

Telluride Fire Protection District Fire Alarm Systems Policy

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FIRE ALARM SYSTEMS POLICY
TELLURIDE FIRE PROTECTION DISTRICT

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FIRE ALARM PROTECTION POLICY

The purpose of a fire alarm system is to provide an early warning, allowing occupants time to react and evacuate and to provide a faster Fire Department response. This policy provides the minimum requirements/guidelines acceptable to the Fire District, in conjunction with NFPA and International Fire Code requirements not specified in this policy.

The designer who follows this policy will find quicker Fire District approval with little or no changes required.

PLAN REVIEW SUBMITTAL

Every fire alarm plan submitted for review must contain the items required in 1.1 through 1.6.1

Every fire alarm plan submitted that requires the installation of 20 or more initiating devices shall comply with this entire section.

Plans and Specifications: A minimum of two complete sets of plans and specifications (cut sheets) are required

Zone Designations: Shall be as required by this policy. See Section 2.21

Specifications: Specification sheets (cut sheets) shall provide information on component operation, primary panel configuration, along with all devices and their operation.

Retransmission of Signals: Signals required to be retransmitted to a monitoring station shall be in accordance with this policy.

Permit Fees: Permit fees shall be assessed by the Fire District and paid prior to issuance of the permit and any work on the system beginning.

Review Letter: Following the Fire District review, a letter will be provided to the fire alarm Contractor noting any deficiencies and or corrections to be made to the system. The review letter must be replied to, prior to a permit being issued.

Table of Contents: To provide for quick reference during the plan review.

Equipment List: Shall provide the number of devices, part numbers and description of equipment provided

Battery Type and Capacity: Calculations supporting the capacity proposed shall be provided.

Wire Size Calculation: The plan submittal shall include the statement that a wire size calculation has been performed and that the proposed system meets the equipment manufactures specifications. The Fire District may require supporting documentation.

Point to Point Wiring Diagram: The Fire District requires a point to point diagram showing the exact number of devices per circuit superimposed over a floor plan.

Riser Diagrams: Riser diagrams shall indicate the zone configuration and designate the number of devices per floor.

Warranty Information: The fire alarm contractor shall designate who will be responsible for any malfunctions during the warranty period.

Manuals: Operation and Maintenance manuals shall be provided. Copies of the manuals shall also be provided to the owner at the completion of the project.

Written Narrative: A written narrative detailing the operational sequence of all alarms (alarm zones) shall be provided. A copy of this narrative shall also be provided to the owner at the completion of the project.

GENERAL REQUIREMENTS

Required Installation and Standards: An approved fire alarm system shall be installed in the following occupancies:

Group A - having an occupant load of 300 or more

Group B - as required by the International Fire Code as amended

Group E - as required by the International Fire Code as amended

Group F - two or more stories in height and having an occupant load of ≥ 500 above or below the lowest level of exit discharge

Group H - as required by the International Fire Code as amended

Group I - as required by the International Fire Code as amended

Group M - as required by the International Fire Code as amended

Group R - as required by the International Fire Code as amended

Exception: An alarm system need not be installed in buildings not over two stories in height when all individual dwelling units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least one hour fire partitions and each individual dwelling unit or guest room has an exit directly to a public way, exit court or yard.

Area separation walls shall not be used to define individual buildings.

All fire alarm systems shall conform with the International Fire Code, the most recent requirements of NFPA-70 National Electrical Code, and NFPA-72 National Fire Alarm Code.

All fire alarm system components shall be UL or FM listed.

All initiating device circuits shall provide the performance capabilities of "Class A" per NFPA-72 table 6.5, 2007 edition.

All notification appliance circuits shall provide the performance and capabilities of "Class A" per NFPA-72 Table 6.7, 2007 edition.

All signaling line circuits shall provide the performance and capabilities of "Style 6/Class A" per NFPA-72 Table 6.6.1, 2007 edition.

Primary Fire Alarm Panel: The primary fire alarm panel shall be located in a heated location approved by the Authority Having Jurisdiction (A.H.J.)

Alarm verification may be required as a feature of the primary fire alarm panel when it serves 50 or more devices. The zone definition for an automatic fire alarm lists typical devices.

Type and Location of Devices: The fire alarm matrix shall list the types of devices and their locations.

