ENGINEERING REPORT

Our Daily Bread Food Pantry
Collier County, FL

PREPARED BY:
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September 4, 2024

This item has been digitally signed and sealed by Lee Alan Davidson P.E. on the date adjacent to the seal.

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Company ID No. 9496

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General

The proposed project is located at 1818 & 1824 San Marco Road in Marco Island, Florida. The ±1.69-acre parcel is located in Section 16, Township 52 South, Lots 25 & 26, and has folio numbers of 56807760005, 56807800004. The property is bounded by the Captain Horr Way to the north, a commercially zoned property to the east, the San Marco Road (ROW) to the south, and a commercially zoned property to the west.

The project will consist of clearing ±26,062 SF of the subject property to make room for the construction of a driveway and a stormwater management system that will be connected to the existing commercial zoned property to the west. The existing commercial property was previously permitted under SDP-05-02. The previously developed property to the west is ±1.20-acres in size. The commercial property to the west consists of a one-story building that was previously utilized as a Fifth Thirds bank.

Figure 1: Site Location Map

Existing Conditions

The subject property consists of ±0.53-acres of undeveloped land and ±1.20-acres of existing commercial space. The site has access to an 8-inch water main along San Marco Road to the south of the property. The existing commercial property was previously permitted under SDP-05-02. The site has no previously approved Environmental Resource Permits (ERP) through South Florida Water Management District (SFWMD). The site also is not part of a master ERP permit.

Proposed Improvements

The property owner proposes to renovate an existing ±4,250 SF drive-in bank building into a food pantry building with a ±890 SF building addition, in total ±5,140 SF of food pantry use. The neighboring property at 1824 San Marco Road will be integrated into the Site Development Plan and be used for vehicular stacking and loading. *Table 1* outlines the proposed conditions land use table.

Table 1. Land use summary.

USE	ACRES	% OF SITE
IMPERVIOUS AREA		
ROOF	0.10 ACRES	5.8%
PAVEMENT/SIDEWALKS/ PAVERS	0.88 ACRES	50.9%
TOTAL IMPERVIOUS AREA	0.98 ACRES	56.6%
PERVIOUS AREA		
OPEN SPACE	0.75 ACRES	43.4%
TOTAL PERVIOUS AREA	0.75 ACRES	43.4%
TOTAL SITE AREA	1.73 ACRES	100.0%

Stormwater Management

Methodology

Stormwater will be conveyed via sheet flow from grading, curbing, and captured in inlet structures of two interconnected dry detention areas. The 2 proposed dry detention areas will capture the surface runoff from the new driveway areas and direct the flow to the 2 existing dry detention areas. The stormwater will pass through the existing control structure before reaching the outfall that is provided by the existing right-of-way ditch located on San Marco Road. The entirety of the site's required stormwater water quality volume and attenuation volume will be stored and distributed within the 4 dry detention areas. The two existing detention areas of ±4,185 SF are utilized to support the existing bank site area, and the 2 new dry retention areas will store ±9,416 SF. The existing site captures stormwater by grading to two type C inlets and flows through 15-inch mitered end RCP pipes until reaching the swale along San Marco Road. The required water quality volume is met at 6.42 ft-NAVD. A 3-inch orifice is proposed at the site's control

elevation, with an invert of 4.20 ft-NAVD and an overflow grate is set at 7.13 ft-NAVD, which is the peak stage of the 25-year, 3-day storm event.

The water quality storage volume required by SFWMD per B.O.R. was determined to be 0.19 ac-ft. The water quality storage volume was calculated to meet the 2.5% impervious criteria, which resulted in a larger volume than the first inch runoff criteria. See the following calculations:

$$Volume\ Storage\ Required = 2.5\ in * \frac{1\ ft}{12\ in} * \frac{Impervious\ Area}{Site\ Area} * Project\ Area$$

$$2.5\ in * \frac{1ft}{12in} * 0.54 * 1.73$$

$$= 0.19\ ac.ft$$

The water quality required by Collier County for the site's contributory basin is 0.22 ac-ft. This is calculated by 1- inch over the entire site criteria which resulted in a larger volume than the 1-inch multiplied by 150% of impervious runoff criteria. See the following calculations:

$$Volume\ Required = 1.5\ in * \frac{1\ ft}{12\ in} * Project\ Area$$

$$1.5\ in * \frac{1\ ft}{12\ in} * 1.73\ ac.$$

$$= 0.22\ ac.ft$$

Stormwater Model

Based on the depicted rain fall events, the project was modeled using HydroCAD® technology to ensure the minimum water quality and quantity are met. *Table 2* provides a summary of the criteria used to model the projects water quantity/ quality volumes:

Table 2: Stormwater Design Criteria	
WSWT Elevation (Ft- NAVD) [1]	4.20
10-year, 1-day Rainfall Event (inches)	7.40
25-year, 3-day Rainfall Event (inches)	12.80
100-year, 3-day Rainfall Event (inches)	16.00
Total Required Water Quality Volume (ac-ft)	0.22
Peak Allowable Discharge (cfs)	0.26

[1] Wet season water table is based on values (NAVD) from the previously permitted commercial property under SDP-05-02.

HydroCAD® Results

The proposed stormwater management system consists of detention up to the water quality elevation. Once water quality is achieved the stormwater is permitted to discharge through the proposed control structure with a 3" orifice. The results from the HydroCAD® modeling are shown in Table 3 as well as Appendix A.

Table 3: Stormwater Management Summary	
	Proposed conditions
Provided Water Quality Volume (ac-ft)	0.54
Water Quality Elevation (ft-NAVD)	5.40 – 7.40
Peak Modeled Discharge (CFS)*	0.40
10-Year, 1-Day Storm Stage (ft-NAVD)	6.70
25-Year, 3-Day Storm Stage (ft-NAVD)	7.13
Minimum Road Elevation (ft-NAVD)	7.40
100-Year, 3-Day Storm Stage (ft-NAVD)	8.42
Minimum Finished Floor Elevation (ft-NAVD)	10.00
Control Structure 3-in. Bleeder Invert (ft-NAVD)	4.20

*Peak discharged was modeled during the 25-year 3-day storm event and was solely from the minimum allowed 3-inch orifice at control elevation for the dry detention system

Utilities

Potable Water

Potable water is provided by the City of Marco utilities via a 6-inch water main located on San Marco Road. The new development will utilize the existing 3/4-inch potable water meter and the existing 1-inch irrigation water meter.

Fire Protection

DE proposes hot tap into an existing 6-inch watermain on site. The proposed system will have backflow preventors, post indicator valves (PIV), check valves, fire department connections (FDC), and fire riser stub-outs to supply the building with fire protection. The existing site is not fully sprinklered; however, the proposed food pantry will be equipped with a fire sprinkler system. Using the NFPA Required Fire Flow Table, the required fire flow for the proposed building type is as follows: See *Appendix D* for full report.

Construction Type:	NFPA V(000) / VB
Proposed Building Fire Area [1]:	4,635 SF
Required Fire Flow:	1,750 GPM
Required Fire flow after 75% Sprinkled Building Protection [2]:	1,000 GPM

[1] The largest proposed building is used to determine the required fire flow

[2] Reduction per NFPA 18.4.5.2.1. The resulting fire flow shall not be less than 1,000 GPM

Based on the hydrant test conducted by the Greater Naples Fire Rescue District, the following calculation was utilized to determine design source pressure per Collier County Utility Specifications and Standards Manual, See Calculation:

$$P_d = P_s - (P_s - P_r)\left(\frac{D}{Q}\right)1.85$$

$$P_d = 80 - (80 - 72)\left(\frac{2.44}{2175}\right)1.85$$

$$P_d = 79.98\,psi = 184.75\,ft - head$$

Whereas…

P_d = Design source pressure
P_s = Static pressure from hydrant flow test
P_r = Residual pressure from hydrant flow test
D = Peak hour demand plus required fire flow (gpm)
Q = Flow rate from hydrant flow test (gpm)

Sanitary

Sanitary sewer service will be collected by the existing 6" PVC lateral system to a sanitary lift station at the southeast corner of the project site. From there it will be pumped into the existing 6" force main located on the south side of San Marco Road via a 4" force main. The lift station will utilize an EONE 1 HP Type 2014-PA 0910 P01 grinder pump. The system has been designed to overcome a 50 PSI entrance pressure into the existing force main.

The utility systems within the property will be operated and maintained by the property owner. The utility systems within the ROW are owned and maintained by the City of Marco Island.

Level-of-Service/ Gravity Hydraulic Analysis

The following hydraulic analysis will determine if the existing gravity sewer main on site is adequate for this project. The diameter, flow, friction factor, and slope are input to calculate the depth of flow and mean velocity based on the values obtained from the FDEP Wastewater Calculation Worksheet. The calculations below are utilized to determine if the eight-inch gravity sanitary main is adequate:

A = Type of Unit	B = Number of Units	C = Population per Unit	D = Total Population (B x C)	E = Per Capita Flow (gpd)	F = Total Average Daily Flow (gpd) (D x E)	G = Peak hour flow (gpm)
Residential*	0	2.5	0	100	0	0
Commercial**			6	100	638	2
Institutional**			0	100	0	0
TOTAL			6	100	638	2

Figure 2 Proposed Level of Service

100 gal/day per person and 2.5 people per household = 250 GPD per residential unit per FDEP Criteria
Use population equivalent based on average daily flow.

