.68	7.12	5.13	13.70	12.51	5.59	0.00	5.59	6.68	0.00	0.00	0.00
59.75	0.85	8.89	6.82	93.69	39.96	6.42	0.00	6.42	7.05	0.00	0.00	0.00
60.00	1.02	10.66	8.53	94.42	76.02	7.99	0.00	7.99	7.26	0.00	0.00	0.00
60.50	1.09	11.42	9.28	20.38	35.03	10.03	0.00	10.03	7.54	0.00	0.00	0.00
61.00	1.13	11.82	9.67	10.78	14.54	10.79	0.00	10.79	7.64	0.00	0.00	0.00
62.00	1.18	12.36	10.19	6.25	7.00	11.51	0.00	11.51	7.74	0.00	0.00	0.00
64.00	1.24	13.01	10.83	3.99	4.27	12.29	0.00	12.29	7.85	0.00	0.00	0.00
68.00	1.31	13.77	11.57	2.28	2.57	13.18	0.00	13.18	7.97	0.00	0.00	0.00
72.00	1.36	14.27	12.06	1.71	1.71	13.76	0.00	13.76	8.03	0.00	0.00	0.00
				Peak stage		8.03	At hour	72.00				
				Peak discharge		0.00	At hour	0.00				

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Santa Barbara Urban Hydrograph Flood Routing, based on South Florida Water Management District Program
Project: 8601 W SUNRISE BLVD

Date : 5/18/21

Table 7 - Stage - Discharge Information — 10 - YEAR STORM EVENT

TIME STEP (HOUR)	Rain Fall Ratio	Rain C*P (In)	Q Scs (In)	Inst Q In (Cfs)	Sbuh Q (Cfs)	Tot Q In (Ac-Ft)	Sumq Out (Ac-Ft)	Stored Vol (Ac-Ft)	Stage Lk-Up (Feet)	Inst Q Lkup (Cfs)	Avg. Q Out (Cfs)	Step Qout (Ac-Ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
4.00	0.02	0.23	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
8.00	0.05	0.47	0.00	0.04	0.02	0.00	0.00	0.00	2.00	0.00	0.00	0.00
12.00	0.07	0.69	0.03	0.23	0.17	0.03	0.00	0.03	2.01	0.00	0.00	0.00
16.00	0.10	0.92	0.10	0.19	0.27	0.11	0.00	0.11	2.03	0.00	0.00	0.00
20.00	0.12	1.16	0.20	0.48	0.36	0.22	0.00	0.22	2.07	0.00	0.00	0.00
24.00	0.15	1.39	0.31	0.56	0.42	0.35	0.00	0.35	2.11	0.00	0.00	0.00
28.00	0.18	1.73	0.51	0.98	0.77	0.57	0.00	0.57	2.31	0.00	0.00	0.00
32.00	0.22	2.06	0.73	0.73	0.78	0.82	0.00	0.82	2.44	0.00	0.00	0.00
36.00	0.25	2.39	0.97	0.78	0.78	1.09	0.00	1.09	2.79	0.00	0.00	0.00
40.00	0.29	2.74	1.23	0.82	0.88	1.39	0.00	1.39	3.21	0.00	0.00	0.00
44.00	0.32	3.08	1.50	1.28	1.00	1.70	0.00	1.70	3.48	0.00	0.00	0.00
48.00	0.36	3.41	1.78	0.88	0.94	2.01	0.00	2.01	3.75	0.00	0.00	0.00
52.00	0.40	3.84	2.14	1.80	1.50	2.41	0.00	2.41	4.10	0.00	0.00	0.00
56.00	0.50	4.71	2.91	3.76	3.43	3.25	0.00	3.25	4.67	0.00	0.00	0.00
58.00	0.57	5.43	3.56	5.29	5.15	3.96	0.00	3.96	4.57	0.00	0.00	0.00
59.00	0.63	5.97	4.05	7.78	7.31	4.47	0.00	4.47	5.74	0.00	0.00	0.00
59.50	0.68	6.44	4.49	12.26	11.19	4.89	0.00	4.89	6.20	0.00	0.00	0.00
59.75	0.85	8.05	6.01	84.03	35.83	5.63	0.00	5.63	6.70	0.00	0.00	0.00
60.00	1.02	9.64	7.54	84.89	68.25	7.04	0.00	7.04	7.13	0.00	0.00	0.00
60.50	1.09	10.34	8.22	18.35	31.50	8.88	0.00	8.88	7.38	0.00	0.00	0.00
61.00	1.13	10.70	8.57	9.71	13.08	9.56	0.00	9.56	7.47	0.00	0.00	0.00
62.00	1.18	11.18	9.04	5.63	6.30	10.21	0.00	10.21	7.56	0.00	0.00	0.00
64.00	1.24	11.77	9.61	3.59	3.85	10.91	0.00	10.91	7.66	0.00	0.00	0.00
68.00	1.31	12.45	10.28	2.06	2.31	11.71	0.00	11.71	7.77	0.00	0.00	0.00
72.00	1.36	12.91	10.73	1.55	1.55	12.23	0.00	12.23	7.84	0.00	0.00	0.00
				Peak stage		7.84	At hour	72.00				
				Peak discharge		0.00	At hour	0.00				

Table 8 - Stage - Discharge Information — 5 - YEAR STORM EVENT

TIME STEP (HOUR)	Rain Fall Ratio	Rain C*P (In)	Q Scs (In)	Inst Q In (Cfs)	Sbuh Q (Cfs)	Tot Q In (Ac-Ft)	Sumq Out (Ac-Ft)	Stored Vol (Ac-Ft)	Stage Lk-Up (Feet)	Inst Q Lkup (Cfs)	Avg. Q Out (Cfs)	Step Qout (Ac-Ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
4.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
8.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
12.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
16.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
20.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
24.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
28.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
32.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
36.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
40.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
44.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
48.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
52.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
56.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
58.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
59.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
59.50	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
59.75	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
60.00	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
60.50	1.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
61.00	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
62.00	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
64.00	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
68.00	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
72.00	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
				Peak stage		2.00	At hour	0.00				
				Peak discharge		0.00	At hour	0.00				

Flynn Engineering
Civil Engineering Services
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Santa Barbara Urban Hydrograph Flood Routing, based on South Florida Water Management District Program
Project: 8601 W SUNRISE BLVD

Date : 5/18/21

Table 9 - Stage - Discharge Information 3 - YEAR STORM EVENT

TIME STEP (HOUR)	Rain Fall Ratio	Rain C*P (In)	Q Scs (In)	Inst Q In (Cfs)	Sbuh Q (Cfs)	Tot Q In (Ac-Ft)	Sumq Out (Ac-Ft)	Stored Vol (Ac-Ft)	Stage Lk-Up (Feet)	Inst Q Lkup (Cfs)	Avg. Q Out (Cfs)	Step Qout (Ac-Ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
4.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
8.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
12.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
16.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
20.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
24.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
28.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
32.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
36.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
40.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
44.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
48.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
52.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
56.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
58.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
59.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
59.50	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
59.75	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
60.00	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
60.50	1.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
61.00	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
62.00	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
64.00	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
68.00	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
72.00	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
				Peak stage		2.00	At hour	0.00				
				Peak discharge		0.00	At hour	0.00				