Chambers County Fire Marshal's Office
Fire Hydrant & Fire Water Requirements

Fire Hydrants:

1. If you are in an area served by a water district or municipal services, fire hydrants are required if a 6" or larger main fronts any side of your property. In areas not served by a water district or municipal services, see the last section of this document, "**Fire Water Supplies in Undeveloped Areas**".
2. The maximum distance from a fire hydrant to a building is 400' per IFC 2015 507.5.1, with an allowable increase of up to 600' for a building with an automatic sprinkler system. This distance should be determined "as a hose would lay", and measured to the exterior portions of the building (perimeter of building).
3. Hydrants shall be located out of the collapse zone of a building (NFPA 24 2013 7.2.4).
4. Hydrants shall have unobstructed access (507.5.4). (ie., not blocked by fences, etc.)
5. A hydrant must be located within 100' from an FDC.
6. The use of a hydrant must not require the blocking of main driveways or access into the facility.

Steps to Determine Number of Hydrants and Spacing:

1. Determine Fire Flow using IFC B105.1;
2. Spacing and minimum number of hydrants are determined by Table C102.1; and
3. Depending upon the area of the building, additional hydrants may be needed to satisfy the spacing requirements of table C102.1.

Example 1:

An 80,000 square foot building of type IIB construction is equipped with an automatic sprinkler system. According to B105.1, the fire flow is determined to be 6,000gpm for 4 hours. According to B105.2, since the building is sprinklered, the fire flow can be reduced by 75%. 6,000 x .75 = 4,500. 6,000 – 4,500 = 1,500. The reduced fire flow requirement is 1,500gpm, with an average hydrant spacing of 500 feet. Table C102.1 specifies one hydrant minimum. However, more hydrants will be needed for the 600' distance requirement. Because there will be multiple hydrants, spacing between hydrants now comes into play. Therefore, a route should be drawn around the exterior of the building, accessible via fire lanes, and a hydrant should be placed every 500', until no part of the perimeter of the building is more than 600' from a hydrant.

Example 2:

One hydrant is available to a 1,400 square foot type IIB building. The building is non-sprinklered. Using the "hose lay" method, a hose would come to within less than 400' to any part of the perimeter of the building. The hydrant is less than 250' from the fire lane, and is easily accessible without obstructions. This would be the only hydrant needed for this building.

TABLE B105.1(2)
REFERENCE TABLE FOR TABLES B105.1(1) AND B105.2

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute)[b]	FLOW DURATION (hours)
Type IA and IB[a]	Type IIA and IIIA[a]	Type IV and V-A[a]	Type IIB and IIIB[a]	Type V-B[a]		
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	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. Types of construction are based on the *International Building Code*.
b. Measured at 20 psi residual pressure.

TABLE C102.1
REQUIRED NUMBER AND SPACING OF FIRE HYDRANTS

FIRE-FLOW REQUIREMENT (gpm)	MINIMUM NUMBER OF HYDRANTS	AVERAGE SPACING BETWEEN HYDRANTS[a, b, c, f, g] (feet)	MAXIMUM DISTANCE FROM ANY POINT ON STREET OR ROAD FRONTAGE TO A HYDRANT[d, f, g]
1,750 or less	1	500	250
2,000-2,250	2	450	225
2,500	3	450	225
3,000	3	400	225
3,500-4,000	4	350	210
4,500-5,000	5	300	180
5,500	6	300	180
6,000	6	250	150
6,500-7,000	7	250	150
7,500 or more	8 or more[e]	200	120

For SI: 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m.

a. Reduce by 100 feet for dead-end streets or roads.
b. Where streets are provided with median dividers that cannot be crossed by fire fighters pulling hose lines, or where arterial streets are provided with four or more traffic lanes and have a traffic count of more than 30,000 vehicles per day, hydrant spacing shall average 500 feet on each side of the street and be arranged on an alternating basis.
c. Where new water mains are extended along streets where hydrants are not needed for protection of structures or similar fire problems, fire hydrants shall be provided at spacing not to exceed 1,000 feet to provide for transportation hazards.
d. Reduce by 50 feet for dead-end streets or roads.
e. One hydrant for each 1,000 gallons per minute or fraction thereof.
f. A 50-percent spacing increase shall be permitted where the building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 of the *International Fire Code*.
g. A 25-percent spacing increase shall be permitted where the building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2 or 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*.

