

# **ATTACHMENT “G”**

## **SCOPE OF WORK AND SPECIFICATIONS**

**PROJECT NAME: TSTC Challenger Learning Center Fire Alarm System**

### **SECTION ONE: GENERAL**

#### **1.1 Scope**

This specification document provides the requirements for the installation, programming and configuration of a complete Silent Knight 5808 digital protocol analog addressable fire alarm system. This system shall include, but not be limited to, system cabinet, power supply, built in Signaling Line Circuit (SLC), 80 character LCD annunciator, four programmable notification circuits, built in dual line digital communicator associated peripheral devices, batteries, wiring, conduit and other relevant components and accessories required to furnish a complete and operational Life Safety System.

#### **1.2 Work Included**

##### **1.2.1 General Requirements**

The contractor shall remove and reinstall an existing operational Silent Knight 5808 fire alarm control panel and all peripheral fire alarm equipment and devices from the “Telecommunications” building and re-install it in the same facility. Now known as “Challenger Learning Center Building”. The system shall include but not be limited to all existing and additional control panels, power supplies, initiating devices, audible and visual notification appliances, alarm devices, and all accessories required to provide a complete operating fire alarm system.

##### **1.2.2 Listings**

All fire alarm system equipment shall be listed for it's intended purpose and be compatibility listed to assure the integrity of the complete system.

#### **1.3 Standards**

The fire alarm equipment and installation shall comply with the current provisions of the following standards and shall be listed for it's intended purpose and be compatibility listed to insure integrity of the complete system.

**1.3.1 National Electric Code, Article 760**

**1.3.2 National Fire Protection Association Standards:**

NFPA 72      National Fire Alarm Code 2013

**1.3.3 Local and State Building Codes**

IFC- 2012      International Fire Code  
IBC- 2012      International Building Code

**1.3.4 Local Authorities Having Jurisdiction**

Waco Fire Dept.

**1.3.5 Underwriters Laboratories Inc.**

All equipment shall be approved by Underwriters Laboratories, Inc. for its intended purpose, listed as power limited by Underwriters Laboratories, Inc., for the following standards as applicable:

UL 864      UOJZ Control units for Fire Protective Signaling Systems  
                 Local Signaling Unit  
                 Central Station Signaling Protected Premises Unit  
                 Remote Signaling Protected Premises Unit.

UL 268      Smoke Detectors for Fire Protective Signaling systems.  
UL 268A      Smoke Detectors for duct applications  
UL 217      Smoke Detectors for Single Stations  
UL 521      Heat Detectors for Fire Protective Signaling systems.  
UL 228      Door Holders for Fire Protective Signaling systems.  
UL 464      Audible Signaling appliances  
UL 1638      Visual Signaling appliances  
UL 38      Manually Activated Signaling Boxes  
UL 346      Waterflow indicators for Fire Protective Signaling systems.  
UL 1481      Power Supplies for Fire Protective Signaling systems.

**1.3.6 Americans with Disabilities Act (ADA).**

All visual Notification appliances and manual pull stations shall comply with the

requirements of the Americans with Disabilities Act.

#### **1.4 General Requirements**

##### **1.4.1 Manufacturers/Distributors Services:**

##### **1.4.2 Submittals**

The contractor shall submit three (3) complete sets of documentation within thirty (30) calendar days after award of the purchase order. Indicated in the document will be the type, size, rating, style, catalog number, manufacturers names, photos, and /or catalog data sheets for all items proposed to meet these specifications.

The proposed equipment shall be subject to the approval of the Architect/Engineer and no equipment shall be ordered or installed on the premises without that approval.

NOTE: DOCUMENTATION - Submittal of shop drawings shall contain at least three (3) copies of original manufacturer specification and installation instruction sheets. Subsequent information may be copies. All equipment and devices on the shop drawings to be furnished under this contract shall be clearly marked in the specification sheets.

Suppliers qualifications shall be submitted indicating years in business, service policies, warranty definitions, NICET certification, and completion of factory training program and a list of similar installations.

Contractor qualifications shall be supplied indicating years in business and prior experience with installations that include the type of equipment that is to be supplied.

