

CITY OF HASTINGS

ADDENDUM NO. 2

October 7, 2025

Museum Air Handler Replacement

Contract No. CH 2025-36

- Updated specs from Alvine Engineering for Planetarium Unit changed from split system to rooftop unit.

CITY OF HASTINGS, UTILITIES DEPARTMENT

By Carson Moritz

Title Mechanical Engineer

The undersigned bidder hereby certifies that the revision set forth in this addendum have been incorporated in their bid and are a part of the contract documents.

Signed _____

Title _____

Firm _____

Date _____

**ALL ISSUED ADDENDUM(S) MUST BE ACKNOWLEDGED
& RETURNED WITH YOUR BID DOCUMENTS**

THIS BID DOCUMENT MUST BE SUBMITTED WITH BID

ADDENDUM 001

This addendum is hereby made a part of the contract documents to the same extent as though it were originally included therein. Specifications and drawings shall be considered modified or revised as hereinafter described. Revisions to the drawings are referenced by the drawing number.

CHANGES TO THE PROJECT MANUAL

Mechanical Specification Items:

- 1MS1. Specification Section 23 74 13 – Packaged Outdoor Rooftop Units
 - 1. Page 23 74 13-3: Add Paragraph 2.2E as follows:
 “E. Carrier: <https://www.carrier.com/commercial/en/us>.”
- 1MS2. Specification Section 23 74 16 – Packaged Rooftop Air Conditioning Units
 - 1. Add the section in its entirety.
- 1MS3. Specification Section 23 81 26. 13 – Small-Capacity Split-System Air Conditioners
 - 1. Delete the section in its entirety.

CHANGES TO THE DRAWINGS

Mechanical Drawing Items:

- 1MD1. Sheet M0.2 – First Floor Plan – Mechanical Demolition
 - 1. Modify the existing planetarium supply and return duct removal.
- 1MD2. Sheet M1.2 – First Floor Plan – Mechanical
 - 1. Delete the new split-system indoor unit AH-1 at the planetarium.
 - 2. Modify the new planetarium supply and return ductwork to connect to a new rooftop air-handling unit instead of a new split system indoor unit.
 - 3. Delete the outside air duct associated with the new split-system indoor unit.
 - 4. Delete the condensate drain line associated with the new split-system indoor unit.
 - 5. Add a space humidity sensor in the planetarium.
 - 6. Modify Flag Note 4.
- 1MD3. Sheet M1.4 – Third Floor Plan – Mechanical
 - 1. Delete the new planetarium split-system outdoor unit and associated refrigerant piping and pipe curb.
 - 2. Delete the new outside air intake hood associated with the new split system indoor unit.
 - 3. Add new rooftop air-handling unit RTU-1 and associated plenum curb.
 - 4. Modify Flag Note 1 to clarify the insulation thickness at the wall in the plenum curb separating the supply and return plenums.
 - 5. Modify Flag Note 3.
 - 6. Add Flag Note 5.
- 1MD4. Sheet M2.0 – Mechanical Details
 - 1. Delete Mechanical Details 2/M2.0 and 3/M2.0 associated with the new planetarium split-system.

1MD5. Sheet M3.0 – Mechanical Schedules

1. Delete the Indoor Unit Schedule Direct Expansion Cooling Electric Reheat schedule.
2. Delete the Air Cooled Condenser” schedule.
3. Delete the “Intake Air Hood” schedule.
4. Add the “Rooftop Unit Schedule (Electric Heat)” schedule.

Electrical Drawing Items:

1ED1. Sheet E0.1 – Basement Floor Plan – Electrical Demolition

1. Delete the existing feeder and note from the Existing Switchboard EDP to Panel A.
2. Update Flag Note 1.

1ED2. Sheet E0.2 – First Floor Plan – Electrical Demolition

1. Delete Flag Note 4 to Panel A.
2. Update Flag Note 2.
3. Delete Flag Note 4.

1ED3. Sheet E0.3 – Second Floor Plan – Electrical Demolition

1. Add the existing humidifier H-8 location and associated circuit.
2. Add Flag Note 3.

1ED4. Sheet E1.1 – Basement Floor Plan – Electrical

1. Delete existing feeder and note from Existing Switchboard EDP to Panel A.
2. Update Flag Note 1.

1ED5. Sheet E1.2 – First Floor Plan – Electrical

1. Delete Flag Note 4 to Panel A.
2. Update Flag Note 4.
3. Delete AH-1 located above-ceiling.

1ED6. Sheet E1.3 – Second Floor Plan – Electrical

1. Add the existing humidifier H-8 location and associated circuit. Extend the existing circuit to serve new RTU-1.
2. Add Flag Notes 2, 3, and 4.

1ED7. Sheet E1.4 – Third Floor Plan – Electrical

1. Delete ACCU-1.
2. Add RTU-1.

1ED8. Sheet E2.0 – Electrical Partial Power Riser Diagrams

1. Modify Panel A to be existing-to-remain. Modify the associated feeder to remain.
2. Delete Flag Notes 2, 3, 4, 5, and 6.
3. Modify Panel A to be existing-to-remain. Delete the pull box. Modify the associated feeder to remain.
4. Modify Flag Notes 2, 3, 4, 5, and 6 to be not used.

1ED9. Sheet E3.0 – Electrical Schedules

1. Modify ACCU-1 and AH-1 to not be used in the Mechanical/Electrical Coordination Schedule.
2. Add RTU-1 to the Mechanical/Electrical Coordination Schedule.
3. Modify Remark 5 to not be used in the Mechanical/Electrical Coordination Schedule.
4. Delete 1 and 2 from the remarks column in CKT#10, Switchboard EDP.

1ED10. Sheet E3.1 – Electrical Schedules

1. Modify Panel A – Demo name to be Panel A – Existing.
2. Update General Note below panel schedule.
3. Delete Panel A – New schedule in its entirety.
4. Modify CKT#10 in Panel AA – Existing.
5. Add Remark 2 below the panel schedule in Panel AA – Existing.
6. Modify CKT#10 in Panel AA – Renovated.

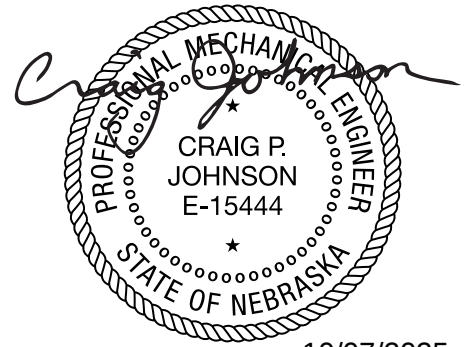
ATTACHMENTS

1. Specification Section 23 74 13 – Packaged Outdoor Rooftop Units
2. Specification Section 23 74 16 – Packaged Rooftop Air Conditioning Units
3. Sheet M0.2 – First Floor Plan – Mechanical Demolition
4. Sheet M1.2 – First Floor Plan – Mechanical
5. Sheet M1.4 – Third Floor Plan – Mechanical
6. Sheet M2.0 – Mechanical Details
7. Sheet M3.0 – Mechanical Schedules
8. Sheet E0.1 – Basement Floor Plan – Electrical Demolition
9. Sheet E0.2 – First Floor Plan – Electrical Demolition
10. Sheet E0.3 – Second Floor Plan – Electrical Demolition
11. Sheet E1.1 – Basement Floor Plan – Electrical
12. Sheet E1.2 – First Floor Plan – Electrical
13. Sheet E1.3 – Second Floor Plan – Electrical
14. Sheet E1.4 – Third Floor Plan – Electrical
15. Sheet E2.0 – Electrical Partial Power Riser Diagrams
16. Sheet E3.0 – Electrical Schedules
17. Sheet E3.1 – Electrical Schedules

END

CPJ/mjh

SECTION 23 74 13
PACKAGED OUTDOOR ROOFTOP UNITS



CA-2169

10/07/2025

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Packaged outdoor rooftop units, variable air volume.
- B. Roof mounting plenum curb.
- C. AHRI 210/240 - Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment.
- D. AHRI 270 (SI/I-P) - Sound Performance Rating of Outdoor Unitary Equipment.
- E. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems.

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Pre-purchased Equipment: The major equipment described in this specification has been prepurchased by the Owner through their Contractor. This document shall serve to document the general performance criteria of the purchased equipment and specify installation requirements and accessories.
- B. Coordinate the work with other trades for installation of roof mounted packaged rooftop units on roof curbs.
- C. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.3 SUBMITTALS

- A. Product Data: Provide capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.
- B. Shop Drawings: Indicate capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.
- C. Manufacturer's Instructions: Indicate assembly, support details, connection requirements, and include start-up instructions.
- D. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.
- E. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements for additional provisions.
 - 2. Extra Filters: One set for each unit.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
- C. Where the National Electrical Code or applicable codes require controllers to be marked with a Short Circuit Current Rating (SCCR), the equipment shall be manufactured as required such that the SCCR of the equipment meets or exceeds the available short circuit current at the equipment.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect units from physical damage by storing off site until roof mounting curbs are in place, ready for immediate installation of units.

1.6 WARRANTY

- A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of equipment that fail in materials or workmanship within specified warranty period. Warranty period for:
 - 1. Compressors and Refrigerant: Five (5) years.
 - 2. Heat Exchangers: Fifteen (15) years.
 - 3. Whole Unit Parts - Three (3) years.
- B. Provide a five year warranty to include coverage for refrigeration compressors.

PART 2 PRODUCTS

2.1 PERFORMANCE, CAPACITIES AND CHARACTERISTICS

- A. See Drawings for Equipment Schedules with Equipment Performance Requirements when capacities and characteristics are not indicated in the specifications.

2.2 MANUFACTURERS

- A. Daikin Applied: www.daikinapplied.com.
- B. Innovent: www.innoventair.com.
- C. Trane, a brand of Ingersoll Rand: www.trane.com.
- D. Other, if approved in writing during the bid period by the Engineer and Owner.

