Last Devenport, Inc.
PROFESSIONAL CONSULTING SERVICES

Allsite Services

NW Corner of Dyer Blvd. & Barbour Rd.
Riviera Beach, FL 33407

SURFACE WATER MANAGEMENT CALCULATIONS

LDi Project No. 20-029

September 15, 2020

LAST DEVENPORT, INC. (E.B. # 9889)

Ronald W. Last, PE Date
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www.lastdevenport.com

Project Name: # Allsite Services

SURFACE WATER MANAGEMENT CALCULATIONS

Date:	9/15/2020
Project Number:	20-029
Sec/Twp/Rge:	S36/T42S/R42E
Vertical Datum:	NAVD

Summary

Required Water Quality Storage Volume:	0.07	ac-ft	
Water Quality Storage Volume Stage:	12.96	NAVD	14.50 NGVD
Allowable Peak Discharge:	0.10	cfs	
Design Peak Discharge:	0.00	cfs	
Control Elevation:	12.50	NAVD	14.04 NGVD

Minimum Design Elevations (Design Storm Event)

	Stage Elevation	Stage Elevation
Parking (5 Year, 1 Hour Storm Event)	15.85 NAVD	17.39 NGVD
Perimeter (25 Year, 3 Day Storm Event)	17.43 NAVD	18.97 NGVD
Finished Floor (100 Year, 3 Day Storm Event)	17.85 NAVD	19.39 NGVD

Flood Routing Elevations (Design Rainfall)

	Stage Elevation	Stage Elevation	Discharge	Runoff Volume
5 Year, 1 Hour Storm Event (3.2 inches)	13.33 NAVD	14.87 NGVD	0.00 cfs	0.13 ac-ft
25 Year, 3 Day Storm Event (13.0 inches)	17.43 NAVD	18.97 NGVD	0.00 cfs	0.90 ac-ft
100 Year, 3 Day Storm Event (16.0 inches)	17.79 NAVD	19.33 NGVD		1.15 ac-ft

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Project Name: Allsite Services

SURFACE WATER MANAGEMENT CALCULATIONS

Date: 9/15/2020
Project Number: 20-029
Sec/Twp/Rge: S36/T42S/R42E

I. Given

A. Post Development Area Acreage:

1. Total 1.00

2. Impervious

a. Buildings (roof) 0.11

b. Pavement 0.63

3. Lakes 0.00

4. Pervious 0.25

B. Proposed Minimum Elevations:

1. Roads and Parking = 15.85 NAVD CONTROL = 12.50 NAVD

2. Floors = 17.85 NAVD

C. Design Storm Allowable Discharge:

1. Basin SFWMD C-17 Basin

2. SFMWD Formula 62.7 csm = 0.10 cfs

Allowable Discharge = 0.10 cfs

D. Water Level Elevations:

1. Wet Season Water Table 12.50 NAVD
2. Receiving body water level will not affect discharge rates

Note: Proposed minimum parking grade {15.85 NAVD} is more than 2 ft. minimum above wet season water table or control elevation of 12.50 NAVD.

E. Rainfall Amounts:

1. Parking (5 year - 1 hour) 3.2 inches

2. Perimeter Design (25 year - 3 day) 13.0 inches

3. Floors (100 year - 3 day) 16.0 inches

II. Design Criteria

A. Site Water Quality:

1. Since this is a dry detention system whichever of the greater of a)or b) shall govern
    a. The first inch of runoff over the entire site , or
    b. The amount of 2.5 inches times the percentage of impervious area
2. The site provides 100% dry detention for water quality and is thereby eligible for a 25% reduction in water quality volume.
2. The retention system will be designed to discharge at least 1/2 of the retention volume per day

B. Quantity:

1. The allowable peak discharge is 0.10 cfs
2. Floors are no lower than 17.85 NAVD
3. Roads and Parking are desired to be no lower than 15.85 NAVD

III. Computations

A. Site Water Quality:

1. Compute first inch of runoff from the developed project

    = 1 in. x 1.00 ac. X 1/12 = 0.08 ac-ft

    0.08 ac-ft for first inch of runoff over the entire site

2. Compute 2.5 inches times the percentage of impervious area
    a. Site Area for water quality pervious/impervious calculations only

    = Total Project area - (Lake + Roof)

    = 1.00 - 0.11 = 0.89 acre

    b. Impervious Area for water quality pervious/impervious calculations only

    = (Site Area for water quality pervious/impervious) - Pervious

    = 0.89 - 0.25 = 0.63 acre

    0.63 acre of impervious area for water quality pervious/impervious

    c. Percentage of Impervious for water quality:

    = (Impervious Area for water quality/Site Area for water quality) x 100%

    = 0.63 / 0.89 X 100%

    = 72% impervious

d. For 2.5 inches times the percentage impervious:

= 2.5 in X 0.72

= 1.79 inches to be treated

e. Compute volume required for water quality detention

= inches to be treated x (total site - lakes)

= 1.79 X 1.00 - 0.00 X 1/12 in.

