This addendum forms a part of the Contract Documents and modifies the original Documents dated **April 5, 2023,** as noted below. Acknowledge receipt of this addendum in the space provided on the Official Bid Form. Failure to do so may subject the Bidder to disqualification.

QUESTIONS AND CLARIFICATIONS

Question: I have been unable to see the finish schedule for the louvers. Mill, Paintable or factory finish?

Answer: The louvers shall have a prime coat finish. Final paint coat finish will be applied in the field by others. The Louver Schedule has been updated to indicate this finish.

Question: Previously we have ran across issues with the fire alarm systems and our HVAC smoke detectors. I am unable to find a reference as to who is covering fire alarm system controls and parts.

Answer: The return air duct smoke detectors shall be provided by the fire alarm contractor and shall be connected to the fire alarm system. The unit shall shut down upon activation of the smoke detector. Additional notes have been added to the mechanical and electrical sheets.

REVISIONS TO SPECIFICATION SECTION 28 4621.11 – ADDRESSABLE FIRE ALARM SYSTEMS
Added text in the fire alarm specification is in bold.

REVISIONS TO PROJECT DRAWINGS M2.01 – MECHANICAL PLAN
Note added to SHEET NOTES.

REVISIONS TO PROJECT DRAWINGS M3.01 – MECHANICAL SCHEDULES AND DETAILS
The DIFFUSER AND GRILL SCHEDULE was replaced with the LOUVER SCHEDULE.
A note was updated on detail 3 - FURNACE & COOLING COIL DETAIL – HORIZONTAL.

REVISIONS TO PROJECT DRAWINGS E0.02 – ELECTRICAL LEGENDS AND NOTES
An item was added to the FIRE ALARM LEGEND.

REVISIONS TO PROJECT DRAWINGS E2.02 – ATTIC PLAN - ELECTRICAL
Items added to 1 – ATTIC PLAN.

ATTACHMENTS

SPECIFICATION SECTION 28 4621.11 – ADDRESSABLE FIRE ALARM SYSTEMS
PROJECT DRAWINGS M2.01 – MECHANICAL PLAN
PROJECT DRAWINGS M3.01 – MECHANICAL SCHEDULES AND DETAILS
PROJECT DRAWINGS E0.02 – ELECTRICAL LEGENDS AND NOTES
PROJECT DRAWINGS E2.02 – ATTIC PLAN - ELECTRICAL

END OF ADDENDUM 2

SECTION 284621.11 - ADDRESSABLE FIRE-ALARM SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Fire-alarm control unit (FACU).
2. Manual fire-alarm boxes.
3. System smoke detectors.
4. **Duct smoke detectors**
5. Fire-alarm notification appliances.
6. Fire-alarm addressable interface devices.
7. Digital alarm communicator transmitters (DACTs).
8. Connection to existing addressable fire-alarm system.

B. Related Requirements:

1. Section 260519 "Low-Voltage Electrical Power Conductors and Cables" or Section 260523 "Control Voltage Electrical Power Cables" for cables and conductors for fire-alarm systems.

1.3 DEFINITIONS

A. DACT: Digital alarm communicator transmitter.

B. EMT: Electrical metallic tubing.

C. FACU: Fire-alarm control unit.

D. Mode: The terms "Active Mode," "Off Mode," and "Standby Mode" are used as defined in the 2007 Energy Independence and Security Act (EISA).

E. NICET: National Institute for Certification in Engineering Technologies.

F. PC: Personal computer.

G. Voltage Class: For specified circuits and equipment, voltage classes are defined as follows:

1. Control Voltage: Listed and labeled for use in remote-control, signaling, and power-limited circuits supplied by a Class 2 or Class 3 power supply having rated output not greater than 150 V and 5 A, allowing use of alternate wiring methods complying with NFPA 70, Article 725.

2. Low Voltage: Listed and labeled for use in circuits supplied by a Class 1 or other power supply having rated output not greater than 1000 V, requiring use of wiring methods complying with NFPA 70, Article 300, Part I.

1.4 SEQUENCING AND SCHEDULING

A. Existing Fire-Alarm Equipment: Maintain existing equipment fully operational. When new equipment is installed, label it "NOT IN SERVICE" until it is accepted. Remove labels from new equipment when put into service.

1.5 ACTION SUBMITTALS

A. Approved Permit Submittal: Submittals must be approved by authorities having jurisdiction prior to submitting them to Architect.

B. Product Data: For each type of product, including furnished options and accessories.

1. Include construction details, material descriptions, dimensions, profiles, and finishes.
2. Include rated capacities, operating characteristics, and electrical characteristics.

C. Shop Drawings: For fire-alarm system.

1. Comply with recommendations and requirements in "Documentation" section of "Fundamentals" chapter in NFPA 72.
2. Include plans, elevations, sections, and details, including details of attachments to other Work.
3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
4. Detail assembly and support requirements.
5. Include voltage drop calculations for notification-appliance circuits.
6. Include battery-size calculations.
7. Include input/output matrix.
8. Include written statement from manufacturer that equipment and components have been tested as a system and comply with requirements in this Section and in NFPA 72.
9. Include performance parameters and installation details for each detector.
10. **Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.**
11. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits and point-to-point wiring diagrams.

1.6 INFORMATIONAL SUBMITTALS

A. Certificates:

1. Seismic Performance Certificates: For FACU, accessories, and components, from manufacturer. Include the following information:

a. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

b. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
c. Detailed description of equipment anchorage devices on which certification is based and their installation requirements.

B. Field quality-control reports.

C. Qualification Statements: For Installer.

D. Sample Warranty: Submittal must include line item pricing for replacement parts and labor.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following and deliver copies to authorities having jurisdiction:

a. Comply with "Records" section of "Inspection, Testing and Maintenance" chapter in NFPA 72.
b. Provide "Fire-Alarm and Emergency Communications System Record of Completion Documents" in accordance with "Completion Documents" Article in "Documentation" section of "Fundamentals" chapter in NFPA 72.
c. Complete wiring diagrams showing connections between devices and equipment. Each conductor must be numbered at every junction point with indication of origination and termination points.
d. Riser diagram.
e. Device addresses.
f. Record copy of site-specific software.
g. Provide "Inspection and Testing Form" in accordance with "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:

1) Equipment tested.
2) Frequency of testing of installed components.
3) Frequency of inspection of installed components.
4) Requirements and recommendations related to results of maintenance.
5) Manufacturer's user training manuals.

h. Manufacturer's required maintenance related to system warranty requirements.
i. Abbreviated operating instructions for mounting at FACU.

B. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On USB media and approved online or cloud solution.
3. Device address list.
4. Printout of software application and graphic screens.

1.8 QUALITY ASSURANCE

A. Installer Qualifications:

1. Personnel must be trained and certified by manufacturer for installation of units required for this Project.
2. Installation must be by personnel certified by NICET as fire-alarm Level IV technician.
3. Obtain certification by NRTL in accordance with NFPA 72.
4. Licensed or certified by authorities having jurisdiction.

1.9 FIELD CONDITIONS

A. Seismic Conditions: Unless otherwise indicated on Contract Documents, specified Work in this Section must withstand the seismic hazard design loads determined in accordance with ASCE/SEI 7 for installed elevation above or below grade.

1. The term "withstand" means "unit must remain in place without separation of parts from unit when subjected to specified seismic design loads."

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail because of defects in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ADDRESSABLE FIRE-ALARM SYSTEM

A. Description:

1. Noncoded, UL-certified addressable system, with multiplexed signal transmission and horn-and-strobe notification for evacuation.

B. Performance Criteria:

1. Regulatory Requirements:

a. Fire-Alarm Components, Devices, and Accessories: Listed and labeled by a NRTL in accordance with NFPA 70 for use with selected fire-alarm system and marked for intended location and application.

2. General Characteristics:

a. Automatic sensitivity control of certain smoke detectors.
b. Fire-alarm signal initiation must be by one or more of the following devices:

1) Manual stations.
2) Smoke detectors.
3) Duct smoke detectors.

c. Fire-alarm signal must initiate the following actions:

1) Continuously operate alarm notification appliances.
2) Identify alarm and specific initiating device at FACU, connected network control panels, off-premises network control panels, and remote annunciators.
3) Transmit alarm signal to remote alarm receiving station.
4) Switch HVAC equipment controls to fire-alarm mode.
5) Record events in system memory.
6) Record events by system printer.

d. Supervisory signal initiation must be by one or more of the following devices and actions:

1) Zones or individual devices have been disabled.
2) FACU has lost communication with network.

e. System trouble signal initiation must be by one or more of the following devices and actions:

1) Open circuits, shorts, and grounds in designated circuits.
2) Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
3) Loss of communication with addressable sensor, input module, relay, control module, remote annunciator, printer interface, or Ethernet module.
4) Loss of primary power at FACU.
5) Ground or single break in internal circuits of FACU.
6) Abnormal ac voltage at FACU.
7) Break in standby battery circuitry.
8) Failure of battery charging.
9) Abnormal position of switch at FACU or annunciator.

f. System Supervisory Signal Actions:

1) Initiate notification appliances.
2) Identify specific device initiating event at FACU, connected network control panels, off-premises network control panels, and remote annunciators.
3) Record event on system printer.
4) After time delay of 200 seconds, transmit trouble or supervisory signal to remote alarm receiving station.

g. Network Communications:

1) Provide network communications for fire-alarm system in accordance with fire-alarm manufacturer's written instructions.
2) Provide network communications pathway per manufacturer's written instructions and requirements in NFPA 72 and NFPA 70.

h. System Printer:

1) Printer must be listed and labeled as integral part of fire-alarm system.

i. Device Guards:

1) Description: Welded wire mesh of size and shape for manual station, smoke detector, gong, or other device requiring protection.

a) Factory fabricated and furnished by device manufacturer.
b) Finish: Paint of color to match protected device.

j. Document Storage Box:

1) Description: Enclosure to accommodate standard 8-1/2-by-11 inch (216-by-279 mm) manuals and loose document records. Legend sheet will be permanently attached to door for system required documentation, key contacts, and system information. Provide two key ring holders with location to mount standard business cards for key contact personnel.
2) Material and Finish: 18-gauge cold-rolled steel; four mounting holes.
3) Color: Red powder-coat epoxy finish.
4) Labeling: Permanently screened with 1 inch (25 mm) high lettering "SYSTEM RECORD DOCUMENTS" with white indelible ink.
5) Security: Locked with 3/4 inch (19 mm) barrel lock. Provide solid 12 inch (304 mm) stainless steel piano hinge.

