

FIRESAFETY

**INSPECTION, TESTING AND MAINTENANCE OF LOCAL,
AUXILIARY, REMOTE STATION, AND PROPRIETARY
SIGNALING SYSTEMS**

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Appendix 1

Model Contract Specifications For Inspection, Maintenance, And Testing of Local,
Auxiliary, Remote Station, And Proprietary Signaling Systems

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1. GENERAL

1.01 This practice is being issued to instruct all responsible personnel having jurisdiction over the inspection, testing, and maintenance of local, auxiliary, remote station, and proprietary signaling systems. This practice will recommend the procedures to be followed for the periodic inspection, testing, and maintenance of the described signaling systems. It should be noted that signaling systems refer to all devices that play a role in fire and smoke detection parameters.

1.02 This practice replaces 770-330-200, Maintenance Of Fire Detection System, Addendum 770-330-200LL, and revises several sections within Corporate Instructions (CIS) 76.203 and 76.204. This practice reflects the latest technological changes and introduction of new detection devices and systems within detection parameters. This practice also provides a broader base of information on various signaling devices used in fire alert, fire detection and related equipment. Whenever this practice is reissued, the reason(s) for that re-issue will be contained in this paragraph.

1.03 This practice contains specific information for the inspection, testing, and maintenance of detection systems, and is based on the National Fire Protection Association Standards NFPA 71 and NFPA 72, subsections A through H. Whenever local codes exceed the provisions of this practice, the local codes shall supersede this instruction. Further information may be obtained from the manufacturer of the equipment and should be reviewed before any inspection, testing, and maintenance procedures are initiated. Manufacturer's instructions address information specific to a particular component or system and may contain vital information concerning inspection, testing and maintenance procedures.

1.04 Comments on AT&T Practices are requested to evaluate the presentation and dissemination of the contained information to the user. For information on how to comment, AT&T employees should refer to AT&T Practice 000-010-015AC.

1.05 Inspection, testing, and maintenance of fire and smoke detection equipment are executed to maintain the prescribed function of the equipment and ensure maximum performance capabilities. Properly maintained equipment will result in higher reliability in its life safety function and lower expense outlays by the organizations responsible for maintenance.

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2. DEFINITIONS

2.01 Certain terms will appear in this section which require definition for the purpose of instructing the user.

Acceptance Test - A complete operational test performed on the entire installation to verify compliance with applicable code standard as stated by the National Fire Protection Association (NFPA) and Underwriters Laboratories. Reacceptance testing is performed when any configuration of the prior approved system is altered.

Automatic Detection - A system utilizing non-manual devices, such as electronic equipment, which is activated upon receipt of a triggering impulse or sensory signal (wisp of smoke, increase in ambient heat in sensory area).

Auxiliary Protection Signaling Systems - electrically operated circuits, instruments, and devices, including the necessary electrical energy for power, designed to transmit alarms and trouble signals necessary for the protection of life and property.

Early Warning Detection - a system that incorporates smoke detection to provide a warning. Early warning detection will respond to hazardous conditions very quickly (involved fire).

Proprietary Protective Signaling Devices - an installation of protective signaling systems which serve one or more properties under one ownership from a central supervising station located at the protected property, which is constantly manned by trained personnel. Included in this definition are the central supervising station, all power supplies, signal-initiating devices, initiating device circuitry, signal notification appliances, equipment for the automatic and permanent recording of signals, and equipment for the operation of emergency building control services.

Remote Station Protective Signaling Systems - an installation using supervised detailed circuits designed to transmit alarm, supervisory, and trouble signals from one or more protected premises to a remote location at which appropriate action is taken.

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Manual Station - a device that requires, for initiation of an alarm on a fire alarm system, an action performed by a person. This action transmits an alarm to the area specified by the type of station. Manual stations are commonly referred to as “pull stations” or “pull boxes”. These types are:

- a. **Noncoded** - Activation causes station contacts to remain in alarm until resetting of the station returns it to the normal mode.
- b. **Coded** - Activation causes a pre-determined signaling code to be transmitted at the station. This code must be repeated a minimum of 3 times.
- c. **Presignal** - Activation will cause an alarm to sound only in previously specified areas. Actuation of a key switch on the station or at the control panel site will affect the activation of an evacuation signal.
- d. **General alarm** - activation causes evacuation signals to sound immediately.

NOTE: Any station described in the above may be classified in 2 categories; Breakglass or Non-breakglass. Activation of the device may be accomplished in 2 ways; single action (breaking glass, pushing button or pulling lever), or Double Action (alarm is initiated with 2 actions; breaking glass, open door, push button or pull lever.)

3. CLASSIFICATION OF EQUIPMENT COMPONENTS

3.01 There are several classifications of detection devices.

a. **Heat Detector** - a device that detects abnormally high temperature or rate of temperature rise.

