

# Texas A&M University Supplemental Guide for the Design, Installation, and Acceptance of Fire and Life Safety Systems



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Texas A&M University  
Supplemental Guide for the Design,  
Installation, and Acceptance  
of Fire and Life Safety Systems

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# Construction Fire and Life Safety

## Purpose Statement

The purpose of this document is to provide project managers, architects, engineers, contractors, and others a guideline as to the fire and life safety requirements for any new construction or renovations on the Texas A&M University campuses (Texas A&M University Higher Education Center at McAllen, Law School in Ft. Worth, etc.), the Texas A&M University System RELLIS Campus, and Texas A&M University Health Science Center Facilities located throughout the state of Texas. This document is not intended to take the place of any required code, standard, or project specification, but rather to supplement such. Nor is this document intended to supersede any code or project specification, and is not intended to serve as an all-inclusive document, but rather as a guide for what systems are required, specific equipment models, an outline as to the acceptance procedure that will be followed by Texas A&M University Environmental Health and Safety (EHS), forms that EHS will use, and what documentation/certification will need to be submitted to EHS by the Architect, Engineer, Contractor, etc. If a conflict arises between a code, standard, or the project specifications and this document, the Texas A&M University Authority Having Jurisdiction (AHJ) and other appropriate project team members will review the information and come to a mutual agreement prior to the affected project phase.

## Fire and Life Safety Commitment Statement

Texas A&M University is committed to providing a safe environment for all faculty, staff, students, visitors and emergency response personnel. Fire and life safety at Texas A&M University is governed by federal, state and local standards including System Regulations, University Rules, and University Standard Administrative Procedures. Ultimate jurisdiction for fire safety lies with the Texas State Fire Marshal and with the local Authority Having Jurisdiction (AHJ) as designated by the President of Texas A&M University. By presidential designation, the Director for Fire and Life Safety Program and University Fire Marshal in Environmental Health and Safety is designated to be the local AHJ and to be responsible for the day to day fire prevention, inspections, and program oversight. However, each and every individual, whether faculty, staff, student, or visitor on our campus shares a role in fire safety.

## Fire and Life Safety Program

The fire and life safety program at Texas A&M University involves numerous activities, programs, and procedures to help ensure that our campus is a safe place to work, live, and play. These program areas include fire prevention, fire suppression, emergency preparedness, preplanning, education, construction review and inspection, and response. The following information is provided as a general guideline for activities associated with fire and life safety. Additional information may be obtained by contacting Environmental Health and Safety or by going to our website for the latest information. Links are provided throughout this document.

## Program Requirements

The basis for the fire and life safety program at Texas A&M University is provided for by Texas A&M University System regulation:

24.01.01 *Supplemental Risk Management Standards*

[System Regulation - Health and Safety](#)

24.01.01.M4 – Environmental Health and Safety Programs

[University Rule - Environmental Health and Safety Programs](#)

24.01.04.M7 - *Fire and Life Safety Compliance*

[University Rule - Fire and Life Safety Compliance](#)

## Fire Protection Engineering Services

Any project involving a new facility or renovation greater than 20,000 gross square feet, any facility incorporating/requiring special hazards/special hazard protection, or any project where an alternate means of compliance to code is proposed, shall incorporate the services of a registered fire protection engineer who has relevant experience in the area(s) that requires these services. The AHJ may request these services if in any situation where in their opinion, code compliance is not being met or may upon special circumstances omit this requirement.

## Licensed, Registered, and Certified Personnel

Any design, installation, testing, certification, or similar activity where licensed, registered, or certified personnel are required by an applicable code, standard, standard practice, etc. shall be conducted by such personnel with the applicable and current license, registration, certification etc. Copies of such license(s) shall be provided to the AHJ upon request.

Any requirements that are identified by a code or standard but without specific value or test method shall be determined by the design professional and included in the design documents.

## Applicable Codes and Standards

The Texas State Fire Marshal's Office has adopted the National Fire Protection Association 101, *Life Safety Code*® (NFPA 101) and NFPA 1, *Fire Code*® (NFPA 1) as the primary guide for fire and life safety. Unless indicated, the most recent edition of these codes and standards shall be utilized. Additionally, all applicable referenced codes and standards within these documents are included and shall be incorporated as appropriate. Where items are not addressed by NFPA 1 or NFPA 101 or, the following codes or standards are more stringent, they shall be utilized for design and construction issues.

- International Building Code – (Including Appendix B, C, D, E, F, G, H, and I)
- International Fire Code
- International Mechanical Code
- International Plumbing Code
- Texas Accessibility Standards Act
- Americans with Disabilities Act
- ASME A17.1 – Safety Code for Elevators and Escalators

## Fire Safety During Construction, Alteration, and Demolition Operations

Any contractor conducting any construction, alteration, or demolition operations shall incorporate applicable requirements of NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations*, as a condition of the construction process (incorporated by reference from NFPA 1).

## Facility Remodels

Any project involving a remodel of a facility with an existing fire alarm, fire sprinkler, standpipe, or any other type of life safety system shall include within the scope of the design, provisions to connect to, expand, or modify any of the existing systems. This scope shall include at a minimum:

- Updating system design calculations (sprinkler flow, battery capacity, etc.)
- Updating as-built drawings and related documents
- Updating any graphics packages associated with these systems (i.e. – addressable fire alarm systems with integrated graphics packages)
- Updating any associated programming with such systems (ex: software updates for addressable fire alarm systems)

## Laboratory Decontamination and Decommissioning

Prior to initiation of renovations or demolition in any laboratory areas on the Texas A&M University Campuses, it is imperative to ensure the area and any equipment remaining in or subject to contact with any personnel be decontaminated or in a state that allows work to safety be accomplished in the area. Depending on the extent of the project, it is possible that the laboratory and/or equipment may be required to be decontaminated or fully decommissioned. The project manager shall coordinate with Environmental Health and Safety prior to project initiation for an inspection and/or verification that the space is clear for such activities to occur. Further information regarding laboratory decommissioning and decontamination may be found on the [EHS Laboratory Safety Webpage](#) and on the [Research Compliance and Biosafety Webpage](#).



## Smoke Detector Protection During Construction and Renovations

The protection of all smoke detectors and other fire alarm devices during construction, renovation, and demolition operations is mandatory to prevent unnecessary responses by local fire departments and prevent the contamination of detectors that ultimately shorten their operational life. Acceptable protection methods include replacing smoke detectors with heat detectors (this will require preprogramming of the fire alarm control panel), or covering and removal at the end of each work day of all detectors subject to contamination/activation with a dust tight cover, powderless glove, or other approved method of protection. Other proposed alternatives will be evaluated on a case by case basis. Detectors determined to be contaminated may be required to be replaced at the end of the project at the contractor's expense.

Any smoke or heat detectors that remain in place during construction, renovation, and demolition operations must be adequately secured within code allowable distances to the ceiling or deck to prevent damage and allow for operation as designed. Fire alarm devices are not to be left hanging by their wires as this will cause damage to the devices and/or unintentional alarms.

## Construction Related Texas A&M University Rules, Standard Administrative Procedures, and Programs

**University Utility Locate Procedures** – To increase the level of safety, Texas A&M University has a policy that is more stringent than State law and requires an advance locate be performed for: 1) any ground penetration on campus, to any depth, when mechanized equipment such as augers, trenchers, excavators, etc. will be used, and 2) for all other ground penetrations to a depth greater than 12 inches. Hand-digging or soft excavation is required whenever any excavation is performed to a depth less than 12 inches without a utility locate. An advance utility locate is always required if the excavation will be deeper than 12 inches.

24.99.99.Mo.01 – [Standard Administrative Procedure - University Utility Locate Procedure](#)

**Stormwater Management Protection** - Texas A&M University is committed to conducting its activities as a responsible steward of the environment. In accordance with the University's environmental commitment and the Texas Pollutant Discharge Elimination System (TPDES) General Permit TXRo40000 for Small Municipal Separate Storm Sewer Systems (MS4), Texas A&M has established a Stormwater Management Plan and this procedure to provide methods for controlling the introduction of pollutants into the stormwater drainage system.

24.99.99.Mo.03 – [Standard Administrative Procedure - Stormwater Management Protection](#)

## Spill Prevention Control and Countermeasures Plan

The Spill Prevention, Control, and Countermeasures (SPCC) Plan for Texas A&M University has been prepared and implemented to establish the procedures and equipment required to prevent the discharge of oil and hazardous substances, including grease from food preparation (i.e. grease traps from food services), in quantities that violate applicable water quality standards, cause a sheen upon or discoloration of the surface of navigable waters or adjoining shorelines, or cause sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines. The plan also establishes the procedures and countermeasure equipment required to mitigate such discharges should they occur.

There are 7 main categories of oil storage containers with capacity of 55 gallons or more covered by the plan:

- Aboveground Storage Tanks: tanks and mobile containers
- Underground Storage Tanks
- Hydraulic Elevator Oil Reservoirs
- Transformers
- Used Cooking Oil Storage Containers: steel and plastic drums; steel constructed tanks
- Hydraulic Compactor Oil Reserves
- Emergency Generators

If any of the above listed items are added during construction, Environmental Health and Safety, specifically Environmental Compliance, must be notified.

All aboveground and underground storage tanks are required to have secondary containment, such as double walled tanks. Any transformer that is to be installed must be reviewed by EHS Environmental Compliance prior to installation to ensure that the transformer has passive spill containment or is in a location where any spills or discharges would be mitigated prior to reaching a storm drain or open ditch.



Any chemical storage areas on construction sites are subject to the SPCC Plan. Chemicals and/or fuel shall be labeled properly. Plastic tanks and containers shall not be brittle, flaky or bulging, as these are signs of wear with the container that may increase chances of leaking. Steel tanks and drums shall be free of rust. Lids, bungs and valves should be checked periodically for signs of wear or degradation.

**Slow Moving Vehicles** – This procedure and regulations have been created to establish proper safety procedures; identification and registration; parking; routes; and access for Slow Moving Vehicles operated on university property and to provide a safe environment for students, faculty, staff, and university visitors.

34.99.99.Mo.01 – [Standard Administrative Procedure - Slow Moving Vehicles](#)

**Asbestos Free Certification** – It is the intent that any new construction be designated as “asbestos-free” (no Asbestos Containing Building Materials (ACBM) used in the construction or renovation of the building). Each project shall complete and submit an Asbestos Free Certification to Environmental Health and Safety. To establish a facility “asbestos-free” the following is required:

A Texas-registered architect or a Texas-licensed professional engineer certifies that the architect or engineer has compiled and reviewed the information from MSDSs and SDSs of the materials used in the original construction of the building and the renovations or alterations of all parts of the building affected by the planned renovation or demolition, matches the MSDSs and SDSs to materials on-site, reviews any asbestos survey reports of the building previously conducted as required at the time of the survey, and certifies that in the architect’s or engineer’s professional opinion, no part of the building, including the building materials, affected by the planned renovation or demolition contain asbestos. This certification must also clearly identify the name of the building, the street address and specific area of the building that applies to the certification, the survey report date of each previous asbestos survey report reviewed, whether the relevant work was new construction or renovation, and the specific dates of completion of all original construction and renovations or alterations that apply to the certification. A 119 Texas-registered architect must prepare this certification in accordance with the rules of professional conduct in 22 TAC Chapter 1. A Texas-licensed professional engineer must prepare this certification in accordance with the rules of professional conduct in 22 TAC Chapter 137. A complaint that a certification was not performed as required in this paragraph will be referred to the Texas licensing boards or another government agency with jurisdiction over the complaint as needed. A building owner that meets the mandatory survey requirement, as described in this subparagraph, must keep the certification, copies of the MSDSs or SDSs or both, and any previous asbestos surveys as required in §296.291(j) of this chapter (relating to Recordkeeping) that were reviewed by the architect or engineer. **A certification prepared as described in this paragraph does not meet the OSHA or NESHAP requirement for an asbestos survey, so it may not be used in the future in place of a current survey.**

More requirements from the [Texas Asbestos Health Protection Rules \(2021\)](#):

- (o) Installation of new materials in a public building. Texas Health and Safety Code, Chapter 161, Subchapter Q (relating to Installation of Asbestos), requires the following:
  - (1) A person who installs a building material or replacement part designated in paragraph (2) of this subsection in a public building must obtain an MSDS or SDS before the installation. A person must not install a material or part designated in paragraph (2) of this subsection that requires an MSDS or SDS under this paragraph unless:
    - (A) the person obtains an MSDS or SDS for the material proposed to be installed showing that the material or replacement part is not ACM; or
    - (B) the material or replacement part, according to the MSDS or SDS, is ACM, but the building owner or contractor can demonstrate that there is no alternative material or part.
  - (2) A person must obtain an MSDS or SDS before installing the following building materials or replacement parts:
    - (A) surfacing materials:
      - (i) acoustical plaster; 125
      - (ii) decorative plaster/stucco;
      - (iii) textured paint/coating;
      - (iv) spray applied insulation;
      - (v) blown-in insulation;
      - (vi) fireproofing insulation;
      - (vii) joint compound; and
      - (viii) spackling compounds;

- (B) TSI:
  - (i) taping compounds (thermal);
  - (ii) HVAC duct insulation;
  - (iii) boiler insulation;
  - (iv) breaching insulation;
  - (v) pipe insulation; and
  - (vi) thermal paper products;
- (C) miscellaneous material:
  - (i) cement pipes;
  - (ii) cement wallboard/siding;
  - (iii) asphalt/vinyl floor tile;
  - (iv) vinyl sheet flooring/vinyl wall coverings;
  - (v) floor backing;
  - (vi) construction mastic;
  - (vii) ceiling tiles/lay-in ceiling panels;
  - (viii) packing materials;
  - (ix) high temperature gaskets;
  - (x) laboratory hoods/table tops;
  - (xi) fire blankets/curtains;
  - (xii) elevator equipment panels;
  - (xiii) elevator brake shoes;
  - (xiv) ductwork flexible fabric connections;
  - (xv) cooling towers;
  - (xvi) heating and electrical ducts;
  - (xvii) electrical panel partitions;
  - (xviii) electrical cloth/electrical wiring insulation;
  - (xix) chalkboards;
  - (xx) roofing shingles/tiles;
  - (xxi) roofing felt;
  - (xxii) base flashing;
  - (xxiii) fire doors;
  - (xxiv) caulking/putties;
  - (xxv) adhesives/mastics;
  - (xxvi) wallboard; and
  - (xxvii) vermiculite.

**Duress Alarms** – The installation of any intrusion/duress alarms or security systems that are planned as a part of any renovation or new construction must receive approval by the University Police department prior to installation in accordance with [Texas A&M Purchasing guidelines](#).

## Acronyms

AED – Automatic External Defibrillator  
AHJ – Authority Having Jurisdiction  
ANSI – American National Standards Institute  
ASME – American Society of Mechanical Engineers  
ASTM – American Society for Testing and Materials  
BFD – Bryan Fire Department  
CSFD – College Station Fire Department  
CPDC – Campus Planning, Design, and Construction  
EDCS – SSC Engineering Design, and Construction and Services  
EHS – Texas A&M University Environmental Health & Safety  
ETJ – Extra Territorial Jurisdiction  
FACU – Fire Alarm Control Unit  
FAS – Fire Alarm System  
FLS – Fire and Life Safety  
FM – Factory Mutual  
FP&C – Texas A&M University System Office of Facilities Planning and Construction  
IBC – International Building Code  
ICC – International Code Council  
IFC – International Fire Code  
LSC – National Fire Protection Association 101, *Life Safety Code*®  
NFPA – National Fire Protection Association  
NICET – National Institute for Certification in Engineering Technologies  
O&M – Operations and Maintenance  
RELLIS – Texas A&M University System Campus (Formerly Riverside Campus)  
SFM – State Fire Marshal, specifically the Texas State Fire Marshal  
SPCC – Spill Prevention, Control, and Countermeasures  
SSC – SSC Service Solutions  
TAMU – Texas A&M University  
TAMUS – Texas A&M University System  
TDI – Texas Department of Insurance  
TDLR – Texas Department of Licensing and Regulation  
UL – Underwriters Laboratories  
UPD – Texas A&M University Police Department

### Fire Safety Systems Summary Table\*

Fire Safety System	Guidelines	Code/Standard/Guidance References	Acceptance Form(s)	Required Documentation**	Comments
Automatic External Defibrillator (AED)	Yes	<a href="#">EHS AED Information</a>			The standard AED for Texas A&M is the Zoll (Cardiac Science) Powerheart G5
Backflow Preventers	Yes	NFPA 13; NFPA 14	State	Backflow Certification	Preferred manufacturer - Watts; Model varies by application
Card Access/ Controlled Access/ Delayed Egress	No	NFPA 80, NFPA 101			Contact Texas A&M University Building Access for acceptable manufacturers
Clean Agent Suppression Systems	Yes	NFPA 2001	<a href="#">Attachment I</a>	FML-009; O&M Manual; Sensitivity Report	
Elevators		ASME A17.1, NFPA 13, NFPA 72, NFPA 101	<a href="#">Attachment II</a>	State Elevator Certification (Temporary)	
Emergency Lighting/Exit Signage	Yes	NFPA 101, NFPA 110	<a href="#">Attachment III</a>		
Emergency Power Supply Systems	Yes	NFPA 110, NFPA 101	<a href="#">Attachment IV</a>	Evidence of the prototype test (for Level 1 Systems); Certified analysis; Letter of Compliance; Manufacture's certification of a rated load test at rated power factor with ambient temperature, altitude and fuel grade; Schematic wiring and interconnection diagrams; O&M Manuals	
Fire Alarm Systems	Yes	NFPA 72, NFPA 101	<a href="#">Attachment V</a> , <a href="#">Attachment VI</a>	FML-009 Form; Record of Completion; As Built Drawings; Sensitivity Test Report	
Fire Dampers/Smoke Dampers	Yes	NFPA 1, NFPA 72, NFPA 80, NFPA 101, NFPA 105		As-built drawing indicating locations	
Fire Department Connections	Yes	NFPA 13, NFPA 13R, NFPA 14;			<a href="http://www.knoxbox.com">www.knoxbox.com</a>
Fire Doors/Motorized Fire Doors	Yes	NFPA 80		O&M Manuals	
Fire Extinguishers/ Fire Extinguisher Cabinets	Yes	NFPA 1, NFPA 10, NFPA 101			

Fire Safety System	Guidelines	Code/Standard/Guidance References	Acceptance Form(s)	Required Documentation**	Comments
Fire Hydrants	Yes	NFPA 291; IFC; <a href="#">Annex C</a>			Preferred manufacturer – American Darling with 5” Storz Connection
Fire Lanes/ Aerial Access Ways/Fire Lane Marking	Yes	<a href="#">Annex C</a> ; IFC		Engineering documents for “soft” surfaces	
Fire Pumps	Yes	NFPA 20, NFPA 72	<a href="#">Attachment VII</a>	Manufactures Initial Flow and Voltage Test; Installers Fire Pump Flow Test; O&M manual; As-Built drawings	
Fire Rated Walls/Partitions	Yes	NFPA 101			
Fixed Extinguishing Systems	Yes	NFPA 17, NFPA 17A		FML-010; O&M manual; As-Built drawings	
Fuel Gas - Natural Gas & Liquefied Petroleum Gas	Yes	NFPA 54, NFPA 58; IFGC; Texas A&M University Fuel Gas Management Plan; Public Private Partnerships Fuel Gas Delivery Systems Management Plan	<a href="#">Attachment XI</a>	Pressure Test Form(s)	
Key Boxes/Key System	Yes	IFC			Order online for BFD, CSFD, and UPD <a href="http://www.knoxbox.com">www.knoxbox.com</a>
Kitchen Hood & Duct Suppression Systems	Yes	NFPA 1, NFPA 17, NFPA 17A, NFPA 72, NFPA 96, NFPA 101, UL 300, UL 300A	<a href="#">Attachment XVI</a> <a href="#">Attachment XVII</a>	FML-010; O&M manual; As-Built drawings	
Room Numbering	Yes	<a href="#">SAP 51.99.99.M0.02</a>			
Signage	No	NFPA 1, NFPA 13, NFPA 4, NFPA 101; <a href="#">SAP 21.99.99.M0.02</a> ;			
Smoke Management Systems	Yes	NFPA 1, NFPA 92, NFPA 92A, NFPA 92B, NFPA 101	<a href="#">Attachment XIV</a>	O&M manual; As-Built drawings	
Sprinkler Systems	Yes	NFPA 1, NFPA 13, NFPA 13D, NFPA 13R, NFPA 14, NFPA 72, NFPA 101	<a href="#">Attachment VII</a> <a href="#">Attachment VIII</a> <a href="#">Attachment IX</a> <a href="#">Attachment X</a> <a href="#">Attachment XI</a> <a href="#">Attachment XII</a> <a href="#">Attachment XIII</a> <a href="#">Attachment XIV</a>	As-built drawings with riser diagram, Backflow Valve Certification, O&M Manual(s); Contractor's Material and Test Certificate for Underground Piping; Contractor's Material and Test Certificate for Aboveground Piping;	

<b>Fire Safety System</b>	<b>Guidelines</b>	<b>Code/Standard/Guidance References</b>	<b>Acceptance Form(s)</b>	<b>Required Documentation**</b>	<b>Comments</b>
Stairwell Pressurization Systems	No	NFPA 1, NFPA 101	<a href="#">Attachment XV</a>	O&M manual; As-Built drawings; Engineering design documentation	
Standpipe Systems	Yes	NFPA 14	<a href="#">Attachment VII</a> <a href="#">Attachment VIII</a> <a href="#">Attachment IX</a> <a href="#">Attachment XII</a> <a href="#">Attachment XX</a>	As-built drawings with riser diagram, Underground Certification, Above Ground Certification, Backflow Valve Certification, O&M Manual(s)	
Two-Way Communication Systems	Yes	NFPA 1, NFPA 101, IBC	<a href="#">Attachment XXI</a>		Texas A&M University/Texas A&M University System acceptable manufactures – Cornell 4800, Rath, Code Blue

\* This table is designed to provide a general list of codes, standards, forms, and documentation required for each component. It is not an all-inclusive list.

\*\* Required documentation may be submitted electronically.

## **EHS Permitting Process**

(Reserved)



# Design and Installation Guidelines and Specifications

## Automatic External Defibrillators (AED)

The standard AED for Texas A&M University campuses is a Zoll (Cardiac Science) [Powerheart G5 AED](#). Installation may be in a surface-mounted or recessed cabinet. Although there are no regulations that dictate where the AED must be located, it should be in a centralized and accessible location in the building and installed per [ADA standards](#). Note that most wall-mount cases have a depth of ~7 inches, so they are considered a protruding object per [ADA standards](#).

## Backflow Preventers

All water-based fire suppression systems shall incorporate a backflow preventer in accordance with the applicable codes and standards. A copy of the testing certification shall be submitted to EHS.

Utility and Energy Services preferred manufacturer: Watts

## Clean Agent Fire Extinguishing Systems

If approved by the AHJ, clean agent fire extinguishing systems may be installed. All clean agent system installations on Texas A&M Campuses shall conform to the requirements of the most recent edition of the applicable sections of NFPA 2001, *Clean Agent Fire Extinguishing Systems*, and the following requirements.

All clean agent systems shall be provided with a reserve agent supply and connected to the distribution piping to allow for uninterrupted protection and easy changeover from the primary agent supply.

