

Fire Hydrant Systems

A fire hydrant system is a safety measure or emergency equipment needed in every building. Buildings include a Fire Hydrant System that provide to help fire authorities in a fire.

- Fire hydrant installation consists of a system of pipework attached directly to the water supply to provide water to every hydrant outlet and intended to provide water for the firefighter to fight a fire. The water discharges into the fire engine from pumped and sprayed over the fire. Where the water supply is not reliable or inadequate, then hydrant pumps should be provided to pressurize the fire mains.
- The pipe network is under underwater pressure. When utilized for fire extinguishing, immediately feed the water supply & main hydrant pump will trigger automatically.
- To meet little leakages pump is installed and supports the pipe network under pressure. On the drop of pre-set water pressure due to leakages or any other reason, the pump will perform automatically & stop at a pre-set pressure.
- On actual fire operation pump being of small capacity cannot maintain the pressure, the main pump will be operated automatically & supply the rated water quantity to the system.
- The system is immediate water supply will be available from all hydrant posts.
- A typical hydrant installation fed directly from the JBA water main and pressurized by fire pumps show below.

A fire hydrant system in Building is a *safety measure* or *emergency equipment* required in buildings that comprise a series of component, when construct a source of water to help fire authorities in a fire.

A *fire hydrant system* is a water collection with sufficient pressure and flow provided through pipes throughout a building to a strategically found network of valves for fire-fighting plans.

In some circumstances, water from a reticulated fire hydrant system share with other safety measures such as automatic fire sprinkler systems or fire hose reels.

These techniques are called "Combined Systems" and *Combined sprinkler and hydrant systems in multistorey buildings*.

In India, a fire hydrant system required in buildings to the degree necessary to facilitate the needs of the fire brigade for;

1. fire-fighting operations; and
2. the floor area of the building; and
3. the fire hazard.

Fire hydrant systems design and installed following comprise the following primary components;

- Water Supply & Storage
- Pipework & Valves system
- Pumpset
- Hydrant, Hydrant Valve/ Landing Valve & Coupling
- Fire Hose
- Block Plan

When designing of a fire Hydrant System-specific performance objectives must be satisfied. These performance purposes need a hydraulic analysis to indicate sufficient water pressure and flow at the most hydraulically disadvantaged hydrant.

The pressure and flow necessities vary according to the building classification, floor area, and sprinkler protection.

System Components: -

- Water Supply & Storage
- Pipework & Valves
- Fire Brigade Booster
- Pumpset
- Hydrant, Hydrant Valve/Landing Valve & Coupling
- Lay flat Fire Hose
- Block Plan

Water Supply & Water Storage

A water supply for a fire hydrant system can from a reliable source of water such as; street mains, and a static water supply such as a tank or dam. Water storage must also have a facility for automatic replenishment due to failures from evaporation, leakage, periodic testing, etc. The volume of the water supply must also be taken into account as part of the hydraulic analysis.

Pipework & Valves

To direct the water from its point of source to its destination (hydrant valve) needs a series of interconnected pipes at defined sizes. The control valves use in combination with the pipework to control and direct the flow of water.

Fire Brigade Booster

The booster assembly provides a point of attachment for the fire brigade to provide additional water to a fire hydrant system in an emergency. The fire brigade booster should be locating to ensure that it is readily available and provide protection to firefighters.

Booster Pumpset

In some circumstances where the hydraulic analysis has determined that the water supply is short for the building necessities, one or more booster pump sets will be required. A pump set may comprise a combination of electric or compression ignition motors.

Hydrant (also known as the Attack Hydrant)

The last point of a fire hydrant system is known as a Hydrant Valve or Landing Valve strategically. It is located throughout a building. The nominal diameter for a hydrant valve connection is 65mm. In simple terms fire brigades use different hose connections. In these cases, the Hydrant must also be fitted with a connected or coupling compatible with the local fire brigade.

Fire Hose

Some buildings may also need the installation of ancillary equipment such as a fire hose. A lay flat fire hose manufacture is a flexible hose and nozzle that may be attached to a hydrant.

Block Plan

A fire hydrant system block plan is an indelible diagram mounted within the booster cabinet, pump room, and fire control room that illustrates the primary features of the fire hydrant system. It includes the water supply location & dimensions, location & capacity of each water storage or tank, location & quantity of each valve, location of each pump, pressure & flow rating of the pumps, location of the main electrical control room, location of all flammable storage areas, year of installation, installing contractors name, the height of the highest fire hydrant and the lower booster connection.

Fire hydrant system performance

The performance of the water supply for a fire hydrant system is crucial to the success of its procedure. To this end, the Standard defines specific system implementation and design standards. Its Factors are:

- Building category and application;
- Extend in stories and fire compartment floor area;
- the quantity of fire hydrants needed to flow simultaneously
- water pressure and flow
- water speed within the fire hydrant system pipework;
- hydraulic failures & friction caused by backflow prevention, metering, pipes, valves, and fittings.

Typical Operation

Under circumstances, a fire hydrant system pressurizes with water for emergency service. When a hydrant valve is opened, the system experiences a reduction in water pressure.

The drop in water pressure detects by a pressure switch which in turn on the booster pump(s), drawing water from the water supply to improve the water pressure of the system.

Water from the hydrant is then directed through the lay flat fire hose to a nozzle which is then directed to the seat of a fire.

During a fire, the fire brigade may provide additional water and grow the water pressure to meet the requirements of the fire hydrant system. This carry out by connecting a fire appliance between an alternate water collection and the booster connection.

Fire Hydrant Systems Maintenance

Fire hydrant systems need periodic inspections (monthly, 6-monthly, yearly, and 5 – Yearly), tests, and surveys to choose whether the system is operating and is maintained in a state that enables it to complete its purpose.

Fire hydrant systems are functional fire protection system. It installed as part of an overall strategy for the protection within a building. Another active fire protection system has automatic fire sprinkler systems, fire hose reels, fire detection & alarm systems, and smoke and heat control measurements of mechanical ventilation systems.

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