(1) **Fixed Temperature** - a device that will activate when its operating element becomes heated to a predetermined level. Types of fixed temperature elements are:

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- (a) **Bimetallic** - two metals having different coefficients of heat expansion arranged so that, when heated, it will deflect in one direction when heated and in another when cooled.
 - (b) **Electrical Conductivity** - a line or spot type sensing element whose resistance varies as a function of temperature
 - (c) **Fusible Alloy** - a sensing element that melts rapidly at the rated temperature tested for the device
 - (d) **Heat-Sensitive Cable** - two current carrying lines separated by a heat sensitive insulation that softens at a rated temperature thereby allowing the wires to touch and close a circuit
 - (e) **Liquid Expansion** - a sensing element containing a liquid that markedly expands in response to temperature increase
- (2) **Rate Compensation Detector** - a device that responds when the temperature of the air surrounding the device reaches a preset level, regardless of the rate of temperature rise.
- (3) **Rate-of-Rise Detector** - a device that responds when the temperature rises at a rate exceeding a pre-set amount.
- b. **Smoke Detector** - a device that detects the visible or invisible air-borne particles of combustion.
- (1) **Ionization Smoke Detection** - a device containing a small amount of radioactive material that ionizes the air in the sensing chamber. One chamber provides a standard voltage against a second chamber that is offset by a nominal voltage. Smoke enters the second chamber (sensing) and the offset voltage is altered so that the resultant voltage difference between the two chambers initiates an electrical signal to a control panel. This type of unit is effective in detecting the small and highly migratory particles associated with a rapidly, developing flaming fire.

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- (2) **Photoelectric Light Scattering** - a device where a light source and a photosensitive sensor are arranged in such a manner that rays from the light source do not

normally fall on the photosensitive sensor. When smoke enters the path of the light, light is scattered by reflection and refraction onto the sensor, causing the detector to respond. This type of unit is effective on detecting the large particles associated with a smoldering, slowly developing fire.

(3) **Photoelectric Light Obscuration** - a device where light is monitored between a light source and a photosensitive sensor. When smoke particles enter the light path, there is a reduction in light reaching the sensor, causing the sensor to respond.

(4) **Cloud Chamber** - a device where an air pump draws a sample of air from the protected area into a high humidity chamber located within the detector. When the humidity of the sample equals the humidity level in the chamber, pressure is lowered slightly. If smoke is present in the sample, moisture from the pressure drop will condense on the smoke particles and a cloud will form. The photoelectric principle measures the density of the cloud and if it falls outside of predetermined levels, a response is initiated.

c. **Flame Detector** - a device that detects the infrared, ultraviolet, or visible radiation produced by a fire.

(1) **Flame Detector** - a device that responds to the presence of radiant energy visible to the human eye or radiant energy outside the range of human vision.

(2) **Flame Flicker** - a device that responds to light when that light source is modulated at a frequency characteristic of the flicker of flame.

(3) **Infrared** - a device whose sensing element responds to radiant energy outside the high end light range of human vision.

(4) **Photoelectric Flame** - a device that contains a photocell as a sensing element that either changes electrical conductivity or produces an electrical potential when exposed to radiant energy.

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(5) **Ultraviolet** - a device whose sensing element responds to radiant energy outside the low end range of human vision.

d. **Fire-Gas Detector** - a device that detects gases produced by a fire.

(1) **Semiconductor** - a device that responds to either oxidizing or reducing gases by creating electrical changes in the semiconductor. The change in conductivity causes initiation of the device.

(2) **Catalytic Element** - a device where a material in the element accelerates the oxidation of combustible gases. The resulting temperature rise in the element actuates the device.

e. **Other Classification Detectors** - devices that detect a phenomenon other than heat, smoke, flame, or gases produced by a fire.

3.02 Detectors may be arranged utilizing several methods to provide coverage.

a. **Line-Type** - a device in which detection is continuous along a path. Examples are heat sensitive cable and projected beam smoke detectors.

b. **Spot-Type** - a device whose effectiveness is concentrated in one area. Examples are bimetallic heat detectors, fusible alloy heat detectors, and thermo-electric heat detectors.

c. **Duct Smoke** - a device which utilizes the drop in air velocity pressure across sampling tubes within an air stream to circulate air past a smoke detector.

d. **Air sampling** - a device which draws air from a protected area back to the detector through air sampling ports, piping, or tubing. Air is analyzed at the detector for products of combustion.

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3.03 Detectors may be classified by their operating modes.

a. **Non-restorable** - a device whose sensing element has been specifically designed to be destroyed when detecting a fire.

b. Restorable - a device whose sensing element usually remains intact in the process of detecting a fire. Restoration may be manual or automatic if the sensing element remains intact after exposure to a fire.

4. INSTALLATION ACCEPTANCE AND REACCEPTANCE PROCEDURES

4.01 Although responsibility for the original installation and any reorientation of the system lies within the building engineering organization, a management level representative from the building line operations organization shall be present at the installation acceptance inspection. This presence will acquaint the building operations representative with the operation of the system and provides an opportunity to ask any questions pertaining to the system (s) operation.

4.02 The building operations representative shall be primarily concerned with installation requirements referencing operations and maintenance responsibilities. Acceptance procedures that should be observed by the representative shall include the following items:

- a. Detection system main power supply and backup power source (battery standby)
- b. Activation of the system shuts down the ventilation equipment providing service to the area under alarm (**exception: ventilation equipment that is part of an engineered smoke removal system**)
- c. Trouble and fire sensor indicators are transmitted to an attended location for any location that is not occupied on a 24-hour, 7-day a week basis. Sent alarms shall be configured to differentiate between a trouble and fire alarm.
- d. Remote indicating lamps are installed to identify zone coverage in areas, such as a closed room or under raised flooring, that are not visible from the zone proper. Visible floor markers may be placed in addition to indicating lamps to identify placement of detectors.

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- e. Clear access to detectors and related equipment that requires inspection, testing, and maintenance is provided.
- f. All system records, including wiring diagrams, system specifications, floor plans, as-built drawings, manufacturer's manuals and any other pertinent material shall be turned over to the building operations representative after completion of the acceptance testing

and approval. Further information concerning the material to be included in the system information package will be discussed in Part 5 of this section.

