

MEMORANDUM

UF Health Florida Recovery Center at Springhill

21-0340



To: Alachua County, GRU
From: Randall Scott Olney, P.E.
Date: September 3, 2023
RE: UF Health Florida Recovery Center at Springhill - Fire Flow Calculations

The following is a calculation for required fire flow for the proposed project based on the NFPA 1: Fire Code.

Building data is based on the information available from the project architect at the time of this memo. Any changes to the building data will void the provided fire flow calculation and require a revised analysis to verify the building complies with the applicable fire protection criteria. Buildings 1 and 2 (Apartment Buildings) **will be** protected by an approved automatic fire sprinkler system. Building 3 (Amenities Building) **will not be** protected by an approved automatic fire sprinkler system.

NFPA 1 Calculations:

Building 1: Apartment Building
Construction Type: V (000)
Fire Flow Area: $\pm 30,000$ SF

Required Fire Flow per NFPA Table 18.4.5.1.2: **4,750 gpm**

Per NFPA 1, 18.4.5.3.2, a reduction in required fire flow of 75% shall be permitted when the building is protected throughout by an approved automatic sprinkler system. The resulting fire flow shall not be less than 1,000 gpm.

Required Fire Flow with automatic sprinkler system reduction: $4,750 * 0.25 = 1,188$ gpm

Per GRU Standards Section V.G.4, a minimum hydraulic capacity of **1,500 gpm at 20 psig** is required.

Building 2: Apartment Building
Construction Type: V (000)
Fire Flow Area: $\pm 12,000$ SF

Required Fire Flow per NFPA Table 18.4.5.1.2: **3,000 gpm**

Per NFPA 1, 18.4.5.3.2, a reduction in required fire flow of 75% shall be permitted when the building is protected throughout by an approved automatic sprinkler system. The resulting fire flow shall not be less than 1,000 gpm.

Required Fire Flow with automatic sprinkler system reduction: $3,000 * 0.25 = 750$ gpm = **1,000 gpm**

Per GRU Standards Section V.G.4, a minimum hydraulic capacity of **1,500 gpm at 20 psig** is required.

Building 3: Amenities Building
Construction Type: V (000)
Fire Flow Area: $\pm 4,175$ SF

Required Fire Flow per NFPA Table 18.4.5.1.2: **1,750 gpm**

Required Fire Flow per ISO NFF Worksheet: **1,750 gpm**

Per GRU Standards Section V.G.4, a minimum hydraulic capacity of **1,500 gpm at 20 psig** is required.

Conclusion:

- Required NFPA fire flow: **1,750 gpm**
- Required ISO fire flow: **1,750 gpm**
- Required GRU fire flow: **1,500 gpm**
- *Available fire flow per hydrant flow test conducted on 05/26/2016: **4,158 gpm**
- The total available fire flow at 20 psi exceeds the fire flow requirement specified by GRU, ISO, and NFPA Table 18.4.5.1.2; therefore, the project site is in compliance with the NFPA 1: Fire Code, GRU, and ISO Standards.

** Updated fire flow data has been requested from GRU and will be provided upon receipt.*

Randall Scott Olney, P.E.
State of Florida, Professional
Engineer, License No. 68382

This item has been digitally
signed and sealed by Randall
Scott Olney, P.E. on the date
indicated here. 9/4/2023

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

Digitally signed by Randall
Scott Olney
DN: E=randy@chwhi.com,
CN=Randall Scott Olney,
O=Randall Scott Olney,
L=Madison, St=Florida, C=US
Date: 2023.09.04
15:37:45-0400