The contractor shall provide hourly Service Rates for this installed Life Safety System with the submittal. These hourly service rates shall be guaranteed for a 1-year period.

##### **1.4.3 Contract close-out Submittals**

Deliver two (2) copies of the following to the owner's representative within Thirty (30) days of system acceptance. The closeout submittals shall include:

- 1) Installation and Programming manuals for the installed Life Safety System.
- 2) Point to point diagrams of the entire Life Safety System as installed. This shall include all connected Smoke Detectors and addressable field

- modules.
- 3) All drawings must reflect device address as verified in the presence of the engineer and/or end user.

#### 1.4.4 **Warranty**

Warranty all materials, installation and workmanship for a one (1) year period, unless otherwise specified. A copy of the manufacturer warranty shall be provided with the close out documentation.

#### 1.4.5 **Products**

This Life Safety System Specification must be conformed to in its entirety to ensure that the installed and programmed Life Safety System will accommodate all of the requirements and operations required by the building owner. Any specified item or operational feature not specifically addressed prior to the bid date will be required to be met without exception.

Submission of product purported to be equal to those specified herein will be considered as possible substitutes only when all of the following requirements have been met:

- 1) Any deviation from the equipment, operations, methods, design or other criteria specified herein must be submitted in detail to the specifying Architect or Engineer a minimum of ten (10) working days prior to the scheduled submission of bids. Each deviation from the operation detailed in these specifications must be documented in detail, including page number and section number, which lists the system function for which the substitution is being proposed.
- 2) A complete list of such substituted products with three (3) copies of working drawings thereof shall be submitted to the approved Architect and/or Consulting Engineer not less than ten (10) working days prior to the scheduled submission of bids.
- 3) The contractor or substitute bidder shall functionally demonstrate that the proposed substitute products are in fact equal in quality and performance to those specified herein.

#### 1.4.6 **General Equipment and Materials Requirements**

All equipment furnished for this project shall be from the original installation or new and unused. All components shall be designed for uninterrupted duty. All equipment, materials, accessories, devices and other facilities covered by this specification or noted on the contract drawings and installation specification shall

be best suited for the intended use and shall be provided by a single manufacturer. If any of the equipment provided under this specification is provided by different manufacturers, then that equipment shall be "Listed" as to its compatibility by Underwriters Laboratories (UL), if such compatibility is required by UL standards.

#### **1.4.7 Satisfying the Entire Intent of these Specifications**

It is the contractor's responsibility to meet the entire intent of these specifications.

Deviations from the specified items shall be at the risk of the contractor until the date of final acceptance by the architect, engineer, and owner's representative.

All costs for removal, relocation, or replacement of a substituted item shall be at the risk of the electrical contractor.

## **SECTION TWO: SPECIFICATIONS**

### **2.1 General**

#### **2.1.1 Control Panel**

The fire alarm control panel (FACP) shall be the Existing Silent Knight 5808 analog addressable control panel.

#### **2.1.2 System Wiring**

The Signaling Line Circuit (SLC) and Data Communication Bus (S-BUS) shall be wired with standard NEC 760 compliant wiring, no twisted, shielded or mid capacitance wiring is required for standard installations. All FACP screw terminals shall be capable of accepting 14-18 AWG wire. All system wiring shall be in accordance with the requirements of NFPA 70, the National Electrical Code (NEC) and also comply with article 760 of the NEC.

#### **2.1.3 Signaling Line Circuits**

Each SLC shall be capable of a wiring distance of 10,000 feet from the SLC driver module and be capable of supporting 127 addressable devices. The communication protocol to SLC devices must be digital. Any SLC loop device, which goes into alarm, must interrupt the polling cycle for priority response from the FACP. The FACP must respond consistently to a device that goes into alarm on an SLC in under 3 seconds. The SLC shall be capable of functioning in a class A or class B configuration.

#### **2.1.4 SLC loop devices**

Devices supported must include analog photoelectric, ionization smoke detectors, analog heat detectors, addressable input modules, relay output modules or addressable notification modules. There is to be no limit to the number of any particular device type up to the maximum of 127 devices that can be connected to the SLC.