Peak Factor Calculations:

$$Total\ Population\ (p) = \frac{6}{1000} = 0.006$$

$$Peak\ Factor = \frac{18 + P^{\frac{1}{2}}}{4 + P^{\frac{1}{2}}} = \frac{18 + 0.006^{\frac{1}{2}}}{4 + 0.006^{\frac{1}{2}}} = 4.4$$

Gravity Hydraulic Analysis:

Pipe Diameter	=	6-inches		
Average Flow	=	638 gpd	=	0.000987132 cfs
Per Capita Flow [3]	=	100 gpd/ person		
Total Population (p)	=	6 people		
P (total population/ 1000)	=	0.006		
Peak Factor (PF)	=	$\frac{18+P^{\frac{1}{2}}}{4+P^{\frac{1}{2}}}$	=	4.4
Peak Flow	=	2 gpm	=	0.00445602 cfs
Slope	=	0.0104		
Manning n-value	=	0.013		
Average Depth	=	0.01-feet	=	0.12 in
Average Velocity	=	0.49 fps		
Peak Depth	=	0.03-feet	=	0.36 in
Peak Velocity	=	0.83 fps		

[3] Use population equivalent based on average daily flow.

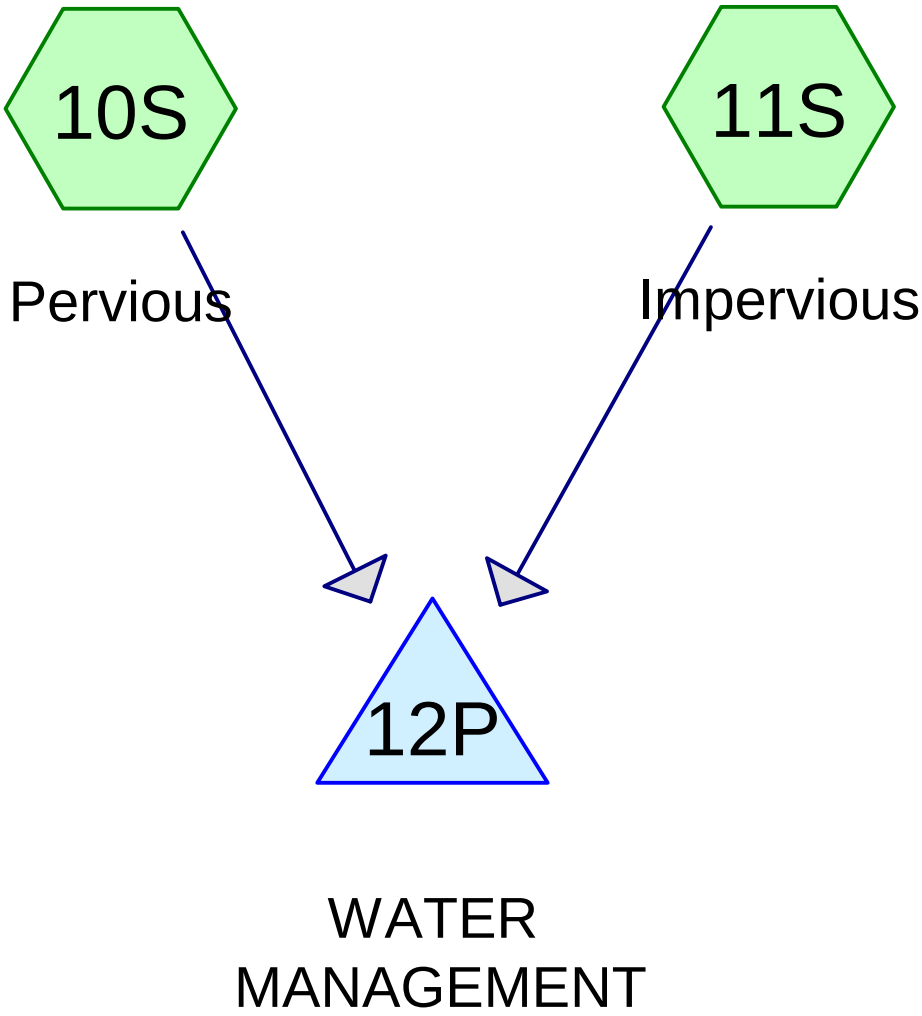
These calculations prove the existing six (6) inch gravity sewer main is more than adequate in size for the proposed flow.

Appendix A

HydroCAD® Modeling Results & SFWMD Worksheet

10-Year, 1-Day and 25-Year, 3-Day

Modeling Results



Subcat Reach Pond Link

Routing Diagram for 2024-09-03 SW Model
Prepared by Davidson Engineering, Printed 9/5/2024
HydroCAD® 10.20-5b s/n 02995 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10 yr 1 day	SFWMD 24-hr		Default	24.00	1	7.40	2
2	25 yr 3 day	SFWMD 72-hr		Default	72.00	1	12.80	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.100	98	BUILDING (11S)
0.440	55	OPEN SPACE (10S)
0.880	98	PAVEMENT (11S)
1.420	**85**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
1.420	Other	10S, 11S
1.420		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	0.100	0.100	BUILDING	11S
0.000	0.000	0.000	0.000	0.440	0.440	OPEN SPACE	10S
0.000	0.000	0.000	0.000	0.880	0.880	PAVEMENT	11S
0.000	**0.000**	**0.000**	**0.000**	**1.420**	**1.420**	**TOTAL AREA**	

Time span=0.00-360.00 hrs, dt=0.01 hrs, 36001 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10S: Pervious Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=2.38"
Tc=15.0 min CN=55/0 Runoff=0.73 cfs 0.087 af

Subcatchment 11S: Impervious Runoff Area=0.980 ac 100.00% Impervious Runoff Depth=7.16"
Tc=15.0 min CN=0/98 Runoff=4.47 cfs 0.585 af

Pond 12P: WATER MANAGEMENT Peak Elev=6.70' Storage=0.323 af Inflow=5.18 cfs 0.672 af
Outflow=0.36 cfs 0.668 af

Total Runoff Area = 1.420 ac Runoff Volume = 0.672 af Average Runoff Depth = 5.68"
30.99% Pervious = 0.440 ac 69.01% Impervious = 0.980 ac

Summary for Subcatchment 10S: Pervious

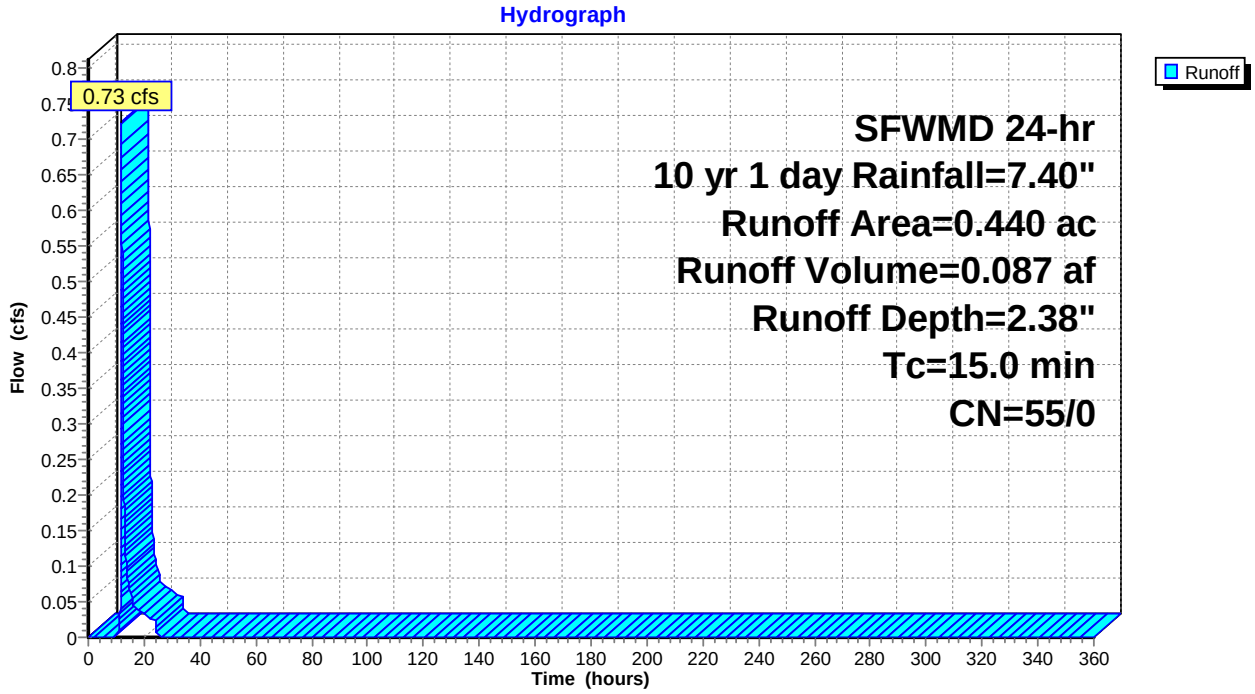
Runoff = 0.73 cfs @ 11.98 hrs, Volume= 0.087 af, Depth= 2.38"
Routed to Pond 12P : WATER MANAGEMENT

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-360.00 hrs, dt= 0.01 hrs
SFWMD 24-hr 10 yr 1 day Rainfall=7.40"

	Area (ac)	CN	Description
*	0.440	55	OPEN SPACE
	0.440	55	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