2.2 FIRE-ALARM CONTROL UNIT (FACU)

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Silent Knight.

B. Description: Field-programmable, microprocessor-based, modular, power-limited design with electronic modules.

C. Performance Criteria:

1. Regulatory Requirements: Comply with NFPA 72 and UL 864.
2. General Characteristics:

a. System software and programs must be held in nonvolatile flash, electrically erasable, programmable, read-only memory, retaining information through failure of primary and secondary power supplies.
b. Include real-time clock for time annotation of events on event recorder and printer.
c. Provide communication between FACU and remote circuit interface panels, annunciators, and displays.
d. FACU must be listed for connection to central-station signaling system service.
e. Provide nonvolatile memory for system database, logic, and operating system and event history. System must require no manual input to initialize in the event of complete power down condition. FACU must provide minimum 500-event history log.
f. Addressable Initiation Device Circuits: FACU must indicate which communication zones have been silenced and must provide selective silencing of alarm notification appliance by building communication zone.

1) Addressable Control Circuits for Operation of Notification Appliances and Mechanical Equipment: FACU must be listed for releasing service.

g. Alphanumeric Display and System Controls: Arranged for interface between human operator at FACU and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and programming and control menu.

1) Annunciator and Display: LCD, two line(s) of 40 characters, minimum.
2) Keypad: Arranged to permit entry and execution of programming, display, and control commands.

h. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:

1) Pathway Class Designations: NFPA 72, Class B.
2) Pathway Survivability: Level 0.
3) Install no more than 50 addressable devices on each signaling-line circuit.
4) Install fault circuit isolators to comply with circuit performance requirements of NFPA 72 or with manufacturer's written instructions, whichever is more conservative.

i. Serial Interfaces:

1) One dedicated RS 485 port for central-station or remote station operation using point ID DACT.
2) One RS 485 port for remote annunciators, Ethernet module, or multi-interface module (printer port).
3) One USB or RS 232 port for PC configuration.

j. Smoke-Alarm Verification:

1) Initiate audible and visible indication of "alarm-verification" signal at FACU.
2) Activate approved "alarm-verification" sequence at FACU and detector.
3) Record events by system printer.
4) Sound general alarm if alarm is verified.
5) Cancel FACU indication and system reset if alarm is not verified.

k. Notification-Appliance Circuit:

1) Audible appliances must sound in three-pulse temporal pattern, as defined in NFPA 72.
2) Where notification appliances provide signals to sleeping areas, alarm signal must be 520 Hz square wave with intensity 15 dB above average ambient sound level or 5 dB above maximum sound level, or at least 75 dB(A-weighted), whichever is greater, measured at pillow.
3) Visual alarm appliances must flash in synchronization where multiple appliances are in same field of view, as defined in NFPA 72.

l. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to remote alarm station.

m. Printout of Events: On receipt of signal, print alarm, supervisory, and trouble events. Identify zone, device, and function. Include type of signal (alarm, supervisory, or trouble) and date and time of occurrence. Differentiate alarm signals from other printed indications. Also, print system reset event, including same information for device, location, date, and time. Commands initiate printing of list of existing alarm, supervisory, and trouble conditions in system and historical log of events.

n. Primary Power: 24 V(dc) obtained from 120 V(ac) service and power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, and supervisory signals must be powered by 24 V(dc) source.

o. Alarm current draw of entire fire-alarm system must not exceed 80 percent of power-supply module rating.

p. Secondary Power: 24 V(dc) supply system with batteries, automatic battery charger, and automatic transfer switch.
q. Batteries: Sealed lead calcium.

D. Accessories:

1. Instructions: Computer printout or typewritten instruction card mounted behind plastic or glass cover in stainless steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe functional operation of system under normal, alarm, and trouble conditions.

2.3 MANUAL FIRE-ALARM BOXES

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Silent Knight.

B. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes must be finished in red with molded, raised-letter operating instructions in contrasting color; must show visible indication of operation; and must be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.

1. Double-action mechanism requiring two actions to initiate alarm, pull-lever type; with integral or attached addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to FACU.
2. Station Reset: Key- or wrench-operated switch.
3. Indoor Protective Shield: Factory-fabricated, clear plastic enclosure hinged at top to permit lifting for access to initiate alarm. Lifting cover actuates integral battery-powered audible horn intended to discourage false-alarm operation.
4. Weatherproof Protective Shield: Factory-fabricated, clear plastic enclosure hinged at top to permit lifting for access to initiate alarm.
5. Able to perform at up to 90 percent relative humidity at 90 deg F (32 deg C).
6. Material: Manual stations made of Lexan polycarbonate.
7. Able to be used in indoor or outdoor areas.

2.4 SYSTEM SMOKE DETECTORS

A. Photoelectric Smoke Detectors:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Silent Knight.

2. Performance Criteria:

a. Regulatory Requirements:

1) NFPA 72.
2) UL 268.

b. General Characteristics:

1) Detectors must be four or two-wire type.
2) Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to FACU.
3) Base Mounting: Detector and associated electronic components must be mounted in twist-lock module that connects to fixed base. Provide terminals in fixed base for connection to building wiring.
4) Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
5) Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.
6) Detector address must be accessible from FACU and must be able to identify detector's location within system and its sensitivity setting.
7) Operator at FACU, having designated access level, must be able to manually access the following for each detector:

    a) Primary status.
    b) Device type.
    c) Present average value.
    d) Present sensitivity selected.
    e) Sensor range (normal, dirty, etc.).

8) Detector must have functional humidity range within 10 to 90 percent relative humidity.
9) Color: White.
10) Remote Control: Unless otherwise indicated, detectors must be digital-addressable type, individually monitored at FACU for calibration, sensitivity, and alarm condition and individually adjustable for sensitivity by FACU.
11) Multiple levels of detection sensitivity for each sensor.

2.1 DUCT SMOKE DETECTORS

A. Description: Photoelectric-type, duct-mounted smoke detector.

B. Performance Criteria:

1. Regulatory Requirements:

a. NFPA 72.
b. UL 268A.

2. General Characteristics:

a. Detectors must be four-wire type.
b. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to FACU.
c. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
d. Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.
e. Detector address must be accessible from FACU and must be able to identify detector's location within system and its sensitivity setting.
f. Operator at FACU, having designated access level, must be able to manually access the following for each detector:

1) Primary status.
2) Device type.
3) Present average value.
4) Present sensitivity selected.
5) Sensor range (normal, dirty, etc.).

g. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; NRTL listed for use with supplied detector for smoke detection in HVAC system ducts.
h. Each sensor must have multiple levels of detection sensitivity.
i. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
j. **Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor-control circuit.**

2.2 FIRE-ALARM NOTIFICATION APPLIANCES

A. Fire-Alarm Audible Notification Appliances:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Silent Knight.

2. Description: Horns, bells, or other notification devices that cannot output voice messages.
3. Performance Criteria:

a. Regulatory Requirements:

1) NFPA 72.

b. General Characteristics:

1) Individually addressed, connected to signaling-line circuit, equipped for mounting as indicated, and with screw terminals for system connections.
2) Connected to notification-appliance signal circuits, zoned as indicated, equipped for mounting as indicated, and with screw terminals for system connections.
3) Audible notification appliances must have functional humidity range of 10 to 95 percent relative humidity.
4) Horns: Electric-vibrating-polarized type, 24 V(dc); with provision for housing operating mechanism behind grille. Comply with UL 464. Horns must produce sound-pressure level of 90 dB(A-weighted), measured 10 ft. (3 m) from horn, using coded signal prescribed in UL 464 test protocol.
5) Combination Devices: Factory-integrated audible and visible devices in single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.

B. Fire-Alarm Visible Notification Appliances:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Silent Knight.

2. Performance Criteria:

a. Regulatory Requirements:

1) NFPA 72.
2) UL 1971.

b. General Characteristics:

1) Rated Light Output:

a) 15/30/75/110 cd, selectable in field.

2) Clear or nominal white polycarbonate lens mounted on aluminum faceplate.
3) Mounting: Wall mounted unless otherwise indicated.
4) For units with guards to prevent physical damage, light output ratings must be determined with guards in place.
5) Flashing must be in temporal pattern, synchronized with other units.
6) Strobe Leads: Factory connected to screw terminals.
7) Mounting Faceplate: Factory finished, white.

2.3 FIRE-ALARM ADDRESSABLE INTERFACE DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Silent Knight.

B. Performance Criteria:

1. Regulatory Requirements:

a. NFPA 72.