Fire Water Supplies in Undeveloped Areas

1. Projects in areas not served by a water district or municipal services may require an alternative to provide water for fire protection. Fire code allows the fire marshal to reduce fire flows and/or utilize NFPA 1142 to meet this requirement.
2. Water storage tanks or ponds with dry hydrants or fire pumps may be utilized to satisfy this requirement.
3. The following types of occupancies will require alternative fire water supplies, and may consist of dry hydrants:
    a. Buildings requiring an automatic sprinkler system (fire sprinklers);
    b. Buildings greater than 12,000sf in area;
    c. Residential occupancies (single story apartments, hotels, etc.);
    d. RV parks greater than 10 sites;
4. Due to the hazards and risks associated with the following types of occupancies, they will require pressurized fire water systems (tanks or ponds with fire pumps) and standard fire hydrants spaced according to code:
    a. Multi-story Residential buildings (apartments, hotels, etc.);
    b. Institutional buildings (hospitals, nursing homes, assisted living facilities, residential board and care, etc.).

*Remote fire hose connections, as approved by the fire marshal, may be utilized in conjunction with dry hydrants to meet the requirements of this section. Remote fire hose connection FDCs shall be labeled and adjacent to dry hydrants and discharge into a 2.5” male NST connection.

Dry Hydrant Design Criteria per NFPA 1142

1. As a minimum, Schedule 40 pipe and component fittings shall be used.

2. All dry hydrant systems shall be designed and constructed to provide a minimum flow of 1000 gpm (3800 L/min) at draft.

3. All exposed surfaces and all underground metal surfaces shall be protected to prevent deterioration.

4. Suction hose connection(s) shall be 6” Male NST and shall conform to NFPA 1963, *Standard for Fire Hose Connections.* The connection(s) shall include a protective cap. The cap and adapter shall be of materials that minimize rust and galvanic corrosion.

5. Dry hydrant system piping shall be supported and/or stabilized using approved engineering design practices. Stabilization or equivalent protection shall be employed at elbows and other system stress points.

6. All connections shall be clean, and the appropriate sealing materials shall be used according to manufacturer’s specifications so as to ensure that all joints are airtight.

7. System strainers shall be constructed to permit required fire flow.

8. Adequate working space shall be provided around the dry hydrant to provide for a safe working environment.

9. Dry hydrants shall be located such that they are accessible under all weather conditions.

10. The dry hydrant system and access to the site shall be developed in a manner that allows the fire department pump to connect to the hydrant using not more than 20 ft (6 m) of hard suction hose.

11. Dry hydrants shall be located a minimum of 100 ft (30 m) from any structure.

12. No parking or other obstacles shall be allowed within 20 ft (6 m) of the access side of the hydrant.

13. Dry hydrants shall be protected from damage by vehicular and other perils, including freezing and damage from ice and other objects.

14. Dry hydrant locations shall be made visible from the main roadway during emergencies by reflective marking and signage approved by the AHJ.

15. There shall be not less than 2 ft (0.6 m) of water above the strainer and not less than 1 ft (0.3 m) below the strainer.