#### **2.1.5 Analog detector functions**

The products of combustion detectors must communicate analog values using a digital protocol to the control panel for the following functions:

- 1) Automatic compliance with NFPA 72 standards for detector sensitivity testing
- 2) Drift compensation to assure detector is operating correctly
- 3) Maintenance alert when a detector nears the trouble condition
- 4) Trouble alert when a detector is out of tolerance
- 5) Alert control panel of analog values that indicate fire.

#### **2.1.6 Sensitivity function**

The FACP shall have the ability to set three different sensitivity levels. A zone can be programmed to a day and a night sensitivity value. The day/night schedule shall allow for 16 holiday dates that are user programmable to allow the FACP to respond at the night level on those days.

#### **2.1.7 Programmable Notification Circuits**

The FACP shall support four programmable notification circuits that are capable of being programmed as supervised reverse polarity notification circuits or supervised auxiliary power circuits that can be programmed as continuous, reset able or door holder power. These circuits shall be programmable for Class A or Class B operation.

#### **2.1.8 Addressable Notification Module**

The contractor shall furnish and install where indicated on the plans, addressable notification modules, Silent Knight model SD-500-ANM. The modules shall be U.L. listed compatible with Silent Knight's 5808 fire alarm control panel. The notification module must provide one class A (Style Z) or class B (Style Y) notification output with one auxiliary power input. The notification module must be suitable for mounting in a standard 4 square electrical box and must include a plastic cover plate. The notification module must provide an LED that is visible

from the outside of the cover plate. The notification module must be fully programmable for such applications as required by the installation. The IDP module shall reside on the SLC loop and can be placed up to 10,000ft. from the control panel.

#### **2.1.9 Annunciators**

The main control must have a built in annunciator with an 80-character LCD display and feature LED's for General alarm, Supervisory, System trouble, System Silence and Power. When in the normal condition the LCD shall display time and date based on a 200 year clock which is capable of automatic daylight savings time adjustments. All controls and programming keys are silicone mechanical type with tactile and audible feedback. Keys have a travel of .040 in.. No membrane style buttons will be permissible. The annunciator must be able to silence and reset alarms through the use of a keypad-entered code, or by using a firefighters key. The annunciators must have two levels of user codes that will allow the limitation of operating system programming to authorized individuals.

#### **2.1.10 Remote Annunciators**

The fire system shall be capable of supporting up to eight remote LCD annunciators in any combination. LCD remote annunciator Model RA-100 shall have the same control and display layout so that they match identically the built in annunciator. The 5860 shall have the same functionality and operation as the built in annunciator. LCD remote annunciator Model 5860 shall be an approved optional annunciator. All annunciators must have 80-character LCD displays and must feature five LED's for general alarm, supervisory, system trouble, system silence, and system power. All controls and programming keys are silicone mechanical type with tactical and audible feedback. Keys shall have a travel of .040 inches. No membrane style buttons will be permitted.

The 5860 must be able to acknowledge, silence and reset alarms without the use of a code. The 5860 must silence and reset alarms with the user of a code or firefighter's key. The annunciators must have 20 programmable user codes that will limit the operating system programming to authorized individuals. The control panel must allow all annunciators to accommodate multiple users input simultaneously. Remote annunciators shall be capable of operating at a distance of 6000 feet from the main control panel on unshielded non-twisted cable.

#### **2.1.13 Distributed Power Module**

The contractor shall supply (where required) a power module model 5495 compatible with the 5808 fire alarm control panel. The power module must have 6 amps of output power with four notification circuits rated at 3 amps each. The four notification circuits shall have the same functionality as the notification circuits on the main panel.

#### **2.1.14 Digital Communicator**

The digital communicator must be an integral part of the control panel and be capable of reporting all zones or points of alarm, supervisory, and trouble conditions as well as all system status information such as loss of AC, low battery, ground fault, and loss of supervision to any remote devices with individual and distinct messages to a central station or remote station. The communicator must also be capable of up/downloading of all system programming options, Event history and Sensitivity compliance information to a PC on site or at a remote location.