4.03 Reacceptance testing shall be performed after any addition or deletion or after any electrical or mechanical damage to the system has been identified and corrected.

4.04 Acceptance and reacceptance testing procedures for appliances, devices, components, and systems will be described in Section 6 of this practice.

5. RECORDS, DRAWINGS, INSTRUCTIONS, AND REGISTRATION

5.01 Upon completion of the original installation and any modification carried out at any future time, and after acceptance testing procedures for any original installation or modification to any part of the system, it is the responsibility of the installer to provide documentation supporting the installation of, type of equipment installed, location of installed equipment, type of detectors used, serial numbers of all detection devices and equipment, and any individual sensitivity readings for detection devices. This record shall be turned over to the building operations representative who shall place the documentation into a permanent file singularly to that location. Original sensitivity readings for each detection device shall serve as a benchmark for future testing procedures.

5.02 Building Engineering personnel shall be responsible for providing to the Building Operations representative the Fire Alarm System Certification and Description Document, any as-built drawings to be used for comparison between engineered and actual system(s) installation, and any manufacturer's instruction manuals pertinent to any installed system(s) maintenance and operating procedures.

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Documentation shall include the layout for all fire detection zones, detailed interconnection wiring, all equipment specifications, and any related material. At the time of the system acceptance inspection, all material shall be reviewed by the Engineering representative and the Building Operations person to ascertain that all contained information is correct.

5.03 It shall be the responsibility of the Building Operations representative to assist supervisory personnel from the tenant groups within the location to prepare a procedure for action upon receipt of an alarm. AT&T Practice 770-300-200 titled "Building Emergency Action Plans" can serve as a guideline and provide the necessary information for preparation of this plan.

5.04 Certain states have issued a requirement that all ionization detector heads must be registered with the appropriate agency having jurisdiction. The Building Operations representative responsible for maintenance of the system(s) shall accomplish this registration where required.

6. DESCRIPTION OF FUNCTIONAL TESTS REQUIRED

The following is a compilation of recommended schedules and methods for testing procedures for equipment discussed in Section 6 of this practice. If local or municipal Fire Codes require more frequent testing or maintenance procedures, those requirements shall supersede any recommendation in this section.

Documentation of all testing and maintenance procedures shall be accomplished and be readily available to any personnel having the need to verify the operation of any equipment, appliance, device, component, or system. This documentation shall normally be kept on-site at the location where the equipment is present, unless the site is unattended or managed from a Centralized Control Center. In that event, the documentation shall be made available to local code officials and insurance loss prevention inspection representatives upon request. If local codes require on-site records maintenance, the code shall be followed regardless of local policy.

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6.01 Manual Station Requirements

Component	Time Frame	Scope of Test
Break Glass	semi-annually	operate per manufacturer's instructions. With break-glass type, remove glass rod before

		initiating alarm.
Without Break Glass	semi-annually	operate per manufacturer's instructions
Double Action	semi-annually	per manufacturer's instructions
Key-Operated/Pre-Signal	semi-annually	per manufacturer's instructions
Non-Coded	semi-annually	per manufacturer's instructions

6.02 Fire Alarm System - Requirements

Meeting fire alarm system testing requirements could result in a disruption of business due to the testing and activation of audible alarms. If possible, the testing requirements should be accomplished after normal business hours. If that cannot be done, the following may be used as a guideline to assist in orientating local personnel regarding the testing procedure.

- a. Notify plant management and the central station location, if applicable, before testing procedures are initiated.
- b. Initially notify all building occupants before each test is to be conducted. Method of notification shall be decided upon by local building management personnel. After the procedure has been in effect for a period of time and local building management is satisfied that all employees are aware of the program, use of a permanent announcement placed on a bulletin board or similar employee communication's device may supplant the individual testing notification.

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- c. In co-located areas, testing shall be coordinated between tenants to avoid duplication.
- d. In multi-storied facilities, assisting personnel, such as floor wardens, maintenance personnel, shall be used to verify the operation of the audible alarm on different floors or in the area of their responsibility.

Component	Time Frame	Scope of Test
System (manual coded	monthly	Operate one station to alarm.

alarm activate audible)		Utilize a different station for each monthly test to insure that all stations will eventually be included in the testing procedure.
System (automatic)	monthly	In systems where a manual alarm station is installed in combination with an automatic fire detection system, activation of the manual station will complete the testing requirement. In systems without a manual station, initiate the audible alarm by activating the audible alarm circuit at the control panel.

NOTE: Certain automatic fire detection systems utilize a manual alarm. When activated, they shut down the ventilation system for the entire building or the area served by the manual station. In such cases, utilize the audible alarm circuit at the control panel to activate the audible alarm.

6.03 Automatic Fire Detector Requirements

All detectors shall be visibly inspected in place at least semi-annually to assure that each detector remains in good physical condition and that there are no changes that would affect the performance of the unit, such as building structure modification, occupancy hazards, and environmental effects.

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(a) Heat Detectors

Component	Time Frame	Scope of Test
Fixed temperature: Non-restorable line or spot type	Acceptance and thereafter, semi-annually	Do not heat test. Test mechanically and electrically for proper function. Measure and record loop resistance of line type and compare with past readings for discrepancies.

