

DRAINAGE REPORT

Self Storage - Margate

City of Margate, FL

May 13, 2016

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License # 58216

Existing Conditions

The subject site is located in the City of Margate on the south side of NW 31st St. east of State Road 7 adjacent to the Walgreen's development. The site is presently vacant and totals approximately 2.60 Ac. According to the FEMA Flood Insurance Rate Map # 12011C0368H the site is not located in a flood zone.

Proposed Development

The proposed development includes a self-storage facility along with the associated drive aisles and parking. The total drainage area considered for design does not include the existing cross access drive aisles constructed as part of the Walgreen's development. The proposed system consists of a series of inlets and pipes conveying runoff to a dry detention pond south of the building. The pond connects to the existing system through a drop inlet and a series of pipes and manholes conveying the flow to the connection point in the existing drive aisle south of the property.

Design Requirements

Water Quality Criteria

SFWMD water quality detention/retention (pre-treatment) criteria and procedures were followed during this analysis. For exfiltration trench, detention/retention volumes for water quality are provided for the greater of, the first inch of storm runoff from the entire site, or the amount of 2.5 inches over the total impervious area.

Water Quantity Criteria

The proposed development is accounted for in the Coral Gate development master permit. Per the master permit only the water quality requirements need to be met on site prior to discharge.

Water Table

The design water table elevation of 8.50' NAVD was obtained from the Broward County Average Wet Season Water Table Map.

Design Analysis

Water Quality

As shown in the attached calculations the required volume for water quality is 0.22 Ac.-Ft. which is reduced by 25% to 0.16 Ac.-Ft. Per the stage storage table at elevation 13.00' the detention pond is providing 0.17 Ac.-Ft. of storage. Structure S-8 is set to elevation 13.00' to ensure water quality requirements are met prior to discharge.

Self Storage - Margate
Onsite Drainage Calculations

Water Quality Calculations:

I. LAND USE:

1.	Proposed Lake Area =	0.000 ac.	0.00%
2.	Proposed Building Footprint Area =	0.750 ac.	35.21%
3.	Proposed Green Building Footprint Area =	0.000 ac.	0.00%
4.	Proposed Pavement & Sidewalk Area =	0.670 ac.	31.46%
5.	Proposed Green Area =	0.710 ac.	33.33%
6.	Total =	2.130 ac.	100%
Total overall impervious surface =		1.420 ac.	67%

II. WATER QUALITY CRITERIA:

Quality standards shall be provided based on the following:

1. If a wet detention system, then whichever is the greater of the following:
 - a. The first inch of runoff from the entire project site.
 - b. The amount of 2.5 inches times the percent impervious for the project site.
2. If a dry detention system, then 75% of the volume required for wet detention
3. If a retention system, then 50% of the volume required for wet detention
4. Exfiltration trench requires the volume required for the wet detention system

III. WATER QUALITY COMPUTATIONS:

1. Compute the first inch of runoff from the entire developed project site:

$$= 1.00 \text{ inch} \times 2.130 \text{ acres} \times (1 \text{ foot} / 12 \text{ inches})$$

$$= \underline{\underline{0.178 \text{ ac-ft for the first inch of runoff}}}$$
2. Compute 2.5 inches times the percent impervious for the developed project site:
 - a. Site area for water quality pervious / impervious calculations only:

$$= \text{Total Project} - (\text{Lake Area} + \text{Buildings} + \text{Green Buildings})$$

$$= 2.130 \text{ acres} - (0.000 \text{ acres} + 0.750 \text{ acres} + 0.000 \text{ acres})$$

$$= \underline{\underline{1.380 \text{ acres of site area for water quality calculations}}}$$
 - b. Impervious area for water quality pervious / impervious calculations only:

$$= \text{Site area for water quality} - \text{Pervious area}$$

$$= 1.380 \text{ acres} - 0.710 \text{ acres}$$

$$= \underline{\underline{0.670 \text{ acres of impervious area for water quality calculations}}}$$
 - c. Percentage of impervious area for water quality:

$$= \text{Impervious area for water quality} / \text{Site area for water quality} \times 100\%$$

$$= 0.670 \text{ acres} / 1.380 \text{ acres} \times 100\%$$

$$= \underline{\underline{48.55 \% \text{ Impervious}}}$$
 - d. For 2.5 inches times the percentage of impervious area:

$$= 2.50 \text{ inches} \times 48.55 \%$$

$$= \underline{\underline{1.214 \text{ inches to be treated}}}$$
 - e. Compute volume required for quality detention:

$$= \text{Inches to be treated} \times (\text{Total Site Area} - \text{Lake Area})$$

$$= 1.214 \text{ inches} \times (2.130 \text{ acres} - 0.000 \text{ acres}) \times (1 \text{ foot} / 12 \text{ inches})$$

$$= \underline{\underline{0.215 \text{ ac-ft required for wet detention storage}}}$$

The volume of	0.22	ac-ft controls
Volume for Dry Detention =	0.16	ac-ft

Project: Preferred Storage Plantation

Subject: Proposed Condition

By: TZ

Date: 5/13/2016

PROPOSED SITE

Stage - Storage Information

Description	Type Storage	Area (ac.)	Starting Elev	Ending Elev	
Building	V	0.75	100.00	100.00	Stage Step Interval: 0.5
Landscape	L	0.58	14.00	15.50	Start Stage Elevation: 9.00
Paving/Sidewalk	L	0.67	14.00	15.50	
Swale Bottom	V	0.06	11.00		
Swale Slope	L	0.07	11.00	14.00	
Total Area =		2.13			

TOTAL

Stage	Building	Landscape	Paving/Sidewalk	Exfiltration Trench	Swale Bottom	Swale Slope	CUM, AC-FT
9.00	0.00	0.00	0.00		0.00	0.00	0.00
9.50	0.00	0.00	0.00		0.00	0.00	0.00
10.00	0.00	0.00	0.00		0.00	0.00	0.00
10.50	0.00	0.00	0.00		0.00	0.00	0.00
11.00	0.00	0.00	0.00		0.00	0.00	0.00
11.50	0.00	0.00	0.00		0.03	0.00	0.03
12.00	0.00	0.00	0.00		0.06	0.01	0.07
12.50	0.00	0.00	0.00		0.09	0.03	0.12
13.00	0.00	0.00	0.00		0.12	0.05	0.17
13.50	0.00	0.00	0.00		0.15	0.07	0.22
14.00	0.00	0.00	0.00		0.18	0.11	0.29
14.50	0.00	0.05	0.06		0.21	0.14	0.45
15.00	0.00	0.19	0.22		0.24	0.18	0.83
15.50	0.00	0.44	0.50		0.27	0.21	1.42
16.00	0.00	0.73	0.84		0.30	0.25	2.11
16.50	0.00	1.02	1.17		0.33	0.28	2.80