= 0.15 ac-ft required detention storage

3. The greater of the first inch or 2.5" times the percentage impervious controls

0.08 < 0.15

Since 2.5 in. times the percentage impervious = 0.15 ac-ft is greater than the first inch of runoff, 2.5 in. times the percentage impervious controls.

4. Because the system is 100% dry retention, a 50% reduction in retention volume is permitted.

Total detained volume = 0.07 ac-ft occurs at elevation 12.96 NAVD

B. SCS Curve Number

1. The control elevation is 12.50 NAVD, and it is assumed that the wet season water table will be the same for the project. Consequently an average water table elevation of 12.50 NAVD will be assumed for purposes of design.

2. The average site finished grades will vary from the lowest elevation of 15.85 to 18.00 NAVD therefore the average site grade elevation will be 16.93 NAVD.

3. The average depth to water table will be:

= average site grade elevation - average water table elevation

= 16.93 - 12.50

= 4.43 ft

4. From the soil storage table using Coastal Storage and assuming 25% compaction with 4.43 ft to the water table, up to 8.18 inches of moisture can be stored in the soil under the pervious areas

5. Compute available soil storage

= storage available X pervious areas

= 8.18 X 0.25 = 2.06 X 1/12 in.

= 0.17 ac-ft of storage under pervious areas

6. Convert available soil storage to site-wide moisture storage, S

S = available soil storage onsite/site area

= 0.17 / 1.00 X 12 in/ 1 ft

= 2.06 inches of site-wide moisture storage, S

7. SCS Curve Number, CN

CN = 1000/(S + 10)

= 1000 / 2.06 + 10

= 83 SCS Curve Number

C. Project Surface Storage

1. Assumptions

a. 0.01 Acres of Sidewalk stores linearly upward from elevation 17.80 to 18.30 NAVD
b. 361 Linear Feet of Exfiltration Trench stores vertically upward from elevation 12.50 to 15.25 NAVD
c. 0.63 Acres of Parking stores linearly upward from elevation 15.85 to 17.95 NAVD
d. 0.25 Acres of Open Space stores linearly upward from elevation 16.0 to 18.0 NAVD

2. Stage-Storage Computations are shown on the attached flood routing calculations.

D. Control Structure

1. Values of stage vs. discharge are shown on the attached flood routing calculations.

IV. Confirm Storm Stages vs Design Elevations

A. Minimum Building Floor Elevation

1. The minimum finished floor elevation must be above the 100 Year - 3 Day flood elevation. Since the flood routing calculations indicate the 100 Year - 3 Day Storm Stage = 17.79 NAVD and the proposed finished floor elevation is 17.85 NAVD, the criteria is met for the site.

The minimum floor elevation is acceptable.

A. Minium Parking Lot Elevation

1. The minimum parking lot elevation must be above the 5 Year - 1 Hour rainfall event, which is 13.33 NAVD. Since the minimum proposed parking lot elevation is 15.85 NAVD, the criteria is met.

The minimum parking lot elevation is acceptable.

B. Allowable Peak Discharge

1. The allowable peak discharge per the SFWMD C-17 Basin of 62.7 csm = 0.10 cfs for the site area of 1.00 acres.

2. The minimum perimeter elevation is based on the 25 Year - 3 Day storm event, which is 17.43 NAVD. Since the flood routing calculations indicate the 25 Year - 3 Day storm stage = 17.43 NAVD, the proposed minimum perimeter elevation is sufficient.

The minimum perimeter berm elevation is acceptable.

Allsite Services

POST-DEVELOPMENT STAGE VS. STORAGE:

STORAGE CATEGORY =	SIDEWALK	EXFILTRATION TRENCH	PARKING	OPEN SPACE	TOTAL STORAGE
STORAGE TYPE =	LINEAR	VERTICAL	LINEAR	LINEAR	
BEGINNING STAGE =	17.80	12.50	15.85	16.00	
ENDING STAGE =	18.30	15.25	17.95	18.00	
STORAGE AREA (Ac) =	0.01	361 LF	0.63	0.25	
STAGE (ft) / STORAGE	(Ac-ft)	(Ac-ft)	(Ac-ft)	(Ac-ft)	(Ac-ft)
12.50	0.00	0.00	0.00	0.00	0.00
13.00	0.00	0.08	0.00	0.00	0.08
14.00	0.00	0.24	0.00	0.00	0.24
15.00	0.00	0.33	0.00	0.00	0.33
16.00	0.00	0.35	0.00	0.00	0.35
17.00	0.00	0.35	0.20	0.06	0.61
18.00	0.00	0.35	0.69	0.25	1.29

Water quality detention volume = 0.07 AC-FT occurs at stage 12.96 NAVD

Project Name: Allsite Services
Date: 9/15/2020
Project Number: 20-029
Sec/Twp/Rge: S36/T42S/R42E