Fixed temperature: Non-restorable type	after 15th year in service, every 5 years when failure occurs	Two (2) detectors per one hundred (100) tested at testing facility. Replace these detectors with new devices. In event of failure, test additional detectors to determine system failure or localized area failure.
Fixed temperature and/or Rate-of-Rise or Rate Compensation. Restorable unit. Line or spot type (except pneumatic tube)	Acceptance test 100% of detectors. Test 10% of units every 6 months so that all detectors are tested within 5 years.	Hair dryer or shielded heat lamp. After each test, detector shall reset. Take precautions to avoid damage to the nontype restorable fixed temperature element of a combination rate-of-rise fixed temperature detector.
Restorable line type; pneumatic tube only	Acceptance test 100%, thereafter semi-annually	Heat source (if a test chamber is in the circuit) or test pneumatically with a pressure pump. Check for leaks.

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6.04 Automatic Smoke Detector - Requirements

All smoke detectors shall be visually inspected in place at least semi-annually to identify missing or damaged units, detectors with impeded smoke entry, abnormally dirty detectors, and detectors no longer functional for their location.

Component	Time Frame	Scope of Test
All Types	Acceptance test 100% of all devices. Thereafter, 100% of all detectors to be functionally tested at least annually.	Calibrated test method (magnet or probe test manufacturer's calibrated sensitivity instrument). Test functionally in place with non-hazardous and non-flammable gas or aerosol

	Calibration test after 1 year and then every other year if sensitivity remains unchanged.	acceptable to manufacturer. Test shall initiate alarm.
Smoke detector with Built-in thermal element	Refer to time frame section equivalent to type in heat or smoke detector section.	Refer to test section equivalent to type in heat or smoke detector section.

6.05 Flame, Fire, Gas, And Other Detectors - Requirements

Component	Time Frame	Scope of Test
All Types	100% testing at least semi-annually	Per manufacturers instructions. Special usage may require more frequent testing.

6.06 Electric Detector - Requirements

Component	Time Frame	Scope of Test
Thermal link	10 years	Electrically operate or external heat

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NOTE: To save on maintenance costs, it is recommended that the link be changed out with a new link instead of performing this test.

6.07 Water Flow Switches - Requirements

Component	Time Frame	Scope of Test
Mechanical	2 months	Per manufacturer's instructions
Electrosonic	2 months	Per manufacturer's instructions
Pressure Type	2 months	Per manufacturer's instructions

6.08 Extinguishing System Alarm Switches - Requirements

Component	Time Frame	Scope of Test
Mechanical	Semi-annually	Per manufacturer's instructions
Pressure Type	Semi-annually	Per manufacturer's instructions

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6.09 Supervisory Signal Initialing Devices - Requirements

Component	Time Frame	Scope of Test
Post Indicator Valve Switch	Semi-annually	Operate valve
Gate Valve Switch	Semi-annually	Operate valve
High Air Pressure Switch	Semi-annually	Per manufacturer's instructions
Low Air Pressure Switch	Semi-annually	Per manufacturer's instructions
Temperature	Semi-annually	Per manufacturer's instructions

Water Level	Semi-annually	Per manufacturer's instructions
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6.10 Annunciator - Requirements

Component	Time Frame	Scope of Test
Remote	Annually	Verify for proper operation

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6.11 Alarm Indicating Appliance - Requirements

Component	Time Frame	Scope of Test
Audible	Annually	Activate alarm
Visible	Annually	Activate alarm
Speakers (one-way Emergency Voice/Alarm System)	Annually	Put into operation and verify voice clarity
Telephones (two-way Communications Systems)	Annually	Put into operation and verify voice clarity

6.12 Control Unit (Panel) - Requirements

Component	Time Frame	Scope of Test
Lamps & LEDs	Annually	Illuminate
Fuses	Annually	Remove fuse and verify rating and supervision
Primary (Main)* Power Supply	Acceptance and re-acceptance tests	Disconnect all standby (secondary) power and test under full load for 5 minutes. Include all alarm devices and appliances. After test, reconnect all standby power circuits.

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Component	Time Frame	Scope of Test
Secondary (Standby) Power Supply	Acceptance and re-acceptance tests	Disconnect all primary (main) power supplies and verify that trouble indicator for loss of power is initiated. Using manufacturer's data, measure system's standby current and calculate whether battery supply can meet standby requirements.
Secondary (Standby) Power Supply	Acceptance and re-acceptance tests	Test under full load for 5 minutes, including all alarm devices and appliances, after test, reconnect main power supply.

NOTE: All redundant power supplies are to be tested separately.

6.13 Battery Maintenance - Requirements

Component	Time Frame	Scope of Test
Sealed Lead Acid	Acceptance test	Check voltage using full load conditions with battery charger disconnected. Check operation of charger.
	Annually	Check open circuit voltage. Measure battery voltage under full load conditions with charger disconnected. Clean all connections. Check operation of battery charger.
	Every 4 years	Replace battery. Clean all connections before installing new unit.

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Component	Time Frame	Scope of Test
Lead Acid	Acceptance test	Check voltage under full load with charger disconnected. Check operation of charger.
	Weekly	Observe all connections and check electrolyte levels with appropriate equipment
	Semi-annually	Measure open circuit voltage. Measure specific gravity of electrolyte with appropriate equipment
	Lead Acid	Annually measure battery voltage under full load with charger disconnected. Clean and coat battery terminals using a nonconductive lubricant. Check

		open circuit voltage. Check operation of charger.
	When needed	Replace battery unit when recharged battery voltage and/or specific gravity fall below manufacturer's recommendations
Nickel-Cadmium	Acceptance test	Check battery voltage under full load conditions with charger disconnected. Check operation of charger.
	Quarterly	Measure open circuit battery voltage. Clean and inspect battery connections.

