

## 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<sub>1</sub>)

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

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

P= 9.0"

S= WEIGHTED S-VALUE

Q<sub>1</sub>= 3.49"

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

V= A x (Q<sub>1</sub>/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 (Q<sub>2</sub>)

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

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

P= 9.0"

S= WEIGHTED S-VALUE

Q<sub>2</sub>= 4.88"

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

V= A x (Q<sub>2</sub>/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 4,462 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<sub>1-INCH</sub>= 37,996 x 1" x (1/12)

R<sub>1-INCH</sub>= 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 4,462 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= 1'

Swale Area Storage=  $[(3,014 \text{ Sq. Ft.} + 1,053 \text{ Sq. Ft.})/2] * 1'$

Swale Area Storage= 2,034 Cu. Ft.

Swale Depth= 0.5'

Swale Area Storage=  $[(457 \text{ Sq. Ft.} + 233 \text{ Sq. Ft.})/2] * 0.5'$

Swale Area Storage= 173 Cu. Ft.

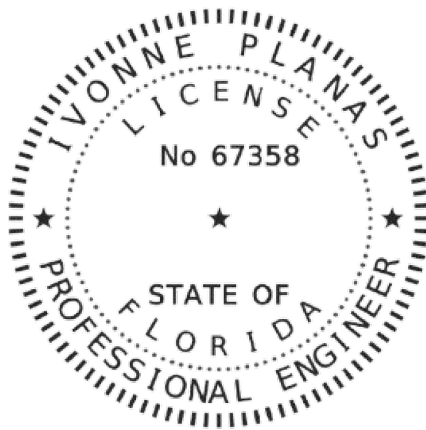
Swale Depth= 0.9'

Swale Area Storage=  $[(3,005 \text{ Sq. Ft.} + 2,005 \text{ Sq. Ft.})/2] * 0.9'$

Swale Area Storage= 2,255 Cu. Ft.

#### 6- POSSIBLE DRY RETENTION DIMENSIONS:

| 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

Digitally signed  
by Ivonne Planas  
Date: 2025.10.16  
16:58:26 -04'00'