I. Exfiltration Trench Calculations - Cross Section A

L = Length of Trench Required (Feet)	185	
W = Trench width (feet)	6.00	
K = Hydraulic conductivity (cfs/sf-ft head)	0.0004415	
H_2 = Depth to water table (feet)	3.35	**15.85 NAVD**
D_u = Non-saturated depth(feet)	1.60	**14.10 NAVD**
D_s = Saturated trench depth (feet)	1.50	**11.00 NAVD**
FS = Factor of Safety	2.00	

$$V = \frac{L * \{ K * [H_2 W + 2 H_2 D_u - D_u^2 + 2 H_2 D_s] + [(1.39 \times 10^{-4}) * W * D_U] \}}{FS}$$

$$V = \frac{185 * \{ 4.415E\text{-}4 * [(3.35 * 6.00) + (2 * 3.35 * 1.60) - (1.60 \wedge 2) + (2 * 3.35 * 1.50)] + [(1.39E\text{-}4) * 6.00 * 1.60)] \}}{(2.00)}$$

$$V = \frac{3.38}{2.00} = 1.69 \text{ ac-in} * \frac{(1 \text{ ft.})}{(12 \text{ in.})} = 0.141 \text{ ac-ft}$$

k-1	k-2	k ave
0.00041	0.000473	0.0004415

II. Exfiltration Trench Calculations - Cross Section B

L = Length of Trench Required (Feet)	76	
W = Trench width (feet)	8.00	
K = Hydraulic conductivity (cfs/sf-ft head)	0.0004415	
H_2 = Depth to water table (feet)	4.55	**17.05 NAVD**
D_u = Non-saturated depth(feet)	2.75	**15.25 NAVD**
D_s = Saturated trench depth (feet)	1.50	**11.00 NAVD**
FS = Factor of Safety	2.00	

$$V = \frac{L * \{ K * [H_2 W + 2 H_2 D_u - D_u^2 + 2 H_2 D_s] + [(1.39 \times 10^{-4}) * W * D_U] \}}{FS}$$

$$V = \frac{76 * \{ 4.415E\text{-}4 * [(4.55 * 8.00) + (2 * 4.55 * 2.75) - (2.75 \wedge 2) + (2 * 4.55 * 1.50)] + [(1.39E\text{-}4) * 8.00 * 2.75)] \}}{(2.00)}$$

$$V = \frac{2.50}{2.00} = 1.25 \text{ ac-in} * \frac{(1 \text{ ft.})}{(12 \text{ in.})} = 0.104 \text{ ac-ft}$$

k-1	k-2	k ave
0.00041	0.000473	0.0004415

III. Exfiltration Trench Calculations - Cross Section C

L = Length of Trench Required (Feet)	100	
W = Trench width (feet)	8.00	
K = Hydraulic conductivity (cfs/sf-ft head)	0.0004415	
H_2 = Depth to water table (feet)	3.35	**15.85 NAVD**
D_u = Non-saturated depth(feet)	2.75	**15.25 NAVD**
D_s = Saturated trench depth (feet)	1.50	**11.00 NAVD**
FS = Factor of Safety	2.00	

$$V = \frac{L * \{ K * [H_2 W + 2 H_2 D_u - D_u^2 + 2 H_2 D_s] + [(1.39 \times 10^{-4}) * W * D_U] \}}{FS}$$

$$V = \frac{100 * \{ 4.415E\text{-}4 * [(3.35 * 8.00) + (2 * 3.35 * 2.75) - (2.75 \wedge 2) + (2 * 3.35 * 1.50)] + [(1.39E\text{-}4) * 8.00 * 2.75)] \}}{(2.00)}$$

$$V = \frac{2.41}{2.00} = 1.21 \text{ ac-in} * \frac{(1 \text{ ft.})}{(12 \text{ in.})} = 0.101 \text{ ac-ft}$$

k-1	k-2	k ave
0.00041	0.000473	0.0004415

Appendix C: Isohyetal Maps
from SFWMD Technical Memorandum, *Frequency Analysis of One and Three Day Rainfall Maxima for central and southern Florida*, Paul Trimble, October 1990.

