Addendum #2
Ball State University
Oakwood Renovation - 2018

Date: June 22, 2018
Project: Ball State Oakwood Renovation – 2018-020.01 OW
krM Project #: 18106
Pages: 28 (8-1/2x11) pages 18 (24x36) pages
Bid Dates: Thursday, June 28, 2018, 11am – BSU Purchasing Office

General Note:

The original Specifications and Drawings dated June 07, 2018 for the project referenced above are amended as noted in this Addendum No. 2. Items revised by this addendum are to be noted delta 2. Receipt of this Addendum and any subsequent Addenda must be acknowledged on the Bid Form. Items changed or added by this addendum are to take precedence over the items or descriptions of the work in the project manual and the drawings. Items not mentioned in this addendum are to remain as described in the original plans and specifications, and previous addenda.

Specifications Items:

Section 00 01 10 Table of Contents
1. DELETE the following items to the table of contents:
   a. 01 78 00 Closeout Submittals
2. ADD the following items to the table of contents:
   a. 23 21 23 Hydronic Pumps
   b. 23 25 23 Gas Vents
   c. 23 52 16 Condensing Boilers
   d. 26 29 13 Manual and Magnetic Motor Controllers

Section 01 78 00 Closeout Submittals
1. Delete specification section included in addendum 1 in it’s entirety.
2. Note that several specification sections reference 01 78 00. All references to 01 78 00 throughout the specification manual should refer to 01 70 00 Execution and Closeout Requirements.

Section 05 31 00 Steel Decking
1. Reference 1.05. Add the following:
   a. B. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated.
   b. C. Installer Qualifications: An experienced installer who has completed steel deck similar in material, design and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
2. Reference 2.01/A. Add the following:
   a. 6. Structural Properties:
      i.  a. Span Design: Triple span or more.
   b. 7. Side Joints: Overlapped.

Section 06 41 00 Architectural Wood Casework
1. Reference 2.06. Add the following:
   a. G. Work Surface Bracket: Heavy-duty steel bracket to support countertops with
      unsupported lengths greater than 36”. Brackets are to be mounted at 16” o.c.
      (maximum).
      i.  1. Product: 287.74.707 manufactured by Hafele America Co.

Section 07 21 00 Thermal Insulation
1. Reference 3.01/A. Add text as follows:
   a. 1. Adhere a 6 inch (150 mm) wide strip of polyethylene sheet over expansion
      joints with double beads of adhesive each side of joint

Section 08 43 13 Aluminum-Framed Storefronts
1. Reference 2.01/A/4. Replace text as follows:
   a. 4. Tubelite Inc.: www.tubeliteinc.com
2. Reference 2.01/A. Add text as follows:
   a. 5. Substitutions: See Section 01 60 00 – Product Requirements.

Section 09 30 00 Tiling
1. Reference 2.01/A/5. Replace text as follows:
   a. 5. Acceptable Products:
      i.  a. LAMINAM 3+ by Crossville; www.crossvilleinc.com.
          1. FTIAT5519.5x39, Cotton.
          1. Macadamia TP16, 1m x 1.5m sizing.

Section 12 24 00 Window Shades
1. DELETE reference 2.01/B in it’s entirety. Shade fabric and performance requirements
   are specified in 2.02/A.

Section 23 09 00 Instrumentation and Control for HVAC
1. Reference 1.2 Summary Add text as follows:
   a. A. Add Condensing Summer Boiler and Pump for VAV Reheat.

Section 23 21 23 Hydronic Pumps
1. ADD this section to specifications in its entirety.

Section 23 51 23 Gas Vents
1. ADD this section to specifications in its entirety.

Section 23 52 16 Condensing Boilers
1. ADD this section to specifications in its entirety.
**Section 23 82 33 Convectors**
1. Reference 2.1/A. Acceptable Manufactures. Add text as follows:
   a. 4. Zehnder – Rittling.

**Section 23 82 36 Finned-Tube Radiation Heaters**
1. Reference 2.1 Acceptable Manufactures. Add text as follows:

**Section 26 29 13 Manual and Magnetic Motor Controllers**
1. ADD this section to specifications in its entirety.

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**Drawing Set Items:**

**Sheet D0-1**
1. REVISE Plan Note #12, as follows:
   a. 12. REMOVE PORTION OF TERRAZZO-TOPPED CONCRETE FLOOR TO CLOSEST EXISTING DIVIDER STRIP. COORDINATE EXTENT WITH NEW WORK THIS AREA.
2. ADD Plan Note #17, as follows:
   a. 17. REMOVE PORTION OF TERRAZZO TOPPING LAYER TO CLOSEST EXISTING DIVIDER STRIP. CONCRETE SLAB AND SAND CUSHION LAYER BELOW TO REMAIN.

**Sheet D1-1**
1. REPLACE Drawing 1, as shown in reissued sheet.
2. REVISE Plan Note #12, as follows:
   a. 12. REMOVE PORTION OF TERRAZZO-TOPPED CONCRETE FLOOR TO CLOSEST EXISTING DIVIDER STRIP. COORDINATE EXTENT WITH NEW WORK THIS AREA.
3. ADD Plan Note #17, as follows:
   a. 17. REMOVE PORTION OF TERRAZZO TOPPING LAYER TO CLOSEST EXISTING DIVIDER STRIP. CONCRETE SLAB AND SAND CUSHION LAYER BELOW TO REMAIN.

**Sheet D1-2**
1. REPLACE Drawing 1, as shown in reissued sheet.
2. REVISE Plan Note #12, as follows:
   a. 12. REMOVE PORTION OF TERRAZZO-TOPPED CONCRETE FLOOR TO CLOSEST EXISTING DIVIDER STRIP. COORDINATE EXTENT WITH NEW WORK THIS AREA.
3. ADD Plan Note #17, as follows:
   a. 17. REMOVE PORTION OF TERRAZZO TOPPING LAYER TO CLOSEST EXISTING DIVIDER STRIP. CONCRETE SLAB AND SAND CUSHION LAYER BELOW TO REMAIN.
4. ADD Plan Note #18, as follows:
   A. 17. REMOVE EXISTING WOOD ACCESS PANELS IN THEIR ENTIRETY.