2. General Characteristics:

a. Include address-setting means on module.
b. Store internal identifying code for control panel use to identify module type.
c. Listed for controlling HVAC fan motor controllers.
d. Monitor Module: Microelectronic module providing system address for alarm-initiating devices for wired applications with normally open contacts.
e. Integral Relay:

1) Allow control panel to switch relay contacts on command.
2) Have minimum of two normally open and two normally closed contacts available for field wiring.

f. Control Module:

1) Operate notification devices.
2) Override intercom/public address system.

2.4 DIGITAL ALARM COMMUNICATOR TRANSMITTERS (DACTs)

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Silent Knight.

B. Performance Criteria:

1. Regulatory Requirements:

a. NFPA 72.

2. General Characteristics:

a. DACT must be acceptable to remote central station and must be listed for fire-alarm use.
b. Functional Performance: Unit must receive alarm, supervisory, or trouble signal from FACU and automatically capture two telephone line(s) and dial preset number for remote central station. When contact is made with central station(s), signals must be transmitted. If service on either line is interrupted for longer than 45 seconds, transmitter must initiate local trouble signal and transmit signal indicating loss of telephone line to remote alarm receiving station over remaining line. Transmitter must automatically report telephone service restoration to central station. If service is lost on both telephone lines, transmitter must initiate local trouble signal.
c. Local functions and display at DACT must include the following:

1) Verification that both telephone lines are available.
2) Programming device.
3) LED display.
4) Manual test report function and manual transmission clear indication.
5) Communications failure with central station or FACU.

d. Digital data transmission must include the following:

1) Address of alarm-initiating device.
2) Address of supervisory signal.
3) Address of trouble-initiating device.
4) Loss of ac supply.
5) Loss of power.
6) Low battery.
7) Abnormal test signal.
8) Communication bus failure.

e. Secondary Power: Integral rechargeable battery and automatic charger.
f. Self-Test: Conducted automatically every 24 hours with report transmitted to central station.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance of the Work.

1. Verify that manufacturer's written instructions for environmental conditions have been permanently established in spaces where equipment and wiring are installed, before installation begins.

B. Examine roughing-in for electrical connections to verify actual locations of connections before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Preinstallation Testing: Perform verification of functionality of installed components of existing system prior to starting work. Document equipment or components not functioning as designed.

B. Interruption of Existing Fire-Alarm Service: Do not interrupt fire-alarm service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary guard service in accordance with requirements indicated:

1. Notify Construction Manager no fewer than seven days in advance of proposed interruption of fire-alarm service.
2. Do not proceed with interruption of fire-alarm service without Construction Manager's written permission.

C. Protection of In-Place Conditions: Protect devices during construction unless devices are placed in service to protect facility during construction.

3.3 INSTALLATION OF EQUIPMENT

A. Comply with NECA 305, NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."

1. Devices placed in service before other trades have completed cleanup must be replaced.
2. Devices installed, but not yet placed, in service must be protected from construction dust, debris, dirt, moisture, and damage in accordance with manufacturer's written storage instructions.

B. Connecting to Existing Equipment: Verify that existing fire-alarm system is operational before making changes or connections.

1. Connect new equipment to existing control panel.
2. Connect new equipment to existing monitoring equipment at supervising station.
3. Expand, modify, and supplement existing equipment as necessary to extend existing functions to new points. New components must be capable of merging with existing configuration without degrading performance of either system.

C. Install wall-mounted equipment, with tops of cabinets not more than 78 inch (1980 mm) above finished floor.

D. Manual Fire-Alarm Boxes:

1. Install manual fire-alarm box in normal path of egress within 60 inch (1520 mm) of exit doorway.
2. Mount manual fire-alarm box on background of contrasting color.
3. Operable part of manual fire-alarm box must be between 42 and 48 inch (1060 and 1220 mm) above floor level. Devices must be mounted at same height unless otherwise indicated.

E. Smoke Detector Spacing:

1. Comply with "Smoke-Sensing Fire Detectors" section in "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.
2. Comply with "Heat-Sensing Fire Detectors" section in "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.
3. Smooth ceiling spacing must not exceed 30 ft. (9 m).
4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas must be determined in accordance with Annex A or Annex B in NFPA 72.
5. HVAC: Locate detectors not closer than 36 inch (910 mm) from air-supply diffuser or return-air opening.
6. Lighting Fixtures: Locate detectors not closer than 12 inch (300 mm) from lighting fixture and not directly above pendant mounted or indirect lighting.

F. Install cover on each smoke detector that is not placed in service during construction. Cover must remain in place except during system testing. Remove cover prior to system turnover.

A. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend full width of duct. Tubes more than 36 inch (9100 mm) long must be supported at both ends.

1. Do not install smoke detector in duct smoke-detector housing during construction. Install detector only during system testing and prior to system turnover.

B. Remote Status and Alarm Indicators: Install in visible location near each smoke detector, sprinkler water-flow switch, and valve-tamper switch that is not readily visible from normal viewing position.

C. Audible Alarm-Indicating Devices: Install not less than 6 inch (150 mm) below ceiling. Install bells and horns on flush-mounted back boxes with device-operating mechanism concealed behind grille. Install devices at same height unless otherwise indicated.

D. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inch (150 mm) below ceiling. Install devices at same height unless otherwise indicated.

E. Device Location-Indicating Lights: Locate in public space near device they monitor.

3.4 ELECTRICAL CONNECTIONS

A. Connect wiring in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

B. Ground equipment in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."

C. Install electrical devices furnished by manufacturer, but not factory mounted, in accordance with NFPA 70 and NECA 1.

D. Install nameplate for each electrical connection, indicating electrical equipment designation and circuit number feeding connection.

1. Nameplate must be laminated acrylic or melamine plastic signs, as specified in Section 260553 "Identification for Electrical Systems."
2. Nameplate must be laminated acrylic or melamine plastic signs with black background and engraved white letters at least 1/2 inch (13 mm) high.

3.5 CONTROL CONNECTIONS

A. Install control and electrical power wiring to field-mounted control devices.

B. Connect control wiring in accordance with Section 260523 "Control-Voltage Electrical Power Cables."

C. Install nameplate for each control connection, indicating field control panel designation and I/O control designation feeding connection.

3.6 PATHWAYS

A. Concealed wiring in accessible ceiling spaces may be run free using j-hooks.

1. Cable support system must be dedicated to fire alarm and not shared with other systems.

B. Exposed pathways must be installed in EMT.

C. Exposed EMT must be painted red enamel.

3.7 CONNECTIONS

A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Section 087100 "Door Hardware." Connect hardware and devices to fire-alarm system.

1. Verify that hardware and devices are listed for use with installed fire-alarm system before making connections.

3.8 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 270553 "Identification for Communications Systems."

B. Install framed instructions in location visible from FACU.

3.9 GROUNDING

A. Conform to Section 260526 "Grounding and Bonding for Electrical Systems."

B. Ground shielded cables at control panel location only. Insulate shield at device location.

3.10 FIELD QUALITY CONTROL

A. Field tests must be witnessed by authorities having jurisdiction.

B. Administrant for Tests and Inspections:

1. Engage factory-authorized service representative to administer and perform tests and inspections on components, assemblies, and equipment installations, including connections.

C. Tests and Inspections:

1. Visual Inspection: Conduct visual inspection prior to testing.

a. Inspection must be based on completed record Drawings and system documentation that is required by "Completion Documents, Preparation" table in "Documentation" section of "Fundamentals" chapter in NFPA 72.
b. Comply with "Visual Inspection Frequencies" table in "Inspection" section of "Inspection, Testing and Maintenance" chapter in NFPA 72; retain "Initial/Reacceptance" column and list only installed components.

2. System Testing: Comply with "Test Methods" table in "Testing" section of "Inspection, Testing and Maintenance" chapter in NFPA 72.
3. Test audible appliances for public operating mode in accordance with manufacturer's written instructions. Perform test using portable sound-level meter complying with Type 2 requirements in ASA S1.4 Part 1/IEC 61672-1.
4. Test audible appliances for private operating mode in accordance with manufacturer's written instructions.
5. Test visible appliances for public operating mode in accordance with manufacturer's written instructions.
6. Factory-authorized service representative must prepare "Fire Alarm System Record of Completion" in "Documentation" section of "Fundamentals" chapter in NFPA 72 and "Inspection and Testing Form" in "Records" section of "Inspection, Testing and Maintenance" chapter in NFPA 72.

D. Reacceptance Testing: Perform reacceptance testing to verify proper operation of added or replaced devices and appliances.

E. Fire-alarm system will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

G. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.

3.11 Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.12 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

3.13 MAINTENANCE

A. Maintenance Service: Beginning at Substantial Completion, maintenance service must include 12 months' full maintenance by skilled employees of manufacturer's designated service organization. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operation. Parts and supplies must be manufacturer's authorized replacement parts and supplies.

1. Include visual inspections in accordance with "Visual Inspection Frequencies" table in "Testing" paragraph of "Inspection, Testing and Maintenance" chapter in NFPA 72.
2. Perform tests in "Test Methods" table in "Testing" paragraph of "Inspection, Testing and Maintenance" chapter in NFPA 72.
3. Perform tests per "Testing Frequencies" table in "Testing" paragraph of "Inspection, Testing and Maintenance" chapter in NFPA 72.