- E. Carrier: <https://www.carrier.com/commercial/en/us>.

2.3 MANUFACTURED UNITS

- A. General: Roof mounted units having a heat exchanger and gas burner and electric refrigeration.
- B. Description: Self-contained, packaged, factory assembled and prewired, consisting of cabinet and frame, supply fan, heat exchanger and burner, controls, air filters, refrigerant cooling coil and compressor, condenser coil and condenser fan.
- C. Refrigerant: R-454B or R-32, listed to UL Standard 60335-2-40, with a factory-installed A2L refrigerant leak detection system.
- D. Electrical Characteristics:
 - 1. 208 VAC, three phase, 60 Hz.
 - 2. 65kA Short Circuit Current Rating (SCCR)
- E. Disconnect Switch: Factory mount disconnect switch in control panel.
- F. Where the National Electrical Code or applicable codes require controllers to be marked with a Short Circuit Current Rating (SCCR), the equipment shall be manufactured as required such that the SCCR of the equipment meets or exceeds the available short circuit current at the equipment.

2.4 FABRICATION

- A. Cabinet: Galvanized steel with a weather resistant baked enamel finish meeting 500+ hour ASTM B117 salt spray test, including hinged access panels with integrated quarter turn latches.. Structural members shall be minimum 18 gauge, 0.0478 inch, with access panels of minimum 20 gauge, 0.0359 inch.
- B. Condensate Drain Pan: Stainless steel, double sloped.
- C. Hoods: Outside air/economizer and/or relief, galvanized steel with a weather resistant baked enamel finish meeting 500+ hour ASTM B117 salt spray test.
- D. Louvers: Manufacturer's standard louvers for outside air/economizer and/or relief, galvanized steel with a weather resistant baked enamel finish meeting 500+ hour ASTM B117 salt spray test.
- E. Insulation: R-13 minimum.
- F. Heat Exchangers: Stainless steel, of welded construction.

2.5 SUPPLY FAN:

- A. Direct drive type, resiliently mounted.
- B. Airfoil blades.

- C. ECM motor or manufacturer provided variable frequency controller(s).
- D. Multiple fans in an array are preferred.

2.6 AIR FILTERS:

- A. Pleated Media Filters:
 - 1. Media: 100 percent synthetic fibers, continuously laminated to a grid with water repellent adhesive, and capable of operating up to a maximum of 625 fpm (3.17 m/s) without loss of efficiency and holding capacity.
 - 2. Frame: Steel wire grid.
- B. Prefilters and Final Filters:
 - 1. Prefilter Media: 2 inch, pleated, 8 MERV, disposable .
 - 2. Final Filter Media: 4 inch, pleated, 13 MERV, disposable.
 - 3. Filter Rack: Side-access rack designed to hold the metal headers.

2.7 HEAT EXCHANGERS AND BURNERS

- A. Heat Exchangers: Stainless steel, drum and tube design, with gasketed cleanout plate.
- B. Modulating Gas Burners: Forced draft type burners with adjustable combustion air supply, pressure regulator, gas valves, manual shut-off, intermittent spark or glow coil ignition, flame sensing device, and automatic 100 percent shut-off pilot.
- C. Gas Burner Safety Controls: Energize ignition, limit time for establishment of flame, prevent opening of gas valve until pilot flame is proven, stop gas flow on ignition failure, energize blower motor, and after airflow proven and slight delay, allow gas valve to open.
- D. High Limit Control: Temperature sensor with fixed stop at maximum permissible setting, de-energize burner on excessive bonnet temperature and energize burner when temperature drops to lower safe value.
- E. Supply Fan Control: Temperature sensor sensing bonnet temperatures and independent of burner controls, with provisions for continuous fan operation.

2.8 EVAPORATOR COIL

- A. Provide copper tube aluminum fin coil assembly with stainless steel drain pan and connection.
- B. Provide capillary tubes or thermostatic expansion valves for units of 6 Tons of refrigeration capacity and less, and thermostatic expansion valves and alternate row circuiting for units 7.5 Tons of refrigeration cooling capacity and larger.

2.9 HOT GAS REHEAT COIL

- A. Provide an aluminum tube micro-channel coil assembly for dehumidification reheat operation.

2.10 COMPRESSOR

- A. Provide direct-drive hermetic digital scroll compressors, 3600 rpm maximum, resiliently mounted with positive lubrication, crankcase heater, high and low pressure safety controls, motor overload protection, suction and discharge service valves and gage ports, and filter drier.
- B. At least one compressor stage must be an inverter-lead circuit type variable speed/capacity compressor with turndown to 10%. Other stages may be fixed speed compressors. Capacity control is accomplished by staging fixed speed compressors and modulating the capacity of the variable speed compressor.

2.11 CONDENSER COIL

- A. Provide copper tube aluminum fin coil assembly with subcooling rows and coil guard.
- B. Provide direct drive propeller fans, resiliently mounted with fan guard, motor overload protection, wired to operate with compressor. Provide high efficiency fan motors.
- C. Condenser fans shall modulate their speed to provide low ambient control down to 25 deg F.
- D. Provide louvered condenser coil guards to protect from hail, wind, and other damage.

2.12 MIXED AIR CASING

- A. Dampers: Provide outside, return, and relief dampers with damper operator and control package to automatically vary outside air quantity. Motorized outside air damper to fail to closed position. Relief air shall be exhausted by power exhaust fans. .
- B. Gaskets: Provide tight fitting outdoor dampers with edge gaskets maximum leakage 5 percent at 2 inches pressure differential.
- C. Damper Operator: 24 volt with gear train sealed in oil.

2.13 ECONOMIZER

- A. Provide a 0 to 100 percent reference enthalpy economizer with powered exhaust.
 - 1. The economizer will compare the measured enthalpy of the outside air to a reference enthalpy setpoint to determine if it is cool enough and dry enough to allow the unit to go into economizing mode. Economizers that compare the measured enthalpy of the outside air to the measured enthalpy of the return air shall not be acceptable.
 - 2. The rooftop unit shall have a factory provided outdoor airflow monitoring station (Ebtron or equal) for accurately measuring outdoor airflow to precisely control ventilation.

2.14 CONDENSER COIL COTTONWOOD HAIL GUARD/INTAKE FILTER SCREENING (BY MECHANICAL CONTRACTOR):

- A. Engineered HVAC Mesh
- B. Non-porous, UV resistant, vinyl coated polyester media w/non-stick surface.
 - 1. Flame resistant (self-extinguishing)
 - 2. Low debris adhesion
 - 3. Mold and mildew resistant.
- C. 1.125" heavy duty fiber reinforced outer binding.
 - 1. Quick release nylon twist-lock fasteners.
- D. Low air resistance and static pressure impact
- E. 10 year Warranty
- F. Basis of design: Air Solution Company, Heavy Duty Commercial Grade

2.15 POWER AND CONTROLS

- A. Equipment and controls shall to interface and integrate to BMCS systems and sequences via vendor protocols including, as a minimum, BACnet, LonTalk and Modbus.
- B. All remote sensors required by the factory-installed controller, including outside and supply air temperature, outside and supply air humidity sensors, and duct and building pressure sensors shall be furnished by the rooftop unit manufacturer. Unless otherwise noted, these sensors shall have a wired connection to the associated rooftop unit.
 - 1. The rooftop unit shall be capable of taking CO2 readings from the BMCS in lieu of directly wired CO2 sensors.
- C. Motor Control Panels: UL listed.
- D. Include necessary motor starters, fuses, transformers and overload protection according to NFPA 70.
- E. Provide single-point field connection to power supply.
- F. Provide non fused main disconnect integral to control panel.
- G. Provide 120 volt field wired GFCI convenience receptacle/outlet.
- H. Install wiring in accordance with NFPA 70.
- I. Wiring: Enclosed in flexible, liquid tight steel conduit.

2.16 ROOF MOUNTING PLENUM CURBS

- A. Manufacturers:
 - 1. Insulated Curbs: Thybar (www.thybar.com) or approved in writing equal.

- B. Insulated Plenum Curb: G-90 Galvanized steel, reinforced sides, fully welded corners, base flange attachments for securing to building structure, factory installed wood nailer, gasketing, factory insulated at the exterior panels with minimum 3 inch thick, 3 pcf density rigid fiberglass insulation (R-12), with two plenums with floors and roofs to connect to supply and return air ductwork.
 - 1. Basis of Design: Thybar TC-3.
 - 2. Plenums: Separate supply air and return air plenums shall be separated by a sheetmetal divider insulated with 1.5 inches of 3 pcf density rigid fiberglass insulation (R-6). The downflow packaged rooftop unit supply and return duct connections and existing supply and return ducts through the roof shall be connected to their respective plenums.
 - 3. See the mechanical drawings for approximate curb dimensions and additional information. The exact curb dimensions shall be coordinated between the curb manufacturer, installing contractor, and rooftop unit supplier/manufacturer.
- C. Vibration Isolation Rail Assembly:
 - 1. General Description: A vibration isolation rail assembly shall be installed between the plenum roof curb (by others) and the supported equipment.
 - 2. Basis of Design: Vibro-Acoustics Model ARTR (virs.vibro-acoustics.com).
 - a. Other manufacturers are acceptable if approved in writing by the Engineer during the project bid period.
 - 3. Isolators: Adjustable 2 inch (50 mm) static deflection springs, with all-directional restraints.
 - 4. Rail: Minimum 4 inch (102 mm) high gauge G90 galvanized steel top channel, full perimeter.
 - 5. Weather Seal: Full perimeter reinforced EPDM.
 - a. Provide a top arrangement with a counter-flashing for rooftop units that do not have a perimeter base with an overhang.

PART 3 EXECUTION

3.1 EXAMINATION (BY MECHANICAL CONTRACTOR)

- A. Verify that roof is ready to receive work and opening dimensions are as indicated on shop drawings.
- B. Verify that proper power supply is available.

