

# ADDENDUM NO. 3

**January 6, 2022**

**Lawrence Central High School Pool, 7300 E. 56<sup>th</sup> St., Indianapolis, IN 46226**

**TO: ALL BIDDERS OF RECORD**

This Addendum forms a part of and modifies the Bidding Requirements, Contract Forms, Contract Conditions, the Specifications, and Drawings dated December 1, 2021, by Schmidt Associates. Acknowledge receipt of the Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of Pages ADD 3-1 through ADD 3-2 and attached Schmidt Associates Addendum No. 3, dated January 6, 2022 consisting of 26 pages, Specification Sections 07 54 19 Polyvinyl-Chloride (PVC) Roofing, 28 46 21 Addressable Fire Alarm Systems and Drawing Sheets: FPD101.1, EP1M1.1, EP1M2.1, Electric Wall Heater Schedule and Fan Coil Unit Schedule.

## **BID**

The Bid on Wednesday January 12, 2022 at 2:00 PM will be a Virtual Bid Opening. Bids may be dropped off in the Lobby of the Administration Building. The bids will be taken to the Board Room, opened, and read live over Microsoft Teams Virtual Meetings.

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**A. SPECIFICATION SECTION 01 12 00 MULTIPLE CONTRACT SUMMARY**

1. Paragraph 3.03 Bid Categories

**B. BID CATEGORY NO. 21 - GENERAL TRADES**

Add the following clarifications:

- 16) Reference Dwg SF1M1.1: The new HSS 8X8 Steel Tube Columns along Column Line A1 at Lines CAe, AL, AJ and AF will need their Anchor Bolts drilled and epoxied into existing piers.
- 17) Provide 40,000 SF of 8” thick stone for temporary laydown/access roads. Include placement and removal. Location designated by the Construction Manager.
- 18) The demolition work shown highlighted on the attached sketch will be completed by a previous phase.

# **ADDENDUM NO. 3**

## **JANUARY 6, 2022**

PREPARED BY SCHMIDT ASSOCIATES FOR:  
**LAWRENCE CENTRAL HIGH SCHOOL POOL**  
**LAWRENCE TOWNSHIP, M.S.D. OF**

This Addendum consists of 2 Addendum pages and 24 attachment pages totaling 26 pages.

Acknowledge receipt of this Addendum by inserting its number on the Bid Form. Failure to do so may subject the Bid to disqualification. This Addendum is part of the Contract Documents.

Bidder is encouraged to verify with reprographer of record all Addenda issued (do not rely exclusively on third party plan room services).

### **PART 1 - CHANGES TO PRIOR ADDENDA (NOT APPLICABLE)**

### **PART 2 - CHANGES TO THE PROJECT MANUAL**

Modifications described herein shall be incorporated in the Project Manual. All other Work shall remain unchanged.

#### **2.1 DIVISION 04 – MASONRY**

##### **A. Section 042000 “UNIT MASONRY”**

1. DELETE Paragraph 2.3 B. in its entirety.
2. DELETE Paragraph 2.3 D. in its entirety.

#### **2.2 DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING(HVAC)**

##### **A. Section 233716.99 “FABRIC AIR-DISTRIBUTION DEVICES”**

1. ADD NanoSox as an acceptable manufacturer to bid Fabric Air-Distribution Devices.

#### **2.3 DIVISION 28 - ELECTRONIC SAFETY AND SECURITY**

##### **A. Section 284621 “ADDRESSABLE FIRE ALARM SYSTEMS”**

1. DELETE AND REPLACE Section 284621 in its entirety.

### PART 3 - CHANGES TO THE DRAWINGS

Modifications described herein shall be incorporated in the Drawings. All other Work shall remain unchanged.

#### 3.1 DRAWING SHEETS: ADDITIONS, DELETIONS AND REPLACEMENTS

DRAWING NO.	INDICATE ACTION: REPLACE (R), ADD (A), DELETE (D)
<b>P-SERIES DRAWINGS</b>	
FPD101.1	ADD
<b>E-SERIES DRAWINGS</b>	
EP1M1.1	DELETE AND REPLACE
EP1M2.1	DELETE AND REPLACE

#### 3.2 A-SERIES DRAWINGS

A. **Drawing Number AC1M1.1**

1. ADD Note 14 as follows:

“Add Reflected Ceiling Plan Note #14 high-volume portion of the space of WEIGHTS N100.”

#### 3.3 M-SERIES DRAWINGS

A. **Drawing Number M-601.1**

1. ADD Fan Coil Unit Schedule per the attached.
2. ADD Electric Wall Heater Schedule per the attached.

**END OF ADDENDUM 3**

SECTION 284621 - 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.
2. Manual fire-alarm boxes.
3. System smoke detectors.
4. Heat detectors.
5. Notification appliances.
6. Device guards.
7. Remote annunciator.
8. Addressable interface device.
9. Digital alarm communicator transmitter.
10. Fire alarm wire and cable.

B. Related Requirements:

1. Section 271513 "Communications Copper Horizontal Cabling" for cables and conductors for fire-alarm systems.
2. Section 087100 "Door Hardware" for magnetic door holders.

1.3 DEFINITIONS

- A. EMT: Electrical Metallic Tubing.
- B. FACP: Fire Alarm Control Panel.
- C. NICET: National Institute for Certification in Engineering Technologies.

1.4 ACTION SUBMITTALS

- A. Product Data, Shop Drawings, General Submittal Requirements,;
  1. Product Data: For each type of product, including furnished options and accessories.

- a. Include construction details, material descriptions, dimensions, profiles, and finishes.
  - b. Include rated capacities, operating characteristics, and electrical characteristics.
2. Shop Drawings: For fire-alarm system.
- a. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
  - b. Include plans, elevations, sections, details, and attachments to other work.
  - c. 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.
  - d. Detail assembly and support requirements.
  - e. Include light output settings for visual notification appliances.
  - f. Include voltage drop calculations for notification-appliance circuits.
  - g. Include battery-size calculations.
  - h. Include input/output matrix.
  - i. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
  - j. Include performance parameters and installation details for each detector.
  - k. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
  - l. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale; coordinate location of duct smoke detectors and access to them.
    - 1) Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators.
    - 2) Show field wiring required for HVAC unit shutdown on alarm.
    - 3) Locate detectors according to manufacturer's written recommendations.
    - 4) Show air-sampling detector pipe routing.
  - m. 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.
3. General Submittal Requirements:
- a. Shop Drawings shall be prepared by persons with the following qualifications:
    - 1) Trained and certified by manufacturer in fire-alarm system design.
    - 2) NICET-certified, fire-alarm technician; Level III minimum.

## 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Field quality-control reports.
- C. Sample Warranty: For special warranty.

## 1.6 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:
    - a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
    - b. Complete wiring diagrams showing connections between all devices and equipment. Each conductor shall be numbered at every junction point with indication of origination and termination points.
    - c. Riser diagram.
    - d. Device addresses.
    - e. Record copy of site-specific software.
    - f. Provide "Inspection and Testing Form" according to the "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.
    - g. Manufacturer's required maintenance related to system warranty requirements.
    - h. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.
- B. Software and Firmware Operational Documentation:
  - 1. Software operating and upgrade manuals.
  - 2. Program Software Backup: On magnetic media or compact disk, complete with data files.
  - 3. Device address list.
  - 4. Printout of software application and graphic screens.

## 1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Lamps for Remote Indicating Lamp Units: Quantity equal to 10 percent of amount installed, but no fewer than one unit.
  - 2. Lamps for Strobe Units: Quantity equal to 10 percent of amount installed, but no fewer than one unit.
  - 3. Smoke Detectors: Quantity equal to 10 percent of amount of each type installed, but no fewer than one unit of each type.
  - 4. Detector Bases: Quantity equal to two percent of amount of each type installed, but no fewer than one unit of each type.
  - 5. Keys and Tools: One extra set for access to locked or tamperproofed components.
  - 6. Audible and Visual Notification Appliances: One of each type installed.
  - 7. Fuses: Two of each type installed in the system. Provide in a box or cabinet with compartments marked with fuse types and sizes.

## 1.8 QUALITY ASSURANCE

- A. Installer Qualifications: Installation shall be by personnel certified by NICET as fire-alarm Level III technician.
- B. NFPA Certification: Obtain certification according to NFPA 72 by a UL-listed alarm company.

## 1.9 PROJECT CONDITIONS

- A. Perform a full test of the existing system prior to starting work. Document any 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 according to requirements indicated:
  - 1. Notify Architect Construction Manager Owner no fewer than days in advance of proposed interruption of fire-alarm service.
  - 2. Do not proceed with interruption of fire-alarm service without Architect's Construction Manager's Owner's written permission.
- C. Use of Devices during Construction: Protect devices during construction unless devices are placed in service to protect the facility during construction.

## 1.10 SEQUENCING AND SCHEDULING

- A. Existing Fire-Alarm Equipment: Maintain existing equipment fully operational until new equipment has been tested and accepted. As new equipment is installed, label it "NOT IN SERVICE" until it is accepted. Remove labels from new equipment when put into service, and label existing fire-alarm equipment "NOT IN SERVICE" until removed from the building.
- B. Equipment Removal: After acceptance of new fire-alarm system, remove existing disconnected fire-alarm equipment and wiring.

## 1.11 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Extent: All equipment and components not covered in the Maintenance Service Agreement.
  - 2. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

## 2.1 SYSTEM DESCRIPTION

- A. Source Limitations for Fire-Alarm System and Components: Components shall be compatible with, and operate as an extension of, existing system. Provide system manufacturer's certification that all components provided have been tested as, and will operate as, a system.
- B. Noncoded, UL-certified addressable system, with multiplexed signal transmission and horn/strobe evacuation.
- C. Automatic sensitivity control of certain smoke detectors.
- D. All components provided shall be listed for use with the selected system.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

## 2.2 SYSTEMS OPERATIONAL DESCRIPTION

- A. Fire-alarm signal initiation shall be by one or more of the following devices and systems:
  - 1. Manual stations.
  - 2. Heat detectors.
  - 3. Smoke detectors.
  - 4. Duct smoke detectors.

5. Automatic sprinkler system water flow.
- B. Fire-alarm signal shall initiate the following actions:
1. Continuously operate alarm notification appliances, including voice evacuation notices.
  2. Identify alarm and specific initiating device at fire-alarm control unit, connected network control panels, off-premises network control panels, and remote annunciators.
  3. Transmit an alarm signal to the remote alarm receiving station.
  4. Unlock electric door locks in designated egress paths.
  5. Release fire and smoke doors held open by magnetic door holders on local alarm from smoke detectors adjacent to door(s) only.
  6. Recall elevators to primary or alternate recall floors.
  7. Activate shutdown of HVLS fans upon waterflow.
  8. Record events in the system memory.
  9. Indicate device in alarm on remote annunciator.
  10. Indicate voice notification on general alarm.
- C. Supervisory signal initiation shall be by one or more of the following devices and actions:
1. Valve supervisory switch.
  2. User disabling of zones or individual devices.
  3. Loss of communication with any panel on the network.
- D. System trouble signal initiation shall 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 any addressable sensor, input module, relay, control module, remote annunciator, printer interface, or Ethernet module.
  4. Loss of primary power at fire-alarm control unit.
  5. Ground or a single break in internal circuits of fire-alarm control unit.
  6. Abnormal ac voltage at fire-alarm control unit.
  7. Break in standby battery circuitry.
  8. Failure of battery charging.
  9. Abnormal position of any switch at fire-alarm control unit or annunciator.
- E. System Supervisory Signal Actions:
1. Initiate notification appliances.
  2. Identify specific device initiating the event at fire-alarm control unit, connected network control panels, off-premises network control panels, and remote annunciators.
  3. After a time delay of 200 seconds, transmit a trouble or supervisory signal to the remote alarm receiving station.
  4. Transmit system status to building management system.
  5. Display system status on remote annunciator.