3.14 SOFTWARE SERVICE AGREEMENT

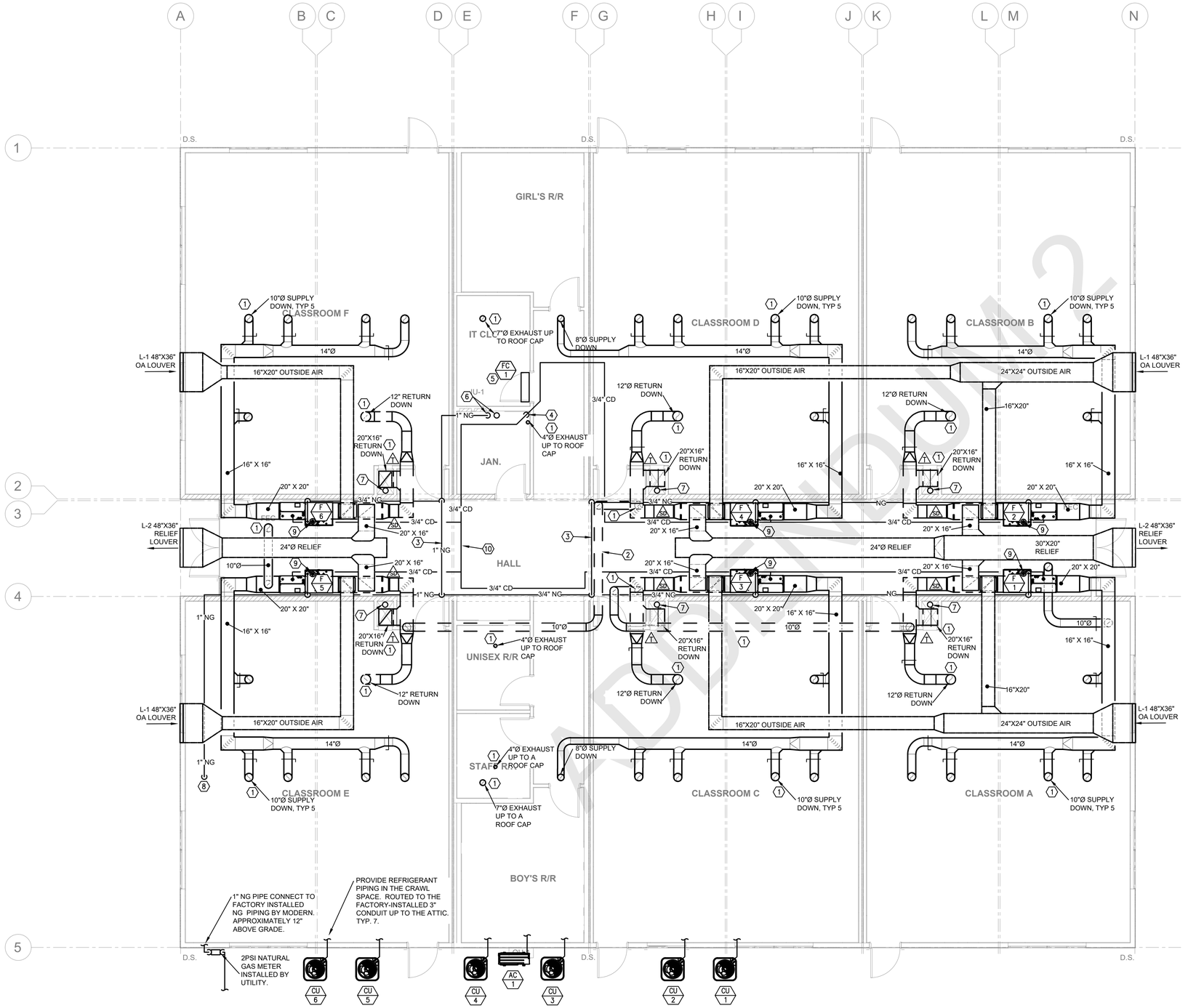
A. Comply with UL 864.

B. Technical Support: Beginning at Substantial Completion, service agreement must include software support for two years.

C. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software must include operating system and new or revised licenses for using software.

1. Upgrade Notice: At least 30 days to allow Owner to schedule access to system and to upgrade computer equipment if necessary.

END OF SECTION 284621.11



1 MECHANICAL PLAN

3/16" = 1'-0"

NORTH

SHEET NOTES

A. UNLESS OTHERWISE NOTED, ALL MECHANICAL SYSTEMS SHOWN ON THIS DRAWING SHALL BE INSTALLED IN THE ATTIC.

B. THE MODULAR BUILDING MANUFACTURER (MODERN) IS PROVIDING MANY FACTORY-INSTALLED HVAC COMPONENTS IN THE FINISHED AREAS AND IN THE SUB-ROOF TO MINIMIZE IMPACT TO FINISHES DURING FIELD INSTALLATION. THESE FACTORY-INSTALLED COMPONENTS INCLUDE:
- B.A. GRILLES AND DIFFUSERS.
- B.B. INSULATED DUCTWORK IN THE SUB-ATTIC AND WALL CHASES.
- B.C. CONDUITS THROUGH THE FINISHED WALLS FOR USE BY THE MECHANICAL CONTRACTOR TO FIELD-INSTALL REFRIGERANT PIPING AND THERMOSTAT WIRING.
- B.D. CONDENSATE PIPING DOWN TO THE MOP SINK.
- B.E. EXHAUST FANS AND EXHAUST DUCTWORK.
- B.F. WATER HEATER CONCENTRIC VENTING.

C. HVAC CONTRACTOR SHALL INSULATE WITH A MINIMUM 3" ON RETURN, SUPPLY, AND OUTSIDE AIR DUCTWORK. EXHAUST DUCTS SHALL HAVE 3" INSULATION FROM EXTERIOR LOUVER TO MOTORIZED DAMPER.

D. THE FIRST 10' OF SUPPLY AND RETURN DUCTS AT EACH FURNACE SHALL HAVE 1" SOUND LINER. DUCT SIZES SHOWN ARE THE INSIDE CLEAR DIMENSION.

E. PROVIDE NATURAL GAS WITH A GAS REGULATOR FOR EACH FURNACE, AND PROVIDE CONDENSATE DRAINS FROM EACH FURNACE TO AN INDIRECT WASTE.

F. PROVIDE RETURN AIR SMOKE DETECTORS FOR EACH UNIT.

G. FURNACES IN THE ATTIC SHALL BE SUSPENDED FROM THE STRUCTURE ABOVE. MECHANICAL CONTRACTOR SHALL PROVIDE ENGINEERED SEISMIC BRACING.

H. SEE MODERN BUILDING SYSTEMS DRAWING SET FOR AIRFLOWS. CONTRACTOR SHALL BALANCE THE SYSTEM ACCORDING TO THE AIRFLOWS LISTED ON THE MODERN BUILDING SYSTEM M SHEETS.

I. RETURN AIR DUCT DETECTORS SHALL BE PROVIDED BY THE FIRE ALARM CONTRACTOR, CONNECTED TO THE FIRE ALARM SYSTEM. UNIT SHALL SHUT DOWN WHEN SMOKE DETECTOR IS ACTIVATED. SEE FIRE ALARM NOTES ON SHEET E0.02 FOR ADDITIONAL COORDINATION INFORMATION. (1)

KEY NOTES

1. POINT OF CONNECTION WITH THE FACTORY-INSTALLED MODERN BUILDING SYSTEM DUCTS IN THE SUB-ROOF.
2. INSTALL DUCT AS HIGH AS POSSIBLE ACROSS THE MEZZANINE.
3. INSTALL NG PIPING ACROSS THE MEZZANINE AGAINST THE DRAFT STOP ABOVE THE ACCESS DOORWAY.
4. CONDENSATE DRAINS SHALL BE INSTALLED IN THE ATTIC WITH A MINIMUM 1/4" PER FOOT SLOPE. CONNECT TO THE 1" FACTORY-INSTALLED CONDENSATE PIPING THAT DRAINS TO THE MOP SINK IN THIS LOCATION.
5. INSTALL FC-1 ABOVE THE DOOR IN THE IT CLOSET. ROUTE REFRIGERANT PIPING DOWN FROM THE ATTIC THROUGH THE FACTORY INSTALLED CONDUIT PROVIDED BY MODERN. INSTALL GRAVITY CONDENSATE DRAIN TO THE ADJACENT MOP SINK.
6. PROVIDE 3"/5" WATER HEATER CONCENTRIC VENT THROUGH THE ROOF TO ROOF CAP. PROVIDE 1" NG PIPING. CONNECT, IN THIS LOCATION, TO FACTORY-INSTALLED CONCENTRIC VENT AND NG PIPING FOR THE WATER HEATER (BY MODERN).
7. 3" FACTORY-INSTALLED CONDUIT FOR USE BY THE MECHANICAL CONTRACTOR TO ROUTE REFRIGERANT LINES THROUGH THE FINISHED SPACE.
8. 1" NG PIPING SHALL CONNECT WITH THE FACTORY-INSTALLED PIPING IN THE SUBROOF BY MODERN.
9. PROVIDE FLUE AND COMBUSTION AIR FOR UP THROUGH THE ROOF WITH A CONCENTRIC VENT.
10. WHERE CONDENSATE DRAINS ARE INSTALLED BELOW DOORWAYS THROUGH THE DRAFTSTOP, ROUTE CONDENSATE PIPING ALONG FLOOR, DROP INTO SUB ROOF AS REQUIRED TO MINIMIZE TRIP HAZARDS.

