



ERECTION  
METHODOLOGY  
MANUAL FOR  
FIRE PROTECTION  
SYSTEM

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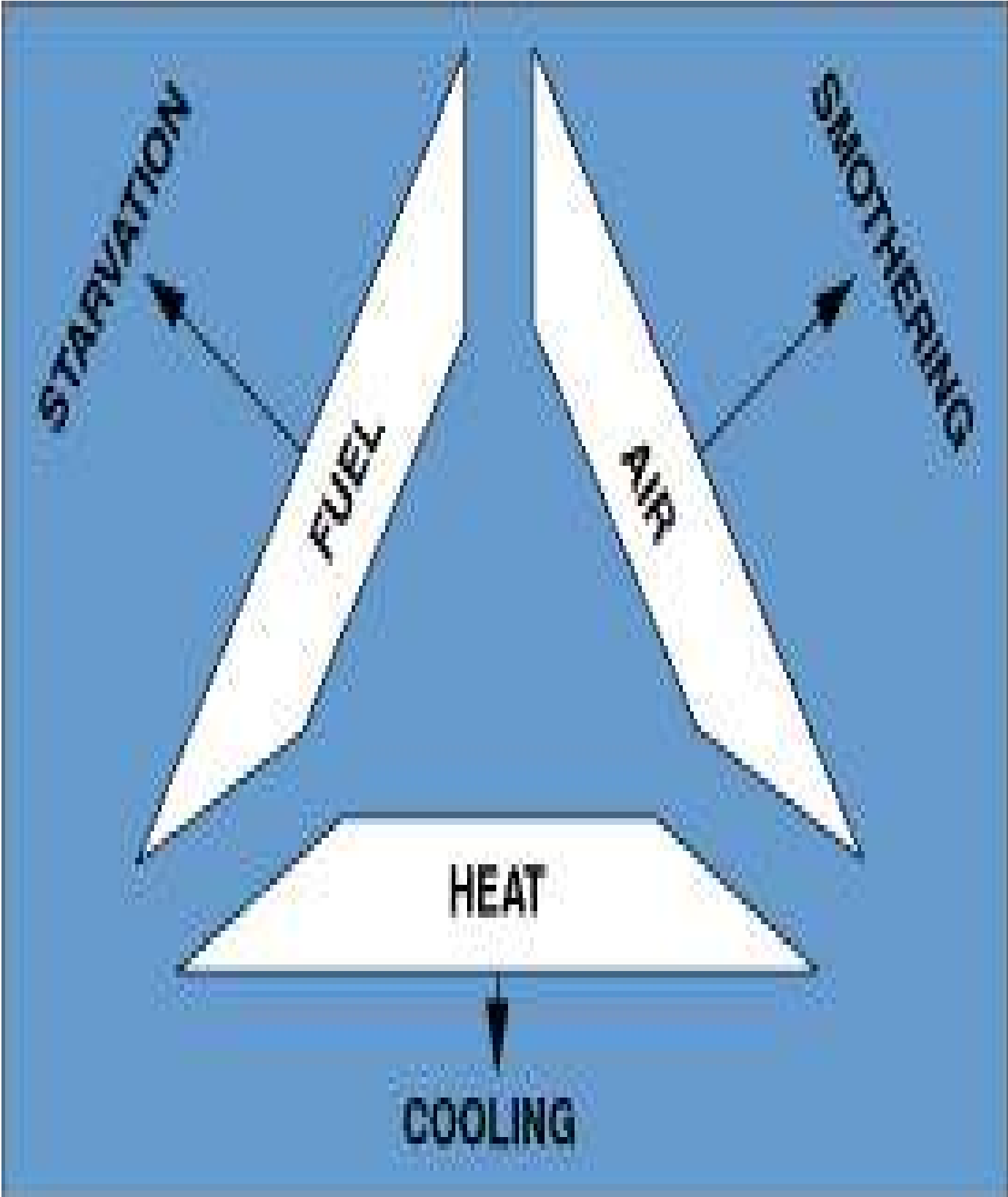
# FIRE



**3 THINGS ARE REQUIRED TO FORM - FIRE TRIANGLE**



**HOW TO BREAK THE - FIRE TRIANGLE**





## **ALL FIRE PROTECTION SYSTEMS** **WORKS ON 3 CONCEPT**

1. By Removing of Heat
2. By Removing of Oxygen
3. By Removing of Fuel



## **FIRE PROTECTION SYSTEMS**

Fire Protection System has below mentioned Division

- a) Fire Fighting System
- b) Fire Alarm System
- c) Two Way Talk Back System
- d) Signages

## **FIRE FIGHTING SYSTEMS**

Fire Fighting System has below mentioned Division

- a) Manual Fire Fighting System
- b) Automatic Fire Fighting System

## **MANUAL FIRE FIGHTING SYSTEMS**

Manual Fire Fighting System has below mentioned Division

- a) Dry Raiser System
- b) Down Comer System
- c) Wet Raiser System
- d) Internal Hydrant System
- e) Yard Hydrant System
- f) Fire Extinguisher

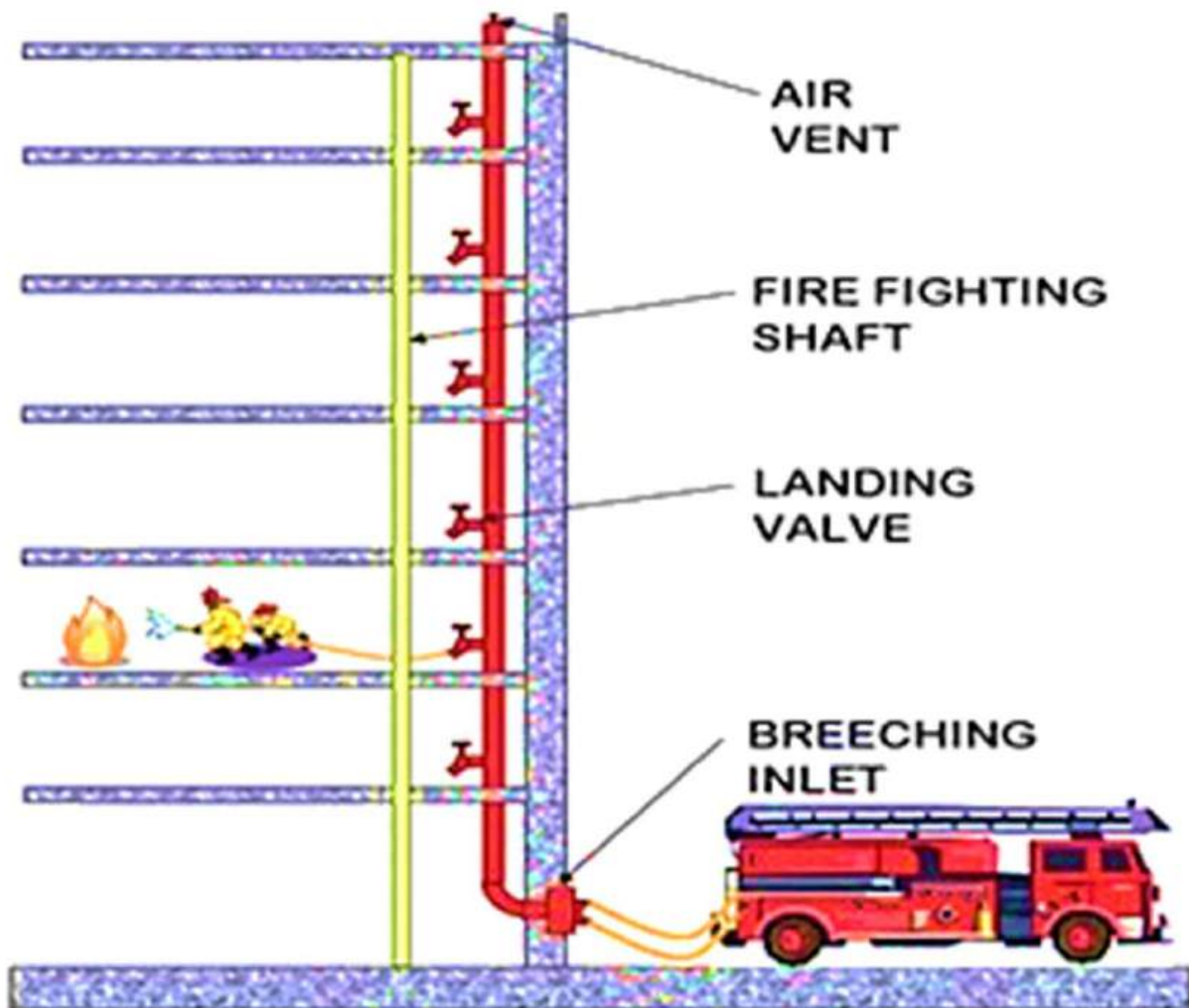
## **AUTOMATIC FIRE FIGHTING SYSTEMS**

Automatic Fire Fighting System has below mentioned Division

- a) Automatic Sprinkler System
- b) Water Curtain System

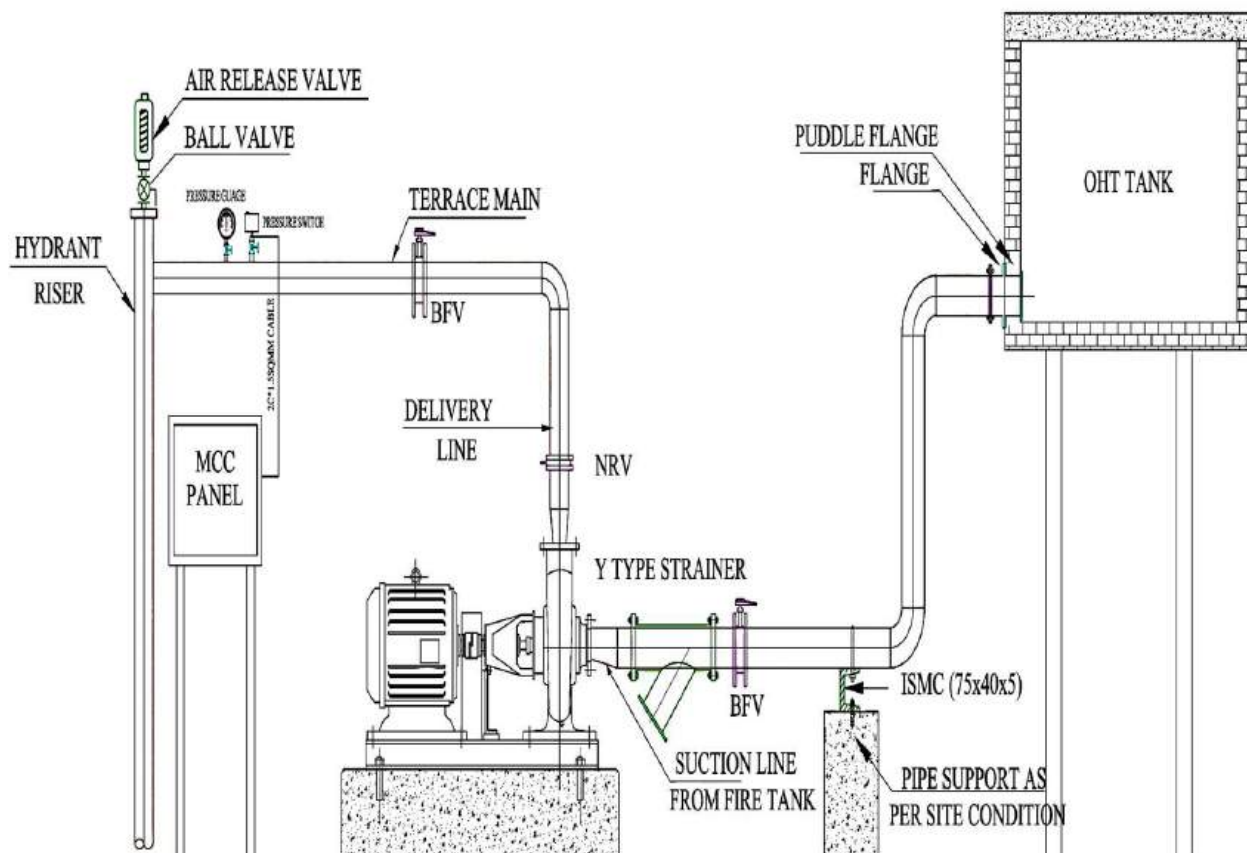
## **DRY RISER SYSTEM**

1. Riser without water, connected to Fire Brigade Inlet at Ground Floor, is called Dry Riser System
2. Hydrant Valve & Hose Reel Drum are connected to Dry Riser, in each floor and 2 Nos. RRL Hose and 1 No. Branch Pipe are kept along with each Hydrant.
3. In Case of Fire, Fire Fighters will fill the Dry Riser with pressurized water, by connecting Fire Engine Hose to Fire Brigade Inlet in Ground Floor, which enables Fire Fighters to easily access water from each individual floor of the entire building.



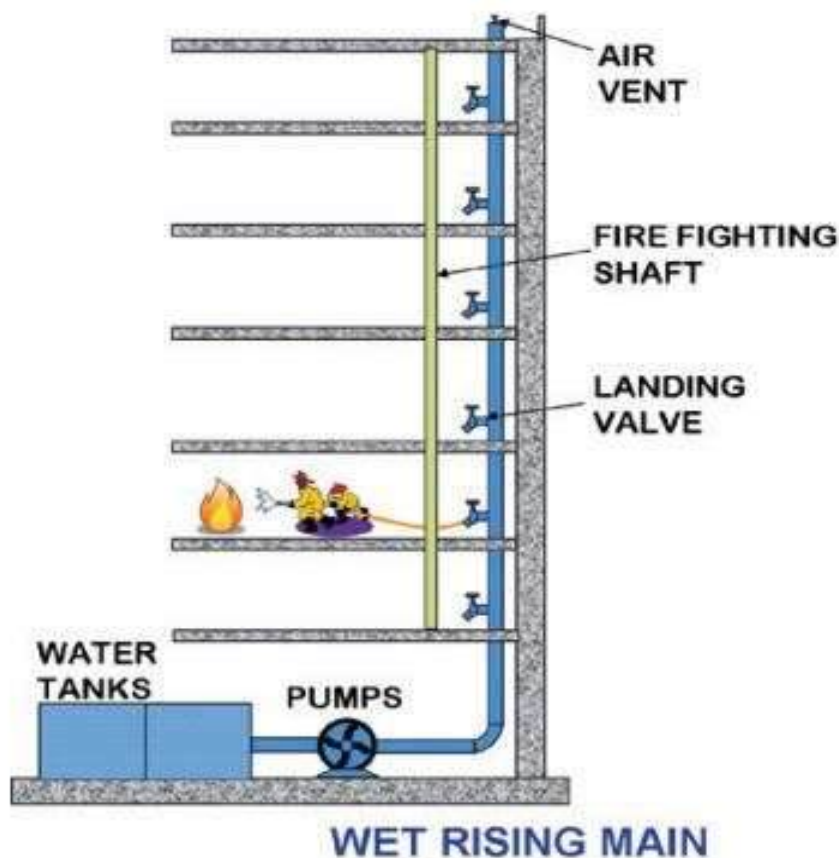
## DOWN COMER SYSTEM

1. riser is always filled with water from a dedicated Fire Water Tank, at terrace level, which is pressurized by using a Booster Pump, is called Down Comer System.
2. Every 1000 sq mts of build up area, one riser should be Provided
3. Hydrant Valve & Hose Reel Drum is connected to the riser, in each Floor, 2 Nos. RRL Hose and 1 No. Branch Pipe are kept along with each Hydrant and Fire Duct Shutter is used, to close the duct
4. In Case of Fire, Fire Fighters will easily access water from each individual floor of the building, while operating, if Pressure reduces below the set Pressure, Pressure Switch will detect and give signal to MCC Panel and it will switch On the Booster Pump, Automatically, to maintain the set Pressure.



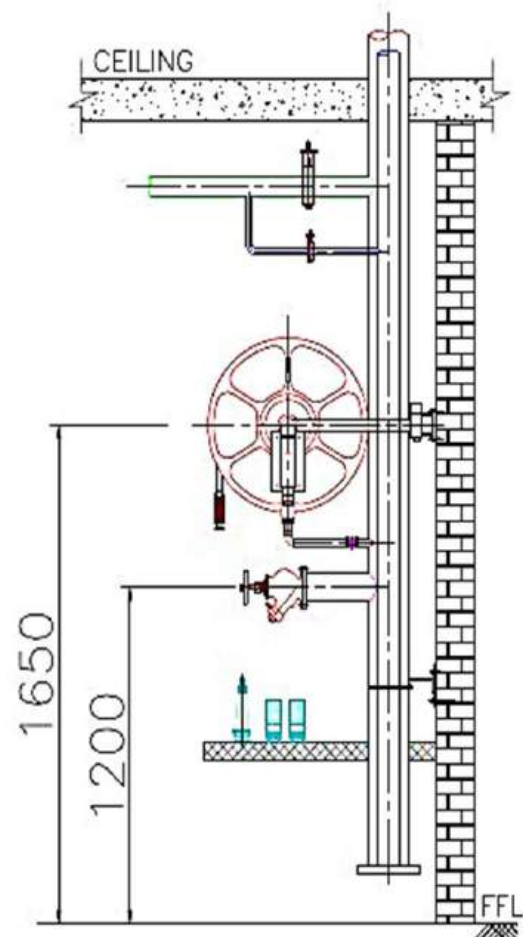
## WET RISER SYSTEM

1. Wet riser is always filled with water from a set of Pumps, which includes Jockey Pump, Electrical Main Pump, Diesel Engine Driven Pump, which is feed by a dedicated Fire Water Sump, below ground level and it is also feed by a dedicated Fire Water Tank, at terrace level
2. Every 1000 sq mts of build up area, one riser should be Provided
3. Hydrant Valve & Hose Reel Drum are connected to the Down Comer in each floor and 2 Nos. RRL Hose and 1 No. Branch Pipe is kept along with every Hydrant and Fire Duct Shutter is used to close the duct
4. In Case of Fire, Fire Fighters will easily access water from each individual floor of the building, if Pressure reduces below the set Pressure, Pressure Switch will detect and give signal to MCC Panel and it will switch On the concerned Pump automatically, to maintain the set Pressure.



## INTERNAL HYDRANT SYSTEM

1. Hydrant Valve & Hose Reel Drum connected to every riser, at every Floor, 2 Nos. of RRL Hose and 1 No. Branch Pipe is kept along with every Hydrants and Fire Duct Shutter is used to close the duct, all this Products together is called “Internal Hydrant System”
2. Internal Hydrant System is used for Fire Fighting inside the Building, in case of Fire incident



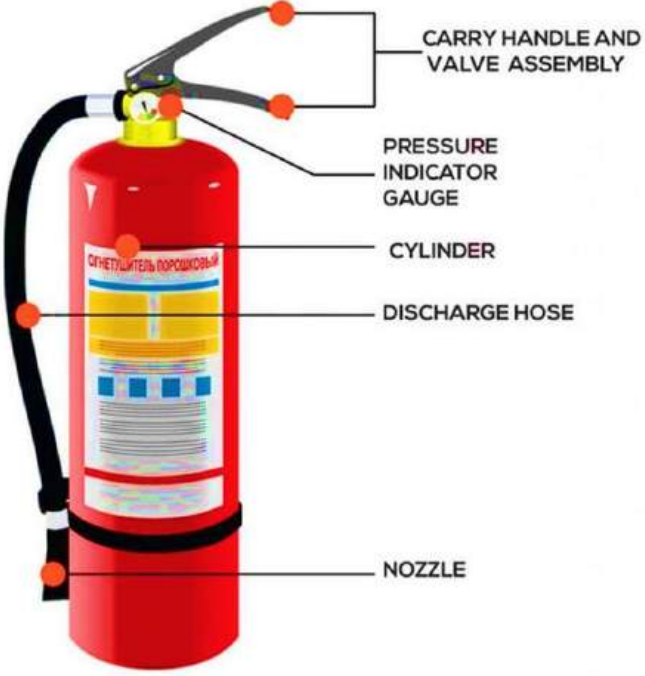
## YARD HYDRANT SYSTEM

1. Hydrant Valve connected to external Ring main, 2 Nos. of RRL Hose and 1 No. Branch Pipe is kept in Fire Hose Box, along with every Hydrants, all this Products together is called “Yard Hydrant System” and the same is used for Fire Fighting from Outside the Building, in case of Fire incident
2. Yard Hydrant System can be installed at a distance of 2m to 15m, from the Building Line, all points should be easily accessible, for fire fighting operations
3. Distance between each Yard Hydrants should be 30 Mts for High Hazard Occupancy
4. Distance between each Yard Hydrants should be 45 Mts for Medium Hazard Occupancy
5. Distance between each Yard Hydrants should be 60 Mts for Low Hazard Occupancy



# FIRE EXTINGUISHER

1. Fire Extinguishers are used to Extinguish the Fire in the initial stage, manually.
2. Fire Extinguishers are Portable Device that discharges a jet of Water / Foam / Gas / Powder, to Extinguish the Fire.
3. Fire Extinguishers are classified based on Type / Cause of Fires, as mentioned in “**Type of Extinguishers**”



**P**ull the pin



**A**im at base of fire 8'-10' away



**S**queeze


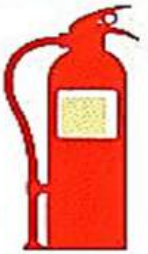










**S**weep



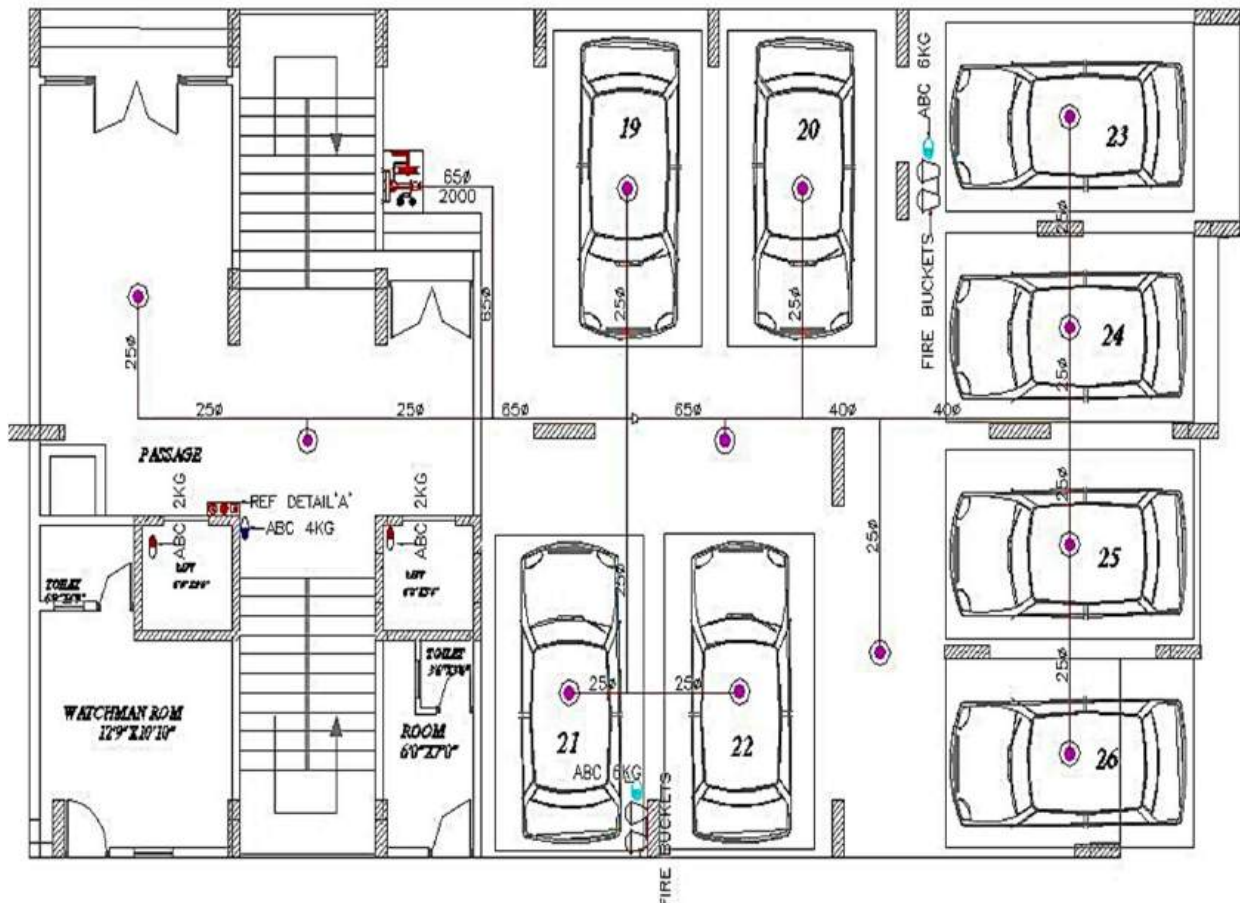
**PASS METHOD**

## TYPES OF FIRE EXTINGUISHER

<i>Symbols found on fire extinguishers &amp; what they mean</i>		 Water	 Foam spray	 ABC powder	 Carbon dioxide	 Wet chemical
Wood, paper & textiles		✓	✓	✓	✗	✓
Flammable liquids		✗	✓	✓	✓	✗
Flammable gases		✗	✗	✓	✗	✗
Electrical contact		✗	✗	✓	✓	✗
Cooking oils & fats		✗	✗	✗	✗	✓

## AUTOMATIC SPRINKLER SYSTEM

1. Sprinklers Bulbs are installed at various location in branch pipes and same is connected to Header Lines, which are connected to charged riser and in turn connected to Pumps in Auto Mode, which will get “On”, if the pressure comes down below the set pressure, it is called Automatic Sprinkler System
2. Automatic Sprinkler System is used for extinguishing the fire automatically.
3. In case of Fire, Sprinkler Bulbs will Bust Automatically, when the ambient temperature reaches a specified temperature, based on type of Sprinkler and it will extinguish the fire.
4. Each Sprinkler can Cover the Area of 3mts Radius / 6mts Diameter
5. Each Sprinkler can Cover the Area of 12 Sq. Mts, Example :- 3mts \* 4mts or 3.5mts \* 3.5mts



## **WATER CURTAIN SYSTEM**

1. Water Curtain System is used for Compartmentation, by creating Zones, so that in case of Fire, it will form a Curtain between Fire Area and Non-Fire Area, to prevent spread of smoke / heat / flame for the entire floor and when Water Curtain System is not in use, it is fully open area without any Barrier.
2. If the Built-Up Area in Basement is more then 750 Sq. Mts., Water Curtain System is required, from there on, every 3000 Sq. Mts. one Water Curtain System is Required.
3. Separate Pump is used to keep the Water Curtain System always Charged till Motorized Butterfly Valve, from there it is connected to Water Curtain Nozzle, where Pipe lines will be dry, however, when Sprinkler System / Fire Alarm System gets activated, that particular zone Motorized Butterfly Valve will get opened automatically & Water Curtain Pump will Switch ON and water will fed to all Nozzles, through Pipe Line and these nozzles have special properties of forming a Curtain from Water, Preventing Smoke / Flame / Fire / Heat to propagate to Non Fire Area.



**WATER CURTAIN NOZZLE**





## **FIRE ALARM SYSTEM**

1. Fire Alarm System is used for Early Detection and alert the entire Building, to prevent loss of People and assets
2. Fire alarm systems have four key functions: Detect, Alert, Monitor, Control.
3. They are 2 Types of Fire Alarm System depending upon mode of Operation, Manual Fire Alarm System and Automatic Fire Alarm System
4. Input devices are connected to the Alarm Panel through Cables, these can be smoke and heat detectors, in-duct smoke detectors, manually operated pull stations and sprinkler water flow sensors.
5. Output Devices are connected to the Fire Alarm Panel through separate Cabling, whose purpose is to announce building occupants when the system enters the alarm state, such as hooters, strobe lights, combination units.
6. Fire Alarm System is also can be interfaced with the emergency services like Lift Management, Pressurization System, Door Unlocking,



## **FIRE ALARM SYSTEMS**

Fire Alarm System is also called Fire Detection System, it has below mentioned Division

- a) Manual Fire Alarm System
- b) Automatic Fire Alarm System

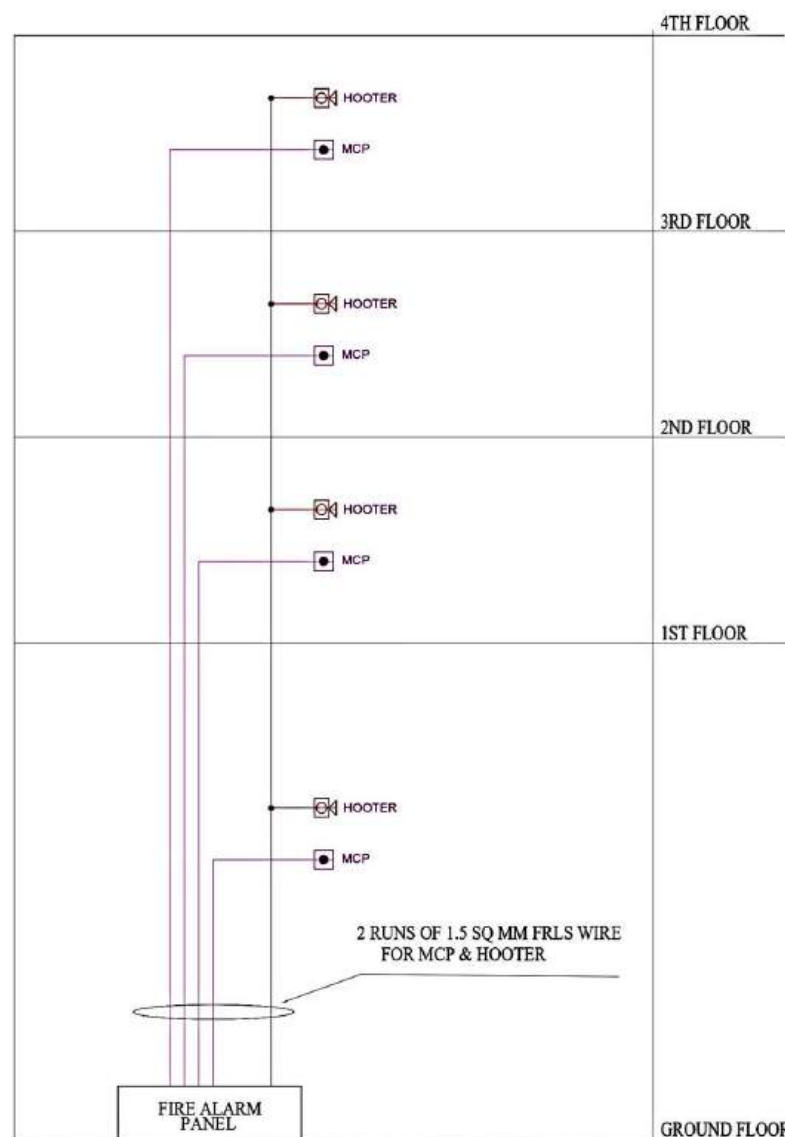
## **FIRE ALARM SYSTEMS TYPES**

Both Manual & Automatic Fire Alarm System has below mentioned Types

- a) Conventional Fire Alarm System
- b) Addressable Fire Alarm System
- c) Hybrid Fire Alarm System

## MANUAL FIRE ALARM SYSTEM

1. Manual Fire Alarm System is used to Alert all the occupants in the entire Building by a Hooter sound, in case of Fire incident, by operating a Manual Call Point (MCP)
2. MCP & Hooter will be installed at every staircase, at each floor
3. Fire Alarm Panel will be installed at Ground floor
4. 2 Run of 1.5 sq mm wire is used to connect all devices with panel
5. In case of Fire, MCP should be operated, by breaking Glass / Pulling the MCP (Based on Type of Device) and it will give signal to Fire Alarm Panel, which will activate the Hooter



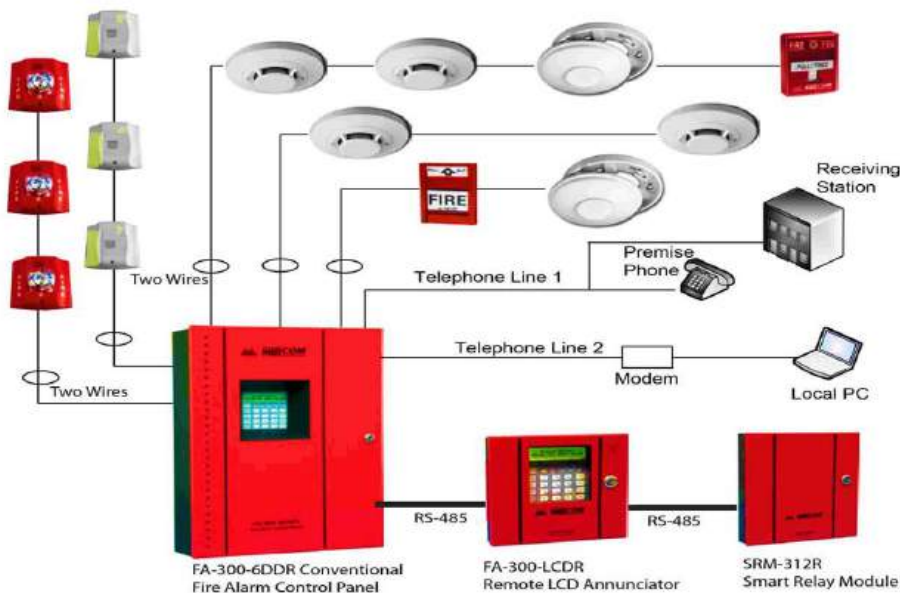


## **AUTOMATIC FIRE ALARM SYSTEM**

1. Automatic Fire Alarm System is used to Alert all the occupants in the entire Building by a Hooter sound, in case of Fire incident, Automatically
2. They are 2 Types of Automatic Fire Alarm System, Conventional Type Fire Alarm System and Addressable Type Fire Alarm System
3. Smoke Detector, Heat Detector, Multi Sensor Detector, Beam Detector, Duct Detector are installed at various places, in case of Fire, it will detect and send signal to Fire Alarm Control Panel Automatically
4. MCP is installed at every staircase, at each floor, which can be operated manually in case of Fire
5. Hooter will be installed at every staircase, at each floor, to alert all occupants, in case of Fire
6. Fire Alarm Panel will be installed at Ground floor
7. 2 Run of 1.5 sq mm wire is used to connect all devices
8. FA System will control Flow Switch, Access Control, Lift, Damper, Automatic Door Locks Etc., by using different Modules like Monitor Modules, Control modules, Relay Modules

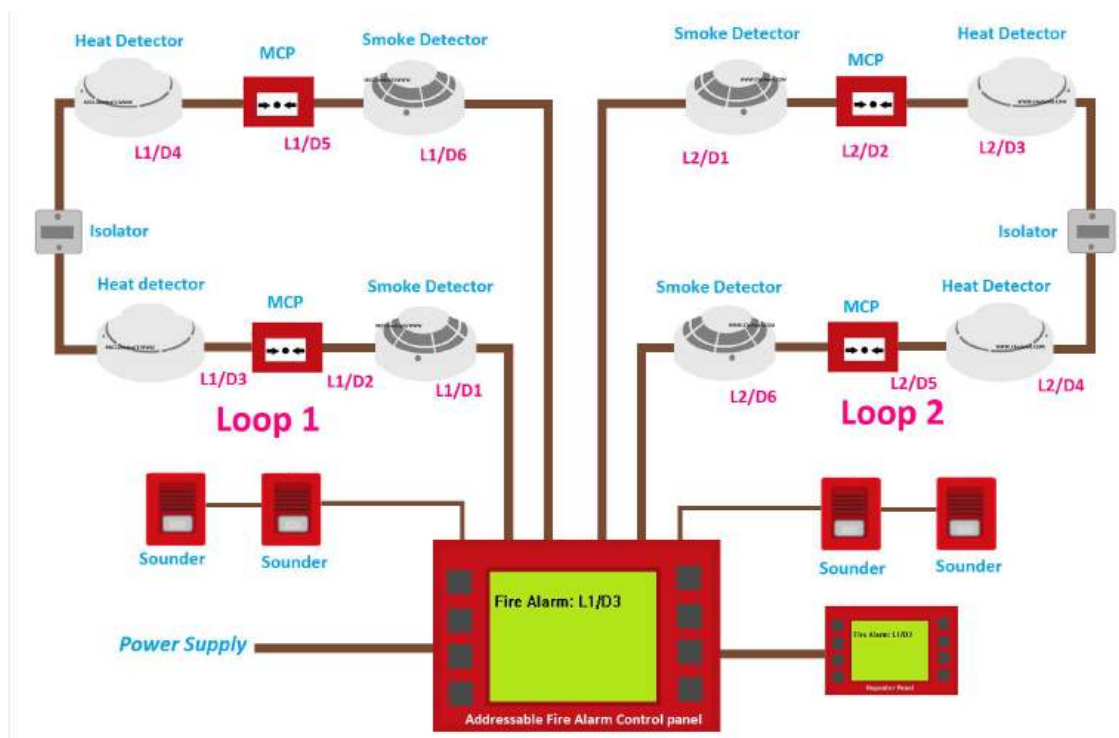
## CONVENTIONAL TYPES FIRE ALARM SYSTEM

1. Conventional Type Fire Alarm System is a Type of Alarm System, in which Entire System is divided into multiple Zones
2. Conventional Type Fire Alarm System is Suitable for Small Buildings / Less Cabling
3. Conventional Type Fire Alarm Panel is Available with below mentioned Zones :-
  - a) 2 Zone Fire Alarm Panel
  - b) 4 Zone Fire Alarm Panel
  - c) 8 Zone Fire Alarm Panel
  - d) 12 Zone Fire Alarm Panel
  - e) 16 Zone Fire Alarm Panel
  - f) 32 Zone Fire Alarm Panel
4. Conventional Type Fire Alarm Panel is Available with 2 to 32 Zones
5. Up to 22 Devices can be connected in a Zone
6. Separate Wire should be laid for each Zone
7. Separate Wire should be laid for Hooter
8. Whenever Smoke Detector / Heat Detector / MCP is Activated in Conventional Type Fire Alarm System, Panel will indicate only the concerned Zone, it can't identify the activated Device