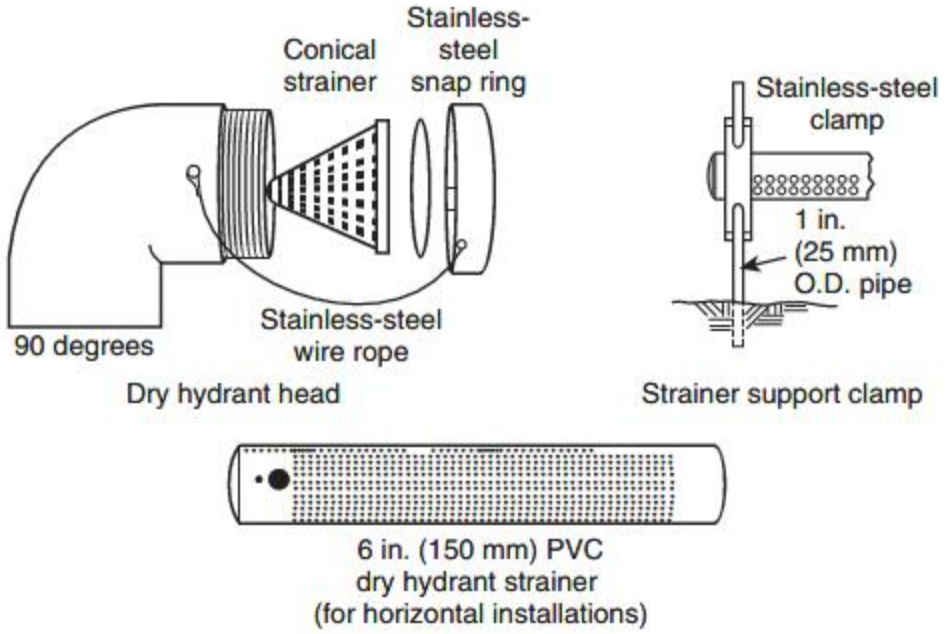

FIGURE A.8.3.2(a) Commercially Available Dry Hydrant Components.

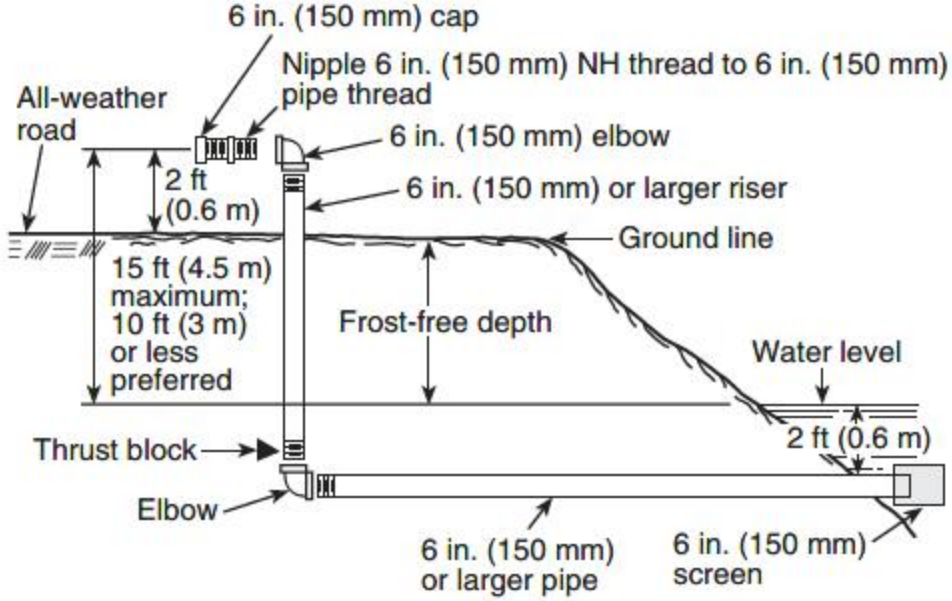

FIGURE A.8.3.2(b) Exploded View of Dry Hydrant Construction.