## 2.3 FIRE-ALARM CONTROL UNIT

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Notifier; a Honeywell Company; NFS Series.
- B. General Requirements for Fire-Alarm Control Unit:
1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.
    - a. System software and programs shall be held in nonvolatile flash, electrically erasable, programmable, read-only memory, retaining the information through failure of primary and secondary power supplies.
    - b. Include a real-time clock for time annotation of events on the event recorder and printer.
    - c. Provide communication between the FACP and remote circuit interface panels, annunciators, and displays.
    - d. The FACP shall be listed for connection to a central-station signaling system service.
    - e. Provide nonvolatile memory for system database, logic, and operating system and event history. The system shall require no manual input to initialize in the event of a complete power down condition. The FACP shall provide a minimum 500-event history log.
    - f. CPU shall include 2GB dedicated compact flash memory for on-site system programming and information storage.
    - g. CPU shall include one active program and one reserve, allowing the system to remain running during download. "Install Mode" shall allow grouping of multiple troubles for uninstalled modules and devices into single trouble condition.
  2. Addressable Initiation Device Circuits: The FACP shall indicate which communication zones have been silenced and shall provide selective silencing of alarm notification appliance by building communication zone.
  3. Addressable Control Circuits for Operation of Notification Appliances and Mechanical Equipment: The FACP shall be listed for releasing service.
- C. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.
1. Annunciator and Display: Liquid-crystal type, 80 characters, minimum.
  2. Keypad: Arranged to permit entry and execution of programming, display, and control commands and to indicate control commands to be entered into the system for control of smoke-detector sensitivity and other parameters.

- D. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:
1. Pathway Class Designations: NFPA 72, Class B, except main riser initiating loops shall be Class A.
  2. Pathway Survivability: Level 0.
  3. Install no more than 256 addressable devices on each signaling-line circuit.
  4. Serial Interfaces:
    - a. One dedicated RS 485 port for remote station operation using point ID DACT.
    - b. One RS 485 port for remote annunciators or Ethernet module.
- E. Notification-Appliance Circuit:
1. Audible appliances shall sound in a three-pulse temporal pattern, as defined in NFPA 72.
  2. Where notification appliances provide signals to sleeping areas, the alarm signal shall be a 520-Hz square wave with an intensity 15 dB above the average ambient sound level or 5 dB above the maximum sound level, or at least 75 dBA, whichever is greater, measured at the pillow.
  3. Visual alarm appliances shall flash in synchronization where multiple appliances are in the same field of view, as defined in NFPA 72.
  4. Each notification shall be capable of being activated with a single initiating device in addition to a general alarm.
- F. Elevator Recall:
1. Elevator recall shall be initiated only by one of the following alarm-initiating devices:
    - a. Elevator lobby detectors except the lobby detector on the designated floor.
    - b. Smoke detector in elevator machine room.
    - c. Smoke detectors in elevator hoistway.
  2. Elevator controller shall be programmed to move the cars to the alternate recall floor if lobby detectors located on the designated recall floors are activated.
- G. Door Controls: Door hold-open devices that are controlled by smoke detectors at doors in smoke-barrier walls shall be connected to fire-alarm system.
- H. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory, and print out the final adjusted values on system printer.
- I. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to a remote alarm station.

- J. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, supervisory signals supervisory and digital alarm communicator transmitters shall be powered by 24-V dc source.
  - 1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.
- K. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.
  - 1. Batteries: Sealed, maintenance free, rechargeable, lead acid.
- L. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

#### 2.4 MANUAL FIRE-ALARM BOXES

- A. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall 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 an alarm, ; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
  - 2. Station Reset: Key- or wrench-operated switch.
  - 3. Weatherproof Protective Shield: Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm, where indicated on Drawings.

#### 2.5 SYSTEM SMOKE DETECTORS

- A. General Requirements for System Smoke Detectors:
  - 1. Comply with UL 268; operating at 24-V dc, nominal.
  - 2. Detectors shall be two-wire type.
  - 3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
  - 4. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring. Provide auxiliary contact as required for door control.
  - 5. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
  - 6. Integral Visual-Indicating Light: LED type, indicating detector has operated[ and power-on status].

7. Device address shall be set in sensor base and shall accept smoke and heat sensors. Replacement of sensor shall not require programming.
8. Remote Control: Unless otherwise indicated, detectors shall be digital-addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition and individually adjustable for sensitivity by fire-alarm control unit.
  - a. Multiple levels of detection sensitivity for each sensor.

B. Photoelectric Smoke Detectors:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall 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.).

C. Duct Smoke Detectors: Photoelectric type complying with UL 268A.

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall 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.).
3. Duct Housing Enclosure: Clear cover; UL listed per UL 268A for use with the supplied detector for smoke detection in HVAC system ducts.
4. Each sensor shall have multiple levels of detection sensitivity.
5. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
6. Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor-control circuit.
7. Remote Test Station: Provide with alarm LED and test switch as indicated on Drawings.

## 2.6 HEAT DETECTORS

A. General Requirements for Heat Detectors: Comply with UL 521.

1. Temperature sensors shall test for and communicate the sensitivity range of the device.

- B. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F or a rate of rise that exceeds 15 deg F per minute unless otherwise indicated.
  - 1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
  - 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

## 2.7 NOTIFICATION APPLIANCES

- A. General Requirements for Notification Appliances:
  - 1. Horns may be individually addressable connected to a signaling-line circuit, or may be non-addressable connected to a notification-appliance signal circuit.
  - 2. Horns shall be equipped for mounting as indicated, and with screw terminals for system connections.
  - 3. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.
- B. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464. Horns shall produce a sound-pressure level of 90 dBA, measured 10 feet from the horn, using the coded signal prescribed in UL 464 test protocol.
- C. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch- high letters on the lens.
  - 1. Rated Light Output:
    - a. 15/30/75/110 cd, selectable in the field.
  - 2. Mounting: Wall mounted unless otherwise indicated.
  - 3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
  - 4. Flashing shall be in a temporal pattern, synchronized with other units.
  - 5. Strobe Leads: Factory connected to screw terminals.
  - 6. Mounting Faceplate: Factory finished, red.

## 2.8 REMOTE ANNUNCIATOR

- A. Description: Annunciator functions shall match those of fire-alarm control unit for alarm, supervisory, and trouble indications. Manual switching functions shall match those of fire-alarm control unit, including acknowledging, silencing, resetting, and testing.
  - 1. Mounting: Flush cabinet, NEMA 250, Type 1.

- B. Display Type and Functional Performance: Alphanumeric display and LED indicating lights shall match those of fire-alarm control unit. Provide controls to acknowledge, silence, reset, and test functions for alarm, supervisory, and trouble signals.

## 2.9 ADDRESSABLE INTERFACE DEVICE

- A. General:
  - 1. Include address-setting means on the module.
  - 2. Store an internal identifying code for control panel use to identify the module type.
  - 3. Listed for controlling HVAC fan motor controllers.
- B. Monitor Module: Microelectronic module providing a system address for alarm-initiating devices for wired applications with normally open contacts.
- C. Integral Relay: Capable of providing a direct signal to elevator controller to initiate elevator recall.
  - 1. Allow the control panel to switch the relay contacts on command.
  - 2. Have a minimum of two normally open and two normally closed contacts available for field wiring.
- D. Control Module:
  - 1. Operate notification devices.
  - 2. Operate solenoids for use in sprinkler service.

## 2.10 DIGITAL ALARM COMMUNICATOR TRANSMITTER

- A. Digital alarm communicator transmitter shall be acceptable to the remote central station and shall comply with UL 632.
- B. Functional Performance: Primary transmission shall send an alarm, supervisory, or trouble signal from fire-alarm control unit and automatically capture one telephone line and dial a preset number for a remote central station. Secondary transmission shall use a different technology. When contact is made with central station, signals shall be transmitted. If service on either line is interrupted for longer than 45 seconds, transmitter shall initiate a local trouble signal and transmit the signal indicating loss of telephone line to the remote alarm receiving station over the secondary transmission line. Transmitter shall automatically report telephone service restoration to the central station. If service is lost on both primary and secondary lines, transmitter shall initiate the local trouble signal.
- C. Local functions and display at the digital alarm communicator transmitter shall 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 the central station or fire-alarm control unit.

D. Digital data transmission shall include the following:

1. Address of the alarm-initiating device.
2. Address of the supervisory signal.
3. Address of the 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.

## 2.11 DEVICE GUARDS

A. Description: Welded wire mesh of size and shape for the manual station, smoke detector, gong, or other device requiring protection, where indicated on Drawings.

1. Factory fabricated and furnished by device manufacturer.
2. Finish: Paint of color to match the protected device.

## 2.12 FIRE ALARM WIRE AND CABLE

A. General Wire and Cable Requirements: NRTL listed and labeled as complying with NFPA 70, Article 760.

B. Power-Limited Circuits: Solid-copper conductors with 300-V rated, 75 deg C, red color-coded, plenum-rated PVC insulation, and complying with requirements in UL 2196 for a two-hour rating.

1. Signal Line Circuits (SLC): Shielded No. 18-2 AWG, minimum.
2. Initiating Device Circuits (IDC): Shielded NO. 18-2 AWG, minimum.
3. Notification Appliance Circuit (NAC): Stranded No. 14-2 AWG, minimum (strobes).  
Twisted-shielded No. 18-2 AWG, minimum (audible).

C. Wiring installed underground shall have insulation rated for wet locations.

D. Coordinate with fire alarm system manufacturer for recommended wire size and type.

## 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 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all 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 all other trades have completed cleanup shall be replaced.
  - 2. Devices installed but not yet placed in service shall be protected from construction dust, debris, dirt, moisture, and damage according to 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 in existing part of the building.
  - 2. Connect new equipment to existing monitoring equipment at the supervising station.
  - 3. Expand, modify, and supplement existing control and monitoring equipment as necessary to extend existing control and monitoring functions to the new points. New components shall be capable of merging with existing configuration without degrading the performance of either system.
- C. Install wall-mounted equipment, with tops of cabinets not more than 78 inches above the finished floor.
- D. Provide (1) telephone line and (1) internet-protocol line adjacent to primary digital alarm communicating transmitter in the FACP.
- E. Manual Fire-Alarm Boxes:

1. Install manual fire-alarm box in the normal path of egress within 60 inches of the exit doorway.
  2. Mount manual fire-alarm box on a background of a contrasting color.
  3. The center line of the manual fire-alarm box shall be between 46 inches above floor level. All devices shall be mounted at the same height unless otherwise indicated.
- F. Smoke- or Heat-Detector Spacing:
1. Comply with the "Smoke-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.
  2. Comply with the "Heat-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.
  3. Smooth ceiling spacing shall not exceed 30 feet.
  4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Annex A or Annex B in NFPA 72.
  5. HVAC: Locate detectors not closer than 36 inches from air-supply diffuser or return-air opening.
  6. Lighting Fixtures: Locate detectors not closer than 12 inches from any part of a lighting fixture and not directly above pendant mounted or indirect lighting.
- G. Install a cover on each smoke detector that is not placed in service during construction. Cover shall remain in place except during system testing. Remove cover prior to system turnover.
- H. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than 36 inches long shall 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.
- I. Remote Status and Alarm Indicators: Install in a visible location near each smoke detector, sprinkler water-flow switch, and valve-tamper switch that is not readily visible from normal viewing position.
- J. Audible/visible and visible-only devices: Install at +80" above finished floor to bottom of device housing. Install on flush-mounted boxes unless noted otherwise.
- K. Device Location-Indicating Lights: Locate in public space near the device they monitor.
- L. Connect all flow switches and tamper switches as indicated on Drawings.
- M. Connect all post indicator valves as indicated on Drawings. Install conduit and wiring from device location to the interior of the building.
- N. Install device guards in locations indicated on Drawings per manufacturer recommendations.
- O. Provide 120 volt power to all fire alarm control panels and notification appliance circuit panels as required.

## 3.3 FIRE ALARM WIRING INSTALLATION

## A. General

1. Comply with NECA 1 and NFPA 72.
2. Cable and raceways used for fire alarm circuits, and equipment control wiring associated with the fire alarm system, may not contain any other wire or cable.
3. Where conduit is required, fire alarm circuits and equipment control wiring associated with the fire alarm system shall be installed in a dedicated raceway system. This system shall not be used for any other wire or cable.
4. Where raceways are required for the installation of fire alarm cables, use EMT. Install raceways according to Section 260533 "Raceways and Boxes for Electrical Systems."
5. Exposed EMT and junction shall be painted red enamel.
6. Fire-Rated Cables: Use of two-hour, fire-rated fire alarm cables, NFPA 70. Types MI and CI, is not permitted.

## B. Wiring Method

1. Install all fire alarm cabling in metal raceways.

## C. Wiring Method

1. Install plenum rated cable above ceiling only. Install cable parallel and perpendicular to surfaces or structural members, and follow surface contours. Secure and support cables by straps, staples, or similar fittings so designed at intervals not exceeding 48" and not more than 6" from every cabinet, box, or fitting.
2. Install cable in raceways when concealed within walls.
3. Install cable in raceways in all exposed locations.