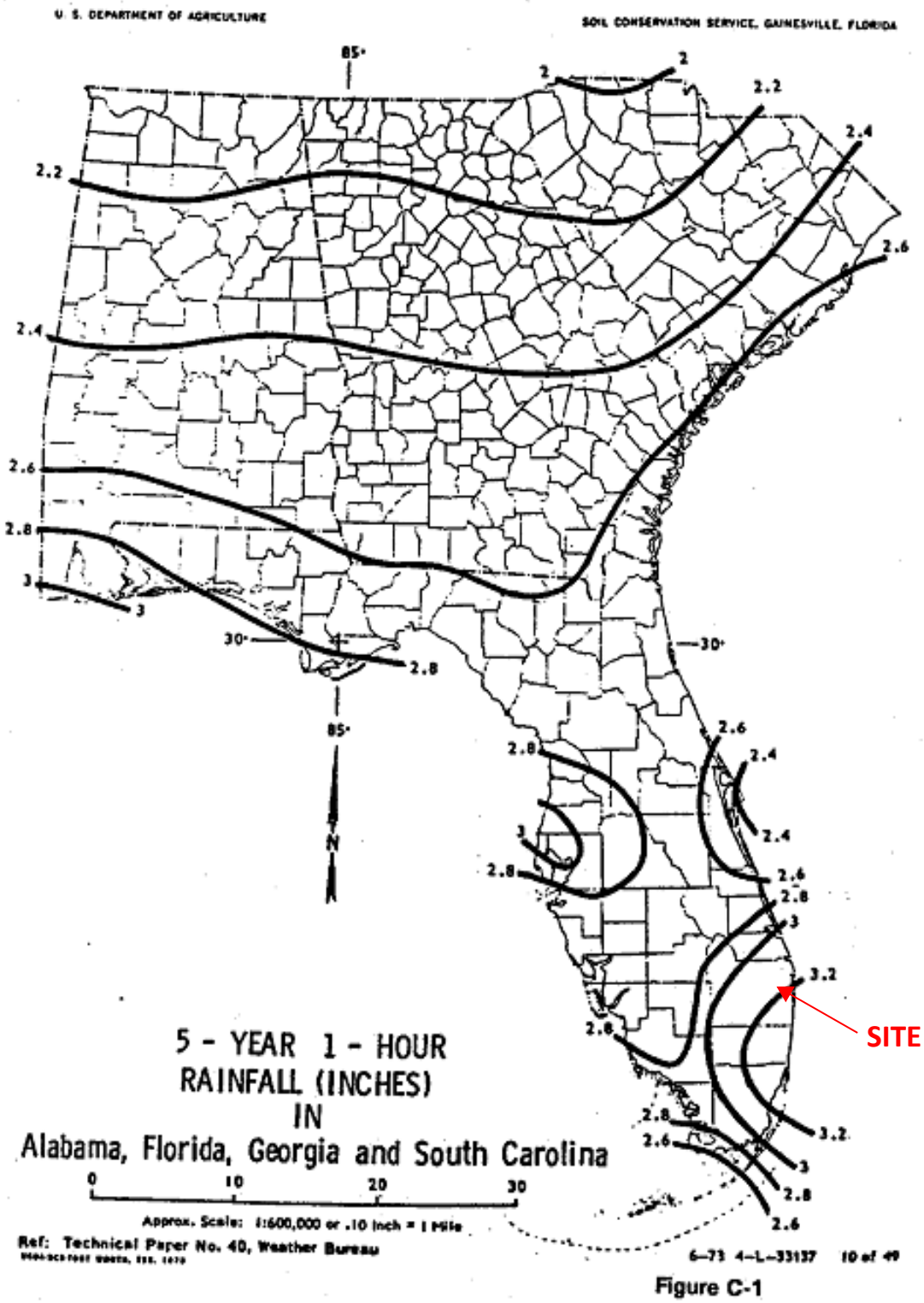

Figure C-1

Project Name: Allsite Services
Reviewer: RWL
Project Number: 20-029
  Period Begin: Sep 15, 2020;0000 hr End: Sep 18, 2020;0000 hr Duration: 72 hr
  Time Step: 0.2 hr,   Iterations: 10

Basin 1: Onsite

  Method: Santa Barbara Unit Hydrograph
  Rainfall Distribution: FDOT - 1 hr
  Design Frequency: 5 year
  1 Day Rainfall: 3.2 inches
  Area: 1 acres
  Ground Storage: 2.06 inches
  Time of Concentration: 0.17 hours
  Initial Stage: 12.5 ft NGVD

Stage (ft NGVD)	Storage (acre-ft)
12.50	0.00
13.00	0.08
14.00	0.24
15.00	0.33
16.00	0.35
17.00	0.61
18.00	1.29

User Specified Rainfall Distribution: FDOT - 1 hr

Time (hr)	Rainfall (percent)
0.00	0.00
0.10	0.02
0.20	0.08
0.30	0.20
0.40	0.41
0.50	0.63
0.60	0.81
0.70	0.92
0.80	0.98
0.90	1.00
1.00	1.00

STRUCTURE MAXIMUM AND MINIMUM DISCHARGES

Struc	Max (cfs)	Time (hr)	Min (cfs)	Time (hr)

BASIN MAXIMUM AND MINIMUM STAGES

Basin	Max (ft)	Time (hr)	Min (ft)	Time (hr)
Onsite	13.33	3.20	12.50	0.00

BASIN WATER BUDGETS (all units in acre-ft)

Basin	Total Runoff	Structure Inflow	Structure Outflow	Initial Storage	Final Storage	Residual
Onsite	0.13	0.00	0.00	0.00	0.13	0.00