3.2 CONNECTIONS (BY MECHANICAL AND ELECTRICAL CONTRACTORS)

- A. Coordinate installations and specialty arrangements with schematics on Drawings and with requirements specified in piping systems. If Drawings are explicit enough, these requirements may be reduced or omitted.
- B. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- C. Install piping adjacent to machine to allow service and maintenance.

1. Gas Piping: Connect gas piping to burner, full size of gas train inlet, and connect with union and shutoff valve with sufficient clearance for burner removal and service.
- D. Coordinate duct installation requirements with schematics on Drawings and with requirements specified for duct systems. If Drawings are explicit enough, these requirements may be reduced or omitted.
- E. Duct installation requirements are specified in other Division 23 Sections. Drawings indicate the general arrangement of ducts. The following are specific connection requirements:
 1. Install ducts to termination in roof curb.
 2. Remove roof decking only as required for passage of ducts. Do not cut out decking under entire roof curb.
 3. Connect supply ducts to rooftop unit with flexible duct connectors.
 4. Terminate return-air duct through roof structure and insulate space between roof and bottom of unit with 2-inch thick, acoustic duct liner.
 5. Provide flexible connection between ductwork and rooftop unit.
- F. Electrical System Connections: Comply with applicable requirements in Division 26 Sections for power wiring, switches, and motor controls.
- G. Ground equipment according to Division 26 Section "Grounding and Bonding."
- H. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.
- B. Perform the following field quality-control tests and inspections and prepare test reports:
 1. After installing rooftop air conditioners and after electrical circuitry has been energized, test units for compliance with requirements.
 2. Inspect for and remove shipping bolts, blocks, and tie-down straps.
 3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- C. Remove malfunctioning units, replace with new units, and retest as specified above.

3.4 ADJUSTING (BY MECHANICAL AND ELECTRICAL CONTRACTORS)

- A. Adjust initial temperature and humidity set points.
- B. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

- C. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to site outside normal occupancy hours for this purpose, without additional cost.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain rooftop air conditioners.

3.6 INSTALLATION (BY MECHANICAL CONTRACTORS)

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NFPA 90A.
- C. Provide filter gage on each filter bank. Refer to Section 23 3300.

3.7 SYSTEM STARTUP

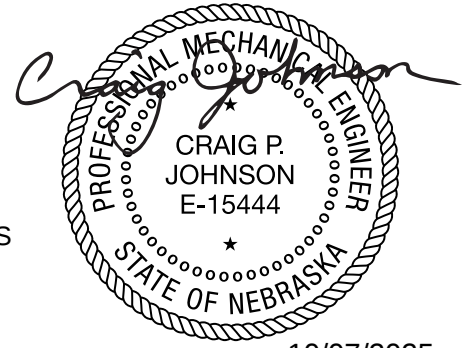
- A. Prepare and start equipment. Adjust for proper operation.
- B. Engage a factory-authorized service representative to perform startup service.
- C. Complete installation and startup checks according to manufacturer's written instructions and do the following:
 - 1. Clean outside coil and inspect for construction debris.
 - 2. Connect and purge gas line.
 - 3. Adjust vibration isolators.
 - 4. Inspect operation of barometric dampers.
 - 5. Lubricate bearings on fan.
 - 6. Inspect fan-wheel rotation for movement in correct direction without vibration and binding.
 - 7. Start unit according to manufacturer's written instructions.
 - a. Start refrigeration system in summer only.
 - b. Complete startup sheets and attach copy with Contractor's startup report.
 - 8. Inspect and record performance of interlocks and protective devices; verify sequences.
 - 9. Operate unit for an initial period as recommended or required by manufacturer.
 - 10. Calibrate thermostats.
 - 11. Adjust and inspect high-temperature limits.
 - 12. Inspect outside-air dampers for proper stroke and interlock with return-air dampers.
 - 13. Start refrigeration system and measure and record the following:
 - a. Coil leaving-air, dry- and wet-bulb temperatures.
 - b. Coil entering-air, dry- and wet-bulb temperatures.
 - c. Outdoor-air, dry-bulb temperature.
 - d. Outdoor-air-coil, discharge-air, dry-bulb temperature.
 - 14. Inspect controls for correct sequencing of heating, mixing dampers, refrigeration, and normal and emergency shutdown.

15. Simulate maximum cooling demand and inspect the following:
 - a. Compressor refrigerant suction and hot-gas pressures.
 - b. Short circuiting of air through outside coil or from outside coil to outside-air intake.
16. Verify operation of remote panel, including pilot-light operation and failure modes. Inspect the following:
 - a. High-limit heat exchanger.
 - b. Warm-up for morning cycle.
 - c. Freezestat operation.
 - d. Economizer to limited outside-air changeover.
 - e. Alarms.
17. After startup and performance testing, change filters, vacuum cooling and outside coils, and lubricate bearings.

END OF SECTION

SECTION 23 74 16

PACKAGED ROOFTOP AIR-CONDITIONING UNITS



CA-2169

10/07/2025

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Packaged, small-capacity, rooftop air-conditioning units.
- B. Roof curbs.

1.2 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.
- C. Sustainable Design Documentation: Submit manufacturer's product data on refrigerant used, showing compliance with specified requirements.
- D. Shop Drawings: Indicate capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.
- E. Manufacturer's Instructions: Indicate assembly, support details, connection requirements, and include start-up instructions.
- F. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.
- G. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.
- H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Filters: Two sets for each unit.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.4 WARRANTY

- A. Provide a five year warranty to include coverage for refrigeration compressors.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Carrier Corporation: www.commercial.carrier.com/
- B. Daikin Applied: www.daikinapplied.com/
- C. Johnson Controls International, PLC: www.johnsoncontrols.com/
- D. Lennox: www.lennox.com
- E. Rheem Manufacturing Company Inc: www.rheem.com/
- F. Trane: www.trane.com/

2.2 PACKAGED, SMALL-CAPACITY, ROOFTOP AIR-CONDITIONING UNITS

- A. General: Roof mounted units having gas burner and electric refrigeration that are 6 tons and smaller in capacity.
- B. Description: Self-contained, packaged, factory assembled and prewired, consisting of cabinet and frame, supply fan, electric heating elements, refrigerant hot gas reheat , controls, air filters, refrigerant cooling coil and compressor, condenser coil and condenser fan.
- C. Refrigerant: R-454B or R-32, listed to UL Standard 60335-2-40, with a factory-installed A2L refrigerant leak detection sysem.
- D. Disconnect Switch: Factory mount disconnect switch in control panel.

2.3 CASING

- A. Cabinet: Steel with baked enamel finish, including access panels with screwdriver-operated flush, cam type fasteners. Structural members to be minimum 18 gauge, 0.0478 inch, with access doors or panels of minimum 20 gauge, 0.0359 inch.
- B. Insulation: 2-inch thick, neoprene-coated glass fiber with edges protected from erosion.

2.4 FANS

- A. Supply Fan: Direct drive blower with forward curved blades and ECM motor, resiliently mounted.

2.5 ELECTRIC HEATING COIL

- A. Helical nickel-chrome resistance wire coil heating elements with refractory ceramic support bushings easily accessible with automatic reset thermal cut-out. Provide with built-in magnetic contactors, galvanized steel frame, control circuit transformer and fuse, manual reset thermal cut-out, airflow proving device, pilot duty toggle switch, load fuses.

- B. Controls: Start supply fan before electric elements are energized and continue operating until air temperature reaches minimum setting, with switch for continuous fan operation.

2.6 EVAPORATOR COIL

- A. Provide copper tube aluminum fin coil assembly with galvanized drain pan and connection.
- B. Provide thermostatic expansion valve.
- C. Provide indoor coil freeze protection.

2.7 CONDENSER COIL

- A. Provide copper tube aluminum fin coil assembly with subcooling rows and coil/hail guard.
- B. Provide direct drive propeller fans, resiliently mounted with fan guard, motor overload protection, wired to operate with compressor. Provide totally enclosed motors.
- C. Provide a low ambient switch to cycle the outdoor fans while allowing compressor operation in the cooling cycle down to 0 degrees F.

2.8 COMPRESSORS

- A. Provide scroll compressor, resiliently mounted with positive lubrication, crankcase heater, high and low pressure safety controls, motor overload protection, suction and discharge service valves and gauge ports, and high capacity filter/drier.
- B. Five minute timed off circuit to delay compressor start.
- C. Provide step capacity control by cycling compressors.
- D. High Pressure Switch: Protects the compressor from overload conditions such as dirty condenser coils, blocked refrigerant flow or loss of outdoor fan operation.
- E. Low Pressure Switch: Protects the compressor from low pressure conditions such as low refrigerant charge or low/no airflow.

2.9 HOT GAS REHEAT

- A. Provide a one row hot gas reheat coil, solenoid valve and humidity controller to perform automatic dehumidification on demand using ASHRAE 90.1 recommended method for comfort conditioning.

2.10 MIXED AIR CASING

- A. Dampers: Provide outside, return, and relief dampers with damper operator and CO2 based demand controlled ventilation package to automatically vary outside air quantity. Outside air damper to fall to closed position. Relief dampers may be gravity balanced.

1. Note: If the demand controlled ventilation package requires an economizer package from the manufacturer, the provided economizer shall be a reference enthalpy type. Comparative enthalpy economizers that compare the measured enthalpy of the return air to the measured enthalpy of the outside air shall not be acceptable.
- B. Gaskets: Provide tight fitting dampers with edge gaskets maximum leakage 5 percent at 2-inch pressure differential.
- C. Damper Operator: 24 volts with gear train sealed in oil.

2.11 AIR FILTERS:

- A. Pleated Media Filters:
 1. Media: 2 inch (50 mm), 100 percent synthetic fibers, continuously laminated to a grid with water repellent adhesive, and capable of operating up to a maximum of 625 fpm (3.17 m/s) without loss of efficiency and holding capacity.
 2. Frame: Steel wire grid.
 3. Minimum Efficiency Reporting Value: MERV 13 when tested in accordance with ASHRAE Std 52.2.