### Design and Installation:

All shop drawings, specifications, and submittals shall be submitted to the AHJ for approval prior to installation.

- ❑ Shop Drawings shall have a uniform scale and include at a minimum the following:
  - Device legend.
  - Enclosure cross section, full height or schematic diagram, including location and construction of building floor/ceiling assemblies above and below, raised access floor and suspended ceiling.
  - Agent being used.
  - Design concentration of agent.
  - Description of occupancies and hazards protected, designating whether or not the enclosure is normally occupied.
  - Description of the agent storage containers used to include the following: internal volume, storage pressure, and nominal capacity expressed in units of agent mass or volume at standard conditions of temperature and pressure.
  - Plan view of protected area showing enclosure partitions (full and partial height); agent distribution system including agent storage containers, piping, and nozzles; detection, alarm, and control system including all devices; location of controlled devices such as dampers.
  - Complete step-by-step description of the system sequence of operations.

An alarm notification device shall be installed on the exterior of the protected room(s) to indicate that the system has discharged. Appropriate signage with system information and instructions regarding the system shall be installed.

An as-built box shall be installed near the main control panel of sufficient size to accommodate any required drawings, etc. This document box shall be a minimum of 16"x16"x6" in size and shall be matching color to the panel, lockable, and require the same key as the main fire alarm panel.

Installation of a clean agent system in a fully sprinkled facility does not eliminate the requirement for sprinkler coverage in the area(s) protected by the clean agent system.

## Elevators

Elevators shall be installed in accordance with applicable NFPA, ASME, IBC, IFC and other related codes. Portable fire extinguishers shall be installed inside elevator machine rooms. Machine-room-less elevator control rooms are not required to have an extinguisher installed. Sprinklers shall not be installed in elevator shafts unless specifically required based on materials requiring such suppression.

## Emergency Lights/Exit Signs

All emergency lights and exit signage shall be designed in accordance with the requirements of the applicable NFPA codes and standards. The use of an approved self-diagnostic/self-testing system is recommended.

In buildings equipped with an emergency generator (life safety) all emergency lighting/exit signage shall be connected to the generator when the capacity exists in lieu of battery powered systems. Exceptions must be approved prior to construction by the AHJ.

## Emergency and Standby Power Systems

All liquid fuel generator installations must be reviewed by the environmental compliance team within EHS for compliance with the Texas A&M University [Spill Prevention, Control, and Countermeasures \(SPCC\) plan](#).

All emergency power system installations on Texas A&M Campuses shall conform to the requirements of the most recent edition of NFPA 110 *Standard for Emergency and Standby Power Systems*, NFPA 70 *National Electric Code*, NFPA 101, and any publications referenced therein.

Special consideration during the design phase shall differentiate between systems supplying power to emergency or life safety equipment and other equipment not related to life safety but necessary for research, or similar uses. Once installed, all emergency power systems shall be tested, including the operation of associated transfer switches monthly in accordance with NFPA 110. Therefore, it is recommended that separate generators be used for equipment not related to life safety.

Generators shall be monitored by the fire alarm system for the following conditions:

- Generator run
- Generator fault
- Generator switch in non-automatic condition

Any addition of circuits/equipment to existing emergency generators for non-emergency (non-life safety use) must be reviewed and approved by EHS and UES prior to installation.

For further information, refer to the Texas A&M University Utilities and Energy Services [Design Standard - Emergency Generator Systems](#).

## Emergency Responder Radio Coverage

Where required by NFPA or the International Fire Code, facilities (new and existing) shall incorporate emergency responder radio coverage. Systems installed at the Texas A&M University System RELLIS campus will follow the RELLIS Public Safety DAS System design standard and be connected to the campus wide Public Safety DAS System

Emergency Responder Radio systems in existing facilities shall be modified to provide required coverage where facility or system alterations are made.

## Fire Alarm Systems

Acceptable Manufacturer:

- Siemens

Acceptable Models:

- Desigo Modular (XLS)
- Desigo
- Other models may be accepted on a case by case basis.

## General Requirements:

The complete installation shall conform to the applicable sections of the most current edition of the National Fire Protection Association (NFPA) codes and standards, American with Disabilities Act (ADA), the National Electrical Code, the International Building Code, the Texas Accessibility Standards Act (TAS), and these specifications.

All fire alarm system retrofit projects shall include a field survey of the facility to determine device locations and system layout. The walkthroughs should include a member from the Texas A&M University/Texas A&M University System project management group, fire alarm design team, and EHS.

All new fire alarm systems shall be intelligent, addressable, and equipped with voice notification including public address capability. Exceptions to this shall be on a case by case basis as approved by the AHJ.

All components of the fire alarm system shall be products of an Underwriters Laboratories Inc. (UL) listed fire alarm manufacturer and shall bear the UL label. Partial listing **shall not** be acceptable.

All components of the fire alarm system shall be able to interface completely with the fiber network reporting system used by Texas A&M University while maintaining a UL listing. In jurisdictions outside of Brazos County, the reporting interface shall be determined by the AHJ in conjunction with the local fire department.

Only new parts, devices, etc. shall be installed at the time of initial installation and to repair a system during a warranty period.

All new fire alarm systems installations at Texas A&M University shall utilize the following general guidelines as a basis for the system layout. These general guidelines are for fully sprinklered buildings. These are general guidelines and may vary as determined by the AHJ during walkthrough and/or plan review sessions.

All components of the fire alarm systems shall use the most current technology available.

### Smoke detectors

- Shall be photoelectric unless specified by the AHJ
- Shall be installed in the following locations:
  - All corridors and common use spaces such as lobbies, reception areas, etc.
  - Intermediate or remote areas where smoke would need to penetrate multiple doors to reach a smoke detector in a corridor or common area
  - Conditioned mechanical, electrical, and IT Rooms
  - Storage rooms with combustible loads
  - At the highest location of smoke collection
  - Only where accessible for maintenance
- Smoke detectors shall not be installed in:
  - Custodial closets with sinks
  - Non-conditioned locations or rooms

### Heat detectors

- Heat detectors shall be installed in:
  - Break rooms/kitchens
- Heat detectors shall not be installed in:
  - Laboratory and other individual rooms protected by an automatic sprinkler system
  - Other areas as determined by the AHJ during design

Manual pull stations shall be installed at the following locations:

- Every level at every enclosed or exterior exit, including exterior mechanical, electrical, and pump rooms
- In corridors where travel distance to a pull station exceeds 200 feet
- Every horizontal exit as defined by NFPA 101®

### Specific design issues

- High-rise building specifications
  - Provide a fireman's phone system and boxes for phone
  - Provide an unsupervised printer that shall record all system events and time of the event
  - All high-rise buildings shall be programmed for general alarm activation (not high-rise mode)

- ❑ Residence Hall specific requirements
  - Smoke detectors shall be installed in all resident hall rooms
  - Activation of any detector shall sound a local and general alarm
  - Activation of a general alarm shall activate sounder bases in all resident hall rooms
- ❑ Apartment Buildings
  - Any activation of any single smoke alarm within an apartment unit shall activate all smoke alarms within the unit but shall not activate the general alarm. Activation of multiple smoke alarms within the same unit shall activate a general alarm within the building.
  - Activation of any smoke detector within an ADA unit shall send a supervisory signal to the fire alarm control unit (FACU)
  - Activation of a general alarm shall activate sounders in all apartment units/bedrooms
- ❑ Animal housing areas - Chimes may be installed in animal housing areas (system designer should verify with user to determine when this might be necessary)

## **Fire Alarm System Reporting Interface**

All new fire alarm installations on the Texas A&M University campus shall be designed to interface directly with the dedicated fiber optics network. The network utilizes Siemens® technology to link all fire alarm systems on the campus and connect to a central monitoring station. In addition, the fire alarm system shall be added to the AES-IntelliNet Wireless network to provide redundancy for alarm transmission and monitoring. In locations where the fiber network is not available the design shall incorporate an AES-IntelliNet Wireless fire alarm monitor as the primary means of alarm transmission.

### General Requirements

Each new FAS installation requires a minimum 3/4" conduit to be installed between the FACU and a fiber interface cabinet in the fiber network room.

- ❑ Wiring requirements
  - Provide one (1) 18/2 shielded cable between the FACU and the fiber interface cabinet
  - Provide one (1) 14/2 cable between the FACU and the fiber module in the fiber interface cabinet

### Panel Specific Requirements

- ❑ Desigo Modular – The following components are required for interfacing a Siemens Desigo Modular FACU to the campus FAS network
  - NIC –C Network Interface Card
  - RPM Remote Printer Interface (Provides the 485 Network)
  - D2300CP OR D2325CPS (single mode module) Fiber Interface Module
- ❑ Desigo – The Siemens Desigo FC 2005 with the Wheelock SP40S Voice Panel and the following components are required for interfacing a Siemens FACU to the campus FAS network via the wireless gateway.
  - AES 7788F-ULP Wireless Interface Module
- ❑ Specific components for other panels, if approved, must be verified with Siemens

### Code Maroon Interface

Provide AIC module for Desigo Modular FACU for interface to Code Maroon. Provide necessary equipment for standalone voice panel for interface to Code Maroon.

### AES-IntelliNet Wireless Radio System

The standard approved transmitter model for the Texas A&M University Campus is a 7788F Fire Subscriber model. Information on the operating frequency and approval letters for purchasing may be obtained by contacting EHS.

## **Fire Department Connections**

Fire department connections (FDC) for sprinkler or standpipe systems shall conform to the requirements of the applicable NFPA standards and this document.

Fire department connections shall be within 100 feet of a fire hydrant measured per hose lay, or meet the minimum requirement of the local fire department for jurisdictions outside of Brazos County. Fire department connections shall be within 40 feet of a public street, approved fire lane, or access roadway.

All fire department connections with a supply line of four inches or greater shall be provided with a 5" Storz fire department connection with a Knox StorzGuard Cap (Model 5002). Where provided, the 5" Storz inlet shall be installed at a 30-degree angle pointing down. Fire department hose connections shall be installed so that the connection is a minimum of two feet above finished grade and a maximum of 4 feet above finished grade for standard inlets and a minimum of 30 inches at the lowest point above finished grade and maximum of four feet above finished grade for Storz inlets. The contractor shall purchase and transfer the caps to EHS (thru FP&C or SSC) for inventorying and installation by EHS.

For buildings that have a perimeter greater than 900 feet in length, a second FDC shall be required.

All fire department connections with a supply line of less than four inches shall utilize Knox Caps (Model 3111 unless otherwise specified). The contractor shall purchase and transfer the caps to EHS (thru FP&C or SSC) for inventorying and installation by EHS.

Fire department connections located on the Texas A&M University System RELIS campus shall be wall mounted and utilize a 2 1/2" siamese connection with Knox Caps model 3111.

Labeling/signage on sprinkler connections shall be in conformance with NFPA 13 and NFPA 14. If a fire department connection or post indicator valve is not installed on a building and not identifiable as to which building it is related to, signage should be installed to indicate which building/system the FDC or post indicator valve is associated with. The signage shall be of sufficient size and font to be seen by approaching emergency responders (Example: [Annex C](#), Photo #5)

Fire department connection signage shall be installed to ensure that it is readily identifiable. Signage shall be red with white letters "FDC" not less than 6" high and not less than a 1" stroke. Signage shall indicate the building name and number (Texas A&M University Main Campus) or building name and street address (Texas A&M University System RELIS Campus).

## **Fire Door Assemblies**

All fire doors, frames, hardware, and other portions of the assembly shall be specified in accordance with the applicable building and fire codes and NFPA 80 and shall bear the appropriate labels/ratings as required.

Automatic fire doors/shutters may be permitted by the AHJ with prior approval. The location, type of door, and other specifications shall be required to be submitted for approval during the design process.

## **Fire/Smoke Dampers**

Where required by code all fire and smoke dampers shall be installed per the manufacturers listing. Prior to installation of any fire stop system, verify with the fire/smoke damper manufacture that the addition of any firestop product will not adversely affect the fire rating or performance of any fire/smoke damper.

Locations of fire/smoke damper installations that are not readily identifiable as such shall be labeled. Access to dampers shall be provided to inspect and test dampers in accordance with applicable codes and standards.

The Architect/Engineer/Contractor shall transmit a list indicating the make, model, and location of all fire and smoke dampers to the owner at final acceptance for future inspection, testing, and maintenance purposes.

## **Fire Extinguishers (Portable)**

**New** portable fire extinguishers shall be installed in every new or renovated facility unless approved by the AHJ. Extinguishers shall be clean and free of any dust and construction debris. All extinguishers shall be selected and installed in accordance with the most recent edition of NFPA 10, *Standard for the Installation of Portable Fire Extinguishers*. If a conflict exists, contact Texas A&M University EHS for clarification or direction.

All fire extinguishers shall bear the current year’s manufacture date at the time of substantial completion of the facility or renovation if substantial completion falls on or after March 1<sup>st</sup> of the year. If substantial completion of a project occurs between January 1<sup>st</sup> and the last day of February, then the previous year’s manufacture date is acceptable. In no case shall an extinguisher be more than one year past its manufacture date.

Extinguishers should be installed in corridors in accessible and conspicuous locations. Wall/ceiling signage shall be installed if the location of extinguishers is not readily visible. Unless travel distance or specific equipment requirements dictate, extinguishers for mechanical, electrical, telecommunication rooms, etc. should be installed in corridors.

Preference should be given to installing extinguishers in corridors and not behind locked doors.

Strap type brackets are not acceptable and shall not be used.

Where type BC fire extinguishers are called for (around electronics, servers, etc.) provide a 5# CO<sub>2</sub> fire extinguisher. In high hazard areas provide a 10#CO<sub>2</sub>. Dry powder BC extinguishers shall not be used.

The Texas A&M University standard fire extinguisher is a 10-pound 4A: 80BC rated ABC fire extinguisher with brass valves (acceptable manufacturers and models are provided in Table 1). Where a hazard requires a higher rated classification of extinguisher, the design team shall submit the proposed extinguisher to the AHJ for approval.

Fire extinguishers installed in exterior locations shall be installed in weather resistant enclosures.

The following manufacturers and model numbers are acceptable for the identified extinguisher types. Other models and manufacturers may be accepted. Any requests to utilize alternate extinguishers shall be submitted to EHS for approval prior to the purchase or installation of extinguishers.

10# ABC – Multipurpose Extinguisher	Amerex*	B441
	Badger*	B10M
	Buckeye*	10 HI-SB
20# ABC – Multipurpose Extinguisher	Amerex	A423
	Badger	B20M
	Buckeye	20HI- SB
5# Carbon Dioxide Extinguisher	Amerex	322
	Badger	B5V
	Buckeye	5CD
10# Carbon Dioxide Extinguisher	Amerex	330
	Badger	B10V
	Buckeye	10CD
15# Carbon Dioxide Extinguisher	Amerex	331
	Badger	B15V
	Buckeye	15CD
20# Carbon Dioxide Extinguisher	Amerex	332
	Badger	B20V
	Buckeye	20CD
2.5 Gallon Water (H <sub>2</sub> O) Extinguisher	Amerex	240
	Badger	WP-61
	Buckeye	500
6L Class K Extinguisher	Amerex	260
	Badger	WC-100
	Buckeye	WC-6
Non-Metallic	Badger	B5V-MR
* Extinguishers manufactured by one of the listed manufactures and distributed under a private label are acceptable provided conformance to the specifications of the models listed		

*Table 1- Approved Portable Fire Extinguisher Manufacturers and Model Numbers*

## Extra Extinguishers

Travel distance to extinguishers can be altered by the placement of furniture, equipment, fixtures, cubicles, etc. after construction has been completed. As a result, additional extinguishers are often needed to ensure compliance once occupants have moved into a facility. The project/contractor shall provide additional extinguishers of the types installed in a facility based on the information located in [Table 2](#). The number and type of the extra extinguishers shall be representative of the number of extinguishers installed in the facility. This will vary from building to building and may be approximate. Final numbers of the various types of extinguishers should be submitted to the AHJ prior to purchasing extinguishers. Exceptions from this requirement may be granted by the AHJ when the design of the facility limits variations in travel distances.

Number of extinguishers to be installed in building	Extra extinguishers to be transferred to EHS
1-15	1
16-30	2
31-50	3
51-75	4
76-100	5
101-125	6
126-150	7
151-175	8
176-200	9
> 200 & greater	10

Table 2 - Extra Fire Extinguishers

## Fire Extinguisher Cabinets

When fire extinguisher cabinets are to be installed the following general guidelines shall be utilized.

Larsen's Cameo series are preferred but other manufacturers and models may be acceptable. Cabinets shall be readily identifiable as a fire extinguisher cabinet or identification must be provided. Wall/ceiling signage shall be installed if the location of an extinguisher cabinet is not readily visible. Cabinets shall be provided with a pull handle with cam-action latch and non-locking hardware. The hinge and door hardware should be of a type which allows full opening of the door and easy removal of the fire extinguisher.

It is the responsibility of the design firm to ensure that fire extinguisher cabinets that are to be installed will accommodate the selected fire extinguishers.

Mounting brackets inside of fire extinguisher cabinets will not be permitted, except in wet environments to prevent base of extinguisher from rusting.

When installed in a fire rated partition, the cabinet construction rating shall be equivalent to the required partition rating.

## Fire Hydrants

Fire hydrants shall be installed in accordance with NFPA 1, NFPA 291, IBC, IFC, [Annex C](#), and this document. Locations outside of Brazos County will conform to local fire department and/or AHJ guidelines.

For hydrants installed on the Texas A&M University or Texas A&M University System RELLIS shall be American Darling per Utilities and Energy Services. All new hydrants shall be installed with a 5" Storz connection. All hydrants shall be installed so that the center of the steamer connection is between 16" and 32" above the finished grade and that there be a 36" clear space around the circumference of the hydrant. Landscaping shall not obstruct access or use of hydrants.

Fire hydrants shall be installed so that all portions of all buildings are within 450 feet of a hydrant and not more than 150 feet from a fire lane.

A fire hydrant shall be installed within 100 feet of any fire department sprinkler or standpipe connection and not require a hose to cross any major streets.

In new development areas, hydrants shall be installed a maximum every 1,000 feet along new roadways.



## **Fire Lanes (Fire Lanes/Aerial Fire Apparatus Access Roads)**

Fire lanes and fire apparatus access roads shall be created for each new facility and shall be designed, installed, and marked in accordance with the International Fire Code, including Appendix D, [Annex C](#), and this document. Fire lanes shall be a minimum of 20' in width with a vertical clearance of 14'. Locations outside of Brazos County shall conform to local fire department and/or AHJ guidelines.

Aerial fire apparatus access roads shall be provided when required by Appendix D of the International Fire Code or as determined by the AHJ during the design phase of the project.

Preliminary site drawings and a project scope shall be submitted to EHS to be reviewed in conjunction with the local municipal fire marshal prior to final design.

The use of drivable "soft" or plantable concrete systems, such as Grasscrete, or similar products may be acceptable. Approval from the AHJ shall be received prior to beginning of construction.

All portions of buildings shall be within 150 ft. of a fire lane. Buildings where this requirement is exceeded shall have a fire lane on more than one side of the building.

Any mechanical gate installed in a fire lane or in access to a fire lane shall incorporate a Knox Gate Switch as well as a means of manual override in the event of a power failure. Manual gates shall utilize a Knox Padlock or a Knox Box with a gate key near the gate (location to be approved by the local AHJ).

## **Fire Lane Marking**

Signage identifying fire lanes or fire apparatus access roads shall be marked in accordance with the requirements of the International Fire Code, including Appendix D, and [Annex C](#). Alternate methods shall be submitted to the AHJ for review during the design phase. Locations outside of Brazos County shall conform to local fire department and/or AHJ guidelines.

## **Fire Pumps**

All fire pump installations on Texas A&M Campuses shall conform to the requirements of the most recent edition of NFPA 20 *Installation of Stationary Pumps for Fire Protection*, referenced publications therein, and the following requirements.

All fire pump installations shall be provided with emergency power.

All shop drawings, specifications, and submittals shall be submitted to the AHJ for approval prior to installation and may be hard or electronic copy.

Electric driven fire pumps are preferred in lieu of diesel driven fire pumps.

Drains in pump rooms shall be designed to accommodate all inspection and testing at the maximum expected flow without causing water to backup into the pump room.

The location of and access to the fire pump room shall be approved by the AHJ.

Fire pump rooms shall be accessed directly from the exterior of the building.

Fire pump rooms shall be provided with a means of automatically maintaining the temperature above 40°F.

Fire pump rooms shall have emergency lighting installed.

Fire pump test headers shall be installed on the exterior of buildings unless approved by the AHJ prior to installation.

## **Fire Pump/Fire Riser Rooms**

Riser rooms shall be accessible from the exterior of the building unless approved by the AHJ. For the RELLIS Campus, riser rooms shall be located no more than 100' from a Knox Box. Durable signage that is visible from the fire lane as determined by the AHJ shall be installed indicating the room use. Riser rooms shall be designed with sufficient space to accommodate all equipment and allow adequate room for all inspection, testing, and maintenance as well as emergency operations.

## Fire Rated Walls/Partitions

All fire rated walls shall be designed in accordance with the applicable sections of the building and fire codes. Sealing of all fire rated wall assemblies shall be in accordance with the applicable UL/ASTM/etc. standards.

Walls located in mechanical rooms, electrical rooms, and other areas shall be stenciled indicating that the wall is rated, specifying the fire resistance rating of the wall (example 2-Hour Rated Wall). The stenciling shall be a minimum size of 3" and placed in accordance with the requirements of the International Building Code. Finished walls should be indicated above lay-in ceilings when provided. Spacing shall be every 25' on center. See [Annex C](#) for example photographs.

## Fire Sprinkler Systems

All new construction and major renovation projects shall be provided throughout with an automatic sprinkler system unless approved by the AHJ (major renovation projects include any single renovation affecting more than 50% of the space within a building **or** the cumulative group of projects **or** any change of occupancy). All fire sprinkler installations shall conform to the latest editions of NFPA 13 *Standard for the Installation of Automatic Sprinkler Systems* or NFPA 13R *Standard for the Installation of Automatic Sprinkler Systems in Low-Rise Residential Occupancies*, NFPA 14 *Standard for the Installation of Standpipe and Hose Systems*, NFPA 20 *Standard for the Installation of Stationary Fire Pumps for Fire Protection*, and NFPA 24 *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*. It is up to the design professional to make the recommendation on the type of system to be installed (wet, dry, pre-action, etc.).

Intelligent nitrogen generation systems shall be incorporated into all new sprinkler systems. The system shall be capable of maintaining a minimum of 98% nitrogen concentration in the system. The system shall be self-diagnostic and capable of remote monitoring.

Dedicated main electrical room and emergency power system rooms may be exempted from the requirements for sprinklers with the incorporation of fire resistance rated walls, doors, dampers, etc. as allowed by code.

In buildings where "cloud ceilings" are installed, sprinkler compliance shall conform to the requirements of NFPA 13.

Where shafts are accessible by a door, hatch, or panel they shall be provided with sprinkler protection at the top and near the bottom of the shaft.

All sprinkler systems with a supply line of four inches or greater shall be provided with a 5" Storz fire department connection. Knox Caps fitting the installed fire department connection shall be provided by the contractor unless approved by the AHJ for local fire departments not utilizing the Knox system.