## D. Wiring within Enclosures: Separate power-limited and non-power-limited conductors as recommended by manufacturer. Install conductors parallel with or at right angles to sides and back of the enclosure. Bundle, lace, and train conductors to terminal points with no excess. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with the fire alarm system to terminal blocks. Mark each terminal according to the system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.

## E. Cable Taps: Use numbered terminal strips in junction, pull, and outlet boxes, cabinets, or equipment enclosures where circuit connections are made.

## F. Risers: Install at least two vertical cable risers to serve the fire alarm system. Separate risers in close proximity to each other with a minimum one-hour-rated wall, so the loss of one riser does not prevent the receipt or transmission of signals from other floors or zones.

## G. Wiring to Remote Alarm Transmitting Device: 1-inch conduit between the fire alarm control panel and the transmitter. Install number of conductors and electrical supervision for connecting wiring as needed to suit monitoring function.

### 3.4 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.
- B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 36 inches from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.
  - 1. Magnetically held-open doors.
  - 2. Electronically locked doors and access gates.
  - 3. Rolling shutters.
  - 4. Air handling units.
  - 5. Alarm-initiating connection to elevator recall system and components.
  - 6. Supervisory connections at valve flow switches.
  - 7. Supervisory connections at valve supervisory switches.
  - 8. Supervisory connections at post indicator valve switches.
  - 9. Data communication circuits for connection to building management system.
  - 10. Alarm-initiating connection to HVLS fans.

### 3.5 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- B. Install framed instructions in a location visible from fire-alarm control unit.

### 3.6 GROUNDING

- A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.
- B. Ground shielded cables at the control panel location only. Insulate shield at device location.

### 3.7 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by Architect.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

- C. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
1. Visual Inspection: Conduct visual inspection prior to testing.
    - a. Inspection shall be based on completed record Drawings and system documentation that is required by the "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
    - b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
  2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
  3. Test audible appliances for the private operating mode according to manufacturer's written instructions.
  4. Test visible appliances for the public operating mode according to manufacturer's written instructions.
  5. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- D. Reacceptance Testing: Perform reacceptance testing to verify the 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.

### 3.8 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall 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 shall be manufacturer's authorized replacement parts and supplies.
1. Include visual inspections according to the "Visual Inspection Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
  2. Perform tests in the "Test Methods" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
  3. Perform tests per the "Testing Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

3.9 SOFTWARE SERVICE AGREEMENT

- A. Comply with UL 864.
- B. Technical Support: Beginning at Substantial Completion, service agreement shall 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 shall 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.

3.10 DEMONSTRATION

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

END OF SECTION 284621



**SCHMIDT ASSOCIATES**

415 Massachusetts Avenue  
Indianapolis, IN 46204  
www.schmidt-arch.com

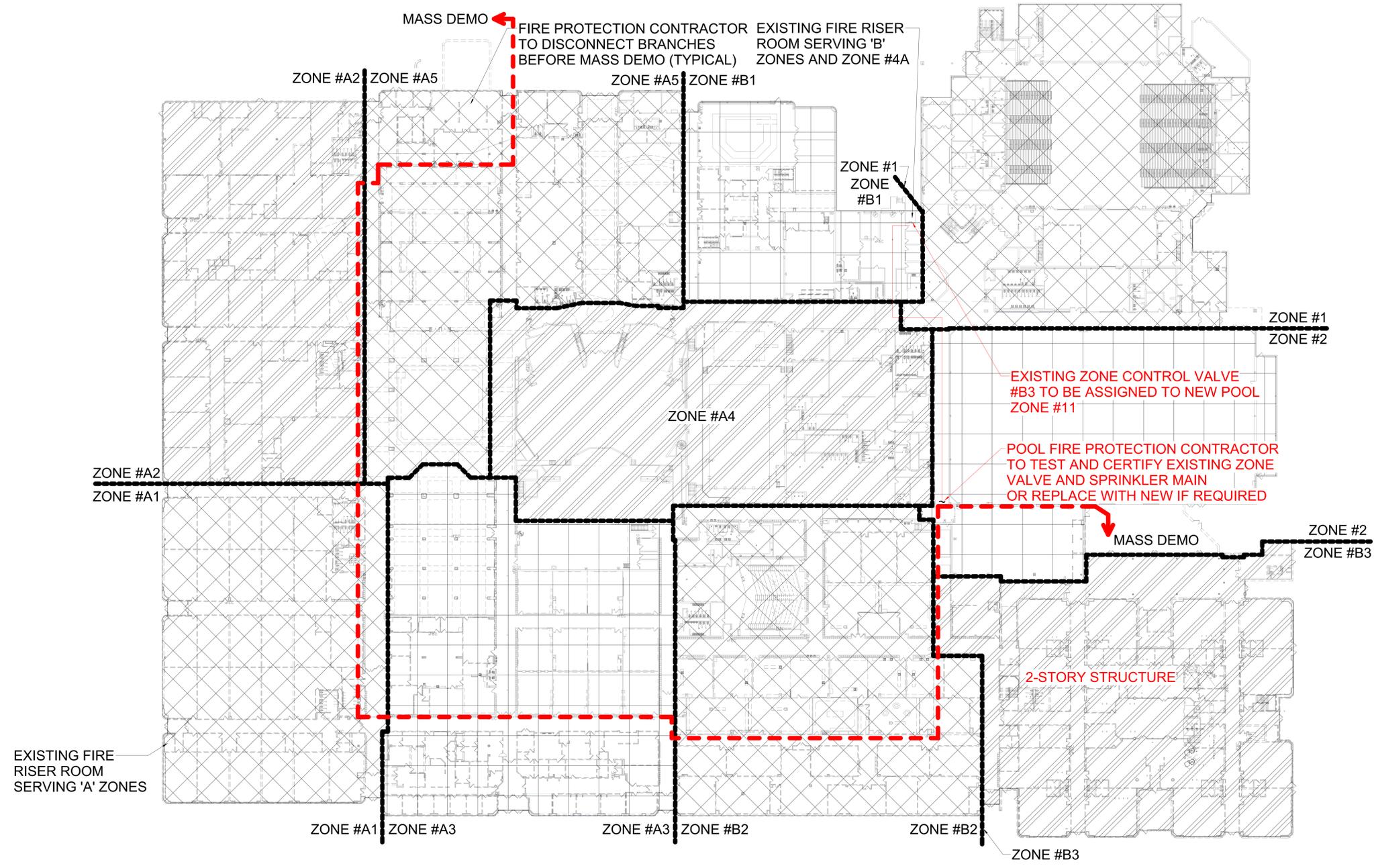
Project No. 2018-050.LCP  
Project Date 01.05.2022  
Produced JH KAV



Sarah K. Hampstead

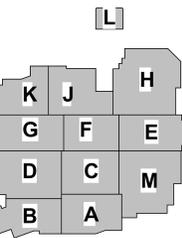
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#	Revision	Date



2A OVERALL DEMOLITION FIRE PROTECTION PLAN - REFERENCE  
1" = 30'-0"