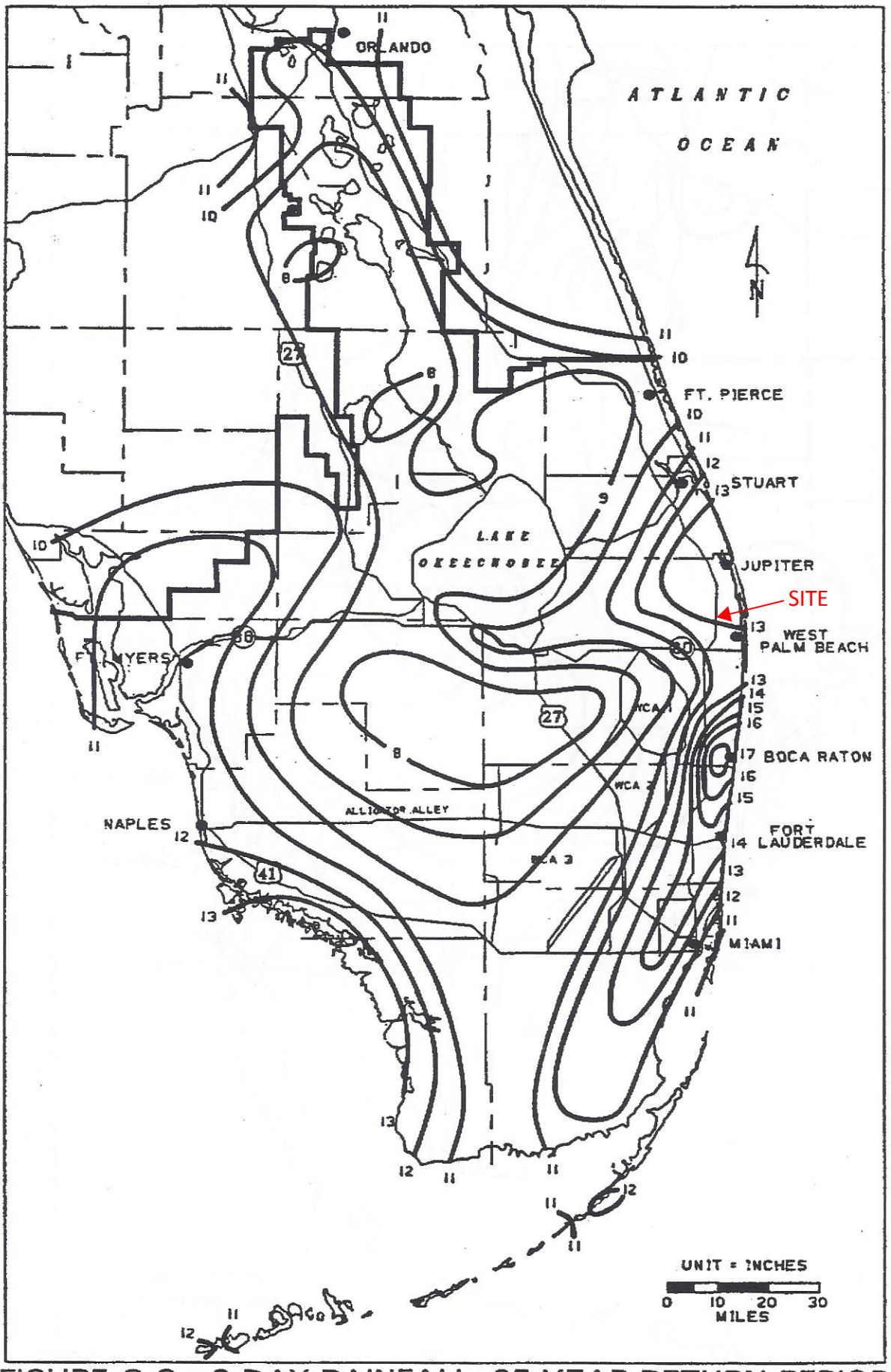

FIGURE C-8. 3-DAY RAINFALL: 25-YEAR RETURN PERIOD

Project Name: Allsite Services
Reviewer: RWL
Project Number: 20-029
  Period Begin: Sep 15, 2020;0000 hr End: Sep 29, 2020;0000 hr Duration: 336 hr
  Time Step: 0.2 hr,   Iterations: 10

Basin 1: Onsite

  Method: Santa Barbara Unit Hydrograph
  Rainfall Distribution: SFWMD - 3day
  Design Frequency: 25 year
  3 Day Rainfall: 13 inches
  Area: 1 acres
  Ground Storage: 2.06 inches
  Time of Concentration: 0.17 hours
  Initial Stage: 12.5 ft NGVD

Stage (ft NGVD)	Storage (acre-ft)
12.50	0.00
13.00	0.08
14.00	0.24
15.00	0.33
16.00	0.35
17.00	0.61
18.00	1.29

STRUCTURE MAXIMUM AND MINIMUM DISCHARGES

Struc	Max (cfs)	Time (hr)	Min (cfs)	Time (hr)

BASIN MAXIMUM AND MINIMUM STAGES

Basin	Max (ft)	Time (hr)	Min (ft)	Time (hr)
Onsite	17.43	73.60	12.50	0.00

BASIN WATER BUDGETS (all units in acre-ft)

Basin	Total Runoff	Structure Inflow	Structure Outflow	Initial Storage	Final Storage	Residual
Onsite	0.90	0.00	0.00	0.00	0.90	0.00