1' 2' 4'
3/16" 3/8" 3/4"
SCALE 3/16"=1'

TABLE ROCK ELEMENTARY SCHOOL

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NOV. 12, 2019
AARON M. MUELLER
EXPIRES: 12/31/24

Revision		Date
1	ADDENDUM #2	04.20.23

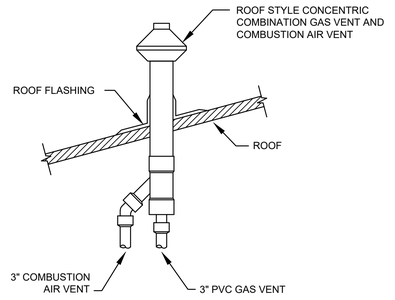
Date	03.29.23
Job	22-012
Drawn By	AMM
Checked By	
Scale	

PERMIT SET

Drawing Title
MECHANICAL PLAN

Drawing No.

M2.01



2 CONCENTRIC ROOF VENT
NTS

SPLIT SYSTEM SCHEDULE: DX COOLING WITH FURNACE

FURNACE/ COIL TAG	COND UNIT TAG	TYPE	AIR FLOW (CFM)	MIN. OUTSIDE AIR (CFM)	ESP (IN)	FURNACE							AIR CONDITIONING									MANUFACTURER	FURNACE MODEL	COIL MODEL	CONDENSING UNIT MODEL	NOTES
						HEATING FUEL	HEATING CAPACITY		% AFUE	ELECTRICAL			REFRIG-ERANT	NOMINAL CAPACITY (TONS CLG)	COOLING CAPACITY		MIN. SEER	ELECTRICAL									
							INPUT (MBH)	OUTPUT (MBH)		VOLTS	PHASE	MOCP			TOTAL (BTUH)	SENS. (BTUH)		VOLTS	PHASE	MCA	MOCP					
F-1	CU-1	HORIZONTAL	1,600	220	0.9	N.G.	60	58	96.0	120	1	15	R410A	4.0	48,000	46,000	14	208/230	3	18	30	TRANE	S9X2B060U	4TXCB006	4TTA4048A3	1
F-2	CU-2	HORIZONTAL	1,600	220	0.9	N.G.	60	58	96.0	120	1	15	R410A	4.0	48,000	46,000	14	208/230	3	18	30	TRANE	S9X2B060U	4TXCB006	4TTA4048A3	1
F-3	CU-3	HORIZONTAL	1,600	220	0.9	N.G.	60	58	96.0	120	1	15	R410A	4.0	48,000	46,000	14	208/230	3	18	30	TRANE	S9X2B060U	4TXCB006	4TTA4048A3	1
F-4	CU-4	HORIZONTAL	1,600	220	0.9	N.G.	60	58	96.0	120	1	15	R410A	4.0	48,000	46,000	14	208/230	3	18	30	TRANE	S9X2B060U	4TXCB006	4TTA4048A3	1
F-5	CU-5	HORIZONTAL	1,600	220	0.9	N.G.	60	58	96.0	120	1	15	R410A	4.0	48,000	46,000	14	208/230	3	18	30	TRANE	S9X2B060U	4TXCB006	4TTA4048A3	1
F-6	CU-6	HORIZONTAL	1,600	220	0.9	N.G.	60	58	96.0	120	1	15	R410A	4.0	48,000	46,000	14	208/230	3	18	30	TRANE	S9X2B060U	4TXCB006	4TTA4048A3	1
NOTES:	1. PROVIDE WITH 7-DAY COMMUNICATING PROGRAMMABLE THERMOSTAT WITH C02 SENSOR, FREEZESTAT, CONCENTRIC VENT KITS, RETURN AIR SMOKE DETECTOR, CONDENSATE NEUTRELIZERS, COMPRESSOR ANTI-SHORT TIMER, HARD START KIT, HORIZONTAL FILTER KIT, STAINLESS STEEL HEAT EXCHANGERS.																									
	2. PROVIDE WITH BUILT-UP LOW-LEAK ECONOMIZER, INCLUDING DAMPERS, ACTUATORS, TEMPERATURE SENSOR, CONTROLLER WITH FAULT DETECTION DIAGNOSTICS, OUTSIDE AIR TEMPERATURE SENSOR. WHEN NOT IN ECONOMIZER MODE THR CONTROLLER SHALL OPERATE IN DEMAND CONTROL VENTILATION MODE MODULATING THE OA DAMPER BETWEEN THE MINIMUM SCHEDULED OUTSIDE AIR AND 600CFM OF OUTSIED AIR BASED ON THE CO2 PPM (800 PPM OF CO2 SHALL BE THE BASELINE CONDITION TO BEGIN DCV).																									

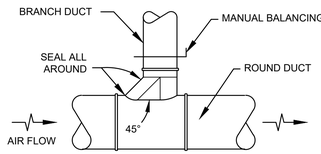
LOUVER SCHEDULE

TAG	TYPE	INLET SIZE	MFGR	MODEL	NOTES
L-1	OUTSIDE AIR	48x36	GREENHECK	ESP-435	1
L-2	RELIEF	48x36	GREENHECK	ESP-435	1
NOTES:	1. PROVIDE WITH BIRD SCREEN AND GRAVITY BACKDRAFT DAMPER, PRIME COAT FINISH.				

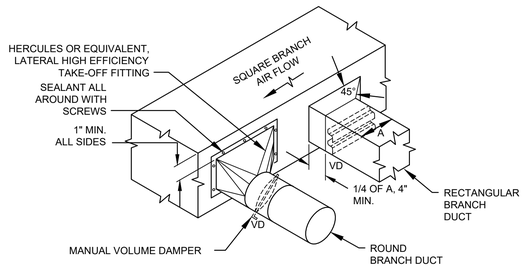
1

DUCT-LESS SPLIT SYSTEM SCHEDULE

TAG	TYPE	BTU	ELECTRICAL				SEER	MANUFACTURER	MODEL	NOTES
			VOLTS	PHASE	MCA	MOCP				
FC-1	FAN COIL - WALL MOUNT	24,000	208-230	1	1.0	25	21.4	MITSUBISHI	PKA-A24LA	1
AC-1	COOLING-ONLY CONDENSER	24,000	208-230	1	19.0			MITSUBISHI	PUY-A24NKA7	
NOTES:	1. PROVIDE 24V, WALL MOUNT THERMOSTAT AND WIND BAFFLE FOR LOW-AMBIENT COOLING.									



1 ROUND COMBINATION TEE
NTS



4 LOW PRESSURE SQUARE AND ROUND BRANCH TAKE-OFF
NTS

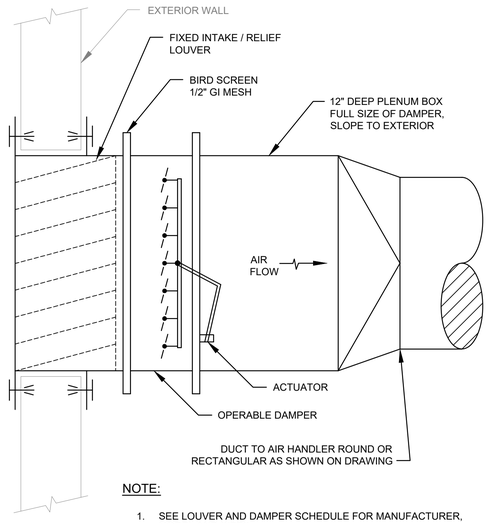
OUTSIDE AIR SCHEDULE

SYSTEM TAG	ZONE	SPACE TYPE	AREA SQ.FT. (Az)	ZONE POP. (Pz)	CFM/ PERSON (Rp)	CFM/ SQFT (Ra)	Pz*Rp	Az*Ra	EFFECTIVE-NESS (Ez)	ZONE OA (Voz)	AIRFLOW TO ZONE		PRIMARY OA FRACTION (Zp)	CODE EXHAUST		DESIGN EXHAUST CFM
											PRIMARY (Vpz)	MIN (Vpzm)		CFM/ SQ.FT.	CFM/ROOM OR /FIXTURE	
F-1, 5	Zone 1	CLASSROOMS (AGE 9 PLUS)	980	34.3	10	0.12	343	117.6	1	461	1,200	1,200	1200.00	0.00	0	0
	Zone 2	CORRIDORS	370	0	0	0.06	0	22.2	0.8	28	400	400	400.00	0.00	0	0
		TOTALS:	1,350	34.3							1,600	1,600				50
		SYSTEM POPULATION (Ps)	30													
		DIVERSITY (D)	0.9													
		UNCORRECTED OSA (Vou)	440													
		MAX Zp	1200.00													
		VENT EFF. (Ev)	0.30													
		MIN. OUTSIDE AIR (Vot), CFM. NOTE 3.	150													
F-3	Zone 1	CLASSROOMS (AGE 9 PLUS)	920	32.2	10	0.12	322	110.4	1	432	1,100	1,100	0.39	0.00	0	0
	Zone 2	TOILET - PUBLIC	190	0	0	0	0	0	0.8	0	200	200	NA	0.00	70	200
	Zone 3	TOILET - PUBLIC	65	0	0	0	0	0	0.8	0	100	100	NA	0.00	70	100
	Zone 4	TOILET - PUBLIC	65	0	0	0	0	0	0.8	0	100	100	NA	0.00	70	100
	Zone 5	CORRIDORS	100	0	0	0.06	0	6	0.8	8	100	100	0.08	0.00	0	0
		TOTALS:	1,340	32.2							1,600	1,600				400
		SYSTEM POPULATION (Ps)	30													
		DIVERSITY (D)	0.9													
		UNCORRECTED OSA (Vou)	416													
		MAX Zp	0.39													
		VENT EFF. (Ev)	0.76													
		MIN. OUTSIDE AIR (Vot), CFM. NOTE 3.	150													
F4	Zone 1	CLASSROOMS (AGE 9 PLUS)	920	32.2	10	0.12	322	110.4	1	432	1,100	1,100	0.39	0.00	0	0
	Zone 2	CORRIDORS	100	0	0	0.06	0	6	0.8	8	100	100	0.08	0.00	0	0
	Zone 3	JANITOR CLOSET, TRASH ROOM, RECYC	65	0	0	0	0	0	0.8	0	200	200	NA	1.00	0	70
	Zone 4	TOILET - PUBLIC	190	0	0	0	0	0	0.8	0	200	200	NA	0.00	70	200
		TOTALS:	1,275	32.2							1,600	1,600				270
		SYSTEM POPULATION (Ps)	30													
		DIVERSITY (D)	0.9													
		UNCORRECTED OSA (Vou)	416													
		MAX Zp	0.39													
		VENT EFF. (Ev)	0.76													
		MIN. OUTSIDE AIR (Vot), CFM. NOTE 3.	150													