7300 E 56th St.  
Lawrence, IN 46226



KEY PLAN

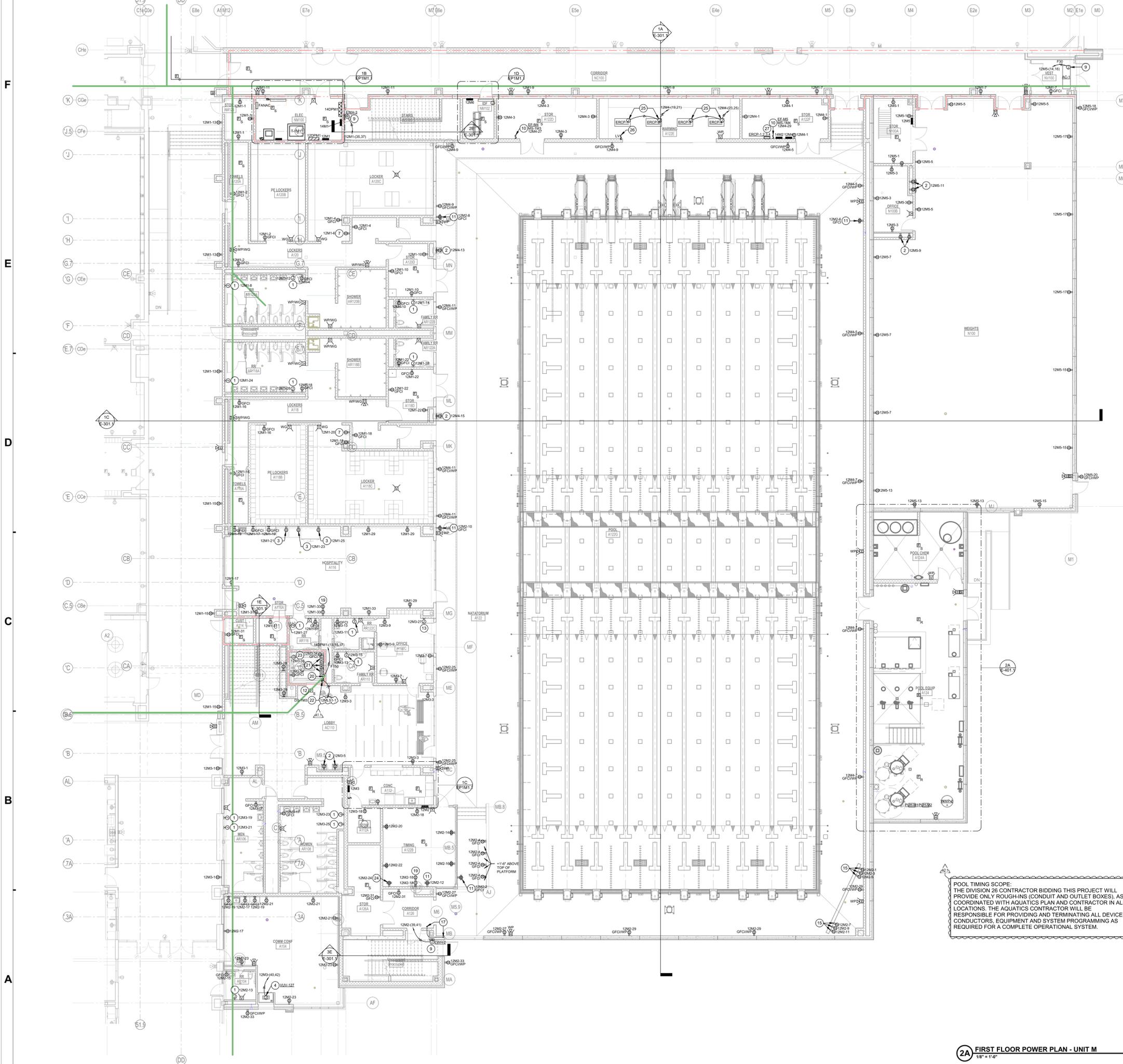
MSD OF LAWRENCE TOWNSHIP



LAWRENCE CENTRAL HIGH SCHOOL POOL

OVERALL DEMOLITION FIRE PROTECTION PLAN - REFERENCE

FPD101.1



- ### GENERAL POWER NOTES
- REFER TO SHEET E-001 FOR ADDITIONAL INFORMATION.
  - PROVIDE CORROSION RESISTANT FASTENERS AND HARDWARE FOR ALL DEVICES AND FIXTURES INSTALLED IN NATATORIUM, POOL EQUIPMENT ROOM, AND POOL CHEMICAL ROOM.
- ### POWER PLAN NOTES
- PROVIDE CIRCUIT CONNECTION FOR HAND DRYER. COORDINATE MOUNTING HEIGHT WITH A-SERIES DRAWINGS.
  - RECEPTACLE FOR ELECTRIC WATER COOLER. COORDINATE LOCATION WITH MANUFACTURER PRIOR TO INSTALLATION. CIRCUIT PROTECTED BY GFCI BREAKER.
  - RECEPTACLE FOR REFRIGERATOR AT 4'0" TO C.L. CIRCUIT PROTECTED BY GFCI BREAKER.
  - CIRCUIT CONNECTION FOR VUV. CONNECT TO MANUFACTURER PROVIDED DISCONNECT SWITCH. PROVIDE BRANCH CIRCUIT WIRING TO MATCH OR EXCEED CIRCUIT BREAKER SIZE.
  - CIRCUIT CONNECTIONS TO AIR HANDLING UNIT. CONNECT THROUGH VFDs FURNISHED BY TEMPERATURE CONTROL CONTRACTOR.
  - CIRCUIT CONNECTION FOR LIGHTS AND RECEPTABLES INSTALLED IN AHU. COORDINATE LOCATION WITH MANUFACTURER.
  - RECEPTACLE FOR SWIM SUIT WATER EXTRACTOR. COORDINATE LOCATION WITH MANUFACTURER PRIOR TO INSTALLATION. CIRCUIT PROTECTED BY GFCI BREAKER.
  - NEMA L6-30 RECEPTACLE FOR TELECOMMUNICATIONS RACK INSTALLED ON TOP RAIL OF RACK. COORDINATE WITH T-SERIES DRAWINGS. TYPICAL FOR ALL SHOWS.
  - PROVIDE CIRCUIT AND CONNECT TO MANUFACTURER PROVIDED DISCONNECT SWITCH.
  - PROVIDE TOGGLE SWITCH OR MOTOR STARTER ON WALL AT 4'0" TO C.L. CONNECT TO UNIT PROVIDED DISCONNECT SWITCH LOCATED IN EXHAUST FAN ON ROOF. COORDINATE CONTROLS WITH M-SERIES DRAWINGS.
  - RECEPTACLE FOR TIMING AND SCORING EQUIPMENT.
  - SMOKE DETECTOR FOR ELEVATOR RECALL.
  - PROVIDE BACK BOX RACKWAYS TO CIRCULATION FANS. CONTROL WIRING AND INSTALL MANUFACTURER FURNISHED CIRCULATION FAN CONTROLLER. REFER TO M-SERIES SHEETS FOR CONTROLLER LOCATION. REFER TO FIRE ALARM PLANS.
  - CONNECT FAN THROUGH CIRCUIT INDICATED AND CONTROL THROUGH CONTROLLER LOCATED IN FIRST FLOOR COACHES OFFICE. INTERCONNECT WITH FIRE ALARM SYSTEM TO DE-ENERGIZE POWER DURING UPON A SPRINKLER SYSTEM ALARM.
  - RECEPTABLES SERVING SCOREBOARD. COORDINATE RECEPTACLE LOCATIONS PRIOR TO ROUGH-IN WITH A-SERIES DRAWINGS. REFER TO SHEET A0220.4.
  - DISCONNECT SWITCH FOR FAN COIL UNIT. REFER TO ROOF PLANS FOR LOCATION OF CORRESPONDING CONDENSING UNIT.
  - PROVIDE RECESSED JUNCTION BOX ROUGH-IN WITH BLANK COVER PLATE AT +3'0" ABOVE POOL DECK FOR FUTURE ELECTRIC SHOCK SYSTEM. PROVIDE 1" CONDUIT WITH PULL STRING FROM JUNCTION BOX DOWN INSIDE OF WALL TO ABOVE CEILING AREA OF CLOSEST ACCESSIBLE CELL.
  - CIRCUIT CONNECTION FOR TEMPERATURE CONTROL PANEL. VERIFY FINAL LOCATION IN FIELD WITH DIVISION 23 CONTRACTOR.
  - RECEPTACLE FOR DISPLAY MONITOR. COORDINATE MOUNTING HEIGHT WITH T-SERIES DRAWINGS.
  - POWER CONNECTION FOR ELEVATOR MOTOR. CONFIRM FINAL LOCATION WITH ELEVATOR EQUIPMENT MANUFACTURER.
  - FIRE ALARM ADDRESSABLE RELAYS FOR ELEVATOR RECALL FOR DESIGNATED FLOOR. ELEVATOR RECALL FOR ALTERNATE FLOOR AND ELEVATOR HAT LIGHT.
  - DISCONNECT SWITCH FOR ELEVATOR CAB LIGHTS. CONFIRM FINAL LOCATION WITH ELEVATOR EQUIPMENT MANUFACTURER.
  - RECEPTACLE FOR ELEVATOR PIT SLUMP PUMP LOCATED AT 4'0" A.F.F. TO C.L.
  - QUADRUPLEX RECEPTACLE FOR SOUND RACK. COORDINATE LOCATION AND MOUNTING HEIGHT WITH T-SERIES DRAWINGS.
  - RADIANT PANEL. CONNECT TO CIRCUIT INDICATED. J-BOX BY RADIANT PANEL MANUFACTURER. REFER TO M-SERIES DRAWINGS.
  - RADIANT PANEL SYSTEM LOW VOLTAGE CONTROLLER.
  - RADIANT PANEL SYSTEM RELAY PANEL.
  - CIRCUIT CONNECTION FOR CAB READER.

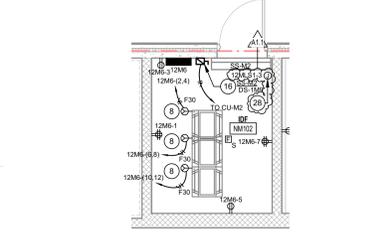


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 Produced JTH/EAG

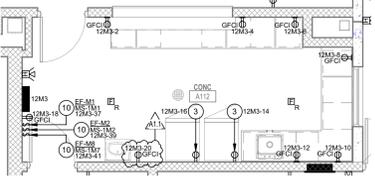


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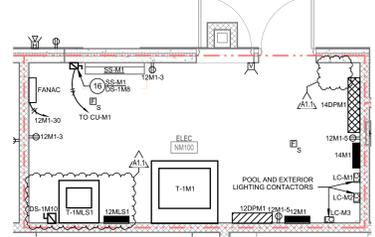
#	Revision	Date
A1.1	Addendum #1	12.13.2021
A2.1	Addendum #2	01.04.2022
A3.1	Addendum #3	01.05.2022



1D ENLARGED POWER PLAN - IDF NM102  
1/4" = 1'-0"



1C ENLARGED POWER PLAN - CONCESSIONS  
1/4" = 1'-0"



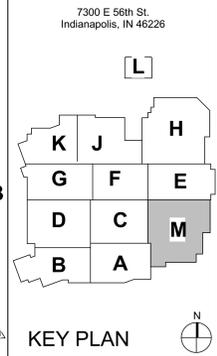
1B ENLARGED POWER PLAN - ELEC NM100  
1/4" = 1'-0"

**POOL TIMING SCOPE:**  
 THE DIVISION 26 CONTRACTOR BIDDING THIS PROJECT WILL PROVIDE ONLY ROUGH-INS (CONDUIT AND OUTLET BOXES), AS COORDINATED WITH AQUATICS PLAN AND CONTRACTOR IN ALL LOCATIONS. THE AQUATICS CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING AND TERMINATING ALL DEVICES, CONDUCTORS, EQUIPMENT AND SYSTEM PROGRAMMING AS REQUIRED FOR A COMPLETE OPERATIONAL SYSTEM.

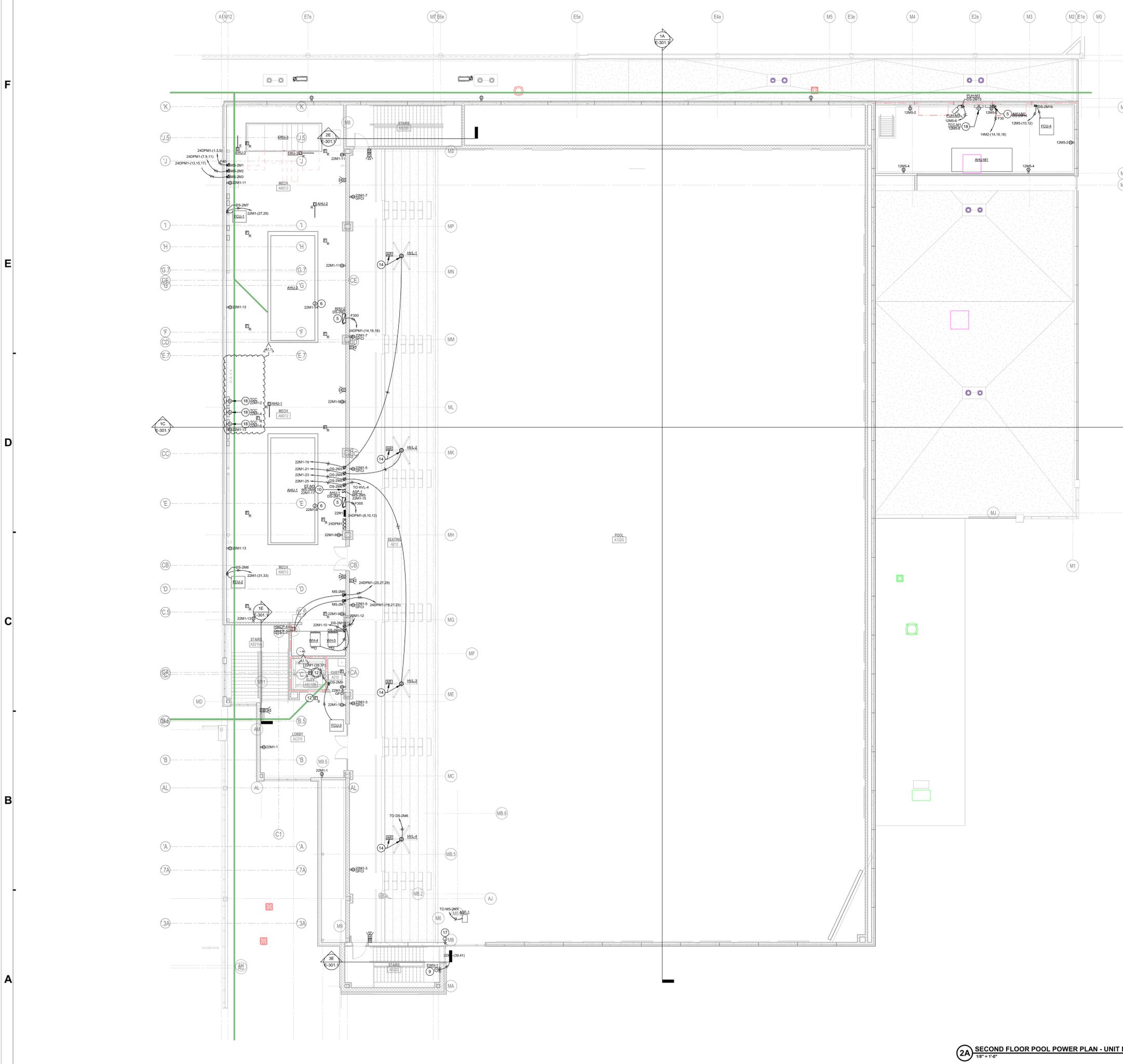
**FIRE ALARM SYSTEM SCOPE:**  
 THE EXISTING FIRE ALARM SYSTEM IN THE BUILDING IS NOTIFIER NFS SERIES. CONTRACTOR BIDDING THIS PROJECT WILL PROVIDE AND TERMINATE ALL NOTIFIER COMPATIBLE DEVICES, CONDUCTORS, EQUIPMENT (SUCH AS NACS, ETC.) AND SYSTEM PROGRAMMING AS REQUIRED FOR A COMPLETE OPERATIONAL SYSTEM CONNECTED INTO EXISTING NOTIFIER NFS FIRE ALARM CONTROL PANEL.

- PROVIDE THE FOLLOWING RACEWAY ITEMS IN ROOM A122, NATATORIUM AND ROOMS A124/A124A POOL EQUIP/POOL CHEM AS REQUIRED:
- SCHEDULE 80 PVC CONDUIT OVERHEAD AND WITHIN WALLS FOR OUTLETS OPENING INTO THE ROOMS LISTED ABOVE. PROVIDE NON-METALLIC OUTLET BOXES.
  - STAINLESS STEEL EXPANSION ANCHORS.
  - STAINLESS STEEL CONDUIT AND CABLE SUPPORTS.
  - STAINLESS STEEL CABLE FOR SUSPENDING LIGHT FIXTURES.
  - NON-METALLIC COATINGS ON STEEL SLOTTED SUPPORT SYSTEMS.