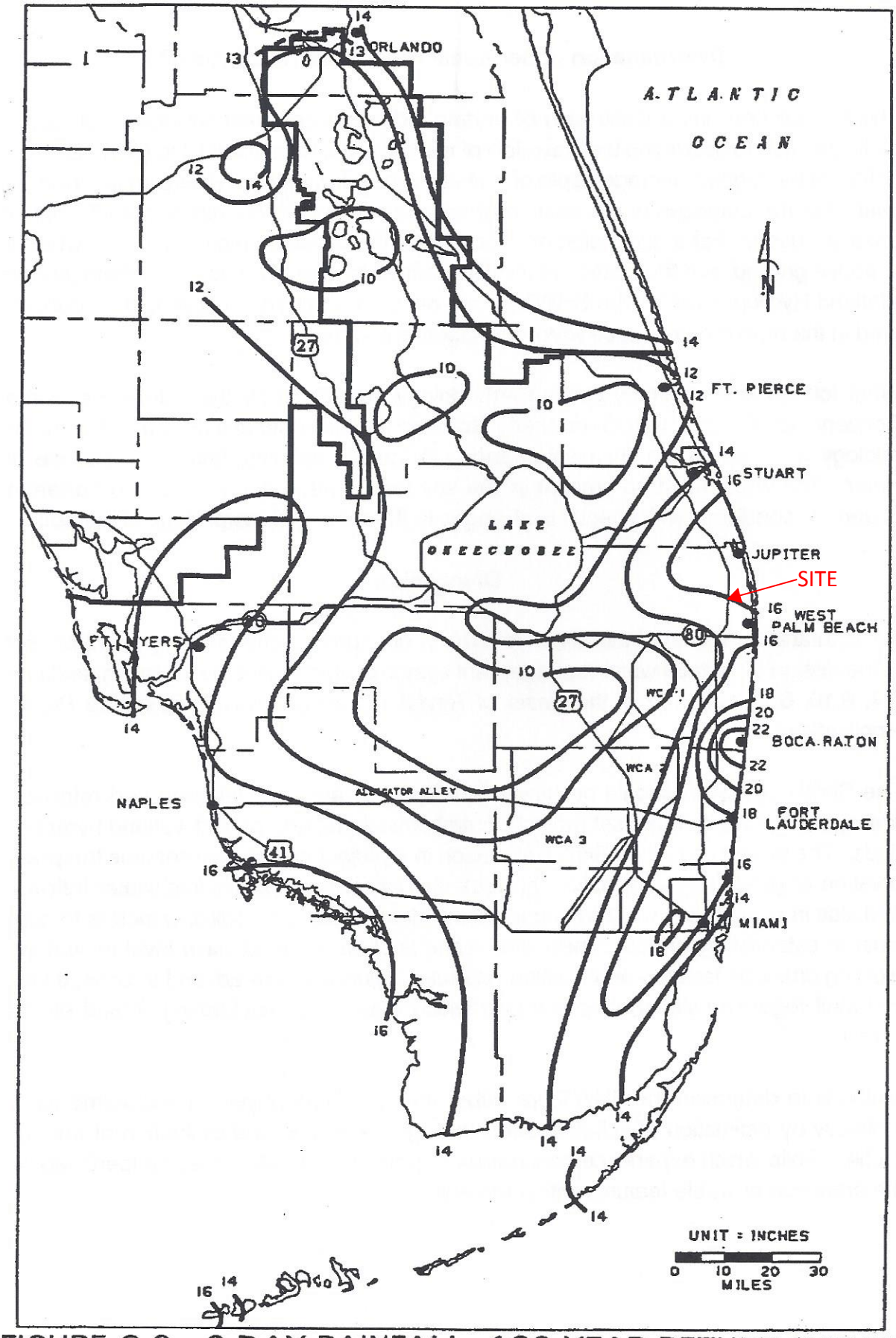

FIGURE C-9. 3-DAY RAINFALL: 100-YEAR RETURN PERIOD

Project Name: Allsite Services
Reviewer: RWL
Project Number: 20-029
  Period Begin: Sep 15, 2020;0000 hr End: Sep 29, 2020;0000 hr Duration: 336 hr
  Time Step: 0.2 hr, Iterations: 10

Basin 1: Onsite

  Method: Santa Barbara Unit Hydrograph
  Rainfall Distribution: SFWMD - 3day
  Design Frequency: 100 year
  3 Day Rainfall: 16 inches
  Area: 1 acres
  Ground Storage: 2.06 inches
  Time of Concentration: 0.17 hours
  Initial Stage: 12.5 ft NGVD

Stage (ft NGVD)	Storage (acre-ft)
12.50	0.00
13.00	0.08
14.00	0.24
15.00	0.33
16.00	0.35
17.00	0.61
18.00	1.29

STRUCTURE MAXIMUM AND MINIMUM DISCHARGES

Struc	Max (cfs)	Time (hr)	Min (cfs)	Time (hr)

BASIN MAXIMUM AND MINIMUM STAGES

Basin	Max (ft)	Time (hr)	Min (ft)	Time (hr)
Onsite	17.79	73.40	12.50	0.00

BASIN WATER BUDGETS (all units in acre-ft)

Basin	Total Runoff	Structure Inflow	Structure Outflow	Initial Storage	Final Storage	Residual
Onsite	1.15	0.00	0.00	0.00	1.15	0.00