2.12 OPERATING CONTROLS - SINGLE ZONE UNITS

- A. Equipment and controls shall be capable of interfacing with the building management control system (BMCS) via vendor protocols including, as a minimum, BACnet, LonTalk and Modbus.
- B. All remote sensors required by the factory-installed controller, including air temperature, space temperature, CO2 sensors, and humidity sensors, shall be furnished by the rooftop unit manufacturer. Unless otherwise noted, these sensors shall have a wired connection to the associated rooftop unit.
- C. Electric solid state microcomputer-based room controller.
- D. Room controller to incorporate:
 1. Automatic switching from heating to cooling.
 2. Preferential rate control to minimize overshoot and deviation from setpoint.
 3. Space humidity, temperature, and CO2 sensors.
 4. Automatic control of dehumidification and CO2 based demand controlled ventilation sequences.
 5. Set up for four separate temperatures per day.
 6. Instant override of setpoint for continuous or timed period from one hour to 31 days.
 7. Short cycle protection.
 8. Programming based on weekdays, Saturday and Sunday.
 9. Switch selection features including imperial or metric display, 12- or 24-hour clock, keyboard disable, remote sensor, fan on-auto.
- E. Room controller display to include:
 1. Actual room temperature.

2. Programmed room temperature.
3. Actual room humidity.
4. Programmed room humidity.
5. Actual room CO2 concentration.
6. Programmed time.
7. Duration of timed override.
8. Time of day.
9. Day of week.
10. System model indication: heating, cooling, auto, off, fan auto, fan on.

2.13 ROOF CURBS

- A. Manufacturers:
 1. Insulated Curbs: Thybar (www.thybar.com) or approved in writing equal.
- B. Insulated Plenum Curb: G-90 Galvanized steel, reinforced sides, fully welded corners, base flange attachments for securing to building structure, factory installed wood nailer, gasketing, factory insulated at the exterior panels with minimum 3 inch thick, 3 pcf density rigid fiberglass insulation (R-12), with two plenums with floors and roofs to connect to supply and return air ductwork.
 1. Basis of Design: Thybar TC-3
 2. Plenums: Separate supply air and return air plenums shall be separated by a sheetmetal divider insulated with 1.5 inches of 3 pcf density rigid fiberglass insulation (R-6). The downflow packaged rooftop unit supply and return duct connections and existing supply and return ducts through the roof shall be connected to their respective plenums.
 3. Curb Height: 20" minimum, taller if recommended by the manufacturer for the scheduled rooftop unit airflow.
 4. Curb Dimensions: Determined by the manufacturer based on the actual rooftop unit submittal.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

3.2 SYSTEM STARTUP

- A. Prepare and start equipment. Adjust for proper operation.

3.3 CLOSEOUT ACTIVITIES

- A. Demonstrate proper operation of equipment to Owner's designated representative.

END OF SECTION

CA-2169 10/07/2025

1	ADDENDUM #1	10/07/2025
NO.	DESCRIPTION	DATE

© COPYRIGHT 2025 Permission to reproduce all or part of this Drawing is hereby granted solely for the limited purpose of construction of this project or for archiving. Unauthorized copying, disclosure or construction use without written permission of Alvine is prohibited by copyright law.

NOTE:

DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS and clearances from ARCHITECTURAL, STRUCTURAL, shop and other appropriate drawing or at site. Lay out and coordinate all work prior to installation to provide clearances required for operation, maintenance, and codes and verify non-interference with other work. DO NOT FABRICATE PRIOR TO VERIFICATION OF CLEARANCE FOR ALL TRADES. READ SPECIFICATIONS.

ALVINE PROJECT NUMBER

Unsaved

DATE:

07/23/2025

ISSUE

CONSTRUCTION DOCUMENTS

SHEET NAME

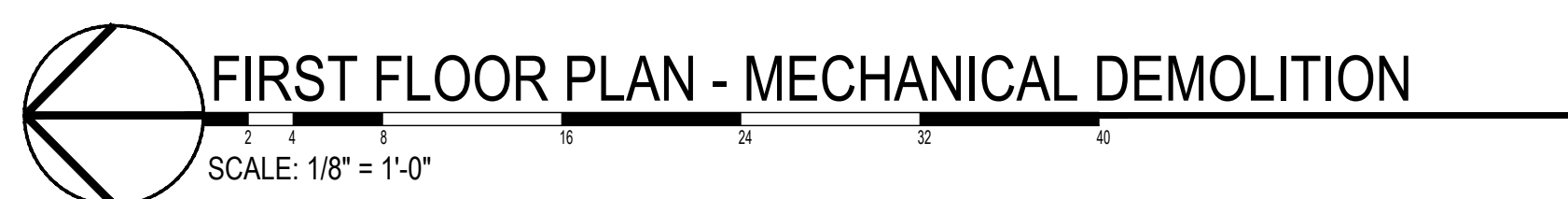
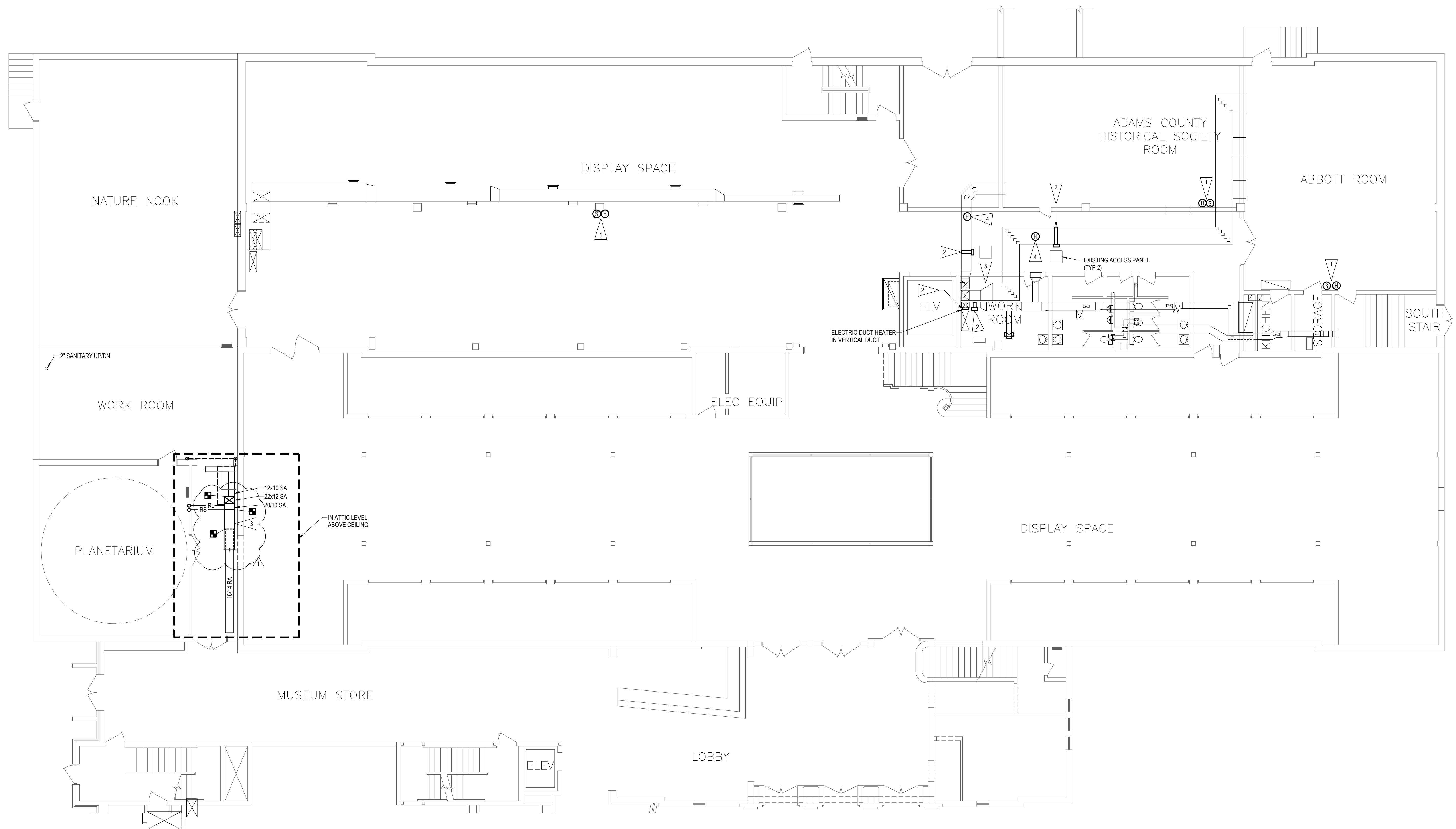
FIRST FLOOR PLAN - MECHANICAL DEMOLITION

SHEET NO.:

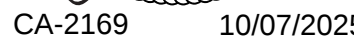
M0.2

FLAG NOTES

1. REMOVE THE EXISTING TEMPERATURE AND HUMIDITY SENSORS.
2. REMOVE THE EXISTING ELECTRIC DUCT HEATER, MAINTAINING THE ASSOCIATED ELECTRICAL CIRCUITS IN PLACE FOR REUSE.
3. REMOVE THE EXISTING HORIZONTAL GAS FURNACE AND ITS ASSOCIATED CONDENSING UNIT AND FLUE ON THE ROOF ABOVE. REMOVE ITS ASSOCIATED GAS PIPING BACK TO THE WALL AND CAP. REMOVE ITS ASSOCIATED CONDENSATE PIPING AND CAP AT ITS CONNECTION TO THE STORM DRAIN.
4. REMOVE THE EXISTING DUCT-MOUNTED HUMIDISTAT.
5. THE EXISTING BUILDING CONTROLLER FOR THE HONEYWELL WEBS-AX BUILDING MANAGEMENT AND CONTROL SYSTEM (BMCS) IS LOCATED IN THIS ROOM. THIS SYSTEM WILL BE REMOVED IN THIS PROJECT WHEN THE EXISTING EQUIPMENT IT SERVES IS REMOVED. SEE THE MECHANICAL SPECIFICATIONS FOR MORE INFORMATION.