NOTES:
1. PER 2022 OMSC CHAPTER 4
2. FOR CONSTANT VOLUME SYSTEMS, Vpz = Vpzm
3. THIS IS THE CODE MINIMUM OSA VOLUME ALLOWED WITH DEMAND CONTROLLED VENTILATION PER OMSC 403.3.1.3. CO2 CONCENTRATION IN THE SPACE SHALL CAUSE THE OUTSIDE AIR DAMPER TO MODULATE TO INCREASE OUTSIDE AIR AS REQUIRED.

SINGLE ZONE OUTSIDE AIR SCHEDULE

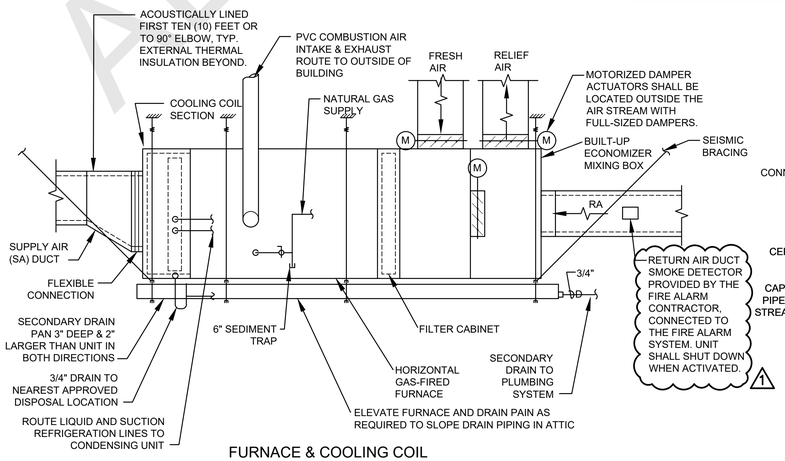
SYSTEM TAG	SPACE TYPE	AREA SQ.FT. (Az)	ZONE POP. (Pz)	CFM/ PERSON (Rp)	CFM/ SQFT (Ra)	Pz*Rp	Az*Ra	EFFECTIVENESS (Ez)	SYSTEM OUTDOOR AIR (Vot)	MINIMUM OUTDOOR AIR, NOTE 2.
F-2, 6	CLASSROOMS (AGE 9 PLUS)	920	32.2	10	0.12	322	110	1	430	110
NOTE:	1. Vot = Voz = SYSTEM MINIMUM OUTDOOR AIRFLOW RATE FOR SINGLE ZONE SYSTEMS PER ASHRAE 62.1 SECTION 6.2.3.									
	2. THIS IS THE CODE MINIMUM OSA VOLUME ALLOWED WITH DEMAND CONTROLLED VENTILATION PER OMSC 403.3.1.3. CO2 CONCENTRATION IN THE SPACE SHALL CAUSE THE OUTSIDE AIR DAMPER TO MODULATE TO INCREASE OUTSIDE AIR AS REQUIRED.									



NOTE:

1. SEE LOUVER AND DAMPER SCHEDULE FOR MANUFACTURER, MODEL AND SIZES.

SECTION - TYPICAL AT OUTSIDE AIR INTAKE/RELIEF LOUVER AND DAMPER
5
NTS



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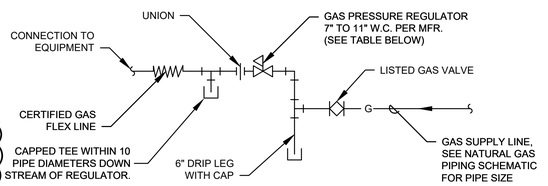
FURNACE & COOLING COIL DETAIL - HORIZONTAL
3
NTS



2 PSI PIPING MAXITROL MODEL	MAX. CAPACITY BTU/HR	PIPE SIZE	INDOOR INSTALLED VENTING
325-3L	140,000	1/2"	12A09 VENT LIMITER

NATURAL GAS HOOK-UP TO EQUIPMENT
6
NTS

TABLE ROCK ELEMENTARY SCHOOL

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NOV. 12, 2015
AARON M. MUELLER
EXPIRES: 12/31/24

Revision		Date
1	ADDENDUM #2	04.20.23

Date	03.29.23
Job	22-012
Drawn By	AMM
Checked By	
Scale	

PERMIT SET

Drawing Title
MECHANICAL SCHEDULES AND DETAILS

Drawing No.

M3.01

FIRE ALARM NOTES

1. PROVIDE A NEW MANUAL AND AUTOMATIC FIRE ALARM SYSTEM IN ACCORDANCE WITH NFPA 72; CONNECT TO OR INTEGRATE AS A SUB-SYSTEM INTO THE EXISTING ADJACENT MANUAL AND AUTOMATIC FIRE ALARM SYSTEM. SEE SYSTEM INTEGRATION NOTES 5a, 5b, THIS SHEET. TEST FIRE ALARM SYSTEM IN ACCORDANCE WITH NFPA 72 AND LOCAL FIRE DEPARTMENT REQUIREMENTS.
2. SYSTEM SUPPLIER AND INSTALLER: AUTHORIZED ENGINEERED SYSTEMS DISTRIBUTOR FOR SPECIFIED SYSTEM WITH 15 YEARS DOCUMENTED EXPERIENCE AND SERVICE FACILITIES WITHIN 150 MILES OF PROJECT.
3. SUBMITTALS: PROVIDE PRODUCT DATA, CALCULATIONS, AND COMPLETE RISER DIAGRAM AND LAYOUT DRAWINGS SHOWING ALL INTERCONNECT WIRING AND EQUIPMENT.
4. PROVIDE BATTERY CAPACITY SUFFICIENT TO OPERATE SYSTEM IN SUPERVISORY MODE FOR 24 HRS FOLLOWED BY ALARM MODE FOR 5 MINUTES.
5. MANUFACTURER: SILENT KNIGHT
6. FIRE ALARM PANEL: MICROPROCESSOR-CONTROLLED, POWER-LIMITED, ELECTRONICALLY-SUPERVISED, ANALOG ADDRESSABLE WITH MULTIPLEXED DATA TRANSMISSION AND SUPERVISORY, ALARM, CONTROL AND ANNUNCIATOR FUNCTIONS, FIELD PROGRAMMABLE AND EXPANDABLE BY MODULES, LCD ALPHANUMERIC DISPLAY. SEE SYSTEM INTEGRATION NOTES 5a, 5b, THIS SHEET. INCLUDE DIGITAL ALARM COMMUNICATOR TRANSMITTER (DACT) UNDER OPTION B.
7. AUDIBLE-VISIBLE INDICATING APPLIANCE: HIGH PERFORMANCE HORN, 85DBA AT 10' WITH VISIBLE STROBE AND FLASHER, RED LETTERED "FIRE" ON WHITE LENS, SYNCHRONIZING TYPE. CANDELAS NOTED.
8. AUDIBLE INDICATING APPLIANCE: HIGH PERFORMANCE HORN, 85DBA AT 10' .
9. VISUAL INDICATING APPLIANCE: VISIBLE STROBE AND FLASHER, RED LETTERED "FIRE" ON WHITE LENS, CANDELAS NOTED, SYNCHRONIZING TYPE.
10. MANUAL PULL STATION: ADDRESSABLE DOUBLE ACTION TYPE WITH KEY RESET, SEMI-FLUSH MOUNTED.
11. SMOKE DETECTOR: ADDRESSABLE ANALOG PHOTOELECTRIC TYPE WITH TWO LED INDICATORS, TWIST-LOCK BASE.
12. HEAT DETECTOR: ADDRESSABLE COMBINATION FIXED TEMPERATURE/RATE OF RISE COMPENSATED TYPE WITH TWO LED INDICATORS, TWIST-LOCK BASE.
13. DUCT SMOKE DETECTOR: ADDRESSABLE ANALOG PHOTOELECTRIC TYPE WITH SAMPLING TUBES EXTENDING WIDTH OF DUCT, LED INDICATOR, DUCT-MOUNTED HOUSING.
14. MONITOR MODULE: ADDRESSABLE MODULE TO CONNECT A SUPERVISED SIGNALLING LINE CIRCUIT TO NORMALLY-OPEN CONTACTS ON CONVENTIONAL DEVICES; MOUNTS TO 4" SQUARE BOX.
15. CONTROL MODULE: ADDRESSABLE MODULE TO CONNECT A SUPERVISED SIGNALLING LINE CIRCUIT TO NORMALLY-OPEN CONTACTS ON CONVENTIONAL DEVICES; MOUNTS TO 4" SQUARE BOX.
16. LOCKDOWN/POLICE CALL BUTTON: STI #SS24A1LD-EN SERIES W/ LETTERS "POLICE", INCLUDE ADDRESSABLE MONITOR MODULE IN BACKBOX.
17. FIRE ALARM CABLE SHALL BE UL LISTED FOR USE WITH THE SYSTEM INSTALLED. ALL FIRE ALARM CABLE SHALL BE IN CONDUIT OR FREE IN ACCESSIBLE CEILING USING J-HOOKS. MODULAR BUILDING INCLUDES CONDUIT CONCEALED IN WALLS. INSTALL CABLE AND ANY NEEDED EXPOSED CONDUIT PER APPROVED MANUFACTURER'S SHOP DRAWINGS.
18. PROVIDE LINE-GROUND SURGE PROTECTION FOR SIGNALING LINE CIRCUITS ENTERING BUILDINGS FROM THE EXTERIOR. 20KA SURGE CURRENT RATING, 5A MAX CONTINUOUS CURRENT, 200kbps - 2Mbps DATA RATE. DITEK SURGE PROTECTION # DTK-2MHLPB SERIES W/ ACCESSORIES OR APPROVED EQUAL.