**Sheet D1-3**

1. REVISE Plan Note #12, as follows:
   a. 12. REMOVE PORTION OF TERRAZZO-TOPPED CONCRETE FLOOR TO CLOSEST EXISTING DIVIDER STRIP. COORDINATE EXTENT WITH NEW WORK THIS AREA.
2. ADD Plan Note #17, as follows:
   a. 17. REMOVE PORTION OF TERRAZZO TOPPING LAYER TO CLOSEST EXISTING DIVIDER STRIP. CONCRETE SLAB AND SAND CUSHION LAYER BELOW TO REMAIN.

**Sheet D2-1**

1. REVISE Plan Note #6, as follows:
   a. 6. NOT USED

**Sheet D2-2**

1. REPLACE Drawing 1, as shown in reissued sheet.
2. REVISE Plan Note #6, as follows:
   a. 6. NOT USED
3. ADD Plan Note #8, as follows:
   a. 8. REMOVE HANGING CURTAINS IN THEIR ENTIRETY

**Sheet D2-3**

1. REPLACE Drawing 1, as shown in reissued sheet.
2. REVISE Plan Note #6, as follows:
   a. 6. NOT USED

**Sheet L1-1**

1. REVISE General Grading Note F as follows:
   a. PROVIDE POSITIVE DRAINAGE AWAY FROM BUILDING IN ALL AREAS.

**Sheet L1-2**

1. REVISE General Grading Note F as follows:
   a. PROVIDE POSITIVE DRAINAGE AWAY FROM BUILDING IN ALL AREAS.

**Sheet L1-3**

1. REVISE General Grading Note F as follows:
   a. PROVIDE POSITIVE DRAINAGE AWAY FROM BUILDING IN ALL AREAS.

**Sheet A1-1**

1. REPLACE Drawing 1, as shown in reissued sheet.
2. REVISE Plan Note #1, as follows:
   a. 1. RECESSED-MOUNT KNOW BOX 3200. ALUMINUM FINISH. COORDINATE FINAL LOCATION WITH FIRE DEPARTMENT.
3. ADD Plan Note #11 as follows:
   a. 11. PATCH CMU WALL AT REMOVED CLOCK LOCATION. TOOTH NEW CMU INTO EXISTING.

4. ADD Plan Note #12 as follows:
   a. 12. PATCH PLASTER AT REMOVED WALL-MOUNTED DEVICE.

**Sheet A1-2**
1. REPLACE Drawing 1, as shown in reissued sheet.
2. ADD Section Detail marker labeled “11/A6-1” to center of stage at existing storage access doors, between room #101 and room #101B.
3. DELETE plan note 1 near east entrance door.
4. REVISE Plan Note #1, as follows:
   a. 1. RECESSED-MOUNT KNOW BOX 3200. ALUMINUM FINISH. COORDINATE FINAL LOCATION WITH FIRE DEPARTMENT.
5. ADD Plan Note #11 as follows:
   a. 11. PATCH CMU WALL AT REMOVED CLOCK LOCATION. TOOTH NEW CMU INTO EXISTING.
6. ADD Plan Note #12 as follows:
   a. 12. PATCH PLASTER AT REMOVED WALL-MOUNTED DEVICE.
7. ADD Plan Note #13 as follows:
   a. 13. MECHANICALLY FASTEN 3/4” FIRE-RATED PLYWOOD (PAINT) OVER EXISTING OPENINGS IN PLATFORM FACE TO RENDER THE AREA BENEATH THE PLATFORM INACCESSIBLE.

**Sheet A1-3**
1. REVISE Plan Note #1, as follows:
   a. 1. RECESSED-MOUNT KNOW BOX 3200. ALUMINUM FINISH. COORDINATE FINAL LOCATION WITH FIRE DEPARTMENT.
2. ADD Plan Note #11 as follows:
   a. 11. PATCH CMU WALL AT REMOVED CLOCK LOCATION. TOOTH NEW CMU INTO EXISTING.
3. ADD Plan Note #12 as follows:
   a. 12. PATCH PLASTER AT REMOVED WALL-MOUNTED DEVICE.

**Sheet A2-1**
8. REVISE Plan Note #1, as follows:
   a. 1. NOT USED

**Sheet A2-2**
1. REPLACE Drawing 1, as shown in reissued sheet.

**Sheet A2-3**
1. REPLACE Drawing 1, as shown in reissued sheet.

**Sheet A6-1**
1. REPLACE Drawing 5, as shown in reissued sheet.
2. REPLACE Drawing 10, as shown in reissued sheet.
3. ADD Drawing 11, as shown in reissued sheet.
Sheet A8-1
1. REVISE Frame Elevation F2, as shown in reissued sheet.
2. REVISE Frame Elevation SF-2, as shown in reissued sheet.
3. REVISE Frame Elevation SF-3, as shown in reissued sheet.
4. ADD abbreviation F-1 to Door & Window Abbreviations list, as shown in reissued sheet.

Sheet A9-1
1. REPLACE drawing 3, as shown in reissued sheet.
2. REVISE Plan Note #4 as shown in reissued sheet.

Sheet A11-1
1. REVISE Plan Note #1 as follows: ‘Clean existing glazed tile and grout. Use masonry detergent cleaner, such as Enviro Klean by Prosoco or equivalent, following the manufacturer recommended dilution rate for Structural Glazed Block. Use cleaner in accordance to manufacturer’s directions, including rinsing. Damp-dry with clean, soft rags. Do not use any product containing unbuffered hydrochloric acid or other unbuffered acids. Do not use steel wool or other abrasives’.

Sheet FP2-1
1. Refer to “Indiana American Water” Fire Service Vault Detail – Fire Service is preliminarily sized at 6” IPS in lieu of 8” shown on the standard detail. Fire Protection Contractor is to verify incoming service size with hydraulic calculations and submittal to State Fire Marshals Office.

Bidder Questions:

1. “M1.4 – Note 1: Demolish unit ventilator and fin-tube radiators under windows. Remove all piping back to hot water supply and return drops.” Question: A6-1 / 5 show that this void get insulated and walled over. It states existing blank off panel. Currently that is foam board. Do we need to do something more substantial for long term sustainability?
   a. **Response:** Detail has been revised, see attachment in this addendum.

