# Fire & Life Safety

# Development Guidelines

The Hurricane Valley Fire SSD (HVFSSD) has prepared the following guidelines to assist you with the development and design of your project:

1. **BUILDINGS UNDER CONSTRUCTION:** Buildings undergoing construction and alteration must comply with Chapter 5 of the IFC. When fire protection, including fire apparatus access roads and water supplies for fire protection, is required to be installed before any combustibles can be on the site. Fire protection and fire department access must be installed and made serviceable prior to and during the time of construction. [IFC 501.4]

2. **OCCUPANCY CLASSIFICATION:** Identify the Occupancy Classification(s) for the building in accordance with the IBC, Chapter 3.

3. **ACTUAL AREA OF STRUCTURE:** Provide the actual area calculated for the building.

4. **ACTUAL HEIGHT OF STRUCTURE:** Provide the actual height (stories and feet) for the building.

5. **TYPE OF CONSTRUCTION:** Identify the type of construction for the building. [IBC Chapter 6 and Table 601]

6. **BUILDING CROSS-SECTIONAL VIEW:** Provide a cross-sectional view for the building. This will be helpful for showing the construction type, roof construction arrangement and interior construction features.

7. **FIRE FLOW REQUIREMENT:** The design team will need to meet with HVFSSD to establish the Fire Flow Requirement for this facility. Fire Flow is based on the following:

    7.1 Building Construction Type.

    7.2 Building Fire Area.

    7.3 Fire Sprinkler System.

The design team needs to provide flow testing data to determine available water supply for the project area. Seasonal and daily fluctuation allowances must be included in the calculations. ***The fire suppression design calculations MUST NOT exceed a static pressure in excess of 75 psi irrespective of actual flow data obtained by the fire suppression engineer. Water pressure equalization projects will not support high pressure flow calculations.***

8. **FIRE DISTRICT EQUIPMENT CACHES:** The HVFSSD requires that an equipment cache be provided in buildings four or more stories in height. Each building will be required to have an equipment cache(s) for use by the HVFSSD. These equipment caches will need to be located as designated by HVFSSD on alternating floor locations within close proximity to elevators and egress stairs. HVFSSD may allow for an equipment cache room to be replaced by a properly located equipment box if storage quantities allow. Equipment cache rooms are to be a minimum of 10-feet by 10-feet, with a minimum 36-inch wide door. An equipment list will be customized based on the floor square footage and a copy will be provided to the design team by the HVFSSD. All equipment on the list is purchased by the Owner.

9. **FIRE DEPARTMENT ACCESS TO FIRE PROTECTION EQUIPMENT:** Fire protection equipment must be identified in an approved manner. Rooms containing equipment caches, controls for fire sprinkler risers and valves, or other fire detection, suppression or control elements must be identified for the use of the fire department. Approved signs required to identify fire protection equipment and equipment location, must be constructed of durable materials, permanently installed and readily visible. [IFC 510.1]

10. **FIRE DEPARTMENT ACCESS TO MECHANICAL EQUIPMENT:** Rooms containing controls for air-conditioning systems, heating systems and other mechanical systems must be identified for the use of the fire department. Approved signs required to identify fire protection equipment and equipment location, must be constructed of durable materials, permanently installed and readily visible. [IFC 510.1]

11. **FIRE DEPARTMENT ACCESS:** Provide a site plan to the HVFSSD for review and approval prior to construction that exhibits the requirements from section 503 of the IFC and the following:

    11.1 **BUILDING AND FACILITIES:** Fire apparatus access roads must be provided such that no portion of the facility or any portion of an exterior wall of the first story of the building is located more than 150-feet from fire apparatus access as measured by an approved route around the exterior of the building or facility. [IFC 503.1.1]

    11.2 **SPECIFICATIONS:** Fire Department Access must be of an all-weather surface, a minimum clear width of 20-feet and a minimum vertical clear height of 13-feet 6-inches (13'-6"). [IFC 503.2.1] See IFC Appendix D for Fire Apparatus Access Road design.

    11.3 **SURFACE:** Fire apparatus access roads must be designed and maintained to support the imposed loads of 75,000 lbs for fire apparatus. [IFC 503.2.3 & D102.1]

    11.4 **TURNING RADIUS:** The turning radius must meet the access requirements for the project. Typical turning radius is shown.