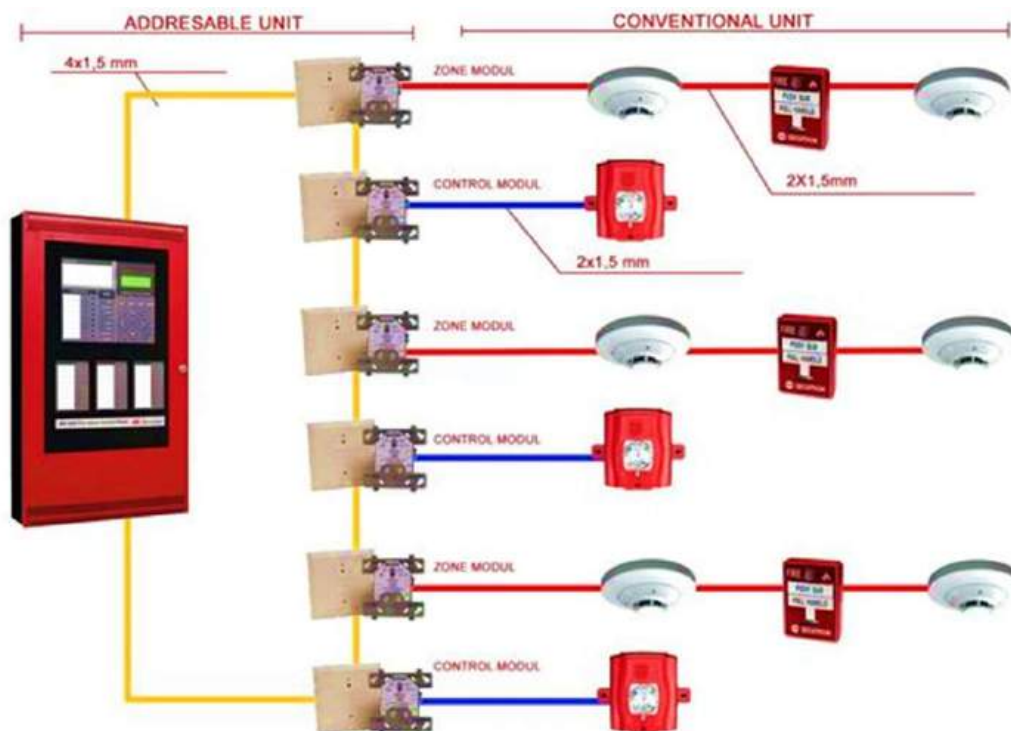
## ADDRESSABLE TYPES FIRE ALARM SYSTEM

1. Addressable Type Fire Alarm System is a Type of Alarm System, in which Entire System is divided into multiple Zones
2. Addressable Type Fire Alarm System is Suitable for Large Buildings / Commercial Buildings
3. Addressable Type Fire Alarm Panel is Available with below mentioned Loops:-
  - a) Single Loop Panel
  - b) Multi Loop Panel
4. Up to 254 Detectors can be connected in a Loop in Multi Loop Panel
5. Up to 127 Detectors can be connected in a Loop in Single Loop Panel
6. Separate Cabling should be done for each Loop
7. Separate Power Cable should be laid for Hooter
8. Whenever Smoke Detector / Heat Detector / MCP is Activated in Addressable Type Fire Alarm System, Panel will indicate activated Device Address with Location



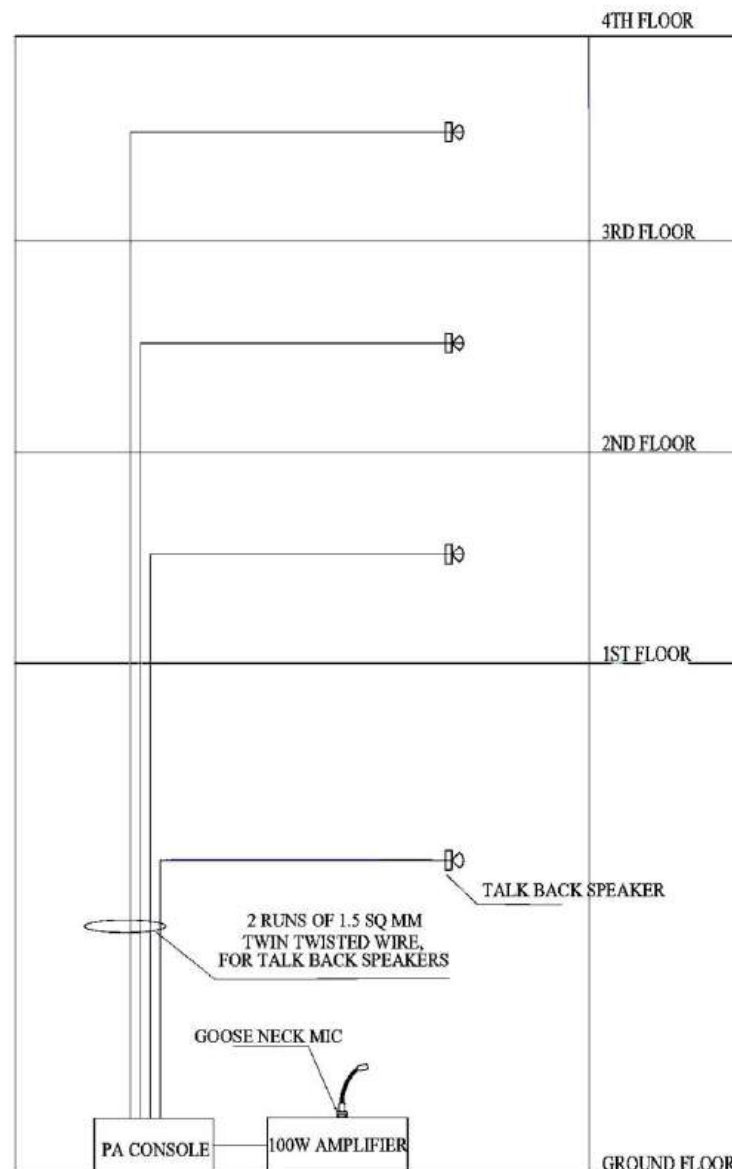
## HYBRID TYPE FIRE ALARM SYSTEM

1. Hybrid Type Fire Alarm System is a Combination of Both Conventional & Addressable Type Fire Alarm System.
2. Hybrid Type Fire Alarm System has Addressable Type Panel and Zone Interface Module / Control Module
3. Hybrid Type Fire Alarm System has any Conventional Type Detectors & MCP
4. Cabling for Detectors and MCPs will be Done same as Conventional Type
5. Cabling between Panel and Modules will be done same as Addressable Type.
6. Up to 20 Devices can be connected in each Zone Interface Module
7. Any of the 20 Devices (Smoke Detector / Heat Detector / MCP) connected to Zone Interface Module gets Activated, concerned Zone Interface Module will show as Activated in the Panel
8. Limitation of Hybrid Type Fire Alarm System, it will indicate Activated Zone Interface Module Location, but it can't exactly Identify the Location of Activated Detector / MCP.



## TWO WAY TALK BACK SYSTEM / PA SYSTEM

1. Two Way Tak Back System is used to communicate from Fire Control Room to any particular floor / all the floors and also listen from any floor, for evacuation at the time of Fire Emergency.
2. Two Way Tak Back Speaker is installed at every staircase, at each floor, which can be operated for Two Way Communication, in case of Fire
3. It consists of Two-Way Talk Back Speaker, Console, Amplifier, Gooseneck Microphone and 2 Run of 40 Stands Twin Twisted Wire.





## **SIGNAGE**

1. Signages are used for Easy Identification of Fire Fighting Equipments and to Guide People for taking Appropriate Action, in case of Emergency.
2. They are 5 Times of Signages used for Fire Protection System
  - a) Floor Identification
  - b) In case of Fire Use Staircase
  - c) Fire Exit
  - d) Fire Order
  - e) Action By Security Incase of Fire
  - f) Fire Equipments Indication
3. Signages are used to indicate the below mentioned.
  - a) Evacuation / Exit Routes
  - b) Fire Extinguisher Location
  - c) Manual Call Point Location
  - d) Hose Reel Drum Location
  - e) Emergency Assembly Point
  - f) Fire Safety Instructions



# ERECTION METHEDODOLOGY



## **CHECK LIST FOR FINALIZING STORE LOCATION**

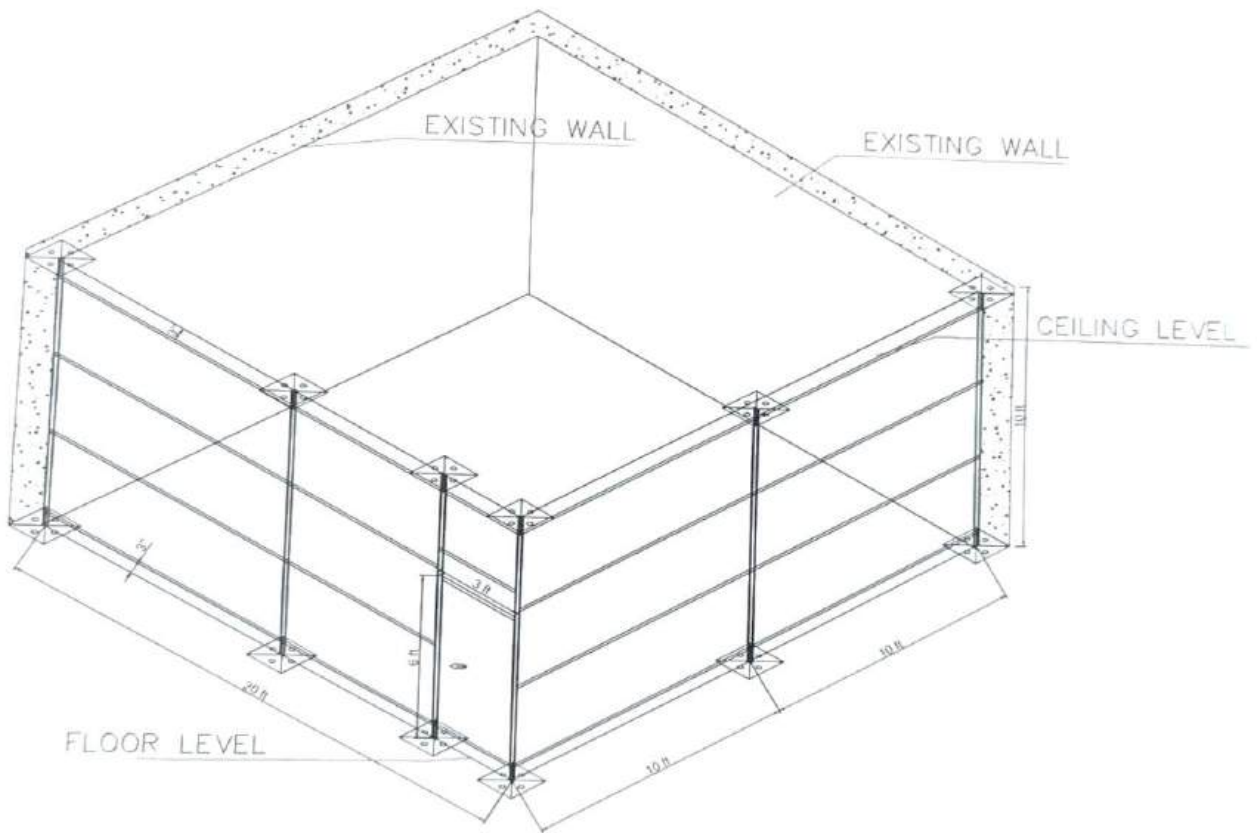
1. If Store construction is mentioned as Client Scope in WO / MOM, Project Manager should coordinate with Client / PMC and get a Flat / Club House / Store or Shed is Constructed with Bricks / Solid Blocks and get the Door fixed with proper locking facilities, for stacking our material.
2. If Store construction is mentioned as TSI Scope in WO / MOM, Project Manager should coordinate and finalize the Location for Store Construction
3. Before finalizing Stores Location, the place should be confirmed that safe and secure. Once located there should not be any further shifting during the execution of project.
4. Store location should not have any opening like Window, Duct, Open To Sky, Water Outlets Pipes, Electrical Cables Crossing, Plumbing Line Crossing & any kind of cut outs.
5. Store location should be away from Scrap Dumping Area, Earth Work Area, Water Logging Area & Direct Earth Area.
6. Storeroom should be constructed in good Visible area, Good Lighting Area, good ventilation, preferably 2 sides have existing walls, strong and clean floor.
7. Store Location should not be in the lowest Basement, it should be at least one floor above the last basement
8. Store Location should be near to the Power Distribution Boards
9. Store Location should be next to other Agency's Store, near People Movement Area, for Material Safety
10. Store Location should be beside the Driveway, to make Transportation & Material Delivery Easy. Should have enough wide approach way, so that, while loading & unloading, it doesn't disturb other Vehicles
11. Store location should be preferably in Southwest Corner (Zone) of the Project



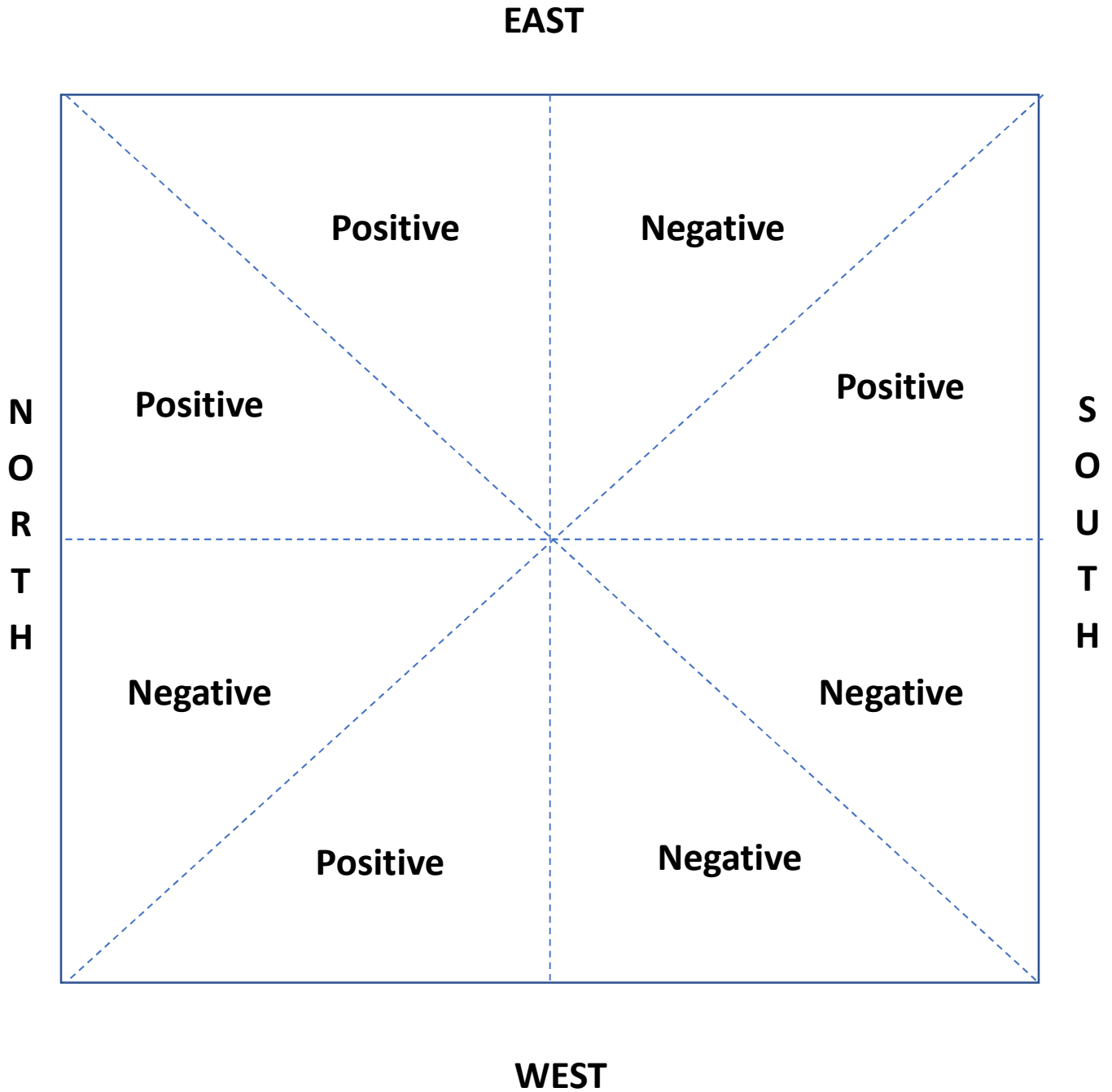
## **CHECK LIST FOR STORE CONSTRUCTION**

1. Store Rough Drawing should be prepared before construction of Store
2. Vertical Tube should be 40mm & Horizontal Tube should be 25mm
3. All Vertical Tubes should Not Exceed 3Mts. gap between each other, including MS Sheet door with frame & internal locking facility should be fixed.
4. Horizontal Tubes should be installed at maximum 3” gap from Floor Level and 3” gap from Ceiling Level and one Horizontal Tube should be in Center
5. Squire MS Plate should be Welding on both side of Vertical Tube and fix it on Floor and Ceiling, by using Fasteners, however, if Client doesn't allow to drill in Floor, MS Plates should be welded in such a way, it can be fixed in Piler / Wall
6. MS Door Frame should be part of the Framework, it should be fixed in Positive Location, as mentioned in Energy Distribution Chart
7. 40mm Tube should be Welded above the Door Frame and extended till Ceiling and all Horizontal Tubes should be directly Welded to Door Frame.
8. All Horizontal & Vertical Square Tube should be fixed with Nut and Bolts, by making holes in both the Tubes, welding should not be done for the same.
9. Yellow Primer should be applied for entire Square Tube framework, before fixing GI Sheet.
10. Holes should be made in GI Sheet and fix “J” Bolt, distance should not exceed 1mtr and GI sheets should Touch to the Ceiling and Floor, No Opening should be left. GI Sheets should be fixed with the “J” Bolts only. Should not use any Bending wire / Screw/Wires.
11. MS Door with Frame should have Internal Lockable Facilities
12. Wiring to be Done for Tube Light & Fan and make it active
13. Table & Chair should be placed in Southwest Corner of the Storeroom
14. TSI Name Board should be Fixed in front of the Sore
15. Store Construction Work should Completed, before first lot of Materials reaches site, and it should be Strong & Good Looking
16. 1 no of 6 kg ABC fire extinguisher and First aid box should be placed in Storeroom

# FRAME WORK FOR STORE CONSTRUCTION



**ENERGY DISTRIBUTION CHART**



# GOOD PRACTICE OF STORE LOCATION AND CONSTRUCTION



**BAD PRACTICE OF STORE LOCATION AND CONSTRUCTION**





## **CHECK LIST FOR STORE MAINTAINANCE**

1. All Electrical & Electronic items like Detector, MCP, Hooter, RI, Speakers, Modules, 3 in 1 Unit, FA Panel, Amplifier, Console, Wire, Flow Switch, Pressure Gauge, Pressure Switches, Sprinklers, Rosette Plate, Rosette Cups and all other Delicate items, should be kept in original Packed condition above floor level / Properly arranged on higher level of the Racks, to avoid any damage, if water enters.
2. All MS/GI items like Reducers/Collars/Flanges/Elbows/Tees/Nuts, Washers, Anchor fasteners, Bolts & all other items are properly arranged directly on floor by keeping 100 mm support from floor level, like Packing Wood / Bricks / Cement Block to avoid any moisture from floor.
3. Finished goods like Valves / Strainer / Branch Pipe, RRL Hose, Hose Reel Drum, Hose Box, Fire Duct Shutter should Not be kept One on One Directly, right packing material should be used in between, so that paint will not get damaged.
4. Maintain Individual Packing of all Finished Goods like Pump, Valve, Branch Pipe, RRL Hose, Hose Reel Drum, Hose Box, Fire Duct Shutter is in Packed Condition, till the day it is Installed and commissioned / Handed over
5. All Item should be arranged Size Wise & Sign Board should be Printed in A4 size Paper and Display it, just above the Item, for easy identification.
6. All flammable items like :- Paints, Thinners, Primers, Diesel, should be kept in a separate corner, it should not be kept along with other item, especially packing material, to avoid any fire accident
7. Paints, Thinners, Primers should always be kept in Airtight condition, because it will get Evaporated and Dried.
8. PVC Conduits should be stored Horizontally, it should never be kept Vertically
9. PVC Conduits & Fitting should be stored in one side of the store and make sure no one walks on it and also make sure no heavy item is stacked on it, so that PVC Conduits doesn't get damaged.
10. Food items should not be spilled inside the Store / No Packing materials should be kept inside the Store, after removing from the items, to avoid any Rat Entry.
11. Any Item has come to site, which has Wrong Specification / Wrong Size / Wrong Make / Defective Item/Damaged items/Bad Quality Item, it should be returned back within 7days.
12. Material in Stock should be maintained in good condition on Daily Basis, especially when searching for any Item / Taking any Item / Returning, it should be kept in appropriate Place, never it should get Mixed / Misplace



## **CHECK LIST FOR STORE MAINTAINANCE**

13. Always provide the good lighting at stores for better visibility of materials.
14. Combustible Materials should not be stored in Storeroom.
15. All Left Out Materials should be Transferred to any other Project, before Dismantling our Store Room.
16. All Scrap Materials should be Sold, before Dismantling our Store Room.

# GOOD PRACTICE OF STORE MAINTAINANCE



**BAD PRACTICE OF STORE MAINTAINANCE**





## **CHECK LIST FOR MATERIALS STACKING OUTSIDE STORE**

1. Finalized Material Stacking Location should never be in Lowest Basement/ Any other water logging area, the same should be confirmed from Client / PMC, about previous Rain, for Material Safety from Water &Silt
2. Finalized Material Stacking Location should be in concreted Area like Driveway/ Upper Basements / Podium & etc., It should never be dumped on Direct Mud Area
3. Finalized Material Stacking Location should be beside the Driveway / Anywhere Trucks can reach, for easy Transportation, Loading &Unloading
4. Finalized Material Stacking Location should not have any Cut Out / Duct in Ceiling / Adjacent to Cement Work Area, to avoid any Fire / Water Entry from Ceiling / Cement will fall
5. Finalized Material Stacking Location should have good Lighting, for Safety Purpose
6. Finalized Material Stacking Location should be near People Movement Area, for Safety Purpose
7. Finalized Material Stacking Location should have enough wide approach way, so that, while loading & unloading, it doesn't disturb other Vehicles
8. Finalized Material Stacking Location for Pipes, should be near to major Pipe Consuming Area
9. Finalized Material Stacking Location should be such that, Client / PMC doesn't ask us to Shift the same, till it Consumed
10. Finalized Material Stacking Location should be wide enough to store each size separately/ Pipe Storage Rack should be fabricated using MS B Class Pipe, to avoid mixing of different Sizes /Pipe rolling off / Storing in Crisscross way / Higher Dia. Pipes stored on Lower Dia. Pipes, which will Lead to Twisting / Bending / Compressing of pipes.
11. Wooden Planks / Cement Blocks should be provided, below the Stacking Material
12. Material in Stock should be maintained in good condition on Daily Basis, especially when searching for any Item / Taking any Item / Returning, it should be kept in appropriate Place, never it should get Mixed / Misplace



## **STACKING OF PIPES**

1. Before Pipes reach the site, suitable location for pipe stacking should be finalized which is away from water logging, excavation, garbage, scrap dumping, civil work, paint work, open ground & any other area which may lead to damage of pipes.
2. Pipes should be stored in an area which is hard & even surface, safe & secured.
3. Select a suitable area so that we can complete the project without shifting from one place to another place.
4. All pipe should be arranged without crossing, uniformly, size wise at equal level in a stand, which should be assembled by scaffolding with separators for different dia, so that pipes will not get bend & it can be retrieved dia wise easily.

# GOOD PRACTICE OF STACKING PIPES



**BAD PRACTICE OF STACKING PIPES**





## **APPLYING PRIMER & PAINT FOR PIPES**

1. Primer should be applied after cleaning all cement, flux, dirt and dust until pipe becomes fully smooth and clean, by using sandpaper / grinding.
2. Primer & Thinner should be mixed in 4 : 1 Ratio, then one coat of primer should be applied evenly.
3. Primer should be applied 50mm away from weldable area.
4. After applying primer, Pipes should be stacked properly, in a dust free area, for drying.
5. If 2 Coat of Primer is mentioned in BOQ specification, 2nd coat of primer should be applied, only after first coat is fully dried up.
6. After Primer is fully dried up, one coat of Signal Red Paint should be evenly applied.
7. After applying one coat of Signal Red Paint, Pipes should be kept with support, so that it doesn't touch the floor
8. Pipes should be stacked properly, in a dust free area, for drying, Painted Pipes should not be stored one above the other.
9. Primer and paint should be applied only for required quantity of pipes, too much stock should not be kept
10. After applying one coat of Signal Red Paint only Pipe Erection work should start.
11. 2nd coat of Painting should be done, only at the time of handing over

## GOOD PRACTICE OF APPLYING PRIMER & PAINT FOR PIPES



## **BAD PRACTICE OF APPLYING PRIMER & PAINT FOR PIPES**





## **CHECKING SOIL CONDITION BEFORE LAYING UNDER GROUND PIPES**

1. Soil condition should be checked at one meter below ground level before doing excavation for underground pipes.
2. Before Excavation Project Manager coordinate with client to find out if any electrical cables / plumbing lines / drainage line or any other service line is interfering in our proposed pipe route / If the soil is loose / watery, obtain approval to take the pipe above ground or find alternative route.

**GOOD CONDITION OF SOIL**  
**FOR LAYING UNDER GROUND PIPES**



**BAD CONDITION OF SOIL**  
**FOR LAYING UNDER GROUND PIPES**





## **WRAPPING COATING**

1. Wrapping coating is used to protect underground MS / GI pipes from rusting and rupture.
2. Bituminous black paint should be applied after cleaning and grinding all cement, flux, dirt and dust until the pipe has become fully smooth and clean.
3. Bituminous black paint should be applied excluding 50mm away from weldable area.
4. Wrapping sheet should be heated by a gas blower and wrap tightly on the pipe by overlapping 15 mm on each layer.
5. The end termination of wrapping sheet has to be done with extra heat in such a way it burns and sticks fully to the pipe, so that it does not peel off.
6. After wrapping coated, pipes should be stored in a location away from water, electrical lines, civil works or any other services that may cause damage to our wrapped and coated pipes.
7. Wrapping & coating should be done only for required quantity of pipes.
8. Width of the wrapping sheet should not beyond 500mm.
9. The packing sheet on wrapping sheet should be removed only at the time of wrapping & coating.
10. Before Wrapping & Coating for Pipe Joints, Full Welding is completed & Successful Pressure Testing is Done, then, Wrapping & Coating should be done by following above mentioned Procedure
11. The end termination of wrapping sheet has to be done at 300mm above finished floor level with extra heat in such a way it burns and sticks fully to the pipe, so that it does not peel off.

**GOOD PRACTICE OF WRAPPING COATING BEFORE WELDING**



# **BAD PRACTICE OF WRAPPING COATING**



**Wrapping Coating  
not done for entire  
Underground Pipe**



## **CORE CUTTING/ SLEEVES**

1. Before core cutting, the marking should be done from both sides to identify any difference in ceiling, marking should be in reference to center of the pipe, marking should be 50mm away from vertical / horizontal walls.
2. After marking of core cutting, that should be shown to client and obtain written approval to ensure there is no electrical lines, plumbing lines, Copper / wastewater lines of AC / Steel Reinforcement in columns / beams etc.
3. Core cutting / bore holes should be done in center of the marking with necessary lubrication.
4. Core cutting / sleeve dia should be as per chart (Core Cutting Sleeve Size),
5. Sleeve to be provided before casting for Precast / Mivan construction. Bore holes should not be done with drilling machines for any reason.
6. Bore holes should be made from both sides, so that plastering doesn't get damaged.
7. Core cutting expert should be engaged for safe operation.
8. Ensure that all the core cutting should done after Cement Plastering/POP Plastering only.

**GOOD PRACTICE OF CORE CUTTING/ SLEEVES**



**BAD PRACTICE OF CORE CUTTING/ SLEEVES**



## CORE CUTTING/SLEEVES SIZE

PIPE INNER DIA (MM)	CORE CUTTING/ SLEEVE DIA (MM)
25	50
32 to 50	80
65 to 100	150
150	200
200 to 250	300
300 to 350	400



## **MARKING FOR LAYING PIPES**

1. Before Starting the Work, Client should be completed all the Civil Works, including Plastering, Grinding & One Coat of Whitewash
2. In Basement Area / Commercial Projects, if Client confirms that they will not do any kind of Plastering / Whitewash in Wall / Ceiling, the same should be documented by Email and start the Piping Work.
3. In inside Flats, if Client confirms that they will Not Do / they will do after Piping, any kind of Plastering / Whitewash / Gyproc in Wall / Ceiling, the same should be documented by Email and ask for Bull Mark Reference for final finishing, Never start the piping work, without Bull Mark, because if Client fixes Cornice later stage, it will be mismatched
4. In Basement Area / Commercial Projects, Pipe bottom level should be decided after discussing with client and do the marking by following below mentioned points :-
  - a) All Pipes should run in same level, never it should be taken up and down, by doing multiple offsets, because it will reduce the Pressure Drastically.
  - b) Sprinklers Location should be Finalised in such a way, Wall / Piler / Beam / Capital / Electrical Cable Tray / HVAC Duct / Bus Bar / Plumbing Line / any other item, doesn't obstruct the Water Flow, when Sprinkler it is Busted.
  - c) If Client accepts for Pipe Bottom Level, which is below Beam & Capital, all support should be taken either side of Beam / Capital, to achieve maximum clearance from FFL.
  - d) If Client doesn't accept Pipe Bottom Level, Pipes should be taken beside Beam & Capital, by calculating the distance between obstruction and the sprinkler point, using "Check List for Fixing Sprinkler Near Obstruction - as per NFPA", so that water flow doesn't get disturbed
  - e) All above mentioned points should be followed at any cost, even if it is shown differently in Approved Shop Drawing
5. Only U Clamp supports should be taken for Pipes from ceiling and Channel Support are taken for Pipes, from side wall.
6. Approved Working Drawing should be studied before marking only and marking should never be done, without receiving Approved Working Drawing
7. Single Line should be Marked, irrespective of Pipe Size
8. Markings should be done using a Thread with a Color and should make sure that the line is straight and as per the measurement.



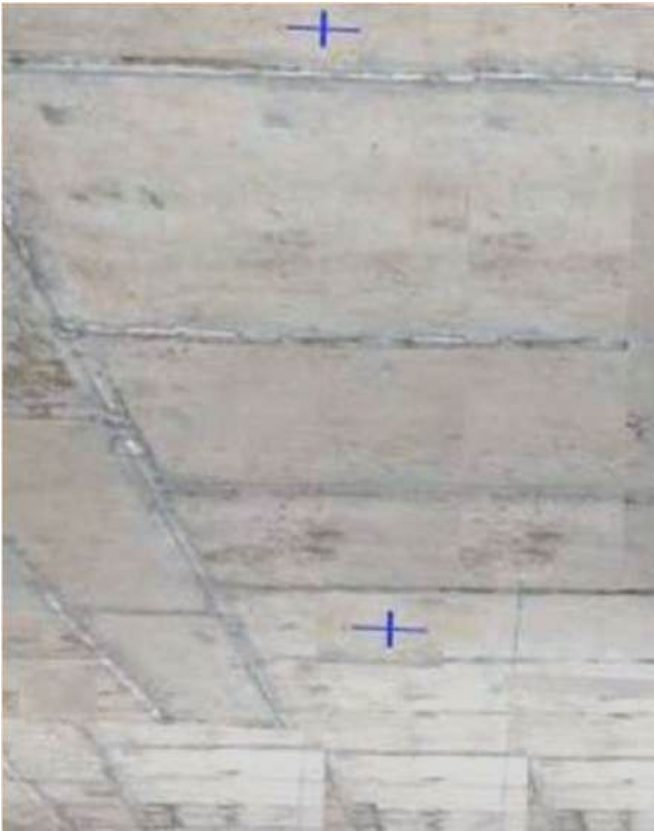
## **MARKING FOR LAYING PIPES**

9. Markings should be done with reference to the center of Pipe & Structure, as per site condition.
10. Marking should be done as per Dimension mentioned in the drawing, measurements should not be calculated, as per Scale in the drawing, during the marking process, since scale will be not accurate and while converting, mistake chances are very high

## **GOOD PRACTICE OF MARKING FOR LAYING PIPES**



**BAD PRACTICE OF MARKING FOR LAYING PIPES**





## **DRILLING**

1. In Basement Area / Commercial Projects, Pipe bottom level should be decided after discussing with Client, before drilling, by following below mentioned points :-
  - a) All Pipes should run in same level, never it should be taken up and down, by doing multiple offsets, because it will reduce the Pressure Drastically.
  - b) If Client accepts for Pipe Bottom Level, which is below Beam & Capital, all support should be taken either side of Beam / Capital, to achieve maximum clearance from FFL.
  - c) If Client doesn't accept Pipe Bottom Level, Pipes should be taken beside Beam & Capital, by calculating the distance between obstruction and the sprinkler point, using "Check List for Fixing Sprinkler Near Obstruction - as per NFPA", so that water flow doesn't get disturbed
  - d) All above mentioned points should be followed at any cost, even if it is shown differently in Approved Shop Drawing
2. Pipe Size should be considered, as per Approved Shop Drawing
3. Based on Pipe Size, Thread Rod Dia should be considered, as per "Check List for Thread Rod".
4. Based on Thread Rod Size, same size Anchor Fastener should be considered.
5. Based on Pipe Size, distance between each Drill should be as per "Check List for Thread Rod"
6. Hole dia should be equal to Anchor Fastener outer dia
7. Drilling Hole Location should be minimum 200 mm away from any Fitting / Sprinkler / Pipe Tapping / Butterfly Flow Switch / any other item, if so, Drilling Location should be moved minimum 200mm away
8. Depth of the hole should be equal to the fastener length (not less or more), to achieve exact depth of the hole, stopper should be used in drill gun / some marking should be done on drill bit like insulation tape, to stop at exact depth.
9. The drill gun should be kept perpendicular to the ceiling. The location of hole (support) should be minimum 100mm away from waterproofing done in toilets, sprinkler bulb, conduits, valves, reducers, elbows, pipe joints & any other fittings location. Project Manager should make sure correct size ladder is used. Technician should use goggles while drilling. In case of few location, where drilling is not feasible due to rope / electrical pipes / steel rods, "L" Angle supports can be used. Drill bit condition should be periodically inspected and replaced when required.
10. Project Manager should make sure holes are not drilled in beam and capital for taking any support, instead it should be taken from either side of beam and capital, to achieve maximum clearance from FFL.