Subcatchment 10S: Pervious



Summary for Subcatchment 11S: Impervious

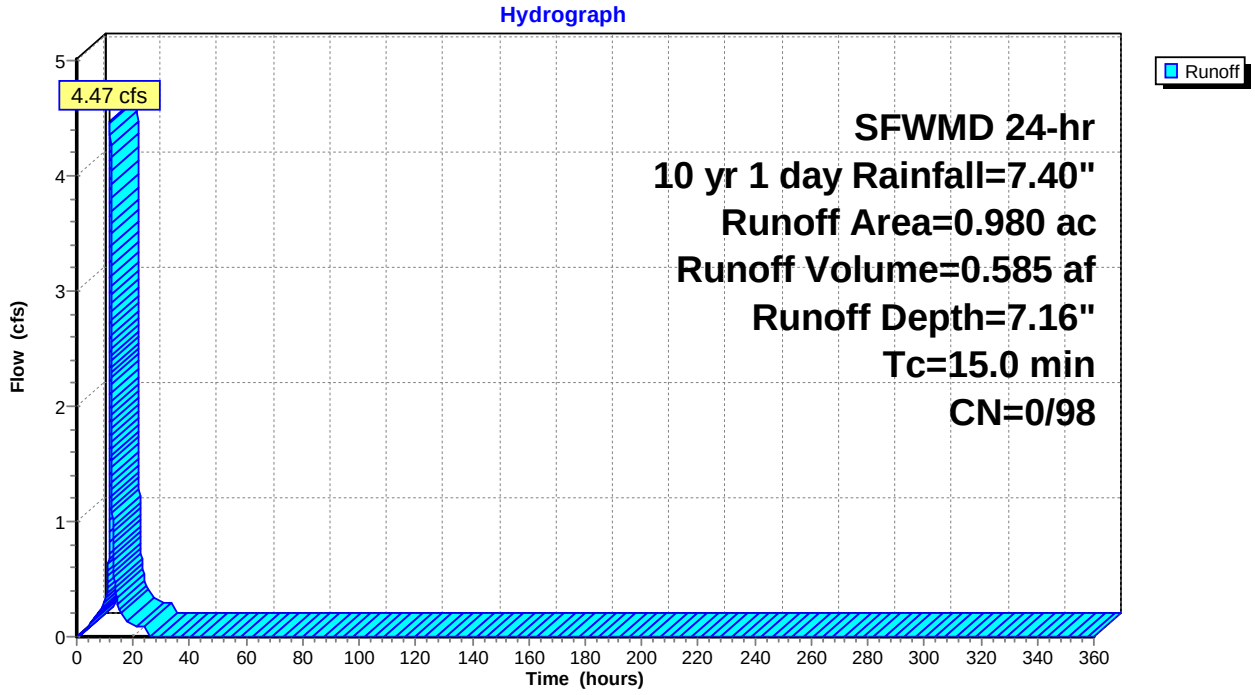
Runoff = 4.47 cfs @ 11.91 hrs, Volume= 0.585 af, Depth= 7.16"
Routed to Pond 12P : WATER MANAGEMENT

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-360.00 hrs, dt= 0.01 hrs
SFWMD 24-hr 10 yr 1 day Rainfall=7.40"

	Area (ac)	CN	Description
*	0.880	98	PAVEMENT
*	0.100	98	BUILDING
	0.980	98	Weighted Average
	0.980	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

Subcatchment 11S: Impervious



Summary for Pond 12P: WATER MANAGEMENT

[42] Hint: Gap in defined storage above volume #7 at 2.85'
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=307)

Inflow Area = 1.420 ac, 69.01% Impervious, Inflow Depth = 5.68" for 10 yr 1 day event
Inflow = 5.18 cfs @ 11.92 hrs, Volume= 0.672 af
Outflow = 0.36 cfs @ 14.33 hrs, Volume= 0.668 af, Atten= 93%, Lag= 144.5 min
Primary = 0.36 cfs @ 14.33 hrs, Volume= 0.668 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-360.00 hrs, dt= 0.01 hrs
Peak Elev= 6.70' @ 14.33 hrs Surf.Area= 0.237 ac Storage= 0.323 af

Plug-Flow detention time= 353.4 min calculated for 0.668 af (99% of inflow)
Center-of-Mass det. time= 349.6 min (1,107.3 - 757.6)

Volume	Invert	Avail.Storage	Storage Description
#1	6.50'	1.540 af	**PAVEMENT STORAGE** Listed below
#2	5.50'	0.990 af	**OPEN SPACE STORAGE** Listed below
#3	5.50'	0.881 af	**EXISTING STORAGE FRONT (Irregular)** Listed below (Recalc)
#4	6.50'	0.398 af	**EXISTING STORAGE BACK (Irregular)** Listed below (Recalc)
#5	5.40'	1.977 af	**PROPOSED STORAGE MIDDLE (Irregular)** Listed below (Recalc)
#6	5.40'	1.060 af	**PROPOSED STORAGE FRONT (Irregular)** Listed below (Recalc)
#7	1.35'	0.004 af	**18.0" Round RCP_Round 18"** L= 90.0'
		6.849 af	Total Available Storage

Elevation (feet)	Cum.Store (acre-feet)
6.50	0.000
7.00	0.030
7.50	0.130
8.00	0.280
8.50	0.500
9.00	0.790
9.50	1.130
10.00	1.540

Elevation (feet)	Cum.Store (acre-feet)
5.50	0.000
6.00	0.010
6.50	0.050
7.00	0.110
7.50	0.200
8.00	0.310
8.50	0.440
9.00	0.600
9.50	0.780
10.00	0.990

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
5.50	0.004	60.0	0.000	0.000	0.004
6.50	0.024	597.0	0.013	0.013	0.649
7.50	0.066	617.0	0.043	0.056	0.695
20.00	0.066	617.0	0.825	0.881	0.872

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
6.50	0.017	177.0	0.000	0.000	0.017
7.50	0.030	197.0	0.023	0.023	0.031
20.00	0.030	197.0	0.375	0.398	0.088

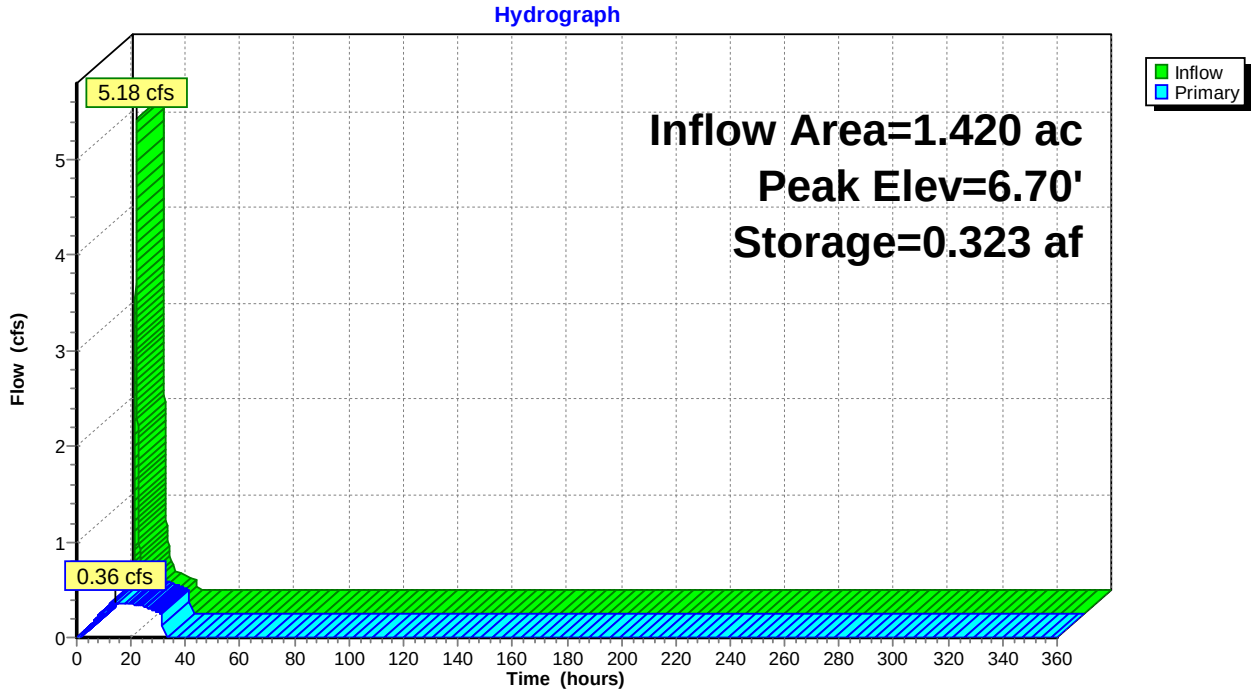
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
5.40	0.101	252.0	0.000	0.000	0.101
6.40	0.119	270.0	0.110	0.110	0.119
7.40	0.138	289.0	0.128	0.238	0.140
20.00	0.138	289.0	1.739	1.977	0.223

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
5.40	0.041	205.0	0.000	0.000	0.041
6.40	0.057	235.0	0.049	0.049	0.066
7.40	0.075	268.0	0.066	0.115	0.097
20.00	0.075	268.0	0.945	1.060	0.174

Device	Routing	Invert	Outlet Devices
#1	Primary	4.20'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.36 cfs @ 14.33 hrs HW=6.70' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.36 cfs @ 7.42 fps)

Pond 12P: WATER MANAGEMENT



Time span=0.00-360.00 hrs, dt=0.01 hrs, 36001 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10S: Pervious Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=6.44"
Tc=15.0 min CN=55/0 Runoff=1.75 cfs 0.236 af

Subcatchment 11S: Impervious Runoff Area=0.980 ac 100.00% Impervious Runoff Depth=12.56"
Tc=15.0 min CN=0/98 Runoff=5.71 cfs 1.026 af

Pond 12P: WATER MANAGEMENT Peak Elev=7.13' Storage=0.536 af Inflow=7.45 cfs 1.262 af
Outflow=0.40 cfs 1.258 af

Total Runoff Area = 1.420 ac Runoff Volume = 1.262 af Average Runoff Depth = 10.66"
30.99% Pervious = 0.440 ac 69.01% Impervious = 0.980 ac

