

METHOD STATEMENT FOR INSTALLATION AND TESTING OF FIRE SPRINKLER SYSTEM

1. SCOPE

This procedure covers installation and inspection of Fire Fighting - Sprinkler System.

2. PURPOSE

The purpose of this procedure is to define the method of installation and inspection of Sprinkler System.

3. ABBREVIATIONS

3.1. Abbreviations

1. ICL - Inspection Check List
2. IR - Inspection Request
3. ITL -Independent Testing Laboratory
4. ITP - Inspection and Test Plan
5. ITR -Inspection & Test Requests
6. MAT - Material Submittal
7. MEP - Mechanical Electrical Plumbing
8. MET - Method Statement
9. MIR - Material Inspection Request
10. MSDS - Material Safety Data Sheet
11. PPE -Personal Protective Equipment
12. PQP -Project Quality Plan
13. PTW -Permit To Work (Working at Height or enclosed spaces)
14. RA -Hazard Identification and Risk Assessment
15. RFIA - Request for Inspection and Approval
16. SPD - Shop Drawing
17. TBM - Temporary Bench Mark

4. QUALITY CONTROL

Quality of installation and materials at site will be ensured by our project team consisting of a Project Manager, Project Engineer, QA / QC Engineer and the site Foreman. Quality of the work will be according to the NFPA standards and local civil defence authority requirements.

5. STORAGE AND HANDLING

The pipes will be stacked in the site store on a flat surface at a height not exceeding 1.7m. From the bottom layer. Fittings will be separately packed and stored as per the sizes required for the project. All open ends of pipes will be covered to protect from foreign matter, dirt/debris.

6. RESPONSIBILITIES / SUPERVISION

1. To ensure that all the preparation and application works are carried out according to the Contract Specification and Manufacturer's data sheet.
2. To ensure that the progressing of works is carried out according to the planned program and as per the approved method statement.
3. To ensure that all the equipment and material required executing the work are available according to the planned construction program.
4. To co-ordinate with the Main Contractor MEP Coordinator & Safety Officer for a safe and proper execution of the work
5. To provide all necessary information and to distribute responsibilities to his construction team.
6. The Foreman will be responsible for the following :
7. The foreman will carry out his duties by maintaining continuous coordination with the project engineer on daily basis, to ensure proper distribution of the work force in the required and planned locations.
8. To provide to the project engineer a daily progress report indicating the works achieved and discuss with him the planned activities for the next day.
9. To ensure that the daily work is progressing as planned and to advise the project engineer of any requirement for additional resources
10. To be aware of test frequencies related to the pipe work and Hydrostatic.
11. To control disposal of waste materials according to the instruction received for the project engineer.
12. To ensure full coordination with the safety officers to maintain safe working and proper housekeeping of the site, following the approved safety measures and further ensure that all his working team are aware of the same to prevent accident and losses.
13. To inform the project engineer about the readiness of work for inspection and it's checking, if any.

7. TOOLS & EQUIPMENT

The following Tools and Equipment will be used for Fire Fighting System Installation:

1. Grooving Machine
2. Threading Machine
3. Welding Machine
4. HILTI Drill Machine Model TE-1 and TE-24
5. 12" Grinding Machine
6. Vice Table
7. Pipe Wrenches

8. FIRE FIGHTING SYSTEM DESCRIPTION

8.1. Sprinkler system:

An Integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The portion of the Sprinkler system above ground in a network of specially sized OR hydraulically designed piping installed in a building, structure, OR area,

generally overhead and to which sprinklers are attached in a systematic pattern. The valve controlling each system riser is located in the system riser OR its supply piping. The system is activated by heat from a fire and discharges water over the fire area.

8.2. Wet Pipe System

A sprinkler system employing automatic sprinklers attached to a piping system containing water and connected to a water supply so that water discharges immediately from sprinkler opened by heat from a fire.

8.3. SYSTEM COMPONENTS

1. Network of pipes
2. Zone control valve assembly
3. Sprinkler
4. Air release valve
5. Fire Department Connection
6. Minimum one four-way inlet breaching connection – to 2 1/2” fire hose and two-way inlet breaching connection to 1” fire hose reel system will be connected according to the accessibility to connect with fire department vehicle.

9. WORK SEQUENCE AND METHODOLOGY

9.1. Installation of Fire Sprinkler System

1. The installation of Fire Sprinkler System shall be according to the approved detailed shop drawings and also as per the recommendations of NFPA 13.
2. Pipe hangers shall be spaced at intervals as specified in our approved shop drawing.
3. Threaded piping will be made with Teflon tape or with a suitable pipe sealing compound (jute and mastic combination) applied on male threads only. Ends of pipe will be reamed out before being made up into fitting.
4. 2” and below sizes of pipe are made threaded & 2 1/2” and above sizes are normally grooved type. Groove can be made cut groove or roll groove.
5. All underground fittings will be welded type. All piping coming underground will be wrapped with polyvinyl chloride tape.
6. All Piping must be rigidly supported by a combination network comprised of pipe hangers and rigid support brackets. Pipe hangers are used to support the ‘dead load’ of the pipe system. The spacing will be as per the schedule attached.
7. Sprinkler Head Location shall be installed in accordance with approved system plans and coordinated RCP layout.