Rooms or areas where it is not desirable to have water filled piping within the room, such as special collections, computer rooms, rooms utilizing water reactive chemicals, etc., may utilize alternative suppression systems with the approval of the AHJ during the design phase of the project.

All sprinkler system equipment shall be new and listed by Underwriters Laboratories (UL) or approved by Factory Mutual (FM). Each major item of equipment shall bear the manufacturer's name or trademark; serial number, and/or UL/FM label.

UL listed flexible drops are permitted where installed in accordance with NFPA 13 and manufacturer's requirements.

A main water flow switch shall be installed at the main riser downstream of the backflow preventer. All sprinkler water flow switches should be set to operate between 30 and 45 seconds.

All sprinkler systems shall incorporate a water motor gong or electric bell.

Unless otherwise approved by the AHJ, standpipe systems shall be installed in any building 2 or more stories in height.

The design team, in cooperation with the building occupants and sprinkler contractor shall complete an Owner's Information Certificate as outlined in NFPA 13, Chapter 4.

Where open grate flooring is installed (i.e. within a shaft) sprinkler protection shall be installed per NFPA 13 at each floor level under the open grate floor.

Hangers shall be installed within six (6) inches of the end of CPVC piping with concealed sprinkler heads.

Spare heads shall be provided in accordance with the requirements of NFPA 13. The location of the box shall be approved by the AHJ prior to installation. A list of sprinklers installed shall be posted in the spare head box. This list shall include the sprinkler identification number, general description of the head (type, temperature rating), and quantity of each type of head in the box.

Surge suppression methods, in compliance with NFPA 13, shall be incorporated in systems where a fire pump is installed.

### **Shop Drawings**

Shop drawings shall conform to and include all items as set forth in NFPA 13. Shop drawings, design calculations, cut sheets, and any other submittals shall be submitted to the AHJ for approval prior to installation. Submittals may be in hard copy form or electronic. Partial submittals are not acceptable and will be rejected without review unless prior approval has been obtained from the AHJ.

All material submittals shall include all items listed in the product section and all additional items necessary to provide a complete installation. Where more than one item appears on a manufacturer's catalog sheet, indicate which item or items will be used.

No work shall be performed until the AHJ has approved the shop drawings, calculations, and data sheets. The contractor shall be held liable for any work performed prior to this approval.

For small renovation projects that affect less than 20 heads, a scope of work and sketch of the area will be acceptable in lieu of shop drawings.

### **Pipe Identification**

All exposed sprinkler piping shall be painted red and marked "Fire", "Fire Sprinkler", "Fire Protection", etc. unless prior approval is obtained from the AHJ. Pipe markers must be red wrap around type with white letters at a minimum of one (1) inch in height. All pipe markers must be installed so that they are visible from the floor. Spacing and location shall be every 20' for mains and a minimum of one location on each branch line.

Provide all control, drain, and test valves with signs identifying the type of valve and the area (floor or portion of the building) affected by the valve. Letters are to be minimum 1/4 inch high. Submit the wording for approval (for example, "Control Valve Fourth Floor North"). The signs are to be hung by a chain from the valve. If the system is a hydraulically calculated system, provide a hydraulic information sign in accordance with NFPA 13 (provide scanned/paper copies for the permanent file).

Sprinkler systems consisting of multiple zones and control valves shall have a laminated map or riser diagram displayed within the main riser room identifying each zone by way of color coding. At each floor control valve, in addition to the installed riser tag, an additional map showing zone locations shall be installed.

All valves and drains located above ceiling shall be labeled (and accessible) at the ceiling grid level and be visible from the floor.

### **Control Valves**

A floor control valve assembly and test drain assembly with water flow and tamper devices shall be installed on each floor and/or zone of a building.

Install all control valves, supply valves and test valves in easily accessible locations, with the valve handle or wheel no higher than 7 feet above the finished floor.

### **Inspector Test and Drain**

Drains shall be sized to accommodate full flow capacity of the sprinkler system main drain. Ensure adequate floor drain capacity exists for operational test of the main drain with a minimum of a 1/2" gap between the pipe and the funnel/drain.

### **Testing**

Hydrostatic testing will be conducted in accordance with the applicable NFPA standard/section(s). The AHJ reserves the right to require a hydrostatic test when less than 20 heads have been added and/or adjusted when multiple modifications have taken place with a single system.

## Fixed Extinguishing Systems

All hood suppression system installations on Texas A&M Campuses shall conform to the requirements of the most recent edition of NFPA 17, *Standard for Dry Chemical Extinguishing Systems*, or NFPA 17A, *Standard for Wet Chemical Extinguishing Systems*, as applicable, and the following requirements.

All suppression systems shall be integrated into the building fire alarm system.

Plans and specifications for fixed extinguishing systems shall be submitted to the AHJ for review. Plans shall include at a minimum the following:

- Device legend
- Uniform scale
- Hazards to be protected
- Location of detection devices
- Location of operating devices
- Layout of piping
- Location of nozzles
- Location of agent bottles.

## Fuel Gas (Liquefied Natural Gas LNG/Liquefied Petroleum Gas LPG)

Installation of any fuel gas (LNG or LPG) piping systems shall be designed in accordance with the requirements of the latest edition of NFPA 54, *National Fuel Gas Code* or NFPA 58, *Liquefied Petroleum Gas Code* and International Mechanical Code. Special attention should be given to the installation of monitoring devices when installed in residential or other potentially sensitive areas.

For further information, refer to the Texas A&M University [Utilities and Energy Services - Design Standard - Piping, Equipment, and Structure Color and Identification](#)

## Gas/Environmental Monitors

Any gas or other type of sensor identified as being required or prudent practice during the design of the project shall be identified and a specification sheet submitted to the AHJ for review. Such devices shall be installed in accordance with the manufacturer's directions.

## Key Boxes

All new construction or major renovations to a facility shall include the installation of a minimum two key boxes on the exterior location of the facility. Location of the key boxes shall be determined by the AHJ during the design phase. The key boxes shall be a Knox Box® brand key box (or matching local jurisdiction requirements outside of Brazos County). The Texas A&M University/Texas A&M University System RELLIS standard key box is a Model 4400 series recessed box with a hinged door. Large or more complex facilities may require a different/larger box or additional boxes if the design/access warrants. In general, a location near the main or service entrance and in near proximity to the location of the fire command center/fire alarm panel is preferred at a maximum mounting height of 6' above finished floor.

Other requirements for Knox products such as padlocks, gate key switches, etc. shall be determined by the AHJ during the design phase of the project.

For facilities located within Brazos County one box will be keyed to the Texas A&M University Police Knox System. Facilities being built within the College Station city limits or within the College Station ETJ shall be keyed to the College Station Fire Department key. Facilities being constructed in the Bryan city limits, on RELLIS Campus, or Bryan ETJ, the boxes shall be keyed to the Bryan Fire Department system. Knox Boxes may be ordered directly from the Knox Company – [www.knoxbox.com](http://www.knoxbox.com).

It is important to ensure that the appropriate order form/city is identified to ensure that the correct locking system is ordered. Any rekeying will be at the contractor's expense.

## **Kitchen Hood and Duct Extinguishing Systems**

All hood suppression system installations on Texas A&M Campuses shall conform to the requirements of the most recent edition of NFPA 96 *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*, NFPA 10 *Standard for the Installation of Portable Fire Extinguishers*, and the following requirements. All systems shall conform to the requirements of UL 300 or UL300A (see below).

Durable marking shall be placed on the floor to identify the intended location of any cooking appliances that are to be protected by the hood and duct suppression system.

All hood suppression systems shall be integrated into the building fire alarm system.

Plans and specifications for kitchen hood and duct extinguishing systems shall be submitted to the AHJ for review. Plans shall include at a minimum the following:

- Device legend
- Uniform scale
- Hazards to be protected
- Location of detection devices
- Location of operating devices
- Layout of piping
- Location of nozzles
- Location of agent bottles

Any new installation or remodel of common kitchen areas (non-commercial kitchens) where ranges are installed in areas such as dormitories, business occupancies, etc. shall incorporate a hood suppression system complying with the requirements of UL 300A.

## **Mass Notification**

Where required by the Life Safety Code® a risk analysis for Mass Notification Systems shall be conducted, and if required installed in accordance with the requirements of NFPA 72.

## **Post Indicator Valves**

All buildings provided with a sprinkler or standpipe system shall utilize a post indicator valve (PIV) on the fire service water main into the building which clearly indicates “Open” or “Closed”. PIV’s may be wall mounted or free standing. All buildings shall have a separate water supply allowing the domestic and fire service water to be isolated. Post Indicator Valves shall be locked and shall not use tamper switches.

Wall mounted PIV shall be installed so that the center of the valve is located between three and five feet above the grade.

## **Room Identification/Numbering**

The rooms on each floor opening off either side of a corridor shall be numbered consecutively in a clockwise direction from the primary entrance, which shall be 100. If there is more than one main entrance to the building, use the one mutually agreed to by the FPC Project Manager and the User Coordinator.

Rooms and spaces not opening off a corridor shall carry the room number of the connecting room with an additional suffix letter (108A, B, C, etc.). Letter clockwise, if more than one room is involved.

Corridors, vestibules and other areas and spaces which have not been assigned numbers by the Campus may be assigned numbers for completing room finish schedules and for use in reference notes and correspondence. These numbers are not to be considered permanent numbers.

Room numbering shall be coordinated with the various design trades to ensure that number is consistent and included on drawings where applicable (example – coordination with the fire alarm submittals/programming). All room numbering must be approved by the Office of Mapping and Space Information prior to construction.

All mechanical, electrical, fire riser, fire pump, and fire alarm panel rooms shall be numbered and labeled with their room use.

## Smoke Management Systems

Where a smoke management system (exhaust or pressurization) is determined to be required the system shall be installed in accordance with NFPA 92, *Standard for Smoke Management Systems* and any other applicable codes or standards.

## Standpipe and Hose Valve Systems

Class I Standpipe systems shall be installed in any building 2 or more stories in height. All standpipe systems with a supply line of four inches or greater shall be provided with a 5" Storz fire department connection with a Knox Storz Lock, model 5002. Fire department connections located on the Texas A&M University System RELIS campus shall be wall mounted and utilize a 2 1/2" siamese connection with Knox Caps model 3041 or 3043.

All piping shall be adequately supported both horizontally and vertically.

Standpipes shall incorporate a pressure gauge at the highest conditioned level.

Hose valves located in stairwells shall be located on the intermediate landings of stairwells between floors unless otherwise approved by the AHJ.

Provide 2 1/2" brass hose valves with a cap and chain. The outlet shall be at an angle between 45 and 135 degrees from the floor. Ensure at least 2" of clearance around handle of valve and provide sufficient clearance for a fire hose to be connected.

Wet standpipes in non-conditioned areas shall incorporate appropriate freeze protection as required/permitted by NFPA 14.

Cabinets in which fire hose connections are installed shall be identified and shall fully open. Valves shall be located to allow ease of connection by fire department personnel during emergency operations.

## Two-Way Communication Systems

Two-way communication systems shall be installed in accordance with the requirements of NFPA 1, NFPA 101, and the International Building Code. The remote monitoring station for Texas A&M University Brazos County facilities (Texas A&M University and Texas A&M University System RELIS Campuses) shall be the Texas A&M Communications Center – Phone 979-845-4311.

The following templates shall be utilized for two-way communication system installations:

### Caller Identification

Template: AOR – TAMU Building XXXX – XXX Location

Example: AOR – TAMU Building 506 – 005A

### Two-way communication system message for the Texas A&M Communication Center

Template: *"An emergency call has been initiated and assistance has been requested. You will be connected to the calling party momentarily. This call is originating from Building XXX, XXX Building Name at XXX Street name. When you have completed the call, prior to hanging up, please press the pound (#) key to disconnect"*

Example: *"An emergency call has been initiated and assistance has been requested. You will be connected to the calling party momentarily. This call is originating from Building 506 Nagle Hall, 454 Throckmorton Street. When you have completed the call, prior to hanging up, please press the pound (#) key to disconnect"*

### Two-way communication system message for emergency call center (building occupants)

Template: *"Please stand by. Your call has been placed to the Texas A&M University Communications Center. An operator has been notified and your call will be answered as soon as possible."*

## **Inspection and Acceptance Testing**

Unless otherwise noted all fire and life safety systems acceptance testing shall be witnessed by the AHJ in conjunction with the appropriate construction project management team. The contractor shall provide all tools, personnel, equipment, and drawings necessary to conduct the acceptance test.

All fire and life safety systems shall be pre-tested and a completed *Contractor Pre-test Certification* submitted to EHS and the project manager prior to the scheduled acceptance test (see [Attachment XXII](#)).

### **Automatic External Defibrillators (AED)**

Upon installation, EHS will inventory and perform an initial inspection before assuming responsibility for ongoing maintenance. No additional testing is needed by the installer or contractor.

### **Backflow Preventers**

An acceptance test shall be required for any back flow preventers. Copies of documentation of testing and the certification for any fire suppression system shall be provided to the AHJ as a part of the closeout documentation.

### **Clean Agent Fire Suppression System**

An acceptance test of all clean agent fire suppression system installations shall be witnessed by the AHJ. A minimum one-week notice shall be provided.

After system installation is completed, the entire system shall be checked out, inspected, and functionally tested by qualified, trained personnel, in accordance with the manufacturers recommended procedures and NFPA 2001. Prior to scheduling a final acceptance of the system, a complete pretest shall be conducted, including an enclosure integrity test.

At time of acceptance the contractor shall be responsible for all necessary tools, personnel, etc. needed to accomplish the acceptance test. This includes inert gas for performing a pneumatic test of the piping for a period of 10 minutes at 40 psi with a loss of pressure not to exceed that which is permitted by code, in addition to a flow test. Any punch list items identified during the final acceptance shall be corrected within 14 calendar days and a retest shall be witnessed by the AHJ. This time period may be accelerated or extended based on the circumstances of the situation.

The system shall be designed, and the enclosure shall be capable of holding a minimum concentration of 85% of the design concentration for a minimum of 10 minutes. Testing shall be conducted in accordance with NFPA 2001 requirements.

A copy of the enclosure test results shall be submitted to the AHJ after the acceptance test has been completed.

### **Elevators**

Newly installed or retrofitted elevators will be tested by the AHJ. The contractor shall pretest all functions prior to the final acceptance. Final acceptance shall include all fire and life safety functions, including Phase I and Phase II, of the elevator including any devices necessary to conduct such test.

### **Emergency Light/Exit Signage**

The contractor shall provide to EHS at the time of inspection a floor/lighting plan indicating all lighting/signage that is required/installed on emergency power. This will be used to verify all lighting has been installed. All emergency lighting/exit signage shall be tested in accordance with the times specified by the applicable code/standard.

### **Emergency and Standby Power Systems**

An acceptance test of all emergency power system installations shall be witnessed by the AHJ. A minimum of one-week notice shall be provided.

Any punch list items identified during the final acceptance shall be corrected within 14 calendar days and a retest shall be witnessed by the AHJ. This time period may be accelerated or extended based on the circumstances of the situation.



A copy of the testing certificate shall be transferred to the AHJ at time of system acceptance.

Acceptance testing shall follow Texas A&M University EHS, FP&C, and NFPA 110 guidelines. The emergency power supply system acceptance checklist is located in [Attachment II](#).

The emergency generator shall undergo a load bank test as required by NFPA 110. The load bank test shall be supervised by FP&C/SSC. Documentation of the test shall be submitted to EHS, FP&C, and the General Contractor.

The emergency generator will be required to perform an emergency power switchover. All emergency circuits will be inspected and tested by EHS and FP&C to ensure correct operation.

## **Fire Alarm Systems**

Smoke detectors **shall not be installed** in a system until cleanup of all construction trades is complete and final in accordance with NFPA 72. Any smoke detector heads found to be installed in an active work zone shall be replaced at the contractor's expense.

The contractor shall have all devices on the system installed and the system pre-tested prior to the scheduled acceptance test that is to be witnessed by the AHJ. Copies of acceptance test forms may be found in the annex section of this document. These completed documents may be used by the contractor and provided to FP&C or SSC as documentation that pre-testing has been completed and that the final acceptance is requested.

Final system acceptance test shall be conducted in accordance with NFPA 72 and this document. All necessary tools, keys, materials, equipment, personnel, etc. needed to accomplish the acceptance test of the fire alarm system and associated equipment shall be provided by the contractor and present at the time of the scheduled acceptance test. Installation and testing shall be inspected and certified by a contractor supplied NICET II (minimum) Technician.

The contractor shall provide at least two (2) copies of shop drawings to be used during the acceptance test. These drawings shall reflect the installed device locations with device address on a floor plan representing the layout of the fire alarm system at the time of acceptance testing. One clean set of installation drawings for verification of location and addresses for the devices shall be placed in the document box after the completion of the acceptance test. A corrected set of As-built drawings shall be provided for installation in the document box within 30 days of the acceptance test. Electronic copies of all as-builts shall be submitted to the project manager and to the AHJ as part of the closeout documentation for the project.

The contractor shall supply an electronic copy of site-specific software within 14 calendar days to the Texas A&M University/Texas A&M University System project manager per NFPA 72.

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. Exception - Items requiring correction prior to occupancy shall be completed prior to the issuance of a Certificate of Occupancy.

At a minimum, an acceptance test will consist of a functional test of each device on the fire detection and alarm system in accordance with the manufactures recommendations.

All fire alarm system acceptance tests shall include verification that trouble, supervisory and fire signals are transmitted to and received at the monitoring station.

Depending on the project management group (i.e. Texas A&M University System Facilities Planning and Construction, SSC Service Solutions, etc.), system acceptance shall be contingent upon approval by EHS and FP&C or SSC Project Manager or Inspector.

### **Required Documentation/Equipment at Acceptance**

- Installation of the fire alarm panel installation tag
- Transfer to EHS a completed NFPA 72 Record of Completion
- Transfer to EHS a completed FML-009 Form
- EHS to provide a copy of the EHS acceptance form to the contractor and to project manager
- O&M Manuals transferred to Texas A&M University
- Transfer of any special tools or equipment to Texas A&M University
- Sensitivity test provided to EHS and placed in the as-built cabinet

## **Required Personnel**

Representatives from all trades and groups associated with the installation of the fire alarm system shall be present at the time of the acceptance test. Representatives of the trades shall have the knowledge, skills, and tools necessary to test any devices that are connected to the fire alarm system. Representatives may include, but are not limited to FP&C or designated project management team, Texas A&M University EHS, fire alarm contractor, sprinkler contractor, elevator contractor, HVAC contractor, Facilities Services FLS technicians, general contractor, and electrical contractor for emergency power.

Upon completion of the installation and testing of the system, the contractor shall provide a structured training class to designated university personnel on troubleshooting, maintenance and repair of the installed system as requested. A manufacturer representative shall be present.

The contractor shall provide a price list identifying any special tools and/or equipment required for inspection, testing or maintenance of any installed components. The project manager will determine any equipment needed and provide a list to the contractor. The cost of this equipment shall be included in the contract price.

## **Fire Dampers/Smoke Dampers**

All fire and smoke dampers shall be installed in accordance with the manufacturer's listing and functionally tested to ensure their operation. Prior to installation of any fire stopping system, verify the addition of any fire stopping product will not adversely affect the fire rating or performance of the fire/smoke damper. Fusible links shall be removed and operation of devices verified. The contractor shall provide a drawing indicating the location of all devices to be used during the inspection/acceptance.

## **Fire Door Assemblies**

All fire doors, whether mechanical or manual, shall be tested for their full functionality. Automatic doors shall be tested by operating any related systems such as activation by the fire alarm system and shall be tested for operation on emergency power if required.

All fire rating labels on fire doors and frames shall be clean, legible, and intact.

## **Fire Extinguishers**

EHS will inspect, inventory, and attach a barcode and inspection tag on all fire extinguishers once they are installed. Any extinguishers requiring maintenance will be brought to the attention of the contractor for extinguisher replacement. No further acceptance testing is necessary.

## **Fire Extinguisher Cabinets**

All fire extinguisher cabinets will be inspected to ensure they are free from damage and fully operational. Any required signage shall be installed prior to the final/life safety inspection.

## **Fire Hydrants**

Upon installation and notification that any new, relocated, or modified fire hydrant is ready for acceptance, EHS will verify proper orientation and height of the hydrant, witness a flow test to verify that the valves are open and that the flow is sufficient, check to ensure that caps are sufficiently lubricated and secured to the hydrant and affix a tag with the assigned hydrant number. EHS will take and record readings of the static, residual, and pitot pressures. If the flow is acceptable, no additional acceptance will be required by EHS.

Measures will need to be taken by the contractor to ensure that any landscaping will not be damaged by the flowing/flushing of any fire hydrants.

Any hydrant that has been installed but is not in service, has not been flushed to remove all debris, or is taken out of service shall be bagged to indicate such to emergency responders.

## **Fire Lanes/Aerial Fire Apparatus Access Roads**

An acceptance test shall be required for any soft “engineered” fire lane such as compacted asphalt, gravel, etc. An initial “pretest” will be required by the contractor. This will consist of the contractor having a loaded dump truck drive on the road and make normal turning maneuvers. If the pretest is successful, EHS will arrange for the local municipal fire department to bring a ladder truck as a final acceptance.

## **Fire Pumps**

An acceptance test of all fire pump installations shall be witnessed by the AHJ.

Prior to any scheduled acceptance testing, the suction and discharge piping shall be hydrostatically tested, flushed, and witnessed by the AHJ.

A certificate for flushing and hydrostatic test shall be provided to the AHJ prior to the acceptance test.

A copy of the manufacturer’s certified pump test characteristic curve shall be provided to the AHJ for comparison with the results of the acceptance test.

## **Fire Rated Walls/Partitions**

All fire rated walls/partitions will be inspected for compliance with the design documents. Cut sheets for any fire stopping material shall be available for review during the inspection if utilized during the project. Proper sealing of rated wall assemblies must be in accordance with the applicable standards and manufacturer’s instructions. Painting of fire caulking materials may be allowed only if approved by the fire caulking manufacturer.

## **Fire Sprinkler Systems**

All fire suppression submittals shall be reviewed by the AHJ and corrected prior to installation. Suppression systems include wet pipe, dry pipe, pre-action, clean agent, foam, and deluge sprinkler systems.

All fire suppression system piping shall be inspected during overhead inspections and prior to ceiling cover up.

All underground piping shall be flushed in accordance with NFPA 13 and meet the required GPM flow rates. The AHJ shall witness the flushing and shall inspect all piping prior to cover-up or burying.

Prior to sprinkler heads being added, all above ground sprinkler piping shall be flushed. Flushing of all underground and above ground piping shall be conducted using a minimum 2 1/2” hose or piping (or as large as the type of material allows). The contractor shall provide documentation of the flush.

All fire sprinkler piping, to include underground piping, FDC piping, backflow preventers and aboveground piping shall be hydrostatically pressure tested in accordance with NFPA 13 and witnessed by the AHJ, FP&C, and the contractor. All sprinkler heads shall be in place (this applies to air leakage testing on dry pipe and pre-action systems). Hydrostatic pressure tests shall include both wet pipe, dry pipe, and pre-action sprinkler systems. Dry pipe and pre-action sprinkler systems shall also be tested with air only at 40 psi for 24 hours. Access to visually inspect all piping shall be provided during the hydrostatic test.