2. We propose furnishing the following Tubelite materials in lieu of those specified.
   a. **Response:** Tubelite has been added to the list of accepted manufacturers. See revision to section 08 43 13.

3. Has the Fire Alarm system been submitted to the state?
   a. **Response:** The fire alarm system is shown and specified in our electrical plans and will be part of the design release. Contractor will be submitting fire alarm shop drawings for compliance to plans and specifications. The fire protection / sprinkler system will be submitted to State by the fire protection contractor.

4. Does the underside of the existing stage need to include sprinkler system coverage?
   a. **Response:** No. Removal of the existing access panels and replacement with fixed panels to render the area inaccessible eliminates the necessity to include sprinkler system coverage on the underside of the existing stage.
Attachments:

1. Specification Section 23 21 23 - Hydronic Pumps (4 pages)
2. Specification Section 23 25 23 - Gas Vents (3 pages)
3. Specification Section 23 52 16 - Condensing Boilers (7 pages)
5. Drawing Sheet D1-1 – Demolition Floor Plan – Area A
6. Drawing Sheet D1-2 – Demolition Floor Plan – Area B
7. Drawing Sheet D2-2 – Demolition Reflected Ceiling Plan – Area B
8. Drawing Sheet D2-3 – Demolition Reflected Ceiling Plan – Area C
9. Drawing Sheet A1-1 – Architectural Floor Plan – Area A
10. Drawing Sheet A1-2 – Architectural Floor Plan – Area B
11. Drawing Sheet A2-2 – Reflected Ceiling Plan – Area B
12. Drawing Sheet A2-3 – Reflected Ceiling Plan – Area C
13. Drawing Sheet A6-1 – Section Details
14. Drawing Sheet A8-1 – Door/Frame Schedules
15. Drawing Sheet A9-1 – Enlarged Floor Plans/Restroom Plans
16. Drawing Sheet M3-2 - First Floor HVAC Plan – Area B
17. Drawing Sheet M3-3 - First Floor HVAC Plan – Area C
18. Drawing Sheet M3-5 - First Floor Piping Plan – Area B
19. Drawing Sheet M5-1 - Mechanical Details
20. Drawing Sheet M6-1 - Mechanical Schedules
21. Drawing Sheet E3-5 - First Floor Power & Systems Plan – Area B
22. Drawing Sheet E6-1 - Electrical Schedules

END
SECTION 23 21 23

HYDRONIC PUMPS

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:

1.3 DEFINITIONS
A. Buna-N: Nitrile rubber.
B. EPT: Ethylene propylene terpolymer.

1.4 ACTION SUBMITTALS
A. Product Data: For each type of pump. Include certified performance curves and rated capacities, operating characteristics, furnished specialties, final impeller dimensions, and accessories for each type of product indicated. Indicate pump's operating point on curves.
B. Shop Drawings: For each pump.
   1. Show pump layout and connections.
   2. Include setting drawings with templates for installing foundation and anchor bolts and other anchorages.
   3. Include diagrams for power, signal, and control wiring.

1.5 CLOSEOUT SUBMITTALS
A. Operation and Maintenance Data: For pumps to include in emergency, operation, and maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS
A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
PART 2 - PRODUCTS

2.1 CLOSE-COUPLED, IN-LINE CENTRIFUGAL PUMPS

A. Acceptable Manufacturers:
   1. Bell & Gossett
   2. TACO

B. Description: Factory-assembled and -tested, centrifugal, overhung-impeller, close-coupled, in-line pump as defined in HI 1.1-1.2 and HI 1.3; designed for installation with pump and motor shafts mounted horizontally or vertically.

C. Pump Construction:
   1. Casing: Radially split, cast iron, with threaded gage tappings at inlet and outlet, replaceable bronze wear rings, and companion-flange connections.
   2. Impeller: ASTM B584, cast bronze; statically and dynamically balanced, keyed to shaft, and secured with a locking cap screw. For constant-speed pumps, trim impeller to match specified performance.
   3. Pump Shaft: Steel, with copper-alloy shaft sleeve.
   4. Seal: Mechanical seal consisting of carbon rotating ring against a ceramic seat held by a stainless-steel spring, and Viton bellows and gasket. Include water slinger on shaft between motor and seal.
   5. Pump Bearings: Permanently lubricated ball bearings.

D. Motor: Single speed and rigidly mounted to pump casing.
   1. 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. Comply with NEMA designation, temperature rating, service factor, and efficiency requirements for motors specified in Section 23 05 13 "Common Motor Requirements for HVAC Equipment."
      a. Enclosure: Totally enclosed, fan cooled. (TEFC)
      b. Enclosure Materials: Cast iron or Rolled steel
      c. Motor Bearings: Permanently lubricated ball bearings.
      d. Efficiency: Premium efficient.
      e. Service Factor: 1.15.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine equipment foundations and anchor-bolt locations for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
B. Examine roughing-in for piping systems to verify actual locations of piping connections before pump installation.

C. Examine foundations and inertia bases for suitable conditions where pumps are to be installed.

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

3.2 PUMP INSTALLATION

A. Install pumps to provide access for periodic maintenance including removing motors, impellers, couplings, and accessories.

B. Independently support pumps and piping so weight of piping is not supported by pumps and weight of pumps is not supported by piping.

C. Automatic Condensate Pump Units: Install units for collecting condensate and extend to open drain.

D. Equipment Mounting: Install in-line pumps with continuous-thread hanger rods and *elastomeric isolator* of size required to support weight of in-line pumps.

3.3 CONNECTIONS

A. Comply with requirements for piping specified. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Where installing piping adjacent to pump, allow space for service and maintenance.

C. Connect piping to pumps. Install valves that are same size as piping connected to pumps.

D. Install suction and discharge pipe sizes equal to or greater than diameter of pump nozzles.

E. Install Y-type strainer and shutoff valve on suction side of pumps.

F. Install pressure gages on pump suction and discharge or at integral pressure-gage tapping, or install single gage with multiple-input selector valve.