        **DEAD END BULB:** The typical minimum turning radius of 28-feet must be provided for the fire apparatus access road turnaround. [IFC Figure D103.1]

**AERIAL ACCESS RADIUS:** The following turning radius must be met:

**INSIDE:** 24 feet 5 inches

**CURB TO CURB:** 40 feet 2 inches

**WALL TO WALL:** 47 feet 7 inches

11.5 **DEAD ENDS:** Dead-end fire apparatus access roads in excess of 150-feet in length must be provided with approved provisions for the turning around of fire apparatus. [IFC 503.2.5]

11.6 **BRIDGES AND ELEVATED SURFACES:** When a bridge or an elevated surface is part of a fire apparatus access road, it must be constructed and maintained in accordance with AASHTO Standard Specification for Highway Bridges and must be designed for a live loading sufficient to carry the imposed loads of fire apparatus. [IFC 503.2.6]

11.7 **GRADE:** The gradient for a fire apparatus access road must not exceed 10%. [IFC 503.2.7] Grades greater than 6% must be submitted for review prior to plan approval.

11.8 **ACCESS ROAD IDENTIFICATION:** Approved signs must be provided and maintained for fire apparatus access roads to identify the road and prohibit the obstruction thereof or both. [IFC 503.3]

12. **PREMISES IDENTIFICATION:** All new buildings must have approved address numbers, building numbers and approved building identification placed in such a position as to be plainly visible and legible from the street or road fronting the property. Address numbers must contrast with their background, and be Arabic numerals or alphabet letters. The numbers and characters must be a minimum of 6-inches in height, with a ½-inch stroke. [IFC 505.1]

13. **STREET OR ROAD SIGNS:** Streets and roads must be identified with approved signs. Temporary signs must be installed at each street intersection when construction of new roadways allows passage by vehicles. Signs must be a minimum of 6-inches in height, with a ½-inch stroke, weather resistant and be maintained until replaced by permanent signs. Provide a site plan that shows location of temporary signs. [IFC 505.2]

14. **FIRE HYDRANT LOCATIONS:** Provide a site plan to HVFSSD for review and approval prior to construction that exhibits the requirements from section 507 of the IFC and the following:

14.1 **DISTRIBUTION OF FIRE HYDRANTS:** The average spacing between fire hydrants located on streets and access roads adjacent to buildings must not exceed the spacing listed in IFC Table C105.1.

14.2 **ON-SITE FIRE HYDRANTS:** When any portion of a building is in excess of 400-feet from a fire hydrant on a fire apparatus access road, as measured by an approved route around

the exterior of the facility, on-site fire hydrants and mains capable of supplying the required fire flow must be provided. [IFC 507.5]

14.3 **WATER MAINS:** Minimum water main size to be 8-inch. The design team needs to provide HVFSSD with hydraulic calculations for the fire hydrant system for review and approval prior to construction. [IFC 501.3 & 507]

14.4 **TIMING OF INSTALLATION:** Water supplies for fire hydrant system are required to be installed and made serviceable prior to and during the time of construction. [IFC 501.4]

14.5 **MARKING OF FIRE HYDRANTS:** Fire hydrants must be clearly identified to prevent obstruction by parking and other obstructions.

**FIRE PROTECTION COMMENTS**

15. **STANDPIPE SYSTEM DESIGN CRITERIA:** A standpipe systems is required to be installed throughout buildings where the floor level of the highest story is located more than 30 feet above the lowest level of the fire department vehicle access, or where the floor level of the lowest story is located more than 30 feet below the highest level of fire department vehicle access, or where the fire department access is compromised. Provide for review and approval the design criteria, concept drawings and specifications that exhibit the standpipe design. [IFC 905.3]

16. **FIRE SPRINKLER SYSTEM DESIGN CRITERIA:** Provide for review and approval the design criteria, concept drawings and specifications that exhibit the design of Fire Sprinkler System. No portion of a system may be installed PRIOR TO review and written approval.