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Component	Time Frame	Scope of Test
	Annually	Measure output voltage and current of battery charger. Measure battery voltage under full load with charger disconnected. Check operation of charger.
	When needed	Replace battery when recharged voltage and/or current falls below manufacturer's recommendations

6.14 Emergency Voice/Alarm Communication System - Requirements

Component	Time Frame	Scope of Test
System	Acceptance and reacceptance tests	Disconnect primary power supply and operate system in a normal manner for 1/4 of the required standby time. All

		indicating device and initiating device circuits shall be in an alarm condition for both partial and total evacuation.
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6.15 Trouble Signals - Requirements

Component	Time Frame	Scope of Test
Audible and Visible	Annually	Verify operation of panel trouble signals and ring back feature for systems using a trouble silencing switch which requires resetting.

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Component	Time Frame	Scope of Test
Zone Disconnect Switches	Annually	Verify trouble signal is received when zone disconnect switch is engaged.
Ground fault Monitoring	Annually	In systems with ground detection feature, Circuit verify a ground fault indicator activation when installation conductor is grounded.

6.16 Transmission Of Signals To Off-Premises Locations - Requirements

(a) Auxiliary System

Component	Time Frame	Scope of Test
System	Monthly	Activate after prior notification to municipal fire department, if their alarm equipment is involved. Coordinate testing with appropriate parties at the

		off-premises location. Reset any transmitter used at conclusion of test.
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(b) Remote Station System

Component	Time Frame	Scope of Test
Fire alarm (other than water flow)	Monthly	Activate after prior notification to municipal fire department, if their alarm equipment is involved. Coordinate testing with appropriate parties at the off-premises location. Reset any transmitter used at conclusion of test.

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7. SYSTEM MAINTENANCE

7.01 All systems shall be under the supervision of qualified personnel having knowledge of the equipment within the system(s) and manufacturers specifications relating to each component, device, or appliance within the parameters of the system(s). Some jurisdictions require that maintenance personnel be trained by authorized manufacturer's representatives and that certification of such training is maintained. A further description of qualifications for maintenance personnel appears in paragraph 8 of this practice. These persons shall be responsible for instituting proper testing procedures and inspections at prescribed intervals. Records and documentation for these tests and maintenance procedures shall be maintained at the site where the equipment and system is located and shall be maintained for a period of at least 5 years.

7.02 All detectors require periodic cleaning to remove dust and dirt that has accumulated. Local ambient conditions and the type of detector will generally affect the frequency of cleaning. Refer to the manufacturer's instructions before cleaning, checking, operating, or obtaining any sensitivity reading or making any adjustment to any detector. These instructions will detail methods such as vacuuming to remove loose dust or insects, and washing to remove heavy greasy or grimy deposits.

7.03 Tools, test equipment, and spare parts utilized to service detection equipment by in-house maintenance personnel may be obtained by contacting the manufacturer of the specific item.

7.04 A maintenance agreement with specialists having knowledge of the equipment within the system(s) may be utilized in place of local maintenance personnel. A manufacturer may also provide factory or on-site maintenance for these units in lieu of local maintenance procedures.

NOTE: Manufacturers supply documentation and recommendations for the testing and maintenance of their products. This documentation will also contain tables depicting values for acceptable levels of sensitivity for their devices, primarily detection units. It is recommended that these manuals be followed closely for the disassembly of all equipment to prevent damage. Documentation for other purposes (installation, removal, testing procedures) should also be carefully reviewed and followed.

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7.05 Ionization Detectors Maintenance - Requirements

Component	Time Frame	Scope of Test
Low voltage	Annually	Sensitivity measured and recorded.
	When needed, (unit appears contaminated with lint, dust or other material; unit performs erratically; major shift in sensitivity reading) 3 years for detectors in clean areas; as frequent as needed elsewhere.	Remove the detector from the base and disassemble the unit per manufacturer's instructions. Clean components per manufacturer's guidelines. Reassemble the detector and take a sensitivity reading for comparison within operating limits as stated by the Manufacturer.
Low voltage		Observe lamps in the base during the check to ascertain that the bulb is not burnt out or broken.
High voltage	Annually	Sensitivity measured and recorded. Light cleaning by dusting off the outer screen.

High voltage	Exceptionally dirty areas - annually, or as needed	Sensitivity measured and recorded. Check for excessive dust build-up and clean, if necessary with a soft brush.

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Component	Time Frame	Scope of Test
	Clean areas every 4 years	If sensitivity reading falls outside of manufacturer's specifications, remove from base and disassemble unit per manufacturer's instructions. Follow manufacturer's instructions for cleaning and reassembling of unit. Check that detector base lamp flashes and that alarm is initiated. Take sensitivity reading to assure that unit falls within the manufacturer's limits.

NOTE: All detectors suspected of exposure to a fire condition shall be tested in accordance with the information in section 6 of this practice.

7.05 Ventilation Duct Detectors Maintenance - Requirements

Component	Time Frame	Scope of Test
Detector	Semi-annually	Check in place for impeded smoke entry or abnormal accumulation of dirt.

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Component	Time Frame	Scope of Test
Detector	Annually	Within 1st year, check detector sensitivity and compare with manufacturer's specifications. After first annual reading, check on alternate years. Visibly inspect, observing detector in installation, including all seals. Note any signs of abuse, alteration to system design, or modification of device. Check the air sampling tubes and clean if necessary. Verify that the device will respond to smoke with minimum air flow through the air sampling tubes. Clean the housing, detector shell and screen of any dust or dirt accumulation.