G. Ground equipment according to Section 26 05 26 "Grounding and Bonding for Electrical Systems."

H. Connect wiring according to Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

3.4 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.
2. Check piping connections for tightness.
3. Clean strainers on suction piping.
4. Perform the following startup checks for each pump before starting:
a. Verify bearing lubrication.
b. Verify that pump is free to rotate by hand and that pump for handling hot liquid is free to rotate with pump hot and cold. If pump is bound or drags, do not operate until cause of trouble is determined and corrected.
c. Verify that pump is rotating in the correct direction.
5. Start motor.
6. Open discharge valve slowly.

3.5 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain hydronic pumps.

END OF SECTION 23 21 23
SECTION 23 51 23

GAS VENTS

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. Special Gas Vents.

B. Related Requirements:
   1. Section 23 52 16 - Condensing Boilers

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for product.

B. Shop Drawings: For vents.
   1. Include plans, elevations, sections, and attachment details.
   2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   3. Detail fabrication and assembly of hangers and seismic restraints.

1.4 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Sample Warranty: For special warranty.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

B. Certified Sizing Calculations: Manufacturer shall certify venting system sizing calculations.

PART 2 - PRODUCTS

2.1 LISTED SPECIAL GAS VENTS

A. Description: Double-wall metal vents tested according to UL 1738 and rated for 480 deg F continuously, with positive or negative flue pressure complying with NFPA 211.

B. Construction: Inner shell and outer jacket separated by at least a 1/2-inch airspace.

C. Inner Shell: ASTM A959, Type 29-4C stainless steel.

D. Outer Jacket: Stainless steel.

E. Accessories: Tees, elbows, increasers, draft-hood connectors, terminations, adjustable roof flashings, storm collars, support assemblies, thimbles, firestop spacers, and fasteners; fabricated from similar materials and designs as vent-pipe straight sections; all listed for same assembly.

1. Termination: Stack cap designed to exclude minimum 90 percent of rainfall.
2. Termination: Exit cone with drain section incorporated into riser.
3. Termination: <Insert termination>.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of work.

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

3.2 APPLICATION

A. Listed Special Gas Vent: Condensing gas appliances.

3.3 INSTALLATION OF LISTED VENTS

A. Comply with minimum clearances from combustibles and minimum termination heights according to product listing or NFPA 211, whichever is most stringent.

B. Seal between sections of positive-pressure vents according to manufacturer's written installation instructions, using sealants recommended by manufacturer.
C. Support vents at intervals recommended by manufacturer to support weight of vents and all accessories, without exceeding appliance loading.

D. Lap joints in direction of flow.

3.4 CLEANING

A. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris, and repair damaged finishes.

END OF SECTION 23 51 23
SECTION 23 52 16
CONDENSING BOILERS

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 gas-fired, water-jacketed condensing boilers, trim, and accessories for generating hot water.

1.3 ACTION SUBMITTALS
A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for boilers.
   2. Include rated capacities, operating characteristics, and furnished specialties and accessories.

B. Shop Drawings: For boilers, boiler trim, and accessories.
   1. Include plans, elevations, sections, and mounting details.
   2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   3. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS
A. Seismic Qualification Data: Certificates, for boiler, accessories, and components, from manufacturer.
   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
   2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
   3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

B. Source quality-control reports.

C. Field quality-control reports.
D. Sample Warranty: For special warranty.

E. Product Certificates:
   1. ASME Stamp Certification and Report: Submit "A," "S," or "PP" stamp certificate of authorization, as required by authorities having jurisdiction, and document hydrostatic testing of piping external to boiler.
   2. CSA B51 pressure vessel Canadian Registration Number (CRN).

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For boilers to include in emergency, operation, and maintenance manuals.

1.6 WARRANTY

A. Manufacturer’s Warranty: Manufacturer agrees to repair or replace components of boilers that fail in materials or workmanship within specified warranty period.
   1. Warranty Period for Condensing Boilers:
      a. Leakage and Materials: 10 years from date of Substantial Completion.
      b. Heat Exchanger Damaged by Thermal Stress and Corrosion: Nonprorated for five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. 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.

B. ASME Compliance: Fabricate and label boilers to comply with 2010 ASME Boiler and Pressure Vessel Code.

C. ASHRAE/IES 90.1 Compliance: Boilers shall have minimum efficiency according to "Gas and Oil Fired Boilers - Minimum Efficiency Requirements."

D. DOE Compliance: Minimum efficiency shall comply with 10 CFR 430, Subpart B, Appendix N.

E. UL Compliance: Test boilers for compliance with UL 795. Boilers shall be listed and labeled by a testing agency acceptable to authorities having jurisdiction.

F. CSA Compliance: Test boilers for compliance with CSA B51.

2.2 WATER-TUBE CONDENSING BOILERS

A. Acceptable Manufacturers:
   1. AERCO AM Series Condensing Boiler
2. Lochinvar, Inc.
3. Cleaver-Brooks, Inc.

B. Description: Factory-fabricated, -assembled, and -tested, copper-finned, water-tube condensing boiler with heat exchanger sealed pressure tight, built on a steel base, including insulated jacket; flue-gas vent; combustion-air intake connections; water supply, return, and condensate drain connections; and controls. Water-heating service only.


D. Combustion Chamber: Stainless steel, sealed.

E. Burner: Natural gas, forced draft drawing from gas premixing valve.

F. Blower: Centrifugal fan to operate during each burner firing sequence and to pre purge and post purge the combustion chamber.

1. Motors: Comply with NEMA designation, temperature rating, service factor, and efficiency requirements for motors specified in Section 23 05 13 "Common Motor Requirements for HVAC Equipment."

   a. Motor Sizes: Minimum size as indicated; if not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

G. Gas Train: Combination gas valve with manual shutoff and pressure regulator.

H. Ignition: Silicone carbide hot-surface ignition that includes flame safety supervision and 100 percent main-valve shutoff.

I. Integral Circulator: Cast-iron body and stainless-steel impeller sized for minimum flow required in heat exchanger.

J. Casing:

   1. Jacket: Sheet metal, with snap-in or interlocking closures.
   2. Control Compartment Enclosures: NEMA 250, Type 1A.
   4. Insulation: Minimum 2-inch- thick, mineral-fiber insulation surrounding the heat exchanger.

2.3 TRIM

A. Include devices sized to comply with ASME B31.1.

B. Pressure Controllers: Operating, firing rate, and high limit.

C. Safety Relief Valve:

   2. Description: Fully enclosed steel spring with adjustable pressure range and positive shutoff; factory set and sealed.
D. Pressure Gage: Minimum 3-1/2-inch diameter. Gage shall have normal operating pressure about 50 percent of full range.

