

PROJECT NAME & COMPANY LOGOS

Method Statement for Testing & Commissioning of Fire Alarm System



Client

Consultant

PMC

Contractor

Issued on

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1. Purpose

This document describes the methodology for testing & commissioning of Fire Alarm System in Project, and to ensure that all concerned persons are familiar with the sequence of activities, utilization of resources, and execution of the works in compliance with applicable Safety and Quality Procedures, and Project Documents and Specification.

2. Scope of Works

This document covers the following scope of works:

This method statement is intended to outline the activities and the methods used for testing & commissioning of Fire Alarm System. All activities will be carried out in accordance with the contract details and in full compliance to the Contract Specifications and Documents. All work within the rights-of-way of the local municipal governments will be done in compliance with requirements issued by those agencies.

3. Legislation and Code of Practice

- All related codes and standards referenced in the Contract Specifications

4. Reference

- 4.1. Contract Specifications.
- 4.2. Contract related drawings
- 4.3. Approved material submittals
- 4.4. Approved shop drawing & coordination drawings.
- 4.5. Manufacturer Recommendations for Installation & Commissioning

5. Definitions / Abbreviations

CxA :	Commissioning Authority
CxM :	Commissioning Manager
MREP:	Manufacturer's Representative
MS :	Method Statement
ITP :	Inspection Test Plan
PM :	Project Manager
PPE :	Personal Protective Equipment
PQP :	Project Quality Plan
QA/QC :	Quality Assurance / Quality Control
WIR :	Work Inspection Request
HSE :	Health and Safety Environment
CxT :	Commissioning Third Party
HSE :	Health and Safety Environment
Cx :	Commissioning

6. Resources

6.1 Tools/Equipment

- Tool kit.
- Measuring Tape
- Ladder / Scaffolding.
- Calibrated Multimeter.
- Safety requirements tools such as safety shoes, safety helmet, safety glasses, fluorescent vest, and safety gloves to ensure maximum ability of safe work and dust mask when require.

6.2 Calibration

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- All instruments used will carry current calibration certificates/certificates of conformance to the tolerances specified in the referenced standards.
- Instruments will be properly maintained and protected against damage.
- Calibration periods for all instruments are as recommended by the instrument manufacturers and are in line with the requirements of the Commissioning Specialists Association.
- Certificates will be available for presentation prior to commencement of the works.















6.3 Safety of Equipment's

Necessary measures will be taken for the safety of the equipment and any other works affected by the works subject of this document. Relevant entities which might require protection include any such works in the vicinity of the area of work or on the service access or discharge path. The construction team will ensure that any such requirements are documented.

7. Health, Safety & the Environment

- A task based risk assessment and mitigation strategy is summarized in the attached table. Work will commence as per safety regulations laid down in the contract specification and project safety plan.
- Safety gears shall be used. All personal protective equipment shall be used as appropriate according to the nature of the job. For electrical works, provide nonconductive tools and PPE.
- Working on live power cables/equipment is not allowed. ELCB shall be used in temporary panel boards; industrial connectors/sockets for temporary power cable connections.
- Always maintain cleanliness in work areas. Housekeeping shall be of good standard and all cut pieces and debris shall be removed by the end of workday. Ensure that all lifting operations are carried out as per approved procedures and safety regulations.
- Ensure that adequate barricade and signage "DANGER KEEP-OUT, HEAVY LIFTING IN PROGRESS" is provided around the affected area. Work will be executed through Permit to Work system.
- All scaffoldings shall be checked by competent person and should carry green tags "safe to use", prior to use for working purpose.
- All plant tools tackles will have valid certificate. Lifting machines, appliances and gear to be examined by qualified rigger and come with valid certification.
- Workers working at height to wear their full body harness and should be anchored to a rigid point. Nobody is allowed to stand on the top of the step ladder; worker should stand two rungs below from top of the step ladder. A co-worker must hold the step ladder while in use. Work inside shafts are not allowed without work permit and supervision. Work areas to be provided with proper lighting and ventilation at all times.
- Store tools and equipment and unused materials stacked in a safe area at the end of the workday.
- Method statement / risk assessments to be briefed to all concerned personnel and signed as read /understood.















