OFFICE OF UNIVERSITY BUILDING OFFICIAL
George Mason University

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FIRE ALARM, DETECTION AND EMERGENCY COMMUNICATION SYSTEMS SHOP SUBMISSION REQUIREMENTS

Code Requirements

Refer to the currently adopted codes and standards relevant to these submission requirements are as follows:

Virginia Construction Code (VCC)
International Fire Code (IFC)
National Electrical Code (NEC - NFPA 70)
National Fire Alarm & Signaling Code (NFPA 72)
George Mason University Higher Education Capital Outlay Manual (GMU HECOM)

General Requirements

A. **Designer Information.** All working drawings (plan drawings, product selection and battery/voltage calculations, etc.) shall be prepared and signed/dated by a designer who is either a Virginia Registered Design Professional (RDP) **or** a NICET Level III or NICET Level IV certified designer. The designer of the system shall be clearly identified on the documents. Fire alarm or emergency communication system designs seeking an equivalent approach in accordance with the Uniform Statewide Building Code (USBC) and NFPA 72 must be prepared by a Registered Design Professional (RDP).

Note: NICET Designer is prohibited from applying a stamp (refer to NICET Policy 28 and the Code of Virginia, section 18VAC10-20-760, Use of seal.). NICET designer shall provide the following information, along with signature:

"(Drawing/Document) (prepared/reviewed) by:

John Q. Public
NICET Certification No. 123456
NICET Certification Type/ Level
(e.g., Fire Alarm Systems Layout - Level IV)
Certification Expiration: xxy

The use of any seal or stamp that resembles or might be construed as the seal or stamp of a licensed professional engineer is unacceptable.

B. **Design Process.** All shop submissions (working plans, product data, calculations) are to be reviewed by the A/E of Record for compliance with project contract documents and the applicable code provisions. At the conclusion of the shop drawing review, the A/E of record must:

1. Verify the Underwriters Laboratories (UL) listings and classifications for the materials, components and equipment provided for this project result in a code compliant fire suppression system.
2. Provide a sealed "approved" statement, attached to the reviewed shop drawings indicating the fire alarm shop drawings (working plans, product data and calculations) satisfy the requirements of the project contract documents and the code (cite the applicable NFPA Sections).

C. **Application of Requirements.** The full extent of these submission requirements is not required for "Minor Fire Protection Project," unless otherwise required by the OUBO. "Minor Fire Protection Project," for fire alarm and signaling systems are defined as any work involving the addition or relocation of less than a total of 5 initiating or supervisory devices, and/or notification appliances on renovation projects. Work related to small projects cannot have an adverse effect on the integrity of the existing fire protection system, including power supplies (primary and secondary). All materials and equipment installed must be listed. A full plan review is not required for small projects, unless the OUBO requires a full submittal.

The "Minor Fire Protection Project" statement (i.e., separate letter or construction drawings documentation), prepared by the A/E of Record, must include the following information: Project name and address, number and type of devices added, moved, or deleted, and indicate that the installation and materials shall be in accordance with NFPA 72, and a **statement indicating there will be no adverse power supply effects on the system's circuit demand (battery supply or power demand on existing NACs)**. All installations require an AHJ rough-in and final inspection regardless of the number of heads altered or installed. Contractors are required to call for inspections prior to work being covered. This excludes minor repairs and maintenance issues (refer to NFPA 72) associated with existing systems. FYI, for intelligent addressable devices added on software-controlled systems, a test of 100% of the new devices and an additional 10% or a minimum of 50 devices on the existing circuits including a variety of initiating devices and notification devices will be required.

	Permit Application	Full Plan Review Submittal	Small Project Statement	Minor Fire Protection Project Drawing (Details provided only on A/E Construction Documents)
New Fire Alarm System	**X**	**X**		
6 or more Devices/ Appliances	**X**	**X**		
Small Project (5 or fewer Devices/Appliances) Renovations	**X**		**X**	**X**

PART II. PERMIT DOCUMENTS

Permit application to include the following:

- Complete set of plans
- Equipment specification sheets
- Voltage-drop and Battery calculations

All Shop Drawing Submittals Shall Contain Relevant Information as Listed In NFPA 72, Documentation Section (Design/Layout and Shop Drawings sections as applicable). Provisions made in this section for drawings to be considered mandatory, unless not specifically applicable to project. Deviation from these requirements will be considered an incomplete submission:

A. Floor Plan Information. Refer to NFPA 72 for applicable requirements. For emergency communication systems, including emergency voice/alarm systems, all acoustically distinguishable spaces (ADS) shall be identified in the drawings for purposes of voice intelligibility. (Refer to NFPA 72 chapter 24). All plan drawings to be scaled to 1/8” or 1/4" per foot.

B. System Riser Diagram.

C. Control Unit Diagrams.

D. Wiring Diagrams. Device to device wiring arrangement, in the plan view, in the structure from fire alarm panel to all devices, inclusive of last device, indicating location of end of line resister where applicable for clarity of system. Indicate the style of wiring used for determining how system will respond to different conditions associated with the functionality. Indicate size of wiring, number of conductors used, and protection methods required by NFPA 70.

E. Input/Output Matrix Required. A narrative permissible only for renovation work.

F. Calculations. Line resistance calculations are required on new or replacement systems.
   1. Use the following output voltage value for calculating the NAC: Voltage drop calculations shall use 20.4 VDC as the supply/starting voltage. NFPA 72 and UL require a power supply – even secondary power – to deliver no less than 85% of the nominal voltage. Therefore, VDC = 0.85 x 24 = 20.4 VDC. A wide variety of voltage drop calculation formats (and results) can be submitted for review (refer to AFAA.org/resources for readily available formats).
   2. Identify Circuit Breaker Panel and Branch Circuit that will be dedicated to the Fire Alarm System.

G. Fire Alarm Zones. Indicate how each fire alarm zone (including signaling line circuits, SLC) is designed in the building to meet provisions of the manufacturer’s accepted practices (i.e., number of devices permitted on a zone) and/or as

required by VCC (maximum floor area, and /or maximum allowable distance in any direction, and each floor zoned separately).

H. Manufacturer's data sheets on all equipment used in the system. Selected equipment shall be identified on data sheets to indicate relevant product.

I. Shop Drawing Plan Re-Submittals: If a re-submittal is required, MINOR plan information revisions shall be submitted with changes clouded. Changes involving a complete system re-design need not be clouded. Changes in other documents shall be clearly identified.