The communicator shall have an answering machine bypass feature that will allow the panel to respond to communication even on phone lines that have other communication equipment present. The communicator must be capable of reporting via SIA and Contact ID formats. The communicator shall have a delayed AC loss report function which will provide a programmable report delay plus a 10-25 min random component to help ease traffic to the central station during a power outage. No controls that use External modems for remote programming and diagnostics shall be accepted.

#### **2.1.15 Dry Contacts**

The FACP will have three form "C" dry contacts, one will be dedicated to trouble conditions, the other two will be programmable for alarm, trouble, sprinkler supervisory, notification, pre-alarm, waterflow, manual pull, aux. 1 or aux. 2. The trouble contact shall be normal in an electrically energized state so that any total power loss (AC and Backup) will cause a trouble condition. In the event that the Microprocessor on the FACP fails the trouble contacts shall also indicate a trouble condition.

#### **2.1.16 Ground Fault Detection**

A ground fault detection circuit, to detect positive and negative grounds on all field wiring. The ground fault detector shall operate the general trouble devices as specified but shall not cause an alarm to be sounded. Ground fault will not interfere with the normal operation, such as alarm, or other trouble conditions.

#### **2.1.17 Over current Protection**

All low voltage circuits will be protected by microprocessor controlled power limiting or have self -restoring polyswitches for the following: smoke detector

power, main power supply, indicating appliance circuits, battery standby power and auxiliary output.

#### **2.1.18 Test Functions**

A "Lamp Test" mode shall be a standard feature of the fire alarm control panel and shall test all LED's and the LCD display on the main panel and remote annunciators.

A "Walk Test" mode shall be a standard feature of the fire alarm control panel. The walk test feature shall function so that each alarm input tested will operate the associated notification appliance for six seconds. The FACP will then automatically perform a reset and confirm normal device operation. The event memory shall contain the information on the point tested, the zone tripped, the zone restore and the individual points return to normal.

A "Fire Drill" mode shall allow the manual testing of the fire alarm system notification circuits. The "Fire Drill" shall be capable of being controlled at the main annunciator, remote annunciators and via a remote contact input.

A "Bypass Mode" shall allow for any point or nac circuit to be bypassed without effecting the operation of the total fire system.

#### **2.1.19 Remote Input Capabilities**

The control panel shall have provisions for supervised switch inputs for the purpose of alarm reset and alarm and trouble silence.

#### **2.1.20 Notification Appliance Mapping Structure**

All notification circuits and modules shall be programmable via a mapping structure that allows for a maximum of 125 output groups. Each of these groups shall have the ability to be triggered by any of the panels 125 Zones. A group may be triggered from zones individually, or may contain a global trigger for manual pull stations, fire drills and two different system alarms. Additionally each zone will individually control the cadence pattern of each of the groups that it is "Mapped" to so that sounders can indicate a variety of conditions. The zone shall be capable of issuing a different cadence pattern for each of the groups under it's control. The mapping structure must also allow a group to be designated to "ignore cadence" for use with strobes and other continuous input devices. Zones shall have eight different output categories; Detector alarm, Trouble, Supervisory, Pre-alarm, Waterflow, Manual Pull, Zone Auxiliary one and Zone Auxiliary two. Each of the categories shall have the ability to control from 1 to 8 output groups with a cadence pattern. The patterns are; March code, ANSI 3.41, Single Stroke

Bell Temporal, California code, Zone 1 coded, Zone 2 coded, Zone 3 coded, Zone 4 coded, Zone 5 coded, Zone 6 coded, Zone 7 coded, Zone 8 coded, Custom output pattern 1, Custom output pattern 2, Custom output pattern 3, Custom output pattern 4, and Constant. This mapping/cadence pattern shall be supported by all system power supplies and Notification Expander Modules.

#### **2.1.21 On board programmer**

The FACP shall have an on board programmer which will allow for all system functions and options to be programmed via the on board annunciator keypad. Any panel that does not have this capability will not be accepted.