Required Documentation includes the Texas Department of Insurance Aboveground and Underground certification papers (see [Attachments VIII](#) and [Attachment IX](#)). Forms shall be completed by the contractor and signed by all representative parties. Forms with all required signatures shall be submitted to the AHJ and FPC.

Additional required documents may include a certified microbial test report of the water supply, backflow preventer forward flow test documents and official backflow certification form from the manufacturer.

All above ground, overhead sprinkler piping shall be inspected and deemed complete and approved prior to cover up. After system installation approval, the official above ground hydrostatic pressure test shall be conducted.

Where any cut in sprinkler piping is made, the disk (coupon) shall be attached to the pipe at the point of the cut and visible for inspection by the AHJ.

Where concealed sprinklers are installed in a building, the cover plates shall not be installed until the ceiling has been installed in those areas and the AHJ has inspected the heads for proper deflector placement in relation to the escutcheon and ceiling.

Any sprinkler head found to have paint or other foreign material of any type or amount shall be replaced. Exception: With approval by the AHJ foreign material that can be easily removed, such as dust, may be carefully removed without having to replace the sprinkler.

As required by the Texas State Fire Marshal's office, the original system installation tag shall be attached to the main system riser and available for inspection at time of system acceptance.

The final functional test shall be considered satisfactorily complete when all valves and switches perform in accordance with the Contractor's approved shop drawings and the following test procedures:

- Operate all control valves to verify proper operation of the valve and associated tamper switch.
- Operate all test connections to verify water flow switch operation.
- Dry-Pipe Valve Operation: Operate the dry system inspector's test connection. Record the following information on the Contractor's Material and Test Certificate during the valve operational test:
  - Time for valve to operate
  - Time to receive water at inspector's test connection
  - Static supply water pressure
  - System air pressure
  - Air pressure at valve release – The inspector's test connection shall receive water within 60 seconds of its operation

## **Fixed Extinguishing Systems**

An acceptance test of all fixed extinguishing system installations shall be witnessed by the AHJ.

The contractor shall be responsible for all necessary tools, personnel, etc. needed to accomplish the acceptance test. This includes inert gas for performing a flow test of system piping.

## **Fuel Gas (Liquefied Natural Gas LNG/Liquefied Petroleum Gas LPG)**

Installation of any fuel gas (LNG or LPG) systems shall be tested in accordance with the requirements of the latest edition of NFPA 54 *National Fuel Gas Code* or NFPA 58 *Liquefied Petroleum Gas Code*. Documentation of all tests shall be provided to the AHJ (See State Fire Marshal Directive – [Annex B](#)).

Any monitoring equipment shall be tested in accordance with the manufacturer's directions. The AHJ shall be notified of any testing.

## **Gas/Environmental Monitors**

Any gas or other type of sensor installed as a safety measure shall be tested in accordance with the manufacturer's directions. Documentation of such testing shall be provided to the AHJ as part of the FLS closeout documentation.

## **Kitchen Hood and Duct Extinguishing Systems**

All hood and duct extinguishing systems shall be tested by conducting a full test of all components of the hood system. The contractor shall provide any required gas canisters for the test. Balloons will not be acceptable as a test method. All components of the system shall be tested including the operation of cutting the fusible link as well as operation of the manual device.

The contractor shall provide a diagrammatic layout of the equipment to be installed along with the location of the suppression nozzles for verification of proper location installation.

## **Key Boxes**

EHS will inspect all key boxes upon final installation. If deemed acceptable, EHS will coordinate, thru Texas A&M University Building Access, obtain a complete set of keys/fobs/access cards for the facility and the transfer of the keys and locking of the box with the appropriate police and/or fire department. EHS will arrange a time with local agencies to test any gate switches.

## **Mass Notification Systems**

EHS will inspect and conduct an acceptance test of all mass notification systems in accordance with the requirements of NFPA 72 and design/performance specifications as noted by the design engineer.

## **Post Indicator Valves**

The PIV for the sprinkler system shall be locked while the building is under construction. Once the building is turned over to the user, the contractor's lock shall be removed and Facilities Services FLS will install a Texas A&M University lock. The PIV shall be tested by fully opening and closing the valve and ensuring that the indicator panel is appropriately adjusted to provide a clear indication as to the status.

## **Smoke Management/Control Systems**

All smoke management systems (stairwell pressurization, smoke evacuation, etc.) shall be tested to meet the design requirement as determined by the Engineer of Record. Testing shall include a functional test of each component and their interconnections with other systems. Force readings shall be taken and recorded for any doors in areas affected by the smoke management/control systems.

## **Standpipe Systems and Hose Valve Systems**

Once installed and tested, standpipe systems shall be flowed at the most hydraulically remote location to flush the system.

## **Two-Way Communication Systems**

EHS will conduct a functional test of each call station to verify the call transmits to the central receiving panel and to the designated remote monitoring location.

# **Annex A**

## **Texas A&M University**

### **Fire Alarm System**

### **Design and Installation Standard**

The following information shall serve as a design and installations standard for fire alarm systems installed on the Texas A&M University campuses, the Texas A&M University System RELIS Campus, and Texas A&M University Health Science Center Facilities located throughout the state of Texas.

#### **General Information**

The contractor shall perform all work necessary to design, install, and test any new fire alarm system installation. This includes, but is not limited to, all labor, materials, and commissioning.

The completed installation shall conform to the applicable sections of the most current edition of the National Fire Protection Association (NFPA) codes and standards. In addition, the design shall conform to the American Disabilities Act (ADA), the National Electrical Code, the International Building Code, the Texas Accessibility Standards Act (TAS), where items are not addressed by NFPA 1 and NFPA 101, and these specifications.

All fire alarm system retrofit projects shall include a field survey of the facility to determine device locations and system layout. The walkthroughs should include a member from the Texas A&M University/Texas A&M University System project management group, the design team, and EHS.

#### **General Design Guidelines**

All components of the fire alarm system shall be able to interface completely with the fiber network reporting system used by Texas A&M University while maintaining a UL listing (see [Annex B](#)).

All new fire alarm systems installations at Texas A&M University shall utilize the following general guidelines as a basis for the system layout. These general guidelines are for fully sprinklered buildings. These are general guidelines and may vary as determined by the AHJ during walkthrough and plan review sessions.

#### Smoke Detectors

- Shall be photoelectric unless specified by the AHJ
- Shall be installed in the following locations:
  - All corridors and common use spaces such as lobbies, reception areas, etc.
  - Intermediate or remote areas where smoke would need to penetrate multiple doors to reach a smoke detector in a corridor or common area
  - Conditioned electrical and mechanical rooms
  - Storage rooms
- Smoke detectors shall not be installed in
  - Custodial closets
  - Non-conditioned pump rooms

Heat Detectors shall be installed in break rooms/kitchens and locations as appropriate.

Manual pull stations shall be installed at the following locations:

- Every level at every enclosed or exterior exit
- In corridors where travel distance to a pull station exceeds 200 feet
- Every horizontal exit as defined by NFPA 101, *Life Safety Code*®

#### **Specific Design Specifications**

##### High-rise buildings

- Provide a fireman's phone system and boxes for phone
- Provide an unsupervised printer that shall record all system events and time of the event
- All high-rise buildings shall be programmed for general alarm activation (not high-rise mode)

##### Residence Halls

- Detectors in resident hall rooms shall be smoke detectors

- Activation of the heat/smoke detector shall sound a local and general alarm unless otherwise approved/directed by the AHJ
- Activation of a general alarm shall activate sounder bases and/or speakers in all resident hall rooms
- Notification appliances/devices shall incorporate the 520 hz frequency as required by NFPA 72

#### Animal housing areas

- Chimes or speakers in a similar frequency range may be installed in animal housing areas (system designer should verify with user to determine if and when this might be necessary)

#### Instructions to Contractors

- The contractor shall provide three (3) copies of detailed plans, and specifications as enumerated in Annex A for review and approval prior to installation.
- The contractor shall get clarification from the AHJ and approval from the University or System Project Manager when a question or discrepancy arises.
- Upon completion of the installation and testing of the system, the contractor shall provide a structured training class to designated university personnel on troubleshooting, maintenance and repair of the installed system as requested. A manufacturer representative shall be present.
- Contractor shall contact the Communications Center and the Building Proctor/Facility Coordinator before work is started each day to advise they are working in the facility.
- The contractor shall provide a price list identifying any special tools and/or equipment required for inspection, testing or maintenance of any installed components. The project manager will determine any equipment needed and provide a list to the contractor. The cost of this equipment shall be included in the contract price.
- The contractor shall provide, within fourteen (14) calendar days of the acceptance test, one (1) electronic copy in AutoCAD 2004 or later version and three (3) hard copies of as-built drawings reflecting all changes noted during acceptance testing. These drawings should be complete and detailed as enumerated in Annex A. The drawings shall accurately reflect the installed system.

#### Quality Control Assurance

- All components of the fire alarm system shall be products of an Underwriters Laboratories Inc. (UL) listed fire alarm manufacturer and shall bear the UL label. Partial listing **shall not** be acceptable.
- All components of the fire alarm systems shall use the most current technology available.
- Only new parts shall be installed at the time of initial installation and to repair the system during the warranty period. No reconditioned parts shall be used.
- All devices shall be tested and certified that they meet or exceed the "Service Life Expectancy Rating" as outlined by UL and NFPA.
- The equipment and installation supervision furnished under this specification is to be provided by a manufacturer who has been engaged in production of this type of equipment (software-driven) for at least 5 years and has a fully equipped service organization within 150 miles of the installation site. Service shall be provided within 24 hours of problem notification.
- All conductors shall be uniformly and consistently color-coded and labeled throughout.
- All power supplies connected to the system shall have transient protection in accordance with UL 864.
- Detectors **shall not** be installed until cleanup of all construction trades is complete as required by NFPA 72. Any detectors found installed prior to this cleanup shall be replaced at the contractor's expense.
- Conduits shall not be filled to more than 40% capacity. Conduits shall have a J-box no further than 100 feet or at each 90° turn, whichever occurs first. All J-boxes shall be painted red or have the letters FA in red on the cover. Where a J-box at every 90° turn may be considered excessive, the contractor should get direction from the Texas A&M University/Texas A&M University System project manager before omitting any J-box. All J-boxes shall be easily accessible.
- The contractor shall identify and label circuit breakers on main and emergency power supplies and identify these electrical panel location(s) and breaker number(s) inside the Fire Alarm Control Unit (FACU) in accordance with NFPA 72. Any breaker associated with the Fire Alarm System (FAS) shall be painted red and shall have a circuit breaker locking device

#### Design Specifications

##### General Requirements

- Panels shall be easily expandable and upgradeable
- Unless otherwise approved by the AHJ, the FACU shall have software that will enable the system to be intelligent
- All Fire Alarm Systems (FAS) shall be equipped with voice notification and have public address capability unless otherwise approved by the AHJ

- Provide software that:
- Is password protected
- Offers computer driven device calibration test and reporting features, by device, loop, or system
- Latches all Alarm, Trouble, and Supervisory signals, unless otherwise requested by AHJ
- Power for the FAS (FACU and all components) shall be from one electrical panel unless approved by the AHJ.
- Wiring shall be class B wiring unless specific design conditions warrant.
- Furnish and install “surge protection devices” on all circuits that extend beyond the main building (i.e. walkways, aerial, or underground methods):
  - Surge protection devices shall be located as close as practical to the point where circuits leave the building
  - Surge protection devices shall have a line-to-line response time of less than one nanosecond capable of accepting 2000 amps to earth
  - Surge protection devices shall comply with UL 497 B and NEC 760
- All addressable loops shall have loop isolation protection devices to maintain partial fire alarm system integrity should a fault occur. A loop isolation device shall not exceed a maximum of 20 devices.
- A maximum of 80% capacity of initiating devices is allowed per loop.
- The fire alarm system shall use closed loop initiating device circuits with individual zone (device) supervision, individual notification appliance supervision, and primary and standby power supervision.
- Each device shall be labeled and the label designations shall be accurate and consistent with those on the prints, the annunciators, the points list, and message displays.
- All devices, panels and auxiliary panels shall be mounted in easily accessible locations. The top of all panels shall be mounted no more than six (6) feet above finished floor.
- The FACU will consist of a control center utilizing state of the art electronics with microprocessor-based technology and a minimum of four zone (loop) capability. The FACU shall be software controlled with the capability of owner programming. The installer shall supply all programming data (complete program, data list) software and all updates to the software. Software media shall be Windows compatible using the most current version.
- The FACU shall have software capable of supervising Air Handler Unit (AHU) shutdown.
- The FACU shall have an audible device and separate LED’s indicating ALARM, TROUBLE and SUPERVISORY conditions with each having a separate and distinguishable sound. The FACU shall have a backlit LCD display of at least three lines of at least 40 characters each. An indication of POWER, TROUBLE, and PARTIAL DISABLE shall be included as an LED output.
- The FACU equipment cabinet shall be of sufficient size to accommodate the main fire panel, main and standby power supplies (battery), cable and wire harnesses and any auxiliary relays. Batteries shall have the manufacturer’s date displayed or noted on the battery.
- Remote annunciators (if installed) shall have the same capabilities as the FACU in all respects unless otherwise directed by the AHJ.
- Where detection devices are installed above ceilings a remote indicator shall be installed at the ceiling level to identify the location of the device. Where installing a remote indicator is not possible signage indicating the type and address of the device(s) shall be permanently attached to the ceiling grid below the device location.
- There shall be a separate box located next to the FACU of sufficient size to accommodate spare detectors and paperwork (16” x 16” x 6” min.). This box shall be of matching color with the FACU cabinet and shall be keyed the same as the FACU.
- Printer interface modules shall be installed in all systems
- All new systems shall interface with Code Maroon



## Programming Requirements

- Provide a “Drill Function” on the panel that is easily identifiable and only initiates notification appliances on all floors.
- Provide a Programmable “Bypass” function for:
  - AHU shut down
  - Elevator recall
  - Stairwell pressurization fans
  - Notification appliances
  - Alarm verification
- Provides for all controlled systems to “auto reset,” (i.e., AHUs and elevators)
- Provides for all system devices to be restorable from the FACU

## Initiating Devices

All water flow switches shall be time adjustable complying with NFPA 72. Activation time should be approximately 30 - 45 seconds.

Valve tamper switches shall comply with NFPA 72. A supervisory condition shall result from a tamper switch activation.

Beam detectors shall:

- Comply with UL 268
- Be 24vdc operation
- Have automatic contamination compensation

Detector bases shall:

- Be low profile, surface, or flush mounted into a standard four-inch square electrical box
- Be able to accept heat, ionization, or photoelectric devices interchangeably

Smoke detectors shall:

- Have an LED that flashes during normal operation
- Ionization detectors shall be dual chamber and be scaled against rear airflow
- Be self-adjusting for airborne contaminants
- Have clear, distinct visual alarm indication
- Be mounted in easily accessible locations
- Be programmed to have alarm verification

Duct detectors shall:

- Report to FACU as a supervisory alarm
- Be of the photoelectric type
- Have clear, distinct visual power and alarm indications
- Be programmed to have alarm verification
- Have extended visual indicators if mounted above ceiling located as close to duct detector as possible

Thermal (Heat) detectors shall:

- Be of the dual element, self-restoring type
- Have a flashing LED for normal operation
- Have clear, distinct visual alarm indication

Manual pull stations shall:

- Be cast aluminum or high impact plastic and be red in color
- Be zoned separately if not addressable
- Provide a clear visual indication when activated
- Not require consumable parts to reset to normal condition
- Be double action

## **Notification Appliances**

Audible devices:

- Shall be tapped to an adequate wattage capable of achieving the minimum code required dB readings throughout the facility
- Shall be tapped at the highest wattage in all mechanical rooms
- May be ceiling mounted speakers or combination devices where permitted to be installed by code

Visual devices:

- May be ceiling mounted or combination devices where permitted by code

## **Installation, Testing, and Acceptance**

The contractor shall have all devices on the system installed and the system pre-tested prior to the scheduled acceptance test (see [Attachment XXII](#)).

The contractor shall provide all tools, labor, and materials required for all installation start-up tests, including a qualified technician to conduct the test.

Installation and testing shall be inspected and certified by a contractor supplied NICET II (minimum) Technician.

System acceptance test shall be conducted in accordance with NFPA 72.

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 acceptance test.

Depending on the project management group (i.e. Texas A&M University System FP&C, Texas A&M University Facilities Services, Engineering, Design, and Construction, etc.), system acceptance shall be contingent upon approval by EHS, FP&C, and a Facilities Services representative.

Upon completion of testing, the contractor shall install the proper certification certificates in the FACU and provide a copy of NFPA 72 Record of Completion, the FML-009 Form, and smoke detector sensitivity test to EHS.

The contractor shall provide three (3) copies of drawings to be used during the acceptance test. These drawings shall reflect the installed device locations with device address on a floor plan representing the layout of the fire alarm system at the time of acceptance testing.

The contractor shall supply an electronic copy of site-specific software within 14 calendar days to the Texas A&M University/Texas A&M University project manager per NFPA 72.

## **Warranty**

The system shall be guaranteed to be free from all defects of material and workmanship for a period of one year, effective upon date of system acceptance.

The contractor shall guarantee parts availability for a minimum of five (5) years after installation.

## Fire Alarm Design Submittal Requirements

All preliminary and as-built design drawings and supporting documentation shall include: Floor plan drawings, riser diagrams, control unit wiring diagrams, point to point wiring diagrams, and typical wiring diagrams as described herein

- Name of owner and occupant
- Location, including street address
- Device legend
- Date
- Input/output programming matrix
- Licensed Designer Information – Registered Professional Engineer or Alarm Planning Superintendent (APS)
- Battery calculations
- Notification appliance circuit voltage drop calculations
- Floor Plan
  - Floor identification
  - Point of compass
  - Correct graphic scale
  - All walls and doors
  - All partitions extending to within 15 percent of ceiling height
  - Room descriptions
  - Fire alarm device/component locations
    - Signal notification devices
    - Initiation devices
    - Smoke control systems
    - Initiation of automatic extinguishing equipment
    - Doors that unlock or close automatically
    - Zone verification for detection devices
    - Fire/Smoke damper control
    - Fire alarm panel location
    - Fire alarm annunciators
    - Control valves to Fire Protection System
    - Duct smoke detectors
    - Supervisory devices
    - Elevator location
    - Elevator recall system location
  - Location of fire alarm primary power connections
  - Location of monitor/control interfaces to other systems
  - Riser locations
  - Methods for compliance with survivability (emergency voice systems), where applicable
  - Ceiling height and ceiling construction details
- Fire alarm system riser diagram
  - General arrangement of the system, in building cross-section
  - Number of risers
  - Type and number of circuits in each riser
  - Type and number of fire alarm components/devices on each circuit, on each floor or level
- Control unit wiring diagrams should be provided for all control equipment, power supplies, battery chargers, and annunciators and should include the following:
  - Identification of control equipment depicted
  - Location(s) of:
    - All field wiring terminals and terminal identification
    - All indicators and Manual controls, including the full text of all labels
    - All field connections to supervising station signaling equipment, releasing equipment, and fire safety control
  - A typical wiring diagram should be provided for all initiating devices, notification appliances, remote light emitting diodes (LEDs), remote test stations, and end-of-line and power supervisory devices.

**Annex B**  
**Texas State Fire Marshal**  
**Gas Directive**

**Texas Department of Insurance  
STATE FIRE MARSHAL'S OFFICE  
AUSTIN, TEXAS**

**State Fire Marshal Directive**

Pursuant to the authority of Texas Government Code § 417.008, the State Fire Marshal is directing that your agency, or university, take immediate steps to insure that:

1. All master-metered natural gas piping systems owned, operated and controlled by a State Agency or State Higher Education Campus are designed, constructed, maintained and operated in accordance with the Minimum Safety Standards for Natural Gas, 49 Code of Federal Regulations (CFR) Part 192, as required by 16 TAC §8.
2. All interior gas piping in structures and buildings is installed, operated, tested, and repaired in accordance with National Fire Protection Association Fuel Gas Code, NFPA 54. In a single-metered building where the gas meter is located remote from the building, any underground piping from the meter to the point of building entry shall also be in compliance with NFPA 54, *Fuel Gas Code*.
3. A pressure test is completed on all interior gas piping in all buildings containing sleeping facilities by December 31, 2005 and retesting shall be conducted at least every two years after completion of the initial test.
4. A leakage survey shall be completed on all interior gas piping in all buildings not containing sleeping facilities by September 1, 2006. Leakage surveys shall be conducted first on those buildings where the occupancy load is 300 or more people and in those buildings considered to be high-hazard or with multiple gas piping installations or appliances.

Once leakage surveys have been completed in a building, gas piping and appliances shall be installed, tested, repaired, and maintained in accordance with NFPA 54, *Fuel Gas Code*.

5. All underground piping between the gas meter and the building shall be leak surveyed in accordance with 49 CFR 192.723 (b) (2).

**Pressure Testing Criteria:** A pressure test to determine if the natural gas piping in each facility will hold at least normal operating pressure shall be performed as follows:

1. For systems on which the normal operating pressure is less than 0.5 pounds per square inch gauge (psig), the test pressure shall be 5.0 psig and the time interval shall be 30 minutes.
2. For systems on which the normal operating pressure is 0.5 psig to 4.9 psig, the test pressure shall be 1.5 times the normal operating pressure or 5.0 psig, whichever is greater, and the time interval shall be 30 minutes.
3. A pressure test using normal operating pressure shall be utilized only on systems operating at 5.0 psig or greater, and the time interval shall be one hour.

Any interior piping failing the pressure test shall be repaired and retested or the piping shall be disconnected from the gas supply.

The testing shall be conducted by:

1. A licensed plumber;
2. A qualified employee or agent of the facility who is regularly employed as or acting as a maintenance person or maintenance engineer; or
3. A person exempt from the plumbing license law as provided in Texas Civil Statutes, Article 6243-101, §3. Documentation of training and experience for these exempt personnel shall be maintained by the agency.

Equivalent methods of compliance that meet the intent of this directive may be acceptable. Requests are to be submitted under the signature of the Executive Director of the Agency or University President to the State Fire Marshal for approval.

All facilities should take immediate action to insure compliance. All facilities should be in compliance no later than the dates listed herein. Documentation of compliance shall be maintained in the facility safety department and be available for inspection by the State Fire Marshal, Railroad Commission, or other state officials.

This directive does not release any facility from requirements of the Texas Railroad Commission or Federal law or regulations.

Any questions can be directed to Wayne Smith, Director of Fire Safety Inspections, State Fire Marshal's Office, Texas Department of Insurance. Mr. Smith can be reached at (512) 305-7911 or by E-mail at [wayne.smith@tdi.state.tx.us](mailto:wayne.smith@tdi.state.tx.us).

Issued February 4, 2005, by the authority of the State Fire Marshal.

A handwritten signature in black ink that reads "Paul W. Maldonado". The signature is written in a cursive, flowing style.