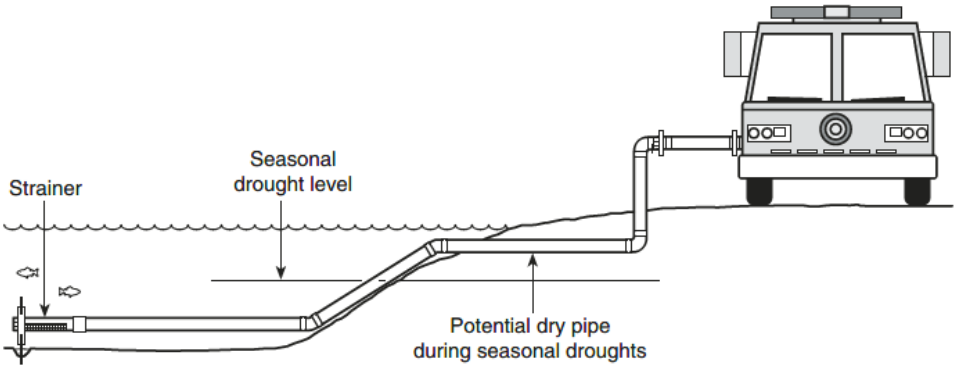

FIGURE A.8.3.5 Typical Dry Hydrant Installation Showing Impact of Seasonal Drought and Freezing Conditions.

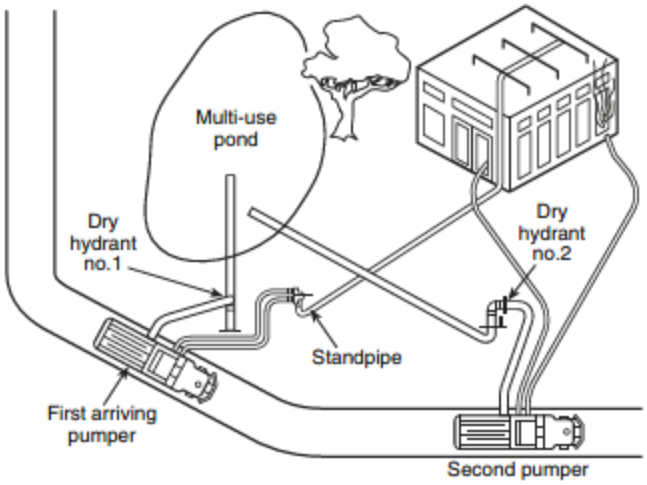

FIGURE A.8.4(a) Multiple Water Supply Points for an Industrial Occupancy.

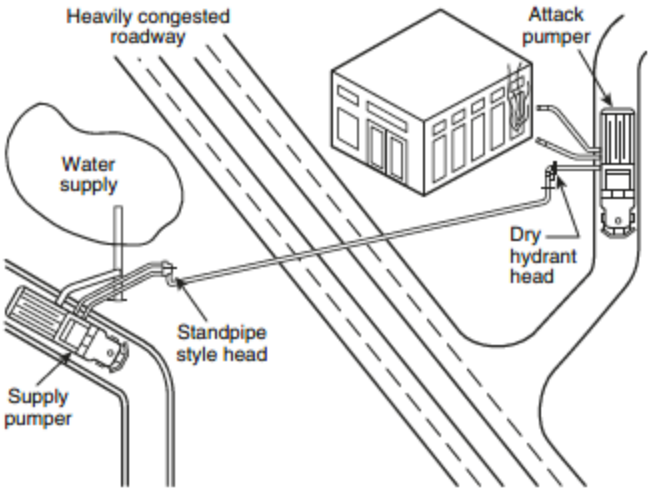

FIGURE A.8.4(b) Overcoming Roadway Obstructions in Supplying Water to a Building.

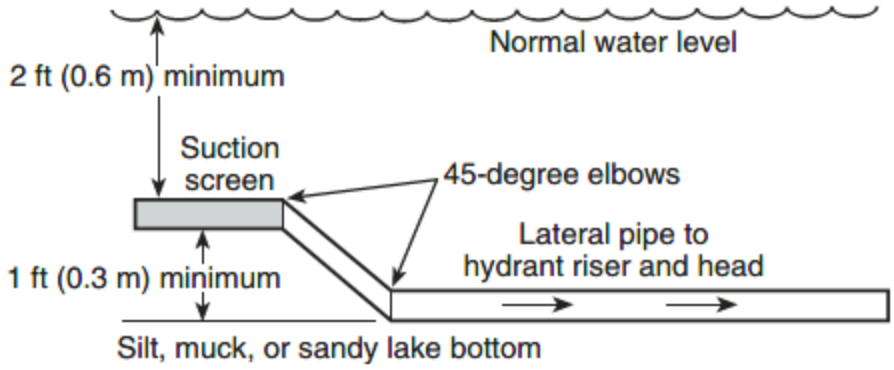

FIGURE A.8.5(a) Offset Screen Installation for Silt and Mud Conditions.