#### **2.1.22 Downloading Software**

The fire alarm control panel must support up/downloading of system programming from a PC under Windows or NT platforms. The FACP must also be able to download the detector sensitivity test results and a 1000 event system event buffer to the PC. Communication shall take place over a direct connection to the PC and/or via the same telephone lines as the built in digital communicator and shall not require an external modem to be connected to the panel. The downloading software shall contain a code that will block unauthorized persons from accessing the panel via direct connection or over the phone lines.

#### **2.1.23 Facility Management Software**

The FACP must support facility management software capable of providing off site access to FACP data that is necessary to manage fire system operation. A software package capable of uploading the detector sensitivity test results and the 1000 event system event buffer to the PC shall be required as part of the bid package. Communication shall take place over a direct connection to the PC and/or via the same telephone lines as the built in digital communicator. The facility management package must be separate from the downloader package and must not be capable of affecting programmed system options.

#### **2.1.24 English language descriptions**

The FACP shall provide the ability to have a text description of each system device, input zone, and output group on the system. The use of individual lights to provide descriptions will not be acceptable except when used for remote annunciation.

### **2.2 SYSTEM OPERATION**

#### **2.2.1 Alarm**

When a device indicates any alarm condition the control panel must respond

within 3 seconds. The General Alarm or Supervisory Alarm LED on the annunciator(s) should light and the LCD should prompt the user as to the number of current events. The alarm information must be stored in event memory for later review. Event memory must be available at the main and all remote annunciators.

When the alarmed device is restored to normal, the control panel shall be required to be manually reset to clear the alarm condition, except that the alarms may be silenced as programmed.

An alarm shall be silenced by a code or Firefighter key at the main or remote annunciators. When silenced, this shall not prevent the resounding of subsequent events if another event should occur (subsequent alarm feature). When alarms are silenced the silenced LED on the control panel, and on any remote annunciators shall remain lit, until the alarmed device is returned to normal

### **2.2.2 Troubles**

When a device indicates a trouble condition, the control panel System Trouble LED should light and the LCD should prompt the user as to the number of current events. The trouble information must be stored in event memory for later review. Event memory must be available at the main and all remote annunciators.

When the device in trouble is restored to normal, the control panel shall be automatically reset, The trouble restore information must be stored in event memory for later review. Event memory must be available at the main and all remote annunciators. A trouble shall be silenced by a code or Firefighter key at the main or remote annunciators. When silenced, this shall not prevent the resounding of subsequent events if another event should occur.

### **2.2.3 Supervision methods**

The SLC loop shall be electrically supervised for opens and ground faults in the circuit wiring, and shall be so arranged that a fault condition on any loop will not cause an alarm to sound. Additionally, every addressable device connected to the SLC will be supervised and individually identified if in a fault condition. The occurrence of any fault will light a trouble LED and sound the system trouble sounder, but will not interfere with the proper operation of any circuit which does not have a fault condition.

Each indicating appliance circuit shall be electrically supervised for opens, grounds and short circuit faults, on the circuit wiring, and shall be so arranged that a fault condition on any indicating appliance circuit or group of circuits will not cause an alarm to sound. The occurrence of any fault will light the trouble LED and sound the system trouble sounder, but will not interfere with the proper operation of any circuit which does not have a fault condition.

## **SECTION THREE: SYSTEM COMPONENTS**

### **3.1 System Cabinet**

#### **3.1.1 Mounting**

The system cabinet shall be red and can be either surface or flush mounted. The cabinet door shall be easily removable to facilitate installation and service. All controls and function shall be behind the locked door but must be visible through a viewing window.

#### **3.1.2 Audible System Trouble Sounder**

An audible system trouble sounder shall be an integral part of the control unit. Provisions shall also be provided for an optional supervised remote trouble signal.

### **3.2 Power Supply and Charger:**

The entire system shall operate on 24 VDC, filtered switch mode power supply with the rated current available of 6 Amps. The FACP must have a battery charging circuit capable of complying with the following requirements:

Sixty (60) hours of battery standby with five (5) minutes of alarm signaling at the end of this sixty (60) hour period (as required per NFPA 72 remote station signaling requirements) using rechargeable batteries with automatic charger to maintain standby gel-cell batteries in a fully charged condition.