2A FIRST FLOOR POWER PLAN - UNIT M  
1/8" = 1'-0"



FIRST FLOOR POWER PLAN - UNIT M  
 EP1M1.1



- ### GENERAL POWER NOTES
- | # | NOTES   |
|---|---|
| A | REFER TO SHEET E-001 FOR ADDITIONAL INFORMATION.  |
| B | PROVIDE CORROSION RESISTANT FASTENERS AND HARDWARE FOR ALL DEVICES AND FIXTURES INSTALLED IN NATATORIUM, POOL EQUIPMENT ROOM, AND POOL CHEMICAL ROOM. |
- ### POWER PLAN NOTES
- | #  | NOTES   |
|----|---|
| 1  | PROVIDE CIRCUIT CONNECTION FOR HAND DRYER. COORDINATE MOUNTING HEIGHT WITH A-SERIES DRAWINGS.   |
| 2  | RECEPTACLE FOR ELECTRIC WATER COOLER. COORDINATE LOCATION WITH MANUFACTURER PRIOR TO INSTALLATION. CIRCUIT PROTECTED BY GFCI BREAKER.   |
| 3  | RECEPTACLE FOR REFRIGERATOR AT 4'0" A.F.F. TO C.L. CIRCUIT PROTECTED BY GFCI BREAKER.   |
| 4  | CIRCUIT CONNECTION FOR VUV. CONNECT TO MANUFACTURER PROVIDED DISCONNECT SWITCH. PROVIDE BRANCH CIRCUIT WIRING TO MATCH OR EXCEED CIRCUIT BREAKER SIZE.  |
| 5  | CIRCUIT CONNECTIONS TO AIR HANDLING UNIT. CONNECT THROUGH VFDS FURNISHED BY TEMPERATURE CONTROL CONTRACTOR.   |
| 6  | CIRCUIT CONNECTION FOR LIGHTS AND RECEPTACLES INSTALLED IN AHU. COORDINATE LOCATION WITH MANUFACTURER.  |
| 7  | RECEPTACLE FOR TELECOMMUNICATIONS RACK INSTALLED ON TOP RAIL OF RACK. COORDINATE WITH T-SERIES DRAWINGS. TYPICAL FOR ALL SHOWN.   |
| 8  | NEMA L6-30 RECEPTACLE FOR TELECOMMUNICATIONS RACK INSTALLED ON TOP RAIL OF RACK. COORDINATE WITH T-SERIES DRAWINGS. TYPICAL FOR ALL SHOWN.  |
| 9  | PROVIDE CIRCUIT AND CONNECT TO MANUFACTURER PROVIDED DISCONNECT SWITCH.   |
| 10 | PROVIDE TOGGLE SWITCH OR MOTOR STARTER ON WALL AT 4'0" A.F.F. TO C.L. CONNECT TO UNIT PROVIDED DISCONNECT SWITCH LOCATED IN EXHAUST FAN ON ROOF. COORDINATE CONTROLS WITH M-SERIES DRAWINGS.  |
| 11 | RECEPTACLE FOR TIMING AND SCORING EQUIPMENT.  |
| 12 | SMOKE DETECTOR FOR ELEVATOR RECALL.   |
| 13 | PROVIDE BACK BOX RACEWAYS TO CIRCULATION FANS. CONTROL WIRING AND INSTALL MANUFACTURER FURNISHED CIRCULATION FAN CONTROLLER. REFER TO M-SERIES SHEETS FOR CONTROLLER LOCATION. REFER TO FIRE ALARM PLANS.   |
| 14 | CONNECT FAN THROUGH CIRCUIT INDICATED AND CONTROL THROUGH CONTROLLER LOCATED IN FIRST FLOOR COACHES OFFICE. INTERCONNECT WITH FIRE ALARM SYSTEM TO DE-ENERGIZE POWER DURING UPON A SPRINKLER SYSTEM ALARM.  |
| 15 | RECEPTACLES SERVING SCOREBOARD. COORDINATE RECEPTACLE LOCATIONS PRIOR TO ROUGH-IN WITH AG-SERIES DRAWINGS. REFER TO SHEET A0210.4.  |
| 16 | DISCONNECT SWITCH FOR FAN COIL UNIT SPLIT SYSTEM. REFER TO ROOF PLANS FOR LOCATION OF CORRESPONDING CONDENSING UNIT.  |
| 17 | PROVIDE RECESSED JUNCTION BOX ROUGH-IN WITH BLANK COVER PLATE AT +3'0" ABOVE POOL DECK FOR FUTURE ELECTRIC SHADE SYSTEM. PROVIDE 1" CONDUIT WITH PULL STRING FROM JUNCTION BOX DOWN INSIDE OF WALL TO ABOVE CEILING AREA OF CLOSEST ACCESSIBLE CEILING. |
| 18 | CIRCUIT CONNECTION FOR TEMPERATURE CONTROL PANEL. VERIFY FINAL LOCATION IN FIELD WITH DIVISION 23 CONTRACTOR.   |
| 19 | RECEPTACLE FOR DISPLAY MONITOR. COORDINATE MOUNTING HEIGHT WITH T-SERIES DRAWINGS.  |
| 20 | POWER CONNECTION FOR ELEVATOR MOTOR. CONFIRM FINAL LOCATION WITH ELEVATOR EQUIPMENT MANUFACTURER.   |
| 21 | FIRE ALARM ADDRESSABLE RELAYS FOR ELEVATOR RECALL FOR DESIGNATED FLOOR. ELEVATOR RECALL FOR ALTERNATE FLOOR AND ELEVATOR HAT LIGHT.   |
| 22 | DISCONNECT SWITCH FOR ELEVATOR CAB LIGHTS. CONFIRM FINAL LOCATION WITH ELEVATOR EQUIPMENT MANUFACTURER.   |
| 23 | RECEPTACLE FOR ELEVATOR PIT PUMP PUMP LOCATED AT 4'0" A.F.F. TO C.L.  |
| 24 | QUADRUPLEX RECEPTACLE FOR SOUND RACK. COORDINATE LOCATION AND MOUNTING HEIGHT WITH T-SERIES DRAWINGS.   |
| 25 | RADIANT PANEL. CONNECT TO CIRCUIT INDICATED. J-BOX BY RADIANT PANEL MANUFACTURER. REFER TO M-SERIES DRAWINGS.   |
| 26 | RADIANT PANEL SYSTEM LOW VOLTAGE CONTROLLER.  |
| 27 | RADIANT PANEL SYSTEM RELAY PANEL.   |
| 28 | CIRCUIT CONNECTION FOR CARD READER.   |

**POOL TIMING SCOPE:**  
THE DIVISION 26 CONTRACTOR BIDDING THIS PROJECT WILL PROVIDE ONLY ROUGH-INS (CONDUIT AND OUTLET BOXES), AS COORDINATED WITH AQUATICS PLAN AND CONTRACTOR IN ALL LOCATIONS. THE AQUATICS CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING AND TERMINATING ALL DEVICES, CONDUCTORS, EQUIPMENT AND SYSTEM PROGRAMMING AS REQUIRED FOR A COMPLETE OPERATIONAL SYSTEM.

**FIRE ALARM SYSTEM SCOPE:**  
THE EXISTING FIRE ALARM SYSTEM IN THE BUILDING IS NOTIFIER NFS SERIES. CONTRACTOR BIDDING THIS PROJECT WILL PROVIDE AND TERMINATE ALL NOTIFIER COMPATIBLE DEVICES, CONDUCTORS, EQUIPMENT (SUCH AS NACS, ETC.) AND SYSTEM PROGRAMMING AS REQUIRED FOR A COMPLETE OPERATIONAL SYSTEM CONNECTED INTO EXISTING NOTIFIER NFS FIRE ALARM CONTROL PANEL.

- PROVIDE THE FOLLOWING RACEWAY ITEMS IN ROOM A122, NATATORIUM AND ROOMS A124/A124A POOL EQUIP/POOL CHEM AS REQUIRED:
- SCHEDULE 80 PVC CONDUIT OVERHEAD AND WITHIN WALLS FOR OUTLETS OPENING INTO THE ROOMS LISTED ABOVE. PROVIDE NON-METALLIC OUTLET BOXES.
  - STAINLESS STEEL EXPANSION ANCHORS.
  - STAINLESS STEEL CONDUIT AND CABLE SUPPORTS.
  - STAINLESS STEEL CABLE FOR SUSPENDING LIGHT FIXTURES.
  - NON-METALLIC COATINGS ON STEEL SLOTTED SUPPORT SYSTEMS.

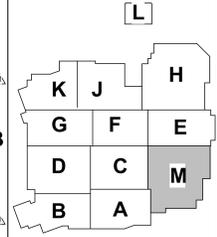


Project No. 2018-050.LCP  
Project Date 12.01.2021  
Produced JTH EAG



#	Revision	Date
A1.1	Addendum #1	12.13.2021
A2.1	Addendum #2	01.04.2022
A3.1	Addendum #3	01.05.2022

7300 E 56th St.  
Indianapolis, IN 46226



KEY PLAN

MSD OF LAWRENCE TOWNSHIP



POOL MEZZANINE  
POWER PLAN - UNIT M

EP1M2.1

2A SECOND FLOOR POOL POWER PLAN - UNIT M  
1/8" = 1'-0"

ELECTRIC WALL HEATER SCHEDULE													
IDENTITY DATA			ROOM		HEATING DATA		FAN DATA						NOTES
MARK	MANUFACTURER	MODEL	#	NAME	CAPACITY (BTUH)	LAT (°F)	AIRFLOW (CFM)	FAN TYPE	DRIVE	VOLTS (V)	PHASE	MCA (A)	
EWH-1	QMARK	AWH4408F	AS122	SOUTH STAIRS	6,824	91.5	200	PROP	DIRECT	208	1	9.6	1, 2, 3
EWH-2	QMARK	AWH4408F	AS122	SOUTH STAIRS	6,824	91.5	200	PROP	DIRECT	208	1	9.6	1, 2, 3
EWH-3	QMARK	AWH4408F		NORTH STAIRS	6,824	91.5	200	PROP	DIRECT	208	1	9.6	1, 2, 3

**ELECTRIC WALL HEATER SCHEDULE NOTES:**

1. 2" SEMI-RECESSED MOUNTING SLEEVE.
2. PROVIDE 14 GAUGE SECURITY FRONT COVER.
3. PROVIDE TAMPER-PROOF INTEGRAL THERMOSTAT.

FAN COIL UNIT SCHEDULE																																	
IDENTITY DATA			DIMENSIONS				FAN DATA						COOLING DATA										HEATING DATA							NOTES			
MARK	MANUFACTURER	MODEL	ROOM NAME	LENGTH	WIDTH	HEIGHT	CFM	ESP (IN-WG)	MOTOR SPEED	VOLTS	PHASE	MOTOR BRAKE HP	MOTOR HP	TOTAL COOLING (BTUH)	SENSIBLE COOLING (BTUH)	ROWS	GPM	EWT (F)	LWT (F)	EDB (F)	EWB (F)	LDB (F)	LWB (F)	COOLING COIL WPD (FT)	TOTAL HEATING (BTUH)	ROWS	GPM	EWT (F)	LWT (F)		EDB (F)	LWB (F)	HEATING COIL WPD (FT)
FCU-1	I.E.C.	HBD16	MECH. ROOM	38"	48"	21"	1600	0.5	1	208	1	0.48	3/4	60,125	41,517	6	15	45	54.5	80	67	55.8	54.5	13.3	49,711	1	4	160	135	60	89.5	3.6	1, 3, 4
FCU-2	I.E.C.	HBD16	MECH. ROOM	38"	48"	21"	1600	0.5	1	208	1	0.48	3/4	60,125	41,517	6	15	45	54.5	80	67	55.8	54.5	13.3	49,711	1	4	160	135	60	89.5	3.6	1, 3, 4
FCU-3	I.E.C.	HBD06	2ND FLOOR LOBBY	36"	28"	19.75"	500	0.5	1	208	1	0.14	1/3	19,370	13,404	4	5	45	52.7	80	67	55.7	54.5	2.9	19,910	1	2	160	133.8	60	96.9	4.7	1, 2, 3, 4
FCU-4	I.E.C.	HBD30	WEIGHT RM MEZZANINE	43"	62"	32"	2200	0.5	1	208	1	0.59	1	84,535	60,555	6	12	45	59	80	67	55	54.6	3.6	114,130	2	6	160	122	60	108	1	1, 3, 4

**FAN COIL UNIT SCHEDULE NOTES:**

1. HEATING COIL TO BE IN THE RE-HEAT POSITION. SEE DETAIL 1B/M-501.1
2. FAN COIL UNIT TO HAVE HERESITE COATING INSIDE AND OUT TO PREVENT CORROSION.
3. PROVIDE MATCHING FILTER RACK.
4. SEE DETAIL 1B/M-501.1, 1C/M-502.1 & 3B/M-502.1

**SECTION 075419 - POLYVINYL-CHLORIDE (PVC) ROOFING**

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Fully Adhered PVC membrane roofing system.
2. Section References:
  - a. Section 019100: Commissioning
  - b. Section 070150: Preparation for [New] Roofing
  - c. Section 076200: Sheet Metal Flashing and Trim
  - d. Section 077200: Roof Accessories

- B. If discrepancies are discovered between the existing conditions and those noted on the drawings, immediately notify the Commissioning Agent (CA) before commencing with any work. If a discrepancy is discovered during work, stop immediately and notify the CA of the issue. Necessary steps shall be taken to make the building watertight until the discrepancies are resolved.