7.06 Flame, Fire-Gas, And Other Type Detectors Maintenance - Requirements

Component	Time Frame	Scope of Test
Detector	Annually, or as needed	Clean the housing detector shell and components of any dirt or dust accumulation. Take a sensitivity reading and compare with manufacturer's

		specifications. Follow manufacturer's instructions for further information.
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NOTE: Additional guidelines for maintenance procedures affecting the above devices may be found in paragraph 6 of this practice.

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7.07 Control And Annunciator Panel Maintenance - Requirements

Component	Time Frame	Scope of Test
System	Annually	Visual inspection of panel and related equipment. Check all terminal connections for tightness. Check system by activating remote trouble and alarm circuits. Replace any burnt out bulbs during the system check. Follow manufacturer's instructions and review paragraph 6.10, 6.12, and 6.15 of this practice for additional information.

7.08 Maintenance Of Additional Equipment

Maintenance of additional equipment shall be performed utilizing guidelines supplied by the manufacturer in documentation furnished with the equipment. Additional information can be found in paragraph 6 of this practice under the sub-paragraph referencing the desired component or system. Topic headings for that section are as follows:

- 6.01 - Manual Stations**
- 6.02 - Fire Alarm Systems**
- 6.03 - Automatic Fire Detectors**
- 6.04 - Automatic Smoke Detectors**
- 6.05 - Flame, Fire, Gas And Other Detectors**
- 6.06 - Electric Detectors**

- 6.07 - Water Flow Switches**
- 6.08 - Extinguishing System Alarm Switches**
- 6.09 - Supervisory Signal Initialing Devices**
- 6.10 - Annunciators**
- 6.11 - Alarm Indicating Appliance**
- 6.12 - Control Panels**
- 6.13 - Battery Maintenance**
- 6.14 - Emergency Voice/Alarm Communications Systems**
- 6.15 - Trouble Signals**
- 6.16 - Transmission Of Signals To Off-Premises Locations**

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8. QUALIFICATIONS OF MAINTENANCE PERSONNEL

8.01 All personnel assigned to provide maintenance for any system or system appliance, device, or component under this section shall be fully trained and totally familiar with the manufacturer's instructions and recommendations for said device or system. Where in-house personnel are utilized, periodic training sessions shall be conducted to re-familiarize the technician with system components or revisions within the manufacturer's recommendations for testing and maintenance of the equipment.

8.02 When a need exists for specific and involved training and instruction pertaining to a component or system, it is recommended that a company management employee be selected to attend the training session. That employee, after successfully completing the training course, shall serve as a qualified course instructor for training personnel having detection system maintenance and testing responsibilities.

9. RADIATION PRECAUTIONS

9.01 No extraordinary precautions are required when normal maintenance operations are performed referencing ionization detector components, units, or detection systems.

9.02 Defective or damaged ionization heads shall be returned to the system manufacturer for disposal.

9.03 Where spare ionization unit components are stored locally for future use, they shall be stored within a locked metal cabinet for security reasons and for protection from component damage from misuse, mishandling, etc.

10. NOTICE OF ISSUANCE

10.01 This practice is issued by:

District Manager - Building Management Staff
Support Services Staff
233 Mt. Airy Road
Room 233-B03
Basking Ridge, NJ 07920-2398

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MODEL CONTRACT FOR THE INSPECTION,
TESTING, AND MAINTENANCE OF LOCAL,
AUXILIARY, REMOTE STATION, AND PROPRIETARY
SIGNALING SYSTEMS

OVERVIEW

The attached specifications have been prepared for use in those Company locations where “in-house” maintenance personnel do not perform the recommended intervals of maintenance for specialized signaling systems. Most jurisdictional codes and regulations require that persons servicing such detection and fire alarm systems be fully trained and qualified to perform such work. Accordingly, it is felt that in many instances, only qualified contractors will perform this work on systems in company owned/ leased facilities. Although the specifications attached should be sufficiently comprehensive and generic enough to meet most regional needs, potential users of this document should feel free to modify it as local needs dictate, or if local codes and regulations in this jurisdiction of the facility exceed the provisions of this document. Additional information specific to the equipment installed in the facility should be obtainable from the manufacturer of the equipment in question. Local Purchasing and Contract groups should be consulted to add the appropriate and applicable clauses that may be pre-conditions to these specifications.

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I. General Scope Of Work

The Exhibit _____ to Contract Number _____ between AT&T and _____ of _____; sets forth the principal services to be rendered under this contract:

1. The contractor shall provide all applicable testing, and maintenance to local, auxiliary, remote station, and signaling systems installed at the following locations:
2. The contractor shall perform all applicable inspection, testing and maintenance routines in accordance with the guidelines established in all segments of these specifications. The time and date of inspection, testing, and maintenance shall be made to any system unless it is done in accordance with manufacturer's written instructions.
3. All parts provided for replacement of existing device, appliance or system components must be furnished by the manufacturer's of the unit or must be equivalent to the manufacturer(s) specifications. No alterations shall be made to any system unless it is done in accordance with manufacturer's written instructions.
4. All work performed must be accomplished in accordance with the guidelines contained herein; the National Fire Codes (NFPA) Codes 72A, 72B, 72C, 72D, 72E, 72F, 72G, and 72H, and in accordance with the manufacturers specific instructions for the device(s), appliance(s), and system(s) components.
5. Any local codes or regulations that may exist in the jurisdiction related to this type of work shall supersede the provisions of this contract if the requirements are more stringent. The work described herein shall be considered as meeting minimum Company standards.
6. The Contractor or its servicing representative shall be fully trained and qualified to perform all work described herein. Where required by local regulation or code, the contractor or its representative shall be licensed or shall hold the applicable permits to

perform the inspection, testing, and maintenance routines for local, auxiliary, remote station, and proprietary signaling systems. In those jurisdictions where such activity is regulated, the Contractor must furnish copies of the applicable permits/licenses required to AT&T's technical representative prior to the commencement of any work.