7.1 Construction Hazards (tick as appropriate)

Corrosive	Oxidizing	Highly flammable	Extremely flammable	Toxic	Highly Toxic	Irritating	Harmful
							
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Explosive	Danger for the Environment	Constrained Space	Slippery Surface	Danger of Electrocutation	Falling from Height	Other	
						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The hazards identified above will be controlled under the overall Project Safety Plan which is a separate document communicated to all parties on the project.

7.2. Personal Protective Equipment (tick as appropriate)

The works subject of this document requires that the following PPE be used:


Safety Precaution	Helmet	Hi-Viz	Eye Protection	Face Protection	Mask Required	Respirator Required	Ear Protection
							
	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Gloves Required	Safety Shoes Required	Protective Clothing	Safety Harness	Equipment Guards	Lifejacket	Other	
						<input type="checkbox"/> Hot Work Permit Required	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> _____	
						<input type="checkbox"/> _____	
						<input type="checkbox"/> _____	

7.3. Safety Training and Emergency procedures

Before commencing any works, all employees will attend a site safety induction training to ensure all safety measures are understood and implemented and to cover specific procedures in case of emergency. If necessary, practical training exercises will be conducted on escape routes, signage, evacuation and rescue.

7.4. First Aid

Prior to the commencement of work, arrangements will be made for medical facilities and medical personnel to be available from prompt attention to the injured person. The contractor's vehicle assigned to the job site will be used for transporting the injured person to the first aid station and to the nearest hospital when required.

	Name of On-Site First Aider/s:	
	First Aid Box Location:	
	Location of Nearest Hospital:	
First Aid and Medical Supplies available at site:		
Potable Water		Ice Cubes
10x6cm Sterile Gauze Pad		4x6cm Gauze Roller Bandage
10x10cm Sterile Gauze Pad		8x10cm Gauze Roller Bandage
Large Sterile Gauze Pad		10x12cm Gauze Roller Bandage
Burn Dressings		5cm Elastic Bandage

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7.5cm Elastic Bandage	10cm Elastic Bandage
Triangular Bandage	Barrier Device for CPR
Adhesive Skin Tape	Adhesive Leucoplast Tape
Emergency Blanket	Safety Pins
First Aid Scissors	Tweezers
Disposable Gloves	Instant Cold Pack
Non-prescription Medicines (Aspirin, Ibuprofen, Acetaminophen)	First Aid and Burn Spray, Deep Heat Spray

8. DETAILED TESTING & COMMISSIONING SEQUENCE (METHODOLOGY)

8.1 Pre- Commissioning Procedure:

8.1.1 Checking system wiring:

- A. Ensure that no power is applied to the 4100U fire alarm panel and that all wiring is properly connected.
- B. Use the green grounding lug in the control panel for all measurements to ground. Each circuit must test free of all grounds and extraneous voltages.
- C. Use the volt/ohm meter to check each circuit type.
- D. At the control panel, locate wires from each initiating device or indicating appliance circuit.
- E. Check each circuit for extraneous voltage by setting the volt / ohm meter to 300VAC.
- F. The meter must read 0 volts.
- G. Set the volt / Ohm meter to 60 VDC .The measurements must read 0 volts.
- H. Set the volt / ohm meter to OHMS X 10 and check the circuits using resistance measurements in following table. Locate and correct any abnormal conditions at this time.