Summary for Subcatchment 10S: Pervious

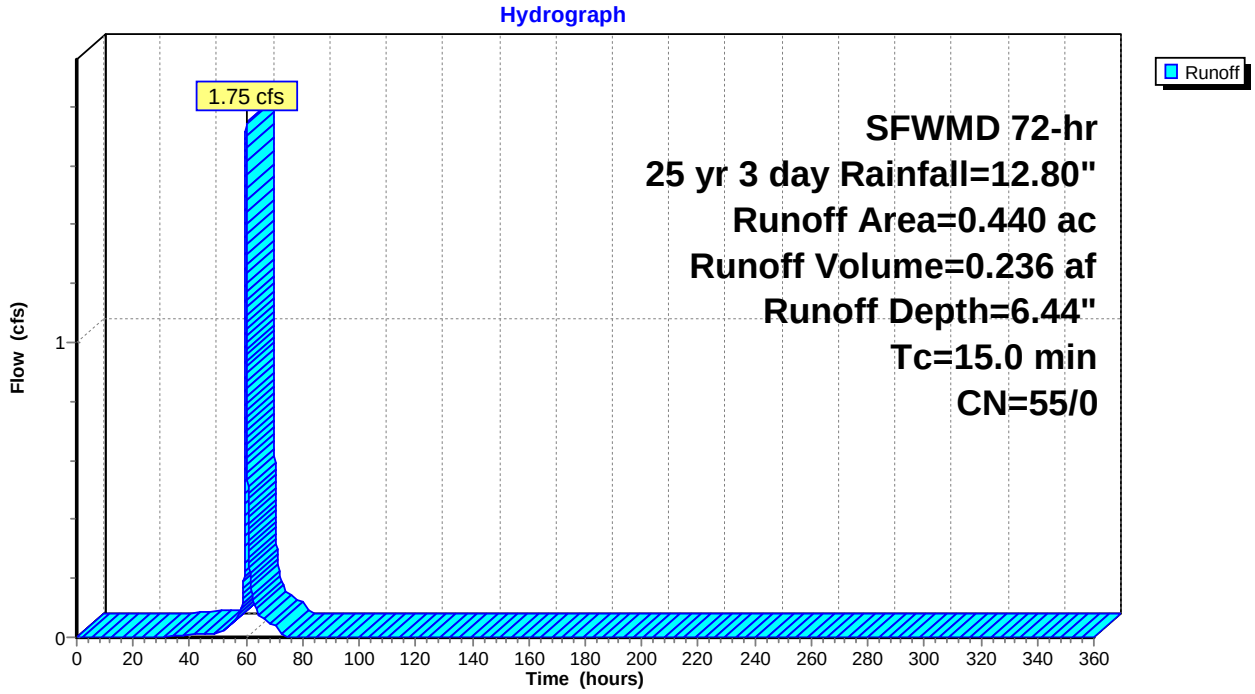
Runoff = 1.75 cfs @ 59.93 hrs, Volume= 0.236 af, Depth= 6.44"
Routed to Pond 12P : WATER MANAGEMENT

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-360.00 hrs, dt= 0.01 hrs
SFWMD 72-hr 25 yr 3 day Rainfall=12.80"

	Area (ac)	CN	Description
*	0.440	55	OPEN SPACE
	0.440	55	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

Subcatchment 10S: Pervious



Summary for Subcatchment 11S: Impervious

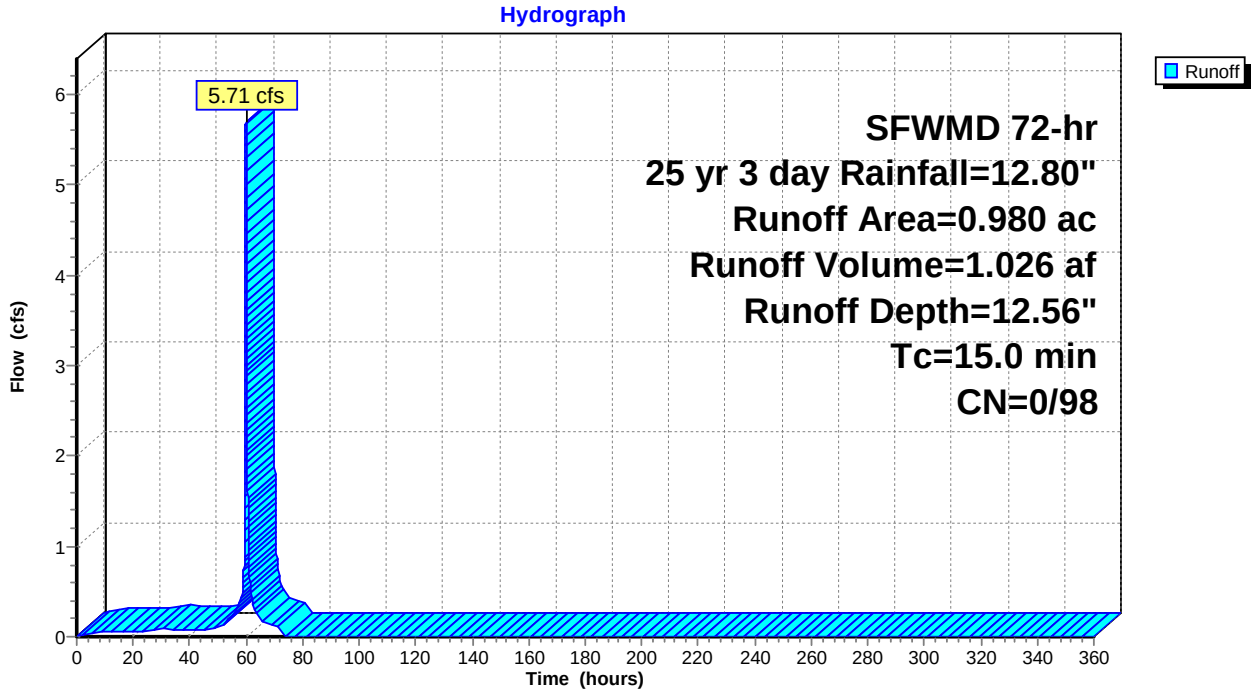
Runoff = 5.71 cfs @ 59.91 hrs, Volume= 1.026 af, Depth=12.56"
Routed to Pond 12P : WATER MANAGEMENT

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-360.00 hrs, dt= 0.01 hrs
SFWMD 72-hr 25 yr 3 day Rainfall=12.80"

	Area (ac)	CN	Description
*	0.880	98	PAVEMENT
*	0.100	98	BUILDING
	0.980	98	Weighted Average
	0.980	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

Subcatchment 11S: Impervious



Summary for Pond 12P: WATER MANAGEMENT

[42] Hint: Gap in defined storage above volume #7 at 2.85'
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=2550)

Inflow Area = 1.420 ac, 69.01% Impervious, Inflow Depth = 10.66" for 25 yr 3 day event
Inflow = 7.45 cfs @ 59.91 hrs, Volume= 1.262 af
Outflow = 0.40 cfs @ 63.22 hrs, Volume= 1.258 af, Atten= 95%, Lag= 198.3 min
Primary = 0.40 cfs @ 63.22 hrs, Volume= 1.258 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-360.00 hrs, dt= 0.01 hrs
Peak Elev= 7.13' @ 63.22 hrs Surf.Area= 0.275 ac Storage= 0.536 af

Plug-Flow detention time= 434.0 min calculated for 1.258 af (100% of inflow)
Center-of-Mass det. time= 430.9 min (3,640.9 - 3,210.0)

Volume	Invert	Avail.Storage	Storage Description
#1	6.50'	1.540 af	**PAVEMENT STORAGE** Listed below
#2	5.50'	0.990 af	**OPEN SPACE STORAGE** Listed below
#3	5.50'	0.881 af	**EXISTING STORAGE FRONT (Irregular)** Listed below (Recalc)
#4	6.50'	0.398 af	**EXISTING STORAGE BACK (Irregular)** Listed below (Recalc)
#5	5.40'	1.977 af	**PROPOSED STORAGE MIDDLE (Irregular)** Listed below (Recalc)
#6	5.40'	1.060 af	**PROPOSED STORAGE FRONT (Irregular)** Listed below (Recalc)
#7	1.35'	0.004 af	**18.0" Round RCP_Round 18"** L= 90.0'
		6.849 af	Total Available Storage

Elevation (feet)	Cum.Store (acre-feet)
6.50	0.000
7.00	0.030
7.50	0.130
8.00	0.280
8.50	0.500
9.00	0.790
9.50	1.130
10.00	1.540

Elevation (feet)	Cum.Store (acre-feet)
5.50	0.000
6.00	0.010
6.50	0.050
7.00	0.110
7.50	0.200
8.00	0.310
8.50	0.440
9.00	0.600
9.50	0.780
10.00	0.990

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
5.50	0.004	60.0	0.000	0.000	0.004
6.50	0.024	597.0	0.013	0.013	0.649
7.50	0.066	617.0	0.043	0.056	0.695
20.00	0.066	617.0	0.825	0.881	0.872

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
6.50	0.017	177.0	0.000	0.000	0.017
7.50	0.030	197.0	0.023	0.023	0.031
20.00	0.030	197.0	0.375	0.398	0.088