OR

Twenty-four (24) hours of battery standby with five (5) minutes of alarm signaling at the end of this twenty-four (24) hour period (as required per NFPA 72 central station signaling requirements) using rechargeable batteries with automatic charger to maintain gel-cell batteries in a fully charged condition.

The power supply shall comply with U.L. Standard 864 and NFPA 70 Article 760 for power limiting.

The FACP will indicate a trouble condition if there is a loss of AC power or if the batteries are missing or of insufficient capacity to support proper system operation in the event of AC failure. A "Battery Test" will be performed automatically every minute to check the integrity of the batteries. The test must disconnect the

batteries from the charging circuit and place a load on the battery to verify the battery condition.

In the event that it is necessary to provide additional power one or more of the model 5495 Distributed Power Modules shall be used to accomplish this purpose.

### 3.2.1 **Connections and Circuits**

Connections to the light and power service shall be on a dedicated branch circuit in accordance with the National Fire Alarm Code NFPA 72, National Electrical Code (NEC) NFPA 70, and the local authority having jurisdiction (AHJ).

The circuit and connections shall be mechanically protected.

A circuit disconnecting means shall be accessible only to authorized personnel and shall be clearly marked "FIRE ALARM CIRCUIT CONTROL".

## 4.3 Furnish and install:

### 4.3.1 **Manual Fire Alarm Stations**

Manual Fire Alarm Stations shall be non-coded, break glass, single or double action type, with a key operated test-reset lock in order that they may be tested, and so designed that after actual emergency operation, they cannot be restored to normal except by use of a key. The reset key shall be so designed that it will reset manual station and open FACP without use of another key.

An operated station shall automatically condition itself so as to be visually detected, as operated, at a minimum distance of fifty feet, front or side. Manual stations shall be constructed of die cast metal with clearly visible operating instructions on the front of the stations in raised letters.

### 4.3.2 **Remote Power Supplies**

The remote power supply model 5495 or 5499 may also be used on the system. These power supplies support 6amps or 9amps of 24VDC power with 4 notification circuits rated at 3amps each. These power boosters may also be activated from another notification circuit from either the fire alarm control or the Distributed Power Modules.

## 4.4 **Notification Devices**

The visual and audio/visual signaling devices shall be compatible with the 5808 and the 5495, as stated in the installation manuals and be Listed with Underwriters Laboratories Inc. per UL 1971 and/or 1638. Each indicating appliance circuit shall be electrically supervised for opens, grounds and short

circuit faults, on the circuit wiring, and shall be so arranged that a fault condition on any indicating appliance circuit or group of circuits will not cause an alarm to sound. The occurrence of any fault will light the trouble LED and sound the system trouble sounder, but will not interfere with the proper operation of any circuit which does not have a fault condition. The notification appliance (combination audio/visual units only) shall produce a peak sound output of 90dba or greater as measured in an anechoic chamber. The appliance shall be capable of meeting the candela requirements of the blueprints presented by the Engineer and ADA. The appliance shall be polarized to allow for electrical supervision of the system wiring. The unit shall be provided with terminals with barriers for input/output wiring and be able to mount a single gang or double gang box or double workbox with the use of an adapter plate. The unit shall have an input voltage range of 19-30 volts. Appliances shall be Wheelock AS-MCCW, RS-MCCW or equivalent.

#### 4.5 **Smoke Detectors**

Smoke detectors shall be Silent Knight model SD-505-APS ceiling mounted, Analog/Addressable photoelectric smoke detectors. The combination detector head and twist lock base shall be U.L. listed compatible with the Silent Knight 5808 fire alarm control panel.

The base shall be the appropriate twist lock base SD-505-6AB.

The smoke detector shall have a flashing status LED for visual supervision. When the detector is actuated, the LED will produce quick flashes or latch on steady at full brilliance. The detector may be reset by actuating the control panel's reset switch. The sensitivity of the detector shall be capable of being selected and measured by the control panel without the need for external test equipment.

The vandal security-locking feature shall be used in those areas as indicated on the drawing. The locking feature shall be field selectable when required. It shall be possible to perform a sensitivity test of the detector without the need of generating smoke. The test method shall simulate the effects of products of combustion in the chamber to ensure testing of the detector circuits.