**GOOD PRACTICE OF DRILLING**



**BAD PRACTICE OF DRILLING**



## **CHECK LIST FOR THREAD ROD SUPPORTS**

<b>PIPE DIA (MM)</b>	<b>THREAD ROD DIA (MM)</b>	<b>SPACING BETWEEN SUPPORTS (MTRS)</b>	<b>MAXIMUM LOAD CAPACITY (KGS)</b>
25	8	3.0	126
32 to 65	8	3.0	229
80 to 100	10	3.0	363
125 to 150	10	3.0	363
200 to 300	12	3.5	528



## **ANCHOR FASTENERS FIXING**

1. Anchor fasteners are used to take support from concrete structure ceiling / wall, with the help of threaded rod, nut and washer, to carry external load.
2. Anchor fastener size drill bit should be used for making hole
3. Hole should be drilled 100% perpendicular to the wall / ceiling
4. Depth of the hole should be equal to anchor fastener length
5. Anchor fastener should be fixed in such a way that it does not project outside or goes inside the ceiling / wall, it should be in same level.
6. Exact size thread rod should be tightened fully, inside the anchor fastener
7. Washer should be fixed, and nut is tightened fully, near anchor fastener end, before connecting the load

**GOOD QUALITY OF ANCHOR FASTENERS FIXING**



**BAD QUALITY OF ANCHOR FASTENERS FIXING**





## **THREAD / STUD ROD FIXING**

1. Thread Rod is also called as Stud Rod, it is a connecting Rod between Anchor Fastener & U clamp, to carry the pipe load.
2. Thread Rod is threaded throughout its length, and it will carry the tension load.
3. If Pipes are suspended from Ceiling, Pipes should be laid at maximum possible height from floor level and close to ceiling, if any beam / capital are their, Pipes should be touching them, so that our pipes will not disturb any other services in future and also height of thread rod is reduced
4. Thread Rod Dia should be decided as per Approved Shop Drawing / as per “Check List for Thread Rod”
5. Distance between each Thread Rod should be as per Approved Shop Drawing / as per “Check List for Thread Rod”
6. Before cutting the Thread Rod, U Clamp height should be considered to maintain height clearance from FFL
7. To maintain 100% straightness in Pipe level, different thread rod height should be calculated based on Pipe dia.
8. Thread rod ends should be grinded before fixing
9. Height of the thread rod should be exact as per the requirement, it should not be excess touching the pipe nor it should be shortage in such a way it is not gone completely inside the nut.
10. Proper Support should be given at end of the Branch. Support should be maximum 300mm from end of the branch.
11. Thread rod should be fully tightened inside the anchor fastener
12. Thread rod should be fixed exactly perpendicular between Clamp and fastener.
13. If thread rod is bent / twisted, the same should be straightened, if not, it should be replaced
14. Threaded Rods should not be painted.

**GOOD QUALITY OF THREAD / STUD ROD FIXING**



**BAD QUALITY OF THREAD / STUD ROD FIXING**



## **U-CLAMP FIXING**

1. U-Clamps are used for supporting the pipes which are hanging from Ceiling
2. Exact Pipe size U-Clamps should be used
3. Bigger size U-clamps should not be used, by bending / folding / giving support from bottom of the U-Clamp
4. U-Clamp should not be used in Beam and Capital Area, instead provide either side of them, so that maximum clearance is achieved from FFL.
5. All U-Clamp support for Pipes should be taken from ceiling only, not to take from side wall.
6. The gap between pipe bottom and the U-Clamp should be nil, so that pipe load completely is on U-Clamp.
7. U-Clamp, Nut and Washers should not be painted.

**GOOD QUALITY OF U-CLAMP FIXING**



**BAD QUALITY OF U-CLAMP FIXING**





## **U-BOLT FIXING**

1. U-Bolts are specially designed to fix pipes on Structural Supports for better stability of pipeline.
2. Holes should be drilled using a drilling machine / gas cutting to fix U-Bolts in all kind of Structural Supports like L angle / C channel / I section, however, for any unavoidable reason, if it is done using welding rod, it should be grinded and finished neatly
3. Exact Pipe size U-Bolt should be used, under size or over size U-Bolts should not be used
4. U-Bolt Thickness (Dia) should be as per below mentioned chart.
5. Holes should be made in Structural Supports as per U-Bolts size, over size / under size U-Bolts should not be used
6. Small size U-Bolts should not be used for higher dia pipes, by expanding them / by making bigger holes
7. Washer should be put and Nut is tightened equally in such a way U-Bolt also comes out equally on both side, so that U-Bolt doesn't get twisted.
8. U-Bolts, Nut and Washers should not painted.

## CHECK LIST FOR U-BOLT SIZE

PIPE DIAMETER (MM)	U-BOLT THICKNESS (MM)
25	6
32	8
40	8
50	10
65	10
80	10
100	10
150	12
200	12

**GOOD QUALITY OF U-BOLT FIXING**



**BAD QUALITY OF U-BOLT FIXING**





## **PIPE ROUTING / ALIGNMENT**

1. In Basement Area / Commercial Projects, Pipe bottom level should be decided after discussing with Client, before drilling, by following below mentioned points :-
  - a) All Pipes should run in same level, never it should be taken up and down, by doing multiple offsets, because it will reduce the Pressure Drastically.
  - b) If Client accepts for Pipe Bottom Level, which is below Beam & Capital, all support should be taken either side of Beam / Capital, to achieve maximum clearance from FFL.
  - c) If Client doesn't accept Pipe Bottom Level, Pipes should be taken beside Beam & Capital, by calculating the distance between obstruction and the sprinkler point, using "Check List for Fixing Sprinkler Near Obstruction - as per NFPA", so that water flow doesn't get disturbed
  - d) All above mentioned points should be followed at any cost, even if it is shown differently in Approved Shop Drawing
2. All Pipe Routing should be maintained, as per Approved Shop Drawing, however, as per site condition, if any other services are clashing with our Pipes, by coordinating with Client the required changes can be done in routing of pipes, as per site condition, well in advance by coordinating with all other services, so that Pipes need not go up and down or left and right or Twists & Turns / it becomes Rework at later stage
3. Wherever Plumbing gravity lines are coming, Piping work should be started only after their work is completed, because those lines can't be made up & down, because, if our piping is done before Plumbing Work, it may lead to rework
4. Pipe routing should be finalized and explain the same to Client and obtain their approval.
5. All pipes should be laid parallelly, by maintaining equal gap between each other and also make sure same level is maintained for all our header lines and branch lines.
6. Header Pipe should be laid in Straight Line, from one end to another end and not to allow any Up and Down / Criss Crossing.
7. All Branch Tapping's should be done at exactly in center of the Header Pipe, never it should be tapped little lower / higher, so that it looks aesthetically good, from one end to other end.
8. Sprinklers, Supports and all Fitting in the Typical Branch Line should be maintained equally, so that it looks aesthetically good, from one end to other end.



## **PIPE ROUTING / ALIGNMENT**

9. Pipes should never go up and down due to any Capital / Beam, pipe should be laid in such way it touches the Capital / Beam and supports should be taken on either side of the Capital / Beam so that all pipes will be laid at same level.
10. All Sprinkler's Deflector should be properly aligned.

**GOOD PRACTICE OF PIPE ROUTING**



**BAD PRACTICE OF PIPE ROUTING**





## **V- GROOVE**

1. V-Groove allows maximum filling materials to form a good welding joint, which results in better welding strength, it also gives very good welding finish
2. V-Groove should be done for all pipes above 50mm dia.
3. Chamfering should be done to both the edges of the pipes, to obtain a clear V-Groove, when both the pipes are kept 2 mm to 3mm gap for welding.
4. Welding should not be allowed without checking and confirming V-Groove.

**GOOD QUALITY OF V- GROOVE MAKING**



**BAD QUALITY OF V - GROOVE MAKING**





## **PIPE FABRICATION**

1. Before Starting the Work, Client should be completed all the Civil Works, including Plastering, Grinding & One Coat of Whitewash
2. In Basement Area / Commercial Projects, if Client confirms that they will not do any kind of Plastering / Whitewash in Wall / Ceiling, the same should be documented by Email and start the Piping Work.
3. In inside Flats, if Client confirms that they will Not Do / they will do after Piping, any kind of Plastering / Whitewash / Gyproc in Wall / Ceiling, the same should be documented by Email and ask for Bull Mark Reference for final finishing, never start the piping work, without Bull Mark, because if Client fixes Cornice later stage, it will be mismatched
4. For Whatsoever Reason, after Piping work, if Client wants to do Plastering / Gyproc / Painting work, Client should cover the entire Piping, Sprinkler Bulb, MCP, Hooter, Speaker, 3 in 1 Unit and any of our equipment, before starting their work.
5. In Basement Area / Commercial Projects, Pipe bottom level should be finalized after discussing with client, before fabrication, by following below mentioned points :-
  - a) All Pipes should run in same level, never it should be taken up and down, by doing multiple offsets, because it will reduce the Pressure Drastically.
  - b) If Client accepts for Pipe Bottom Level, which is below Beam & Capital, all support should be taken either side of Beam / Capital, to achieve maximum clearance from FFL.
  - c) If Client doesn't accept Pipe Bottom Level, Pipes should be taken beside Beam & Capital, by calculating the distance between obstruction and the sprinkler point, using "Check List for Fixing Sprinkler Near Obstruction - as per NFPA", so that water flow doesn't get disturbed
  - d) All above mentioned points should be followed at any cost, even if it is shown differently in Approved Shop Drawing
6. In commercial Projects, Side Wall Sprinkler should be installed at a distance of 600mm from Glazing.
7. Pipe Welding Joints should never come on MS Structural Supports / Slab / Sleeve , minimum 100 mm gap should be maintained

## **PIPE FABRICATION**

8. In Car Parking Area, below mentioned points should be followed, before fabricating branches :-
  - a) Final Car Parking Layout should have been received / Client should have done physical marking for every Car Parking.
  - b) Sprinkler should be in Center of the Car Parking Area, even if the Sprinkler Location is different in Approved Shop Drawing.
  - c) If Stack Parking is mentioned in Approved Shop Drawing, Pendent / Upright Sprinkler should be Installed in center of the above Car Parking and Side Wall Sprinklers should be installed for below Car Parking.
  - d) MS Support should be given for all Vertical Piping, from Floor Level
9. All Pipes should be Straight without any Bend & V-Groove is done for all Pipes above 50mm dia, before starting the fabrication.
10. Butt-welded fittings / pipe to pipe joint should be away from 150mm away from the sprinkler point
11. Over sized / under sized fittings should not be used.
12. If any Branch is connecting at the end of the Higher Dia Header, same size reducer should be used. If did not get same size Reducer ,Branch should tap from side/ top of the header.
13. Welded Joints should not come inside Bore Holes / below the Capital / Beam Bottom
14. Whenever Pipes are laid near the walls, at least 40mm gap should be maintained from wall to pipe so that proper welding is done
15. 2 to 3 mm gap should be maintained between 2 pipes while welding
16. All Pipes should be in Straight Line from starting point till end point, especially whenever any Fitting are used in-between the Pipes / Pipe to Pipe is directly welded
17. Branch ends should not be extended more than 100mm after the last Point of sprinkler bulb.
18. Thread rod should be adjusted properly to make Pipeline straight, before full welding.
19. All Pipes should be Fabricated & Alignment work should be completed perfectly using spirit level in a particular Zone, including Header Pipe goes inside Fire Shaft, before starting Full Welding



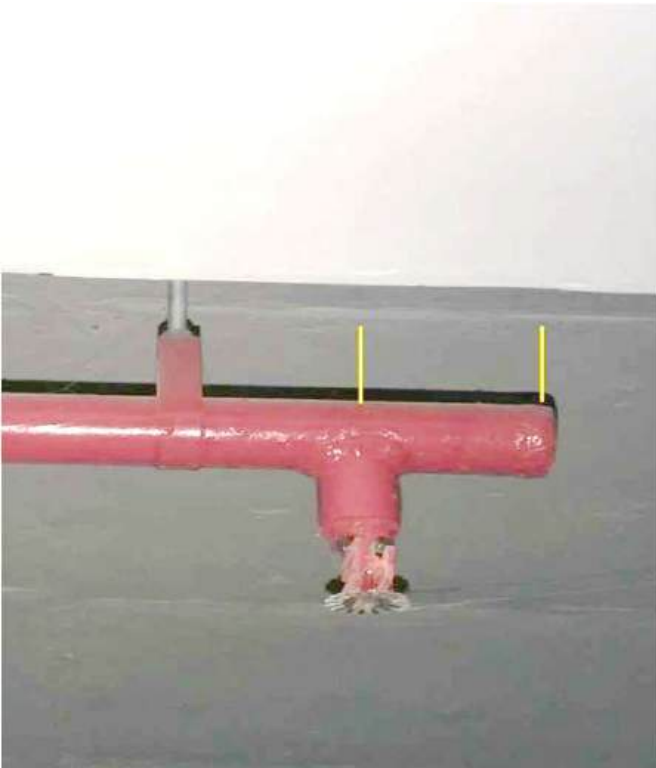
## **PIPE FABRICATION**

20. After adhering to all above mentioned points, Visual Inspection should be done and then Full Welding should be start.

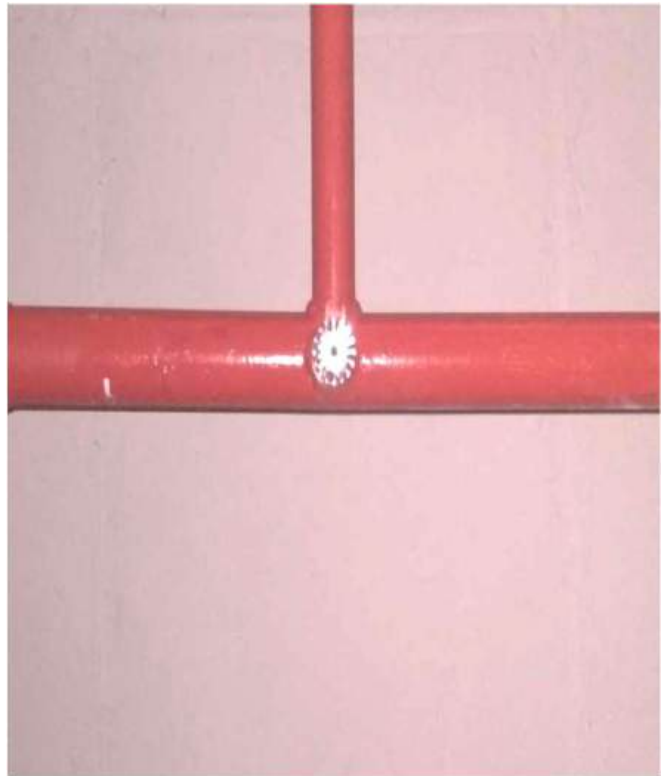
**GOOD QUALITY OF PIPE FABRIATION**



**GOOD QUALITY OF PIPE FABRIATION**



**BAD QUALITY OF PIPE FABRICATION**



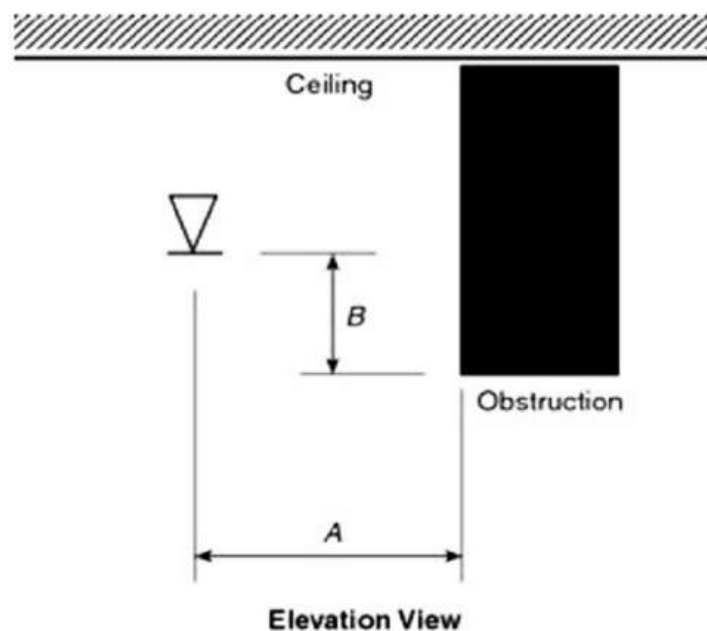
**BAD QUALITY OF PIPE FABRICATION**



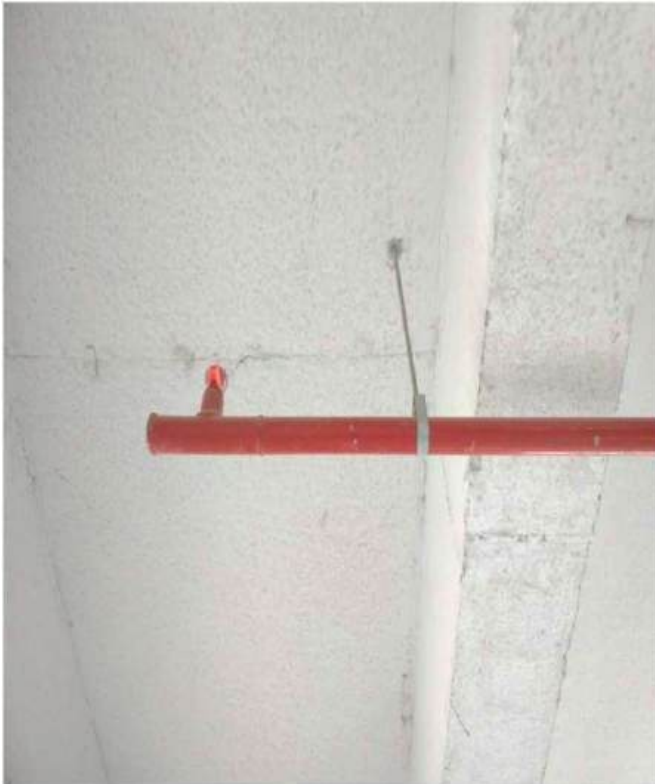
## CHECKLIST FOR FIXING SPRINKLER NEAR OBSTRUCTION - AS PER NFPA

<b>Distance from Sprinklers to Side of Obstruction (A)</b>	<b>Maximum Allowable Distance of Deflector Above Bottom of Obstruction (in.) (B)</b>
Less than 1 ft	0
1 ft to less than 1 ft 6 in.	0
1 ft 6 in. to less than 2 ft	1
2 ft to less than 2 ft 6 in.	1
2 ft 6 in. to less than 3 ft	1
3 ft to less than 3 ft 6 in.	3
3 ft 6 in. to less than 4 ft	3
4 ft to less than 4 ft 6 in.	5
4 ft 6 in. to less than 5 ft	7
5 ft to less than 5 ft 6 in.	7
5 ft 6 in. to less than 6 ft	7
6 ft to less than 6 ft 6 in.	9
6 ft 6 in. to less than 7 ft	11
7 ft and greater	14

For SI units, 1 in. = 25.4 mm; 1 ft = 0.3048 m.



**GOOD PRACTICE OF FIXING  
SPRINKLERS NEAR OBSTRUCTION**



**BAD PRACTICE OF FIXING**  
**SPRINKLER NEAR OBSTRUCTION**





## **THREADED JOINTS**

1. Whenever Threading is mentioned in Pipe Specification in BOQ, Project Manager should consider the same for Pipes up to 50mm dia
2. Visual Inspection should be done for all Fittings to ensure they are free from any kind of Thread Damage / Pin Holes / Cracks, before fabrication.
3. Threading should be done properly for Pipes, the same should be checked with sample fittings
4. If Threading is done crossly, Threaded portion should be cut and Re-Threading should be done, because if the threading is cross, further Piping will go cross
5. If Threading is done crossly, Threaded portion should be cut and Re-Threading should be done, because if the threading is cross, further Piping will go cross
6. Enough Thread Pitch & Length should be achieved while Threading the Pipe, which is equal to the Thread Pitch & Length, inside the fittings, if not, the fitting may get cracked, while fabrication
7. One layer of Cotton Thread should be put on the Threading, never it should be over done, so that fitting may get cracked, while fabrication
8. Holdtite should be applied on the entire Cotton Thread, if the same is not applied on some portion of thread, chance of leakage is very high.
9. Extra Thread should not be hanging outside of pipe joint, it looks very shabby.

**GOOD QUALITY OF THREADED JOINTS**





## **BAD QUALITY OF THREADED JOINTS**



## **PIPE WELDING & FINISHING**

1. All Pipes should be Fabricated & Alignment should be completed perfectly using spirit level in a particular Zone, including Header Pipe goes inside Fire Shaft, before starting Full Welding
2. Full Welding Work should be started only after visual inspection
3. Full Welding should be done in a sequence from higher Dia to lower Dia.
4. Route welding should be done in a single line and after removing all flux, final round welding should be done, however, if the welder is expert, it can be done in single line with good finish.
5. Flux should be fully removed and reconfirm that welding quality is good
6. If welding Quality is not good Finish / it has become bulged, that area should be grinded and Re-welding should be done in a single line, by an expert welder.
7. After good quality welding and successful pressure testing, Painting work should be started for Welding joints.

**GOOD QUALITY OF PIPE WELDING & FINISHING**



**BAD QUALITY OF PIPE WELDING & FINISHING**





## **MAKING HOLES IN PIPE** **FOR BUTT WELDED FITTINGS**

1. Hole should be made in circular shape, by using Hole Saw Cutting Machine / Grinding Machine / Gas Cutting / Welding
2. If Holes are made by welding, it should be grinded and finished neatly
3. Holes should be made in Feeder line Pipe
4. Hole Size in Feeder Line Pipe should be equal to inner Dia of Tapping Pipes
5. Hole Size for Pipe tapings / Collar Fixing should be checked before full welding.

**GOOD QUALITY OF MAKING HOLES FOR COLLAR FIXING IN PIPE**



**BAD QUALITY OF MAKING HOLES FOR  
COLLAR FIXING IN PIPE**





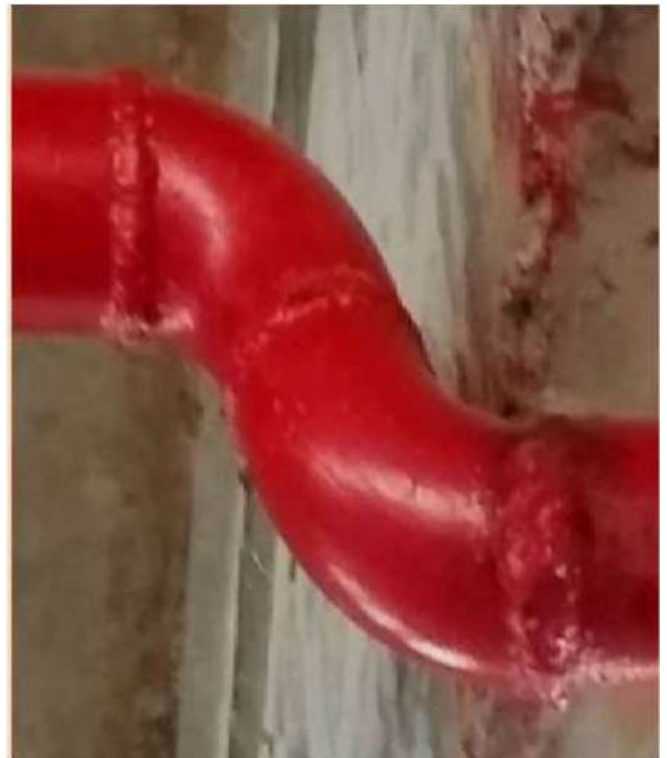
## **WELDING OF BUTT WELDED FITTINGS**

1. Elbow / Reducers Thickness should be matching with Pipe Thickness
2. Visual Inspection should be done all Fittings to ensure that they are free from any kind of Bend / Pin Holes / Cracks.
3. Before welding, Holes should be made in circular shape.
4. Nose cutting should be done in Tapping Pipe and the same should be matching to the Feeder Pipe
5. While fabricating Tee Joint, Inner dia of Tapping pipe should be exactly matching with hole done in Feeder Pipe, no mismatch should be there
6. Entire Nose Cut Portion (wall thickness of Pipe) of Tapping pipe should be having support of Feeder Pipe
7. Branch lines should be in 90 degrees to Main Header line, especially when branch line is coming from Core Cutting / Sleeve / Bore Holes
8. After doing V-groove, 2mm to 3mm gap should be maintained between pipe & elbow
9. 90° should be maintained between Pipe & Elbow, after tack welding.
10. After tack welding, alignment should be checked by using spirit level from the extended pipe at a distance of about one meter away from elbow, before doing final welding.
11. Before Welding, Flux / Mud / Waste Cloth / Paper / Stones / any other item should be removed from inside the Pipe, so that later, it doesn't block the water flow.

**GOOD QUALITY OF WELDING  
FOR BUTT WELDED FITTINGS**



**BAD QUALITY OF WELDING**  
**FOR BUTT WELDED FITTINGS**





## **DUMMY PLATE WELDING**

1. Dummy plates are flat circular shaped plates used to close the ends of Pipe opening.
2. Factory-made Dummy Plate should be used, never use any Un Size / Non-Circular / Cut Piece / Fabricated in Site using Welding Rod
3. Dummy Plate Thickness should be more then Pipe Thickness
4. Dummy Plate Dia should be 5-10mm bigger than outer diameter of concern Pipe, never use Over Size / Small Size / Equal Size of Pipe.
5. Visual Inspection should be done to check Dummy Plates are free from any kind of Bend / Pin Holes / Cracks.
6. Dummy plate should be fixed 100mm away from the last tapping, never it should be fixed immediately after the tapping

**GOOD QUALITY OF DUMMY PLATE WELDING**



**BAD QUALITY OF DUMMY PLATE WELDING**





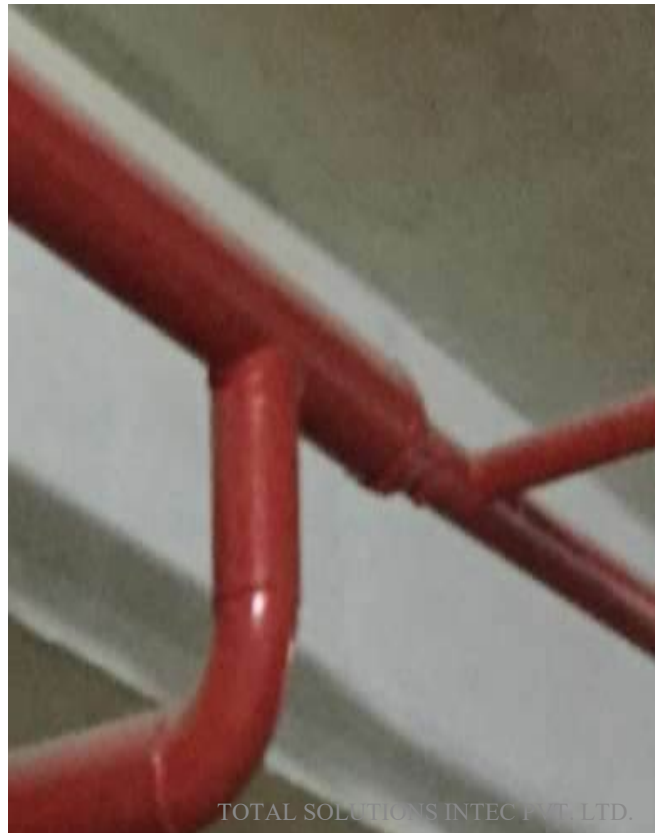
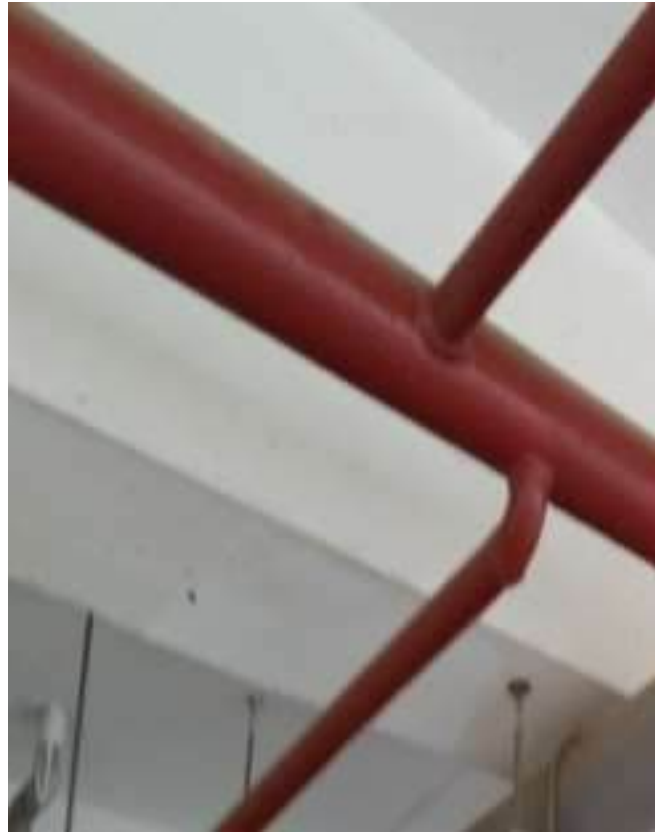
## **PIPE TAPPING**

1. Branch tapping should be taken from sides of the main header line and from top of the header line and should also make sure tapping is done exactly in center of the pipe, so that joints of different dia pipes matches to center of Header pipes.
2. Branch tapping should not be taken from the bottom of the header pipe.
3. If the branch tapping is done at the bottom of the header line, the scale / sediments present in the header may cause blockage of sprinkler water inlet.
4. Second tapping in the same side should not be taken in less than 200mm from tapping because while welding it may cause pipe bend due to heat produced by welding.
5. Bigger Dia pipes should not be tapped from smaller dia pipes as feeder line.
6. All above points should be followed even, if it is not mentioned in approved working drawing. And the same should be explained to clients and obtain the approval.

**GOOD QUALITY OF PIPE TAPPING**



**BAD QUALITY OF PIPE TAPPING**



## **APPLYING PRIMER & PAINT** **FOR WELDING JOINTS**

1. Before pressure testing, all joints should be grinded using grinding machine till smooth finish is achieved & Clean Flux / Cement / Mud / Dirt on all pipes with Grinding / Sandpaper.
2. After conducting successful Pressure Test, approved make primer (Asian / Berger Brand) yellow primer should be applied equally on all pipes.
3. After first primer coat is dried fully, smooth finish should be achieved.
4. After applying primer (approved make and shade of Red paint ex. Asian / Berger Brand) should be mixed with thinner / hardener in a ratio of 4:1 and then apply on pipe.
5. Second coat painting should be done only at the time of hand over.

**GOOD QUALITY OF APPLYING PRIMER & PAINT FOR WELDED JOINTS**



**BAD QUALITY OF APPLYING PRIMER & PAINT FOR WELDED JOINTS**





## **PIPING INSIDE FLAT**

1. Before Starting the Work, all the Civil Works should be completed, including Plastering, Grinding & One Coat of Whitewash
2. If Client instructs us to do the Piping work first and then they will do Plastering / Whitewash / Gyproc, in Wall / Ceiling, the same should be documented by Email and ask for Bull Mark Reference for final finishing, Project Manager should never start the Piping Work, without Bull Mark, because if Client fixes Cornice later stage, it will be mismatched
3. After Piping work, if Client wants to do Plastering / Gyproc / Painting work, the entire Piping, Sprinkler Bulb should be covered, before starting their work.
4. Project Manager should make sure Primer and Paint is applied for all Pipes before erection, excluding 50mm from weldable joints.
5. Piping work should be done, as per Approved Shop Drawing
6. Before Finalising the gap between Pipe and Wall, Approved Shop Drawing referred / make sure it is within the Cornice Size and take Client Approval
7. Rosette Plate should be fixed in the Highest dia pipe is equal to the Approved Cornish Level, all other lower dia Pipe's support should be adjusted to match the same Level.
8. After Welding, all Welding Joints should be cleaned with Wire Brush to Remove all the Flux.
9. Before doing Pressure Testing, all Sprinklers should be fixed with Rosette Plate
10. After Successful Pressure Testing Primer and Paint should be applied for all the Welding Joint and second coat of Painting should be done only at the time of handing over.

**GOOD PRACTICE FOR PIPING INSIDE FLAT**



**BAD PRACTICE FOR PIPING INSIDE FLAT**





## **MS STRUCTURAL SUPPORT - COMMON POINTS**

1. For Vertical Pipes, MS Structural Support should be used for all Dia Pipes
2. For Vertical Pipes & Pipes Running in Ground Level, only “C” channel should be used for Fabricating MS Structural Support
3. For Horizontal Pipes laid in ceiling, MS Structural Support should be used for 200mm Pipe dia and above, for lower dia Pipes, Thread Rod Support is good enough, however, if Multiple Pipes are Running together, MS Structural Support should be used, as per “Check List for MS Structural Support”
4. For Horizontal Pipes laid in ceiling, if MS Structural Support is mentioned every 6 Mts. in WO Specification, the same should be followed, along with Thread Rod Support every 3 Mts. Distance, however, if it is mentioned as 3Mts. the same should be followed, without using any Thread Rod Support.
5. Only “U” Shaped MS Structural Support should be fixed, never do “L” shaped MS Structural Support
6. “L” Angle, “C” Channel & Square Plate should be used for fabricating MS Structural Support, as per “Check List for MS Structural Support”
7. Distance between each Support’s as per “Check List for MS Structural Support”
8. Width of MS Structural Support should be based on Pipe Dia and Number of Pipes are Running, based on, Check List for MS Structural Support Width Calculation”
9. MS Structural Support should be fabricated only after completing all the piping works in that particular zone
10. While Fabricating MS Structural Support, Minimum 2 Holes for “L” Angle & Minimum 4 Holes for “C” Channel should be Drilled in Square Base Plate and it should be fixed with Anchor Fasteners
11. Separate measurement for each MS Structural Support should be taken between height between ceiling & Pipe bottom, as per site condition, before starting the Fabrication
12. “L” Angle / “C” Channel should be cut using disc cutters / gas cutting and never use Arc welding for cutting.
13. 100% alignment should be done before doing final welding of Structural supports.