HASTINGS MUSEUM



1	ADDENDUM #1	10/07/2025
NO.	DESCRIPTION	DATE

© COPYRIGHT 2025 Permission to reproduce all or part of this Drawing is hereby granted solely for the limited purpose of construction of this project or for archiving. Unauthorized copying, disclosure or construction use without written permission of Alvine is prohibited by copyright law.

NOTE:

DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS and clearances from ARCHITECTURAL, STRUCTURAL, shop and other appropriate drawing or at site. Lay out and coordinate all work prior to installation to provide clearances required for operation, maintenance, and codes and verify non-interference with other work. DO NOT FABRICATE PRIOR TO VERIFICATION OF CLEARANCE FOR ALL TRADES. READ SPECIFICATIONS

ALVINE PROJECT NUMBER

20251723

DATE:

07/23/2025

ISSUE

CONSTRUCTION DOCUMENTS

SHEET NAME:

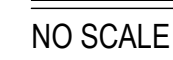
THIRD FLOOR
PLAN - MECHANICAL

SHEET NO.:

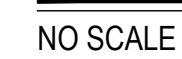
M1.4



SCALE: 1/8" = 1'-0"

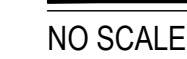


1
M2.0



NO SCALE

A circular pill icon with a horizontal line. The number '2' is above the line and 'M2.0' is below the line.



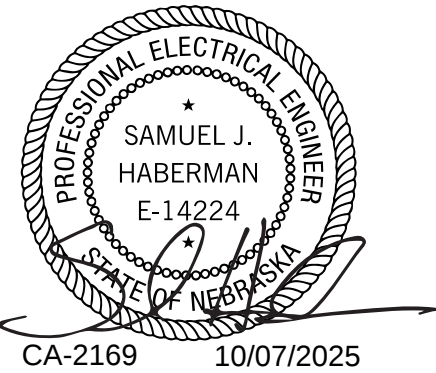
M-MD-DuctFittingDetails2020-09-07

5
M2.0

ROOFTOP UNIT SCHEDULE (ELECTRIC HEAT)																								
MARK	SERVES	CONFIGURATION	AIRFLOW DATA				COOLING DATA						HEATING DATA		FAN DATA		DIMENSIONS (LxWxH) (IN)	OPERATING WEIGHT (LBS)	MANUFACTURER	MODEL	REFERENCE SPECIFICATION	REMARKS		
			AIRFLOW (CFM)	EXT S.P. (IN. W.C.)	MAXIMUM OUTSIDE AIRFLOW (CFM) [2]	MINIMUM OUTSIDE AIRFLOW (CFM) [2]	AMBIENT AIR TEMP (°F)	MIN EER (AHR)	EAT (DB/WB) (°F)	LAT (DB/WB) (°F)	NET TOTAL COOLING (MBH)	NET SENSIBLE COOLING (MBH)	NUMBER OF COMPRESSORS	STEPS OF UNLOADING	HEATER CAPACITY (KW)	NO. OF STEPS							SUPPLY FAN	
																							CONTROL	HP
RTU-1	PLANETARIUM	DOWNFLOW	1200	1.0	360	60	105	11.5	80/67	55/54	43.3	29.0	1	1	15	1	ECM	1	82.25x47.0x36.38	793	LENNOX	LCX048SSE	23 74 16	1,2,3,4,5,6

ELECTRIC REHEAT COIL SCHEDULE																		
MARK	SERVES	LOCATION	MIN AIR FLOW (CFM)	MAX AIR FLOW (CFM)	TYPE	APPROX SIZE (IN)	MINIMUM FACE VELOCITY (FPM)	ENTERING AIR CONDITIONS	LEAVING AIR CONDITIONS	TOTAL CAPACITY(MBH)	TOTAL KW	NO. OF STAGES	KW PER STAGE	MANUFACTURER	MODEL	REFERENCE SPECIFICATION	REMARKS	
								(DB) (°F)	(DB) (°F)									
ERHC-2	TU-1-2	SEE PLANS	1575	3200	DUCT HEATER	40 x 14	405	55	85	102.4	30	SCR	N/A	INDEECO	QUA	238200	1,2,3,4,8	
ERHC-3	TU-1-3A & TU-1-3B	SEE PLANS	1764	3630	DUCT HEATER	38 x 18	415	55	85	116.0	34	SCR	N/A	INDEECO	QUA	238200	1,2,3,4,6	
ERHC-4	TU-2-1	SEE PLANS	1674	3420	DUCT HEATER	42 x 14	410	55	85	109.2	32	SCR	N/A	INDEECO	QUA	238200	1,2,3,5,8	
ERHC-5	TU-2-2	SEE PLANS	427	750	DUCT HEATER	16 x 12	320	55	85	23.9	7	SCR	N/A	INDEECO	QUA	238200	1,2,3,5,8	
ERHC-6	TU-2-3	SEE PLANS	827	1600	DUCT HEATER	34 x 10	372	55	85	51.2	15	SCR	N/A	INDEECO	QUA	238200	1,2,3,5,8	
ERHC-7	TU-2-4	SEE PLANS	684	1280	DUCT HEATER	20 x 14	352	55	85	40.9	12	SCR	N/A	INDEECO	QUA	238200	1,2,3,5,8	
ERHC-8	TU-2-5A & TU-2-5B	SEE PLANS	1760	3310	DUCT HEATER	36 x 20	352	55	85	105.8	31	SCR	N/A	INDEECO	QUA	238200	1,2,3,5,7	

ELECTRIC UNIT HEATER SCHEDULE												
MARK	SERVES	LOCATION	CONFIGURATION	KW	HEATING CAPACITY (MBH)	AIRFLOW (CFM)	DIMENSIONS (LxWxH) (IN)	OPERATING WEIGHT (LBS)	MANUFACTURER	MODEL	REFERENCE SPECIFICATION	REMARKS
UH-1	VESTIBULE 102	VESTIBULE 102	WALL	4.8	16378	100	15.75x5.38x19.3	25	BERKO	FRC48203F	23 8200	1, 2

[illegible]

© COPYRIGHT 2025 Permission to reproduce all or part of this Drawing is hereby granted solely for the limited purpose of construction of this project or for archiving. Unauthorized copying, disclosure or construction use without written permission of Alvine is prohibited by copyright law.

NOTE:
DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS and clearances from ARCHITECTURAL, STRUCTURAL, shop and other appropriate drawing or at site. Lay out and coordinate all work prior to installation to provide clearances required for operation, maintenance, and codes and verify non-interference with other work. DO NOT FABRICATE PRIOR TO VERIFICATION OF CLEARANCE FOR ALL TRADES. READ SPECIFICATIONS.

ALVINE PROJECT NUMBER
20251723

DATE: 07/23/2025

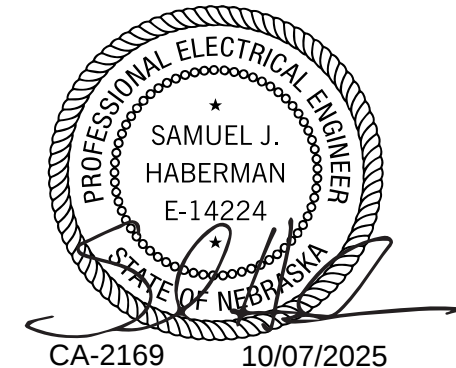
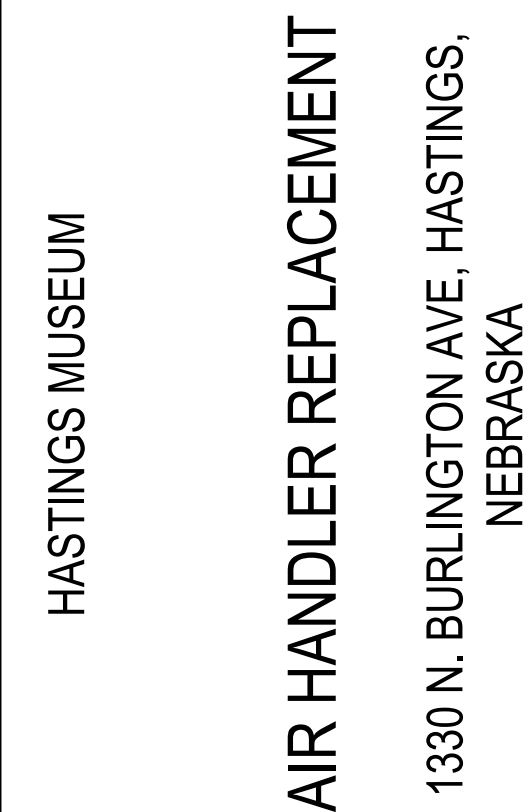
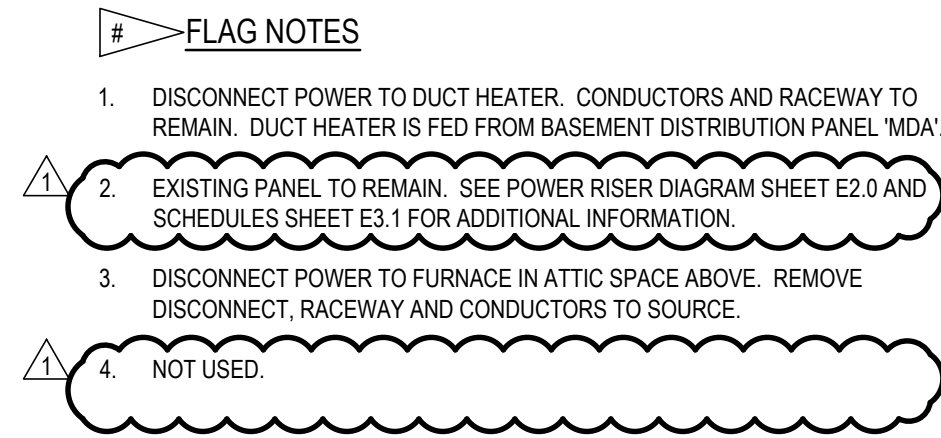
ISSUE:

CONSTRUCTION DOCUMENTS

SHEET NAME:

**BASEMENT FLOOR
PLAN - ELECTRICAL
DEMOLITION**

SHEET NO.: E0.1

[illegible]

© COPYRIGHT 2025 Permission to reproduce all or part of this Drawing is hereby granted solely for the limited purpose of construction of this project or for archiving. Unauthorized copying, disclosure or construction use without written permission of Alvine is prohibited by copyright law.