Randall Scott Olney
FL PE #68382

Table 18.4.5.1.2 Minimum Required Fire Flow and Flow Duration for Buildings

Fire Flow Area ft ² (× 0.0929 for m ²)					Fire Flow gpm [†] (× 3.785 for L./min)	Flow Duration (hours)
I(443), I(332), II(222)*	II(111), III(211)*	IV(2HH), V(111)*	II(000), III(200)*	V(000)*		
0-22,700	0-12,700	0-8200	0-5900	0-3600	1500	2
22,701-30,200	12,701-17,000	8201-10,900	5901-7900	3601-4800	1750	
30,201-38,700	17,001-21,800	10,901-12,900	7901-9800	4801-6200	2000	
38,701-48,300	21,801-24,200	12,901-17,400	9801-12,600	6201-7700	2250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7701-9400	2500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9401-11,300	2750	3
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3000	
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5750	
Greater than 295,900	Greater than 166,500	106,501-115,800	77,001-83,700	47,401-51,500	6000	
		115,801-125,500	83,701-90,600	51,501-55,700	6250	
		125,501-135,500	90,601-97,900	55,701-60,200	6500	
		135,501-145,800	97,901-106,800	60,201-64,800	6750	
		145,801-156,700	106,801-113,200	64,801-69,600	7000	
		156,701-167,900	113,201-121,300	69,601-74,600	7250	
		167,901-179,400	121,301-129,600	74,601-79,800	7500	
		179,401-191,400	129,601-138,300	79,801-85,100	7750	
		Greater than 191,400	Greater than 138,300	Greater than 85,100	8000	

*Types of construction are based on NFPA 220.

†Measured at 20 psi (139.9 kPa).

ISO Needed Fire Flow (NFF) Worksheet

(Page references are to the appropriate sections in the ISO Guide for Determination of Needed Fire Flow)

Petition Number:		Date:	9/3/2023
Project:	UF Recovery Center at Springhill	Engineer:	C. Menhennett, E.I.
	Office Building - Worst Case	Checked By:	Randall S. Olney, P.E.
Location:	4305 NW 90 Blvd		
	Gainesville, FL 32606		

Subject Building

Construction Class (p. 4): Wood Frame Construction ▼ **construction coefficient (F) (p. 2):** 1.5

Area of largest floor in the building (if modifications are made for division walls (p. 8), the division walls must be shown on the site plan.): 4,175 sq.ft.

Total area of all other floors (if modifications are made for division walls (p. 8), the division walls must be shown on the site plan.): sq. ft.

Effective Area (A_i) (p. 9) : 4,175 sq. ft. (Show calculations below)

Needed Fire Flow attributed to construction (C _i) (per formula (p. 2)):	1744.584478
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(Round to the nearest 250 gpm. See p. 10 for maximum and minimum values of C_i)

Type of Occupancy: Limited-combustible (C-2) ▼ **Occupancy Factor (O_i) (p. 11):** 0.85

Exposures (p. 16)

Front: construction of facing wall of exposure building (p. 4): ▼

Distance (ft.) to the exposure building: ▼ **Length of exposure wall:** ▼

Number of stories of exposure wall: 1 **Length x number of stories:** 0

Opening Protection in exposure wall: ▼

Factor for exposure (X_i) from Table 330.A (p. 17): 0

Back: construction of facing wall of exposure building (p. 4): ▼

Distance (ft.) to the exposure building: ▼ **Length of exposure wall:** ▼

Number of stories of exposure wall: 1 **Length x number of stories:** 0

Opening Protection in exposure wall: ▼

Factor for exposure (X_i) from Table 330.A (p. 17): 0

Left: construction of facing wall of exposure building (p. 4): Wood Frame Construction ▼

Distance (ft.) to the exposure building: 11 - 30 ▼ **Length of exposure wall:** 45

Number of stories of exposure wall: 1 **Length x number of stories:** 45

Opening Protection in exposure wall: Unprotected ▼

Factor for exposure (X_i) from Table 330.A (p. 17): 0.17

Right: construction of facing wall of exposure building (p. 4): Wood Frame Construction ▼

Distance (ft.) to the exposure building: 31 - 60 ▼ **Length of exposure wall:** 40

Number of stories of exposure wall: 1 **Length x number of stories:** 40

Opening Protection in exposure wall: Unprotected ▼

Factor for exposure (X_i) from Table 330.A (p. 17): 0.12

Communications (p. 18)