## **MS STRUCTURAL SUPPORT - COMMON POINTS**

14. Holes should be made in MS Structural Supports, using a Drilling Machine / Gas Cutting to fix U-Bolts, if it is done using with welding rod, it should be grinded and finished neatly
15. “L” Angle / “C” Channel should be welded to center of Square Plates, for Fabricating MS Structural Support, for fixing it in Ceiling.
16. Whenever two or more pipes are running, minimum 50mm gap is maintained between U Bolt and end of Channel / Angle and also make sure Pipe to Pipe minimum 100mm gap is maintained, so that both the U Bolt doesn't touch each other, and it looks equal gap between each Pipe.
17. MS Support should be grinded and make the perfect finish, including all corner and make sure one coat of primer and one coat of Black paint is applied, before fixing
18. MS Structural Support should be fixed Exactly Perpendicular to the Pipes
19. Correct Size U-Bolt should be used for fixing the Pipes to MS Structural Support.
20. U Bolt should be fixed without any gap between Structural support and Pipe bottom
21. MS Structural Supports for Vertical Pipes should be fixed to Beam / Column / Slab, it should never be fixed to Sold Block / Brick Wall
22. For Vertical Pipes, one side of “C” channel should be directly fixed with the help of Anchor Fasteners and other side of the “C” channel, Pipe should be fixed, by using U-Bolt & nut & washers.
23. Size and Alignment of all MS Structural Support should be equal between each other, from beginning till end of the building, it is in Straight line
24. Pipe Welding Joints should never come on MS Structural Supports, minimum 100 mm gap should be maintained

## CHECK LIST FOR MS STRUCTURAL SUPPORT

PIPE DIA	PIPE RUNS	MATERIAL TYPE	SIZE	SQUARE PLATE SIZE	DISTANCE BETWEEN EACH SUPPORT
80 MM	SINGLE RUN	‘L’ ANGLE	40 X 40 X 4 MM	100 X 100 X 4 MM	6 MTRS
100 MM	SINGLE RUN	‘L’ ANGLE	40 X 40 X 4 MM	100 X 100 X 4 MM	6 MTRS
150 MM	SINGLE RUN	‘L’ ANGLE	50 X 50 X 4 MM	100 X 100 X 4 MM	6 MTRS
100 MM	DOUBLE RUN	‘C’ CHANNEL	75 X 40 MM	150 X 150 X 4 MM	6 MTRS
150 MM	DOUBLE RUN	‘C’ CHANNEL	75 X 40 MM	150 X 150 X 4 MM	6 MTRS
100 MM /150 MM	MULTIPLE RUN	‘C’ CHANNEL	100 X 50 MM	150 X 150 X 4 MM	6 MTRS

## **CHECK LIST FOR MS STRUCTURAL SUPPORT WIDTH CALCULATION**

<b>PIPE DIA</b>	<b>PIPE RUNS</b>	<b>MATERIAL</b>	<b>SUPPORT WIDTH</b>
80 MM	SINGLE RUN	'L' ANGLE & 'C' CHANNEL	220 MM
100 MM	SINGLE RUN	'L' ANGLE & 'C' CHANNEL	250 MM
150 MM	SINGLE RUN	'L' ANGLE & 'C' CHANNEL	300 MM
80 MM	MULTIPLE RUN	'L' ANGLE & 'C' CHANNEL	220 MM X NO. OF PIPES
100 MM	MULTIPLE RUN	'L' ANGLE & 'C' CHANNEL	250 MM X NO. OF PIPES
150 MM	MULTIPLE RUN	'L' ANGLE & 'C' CHANNEL	300 MM X NO. OF PIPES

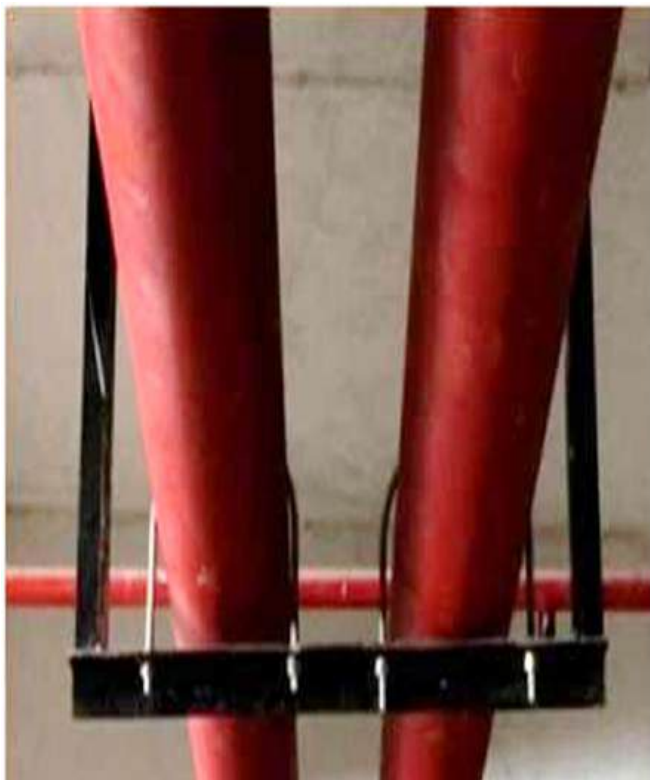
**GOOD QUALITY MS STRUCTURAL SUPPORT FOR VERTICAL PIPES**



**BAD QUALITY MS STRUCTURAL SUPPORT**  
**FOR VERTICAL PIPE**



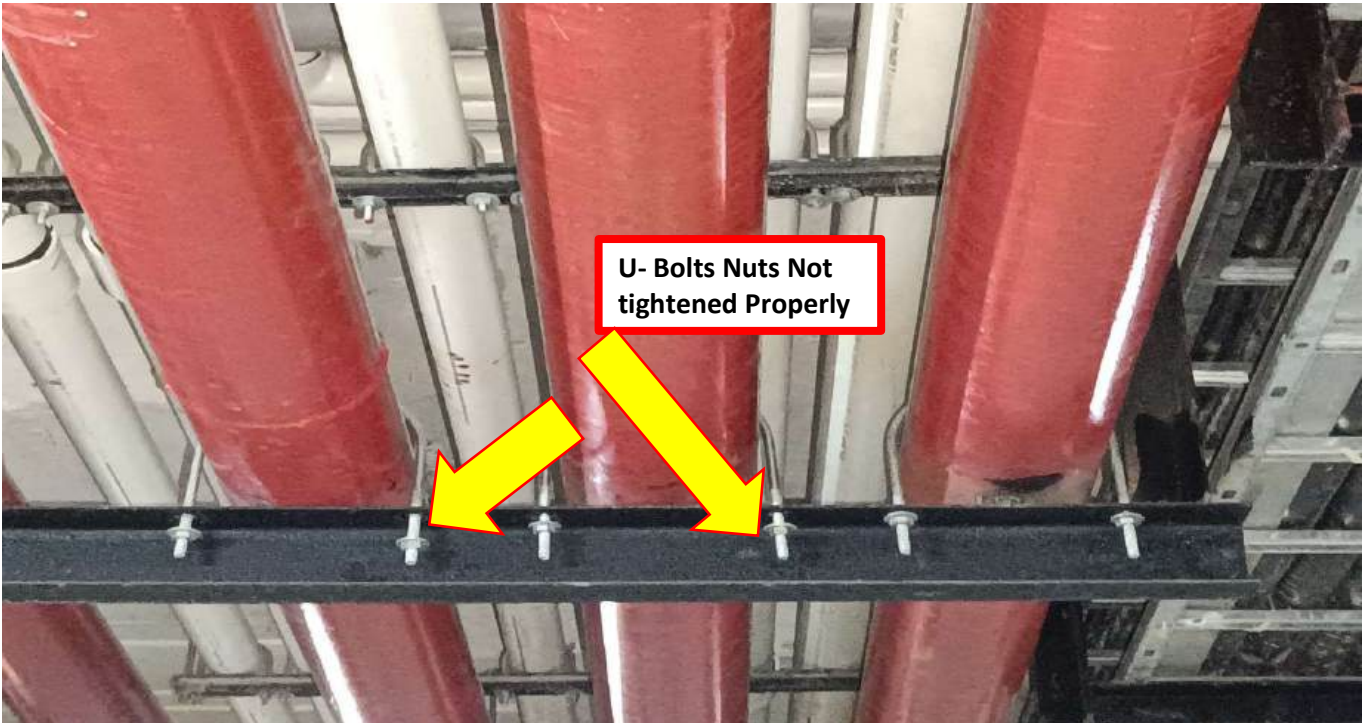
**GOOD QUALITY MS STRUCTURAL SUPPORT  
FOR HORIZONTAL PIPES IN CEILING**



**BAD QUALITY MS STRUCTURAL SUPPORT FOR HORIZONTAL PIPES IN CEILING**



# **BAD QUALITY MS STRUCTURAL SUPPORT FOR HORIZONTAL PIPES IN CEILING**





## **PEDESTAL SUPPORTS FOR PIPES**

1. If Pedestals are Not Casted for Pipes Running above RCC Terrace Level / Floor Level, RCC Pedestals should be Casted directly, using MS Structural Support, with extra supports for concrete, from “C” Channel
2. If Pedestals are already Casted for Pipes Running above RCC Terrace Level / Floor Level, the MS Structural Support should be fixed on Casted Pedestals, using Fasteners, it should never be fixed directly on floor.
3. One side of “C” channel should be fixed to RCC Pedestals and other side of the “C” channel should be fixed to Pipe, using U-Bolt, Nut & Washers.
4. Before Finalising Pedestals Height at Terrace Level, Pipes should be aligned with “Y” strainer, in such a way, 200mm clearance is available from FFL to bottom of the “Y” Strainer .
5. All Pedestals should be aligned with each other, and Pipes should be fixed in such a way, both looks in Straight Line, from start to end of the Pipeline
6. Top Surface of all the Pedestals should be finished Smoothly.
7. Gap between Floor Level and Pipe Bottom should be maintained same, from start to end of the Pipeline
8. Pedestal Support should be provided every 3Mts. and the gap between each Pedestal Support should be equal to each other.
9. Pedestal Support should not be Fixed on any Fittings, BFV, NRV etc.

**GOOD QUALITY OF PEDESTALS SUPPORTS FOR PIPES**







**BAD QUALITY OF PEDESTALS SUPPORTS FOR PIPES**



## SPRINKLERS & WATER CURTAIN NOZZLE

The Sprinkler operating device which is contains frangible glass bulb .The glass bulb contains fluid which expands when exposed to heat. When rated temperature is reached, the bulb shatters and water flows through the sprinkler and strikes deflector, forming a uniform water spray pattern to control or extinguish fire.

Description	Photo
Pendent Sprinkler	
Upright Sprinkler	
Side Wall Sprinkler	
Concealed Sprinkler	
Water curtain Nozzle	



## **FIXING SPRINKLERS & WATER CURTAIN NOZZLES**

1. Sprinklers & Water Curtain Nozzles should be installed only after Final Welding is completed for all the Piping, in that Particular Zone
2. Sprinklers & Water Curtain Nozzles Indent should be given only after cross checking and confirming that Sprinklers & Water Curtain Nozzles Approved TDS with SLD is in line with BOQ Specification and Actual Requirement as per Pumps.
3. After fixing the Sprinklers & Water Curtain Nozzles, welding should not be done in that zone.
4. Sprinkler Head, Body and Bulbs should be checked for any damages / cracks, before fixing.
5. Sprinklers & Water Curtain Nozzles should be fixed, using Teflon Tape.
6. Cotton Thread and Paint should not be used, for fixing the Sprinklers & Water Curtain Nozzles.
7. Correct quantity of Teflon Tape should be neatly wrapped around the threaded portion of the Sprinkler & Water Curtain Nozzle, never it should be over wrapped, it may cause Cracks in Sprinkler Body / Fitting while Tightening.
8. Teflon Tape should not be hanging outside, after fixing the Sprinkler & Water Curtain Nozzle
9. Sprinklers & Water Curtain Nozzles should not be Over Tightened, it may cause Cracks in Sprinklers / Water Curtain Nozzles Body / Fitting .
10. Whenever Side Wall Sprinkler is Fixed, the Deflector of Side Wall Sprinkler should be exactly parallel to the Ceiling, so that water will spread equally on both sides.
11. Whenever Water Curtain Nozzles is fixed, Orientation of Orifice Slot should be perfectly horizontal to Ceiling pointing downward direction, so that water will spread equally on both sides.
12. Sprinklers Bulb Safety Cover (PVC Cap) should be removed, before Handing Over.
13. Care should be taken while other Agency is working in the same location, they should not put any kind of Paint / Gyproc / Cement on Sprinklers

**GOOD QUALITY OF SPRINKLER FIXING**



**BAD QUALITY OF SPRINKLER FIXING**



**GOOD PRACTICE OF FIXING  
PENDENT/UPRIGHT SPRINKLER NEAR OBSTRUCTION**



**BAD PRACTICE OF FIXING**  
**PENDENT/UPRIGHT SPRINKLER NEAR OBSTRUCTION**



**GOOD PRACTICE OF SIDE WALL SPRINKLER FIXING LOCATION**



**BAD PRACTICE OF SIDE WALL SPRINKLER FIXING LOCATION**





## **SPRINKLERS IN FALSE CEILING / CORNICE AREA**

1. All points mentioned in “Fixing Sprinklers & Water Curtain Nozzles” sheet should be followed
2. Before starting the works in False Ceiling Area, Approved shop drawing should be synchronized with other services.
3. Pipe Level and Pipe Routing should be finalized after discussing with Clients about all crossings of other services
4. If Too Many Crossing of other services are coming / Zig Zag Piping is coming / Grid False Ceiling is coming / Multi Levels are coming in False Ceiling, Sub Contractor should discuss with our Project Manager and check if we can get Client Approval at Extra Cost, for Flexible Drop, instead of Rigid Drop
5. Before starting the works in False Ceiling Area, final Marking for False Ceiling Level / FFL Marking with exact measurement should be taken from Clients.
6. Before starting the works in Cornice Area, Cornice Size should be taken from Clients.
7. Before giving clearance for False Ceiling Gypsum Board fixing / Corncing, all our works should be completed with successful Pressure Testing, including alignment of Sprinklers
8. After False Ceiling Gypsum Board is fixed / Grid Ceiling work is done, get the holes cut for Rosette Cup by Interior team and fix the same
9. After False Ceiling / Grid Ceiling, all Sprinklers should be aligned properly from starting to end and sprinkler heads should be parallel to False Ceiling

**GOOD QUALITY OF FIXING PENDENT SPRINKLER-CORRIDOR**



**BAD QUALITY OF FIXING PENDENT SPRINKLER-  
CORRIDOR**





## **ROSETTE CUP / ROSETTE PLATE**

1. Rosette Plates / Rosette Cups are used to give Good Appearance for Sprinklers, by covering the gap between Sprinkler and False Ceiling / Cornice / Walls
2. Rosette Plates / Rosette Cups Indent should be given only after cross checking and confirming that Rosette Plates / Rosette Cups Approved TDS with SLD is in line with BOQ Specification and Actual Requirement as per Pumps.
3. Rosette Cups (2 pcs) should be fixed along with Pendent Sprinkler, in all types of False Ceiling Area, except any Designer Type / Wave Type False Ceiling
4. Rosette Inner Cup should be fixed along with Pendent Sprinkler
5. After Grid work is done in False Ceiling area, Rosette Inner Cup level should be matched with False Ceiling Level
6. All Sprinklers should be aligned 100% Perpendicular to False Ceiling and Successful Pressure Testing is done, before giving Clearance for Gypsum Board / Grids fixing.
7. After 1 coat of Painting is done for False Ceiling Area, get the holes cut for Rosette Cup by Interior team and fix the same
8. Rosette Plate should be used in all types of Cornice Area and Walls, except any Round Type Cornice, Tapered Type Cornice, any other Designed Cornice.
9. Rosette Plate should be covered with tape before starting the Cornice Work by Cornice Agency
10. Cornice should be fixed below Rosette Plate, in such a way wall thickness of Rosette Plate should be clearly visible, it should never be fixed equal / above Rosette Plate.

**GOOD PRACTICE OF ROSETTE PLATE FIXING**



**BAD PRACTICE OF ROSETTE PLATE FIXING**





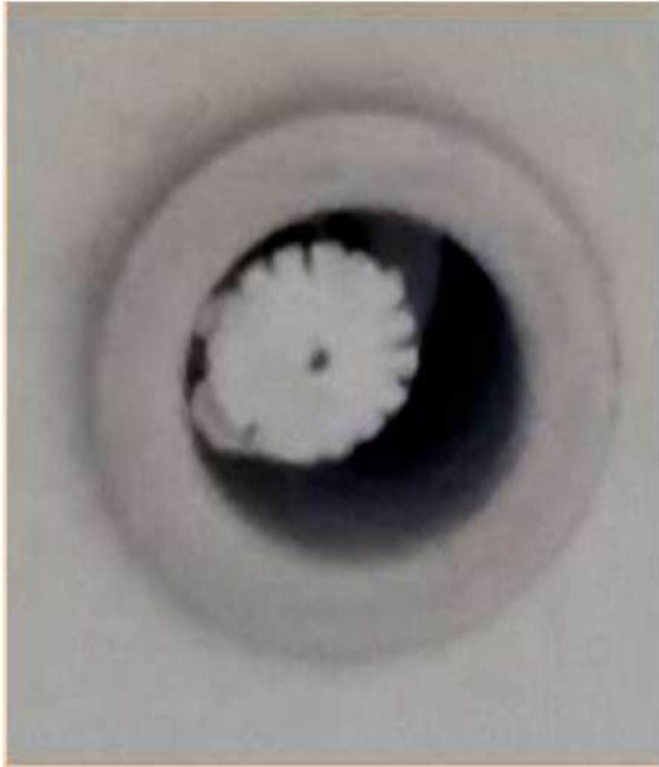
## **RIGID DROP IN FALSE CEILING AREA**

1. Collar should be welded perpendicular to header, so that Sprinkler also will be perpendicular to False Ceiling.
2. Correct size collar should be welded, in such way, bottom portion of collar is just 2-3mm inside of False Ceiling, so that sprinkler will be projecting fully outside the false ceiling, in case if Sprinklers are Not Aligned to False Ceiling, Thread Rod should be adjusted to required level.
3. Even after doing Thread Rod adjustment, if the Sprinkler has gone up to 20mm inside the False Ceiling Level, the same will be covered in Rosette Cup (2 pcs), no need of using Extension Nipple.
4. Even after doing Thread Rod adjustment, if the Sprinkler has gone more then 20mm inside the False Ceiling Level, correct size Extension Nipple should be used to match it
5. Even after doing Thread Rod adjustment, if the Sprinkler has come outside the False Ceiling Level, the Pipe / Nipple Piece should be cut, and re-work should be done to match it
6. All Sprinkler Bulb should be aligned in straight line and projection of all sprinkler bulb outside the false ceiling should be equal, from starting to end.
7. If Too Many Crossing of other services are coming / Zig Zag Piping is coming / Grid False Ceiling is coming / Multi Levels are coming in False Ceiling, Subcontractor should discuss with our Project Manager and check if we can get Client Approval at Extra Cost, for Flexible Drop, instead of Rigid Drop
8. Before giving Clearance for Gypsum Board / Grids fixing, all Sprinklers should be aligned 100% Perpendicular to False Ceiling and Successful Pressure Testing should be done.

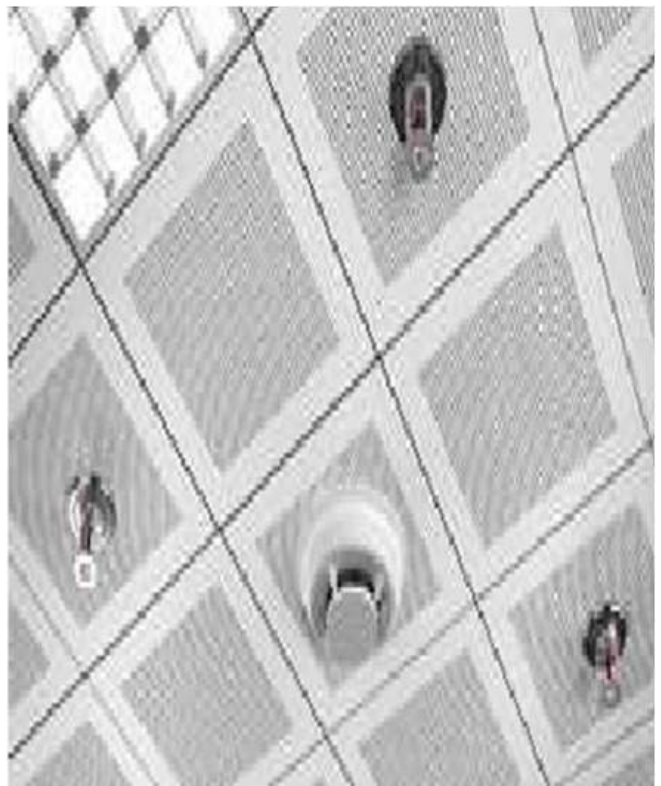
**GOOD QUALITY OF FIXING PENDENT SPRINKLER WITH RIGID DROP IN POP FALSE CEILING**



**BAD QUALITY OF FIXING PENDENT SPRINKLER WITH RIGID DROP IN POP FALSE CEILING**



**GOOD QUALITY OF FIXING PENDENT SPRINKLER WITH RIGID DROP - GRID FALSE CEILING**



**BAD QUALITY OF FIXING PENDENT SPRINKLER WITH RIGID DROP - GRID FALSE CEILING**

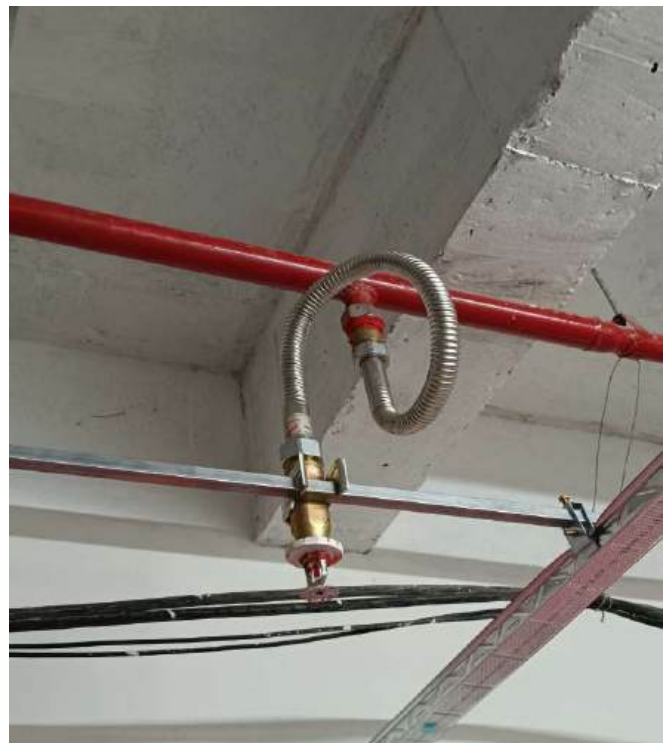
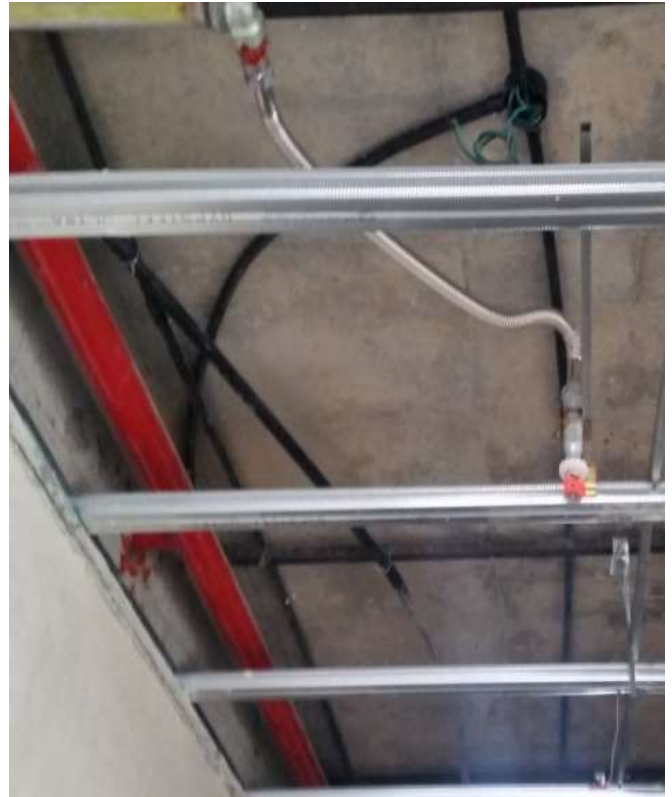




## **FLEXIBLE DROPS IN FALSE CEILING AREA**

1. Flexible drops are used whenever Sprinkler are coming in False Ceiling Area / Sprinkler needs to be moved to different location / Sprinkler needs to be Extended from Rigid Piping / Criss Cross Piping
2. Flexible drops Indent should be given only after cross checking and confirming that Flexible drops Approved TDS with SLD is in line with BOQ Specification and Actual Requirement as per Pumps.
3. 1" Threaded Collar Tapping should be done, from Side / Top Portion of the Pipe
4. Tapping should be done near Sprinkler Location
5. Rosette Inner Cup should be fixed along with Pendent Sprinkler to Flexible drop
6. Based on RCP Layout (Reflected Ceiling Plan), Flexible Drop should be bent to required shape, to reach exact Sprinkler Location, because Flexible Drop will Crack, if it is bent multiple times.
7. Flexible Hose should be always Bent in Long Radius, it should never be Bent Sharply / it should never be Twisted, because it will Crack
8. After Grid work is done in False Ceiling area, Sprinkler should be in Exact Location / Center of Grid Ceiling, by adjusting the Flexible Drop Nipple, Left & Right, in Center Bracket / Clamp which is fixed on alignment bar (Square Rod)
9. After adjusting the Sprinkler in exact Location, Rosette Inner Cup level should be matched with False Ceiling Level, by adjusting the Flexible Drop Nipple, Up & Down, in Center Bracket / Clamp which is fixed on alignment bar (Square Rod)
10. All Sprinklers should be aligned 100% Perpendicular to False Ceiling and Successful Pressure Testing should be done, before giving Clearance for Gypsum Board / Grids fixing.

**GOOD QUALITY OF FIXING PENDENT SPRINKLER WITH FLEXIBLE DROP**



**BAD QUALITY OF FIXING PENDENT SPRINKLER WITH FLEXIBLE DROP**





## **FLOW SWITCH**

1. Flow Switches are used to detect the water flow and to send signals to Control Panel, they are 2 Types, Paddle Type & Vane Type of Flow Switches
2. Flow Switch Indent should be given only after cross checking and confirming that Flow Switch Approved TDS with SLD is in line with BOQ Specification and Actual Requirement as per Pumps.
3. Flow Switch should be installed at least 400mm away from the Butterfly Valve, so that Butterfly Handle doesn't touch the Flow Switch, while operating.
4. Flow Switches should be installed inside Fire Shaft, in such a way, it is easily accessible.
5. Flow Switches should be fixed on Top of the Sprinkler Horizontal Pipe, near Floor Tapping from Sprinkler Raiser
6. Before Fixing Flow Switches, All Welding Works should be Completed in that Location.
7. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.



## **INSTALLATION OF FLOW SWITCH**

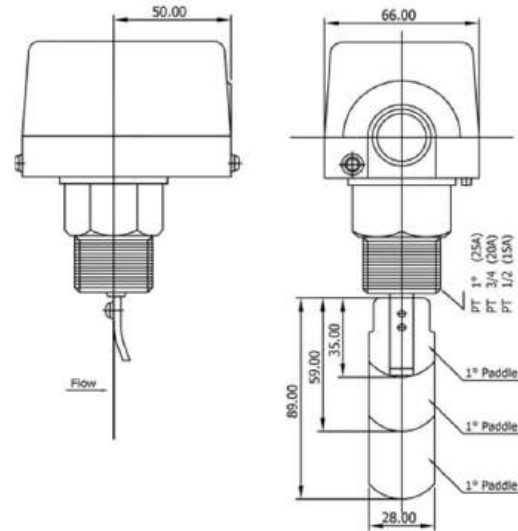
### 1. Procedure for Installing Paddle Type Flow Switches :-

- a) 1” Hole should be Done on Top of the Sprinkler Horizontal Pipe and finish it with Grinding
- b) Collar should be Welded
- c) Dismantle All SS Plates from Paddle Type Flow Switch Body (3-5 Nos. of SS Plates would have come along with Paddle Type Flow Switch)
- d) Only one Correct Size SS Plate should be Fixed to Paddle Type Flow Switch Body, it should be Selected based on “Checklist for Selecting SS Plate Size for Paddle Type Flow Switch”
- e) Throw away all other Size SS Plates, which has come along with Paddle Type Flow Switch
- f) Correct Quantity of Teflon Tape should be Neatly Wrapped around the Threaded Portion of the Paddle Type Flow Switch, Never it should be Over Wrapped, it may Cause Cracks in Flow Switch Body / Fitting while Tightening and also make sure Teflon Tape is Not Hanging Outside, after fixing the Flow Switch

### 2. Procedure for Installing Vane Type Flow Switch :-

- a) Correct Size Hole should be Done on Top of the Sprinkler Horizontal Pipe and finish it with Grinding
- b) Correct Size Vane Type Flow Switch should be used, based on Pipe Size
- c) U Bolt of Vane Type Flow Switch should be fixed Exactly Perpendicular to the Pipe
- d) U Bolt of Vane Type Flow Switch should Not Be Over Tightened, it may cause Cracks in Flow Switch Body

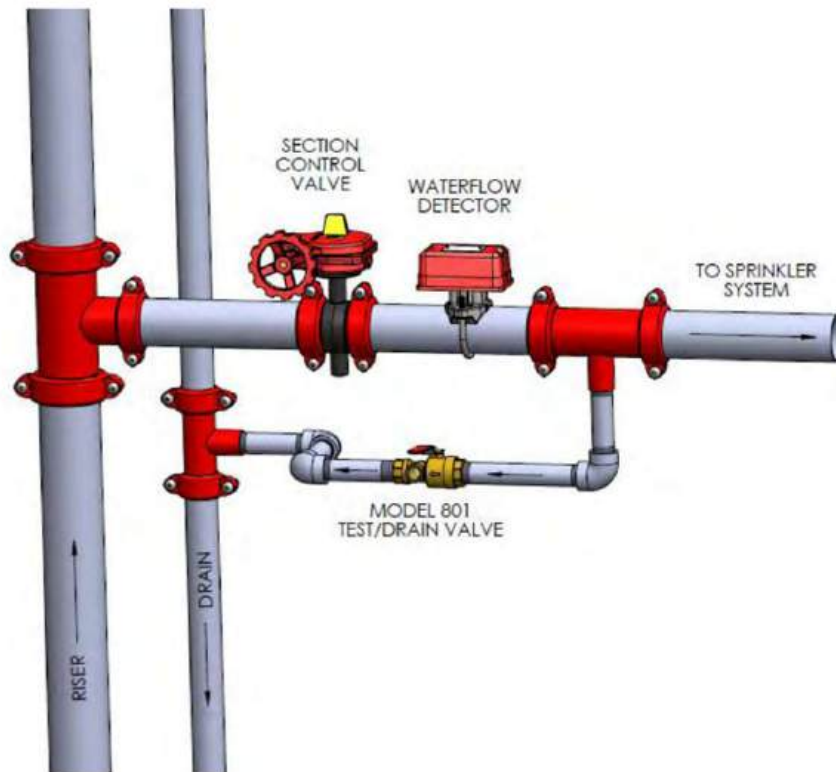
## PADDLE TYPE FLOW SWITCH



### Checklist for Selecting SS Plate Size for Paddle Type Flow Switch

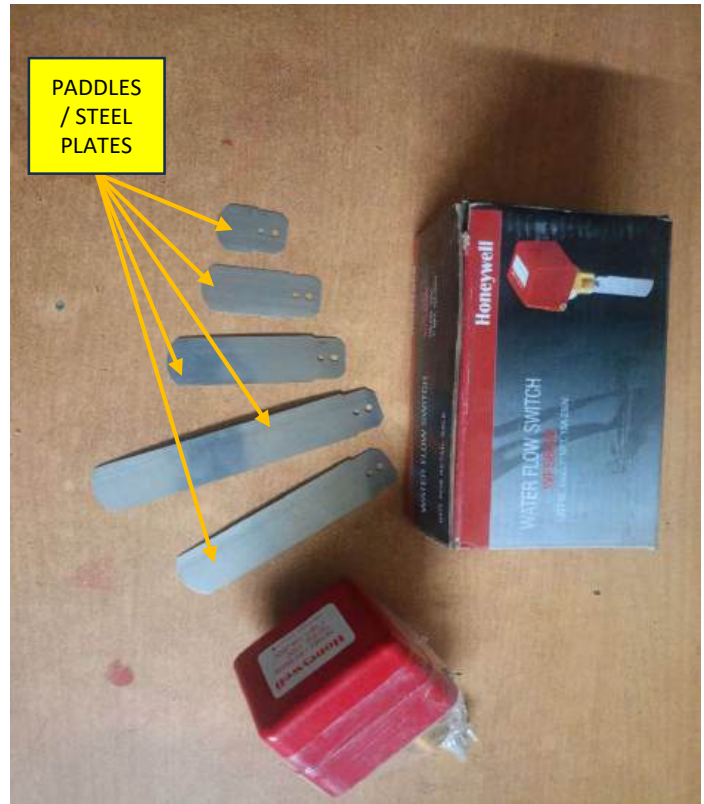
Pipes Dia (in mm)	Paddle No.
25mm	1
32mm	
40mm	
50mm	2
65mm	
80mm	3
100mm	
150mm	

# VANE TYPE FLOW SWITCH



## INSTALLATION

# GOOD PRACTICE OF FLOW SWITCH FIXING



# **BAD PRACTICE OF FLOW SWITCH FIXING**





## **SIGHT GLASS UNIT**

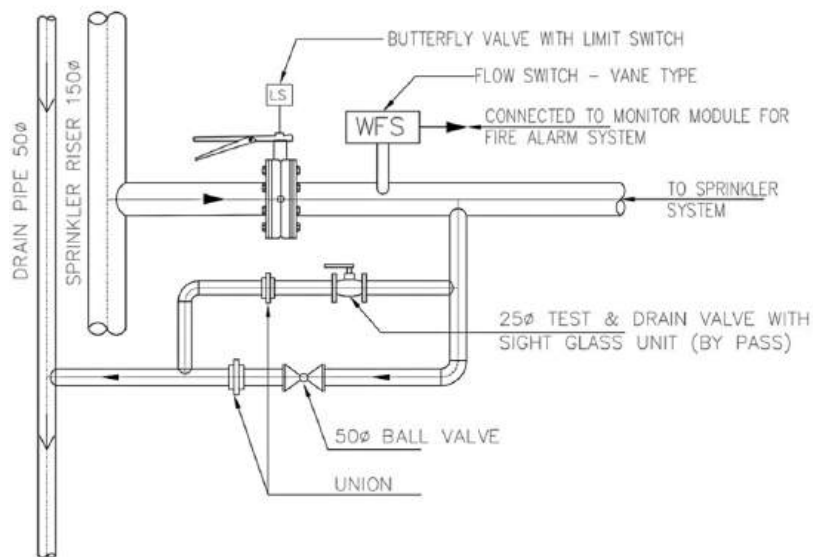
1. Sight Glass Unit is used to find out Water Flow in Sprinkler Floor Tapping Line and it has a single handle Ball Valve with three working positions (Test, Drain & Off).
2. Sight Glass Unit Indent should be given only after cross checking and confirming that Sight Glass Unit Approved TDS with SLD is in line with BOQ Specification and Actual Requirement as per Pumps.
3. Sight Glass Unit should be installed at least 400mm away from the Butterfly Valve, so that Butterfly Handle doesn't touch the Sight Glass Unit, while operating.
4. Sight Glass Unit should be installed inside Fire Shaft, in such a way, it is easily accessible.
5. Sight Glass Unit should be fixed in Floor Drain Tapping Horizontal Pipe, which is connected to Drain Raiser
6. Correct Quantity of Teflon Tape should be neatly wrapped around the threaded portion of the Nipple, never it should be over wrapped, it may cause Cracks in Sight Glass Unit, while Tightening and make sure Teflon Tape is not hanging outside, after fixing the Sight Glass Unit
7. Sight Glass Unit should Not be Over Tightened, it may cause Cracks.
8. After fixing Sight Glass Unit, welding should not be done in that Location.
9. After fixing Sight Glass Unit, the entire system is called "Test and Drain Valve Assembly"
10. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

**SIGHT GLASS UNIT**



**TEST AND DRAIN VALVE ASSEMBLY**

SPRINKLER MAIN TAPPING DETAILS



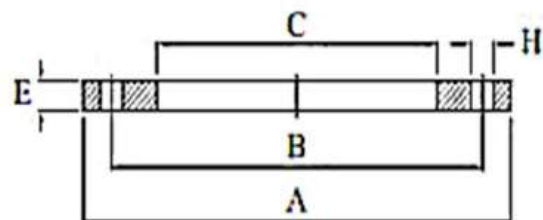


## **FLANGE, GASKET, NUT, BOLT & WASHER**

1. To Install Valves / Pumps / Strainer, Flanges are welded to Pipe side, so that it can be erected with Gasket, Bolt, Nut & Washer, so that Valve / Pumps / Strainer can be removed easily, for Service / Replacement purpose
2. Flange PCD, Outer Dia and Inner Dia should be matched with Valve / Pumps / Strainer Flange
3. Flange Thickness & Bolt Dia should be as per below mentioned “Flange Size Table”
4. Whenever Flanges are fixed both side of the Valve, both the Flange Thickness, Outer Dia, Inner Dia, No. of Holes and PCD should be same
5. While Fabricating, Flange Holes should be aligned with other Valve / Pumps / Strainer Flange’s Hole
6. Whenever 2 Flanges are welded for fixing any type of Valves, Equal Gap should be maintained between two flanges, without any kind of twist in the flanges, to avoid any kind of Leakage.
7. Whenever Pipe is running near wall / any other obstacles, minimum 300mm Gap should be maintained between Flange and obstacle, for easy operation of Valves
8. Only Galvanized Nut, Bolt & Washer should be used
9. Bolt Lenth should be exactly as per requirement, after fixing Nut, it should project only 20mm, it should not project more then that,
10. Correct Size Washer should be used on both sides of the flanges
11. Correct Size Die Cut Gasket should be used in-between both the Flanges, to prevent any kind of leakage, Gasket should never be projecting out side the Flange.
12. Bolt & Nut should be Tightened equally in a sequence, without over tightening any particular Nut, so that gasket doesn’t get cut / Flange doesn’t get twisted.
13. Never Painting should be done on Bolt, Nut & Washer

## FLANGE SIZE TABLE

A	B	C	E	H	BOLT SIZE	NO. OF HOLES
95	67	23	12	14	M12	4
102	73	29	12	14	M12	4
114	83	35	12	14	M12	4
121	87	44	12	14	M12	4
133	98	50	12	14	M12	4
152	114	62	12	18	M16	4
165	127	78	12	18	M16	4
184	146	90	12	18	M16	4
216	178	117	13	18	M16	8
254	210	144	14	18	M16	8
279	235	167	17	22	M20	8
337	292	221	19	22	M20	8
406	356	275	22	22	M20	12
457	406	327	25	26	M24	12
525	470	359	29	26	M24	12
580	521	410	32	26	M24	12
640	584	461	35	26	M24	16
705	641	513	38	26	M24	16
825	755	615	48	33	M30	16



## GOOD PRACTICE OF FLANGE FIXING



**BAD PRACTICE OF FLANGE FIXING**



**GOOD QUALITY OF GASKET FIXING IN FLANGE**



**BAD QUALITY OF GASKET FIXING IN FLANGE**





## **BUTTERFLY VALVE**

1. Butterfly Valve is used to Control the Flow of Water.
2. Butterfly Valve should be fixed in such a location where it is easily accessible for smooth operation. Minimum 100 mm Gap should be maintained from end of Butterfly Valve Handle, for easy operation.
3. Butterfly Valve Indent should be given only after cross checking and confirming that Butterfly Valve Approved TDS with SLD is in line with BOQ Specification and Actual Requirement as per Pumps.
4. Whenever Butterfly Valve needs to be fixed near wall / any other obstacles, minimum 300mm Gap should be maintained between Butterfly Valve and obstacle, for easy operation.
5. Whenever Butterfly Valve is installed in Vertical Pipes, near FBI / Yard Hydrant / ICV, make sure handle doesn't touch the floor, when operated fully
6. Before installing Butterfly Valve, Gap between 2 flanges should be re-checked and confirmed it is Exactly as per the size of Butterfly Valve, because, if the gap is less, Butterfly Valve's Rubber Gasket may get damaged while inserting and if the gap is more, it may start Leaking / Pipe or Flange Welding may get Damaged, when Bolt Nut is tightened
7. Before installing Butterfly Valve, both the flanges should be 100% parallel to each other and uniform all-around, without any kind of twist in the flanges, to avoid any kind of Leakage / Damage
8. Flange should be welded 100% Perpendicular / Parallel to FFL, in such a way, when Butterfly Valve is installed, it is 100% straight
9. Butterfly Valve should be installed only after applying one coat of Yellow Primer and one coat of Signal Red Paint for Pipes & Flange.
10. Only Galvanized Nut, Bolt & Washer should be used for all holes in the flange, no holes should be left open
11. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.
12. Never Painting should be done on Butterfly Valve, Bolt, Nut & Washer

