

TOWN OF GOLDEN BEACH DRAINAGE COMPUTATION WORKSHEET

Last Updated January 24th, 2017

In order to help professionals designing residential developments (single family units) the Town has developed a worksheet to aid applicants in determining the volume of runoff generated during a 10-year / one-day storm. This has been the adopted Level of Service (LOS) standard in the Town's Comprehensive Plan since December 1988 and is also the drainage standard specified in the Miami-Dade County Public Works Manual, Section D4 – Water Control. The calculations follow the methodology recommended by the SFWMD in their publication "Management and Storage of Surface Waters, Permit Information Manual, Volume 4" and in their publication "Technical Publication EMA #390 - Frequency Analysis of Daily Rainfall Maxima for Central and South Florida" dated January 2001. 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 10-year / one-day 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, injection wells, collection systems for reuse (example - cistern for irrigation), underground drains or other methods approved by the Town.

The applicant must also provide plans showing existing and proposed land elevations throughout the property demonstrating the volume of runoff generated during the design storm (10-year / one-day) will be contained within the on-site retention system. The existing and proposed land elevations must also show no overflow from the property will occur to adjacent properties or Right-of-Ways during a 10- year / one-day storm.

Definitions are located below the worksheet.

Step 1:

Determine A A = _____ square feet

Step 2:

Determine AP and AI AP = _____ square feet
AI = _____ square feet

Note: P = Pervious / I = Impervious

Step 3:

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

Step 5:

Determine an S_1 value from the table below:

Distance between ground water 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:

$$S = \frac{AP}{A} * S_1$$

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 = 7.00 inches of rainfall produced during a 10-year / one-day storm. Then:

$$R = \frac{(7.00 - 0.2 * S)^2}{(7.00 + 0.8 * S)}$$

R is computed in inches R = _____ inches

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 10-year / one day storm within the property or sub-basin of 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 the property or sub-basin within the property.

- **Attach calculations showing how the volume was calculated.**
- **Calculations must be consistent with existing and proposed elevations shown on design plans.**

VP = _____ cubic feet

Step 10:

Compare values of retention volume provided (VP in Step 9) with retention volumes 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 Comprehensive Plan Level of Service (LOS) and 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 runoff in cubic feet.
AI:	Total area of roof, pavement, patios, pool decks, walkways and any other hardscape areas within the property in square feet (i.e., total impervious area).		

Note: * means multiply.