## 1.2 SCOPE OF WORK

- A. Roofs specified: Furnish and install specified roofing system and related components per the contract documents.

## B. Roof Section #55 Scope of Work:

1. Inspect newly installed decking components for impaired areas.
2. Before installing roof system components, make sure decking is of adequate condition and slope. All imperfections must be remediated to the satisfaction of the Commissioning agent. If the roofing contractor has a concern that the existing decking is not an adequate substrate to move forward, he must notify the General Contractor immediately.
3. Install one (1) layer of SBS modified bitumen self-adhering vapor barrier.
4. Seal all openings, including roof drains at the vapor barrier level prior to installing the insulation system.
5. Install two (2) layers of two and one-half inch (2.5") thick polyisocyanurate insulation adhered with urethane foam adhesive. Adhesive application shall be in accordance with the manufacturer's wind uplift approvals, including perimeter and corner enhancement. Stagger the upper layer from the underlying layer a minimum of six inches (6") in all directions.
6. Install minimum 4' x 8' tapered sumps at all double roof drains.
7. Install new tapered saddle system, including drain line saddles, tapered edge sumps and crickets, set into urethane foam adhesive in locations noted on the drawings.
8. Install new perimeter flashings, counterflashings, and metal coping as detailed.
9. Install a new roof hatch, access ladder and telescoping safety pole in accordance with the specifications and drawings.
10. Install new fully adhered 60 mil PVC roofing system.

11. Provide a 20-year NDL Total System Warranty by the roofing system manufacturer.
- C. Roof Sections #16A, #39, #56, #57, #58, #59 #60 and #61 Scope of Work:
1. Inspect newly installed decking components for impaired areas.
  2. Before installing roof system components, make sure decking is of adequate condition and slope. All imperfections must be remediated to the satisfaction of the Commissioning agent. If the roofing contractor has a concern that the existing decking is not an adequate substrate to move forward, he must notify the General Contractor immediately.
  3. Install one (1) layer of one and one-half inch (1.5") thick polyisocyanurate insulation, mechanically fastened in accordance with the system manufacturer's wind uplift approvals, including perimeter and corner enhancement. Install a ¼" per foot tapered polyisocyanurate roof insulation system in insulation adhesive, staggered with the underlying layers with a minimum average R-Value of 22.0.
  4. Install minimum of 4' x 8' tapered sumps at all double drains.
  5. Install new tapered saddle system, including drain line saddles, tapered edge sumps and crickets, set into urethane foam adhesive in locations noted on the drawings.
  6. Install new perimeter edge metal and metal coping as detailed.
  7. Install new expansion joints and area dividers, as detailed.
  8. Install gas line supports as detailed for the gas line crossing the roof areas.
  9. Install new fully adhered 60 mil PVC roofing system.
  10. Provide a 20-year NDL Total System Warranty by the roofing system manufacturer.
- D. Wind uplift rating: Comply with the general guidelines of Factory Mutual Global.
1. 1A-60 insulation attachment guidelines where applicable.
  2. 74 mph wind warranty upgrade.
  3. The specified roofing assembly must be rated by Factory Mutual Global (FMG) to meet or exceed the factored uplift pressures outlined in FMG Property Loss Prevention Data Sheet 1-28 and complies with FMG Property Loss Prevention Data Sheet 1-29 for enhancements at the perimeter and corners.
- E. Fire Rating:
1. FM/UL Class A fire rating.
- F. Materials furnished and installed shall meet the intent of:
1. SPRI's Single ply recommendations 2016.
  2. 20-Year "NDL" Manufacturer's Warranty as specified in Section 1.7 Warranty.
  3. 20-Year RoofSMART™ Warranty as specified in Section 1.7 Warranty.
  4. SMACNA
  5. FM Global Section 1-49 of the Loss Prevention Data Sheets for Roofing Contractors.
  6. ANSI SPRI ES-1.
- G. New Membrane Type:
1. Fully adhered, Polyester reinforced .060 mil PVC. Membrane shall conform to ASTM D4434 (latest version), "Standard for Polyvinyl Chloride Sheet Roofing".
  2. Color: White, initial solar reflectance of 0.83, emittance of 0.90, and solar reflective index (SRI) of 104 minimum (in accordance with ASTM E 1980).
  3. Certified Polymer Thickness above scrim; .025 mil minimum - ASTM +/- tolerance for thickness above scrim is not acceptable. The ASTM D7635 testing method will be the acceptable testing

method, but the performance result of that testing method must be at the specified rate listed above.

4. Certified Membrane Thickness - .057 mil minimum - ASTM +/- tolerance for membrane thickness is not acceptable. The ASTM D751 testing method will be the acceptable testing method, but the performance result of that testing method must be at the specified rate listed above. Nominal sheets are not acceptable.

H. Roof installation Requirements:

1. Refer to new roof construction details for application.
2. Install all new roofing system and system components as per published specifications and detail drawings.
3. It is the roofing contractors' responsibility to install/add/remove wood/wood nailers as required to meet flush with new insulation thickness, if upon inspection the insulation thickness is not flush as required.
4. Inspect the slope to drain and install additional tapered saddles crickets and/or other modifications to provide positive slope to drain. Saddles and cricket widths shall be 1/2 the length minimum, at a slope double to the roof slope.
5. Fabricate and install tapered edge sumps at all roof drains:
  - a. Lower drains to ensure slope to drain at deck slope transition areas. Coordinate with the General Contractor to ensure drains are located properly.
  - b. Install tapered sumps/insulation at all drains to accommodate 4ft. by 8ft. tapered edge sumps with a maximum of a 1/12 slope as specified. See roof drawings and plan notes. *(NOTE: Roofing Contractor has the responsibility to assemble the tapered sumps and saddles using the drain line as the low point of the roof. Ponding water due to the drain assembly not being the low point of the roof system will NOT be accepted.)*
6. Provide all required foresight, components and details to provide a complete project and roof assembly

1.3 REQUIRED SUBMITTALS

- A. Any contractor who intends to submit a bid using a roofing system other than the approved manufacturers listed must submit for pre-qualification in writing ten (10) days prior to the bid date. Any contractor who fails to submit all information as requested will be subject to rejection. Bids stating "as per plans and specs" will be unacceptable.

1.4 QUALITY ASSURANCE / QUALITY CONTROL

- A. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
  3. Specific test and inspection requirements are not specified in this Section.

**B. Definitions**

1. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
2. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
3. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
4. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
5. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
6. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
7. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
8. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
9. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
10. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction

**C. Conflicting Requirements**

1. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
2. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

**D. Reports & Documents**

1. Manufacturer's Field Reports (A copy of each field report must be sent to the Architect & Commissioning Agent): Prepare written information documenting tests and inspections specified in other Sections. Include the following:
  - a. Name, address, and telephone number of representative making report.

- b. Statement on condition of substrates and their acceptability for installation of product.
  - c. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  - d. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  - e. Other required items indicated in individual Specification Sections.
2. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.
  3. The contractor is required to submit to the Commissioning Agent, General Contractor and Architect a weekly production report. That report must be received by all parties by each Monday of the following production week by 9:00am.
- E. Quality Control: During construction, QC is the responsibility of the Roofing Contractor and shall be provided by the roofing contractor during the entire application process. A competent qualified officer shall be designated for the project, with understanding of the system and what is to be considered as "Good roofing practice". The QC officer will have authority to correct non-compliant work. Failure to recognize and/or correct non-compliant work as noted by the CA,GC, Architect or Manufacturer's rep can result in termination of the QC officer by the Owner rep (CA) or Architect, and all work will cease until a competent & qualified officer can be re-appointed. If this should occur, this delay in production will in no way relieve the contractor from his liability & responsibility to meet specified completion dates.
- F. Manufacturer's Field Services: Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports. Manufacturer's published minimum standards are required but do not supersede any or all higher standards called out in these specifications. Manufacturer's field services inspectors have no authority to change any specified standard without written approval of the Architect.
1. Manufacturer's field services inspectors may NOT approve a roof installation as warrantable or acceptable if any current condition of the application of the new system does not meet the current published Manufacturer's standards regardless of any verbal acceptance that conflicts with the actual published standard.
  2. Manufacturer's field services quality assurance or quality control recommendations will not supersede Architect's quality assurance or quality control recommendations. The contractor is responsible for all associated costs to complete any/all remediation directives by the Architect and the Architects agents.
- G. Commissioning Agent Field Services: Contractor agrees to engage CA's field services representative to observe and inspect the work on behalf of the Owner; (*See Section 019100-Commissioning*)
1. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract Documents.

- H. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.
1. If the CA, or its agents, re-inspect work that is to be repaired by a specified date and it has not been completed, the CA will return one additional time to re-inspect the work. If the CA has to return to the project after the additional grace visit to inspect the same work, the contractor will be responsible to pay for the associated costs to the CA. Cost is established at the current published daily inspection fee of \$950/day or a minimum charge of \$500/half day. All mileage will be billed at current published IRS rates. Owner reserves the right to deduct balance owed to the Commissioning Agent, from the final retainage payment.
- I. Testing Agency Responsibilities: Cooperate with Architect Commissioning Agent and General Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Commissioning Agent promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through General Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform any duties of Contractor.
- J. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- K. Repair and Protection
1. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
    - a. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
    - b. Wrinkles in the membrane will not be tolerated regardless of the Manufacturer's acceptance. Commissioning Company & its agents will be the designated quality assurance verification on this project. Any wrinkles will be remediated to the approval & acceptance of the Commissioning Agent (CA). This includes complete removal & replacement of the membrane system if & when deemed necessary by the CA.
  2. Protect construction exposed by or for quality-control service activities.
  3. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

- L. Installer/Contractor Requirements: A qualified firm that is approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product.
1. Installer must be capable of delivering a signed copy of the RoofSMART™ Quality Assurance Warranty. Signature of warrantor must be signed by an officer of the company.
  2. Installer must have installed at least three roofs of the same materials and methods specified for this project that have been warranted for the same number of years as required under this specification. **Bid Submittals will require 3 references.**
  3. Job Site Foreman's presence is required at the Preconstruction Meeting conducted by the CA for this project, and the Job Site Foreman's presence is required during all work being completed.
  4. Roofing Mechanic: is defined as individual that will participate in the construction of the roof system. The participating roof mechanic's will be trained by the Roofing Manufacture in all aspects of the installation, including all components, of the specified roof system.
  5. Roofing Manufacturer to certify Roofing Mechanic(s) & Job Site Foreman has completed the training required to install the Roofing Manufacturer's specified roof system to their specifications and standards by way of letter or individual certification card.
  6. Placing insulation plates beneath field seams where robot will track over them is unacceptable and installed area will be rejected by inspector.
  7. All start / stops in the field seam with the robot are to be marked & field verified. These areas will be cleaned and a 4"x4" patch will be installed.
  8. Reheating cold welds, voids and other deficiencies in seams and flashing details is unacceptable.
  9. Wrinkles in the membrane will not be tolerated regardless of the Manufacturer's acceptance. Commissioning Agent will be the designated quality assurance verification on this project. Any wrinkles will be remediated to the approval & acceptance of Commissioning Agent. This includes complete removal & replacement of the membrane system if & when deemed necessary by Commissioning Agent.
  10. All roof penetration flashings, wall flashings and perimeter detail work, (except sheet metal), is to be completed within seventy-two (72) hours from the time the adjacent field membrane is installed.
  11. Field seams and / or flashing detail work are to be probed the same day the work is completed. All deficiencies noted should be repaired the same day.
  12. Prefabricated pipe boots, corners and other accessories are to be used whenever possible. If a conflict exists with determination of whether a prefab product can or can't be used, the Quality Assurance Inspector employed by Commissioning Agent reserves the right to be the final authority.
  13. Contractor must have a full set of specifications and detail drawings ON THE ROOF with the job site foreman at all times.
  14. Complete housekeeping each day. Contractor agrees to inspect the area daily for debris or trash of any kind left loose on the roof after the crew has left for the day that results in debris blowing onto or around the School campus. This includes any materials stacked on the roof surface with no protection board laid down.
  15. Contractor agrees respond on the same day for leaks occurring during construction and will be responsible for all costs deemed to be caused due to improper nightly/daily tie-offs. This monetary amount is in addition to any internal damages caused by the leak(s).
  16. Infra-Red Scanning shall be performed upon completion of the project and per the request for Final Inspection by the contractor. A Level II certified thermographer will be commissioned by the contractor and the associated costs must be included in the contractor's base bid and any

accepted alternates. The costs have been established at \$.03 cents per sq. ft, or a minimum charge of \$1,500 dollars.