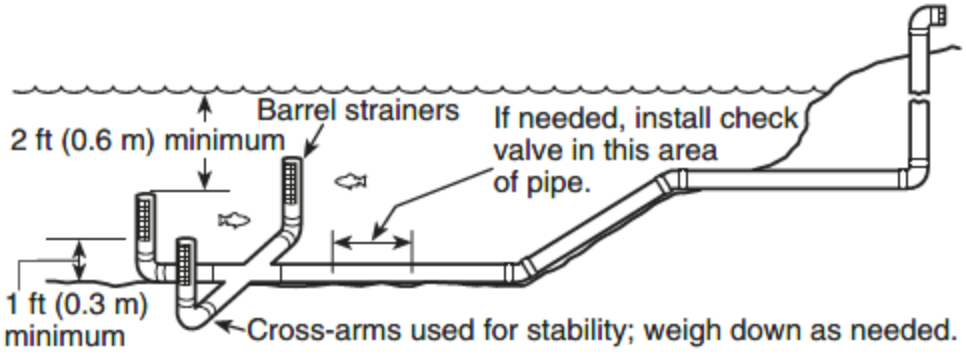

FIGURE A.8.5(b) Vertical Strainer Installation for Silt and Mud Conditions.

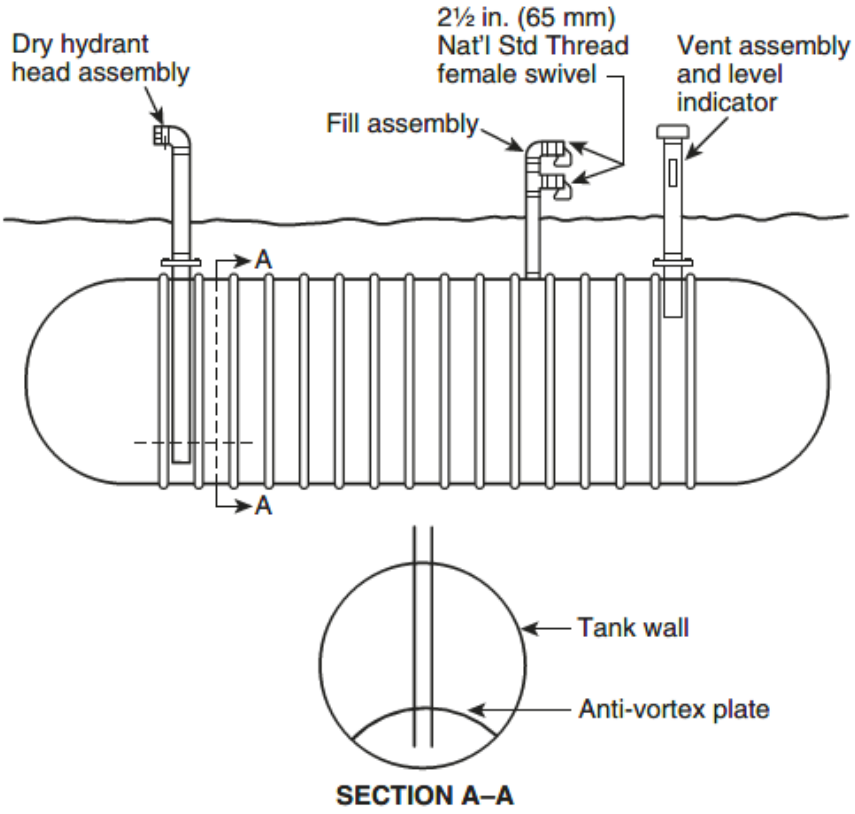

FIGURE B.5 Example of Construction of Water Cisterns Using an Underground Fiberglass Storage Tank.