Passageway Opening Protection:	<input type="text"/>	▼
Construction class of communication (Table 330.B) :	<input type="text"/>	▼
Is communication open or enclosed?	<input type="text"/>	▼
Length of communication (in feet):	<input type="text"/>	▼
Factor for Communications (P _i) from Table 330.B on p.19):	<input type="text" value="0"/>	

Calculation of Needed Fire Flow (p. 1)

$NFF = (C_i)(O_i)[1.0 + (X + P)_i]$ (substitute values as determined above. For exposures and communications use the single side with the highest charge.)

$$NFF = 1750 \times 0.85 \times [1 + (0.17 + 0)]$$

$$NFF = 1740.375 \text{ gpm}$$

$NFF = 1750 \text{ gpm (rounded to nearest 250 gpm per ISO requirements)}$
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Note: ISO evaluates hydrant distribution by examining the number and type of hydrants within 1,000 feet of each representative building. They also look at the distance from each such hydrant to the subject building, measured as apparatus can lay hose.

Hydrants with at least one large pumper outlet may receive credit for up to 1,000 gpm. Hydrants with at least two hose outlets, but no pumper outlet, may receive credit for up to 750 gpm. And hydrants with only one hose outlet may receive credit for up to 500 gpm.

Hydrants within 300 feet of the subject building may receive credit for up to 1,000 gpm (but not more than the credit that would apply based on the number and type of outlets). Hydrants from 301 feet to 600 feet from the subject building may receive credit for up to 670 gpm (but not more than the credit that would apply based on the number and type of outlets). And hydrants from 601 feet to 1,000 feet from the subject building receive credit for 250 gpm. Under certain circumstances, when all fire department pumpers carry sufficient large-diameter hose, ISO may allow maximum credit for hydrants up to 1,000 feet from the subject building.

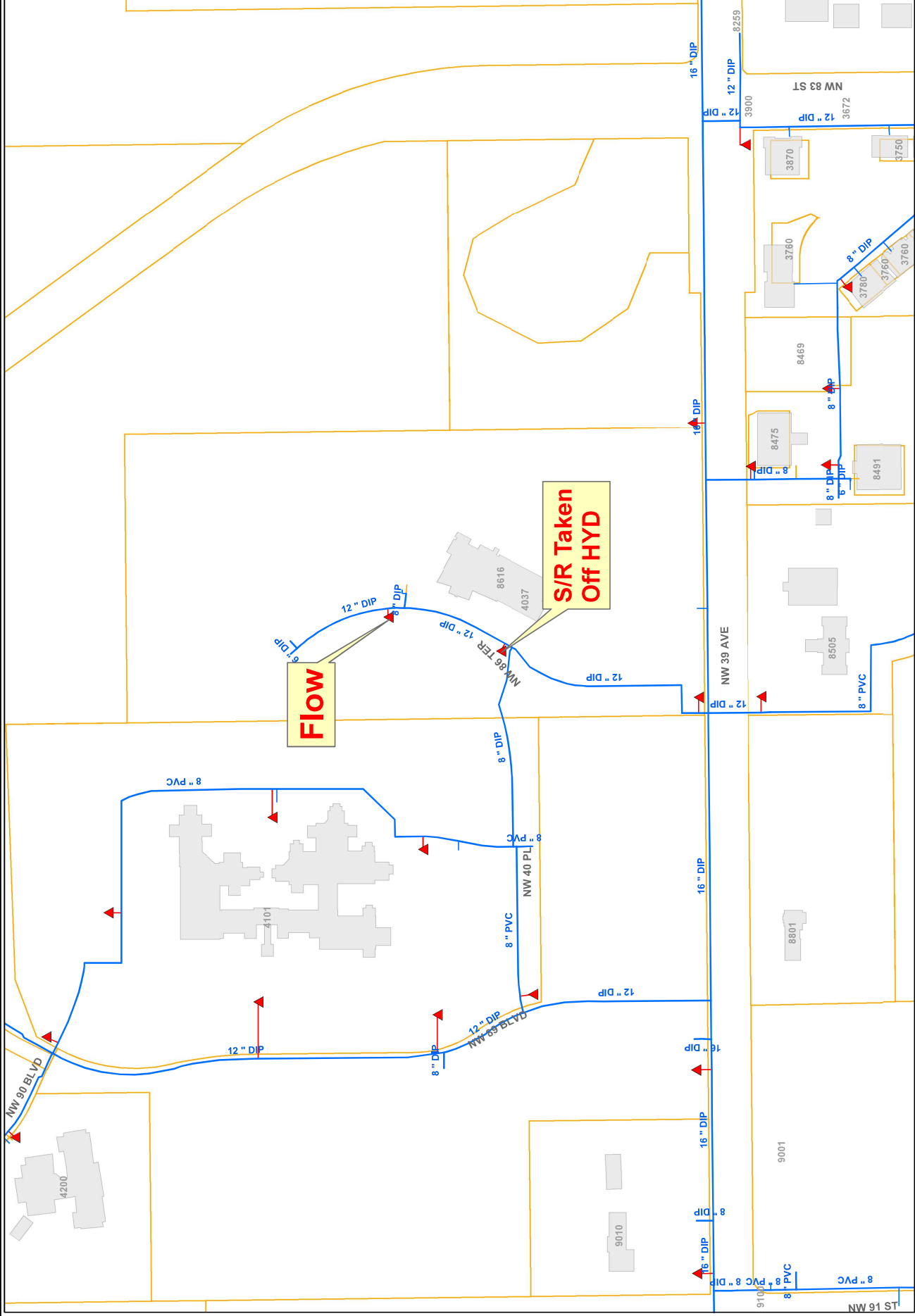
More than one fire hydrant may be required for proper distribution of water per ISO requirements.