17. Field Seam Test Weld: Remove a (1" x 8") section of the initial field seam welded with the robot each time work with the robot is initiated, for the purpose of determining proper peel strength and consistency of the weld. Note: A proper heat welded seam has no voids or wrinkles in the lap.
  - a. Perform 2 test welds daily. First test weld shall be on the first welded seam of the day's work. The second weld shall be on the last seam of the day.
  - b. Test welds are to be dated, noted as to who performed the test and placed adjacent to where test was taken.
  - c. Immediately patch field seam.

#### 1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All products delivered to the job site shall be in the original unopened containers or wrappings bearing all seals and approvals.
- B. Handle all materials to prevent damage. Place all materials on pallets and fully protect from moisture.
- C. Membrane rolls shall be stored on provided pallets in the original undisturbed plastic wrap and cover with light colored breathable waterproof tarpaulins in a cool, shaded area. The membrane that has been exposed to the elements must be prepared with PVC cleaner prior to hot air welding. Tarpaulin to be secured.
- D. Insulation bunks when stored outdoors, insulation is to be stacked on pallets or dunnage at least four (4) inches above ground level and covered with "non-sweating" canvas tarpaulins. All insulation must be removed from original plastic packaging shrouds immediately at project site; polyethylene tarpaulins are not acceptable due to the accumulation of moisture beneath the tarpaulin in certain weather conditions. Cover top and sides of all stored materials with canvas tarpaulin.
- E. As a general rule all adhesives shall be stored at temperatures between 40 degrees F (5 degrees C) and 80 degrees F (27 degrees C). Read instructions contained on adhesive canister for specific storage instructions.
- F. All flammable materials shall be stored in a cool, dry area away from sparks and open flames. Follow precautions outlined on containers or supplied by material manufacturer/supplier.
- G. Any materials which the CA or the manufacturer determines to be damaged or not newly purchased as "new" are to be removed from the job site and replaced at no cost to the Owner. All materials which are found to be damaged shall be removed and replaced at the applicator's expense.

#### 1.6 JOB CONDITIONS

- A. Only as much of the new roofing as can be made weathertight each day, including all flashing and detail work, shall be installed. All seams shall be cleaned, and heat welded before leaving the job site that day.

- B. All work shall be scheduled and executed without exposing the interior building areas to the effects of inclement weather. The existing building and its contents shall be protected against all risks.
- C. All surfaces to receive new insulation, membrane or flashings shall be dry.
- D. All new and temporary construction, including equipment and accessories, shall be secured in such a manner as to preclude wind blow-off and subsequent roof or equipment damage.
- E. Uninterrupted waterstops shall be installed at the end of each day's work and shall be completely removed before proceeding with the next day's work. Waterstops shall not emit dangerous or unsafe fumes and shall not remain in contact with the finished roof as the installation progresses. Contaminated membrane shall be replaced at no cost to the Owner.
- F. The Applicator is cautioned that certain thermoplastic PVC membranes are incompatible with asphalt, coal tar, heavy oils, roofing cements, creosote and some preservative materials. Such materials shall not remain in contact with thermoplastic PVC membranes. The Applicator shall consult the manufacturer regarding compatibility, precautions and recommendations.
- G. Arrange work sequence to avoid use of newly constructed roofing as a walking surface or for equipment movement and storage. Where such access is absolutely required, the Applicator shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas. A minimum 1" layer of polyisocyanurate board with  $\frac{3}{4}$ " protection layer consisting of plywood over the insulation board shall be provided for all new and existing roof areas that receive rooftop traffic during construction.
- H. Prior to and during application, all dirt, debris and dust shall be removed from surfaces by vacuuming, sweeping, blowing with compressed air or similar methods.
- I. The Applicator shall follow all safety regulations as required by OSHA and any other applicable authority having jurisdiction.
- J. Flammable adhesives and deck primers shall not be stored and not be used in the vicinity of open flames, sparks and excessive heat.
- K. The Applicator shall verify that all roof drain lines are functioning correctly (not clogged or blocked) before starting work.
- L. Applicator shall immediately stop work if any unusual or concealed condition is discovered and shall immediately notify Architect of such condition for correction.
- M. All landscaped areas damaged by construction activities shall be repaired at no cost to the Owner.
- N. The Applicator shall conduct fastener pullout tests in accordance with the latest version of the SPRI/ANSI Fastener Pullout Standard to verify condition of the deck/substrate and to confirm expected pullout values. All testing results to be submitted to the design consultant for review before work commences.
- O. DRAINAGE: Provide a roof system with positive drainage where all standing water dissipates within 72 hours after precipitation ends.

- P. Precautions shall be taken when using solvent based adhesives at or near rooftop vents or air intakes. Adhesive odors could enter the building. Coordinate the operation of vents and air intakes in such a manner as to avoid the intake of adhesive odor while ventilating the building. Always keep lids on unused cans.
- Q. Protective wear shall be worn when using solvents or adhesives or as required by job conditions.
- R. Thermoplastic PVC membranes are slippery when wet or covered with snow, frost, or ice. Working on surfaces under these conditions is hazardous. Appropriate safety measures must be implemented prior to working on such surfaces. Always follow OSHA and other relevant fall protection standards when working on roofs.

## 1.7 WARRANTY

- A. **Base Bid: Manufacturer Labor & Workmanship Warranty:** Shall include the Manufacturer's standard warranty without monetary limitation (i.e., no-dollar-limit) in which manufacturer agrees to repair or replace components of roof system that fails in workmanship within specified warranty period. Failure includes roof leaks and wet insulation, wind warranty coverage of up to 74 mph. Warranty Period: 20-years from date of Completion.
- B. **Add Alternate: 20-Year RoofSMART™ Quality Assurance Warranty:** Upon completion and close-out of the project, the contractor must provide a signed copy of the Owner's RoofSMART™ warranty as written and detailed in this section in lieu of the 20-year Manufacturer's NDL Warranty. Please note that the signature must represent an officer of the manufacturing company of the warrantor of this roof system. The client will not accept a manufacturer's warranty for this project unless requested in change order or in writing by the client.
  - 1. Contractor shall include in his **ALTERNATE** bid the amount of **Twenty cents per square foot** for the RoofSMART™ Warranty charge. This amount shall be paid by the contractor to Moisture Management BEFORE the warranty will be issued to the contractor for signature by the manufacturer and submitted to the Owner.
- C. No warranties shall be issued until Manufacturer and Commissioning Agent/Architect have completed the final inspection and all punch list items have been remedied to the Owner's satisfaction.

## PART 2 - PRODUCTS

### 2.1 PVC MEMBRANE ROOFING

- A. PVC Sheet: Membrane shall conform to ASTM D4434 (latest version), "Standard for Polyvinyl Chloride Sheet Roofing".
  - 1. Color: White, initial solar reflectance of 0.83, emittance of 0.90, and solar reflective index (SRI) of 104 minimum (in accordance with ASTM E 1980).
  - 2. Type III, fabric-reinforced sheet modified as follows:

- a. Thickness (ASTM D 751): 0.060-inch with a tolerance of 5 percent exclusive of fabric backing.
  - b. Breaking Strength: >300 psi (ASTM D 751, A)
  - c. Elongation of Reinforcing at Break: >20 percent (ASTM D 751 A)
  - d. Tearing Strength: >50 lbf (ASTM D 751, B)
3. See Part I – General: Section 1.2, O for additional minimum requirements.

B. Acceptable Manufacturers:

1. Carlisle Syntec
2. Tremco Inc.
3. Johns Manville
4. Soprema

## 2.2 AUXILIARY MEMBRANE ROOFING MATERIALS

- A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use, and compatible with membrane roofing.
1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
    - a. Plastic Foam Adhesives: 50 g/L.
    - b. Multipurpose Construction Adhesives: 70 g/L.
    - c. Fiberglass Adhesives: 80 g/L.
    - d. Single-Ply Roof Membrane Adhesives: 250 g/L.
    - e. Other Adhesives: 250 g/L.
    - f. PVC Welding Compounds: 510 g/L.
    - g. Adhesive Primer for Plastic: 650 g/L
    - h. Single-Ply Roof Membrane Sealants: 450 g/L.
    - i. Nonmembrane Roof Sealants: 300 g/L.
    - j. Sealant Primers for Nonporous Substrates: 250 g/L.
    - k. Sealant Primers for Porous Substrates: 775 g/L.
- B. Sheet Flashing: Manufacturer's standard sheet flashing of same material type, thickness, and color as PVC sheet membrane.
- C. Bonding Adhesive: Manufacturer's standard.
- D. Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

## 2.3 ROOF INSULATION

- A. Polyisocyanurate Board Insulation: ASTM C 1289-06, Type II, Class 1, Grade 3, 25 psi density, glass-fiber mat facer on both major surfaces.

- B. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
  - 1. Saddles and cricket slope to double the roof slope. (Saddle width must equal half (1/2) the length of the full saddle.)

#### 2.4 INSULATION ACCESSORIES

- A. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation, substrate boards, and acceptable to roofing system manufacturer.
- B. Standard Insulation Plate: Used with various fasteners to attach insulation boards to the roof deck. Plate is a 3 inch (75 mm) square or round, 26 gauge stamping of SAE 1010 steel with an AZ 55 aluminum-zinc coating. Consult Product Data Sheet for additional information.
- C. Miscellaneous Fasteners and Anchors: All fasteners, anchors, nails, straps, bars, etc. shall be post-galvanized steel, aluminum or stainless steel. Mixing metal types and methods of contact shall be assembled in such a manner as to avoid galvanic corrosion. Fasteners for attachment of metal to masonry shall be expansion type fasteners with stainless steel pins. All concrete (including light weight concrete) fasteners and anchors shall have a minimum embedment of 1-1/4 inch (32 mm) and shall be approved for such use by the fastener manufacturer. All miscellaneous wood fasteners and anchors used for flashings shall have a minimum embedment of 1 inch (25 mm) and shall be approved for such use by the fastener manufacturer.
- D. Insulation Adhesive: Adhesive shall be a fast-acting, dual component low rise polyurethane adhesive used to secure insulation to substrates, including other insulation boards, equal to OlyBond500 and as approved by the membrane manufacturer. To be used in construction of multiple layers of flat board stock, tapered panels, saddles or roof drain sumps, as required.
- E. Vapor Barrier: Self adhering SBS modified bitumen membrane equal to Soprema SOPAVAP'R™.

#### 2.5 WALKWAYS

- A. Standard Walkmat: A polyester reinforced, 0.096 inch (96 mil/2.4 mm), weldable membrane with surface embossment. Used as a protection layer from rooftop traffic. Consult Product Data Sheet for additional information.
- B. Crossgrip Walkway: A rolled-out walkway protection mat used to protect roofing membrane from mechanical abuse. Crossgrip Walkway is 9/16 inch (14 mm) thick flexible PVC with a heavily textured surface. Crossgrip Walkway is loose laid on top of completed roof assemblies. Where design windspeeds exceed 94 mph (150 km/h) the walkway must be secured with loops of PVC membrane welded to the field sheet. Consult Product Data Sheet for additional information.

#### 2.6 VAPOR RETARDER

- A. The use of a vapor retarder to protect insulation and reduce moisture accumulation within an insulated roofing assembly should be investigated on the new construction portion of the project. Please use manufacturer's recommendations or requirements.
- B. A vapor barrier is specified and required over the pool area (Roof #55) and shall be installed without any fasteners penetrating through the membrane.

