

WATER QUANTITY ANALYSIS

PRE-DEVELOPMENT ANALYSIS

SITE DATA	SQ. FEET
TOTAL PROJ. AREA	37,996
BUILDING AREA	0
TOTAL IMPERVIOUS AREA	0
PERVIOUS AREA	37,996

SITE ELEVATIONS	ELEV. (NGVD)
OCTOBER WATER LEVEL	2.1
AVG. EXIST. GRADE	9.6

Depth to water level= Avg. Pervious Grade-Water Control Elev.

Depth to water level= 9.7-2.1

Depth to water level (NGVD)= 7.5

DEPTH TO WATER TABLE (FT)	COMPACTED SOIL STORAGE (IN)
1	0.45
2	1.88
3	4.95
4	8.18

S VALUE (FROM ABOVE TABLE
FOUND IN SFWMD VOL. IV)= 8.18

WEIGHTED S-VALUE

S= S-VALUE x % PERVIOUS

S= 8.18" x 100%

S= 8.18"

RUN-OFF QUANTITY (Q_i)

$$[\text{Eq. 2-3}] \quad Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

P= RAINFALL IN INCHES FOR A 25 YEAR-24 HOURS STORM EVENT

P= 9.0"

S= WEIGHTED S-VALUE

Q_i= 3.49"

PRE-DEVELOPMENT RUNOFF FOR A 25 YEAR-24 HOURS STORM EVENT

V= A x (Q_i/12)

A= SITE AREA

V=11,047 Cu. Ft.

POST-DEVELOPMENT ANALYSIS

SITE DATA	ACRES
TOTAL PROJ. AREA	37,996
BUILDING AREA	5,714
TOTAL IMPERVIOUS AREA	14,432
PERVIOUS AREA	23,564

SITE ELEVATIONS	ELEV. (NGVD)
OCTOBER WATER LEVEL	2.1
AVG. EXIST. GRADE	10.5

Depth to water level= Avg. Pervious Grade-Water Control Elev.

Depth to water level= 10.5-2.1

Depth to water level (NGVD)= 8.4

DEPTH TO WATER TABLE (FT)	COMPACTED SOIL STORAGE (IN)
1	0.45
2	1.88
3	4.95
4	8.18

S VALUE (FROM ABOVE TABLE
FOUND IN SFWMD VOL. IV)= 8.18

WEIGHTED S-VALUE

S= S-VALUE x % PERVIOUS
S= 8.18" x 62%

S= 5.07"

RUN-OFF QUANTITY (Q₂)

$$[Eq. 2-3] \quad Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

P= RAINFALL IN INCHES FOR A 25 YEAR-24 HOURS STORM EVENT

P= 9.0"

S= WEIGHTED S-VALUE

Q₂= 4.88"

POST-DEVELOPMENT RUNOFF FOR A 25 YEAR-24 HOURS STORM EVENT

V= A x (Q₂/12)

A= SITE AREA

V= 15,462 Cu. Ft.

-THUS, POST-DEVELOPMENT RUNOFF IS GREATER THAN PRE-DEVELOPMENT RUNOFF BY 4,415 Cu. Ft.

-FROM PROVIDED STORAGE CALCULATIONS, THE SITE STORES APPROXIMATELY 5,734 Cu. Ft.

-THEREFORE, THE SITE MEETS THE VILLAGE'S STORMWATER QUANTITY CRITERIA

WATER QUALITY ANALYSIS

1- PROJECT LAND USE

SITE DATA	ACRES
TOTAL PROJ. AREA	37,996
BUILDING AREA	5,714
IMPERVIOUS AREA (WALKWAYS AND PATIO)	14,432
PERVIOUS AREA	23,564

2- OTHER INFORMATION

SITE ELEVATIONS	ELEV. (NGVD)
OCTOBER WATER LEVEL	2.1
AVG. EXIST. GRADE	10.5

3- COMPUTATIONS

A) COMPUTE FIRST INCH OF RUNOFF FROM DEVELOPED PROJECT

R_{1-INCH}= 37,996 x 1" x (1/12)

R_{1-INCH}= 3,167 Cu. Ft.

B) 2.5 x % IMPERVIOUS

B.1) SITE AREA FOR WATER QUALITY PERVIOUS/IMPERVIOUS CALCULATIONS

SITE AREA= [TOTAL PROJECT AREA-(BUILDING AREA-RETENTION AREA)]

SITE AREA= 37,996-5,714= 32,282 Cu. Ft.

B.2) IMPERVIOUS AREA FOR WATER QUALITY PERVIOUS/IMPERVIOUS CALCULATIONS

IMPERVIOUS AREA= SITE AREA-PERVIOUS

IMPERVIOUS AREA= 32,282-23,564 = 8,718 Cu. Ft.

B.3) PERCENTAGE OF IMPERVIOUSNESS FOR WATER QUALITY

IMPERVIOUS AREA/SITE AREA=8,718/32,282= 27.0%

B.4) 2.5% x IMPERVIOUS

2.5 x 27.0%= 0.68"

C) REQUIRED TREATMENT VOLUME

0.68" x (37,996/12)= 2,138 Cu. Ft.

THE 3,167 Cu. Ft. FOR THE FIRST INCH OF RUNOFF IS GREATER THAN THE 2,138 Cu. Ft. COMPUTED FOR THE 2.5" x % IMPERVIOUS.

SINCE THE WATER QUALITY VOLUME IS 3,167 Cu. Ft. AND THE SITE STORES APPROXIMATELY 5,734 Cu. Ft., WATER QUALITY CRITERIA IS SATISFIED.

4- DETERMINE DRY RETENTION VOLUME REQUIRED

A-CRITICAL VOLUME (Cu. Ft.)= 4,415

5- PROVIDED STORAGE:

Swale area storage= $[(\text{Top area} + \text{Bottom area})/2] * (\text{Swale Depth})$

Swale Depth= 0.7'

Swale Area Storage= $[(564 \text{ Sq. Ft.} + 233 \text{ Sq. Ft.})/2] * 0.7'$

Swale Area Storage= 278 Cu. Ft.

Swale Depth= 0.8'

Swale Area Storage= $[(1,053 \text{ Sq. Ft.} + 6383 \text{ Sq. Ft.})/2] * 0.8'$

Swale Area Storage= 676 Cu. Ft.

Swale Depth= 0.9'

Swale Area Storage= $[(4,679 \text{ Sq. Ft.} + 2,458 \text{ Sq. Ft.})/2] * 0.9'$

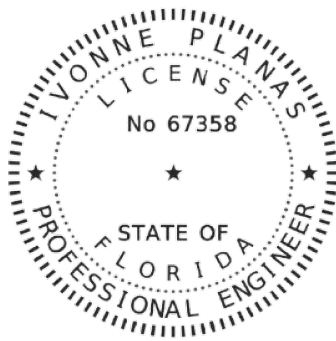
Swale Area Storage= 3,211 Cu. Ft.

Swale Depth= 1'

Swale Area Storage= $[(2,255 \text{ Sq. Ft.} + 883 \text{ Sq. Ft.})/2] * 1'$

Swale Area Storage= 1,569 Cu. Ft.

Average Area (Sq. Ft.)	Depth (in.)	% of pervious
17660	3	75
13245	4	56
8830	6	37
5887	9	25
4415	12	19



Ivonne Planas

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by Ivonne Planas
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