Town of Golden Beach
Drainage Computations Worksheet

In order to help residential developments (single family units) the Town's Building Department has developed a worksheet to aid applicants in determining the volume of runoff generated during a 5-year, 1-hour storm. The calculations follow the methodology recommended by the SFWMD in their publication "Management and Storage of Surface Waters, Permit Information Manual, Volume 4." Applicants may include the calculations on this worksheet with their permit application. A registered professional engineer or a registered architect must perform these calculations.

Once the volume of runoff generated during a 5-year, 1-hour storm within the property or a sub-basin within the property is determined, the applicant must include calculations showing this volume will be contained within the property. Retention of this volume can be provided within shallow retention swales (including swale at frontage of property), or drains.

The applicant must also provide plans showing existing and proposed elevations throughout the property demonstrating the volume of runoff generated during the design storm (5-year, 1-hour) will be contained within the retention areas. The existing and proposed elevations must also show no overflow from the property will occur to adjacent properties or Right-Of-Ways during a 5-year, 1-hour storm.

Definitions are located below the worksheet.

Property Address: _____

Step 1:

Determine A **A = _____ square feet**

Step 2:

Determine AP and AI

AP = _____ square feet
AI = _____ square feet

Step 3:

Determine the average NGVD elevation of pervious areas within property or sub-basin within property.

Average Elevation of Pervious Areas = _____ feet NGVD

Step 4:

Determine the distance between the average high ground water elevation and the average elevation of pervious areas. For design purposes, the average high ground water elevation for most of Golden Beach is 2 feet NGVD (Additionally, please check with your geotechnical engineer and/or geotechnical report).

Distance = _____ feet

Property Address:_____

Step 5:

Determine an S_1 value from the table below:

Distance between groundwater table and average elevation of pervious areas:	S_1
1 foot	0.45 inches
2 feet	1.88 inches
3 feet	4.95 inches
4 feet	8.18 inches
>4 feet	8.18 inches

If necessary, compute a value of S_1 by interpolation.

S_1 = _____ inches

Step 6:

Determine S as:

$$S = \frac{AP}{A} * S$$

S is computed in inches S = _____ inches

Step 7:

Determine runoff depth (R) as:

$$R = \frac{(P - 0.2 * S)^2}{(P + 0.8 * S)}$$

Where P=3.3 inches of rainfall produced during a 5-year, 1-hour storm. Then:

$$R = \frac{(3.3 - 0.2 * S)^2}{(3.3 + 0.8 * S)}$$

R is computed in inches **R = _____ inches**

Property Address:_____

Step 8:

Determine runoff depth (R) as:

$$V = A * \frac{R}{12}$$

V is computed in cubic feet. V is the volume of runoff generated during a 5-year, 1-hour storm within the property or the sub-basin within the property. This is the volume of runoff that must be contained within the property.

- **V = _____ cubic feet**

Step 9:

Compute "retention volume provided" (VP) as the retention volume capacity, in cubic feet, of swales, retention areas, and drains within property or sub-basin within property.
****Attach calculations showing how this volume was computed.**
****Calculations must be consistent with existing and proposed elevation shown on design plans.**

- **VP = _____ cubic feet**

Step 10:

Compare values of retention volume provided (VP in Step 9) with retention volume needed (V in Step 8). Retention volume provided (VP) must be larger than retention volume needed (V).
(VP = _____ cubic feet) > (V = _____ cubic feet)

NOTE: These volume calculations are needed to satisfy the Town of Golden Beach code requirements.

DEFINITIONS:			
P:	Rainfall depth in inches.	A:	Total area of property in square feet.
S:	Soil storage capacity in inches.	AP:	Total pervious areas within property in square feet.
R:	Runoff depth in inches.	V:	Volume of run-off in cubic feet.
AI:	Total area of roof, pavement, and walkways within property in square feet (i.e., total impervious area)		