

DRAINAGE CALCULATIONS

**Medical Building
47 West 14 Street
Riviera Beach, FL 33404**

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**MEDICAL BUILDING
RIVIERA BEACH, FLORIDA**

1) PROPOSED LAND USE

	LAND AREA (ACRES)	BUILDING (ACRES)	23.21%	PAVED COVERAGE (ACRES)	48.86%	TOTAL IMPERVIOUS (ACRES)	
	0.32	0.07		0.16		0.23	72.1%
TOTAL	0.32	0.07		0.16		0.23	

Site Area.....	0.32	acres
Net Area.....	0.32	acres
Building Area.....	0.07	acres
Parking Lot/Sidewalk Area	0.16	acres
Green Area.....	0.09	acres

2) FLOOD AND RAINFALL CRITERIA

5 year, 1 hour storm.....	3.20	inches	
5 year, 1 day storm.....	7.00	inches	
10 year, 1 day storm.....	8.50	inches	Minimum road crown.....
25 year, 1 day storm.....	9.50	inches	14.00
100 year, 3 day storm.....	16.00	inches	Finish Floor Elev.
			15.50

3) COMPUTE SOIL STORAGE

Wet season water elev.....	2.00	navd
Ave. groundwater elev.....	2.00	navd
Ave. site elevation.....	12.50	navd
Depth to water table.....	10.50	ft
Assuming 25% compaction, available ground storage is.....	6.75	inches
Storage available in pervious areas of the site is	0.05	acre ft.
Converting to site wide moisture storage, S	1.89	inches

4) WATER QUALITY REQUIREMENTS

i) Based on the first 1" of runoff

Site area..... 0.32 acres
 Required detention..... 0.03 acre ft.

ii) Based on 2.5 inches times percent impervious

Site area..... 0.25 acres (Excluding building areas)
 Impervious area..... 0.16 acres (Excluding building areas)
 Percent impervious..... 63.63 %
 Required detention..... 0.04 acre ft.

Therefore the required detention is..... 0.04 acre ft. 0.51 ac. Inches

Corresponding stage is between..... 10.50 and..... 11.00 navd

Interpolating gives a weir crest of..... 10.60 navd

iii) Compute exfiltration trench requirements for pre-treatment of pavement areas

Impervious area..... 0.16 acres
 Pretreatment based on 1/2 inch..... 0.01 acre ft.

iv) Compute required exfiltration trench volume 0.01 acre ft.

Required treatment in exfiltration trench is 0.04 ac.ft or 0.51 ac. inches

Average Hydraulic conductivity, K..... 1.05E-04

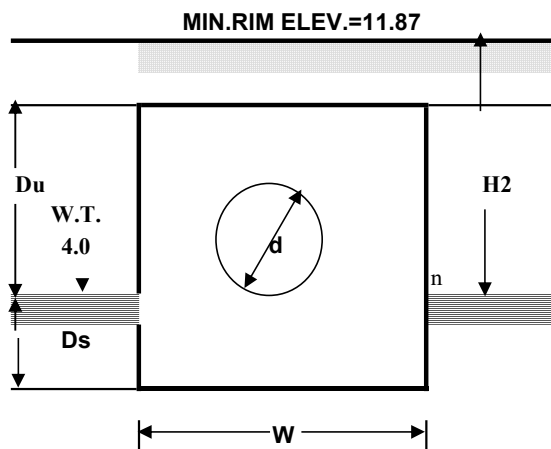
Top of trench elevation..... 10.75 navd
 Bottom of trench elevation..... 6.75 navd
 Trench width..... 5.0 ft
 Trench height..... 4.0 ft
 Pipe diameter..... 1.50 ft min.
 Depth to water table..... 12.0 ft
 Non saturated trench depth..... 4.0 ft
 Saturated trench depth..... 0.0 ft
 Trench storage area..... 10.88 sq.ft.