E. Drain Valves: Minimum NPS 3/4 or nozzle size with hose-end connection.

2.4 CONTROLS

A. Boiler operating controls shall include the following devices and features:

1. Control transformer.
2. Set-Point Adjust: Set points shall be adjustable.
3. Operating Pressure Control: Factory wired and mounted to cycle burner.
4. Low-Water Cutoff and Pump Control: Cycle feedwater pump(s) for makeup water control.
5. Sequence of Operation: Electric, factory-fabricated and field-installed panel to control burner firing rate to maintain space temperature in response to thermostat with heat anticipator located in heated space.
   a. Include automatic, alternating-firing sequence for multiple boilers to ensure maximum system efficiency throughout the load range and to provide equal runtime for boilers.
6. Sequence of Operation: Electric, factory-fabricated and field-installed panel to control burner firing rate

B. Burner Operating Controls: To maintain safe operating conditions, burner safety controls limit burner operation.

1. High Cutoff: Manual reset stops burner if operating conditions rise above maximum boiler design temperature and Pressure.
2. Low-Water Cutoff Switch: Electronic probe shall prevent burner operation on low water. Cutoff switch shall be manual-reset type.
3. Audible Alarm: Factory mounted on control panel with silence switch; shall sound alarm for above conditions.

C. Building Automation System Interface: (Interface Shall be for Trane “Tracer” Control System) Factory install hardware and software to enable building automation system to monitor, control, and display boiler status and alarms.

1. Hardwired Points:
   b. Control: On/off operation, hot-water-supply temperature set-point adjustment.
2. A communication interface with the Trane “Tracer” building automation system shall enable building automation system operator to remotely control and monitor the boiler from an operator workstation. Control features available, and monitoring points displayed, locally at boiler control panel shall be available through building automation system.

2.5 ELECTRICAL POWER

A. Controllers, Electrical Devices, and Wiring: Electrical devices and connections are specified in electrical Sections.
B. Single-Point Field Power Connection: Factory-installed and -wired switches, motor controllers, transformers, and other electrical devices necessary shall provide a single-point field power connection to boiler.

1. House in NEMA 250, Type 1 enclosure.
2. Wiring shall be numbered and color coded to match wiring diagram.
3. Install factory wiring outside of an enclosure in a metal raceway.
4. Field power interface shall be to fused disconnect switch or circuit breaker.
5. Provide branch power circuit to each motor and to controls with a circuit breaker.
6. Provide each motor with overcurrent protection.

2.6 VENTING KITS

A. Kit: Complete system, ASTM A959, Type 29-4C stainless steel, pipe, vent terminal, thimble, indoor plate, vent adapter, condensate trap and dilution tank, and sealant.

B. Combustion-Air Intake: Complete system, stainless steel, pipe, vent terminal with screen, inlet air coupling, and sealant.

2.7 SOURCE QUALITY CONTROL

A. Burner and Hydrostatic Test: Factory adjust burner to eliminate excess oxygen, carbon dioxide, oxides of nitrogen emissions, and carbon monoxide in flue gas and to achieve combustion efficiency; perform hydrostatic test.

B. Test and inspect factory-assembled boilers, before shipping, according to 2010 ASME Boiler and Pressure Vessel Code.

C. Allow Owner access to source quality-control testing of boilers. Notify Architect 14 days in advance of testing.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine roughing-in for concrete equipment bases, anchor-bolt sizes and locations, and piping and electrical connections to verify actual locations, sizes, and other conditions affecting performance of the Work.

1. Final boiler locations indicated on Drawings are approximate. Determine exact locations before roughing-in for piping and electrical connections.

B. Examine mechanical spaces for suitable conditions where boilers will be installed.

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

3.2 BOILER INSTALLATION

A. Equipment Mounting:
1. Install boilers on cast-in-place concrete equipment base.

B. Install gas-fired boilers according to NFPA 54.

C. Assemble and install boiler trim.

D. Install electrical devices furnished with boiler but not specified to be factory mounted.

E. Install control wiring to field-mounted electrical devices.

3.3 CONNECTIONS

A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to boiler to allow service and maintenance.

C. Install piping from equipment drain connection to nearest floor drain. Piping shall be at least full size of connection. Provide an isolation valve if required.

D. Connect piping to boilers, except safety relief valve connections, with flexible connectors of materials suitable for service. Flexible connectors and their installation are specified in Section 23.21.16 "Hydronic Piping Specialties."

E. Connect gas piping to boiler gas-train inlet with union. Piping shall be at least full size of gas-train connection. Provide a reducer if required.

F. Connect hot-water piping to supply- and return-boiler tappings with shutoff valve and union or flange at each connection.

G. Install piping from safety relief valves to nearest floor drain.

H. Install piping from safety valves to drip-pan elbow and to nearest floor drain.

I. Boiler Venting:
   1. Install flue venting kit and combustion-air intake.
   2. Connect full size to boiler connections.

J. Ground equipment according to Section 26.05.26 "Grounding and Bonding for Electrical Systems."

K. Connect wiring according to Section 26.05.19 "Low-Voltage Electrical Power Conductors and Cables."

3.4 FIELD QUALITY CONTROL

A. Manufacturer’s Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
1. Perform installation and startup checks according to manufacturer's written instructions.
2. Leakage Test: Hydrostatic test. Repair leaks and retest until no leaks exist.
3. Operational Test: Start units to confirm proper motor rotation and unit operation. Adjust air-fuel ratio and combustion.
4. Test and adjust controls and safety systems. Replace damaged and malfunctioning controls and equipment.
   a. Check and adjust initial operating set points and high- and low-limit safety set points of fuel supply, water level, and water temperature.
   b. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

C. Boiler will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

E. 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 Project during other-than-normal occupancy hours for this purpose.