FIRE ALARM LEGEND

- SMOKE DETECTOR, CEILING MOUNTED
- P — MANUAL PULL STATION, MOUNTED +48" TO TOP
- L — LOCKDOWN/POLICE CALL BUTTON, MOUNTED +48" TO TOP
- 2 DS — DUCT SMOKE DETECTOR, DUCT MOUNTED
- AUDIBLE INDICATING APPLIANCE, WALL MOUNTED
- VISIBLE INDICATING APPLIANCE, MOUNTED AT +80", OR AT 6" BELOW CEILING, WHICHEVER IS LOWER
- AUDIBLE & VISIBLE INDICATING APPLIANCE, MOUNTED AT +80", OR AT 6" BELOW CEILING, WHICHEVER IS LOWER
- AUDIBLE INDICATING APPLIANCE, CEILING MOUNTED
- VISIBLE INDICATING APPLIANCE, CEILING MOUNTED
- AUDIBLE & VISIBLE INDICATING APPLIANCE, CEILING MOUNTED
- M C — MONITOR OR CONTROL MODULE

INTERCOM/PA SYSTEM NOTES

1. EXTEND THE EXISTING CAMPUS INTERCOM/PUBLIC ADDRESS SYSTEM IN ACCORDANCE WITH NFPA 70.
2. MANUFACTURER: BOGEN
3. SYSTEM SUPPLIER AND INSTALLER: AUTHORIZED DISTRIBUTOR FOR SPECIFIED SYSTEMS WITH MIN. 15 YEARS DOCUMENTED EXPERIENCE AND SERVICE FACILITIES WITHIN 150 MILES OF THE PROJECT.
4. SUBMITTALS: PROVIDE COMPLETE SYSTEM DESIGNS INCLUDING CERTIFICATIONS, PRODUCT DATA, PLANS, SCHEDULES, DETAILS, AND WIRING DIAGRAMS SHOWING ALL EQUIPMENT, DEVICES AND INTERCONNECT WIRING. INCLUDE A CABLE IDENTIFICATION SYSTEM.
5. INTERCOM/PA SYSTEM CABLE SHALL BE AS DETERMINED BY SYSTEM VENDOR. CABLE SHALL BE IN CONDUIT OR FREE IN ACCESIBLE CEILING SPACE USING J-HOOKS. MODULAR BUILDING INCLUDES CONDUIT CONCEALED IN WALLS. INSTALL CABLE AND ANY ADDITIONAL NEEDED CONDUIT PER APPROVED MANUFACTURER'S SHOP DRAWINGS.

INTERCOM/PA SYSTEM LEGEND

- S ICF — INTERCOM SPEAKER, FLUSH CEILING OR FLUSH WALL MOUNTED AT +84" U.N.O; PROVIDE (1) CABLE TO EQUIPMENT IN IDF.
- S ICS — INTERCOM SPEAKER, SURFACE CEILING OR SURFACE WALL MOUNTED AT +84" U.N.O.; PROVIDE (1) CABLE TO EQUIPMENT IN IDF.
- S PF — PAGING SPEAKER, FLUSH CEILING OR FLUSH WALL MOUNTED AT +84" U.N.O.; PROVIDE COMMON CABLE FOR ALL PAGING SPEAKERS TO EQUIPMENT IN IDF.
- S PS — PAGING SPEAKER, SURFACE CEILING OR SURFACE WALL MOUNTED AT +84" U.N.O;. PROVIDE COMMON CABLE FOR ALL PAGING SPEAKERS TO EQUIPMENT IN IDF.
- H — OUTDOOR HORN, SURFACE WALL MOUNTED AT +96"; PROVIDE COMMON CABLE FOR ALL OUTDOOR HORNS TO EQUIPMENT IN IDF ROOM.
- B — IP CALL SWITCH, SURFACE WALL MOUNTED AT +48" U.N.O.; PROVIDE (1) CABLE TO INTERCOM SPEAKER IN SAME ROOM.

INTRUSION DETECTION NOTES

1. EXTEND THE EXISTING CAMPUS INTRUSION DETECTION AND VIDEO SURVEILLANCE SYSTEMS IN ACCORDANCE WITH NFPA 70.
2. SYSTEM MANUFACTURER: SONITROL.
3. SYSTEM SUPPLIER AND INSTALLER: AUTHORIZED DISTRIBUTOR FOR SPECIFIED SYSTEMS WITH MIN. 15 YEARS DOCUMENTED EXPERIENCE AND SERVICE FACILITIES WITHIN 150 MILES OF THE PROJECT.
4. SUBMITTALS: PROVIDE COMPLETE SYSTEM DESIGNS INCLUDING CERTIFICATIONS, PRODUCT DATA, PLANS, SCHEDULES, DETAILS, AND WIRING DIAGRAMS SHOWING ALL EQUIPMENT, DEVICES AND INTERCONNECT WIRING. INCLUDE A CABLE IDENTIFICATION SYSTEM.
5. INCLUDE ALL SOFTWARE, PROGRAMMING, TESTING, LICENSING FOR FUNCTIONING SYSTEMS
6. POWER & CONTROL CABLE: AS DETERMINED BY SYSTEM VENDOR.
7. NETWORK CABLE: AS DETERMINED BY SYSTEM VENDOR.
8. CABLE SHALL BE IN OR CONDUIT OR FREE IN ACCESSIBLE CEILING SPACE USING J-HOOKS. MODULAR BUILDING INCLUDES CONDUIT CONCEALED IN WALLS. INSTALL CABLE AND ANY ADDITIONAL NEEDED CONDUIT PER APPROVED MANUFACTURER'S SHOP DRAWINGS.

INTRUSION DETECTION LEGEND

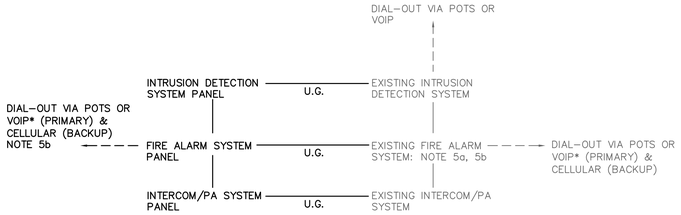
- K — INTRUSION DETECTION KEYPAD, WALL MOUNTED AT +42" TO CENTER: PROVIDE CABLE TO INTRUSION DETECTION CONTROL PANEL.
- M — MAGNETIC DOOR CONTACT (POSITION SENSOR): PROVIDE CABLE TO INTRUSION DETECTION CONTROL PANEL.

CCTV NOTES

1. VIDEO SURVEILANCE SYSTEM EQUIPMENT IS OWNER-FURNISHED, OWNER-INSTALLED.
2. SYSTEM MANUFACTURER: VERKADA.
3. CABLE SHALL BE IN OR CONDUIT OR FREE IN ACCESSIBLE CEILING SPACE USING J-HOOKS.MODULAR BUILDING INCLUDES CONDUIT CONCEALED IN WALLS. INSTALL CABLE AND ANY ADDITIONAL NEEDED CONDUIT PER APPROVED MANUFACTURER'S SHOP DRAWINGS.

CCTV LEGEND

- IP CAMERA, WALL OR CEILING MOUNTED W/ INDOOR OR OUTDOOR DOME AS REQUIRED: PROVIDE (1) CAT 6 CABLE TO EQUIPMENT IN IDF. MOUNT EXTERIOR CAMERAS AT +12'



INTEGRATION OF LOW VOLTAGE SYSTEMS

SCHEMATIC

* NFPA 72 NOW ALLOWS VOIP VS POTS FOR DIAL-OUT CONDITIONS: THE CABLED CONNECTION MUST BE TO A PUBLIC SWITCHED TELEPHONE NETWORK (PSTN) USING MANAGED FACILITIES-BASED VOICE NETWORKS (MFVN) OPERATED BY THE TELEPHONE SERVICE PROVIDER, FOR RELIABILITY. THE SERVICE PROVIDER FACILITIES MUST HAVE MINIMUM 8-HOUR STANDBY POWER.

