SIMMONS & WHITE
CIVIL & TRAFFIC ENGINEERING

398 NE 6TH AVE, DELRAY BEACH
Delray Beach, Florida

WATER MANAGEMENT CALCULATIONS

PREPARED FOR:

Mr. Don Hickey
398 NE 6th Avenue
Delray Beach, Florida 33483

JOB NO. 24-096

DATE: 5/28/25

Erik R. Cooper, Professional Engineer, State of Florida, License No. 56934

This item has been digitally signed and sealed by Erik R. Cooper, P.E., on May 28, 2025.

Printed Copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

1.0   SUMMARY

The scope of this project includes redeveloping an existing 1-story building into a mixed-use building located at 398 NE 6th Ave, Delray Beach. The proposed development will entail the demolition of the existing building and paving, with the construction of a new building with a parking lot and associated site improvements. The building area over the site decreases by 0.04 ac, while the impervious area increases by 0.05 ac and the pervious area decreases by 0.01 ac. As a result, this report will calculate the extra runoff generated on site by the 3-year, 5-year, 10-year, 25-year, and 100-year design storms. Additional runoff from the proposed development will be held onsite via means of exfiltration trench and underground chambers.

Land Use Table:

	Pre		Post	
Land Use	**Areas**	**Grading (NAVD 88)**	**Areas**	**Grading (NAVD 88)**
Building	0.11 ac	FFE = 13.96'	0.07 ac	FFE = 14.5'
Impervious	0.14 ac	12.8' – 14.0'	0.19 ac	12.7' – 14.5'
Pervious	0.04 ac	12.6' – 14.0'	0.03 ac	12.5' – 13.5'
Total	**0.29 ac**		**0.29 ac**	

2.0   PRE-DEVELOPMENT CONDITIONS

Existing Soil Storage:

Seasonal High Water Table: 0.5 NAVD
(Water table based on SFWMD Permit #50-04430-P)

(0.04 ac * 8.18") / 0.29 ac = **1.13" storage**

Storm Event	Rainfall (in)
3 year – 1 day	6.5
5 year – 1 day	8.5
10 year – 1 day	11
25 year – 3 day	15.5
100 year – 3 day	19.0

Runoff Volume = $\dfrac{(P - 0.2S)^2}{(P - 0.8S)}$ x 0.29 ac

Existing Design Storm Runoff:

For the 3-year, 1-day:

$$Q = \frac{[6.5-(0.2\times1.13)]^2}{6.5+(0.8\times1.13)} \times 0.29 \text{ ac} \times \frac{1}{12} \quad = 0.128 \text{ ac-ft}$$

For the 5-year, 1-day:

$$Q = \frac{[8.5-(0.2\times1.13)]^2}{8.5+(0.8\times1.13)} \times 0.29 \text{ ac} \times \frac{1}{12} \quad = 0.176 \text{ ac-ft}$$

For the 10-year, 1-day:

$$Q = \frac{[11-(0.2\times1.13)]^2}{11+(0.8\times1.13)} \times 0.29 \text{ ac} \times \frac{1}{12} \quad = 0.236 \text{ ac-ft}$$

For the 25-year, 3-day:

$$Q = \frac{[15.5-(0.2\times1.13)]^2}{15.5+(0.8\times1.13)} \times 0.29 \text{ ac} \times \frac{1}{12} \quad = 0.344 \text{ ac-ft}$$

For the 100-year, 3-day:

$$Q = \frac{[19.0-(0.2\times1.13)]^2}{19.0+(0.8\times1.13)} \times 0.29 \text{ ac} \times \frac{1}{12} \quad = 0.428 \text{ ac-ft}$$

3.0 POST DEVELOPMENT CONDITIONS

Proposed Soil Storage:
(0.03 ac * 8.18") / 0.29 ac = **0.85" storage**

Proposed Design Storm Runoff:

For the 3-year, 1-day:

$$Q = \frac{[6.5-(0.2\times0.85)]^2}{6.5+(0.8\times0.85)} \times 0.29 \text{ ac} \times \frac{1}{12} \quad = 0.135 \text{ ac-ft}$$

For the 5-year, 1-day:

$$Q = \frac{[8.5-(0.2\times0.85)]^2}{8.5+(0.8\times0.85)} \times 0.29 \text{ ac} \times \frac{1}{12} \quad = 0.183 \text{ ac-ft}$$

For the 10-year, 1-day:

$$Q = \frac{[11-(0.2\times0.85)]^2}{11+(0.8\times0.85)} \times 0.29 \text{ ac} \times \frac{1}{12} \quad = 0.243 \text{ ac-ft}$$

For the 25-year, 3-day:

$$Q = \frac{[15.5-(0.2\times0.85)]^2}{15.5+(0.8\times0.85)} \times 0.29 \text{ ac} \times \frac{1}{12} \quad = 0.351 \text{ ac-ft}$$

For the 100-year, 3-day:

$$Q = \frac{[19.0-(0.2\times0.85)]^2}{19.0+(0.8\times0.85)} \times 0.29 \text{ ac} \times \frac{1}{12} \quad = 0.435 \text{ ac-ft}$$

4.0 DETERMINE STORAGE REQUIRED FOR PROPOSED DEVELOPMENT

For the 3-year, 1-day:

$$0.135 - 0.128 \quad = 0.007 \text{ ac-ft}$$

For the 5-year, 1-day:

$0.183 - 0.176 = 0.007$ ac-ft

For the 10-year, 1-day:

$0.243 - 0.236 = 0.007$ ac-**0.007 ac-ft = 0.084 ac-in (to be provided in exfiltration trench or underground storm chambers)**

For the 25-year, 3-day:

$0.351 - 0.344 = 0.007$ ac-ft

For the 100-year, 3-day:

$0.435 - 0.428 =$ **0.007 ac-ft = 0.084 ac-in (to be provided in exfiltration trench or underground storm chambers)**