F. Performance Tests:
   1. Engage a factory-authorized service representative to inspect component assemblies and equipment installations, including connections, and to conduct performance testing.
   2. Boilers shall comply with performance requirements indicated, as determined by field performance tests. Adjust, modify, or replace equipment to comply.
   3. Perform field performance tests to determine capacity and efficiency of boilers.
      a. Test for full capacity.
      b. Test for boiler efficiency at low fire 20, 40, 60, 80, 100, 80, 60, 40, and 20 percent of full capacity. Determine efficiency at each test point.
   4. Repeat tests until results comply with requirements indicated.
   5. Provide analysis equipment required to determine performance.
   6. Provide temporary equipment and system modifications necessary to dissipate the heat produced during tests if building systems are inadequate.
   7. Notify Architect 24 hours minimum in advance of test dates.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain boilers. Refer to Section 01 79 00 "Demonstration and Training."

END OF SECTION 23 52 16
SECTION 26 29 13
MAGNETIC MOTOR CONTROLLERS

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. Combination full-voltage magnetic motor controllers.
   2. Enclosures.
   3. Accessories.
   4. Identification.

1.3 DEFINITIONS

A. CPT: Control power transformer.
B. MCCB: Molded-case circuit breaker.
C. MCP: Motor circuit protector.
D. NC: Normally closed.
E. OCPD: Overcurrent protective device.
F. SCCR: Short-circuit current rating.
G. SCPD: Short-circuit protective device.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Shop Drawings: For each type of magnetic controller.
   1. Include plans, elevations, sections, and mounting details.
   2. Indicate dimensions, weights, required clearances, and location and size of each field connection.
3. Wire Termination Diagrams and Schedules: Include diagrams for signal, and control wiring. Identify terminals and wiring designations and color-codes to facilitate installation, operation, and maintenance. Indicate recommended types, wire sizes, and circuiting arrangements for field-installed wiring, and show circuit protection features. Differentiate between manufacturer-installed and field-installed wiring.

4. Include features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

C. Product Schedule: List the following for each enclosed controller:

1. Each installed magnetic controller type.
2. NRTL listing.
3. Factory-installed accessories.
5. SCCR of integrated unit.
6. For each combination magnetic controller include features, characteristics, ratings, and factory setting of the SCPD and OCPD.
   a. Listing document proving Type 2 coordination.
7. For each series-rated combination state the listed integrated short-circuit current (withstand) rating of SCPD and OCPDs by an NRTL acceptable to authorities having jurisdiction.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For magnetic controllers to include in operation and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
   a. Routine maintenance requirements for magnetic controllers and installed components.
   b. Manufacturer's written instructions for testing and adjusting circuit breaker and MCP trip settings.
   c. Manufacturer's written instructions for setting field-adjustable overload relays.
   d. Load-Current and List of Settings of Adjustable Overload Relays: Compile after motors have been installed, and arrange to demonstrate that switch settings for motor-running overload protection suit actual motors to be protected.
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. Fuses for Fused Switches: Equal to 10 percent of quantity installed for each size and type, but no fewer than two of each size and type.
2. Control Power Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than two of each size and type.

1.8 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by NETA.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store controllers indoors in clean, dry space with uniform temperature to prevent condensation. Protect controllers from exposure to dirt, fumes, water, corrosive substances, and physical damage.

B. If stored in areas subject to weather, cover controllers to protect them from weather, dirt, dust, corrosive substances, and physical damage. Remove loose packing and flammable materials from inside controllers; install temporary electric heating, with at least 50 W per controller.

1.10 FIELD CONDITIONS

A. Ambient Environment Ratings: Rate equipment for continuous operation under the following conditions unless otherwise indicated:

1. Ambient Temperature: Not less than 23 deg F and not exceeding 104 deg F.
3. The effect of solar radiation is not significant.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. UL Compliance: Fabricate and label magnetic motor controllers to comply with UL 508 and UL 60947-4-1.

C. NEMA Compliance: Fabricate motor controllers to comply with ICS 2.

1. Component Importance Factor: 1.5.
2.2 COMBINATION FULL-VOLTAGE MAGNETIC MOTOR CONTROLLER

A. Description: Factory-assembled, combination full-voltage magnetic motor controller consisting of the controller described in this article, indicated disconnecting means, SCPD and OCPD, in a single enclosure.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
2. Square D; by Schneider Electric.
3. Eaton.

C. Standard: Comply with NEMA ICS 2, general purpose, Class A.

D. Configuration: Nonreversing.

E. Contactor Coils: Pressure-encapsulated type.

1. Operating Voltage: Manufacturer's standard, unless indicated.

F. Control Power:

1. For on-board control power, obtain from line circuit or from integral CPT. The CPT shall have capacity to operate integral devices and remotely located pilot, indicating, and control devices.
   a. Spare CPT Capacity as Indicated on Drawings: 50 VA.

G. Overload Relays:

1. Solid-State Overload Relay:
   a. Switch or dial selectable for motor-running overload protection.
   b. Sensors in each phase.
   c. Class 10/20 selectable tripping characteristic selected to protect motor against voltage and current unbalance and single phasing.

H. Class II ground-fault protection shall comply with UL 1053 to interrupt low-level ground faults. The ground-fault detection system shall include circuitry that will prevent the motor controller from tripping when the fault current exceeds the interrupting capacity of the controller. Equip with start and run delays to prevent nuisance trip on starting, and a trip indicator.

I. General Requirements for Control Circuit and Pilot Devices: NEMA ICS 5; factory installed in controller enclosure cover unless otherwise indicated.

1. Push Buttons, Pilot Lights, and Selector Switches: Heavy-duty or oil-tight.
   a. Push Buttons: ON, OFF.
   b. Selector Switch: ON-AUTO-OFF.
   c. Pilot Lights: Green pilot light. Lamp shall be LED.

2. Field Changeable two set of N.C./N.O. alarm contact.
J. MCCB Disconnecting Means:
   1. UL 489 and NEMA AB 3, with interrupting capacity to comply with available fault currents; thermal-magnetic MCCB, with inverse-time-current element for low-level overloads and instantaneous magnetic trip element for short circuits.
   2. Front-mounted, adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
   3. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.

2.3 ENCLOSURES
   A. Comply with NEMA 250, type designations as indicated on Drawings, complying with environmental conditions at installed location.
   B. The construction of the enclosures shall comply with NEMA ICS 6.