NOTE:
DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS and clearances from ARCHITECTURAL, STRUCTURAL, shop and other appropriate drawing or at site. Lay out and coordinate all work prior to installation to provide clearances required for operation, maintenance, and codes and verify non-interference with other work. DO NOT FABRICATE PRIOR TO VERIFICATION OF CLEARANCE FOR ALL TRADES. READ SPECIFICATIONS.

ALVINE PROJECT NUMBER
20251723

DATE: 07/23/2025

ISSUE:

CONSTRUCTION DOCUMENTS

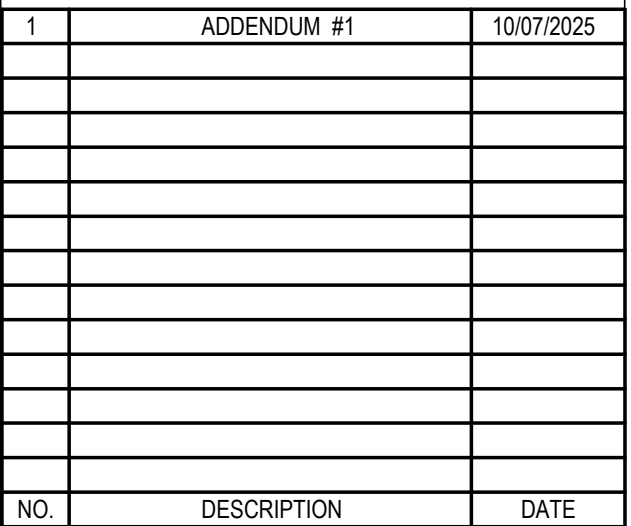
SHEET NAME:

FIRST FLOOR
PLAN - ELECTRICAL
DEMOLITION

SHEET NO.: E0.2



1. DISCONNECT POWER TO DUCT HEATER. CONDUCTORS AND RACEWAY TO REMAIN. DUCT HEATER IS FED FROM BASEMENT DISTRIBUTION PANEL 'MDA'.
2. DISCONNECT POWER TO DUCT HEATER. REMOVE CONDUCTORS AND RACEWAY BACK TO SOURCE. DUCT HEATER IS FED FROM BASEMENT DISTRIBUTION PANEL 'MDA'. PROVIDE NEW NAMEPLATE FOR CIRCUIT BREAKER AND LABEL "SPARE".



NOTE:
DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS and clearances from ARCHITECTURAL, STRUCTURAL, shop and other appropriate drawing or at site. Lay out and coordinate all work prior to installation to provide clearances required for operation, maintenance, and codes and verify non-interference with other work. DO NOT FABRICATE PRIOR TO VERIFICATION OF CLEARANCE FOR ALL TRADES. READ SPECIFICATIONS.

SECOND FLOOR PLAN - ELECTRICAL DEMOLITION

E0.3

1	ADDENDUM #1	10/07/2022
NO.	DESCRIPTION	DATE

© COPYRIGHT 2025 Permission to reproduce all or part of this Drawing is hereby granted solely for the limited purpose of construction of this project or for archiving. Unauthorized copying, disclosure or construction use without written permission of Alvine is prohibited by copyright law.

DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS and clearances from ARCHITECTURAL, STRUCTURAL, shop and other appropriate drawing or at site. Lay out and coordinate all work prior to installation to provide clearances required for operation, maintenance, and codes and verify non-interference with other work. DO NOT FABRICATE PRIOR TO VERIFICATION OF CLEARANCE FOR ALL TRADES. READ SPECIFICATION

20251723

07/23/2025

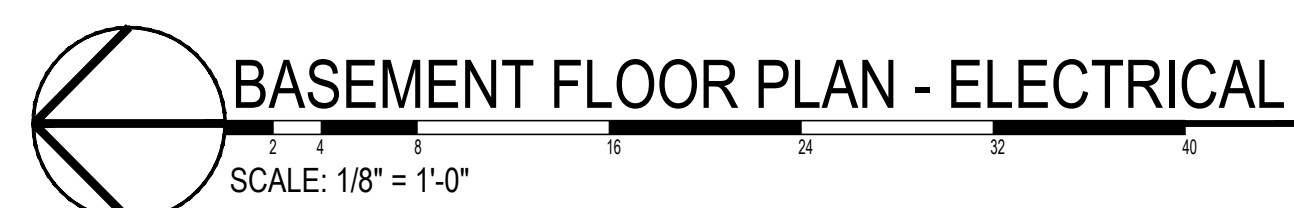
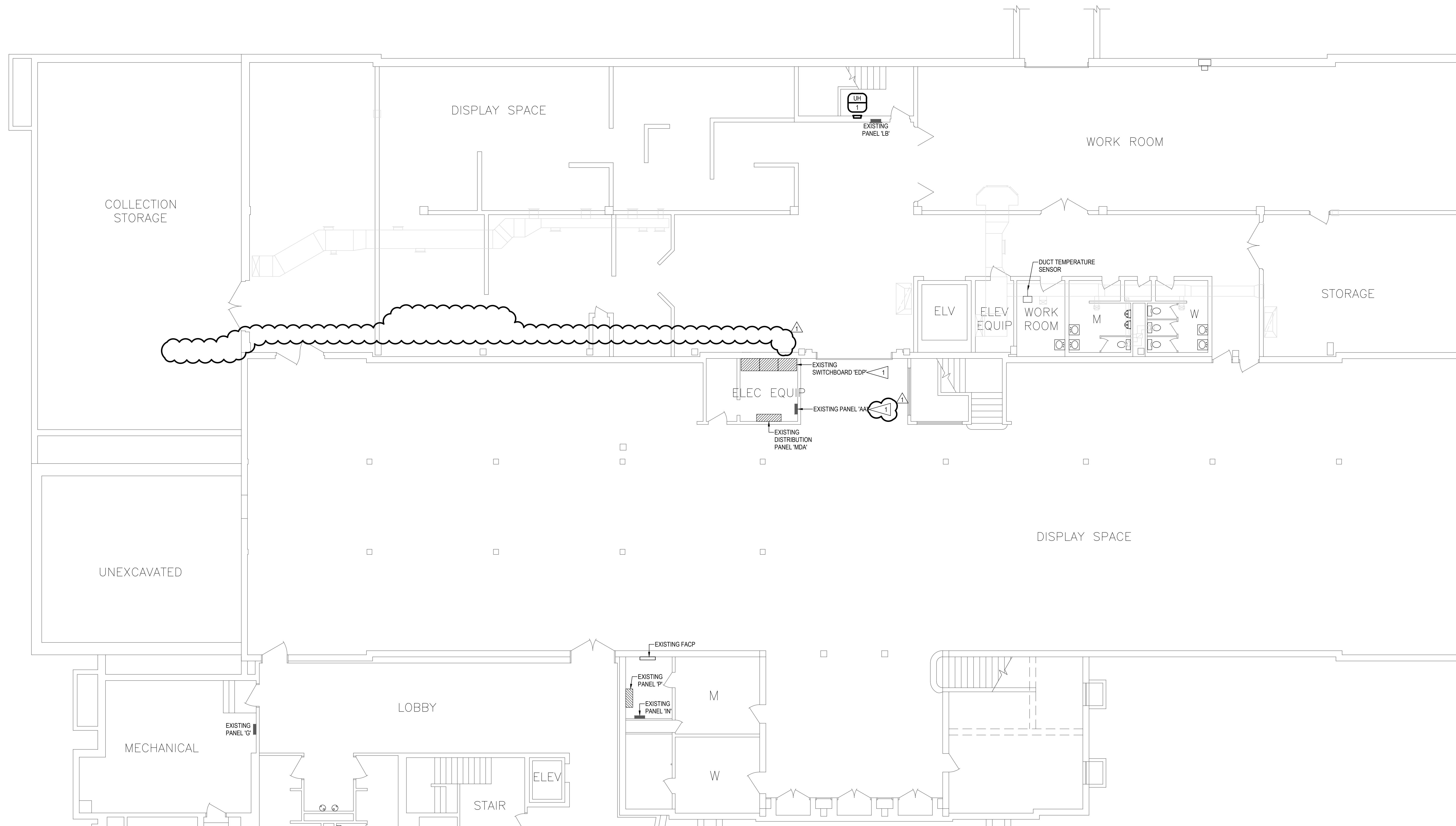
CONSTRUCTION DOCUMENTS

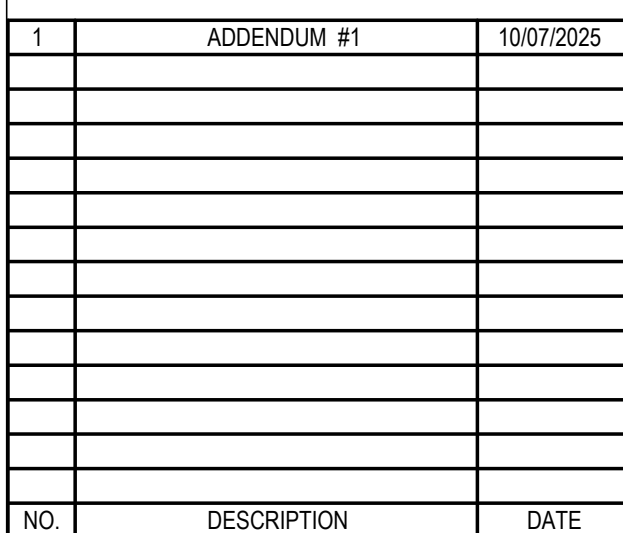
BASEMENT FLOOR
PLAN - ELECTRICAL

E1.1

 FLAG NOTES

- A. PROVIDE CONDUIT AND BOXES FOR LOW VOLTAGE CONTROL WIRING FROM ROOF TOP UNIT TO ASSOCIATED DUCT HEATERS AND VALV TERMINAL UNITS. COORDINATE ROUTING AND LOCATIONS WITH MECHANICAL CONTRACTOR.
- AHU-1 ASSOCIATED DUCT HEATERS / TERMINAL UNITS:
 - ERHC-2, ERHC-3
 - TU-1-2, TU-1-3A, TU-1-3B
 - AHU-2 ASSOCIATED DUCT HEATERS / TERMINAL UNITS:
 - ERHC-4, ERHC-5, ERHC-6, ERHC-7, ERHC-8
 - TU-2-1, TU-2-2, TU-2-3, TU-2-4, TU-2-5A, TU-2-5B
- B. PROVIDE CONDUIT AND BOXES FOR LOW VOLTAGE WIRING FROM DUCT TEMPERATURE SENSORS TO TERMINAL UNITS. COORDINATE ROUTING AND LOCATIONS WITH MECHANICAL CONTRACTOR.