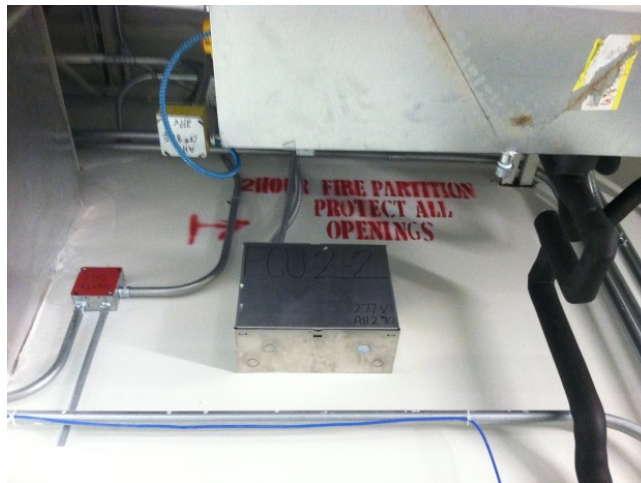
Paul W. Maldonado  
State Fire Marshal

**Annex C**  
**Example Photographs, Illustrations, and Templates**

## Example Photographs, Illustrations, and Templates



*Photo 1 – Fire Wall Label Example #1*



*Photo 2 – Fire Wall Label Example #2*



*Photo 3 – Floor Control Valve Identification*



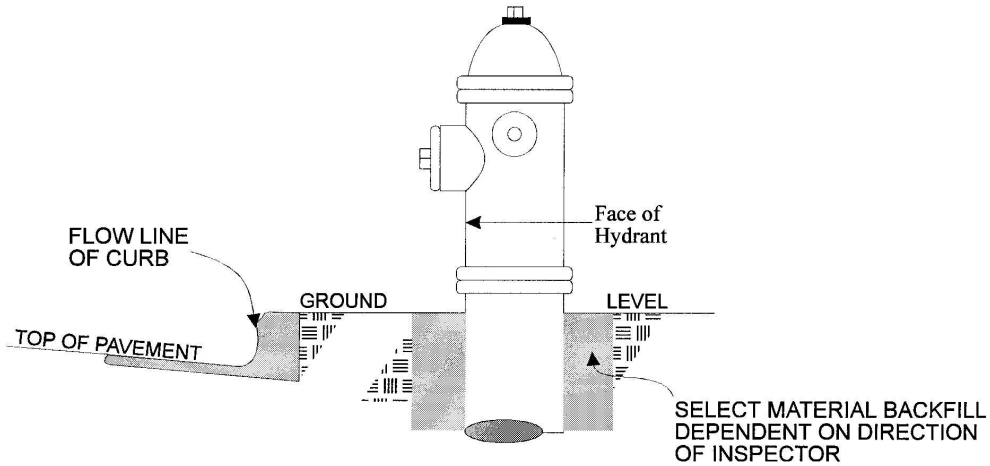


*Photo 4 – Remote Standpipe/Sprinkler Identification*



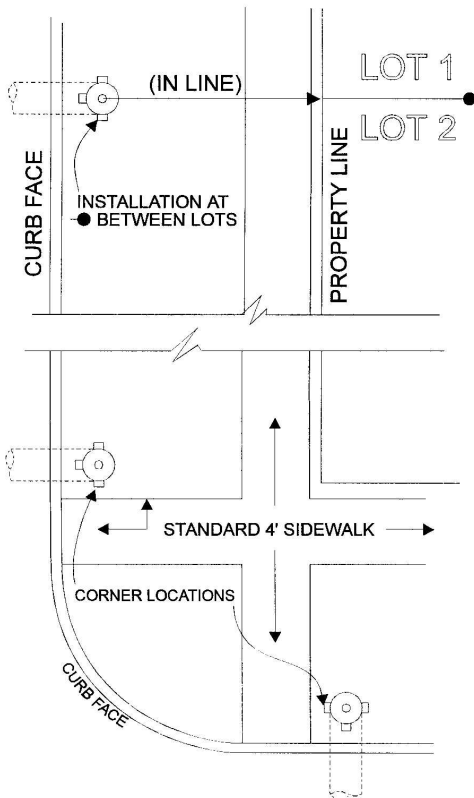
*Photo 5 – Fire Department Connection Sign*

# FIRE HYDRANT INSTALLATION DETAIL

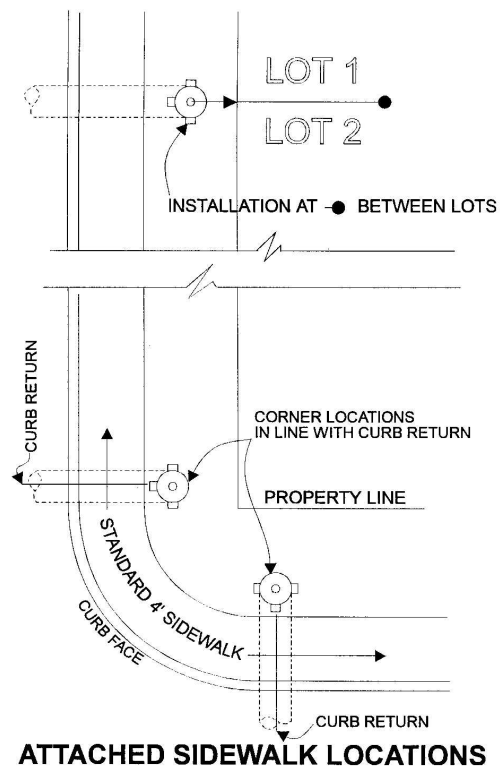


## GENERAL NOTES

- 1) HYDRANT NOZZLES SHALL BE POSITIONED AT RIGHT ANGLES TO CURB. IF NO CURB OR SIDEWALK EXISTS, CONTACT FIRE MARSHALL'S OFFICE FOR SITE EVALUATION
- 2) HYDRANTS WILL BE PLACED A MINIMUM OF 5.0 FT. FROM ANY UTILITY OR DRAINAGE STRUCTURE

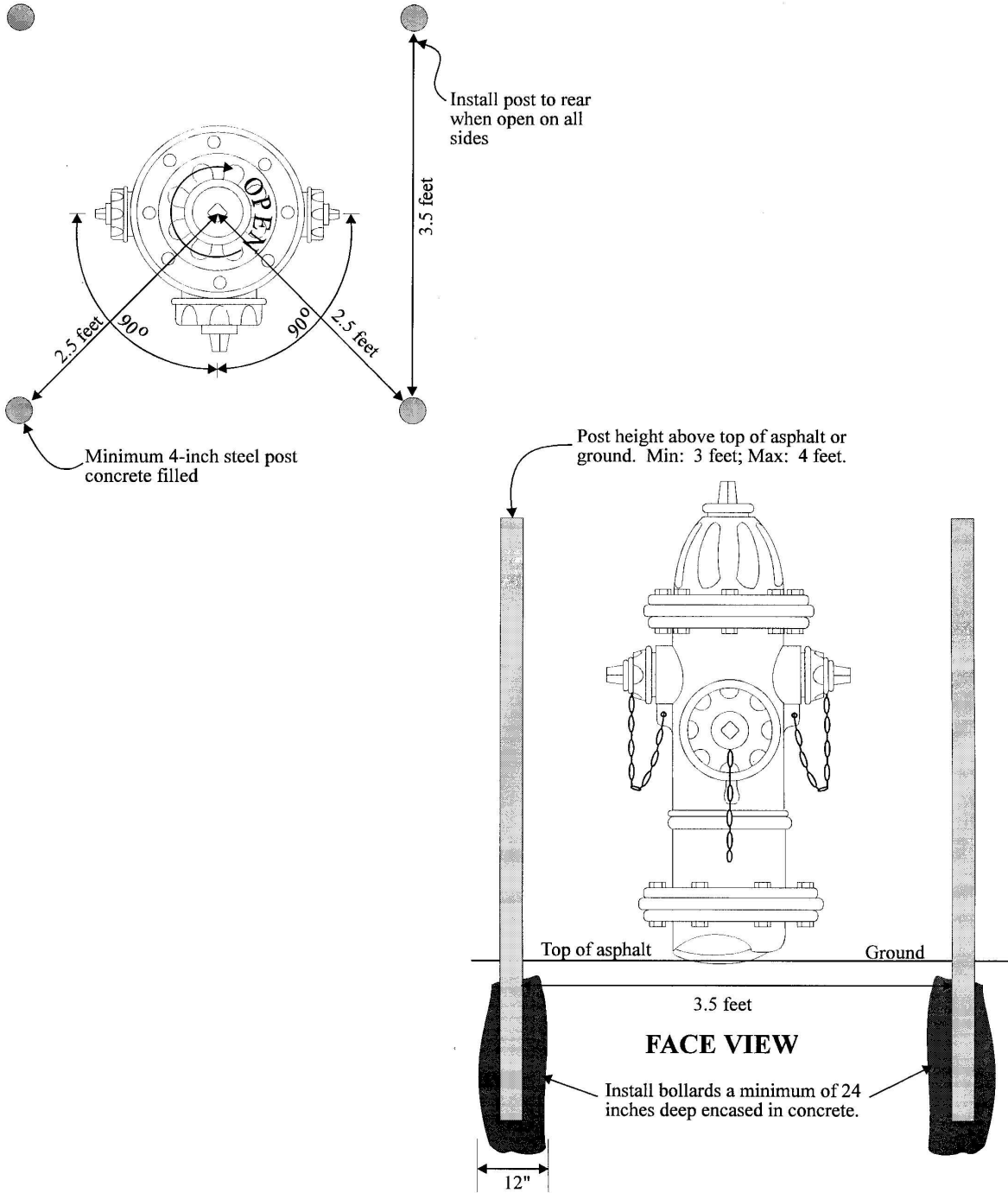


**DETACHED SIDEWALK LOCATIONS**



**ATTACHED SIDEWALK LOCATIONS**

# FIRE HYDRANT BOLLARD DETAIL

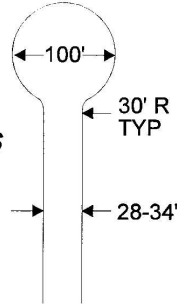


A2

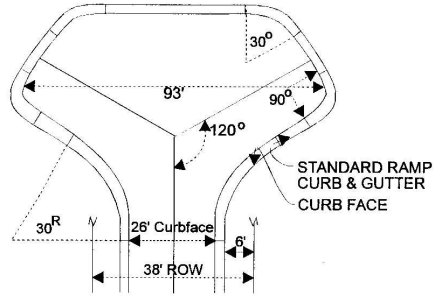


# APPROVED ACCESS ROADWAY TURNAROUNDS

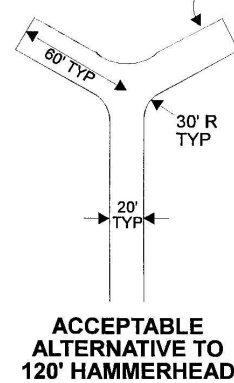
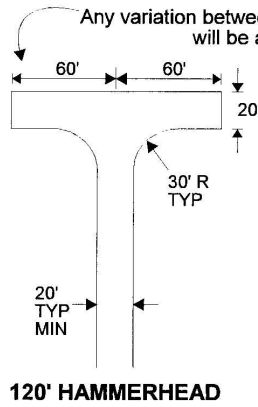
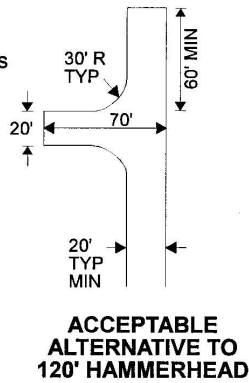
## City Access Roadways



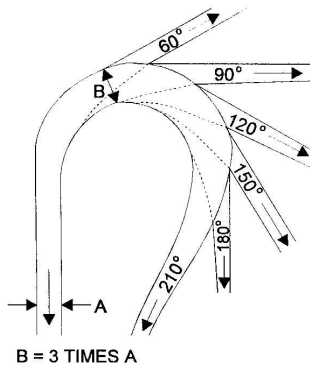
Cul-de-sac not to exceed 600 feet



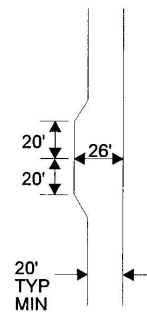
Alternate access roadway considerations for private driveways (one to two homes maximum) and special approved applications.



## Misc.

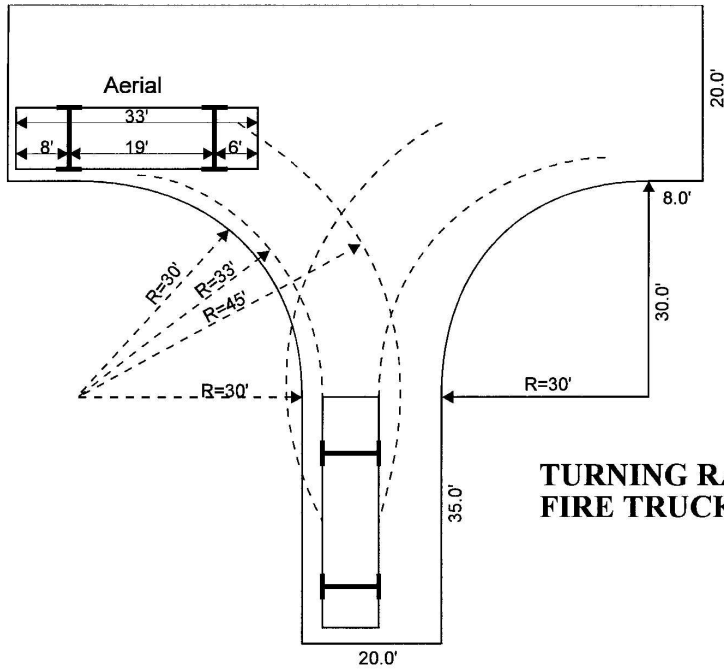


**SEMITRAILER WHEELTRACKS  
48' RADIUS**



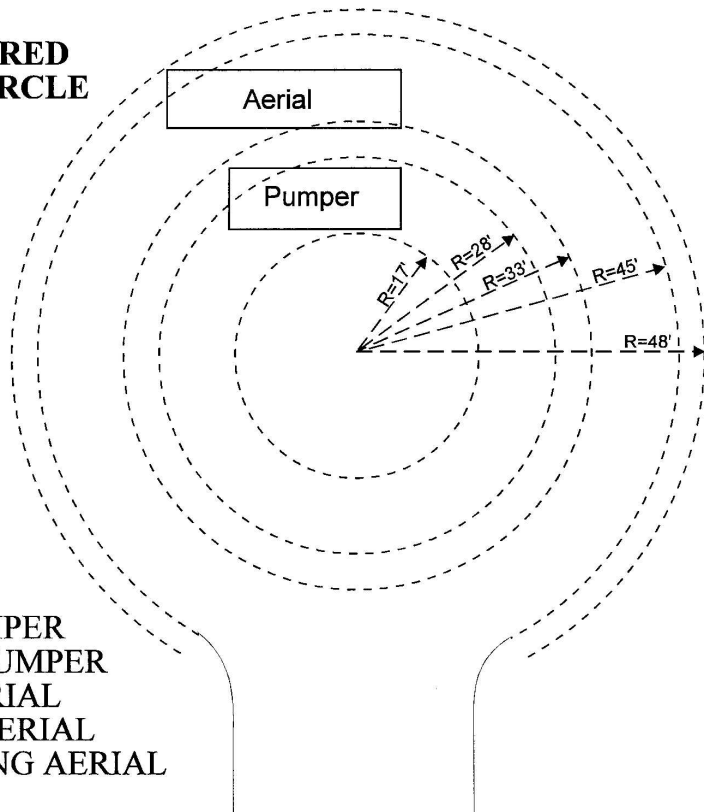
**MINIMUM CLEARANCE  
AROUND A FIRE HYDRANT**

# TURNING RADIUS SPECIFICATIONS



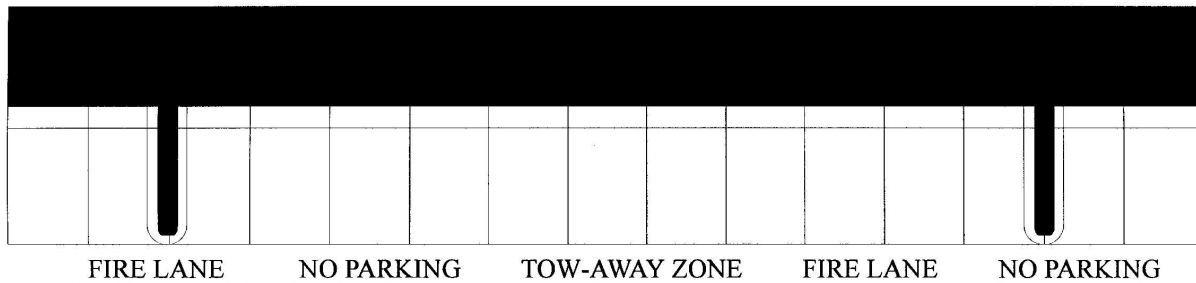
**TURNING RADIUS REQUIRED FOR FIRE TRUCKS IN A TEE TURNAROUND**

## TURNING RADIUS REQUIRED FOR FIRE TRUCKS IN A CIRCLE TURNAROUND

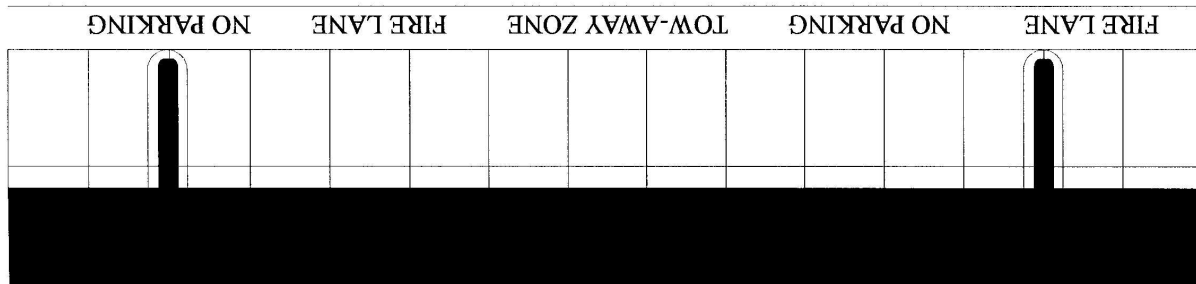


- R-17': INSIDE WHEEL PUMPER
- R=28': OUTSIDE WHEEL PUMPER
- R=33': INSIDE WHEEL AERIAL
- R=45': OUTSIDE WHEEL AERIAL
- R=48': OUTSIDE OVERHANG AERIAL

# FIRE LANE MARKINGS



8" red stripe painted on drive surface with 4" white letters stating  
**FIRE LANE      NO PARKING      TOW-AWAY ZONE**



**Attachment I**  
**Clean Agent Fire Extinguishing**  
**System Acceptance Form**

## Clean Agent Fire Extinguishing System Acceptance Checklist



TEXAS A&M UNIVERSITY  
Environmental  
Health & Safety

**Building #:** \_\_\_\_\_ **Building Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Attendees:** \_\_\_\_\_  
\_\_\_\_\_

**EHS Representative:** \_\_\_\_\_

**Clean Agent System Manufacturer:** \_\_\_\_\_

**Control Panel Manufacturer:** \_\_\_\_\_

**Room or Area Protected:** \_\_\_\_\_

**Type of Extinguishing Agent:** \_\_\_\_\_

**Volume Protected**     Above Ceiling                       Below Raised Floor                       Between Floor and Ceiling

**System Concentration (%)** \_\_\_\_\_

**Weight of Clean Agent with Cylinder** \_\_\_\_\_ **lbs.**

**Weight of Cylinder** \_\_\_\_\_ **lbs.**

**Weight of Clean Agent** \_\_\_\_\_ **lbs.**

**Normal Operating Pressure** \_\_\_\_\_ **psi**

**Detection System:**

- |  |   |
|--|---|
| <input type="checkbox"/> Ionization-type smoke detectors | <input type="checkbox"/> Fixed-temperature heat detectors |
| <input type="checkbox"/> Photoelectric smoke detectors   | <input type="checkbox"/> Rate-compensation heat detectors |
| <input type="checkbox"/> Rate-of-rise heat detectors     | <input type="checkbox"/> Other _____                      |

**Type of Detection for Operation:**

- |  |   |
|--|---|
| <input type="checkbox"/> Single zone             | <input type="checkbox"/> Two detectors any zone |
| <input type="checkbox"/> Two zones (cross zoned) | <input type="checkbox"/> Other _____            |

**Requirements Before Acceptance Testing:**

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| <input type="checkbox"/> Building construction is complete   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> All trades are complete   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Clean-up is complete  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> System integration with fire alarm system complete and pre-tested             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> All devices verified with correct address/location shown on as built drawings | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**Required Documentation at Time of Acceptance Test:**

- |   |                              |                             |
|---|------------------------------|-----------------------------|
| <input type="checkbox"/> FML-009- 1 copy to EHS   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> O&M manual transferred to Facilities Services personnel        | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Transfer of any special tools to Facilities Services personnel | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Sensitivity of smoke detectors received by EHS                 | <input type="checkbox"/> Yes | <input type="checkbox"/> No |



**Acceptance Test**

Clean agent containers free from physical damage	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Warning signage installed at doorways with relevant instruction/information	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Visible warning device (strobe) outside of room	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Warning and instruction signs posted outside cylinder storage room	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Main and reserve (if present) tanks clearly identified	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Warning sign affixed by manual pull	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Piping, joints, discharge nozzles secure	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Information tag attached (agent, tare, gross weight)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Verify storage containers are secured	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Pneumatic test on piping (10 min @ 40 psi)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Enclosure integrity test - Change of 10 Pa (.15psi) or less	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Flow test (puff test)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Batteries shall power full alarm for 15 minutes	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Properly labeled dedicated power circuit	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Functional test of detectors	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Functional test of all manual pull stations (2 separate/distinct functions) push/pull	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Functional test of abort switches	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Functional test of all audio/visual devices	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Functional test of control panel	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Functional test of all remote annunciators	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Verification of trouble alarms: <input type="checkbox"/> Battery charger <input type="checkbox"/> Loss of bottle pressure (pressure shall be supervised) <input type="checkbox"/> Smoke <input type="checkbox"/> A/V <input type="checkbox"/> Loss of dedicated power	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Verification of supervisory Alarms	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Functional test of all relays: <input type="checkbox"/> AHU Shutdown & damper closure <input type="checkbox"/> Other	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Test system on backup power by simulating primary power failure	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Verify alarm, supervisory, and trouble signals received at Communication Center	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Verify dedicated power source	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Verify 24-hour standby power source	<input type="checkbox"/> Yes	<input type="checkbox"/> No
O&M manual transferred to Facilities Services personnel	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Transfer of any special tools to Facilities Services personnel	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Other:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

**Code References:**

- If abort switch is used, abort switch shall only be valid after 1<sup>st</sup> detector reports. After 2<sup>nd</sup> detector reports, abort switch shall no longer be functional. (Only valid in zoned 2 detection systems).
- 30 Seconds max for time delay release.
- If dead man switch is pressed and no alarm condition is present, a trouble signal shall be indicated.
- Manual discharge shall bypass time delay and dead man switch
- If smoke detector is in trouble, system shall still operate
- Operation of abort switch shall result in both audible and distinct visual indication of system impairment. NFPA 2001 (most current edition)
- The piping shall be pneumatically tested in a closed circuit for a period of 10 minutes at 40psi. At the end of 10 minutes, the pressure drop shall not exceed 20 percent of the test pressure. NFPA 2001-10.4.14