#### 4.6 **Heat Detectors**

Where required, furnish and install analog/addressable heat detectors, Silent Knight model SD-505-AHS. The combination heat detector and twist lock base shall be U.L. listed compatible with the Silent Knight 5808 fire alarm control panel. The base shall be appropriate twist lock base SD-5056AB. The heat detector shall have a flashing status LED for visual supervision. When the detector is actuated, the LED will produce quick flashes or latch on steady at full brilliance. The detector may be reset by actuating the control panel's reset switch. The vandal security-locking feature shall be used in those areas as indicated on

the drawings. Electronics of the unit shall be shielded to protect against false alarms from E.M.I. and R.F.I.

#### **4.7 Duct Detectors**

Duct Detector shall be Silent Knight Model SD-505-DUCT Housings with the Model SD-505-APS Smoke detectors.

### **SECTION FIVE: WIRING**

#### **5.1 Installer's Responsibilities**

The installer shall coordinate the installation of the fire alarm equipment.

All conductors and wiring shall be installed according to the manufacturer's recommendations.

It shall be the installer's responsibility to coordinate with the supplier, regarding the correct wiring procedures before installing any conduits or conductors.

#### **5.2 Installation of System Components**

System components shall be installed in accordance with the latest revisions of the appropriate NFPA pamphlets, the requirements contained herein, National Electrical Code, local and state regulations, the requirements of the fire department and other applicable authorities having jurisdiction (AHJ).

All wire used on the fire alarm system shall be U.L. Listed as fire alarm protection signaling circuit cable per National Electrical Code, Articles 760.

### **SECTION SIX: WARRANTY AND FINAL TEST**

#### **6.1 General**

The contractor shall warrant all equipment and wiring free from inherent mechanical and electrical defects for one year (365 days) from the date of final acceptance.

#### **6.2 Final Test**

Before the installation shall be considered completed and acceptable by the awarding authority, a test of the system shall be performed as follows:

The contractor's job foreman, a representative of the owner, and the fire department shall operate every building fire alarm device to ensure proper

operation and correct annunciation at the control panel.

At least one half of all tests shall be performed on battery standby power.

Where application of heat would destroy any detector, it may be manually activated.

The communication loops and the indicating appliance circuits shall be opened in at least two (2) locations per circuit to check for the presence of correct supervision circuitry.

When the testing has been completed to the satisfaction of both the contractor's job foreman and owner, a notarized letter cosigned by each attesting to the satisfactory completion of said testing shall be forwarded to the owner and the fire department.

The contractor shall leave the fire alarm system in proper working order, and, without additional expense to the owner, shall replace any defective materials or equipment provided by him under this contract within one year (365 days) from the date of final acceptance by the awarding authority.

Prior to final test the fire department must be notified in accordance with local requirements.

### **6.3 As Built Drawings, Testing, and Maintenance Instructions**

#### **6.3.1 As Built Drawings**

A complete set of reproducible "as-built" drawings showing installed wiring, color coding, and wire tag notations for exact locations of all installed equipment, specific interconnections between all equipment, and internal wiring of the equipment shall be delivered to the owner upon completion of system.