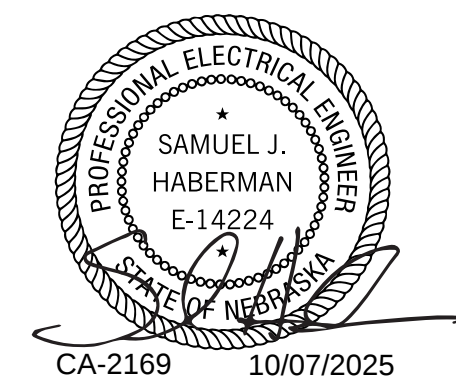
NOTE:
DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS and clearances from ARCHITECTURAL, STRUCTURAL, shop and other appropriate drawing or at site. Lay out and coordinate all work prior to installation to provide clearances required for operation, maintenance, and codes and verify non-interference with other work. DO NOT FABRICATE PRIOR TO VERIFICATION OF CLEARANCE FOR ALL TRADES. READ SPECIFICATIONS.

FIRST FLOOR
PLAN - ELECTRICAL

E1.2

1. CONNECT EXISTING FEEDER TO NEW DUCT HEATER.
2. PROVIDE EXISTING PANEL WITH NEW TYPE-WRITTEN CIRCUIT DIRECTORY.
3. EXTEND EXISTING FEEDER TO NEW DUCT HEATER LOCATION.
4. SEE POWER RISER DIAGRAM SHEET E2.0 FOR NEW WORK AND SCHEDULE SHEET E3.1 FOR ADDITIONAL INFORMATION.
5. LOCATE NEW RECEPTACLE IN ATTIC SPACE. CONNECT TO SPARE 20A 1P CIRCUIT BREAKER IN PLANETARIUM PANEL.





1	ADDENDUM #1	10/07/2025
NO.	DESCRIPTION	DATE

© COPYRIGHT 2025 Permission to reproduce all or part of this Drawing is hereby granted solely for the limited purpose of construction of this project or for archiving. Unauthorized copying, disclosure or construction use without written permission of Alvine is prohibited by copyright law.

NOTE:

DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS and clearances from ARCHITECTURAL, STRUCTURAL, shop and other appropriate drawing or at site. Lay out and coordinate all work prior to installation to provide clearances required for operation, maintenance, and codes and verify non-interference with other work. DO NOT FABRICATE PRIOR TO VERIFICATION OF CLEARANCE FOR ALL TRADES. READ SPECIFICATIONS

ALVINE PROJECT NUMBER	20251723
-----------------------	----------

DATE: 07/23/2025

ISSUE:

CONSTRUCTION DOCUMENTS:

SHEET NAME:

SECOND FLOOR
PLAN - ELECTRICAL

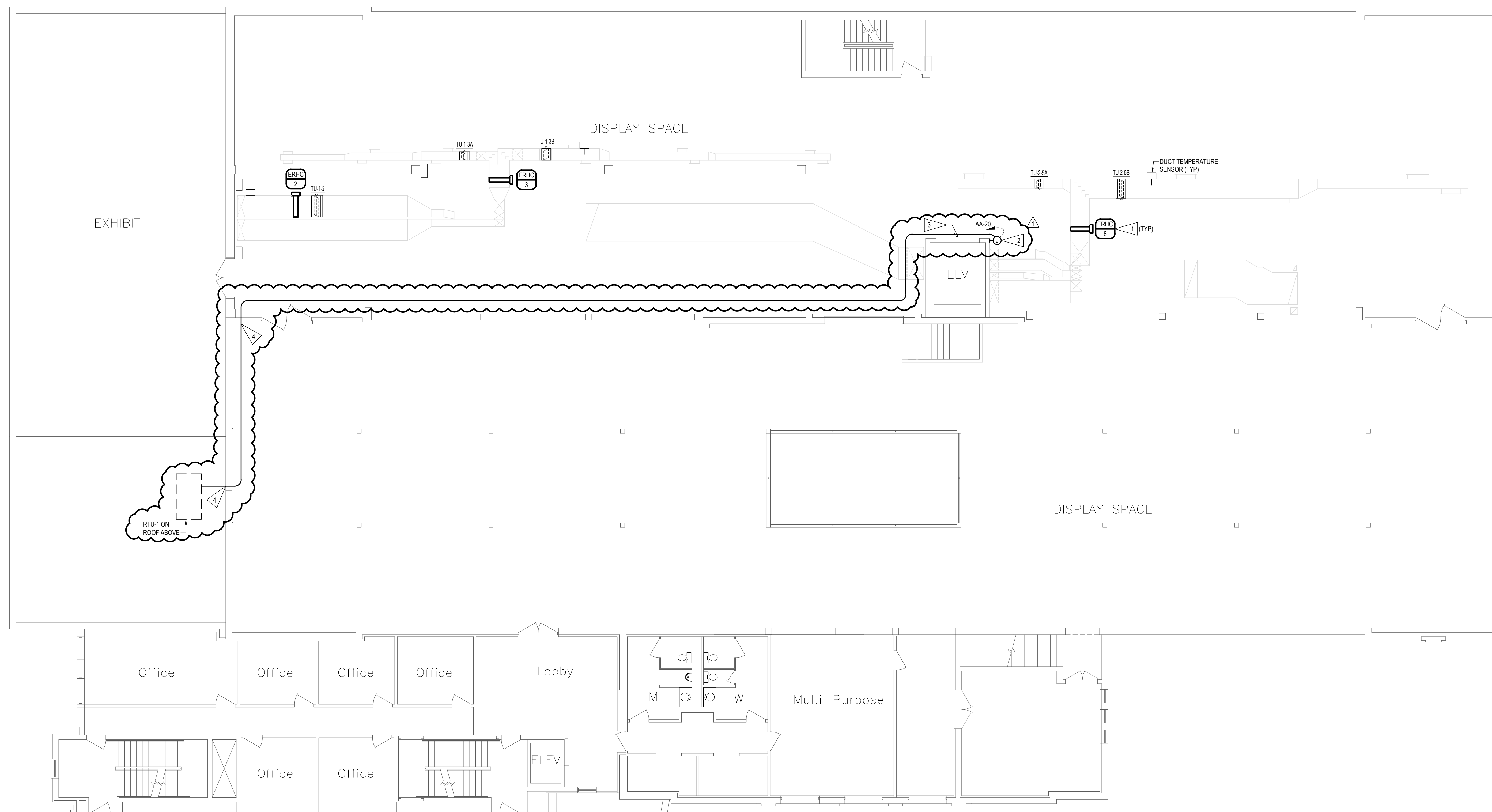
SHEET NO.: E1.3

GENERAL NOTES

- A. PROVIDE CONDUIT AND BOXES FOR LOW VOLTAGE CONTROL WIRING FROM ROOF TOP UNIT TO ASSOCIATED DUCT HEATERS AND VALV TERMINAL UNITS. COORDINATE ROUTING AND LOCATIONS WITH MECHANICAL CONTRACTOR.
- AHU-1 ASSOCIATED DUCT HEATERS / TERMINAL UNITS:
 - ERHC-2, ERHC-3
 - TU-1-2, TU-1-3A, TU-1-3B
 - AHU-2 ASSOCIATED DUCT HEATERS / TERMINAL UNITS:
 - ERHC-4, ERHC-5, ERHC-6, ERHC-7, ERHC-8
 - TU-2-1, TU-2-2, TU-2-3, TU-2-4, TU-2-5A, TU-2-5B
- B. PROVIDE CONDUIT AND BOXES FOR LOW VOLTAGE WIRING FROM DUCT TEMPERATURE SENSORS TO TERMINAL UNITS. COORDINATE ROUTING AND LOCATIONS WITH MECHANICAL CONTRACTOR.

FLAG NOTES

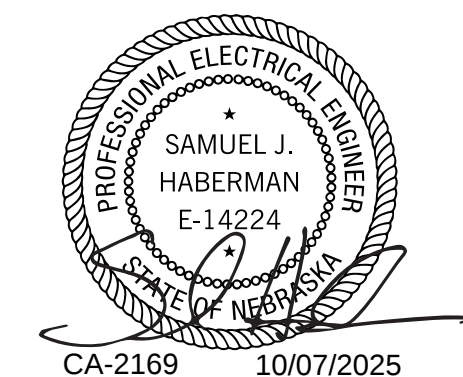
1. CONNECT EXISTING FEEDER TO NEW DUCT HEATER.
2. PROVIDE NEW J-BOX AND EXTEND CIRCUIT TO AHU-3. SEE MECHANICAL / ELECTRICAL COORDINATION SCHEDULE ON SHEET E3.0 FOR MORE INFORMATION.
3. COORDINATE ROUTING OF NEW CONDUIT WITH OWNER PRIOR TO INSTALLATION.
4. COORDINATE NEW WALL PENETRATIONS THRU CONCRETE AND MASONRY WALLS WITH OWNER PRIOR TO INSTALLATION.