THIS PLAN AND SPECIFICATIONS ARE PREPARED FOR THE CITY OF GAINESVILLE, FLORIDA, AND ARE NOT TO BE USED FOR ANY OTHER PROJECT OR PURPOSE. THE CITY OF GAINESVILLE, FLORIDA, IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS IN THIS PLAN AND SPECIFICATIONS. THE USER OF THIS PLAN AND SPECIFICATIONS SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR COMPLIANCE WITH ALL APPLICABLE REGULATIONS AND ORDINANCES. THE USER OF THIS PLAN AND SPECIFICATIONS SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY INFORMATION FROM THE WATER/WASTEWATER DIVISION BY CALLING (352) 395-1653.

- Legend**
- Hydrant
 - Water Main
 - Owner - STATUS
 - GRU - Active/Unknown
 - GRU - Abandoned/POS
 - Private System
 - Owner - Description
 - GRU - Hydrant - Active

1 inch = 200 feet

GPU
More than Energy



FIRE HYDRANT FLOW TEST

NAME: Springhill MOB - Phase II

ADDRESS: 8616 NW 86th Ter

MAP NO: 3338

REC NO

3762

HYDRANT ADDRESSES:

HYD

HYD NO MAP NO

STATIC/RESIDUAL HYD 4037 NW 86th Ter

30025 3338

PITOT HYD:

#1 (4.5" NOZZLE)

#2 (2.5" NOZZLE) 8616 NW 86th ter

30499 3338

#3 (2.5" NOZZLE)

TEST DATE: 05/26/2016

TEST TIME: 3:39 pm

NOZZLE DIA (IN.)	"C" FACTOR	NO OF NOZZLES FLOWING	STATIC PSIG	RESIDUAL PSIG	PITOT PSIG	ACTUAL FLOW GPM	AVAIL. FLOW @ 20 PSIG GPM
#1 4.5"	0.9						
#2 2.5"	0.9	2	56.9	49.3	27.8	1772	4158
#3 2.5"	0.8						
TOTAL FLOW:						1772 GPM	4158 GPM

TESTED BY: M. DeAngelo

VERIFIED BY: J. Worley

PETITION NO:

COMMENTS:

The pressure drop between the static and residual pressures is less than 10 psi which affects accuracy of test results. S/R taken off HYD

REQUESTED BY:

Jessica Junkin, CHW, 352-519-5909, jessicaj@chw-inc.com

(352)334-3400 P.O.Box 147117, I/O Box A122, Gainesville, FL 32614-7117

GISNOTEST