**GOOD QUALITY OF BUTTERFLY VALVE FIXING**



**BAD QUALITY OF BUTTERFLY VALVE FIXING**





## **STRAINER**

1. Strainers are used for filtering the water from heavy particles like any metals, Mud, Scales and any other debris, which will avoid any kind of blockages in Pump, Valves & Pipe
2. They are 3 Types of Strainers, “Y” Type, “Pot” Type & “Basket” Type, “Y” Type Strainers are widely used in Fire Fighting System.
3. Strainers Indent should be given only after cross checking and confirming that Strainers Approved TDS with SLD is in line with BOQ Specification and Actual Requirement as per Pumps.
4. Strainers are fixed in the main inlet Pipe, which is connected from Sump / Over Head Tank, immediately after Control Valve.
5. Inlet Pipe Line should be laid at the height which is convenient to fix “Y” Strainer, with a minimum gap of 200mm -500mm, based on “Y” Strainer size, gap should be measured from Finished Floor Level to bottom drain portion of “Y” Strainer
6. “Y” Strainers should be always installed horizontally, with the cap facing downwards, for removing the cap, basket / screen, for cleaning purpose
7. Before installing Strainer, Gap between 2 flanges should be re-checked and confirmed it is Exactly as per the size of Strainer, because if the gap is more, it may start Leaking / Pipe or Flange Welding may get Damaged, when Bolt Nut is tightened
8. Before installing Strainer, both the flanges should be 100% parallel to each other and uniform all-around, without any kind of twist in the flanges, to avoid any kind of Leakage / Damage
9. Flange should be welded 100% Perpendicular to FFL, in such a way, when Strainer installed, it is 100% straight
10. Location of fixing “Y” Strainer should be selected based on convenient for Installation / Dismantling & Servicing, Minimum 250mm gap should be maintained from any other accessories / obstacle.
11. Strainer should be installed only after applying one coat of Yellow Primer and one coat of Signal Red Paint for Pipes & Flange.
12. Only Galvanized Nut, Bolt & Washer should be used for all holes in the flange, no holes should be left open
13. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.
14. Never Painting should be done on “Y” Strainer, Bolt, Nut & Washer

**GOOD QUALITY OF FIXING Y STRAINER**



# BAD QUALITY OF FIXING Y STRAINER



Y Strainer should be Fixed in Horizontal Position



## **GATE VALVE / SLUICE VALVE**

1. Gate Valves are also called Sluice Valve.
2. Gate Valves are used for Controlling Water Flow Gradually.
3. They are 2 Types of Gate Valve, Rising Stem Type & Non-Rising Stem Type. Rising Stem Type are widely used in Fire Fighting System.
4. Gate Valves Indent should be given only after cross checking and confirming that Gate Valves Approved TDS with SLD is in line with BOQ Specification and Actual Requirement as per Pumps.
5. Location of fixing Gate Valve should be selected based on convenient for operating, Installation, & Dismantling, Minimum 200mm - 500mm gap should be maintained, based on size of Gate Valve, from any other accessories / obstacle, including Sump / Over Head Tank side
6. Before installing Gate Valve, Gap between 2 flanges should be re-checked and confirmed it is Exactly as per the size of Gate Valve, because, if the gap is more, it may start Leaking / Pipe or Flange Welding may get Damaged, when Bolt Nut is tightened
7. Before installing Gate Valve, both the flanges should be 100% parallel to each other and uniform all-around, without any kind of twist in the flanges, to avoid any kind of Leakage / Damage
8. Flange should be welded 100% Perpendicular / Parallel to FFL, in such a way, when Gate Valve is installed, it is 100% straight
9. Minimum 250mm Tool Piece should be used after Gate Valve Flange, to fix MS Supports.
10. Gate Valve should be installed only after applying one coat of Yellow Primer and one coat of Signal Red Paint for Pipes & Flange.
11. Only Galvanized Nut, Bolt & Washer should be used for all holes in the flange, no holes should be left open
12. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.
13. Never Painting should be done on Gate valve , Bolt, Nut & Washer

**GOOD QUALITY OF FIXING GATE VALVE**



**BAD QUALITY OF FIXING GATE VALVE**





## **NON RETURN VALVE**

1. Non-Return Valve (NRV) is used to make sure water will flow only in one direction.
2. Types of 3 Types of NRV, Wafer type, Dual disc type & Swing type
3. NRV Indent should be given only after cross checking and confirming that NRV Approved TDS with SLD is in line with BOQ Specification and Actual Requirement as per Pumps.
4. In Pump Room Wafer Type NRV should Not be used, even if it is mentioned in BOQ.
5. NRV should be installed only in Horizontal Pipes, never it should be installed in Vertical Pipes.
6. NRV should be installed in Pump Delivery Side, before installing Butterfly Valve .
7. NRV should be installed, as per the Direction of Water Flow shown on NRV, so that water doesn't Flow Back.
8. Location of fixing NRV should be selected based on convenient for Installation & Dismantling, Minimum 300mm gap should be maintained, from any other accessories / obstacle.
9. Before installing NRV, Gap between 2 flanges should be re-checked and confirmed it is Exactly as per the size of NRV, because, if the gap is less, NRV's Rubber Gasket may get damaged while inserting and if the gap is more, it may start Leaking / Pipe or Flange Welding may get Damaged, when Bolt Nut is tightened
10. Before installing NRV, both the flanges should be 100% parallel to each other and uniform all-around, without any kind of twist in the flanges, to avoid any kind of Leakage / Damage
11. Flange should be welded 100% Perpendicular / Parallel to FFL, in such a way, when NRV is installed, it is 100% straight
12. NRV should be installed only after applying one coat of Yellow Primer and one coat of Signal Red Paint for Pipes & Flange.
13. Only Galvanized Nut, Bolt & Washer should be used for all holes in the flange, no holes should be left open
14. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust
15. Never Painting should be done on NRV, Bolt, Nut & Washer

**GOOD QUALITY OF FIXING NON RETURN VALVE**



**BAD QUALITY OF FIXING NON RETURN VALVE**





## **FIRE SHAFT**

1. Before starting Pipe Fabrication in Fire Shaft, all Civil Works like Grinding / Plastering with Whitewash should be completed
2. Duct Opening should start from Minimum 600mm and maximum 750mm from FFL level, which will make sure water flow is smooth, because RRL Hose will not get bent, due Fire Duct Shutter Height.
3. Standard Duct Opening Size should be 1200 mm (Height) \* 900 mm (Width)
4. As per Site Condition, Layout of Pipe Fabrication inside Fire Shaft should be prepared and Client Approval should be obtained, including MS Structural Supports
5. Sprinkler control Butterfly Valves should be installed inside the Fire Shaft and the same should be easily accessible
6. Drain Tapping, Ball Valve, Flow Switch, Sight Glass Unit, Test and Drain Ball Valve should be installed inside the Fire Shaft and the same should be easily accessible
7. MS Structural Supports should be Fabricated and fixed, by following all points mentioned in “MS Structural Supports”
8. Hose Reel Drum should Planed and Installed, by following all points mentioned in “Hose Reel Drum”
9. Only After applying one coat of Yellow Primer & one coat of Signal Red Paint / as mentioned in BOQ Specification, Pipes should be fabricated in Fire Shaft
10. Welding Joints should never come on MS Structural Supports / Slab / Core Cutting / Sleeve, minimum 100 mm gap should be maintained from above and below.
11. Hydrant Raiser should be fabricated in center of the Fire Duct, if not possible, Hydrant Valve at least should come in center of the Fire Duct



**GOOD QUALITY OF RISER INSTALLATION IN FIRE  
SHAFT**

**BAD QUALITY OF RISER INSTALLATION IN FIRE SHAFT**





## **INTERNAL HYDRANT VALVE FIXING**

1. Hydrants Valves is also called Landing Valve
2. Internal Hydrants are used for Extinguishing the Fire inside the Building
3. Up to 1000 Sq. Mtrs of Built-up Area, one Internal Hydrants should be provided, at every floor.
4. Hydrant Valve should be installed, only after all Civil Works like Grinding / Plastering with Whitewash is completed
5. Internal Hydrant Valves are installed inside the Fire Shaft, it is used to control the water from Hydrant Raiser / Down Comer.
6. There are Two types of Hydrant Valves, Single Headed and Double Headed Hydrant Valve
7. Single Headed Hydrant Valve is connected to 80mm dia Pipe Tapping and Double Headed Hydrant Valve is connected to 100mm Pipe Tapping from Hydrant Raiser / Down Comer.
8. Matching Flange's Outer Dia, Inner Dia, No. of Holes & PCD should be exactly matching with Hydrant Valve's Flange.
9. Fabrication of Matching Flange should be done in such a way, center point should be at 1.2-meter Height from Finished Floor Level (FFL), which is Standard Height for Hydrant Valve fixing
10. Duct Opening should start from Minimum 600mm and maximum 750mm from FFL level, which will make sure water flow is smooth, because RRL Hose will not get bent, due Fire Duct Shutter Height.
11. If Duct Opening is more than 750mm from FFL level, actual difference in height should be added to Standard Hydrant Valve installation height of 1.2 meter, so that water flow is still smooth, because RRL Hose will not get bent, due to Fire Duct Shutter Height, however, if the Duct Opening is more than 900mm from FFL level, Client has to reduce the height.
12. Matching Flange should be fabricated to Pipe Tapping, by making sure all Holes are perpendicular to FFL, in such a way, when Hydrant Valve is installed, it is 100% straight.
13. Hydrant Valve should be installed in such a way, its outlet should be facing downwards, without any tilt.
14. Hydrant Valve should be installed only after applying one coat of Yellow Primer and one coat of Signal Red Paint for Pipes.



## **INTERNAL HYDRANT VALVE FIXING**

15. Only Galvanized Nut, Bolt & Washer should be used for all holes in the flange, no holes should be left open
16. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

**GOOD QUALITY OF HYDRANT VALVE FIXING**



**BAD QUALITY OF HYDRANT VALVE FIXING**





## **YARD HYDRANT**

1. Yard Hydrants are used for Extinguishing the Fire from outside the Building
2. Yard Hydrants are installed at below mentioned intervals, based on the Type of Hazard
  - a. Light Hazards – 30 Mtrs
  - b. Medium Hazards – 45 Mtrs
  - c. High Hazards – 60 Mtrs
3. Yard Hydrant should be installed within 15 meters from the Building Line.
4. Yard Hydrant should be installed, only after all Civil Works like Grinding / Plastering with Whitewash is completed, in the surrounding area
5. Yard Hydrant should be installed beside the Drive Way, in such a way, it doesn't obstruct any Vehicle movement / People movement
6. Yard Hydrant should be installed in such a way, Operating Wheel is at least 500mm away from Wall / any other kind of obstacle, for easy operation
7. Yard Hydrant should be connected to 80mm dia Pipe Tapping
8. Matching Flange's Outer Dia, Inner Dia, No. of Holes & PCD should be exactly matching with Yard Hydrant Valve's Flange.
9. Fabrication of Matching Flange should be done in such a way, center point should be at 1.2 meter Height from Finished Floor Level (FFL)
10. While installing Butterfly Valves for Yard Hydrant, make sure handle doesn't touch the floor, when operated fully, FFL Marking should be taken before fabricating
11. Matching Flange should be fabricated to Pipe Tapping, by making sure all Holes are perpendicular to FFL, in such a way, when Yard Hydrant Valve is installed, it is 100% straight.
12. Yard Hydrant should be installed in such a way, its outlet should be facing downwards.
13. Yard Hydrant should be installed only after applying one coat of Yellow Primer and one coat of Signal Red Paint for Pipes.
14. Yard Hydrant should not be installed near any kind of Electrical Equipment's like :- LT / HT Panel / Transformer Yard / DG / Over Head Power Line (if any)



## **YARD HYDRANT**

15. Only Galvanized Nut, Bolt & Washer should be used for all holes in the flange, no holes should be left open
16. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

**GOOD QUALITY OF YARD HYDRANT VALVE FIXING**



**BAD QUALITY OF YARD HYDRANT VALVE FIXING**





## **RRL HOSE & BRANCH PIPE**

1. RRL Hose is Reinforced Rubber Lined Hose, it is 63mm dia Flexible Hose, with male female coupling on both side, it is used to connect Hydrant Valve and Branch Pipe, to extinguish Fire
2. Branch Pipe is also called as “Short Branch Pipe”, Branch Pipe comes with 3 different nozzle sizes, 15mm, 20mm & 25mm
3. RRL Hose & Branch Pipe Indent should be given only after cross checking and confirming that RRL Hose & Branch Pipe Approved TDS with SLD is in line with BOQ Specification and Actual Requirement as per Pumps.
4. Branch pipe will convert the water pressure into High Velocity Water Jet so that water can reach Maximum Distance to Extinguish the Fire.
5. Branch Pipe is used for holding RRL Hose Steadily, Branch Pipe will be connected to RRL Hose Coupling.
6. RRL Hose and Branch Pipe should be kept on Stand, inside the Fire Duct Shaft, it should never be kept directly on Floor / Chequered Plate
7. Stand should be Fabricated for fixing RRL Hose and Branch Pipe, as shown in Good Practice Photo
8. Stand should be fixed in such a way, it should be convenient to remove and keep back the RRL Hose and Branch Pipe and make sure it doesn't disturb Hydrant Valve Operation / Hose Reel Drum Operation, it should be installed, only after all Civil Works like Grinding / Plastering with Whitewash is completed, inside Fire Duct Shaft
9. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.
10. RRL Hose and Branch Pipe should be kept inside the Fire Duct Shaft, only at the time of Handing Over

**GOOD QUALITY OF FIXING RRL HOSE/BRANCH PIPE**



**BAD QUALITY OF FIXING RRL HOSE/BRANCH PIPE**





## **HOSE REEL DRUM**

1. Hose Reel Drum is also called First Aid Hose, it can be used as a quick-response method for extinguishing fire at the early stages by any common man, it is ideal for class A fires (paper, textiles, wood, plastics, and rubber), it should not be used in case of electrical fires.
2. Hose Reel Drum Indent should be given only after cross checking and confirming that Hose Reel Drum Approved TDS with SLD is in line with BOQ Specification and Actual Requirement as per Pumps.
3. Hose Reel Drum is a cylindrical drum, it is used for Storing Fire Fighting Hose
4. 2 Type of Hoses are available, PVC Hose & Rubber Hose
5. 3 Standard Length of Hoses are available, 30mts, 36mts & 40mts
6. Hose Reel Drum should be installed, only after all Civil Works like Grinding / Plastering with Whitewash is completed, inside Fire Duct Shaft
7. Center Point of Hose Reel Drum should be fixed at 1500mm from FFL.
8. Hose Reel Drum should be installed inside Fire Shaft and make sure it is freely rotating even if the hose is pulled from different directions
9. If Fire Duct Shaft length is too long, Hose Reel Drum should not be installed in full Depth, it should be installed near the Fire Duct Door, in such a way it is easily accessible, at the time of Emergency
10. Hose Reel Drum should be installed in such a Location, it should not be disturb the Hydrant Valve Operation.
11. Hose Reel Drum should be always installed by using fastener in Concrete Wall / Column / Piler, however, if the same is not possible, as a last option, it should be fixed to Brick Wall / Solid Concrete Block / Light Weight Fly Ash Brick, by drilling Through Hole and fix Long Bolt, in such a way it is fixed on either side of the wall, after discussion with Client.
12. Only Galvanized Nut, Bolt & Washer should be used for all holes in the Hose Reel Drum Plate, no holes should be left open
13. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

**GOOD QUALITY OF HOSE REEL DRUM FIXING**



**BAD QUALITY OF HOSE REEL DRUM FIXING**





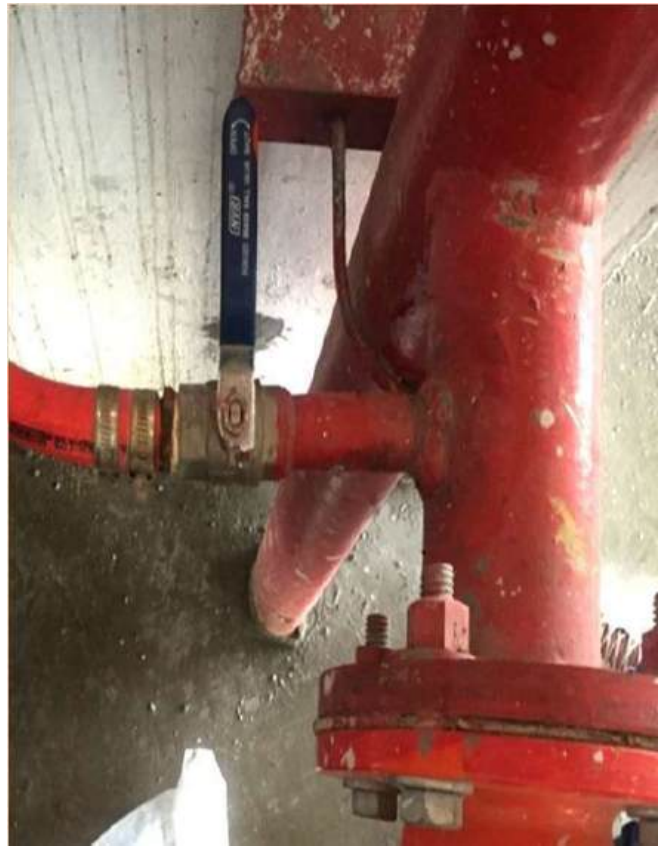
## HOSE REEL DRUM TAPPING

1. Hose Reel Drum Tapping is done to connect Hydrant Raiser and Hose Reel Drum
2. Hose Reel Drum Tapping should be 25mm dia Pipe Nipple and length should be 150mm
3. Hose Reel Drum Tapping should be done, only after all Civil Works like Grinding / Plastering with Whitewash is completed, inside Fire Duct Shaft
4. Hose Reel Drum Tapping should be taken directly from Hydrant Riser, for connecting Hose Reel Drum, it should never be taken from Hydrant Tapping Pipe
5. Hose Reel Drum Tapping should be Done below 300mm from Hydrant Valve Tapping.
6. Hose Reel Drum Tapping should be done Perpendicular to Hydrant Raiser
7. Hose Reel Drum Tapping should be done in the same side where hose reel drum is installed, so that connection pipe does not get bend / twisted.
8. Only after full welding of the Hose Reel Drum Tapping, Needle Valve / Gate Valve / Ball Valve should be fixed, for controlling the Water Flow
9. Hose Reel Drum Tapping should be done in such a location, Needle Valve / Gate Valve / Ball Valve is easily accessible, at the time of Emergency
10. After fixing Needle Valve / Gate Valve / Ball Valve, 25mm X 20mm Hose Adapter should be fixed to Needle Valve / Gate Valve / Ball Valve and Connecting Hose

**GOOD QUALITY OF TAPPING FOR HOSE REEL DRUM**



**BAD QUALITY OF TAPPING FOR HOSE REEL DRUM**





## **HOSE REEL DRUM- CONNECTION HOSE**

1. Hose Reel Drum Connection Hose should be fixed only after all Civil Works like Grinding / Plastering with Whitewash is completed, inside Fire Duct Shaft
2. Hose Reel Drum Connection Hose should be 19mm dia
3. Correct Size Hose should be used, so that full Pressure Water Flow will be there
4. Connection Hose should Not be Very Tight, because it will get Cut / Strip Off very easily
5. Connecting Hose should Not be Very Loose, because it will get Twisted / Bent very easily
6. Correct Size Hose Clamps should be used, so it gets Tightened properly
7. Galvanized Nut Bolt Type Hose Clamps should be used, Worm type clamp should not be used
8. After fixing Connection Hose, Needle Valve / Gate Valve / Ball Valve should be opened to charge the Connection Pipes and Hose Reel Drum, to check any kind of leakages

**GOOD QUALITY OF**  
**HOSE REEL DRUM- CONNECTION HOSE**



**BAD QUALITY OF HOSE REEL DRUM- CONNECTION HOSE**





## **FIRE DUCT SHUTTER**

1. Fire Duct Shutter should be installed, only after all Civil Works like Grinding / Plastering with Whitewash is completed, Inside & Outside of Fire Duct Shaft
2. Fire Duct Shutter is used to cover the Fire Duct Opening
3. Fire Duct Shutter Indent should be given only after cross checking and confirming that Fire Duct Shutter Approved TDS with SLD is in line with BOQ Specification and Actual Requirement as per Pumps.
4. Fire Duct Shutter has 2 Nos Openable Shutter, for easy access, in case of emergency
5. Standard Fire Duct Shutter Size is 1200 mm (Height) \* 900 mm (Width)
6. Fire Duct Shutter comes with Universal Locking arrangements, by which any of the Key can be used for opening any of the Fire Duct Shutter.
7. Duct Opening should start from Minimum 600mm and maximum 750mm from FFL level, which will make sure water flow is smooth, because RRL Hose will not get bent, due Fire Duct Shutter Height
8. Fire Duct Opening Size should be measured separately for each shutter at Site, before giving Indent
9. If the actual size of Fire Duct Opening is bigger than the size mentioned in WO, separate Quote should be sent and Approval should be obtained, before giving Indent
10. Fire Duct Shutter should be fixed maintaining Water Level / Plumb Level.
11. Fire Duct Shutter should be fixed at 90 degree only, no tilt should be visible, when seen from far
12. Fire Duct Shutter should be fitted smoothly, it should never be forced / hammered to fit in, however, if the Civil Work is having any kind of variation, inform the Client and get it rectified.
13. After doing all alignment, holes should be marked and remove the Fire Duct Shutter, then make 8mm hole and fix it with coach screw, for every hole in Fire Duct Shutter Frame
14. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

**GOOD QUALITY OF FIRE DUCT SHUTTER FIXING**



**BAD QUALITY OF FIRE DUCT SHUTTER FIXING**





## **FIRE HOSE BOX**

1. Fire Hose Box is also called as Fire Hose Cabinet
2. Fire Hose Box is used for storing RRL Hose and Branch Pipe
3. Fire Hose Box Indent should be given only after cross checking and confirming that Fire Hose Box Approved TDS with SLD is in line with BOQ Specification and Actual Requirement as per Pumps.
4. Fire Hose Box is installed near every Internal Hydrant Valve which is installed out side the Fire Duct / near every Yard Hydrant.
5. Fire Hose Box should be installed in such a location, which is easily accessible from all directions, in case of emergency
6. For installing Fire Hose Box, 80 mm GI pipe should be fixed vertically on RCC Pedestals, in such a way it is firmly fixed without any Bend / Tilt
7. If the pipe is going underground, Wrapping Coating should be done for underground portion of pipe.
8. Fire Hose Box bottom size Frame should be fabricated in “L” Angle and the same should be fixed on 80mm dia Vertical Pipe
9. Fire Hose Box should be fixed on Fabricated “L” Angle Frame and make sure it is 100% aligned
10. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

**GOOD QUALITY OF FIRE HOSE CABINET FIXING**



**BAD QUALITY OF FIRE HOSE CABINET FIXING**





## **FIRE BRIGADE INLET (FBI)**

1. Fire Brigade Inlet (FBI) is used for Filling the Water in Fire Fighting System / Sump, by Fire Department, in case, if the Water is Empty in Fire Fighting System
2. 2way FBI is used for filling the Water to 100mm dia Raiser / Filling the Sump
3. 4way FBI is used for filling the Water to 150mm dia Raiser
4. Fire Brigade Inlet (FBI) Indent should be given only after cross checking and confirming that Fire Brigade Inlet (FBI) Approved TDS with SLD is in line with BOQ Specification and Actual Requirement as per Pumps.
5. Matching Flange's Outer Dia, Inner Dia, No. of Holes & PCD should be exactly matching with FBI's Flange.
6. Fabrication of Matching Flange should be done in such a way, center point should be at 1.2 meter Height from Finished Floor Level (FFL)
7. While installing Butterfly Valves for FBI, make sure handle doesn't touch the floor, when operated fully, FFL Marking should be taken before fabricating
8. Matching Flange should be fabricated to Pipe Tapping, by making sure all Holes are perpendicular to FFL, in such a way, when FBI is installed, it is 100% straight.
9. FBI should be installed only after applying one coat of Yellow Primer and one coat of Signal Red Paint for Pipes.
10. FBI should not be installed near any kind of Electrical Equipments like :- LT / HT Panel / Transformer Yard / DG / Over Head Power Line (if any)
11. Only Galvanized Nut, Bolt & Washer should be used for all holes in the flange, no holes should be left open
12. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

**GOOD QUALITY OF FIRE BRIGADE INLET (FBI) FIXING**



**BAD QUALITY OF FIRE BRIGADE INLET (FBI) FIXING**





## **WATER MONITOR**

1. Water Monitor is used to Extinguish the Fire, from outside the Building
2. Water Monitor is the combination of Hydrant Valve with Branch Pipe (Nozzle)
3. Water Monitor has inbuilt Swivel Joint, which is used for rotating 360°degs
4. Whenever Fire / Heat is too much, Water Monitor operator can set the Direction of Spray of Water towards the Hazard and Leave the area, to avoid any kind of immediate danger.
5. Water Monitors are majorly used in Oil Fields, Refineries, Tank Farms, Petrochemical Plants or as recommended by Fire Officer
6. Water Monitors Indent should be given only after cross checking and confirming that Water Monitors Approved TDS with SLD is in line with BOQ Specification and Actual Requirement as per Pumps.
7. Matching Flange's Outer Dia, Inner Dia, No. of Holes & PCD should be exactly matching with Water Monitor's Flange.
8. Fabrication of Matching Flange should be done in such a way, center point should be at 1.2 meter Height from Finished Floor Level (FFL)
9. Matching Flange should be fabricated to Pipe Tapping, by making sure Flange is Parallel to FFL, in such a way, when Water Monitor is installed, it is 100% straight
10. Water Monitor should be installed only after applying one coat of Yellow Primer and one coat of Signal Red Paint for Pipes.
11. Water Monitor should not be installed near any kind of Electrical Equipments like :- LT / HT Panel / Transformer Yard / DG / Over Head Power Line (if any)
12. Only Galvanized Nut, Bolt & Washer should be used for all holes in the flange, no holes should be left open
13. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

**GOOD PRACTICE OF INSTALLING WATER MONITOR**



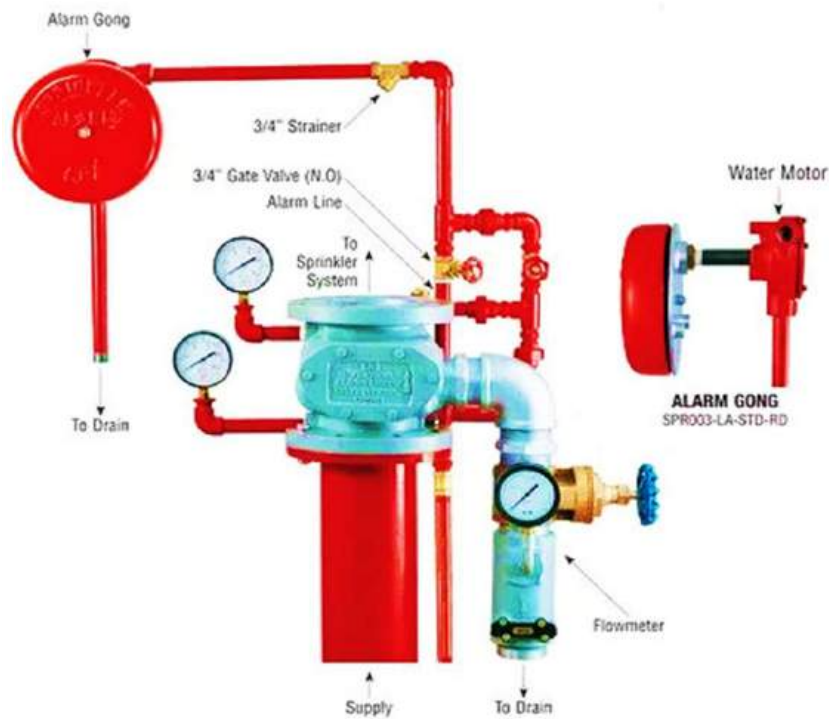


## **BAD PRACTICE OF INSTALLING WATER MONITOR**

## **ALARM GONG BELL**

1. Alarm Gong Bell is also called as Alarm Valve / Isolation Control Valve (ICV)
2. ICV is used for alerting People with sound of an alarm, by Hydraulically Driven Mechanical Bell, when water is flowing in Sprinkler System.
3. ICV does the work of NRV and controls the water flow, by maintaining same Pressure on both side Automatically
4. Indent for ICV should be given, only after cross checking and confirming that ICV Approved TDS is in line with BOQ Specification / Approved Shop Drawing
5. ICV should be installed inside Pump Room, as per NBC 2016
6. Before installing ICV, Gap between 2 flanges should be re-checked and confirmed it is Exactly as per the size of ICV, because, if the gap is more, it may start Leaking / Pipe or Flange Welding may get Damaged, when Bolt Nut is tightened
7. Before installing ICV, both the flanges should be 100% parallel to each other and uniform all-around, without any kind of twist in the flanges, to avoid any kind of Leakage / Damage
8. Matching Flange should be fabricated to Pipe Tapping, by making sure Flange is Parallel to FFL, in such a way, when ICV is installed, it is 100% straight
9. While installing Butterfly Valves near ICV, make sure handle doesn't touch the floor, when operated fully, FFL Marking should be taken before fabricating
10. Matching Flange's Outer Dia, Inner Dia, No. of Holes & PCD should be exactly matching with ICV's Flange.
11. ICV should not be installed near any kind of Electrical Equipments like :- LT / HT Panel / Transformer Yard / DG / Over Head Power Line (if any)
12. ICV should be installed only after applying one coat of Yellow Primer and one coat of Signal Red Paint for Pipes & Flange.
13. Only Galvanized Nut, Bolt & Washer should be used for all holes in the flange, no holes should be left open
14. Never Painting should be done on ICV, Bolt, Nut & Washer
15. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

# GOOD QUALITY OF ALARM VALVE WITH GONG BELL FIXING



## **BAD QUALITY OF ALARM VALVE WITH GONG BELL FIXING**



## **DELUGE VALVE**

1. Deluge Valve is used for Controlling Water Flow, for a Dry Sprinkler / Water Curtain System
2. Deluge Valve has inbuilt Mechanical Actuator, which operates the Diaphragm
3. Separate Sprinkler Line is laid for detecting Fire
4. 25mm dia Pipe is connected from Sprinkler Line to Deluge Valve Chamber
5. Whenever any Sprinkler breaks, Pressure Drops in Sprinkler Line which cause the Pressure Drop in Deluge Valve Chamber, due to Pressure difference, Mechanical Actuator will operate the Diaphragm and allow the Water Flow.
6. Deluge Valve is used for systems like Water Curtain, Medium Velocity Water Spray System, High Velocity Water Spray System and any other system, in which entire system will be dry at initial stage and it will get charged through Deluge Valve in later stage
7. Solenoid Valve can be integrated to Deluge Valve, to operate it electrically
8. Indent for Deluge Valve should be given, only after cross checking and confirming that Deluge Valve Approved TDS is in line with BOQ Specification / Approved Shop Drawing
9. Before installing Deluge Valve , Gap between 2 flanges should be re-checked and confirmed it is Exactly as per the size of Deluge Valve, because, if the gap is more, it may start Leaking / Pipe or Flange Welding may get Damaged, when Bolt Nut is tightened
10. Before installing Deluge Valve, both the flanges should be 100% parallel to each other and uniform all-around, without any kind of twist in the flanges, to avoid any kind of Leakage / Damage
11. Matching Flange should be fabricated to Pipe Tapping, by making sure Flange is Parallel / Perpendicular to FFL, in such a way, when Deluge Valve is installed, it is 100% straight
12. While installing Butterfly Valves for Deluge Valve, make sure handle doesn't touch the floor, when operated fully, FFL Marking should be taken before fabricating
13. Matching Flange's Outer Dia, Inner Dia, No. of Holes & PCD should be exactly matching with Deluge Valve Flange.
14. Deluge Valve should not be installed near any kind of Electrical Equipments like :- LT / HT Panel / Transformer Yard / DG / Over Head Power Line (if any)



## **DELUGE VALVE**

15. Deluge Valve should be installed only after applying one coat of Yellow Primer and one coat of Signal Red Paint for Pipes & Flange.
16. Only Galvanized Nut, Bolt & Washer should be used for all holes in the flange, no holes should be left open
17. Never Painting should be done on Deluge Valve , Bolt, Nut & Washer
18. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.