**System Accepted by EHS:**       Yes       No

\_\_\_\_\_  
**AHJ (or designee)**

\_\_\_\_\_  
**Date**

**Comments:**

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**Attachment II**  
**Elevator Acceptance Checklist**

## Elevator Acceptance Checklist



**Building #:** \_\_\_\_\_ **Building Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Attendees:** \_\_\_\_\_

**EHS Representative:** \_\_\_\_\_

**Project Number:** \_\_\_\_\_ **Type of Elevator:**  Traction  Hydraulic

**Elevator Location:** \_\_\_\_\_

**Requirements Before Acceptance Testing:**

- Elevator integration with fire alarm system complete  Yes  No
- Elevator has been pre-tested  Yes  No
- Pre-test documentation has been submitted to EHS  Yes  No

Elevator Has Identifier (1, 2, A, B, etc.)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Elevator Shaft Sprinkled	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Elevator Machine Room Sprinkled	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Sprinkler Head no More Than 2 ft. From Pit Floor	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
If Sprinkled, Heat & Smoke Detection Required (Heat w/in 24" of Sprinkler) unless sprinkler within 24" of the bottom of the shaft	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
If Sprinkled, Shunt Trip Present and Operational	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Hoistway Smoke Relief Dampers Present <input type="checkbox"/> Verify Normally Closed and Will Open in Alarm	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Fire Hat Lights Up in Alarm Mode	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Fire Hat Flashes with Activation of Machine Room/Shaft Detection	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Emergency Call Operational and Location Accurate	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Emergency Call-Back Operational	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Primary Recall Reports to Correct Location	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Secondary Recall Reports to Correct Location	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Smoke Detection Tested at All Levels <input type="checkbox"/> Smoke Detectors Located on Ceiling Within 21' of Center-line of Doors	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Phase II (Fire Operation) Operating Correctly	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Other: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

**Applicable Codes/Standards:** NFPA 1, NFPA 101, ASME A17.1

**Notes:** Smoke detectors shall not be installed in un-sprinkled hoistways unless they are installed to activate elevator hoistway smoke relief equipment or to initiate Phase I Emergency Recall Operations (NFPA 72:21.3.6.1, 2022)

**System Accepted by EHS:**  Yes  No

\_\_\_\_\_  
**AHJ (or designee)**

\_\_\_\_\_  
**Date**

**Comments:**

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**Attachment III**  
**Emergency Power Supply Systems**  
**Acceptance Checklist**

## Emergency Power Supply Systems Acceptance Checklist



TEXAS A&M UNIVERSITY  
Environmental  
Health & Safety

**Building #:** \_\_\_\_\_ **Building Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Attendees:** \_\_\_\_\_

**Project Number:** \_\_\_\_\_

*NOTE: All trades complete, system has been pre-tested for emergency power transfer, all circuits identified as emergency circuits are functional*

**Generator Location:** \_\_\_\_\_

**Generator Level/Class:** \_\_\_\_\_ **Generator Type:** \_\_\_\_\_

**Generator Manufacturer:** \_\_\_\_\_

**Prime Mover Manufacturer:** \_\_\_\_\_

**KVA (or KW)** \_\_\_\_\_ **@** \_\_\_\_\_ **Hz**      **Rated RPM** \_\_\_\_\_ **@ 100%**

**Transfer Switches** \_\_\_\_\_ **Energy Source** \_\_\_\_\_

**Remote Annunciator Location(s):** \_\_\_\_\_

**Type of Diesel Fuel Tank:**

- Aboveground
- Underground
- Fire resistant aboveground
- Underground vault
- Secondary containment aboveground tank
  - Indoors
  - Outdoors
- Other specialty tank (Specify) \_\_\_\_\_

**Location(s) of diesel fuel storage tanks:**

- In building, floor \_\_\_\_\_      Quantity (gallons) \_\_\_\_\_
- Outdoors, Location \_\_\_\_\_      Quantity (gallons) \_\_\_\_\_

**The Following Documents Shall Be Provided To The AHJ At The Time Of The Acceptance Test:**

- Evidence of the prototype test as specified in NFPA 110 5.2.1.2 (for level 1 systems)
- A certified analysis as specified in NFPA 110 5.6.10.2
- A Letter of Compliance as specified in NFPA 110 5.6.10.5
- A manufacturer's certification of a rated load test at rated power factor with the ambient temperature, altitude, and fuel grade recorded
- Schematic, wiring, and interconnection diagrams showing all terminal and destination markings for all EPS equipment, as well as the functional relationship between all electrical components. NFPA 110, 5.6.10.4
- For Level 1 systems, instruction manuals shall be kept in a secure, convenient location, one set near the equipment, and the other set in a separate location.

**General:**

- The room shall have a minimum 2-hour fire rating or be located in an adequate enclosure located outside the building capable of resisting the entrance of snow or rain at a maximum wind velocity required by local building codes. NFPA 110, 7.2.1.1.

- ❑ Pilot lights w/ ID nameplates or other approved indicators showing transfer switch position.
- ❑ Mounting platform At Least 6" above floor or grade level.
- ❑ Generator controllers monitored by fire alarm system or attended location for the following items:
  1. Generator Running
  2. Generator fault
  3. Generator switch in non-automatic position
- ❑ Battery charger furnished with the following properly marked:
  1. Allowable range of battery unit capacity
  2. Nominal output current and voltage
  3. Sufficient battery-type data to allow replacement batteries to be obtained
- ❑ Remote manual shutdown station provided.
- ❑ EPS shall have minimum clearance of 3' on all sides.
- ❑ Battery powered emergency lighting shall be provided.
- ❑ Ambient temperature above 40F.

**Fuel System Tanks:**

- ❑ A minimum clearance of 36" shall be maintained on all sides. NFPA 110 7.9.12.1

***For Further Fuel System Requirements, See NFPA 110, 5.5 & 7.9***

**Exhaust Systems:**

See NFPA 110, 7.10 for indoor exhaust requirements.

**Acceptance Test: NFPA 110 7.13.4**

- ❑ For any generator serving emergency lighting, the load must be picked up by the generator within 10 seconds. NFPA 101, Life Safety Code
- ❑ All paralleled EPSSs intended to be operated simultaneously shall be operated simultaneously
- ❑ Test load shall be loads that are served by the EPSS
- ❑ Observe/ Record time delay on cold start
- ❑ Observe/ Record crank time until prime mover starts and runs
- ❑ Observe/ Record time to reach operating speed
- ❑ Confirm Engine start function by verifying operation of the initiating circuit of all transfer switches supplying EPSS loads
- ❑ Observe/ Record time to achieve steady-state condition with all switches transferred to the emergency position
- ❑ Record voltage, frequency, and amperes.
- ❑ Record prime mover oil pressure and water temperature.
- ❑ Continue load test with intended load for not less than 1.5 hours, run time shall be recorded
  - Type U= Basically uninterruptible
  - Type 10= 10 Seconds
  - Type 60= 60 seconds
  - Type 120= 120 seconds
  - Type M= manual or stationary-no time limit
- ❑ Record time for switch over back to normal power. (minimum setting of 5 minutes for each switch)
- ❑ Record time delay on the prime mover cool down period and shutdown.
- ❑ Prime mover shall be allowed to cool for not less than 5 minutes.

**Load Test:**

After the above test, conduct 2-hour full load test.

**(Building load shall be allowed to serve as part or all of the load, supplemented by load bank of sufficient size to provide a load equal to 100 percent of the nameplate kW rating.)**

Load test shall follow the following schedule:

- Not less than 30% of KW in first 30 minutes
- Not less than 50% of KW in the next 30 minutes
- 100% of the nameplate KW for the next 60 minutes

Where EPS is a paralleled multi-unit EPS, each unit shall be permitted to be tested individually at its rating.

**Crank Cycle Test:**

Any method recommended by the manufacturer for the cycle crank test shall be utilized to prevent the prime mover from running.

Set control switch to “run”

Perform crank/rest cycle (see NFPA 110, 5.6.4.2)

- Crank cycle test shall consist of an automatic crank period of approximately 15 seconds followed by a rest period of approximately 15 seconds.
- \*Otto cycle prime movers of 15kW and lower and all diesel prime movers shall be permitted to use continuous cranking methods.
- Crank cycle shall last for approximately 75 seconds (crank, rest, crank, rest, crank)
- Continuous crank test shall last for approximately 45 seconds
- Two means of cranking termination shall be utilized so that one serves as backup to prevent inadvertent starter engagement

**Safety/ Alarm Test:** (see NFPA 110, 5.6.5)

It shall be acceptable for the manufacturer to test and document over crank, high engine temperature, low lube oil pressure and over speed safeties prior to shipment.

If not tested at manufacturer, above safeties must be tested on site.

LEVEL 1

Indicator Function (at battery Voltage)	CV	S	RA	Item Checked/ Tested by Contractor	Witnessed by FP&C or Texas A&M University EHS
(a)Over Crank	X	X	X		
(b)Low Water Temperature	X	NA	X		
(c)High Engine Temperature Pre-alarm	X	NA	X		
(d)High Engine Temperature	X	X	X		
(e)Low Lube Oil Pressure	X	X	X		
(f)Over Speed	X	X	X		
(g)Low Fuel Main Tank	X	NA	X		
(h)Low Coolant Level	X	O	X		
(i)EPS Supplying Load	X	NA	NA		
(j)Control Switch Not in Automatic Position	X	NA	X		
(k)High Battery Voltage	X	NA	NA		
(l)Low Cranking Voltage	X	NA	X		
(m)Low Voltage in Battery	X	NA	NA		
(n)Battery Charger AC Failure	X	NA	NA		
(o)Lamp Test	X	NA	NA		
(p>Contact for Local and Remote Common Alarm	X	NA	X		
(q)Audible Alarm Silencing Switch	NA	NA	X		



(r)Low Starting Air Pressure	X	NA	NA		
(s)Low Starting Hydraulic pressure	X	NA	NA		
(t)Air Shutdown Damper	X	X	X		
(u)Remote Emergency Stop	NA	X	NA		

CV: Control panel-mounted visual. S: Shutdown of EPS indication. RA: Remote audible. X: Required.  
O: Optional. NA: Not applicable.

**NOTES:**

- (1) Item “p” shall be provided, but a separate remote audible signal shall not be required when the regular work site in NFPA 110, 5.6.6 is staffed 24 hours a day
- (2) Item “b” is not required for combustion turbines
- (3) Item “r” or “s” shall not apply only where used as a starting method
- (4) Item “I” EPS ac ammeter shall be permitted for this function
- (5) All required CV functions shall be visually annunciated by a remote, common visual indicator
- (6) All required functions indicated in the RA column shall be annunciated by a remote, common audible alarm as required in NFPA 110, 5.6.5.3(4)
- (7) Item “g” on gaseous systems shall require a low gas pressure alarm
- (8) Item “b” shall be set at 20F below the regulated temperature determined by the EPS manufacturer as required in 5.3.1

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**Testing Time Requirements**

Class:	Max. Time	Type:	Power Restoration Minimums
0.083	5 min	U	Basically uninterrupted
0.25	15 min	10	10 sec (NFPA 101)
2	2 hr.	60	60 sec
6	2 hr.	120	120 sec
48	2 hr.	M	Manual or non-automatic
X	2 hr.		(no time limit)

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See also NFPA 110, 4.1

**APPENDIX A:**

- (1) Certification provided verifying the torsional vibration compatibility of the rotating element of the prime mover and the generator for the intended use of the energy converter. NFPA 110, 5.6.10.2
- (2) The Energy converter supplier shall stipulate compliance and performance with this standard for the entire unit when installed. NFPA 110, 5.6.10.5
- (3) 8.2.2 For Level 1 systems, instruction manuals shall be kept in a secure, convenient location, one set near the equipment, and the other set in a separate location.
- (4) Two pilot lights with identification nameplates or other approved position indicators shall be provided to indicate the transfer switch position. NFPA 110, 6.2.13
- (5) Mounting locations shall raise the engine at least 6” above the floor or grade level and be of sufficient elevation to facilitate lubricating-oil drainage and ease of maintenance. NFPA 110, 7.4.1.1
- (6) New generator controllers must be monitored by the fire alarm system or at an attended location for the following conditions: NFPA 101, 9.1.3.2
  - 1. Generator running
  - 2. Generator fault
  - 3. Generator switch in non-automatic position
- (7) Battery charger shall be furnished. Charger shall be permanently marked with the following:
  - 1. Allowable range of battery unit capacity
  - 2. Nominal output current and voltage
  - 3. Sufficient battery-type data to allow replacement batteries to be obtained. NFPA 110, 5.6.4.6
- (8) All installations shall have a remote manual stop station of a type to prevent inadvertent or unintentional operation located outside the room housing the prime mover, where so installed, or elsewhere on the premises where the prime mover is located outside the building. NFPA 110, 5.6.5.6



**Attachment IV**  
**Emergency Lighting Checklist**

## Emergency Lighting Checklist



**Building #:** \_\_\_\_\_ **Building Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Attendees:** \_\_\_\_\_

**EHS Representative:** \_\_\_\_\_

**Project Number:** \_\_\_\_\_

**Requirements Before Acceptance Testing:**

- Emergency lighting has been pre-tested  Yes  No
- Pre-test documentation has been provided to EHS  Yes  No

**Emergency Lighting Provided by:**

- Generator  Battery back-up

**Generator Information:**

**Generator Location:** \_\_\_\_\_

**Type of Generator, if applicable:**

- Emergency power (life safety)  Stand-by power  Emergency and stand-by combination

**Generator Fuel Source:** \_\_\_\_\_

**Generator Fuel Capacity:** \_\_\_\_\_

**Fuel Tank Equipped with Secondary Containment:**  Yes  No

**Transfer Time (Emergency Generators Only):**  <= 10 Seconds  > 10 Seconds

**Emergency Lighting Information:**

- Adequate lighting provides for egress (1-foot candle at floor level, 10-foot candle for stairways):  Yes  No

Emergency Lighting Provided at the Following Locations:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<input type="checkbox"/> Restrooms			
<input type="checkbox"/> Electrical/Mechanical Rooms			
<input type="checkbox"/> IT Rooms			
<input type="checkbox"/> Building Exterior at Egress Doors			
<input type="checkbox"/> Corridors			
<input type="checkbox"/> Stairways			
<input type="checkbox"/> Pump Rooms			
<input type="checkbox"/> Elevator Machine Rooms			
<input type="checkbox"/> Other:			
Adequate exit signage provided			
Emergency lighting/exit signage maintained for 90 minutes (battery units only)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Other:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

**Code Reference:** NFPA 1, NFPA 101, NFPA 110

**System Accepted by EHS:**  Yes  No

\_\_\_\_\_  
**AHJ (or designee)**

\_\_\_\_\_  
**Date**

**Comments:**

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**Attachment V**  
**Fire Alarm Certificate of Installation**  
**SFM-TDI Form FML-009**



TEXAS DEPARTMENT OF INSURANCE

State Fire Marshal's Office (112-FM)
333 Guadalupe, Austin, Texas 78701 \* PO Box 149221, Austin, Texas 78714-9221
(512) 676-6800 | F: (512) 490-1063 | (800) 578-4677 | TDI.texas.gov | @TXSPMO

FIRE ALARM INSTALLATION CERTIFICATE

After completion of an installation, modification, or addition of a system or single station detector (excluding a one or two family residence) the licensee shall complete and present this certificate to the owner or their representative or post the certificate near the main control panel according to the Fire Alarm Rules 28TAC§34.617
DISTRIBUTION: Original to owner or posted on site at control panel. Copy 1 to main authority having jurisdiction. Copy 2 Certifying firm to retain in their office for access by SFMO.

Property Name:
Bldg. or Floor No.:
Street:
City / Zip:
Name of CERTIFYING firm:
City / State / Zip:
Phone Number:
ACR-
Type of Installation:
Code or Std. Year/Edition Code or Std. Year/Edition
NFPA 72 IBC / IFC
NFPA 70
NFPA 101
The system complies with the following codes and standards.
Name of nearest Fire Department:
Fire Department (non-emergency) Phone:
Emergency Phone Number:

SYSTEM INFORMATION
Control Panel Manufacturer: Model # Other:
Check all the applicable system types below that were installed by the above certifying firm or the system type(s) in which the firm made modifications or additions.
Fire Alarm/Evacuation
Voice Notification
Initiating Devices: Smoke Detectors, Heat Detectors, Duct Smoke Detectors, Beam Smoke Detectors, Fire Alarm Boxes
Notifying Appliances: Bell, Horn or Chime, Strobe, Speaker, Horn/Chime/Strobe, Speaker Strobe, Fire Phones, Annunciation Panel
Supervisory Devices: Valve Tamper Switches, High / Low Air Pressure, Fire Pump
Circuit Style/Class: SLC 4, SLC 6, SLC 7, IDC A, IDC B

RECORD DRAWINGS
Company
City / State
Planner's Name
License Num. PE or APS
Date on Plan
Revision number/date
Record Drawings (One with original planner's signature.)
Instructions describing, operation, test & maintenance information to aid in establishing an Emergency Evacuation Plan
The above required documents were supplied to:
Person's name:
Company's name:
Date:

I hereby certify, on behalf of the registered certifying firm, that this fire alarm system has been tested and complies with the requirements of Texas Insurance Code, Chapter 6002, the Fire Alarm Rules, the applicable codes and standards and the manufacturer's installation requirements.

Signature of Licensee:
Printed name of Licensee:
License Number:
Date signed:
SF035 | 0615 FML-009A

**Attachment VI**  
**Fire Alarm System Acceptance Checklist**

## Fire Alarm System Acceptance Checklist



TEXAS A&M UNIVERSITY  
Environmental  
Health & Safety

**Building #:** \_\_\_\_\_ **Building Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Attendees:** \_\_\_\_\_

**EHS Representative:** \_\_\_\_\_

**Project Number:** \_\_\_\_\_

**Fire Alarm Panel Type:** \_\_\_\_\_ **Fire Alarm Panel Location:** \_\_\_\_\_

**Requirements Before Acceptance Testing:**

- Building construction is complete; All trades are complete; Clean-up is complete  Yes  No
- Fire Alarm System has been pre-tested  Yes  No
- Pre-test documentation has been submitted to EHS  Yes  No
- All other FLS systems integrated with fire alarm system complete/pre-tested  Yes  No
- All devices verified with correct address/location shown on as built drawings  Yes  No

**Required Documentation at Time of Acceptance Test:**

- System as-built plans, all devices, circuitry  Yes  No
- NFPA 72 Record of Completion (NFPA 72, 7.5.6) – Copy to EHS  Yes  No
- FML-009 Form Completed– Copy to EHS  Yes  No
- Sensitivity test printout transferred to AM Personnel– Copy to EHS  Yes  No
- O&M Manual transferred to AM Personnel  Yes  No
- Transfer of any special tools to AM Personnel  Yes  No

**Acceptance Test:**

FAP located in conditioned space	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Smoke detector located above FAP	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Battery discharge test	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
<input type="checkbox"/> 24 Hours (Without life safety generator)			
<input type="checkbox"/> 4 Hours (With life safety generator)			
Functional test of all A/V devices (Horns - 5 minutes/Voice 15 minutes)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
All visual devices synchronized	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Activation of stairway pressurization system(s)*	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Activation of smoke exhaust system(s)**	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Functional test of all magnetic releases	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Proper activation of door hold open magnets	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
dB level check on all audible devices (15dB Above ambient)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Functional test of all flow switches (30-45 Seconds preferred)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Functional test of all smoke detectors	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Functional test of all heat detectors	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Functional test of all manual pull stations	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Functional test of all remote annunciators	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Functional test of all fireman phones	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Functional test of all HVAC duct detectors	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Record initial power level of fiber line (dBm): _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Functional test of all relays	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<input type="checkbox"/> AHU shutdown			
<input type="checkbox"/> Elevator recall			
<input type="checkbox"/> Suppression systems			
<input type="checkbox"/> Exhaust fans			
<input type="checkbox"/> Pressurization fans			



Verify of trouble alarms reports within 200 seconds <input type="checkbox"/> Smoke detector circuit <input type="checkbox"/> A/V circuit <input type="checkbox"/> Telephone circuit <input type="checkbox"/> Amplifier circuit <input type="checkbox"/> Failure of primary/secondary power supplies <input type="checkbox"/> Initiating device circuit <input type="checkbox"/> Battery charger	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify all supervisory alarms <input type="checkbox"/> Sprinkler/tamper <input type="checkbox"/> Duct detector	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify alarm, supervisory, and trouble signals received at the Communications Center - Test all circuits <input type="checkbox"/> Desigo system <input type="checkbox"/> AES radio system	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify all applicable faults <input type="checkbox"/> Ground-fault monitoring circuit <input type="checkbox"/> Transmission/receipt of signal during open fault	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify FAP batteries are sized to specified current draw	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify that the locations of all power supplies are identified at FAP ("Fire Alarm Circuit")	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify batteries date of manufacture - month/year	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify breaker identified/painted red	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Verify circuit breaker lock installed	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Verify installation of storage box/As-built drawings	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify install/service tag in FACP	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Code Maroon interface installed/tested	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Other:			

\* Use Stairway Pressurization Acceptance Checklist  
\*\* Use Smoke Management Acceptance Test Checklist

**System Accepted by EHS:**       Yes     No

\_\_\_\_\_ **AHJ (or designee)**

\_\_\_\_\_ **Date**

Comments:

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**Attachment VII  
Fire Pump**

## Fire Pump Acceptance Checklist



TEXAS A&M UNIVERSITY  
Environmental  
Health & Safety

**Building #:** \_\_\_\_\_ **Building Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Attendees:** \_\_\_\_\_

**EHS Representative:** \_\_\_\_\_

**Project Number:** \_\_\_\_\_

**Requirements Before Acceptance Testing:**

- |   |  |
|---|--|
| <input type="checkbox"/> Fire pump has been pretested                     | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <input type="checkbox"/> Pre-test documentation has been submitted to EHS | <input type="checkbox"/> Yes <input type="checkbox"/> No |

**Fire Pump Information:**

**Location of Pump(s):** \_\_\_\_\_

**Type of Pump:** \_\_\_\_\_ **Location of Breaker:** \_\_\_\_\_

**Pump Manufacturer:** \_\_\_\_\_ **Pump Fuel Source:** \_\_\_\_\_

**Pump Rated Flow:** \_\_\_\_\_

	Normal Power	Emergency Power	<input type="checkbox"/> Yes	<input type="checkbox"/> No
1 Hour of operation				
<input type="checkbox"/> Six automatic operations (5 min each)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
<input type="checkbox"/> Six manual operations (5 min each)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
Flow/pressure test			<input type="checkbox"/> Yes	<input type="checkbox"/> No
<input type="checkbox"/> No flow				
<input type="checkbox"/> Rated Flow				
<input type="checkbox"/> 150% of rated flow				
Functional test of fire pump (pressure drop)			<input type="checkbox"/> Yes	<input type="checkbox"/> No
Functional test of controller			<input type="checkbox"/> Yes	<input type="checkbox"/> No
Load start test			<input type="checkbox"/> Yes	<input type="checkbox"/> No
Phase reversal test			<input type="checkbox"/> Yes	<input type="checkbox"/> No
<input type="checkbox"/> Normal power supply				
<input type="checkbox"/> Alternate power supply				
Emergency power operation			<input type="checkbox"/> Yes	<input type="checkbox"/> No
<input type="checkbox"/> Power Restored in 10 seconds				
<input type="checkbox"/> Peak Flow Redelivered in 30 seconds				
Verify visible indicators and audible alarm present			<input type="checkbox"/> Yes	<input type="checkbox"/> No
Vibration			<input type="checkbox"/> Yes	<input type="checkbox"/> No
Leaks			<input type="checkbox"/> Yes	<input type="checkbox"/> No
Pressure maintenance pump installed			<input type="checkbox"/> Yes	<input type="checkbox"/> No
Name plate and markings visible			<input type="checkbox"/> Yes	<input type="checkbox"/> No
Correct identification of all valves			<input type="checkbox"/> Yes	<input type="checkbox"/> No
Gauges installed and functional			<input type="checkbox"/> Yes	<input type="checkbox"/> No
Verify alarm signals received at Communications Center			<input type="checkbox"/> Yes	<input type="checkbox"/> No
Certificate of test transferred to EHS			<input type="checkbox"/> Yes	<input type="checkbox"/> No
O&M manual transferred to TAMU personnel			<input type="checkbox"/> Yes	<input type="checkbox"/> No
Other:			<input type="checkbox"/> Yes	<input type="checkbox"/> No

**Fire Pump Accepted by EHS:**  Yes  No

\_\_\_\_\_  
**AHJ (or designee)**

\_\_\_\_\_  
**Date**

**Comments:**

\_\_\_\_\_  
\_\_\_\_\_

**Attachment VIII  
Fire Sprinkler Aboveground  
Contractor's Test Materials (TDI-SFM)**



**TEXAS DEPARTMENT OF INSURANCE**

**State Fire Marshal's Office (112-FM)**

333 Guadalupe, Austin, Texas 78701 \* PO Box 149221, Austin, Texas 78714-9221  
 (512) 676-6800 | F: (512) 490-1063 | (800) 578-4677 | TDI.texas.gov | @TXSFMO

**Contractor's Material and Test Certificate for Aboveground Piping**

**PROCEDURE**

Upon completion of work, inspection and tests shall be made by the contractor's representative and witnessed by an owner's representative. All defects shall be corrected and system left in service before contractor's personnel finally leave the job.