In dwelling units and guest rooms a system smoke detector and an isolated thermal shall be provided. Smoke detection shall sound a local alarm only. Heat detection shall sound an evacuation alarm and activate a signal at the fire alarm panel.

In common areas and storage rooms, system smoke detectors shall be provided.

Any lockable room or area that has detection shall have a remote indicating light unless the system is an addressable system.

Exceptions: Rooms with Magnetic hold-open devices. Remote enunciator if lamp test switch provided.

Secondary Power Supply: A secondary power supply is required for all fire alarm systems. Secondary power supply shall be in accordance with Section 4.4.1.5 of NFPA-72, 2007 edition.

Labeling: All fire alarm panels, remote enunciators, red remote indicating lights, and firefighter telephone jacks shall be labeled. Labels shall be word graphic, of a durable material and permanently attached. Engraved plastic labels are recommended.

Temporary labels for new fire alarm installations will not be acceptable.

TYPICAL LABELING EXAMPLES

Zone Description	Floor Level
Tamper Alarm	Second Floor
Automatic Fire Alarm	First Floor
Low Air Alarm	Parking Garage

Certification Date Tag: A tag showing the date of certification, company name and name of the individual performing the certification inspection shall be provided. This tag shall be attached to the inside of the fire alarm primary panel.

Monitoring Company Identification Label: A Label identifying the company name, address, business telephone and 24 hour telephone shall be provided. This label shall be adhesive and placed on the front of the primary fire alarm panel.

Outside Alarm & Light: Every building shall have an outside audible alarm (minimum 85db) and flashing light (minimum 80,000 candlepower).

The outside alarm and light shall be located above the Fire Department Connection (FDC) or as approved by the A.H.J.

The outside audible alarm and light shall activate upon all evacuation alarms.

Fire alarm outside audible alarm shall be silenced with the primary panel silence switch

Alarm Audibility: All fire alarm systems shall provide a sound level of not less than 60db at 10 ft. (3m) or more than 120db at the minimum hearing distance from the audible appliance in all areas of the building with all intervening doors closed. The primary concern is that 60db be provided at the pillow of all sleeping areas.

The system shall also be capable of providing 60 db to all areas of the building simultaneously.

Occupancies such as nightclubs, discos, dining and drinking establishments with amplified music, shall have a fire alarm activated power disconnect to the sound source.

All other occupancies with a normally high ambient noise level shall install strobe lights that activate with the horns. The horns in these occupancies shall provide an alarm 15 db over ambient up to a maximum of 120 db.

Area of Alarm Audibility:

Buildings 3 stories or less in height shall alarm the entire building.

Exceptions:

No horns shall be installed within stair towers.

No audible alarm device signaling evacuation alarm shall be installed in the Fire Command Center or adjacent to the primary fire alarm panel (i.e., 10-15 feet).

No audible alarm device signaling evacuation alarm shall be installed in an elevator car.

All buildings 4 stories and higher shall sound the evacuation alarm on the fire floor, the floor above and the floor below.

Exceptions

Stair towers in buildings equipped with an Emergency Voice Communications Systems (EVCS), shall sound an evacuation alarm only in the same stair tower zone which initiates the alarm.

No audible alarm device signaling evacuation alarm shall be installed in the Fire Command Center or adjacent to the primary fire alarm panel (i.e., 10-15 feet).

No audible alarm device signaling evacuation alarm shall be installed in an elevator car.

All fire alarm devices of kitchen hood extinguishing systems shall sound an evacuation alarm the same as any other device on that floor.

Exception

Single station smoke detectors located within dwelling units shall not cause an evacuation alarm to sound.

The activation of any tamper zone shall not sound an evacuation alarm.

All fire alarm systems shall be capable of sounding an "all call" evacuation alarm.

Trouble Indicators: All fire alarm zones, emergency voice communication zones, and telephone communication zones shall annunciate trouble per zone, both audibly and visually at the primary panel.

Remote Annunciators: Complexes with multiple buildings, remote access points or a 24 hour front desk, shall provide remote panel annunciators.

Smoke Detection: All system smoke detectors shall lock on and have a solid red light when in alarm.

All system smoke detectors shall reset from the fire alarm panel

Photoelectric smoke detectors shall be used in all heated locations. Heat detectors shall be used to protect unheated areas.