# **GOOD PRACTICE OF DELUGE VALVE INSTALLATION**

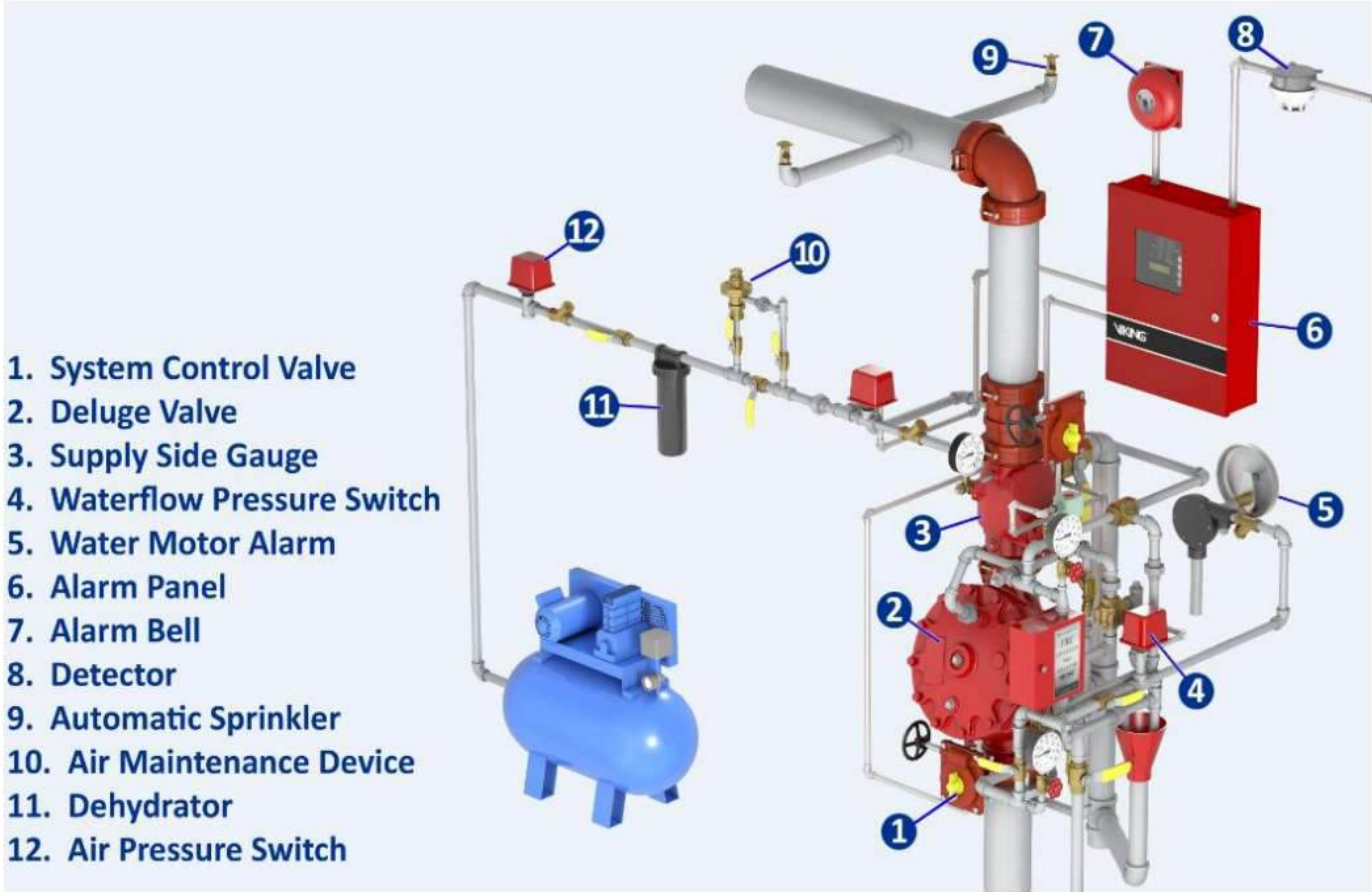


# **BAD PRACTICE OF DELUGE VALVE INSTALLATION**

## **PRE-ACTION SYSTEM**

1. Pre-Action System is used for Controlling Water Flow
2. Pre-Action System is used for Water Curtain System / Medium Velocity Water Spray System / High Velocity Water Spray System and any other system, in which entire Pipe Line will be dry at initial stage and get charged, when Fire Alarm System is Activated
3. Pre-Action System is a combination of many Products, as shown in diagram including Deluge Valve, Note : Different Models have different Combination of Equipment.
4. Pre-Action System comes with 2 types, Electrical Actuator Pre-Action System & Double Interlock Pre-Action System
5. In Electrical Actuator Pre-Action System, Deluge Valve Chamber is Pressurised with Water, the same gets released by Electrical Actuator Valve, when Fire Alarm System is Activated
6. In Double Interlock Pre-Action System, Deluge Valve Chamber is Pressurised with Compressed Air, the same gets released by Electrical Actuator Valve, when Fire Alarm System is Activated
7. Indent for Pre-Action System should be given, only after cross checking and confirming that Pre-Action System Approved TDS is in line with BOQ Specification / Approved Shop Drawing
8. After Pre-Action System is Activated, Other Side of Pipe Line get Charged
9. Matching Flange's Outer Dia, Inner Dia, No. of Holes & PCD should be exactly matching with Pre-Action System Inlet and Outlet Flange.
10. Pre-Action System should not be installed near any kind of Electrical Equipments like :- LT / HT Panel / Transformer Yard / DG / Over Head Power Line (if any)
11. Pre-Action System should be installed only after applying one coat of Yellow Primer and one coat of Signal Red Paint for Pipes & Flange.
12. Only Galvanized Nut, Bolt & Washer should be used for all holes in the flange, no holes should be left open
13. Never Painting should be done on Pre-Action System Equipments, Bolt, Nut & Washer
14. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

# PRE-ACTION SYSTEM





# **GOOD PRACTICE OF INSTALLATING PRE-ACTION SYSTEM**



# **BAD PRACTICE OF INSTALLATING PRE-ACTION SYSTEM**



## **MOTORIZED BUTTERFLY VALVE**

1. Motorized Butterfly Valve is used for controlling the Water Flow Automatically,
2. Motorized Butterfly Valve is used for Water Curtain System and any other system, in which entire Pipe Line will be dry at initial stage and it will get charged, when Fire Alarm System is activated.
3. Motorized Butterfly Valve is a Gear Operated Valve, which is driven by a Electrical Actuator
4. Motorized Butterfly Valve's Electrical Actuator gets Activated, when Fire Alarm System is Activated.
5. Indent for Motorized Butterfly Valve should be given, only after cross checking and confirming that Motorized Butterfly Valve Approved TDS is in line with BOQ Specification / Approved Shop Drawing
6. Before installing Motorized Butterfly Valve, Gap between 2 flanges should be re-checked and confirmed it is Exactly as per the size of Motorized Butterfly Valve, because, if the gap is more, it may start Leaking / Pipe or Flange Welding may get Damaged, when Bolt Nut is tightened
7. Before installing Motorized Butterfly Valve, both the flanges should be 100% parallel to each other and uniform all-around, without any kind of twist in the flanges, to avoid any kind of Leakage / Damage
8. Matching Flange should be fabricated to Pipe Tapping, by making sure Flange is perpendicular to FFL, in such a way, when Motorized Butterfly Valve is installed, it is 100% straight
9. Motorized Butterfly Valve should be installed only after applying one coat of Yellow Primer and one coat of Signal Red Paint for Pipes & Flange.
10. Only Galvanized Nut, Bolt & Washer should be used for all holes in the flange, no holes should be left open
11. Never Painting should be done on Motorized Butterfly Valve, Bolt, Nut & Washer
12. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

# GOOD PRACTICE OF MOTORIZED BUTTERFLY VALVE INSTALATION










# **BAD PRACTICE OF MOTORIZED BUTTERFLY VALVE INSTALATION**



## **FIRE EXTINGUISHER INSTALLATION**

1. Indent for Fire Extinguisher should be given, only after cross checking and confirming that Fire Extinguisher Approved TDS is in line with BOQ Specification / Approved Shop Drawing
2. Indent for Fire Extinguisher should be given, only when Customer is Ready to take Handover
3. Fire Extinguisher should be installed in every Staircase Landing and all other location as mentioned in Approved Shop Drawing
4. Fire Extinguishers should be installed in such a Location, Travel Distance is within “**Travel Distance Between Extinguishers**”
5. Fire Extinguishers should be installed in such a Location, it is easily Visible and Accessible
6. Fire Extinguishers should Not be installed in such a Location, where it is disturbance to people who are passing by
7. Fire Extinguisher’s Bracket should be Installed, only after all Civil Work / POP Work / Putty / Primer / 1 Coat of Painting is completed in concerned Walls
8. Fire Extinguisher Bracket should be Installed in such a way, Fire Extinguisher Top will be at 5 feet / 1.53 Mtrs from FFL
9. Fire Extinguisher Bracket should be Installed by using Fasteners
10. Fire Extinguisher Bracket should be installed Perpendicular to FFL and make sure it is aligned perfectly, so that when Fire Extinguisher is mounted, it should be 100% Straight.
11. Fire Extinguishers should be fully locked inside the brackets, so that it doesn’t fall off, when people touch it
12. Expiry Date should be Valid, at the time of Handing over to Clients
13. Fire Extinguishers should be mounted on its Bracket, only after Final coat Painting is completed in that entire Area
14. Fire Extinguishers Seal should not be opened at the time of Installation & Handing over.
15. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.
16. Never Painting should be done for Fire Extinguisher & Bracket

## TRAVEL DISTANCE BETWEEN EXTINGUISHERS

Extinguisher Class	Max Travel Distance	NFPA 10 Section (2018 ed.)	Notes
Ordinary  Combustibles	75 ft	Table 6.2.1.1	Travel distance can be altered by the type of hazard anticipated and the numerical A rating of the extinguisher.
Flammable  Liquids	30 ft or 50 ft	Table 6.3.1.1	Travel distance is based on the type of hazard anticipated and the numerical B rating of the extinguisher. See table 6.3.1.1 below.
Electrical  Equipment	N/A	6.4.3	Since extinguishers are never only Class C rated you need to follow the Class A or Class B rating requirements.
Combustible  Metals	75 ft	6.5.2	
K Cooking Media 	30 ft	6.6.2	Class K: Cooking Media

## GOOD PRACTICE FOR FIRE EXTINGUISHER INSTALLATION



## **BAD PRACTICE FOR FIRE EXTINGUISHER INSTALLATION**





## **FIRE BUCKET WITH STAND**

1. Fire Bucket is used for Storing Sand and Water, which will be used to Extinguish the Fire
2. Indent for Fire Bucket and Stand should be given, only after cross checking and confirming that Fire Bucket and Stand Approved TDS is in line with BOQ Specification and Actual Requirement as per NOC, issued by Fire Department.
3. Fire Bucket should be Round Bottom Type.
4. Fire Bucket should be 9 Liters Capacity.
5. Fire Buckets should be Fabricated with Galvanized Steel.
6. Fire Bucket Stand Size should be based on No. of Fire Buckets, in that particular Location
7. Fire Bucket Stand should be Fabricated, as per “Chart for Fabricating Fire Bucket Stand”
8. If Fire Buckets should be kept out side the Building, Cover should be provided for Fire Buckets / Canopy should be provided for Fire Bucket Stand.
9. Fire Bucket should be Supplied, only when Customer is Ready to take Hand over
10. Fire Bucket should be Kept in Visible and Easily Accessible Location
11. Dry Sand & Water should be filled in Alternate Fire Bucket.
12. One coat of Primer and 2 coat of Black Paint should be applied, for Fire Bucket Stand
13. Fire Bucket should be hanged in Stand, only after Final coat Painting is completed for Stand
14. Fire Bucket and Stand should be kept in concerned Location, only after confirming Final Coat Painting is completed in that entire Area

**GOOD PRACTICE OF FIRE BUCKETS INSTALLING**



**BAD PRACTICE OF FIRE BUCKETS INSTALLING**





## **BOOSTER PUMP**

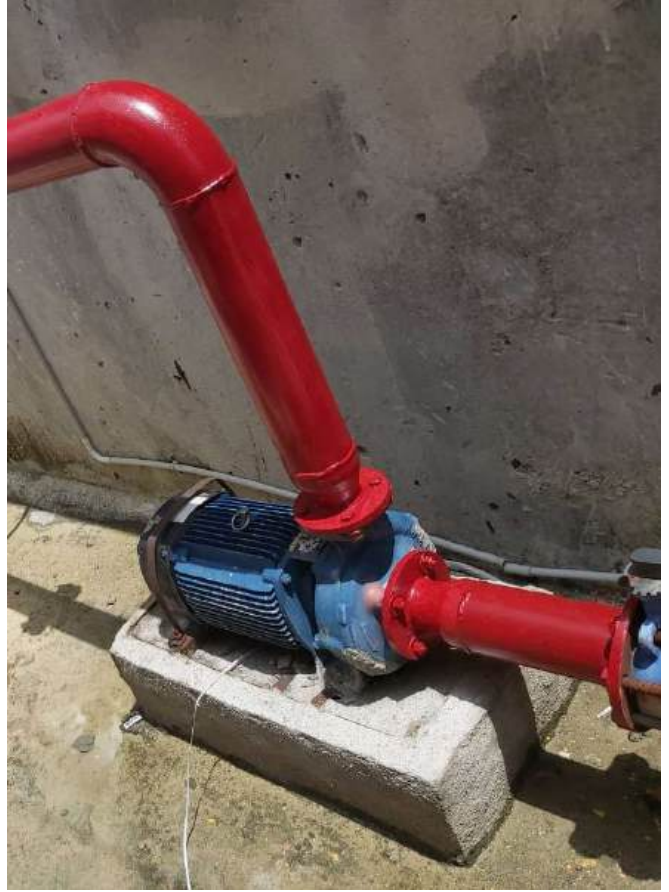
1. Booster Pump is used for pressurising the entire Pipe Line of the building, for doing Fire Fighting, in case of Fire.
2. Indent for Booster Pump should be given, only after cross checking and confirming that Pump Approved TDS is in line with BOQ Specification and Actual Requirement as per NOC, issued by Fire Department.
3. While Finalising Booster Pumps Location, below mentioned points should be followed :-
  - a) It should have a Roof for Pump, to protect from rain
  - b) Preferably it should be Near Over Head Tank / Riser
  - c) It should be as per Approved Shop Drawing, if changed, Client Approval to be taken
  - d) Enough Space should be maintained all around the Booster Pump and Roof Height should be at least 6ft., for Installation and Servicing purpose
4. Booster Pump Height should be calculated in such a way, its inlet should be equal or lower than Puddle Flange Height, to maintain Positive Suction.
5. Booster Pump Height should be calculated in such a way, its inlet should be equal or more than "Y" Strainer Height, including the Gap required for Servicing.
6. Enough Support should be Welded to the Booster Pump Base Frame, as per the decided Height and make sure it is 100% stable and aligned perfectly in all direction, including height level, without any shaking, before concreting.
7. Shuttering for Pedestal should be minimum 4" extra, all around the Booster Pump Base Frame
8. Concrete should be done till the bottom of the Base Frame, never it should come above the Base Frame.
9. Cable Termination should be done properly with correct size Glands and Lugs, there should not be any kind of loose contact, which may cause sparks.
10. Correct size Earthing Strips should be installed, for Booster Pump, as per Approved Shop Drawing.
11. Only Galvanized Nut, Bolt & Washer should be used for all holes in the Booster Pumps Base Frame, no holes should be left open
12. Visual Inspection should be done and confirm that Shaft Alignment is perfect before starting the Pumps



## **BOOSTER PUMP**

11. Never Painting should be done for Booster Pump, Bolt, Nut & Washer
12. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

**GOOD PRACTICE OF BOOSTER PUMP INSTALLATION**



**BAD PRACTICE OF BOOSTER PUMP INSTALLATION**



## **MCC PANEL FOR BOOSTER PUMP**

1. MCC Panel means Motor Control Center, it is used for Automatic Operation of Booster Pump, at Set Pressures, using Pressure Switches.
2. Indent for MCC Panel should be given, only after cross checking and confirming that MCC Panel Approved TDS is in line with BOQ Specification and Actual Requirement, as per Pumps
3. While Finalising MCC Panel Location, below mentioned points should be followed :-
  - a) It should have a Roof for MCC Panel, to protect from rain
  - b) Preferably it should be near to the Booster Pump
  - c) It should be as per Approved Shop Drawing, if changed, Client Approval to be taken
  - d) Enough Space should be there in front of MCC Panel and Roof Height should be at least 6ft., for Installation, Manual Operation and Servicing purpose
4. MCC Panel should be installed, by making sure it is perfectly aligned, with help of water level.
5. Cabling should be Done, only after installing Booster Pump and MCC Panel.
6. Cables should be laid, above floor level and it should be Clamped firmly, after it is aligned.
7. Cable Termination should be done properly with correct size Glands and Lugs, there should not be any kind of loose contact, which may cause sparks.
8. After confirming all the above mentioned points, incoming Power should be given
9. All Indication lights and Meters in the MCC Panel should be checked.
10. Never Painting should be done for MCC Panel
11. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

## GOOD PRACTICE FOR MCC PANEL INSTALLATION FOR BOOSTER PUMP



## **BAD PRACTICE FOR MCC PANEL INSTALLATION FOR BOOSTER PUMP**





## **CHECK LIST FOR STARTING PUMP ROOM WORK**

1. Before Shifting the Pumps & MCC Panel / Before Constructing Pump Pedestal / Before starting any work in Pump Room, below mentioned points should be checked and confirmed :-
  - a) Pump Room Size should be sufficient to install all Pumps & MCC Panel as per Approved Shop Drawing.
  - b) Cross Check the Puddle Flange Height if it is in line with our requirement for “Y” Strainer / it should be as per Approved Shop Drawing
  - c) All Puddle Flanges inside Pump Room should have been Closed, without any Water Leakage
  - d) Water Proofing Work should have been Completed inside Fire Sump
  - e) Cutout should have been provided for all our Pipes and for Diesel Engine Exhaust Line
  - f) If any kind of opening (Ventilator / Duct / OTS) is provided in the Ceiling of Pump Room, the same should be closed
  - g) Windows should have been Provided in Walls of Pump Room for Natural Ventilation.
  - h) Walls & Ceiling Plastering Work should have been completed inside the Pump Room, without any kind of Leakage
  - i) Flooring Work should have been completed inside the pump room, without any kind of Leakage
  - j) Bund should have been Constructed in the Entrance of Pump Room / Pump Room Entry should be at least 6" Above Parking Level (FFL), in such a way, Water doesn't Enter the Pump Room, in case of Flooding.
  - k) Painting Work should have been Completed in Pump Room
  - l) Proper Lighting should have been provided inside Pump Room
  - m) Door should have been Fixed for Pump Room, with Locking Facility

**GOOD PRACTICE FOR STARTING PUMP ROOM WORK**



**BAD PRACTICE FOR STARTING PUMP ROOM WORK**





## **PEDESTAL FOR PUMP & MCC PANEL**

1. Pedestals for Pumps are provided to match Pumps Inlet level to the Puddle Flange Height, to maintain it as Positive Suction.
2. Pedestals for Pumps and MCC Panel are provided to install them at higher level than FFL, to avoid any kind of damage due to Water Logging.
3. Pedestal Marking for Pumps & MCC Panel should be done as per Approved Shop Drawing if changed, Client Approval to be taken and also make sure enough gap is maintained all around, for Installation and servicing purpose
4. While Finalising Pumps & MCC Panel Location, below mentioned points should be followed :-
  - a) It should have a Roof, to protect from Rain
  - b) Preferably it should be Near to Sump
  - c) Roof Height of Pump Room should be at least 10ft., for Installation and Servicing purpose
  - d) MCC Panel location should be near to all the Pumps, inside the Pump Room
  - e) Make sure there is No Cut Out / Opening, near to the Pump / MCC Panel, in which some Debris / Water may enter.
5. Before Pedestal Marking for Diesel Engine Driven Pump, Exhaust Line Route should be Finalised with minimum bends.
6. Pedestal Marking for Pumps & MCC Panel should be cross checked Physically and make sure it is 150mm bigger than Base Channel Support Dimensions of Pumps & MCC Panel, in all sides.
7. Pedestal Marking for each Pump should be cross checked and make sure it is in line with concerned Pump's GI Drawing
8. Pedestal Height should be decided based on Puddle flange Height, to maintain it as Positive Suction.
9. Puddle Flange Height Level should be Transferred to Pump Inlet Level, with help of Water Level, for calculating the Pedestal Height
10. Pedestal Height of MCC Panel should be Minimum 9" from FFL, to avoid any Damage, due to Water Logging



## **PEDESTAL FOR PUMP & MCC PANEL**

11. If Base Channel Supports is not provided for Vertical Pumps / any other Pumps, the same should be Fabricated and consider that Support Height, for calculating the Pedestal Height
12. Antivibration Pads should not be used, however, if the same is mentioned in Approved Shop Drawing, height of Antivibration Pad should be considered for calculating the Pedestal Height
13. After Shuttering, Sleeve should be provided for “J” Bolt, as per Approved Shop Drawing.

**GOOD PRACTICE FOR PEDESTAL CONSTRUCTION FOR PUMP & MCC PANEL**



**BAD PRACTICE FOR PEDESTAL CONSTRUCTION FOR PUMP & MCC PANEL**





## **PUMPS INSTALLATION**

1. Pumps are used for pressurising the entire Pipe Line of the building, for doing Fire Fighting, in case of Fire.
2. Pump Indent should be given, only after cross checking and confirming that Pump Approved TDS is in line with BOQ Specification and Actual Requirement as per NOC, issued by Fire Department.
3. Pump Inlet level should be matched to Puddle Flange Level, to maintain it as Positive Suction.
4. Pump Pedestal's Location should have been Finalised, by adhering to all the points mentioned in "Pedestal for Pumps & MCC Panel".
5. Pump Pedestal should have been Constructed, by adhering to all the points mentioned in "Pedestal for Pumps & MCC Panel".
6. Pump should be installed as per Approved Shop Drawing
7. If Base Channel Supports is not provided for Vertical Pumps / any other Pumps, the same should be Fabricated and Fixed
8. Before Shifting the Pump on Pedestal, minimum 7 Days Curing & De-Shuttering should have been done for Pedestals
9. Before Shifting the Pump on Pedestal, it should be fully dry
10. Antivibration Pads should not be used, however, if the same is mentioned in Approved Shop Drawing, those should be installed, before positioning the Pump
11. Sleeve for "J" Bolt should have been provided, as per Approved Shop Drawing & GI Drawing.
12. "J" Bolt should be fixed after shifting the pumps on pedestals
13. After shifting the Pumps on Pedestals, Galvanized Nut and Washer should be put for every "J" Bolt, nothing should be left open
14. Pump Alignment should have been done, before doing the Grouting for "J" Bolt.
15. Plastering for Pedestals should be done, only till bottom of the Pump Base Frame, never it should come above.
16. Visual Inspection should be done and confirm that Shaft Alignment & Gland packing is perfect before starting the Pumps.



## **PUMP INSTALLATION**

17. Diesel Engine Control Panel should be installed in such away it is easily accessible for operations
18. Cables should have been Laid and Terminated, by adhering to all the points mentioned in “Pump Room Cabling and Earthing”.
19. Earthing should have been done for all the Pumps , by adhering to all the points mentioned in “Pump Room Cabling and Earthing” and as per Approved Shop Drawing.
20. Never Painting should be done for Pumps, Motors, Diesel Engines, Base Frames, DG Panel, Diesel Tank and all other Accessories
21. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

# GOOD PRACTICE FOR PUMP INSTALLATION



# **BAD PRACTICE FOR PUMP INSTALLATION**





## **INLET & OUTLET FOR PUMPS**

1. Below mentioned details should be given while giving Indent for Inlet and Outlet Matching Flange of Pumps
  - a) No. of Holes in the Flange
  - b) Inner dia of the Flange
  - c) Outer dia of the Flange
  - d) PCD of the Flange
2. Before starting the Fabrication of Inlets & Outlet Pipes, Matching Flange should be cross checked with Pump Flange and make sure it is matching 100%
3. All Valves used in Pump Inlet side, should be PN 10 / PN 16
4. All Valves used in Pump Outlet side, should be Next Available PN Rating Valves, of the Pump Head
5. Eccentric Reducer is used to reduce the Air Entrapping in Suction Line. Correct Size Eccentric Reducer should be used to Reduce Suction Side Pipe Size to Pump Flange Size.
6. Correct Size Concentric Reducer should be used to Reduce Delivery Side Pipe Size to Pump Flange Size.
7. All Pipe dia should be as per Approved Shop Drawing
8. Suction Header & Tapping Pipe should be at the Same Level of Pump Inlet Flange, it should never be at Below Level
9. Dia of Gate Valve / Butterfly Valve, Strainer & Expansion Bellow should be same as Suction Side Pipe Size.
10. Suction Side Pipe Size should be One Size Bigger than Delivery Size Pipe Size.
11. Dia of NRV, Gate Valve / Butterfly Valve & Expansion Bellow should be same as Delivery Side Pipe Size.
12. Non Return Valve (NRV) should be Dual Plate Type NRV / Swing Check Type NRV, it should never be Wafer Type NRV in Pump Room.
13. MS Structural Support should be 100 mm away from any Valve / Fitting / Joint
14. Inlets Pipes, Outlets Pipes and all Valve / Fitting / Joint of all Pumps should be aligned to each other

**GOOD PRACTICE OF INLETS FOR PUMPS**



**BAD PRACTICE OF INLETS FOR PUMPS**



**GOOD PRACTICE OF OUTLET FOR PUMPS**



**BAD PRACTICE OF OUTLET FOR PUMPS**





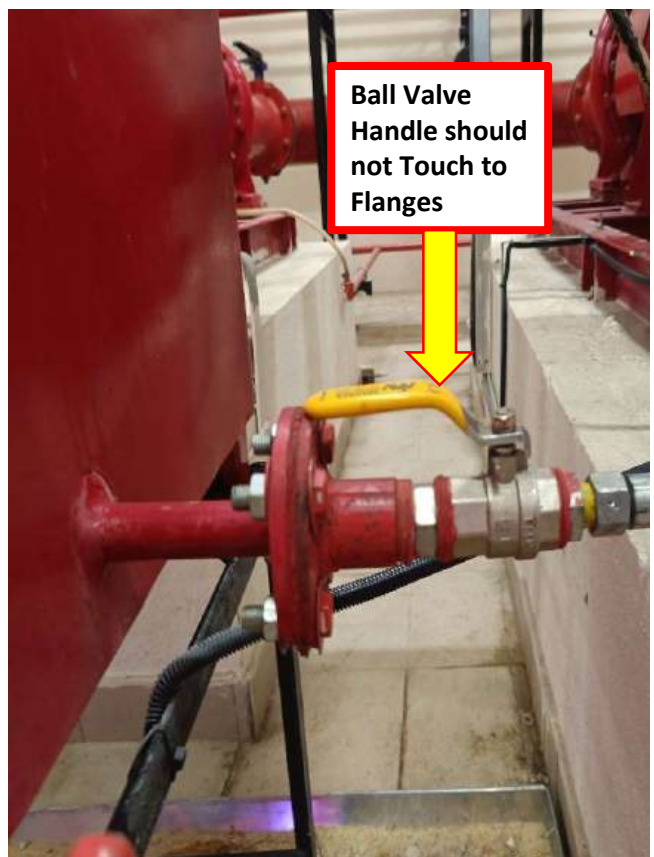
## **DIESEL TANK**

1. Diesel Tank is used for storing Diesel, for Diesel Engine Driven Pump
2. Standard Diesel Tank Capacity is 200 Liters
3. Indent for Diesel Tank should be given only after checking BOQ Specification with Actual Requirement as per Diesel Engine Pumps.
4. Diesel Tank should be kept on a Stand
5. Stand should be Fabricated with “L” Angle
6. Diesel Tank Stand Height should be such that, Diesel Outlet of the Tank should be Higher than Fuel Pump of Diesel Engine, so that Diesel will flow to Pump in gravity itself.
7. If Filling of Diesel is Not Convenient, due to more Height, the same should be informed to Client to construct steps
8. Before installing the Diesel Tank, Visual Inspection should be done and confirm that there is no Cracks / Pin Holes in Tank
9. Diesel Tank should be kept near to Diesel Engine
10. Diesel Tank Location should be convenient for filling the Diesel
11. Diesel Tank Location should Not be near MCC Panel
12. Both Fuel Inlet & Outlet should be connected from Diesel Tank to Engine, through a Fuel Pipe
13. Ball Valve for Diesel Tank Outlet Line should be Fixed in such a way, sufficient gap is available for easy operation.
14. Whenever Distance between Diesel Engine and Diesel Tank is up to 2 Mts., 15mm PVC Hose should be used as Fuel Pipe, if it is more then 2 Mts., 20mm MS Pipe should be used, however, GI Pipe should not be used as Fuel Pipe, since Diesel reacts with Zinc and dissolves, which will contaminate the Diesel
15. At the time of Maintenance, Drain Connection should used for draining the Diesel.
16. Fuel Indicator should be observed, to identify the Diesel Level in the Tank, so that it doesn't overflow, while filling Diesel.
17. Diesel Tank should not be installed opposite to the Radiator it should be placed beside Pedestals with minimum 150mm gap.

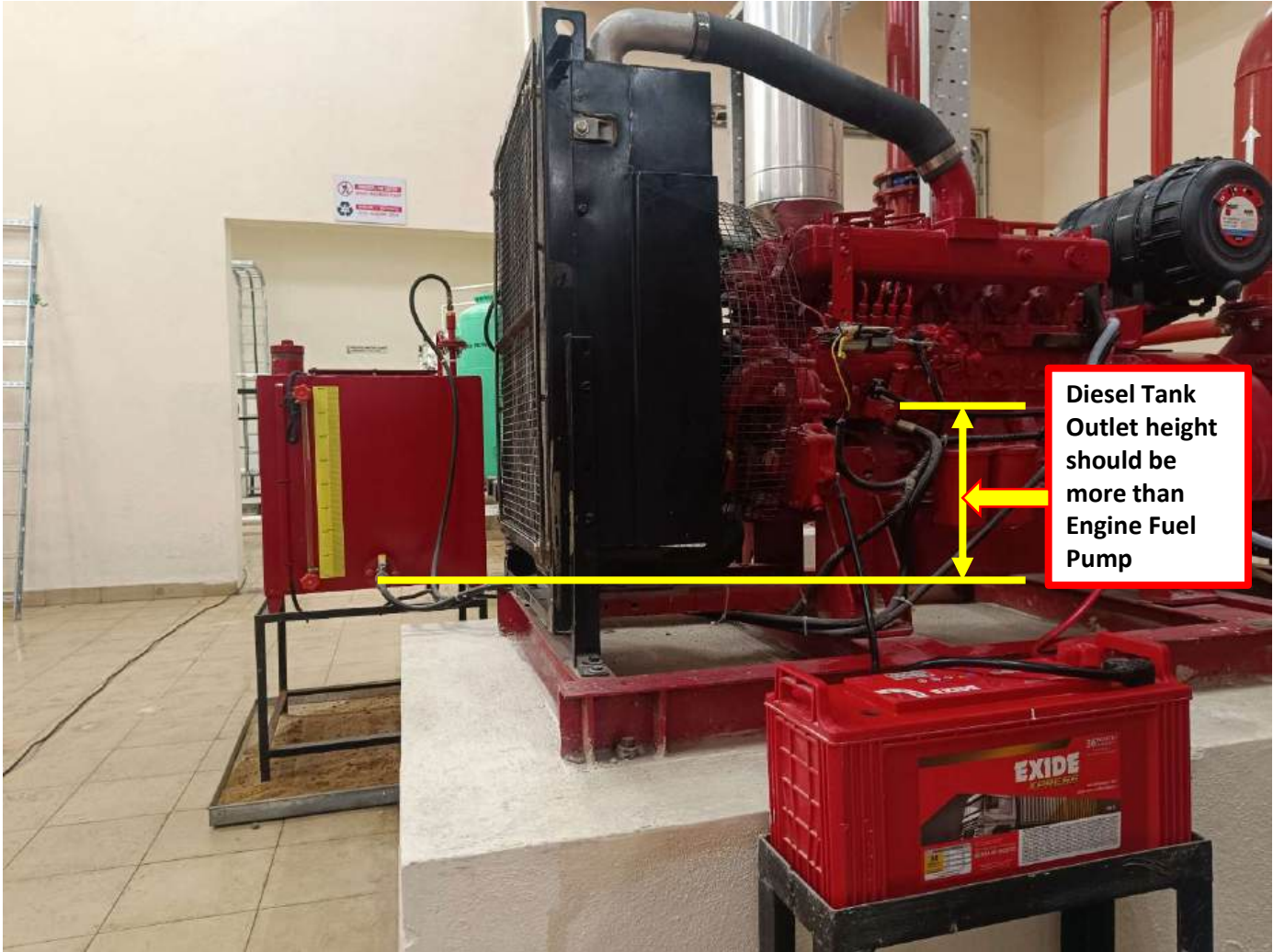
**GOOD PRACTICE FOR DIESEL TANK INSTALLATION**



# BAD PRACTICE FOR DIESEL TANK INSTALLATION



# **BAD PRACTICE FOR DIESEL TANK INSTALLATION**





## **BATTERY FOR DIESEL ENGINE**

1. One Battery should be provided, for 4R (12 v) Diesel Engine Model.
2. Two Batteries should be provided, for 6R (24 v) Diesel Engine Model.
3. Indent for Batteries should be given only after checking BOQ Specification with Actual Requirement as per Diesel Engine Pumps.
4. Before Connecting Batteries, Distill Water Level should be checked and confirmed it is correct
5. Before Connecting Batteries, Voltage should be checked and confirmed it is fully Charged.
6. Location of Batteries should be such that it is easily accessible for servicing
7. Location of Batteries should be near to Diesel Engine Control Panel.
8. Location of Batteries should Not be near Radiator / Diesel Tank / Fuel Pipe
9. Batteries should be always kept on Stand; it should never be kept directly on Floor.
10. Stand should be Fabricated with one Inch “L” Angle
11. Stand Size should be equal to Batteries Total Size.
12. Stand Height should be 300mm, so that Batteries will be kept 300mm higher than Floor level.
13. Correct Length and Correct Sq.mm Connection Cable should be used
14. Grease / Vaseline should be applied on all Battery Terminal, before Fixing Battery Cable.
15. Both side Cable Termination should be done tightly (Engine Panel and Battery Terminals) and make sure it is not having any loose contact, which may cause spark.

**GOOD PRACTICE FOR BATTERY INSTALLATION**



# BAD PRACTICE FOR BATTERY INSTALLATION



## **EXHAUST LINE FOR DIESEL ENGINE**

1. Exhaust Line is used for routing the smoke away from Diesel Engine area
2. If Multiple Diesel Engines are there, separate Exhaust Line should be installed for each Diesel Engine, if not, it will have back pressure.
3. MS “B” Class (Medium Grade) Pipe should be used for Fabricating Exhaust Line, however, if any other Type of Pipe is mentioned in BOQ, the same should be used
4. Routing for Exhaust Line should be Finalised by following below mentioned Points :-
  - a) Never Exhaust Line should be taken Under Ground.
  - b) Too many Bends should Not be Used in Exhaust Line, which will cause back pressure.
  - c) Exhaust Line should Not be Terminated inside Pumproom / Basement / Near any Combustible Material Storage Area / In any Closed Area where people movement is there
  - d) Exhaust Line should be Terminated in Nearest Driveway / Set Back Area / Compound Wall / Terrace
5. After Finalising the Routing for Exhaust Pipe, Approval should be taken from Client.
6. After obtaining Approval for Routing, Indent should be given for Exhaust Pipe.
7. Fabrication of Exhaust Line should be done as per Approval
8. Minimum 200mm Tool Piece should be welded to Exhaust Line Outlet Elbow, so that Rainwater will never Enter Exhaust Line.
9. Only after Exhaust Pipe Line Welding work is Completed, it should be connected to Diesel Engine Pump, so that Welding Flux will not enter in to Diesel Engine.
10. After connecting Exhaust Pipe Line to Diesel Engine Pump, one Coat of Primer and two Coat of Black Paint should be applied
11. Only after Painting the Exhaust Pipe Line, Aluminum Cladding should be done
12. Aluminum Cladding should be done only inside the Pump Room, however, it can be done outside the Pump Room, only if it is mentioned in Shop Drawing / BOQ.
13. Welding should not be done near Aluminum Cladding, because it will get Damaged

**GOOD PRACTICE FOR EXHAUST LINE WITH CLADDING**



**BAD PRACTICE FOR EXHAUST LINE WITH CLADDING**



## MCC PANEL

1. MCC Panel means Motor Control Center
2. MCC Panel is used for making every Pump to work Automatically, at Preset Pressures set in Pressure Switch of concerned Pump.
3. MCC Panel Indent should be given only after cross checking and confirming that MCC Panel Approved TDS with SLD is in line with BOQ Specification and Actual Requirement as per Pumps.
4. MCC Panel Pedestal's Location should have been Finalised, by adhering to all the points mentioned in "Pedestal for Pumps & MCC Panel".
5. MCC Panel Pedestal should have been Constructed, by adhering to all the points mentioned in "Pedestal for Pumps & MCC Panel".
6. Before Shifting the MCC Panel on Pedestal, minimum 7 Days Curing & De-Shuttering should have been done for Pedestal and it should be fully dry
7. **MCC Panel should be Installed, only after making sure all Walls are Plastered and Whitewashed, inside the Pumproom**
8. After shifting MCC Panel on Pedestal, Galvanized Thread rod, Nut and Washer should be put in every Holes of the Base Channel of MCC Panel, nothing should be left open
9. After Installing MCC Panel on Pedestal, Plastering should be done, only till bottom of the MCC Panel Base Frame, never it should come above.
10. Cables should have been Laid and Terminated, by adhering to all the points mentioned in "Pump Room Cabling and Earthing"
11. Earthing should have been done for MCC Panel, by adhering to all the points mentioned in "Pump Room Cabling and Earthing"
12. After confirming all the above-mentioned points, incoming Power should be given
13. All Indication lights and Meters in the MCC Panel should be checked.
14. Never Painting should be done for MCC Panel
15. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

# GOOD PRACTICE FOR MCC PANEL INSTALLATION



# **BAD PRACTICE FOR MCC PANEL INSTALLATION**





## **PUMP ROOM CABLING**

1. Pump Room Cables are used for Current Flow between MCC Panel & concerned Motor
2. Indent for Cable Tray should be given with Specification, after following below mentioned points :-
  - a) Approved TDS is in line with BOQ Specification
  - b) Indent should be given for Perforated Type Cable Tray.
  - c) Only after casting the Pedestals for Pumps and MCC Panel, Cable Tray Route should be Finalised, and actual required Cable Tray measurement should be taken
  - d) Multiple Cables and Earthing Strip can be laid in a single Cable Tray
  - e) Indent should be given for Correct Size (Width and Height) of Cable Tray, which is suitable for fixing No. of Cables of same / different Size & Earthing Strip, in such a way, when all are Laid, exact required Gap should be maintained on both side, for dressing purpose.
  - f) Indent should be given for Correct Length of Cable Tray, because, if it becomes short, it has to be joined with patch, which looks very shabby and if it becomes extra, Client may not give JMR
3. Indent for Pump Room Cable should be given with Specification, after following below mentioned points :-
  - a) Approved TDS is in line with BOQ Specification.
  - b) Cable Indent Specification should be is in line with Motor Capacity
  - c) Cable Size should be selected based on “Cable Selection Chart”
  - d) Only after Finalising Cable Tray Route, actual required Cable measurement should be taken
  - e) Separate Cable should be considered for each Pump, as per “Cable Size Calculation Chart”
  - f) 1 Meter Extra cable should be considered near every Pump to avoid Direct Load on Joints & for Repair & Maintenance
  - g) Long Radius Bends should be considered for all the bends, while calculating Cable Length
  - h) Indent should be given for Correct Length of Cables, because if it becomes short, total Cable will become waste, if it becomes extra more then 1 meter on Pump side, it is unsafe, it look very shabby and Client also may not give JMR



