

Fire Alarm Acceptance Testing – New Construction and Renovation Projects Guideline

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Applies to: This document's intent is to provide project managers, architects, engineers, contractors, and other University partners a guideline on roles, responsibilities and expectations of initial acceptance and / or reacceptance of fire alarm testing on University of Michigan campuses for new construction and renovation projects.

Summary:

The purpose for initial and reacceptance tests of fire alarm and signaling systems is to ensure system operation in accordance with the design documents, while the purpose for initial and reacceptance inspections is to ensure compliance with approved design documents and to ensure installation in accordance with the University's Fire Code (IFC, 2021) and NFPA 72 (2013).

This guideline addresses the most common aspects of fire alarm acceptance / reacceptance tests for University of Michigan owned properties. In cases where this guideline does not address a device or operation used within a University of Michigan fire alarm system, the IFC, MBC, NFPA, and/or Manufacturer Specifications will be used to determine testing criteria. This document will be located within AEC's Procedure Manual, F&O's Maintenance Procedure Guide, and EHS' Guideline Library.

This document is not intended to take the place of any required code, standard, or project specification but rather to supplement as such; nor is this document intended to supersede any code, project specification, and is not intended to serve as an all-inclusive document, but rather as a guide on the roles and responsibilities of University of Michigan staff during fire alarm acceptance procedures being conducted on University of Michigan own properties.

If a conflict arises between a code, standard, or project specifications and this document, the University of Michigan designated Authority Having Jurisdiction and other appropriate project team members will review the information and come to a collaborative agreement.

Procedure:

Final fire alarm system acceptance and / reacceptance testing shall be conducted by the contracted fire alarm contractor in accordance with NFPA 72 and witnessed by University of Michigan staff.

The University of Michigan prefers to utilize provided battery calculations that would support such additions of incidental devices in lieu of an extended battery test to preserve the life cycle of a fire alarm system's battery system.

Fire Alarm Contractor/AEC Representative Responsibilities

- No less than 14-days prior to the scheduled fire alarm acceptance test, an AEC Project Manager or Supervisor shall provide EHS Fire Safety Services (ehs-firesafety@umich.edu) a set of final shop drawings, a points list and supporting fire alarm system battery calculations, and include an appropriate notification of the assigned Michigan Bureau of Fire Services' fire inspector for 12A BFS buildings.
- The AEC representative shall schedule the FA inspection date with all parties.
- Final shop drawings shall reflect the installed device locations with device addresses and panel terminations on a floor plan representing the layout of the fire alarm system at the time of acceptance testing.
- All necessary tools, keys, materials, equipment, and personnel needed to accomplish the fire alarm system acceptance test and associated equipment shall be provided by the contractor and present at the time of the scheduled acceptance test.
- Any deficiencies noted during acceptance testing shall be corrected within 14 calendar days, and a retest shall be scheduled for all deficiencies noted if not corrected during the initial acceptance test. NOTE: All life safety systems must be tested and accepted by EHS Fire Safety Services to be operational before acquiring a Temporary or Final Certificate of Occupancy from the University's Building Code Official.

EHS Responsibilities

- Fire Safety Services
 - Notifications
 - Fire Safety Services will review fire alarm system battery calculations and provide a determination on the level of fire alarm system battery testing within the recognized F&O Maintenance 10-day shutdown notification time period.

- Battery Calculations
 - Based on provided battery calculations, EHS Fire Safety Services will determine one of the following battery testing criteria according to NFPA 72:
 - No battery testing is required.
 - Provided battery calculations support the prescribed devices / systems.
 - Determination is made that a system's battery life is less than 4-years of service life indicated by date (Month/Year) posted (written / labeled) on the installed battery. Service life shall be recognized as the time period from date of installation to date of system test date.
 - A 4-hour battery test with Emergency Stand-By Generator is required.
 - Provided battery calculations support the prescribed devices / systems.
 - It has been determined the project's entire fire alarm system is supported by an emergency generator that is compliant with NFPA 72 as a secondary power source.
 - Determination is made that a system's battery life is less than 4-years of service life indicated by date (Month/Year) posted (written / labeled) on the installed battery. Service life shall be recognized as the time period from date of installation to date of system test date.
 - A 24-hour battery test is required.
 - No battery calculations are available.
 - No installation date is posted (written / labeled) on the installed battery system and such determination is not available to verify the battery service life is less than 4-years. Service life shall be recognized as the time period from date of installation to date of system test date.
 - Fire Safety Services is unable to verify the entire fire alarm system is supported by a NFPA 72 compliant generator as a secondary power source.
- Testing
 - EHS fire inspectors shall witness the fire alarm components are installed and functioning according to NFPA 72.
- Code Inspection
 - Electrical inspectors will witness that the fire alarm system's components are installed and functional according to NFPA 70. They will also verify that the points list, labeling, and circuit monitoring are correct.
 - Electrical inspectors do not conduct battery calculations; however, they may review calculations occasionally.

Facility & Operations Maintenance Responsibilities

- Primary role of Fire Alarm Electricians (FAEs) is to provide the tested system's criteria listed below in order to be entered into the Fire Alarm Data Base as the Source of Record:
 - Type
 - Addresses
 - Locations
- If requested by EHS Fire Safety Services, assist in determining a battery system's service life.

AEC Building Commissioning Responsibilities

- Provide pre-testing of building smoke control system functionality. The Commissioning Agent (CxA) shall verify and separately document, in advance of the AHJ's inspection, that any mechanical equipment controlled by the fire alarm system (directly or indirectly) operates per the intended sequence of operation. Examples: Smoke or fire/smoke dampers in AHUs and in ducts and smoke control zones, fans, actuated doors or door release mechanisms, stairway or smoke zone pressurization systems, atrium smoke control systems, etc.
- Provide pretesting of Fire Fighter Command Center control panels to ensure proper functionality. This includes but is not limited to: smoke control panels, firefighters air distribution & status panels, and remote generator & ATS monitoring panels.
- Participate in the Fire Alarm Battery Test if applicable. Verify that any NFPA required interlocks to the lighting control systems and A/V systems are wired and operate correctly.
- On projects providing a new or replacing/expanding an existing emergency power distribution system, perform a preliminary "pull the plug" test of the system. Prior to AHJ testing, the CxA shall verify engine-generator and/or battery systems start all legally required standby loads within their required time (e.g. smoke pressurization fans) and optional standby loads, and these loads operate as intended. Verify that the generator tap box is capable of controlling the temporary generator and sized properly to replace the permanent generator when required for extended maintenance.
- In conjunction with AHJ, witness fire pump flow tests and verify that the correct notifications and alarms report back to the fire alarm system and/or BAS system when the fire pump is in operation.
- When an Emergency Responder Radio Coverage System is required; Verify that the Alarm points communicate with the Fire Alarm Panel (Loss of Building Power and Battery Power, General Trouble, Loss of Antenna, Battery Not Charging).
- Schedule and assist with fire alarm system training and O&M manual turnover at completion of project.