

Project:2400 E Atlantic

Date: 05/13/2025

Flood Routing Description:Post-Development Calculations

Client :Portman Holdings

Job Number: 14267.00

Design Engineer :Bryan Baldwin

Project Address / Location :2400 East Atlantic Blvd

City: Pompano Beach

County: Broward

State: Florida

Section/Township/Range:Section 05, Township 48S, Range 43E

Surfacewater License:

FEMA FIRM Information:12011X0376J

Project Description:A mixed-use building with ground floor commercial, approximately 350 units, and structured parking,

Total Drainage Basin:0.238 Acres

Hydrogeologic Information :

Table 1.	1 Day Storm Event			3 Day Storm Event		
RAINFALL DATA	Rainfall Inches	Runoff Inches	Runoff Ac-Ft	Rainfall Inches	Runoff Inches	Runoff Ac-Ft
100 Year Return Period						
25 Year Return Period						
10 Year Return Period	9.5	0.10	0.002			
5 Year Return Period	7.8	5.81	0.115	10.6	8.51	0.169
3 Year Return Period						
5 Yr Return Period - 1 Hr	3.2	0.00	0.000			

Runoff estimation - USDA SCS formula

Runoff (in) $Q=\frac{(P-0.2S)^2}{P+0.8S}$

Where: P = accumulated rainfall (in.)
S = Soil Storage Value

Table 2. SUMMARY OF FLOOD ROUTING	Agency maps	SBUH Calculated with Q-1 Day Storm		SBUH Calculated with Q-3 Day Storm		SBUH Calculated *Zero Q-3 Day Storm		Calc. 5Yr 1 hour Peak Stage (ft)
		Peak Stage(ft)	Peak Q (CFS)	Peak Stage(ft)	Peak Q (CFS)	Peak Stage(ft)	Peak Q (CFS)	
100 Year Return Period								Zero Q (Water Budget)
25 Year Return Period								
10 Year Return Period		5.17	0.00					
5 Year Return Period		4.98	0.00	5.29	0.00	5.29	0.00	3.20
3 Year Return Period								

For 5 yr - 1 hr rainfall, Calculate 5 yr Vol by subtracting Exfil vol in inches from 5 yr 1 h rainfall, then calc Runoff using SCS formula. From stage storage table find Zero Discharge Stage. Uses Max. Elev of Lookup Stage or highest top of EXFIL trench. If exfil vol exceeds 5 year 1 hour vol. Uses Max. Elev of highest top of EXFIL trench.

* Zero Q indicates there is no offsite discharge included in the calculations (only Exfil Trench and Wells). Hypothetical stage calc. for PRE-POST Analysis.

Table 3. WATER QUALITY STORAGE REQUIREMENTS:	
Based on Total Drainage Basin Acreage	Ac-Ft
1" x Basin Area	0.020
2.5" x WQPI x (Basin Area 1.82 Inches	0.036
Required Wet Detention (Total basin incl Offsite)	
0.5" Pretreatment-Com. Prjs,x(Basin Area - water area)	0.010
Credit for Inlets in Grass Areas, GAC=0.2" x (TDA	0.004
	N

Table 4. WATER QUALITY STORAGE SOURCE	Basin Storage Elev. (Ac-Ft)	WQ Eq WDV (Ac-Ft)	WQ Eq WDV Inches
Retention (RV) @			
Dry Det. (DDV) @			
Wet Det. (WDV) @			
Equiv WDV=WDV+RV/.5+DDV/.75)		0.000	
Exfil Trench Storage	0.039	0.079	3.96
Total WQ EQ WDV - Provided		0.079	3.96
Total WQ EQ WDV - Required		0.036	1.82

Exfil Vol. in Stage Storage =

(Ac-FT)	(Inches)
0.057	2.89

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Table 5. PRE - POST COMPARISON	PRE-DEVELOP. with Q - 3 Day Storm		POST-DEVELOP. with Q - 3 Day Storm		PRE-DEVELOP. *Zero Q - 1 Day Storm		POST-DEVELOP. *Zero Q - 1 Day Storm	
	Peak Stage(ft)	Peak Q (CFS)	Peak Stage(ft)	Peak Q (CFS)	Peak Stage(ft)	Peak Q (CFS)	Peak Stage(ft)	Peak Q (CFS)
100 Year Return Period								
25 Year Return Period								
10 Year Return Period					5.19		5.17	
5 Year Return Period					5.05		4.98	
3 Year Return Period								