### PART 3 - EXECUTION

#### 3.1 SUBSTRATE AND INSULATION INSTALLATION

- A. Coordinate installing membrane roofing system components, so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.
  - 1. Fasten substrate board to top flanges of steel deck to resist uplift pressure at corners, perimeter, and field of roof according to membrane roofing system manufacturers' written instructions.
- D. Install insulation under area of roofing to achieve required thickness.
- E. Mechanically Fasten Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
  - 1. Insulation shall be mechanically fastened to the structural deck with approved fasteners and plates according to the insulation manufacturer's and roofing system manufacturer's recommendations for fastening rates and patterns. The quantity and locations of the fasteners and plates shall also cause the insulation boards to rest evenly on the roof deck/substrate. Each insulation board shall be installed tightly against the adjacent boards on all sides.
  - 2. Perimeter and Corner Areas: The perimeter and corner area will be determined by building height and width and other conditions according to ASCE 7 guidelines, Manufacturers Technical or FM LPDS 1-29 if insured by Factory Mutual. To meet the perimeter and corner uplift requirements, increase fastener density by decreasing the spacing between fastener points in one or both directions. The total tributary area to each fastener is no more than 60 percent for the perimeter and 40 percent for corners, based on the field of roof fastening density. See Detail Drawings.
    - a. Perimeter area is defined as the outer boundary of the roof. If the roof is broken into different levels, each roof area shall be treated as an individual roof with its outer boundary being treated as a perimeter. Typically, internal expansion joints and firewalls

are not considered to be full perimeters. Refer to Factory Mutual's Data Sheet 1-28 for more information.

- b. The ridge area is defined as the high point in the roof area formed by two intersecting planes. When the sum of the slopes is a minimum of 4 inches in 12 inches (30 degrees), each side of the ridge shall be treated as a perimeter area.
3. Fasteners are to be installed consistently in accordance with fastener manufacturer's recommendations. Fasteners are to have minimum penetration of 1 inch (25 mm) through the structural deck.
  4. Use fastener tools with a depth locator and torque-limiting attachment as recommended or supplied by fastener manufacturer to ensure proper installation.
- F. Adhered Insulation: Install the second and subsequent layers of insulation (ALL layers over the pool area) in an application of insulation adhesive in accordance with the membrane manufacturer's requirements.
1. The insulation layers shall be applied with beads of membrane manufacturer's approved urethane foam adhesive spaced 12 inches O.C. Approximate coverage rate is one (1) gallon per 100 square feet, depending on the substrate. Allow the foam to rise 1/2 inch to 3/4 inch. Press each board firmly into place to insure positive attachment to the substrate.
  2. Perimeter and Corner Areas: To meet the perimeter and corner uplift requirements, the adhesive beads may have to be spaced closer together. Follow manufacturer's guidelines for their wind uplift approvals.
  3. The substrate shall be free of debris, dust, dirt, oil, grease, and moisture before applying the adhesive.
- G. Install boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together.

### 3.2 MEMBRANE PLACEMENT AND ATTACHMENT (Fully Adhered)

- A. Position the membrane over the acceptable substrate. Fold membrane sheet back lengthwise so half the underside of the membrane is exposed.
- B. Apply PVC Bonding Adhesive in accordance with the manufacturer's published instructions, to the exposed underside of the membrane and the corresponding substrate area. Do not apply Bonding Adhesive along the splice edge of the membrane to be hot air welded over the adjoining sheet. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch:
  1. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded section of the membrane sheet immediately after rolling the membrane into the adhesive with a soft bristle push broom to achieve maximum contact.
  2. Fold back the unbonded half of the sheet lengthwise and repeat the bonding procedures.
- C. Position adjoining sheets to allow a minimum overlap of 2 inches.

- D. Hot-air weld the membrane sheets using the Automatic Hot Air Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's hot air welding procedures.
- E. Continue to install adjoining membrane sheets in the same manner, overlapping edges a minimum of 2 inches and complete the bonding procedures as stated previously.

### 3.3 HOT-AIR WELDING OF SEAM OVERLAPS

#### A. General:

- 1. Hot-air weld membrane using an Automatic Hot Air Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's current guidelines. At all splice intersections, roll the seam with a silicone roller to ensure a continuous hot air welded seam.
- 2. Placing insulation plates beneath field seams where robot will track over them is unacceptable and installed area will be rejected by inspector.
- 3. Overlay all splice intersections with T-Joint Covers.
- 4. All start / stops in the field seam with the robot are to be marked and field verified. These areas will be cleaned and a 4" x 4" patch will be installed.
- 5. All membrane to be welded shall be clean and dry.
- 6. Probe all seams once the hot air welds have thoroughly cooled (approximately 30 minutes).
- 7. Repair all seam deficiencies the same day they are discovered.
- 8. Apply Cut Edge Sealant on all cut edges of reinforced membrane (where the scrim reinforcement is exposed) after seam probing is complete. Cut Edge Sealant is not required on vertical splices.

#### B. Hand-Welding:

- 1. Hand-welded seams shall be completed in two stages. Hot-air welding equipment shall be allowed to warm up for at least one minute prior to welding.
  - a. The back edge of the seam shall be welded with a narrow but continuous weld to prevent loss of hot air during the final welding.
  - b. The nozzle shall be inserted into the seam at a 45 degree angle to the edge of the membrane. Once the proper welding temperature has been reached and the membrane begins to "flow", the hand roller is positioned perpendicular to the nozzle and rolled lightly. For straight seams, the 1-1/2 inch wide nozzle is recommended for use. For corners and compound connections, the 3/4 inch wide nozzle shall be used.

#### C. Machine-Welding:

- 1. Machine welded seams are achieved by the use of automatic welding equipment. When using this equipment, Manufacturer's instructions shall be followed and local codes for electric supply, grounding and over current protection observed. Dedicated circuit house power or a dedicated portable generator is recommended. No other equipment shall be operated simultaneously off the generator.
- 2. Metal tracks may be used over the deck membrane and under the machine welder to minimize or eliminate wrinkles.

## D. Quality Control of Welded Seams

1. The Applicator shall check all welded seams for continuity using a rounded screwdriver or approved probe. On-site evaluation of welded seams shall be made daily by the Applicator at locations as directed by the CA or manufacturer's representative. Samples of welded one inch wide cross-section seams shall be taken at least two times a day. Correct welds display failure from shearing of the membrane prior to separation of the weld. Each test cut shall be patched by the Applicator at no extra cost to the Owner.
2. Seam welds shall be one-inch (1") minimum width regardless of robotic or hand weld.
3. Reheating cold welds, voids and other deficiencies in seams and flashing details is unacceptable.

## 3.4 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate at required rate and allow to completely dry. Apply bonding adhesive to the underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal behind top of sheet flashings and mechanically anchor to substrate through termination bars.
- F. All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative, CA, and the roofing system manufacturer. Approval shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at the Applicator's expense. Flashing shall be adhered to compatible, dry, smooth, and solvent-resistant surfaces. Use caution to ensure adhesive fumes are not drawn into the building.
- G. Solvent Based Adhesive for Membrane Flashings:
  1. Over the properly installed and prepared flashing substrate, Solvent based adhesive shall be applied according to instructions found on the Product Data Sheet. The adhesive shall be applied in smooth, even coats with no gaps, globs or similar inconsistencies. Only an area which can be completely covered in the same day's operations shall be flashed. The bonded sheet shall be pressed firmly in place with a hand roller.
  2. No adhesive shall be applied in seam areas that are to be welded. All panels of membrane shall be applied in the same manner, overlapping the edges of the panels as required by welding techniques.

- H. Install termination according to the Detail Drawings with approved fasteners into the adjacent intersection at the base of parapets, walls and curbs.
- I. Manufacturer requirements and recommendations and the specifications shall be followed. All material submittals shall have been accepted by manufacturer prior to installation.
- J. All flashings shall extend a minimum of 8 inches above roofing level unless otherwise accepted in writing by the Owner's Representative and the Manufacturer's Technical Department.
- K. All flashing membranes shall be consistently adhered to substrates. All interior and exterior corners and miters shall be cut, and hot-air welded into place. No bitumen shall be in contact with the PVC membrane.
- L. All flashing membranes shall be mechanically fastened along the counter-flashed top edge with an approved termination bar at 6 inches on center.
- M. If no specified detail exist, membrane flashings shall be terminated according to Manufacturers recommended details.
- N. All adhered flashings that exceed 30 inches in height shall receive additional securement. Consult Manufacturer's Technical Department for securement methods.

### 3.5 ROOF DRAIN FLASHING INSTALLATION

- A. General: Lower drains as needed to ensure slope to drain at deck slope transition areas.
- B. Install tapered insulation to form a minimum 48" square sump around the drain base. Increase the sump size as necessary to not exceed 1" per foot slope in the sump area. If necessary, taper adjacent insulation to form an even transition to the elevation of the top of the tapered strip or install multiple layers of tapered strips to match the insulation thickness to create the transition. Miter corners of the tapered strip to form a square recess. All tapered strips shall be mechanically fastened with appropriate length screws and plates.
- C. Under **NO** circumstances shall the insulation around the drain be "bowled" or scraped out to form the sump.
- D. Remove all existing flashings (including lead flashings); roofing materials and cement from the existing drain in preparation for the single-ply membrane and water block sealant. Provide a clean even finish on the mating surfaces between the clamping ring and the drain bowl. Position the membrane, then cut a hole for the roof drain to allow a ½" minimum and ¾" maximum inside the clamping ring. Make round holes in the membrane to align with clamping bolts. Do not cut the membrane back to the bolt holes.
- E. Place water block seal on the clamping ring seat flange below the membrane (use a minimum of a full tube for a ten-inch (10") drain bowl. Install the roof drain clamping ring and clamping bolts. Tighten the clamping bolts to achieve constant compression.

- F. Install a target sheet of the specified single-ply roof membrane within the drain sump area before installing field membrane on the surrounding roof areas. Extend the field membrane onto the target sheet allowing the water to flow over the lap rather than against it. The target sheet is to be fully adhered just like the rest of the field membrane.
- G. Replace drain strainers after drain installation to prevent debris from clogging the drain leaders. All missing/broken drain components shall be replaced under this contract and provision shall be made in the Base Bid to replace missing strainers and/or to replace existing plastic drain strainers with metal units.

### 3.6 WALKWAY INSTALLATION

- A. General: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.
- B. Standard Walkmat: Roofing membrane to receive standard walkmat shall be clean and dry. Place chalk lines on deck sheet to indicate location of walkmat. Apply a continuous coat of membrane adhesive to the deck sheet and the back of walkmat in accordance with manufacturer's technical requirements and press walkmat into place with a minimum 100 lb. linoleum roller. Clean the deck membrane in areas to be welded. Hot-air weld the entire perimeter of the walkmat to the deck membrane sheet. Check all welds with a rounded screwdriver. Re-weld any inconsistencies. Important: Check all existing deck membrane seams that are to be covered by walkmat with rounded screwdriver and reweld any inconsistencies before walkmat installation.
- C. Crossgrip Walkway: Crossgrip walkway is installed loose laid on top of completed roof assemblies. Where design windspeeds exceed 94 mph the walkway must be secured with loops of PVC membrane welded to the field sheet. Unroll and position crossgrip walkway within specified areas and cut to desired length. Connecting clips are available for butting two ends together. Important: Check all existing deck membrane seams that are to be covered and reweld any inconsistencies before installation.

### 3.7 TEMPORARY CUT-OFF

- A. All flashings shall be installed concurrently with the roof membrane in order to maintain a watertight condition as the work progresses. All temporary waterstops shall be constructed to provide a 100 percent watertight seal. The stagger of the insulation joints shall be made even by installing partial panels of insulation. The new membrane shall be carried into the waterstop. Waterstop shall be sealed to the deck and substrate so that water will not be allowed to travel under the new or existing roofing. The edge of the membrane shall be sealed in a continuous heavy application of sealant. When work resumes, the contaminated membrane shall be cut out. All sealant, contaminated membrane, insulation fillers, etc. shall be removed from the work area and properly disposed of off site. None of these materials shall be used in the new work.
- B. If inclement weather occurs while a temporary waterstop is in place, the Applicator shall provide the labor necessary to monitor the situation to maintain a watertight condition.

- C. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at the Applicator's expense.

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion. (*See commissioning section for details, 019100*)
- C. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.

END OF SECTION 075419