## **PUMP ROOM CABLING**

4. Cable Tray should be installed only after Pumps and MCC Panel are installed
5. Cable Tray should be cut with Hand Cutting Machine; Welding Machine should never be used for Cutting purpose.
6. Only after Installing Cable Tray, Cables should be laid above Floor Level, in Cable Tray.
7. Always Cable should have Long Radius Bends, it should never have Sharp Bend, because it may get cut, on long period
8. Always 1 Meter Extra Cable should be Left Near Every Pump, for Repair & Maintenance.
9. Cable should be Laid in Center of the Cable Tray, by maintaining equal Gap on both side
10. Cable Dressing should be done after Aligning the Cables 100%, in such a way there is No Bend / Loose, in the entire Cabling, before doing the Termination of Cable
11. Cable Ties should be used for Cable Dressing
12. Holes Provided for Cable should be of Exact Size, in such a way, after fixing Cable with Glands, there should not be any Gap.
13. Pump side Cable should have been Terminated, before Terminating Cable in MCC Panel.
14. Cables should be properly Crimped and install Correct Size Glands and Lugs, in such a way Cable is Rigidly Fixed to Body and it is not Shaking / Loose
15. Cables connected to the Pumps should be properly tied with Cable ties.
16. After confirming all the above-mentioned points, incoming Power should be given
17. Never Painting should be done for Cable & Cable Tray

**CABLE SELECTION CHART**

<b>FOR ALLUMINIUM CONDUCTOR, PVC INSULATED CABLE ( 3.5 CORE CABLE )</b>	
Cross-sectional area of Conductor (Sq. mm)	Current Rating of Motor ( in Amps)
25	70
35	86
50	105
70	130
95	155
120	180
150	205
185	240
240	280
300	315
400	375
500	425
630	480

# GOOD PRACTICE FOR CABLE TRAY INSTALLATION

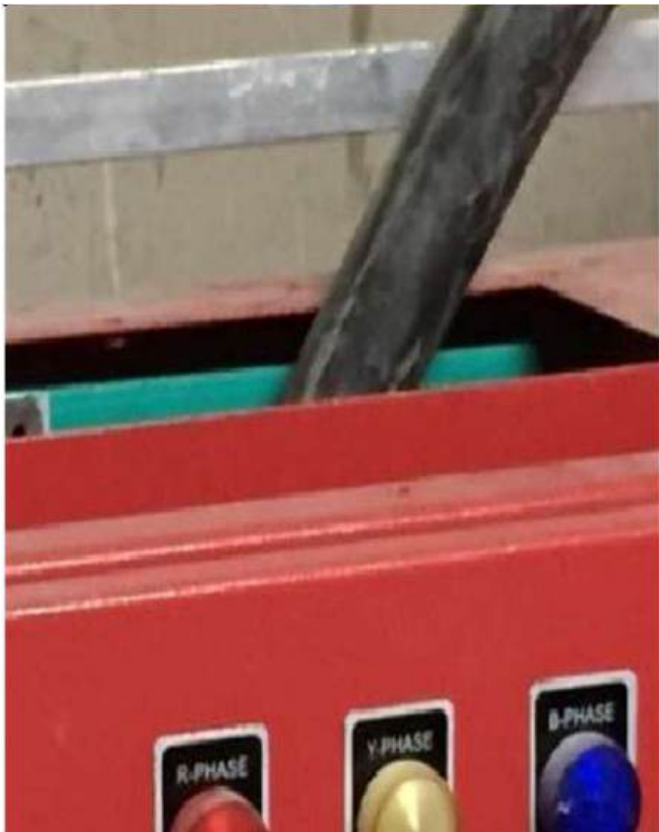


**BAD PRACTICE FOR CABLE TRAY INSTALLATION**





**BAD PRACTICE FOR PUMP ROOM CABLING**





## **EARTHING STRIP**

1. Earthing is used to provide a path for Fault Current to Flow to Earth.
2. Because of Earthing, Protective Device like Circuit Breaker / Fuse will Switch Off the Electric Current to the Circuit, which has the Fault.
3. Indent for Earthing Strip should be given with Specification, after following below mentioned points :-
  - a) Approved TDS is in line with BOQ Specification.
  - b) Earthing Strip Specification should be is in line with Motor Capacity
  - c) Only after Finalising Cable Tray Route, actual required Earthing Strip Measurement should be taken
  - d) Separate Earthing Strip should be considered for each Pump
  - e) Indent should be given for Different Size (Width and Thickness) of Earthing Strip, to suit concerned Motor Capacity
  - f) Indent should be given for Correct Length of Earthing Strip, because, if it becomes short, it has to be joined with patch, which looks very shabby and if it becomes extra, Client may not give JMR
4. Only after Installing MCC Panel and all Pumps, Earthing strip should be Laid
5. Earthing strip should be Laid in such a way, it should be Flash Mounted on Wall / Pedestal / Cable Tray, without any gap in between.
6. Earthing Strip should be cut with Hand Cutting Machine, Welding Machine should never be used for Cutting purpose.
7. After Installing Cable Tray, Earthing Strip should be laid above Floor Level, in Cable Tray.
8. Earthing Strip should be Joined together by welding however, it should Not Be Directly Welded to Cable Tray or any Other Support.
9. After confirming all the above-mentioned points, incoming Power should be given
10. Never Painting should be done for Earthing Strip

**GOOD PRACTICE FOR LAYING EARTHING STRIPS**



**BAD PRACTICE FOR LAYING EARTHING STRIPS**





## **MANIFOLD**

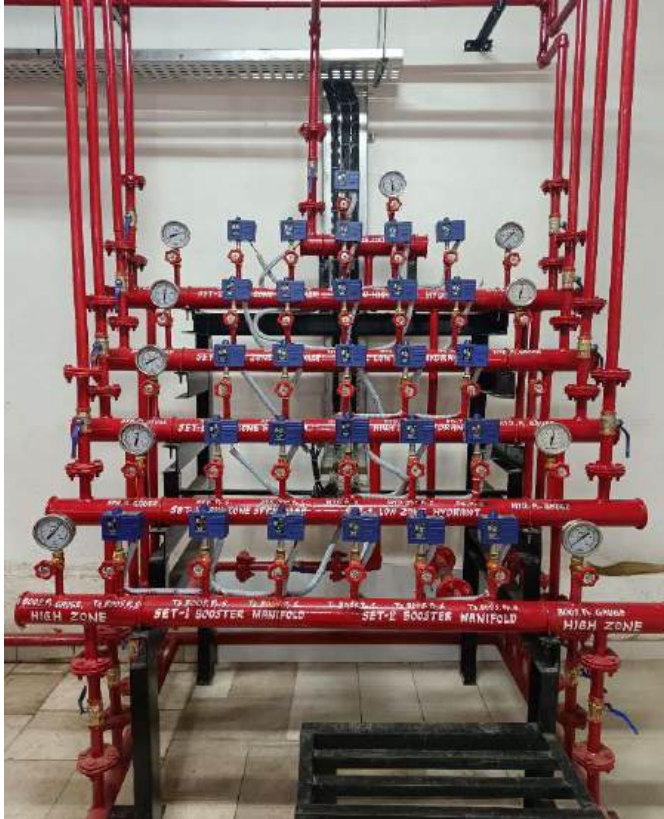
1. Manifold is a Fabricated System with Pressure Switches, Pressure Gauges, Needle Valve & Ball Valve
2. Manifold is used to monitor Pressure in different Systems like Sprinkler, Hydrant & Water Curtain
3. Manifold should be Fabricated with 80mm Dia Pipe, and all Inlets and Drainpipes should be of 25mm Dia / as per Approved Shop Drawing
4. Manifold Length should be calculated to accommodate all Pressure Gauges and Pressure Switches with enough Gap in between, for Installation & Maintenance.
5. Manifold Location should be in such a way, it is Easily Accessible and Visible while Operating the MCC Panel
6. Manifold Height should be in such a way, it is Easily Accessible for Installation & Maintenance
7. All Collars welded in Manifold, for installing Needle Valve should be 100% Perpendicular to the Manifold, all Collars should be at same Height and all aligned together
8. Ball Valve should be used for Inlets and Drainpipes, and it should be installed at such a Height, it is Easily Accessible to operate
9. 25mm Dia Ball Valve should be used for all Inlet and Drain Connections of Manifold
10. 25mm Dia Flanges should be installed for fixing the Ball Valves so that it will be convenient for maintenance.
11. Manifold Drain should be left in Trench or Drainage Pit provided inside the Pump Room
12. One Coat of Primer & One Coat of Paint should be Applied to Fabricated Manifold, before installing Needle Valves, Pressure Gauges & Pressure Switches.
13. Indent should be given for Needle Valve with specification, only after cross checking and confirming that Approved TDS is in line with BOQ Specification, and it should be more than Pump Head.
14. Needle Valves are used to control the Water Flow in Inlet of Pressure Gauge and Pressure Switch
15. Separate Needle Valves should be installed for every Pressure Gauge & Pressure Switch
16. Manifold Location should be such that, it is easily accessible



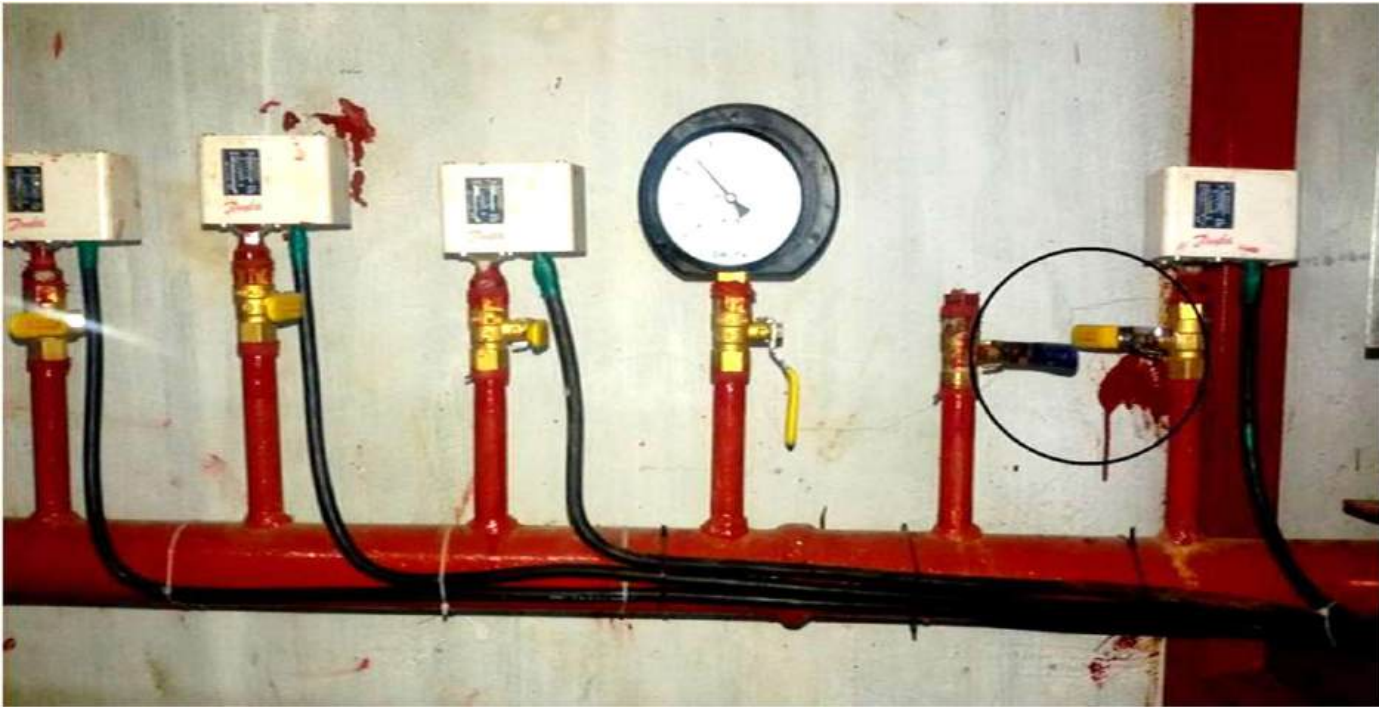
## **MANIFOLD**

17. Manifold Location should be such that, MCC Panel is easily Visible
18. Manifold Location should be such that, it can be easily connected to drain
19. Operating Wheel of the Needle Valve should be in the Front Side and also make sure enough Gap is maintained all around the Wheel for Easy Operation
20. Pressure Gauge is used for Displaying the Pressure in the Line
21. Indent should be given for Glycerin Filled Pressure Gauge with specification, only after cross checking and confirming that Approved TDS is in line with BOQ Specification, and it should be more than Pump Head.
22. Separate Pressure Gauge should be used for Sprinkler System, Hydrant System & Water Curtain System.
23. Pressure Switch is a Electro Mechanical Switch, which is used to keep Sensing the Pressure in the Line and it has 2 adjustable Pressure setting Dip Switches, which is used for sending signals to turn ON / OFF of Pumps
24. Whenever Pressure in Line touches the Set Pressure in Dip Switches, Pressure Switches will send the Signal to MCC Panel, for Automatic Operation of the Pumps
25. Indent should be given for Pressure Switch with specification, only after cross checking and confirming that Approved TDS is in line with BOQ Specification, and it should be more than Pump Head, Pressure Adjustment in Pressure Switch should be according to System Working Pressure, for Each Pump
26. Separate Pressure Switch should be installed for each Pump
27. Separate Armored Cable should be laid between Every Pressure Switch and MCC Panel
28. Cabling should be done behind the Manifold and it should be dressed properly.
29. Pressure Switch & Pressure Gauge should be installed after the Needle Valve is installed.
30. Pressure Gauge & Pressure Switches should be aligned parallel to the Manifold
31. Painting should not be done for Ball Valve, Needle Valve, Pressure Switch & Pressure Gauge
32. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

# GOOD PRACTICE FOR MANIFOLD FABRICATION



**BAD PRACTICE FOR MANIFOLD FABRICATION**



## GOOD PRACTICE FOR PRESSURE GAUGE INSTALLATION



**BAD PRACTICE FOR  
PRESSURE GAUGE INSTALLATION**



## GOOD PRACTICE FOR PRESSURE SWITCH INSTALLATION



## BAD PRACTICE FOR PRESSURE SWITCH INSTALLATION





## **MS STRUCTURAL SUPPORT FOR PUMP ROOM**

1. MS Structural Support is used for supporting Pipes Like Suction Line, Suction Header, Delivery Header & Test Line, in Pump Room.
2. MS Structural Support should be Fabricated as per Approved Shop Drawing, after cross checking Pipe Height of Suction Line, Suction Header, Delivery Header & Test Line, as per site condition.
3. MS Structural Support should be Fabricated only with “C” Channel & Square Plate
4. MS Structural Support should be Grinded and Finished Perfectly, including all Corners
5. Before Fixing MS Structural Support One Coat of Primer and One Coat of Black Paint should be Applied
6. Location of MS Structural Support should be Finalised, in such a way, it doesn't obstruct operation of any Valves
7. Location of MS Structural Support should be Finalised, in such a way, it doesn't come on Gate Valve / Butterfly valve, NRV, Strainer, Expansion Bellows
8. Location of MS Structural Support should be Finalised, in such a way, minimum 100 mm gap is maintained from Pipe Joints and Fittings.
9. Minimum 4 Holes should be Drilled for each Square Base Plate of the MS Structural Support and the same should be fixed to Floor, with the help of Anchor Fasteners
10. Holes should be made in MS Structural Supports, using a Drilling Machine / Gas Cutting to fix U-Bolts, if it is done using with welding rod, it should be grinded and finished neatly
11. MS Structural Support should be Fixed exactly Perpendicular to the Floor
12. Equal Gap should be maintained between each MS Structural Support, and it should be aligned between each other.
13. After Fixing MS Structural Support, Pipes should be Erected on it, without any gap in between Structural support and Pipe Bottom
14. Pipe Welding Joints should never come on MS Structural Supports, minimum 100 mm gap should be maintained
15. Correct Size U-Bolt should be used for fixing the Pipes to MS Structural Support.

## GOOD PRACTICE FOR MS SUPPORT FIXING IN PUMP ROOM



**BAD PRACTICE FOR  
MS SUPPORT FIXING IN PUMP ROOM**





## **SHAFT CLOSING WITH CHEQUERED PLATE & PCC**

1. Shaft Floor Area is Closed with Chequered Plate & Concreate / Foam, to stop the Fire & Smoke Traveling from one floor to another floor
2. Indent for Chequered Plate should be given, only after physically measuring the open Floor Area inside Fire Shaft, separately in each Floor
3. “L” Angle support should be fixed with Fasteners, all around the open floor area of the shaft, however, if Beam / Slab is Projecting out, no need of fixing “L” Angle on that.
4. “L” Angle support should be fixed just below the existing Floor Level, in such a way, when Chequered Plate is fixed, entire shaft floor area becomes same Level.
5. After Erecting the Pipes in Fire Shaft, Chequered Plate should be Cut in Exact Shape of the Fire Shaft Base, without any gap all around.
6. Chequered plate should be cut using the Gas Cutting, Welding machine should not be used for cutting
7. Before Fixing “L” Angle, One Coat of Primer and One Coat of Black Paint should be Applied.
8. After fixing “L” Angle, exactly Cut Chequered Plate should be installed, if Multiple Piece Chequered Plates are used, those should be aligned and welded together.
9. If the Beams or slab is Extended inside the shaft Chequered Plate should be directly fixed on it with help of Anchor Fasteners, without “L” Angle support
10. Chequered Plate should be always fixed on “L” Angle Support / Projected Beams & Slab, Never it should be Directly Fixed on Thread Rod.
11. After fixing Chequered Plate, Concreate should be put on it / Fill the Foam in all the Gaps.
12. Shaft Closing Work should be done before fixing Hose Reel Drum, RRL Hose, Branch Pipe.

**GOOD PRACTICE FOR FIXING CHEQUERED PLATE**





## **BAD PRACTICE FOR FIXING CHEQUERED PLATE**



# **GOOD PRACTICE FOR PUTTING CONCRETE / FOAM**



**BAD PRACTICE FOR PUTTING CONCRETE / FOAM**



## **LABELING ON PIPES AND PUMPS**

1. Labeling for Pipes and Pumps is done for Easy Identification
2. Labeling for Pipes should be done, only after doing Final Coat of Painting to all Pipe, however, if the same is not possible for what so ever reason, Final Coat Paint should be done for that particular Portion of the Pipe.
3. Labelling for Pipes and Pumps should be Painted only by using Stencils
4. Stencils should be made in Laser Cutting Machine, for Labeling for Pipes and Pumps
5. Matter, Font and Letter Size, should be as per “Matter for Labelling”, as per Format, which is Circulated along with this Erection Manual
6. Labelling for Pipes and Pumps should never be written in Free Hand
7. Location of Labeling should be in such a way, it is Visible from far away
8. Labeling for Pipes should be done, in the Center of the Pipe.
9. Equal Distance should be maintained between each Labeling
10. Sponge / Cloth should be used for Painting inside the Stencils, Paint Brush should not be Used
11. Painting should be Done inside Stencils Perfectly, without Leaving any Corners and without Dropping any Paint.
12. Painting Finish of Labeling on Pipes and Pumps should be Perfectly Done

**GOOD PRACTICE FOR LABELING ON PIPES AND PUMPS**



**GOOD PRACTICE FOR LABELING ON PIPES AND PUMPS**



**BAD PRACTICE FOR LABELING ON PIPES AND PUMPS**



## SEQUENCE CHART FOR FIRE PUMPS OPERATION

1. Sequence Chart is used to give Entire Pump Room Information, at a Glance
2. Sequence Chart should be fixed, only after Surface is made Fully Smooth and Painting is Done in the entire Pump Room.
3. Location for Fixing Sequence Chart should be finalised, based on the Visibility without any obstacle from Manifold, MCC Panel & from the Entrance of Pump Room and also obtain Client Approval for the same
4. Based on No. of Fire Pumps in concerned Project, “Fire Pumps Operation Sequence Chart” should be Selected, in PPT Format, which is Circulated along with this Erection Manual.
5. Size of Sequence Chart should be as mentioned in “Fire Pumps Operation Sequence Chart” and also make sure that Size Chart can be Installed in the Finalised Location
6. All below mentioned Details should be filled in “Fire Pumps Operation Sequence Chart” :-
  - a) OHT & UG Tank Capacity should be filled in the Sequence Chart, after Confirming with Client and make sure the same is equal / more than what is mentioned in NOC
  - b) Pump LPM & Head should be filled in the Sequence Chart, after checking in physical in the Delivered Pump, NOC and BOQ
  - c) Pumps Start Pressure and Pump Stop Pressure should be filled in the Sequence Chart, as mentioned in Approved Shop Drawing
6. After Filling all Details, Sequence Chart should be Converted to PDF Format and obtain concerned PH, DPH, TCDH & Client’s Approval, by Email
7. Indent should be given for Sequence Chart, by forwarding Approved Email for the same
8. After receiving Sequence Chart, all the Printed Matter should be Cross checked
9. Before Fixing Sequence Chart, Marking should be done and make sure the same is Perpendicular to the Floor, without any Tilts
10. Sequence Chart should be installed, by using Mirror Screw

## SEQUENCE CHART FOR FIRE PUMPS OPERATION

### PROJECT : SMART

#### SEQUENCE CHART FOR FIRE PUMPS OPERATION

Sl. No.	Pumps Name	Rating (KW)	Discharge (LPM)	Head (MWC)	Auto On Pressure (Kg/Cm <sup>2</sup> )	Auto Off Pressure (Kg/Cm )
1	Jockey Pump for Sprinkler	5.6	180	120	11	12
2	Jockey Pump for Hydrant	5.6	180	120	10	11
3	Main Pump for Sprinkler	112	2850	120	09	Manual
4	Main Pump for Hydrant	112	2850	120	08	Manual
5	Diesel Engine Pump	123	2850	120	07	Manual
6	Water Curtain Pump	15	900	50	03	Manual

**Fire Water Tank Capacity In Liters**

<b>Under Ground Fire Sump</b>	<b>2,00,000</b>
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<b>Over Head Fire Tank Tower - A</b>	<b>10,000</b>
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<b>Over Head Fire Tank Tower - B</b>	<b>10,000</b>
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**TOTAL SOLUTIONS INTEC PVT. LTD.**


Office Address : No # 20, 17th Main, HAL 2<sup>nd</sup> Stage  
Indiranagar, Bengaluru - 560 008, Ph: 41255556

Email Id : [info@tsi.net.in](mailto:info@tsi.net.in) / Web Site : [www.tsi.net.in](http://www.tsi.net.in)

## BAD PRACTICE FOR LABELING SEQUENCE CHART


PROJECT: PRESTIGE JINDAL CITY CLUSTER - II PUMP ROOM-02, B-02 E & B-04

### FIRE PUMPS OPERATION SEQUENCE

SL NO	PUMP NAME	RATING KW	DISCHARGE IN LPM	SPEED RPM	HEAD IN MTRS		LOW ZONE		HIGH ZONE	
					LOW ZONE	HIGH ZONE	AUTO-ON Kg/cm <sup>2</sup>	AUTO-OFF Kg/cm <sup>2</sup>	AUTO-ON Kg/cm <sup>2</sup>	AUTO-OFF Kg/cm <sup>2</sup>
SET-01 (BUILDING-02 E T-04, T-05 & T-06)										
1	JOCKEY PUMP HYDRANT SYSTEM	11	180	2920	120	150	11	AUTO OFF/13	12	AUTO OFF/14
2	JOCKEY PUMP SPRINKLER SYSTEM	11	180	2920	120	150	10	AUTO OFF/12	13	AUTO OFF/15
3	MAIN HYDRANT PUMP	125	2850	1485	120	150	8	MANUAL OFF	11	MANUAL OFF
4	MAIN SPRINKLER PUMP	125	2850	1485	120	150	7	MANUAL OFF	10	MANUAL OFF
5	DIESEL ENGINE PUMP	122.8	2850	1800	120	150	6	MANUAL OFF	9	MANUAL OFF
SET-02 (BUILDING-04 T-1, T-2 & T-3)										
6	JOCKEY PUMP HYDRANT SYSTEM	11	180	2920	120	150	11	AUTO OFF/13	12	AUTO OFF/14
7	JOCKEY PUMP SPRINKLER SYSTEM	11	180	2920	120	150	10	AUTO OFF/12	13	AUTO OFF/15
8	MAIN HYDRANT PUMP	125	2850	1485	120	150	8	MANUAL OFF	11	MANUAL OFF
9	MAIN SPRINKLER PUMP	125	2850	1485	120	150	7	MANUAL OFF	10	MANUAL OFF
10	DIESEL ENGINE PUMP	122.8	2850	1800	120	150	6	MANUAL OFF	9	MANUAL OFF
COMMON PUMP B-02 E & B-04										
11	WATER CURTAIN PUMP	45	2280	2900	70		6			MANUAL OFF
BUILDING-02 E TERRACE (OHT)										
12	BOOSTER PUMP (T-04)	9.3	900	2900	35 MWC		-		12	AUTO OFF
13	BOOSTER PUMP (T-05)	9.3	900	2900	35 MWC		-		12	AUTO OFF
14	BOOSTER PUMP (T-06)	9.3	900	2900	35 MWC		-		12	AUTO OFF
BUILDING-04 TERRACE (OHT)										
15	BOOSTER PUMP (T-01)	9.3	900	2900	35 MWC		-		12	AUTO OFF
16	BOOSTER PUMP (T-02)	9.3	900	2900	35 MWC		-		12	AUTO OFF
17	BOOSTER PUMP (T-03)	9.3	900	2900	35 MWC		-		12	AUTO OFF
UNDER GROUND SUMP WATER CAPACITY										
		TANK-01 (250cum)		2,50,000 Ltrs						
		TANK-02 (250cum)		2,50,000 Ltrs						
		TANK-03 (100cum)		1,00,000 Ltrs						
OVER HEAD TANK WATER CAPACITY										
		B-02 E PER TANK (20cum)		20,000 Ltrs						
		B-04 PER TANK (20cum)		20,000 Ltrs						
				INSTALLED BY				NO-20, 17 <sup>TH</sup> MAIN, HAL 2 <sup>ND</sup> STAGE OFF 100 FT ROAD, INDIRA NAGAR, OPP BARBEQUENATION BANGALORE - 560008		
				MEP TURNKEY PROFESSIONALS						

PROJECT NAME: VAISHNO SPARK

### FIRE PUMPS OPERATION CHART

SL No.	PUMP NAME	RATING KW	DISCHARGE IN LPM	HEAD IN MTRS	AUTO ON Kg/cm <sup>2</sup>	AUTO OFF Kg/cm <sup>2</sup>				
1.	JOCKEY PUMP	7.5	180	75	6	7.5				
2.	MAIN PUMP	45	2280	75	5	MANUAL OFF				
3.	DIESEL ENGINE PUMP	50	2280	75	4	MANUAL OFF				
4.	WATER CURTAIN PUMP	15	1620	40	3	MANUAL OFF				
				INSTALLED BY				NO.20, 17 <sup>TH</sup> MAIN HAL 2 <sup>ND</sup> STAGE, INDIRANAGAR BANGALORE - 560008, INDIA.		
				MEP TURNKEY PROFESSIONALS						

## BAD PRACTICE FOR LABELING SEQUENCE CHART

**PROJECT NAME: ARVIND OASIS SPACES**

### FIRE PUMPS OPERATION SEQUENCE

Sl. No.	PUMP NAME	RATING KW/HP	DISCHARGE IN LPM	HEAD IN MTR	CUT IN Kg/cm <sup>2</sup>	CUT OFF Kg/cm <sup>2</sup>
1.	SPR. JOCKEY PUMP	7.5 KW	180	110	10	AUTO OFF
2.	HYD. JOCKEY PUMP	7.5 KW	180	110	9	AUTO OFF
3.	SPRINKLER PUMP	75 KW	2280	110	8	MANUAL OFF
4.	HYDRANT PUMP	75 KW	2280	110	7	MANUAL OFF
5.	DIESEL ENGINE PUMP-1	110 HP	2280	110	6	MANUAL OFF
6.	DIESEL ENGINE PUMP-2	110 HP	2280	110	4	MANUAL OFF
7.	WATER CURTAIN PUMP	30 KW	2280	50	4	MANUAL OFF

INSTALLED BY **TSI** NO:101,10<sup>TH</sup> CROSS 11<sup>TH</sup> MAIN  
 HAL 2<sup>ND</sup> STAGE INDIRANAGAR  
 BANGALORE-560008, INDIA  
**MEP TURNKEY PROFESSIONALS**



## SIGNAGES

1. Signages are regularly used for Guiding People and also in case of Emergency
2. Indent should be given for Signages, only after Final Coat Painting is done for concerned Walls / Client Confirms that they will take Hand Over of Signages, immediately after Installation
3. “Matter for Signages” as per Format, which is Circulated along with this Erection Manual, should be considered for giving indent, after Editing Nearest Hospital and Fire Station Details
6. After Filling all Details, Matter for Signages should be Converted to PDF Format and obtain concerned PH, DPH, TCDH & Client’s Approval, by Email.
7. Indent should be given for Signages, by forwarding Approved Email for the same.
8. After receiving Signages, all the Printed Matter should be Cross checked.
9. Location for installing Signage should be based on the Visibility without any obstacle from the Entrance of Lobby and obtain Client / PMC Approval for the same
10. Before Fixing Signages, Marking should be done and make sure the same is Perpendicular to the Floor, without any Tilts
11. Small Size Signages should be installed with 2 Way Tape
12. Bigger Size Signages (4ft \* 2ft) should be installed with Mirror Screw
13. Whenever Signages are installed while giving Demo to Fire Officer, the same should be Handed over to Client / PMC, however, if they don’t agree to Take Handover, the same should be removed and kept Safely
14. Signages should be installed, just one day before Client is Taking Hand Over

## MATTER FOR SIGNAGES

### ACTION BY SECURITY

UPON RECEIPT OF INFORMATION THROUGH FIRE ALARM OR FIRE DETECTORS OR SPRINKLERS OR BY ANY OTHER SAFETY MEANS,

- A. ALERT THE OCCUPANTS BY USING PUBLIC ADDRESS SYSTEM
- B. INFORM FIRE CONTROL THROUGH ANY ONE OF THE FOLLOWING PHONE NO :  
101, 080 - 22971500, 22971550 AND  
SARJAPUR FIRE STATION : 080 2574 6166  
VARTHUR POLICE STATION : 080 2853 9196
- C. OPERATE THE GROUNDING SWITCH TO BRING ALL THE ELEVATORS TO GROUND FLOOR LEVEL
- D. GUIDE THE FIRE FORCE ON THEIR ARRIVAL TO THE SEAT OF FIRE.
- E. IN CASE OF THE CAUSALITIES, CALL AMBLAUNCE BY DIALING NUMBER : 102 / 108 MANIPAL HOSPITAL : 1800 102 4647



### FIRE ORDER IN CASE OF FIRE

- A. ALERT THE SECURITY AT SECURITY ROOM BY ACTUATING MANUAL CALL POINT LOCATED AT STRATEGIC LOCATIONS.
- B. EVACUATE THE OCCUPANTS BY USING THE STAIR CASE ONLY AND ASSEMBLE AT GROUND LEVEL. (DO NOT USE THE LIFT)
- C. IF POSSIBLE TRY TO EXTINGUISH THE FIRE BY USING PORTABLE EXTINGUISHER OR WATER FROM HYDRANTS AVAILABLE AT EACH LOBBY
- D. BE CALM AND DO NOT GIVE ANY ROOM FOR PANIC, WALK, DO NOT RUN.
- E. IF YOU ENCOUNTER SERIOUS DIFFICULTY IN EVACUATION, STAY IN YOUR OFFICE / FLAT ROOM AND TRY TO ATTRACT ATTENTION OF RESCUE TEAM





## **GOOD PRACTICE OF SIGNAGES FIXING**



## **BAD PRACTICE OF SIGNAGES FIXING**



## **SCRAP MAINTENANCE AT SITE**

1. Scrap is a Cut Pieces of Pipe / Rework Materials, which can't be Reused.
2. Scrap should be always stored inside the Store Room
3. Pipe Scrap should be Segregated & Stored Size Wise, end of every day
4. All Scrap Materials from All Working Areas should be shifted back to Store Room, end of every day.
5. Weekly Patrol should be done in other Vendor's Scrap Yard & Stores Room and find out if any of our material is there, if yes, the same should be informed to Project Manager and also make sure he Escalates the same to Client with Photos, by Email with CC to Project Specific Group Email id and then coordinate and take back the material.
6. Whenever Small Length Pipes is Required, the same should be taken from Scrap, never it should be cut from Full Length Pipe.
7. Scarp should be fully Segregated before Selling and remove all usable Pipes / other Materials

**GOOD PRACTICE OF SCRAP MAINTENANCE AT SITE**



**BAD PRACTICE OF SCRAP MAINTENANCE AT SITE**





## **CHECK LIST FOR PRESSURE TESTING**

1. Always Pressure Testing is done 1.5 times of Pump Head, so that never Leakage will happen in later stage.
2. Before doing Pressure Testing, Erecting & Full Welding should have been completed, in that particular Zone, Never Pressure Testing should be allowed only for Header Line / Raiser / Part Work, with Dummy Plug / Dummy Plate.
3. Before doing Pressure Testing, all Sprinklers should have been Fixed, including Lobby Area, in that particular Zone, because if Pressure testing is done with Dummy Plug and latter replaced with Sprinkler, Pressure Testing becomes invalid, due to Leakage or Dampness, in latter stage
4. Before doing Pressure Testing for Sprinkler Line, make sure one side of the Pipe is Terminated inside Fire Duct, it should never be Terminated out side the Flat / In Corridor Area / anywhere outside the Fire Duct, even if Client / PMC instructs.
5. Before doing Pressure Testing, Always Sprinkler Line should be Terminated in side Fire Duct with Butterfly Valve / Dummy Flange, never it should be Terminated with Dummy Plate
6. Before doing Pressure Testing, MS Structural Supports should have been fixed for all Higher Dia Pipes, as per “Check List For Ms Structural Support” / as per Approved Shop Drawing, in that particular Zone
7. Before doing Pressure Testing, all Piping Alignment works should be completed
8. Primer / Paint should not be applied on Position Welding Joints, before doing Pressure Testing
9. Before doing Pressure Testing for Sprinkler Riser, Floor Tapping, Butterfly Valves Fixing, Drain Raiser, Drain Tapping, Flow Switch and all other works inside concerned Fire Duct should have been completed.
10. Ball Valve used for Fixing Hose Reel Drum / Air Release Valve should be used for Water Inlet and for Fixing Pressure Guage, while doing Pressure Testing
11. Before doing Pressure Testing for Hydrant Riser, Hydrant Valve should have been fixed, Hose Reel Drum should have been fixed and connected to Riser in concerned Fire Duct.
12. Only Glycerin filled Pressure Gauge should be used for Pressure Testing
13. While doing Pressure Testing, one Ball valve should be used to Fill the Water and one Pressure Gauge should be installed for Pressure monitoring



## **CHECK LIST FOR PRESSURE TESTING**

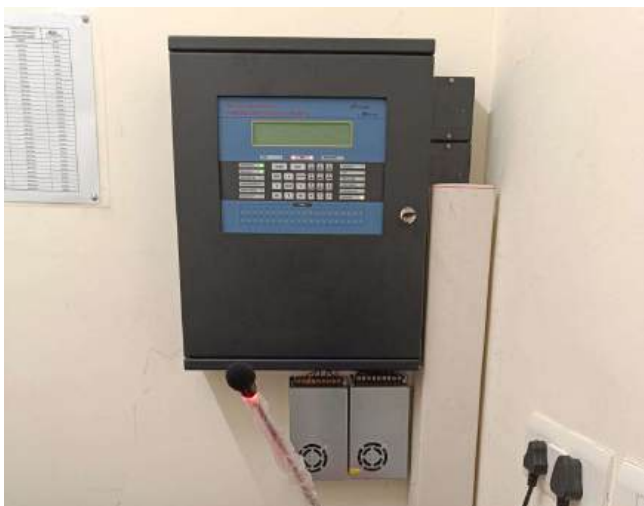
14. Location of Ball Valve & Pressure Gauge used for Pressure Testing should be outside the Cornice / False Ceiling Area, because if any Leakage or Dampness comes in later stage, it can be easily arrested, after replacing it with Sprinkler
15. Before doing Pressure Testing, make sure proper Flushing is done, for the entire Piping with Gravity Pressure / Minimum 2bar Pressure, so that all Dust Particles & Welding Flux inside the Pipes, is washed out.
16. Before Raising Full Pressure, Leaks should be identified and arrested with Gravity Pressure / Minimum 2 KG Pressure, in that particular Zone and then Raise the Pressure 1.5 times of Pump Head
17. Only after Pressure Sustains for Minimum 2 Hour in that particular Zone, Client / PMC should be Invited for Checking.
18. Before Inviting Client / PMC for Checking, fill all the details in “Pressure Test Report”, as per Format in “PI SOP” and keep ready, however, if Client / PMC insists to use their “Pressure Test Report” Format, the same should be used.
19. After Client / PMC Physically witnessed the Pressure Testing, in that Particular Zone, obtain their Seal and Signature with Checking Time and Pressure, in Pressure Test Report.
20. After 24 Hours, if the Pressure is Same / Up to 10% Less due to Natural Temperature Loss / Air Trap, invite Client / PMC to Physically witness the Pressure Testing, in that Particular Zone and obtain their Seal and Signature with Checking Time and Pressure, in Pressure Test Report.
21. After Successful Pressure Testing and obtaining all required Approvals, Original Pressure Test Report should be handed over to PSE, however if Client / PMC insists for original copy, Pressure Test report should have been done in Two Originals.
22. While Releasing the Pressure in Pipe Line, Water should be drained only in Water Drum, it should never be let out openly in floor / shaft, water should not be wasted.
23. Maximum Precautions should be taken, while Doing Pressure Testing & while Releasing the same, so that water doesn't enter Lifts / Damage any of the Third Party Assets.
24. After Releasing the Pressure from Sprinkler Line, Ball Valves and Pressure Gauges used for Pressure Testing should be removed and Sprinklers should be Fixed in those Places, by taking maximum care, so that leak will never come in those joints.
25. After Releasing the Pressure from Hydrant Raiser / Line, Pressure Gauge should be Removed and both the Ball Valves should be used for connecting Hose Reel Drum / Air Release Valve.