A certificate shall be filled out and signed by both representatives. Copies shall be prepared for approving authorities, owners and the contractor. It is understood the owner's representative's signature in no way prejudices any claim against contractor for faulty material, poor workmanship, or failure to comply with approving authorities requirements or local ordinances.

Property Name	Date
Property Address	City State Zip

<b>PLANS</b>	Accepted by approving authorities(names)		
	Address		
	Installation conforms to accepted plans	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Equipment used is approved? If no, explain deviations	<input type="checkbox"/> Yes	<input type="checkbox"/> No

<b>INSTRUCTIONS</b>	Has person in charge of fire equipment been instructed as to location of control valves and care and maintenance of this new equipment? If no, explain		<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Have copies of the following been left on the premises? 1. System Components Instructions 2. Care and Maintenance Instructions 3. NFPA 25		<input type="checkbox"/> Yes	<input type="checkbox"/> No

<b>LOCATION OF SYSTEM</b>	Supplies buildings
---------------------------	--------------------

<b>SPRINKLERS</b>	Make	Model	Year of Manufacture	Orifice Size	Quantity	Temperature Rating	

<b>PIPE AND FITTINGS</b>	Type of pipe
	Type of fittings

<b>ALARM VALVE OR FLOW INDICATOR</b>	ALARM DEVICES			Maximum time to operate through test connection	
	Type	Make	Model	Minutes	Seconds

<b>DRY PIPE OPERATING TEST</b>	DRY VALVE				Q.O.D.				
	Make	Model	Serial No.		Make	Model	Serial No.		
		Time to trip through test connection <sup>1,2</sup>	Water Pressure	Air Pressure	Trip Point Air Pressure	Time water reached test outlet <sup>1,2</sup>	Alarm operated properly		
		Minutes    Seconds	psi	psi	psi	Minutes    Seconds	Yes    No		
	Without Q.O.D.								

<b>DELUGE &amp; PREACTION VALVES</b>	Operation		<input type="checkbox"/> Pneumatic	<input type="checkbox"/> Electric	<input type="checkbox"/> Hydraulic	
	Piping supervised		<input type="checkbox"/> Yes <input type="checkbox"/> No	Detection media supervised		<input type="checkbox"/> Yes <input type="checkbox"/> No
	Does valve operate from the manual trip, remote, or both control stations?		<input type="checkbox"/> Yes	<input type="checkbox"/> No		
	Is there an accessible facility in each circuit for testing?		<input type="checkbox"/> Yes	<input type="checkbox"/> No	If no, explain	
	Make	Model	Does each circuit operate supervision loss alarm?		Does each circuit operate valve release?	
			Yes	No	Yes	No

<sup>1</sup> Measured from time inspector's test connection is opened.

<sup>2</sup> NFPA 13 only requires the 60-second limitation in specific sections

PRESSURE REDUCING VALVE TEST	Location	Make & Model	Setting	STATIC PRESSURE		RESIDUAL PRESSURE		FLOW
				Inlet (psi)	Outlet	Inlet (psi)	Outlet (psi)	Flow (GPM)
<b>TEST DESCRIPTION</b>	<p><b>HYDROSTATIC:</b> Hydrostatic tests shall be made at not less than 200 psi (13.6 bars) for two hours or 50 psi (3.4 bars) above static pressure in excess of 150 psi (10.2 bars) for two hours. Differential Dry-Pipe Valve clappers shall be left open during test to prevent damage. All aboveground piping leakage shall be stopped.</p> <p><b>PNEUMATIC:</b> Establish 40 psi (2.7 bars) air pressure and measure drop, which shall not exceed 1-1/2 psi (0.1 bars) in 24 hours. Test pressure tanks at normal water level and air pressure and measure air pressure drop, which shall not exceed 1-1/2 psi (0.1 bars) in 24 hours.</p>							
<b>TESTS</b>	All pipe hydraulically tested at: _____ psi (_____ bar) for _____ hrs			If no, state reason				
	Dry Pipe pneumatically tested <input type="checkbox"/> Yes <input type="checkbox"/> No							
	Equipment operates properly <input type="checkbox"/> Yes <input type="checkbox"/> No							
	Do you certify as the sprinkler contractor that additives and corrosive chemicals, sodium silicate or derivatives of sodium silicate, brine, or other caustic chemicals were not used for testing systems or stopping leaks? <input type="checkbox"/> Yes <input type="checkbox"/> No							
	<b>DRAIN</b>	Reading of gage located near water supply test connection: _____ psi (_____ bar)			Residual pressure with valve in test connection open wide. _____ psi (_____ bar)			
Underground mains and lead in connections to system risers flushed before connection made to sprinkler piping								
Verified by copy of the Contractor's Material & Test Certificate for Underground Piping. <input type="checkbox"/> Yes <input type="checkbox"/> No			Other, explain					
Flushed by installer of underground sprinkler piping. <input type="checkbox"/> Yes <input type="checkbox"/> No								
If powder driven fasteners are used in concrete, has representative sample testing been satisfactorily completed? <input type="checkbox"/> Yes <input type="checkbox"/> No				If no, explain				
<b>BLANK TESTING GASKETS</b>	Number used	Locations					Number removed	
<b>WELDING</b>	Welded piping <input type="checkbox"/> Yes <input type="checkbox"/> No			If yes...				
	Do you certify as the sprinkler contractor that welding procedures comply with the requirements of at least AWS B2.1? <input type="checkbox"/> Yes <input type="checkbox"/> No							
	Do you certify that the welding was performed by welders qualified in compliance with the requirements of at least AWS B2.1? <input type="checkbox"/> Yes <input type="checkbox"/> No							
	Do you certify that the welding was carried out in compliance with a documented quality control procedure to ensure that all discs are retrieved, that openings in piping are smooth, that slag and other welding residue are removed, and that the internal diameters of piping are not penetrated? <input type="checkbox"/> Yes <input type="checkbox"/> No							
<b>CUTOUTS (DISCS)</b>	Do you certify that you have a control feature to ensure that all cutouts (disks) are retrieved? <input type="checkbox"/> Yes <input type="checkbox"/> No							
<b>HYDRAULIC DATA NAMEPLATE</b>	Nameplate provided? <input type="checkbox"/> Yes <input type="checkbox"/> No			If no, explain				
<b>REMARKS</b>	DATE left in service with all control valves open: _____							
<b>Signature</b>	Name of sprinkler contractor					C of R No. <b>SCR-</b>		
	Contractor's Address				City		State	Zip
	<b>Tests witnessed by</b>							
	For property owner (signed)					Title		Date
	For sprinkler contractor (signed)					Title		Date
Additional explanation and notes								

<b>RME CERTIFICATION</b>	<b>I certify that the information herein is true and that this sprinkler system was installed in accordance with Chapter 6003, Texas Insurance Code and the rules and standards adopted by the State Fire Marshal's Office.</b>							
	Responsible Managing Employee (signature)							
	Responsible Managing Employee (print or type name)							
RME License Number					Date			

**DISTRIBUTION:** Original COPY 1 Posted at site or give to owner      COPY 2 for the installing firm in file accessible to SFMO  
COPY 3 for local approving authority within 10 days after completion

**Attachment IX  
Fire Sprinkler Underground  
Contractor's Test Materials (TDI-SFM)**



## Contractor's Material and Test Certificate for **U**nderground Piping

**PROCEDURE**

Upon completion of work, inspection and tests shall be made by the contractor's representative and witnessed by an owner's representative. All defects shall be corrected and system left in service before contractor's personnel finally leave the job.

A certificate shall be filled out and signed by both representatives. Copies shall be prepared for approving authorities, owners, and the contractor. It is understood the owner's representative's signature in no way prejudices any claim against contractor for faulty material, poor workmanship, or failure to comply with approving authority's requirements or local ordinances.

Property Name	Date
---------------	------

Property Address	City	State	Zip
------------------	------	-------	-----

<b>PLANS</b>	Accepted by approving authorities (names)		
	Address		
	Installation conforms to accepted plans	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Equipment used is approved If no, state deviations	<input type="checkbox"/> Yes	<input type="checkbox"/> No

<b>INSTRUCTIONS</b>	Has person in charge of fire equipment been instructed as to location of control valves and care and maintenance of this new equipment? If no, explain			<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Have copies of appropriate instructions and care and maintenance charts been left on premises? If no, explain			<input type="checkbox"/> Yes	<input type="checkbox"/> No

<b>LOCATION</b>	Supplies buildings
-----------------	--------------------

<b>UNDERGROUND PIPES AND JOINTS</b>	Pipe types and class	Type joints	
	Pipe conforms to _____ Standard	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Fittings conform to _____ Standard If no, explain	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Joints needed anchorage clamped, strapped or blocked in accordance with _____ standard If no, explain		<input type="checkbox"/> Yes	<input type="checkbox"/> No

<b>TEST DESCRIPTION</b>	<b>FLUSHING:</b> Flow the required rate until water is clear as indicated by no collection of foreign material in burlap bags at outlets such as hydrants and blow-offs. Flush at flows not less than 390 GPM (1476 L/min) for 4-inch pipe, 880 GPM (3331 L/min) for 6-inch pipe, 1560 GPM (5905 L/min) for 8-inch pipe, 2440 GPM (9235 L/min) for 10-inch pipe, and 3520 GPM (13323 L/min) for 12-inch pipe. When supply cannot produce stipulated flow rates, obtain maximum available.		
	<b>HYDROSTATIC:</b> Hydrostatic tests shall be made at not less than 200 psi (13.8 bars) for two hours or 50 psi (3.4 bars) above static pressure in excess of 150 psi (10.3 bars) for two hours.		
	<b>LEAKAGE:</b> New pipe laid with rubber gasketed joints shall, if the workmanship is satisfactory, have little or no leakage at the joints. The amount of leakage at the joints shall not exceed 2 quarts per hour (1.89 L/hr) per 100 joints irrespective of pipe diameter. The leakage shall be distributed over all joints. If such leakage occurs at a few joints, the installation shall be considered unsatisfactory and necessary repairs made. The amount of allowable leakage specified above can be increased by 1 fl oz per inch valve diameter per hour (30 mL/25 mm/hr) for each metal seated valve isolating the test section. If dry barrel hydrants are tested with the main valve open so the hydrants are under pressure, an additional 5 oz per minute (150 mL/min) leakage is permitted for hydrant.		

<b>FLUSHING TESTS</b>	New underground piping flushed according to _____ standard by (company) If no, explain			<input type="checkbox"/> Yes	<input type="checkbox"/> No
	How flushing flow was obtained <input type="checkbox"/> Public water <input type="checkbox"/> Tank or reservoir <input type="checkbox"/> Fire pump		Through what type of opening <input type="checkbox"/> Hydrant butt <input type="checkbox"/> Open pipe		
	Lead-ins flushed according to _____ standard by (company) If no, explain			<input type="checkbox"/> Yes	<input type="checkbox"/> No
	How flushing flow was obtained <input type="checkbox"/> Public water <input type="checkbox"/> Tank or reservoir <input type="checkbox"/> Fire pump		Through what type of opening <input type="checkbox"/> Y connection to flange spigot <input type="checkbox"/> Open pipe		





**Attachment X**  
**Dry Pipe Sprinkler System**  
**Acceptance Checklist**

## Dry Pipe Sprinkler System Acceptance Test Checklist



**Building #:** \_\_\_\_\_ **Building Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Attendees:** \_\_\_\_\_  
\_\_\_\_\_

**EHS Representative:** \_\_\_\_\_  
\_\_\_\_\_

**Project Number:** \_\_\_\_\_

**Location of Riser(s):** \_\_\_\_\_

**Type of System:** \_\_\_\_\_ **Location of Spare Head/Wrench Box:** \_\_\_\_\_

**Coverage:**     Total     Partial    **Location if Partial:** \_\_\_\_\_

**Sprinkler Heads:**

Make	Model	Year	Orifice	Quantity	Temperature Rating

**Backflow Prevention:**

**Type:** \_\_\_\_\_ **Manufacturer:** \_\_\_\_\_ **Serial #:** \_\_\_\_\_ **Size:** \_\_\_\_\_ **PSI:** \_\_\_\_\_

**Requirements Before Acceptance Test**

- |   |                              |                             |
|---|------------------------------|-----------------------------|
| <input type="checkbox"/> Building construction is complete; All trades complete; Clean-up is complete | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> System integration with fire alarm system complete                           | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> System pre-tested  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> All devices verified/correct address/location shown on as built drawings     | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**Required Documentation at Time of Acceptance Test:**

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| <input type="checkbox"/> System as-built riser diagram                                   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Underground certification - Copy to EHS                         | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Aboveground certification - Copy to EHS                         | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> O&M manual transferred to Texas A&M University personnel        | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Backflow Valve Certification. Forward flow Tested - Copy to EHS | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**Acceptance Test**

2-hour full system hydrostatic pressure test	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
40 psi and 24-hour pressure test complete	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Correct identification of all valves	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Gauges installed and functional	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Low temperature alarm in valve enclosures	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Valve room lighted & heated	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify installation of storage box	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Appropriate number and type of spare heads/fusible heat responsive devices, sprinkler wrench <input type="checkbox"/> Minimum 2 of each type <input type="checkbox"/> 1-300 = Minimum 6 <input type="checkbox"/> 300-1,000 = Minimum 12 <input type="checkbox"/> Over 1,000 = Minimum 24 <input type="checkbox"/> Wrench(s)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify check valves installed on each independent system	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Appropriate system air pressure (15-20psi over operating pressure)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Functional test of all tamper switches	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Full flow trip valve test	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Alarm valve test sounds water gong/electric bell	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Automatic air maintenance device test	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Low air pressure alarm test	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Relief valve test with no less than 10 PSI in excess of working pressure	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Main drain test of riser-flush of system until water runs clear	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Functional test of all valves	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify alarm, supervisory, trouble signals received at Communications Center	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Required installation tag/documents on site <input type="checkbox"/> Air & water pressure <input type="checkbox"/> Tripping air pressure <input type="checkbox"/> Dry pipe valve operating condition	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Post indicator valve open & locked **	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Knox caps installed on FDC ***	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Hydraulic plate installed	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
General information plate installed	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Other:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	

\* As required by NFPA 13 29.2.1; 6.10.2.2

\*\* Lock is ordered and installed by Texas A&M University Facilities Services

\*\*\* To be supplied by general contractor

**System Accepted by EHS:**       Yes     No

\_\_\_\_\_ **AHJ (or designee)**

\_\_\_\_\_ **Date**

**Comments:**

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**Attachment XI**  
**Automatic Sprinkler System**  
**Acceptance Checklist**

## Automatic Sprinkler System Acceptance Checklist



TEXAS A&M UNIVERSITY  
Environmental  
Health & Safety

**Building #:** \_\_\_\_\_ **Building Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Attendees:** \_\_\_\_\_  
\_\_\_\_\_

**EHS Representative:** \_\_\_\_\_

**Project Number:** \_\_\_\_\_

**Location of Riser(s):** \_\_\_\_\_

**Type of System:** \_\_\_\_\_ **Location of Spare Heads/Wrench/ Box:** \_\_\_\_\_

**Coverage:**     Total     Partial    **Location if Partial:** \_\_\_\_\_

**Sprinkler Heads:**

Make	Model	Year	Orifice	Quantity	Temp Rating

**Backflow Prevention:**

**Type:** \_\_\_\_\_ **Manufacture:** \_\_\_\_\_ **Serial #:** \_\_\_\_\_ **Size:** \_\_\_\_\_ **PSI:** \_\_\_\_\_

**Requirements Before Acceptance Testing:**

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| <input type="checkbox"/> Building construction complete; All trades complete; Clean-up complete        | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> System integration with fire alarm system complete                            | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> System has been pre-tested  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> All devices verified with correct address/location shown on as built drawings | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Main drain test/flush of system   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**Required Documentation at Time of Acceptance Test:**

- |   |                              |                             |
|---|------------------------------|-----------------------------|
| <input type="checkbox"/> System as-built riser diagram                        | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Underground certification transferred- 1 Copy to EHS | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Aboveground certification transferred- 1 Copy to EHS | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Backflow valve certification - forward flow tested   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> O&M manual transferred to maintenance personnel      | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**Acceptance Test**

2-Hour full system pressure test*	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Functional test of fire pump - Use fire pump test form (If equipped)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify installation of storage box for spare sprinkler heads (in conditioned space)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Appropriate number and type of spare heads/sprinkler wrench(es)/socket <ul style="list-style-type: none"> <li>• Minimum 2 of each type</li> <li>• 1-300 = Minimum 6</li> <li>• 300-1000 = Minimum 12</li> <li>• Over 1000 = Minimum 24</li> </ul>	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Gauges installed (above & below check valve) and functional	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Main drain/flow test - Record Residual pressure _____ PSI Static pressure _____ PSI	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Functional test of all flow switches (30-45 seconds)**	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Functional test of all tamper switches	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

Functional test of water gong or bell with inspectors test valve	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Functional test of all valves	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Correct identification of all valves with appropriate signage	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
FDC properly identified	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Test header connections have proper caps	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Post indicator valve open & locked**	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Knox caps installed on FDC***	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
General information plate installed	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Hydraulic plate installed	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Other: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

\* Hydrostatic pressure test shall be in accordance with NFPA 13 (most current edition)

\*\* Lock is ordered and installed by Texas A&M Facilities Services

\*\*\* To be supplied by general contractor

**System Accepted by EHS:**       Yes                       No

\_\_\_\_\_ **AHJ (or designee)**

\_\_\_\_\_ **Date**

**Comments:**

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**Attachment XII**  
**Hydrostatic Acceptance Checklist**



## Hydrostatic Acceptance Checklist



**Building #:** \_\_\_\_\_ **Building Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Attendees:** \_\_\_\_\_

**Project Number:** \_\_\_\_\_ **Inspector:** \_\_\_\_\_

**Type of Test/Hydrostatic Test:**

**Type of System(s):**

- |   |  |                                   |
|---|--|-----------------------------------|
| <input type="checkbox"/> Underground w/thrust blocks in place | <input type="checkbox"/> Wet Pipe            | <input type="checkbox"/> Dry Pipe |
| <input type="checkbox"/> Aboveground – Sprinkler              | <input type="checkbox"/> Pre-Action          | <input type="checkbox"/> Deluge   |
| <input type="checkbox"/> Aboveground - Standpipe              | <input type="checkbox"/> Combination Wet/Dry |                                   |

System pressurized to 200 psi (Water) <input type="checkbox"/> Above ground - 200 psi - no changes in 2 hours <input type="checkbox"/> Underground - 200 psi - no more than 5 psi drop in 2 hours <input type="checkbox"/> Underground HDPE – 150 psi – no more than 5 psi drop in 2-hours <input type="checkbox"/> Ensure compressor / pump removed from location <input type="checkbox"/> Thrust blocks in place / acceptable	□ Yes	□ No	□ N/A
24 Hour air pressure check system pressurized to 40 psi (Air) <input type="checkbox"/> Above ground - 40 psi - no changes in 2 hours <input type="checkbox"/> Ensure compressor / pump removed from location	□ Yes	□ No	□ N/A
System free of water leaks (elbows, joints, heads, etc.)	□ Yes	□ No	□ N/A
Pipe hangers adequately spaced and free of damage <input type="checkbox"/> Loose hangers <input type="checkbox"/> All-thread straight (no bends) <input type="checkbox"/> Within 12” if a fire pump is installed <input type="checkbox"/> Within 6” if CPVC pipe <input type="checkbox"/> Proper distance from end of Piping <ul style="list-style-type: none"> <li>○ Armover – no more than 12" (if system pressure &gt;100 psi)</li> <li>○ Armover – no more than 24" cumulative (if system pressure &lt;100 psi)</li> <li>○ Pendant – no more than 12" (if system pressure &gt;100 psi)</li> <li>○ Upright – no more than 36"</li> </ul>	□ Yes	□ No	□ N/A
Fire stopping performed <input type="checkbox"/> Fire caulk both sides of penetrations <input type="checkbox"/> Sleeves in place <input type="checkbox"/> Escutcheons installed	□ Yes	□ No	□ N/A
Spray pattern clear (note any objects that may interfere with spray pattern) <input type="checkbox"/> Pipe hangers within 3" of head <input type="checkbox"/> Sprinkler head < 4" from wall <input type="checkbox"/> Sprinkler head deflector < 1" from ceiling	□ Yes	□ No	□ N/A
Gauge zeroed out	□ Yes	□ No	□ N/A
Water observed flowing from drain	□ Yes	□ No	□ N/A
System flushed & clear water observed flowing <input type="checkbox"/> Flow from most remote point in the system through a 2 1/2" hose, or largest outlet available for the system	□ Yes	□ No	
Copy of paperwork submitted to EHS	□ Yes	□ No	□ N/A
Hydrostatic test completed/passed	□ Yes	□ No	
Other: _____	□ Yes	□ No	□ N/A