17. **FIRE DEPARTMENT CONNECTION (FDC):** Indicate the location for the FDC for the facility. Provide the HVFSSD for review and approval a drawing that exhibits the requirements from section 912 of the IFC and the following:

17.1 **LOCATION:** The FDC shall be located greater than 1 ½ the building height away from the building on the "address side" and in an area of no less than 15 feet unobstructed "curbside" access. It must be provided with impact protection and with an approved number of hose connections. A fire hydrant must also be located a minimum of 1 ½ the building height away from any building and within 100 feet of the FDC. The FDC must be located such that the fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. [IFC 912.2]

17.2 **VISIBLE LOCATION:** FDC must be located on the street side of buildings, fully visible and recognizable from the street or nearest point of fire department vehicle access. [IFC 912.2.1]

17.3 **ACCESS:** Immediate access to the FDC must be maintained at all times and without obstruction by fences, bushes, trees, walls or any other object for a minimum of 3 feet. Note: An all-weather, clear access path must be provided to and around the FDC for fire department personnel. [IFC 912.3]

17.4 **SIGNS:** A metal sign with raised letters at least 1-inch in size must be mounted on all FDC's serving fire sprinklers, or fire pump connections. Such signs must read: Automatic Sprinklers or Standpipes or Test Connection, or a combination thereof as applicable. [IFC 912.4]

18. **WATER FLOW SWITCHES:** All water-flow switches for the automatic fire sprinkler systems must be electrically supervised. Water-flow alarm and trouble signal must be distinctly different and must be automatically transmitted to an approved central station, remote station or proprietary monitoring station. [IFC 903.4.1]

19. **FIRE SPRINKLER CONTROL VALVES:** All valves controlling the water supply for the automatic fire sprinkler system must be electrically supervised. Valve monitoring signal must be distinctly different and must be automatically transmitted to an approved central station, remote station or proprietary monitoring station. Provide supervision for control valves on fire sprinkler system. [IFC 903.4.1]

20. **FIRE SPRINKLER FLOOR CONTROL VALVES:** NFPA-13, section 5-13.22 requires a floor control valve be provided on each floor for fire sprinkler piping, when the floor area is in excess of 5,000 square feet. A floor control valve must be provided on each floor to control the fire sprinkler system as required.

21. **EXTERIOR FIRE SPRINKLER FLOW ALARM:** An approved audible sprinkler flow alarm must be provided on the exterior of the building in an approved location. [IFC 903.4.2]

22. **INTERIOR FIRE SPRINKLER FLOW ALARM:** An approved audible sprinkler flow alarm to alert the occupants must be provided in the interior of the building in a normally occupied location. Note: An approved audible sprinkler flow alarm must be provided in the interior of each Tenant Space to alert the occupants. [IFC 903.4.2]

**FIRE ALARM COMMENTS**

23. **FIRE ALARM SYSTEM DESIGN CRITERIA:** Provide the design documents and drawings to indicate the location for the Fire Alarm System within the facility. Provide to HVFSSD for review and approval the design criteria, concept drawings and specifications that exhibit the requirements from section 907 of the IFC and requirements of NFPA-72. Location for the Main Fire Alarm

Panel and Remote Annunciator must be shown. Plan review and written approval MUST be granted PRIO TO initiating any work.

24. **INPUT/OUTPUT MATRIX:** To assist the HVFSSD with approval and understanding of Fire Alarm System operation, Fire Alarm Contractor and/or Electrical Engineer must provide an input/output matrix defining the system operation.

25. **OFF PREMISES MONITORING OF FIRE ALARM SYSTEM:** Off Premise Monitoring for the Fire Alarm System must be provided. [IFC 903.4.1 and 907]

## STAIRWAY

26. **STAIRWAY ACCESS TO ROOF:** New buildings four or more stories in height, must be provided with a stairway to the roof. Such stairway must be marked at street and floor levels with a sign indicating that the stairway continues to the roof. Where roofs are used for roof gardens or for other purposes, stairways must be provided as required for such occupancy classification. [IFC 504.3]

27. **STAIRWAY FLOOR NUMBER SIGNS:** A sign must be provided at each floor landing in interior vertical exit enclosures connecting more than three stories designating the floor level, the terminus of the top and bottom of the stair enclosure, and the identification of the stair. The signage must also state the story of, and the direction to the exit discharge and the availability of, roof access from the stairway for the fire department. The sign must be located five (5) feet above the floor landing in a position which is readily visible when the doors are in the open and closed positions. [IFC 1022.9] The IBC requires that approved stairway identification signs be provided at each floor level in all enclosed stairways in buildings four or more stories in height. The sign must identify the stairway, indicate whether there is roof access, the floor level and the upper and lower terminus of the stairway. The sign must be located approximately five-feet above the floor landing in a position which is readily visible when the door is in the open position or closed position. Provide stairway identification signs in all stairways.