Routing Results from Analysis WITHOUT Offsite Discharge

Table 8. STAGE - DISCHARGE INFORMATION 10 - YEAR STORM - Zero Offsite Discharge

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	1.50	0.00	0.00	0.00
4.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
8.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
12.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
16.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
20.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
24.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
28.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
32.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
36.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
40.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
44.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
48.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
52.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
56.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
58.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
59.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
59.50	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
59.75	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
60.00	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
60.50	1.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
61.00	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
62.00	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
64.00	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
68.00	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
72.00	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
Peak stage						1.50	At hour	0.00				
Peak discharge						0.00	At hour	0.00				

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Routing Results from Analysis WITHOUT Offsite Discharge

Table 9. STAGE - DISCHARGE INFORMATION 5 - YEAR STORM - Zero Offsite Discharge

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	1.50	0.00	0.00	0.00
4.00	0.02	0.19	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
8.00	0.05	0.38	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00
12.00	0.07	0.57	0.01	0.00	0.00	0.00	0.00	0.00	1.51	0.00	0.00	0.00
16.00	0.10	0.75	0.05	0.00	0.00	0.00	0.00	0.00	1.54	0.00	0.00	0.00
20.00	0.12	0.95	0.12	0.01	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0.00
24.00	0.15	1.14	0.20	0.01	0.00	0.00	0.00	0.00	1.65	0.00	0.00	0.00
28.00	0.18	1.42	0.34	0.01	0.01	0.01	0.00	0.01	1.76	0.00	0.00	0.00
32.00	0.22	1.69	0.51	0.01	0.01	0.01	0.00	0.01	1.90	0.00	0.00	0.00
36.00	0.25	1.96	0.69	0.01	0.01	0.01	0.00	0.01	2.06	0.00	0.00	0.00
40.00	0.29	2.24	0.89	0.01	0.01	0.02	0.00	0.02	2.22	0.00	0.00	0.00
44.00	0.32	2.52	1.10	0.02	0.01	0.02	0.00	0.02	2.40	0.00	0.00	0.00
48.00	0.36	2.79	1.31	0.01	0.01	0.02	0.00	0.02	2.58	0.00	0.00	0.00
52.00	0.40	3.14	1.59	0.02	0.02	0.03	0.00	0.03	2.80	0.00	0.00	0.00
56.00	0.50	3.86	2.20	0.05	0.04	0.04	0.00	0.04	3.24	0.00	0.00	0.00
58.00	0.57	4.45	2.72	0.07	0.06	0.05	0.00	0.05	3.62	0.00	0.00	0.00
59.00	0.63	4.89	3.11	0.11	0.08	0.05	0.00	0.05	3.88	0.00	0.00	0.00
59.50	0.68	5.27	3.46	0.17	0.11	0.06	0.00	0.06	4.05	0.00	0.00	0.00
59.75	0.85	6.59	4.68	1.18	0.24	0.06	0.00	0.06	4.22	0.00	0.00	0.00
60.00	1.02	7.90	5.92	1.19	0.45	0.07	0.00	0.07	4.51	0.00	0.00	0.00
60.50	1.09	8.46	6.47	0.26	0.45	0.09	0.00	0.09	4.74	0.00	0.00	0.00
61.00	1.13	8.76	6.75	0.14	0.34	0.11	0.00	0.11	4.92	0.00	0.00	0.00
62.00	1.18	9.16	7.14	0.08	0.18	0.13	0.00	0.13	5.07	0.00	0.00	0.00
64.00	1.24	9.64	7.60	0.05	0.07	0.15	0.00	0.15	5.17	0.00	0.00	0.00
68.00	1.31	10.20	8.15	0.03	0.03	0.16	0.00	0.16	5.25	0.00	0.00	0.00
72.00	1.36	10.57	8.51	0.02	0.02	0.17	0.00	0.17	5.29	0.00	0.00	0.00
Peak stage						5.29	At hour	72.00				
Peak discharge						0.00	At hour	72.00				

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Total Drainage Basin:

0.238 Acres

Y

Y/N -Do you want to limit the Exfiltration Trench Vol. to a maximum of 3.28" over the site?

Water Table Elevation =

1.50 Feet

N

Y/N -Deduct EXFIL Vol. from Rainfall amount rather than include Vol. in Stage Storage table

Time of Conc. (hr.) =

1.00

Y

Y/N -Use EXFIL Vol. in Stage Storage, up to Water Quality Vol., without safety Factor of 2.