**System Accepted by EHS:**       Yes     No

\_\_\_\_\_ **AHJ (or designee)**

\_\_\_\_\_ **Date**

**Comments:**

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**Attachment XIII**  
**Pre-Action Fire Sprinkler System**  
**Acceptance Checklist**

## Pre-Action Sprinkler System Acceptance Checklist



TEXAS A&M UNIVERSITY  
Environmental  
Health & Safety

**Building #:** \_\_\_\_\_ **Building Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Attendees:** \_\_\_\_\_  
\_\_\_\_\_

**EHS Representative:** \_\_\_\_\_

**Project Number:** \_\_\_\_\_

**Location of Riser(s):** \_\_\_\_\_  
\_\_\_\_\_

**Type of System:**       Non-Interlock       Single Interlock       Double Interlock

**Location of Spare Heads/Wrench/ Box:** \_\_\_\_\_

**Coverage:**     Total     Partial      **Location if Partial:** \_\_\_\_\_

**Sprinkler Heads:**

Make	Model	Year	Orifice	Quantity	Temp Rating

**Backflow Prevention:**

**Type:** \_\_\_\_\_ **Manufacturer.:** \_\_\_\_\_ **Serial #:** \_\_\_\_\_ **Size:** \_\_\_\_\_ **PSI:** \_\_\_\_\_

**Requirements Before Acceptance Testing:**

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| <input type="checkbox"/> Building construction complete; All trades complete; Clean-up complete        | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> System integration with fire alarm system complete                            | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> System pre-tested   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> All devices verified with correct address/location shown on as built drawings | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Main drain test/flush of system   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**Required Documentation at Time of Acceptance Test:**

- |  |                              |  |
|--|------------------------------|--|
| <input type="checkbox"/> System as-built riser diagram                         | <input type="checkbox"/> Yes | <input type="checkbox"/> No                              |
| <input type="checkbox"/> Underground Certification transferred - 1 Copy to EHS | <input type="checkbox"/> Yes | <input type="checkbox"/> No <input type="checkbox"/> N/A |
| <input type="checkbox"/> Aboveground Certification transferred - 1 Copy to EHS | <input type="checkbox"/> Yes | <input type="checkbox"/> No <input type="checkbox"/> N/A |
| <input type="checkbox"/> Backflow valve certification. Forward flow tested     | <input type="checkbox"/> Yes | <input type="checkbox"/> No <input type="checkbox"/> N/A |
| <input type="checkbox"/> O&M Manual Transferred to AM Personnel                | <input type="checkbox"/> Yes | <input type="checkbox"/> No                              |

**Acceptance Test**

2-Hour full system pressure test*	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
For double interlock system: 24-hour air test at 40 psi for 24 hours (pressure loss must not be more than 1 1/2 PSI)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Functional test of fire pump - Use fire pump test form (if equipped with fire pump)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify installation of storage box for spare sprinkler heads (in conditioned space)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Appropriate number and type of spare heads/sprinkler wrench(s) <ul style="list-style-type: none"> <li>• Minimum 2 of each type</li> <li>• 1-300 = Minimum 6</li> </ul>	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A



**Attachment XIV  
Deluge Fire Sprinkler System  
Acceptance Checklist**

## Deluge Sprinkler System Acceptance Checklist



**Building #:** \_\_\_\_\_ **Building Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Attendees:** \_\_\_\_\_  
\_\_\_\_\_

**EHS Representative:** \_\_\_\_\_

**Project Number:** \_\_\_\_\_

**Location of Riser(s):** \_\_\_\_\_  
\_\_\_\_\_

**Type of System:** \_\_\_\_\_ **Location of Spare Heads/Wrench/ Box:** \_\_\_\_\_

**Coverage:**

- Total       Partial

**Area(s) Protected if Partial Coverage:** \_\_\_\_\_

**Sprinkler Heads:**

Make	Model	Year	Orifice	Quantity	Temp Rating

**Backflow Prevention:**

**Type:** \_\_\_\_\_ **Manufacturer:** \_\_\_\_\_ **Serial #:** \_\_\_\_\_ **Size:** \_\_\_\_\_ **PSI:** \_\_\_\_\_

**Requirements Before Acceptance Testing:**

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| <input type="checkbox"/> Building construction complete; All trades complete; Clean-up complete        | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Integration with fire alarm system complete                                   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> System pre-tested   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> All devices verified with correct address/location shown on as built drawings | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Main drain test/flush of system   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**Required Documentation at Time of Acceptance Test:**

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| <input type="checkbox"/> System as-built riser diagram                         | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Underground certification transferred - 1 Copy to EHS | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Aboveground certification transferred - 1 Copy to EHS | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Backflow valve certification; Forward flow tested     | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> O&M manual transferred to maintenance personnel       | <input type="checkbox"/> Yes | <input type="checkbox"/> No |





**Attachment XV**  
**Fuel Gas Test Form**

# Fuel Gas Test Form



This form is required to be completed for any new installation, modification, or required testing of any fuel gas system on the Texas A&M University Campuses.

**Date of Test:** \_\_\_\_/\_\_\_\_/\_\_\_\_      **Work Request #:** \_\_\_\_\_  
**Previous Test Date:** \_\_\_\_/\_\_\_\_/\_\_\_\_      **Type of Gas:** \_\_\_\_\_  
**Meter Number:** \_\_\_\_\_  
**Facility Name:** \_\_\_\_\_      **Facility #:** \_\_\_\_\_  
**Facility Address:** \_\_\_\_\_      **Room #:** \_\_\_\_\_  
**Location of Gas Pipe:** \_\_\_\_\_  
**Testing Company:** \_\_\_\_\_      **Phone #:** \_\_\_\_\_  
**Tested by:** \_\_\_\_\_      **License #:** \_\_\_\_\_  
(Please Print)

**TAMU    SSC    Contractor** (Circle One)

Start Time	am/pm	Start Temperature	
End Time	am/pm	End Temperature	
Survey	Pressure (Use Diaphragm Type Gauge)		
Detector <input type="checkbox"/>	Low Pressure (LP): [1 psi or less] 5 psi for 30 min		
	Intermediate Pressure (IP): 10 psi or Relieve Valve Opening Point for 1 hour		
Bubbles <input type="checkbox"/>		Start Pressure	
		End Pressure	

**Test Results:**    Pass     Fail       **Repairs Required?**      Yes     No

**Comments:**  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Verifying Official:** \_\_\_\_\_      **Date:** \_\_\_\_/\_\_\_\_/\_\_\_\_

**Witnessed by:** \_\_\_\_\_      **Date:** \_\_\_\_/\_\_\_\_/\_\_\_\_  
(Texas A&M University or SSC representative)

**Submit Completed and Signed Form to:**  
 Texas A&M University EHS  
 MS 4472 TAMU or [ehs@tamu.edu](mailto:ehs@tamu.edu)

**Attachment XVI**  
**Kitchen Hood Extinguishing System**  
**Acceptance Test Checklist**

## Kitchen Hood Extinguishing System Acceptance Test Checklist



**Building #:** \_\_\_\_\_ **Building Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**System Type:** \_\_\_\_\_

**Attendees:** \_\_\_\_\_

**EHS Representative:** \_\_\_\_\_

**Project Number:** \_\_\_\_\_

**Requirements Before Acceptance Testing:**

- |   |                              |                             |
|---|------------------------------|-----------------------------|
| <input type="checkbox"/> System integration with fire alarm system complete | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> System has been pre-tested                         | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Pre-test documentation submitted to EHS            | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**UL 300**

Discharge Test (Caps in Place/No Balloons) Fully Released	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Nozzle Placement	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Shunt Trip <input type="checkbox"/> Fuel <input type="checkbox"/> Electrical	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Manual Reset for Shutoff	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Backup Extinguisher (Type K)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Placard Identifying Backup Extinguisher	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Suppression System Tied to FAS	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Audible Alarm Where FAS Not Installed	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Manual Activation <input type="checkbox"/> Pull station <input type="checkbox"/> Fusible link	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Exhaust Fans Activated	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Valves Accessible	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Alarm Received at FACU/Communications Center	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Installation Certification Transferred to EHS	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Other:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

**UL 300A**

Discharge Test Fully Released	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Nozzle Placement	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Shunt Trip <input type="checkbox"/> Temperature Setting: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Manual Reset for Shutoff	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Backup Extinguisher (Type K)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Placard Identifying Backup Extinguisher	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Suppression System Tied to FAS	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Audible Alarm	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Manual Activation <input type="checkbox"/> Pull station	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Exhaust Fans Activated	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Alarm Received at FACU/Communications Center	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Installation Certification Transferred to EHS	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Pull Station Signage Installed	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Other:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

**System UL 300/UL 300A Compliant:**  Yes  No

**System Accepted by EHS:**  Yes  No

\_\_\_\_\_  
AHJ (or designee)

\_\_\_\_\_  
Date



**Attachment XVII**  
**Fixed Extinguishing System Installation Certificate**  
**SFM-TDI Form FML-010**



TEXAS DEPARTMENT OF INSURANCE

State Fire Marshal's Office (112-FM)
333 Guadalupe, Austin, Texas 78701 \* PO Box 149221, Austin, Texas 78714-9221
(512) 676-6800 | F: (512) 490-1063 | (800) 578-4677 | TDI.texas.gov | @TXSFMO

INSTALLING COMPANY

Address:
City:
Phone:
Zip

Company Certificate of Registration Number

PROTECTED PROPERTY

Name:
Street Address:
City:
Zip:
Owner or Owner's representative instructed on system operation & maintenance:
Yes No
LOCAL AUTHORITY HAVING JURISDICTION
Name:
Street Address:
City:
Zip:

HAZARD ANALYSIS

Name of area, room, building or hazard protected

Primary Class of Protected Hazard

- Class A - Wood, paper, etc.
Class B - Flammable liquids
Class C - Electrical equipment
Class D - Combustible metals
Explosives

Kitchen Hoods & Appliance System

Table with columns: Overall Hood, Plenum, Exhaust duct perimeter, Appliances (Protected, Gas or Elect), Qty, Height, Length, Width, in x ft x ft

Other Type Hazards

Is hazard normally occupied?
Size of Hazard
Total Volume or Total Area
Height
Length
Width
Area sealed to prevent agent loss?
Number of room air changes per minute?
Warning & instruction signs posted?

SYSTEM INFORMATION

System Manufacturer's Name:
Installation Manual:
Design type:
If Pre-engineered, Model Number
Coverage Type:
System Actuation:
Air/Fan shutdown on actuation?
Design discharge rate or concentration level:
Design discharge time:
Seconds:

AGENT INFORMATION

Type of agent provided:
Qty
Storage cylinder
Manufacturer
Part No.
Amount of agent

EQUIPMENT INFORMATION

Table with columns: Initiating Devices, City, Item, Manufacturer, Part No., Temperature, Nozzles, Interlock, Item, Manufacturer, Part No.

TESTING

Method system was tested:

I certify that this fixed fire extinguishing system has been tested and complies with the requirements of Chapter 6001 of the Texas Insurance Code, as amended, and the fire extinguisher rules and adopted NFPA Standards.

This system was installed in accordance with the following codes:

NFPA Year
NFPA Year
NFPA Year
NFPA Year

Signature of Licensee & License Number
Completion Date

Reproduce Form & Distribute
Original to Protected Premise
Copy 1 to Installing Contractor
Copy 2 Certifying Firm for access by SFMO
Form # FML 010 July 2015
SF205 Rev. 07/15

**Attachment XVIII**  
**Smoke Management Systems Acceptance Form**



## Smoke Management Systems Acceptance Checklist



TEXAS A&M UNIVERSITY  
Environmental  
Health & Safety

**Building #:** \_\_\_\_\_ **Building Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**System Info:** \_\_\_\_\_

**Attendees:** \_\_\_\_\_

**Project Number:** \_\_\_\_\_ **System Location:** \_\_\_\_\_

**Requirements Before Acceptance Testing:**

- |   |                              |                             |
|---|------------------------------|-----------------------------|
| <input type="checkbox"/> All system components should be thoroughly tested                        | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Fire protection and life safety system integrated with fire alarm system | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Installation is complete and pre-tested                                  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**Required Documentation at Time of Acceptance Test:**

- |   |                              |                             |
|---|------------------------------|-----------------------------|
| <input type="checkbox"/> Construction documents should be readily available (detailed design report and O&M manual) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Construction documents including all acceptance testing procedures and pass/fail criteria  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**General Procedures:**

- Prior to performance testing, inspectors will verify the exact location of the perimeter of each large-volume space smoke management system, identify any door openings into that space, and identify all adjacent areas that are to remain open and that are to be protected by airflow alone.
- System testing of smoke control systems shall include all equipment such as initiating devices, fans, dampers, controls, doors and windows. Tests shall be performed on primary and standby power conditions.

**Acceptance Test**

Activate the smoke management system (primary power)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify the operation of all fans	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify the operation of all dampers	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify the operation of all doors	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify the operation of related equipment	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Measure fan exhaust capacities	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Measure air velocities of supply grilles	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Measure force needed to open exit doors	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Measure and record pressure difference across all doors that separate the smoke management area from adjacent spaces	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify alarm, supervisory and trouble signals received at the Communications Center	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify system operation in standby power conditions	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Exhaust air information: _____ Number of fans: _____ CFM per fan: _____ RPM's required for each fan to achieve required CFM: _____ Total CFM provided by fans: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Make-up air information: Total sq. ft. of makeup air required: _____ Make up air provided by (circle one) <ul style="list-style-type: none"> <li>• Louvers</li> <li>• Overhead doors</li> <li>• Personnel doors</li> <li>• Other</li> </ul> Number of openings and number of square feet each: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Verify manual means of starting/stopping system	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
O&M manual/special tools transferred to maintenance personnel	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Other: _____			

**Code References:**

**NFPA 92 B. Smoke Management Systems in Malls, Atria, and Large Spaces**

92B A.8.2.3 Operational testing of system components should be completed during construction. It should be documented in writing that each individual system component's installation is complete and the component is functional.

8.3.5.2 Acceptance testing to verify system performance shall include the following:

1. Prior to performance testing, verify the exact location of the perimeter of each large-volume space smoke management system, identify any door openings into that space, and identify all adjacent areas that are to remain open and that are to be protected by airflow alone.
2. Activate the smoke management system. Verify and record the operation of all fans, dampers, doors and related equipment. Measure fan exhaust capacities and air velocities through inlet doors and grills or at supply grills if there is a mechanical makeup air system. Measure the force to open exit doors.
3. Where appropriate, measure and record the pressure difference across all doors that separate the smoke management system area from adjacent spaces and the velocities at interfaces with open areas.

A.8.3.1 The following equipment might be needed to perform acceptance testing:

1. Differential pressure gauges, inclined water manometers, or electronic manometers.
2. Scale suitable for measuring door-opening force
3. Anemometer
4. Ammeter and voltmeter
5. Tissue paper roll or other device for indicating direction of airflow
6. Door wedges
7. Signs indicating that a test is in progress
8. Radios or other means of communication to help coordinate equipment operation.

**Comments:**

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**Attachment XIX**  
**Smoke Management Systems**  
**Stairwell Pressurization System**  
**Acceptance Checklist**





**Attachment XX**  
**Standpipe and Hose Valve System**  
**Acceptance Checklist**



Gauges <input type="checkbox"/> Installed (above & below check valve) and functional <input type="checkbox"/> Installed at top of most remote riser	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
General information plate installed	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Hose cabinets <input type="checkbox"/> Labeled <input type="checkbox"/> Positioned for ease of connection	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Hydraulic plate installed	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Knox caps transferred to EHS	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Main drain/flow test – record Residual pressure: _____ PSI Static pressure: _____ PSI	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Piping adequately supported	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Post indicator valve open & locked	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Test header connections have appropriate caps	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Other:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

**Code reference:** NFPA 14

**System Accepted by EHS:**      Yes    No

\_\_\_\_\_ **AHJ (or designee)**

\_\_\_\_\_ **Date**

**Comments:**

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**Attachment XXI**  
**Two-Way Communication**  
**Acceptance Checklist**

## Two-Way Communication System Acceptance Checklist



**Building #:** \_\_\_\_\_ **Building Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Attendees:** \_\_\_\_\_

**EHS Representative:** \_\_\_\_\_

**Project Number:** \_\_\_\_\_

**Base System Location:** \_\_\_\_\_

**Call Box Location(s):** \_\_\_\_\_

\_\_\_\_\_

**Remote Monitoring Location:** \_\_\_\_\_ **Phone Number:** \_\_\_\_\_

**Requirements Before Acceptance Testing:**

- Two-way communication system has been pretested  Yes  No
- Pre-test documentation has been submitted to EHS  Yes  No

Base system receives calls from each call box	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Base system transfers call to remote monitoring location	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Signage installed/code compliant at each call box location	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Communication is clear & audible/intelligible	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Other: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

**Applicable Codes/Standards:** NFPA 1, NFPA 101 – Most Recent Editions

**System Accepted by EHS:**  Yes  No

\_\_\_\_\_ **AHJ (or designee)**

\_\_\_\_\_ **Date**

**Comments:**

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**Attachment XXII**  
**Contractor Pre-test Certification**

## Contractor Pre-test Certification



TEXAS A&M UNIVERSITY  
Environmental  
Health & Safety

**Building #:** \_\_\_\_\_ **Building Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Street Address:** \_\_\_\_\_

**Project Number:** \_\_\_\_\_ **Project Manager:** \_\_\_\_\_

**Installer:**

**Name:** \_\_\_\_\_ **Phone #:** \_\_\_\_\_ **Email:** \_\_\_\_\_

**General Contractor:**

**Name:** \_\_\_\_\_ **Phone #:** \_\_\_\_\_ **Email:** \_\_\_\_\_

**System Type:**

- |  |   |
|--|---|
| <input type="checkbox"/> Automatic sprinkler system      | <input type="checkbox"/> Fire pumps                       |
| <input type="checkbox"/> Wet pipe sprinkler system       | <input type="checkbox"/> Fire/smoke dampers               |
| <input type="checkbox"/> Dry pipe sprinkler systems      | <input type="checkbox"/> Fuel gas system                  |
| <input type="checkbox"/> Pre-action sprinkler system     | <input type="checkbox"/> Hood extinguishing systems(s)    |
| <input type="checkbox"/> Deluge sprinkler systems        | <input type="checkbox"/> Mass communication system        |
| <input type="checkbox"/> Clean agent suppression systems | <input type="checkbox"/> Smoke exhaust                    |
| <input type="checkbox"/> Emergency lighting/exit signage | <input type="checkbox"/> Smoke management system          |
| <input type="checkbox"/> Elevators/conveying systems     | <input type="checkbox"/> Special gas/monitoring equipment |
| <input type="checkbox"/> Emergency power supply system   | <input type="checkbox"/> Stairwell pressurization         |
| <input type="checkbox"/> Fire detection and alarm system | <input type="checkbox"/> Standpipe systems                |
| <input type="checkbox"/> Fire doors/curtains/shutters    | <input type="checkbox"/> Two-way communication systems    |
| <input type="checkbox"/> Fire lanes/aerial access roads  | <input type="checkbox"/> Code Maroon                      |
| <input type="checkbox"/> Other: _____                    |   |

**System Location/Zone:** \_\_\_\_\_

**Pre-test Date:** \_\_\_\_\_

The above system has been pre-tested in accordance with all applicable codes and standards and is ready for final acceptance by the Authority Having Jurisdiction (AHJ)\*.

\_\_\_\_\_  
**Installer**

\_\_\_\_\_  
**General Contractor**

\* Final acceptance checklists are available [here](#)

**Attachment XXIII  
Common Construction  
Fire and Life Safety Deficiencies**

# Common Construction Fire and Life Safety Deficiencies



**Document Name:** Fire and Life Safety – Common Construction Deficiencies

**Document Number:** 7512.10.02

**Drafted:** 11/27/2023

**Last Revised:** 11/27/2023

## General Information

This document was compiled to represent some of the most commonly noted deficiencies identified during construction fire and life safety final inspections. This list is provided a guidance for contractors when conducting pre-acceptance walk throughs and quality assurance checks prior to requesting a fire and life safety final acceptance. This is not an all-inclusive list.

### Cleaning/Housekeeping

- Trash in Mechanical Shaft
- Trash/Debris in Elevator Pit/Hoistway
- Trash/Debris in Room

### Documentation

- No Contractor Pre-Test Certification Documentation Submitted
- No Backflow Preventer Documentation Submitted
- No Underground Sprinkler Documentation Submitted
- No Aboveground Sprinkler Documentation Submitted
- No Gas Pressure Testing Documentation Submitted

### Doors

- Fire Door Label Damaged/Illegible
- Fire Door Label Missing
- Fire Door Label Taped/Painted
- Fire Door Not Self Closing/Latching
- Fire Rated Hardware Not Installed
- Incorrect Fire Rating
- Springs for Self-closing Access Door Not Installed

### Electrical

- Breaker Panel Blanks Not Installed
- J-Box Cover Missing
- Panel Schedules Not Installed

### Fire Extinguishers

- Not Installed
- Non-rated Cabinet in Rated Wall
- Non-TAMU Compliant Extinguisher

### Emergency/Exit Lighting & Signage

- Additional Exit Signage Needed - Path to Exit Not Obvious
- Directional Arrow/Chevron on Exit Sign Incorrect
- Emergency Lighting Did Not Illuminate for Minimum of 90 Minutes
- Emergency Lighting Not Installed per Drawings
- Emergency Lighting Not Working

**Penetrations**

- Fire Seal Around Conduit
- Fire Seal Around Duct
- Fire Seal Around Piping
- Fire Seal at Deck
- Fire Seal Inside Sleeve
- Smoke Seal Around Conduit
- Smoke Seal Around Duct
- Smoke Seal Around Piping
- Smoke Seal at Deck
- Smoke Seal Inside Sleeve

**Signage**

- Building Number/Address Not Installed
- Identify Equipment Above Ceiling/In-Wall (Damper/Duct Detector, etc.)
- No Label/Stencil on Fire Rated Wall
- Room Number Not Installed
- Room Use Identification Not Installed (Mechanical/Data/Telecom/Custodial etc.)

**Sprinkler/Standpipe System**

- Escutcheon Missing
- Escutcheon Needs Alignment
- Knox Caps/Storz Cap Not Installed
- Signage Not Installed
  - Hydraulic Calculations
  - General Information
  - FDC Signage
  - Riser Diagram
- Sprinkler Head < 4" From Wall
- Sprinkler Head Needs Protection/Cage Installed
- Sprinkler Heads Taped/Covered
- Sprinkler Head Obstruction > or = 48" Wide
- Sprinkler Head Spray Pattern Obstruction
- Paint or Other Material on Escutcheon
- Paint/Other Material on Sprinkler Head
- Raise Sprinkler Head
- Remove Clip from Sprinkler Head
- Sprinkler Head < 1" From Deck
- Sprinkler Head Damaged
- STP - FHC Needs to Be Adjusted/Turned to Allow Easy Access/Operation
- STP/SPR - Incorrect Identification Ring at FDC

**General**

- AED Not Installed
- Elevator Programming Not Correct
- Fire Lane/Access - Not Marked
- Handrail not Deburred/Rough
- Knox Box Not Installed/Incorrect
- Smoke Detector < 36" to Supply/Return
- Trip Hazards
- Two-Way Communication System Programming Not Correct

**Attachment XXIV  
EHS Project  
Final Completion Checklist**





