New Construction Water Supply & Fire Flow Calculation Requirements

Note:
Water models may be required for large fire flow requirements, systems that have long pipe runs, unusual or questionable layouts or as deemed necessary by this office. To help expedite your plans, engineers are encouraged to submit water models before formal requests are made by the fire marshal.

Florida Fire Prevention Code NFPA 1 Current Edition

18.3 Water Supplies

18.3.1 an approved water supply capable of supplying the required fire flow for fire protection shall be provided to all premises upon which facilities, buildings, or proportions of buildings are hereafter constructed or moved into the jurisdiction. The approved water supply shall be in accordance with section 18.4.

18.4 Fire Flow Calculations for buildings.

18.4.1 Scope.

A.18.4.1 Section 18.4 and the associated tables are only applicable for determining minimum water supplies for manual fire suppression efforts. Water supplies for fire protection systems are not addressed by this section. It is not the Intent to add the minimum fire protection water supplies, such as for a fire sprinkler system, to the minimum fire flow for manual fire suppression purposes required by this section.

18.4.1.1The procedure determining fire flow requirements for buildings hereafter constructed or moved into the jurisdiction shall be in accordance with Section 18.4.

18.4.1.2 Section 18.4 shall not apply to structures other than buildings.

18.4.2 Definitions. See definitions 3.3.14.4 (Fire Flow Area) and 3.3.119 (Fire Flow).

3.3.14.4 Fire Flow Area. The floor area, in square feet, used to determine the required fire flow.

3.3.119 Fire Flow. The flow rate of a water supply, measured at 20psi (137.9 kPa) residual pressure, that is available for firefighting.

18.4.3 Modifications

18.4.3.1.1 Fire Flow requirements shall be permitted to be decreased by the AHJ for isolated buildings or a group of buildings in rural areas or suburban areas where the development of full fire flow requirements is impractical as determined by the AHJ.

18.4.3.2 The minimum required fire flow shall be permitted to be increased by the AHJ where conditions indicate an unusual susceptibility to group fires or conflagrations. An upward modification shall not be more than twice that required for the building under consideration.

18.4.4 Fire Flow Area.

18.4.4 .1 General. The fire flow area shall be the total floor area of all floor levels of a building except as modified in 18.4.4.2.

18.4.4.2 Type 1 (443), Type 1(332), and Type II (222) Construction. The fire flow area of a building constructed of Type I (443), Type I (332), and Type II (222) construction shall be the area of the three largest successive floors.

18.4.5 Fire Flow Requirements for buildings.

18.4.5.1 One and two-family dwellings not exceeding 5000 square feet.

18.4.5.1.1 The minimum fire flow and flow duration requirements for one and two-family dwellings having a fire flow area that does not exceed 5000 square feet shall be 1000 gpm for 1 hour.

18.4.5.1.2 A reduction in required fire flow of 75 percent shall be permitted when the building is provided with an approved automatic sprinkler system.

18.4.5.1.4 A reduction in the required fire flow of 25 percent shall be permitted when the building is separated from other buildings by a minimum of 30 feet.

18.4.5.1.5 The reduction in 18.4.5.1.1.2, 18.4.5.1.1.3 and 18.4.5.1.1.4 shall not reduce the required fire flow to less than 500 gpm.

18.4.5.2 One & Two-Family Dwellings Exceeding 5,000 ft2.

18.4.5.2.1 Fire flow and flow duration for dwellings having a fire flow area in excess of 5000 square feet shall not be less than that specified in table 18.4.5.2.1.

18.4.5.2.2 Required fire flow shall be reduced by 75 percent and the duration reduced to one hour where the one and two-family dwelling is provided with an approved automatic sprinkler system.

18.4.5.2.3 A reduction in the required fire flow shall be permitted where a one and two-family dwelling is separated from all lot lines in accordance with Table 18.4.5.1.4.

18.4.5.2.5 The reductions in 18.4.5.2.2 and 18.4.5.2.3 shall not reduce required fire flow to less than 500 gpm for 1 hour.

18.4.5.3 Buildings other than one and two-family dwellings.

18.4.5.3.1 Buildings other than one and two-family dwellings. The minimum fire flow and flow duration for buildings other than one and two-family dwellings shall be as specified in Table 18.4.5.2.1. (See below).

18.4.5.3.2 A reduction in required fire flow of 75 percent shall be permitted when the building is protected throughout by an approved automatic sprinkler system. The resulting fire flow may not be less than 1000 gpm.

18.4.5.3.3 A reduction in required fire flow of 75 percent shall be permitted when the building is protected throughout by an approved automatic sprinkler system which utilizes quick response sprinklers throughout. The resulting fire flow shall not be less than 600 gpm.

EXPOSURES: DISTANCES

(ANY BUILDING WITHIN 150 FEET IS CONSIDERED AN EXPOSURE)

HAZARD CHARGE

0-10' = +25%

11-30' = +20%

31- 60' = +15%

61- 100'= +10%

101- 150' = + 5%

Add the percentage of all 4 side of the building for a total percentage.

Hazard Charge= Fire Flow using table 18.4.5.1.2 X Total Percentage Minimum Fire Flow Fire Flow using table18.4.5.1.2 + Hazard Charge.

Table 18.4.5.2.1 Minimum Required Fire Flow and Flow Duration for Buildings

Fire Flow Area ft^2 (x 0.0929 for m^2)					Fire Flow gpm† (x 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	
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	2
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	
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	3
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	
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	4
		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).

FIRE FLOW CALCULATION

Project Name		**Permit No.**	
Project Address			

FIRE AREA (A)		
1st Floor		Sq. Ft.
2nd Floor		Sq. Ft.
3rd Floor		Sq. Ft.
4th Floor		Sq. Ft.
5th Floor		Sq. Ft.
6th Floor		Sq. Ft.
TOTAL AREA (A)		**Sq. Ft.**

CONSTRUCTION TYPE (C)	
Wood Frame	1.5=C
Ordinary	1.0=C
Non-Combustible	0.8=C
Fire Resistive	0.6=C

BASE FLOW (Q)		**GPM**

Q=18(C)(√A)

HAZARD (P)		**Factor**

N=(P) *Q

Hazard Classification Table		
Noncombustible	-25%	0.75
Limit-Combust	-15%	0.85
Combustible	0%	1.00
Free Burning	+15%	1.15
Ex/Rapid Burn	+25%	1.25
Compl Auto Sprk	-30%	0.70

NEW BASE FLOW (N)		**GPM**

EXPOSURES %			
	Distance (Ft.)	Charge	
North			%
South			%
East			%
West			%
TOTAL% (E)			**%**

Exposure Charge Table		
0-10'	+25%	1.25
11-30'	+20%	1.20
31-60'	+15%	1.15
61-100'	+10%	1.10
101-150'	+5%	1.05

(75% Maximum)

Convert percentage into decimal & insert as E if not on Chart

TOTAL FLOW (T)		**GPM**

T=(1+E) *N

# HYDRANTS NEEDED		**GPM**

T/1000

(within 500' of remote point of building)

Calculated By: **Date:**