HASTINGS MUSEUM

AIR HANDLER REPLACEMENT

1330 N. BURLINGTON AVE., HASTINGS,
NEBRASKA



1	ADDENDUM #1	10/07/2025
NO.	DESCRIPTION	DATE

© COPYRIGHT 2025 Permission to reproduce all or part of this Drawing is hereby granted solely for the limited purpose of construction of this project or for archiving. Unauthorized copying, disclosure or construction use without written permission of Alvine is prohibited by copyright law.

NOTE:

DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS and clearances from ARCHITECTURAL, STRUCTURAL, shop and other appropriate drawing or at site. Lay out and coordinate all work prior to installation to provide clearances required for operation, maintenance, and codes and verify non-interference with other work. DO NOT FABRICATE PRIOR TO VERIFICATION OF CLEARANCE FOR ALL TRADES. READ SPECIFICATIONS

ALVINE PROJECT NUMBER	20251723
-----------------------	----------

DATE: 07/23/2025

ISSUE:

CONSTRUCTION DOCUMENTS:

SHEET NAME:

THIRD FLOOR
PLAN - ELECTRICAL

SHEET NO.:

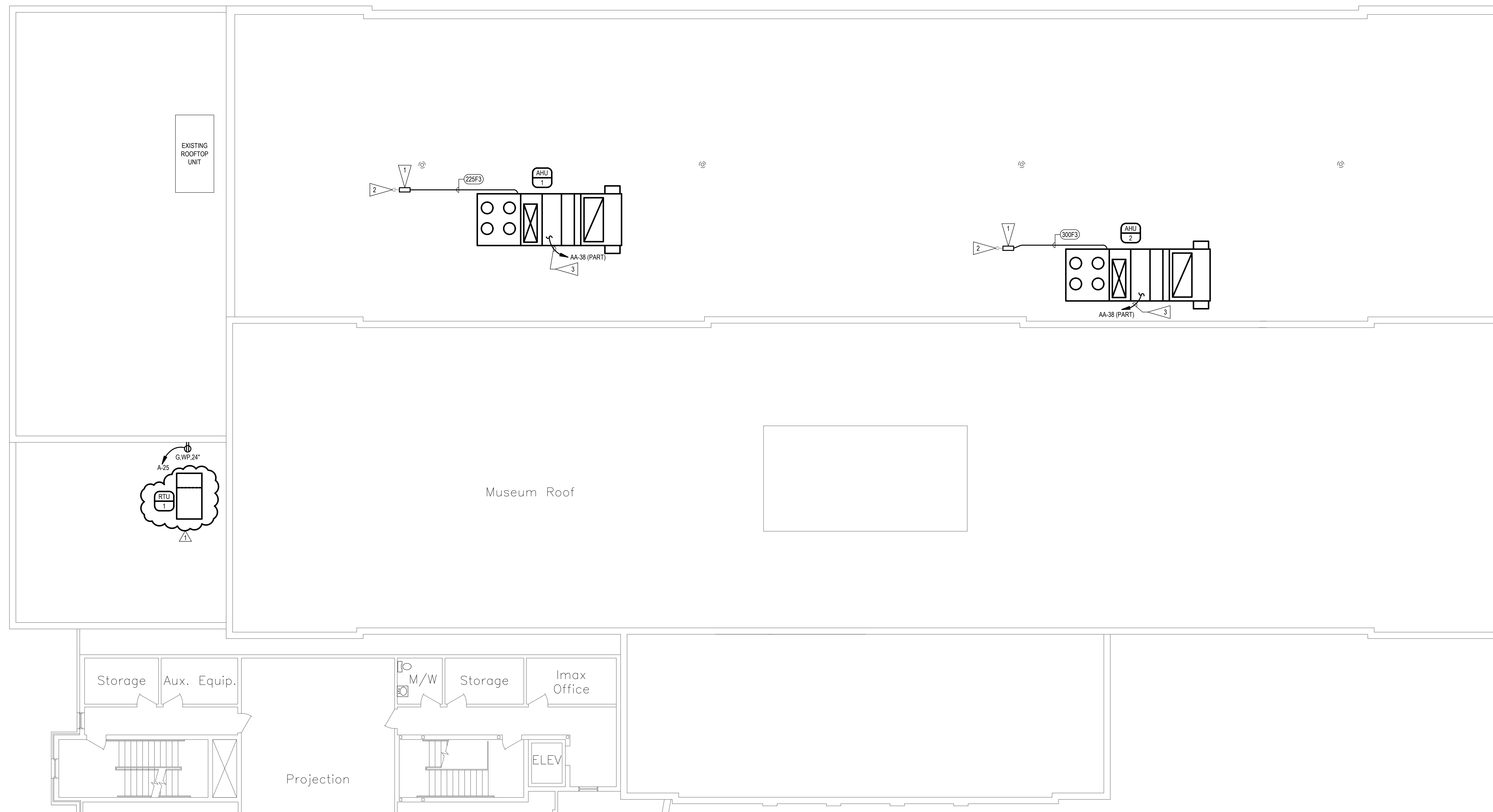
E1.4

GENERAL NOTES

- A. PROVIDE CONDUIT AND BOXES FOR LOW VOLTAGE CONTROL WIRING FROM ROOFTOP UNIT TO ASSOCIATED DUCT HEATERS AND VAV TERMINAL UNITS. COORDINATE ROUTING AND LOCATIONS WITH MECHANICAL CONTRACTOR.
- AHU-1 ASSOCIATED DUCT HEATERS / TERMINAL UNITS:
 - ERHC-2, ERHC-3
 - TU-1-2, TU-1-3A, TU-1-3B
 - AHU-2 ASSOCIATED DUCT HEATERS / TERMINAL UNITS:
 - ERHC-4, ERHC-5, ERHC-6, ERHC-7, ERHC-8
 - TU-2-1, TU-2-2, TU-2-3, TU-2-4, TU-2-5A, TU-2-5B
- B. RECONNECT DETECTORS AND RELAYS TO SHUTDOWN NEW ROOFTOP UNITS AS REQUIRED.

FLAG NOTES

1. PROVIDE NEW NEMA 3R ENCLOSURE / TAP BOX. PROVIDE UNISTRUT STAND AND SECURE TO ROOF. PROVIDE NEW CONDUIT AND WIRE FROM TAP BOX TO AHU DISCONNECT. PROVIDE NEW ROOF SUPPORTS FOR NEW CONDUIT ROUTING.
2. EXISTING RACEWAY THRU ROOF. PROVIDE NEW COVER, GASKET AND SCREWS TO EXISTING LB FITTING.
3. CONNECT TO RECEPTACLE FURNISHED WITH ROOFTOP UNIT.



ABBREVIATIONS:



208/120V 3 PHASE 4 WIRE W/ GND BAR
1200 AMP MAIN SWITCH
22000 AIC
FUSIBLE DISTRIBUTION

208/120V 3 PHASE 4 WIRE W/ GND BAR
1200 AMP MCB
42000 AIC
BREAKER DISTRIBUTION

CA-2169 10/07/2025

MARK	CONDUCTORS AND CONDUIT
	2 WIRE PLUS GRO

100F3	3 #3, #8 GND. 1-1/4" C.
125F3	3 #2, #6 GND. 1-1/4" C.
225F3	3 #4/0, #4 GND. 2" C.
250F3	3 #4/0, #4 GND. 2" C.

HASTINGS MUSEUM

CA-2169 10/07/2025

NO.	DESCRIPTION	DATE
-----	-------------	------

permission of Alvine is prohibited by copyright law.

DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS and clearances from ARCHITECTURAL, STRUCTURAL, shop and other appropriate drawing or at site. Lay out and coordinate all work prior to installation to provide clearances required for operation, maintenance, and codes and verify non-interference with other work. DO NOT FABRICATE PRIOR TO VERIFICATION OF CLEARANCE FOR ALL TRADES. READ SPECIFICATIONS.

20251723

07/23/2025

CONSTRUCTION DOCUMENTS

ELECTRICAL SCHEDULES

E3.0

PANEL A - EXISTING
FLUSH MOUNTED



PANEL PLANETARIUM - EXISTING

REMARKS:

1. DISCONNECT EXISTING LOAD, CIRCUIT BREAKER REMAINS AS SPARE.
2. CONNECT NEW RECEPTACLE TO EXISTING CIRCUIT BREAKER. LABEL 'ATTIC RECEPT'.

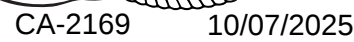
PANEL AA - EXISTING

2. VERIFY CIRCUIT BREAKER IS SPARE. SEE NEW SCHEDULE FOR NEW LOAD.

PANEL AA - RENOVATED

REMARKS:

1. PROVIDE NEW CIRCUIT BREAKER, SIZE AS INDICATED. CONNECT TO NEW LOAD.
2. CONNECT NEW LOAD TO EXISTING SPARE CIRCUIT BREAKER.



© COPYRIGHT 2025 Permission to reproduce all or part of this Drawing is hereby granted solely for the limited purpose of construction of this project or for archiving. Unauthorized copying, disclosure or construction use without written permission of Alvine is prohibited by copyright law.

NOTE:
DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS and clearances from ARCHITECTURAL, STRUCTURAL, shop and other appropriate drawing or at site. Lay out and coordinate all work prior to installation to provide clearances required for operation, maintenance, and codes and verify non-interference with other work. DO NOT FABRICATE PRIOR TO VERIFICATION OF CLEARANCE FOR ALL TRADES. READ SPECIFICATIONS.

ALVINE PROJECT NUMBER	20251723
-----------------------	----------

DATE: 07/23/2025

ISSUE:

CONSTRUCTION DOCUMENTS

SHEET NAME:

ELECTRICAL SCHEDULES

SHEET NO.:

E3.1