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FLOOD PLAIN STORAGE COMPENSATION CALCULATIONS

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PROFESSIONAL CONSULTING SERVICES

Project Name: Allsite Services

FLOOD PLAIN STORAGE COMPENSATION CALCULATIONS

Date: 9/15/2020
Project Number: 20-029
Sec/Twp/Rge: S36/T42S/R42E

I. Site Predevelopment

A. Predevelopment Area Acreage:

1. Total	1.00
2. Impervious	
a. Buildings (roof)	0.00
b. Pavement	0.66
3. Lakes	0.00
4. Pervious	0.35

B. Site Design Criteria

1. Basin SFWMD C-17 Basin
2. 100 Year - 3 Day Flood Plain Elevation = 17.84 NAVD
3. Control Elevation = 12.50 NAVD

C. Predevelopment Soil Storage

1. The control elevation is 12.50 NAVD, and it is assumed that the wet season water table will be the same for the project. Consequently an average water table elevation of 12.50 NAVD will be assumed for purposes of design.

2. The average site finished grades will vary from the lowest elevation of 16.00 to 18.00 NAVD therefore the average site grade elevation will be 17.00 NAVD.

3. The average depth to water table will be:

   = average site grade elevation - average water table elevation

   = 17.00 - 12.50

   = 4.50 ft

4. From the soil storage table using Coastal Storage and assuming 25% compaction with 4.50 ft to the water table, up to 8.18 inches of moisture can be stored in the soil under the pervious areas

5. Compute available soil storage

   = storage available X pervious areas

   = 8.18 X 0.35 = 2.83 X 1/12 in.

   = 0.24 ac-ft of storage under pervious areas

6. Convert available soil storage to site-wide moisture storage, S

S = available soil storage onsite/site area

= 0.24 / 1.00 X 12 in/ 1 ft

= 2.83 inches of site-wide moisture storage, S

D. Predevelopment 100-year 3-day Storm Runoff Volume

$$Q = \frac{(\text{Rainfall} - (0.2 \times \text{Soil Storage}))^2}{(\text{Rainfall} + (0.8 \times \text{Soil Storage}))}$$

$$Q = \frac{(16.00\text{ in} - (0.2 \times 2.83\text{ in.}))^2}{(16.00\text{ in} + (0.8 \times 2.83\text{ in.}))} = \frac{238.22}{18.26}$$

Q = 13.04 in.

Runoff = (Q / 12) x Total Site Acreage

= (13.04 / 12) x 1.00

= 1.09 ac-ft

E. Site Runoff Contribution Characteristic

1. Available Site Storage for SFWMD C-17 Basin during 100-year Flood

= 1.09 ac-ft

2. Check to see if the site is an importer or exporter.

= site predevelopment runoff volume - site predevelopment available storage

= 1.09 - 1.09 = 0.00 ac-ft

3. The site is a basin runoff volume exporter.

II. Site Post Development

A. Redevelopment Area Acreage:

1. Total	1.00
2. Impervious	
a. Buildings (roof)	0.11
b. Pavement	0.63
3. Lakes	0.00
4. Pervious	0.25

B. Site Design Criteria

1. Basin SFWMD C-17 Basin

2. 100 Year - 3 Day Flood Plain Elevation = 17.84 NAVD

3. Control Elevation = 12.50 NAVD

C. Post Development Soil Storage

1. The control elevation is 12.50 NAVD, and it is assumed that the wet season water table will be the same for the project. Consequently an average water table elevation of 12.50 NAVD will be assumed for purposes of design.

2. The average site finished grades will vary from the lowest elevation of 15.85 to 18.00 NAVD therefore the average site grade elevation will be 16.93 NAVD.

3. The average depth to water table will be:

   = average site grade elevation - average water table elevation

   = 16.93 - 12.50

   = 4.43 ft

4. From the soil storage table using Coastal Storage and assuming 25% compaction with 4.43 ft to the water table, up to 8.18 inches of moisture can be stored in the soil under the pervious areas

5. Compute available soil storage

   = storage available X pervious areas

   = 8.18 X 0.25 = 2.06 X 1/12 in.

   = 0.17 ac-ft of storage under pervious areas

6. Convert available soil storage to site-wide moisture storage, S

   S = available soil storage onsite/site area

   = 0.17 / 1.00 X 12 in/ 1 ft

   = 2.06 inches of site-wide moisture storage, S

D. Post Development 100-year 3-day Storm Runoff Volume

$$Q = \frac{(\text{Rainfall} - (0.2 \times \text{Soil Storage}))^2}{(\text{Rainfall} + (0.8 \times \text{Soil Storage}))}$$

$$Q = \frac{(16.00\text{ in} - (0.2 \times 2.06\text{ in.}))^2}{(16.00\text{ in} + (0.8 \times 2.06\text{ in.}))} = \frac{242.99}{17.65}$$

Q = 13.77 in.