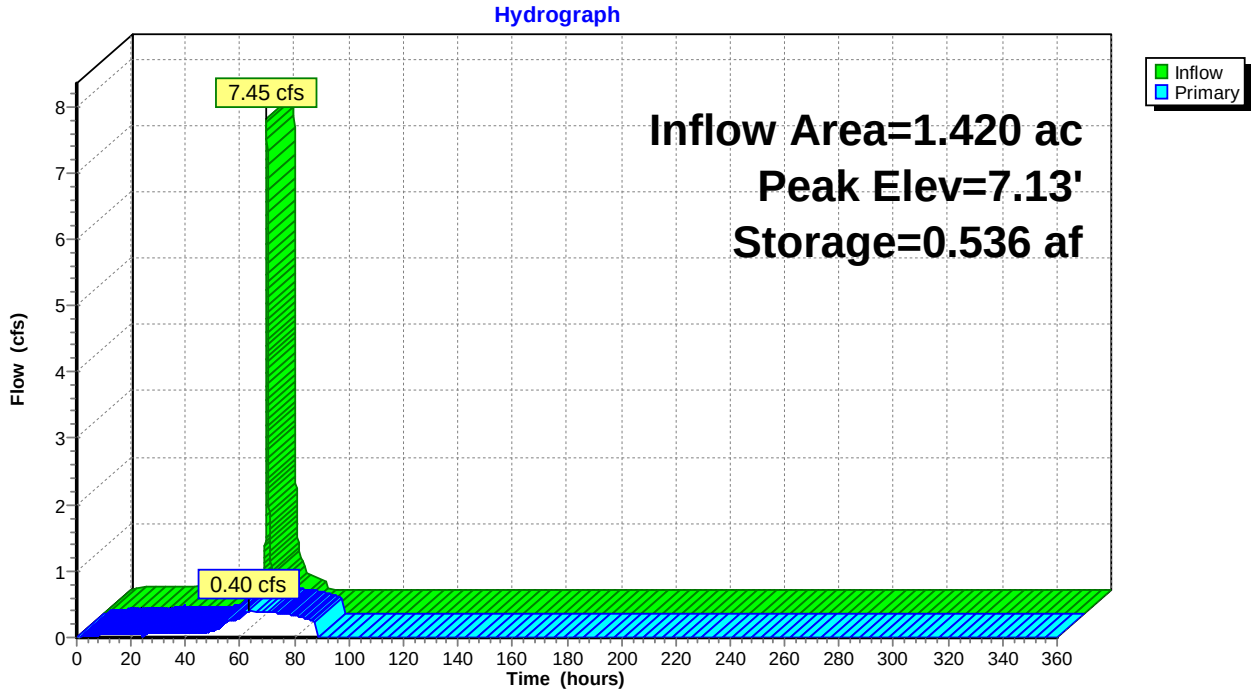
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
5.40	0.101	252.0	0.000	0.000	0.101
6.40	0.119	270.0	0.110	0.110	0.119
7.40	0.138	289.0	0.128	0.238	0.140
20.00	0.138	289.0	1.739	1.977	0.223

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
5.40	0.041	205.0	0.000	0.000	0.041
6.40	0.057	235.0	0.049	0.049	0.066
7.40	0.075	268.0	0.066	0.115	0.097
20.00	0.075	268.0	0.945	1.060	0.174

Device	Routing	Invert	Outlet Devices
#1	Primary	4.20'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

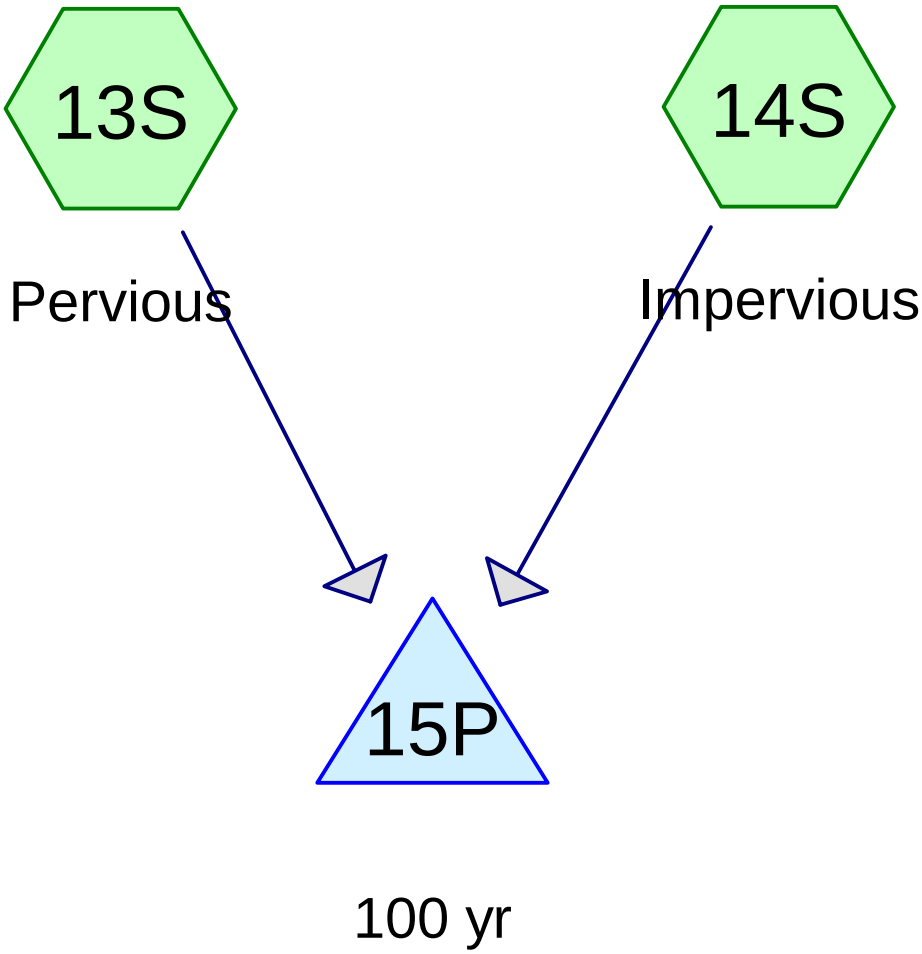
Primary OutFlow Max=0.40 cfs @ 63.22 hrs HW=7.13' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.40 cfs @ 8.06 fps)

Pond 12P: WATER MANAGEMENT



100-Year, 3-Day (Zero Discharge)

Modeling Results



Subcat Reach Pond Link

Routing Diagram for 2024-09-03 SW Model
Prepared by Davidson Engineering, Printed 9/5/2024
HydroCAD® 10.20-5b s/n 02995 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100 yr 3 day	SFWMD 72-hr		Default	72.00	1	16.00	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.100	98	BUILDING (14S)
0.440	55	OPEN SPACE (13S)
0.880	98	PAVEMENT (14S)
1.420	**85**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
1.420	Other	13S, 14S
1.420		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	0.100	0.100	BUILDING	14S
0.000	0.000	0.000	0.000	0.440	0.440	OPEN SPACE	13S
0.000	0.000	0.000	0.000	0.880	0.880	PAVEMENT	14S
0.000	**0.000**	**0.000**	**0.000**	**1.420**	**1.420**	**TOTAL AREA**	

Time span=0.00-360.00 hrs, dt=0.01 hrs, 36001 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 13S: Pervious Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=9.15"
Tc=15.0 min CN=55/0 Runoff=2.42 cfs 0.336 af

Subcatchment 14S: Impervious Runoff Area=0.980 ac 100.00% Impervious Runoff Depth=15.76"
Tc=15.0 min CN=0/98 Runoff=7.14 cfs 1.287 af

Pond 15P: 100 yr Peak Elev=8.42' Storage=1.622 af Inflow=9.55 cfs 1.622 af
Outflow=0.00 cfs 0.000 af

Total Runoff Area = 1.420 ac Runoff Volume = 1.622 af Average Runoff Depth = 13.71"
30.99% Pervious = 0.440 ac 69.01% Impervious = 0.980 ac

Summary for Subcatchment 13S: Pervious

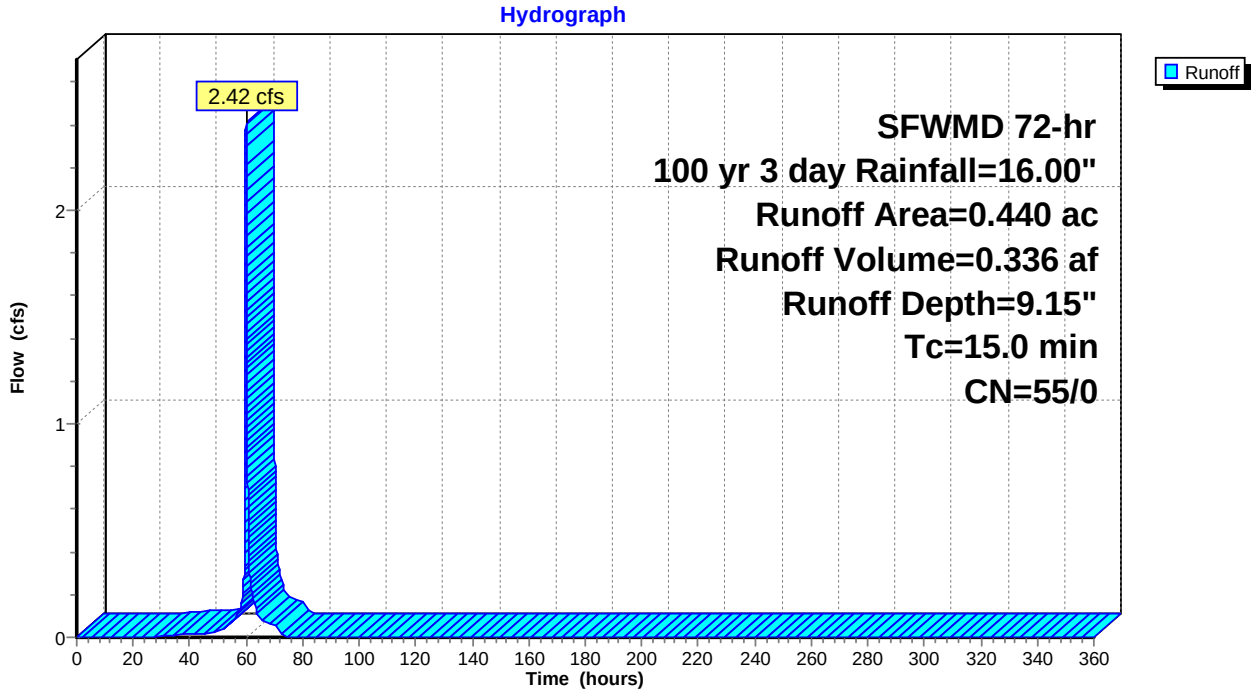
Runoff = 2.42 cfs @ 59.92 hrs, Volume= 0.336 af, Depth= 9.15"
Routed to Pond 15P : 100 yr