2.4 IDENTIFICATION
   A. Controller Nameplates: Laminated acrylic or melamine plastic signs, as described in Section 260553 "Identification for Electrical Systems," for each compartment, mounted with corrosion-resistant screws.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. Examine areas and space conditions for compliance with requirements for motor controllers, their relationship with the motors, and other conditions affecting performance of the Work.

3.2 INSTALLATION
   A. Comply with NECA 1.
   B. Wall-Mounted Controllers: Install magnetic controllers on walls with tops at uniform height indicated, and by bolting units to wall or mounting on lightweight structural-steel channels bolted to wall. For controllers not at walls, provide freestanding racks complying with Section 260529 "Hangers and Supports for Electrical Systems" unless otherwise indicated.
   C. Maintain minimum clearances and workspace at equipment according to manufacturer's written instructions and NFPA 70.
   D. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.
   E. Setting of Overload Relays: Select and set overloads on the basis of full-load current rating as shown on motor nameplate. Adjust setting value for special motors as required by NFPA 70 for motors that are high-torque, high-efficiency, and so on.
3.3 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

A. Tests and Inspections:

2. Visual and Mechanical Inspection:
   a. Compare equipment nameplate data with drawings and specifications.
   b. Inspect physical and mechanical condition.
   c. Inspect anchorage, alignment, and grounding.
   d. Verify the unit is clean.
   e. Inspect contactors:
      1) Verify mechanical operation.
      2) Verify contact gap, wipe, alignment, and pressure are according to manufacturer's published data.
   f. Motor-Running Protection:
      1) Verify overload element rating is correct for its application.
      2) If motor-running protection is provided by fuses, verify correct fuse rating.
   g. Inspect bolted electrical connections for high resistance using one of the two following methods:
      1) Use a low-resistance ohmmeter. Compare bolted connection resistance values with values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
      2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method according to manufacturer's published data or NETA ATS Table 100.12. Bolt-torque levels shall be according to manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.
   h. Verify appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.
3. Electrical Tests:
   a. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with switch closed, and across each open pole. Insulation-resistance values shall be according to manufacturer's published data or NETA ATS Table 100.1. In the absence of manufacturer's published data, use Table 100.5. Values of insulation resistance less than those of this table or manufacturer's recommendations shall be investigated and corrected.
   b. Measure fuse resistance. Investigate fuse-resistance values that deviate from each other by more than 15 percent.
c. Test motor protection devices according to manufacturer's published data.
d. Test circuit breakers as follows:
   1) Operate the circuit breaker to ensure smooth operation.
   2) For adjustable circuit breakers, adjust protective device settings according to the coordination study. Comply with coordination study recommendations.

e. Perform operational tests by initiating control devices.

B. Motor controller will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.5 SYSTEM FUNCTION TESTS

A. System function tests shall prove the correct interaction of sensing, processing, and action devices. Perform system function tests after field quality control tests have been completed and all components have passed specified tests.

1. Develop test parameters and perform tests for the purpose of evaluating performance of integral components and their functioning as a complete unit within design requirements and manufacturer's published data.
2. Verify the correct operation of interlock safety devices for fail-safe functions in addition to design function.
3. Verify the correct operation of sensing devices, alarms, and indicating devices.

B. Motor controller will be considered defective if it does not pass the system function tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION 26 29 13
1. Remove door and hardware only; frame to remain.
2. Remove door and frame in its entirety.
3. Remove electrical pole; ref. plan.
4. Remove existing electrical panel.
5. Remove electrical panel in its entirety.
6. Remove flat panel in its entirety.
7. Remove all electrical conduit and wires.
8. Remove all metal framing and blocking.
9. Remove all electrical conduit and electrical boxes.
10. Remove all electrical wiring from ceiling and walls.
11. Remove all electrical wiring from walls and ceilings.
12. Remove all electrical wiring from floors.
13. Remove all electrical wiring from ceilings.
14. Remove all electrical wiring from walls.
15. Remove all electrical wiring from floors.
16. Remove all electrical wiring from ceilings.
17. Remove all electrical wiring from walls.
18. Remove all electrical wiring from floors.
19. Clear all existing wires and conduits in the area.
20. Clear all existing wires and conduits in the area.
GENERAL NOTES - DEMOLITION PLAN

A. SEE GENERAL NOTES ON CUTTING AND PATCHING OUTLINED IN SPECIFICATIONS.
B. PERFORM ALL WORK UNDER ESTABLISHED PROJECT água.
C. IF FIELD CHANGES ARE NEEDED DUE TO VARIOUS CONSIDERATIONS SUCH AS HIDDEN ITEMS OR DIFFERENCES BETWEEN DRAWING AND ACTUAL CONDITIONS, NOTIFY THE CONTRACTOR IMMEDIATELY AND DOCUMENT ANY SUCH GROSS DIFFERENCES.
D. EXTREME CAUTION SHOULD BE USED whenever it is suspected or discovered to contain asbestos or other hazardous materials, stop demolition and notify owner immediately.

PLAN NOTES - DEMOLITION REFLECTED CEILING PLAN

1. METAL PANEL CEILING HAS BEEN PARTIALLY REMOVED BY OWNER. REMOVE RESIDUAL CEILING COMPONENTS.
2. REMOVE LIGHT FIXTURES.
3. REMOVE CEILING IN ITS ENTIRETY.
4. REMOVE HANGING CURTAINS IN THEIR ENTIRETY.
5. REMOVE WOOD VENEER BULKHEAD.
6. NOT USED.
7. REMOVE CEILING IN ITS ENTIRETY.

06/07/2018

1/8" = 1'-0"
GENERAL NOTES - DEMOLITION PLAN

1. REMOVE ALL METAL PANELS AND REFLECTED CEILINGS. REMOVE ALL PENETRATIONS WHERE PIPING AND AIR DUCTS PASS THROUGH CEILINGS. REMOVE LIGHT FIXTURES, CEILING TILES, AND ALL SUSPENDED CEILING MATERIALS.

2. REMOVE ALL WOOD VENEER BULKHEADS. REMOVE ALL SUSPENDED CEILING COMPONENTS. REMOVE ALL LIGHT FIXTURES AND CEILING TILES.