Smoke detectors shall not be installed on the mounting plate until the building is cleaned, construction finished and ready for Certificate of Occupancy.

Thermal Detection: Heat detectors shall be capable of latching a remote indicating light.

Heat detectors shall be used in areas that are likely to contaminate smoke detectors, causing false fire alarms, or are unheated.

Duct Detection: Duct detectors shall be provided for all air handling systems exceeding 2000 CFM. Duct detectors shall be located as required by the current International Mechanical Code. All duct detectors shall have a red remote indicating light, reset and test switch and be labeled.

Manual Pull Stations: All manual pull stations shall be double action.

Magnetic Hold-opens: All doors with magnetic holders shall release on evacuation alarm.

Multiplex Systems: Multiplex fire alarm systems shall provide Class A communications loops between Data Gathering Panels (DGP's) and the primary fire alarm panel. This wiring may be in a common chase, however, the feed and return pairs must be in separate conduits.

Computer Driven Systems: Shall be reset with no more than one computer command sequence and/or one manual switch activation.

The system shall not reset if any circuit or device is in trouble or alarm.

A replacement EPROM or tape (software) shall be provided and locked in the replacement parts cabinet.

An all-points list shall be provided 48 hrs. Prior to the acceptance test. This list is provided for accurate testing of devices and terminology.

A complete instruction/owners manual shall be provided with the plan review submittal.

The fire alarm installer shall provide two training sessions within the District at the Fire District's discretion.

Replacement Devices: Replacement devices shall be provided. A ratio of 1 smoke detector for every 25 detectors (minimum of 2) for each type. All other devices shall be provided at a ratio of 1 device for every 50 (minimum of 1).

An approved lockable storage cabinet with label for replacement devices is required. A typed inventory list shall be attached to the inside of the door identifying the quantity, model, and type of device stored.

Special tools for opening duet detectors, tamper switches, pull stations or any other device shall be provided.

Key Box: Key boxes shall be installed in such a manner so that water, ice, or dirt will not cause it to be inoperable. Forms to order Key Boxes shall be provided by the Fire District.

Fire Alarm Zones. The following zones are required if applicable:

Automatic Fire Alarm per floor. (and wing if needed)

Main Sprinkler Water Flow

Sprinkler Water Flow per floor. (and wing if needed)

Tamper Alarm per floor
Each stairwell
Each trash chute
Each linen chute
Each elevator shaft/equipment room
Each "A" occupancy
Kitchen-hood extinguishing system
Duct detectors, one system per zone (see 2.12)
Low air, supervisory

Zone Definitions:

Automatic Fire Alarm - Initiating devices include smoke detectors, heat detectors, manual pull stations, duct detectors, and kitchen hood system

Sprinkler Water Flow - Flow switches activated by sprinkler system discharge.

Tamper Alarm - Tamper switches shall be treated as an initiating device. Tamper switches shall be activated by the closing of any sprinkler/standpipe control valve.

Low Air Alarm - Activates upon loss of air pressure in dry pipe sprinkler systems prior to charging the system.

Trouble - Separate for each required zone and panel circuits.

Retransmission of Alarm Signals: The following codes are required to be telegraphed separately and distinctly to an approved central receiving station when applicable;

Code 1 - Trouble (common)
Code 2 - Tamper (common)
Code 3 - Low Air (common)
Code 4 - Automatic Fire Alarm\Building One
Code 5 - Sprinkler flow Alarm\Building One
Code 6 - Automatic Fire Alarm\Building Two
Code 7 - Sprinkler Flow Alarm/Building Two

All water flow zones shall cause a flow alarm indication to be telegraphed.

Remote buildings served by a common fire command center must be capable of providing retransmission signals as shown in this section.

Fire Command Centers: Buildings with Fire command Centers must comply with the Fire Department policy on Fire Command Centers.

ELEVATORS

Alarm Systems w/ Elevators. All elevators shall recall upon evacuation alarm.

All elevators within the building shall automatically recall to main entry or alternate floor as designated by the Fire Department.

Elevators automatically recalled shall return to normal operation upon resetting of fire alarm system or by manual switch operation at fire alarm panel.