Calculated weighted soil (s)

1.99

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

Calculated CN value

83.4

Soil Storage under pavement and buildings is not considered in computations

Table 16. STAGE STORAGE TABLE

Stage Elevation (feet)	Storage (Ac-ft)	Storage (CF)	Depth to water table (Ft)	Compacted Ground storage table			
				1.00	2.00	3.00	4.00
			Ground storage(In)	0.45	1.88	4.95	8.18
1.50	0.000	0	Mean depth to ground water table (ft)=	3.75	(Pervious Area)		
2.00	0.011	500					
2.50	0.023	1,001					
3.00	0.034	1,501	Soil Storage Type	Ground Storage Values (In Inches)			
3.50	0.046	2,002	Depth to Ground Water (Ft)	1	2	3	4
4.00	0.057	2,502	* Depressional	0.45	1.58	3.3	5.1
4.50	0.072	3,134	Flatwoods	0.45	1.88	4.05	6.75
5.00	0.115	5,029	Coastal Type	0.45	1.88	4.95	8.18
5.50	0.204	8,888	* (Low Flatwoods & Costal Lowlands)				
6.00	0.323	14,080	Ground Storage Values reflect 25% reduction of Available Storage,				
6.50	0.442	19,272	to take into account compaction of native soils.				
7.00	0.562	24,465					
7.50	0.681	29,657					
8.00	0.800	34,849					
8.50	0.919	40,041					
9.00	1.038	45,233					
9.50	1.158	50,426					
10.00	1.277	55,618					
10.50	1.396	60,810					

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Table 17. SITE ACREAGE INFORMATION

Input Information								Imperv. Paved Acres	Perv. Acres	Bldgs. Acres	Non Bldgs. Acres	Water Lake Acres	Perv. Area Avg. El.	perv. acres * avg el
LAND USES		Acres	High Elev.	Low Elev.	% Imperv. Paved	% Bldgs.	% Water							
BASIN TOTALS / AVERAG		0.238	5.50	1.50	72.99	0.00	0.00	0.17	0.06	0.00	0.24	0.00	5.25	
1	Pervious	0.064	5.50	5.00	0	0	0	0.00	0.06	0.00	0.06	0.00	5.25	0.
2	Impervious	0.174	5.50	4.00	100	0	0	0.17	0.00	0.00	0.17	0.00	0.00	0.
3														
4														
5														
6														
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39														
BASIN SUBTOTALS / AVG		0.238	5.50	4.00	72.99	0.00	0.00	0.17	0.06	0.00	0.24	0.00	5.25	0.

Table 18. UNDERGROUND STORAGE INFORMATION

Underground Storage	Area (SF)	Top Elev	Bottom Elev	% Voids
1 Underground Storage 1				
2 Underground Storage 2				
3 Underground Storage 3				
4 Underground Storage 4				
5 Underground Storage 5				
BASIN TOTALS / AVERAGE	0.238	5.50	1.50	72.99

Basin % Imper. for Water Quality Purposes = 72.99

Basin % Pervious (incl. Bldg., No lakes)= 72.99

P&Z

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Flood Routing Description:Post-Development Calculations

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Detail - Stage - Storage Information

Table 19. STAGE - STORAGE INFORMATION													
		Surface storage (Ac-Ft)											
LAND USES	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.
	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50
Total Surface Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.058	0.147	0.266	0.385	0.504	0.623
Underground Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Exfil Trench Storage	0.000	0.011	0.023	0.034	0.046	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057
TOTAL Storage	0.000	0.011	0.023	0.034	0.046	0.057	0.072	0.115	0.204	0.323	0.442	0.562	0.681
1 Pervious	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.048	0.080	0.113	0.145
2 Impervious	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.058	0.131	0.218	0.305	0.392	0.479
3													
4													
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37													
38													
39													
40													
Total Surface Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.15	0.27	0.38	0.50	0.62
Underground Storage													
	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50
1 Underground Storage 1													
2 Underground Storage 2													
3 Underground Storage 3													
4 Underground Storage 4													
5 Underground Storage 5													
Total Underground Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Exfil Trench Storage	0.000	0.011	0.023	0.034	0.046	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057
TOTAL Storage	0.000	0.011	0.023	0.034	0.046	0.057	0.072	0.115	0.204	0.323	0.442	0.562	0.681
Stage Elevation	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50

Table 20. SOIL - STORAGE INFORMATION
Detail - Soil Storage Information

	LAND USES	Depth to Water Table	Ground Storage Under Pervious	
			Inches	Ac-Ft
	TOTAL/AVERAGE		7.37	0.04
1	Pervious	3.75	7.37	0.040
2	Impervious	0.00	0.00	0.000
3				
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40				
	TOTAL/AVERAGE		7.37	0.040