1. INTERCOM/PA SYSTEM WILL ACCEPT INPUT FROM THE TELEPHONE SYSTEM.
2. INTERCOM/PA SYSTEM WILL BE USED FOR MASS NOTIFICATION DURING A LOCKDOWN EVENT.
3. FIRE ALARM SYSTEM WILL OVERRIDE THE INTERCOM/PA SYSTEM UNDER FIRE ALARM CONDITION.
4. FIRE ALARM SYSTEM WILL MONITOR THE INTRUSION DETECTION SYSTEM AS A SUPERVISORY CONDITION.

5a OPTION A) NETWORK THE NEW FIRE ALARM PANEL TO A NEW SILENT KNIGHT MULTIPLEXED ADDRESSABLE SYSTEM WITH NETWORK CAPABILITIES LOCATED IN THE MID-CAMPUS OFFICE BUILDING. SEE SITE PLAN DRAWINGS. USE THE EXISTING UNDERGROUND TELECOMMUNICATIONS CONDUITS LINKING BUILDINGS. THE NEW PANEL SHALL FUNCTION AS AN EXTENSION OF THE MAIN SYSTEM.

5b OPTION B) PROVIDE DACT AND DIAL-OUT. CONNECT THE NEW FIRE ALARM SUB-PANEL TO THE EXISTING SILENT KNIGHT 5808 MULTIPLEXED ADDRESSABLE SYSTEM LOCATED IN THE WEST CAMPUS MAIN ELECTRICAL ROOM, WITH MONITOR AND CONTROL CIRCUITS. SEE SITE PLAN DRAWINGS. USE THE EXISTING UNDERGROUND TELECOMMUNICATIONS CONDUITS LINKING BUILDINGS. THE SYSTEMS SHALL MONITOR EACH OTHER'S STATUS AS SUPERVISORY CONDITIONS.

TELECOMMUNICATIONS GROUNDING NOTES

1. GROUNDING: PROVIDE A COMPLETE TELECOMMUNICATIONS GROUNDING SYSTEM CONFORMING TO ANSI-J-STD-607-A.
2. PROVIDE A COPPER PRIMARY BONDING BUSBAR (PBB) AT THE IDF WITH A #3/0 COPPER TELECOMMUNICATIONS BONDING CONDUCTOR (TBC) TO THE BUILDING ELECTRICAL SERVICE GROUND. PROVIDE 3' COIL OF SPARE CONDUCTOR AT PBB
3. BOND THE EQUIPMENT RACK WITH A #2/0 COPPER TELECOMMUNICATIONS EQUIPMENT BONDING CONDUCTOR (TEBC) TO THE PBB.
3. BOND CABLE TRAY, AND RACEWAY ENTERING THE IDF, WITH A #6 COPPER TELECOMMUNICATIONS EQUIPMENT BONDING CONDUCTOR (TEBC) TO THE PBB.

TELEPHONE/LAN NOTES

1. INSTALL TELECOMMUNICATIONS CABLING SYSTEM IN ACCORDANCE WITH NFPA 70 AND APPLICABLE TIA/EIA AND UL GUIDELINES.
2. SYSTEM DESIGNER AND INSTALLER: LICENSED TELECOMMUNICATIONS CONTRACTOR WITH MINIMUM 15 YEARS EXPERIENCE, REGISTERED AS CABLING SYSTEM INSTALLERS, NICET TECHNICIAN LEVEL IV.
3. SUBMITTALS: PROVIDE PRODUCT DATA, CALCULATIONS, AND COMPLETE RISER DIAGRAM AND LAYOUT DRAWINGS SHOWING ALL INTERCONNECT WIRING AND EQUIPMENT. INCLUDE A CABLE IDENTIFICATION SYSTEM.
4. GROUNDING, RACKS, CABLE TRAY, DEVICES, CABLE AND PATCH PANELS ARE CONTRACTOR-FURNISHED, CONTRACTOR-INSTALLED INCLUDING CABLE TERMINATIONS.
5. TELEPHONE/LAN EQUIPMENT (SWITCHES, SERVERS, ROUTERS) IS OWNER-FURNISHED, OWNER-INSTALLED. CONNECTIONS FROM PATCH PANELS TO EQUIPMENT WILL BE BY OWNER.
6. POWER SUPPLIES, CONDUIT AND BACKBOXES ARE FURNISHED AND INSTALLED AS PART OF THE MODULAR BUILDING.
7. EQUIPMENT RACK: 2-POST RACK, FLOOR MOUNTED, 7'H x 19"W x 6"D, 45U. TRIPP LITE # SR2POST WITH # SRCABLERING VRT CABLE MANAGERS
8. CABLE LADDER IN IDF ROOM: 12" WIDE x 1,5" DEEP WITH CROSS MEMBERS AT 12" INTERVALS. TRIPP LITE # SRCABLELADDER WITH #SRLADDERATTACH
9. PROVIDE LIU AND PATCH PANELS IN THE EQUIPMENT RACK FOR TERMINATION OF FIBER OPTIC AND COPPER NETWORK CABLE.
9. PROVIDE 12-STRAND SINGLE MODE FIBER OPTIC CABLE FROM THE IDF IN THE ADJACENT GYM BUILDING TO THE NEW IDF. INSTALL FIBER OPTIC CABLE IN INNERDUCT.
10. PROVIDE INNERDUCT IN EACH UNDERGROUND BACKBONE CONDUIT.
11. TELEPHONE/LAN CABLE SHALL BE IN CONDUIT OR IN J-HOOKS IN ACCESSIBLE CEILING SPACE. MODULAR BUILDING INCLUDES CONDUIT CONCEALED IN WALLS. PROVIDE ADDITIONAL CONDUIT WHERE REQUIRED TO PROTECT WIRING.
12. PENETRATIONS THROUGH WALLS: USE GRS CONDUIT OR EMT, SIZE AND QUANTITY AS INDICATED ON PLANS.
13. CONDUIT PENETRATIONS THROUGH FIRE-RATED WALLS AND SLABS: SEAL TO MAINTAIN THE INTEGRITY OF THE FIRE RATING, USING A UL LISTED FIRE RATED SYSTEM.
14. CONDUIT PENETRATIONS THROUGH SEISMIC GAPS: TRANSITION FROM GRS CONDUIT OR EMT TO LIQUIDTIGHT FLEXIBLE CONDUIT; PROVIDE SUFFICIENT SLACK CONDUIT AND CABLE TO ALLOW FOR MOVEMENT.

TELEPHONE/LAN LEGEND

- ▽# — TEL/DATA OUTLET AT +17" TO CENTERLINE U.N.O.: PROVIDE # OF RJ45-A JACKS AND CAT 6A CABLES TO IDF AS INDICATED
- ▽# — TEL/DATA OUTLET, CEILING MOUNTED: PROVIDE # OF RJ45-A JACKS AND CAT 6A CABLES TO IDF AS INDICATED
- ▽ — HDMI OUTLET AT +17" TO CENTERLINE U.N.O.: PROVIDE CLASS 2 CAT 3 8K 60Hz HDMI CABLE WITH TYPE A CONNECTORS BETWEEN OUTLETS IN EACH CLASSROOM AS INDICATED ON PLANS
- 2-POST RACK, FLOOR MOUNTED

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REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 20, 1993
DOUGLAS A. BUHR
EXPIRES: 12-31-23

Revision		Date
2	ADDENDUM 2	4/20/2023

Date	03/29/2023
Job	22-012
Drawn By	MKH
Checked By	DAB
Scale	As Noted

100% CD

Drawing Title

Electrical Legends and Notes

Drawing No.

E0.02

1 E2.02 **ATTIC PLAN - ELECTRICAL**
3/16" = 1'-0"

NEW WORK
EXISTING OR DESCRIBED ELSEWHERE IN THESE DOCUMENTS
EXISTING TO BE REMOVED

3/16"=1'-0" scale 2' 0 2' 4' 6' 8' 10' feet

POWER SYSTEM NOTES

1. MODULAR UNIT POWER PANELS HAVE CONDUIT STUBS DOWN TO THE CRAWLSPACE BELOW THE BUILDING. CONNECT POWER FEEDERS FROM THE SERVICE EQUIPMENT TO TO THE MODULAR UNIT POWER PANELS USING THE STUBS PROVIDED.
2. INTERIOR AND EXTERIOR POWER DEVICES, EQUIPMENT CONNECTIONS AND RELATED WIRING ARE INSTALLED COMPLETE, ARE NOT SHOWN, AND ARE NOT TO BE MODIFIED.
3. INTERIOR AND EXTERIOR LIGHTING, CONTROLS AND RELATED WIRING ARE INSTALLED COMPLETE, ARE NOT SHOWN, AND ARE NOT TO BE MODIFIED.

LOW VOLTAGE SYSTEM NOTES

1. MODULAR UNIT IS PROVIDED WITH BACKBOXES AND RACEWAY TO CEILING SPACE FOR TEL/DATA OUTLETS.
2. SEE SHEET E0.01 FOR IT INFRASTRUCTURE NOTES, TEL/LAN LEGEND AND NOTES.
3. SEE SHEET E0.02 FOR INTERCOM/PA, SECURITY AND FIRE ALARM SYSTEMS LEGENDS AND NOTES.
4. SEE MODERN BUILDING SYSTEMS ELECTRICAL DRAWING, SHEET E1.0, FOR 120VAC DOOR HARDWARE POWER AT DOORS 1 & 2.

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Drawing Title
Attic Plan - Electrical

Drawing No.
E2.02

Drawing name: C:\Douglas Engineering Pacific, Inc\Projects - 2022\22501 Table Rock Elementary School Modular Classroom\22501 e building.dwg, Apr 18, 2023 - 10:35am