9.2. Installation of Sprinkler Head:

1. All the Sprinkler Heads must be installed according to current NFPA 13 standard.
2. The system piping must be properly sized according to the approved drawings and calculation to insure the minimum required flow rate at the sprinkler head.
3. Install the Sprinkler Heads after the piping is in place to avoid mechanical damage.
4. In the event of a thread leak, remove the unit, apply new pipe Teflon tape, and reinstall.

5. The face of the sprinkler fitting should be installed a nominal 3/8" to 1" behind the finished ceiling line, adjustment may be made via the push-on escutcheon plate to compensate for variation in the fittings.
6. Hand tightens the sprinkler into the fitting using the proper size of wrench.
7. To install the escutcheon plate, align it with and press it over the sprinkler body until the outer edge of the escutcheon meets the mounting surface

9.3. Installation of Butterfly Valve:

1. The Butterfly Valve should be located as per the approved drawings, also to make sure that it is located where it will be readily accessible for operation, inspection and maintenance.
2. During Installation make sure that the valve disc does not interfere with the operation of other systems components immediately adjacent to the butterfly valve.
3. When a valve "closes hard", it may be due to debris lodged in the sealing area. This may be corrected by backing-off the hand wheel and closing it again, several times if necessary. The valve should never be forced to seat by applying a wrench to the hand wheel as this may distort the valve components or score the sealing surfaces.
4. The inlet and outlet piping adjacent to the valve should be properly supported to prevent excessive stress on the valve body. The valve should not be used to force a pipeline into position as this may result in distortion of the valve body.

9.4. Installation of Flow Switch:

1. The flow switch should be located as per the approved drawings, also to make sure that it is located where it will be readily accessible for operation, inspection and maintenance.
2. The flow switch may be mounted on a horizontal or vertical pipe. On Horizontal pipe they should be installed on the top side of the pipe where they will accessible.
3. Drain the system and drill a hole in the pipe using a circular saw in a slow speed drill. The whole size shall be 2".
4. Clean the inside pipe of all growth or other material for a distance equal to the pipe diameter on either side of the hole.
5. Roll the vane so that it may be inserted in the hole; do not bend or crease it.
6. Insert the Vanes so that the arrow on the saddle points in the direction of the water flow.
7. Install the saddle strap and tighten nuts alternately.
8. The vane must not rub the inside of the pipe or bind in anyway.

10. METHOD OF PRESSURE TESTING OF PIPING

SPRINKLER & FIRE FIGHTING SYSTEMS PIPING

10.1. Installation Check

10.2. Hydrostatic Testing of pipe line.

Test Condition	Performance requirement
Test Pressure :1.5 times of the working pressure Duration : 2 hrs. pressure Monitoring : By calibrated pressure Gauge installed at the lowest element	No visible leakage from external piping. At the end of 2 hrs. Duration, there should not be any remarkable change in system pressure.

10.3. Method of Testing

1. Plug all the openings
2. Close all the drain valves.
3. Fill complete pipeline with water avoiding any air column. (For this purpose keep the drain valve at the highest elevation slightly open, while filling water when line is completely filled with water close the valve)
4. By a pressure pump pressurize the line to an intermediate pressure, say 100 psi. Wait for 5 minutes; check all major joints for any visible leak.
5. If the system is OK as per point No. 4 again pressurize the system to 150 psi and wait for 10 minute for any drop in pressure or leakage.
6. If the system is found to be leak proof as per item No. 5 pressurizes the line to the required testing pressure and keep for 2 hrs.

10.4. Functional Testing for Sprinkler System

Sl. No.	Test Description	Performance Requirement	Report
1	Open the test valve on Alarm Check Valve	Water Motor Alarm Gong should operate.	
2	Open sure test valve	Water motor Alarm Gong should operate. Fire Alarm System bell should ring. Main pump should Start.	
3	By a heat source operate remote Sprinkler	Water should spray covering the area specified. Main Pump should start should repeat performance and item # 02. Indication on fire Alarm panel & repeater panel regarding the zone being operated	

11. HEALTH AND SAFETY

Work shall strictly follow as per the Manufacturer's / Client's / Consultant's Health & Safety recommendations for handling and use of the materials. Ensure all involved personnel shall be aware of the same.