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

S=	1.9914278
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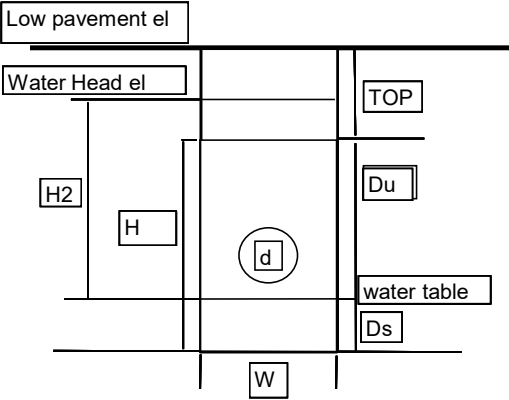
Flood Routing Description:

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Table 22-1 EXILTRATION TRENCH -1 INFORMATION

INPUT INFORMATION	
Trench Width (Ft) (W)	6.80
Trench Height (Ft) (H)	3.40
Diameter of Pipe (inches) (d)	18
Invert of Pipe (Ft) (IE)	1
Top of trench elevation	3.2
Low pavement elevation	5
Water Head elevation (Ft)	4.00
Avg. Hydraulic Conductivity (Cfs/Ft^2) (k)	1.00E-04



Length of Exfiltration trench Provided (Ft) (L)	200
Water table elevation (Ft)	1.50
Trench Data	
Depth To Top Of Trench (Ft) (TOP)	0.80
Bottom of trench elevation	-0.20
Saturated Trench Depth (Ds)	1.70
Non-Saturated Trench Depth (Du)	1.70
Depth To Water Table or Trench Bottom (Ft) (H2)	2.50
Trench Storage Begins at Higher of Water Table or Trench Bot. Elev.	1.50

= Water head El - Top of Trench El.
= Top of Trench El. - Trench Height (H)
= Trench Height below water Table
= Trench depth above water Table
= Water head El to the water table or bottom of trench

Trench Volumes Stored & Exfiltrated in 1 hour (CF)

1 Hr. Vol by exfil SFWMD Eq.7 (Du > Ds and W < 2H) (CF)	3,425
1 Hr. Vol by exfil SFWMD Eq.8 (Du < Ds or W > 2H) (CF)	0
This Trench Volume with Safety Factor of 2 (V(trnSF))	1,713
Max. Vol allowed in Exfil (3.28" = 0.273 Ac-Ft / Ac) (Val) (CF)	2,838
Total EXFIL Vol Provided ALL EXFIL Trenches (Vtot) (CF)	1,713
Equivalent Wet Detention Vol:50% credit ALL EXFIL (Vwteq) (CF)	3,425
Total System ALL EXFIL WQ Equivalent Wet Det. Vol Provided	3,425
Total System ALL EXFIL Volume Used in Stage-Storage	2,502

Note: 3630 in Eqn. is conversion factor from (Ac-In) to (CF)-> (43560 SF/Ac)(1FT/12In)

$V_{trn} = 3630 * L * [k * ((H2 * W) + (2 * H2 * Du) - Du^2 + (2 * H2 * Ds)) + ((1.39 * 10^{-4}) * (W * Du))]$	
$V_{trn} = 3630 * L * [k * ((2 * H2 * Du) - Du^2 + (2 * H2 * Ds)) + ((1.39 * 10^{-4}) * (W * Du))]$	
$V(TrnSF) = V_{trn} / (\text{Safety Factor of } 2)$	
$V_{tot} = V_{design} + V_{sto}$	
$V_{wteq} = V_{tot} * 2$	

0.039	Ac-Ft	0.47	Ac-In
0.065	Ac-Ft	0.78	Ac-In
0.039	Ac-Ft	0.47	Ac-In
0.079	Ac-Ft	0.94	Ac-In

CF 0.079 Ac-Ft NOTE: This line is Sum of all Exfiltration Trenches
CF 0.057 Ac-Ft NOTE: This line is Sum of all Exfiltration Trenches

NOTE: For Exfiltration Trench design, a factor of safety of 2 is used for WQ in all conditions (WQ vol & above WQ vol), per the "New" SFWMD formula.
Select on the Stage-Storage tab, whether to use the safety factor for the Exfil trench, up to the required WQ amount, in the flood routing Stage-Storage volumes.
Because of the built in safety factor of only using the trench discharge for one hour during the 72 hour storm event, some Agencies allow the use of the
Exfiltration trench volume, up to the required Water Quality Volume, without a safety factor of 2, for use in storm routing calculations.