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-360.00 hrs, dt= 0.01 hrs
SFWMD 72-hr 100 yr 3 day Rainfall=16.00"

	Area (ac)	CN	Description
*	0.440	55	OPEN SPACE
	0.440	55	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

Subcatchment 13S: Pervious



Summary for Subcatchment 14S: Impervious

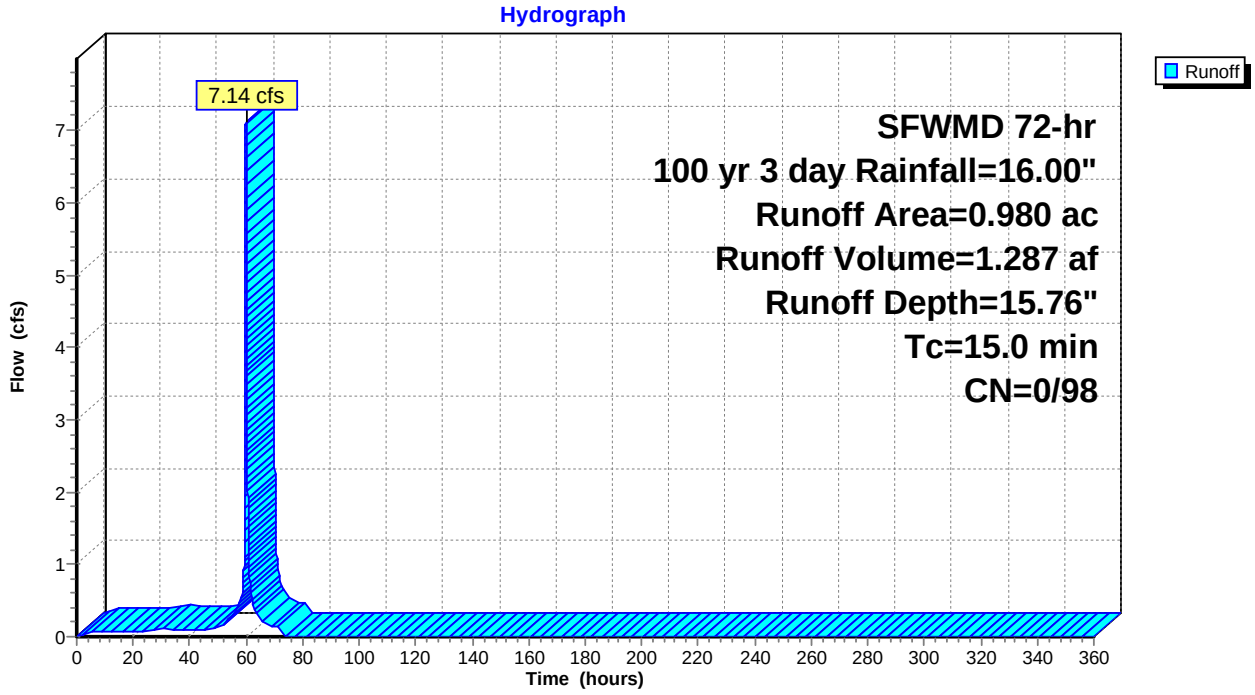
Runoff = 7.14 cfs @ 59.91 hrs, Volume= 1.287 af, Depth=15.76"
Routed to Pond 15P : 100 yr

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-360.00 hrs, dt= 0.01 hrs
SFWMD 72-hr 100 yr 3 day Rainfall=16.00"

	Area (ac)	CN	Description
*	0.880	98	PAVEMENT
*	0.100	98	BUILDING
	0.980	98	Weighted Average
	0.980	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

Subcatchment 14S: Impervious



Summary for Pond 15P: 100 yr

[42] Hint: Gap in defined storage above volume #7 at 2.85'

Inflow Area = 1.420 ac, 69.01% Impervious, Inflow Depth = 13.71" for 100 yr 3 day event
Inflow = 9.55 cfs @ 59.91 hrs, Volume= 1.622 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-360.00 hrs, dt= 0.01 hrs
Peak Elev= 8.42' @ 78.89 hrs Surf.Area= 0.309 ac Storage= 1.622 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	6.50'	1.540 af	**PAVEMENT STORAGE** Listed below
#2	5.50'	0.990 af	**OPEN SPACE STORAGE** Listed below
#3	5.50'	0.881 af	**EXISTING STORAGE FRONT (Irregular)** Listed below (Recalc)
#4	6.50'	0.398 af	**EXISTING STORAGE BACK (Irregular)** Listed below (Recalc)
#5	5.40'	1.977 af	**PROPOSED STORAGE MIDDLE (Irregular)** Listed below (Recalc)
#6	5.40'	1.060 af	**PROPOSED STORAGE FRONT (Irregular)** Listed below (Recalc)
#7	1.35'	0.004 af	**18.0" Round RCP_Round 18"** L= 90.0'
		6.849 af	Total Available Storage

Elevation (feet)	Cum.Store (acre-feet)
6.50	0.000
7.00	0.030
7.50	0.130
8.00	0.280
8.50	0.500
9.00	0.790
9.50	1.130
10.00	1.540

Elevation (feet)	Cum.Store (acre-feet)
5.50	0.000
6.00	0.010
6.50	0.050
7.00	0.110
7.50	0.200
8.00	0.310
8.50	0.440
9.00	0.600
9.50	0.780
10.00	0.990

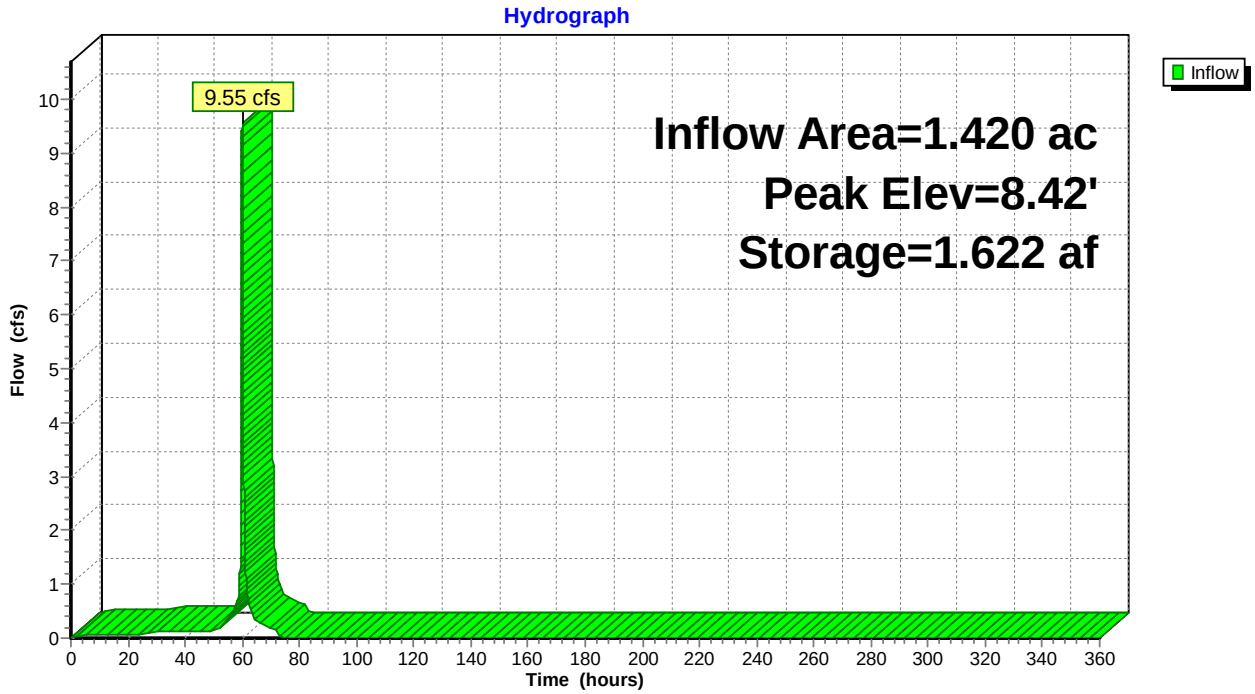
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
5.50	0.004	60.0	0.000	0.000	0.004
6.50	0.024	597.0	0.013	0.013	0.649
7.50	0.066	617.0	0.043	0.056	0.695
20.00	0.066	617.0	0.825	0.881	0.872

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
6.50	0.017	177.0	0.000	0.000	0.017
7.50	0.030	197.0	0.023	0.023	0.031
20.00	0.030	197.0	0.375	0.398	0.088

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
5.40	0.101	252.0	0.000	0.000	0.101
6.40	0.119	270.0	0.110	0.110	0.119
7.40	0.138	289.0	0.128	0.238	0.140
20.00	0.138	289.0	1.739	1.977	0.223

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
5.40	0.041	205.0	0.000	0.000	0.041
6.40	0.057	235.0	0.049	0.049	0.066
7.40	0.075	268.0	0.066	0.115	0.097
20.00	0.075	268.0	0.945	1.060	0.174

Pond 15P: 100 yr



DAVIDSON ENGINEERING

Project **DAILY BREAD FOOD PANTRY**
Proj. #: Task #
Calculated By: Date:
Checked By: Date:

Water Management Design Calculations

DAILY BREAD FOOD PANTRY

A) LAND USE SUMMARY - CONTRIBUTORY BASIN ONLY

Land Use	Total Basin Area	Water Surface	Future Imp.	Pavement	Impervious Area	Pervious Area
	Acres	Acres	Acres	Acres	Acres	Acres
Lake	0.00	0.00	0.00	0.00	0.00	0.00
Upland Perserve	0.00	0.00	0.00	0.00	0.00	0.00
Pavement/Driveway	0.88	0.00	0.00	0.88	0.88	0.00
Building	0.10	0.00	0.10	0.00	0.10	0.00
Open Space	0.44	0.00	0.00	0.00	0.00	0.44
Water Management	0.31	0.00	0.00	0.00	0.00	0.31
Total Basin:	**1.73**	**0.00**	**0.10**	**0.88**	**0.98**	**0.75**

B) DESIGN PARAMETERS

Control Elevation =	4.20	NAVD	
3-day rainfall(100yr) =	16.0	Inches	
3-day rainfall(25yr) =	12.8	Inches	
1-day rainfall(10yr) =	7.4	Inches	
Q(Allow) =	0.15	CFS/ac	(BASIN: GRE)
Soil compaction factor (i.e. 25%)	25%		

Pervious Area= Project Area - Impervious Area
Pervious Area= 1.73 - 0.98
Pervious Area= **0.75** Acres

B) PEAK ALLOWABLE DISCHARGE

Excludes Wetland and Upland Preserve

Q(Allowable)= 0.15 x 1.73 ac
Q(Allowable)= **0.26** CFS

C) WATER QUALITY STORAGE VOLUME

1. First Inch of Runoff Criteria:

Water Quality Vol.= Project Area * 1 in.*(1ft/12in.)
Water Quality Vol.= 1.73 * 1 in.*(1ft/12in.)
Water Quality Vol.= **0.14** Ac-ft.
Allowable 24-HR Discharge Volume **0.07** Ac-ft. 1/2"

2. 2.5 % Impervious Criteria:

a) Site Area= Project Area - (Lake + Conservation) - Roof
Site Area= 1.73 - - - 0.10
Site Area= 1.63 Acres
b) Imp. Area= Site Area - Pervious Area
Imp. Area= 1.63 - 0.75
Imp. Area= 0.88 Acres
c) Vol. Stor. Req'd= 2.5 in.*(1ft/12in.) * (Imp. Area/Site Area) * (Project Area - Lake - Conserv.)
Vol. Stor. Req'd= 2.5 in.*(1ft/12in.) * 0.54 * 1.73
Vol. Stor. Req'd= **0.19** Ac-ft.

Therefore, calculation # 2 controls and a water quality volume of
0.19 Ac-ft must be detained on-site prior to discharge.

3. Maximum Daily Discharge:
Criteria: 1/2" per day
Q(Bleed-Down)= {(0.5in./24hrs.) * (1ft/12in.) * (43560sf/acre) * (1hr/3600s)} * (Project Area - Lake-Wetland-Preserve)
Q(Bleed-Down)= 0.021 * 11.33 - 1.75
Q(Bleed-Down)= **0.20** CFS

4. Type of Water Quaility Area (1st stage or pre-treatment) **Dry Detention**
Type of Water Quaility Area (2nd stage if needed) **Not Required**

5. Water Quaility calculations

Water quaility pre-treatment for Commerical and Industrial sites (1/2" min. no reduction) =	1/2" =	**0.07**	Ac-Ft.
Water Quality Required By SFWMD per B.O.R. (Greater of 1" or 2.5" x % Imp.)	2.5" x % imp =	**0.19**	Ac-Ft.
Water Quality Required by Collier County [per CC LDC 3.07.02 150% of BOR 5.2.1(a)	150% of B.O.R. =	**0.22**	Ac-Ft. of Dry Detention
25% reduction for Dry Detention or 50% reduction for Dry Retention or 1 1/2" min.]	1 1/2" =	**0.22**	Ac-Ft.
Water Quaility Required =		**0.22**	Ac-Ft.
Total Water Quality Volume Required =		**0.22**	

Water quaility provided (1st stage or pre-treatment) =	**0.23**	Ac-Ft. of Dry Detention
Water quaility provided equvilent to Wet Detention per B.O.R. (1st stage or pre-treatment)	**0.31**	Ac-Ft.
Water quaility provided (2nd stage, i.e. Lake or Dry Detention)	**0.00**	
Water quaility provided equvilent to Wet Detention per B.O.R. (2nd stage, i.e. Lake or Dry Detention)	**0.00**	
Total Water Quality Volume per B.O.R. Provided =	**0.31**	Ac-Ft.

Water quality volume will start at stone invert (1' above the wet season water table elevation): **5.20** NAVD (ft.)

D) SOIL STORAGE

Depth to Water Table = 5.0 ft.

Interpolated Soil Storage for pervious areas = Sd = 8.18 Inches
From SFWMD; Basis for Review, Volume IV

S= Site-Wide Soil Storage
S= Sd * (Pervious Area/Project Area)
S= 8.18 * 0.75 / 11.33
S= **0.54** Inches

E) MINIMUM FINISHED FLOOR ELEVATION

1. Peak Stage from HydroCAD routings (100-year, 3-day, zero discharge):

Peak Stage= **8.42** NAVD (ft.)

2. FEMA Flood Zone: **AE7**

The flood hazard elevation is: **7.00** (worst case if more than one elevation zone)

3. 100-year, 3-day, zero discharge calculations (SCS method)

3-day rainfall= 16.00 Inches

Inches of Runoff= (P-0.2S)^2/(P+0.8S)

Inches of Runoff= 15.37 Inches

Volume of Runoff= (1ft/12in.) * (Inches of Runoff) * (Project Area)

Volume of Runoff= 1ft/12in. * 15.37 * 1.73

Volume of Runoff= **2.22** Ac-ft.

Therefore, using the stage storage curve a minimum finished floor elevation will be equal to or greater than **8.42** NAVD

F) MINIMUM ROADS ELEVATION

1. Peak Stage from HydroCAD routings (25-year, 3-day):

Peak Stage= **7.13** NAVD (ft.)

2. 25-year, 3-day, zero discharge calculations (SCS method)

3-day rainfall= 12.80 Inches

Inches of Runoff= (P-0.2S)^2/(P+0.8S)

Inches of Runoff= 12.17 Inches

Volume of Runoff= (1ft/12in.) * (Inches of Runoff) * (Project Area) - (Bleed-down 3-Day Volume Allowed in Ac-Ft)

Volume of Runoff= 12.17 * 1'/12" * 1.73 - 1.20

Volume of Runoff= **0.56** Ac-ft.

Therefore, using the stage storage curve a minimum road elevation will be approximately: **7.13** NAVD (ft.) Minimum 2' above C.E. Controls

G) MINIMUM PARKING ELEVATION

1. Peak Stage from HydroCAD routings (10-year, 1-day):

Peak Stage= **6.70** NAVD (ft.)

2. 10-year, 1-day, zero discharge calculations (SCS method)

1-day rainfall= 7.40 Inches

Inches of Runoff= (P-0.2S)^2/(P+0.8S)

Inches of Runoff= 6.79 Inches

Volume of Runoff= (1ft/12in.) * (Inches of Runoff) * (Project Area) - (Bleed-down 3-Day Volume Allowed in Ac-Ft)

Volume of Runoff= 6.79 * 1'/12" * 1.73 - 1.20

Volume of Runoff= **-0.22** Ac-ft.

Therefore, using the stage storage curve a minimum parking elevation will be approximately: **6.70** NAVD (ft.) (Minimum 2' above C.E. Controls)

H) PERCENT DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)

%DCIA= Impervious Area / Project Area

%DCIA= 0.98 / 1.73

%DCIA= **56.6%**

I) CURVE NUMBER FOR PERVIOUS AREA

CN= 1000 / (10 + Sd)

CN= 1000 / 10.00 + 8.18

CN= **55**

J) DISCHARGE STRUCTURE

See Storm Water or HydroCAD® Draw Down Routings for calculations and results.

K) STORMWATER FLOOD ROUTING

1. Flood routing for the system is accomplished through the use of Santa Barbara Urban Hydrograph method to generate the runoff hydrographs and through the HydroCAD
for multiple pond routing. The following pages are the input and output for this drainage area.

DEPTH TO WTR TABLE	NATURAL AVAILABLE STORAGE	DEV. AVAIL. STORAGE
0	0.00	0.00
1	0.60	0.45
1.5	1.50	1.10
2	2.50	1.88
2.5	4.50	3.40
3	6.60	4.95
3.5	8.90	6.80
4	10.90	8.18
10	10.9.	8.18

Appendix B

Water Meter Sizing Worksheet

Water Meter Sizing Form

One Form Per Meter

Preparer's Information:

Name ============> Lee Davidson

Title ============> Project Manager

Company=========> Davidson Engineering

Address ==========> 4365 Radio Road, Suite 201, Naples, FL 34104

Phone ============> 239.434.6060

Email Address =====> lee@davidsonengineering.com

Project Information:

Date ====> 4-Sep-24

Permit or AR Number

Name of Project ===> Our Daily Bread Food Pantry

Project Address ===> 1818 San Marco Road

Please Note:

1. All commercial facilities must be metered separately from residential facilities with the exception of those commercial facilities that are within a master metered residential development and designed for the exclusive use of the residents within such development.

2. The Design Engineer/Architect must submit signed and sealed documentation supporting meter sizing. Sizing shall be based upon fixture flow values, as shown on the following page and the table on page 3, unless approved otherwise by Utility Deviation. If an increase in meter size is requested to accommodate for fire flow, the Engineer/Architect should check appropriate box below. A Utility Deviation will not be required for increasing meter size for fire flow requirements. For all meter sizes, the

3. For remodeling projects this form must be submitted only if there is a net increase in fixture flow value.

This Section to be filled out by Engineer/Architect of Record:

Demand in accordance with the Fixture Flow Value Worksheet and the Table for Estimating Demand

19 **GPM**

Meter Size Required: 3/4"

Meter Size Requested:

Existing Meter Size: 3/4"

If the meter size requested is larger than the meter size required per the table velow, please indicate the reason for the request by checking the appropriate box:

☐ **Fire Flow** ☐ **Other (Please attach Utility Deviation approval)**

Lee Davidson, P.E.