## CODE FOOTPRINT AND FIRE AND LIFE SAFETY NARRATIVE FOR BLDG REQUIREMENTS

28. **CODE FOOTPRINT:** The HVFSSD requires that a graphic submittal format (code footprint) be provided for every newly constructed building, new building addition, changes in occupancy, or significant building renovation. The code footprint must be prepared and submitted to the HVFSSD at the early plan development stages of the construction project for review and acceptance. The code footprint will map key building and exiting features, and provide key performance information for fire and life safety features throughout the life span of a building. The following are the minimum requirements that must be shown and documented on the code footprint:

    28.1 On the Schematic floor plan, show the following:

        28.1.1 Graphic bar scale.

28.1.2 North indicator.

28.1.3 Complete building floor plan with clear identification of new, remodeled, and existing portions.

28.1.4 All permanent partitions taller than 6 feet.

28.1.5 Each room and space labeled with plain text, keynotes, or legends.

28.1.6 Occupant load of assembly rooms.

28.1.7 Total occupant load for each floor level.

28.1.8 Stair and shaft enclosures and ratings with identification of openings and ratings.

28.1.9 Rated corridors and openings with identification of openings and ratings.

28.1.10 Occupancy and area separations walls.

28.1.11 Horizontal exit arrangements, exit passageways, smoke compartments.

28.1.12 Designated required exterior exits and capacity.

28.1.13 Fire department access to property and buildings.

28.1.14 Location of fire hydrants that serve the building.

28.1.15 Fire department connections for fire sprinkler systems and/or standpipe(s).

28.1.16 Location of fire sprinkler system risers and floor control valve(s).

28.1.17 Location of standpipes.

28.1.18 Location of Fire Department Command Center.

28.1.19 Location of main fire alarm panel and remote annunciator.

28.1.20 Location of Smoke Control Panel.

28.1.21 Location of all power and fuels shut-off for building.

28.1.22 Distances to exposures and property lines.

28.1.23 Grade elevation at each corner of building.

28.1.24 Location of any special hazards or conditions.

28.1.25 Location of any planned additions.

28.1.26 Location of Fire Equipment Cache Rooms.

28.1.27 When available, small scale site plan (11-inch by 17-inch).

29. **NARRATIVE:** Provide a fire and life safety narrative for the building that exhibits the following:

29.1 Codes of record and other requirements or regulations.

29.2 Purpose for project construction, such as:

29.2.1 New construction.

29.2.2 Addition to existing building.

29.2.3 Change in use of building and/or Occupancy.

29.2.4 Renovation of building.

29.2.5 Other purpose.

29.3 Reason for submittal:

29.3.1 Project Clearance / Certificate of occupancy.

29.3.2 Plan of Correction for existing code deficiencies.

29.4 Building location and address.

29.5 Owner and facility name.

29.6 Date developed and revision dates.

29.7 Designer 's information (name, address, telephone number and tele-fax number).

29.8 Occupancy type(s).

29.9 Type of construction.

29.10 Total floor area for each occupancy versus allowable area.

29.11 Actual height of building verus allowable height.

29.12 Fire assembly rating(s) for structural members.

29.13 Identification of active fire protection features such as:

29.13.1 Automatic suppression systems.

29.13.2 Fire alarm signaling systems.

29.13.3 Emergency lighting and power features.

29.13.4 Smoke control system.

29.13.5 Decision matrix on how fire protection features are activated.

29.14 Type of Hazardous Materials, if any and identified by the fire code hazard class:

29.14.1 Inside storage.

29.14.2 Outside storage.

29.14.3 In-use-open systems.

29.14.4 In-use-closed systems.

29.15 Water supply requirements of the facility for fire suppression.

29.16 Alternative design and/or methods of construction used.

29.17 Modifications of codes and board of appeals case number.

**IMPACT FEES**

30. **IMPACT FEE ASSESSMENT:** Impact fees will be assessed and collected as a condition for building permit approval. The design team will need to meet with HVFSSD to determine the Impact Fee assessment.

QUESTION AND ADDITIONAL INFORMATION

If you need any assistance, please contact:

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