## **FIRE ALARM PANEL**

1. Fire Alarm Panel is a Control Center for the entire Fire Alarm System, which receives Input Signal from MCP & Detectors and Give Output for Hooter and other Output Devices
2. Indent for Fire Alarm Panel should be given, only after confirming that Fire Alarm Panel Approved TDS is in line with BOQ Specification / Approved Shop Drawing
3. While giving Indent for Addressable Fire Alarm System, all Equipment should be of same Make
4. Fire Alarm Panel should be installed inside Fire Command Room / Easily Accessible Area, at Ground Floor
5. Emergency / UPS Power Supply Should be given for Panel
6. Never Painting should be done on Fire Alarm Panel
7. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

## GOOD PRACTICE OF FIRE ALARM PANEL INSTALLATION





**BAD PRACTICE OF  
FIRE ALARM PANEL INSTALLATION**



## **DETECTORS**

1. Detectors are used to sense the Smoke/Heat and sends the signal to Fire Alarm Panel
2. Detectors are available in Different Types Smoke, Heat, Multi Sensor & Beam Type
3. Indent for Detectors should be given, only after cross checking and confirming that Detectors Approved TDS is in line with BOQ Specification / Approved Shop Drawing
4. Detectors should be installed in only after complete Civil Works Completion in respective Areas
5. Detector's location should be as per Approved Shop Drawing / as per RCP Layout
6. Never Painting should be done on Detectors which may cause False Alarms
7. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

**GOOD PRACTICE OF DETECTORS INSTALLATION**





# **BAD PRACTICE OF DETECTORS INSTALLATION**



## **MANUAL CALL POINT**

1. Manual Call Points (MCP) are used to send signal to Fire Alarm Panel by activation manually in case of Emergency
2. MCPs are available in Three Types ,Break Glass, Pull Station, Button Type
3. Indent for MCPs should be given, only after cross checking and confirming that MCPs Approved TDS is in line with BOQ Specification / Approved Shop Drawing
4. Whenever Fire Alarm System's Armored Cable / Conduits are Running inside the Fire Duct, the same should be Laid in Hidden Location, preferable either side of Fire Duct Shutter, in such a way, Armored Cable / Conduits is Not Visible from Front Side of the Fire Duct Shutter.
5. MCPs should be installed in only after complete Civil Works Completion in respective Areas
6. MCPs location should be as per Approved Shop Drawing
7. Never Painting should be done on MCPs
8. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.



**GOOD PRACTICE FOR**  
**MANUAL CALL POINT INSTALLATION**

## **BAD PRACTICE FOR MANUAL CALL POINT INSTALLATION**





## **HOOTERS**

1. Hooters are used for Alarming when the Alarm Initiating Devices sends the signals to Fire Alarm Panel in case of Emergency
2. Indent for Hooters should be given, only after cross checking and confirming that Hooters Approved TDS is in line with BOQ Specification / Approved Shop Drawing
3. Whenever Fire Alarm System's Armored Cable / Conduits are Running inside the Fire Duct, the same should be Laid in Hidden Location, preferable either side of Fire Duct Shutter, in such a way, Armored Cable / Conduits is Not Visible from Front Side of the Fire Duct Shutter.
4. Hooters should be installed in only after complete Civil Works Completion in respective Areas
5. Hooter's location should be as per Approved Shop Drawing
6. Never Painting should be done on Hooters
7. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.



**GOOD PRACTICE FOR  
HOOTERS INSTALLATION**



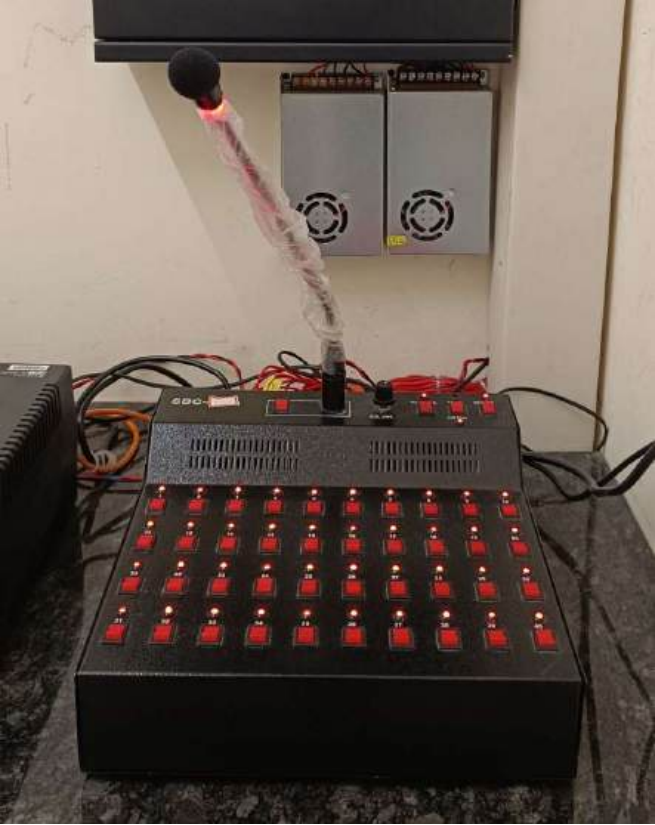
**BAD PRACTICE FOR**  
**HOOTERS INSTALLATION**



## **PA CONSOLE**

1. PA Console are used for synchronize the Two-Way Talk Back Speaker Operations in case of Emergency
2. PA Console consists of a Zone Selecting switches and LED Lights for Selected Zone Indication
3. Indent for PA Console should be given, only after cross checking and confirming that PA Console Approved TDS is in line with BOQ Specification / Approved Shop Drawing
4. PA Console should be installed in only after complete Civil Works Completion in Fire Command Room
5. Never Painting should be done on PA Console
6. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.

**GOOD PRACTICE FOR PA CONSOLE INSTALLATION**





**BAD PRACTICE FOR**  
**PA CONSOLE INSTALLATION**



## **TWO-WAY TALK BACK SPEAKERS**

1. Two-way Talk Back Speakers are used for Communication from Fire Command Room to the Floors in case of Emergency
2. In case of Emergency announcements can be done through Two-way Talk Back Speakers
3. Indent for Two-way Talk Back Speakers should be given, only after cross checking and confirming that Two-way Talk Back Speakers Approved TDS is in line with BOQ Specification / Approved Shop Drawing
4. Whenever Fire Alarm System's Armored Cable / Conduits are Running inside the Fire Duct, the same should be Laid in Hidden Location, preferable either side of Fire Duct Shutter, in such a way, Armored Cable / Conduits is Not Visible from Front Side of the Fire Duct Shutter.
5. Two-way Talk Back Speakers should be installed in only after complete Civil Works Completion in Respective Area
6. Two-way Talk Back Speakers location should be as per Approved Shop Drawing
7. Never Painting should be done on Two-way Talk Back Speakers
8. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.'



**GOOD PRACTICE FOR**  
**TWO-WAY TALK BACK SPEAKERS INSTALLATION**

**BAD PRACTICE FOR  
TWO-WAY TALK BACK SPEAKERS INSTALLATION**





## **AMPLIFIER**

1. Amplifiers are used for control the Power Input / Volume of the Two-Way Talk Back Speakers
2. Indent for Two-way Talk Back Speakers should be given, only after cross checking and confirming that Two-way Talk Back Speakers Approved TDS is in line with BOQ Specification / Approved Shop Drawing
3. Amplifier should be installed in only after complete Civil Works Completion in Fire Command Room
4. Never Painting should be done on Amplifiers
5. Factory Packing should Not be Removed / Re-packing should be done, till the Project is Handed Over to Client, to avoid any kind of Physical Damage / Scratches, becoming Dirty / Dusty / Rust.'



**GOOD PRACTICE FOR**  
**AMPLIFIER INSTALLATION**



**BAD PRACTICE FOR**  
**AMPLIFIER INSTALLATION**



## **SAFETY IN SITE**

1. All Workmen should enter into the site with necessary PPEs.
2. All hot works should be carried out with fire extinguishers, fire bucket, Hot Work signage's.
3. Night shifts should be done only if approval is taken from Client side.
4. Sufficient lighting and emergency contact numbers should be available at work locations.
5. Above 1.8 Mtrs Height all Workman should be use Safety Belts
6. All Job Specific PPEs should be used while doing the respective Works.
7. Power Cables should be Taken Ove Head Only
8. Before starting work, equipment should be in proper condition, wires should be managed in proper way
9. Flammable paints or waste materials such as paper, cloth should not be present in work location.
10. Water logging should not be there in work location.

## GOOD PRACTICE OF SAFETY IN SITE



**BAD PRACTICE OF SAFETY IN SITE**





## **CHECK LIST FOR DOING JOINT MEASUREMENT (JMR)**

1. JMR is done to have a common measurement for all, that is for our Company, our Sub Contractor and our Client
2. JMR should be done in the Presence of our Company Representative, concerned Sub Contractor & Client / PMC.
3. Suitable Length Measurement Tape should be used for doing JMR, never use Metal Tape / Small Measurement Tape, below 5mtrs.
4. JMR should be done at least once in a month, so that TSI Bill can be Raised & Sub Contractor also can raise the Bill, never wait for entire Basement / Tower / Block to get over.
5. JMR should be done, only after 100% work is completed in that particular Zone / Floor, never JMR should be done, only for Header / Raiser / Part Work, for whatever reason.
6. All work should have been completed as per TSI Erection Methodology Manual.
7. While doing JMR for Pipes, all Valves, Fittings & Accessories should be included in Measurement, as a Standard Practice, since we are not considering Flanges
8. While doing JMR for Pipes in Elbows, Outer Radius should be considered.
9. Before doing JMR, concerned Project Manager should fill all required information in our “Joint Measurement Report”, as per Format, mentioned in “PI’s SOP” & then fill the Measurements, however, if Client / PMC insists to use their JMR format, the same can be used.
10. After Mutually agreeing to Final JMR Quantity, concerned Project Manager should put his Seal & Signature and also obtain from Client / PMC.
11. Approved Shop Drawing Print Out should be taken, in which Work Done Area is Marked / Clouded, the same should be used for taking JMR.
12. Whenever Excess Measurement is given by Client / PMC, against some Power Charges / Extra Work Done / Liasoning Charge / NT Item / Re-work / Any other Debit Amount, same should be mentioned Separately / Highlighted in concerned JMR, that quantity should not be considered for Sub Contractor Billing.
13. Original JMR should be submitted to TSI Office, however if Client / PMC insists for original copy, JMR should be done in Two Original and Submitted to each.



## **CHECK LIST FOR TESTING & COMMISSIONING - FPS**

1. Testing and Commissioning of Fire Protection System is done to cross check if the entire System is Working as per Design, before Handing Over.
2. Before doing any Testing & Commissioning Work in the entire Project, except Pressure Testing, concerned Project Manager should coordinate and make sure concerned Project Head is available at site, if not, some other Project Head should be Deputed, who have enough experience in Testing & Commissioning of FPS.
3. Before Starting Testing & Commissioning of Entire System, First Pump Room should be Charged.
4. Before Starting Testing & Commissioning Entire Pump Room, below mentioned Persons should be available at Site, at same time
  - a) Pump Commissioning Person from TSI
  - b) MCC Panel Commissioning Person from TSI
  - c) Pump Commissioning Person from Manufacturer
  - d) DG Commissioning Person from Manufacturer
  - e) MCC Panel Commissioning Person from Manufacturer
5. Before Starting Testing & Commissioning, Walkie Talkies must be used by entire Team for Communication.
6. Before Charging Pump Room, all Delivery lines, which are going out of Pump Room should be Closed.
7. Before Doing Auto Setting, Individual Pump Performance should be Cross Check, if the Maximum Pressure in the Manifold Pressure Gauge is showing equal to Pump Head.
8. While Charging any Particular Zones / Floor / Towers / Wings / Blocks / Pump Room, concerned Valves should be Opened only 25%, after getting confirmation that there is no leak, Valve should be open Fully.
9. After Testing & Commissioning of all Pumps, Auto Setting should be done, as mentioned in Approved Shop Drawing / Sequence Chart.
10. Before Charging Headers, Risers, Floors, Pumps should be in Manual mode.
11. Before Starting Testing & Commissioning of any Particular Zones / Floor / Towers / Wings / Blocks, confirm if Pressure Test Report is Available for the same.



## **CHECK LIST FOR TESTING & COMMISSIONING - FPS**

12. Before Charging Hydrant and Sprinkler Headers / Risers, do Physical Inspection and Confirm Full Welding is done for all the Joints, all Dummy Flanges are Fixed and all Valves are Fixed and check if any kind of Rework is done, after Pressure Testing.
13. While Charging Hydrant Headers / Risers, concerned Delivery Line's Butterfly Valves should be opened, only after confirming Hydrant Valves, Ball Valves for Hose Reel Drums are in closed condition and Air Release Valves are Fixed.
14. While Charging Sprinkler Headers / Risers, concerned Delivery Line's Butterfly Valves should be opened, only after confirming Butterfly Valves in all Floors Sprinkler Tapping, Ball Valves / Butterfly Valves for Drain are Closed, Flow Switches are Fixed and Air Release Valves are Fixed.
15. Before Charging Sprinkler Lines in Floors, do Physical Inspection and Confirm Full Welding is done for all the Joints, All Sprinklers are Fixed, Butterfly Valve, Drain Valve & Flow Switch is Fixed and check if any kind of Rework is done, after Pressure Testing.
16. After Charging the Hydrant Headers / Risers, it should be confirmed that there is no Leakage in Hydrant Valve and Ball Valve for Every Hose Reel Drum should be Opened to check Leakages, Only After confirming there is no leak then next Hose Reel Drum should be checked
17. Before Opening the Butterfly Valve of any Zone / Floor / Risers, make sure our TSI Person is available in that Particular Location to check any kind of Leakages
18. System Charging should be done with Maximum Care, by making sure Water Doesn't Leak in any Lift / inside any Flat / False Ceiling Area, however, if Water Leaks for any Reason, the same should be identified and Arrested immediately.
19. After Successful Testing and Commissioning, Live Demo should be shown to Client / PMC / Consultant
20. Before Inviting Client / PMC for showing Demo, fill all the details in "Testing and Commissioning Report", as per Format in "PI SOP" and keep it ready, however, if Client / PMC insists to use their Format, the same should be used.
21. After Client / PMC Physically witnessed the Demo of entire FPS, obtain their Seal and Signature in "Testing and Commissioning Report"
22. Testing and Commissioning Report should be always done in 2 Originals, one should be handed over to PSE and another should be handed over to Client / PMC



## **CHECK LIST FOR THIRD PARTY CHECKING** **FIRE PROTECTION SYSTEM**

1. 3<sup>rd</sup> Party Checking is Done by any other PH from our own Company
2. 3<sup>rd</sup> Party Checking is Done to Reconfirm that all Systems are working perfectly, to give Demo to Fire Officer.
3. 3<sup>rd</sup> Party PH should do the Checking, by a Joint Walk through with concerned PH & BH
4. All required works to show Demo to Fire Officer, should have been completed.
5. At least one coat of Painting should have been done for the Entire Fire Fighting Works.
6. All Pumps should be in Auto Mode.
7. Successful Demo should have been conducted Randomly from Internal Hydrant Valve and Hose Reel Drum, at Terrace Level
8. Successful Demo should have been conducted Randomly from Yard Hydrants / Internal Hydrant at Ground Level
9. Successful Demo should have been conducted Randomly from Hose Reel Drum, at Basement / Ground Level
10. Successful Demo should have been conducted Randomly from any Sprinkler, at any Flat / Office Floor, if Sprinkler are applicable as per NBC / NOC Issued by Fire Department.
11. Successful Demo should have been conducted Randomly from any Sprinkler, at Basement / Ground Level.
12. Successful Demo should have been conducted Randomly from any Detectors / MCP
13. Successful Demo should have been conducted Randomly from 2 Way Talk Back Speaker
14. Make sure a) Floor Indication b) In case of Fire Use Staircase c) Fire Order d) Action by Security Signages are installed at concerned Location and also check if Contact Details of Hospital and Fire Department is correct, if not, the same has to be changed.
14. Make sure Fire Extinguisher are fixed at concerned Location, including Lift Machine Room.
15. Make sure 2 RRL Hose & 1 Branch Pipe are kept inside Fire Duct Shutter and Hose Box.



## **CHECK LIST FOR THIRD PARTY CHECKING** **FIRE PROTECTION SYSTEM**

16. Make sure Fire Duct Openings are sealed with Chequered Plate & RCC / Fire Resistant Foam.
17. Finalised Fire Inspection Route & one Typical Floor should have been Cross Checked and make sure 100% works are completed in that Route, by adhering to all the above mentioned Points.



## **CHECK LIST FOR THIRD PARTY CHECKING** **CLIENT SIDE**

1. Entry & Exit Opening Size should be as mentioned in NOC, issued by Fire Department.
2. Entry & Exit Gate should have been Fixed
3. Entry & Exit opening should be fully free, without any obstruction, up to 6 mtrs Height.
4. Approach Road from the Gate should be Capable to carry 45 Tones Load, without any obstruction, up to 6 mtrs Height.
5. 6 Mts / 8Mtrs Drive Way should be provided all around the Building, as mentioned in NOC and it should be Capable to carry 45 Tones Load, without any obstruction, up to 6 mtrs Height,
6. Turning Radius in Entire Drive Way should be Minimum 9 mtrs.
7. Setbacks Area all around the building should be as mentioned in NOC.
8. Entire Setbacks Area should be in Same Level, equal to Drive Way, however Fire Pump Room, STP, Transformer Yard, Gas Bank, Swimming Pool, DG can be Built / Installed in Setback Area, after Driveway, if the same is mentioned in NOC.
9. Water should be filled in Over Head Tank & UG Sump.
10. Electricity Supply / DG Power should have been Provided for all Our Pumps.
11. Fire Command Room / Proper Place with Protection should have been provided for installing FA PA System, at Ground Floor.
12. All Cranes / Scaffoldings / Passenger Hoist / Gondola should have been removed, from the Entire Project.
13. All Civil Works should have been completed, in the Entire Project.
14. All Debris should have been removed, from the Entire Project.
15. Painting should have been completed in the Entire Project.
16. All Staircases work should have been finished
17. Hand Rails should have been Fixed in all Staircase & Balcony.

## **CHECK LIST FOR THIRD PARTY CHECKING** **CLIENT SIDE**

18. Car Parking Layout Marking should have been Done, in all Car Parking Area.
19. All Common Area work should have been finished, including Lift Lobby.
20. All Staircases should have been Terminated at Ground Floor.
21. Separate Staircase should have been provided from Ground Floor to Basements.
22. Fire Door should have been fixed in all Floors, as Mentioned in NOC.
23. Basement Staircase Lobby & Lift Lobby should have been Enclosed.
24. All Lifts should be Working in Full Speed.
25. Fireman Switch should be in Working Condition in all Lifts, at Ground Floor
26. Operation Sign Boards should have been Fixed in Lift Machine Room.
27. Required Capacity DG for Backup Power should be provided, as mentioned in NOC.
28. Good Lighting should have been provided in all Common Area, including Basement



## **CHECK LIST FOR FIRE OFFICER VISIT – TSI SIDE**

1. Concerned Project Manager should give Highest Priority to Fire Officer Visit, because showing a Successful Demo to Fire Officer is like a Exam for our Entire Company.
2. 3rd Party PH should have done the Checking and sent “OK Email” to all concerned.
3. If Liasoning to get CC is in our Scope, concerned Project Manager should coordinate with concerned BH and ask them to send the Schedule to Client / PMC, well in advance, by email, after getting confirmation from Fire Officer.
4. If Liasoning to get CC is in Client Scope / Other Agency Scope, concerned Project Manager should coordinate and ask them to send the Schedule and Fire Officer Name by email.
5. Concerned Project Manager should send “Invitation for showing Demo to Fire Officer” as per Format, mentioned in PM’s SOP, to concerned Project Specific Group Email id, CMD & CMD’s Driver, by email, requesting all of them to come as per schedule to support in showing the Successful Demo to Fire Officer.
6. Concerned Project Manager should Call and Invite concerned PH, DPH, BH, TCDM, PUM, CMD’s Driver & Sub Contractors to come as per schedule to support in showing the Successful Demo to Fire Officer.
7. Concerned Project Manager should send Project Address & Location to concerned Project Specific WhatsApp Group, CMD, CMD’s Driver & Sub Contractor’s WhatsApp Numbers, with Schedule for Fire Officer Visit.
8. Concerned Project Manager should also make sure concerned PH / DPH and BH has invited CMD to come and support in showing Successful Demo to Fire Officer and also make sure they have Blocked CMD’s Schedule.
9. Concerned Project Manager should send “Invitation for Sub Contractors for showing Demo to Fire Officer”, as per Format mentioned in PM’s SOP, to all concerned Sub Contractors, by Email.
10. Concerned Project Manager should coordinate personally and make sure all concerned Employees to whom invitation is sent, will reach the Project 30 Minutes before the Scheduled Fire Officer Visit.
11. If any Employee to whom Invitation is sent, is not Coming for any Unavoidable reason, concerned Project Manager should coordinate and make sure their Buddy of equal Cadre will join for Fire Officer Visit.
12. Concerned Project Manager should prepare the Inventory list One day before the Scheduled Fire Officer Visit.



## **CHECK LIST FOR FIRE OFFICER VISIT – TSI SIDE**

13. Concerned Project Manager should coordinate personally and make sure all concerned Sub Contractors to whom invitation is sent have reached the Project 1hr before the Scheduled Fire Officer Visit
14. Concerned Project Manager should keep Fire Duct Shutter's Key & Screw Driver to open the MCP Cover, through out the Fire Inspection.
15. 30 Minutes before Fire Officers Visit, Concerned Project Manager should discuss with their PH and make sure Appropriate Work is Allocated to all Employees, in below mentioned works
  - a) For Taking Measurement
  - b) For Taking Photos
  - c) Showing Demo of Pumps in Auto Setting in Pump Room
  - d) Showing Demo of FA & PA System in Fire Command Room
  - e) Showing Demo of Yard Hydrant in Driveway
  - f) Showing Demo of Internal Hydrant in Terrace Level
  - g) Showing Demo of Hose Reel Drum in Driveway, Basement & Terrace Level
  - h) Showing Demo of Sprinklers in Basement
  - i) Showing Demo of Smoke Detector in Floors
  - j) Showing Demo of MCP in Floors
  - k) Showing Demo of Two way Talk Back System in Floors
  - l) Arranging Refreshments
16. Concerned Project Manager should coordinate with concerned TCDM and make sure they handover a copy of concerned NOC to CMD / Fire Officer, when they reach the site / when they ask for it.
17. Concerned Project Manager should make sure Walkie Talkies are used by their entire Team for Communication.
18. Whenever any kind of Arch / Pergola / Portico / any kind of Obstruction is Constructed above the Gate / Entrance / any where in Driveway, Concerned Project Manager should coordinate and get the Leveling Staff from CMD's Driver, which is kept in CMD's Car, before Fire Officer's come to site.
19. Concerned Project Manager should coordinate with Client and select a Right Location, where there is No Obstructions and Drop the Measuring Tape from Terrace to Ground Floor, before Fire Officer's come to site.



## **CHECK LIST FOR FIRE OFFICER VISIT – TSI SIDE**

20. Concerned Project Manager should coordinate with Client / PMC and make sure they Adhere to all Points Mentioned in “Check list for Fire Officer Visit – Client Side”.
21. Concerned Project Manger should coordinate with all Sub Contractor and make sure they Adhere to all Points Mentioned in “Check list for Fire Officer Visit – Sub Contractor Side”.
22. 30 Minutes Before Scheduled Fire Officer Visit, Concerned Project Manger should Fix RRL Hose and Branch Pipe in such a Location, where Wind is Very Low, so that Water Jet Goes Maximum Height, while showing Demo
23. Concerned Project Manger should discuss with concerned BH and Decide, which side Fire Officer & our CMD should be Standing, based on Wind Direction while giving Hydrant Demo, so that Water doesn't fall on them
24. RRL Hose and Branch Pipe should be Fixed in such a Location, there is No Windows / Clothes are Dried / Balcony / Canopy / Pergola / any other Objection, so that Water Jet Doesn't Damage any Third Party Items, while showing the Demo
25. Concerned Project Manger should show Trail Demo of Hydrant System to concerned PH / DPH / BH / DBH, 30 Minutes Before Scheduled Fire Officer Visit
26. Concerned Project Manger should instruct and also make sure Hydrant Demo Showing Person Doesn't Spill Water On Fire Officer / our CMD, while showing Demo of Hydrant System
27. Concerned Project Manager should Light up the Torch only after CMD / Fire Officer comes to the spot and gives Approval, never they should lighten up and wait for them to come / give Approval
28. While showing Sprinkler Demo, Torch should be kept 100mm away from Sprinkler, because there are chances of Cloth in the Touch getting pulled by Sprinkler, due to Vacuum in Pipes
29. Concerned Project Manager should Show Sprinkler Demo Near Water Curtain Line, so that when Sprinkler is Operated, Water Curtain System will also Operate Automatically, so that Fire Officer can see both the System together
30. Concerned Project Manager should Show Sprinkler Demo, in such a Location, where there is No Obstacles Like Cable Tray, Loose Electrical Wires, Plumbing Lines, Ventilation Fans / Ducts, Pillers / Beams or any other things which will Block Sprinkler Water Flow
31. Concerned Project Manager should Show Sprinkler Demo, in such a Location, where there is No Cable Tray, Loose Electrical Wires, Plumbing Lines, Ventilation Fans / Ducts, Lights, Speakers / any other Equipment, which will get Damaged while showing Torch / Fire to Sprinkler



## **CHECK LIST FOR FIRE OFFICER VISIT – TSI SIDE**

32. Concerned Project Manager should Show Sprinkler Demo, in such a Location, Fire Officer and our CMD doesn't get Wet, due to Water Curtain System, while they are going to Pump Room
33. Whenever Fire Officer's Visit is confirmed, concerned Project Manager should prepare "List of Fire Fighting Equipment Installed", as per Format, which is circulated along with PM's SOP, all details should be as mentioned in NOC
34. Concerned Project Manager should print "List of Fire Fighting Equipment Installed" in White Sheet, never our company Name should be mentioned / it should never be printed in our Company's Letter Head.
35. Concerned Project Manager should coordinate and obtain concerned PH's & DPH's Approval in "List of Fire Fighting Equipment Installed" and handover the same to concerned BH, if Liasoning is in our Scope, if not the same should be given to Client, one day before scheduled Fire Officer's Visit.



## **CHECK LIST FOR FIRE OFFICER VISIT – CLIENT SIDE**

1. Client should give Highest Priority to Fire Officer Visit, because Satisfying Fire Officer and obtaining CC from Fire Department, is like a Exam for Everyone, so Client should follow all the Points mentioned in this Check list without fail
2. Client should allot one dedicated Senior Person, who knows Regional Language and all details about the Project, they should be with us in the entire walk through, in Fire Officer Visit, who will be called as “Client” in below mentioned points
3. One day before the Scheduled Fire Inspection, below mentioned works should be executed :-
  - a) Client, our Project Head and Business Head should meet and do a walk through, discuss and decide the route for Fire Officer walk through, in which best of the best can be shown to Fire Officer, the decided Route should be in sequence of :- Road, Entry & Exit Gate, Driveway, Ramps, Basements, Typical Floors (Mockup / Best Finished Floor / Tower / Block), Terrace and end in Ground Floor.
  - b) Client should check and make sure Enough Water is Available in Fire Sump / Fire Overhead Tank
  - c) Client should instruct DG Operator to be available 1 hour before the Scheduled Fire Officer Visit and make sure No Disturbance in Power Supply till Fire Officer Leaves the Project.
  - d) Client should instruct Lift Company Senior Persons to come and check if the Lift is working in Full Speed, Fire Man Switch is functioning and ask them to deploy dedicated Lift Operators for each Lift, 30 Minutes before the Scheduled Fire Officer Visit.
  - e) Client should make sure one Lift is Dedicatedly kept only for Fire Officer, No other Person should be using it, in the entire Fire Inspection Period.
  - f) Client should witness Live Demo of all our Fire Protection Systems.
  - g) Client should go through the entire NOC and cross check if they have Not Adhered to any Point mentioned in NOC / Any Deviation / If they have any kind of Doubts / Not Clear about any Point, if yes, the same should be informed to our CMD.
  - h) Client should cross check and make sure EB / DG Power is available for showing Demo to Fire Officer.
  - i) Client should make sure one Representative is carrying Keys of all the Flats.
  - j) Client should instruct their Entire Team & Other Agency Member who will be present in Fire Officer Visit that they should Not Discuss / Comment / Do Loose Talk / Ask Doubts / Suggest / Talk with Fire Officer and No one should come near / walk along with Fire Officer, for what so ever Reason.



## **CHECK LIST FOR FIRE OFFICER VISIT – CLIENT SIDE**

- j) Client should instruct their Entire Team & Other Agency Member who will be present in Fire Officer Visit that they should Not Shout / Scream / Discuss among them self / Talk in Mobile, everyone should maintain Pin Drop Silence and put their Mobile Phone in Fully Silent Mode, in the entire Fire Officer Walk Through
  - k) Client should instruct their Team Members / Other Agency People should not keep moving in Front / Back / Around the Fire Officer and make sure even all Labour Movement is stopped, Maximum 3 persons only should be present from Client Side for the entire Fire Officer Walk Through.
  - l) Client should arrange Refreshments / Break Fast / Lunch for Fire Officer, their Assistants, our CMD and later for our Team Members, Dishes and Sitting Location should be decided after discussing with our Business Head.
4. Client should be present at site 1 hour before the scheduled time of Fire Officer Visit and check below mentioned :-
- a) Client should check and confirm if all Lifts are working in Full Speed and dedicated operators are available for each Lift and instruct them to have one Lift dedicated for Fire Officer and Lift Operator should be Present inside the Lift and operate it in Attendance Key Mode.
  - b) Client should Instruct / do all required formalities, to Entry Gate Security, so that they allow Fire Officer's & our CMD's Vehicle inside the Project and allow them to Park in Drive way, without Stopping them in Gate.
  - c) Client should make sure no Vehicles are Parked in front of the Entry / Exit Gate, Drive Way and also avoid Parking in Basement Area and Vehicle Movement should be Stopped, till Fire Officer is there in the Site.
  - d) Client should stop all Labour Works 15 minutes before Fire Officer Visit.
  - e) Client should make sure one person from their side is carrying enough Packaged Drinking Water Bottle along with Fire Officer, in the entire walking through.
  - f) Client should allot 2 persons exclusively for taking Measurements and they should be present along with Fire Officer, in the entire Walk Through.
  - g) Client should be Present 15 minutes before Fire Officer Visit, near the Entry Gate to welcome Fire Officer.
5. Client should be always next to Fire Officer / our CMD, in entire Walk Through



## **CHECK LIST FOR FIRE OFFICER VISIT – CLIENT SIDE**

6. Client should always lead the way for showing the Route, as Decided.
7. Whenever Client is interacting with Fire Officer, they should always talk in Regional Language.
8. Only Client should interact with Fire Officer, in the entire Walk through, Client should make sure No Other person from their Company / any other Contractors / PMC / Consultant interact with Fire Officer and also make sure No one should come near / walk along with Fire Officer, for what so ever Reason, except TSI Team.
9. Client should make sure None of their Team Members & Other Agency Members Shout / Scream / Discuss among them self / Talk in Mobile, everyone should maintain Pin Drop Silence, till Fire Officer leaves the Site.
10. If Fire Officer ask any Queries / Doubts, Client should replay what is mentioned in NOC.
11. Client should Never Voluntarily Discuss / Ask any Queries / Doubts / Casual Discussion / Telling any details about their Project, to Fire Officer.
12. Whenever Fire Officer Ask any Question for which Client doesn't know the exact Answer, they should not give any Answer, instead tell them we will get back to you.
13. Whatever Fire Officer Says, Client should just Accept it, whether it is Right or Wrong, Client should Never Argue / Talk Back / Raise Voice to Fire Officer, for what so ever reason.
14. Client should always follow our CMD's Instruction, till Fire Officer is at Site.
15. After completing the Walk through, Client should Invite Fire Officer & CMD for Refreshments / Break Fast / Lunch and take care of them, till Fire Officer Leaves.
16. If Client has not Understand any of the above mentioned points, they should call our Business Head / CMD and get it Clarified.



## **CHECK LIST FOR FIRE OFFICER VISIT – SUB CONTRACTOR SIDE**

1. Sub Contractor should give Highest Priority to Fire Officer Visit, because showing a Successful Demo to Fire Officer is like a Exam for every one.
2. Sub Contractor and Team members should be Present at the Client Walk through and Show the Demo of concerned System, one day before Fire Inspection.
3. Sub Contractor and Team members should be Present 1 hour before Fire Officer Visit.
4. Fire Fighting Sub Contractor should keep Fire Duct Shutter Key Ready for showing Demo of Hydrant System and keep 2 Torch, Thinner, Spare Sprinkler Bulbs, Spanner & Ladder to show Demo of Automatic Sprinkler System.
5. Fire Alarm Sub Contractor should keep Screw Driver / Hammer Ready to show the Demo of MCP and keep minimum 25 Nos. Incense Sticks, Match Box and Ladder for showing Demo of Smoke Detector
6. Sub Contractor and Team members should be wearing TSI Safety Jacket, which is Neat, Clean and Not Torn, in Fire Officer Visit.
7. Sub Contractor and Team members should be wearing Safety Shoe and Safety Helmet, in Fire Officer Visit.
8. Sub Contractor and Team members should show Successful Demo of concerned System, to our PH / DPH & BH, one hour before Fire Officer Visit.
9. Sub Contractor should be present next to our Project Manager, in the entire walk through.
10. Sub Contractor Team Members should be present, in their allotted position and should not be moving around Fire Officer.
11. Sub Contractor and Team members should Not Shout / Scream / Talk among themselves / Talk in Mobile, everyone should maintain Pin Drop Silence and Mobile Phones should be in fully Silent Mode, Till Fire Officer Leaves the Site.
12. Sub Contractor and their Team members should Not Talk to Fire Officer / Their Assistant or give any kind of information about our System / Project, even if they ask for it.
13. After Fire Officer Leaves the Project, Sub Contractor and Team Members should stay back and keep all the Equipment's neatly back to its place.



## **CHECK LIST FOR HANDING OVER**

1. After doing the Testing & Commissioning of all the System, concerned Project Manager should check below mentioned points, before Handing Over the Project :-
  - a. Check and Confirm if MCC Panel is in Auto mode.
  - b. Check and Confirm if all Suction & Delivery Side Butterfly Valves are in Open Condition.
  - c. Check and Confirm if Test Line Butterfly Valves is in Closed Position.
  - d. Check and Confirm if Manifold's Pressure is as per Sequence Chart.
  - e. Check and Confirm if Pressure Switch Auto Settings is as per Sequence Chart.
  - f. Check and Confirm if Pumps Rotation is in correct Direction.
  - g. Check and Confirm if DG Battery Voltage is 12V per Battery.
  - h. Check and Confirm if DG Radiator Coolant is in Correct Level.
  - i. Check and Confirm if DG Engine oil is in correct Level.
  - j. Check and Confirm if Final Coat Painting is done for entire Project
  - k. Check and Confirm if all Sprinkler Bulb Covers are Removed.
  - l. Check and Confirm if all Smoke / Heat / Multi Sensor Detector Covers are Removed.
2. Concerned Project Manager should fill all the details in "Handing Over Report", as per Format, mentioned in PM's SOP and keep 2 Nos. of Original Hard Copy Ready, however, if Client / PMC insists to use their Format, the same should be used.
3. Concerned Project Manager should Hand Over the Entire Project to Clients / PMC / Association and obtain their Seal and Signature in both the Handing Over Report
4. Concerned Project Manager should hand over one Original to our PSE and another Original should be handed over to Client / PMC.



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**TOTAL SOLUTIONS INTEC PVT. LTD.**

No.20, 17<sup>th</sup> Main, HAL 2<sup>nd</sup> Stage, Indiranagar, Bangalore 560 008

Phone: +91-80-41255556, E-Mail : [info@tsi.net.in](mailto:info@tsi.net.in)

Website : [www.tsi.net.in](http://www.tsi.net.in)