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7. All tools and equipment utilized by the contractor to perform the inspection, testing and maintenance routines must be the type approved by local applicable regulations and the manufacturer's specifications.
8. If required by one or more of AT&T's contracted third party loss prevention agencies, authorized personnel representing said agencies may witness any portion of any test performed under the provisions of this contract.
9. The Contractor shall provide a report of any inspection, testing, and maintenance performed on any device(s), appliance(s), or system(s) component(s) to AT&T's technical representative, AT&T's authorized loss prevention agencies, and to the authority having local jurisdiction if local codes require.
10. At the request of AT&T's technical representative, the Contractor shall provide training, familiarization, and short term interval inspection requirements to AT&T's maintenance personnel, or to AT&T's authorized contracted maintenance personnel so as to qualify said personnel to perform inspections between service intervals. Instruction shall consist of the following:
 - how to take a sensitivity reading on a detector
 - how to test and, if necessary, change burnt out bulbs
 - how to properly remove a detector from its mounting without damaging the unit
 - how to re-set false alarms
 - any additional inspection observation and requirement that would insure the proper operation of a device, appliance, or system

II. Specification For Inspection, Testing, And Maintenance Work

A. General

A general inspection shall be made observing the overall physical appearance of the system(s) and its component(s). Records and documentation of any device(s),

appliance(s), or system(s) component(s) should be readily available for study to comparison to present conditions.

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B. Description Of The Inspection, Testing, And Maintenance Procedures For Local, Auxiliary, Remote Station, And Proprietary Signaling Systems

Manual Station Maintenance Specification

Component	Time Frame	Scope Of Test
Break Glass	Semi-annually	Operate per manufacturer's instructions. With break-glass type, remove glass rod before initiating alarm.
Without Break	Semi-annually	Operate per Glass manufacturer's instructions.
Double Action	Semi-annually	Per manufacturer's instructions
Key-Operated Pre-Signal	Semi-annually	Per manufacturer's instructions
Coded	Semi-annually	Per manufacturer's instructions

Fire Alarm System Maintenance Specifications

Component	Time Frame	Scope Of Test
System (manual coded alarm)	Monthly	Operate one station to activate audible alarm. Utilize a different station for each monthly test to insure that all stations will eventually be included in

		the testing procedure.
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Component	Time Frame	Scope Of Test
System	Monthly	In systems where a (automatic) manual alarm stations is installed in combination with an automatic fire detection system, activation of the manual station, initiate the audible alarm by activating the audible alarm circuit at the control panel.

NOTE: Certain automatic fire detection systems utilize a manual alarm. When activated, they shut down the ventilation system for the entire building or the area served by the manual station. In such cases, utilize the audible alarm circuit at the control panel to activate the audible alarm.

Automatic Fire Detector Maintenance Specifications

All detectors shall be visibly inspected in place at least semiannually to assure that each detector remains in good physical condition and that there are no changes that would affect the performance of the unit, such as building structure modification, occupancy hazards, and environmental effects.

(a) Heat Detectors

Component	Time Frame	Scope Of Test
Fixed temperature: Non-restorable type	Acceptance and thereafter, semi-annually	Do not hear test. Test mechanically and electronically for proper function. Measure and record loop resistance of line type and compare with past readings for discrepancies.

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Component	Time Frame	Scope Of Test
Fixed temperature: Non-restorable type	after 15th year in service, every 5 years when failure occurs	(Two) 2 detectors per one hundredx (100) tested at testing facility. Replace these detectors with new devices. In event of failure, test additional detectors to determine system failure or localized area failure.
Fixed temperature and/or Rate-of-Rise or Rate Compensation. Restorable unit. Line or spot type (except pneumatic tube)	Acceptance test 100% of detectors. Test 10% of units every 6 months so that all detectors are tested within 5 years.	Hair dryer or shielded heat lamp. After each test, detector shall re-set. Take precautions to avoid damage to the non-restorable fixed temperature element of a combination rate-of-rise fixed temperature detector.
Restorable line type; pneumatic tube only	Acceptance test 100%, thereafter semi-annually	Heat source (if a test chamber is in the circuit) or test pneumatically with a pressure pump. Check for leaks.

Automatic Smoke Detector Maintenance Specifications

All smoke detectors shall be visually inspected in place at least semi-annually to identify missing or damaged units, detectors with impeded smoke entry, abnormally dirty detectors, and detectors no longer functional for their location.

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Component	Time Frame	Scope Of Test
All Types	Acceptance test 100% of all devices. Thereafter, 100% of all detectors to be functionally tested at least semi-annually. Calibration test after 1 year and then every other year if sensitivity remains unchanged.	Calibrated test method (magnet or probe test manufacturer's calibrated sensitivity instrument). Test functionally in place with smoke or aerosol acceptable to manufacturer. Test shall initiate alarm.
Smoke detector with Built-in thermal element	Refer to time frame section equivalent to type in heat or smoke detector section.	Refer to test section equivalent to type in heat or smoke detector section.

Flame, Fire, Gas, And Other Detectors Maintenance Specifications

Component	Time Frame	Scope Of Test
All Types	100% testing at least semi-annually	Per manufacturer's instructions. Special usage may require more frequent testing.