Circuit Type	Meter Reading (recommended values in brackets)
Class A / style D initiating Device circuit	
From IDNet + to IDNet -	(Infinity)
From IDNet + to Ground	(Infinity)
From IDNet - to Ground	(Infinity)
From IDNet + to IDNet +	(Less than 25 Ohm)
From IDNet - to IDNet -	(Less than 25 Ohm)
Class B / style Y, NAC circuit	
From + to Ground	Infinity
From - to Ground	Infinity
End of line monitoring Resistance	10 K Ohm

- I. Check all other system wiring to verify that each circuit is free of grounds and extraneous voltages.

8.2 Testing & Commissioning procedure

8.2.1 Type of initiating devices used in this project and their test methods are as follows:

- Smoke detector- Apply SOLO Aerosol in the smoke detector chamber until red LED glows steady

- Heat detector – Switch on and place the heat gun covering the detector until the red LED glows steady.
- Manual Call Point – Open the MCP using Simplex key.
- Sprinkler Flow switch – Open the Test drain valve until FACP receives FIRE signal. (Sprinkler Supplier coordination required).

8.2.2 Voice evacuation shall be tested by the following method.

- Create any fire alarm in the area.
- Check all speakers in the corridor and staircase Voice Evacuation Zone are functioning.
- Check the audibility and voice clarity.
- All the speakers for each zone will be tested at least once during detectors test for each voice evacuation zone.

8.2.3 Function test of devices shall be carried out loop by loop as follows:

- Activate the devices described in 8.2.1. one by one
- Function test will annunciate to the FACP, The annunciation includes panel buzzer and LCD display of location.
- The tests will be printed in the printer which is located in main control room.
- Check for cause and effects are functioned according to the approved matrix.
- If the test is successful, move to the next device and continue the test up to the consultant's acceptance.
- Check the sounders and bells are functioning.
- If the test result is successful, move to the next device and continue the test until all devices are tested in the loop.
- If all devices tested successfully in one loop, move to next loop and continue in the same manner.
- If the “Alarm Silence” button is pressed, it will stop all notifications and an “ALARM SILENCE IN PROGRESS” message will show in the FACP prior to stop the appliances.
- If the “SYSTEM RESET” button is pressed, “SYSTEM RESET IN PROGRESS” message will display and reset will take place. Alarm will be cleared after a successful reset or the panel will show a message that “ALARM PRESENT, SYSTEM RESET ABORTED”.

8.2.4 Function test of the Interfaces.

- Verify all interfaces are functioning in case of activation of corresponding initiating devices.
- Test shall be carried out in the sequence of loop by loop. It will be tested by activating any detector or break glass in the loop and verify the following effects are taken place.
- It will be tested by activating one device in the building Also, one Manual Call Point will be operated in each floor. The testing will be done as follows:
 - **Elevator:** Create fire in any floors other than ground floor and ensure that the elevator lands to ground floor. Create fire in ground floor and ensure that the elevator lands to alternate landing level. Once the system is reset and the fire condition is cleared, the elevator relay will reset and will start functioning as normal.
 - **Lift well pressurization fan:** Create fire and ensure that all the fans turn on and once reset it should turn off.
 - **Motorized Fire Dampers (Pressurization dampers & extract dampers):** Create fire in any floor and make sure that the **extract dampers** are opened in the incident floor and while the others remain close and also make sure that the **Pressurization dampers** are opened in the above and below floors.

- **FAHU:** Create fire and ensure that the FAHUs are shutdown.
- **Stair case pressurization fan:** Create fire in any floor and ensure that the fan is running (SPF pressure could not able to maintain, running at constant pressure).
- **Smoke Extract fan:** create fire in any floor and the make sure that the fan is running (SEF pressure could not able to maintain, running at constant pressure).
- **PA system:** Create Fire and Ensure that all Speakers are working.
- **Fire Fighting System:** Create Fire and ensure that the signal is going to the panel.

8.2.5 History Log

After successful testing of entire system a historical log shall be generated and printed for review and comments for inspectors.

8.2.6 WALK TEST

The system has a Walk test feature which allows a single person to test the devices. Walk test enable will show as a trouble warning in the system and will be cleared after successful exit of walk test. Walk test events also will be recorded in Main FACP. System will reset itself after every device test.