Trench length required for retention volume to be exfiltrated in 1 hour:

Length required..... 29 ft
 Associated average percolation rate..... 0.52 cfs

Length of trench to be used..... 80 l.f.

Associated average percolation rate..... 1.41 cfs or 0.1 ac.ft/hr



5) COMPUTE STAGE STORAGE

Assumptions:

Roads stores linearly from..... 11.75 to elevation... 12.52 then vertically
 Green areas store linearly from..... 12.50 to elevation... 12.75 then vertically
 Trench stores linearly from..... 6.75 to elevation... 10.75 then vertically

Storage (acre ft.)

Stage	Roads	Site	Trench**	Total	Stage
7.00	0.00	0.00	0.00	0.00	7.00
7.50	0.00	0.00	0.00	0.00	7.50
8.00	0.00	0.00	0.01	0.01	8.00
8.50	0.00	0.00	0.01	0.01	8.50
9.00	0.00	0.00	0.01	0.01	9.00
9.50	0.00	0.00	0.01	0.01	9.50
10.00	0.00	0.00	0.02	0.02	10.00
10.50	0.00	0.00	0.02	0.02	10.50
11.00	0.00	0.00	0.14	0.14	11.00
11.50	0.00	0.00	0.14	0.14	11.50
12.00	0.01	0.00	0.14	0.14	12.00
12.50	0.06	0.00	0.14	0.19	12.50
13.00	0.13	0.02	0.14	0.29	13.00
13.50	0.21	0.07	0.14	0.42	13.50
14.00	0.29	0.11	0.14	0.54	14.00
14.50	0.37	0.16	0.14	0.66	14.50
15.00	0.45	0.20	0.14	0.79	15.00
15.50	0.53	0.25	0.14	0.91	15.50
16.00	0.60	0.29	0.14	1.03	16.00
16.50	0.68	0.34	0.14	1.16	16.50
17.00	0.76	0.38	0.14	1.28	17.00
17.50	0.84	0.43	0.14	1.40	17.50
18.00	0.92	0.47	0.14	1.53	18.00
18.50	1.00	0.52	0.14	1.65	18.50
19.00	1.07	0.56	0.14	1.77	19.00
19.50	1.15	0.61	0.14	1.90	19.50
20.00	1.23	0.65	0.14	2.02	20.00
20.50	1.31	0.70	0.14	2.14	20.50
21.00	1.39	0.74	0.14	2.27	21.00
21.50	1.47	0.79	0.14	2.39	21.50
22.00	1.55	0.83	0.14	2.51	22.00
22.50	1.62	0.88	0.14	2.64	22.50
23.00	1.70	0.92	0.14	2.76	23.00

** Trench storage includes the first hour of trench discharge

6) FLOOD STAGE CRITERIA

5 Year 1 day Flood

5 year, 1 day storm	7.00 in.		
Runoff	5.16 in.		
Volume of runoff	0.14 acre ft.		
Corresponding stage is between.....		11.50 and.....	12.00 navd
Interpolating gives an elevation of.....		11.59 navd	

5 Year 1 hour Flood

5 year, 1 hour storm	3.20 in.		
Runoff	1.69 in.		
Volume of runoff	0.05 acre ft.		
Corresponding stage is between.....		10.50 and.....	11.00 navd
Interpolating gives an elevation of.....		10.61 navd	

25 Year 3 day Flood

25 year, 3 day storm	12.92 in.		
Runoff	10.90 in.		
Volume of runoff	0.29 acre ft.		
Corresponding stage is between.....		12.50 and.....	13.00 navd
Interpolating gives an elevation of.....		13.00 navd	

100 Year 3 day Flood

$$Q = (P - (0.2xS))^2 / (P + (0.8xS))$$

100 year, 3 day storm	16.00 in.		
Runoff	13.94 in.		
Volume of runoff	0.37 acre ft.		
Corresponding stage is between.....		13.00 and.....	13.50 navd
Interpolating gives an elevation of.....		13.33 navd	