Electric Detector Maintenance Specifications

Component	Time Frame	Scope Of Test
Thermal link	10 years	Electrically operate or external heat

NOTE: To save on maintenance costs, it is recommended that the link be changed out with a new link instead of performing this test.

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Water Flow Switches Maintenance Specifications

Component	Time Frame	Scope Of Test
Mechanical	2 months	Per manufacturer's instructions
Electrosonic	2 months	Per manufacturer's instructions
Pressure Type	2 months	Per manufacturer's instructions

Extinguishing System Alarm Switches Maintenance Specifications

Component	Time Frame	Scope Of Test
Mechanical	Semi-annually	Per manufacturer's instructions
Pressure	Semi-annually	Per manufacturer's instructions

Supervisory Signal Initialing Devices Maintenance Specifications

Component	Time Frame	Scope Of Test
Post Indicator Valve Switch	Semi-annually	Operate valve
Gate Valve Switch	Semi-annually	Operate valve
High Air Pressure Switch	Semi-annually	Per manufacturer's instructions

Supervisory Signal Initialing Devices Maintenance Specifications (cont'd)

Component	Time Frame	Scope Of Test
Low Air Pressure Switch	Semi-annually	Per manufacturer's instructions
Temperature	Semi-annually	Per manufacturer's instructions
Water Level	Semi-annually	Per manufacturer's instructions

Annunciator Maintenance Specifications

Component	Time Frame	Scope Of Test
Remote	Annually	Verify for proper operation

Alarm Indicating Appliance Maintenance Specifications

Component	Time Frame	Scope Of Test
Audible	Annually	Activate alarm
Visible	Annually	Activate alarm
Speakers (one-way Emergency Voice/Alarm System)	Annually	Put into operation and verify voice clarity
Telephones (two-way Communications Systems)	Annually	Put into operation and verify voice clarity

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Control Unit (Panel) Maintenance Specifications

Component	Time Frame	Scope Of Test
Lamps & LEDs	Annually	Illuminate
Fuses	Annually	Remove fuse and verify rating and supervision
Primary (Main) Power Supply	Acceptance and re-acceptance tests	Disconnect all standby (secondary) power and test under full load for 5 minutes. Include all alarm devices and appliances. After test, reconnect all standby power circuits.
Secondary (Standby) Power Supply	Acceptance and re-acceptance tests	Disconnect all primary (main) power supplies and verify that trouble indicator for loss of power is initiated. Using manufacturer's data, measure system's standby current and calculate whether battery supply can meet standby requirements.
Secondary (Standby) Power Supply	Acceptance and reacceptance tests	Test under full load for 5 minutes, including all alarm devices and appliances, after test, reconnect main power supply.

NOTE: All redundant power supplies are to be tested separately.

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Battery Maintenance Specifications

Component	Time Frame	Scope of Test
Sealed Lead Acid	Acceptance test	Check voltage using full load conditions with battery charger disconnected. Check operation of charger.
	Annually	Check open circuit voltage. Measure battery voltage under full load conditions with charger disconnected. Clean all connections. Check operation of battery charger.
	Every 4 years	Replace battery. Clean all connections before installing new unit.
Lead Acid	Acceptance test	Check voltage under full load with charger disconnected. Check operation of charger.
	Weekly	Observe all connections and check electrolyte levels with appropriate equipment
	Semi-annually	Measure open circuit voltage. Measure specific gravity of electrolyte with appropriate equipment

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Battery Maintenance Specifications (cont'd)

Component	Time Frame	Scope of Test
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Lead Acid	annually	Annually measure battery voltage under full load with charger disconnected. Clean and coat battery terminals using a nonconductive lubricant. Check open circuit voltage. Check operation of charger.
	When needed	Replace battery unit when recharged battery voltage and/or specific gravity falls below manufacturer's recommendations
Nickel-Cadmium	Acceptance test	Check battery voltage under full load conditions with charger disconnected. Check operation of charger.
	Quarterly	Measure open circuit battery voltage. Clean and inspect battery connections.
	Annually	Measure output voltage and current of battery charger. Measure battery voltage under full load with charger disconnected. Check operation of charger.
	When needed	Replace battery when recharged voltage and/or current falls below manufacturer's recommendations

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Emergency Voice/Alarm Communication System Maintenance Specifications

Component	Time Frame	Scope of Test

System	Acceptance and reacceptance tests	Disconnect primary power supply and operate system in a normal manner for 1/4 of the required standby time. All indicating devices and initiating device circuits shall be in an alarm condition for both partial and total evacuation.
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Trouble Signals Maintenance Specifications

Component	Time Frame	Scope of Test
Audible and Visible	Annually	Verify operation of panel trouble signals and ring back feature for systems using a trouble silencing switch which requires resetting.
Zone Disconnect Switches	Annually	Verify trouble signal is received when zone disconnect switch is engaged.
Ground fault Monitoring Circuit	Annually	In systems with ground detection feature, verify a ground fault indicator activation when installation conductor is grounded.

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Transmission Of Signals To Off-Premises Locations Maintenance Specifications

(a) Auxiliary System

Component	Time Frame	Scope of Test

System	Monthly	Activate after prior notification to municipal fire department, if their alarm equipment is involved. Coordinate testing with appropriate parties at the off-premises location. Reset any transmitter used at conclusion of test.
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(b) Remote Station System

Component	Time Frame	Scope of Test
Fire alarm	Monthly	Activate after prior (other than notification to water flow) municipal fire department, if their alarm equipment is involved. Coordinate testing with appropriate parties at the off-premises location. Reset any transmitter used at conclusion of test.

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