8.2.7 Witness Demonstrations / Completion

After the successful commissioning the results will be recorded on the testing and commissioning sheets attached with the document.

9. Testing & Commissioning Programs.

- As per main T&C program

9.1 Housekeeping

The work area shall be maintained neat and tidy as reasonable practical at all times.

9.2 Protection of Executed Works

Executed works in areas where other works are still being carried out shall be protected as per the contract requirements.

9.3 Responsibilities

Commissioning Manager (CxM):

- CxM shall be responsible for entire Pre-commissioning and Commissioning of the System. All necessary manpower, apparatus and instruments which are required for Pre-commissioning and commissioning activities shall be supplied by commissioning team.
- CxM leads, plans, schedules and coordinates the Commissioning team to implement the procedure.
- Notification of any witnessing of Pre-commissioning & Commissioning activities shall be forwarded two (2) working days prior to commencement of activity.

Commissioning Team:

- All Pre-Commissioning and Commissioning activities of System are the responsibility of supplier and Commissioning Team.
- CxM shall check the commissioning works prior to submission to the CxA for witnessing and approval.
- In case of failure in any test, Cx Team will rectify, to re-offer the test to CxA for re-witnessing and approval.
- Final Testing & Commissioning Report for System will be forwarded to the CxA by the contractor team.

QA/QC Engineer:

- QA/QC Engineer shall inspect the installation activities to ensure system completeness/readiness is achieved before commencement of any Commissioning activity.
- QA/QC Engineers shall be monitoring the Commissioning activities to ensure quality standards are maintained throughout testing and commissioning of System.
- QA/QC Engineers shall be witness the Pre-Commissioning and commissioning activities.
- Notification of any witnessing of Pre-commissioning & Commissioning activities shall be forwarded to the QA/QC Engineer two (2) working days prior to commencement of activity
- QA/QC Engineer shall ensure system completeness/readiness is achieved before commencement of any Pre-Commissioning activity.

Specialist Contractor:

Supplier shall perform Testing and Commissioning of all the system under direct supervision of MEP Engineers, complying with the procedure specified in the specification as a requirement and in line with manufacturer recommendations and instructions (included in manufacturer provided catalogue/O&M manual to be submitted as per O&M Manual Submission Plan).

9.4 Records

In accordance with the Quality Management System, the following records will be maintained as documentary evidence of the establishment of this method statement:

Records to be retained	Responsibility	Minimum Retention Period	Disposition
Work Notification (If required)	Construction Manager	As per Contract Requirements	
Request for Inspection & Approval (RFIA)	QA/QC Engineer	As per Contract Requirements	

10.INSPECTION &TEST / COMMISSIONING PLAN

- The Commissioning Engineer should verify that the CxT who is responsible for Testing & Commissioning responsibilities for Commissioning is familiar with this Method Statement and is issued with copies of the checklists.
- The CxT Engineer should satisfy the procedures provided by Commissioning Engineer inspections to ensure the Commissioning of the system meets the specified Engineering requirements and approved drawings.
- As part of the assessment, the CxT Inspection Procedures must ensure a quantitative or qualitative acceptance criteria for determining the prescribed activities have been accomplished satisfactorily.
- The CxT should verify any as-built record of system and confirm that the information meets the project requirements.
- Request for Inspection & Approval (RFIA) shall be submitted by Commissioning Engineer to QA/QC department for verification, inspection and approval in accordance with Commissioning Plan.
- Readable stamped approved Method of Statement to be available during testing and commissioning.
- All the instruments engaged for testing shall have valid calibration and certificate should be furnished.

11. Related Forms

- As per standard checklists for pre commissioning and commissioning.

12. Attachments

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- Supplier T&C Procedure
- Pre Commissioning Checklist
- Commissioning Checklists / Reports
- Risk Assessment
- Manufacturer Recommendations