Type or Print Name of Engineer/Architect of Record for Project

Signature of Engineer/Architect of Record for Project and Date

Demand Range (GPM)	Meter Size
0 to 30	3/4"
30.1 to 50	1"
50.1 to 100	1 1/2"
100.1 to 160	2"
160.1 to 450	3"
450.1 to 1000	4"
1001.1 to 2000	6"

Fixture Flow Value Worksheet

Please call Public Utilities Engineering (239) 252-2583 with any questions.

Enter # of Fixtures of each Fixture Type, per unit, then multiply by appropriate Flow Rate to get Fixture Value

Fixture	Flow Rate		# of Fixtures Per Unit		Fixture Flow Value
Automatic clothes Washer					
Commercial	3	x		=	
Residential	2	x		=	
Bathroom group					
As defined in FL Plumbing Code Section 202 (1.6 gpf water closet)	5	x		=	
Bathtub	4	x		=	
Bidet	2	x		=	
Dental unit or cuspidor	1	x		=	
Dishwasher, residential	2.75	x		=	
Drinking fountain	0.75	x	2	=	1.5
Shower	3	x		=	
Sillcock, hose bibb	5	x		=	
Sink (per faucet)					
Kitchen, residential	2	x		=	
Laundry tray	4	x		=	
Lavatory	2	x	2	=	4
Service	3	x	1	=	3
Wash	2	x	1	=	2
Urinal					
Standard	4	x		=	
Flushless	0	x		=	
Valve* Gallons/Flush = x10		x		=	
Water Closet					
Flushometer valve* Gallons/Flush = x10		x		=	
Flushometer tank	1.6	x		=	
Tank	4	x	2	=	8
For any fixtures not listed, submit manufacturer's data sheets and enter appropriate description and value:					
Other:		x		=	
Other:		x		=	
Other:		x		=	
Other:		x		=	
Other:		x		=	

Total Fixture Value Per Unit =====>	**18.5**
Number of Units with this Fixture Count =====>	1
Grand Total of Fixture Flow Value (Per Unit Total x Number of Units) =====>**	**18.5**

*Valves are calculated using a flush rate of 10 flushes per minute (according to Florida Plumbing Code).
The flow rate is 10 times the gallons per flush.
The fixture flow value is calculated as follows:

Number of Valves	Calculation
1 - 2	Flow Rate **times** Number of Fixtures.
3 - 10	Flow Rate **times** two **plus** two **times** the Number of Fixtures.
11 or more	Flow Rate **times** Number of Fixtures **divided** by two.

**Use total Fixture Flow Value on "Table for Estimating Demand" to estimate water meter demand.

Table for Estimating Demand

Please call Public Utilities Engineering (239) 252-2583 with any questions.

SUPPLY SYSTEMS PREDOMINANTLY FOR FLUSH TANKS		SUPPLY SYSTEMS PREDOMINANTLY FOR FLUSH VALVES	
Load	**Demand**	**Load**	**Demand**
Fixture Flow Value	Gallons per minute	Fixture Flow Value	Gallons per minute
1	3.0	---	---
2	5.0	---	---
3	6.5	---	---
4	8.0	---	---
5	9.4	5	15.0
6	10.7	6	17.4
7	11.8	7	19.8
8	12.8	8	22.2
9	13.7	9	24.6
10	14.6	10	27.0
11	15.4	11	27.8
12	16.0	12	28.6
13	16.5	13	29.4
14	17.0	14	30.2
15	17.5	15	31.0
16	18.0	16	31.8
17	18.4	17	32.6
18	18.8	18	33.4
19	19.2	19	34.2
20	19.6	20	35.0
25	21.5	25	38.0
30	23.3	30	42.0
35	24.9	35	44.0
40	26.3	40	46.0
45	27.7	45	48.0
50	29.1	50	50.0
60	32.0	60	54.0
70	35.0	70	58.0
80	38.0	80	61.2
90	41.0	90	64.3
100	43.5	100	67.5
120	48.0	120	73.0
140	52.5	140	77.0
160	57.0	160	81.0
180	61.0	180	85.5
200	65.0	200	90.0
225	70.0	225	95.5
250	75.0	250	101.0
275	80.0	275	104.5
300	85.0	300	108.0
400	105.0	400	127.0
500	124.0	500	143.0
750	170.0	750	177.0
1,000	208.0	1,000	208.0
1,250	239.0	1,250	239.0
1,500	269.0	1,500	269.0
1,750	297.0	1,750	297.0
2,000	325.0	2,000	325.0
2,500	380.0	2,500	380.0
3,000	433.0	3,000	433.0
4,000	535.0	4,000	535.0
5,000	593.0	5,000	593.0

Appendix C

NFPA Required Fire Flow Table & Fire Flow Test

CROSS-REFERENCE OF BUILDING CONSTRUCTION TYPES

NFPA 220	I(442)	I(332)	II(222)	II(111)	II(000)	III(211)	III(200)	IV(2HH)	V(111)	V(000)
IBC	----	IA	IB	IIA	IIB	IIIA	IIIB	IVHT	VA	VB

Table H.5.1 Minimum Required Fire Flow and Flow Duration for Buildings

Fire Area ft² (×0.0929 for m²)					Fire Flow gpm[2] (× 3.785 for L/min)	Flow Duration (hours)
I(443), I(332), II(222)[1]	II(111), III(211)[1]	IV(2HH), V(111)[1]	II(000), III(200), III(000)[1]	V(000)[1]		
0–22,700	0–12,700	0–8,200	0–5,900	0–3,600	1,500	2
22,701–30,200	12,701–17,000	8,201–10,900	5,901–7,900	3,601–4,800	1,750	
30,201–38,700	17,001–21,800	10,901–12,900	7,901–9,800	4,801–6,200	2,000	
38,701–48,300	21,801–24,200	12,901–17,400	9,801–12,600	6,201–7,700	2,250	
48,301–59,000	24,201–33,200	17,401–21,300	12,601–15,400	7,701–9,400	2,500	
59,001–70,900	33,201–39,700	21,301–25,500	15,401–18,400	9,401–11,300	2,750	
70,901–83,700	39,701–47,100	25,501–30,100	18,401–21,800	11,301–13,400	3,000	3
83,701–97,700	47,101–54,900	30,101–35,200	21,801–25,900	13,401–15,600	3,250	
97,701–112,700	54,901–63,400	35,201–40,600	25,901–29,300	15,601–18,000	3,500	
112,701–128,700	63,401–72,400	40,601–46,400	29,301–33,500	18,001–20,600	3,750	
128,701–145,900	72,401–82,100	46,401–52,500	33,501–37,900	20,601–23,300	4,000	4
145,901–164,200	82,101–92,400	52,501–59,100	37,901–42,700	23,301–26,300	4,250	
164,201–183,400	92,401–103,100	59,101–66,000	42,701–47,700	26,301–29,300	4,500	
183,401–203,700	103,101–114,600	66,001–73,300	47,701–53,000	29,301–32,600	4,750	
203,701–225,200	114,601–126,700	73,301–81,100	53,001–58,600	32,601–36,000	5,000	
225,201–247,700	126,701–139,400	81,101–89,200	58,601–65,400	36,001–39,600	5,250	
247,701–271,200	139,401–152,600	89,201–97,700	65,401–70,600	39,601–43,400	5,500	
271,201–295,900	152,601–166,500	97,701–106,500	70,601–77,000	43,401–47,400	5,750	
295,901-Greater	166,501-Greater	106,501–115,800	77,001–83,700	47,401–51,500	6,000	
295,901-Greater	166,501-Greater	115,801–125,500	83,701–90,600	51,501–55,700	6,250	
295,901-Greater	166,501-Greater	125,501–135,500	90,601–97,900	55,701–60,200	6,500	
295,901-Greater	166,501-Greater	135,501–145,800	97,901–106,800	60,201–64,800	6,750	
295,901-Greater	166,501-Greater	145,801–156,700	106,801–113,200	64,801–69,600	7,000	
295,901-Greater	166,501-Greater	156,701–167,900	113,201–121,300	69,601–74,600	7,250	
295,901-Greater	166,501-Greater	167,901–179,400	121,301–129,600	74,601–79,800	7,500	
295,901-Greater	166,501-Greater	179,401–191,400	129,601–138,300	79,801–85,100	7,750	
295,901-Greater	166,501-Greater	191,401-Greater	128,301-Greater	85,101-Greater	8,000	

[1] Types of construction are based on NFPA 220.
[2] Measured at 20 psi (139.9 kPa).

Marco Island Fire Rescue

Department of Fire Prevention

(239)394-5405
danielz@cityofmarcoisland.com

Company/Firm Requesting Test: Davidson Engineering, Inc.

Project Name: Daily Bread Food Pantry

Contact Person & Email: Lee Davidson; lee@davidsonengineering.com

Date Requested: 07/16/2024

Amount Due and Payable to The Marco Island Fire Department $113___*

*Note: Charges for flow testing will be **$77.00** for the first hydrant and **$36.00** for each additional hydrant tested at the same date and time as the first hydrant.

Remit payment with invoice # to the link below:

https://marcoislandfl.munisselfservice.com/citizens/GeneralBilling/Default.aspx

Date Tested: 7/18/24

Location: 1818 San Marco Rd.

Time of Test: 2:35 PM

Pitot: 42x2 Static: 80 Residual: 72

Flow: 2,175 gpm

Flow @ 20psi: 6,456 estimated gpm

1280 San Marco Road, Marco Island, FL 34145