#### **6.3.2 Operating and Instruction Manuals**

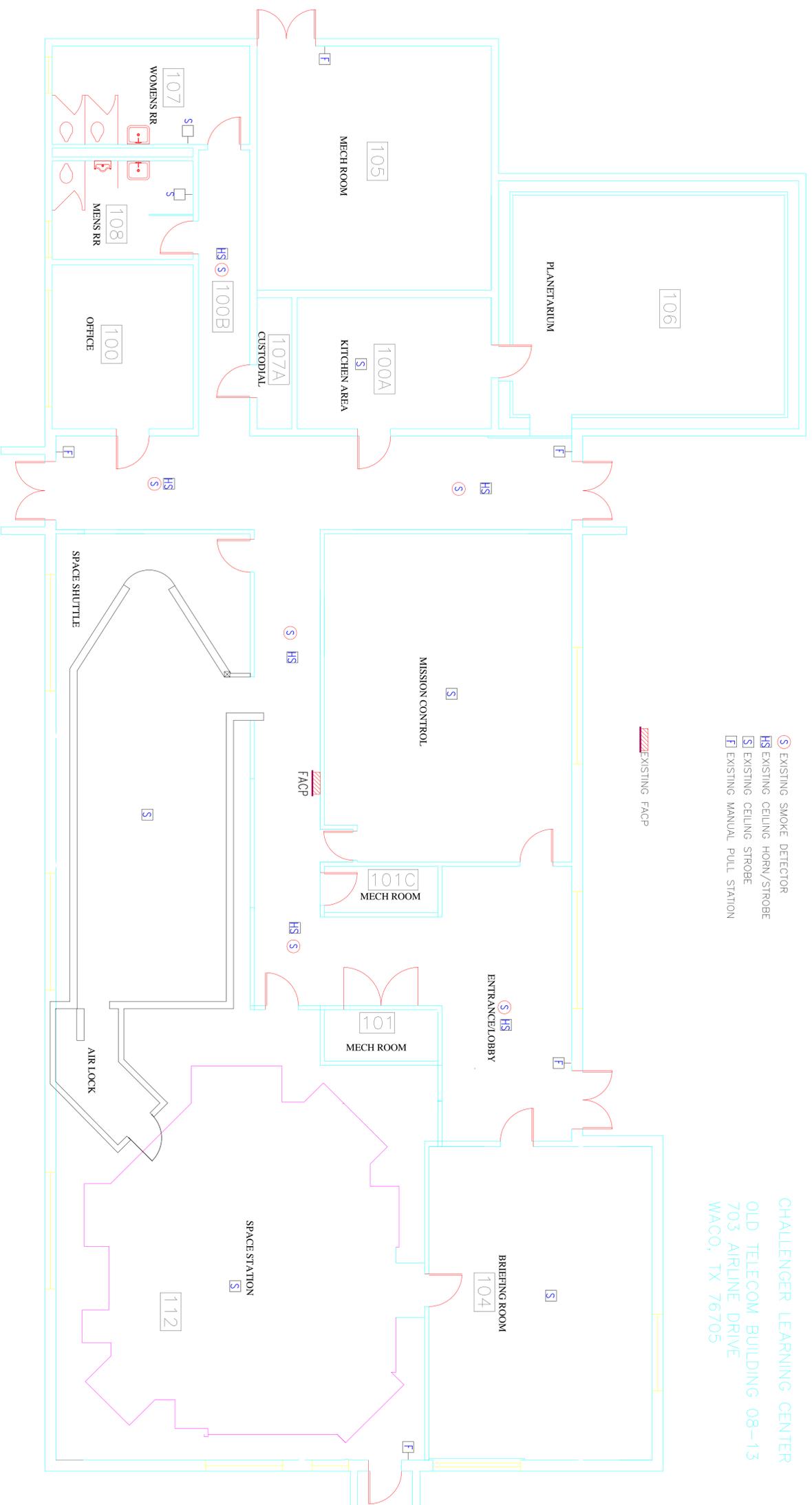
Operating and instruction manuals shall be submitted prior to testing of the system. Three (3) complete sets of operating and instruction manuals shall be delivered to the owner upon completion. User operating instructions shall be provided prominently displayed on a separate sheet located next to the control unit in accordance with U.L. Standard 864.

**FOLLOWING ARE THE PLANS THAT SHOW WHERE THE EXISTING DEVICES ARE TO BE INSTALLED AS WELL AS THE NEW CONTRACTOR FURNISHED AND INSTALLED DEVICES ARE TO BE INSTALLED.**

CHALLENGER LEARNING CENTER  
 OLD TELECOM BUILDING 08-13  
 703 AIRLINE DRIVE  
 WACO, TX 76705

- Ⓢ EXISTING SMOKE DETECTOR
- HS EXISTING CEILING HORN/STROBE
- S EXISTING CEILING STROBE
- F EXISTING MANUAL PULL STATION

EXISTING FACP



CHALLENGER LEARNING CENTER  
 OLD TELECOM BUILDING 08-13  
 703 AIRLINE DRIVE  
 WACO, TX 76705