Runoff = (Q / 12) x Total Site Acreage

= (13.77 / 12) x 1.00

= 1.15 ac-ft

E. Site Runoff Contribution Characteristic

1. Available Site Storage for SFWMD C-17 Basin during 100-year Flood

= 1.15 ac-ft

2. Check to see if the site is an importer or exporter.

= site post development runoff volume - site post development available storage

= 1.15 - 1.15 = 0.00 ac-ft

3. The site is a basin runoff volume importer.

III. Confirm Flood Plain Compensation

A. Compare Pre and Post Development Storage

1. Because the predeveloped site is an exporter, the post development site design export volume must be less than or equal to the predeveloped site conditions.

0.00 > 0.00

The post development site design is acceptable.

Allsite Services

COMPENSATING STORAGE COMPARISON

PRE-DEVELOPMENT STAGE VS. STORAGE:

STORAGE CATEGORY =	N/A	N/A	ASPHALT	OPEN SPACE	TOTAL STORAGE
STORAGE TYPE =	LINEAR	LINEAR	LINEAR	LINEAR	
BEGINNING STAGE =	99.00	99.00	16.00	16.10	
ENDING STAGE =	100.00	100.00	17.20	18.00	
STORAGE AREA (Ac) =	0.00	0.00	0.66	0.35	
STAGE (ft) / STORAGE	(Ac-ft)	(Ac-ft)	(Ac-ft)	(Ac-ft)	(Ac-ft)
16.00	0.00	0.00	0.00	0.00	0.00
17.00	0.00	0.00	0.27	0.07	0.35
17.84	0.00	0.00	0.81	0.28	1.09
18.00	0.00	0.00	0.92	0.33	1.25
19.00	0.00	0.00	1.57	0.68	2.25

POST-DEVELOPMENT STAGE VS. STORAGE:

STORAGE CATEGORY =	SIDEWALK	EXFILTRATION TRENCH	PARKING	OPEN SPACE	TOTAL STORAGE
STORAGE TYPE =	LINEAR	VERTICAL	LINEAR	LINEAR	
BEGINNING STAGE =	17.80	12.50	15.85	16.00	
ENDING STAGE =	18.30	15.25	17.95	18.00	
STORAGE AREA (Ac) =	0.01	361 LF	0.63	0.25	
STAGE (ft) / STORAGE	(Ac-ft)	(Ac-ft)	(Ac-ft)	(Ac-ft)	(Ac-ft)
12.50	0.00	0.00	0.00	0.00	0.00
13.00	0.00	0.08	0.00	0.00	0.08
14.00	0.00	0.24	0.00	0.00	0.24
15.00	0.00	0.33	0.00	0.00	0.33
16.00	0.00	0.35	0.00	0.00	0.35
17.00	0.00	0.35	0.20	0.06	0.61
17.84	0.00	0.35	0.59	0.21	1.15
18.00	0.00	0.35	0.69	0.25	1.29

Last Devenport, Inc.
PROFESSIONAL CONSULTING SERVICES

REFERENCES

1860 Old Okeechobee Road, Suite 504 • West Palm Beach, FL 33409 • Phone: 561-615-6567 • Fax: 561-683-0872
www.lastdevenport.com

Questions concerning the VERTCON process may be mailed to NGS

Latitude: 26 46 42.840

Longitude: 080 06 40.810

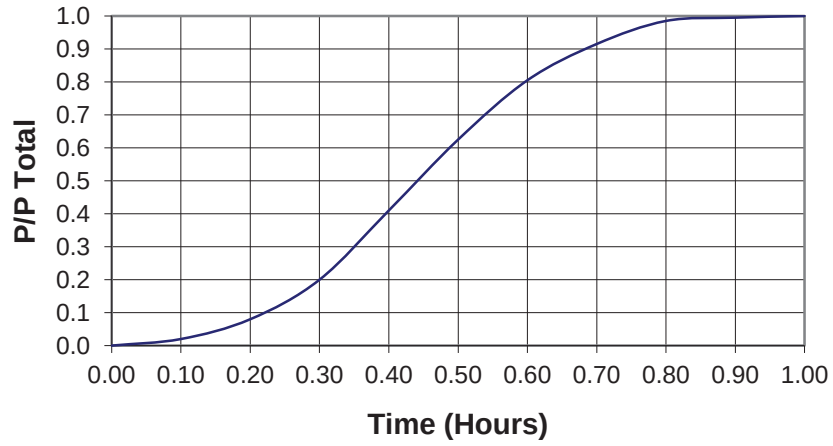
NGVD 29 height: 0000.00 ft

Datum shift(NAVD 88 minus NGVD 29): -1.542 feet

Converted to NAVD 88 height: -1.542 feet

Rainfall Distribution Curves 1 Hour Duration

1 Hour Duration Mass Rainfall Curve



T(hrs)	P/P tot	i/P tot
0.0	0.000	0.000
0.1	0.020	0.200
0.2	0.080	0.600
0.3	0.200	1.200
0.4	0.410	2.100
0.5	0.625	2.150
0.6	0.805	1.800
0.7	0.915	1.100
0.8	0.985	0.700
0.9	0.995	0.100
1.0	1.000	0.000

1 Hour Duration Intensity Curve