Sportfish Marina Resort

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PE 37638

STATE OF

304 NW Flagler Avenue, Stuart FL 34994 Project No. 1992



Drainage Statement:

Currently, the site consists of an abandoned building and accompanying parking lot. There are no South Florida Water Management District Permits applicable to the site. Proposed Water Quality for the site will be provided in exfiltration trenches that will be installed under the parking areas in accordance with City of Stuart Land Development Code Section 3.01.03.F.11. Storm water discharge will drain to the exfiltration system / control structure in the lower level and ultimately into the adjacent St. Lucie River, as it currently discharges. The exfiltration system will treat and store 0.24 Ac-Ft (380 lf) prior to discharging into the St. Lucie River. The required water quality treatment into the St. Lucie River is 0.08 Ac-Ft.



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Drainage Calculations

Site Data

Calculate Basin Area		
Total Site Area	=	0.63 Ac.
Wetland Area	=	0.00 Ac.
Non Contributing Site Area	=	0.00 Ac.
Total Proposed Developed Basin Area	=	0.63 Ac.
Calculate Impervious Area		
Building	=	0.46 Ac.
Other Impervious Areas	=	0.03 Ac.
Total Impervious Area	=	0.49 Ac.
Total Pervious Area	=	0.14 Ac.
Calculate CN		
The proposed DCIA area	=	0.00 Ac.
Remaining Site Area	=	0.63 Ac.

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Drainage Calculations



Water Quality Storage

South Fl	orida Water Management District		
1.) Rec	uired Water Quality Treatment Volume		
a)	First inch of runoff Va = 0.63 * 1 In. * (1 Ft./12 In.)	=	0.05 AcFt.
b)	Runoff from 2.5 * % net impervious Runoff = 2.5 * (Impervious Area)/(Basin-Bldg. Area-Lake Area)		
	= 2.5 * (0.03 / (0.63 - 0.46))	=	0.4610 In.
	Vb (sfwmd) = (0.63) * 0.46 * (1 Ft./12 In.)	=	0.0200 In.
c)	Since Vb (sfwmd) > Va the water quality volume required	=	0.05 AcFt.
d)	Discharge is to the St. Lucie River, the required Volume (150%)	=	0.08 AcFt.

2.) Provided Water Quality Treatment Volume

Wet Retention (Exfiltration) *	=	0.24 AcFt.	100% Required	=	0.24 AcFt.

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Exfiltration Design

a)

** V = L * (k * (H*W + 2*H*D_U - D_U*D_U + 2*H*D_S) + (0.000139*W*D_U)) / FS



Where:

V = Volume (Ac.-In.)

FS = Factor of Safety	=	2.00
L = Length of Exfiltration (FT.)	=	380.00 Ft.
k = Hydraulic Conductivity (cfs/Ft^2-Ft-Hd) *	=	1.50E-04
H = Water Table Depth	=	3.50 Ft.
W = Width of Trench	=	5.00 Ft.
D _U = Unsaturated Depth	=	3.50 Ft.
D_{S} = Saturated Depth	=	0.50 Ft.

$V = 380 * (0.000150 * (3.5*5 + 2*3.5*3.5) - 3.5^2 + 2*3.5*0.5) + (0.000139*5*3.5)) = 2.82 \text{ Ac.-In.}$

Exfiltration Trench Volume Provided:

= 2.82 Ac.-In.
= 0.24 Ac.-Ft.

* Note: Hydraulic Conductivity value taken from neighboring property.

CAPTEC Engineering, Inc. 12/8/2020