Fire Command Centers shall have an elevator annunciator that visually indicates the location of the elevators and operational status.

EMERGENCY VOICE COMMUNICATIONS

Alarm Systems w/ Emergency Voice Communications. Emergency Voice Communication Systems shall be installed in every building 5 stories and higher.

Emergency Voice Communication System (EVCS) shall provide one-way communication on a “per zone” or “all call” basis.

The EVCS shall provide audibility in accordance with Section 2.8.

The following EVCS speaker zones are required if applicable:

Each floor (per wing if needed)

Each stair tower

FIREFIGHTER TELEPHONES

Alarm System w/ Telephone Communications. Firefighter telephone communication systems shall be installed in all building 5 stories or higher.

All fire department telephones must have the ability to communicate (cross-talk) with each other.

Each fire department telephone zone when activated must announce both audibly and visually at the primary panel. A silence switch per zone is required. When the telephone system is in use and another telephone is plugged in, the panel must re-signal this fact both audibly and visually.

Fire department telephone jacks shall be installed adjacent to all manual pull stations.

Each telephone jack shall be labeled so that its location is given.

Each telephone jack shall be provided within 6 inches of the pull station.

TYPICAL LABELING EXAMPLES

Floor Jack Location		
Garage N. Stair Tower	Third Floor Grid 5 Corridor	Roof Penthouse Elevator Equip. Room

Six spare fire department telephones shall be provided at the primary panel and each remote panel annunciator.

Exception: Remote panel annunciator located behind the front desk.

The spare telephones required in 5.4 shall be stored in a lockable storage cabinet. This cabinet shall be labeled "Firefighter Telephones".

The following fire department telephone communication zones are required:

Each floor (per wing if needed)

Elevator penthouse

Each elevator car

Main sprinkler control valve room

A non-removable Fire Department telephone handset shall be installed in the main sprinkler control valve room.

SPRINKLERED BUILDING

Alarm system in Sprinklered Buildings. All sprinkler systems shall be connected into a fire alarm panel. The fire alarm panel shall be capable of annunciating water flow, tamper and trouble. If a dry pipe system is used, low air annunciation is also required.

All sprinkler systems shall have interior horns and an exterior horn and light assembly connected to the fire alarm panel. All horn circuits shall be supervised. A single silence switch shall control all interior and exterior horns. The sprinklered portions of the building shall have horns that provide 60db with all intervening doors closed.

Any existing building retrofitted with only a sprinkler system and not already having a fire alarm system: Is not required to provide supervised horn circuits of a silence switch, however, the panel shall be clearly labeled to indicate how the water flow is silenced. An exterior horn and light meeting the requirements of section 2.7 shall be installed. Interior horn/s shall also be installed. Interior horn/s shall provide 60db to all areas protected by the sprinkler system.

The panel shall be clearly labeled to indicate how the panel is silenced.

An exterior horn and light meeting the requirements of this policy shall be installed.

Interior horns shall be installed. Interior horns shall provide 60db to all areas protected by the sprinkler system.

A water flow alarm shall cause the evacuation alarm to sound. Tamper alarms and low air alarms shall not cause an evacuation alarm. See Section 2.8 for all audibility requirements.

All sprinkler systems shall be zoned in accordance with Section 2.21.

All sprinkler system control valves shall have tamper switches, indicating valve closure, zoned per floor. Chains and locks will be acceptable in lieu of tamper switches.

Water flow, tamper, and low air switches shall all be initiating devices (normally open switches). Class "A" wiring and/or zone modules may be needed to meet these requirements. All initiating devices shall be capable of signaling an alarm condition (red LED), along with a separate and distinct trouble condition (yellow LED).

No indicator lights will be allowed that require a message interpretation. A single yellow LED shall not show both tamper and trouble because this requires interpretation. For example: A tamper switch will not have any indication when the valve is open. If the valve is closed the tamper switch shall cause the red LED to illuminate with no horns sounding. If the wiring to the tamper switch is broken the yellow LED shall illuminate and sound a trouble alarm.

All dry pipe sprinkler systems shall annunciate low aft.

All sprinkler systems shall be telegraphed to an approved central receiving station. See Section 2.22 for complete requirements. Buildings with only sprinkler systems shall telegraph the following codes when applicable:

System Trouble
Valve Tamper
Sprinkler Water Flow
Low Air Alarm

The fire alarm panel shall be capable of providing the retransmission codes required to Section 6.7. Each code shall be separate and distinct from the other. For example: a tamper and trouble code sent simultaneously when a sprinkler valve is closed is not acceptable. Also, the simultaneous sending of a water flow and automatic fire alarm code is not acceptable. Coordinated efforts by the sprinkler, fire alarm, electrical, general and monitoring Contractors are necessary to ensure a problem free installation and final acceptance.

MONITORING

Fire Alarm Monitoring. The following are required to have supervised telephone lines for fire alarm monitoring. Monitoring shall be performed according to NFPA-72

All buildings with required fire alarm systems.

All buildings with sprinkler systems.

Exception: Buildings with only sprinkled trash chutes.

Retransmission devices shall be UL or FM listed. These devices may be any of the following:

Polarity reversal signaling

Multiplex signaling

Dual-line digital communicator with a test signal every 24 hours.

A failure to receive the test signal shall result in a service call for maintenance.

A record of the 24 hour test signal must be kept by the monitoring company.

Non-required retransmission devices may be and listed in 7.2 or a single line digital communicator.

Automatic telephone dialing devices to transmit an emergency alarm shall not be connected to any fire or police department telephone number unless approved by the Fire Marshal. Fire Department telephone numbers include Dispatch and 9-1-1.

FINAL ACCEPTANCE TESTING AND SYSTEM CERTIFICATION

Final Acceptance Testing. A fire alarm final inspection shall be performed prior to issuance of certificate of occupancy.

A fire alarm final inspection shall be requested at least 24 hours prior to inspection.

Prior to fire alarm final inspection, the fire alarm supplier shall perform a 100% inspection of the system, per NFPA-72.

Prior to fire alarm final inspection, a certificate on company letterhead containing the following information shall be provided to the Fire Department.

Certification for this fire alarm system is by:

Company Name _____
Address _____
Telephone _____
Owner/Manager _____

I, _____, an authorized representative of _____, do hereby certify that on this _____ day of _____, 20__ that this fire alarm system has been 100% tested and has been found to function properly, and is in full compliance with the International Fire Code, National Fire Protection Association standards. Approved drawings/specifications and all manufactures requirements.

The certificate must be signed.

Signature _____

Printed Name _____

Protected Property:

Project Name _____
Address _____

System Installer:

Company Name _____
Address _____
Telephone _____
Owner/Manager _____

System Supplier:

Company Name _____
Address _____
Telephone _____
Owner/Manager _____

Warranty Repairs will be done by:

Company Name _____
Address _____
Telephone _____
Owner/Manager _____

See also 2.12.3 of this policy regarding smoke detector installation.

If the building is not 100% completed, including all painting, trim and cleaning, all smoke detectors will be removed prior to Certificate of Occupancy and cleaned by authorized personnel.

After the fire alarm final inspection, the system shall be placed into service.

During Final Inspection; The installer must provide all needed test equipment. The Fire Department will only observe a test of the following, when applicable:

Circuit Supervision for:

Smoke/heat detectors

Horns and/or speakers

Flow Switches

Tamper Switches

All Devices

Battery Back-up

Outside audible alarm and light

Magnetic Hold-open Devices

Elevator Recall

Audibility Levels

Correct Audible Alarm (evacuation vs. trouble)

Correct Zoning

Labeling

Replacement devices

Fire Department telephones

Low Air

The installation of two separate phone lines, when applicable

Telegraphing to remote station

Smoke Exhaust

Stairwell pressurization

A testing device meeting the manufacturers' specifications for the testing of smoke detectors shall be provided.

During the fire alarm final inspection, the following shall be present:

Alarm Contractor Representative

Electrician or Installer

General Contractor Representative

Owner's Representative

Elevator Representative (if elevator present)

Fire Sprinkler Contractor Representative (if sprinklers present)

As-Built drawings of the fire alarm system shall be provided at the time of acceptance by the Fire Department.

The A.H.J. reserves the right to require additional devices or items deemed necessary to provide a complete and functional early warning fire alarm system. The A.H.J. may also grant variances on a project by project basis. Where public safety is the primary concern, the A.H.J. has final approval.