3. REMOVE ALL METAL PANELS FROM THE AREA OF THE CEILING PLAN.

4. REMOVE ALL SUSPENDED CEILING COMPONENTS FROM THE AREA OF THE CEILING PLAN.

5. REMOVE ALL LIGHT FIXTURES FROM THE AREA OF THE CEILING PLAN.

6. REMOVE ALL CEILING PANELS FROM THE AREA OF THE CEILING PLAN.

7. REMOVE ALL SUSPENDED CEILING COMPONENTS FROM THE AREA OF THE CEILING PLAN.

PLAN NOTES - DEMOLITION REFLECTED CEILING PLAN

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2. DEMOLITION CEILING PLAN - AREA C

3. DEMOLITION CEILING PLAN - AREA C

4. DEMOLITION CEILING PLAN - AREA C

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49. DEMOLITION CEILING PLAN - AREA C

50. DEMOLITION CEILING PLAN - AREA C
A. CONTRACTOR TO VISIT SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS PRIOR TO START OF WORK. CONTRACTOR TO FIELD MEASURE ELECTRICAL, AND PLUMBING DRAWINGS FOR REMOVAL WORK THAT MAY REQUIRE ADDITIONAL PATCHING NOT IDENTIFIED ON THIS SHEET.

KEY

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

FLOOR PLAN - AREA B

REVISIONS

1/8" = 1'-0"

A1-2

ARCHITECTURAL FLOOR PLAN - AREA B

BID DOCUMENTS

ARCHITECTURAL

16/20 06/08/18

143

206/22/2018 ADDENDUM 2

ANDERSON INDIANAPOLIS ANN ARBOR

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## Door Schedule

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### Door & Window Abbreviations

- **HM** = Hollow Metal
- **ALUM** = Aluminum
- **SF** = Storefront

### ADA Approach Legend

- **FRONT APPROACHES**
- **HINGE SIDE APPROACHES**

### Typ. Door Location

- **A** = Alum. Sill Detail
- **B** = Alum. Head Detail
- **C** = Alum. Jamb Detail
- **D** = Door as Scheduled

### Frame Type Schedule

- **SF-1**
- **SF-2**
- **SF-3**

---

**Note:**

As indicated
NO WORK IN THIS AREA DURING PH 1 PROJECT
PLAN NOTES:

1. SEE SHEET M3-7 FOR NEW ROOFTOP FOR THIS LOCATION
2. EXISTING SUPPLY AND RETURN AIR DUCTWORK TO REMAIN. REMOVE EXISTING DUCT INSULATION ON SUPPLY AND RETURN AIR PLENUMS. PROVIDE 1'-1/2" FOIL FACED DUCTWRAP ON SUPPLY AND RETURN PLENUM. SEAL ALL JOINTS AIR TIGHT.
3. NEW RTU COOLING ONLY THERMOSTAT.
4. EXISTING SUPPLY AND RETURN DIFFUSERS AND GRILLES TO BE REMOVED WITH CEILING. WIRE-UP FLEX DUCT TO NOT HANG BELOW BLACK STEEL SUPPORTS.

SCALE: 1/8" = 1'-0"
7. CONTROL TRANSFORMER AND INTERFACE CARD FOR TRANE "TRACER" DDC SYSTEM. REQUIRED FOR ALL RTU's.

5. COIL HAIL GUARDS

<table>
<thead>
<tr>
<th>TAG NO.</th>
<th>AREA SERVED</th>
<th>TYPE</th>
<th>FACTORY COLOR TO BE STANDARD &quot;BRIGHT WHITE&quot; ENAMEL.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTU-2</td>
<td>SOUTH 1/2 WEST WING</td>
<td>PACKAGED RTU</td>
<td>4000</td>
</tr>
<tr>
<td>800</td>
<td>114.00</td>
<td>01.52</td>
<td>81.50</td>
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<tr>
<td>68.00</td>
<td>55.00</td>
<td>54.80</td>
<td>410A</td>
</tr>
<tr>
<td>500</td>
<td>16.7</td>
<td>NAT</td>
<td>200.00</td>
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<tr>
<td>162.00</td>
<td></td>
<td></td>
<td>208/3</td>
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<tr>
<td>1 VS-SCROLL</td>
<td>1 PROPELLER</td>
<td>YES</td>
<td>1750.0</td>
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<tr>
<td>95</td>
<td>DISPOSABLE</td>
<td>20X25X2 DEEP</td>
<td>53.00</td>
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<tr>
<td>A NO NOTE</td>
<td>6 &amp; 7 TRANE YZC120F3</td>
<td>SEE NOTES</td>
<td></td>
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</tbody>
</table>

| RTU-4   | EAST SIDE SOUTH WING | PACKAGED RTU | 2000 |
| 480     | 60.00      | 50 .40 | 82.50 |
| 68.50   | 55.00      | 53.00 | 410A  |
| 500     | 9.89       | N/A  | N/A  |
| 1750.0  | 95         | DISPOSABLE | 20X30X2 DEEP |
| 28.00   | 40 A NO NOTE | 6 & 7 TRANE TZC060E3 | SEE NOTES |

BB-1 SEE PLAN 975 16'-0" 1.60 160 3/4" COPPER 4-1/4" ALUM 40 1 5-1/4" 14" 18'-2" 6" SLANT / FIN JA-14 1, 2, 3, 4, 5, 6

BB-3 SEE PLAN 975 5'-0" 0.50 160 3/4" COPPER 4-1/4" ALUM 40 1 5 -1/4" 14" 6'-11" 6" SLANT / FIN JA-14 1, 2, 3, 4, 5, 6

BB-9 SEE PLAN 975 6'-0" 0.75 160 3/4" COPPER 4-1/4" ALUM 40 1 5 -1/4" 14" 8'-3" 6" SLANT / FIN JA-14 1, 2, 3, 4, 5, 6

BB-5 SEE PLAN 975 7'-6" 0.75 160 3/4" COPPER 4-1/4" ALUM 40 1 5 -1/4" 14" 9'-5" 6" SLANT / FIN JA-14 1, 2, 3, 4, 5, 6

BB-7 SEE PLAN 975 8'-10" 1.00 160 3/4" COPPER 4-1/4" ALUM 40 1 5-1/4" 14" 10'-10" 6" SLANT / FIN JA-14 1, 2, 3, 4, 5, 6

BB-4 SEE PLAN 975 8'-6" 1.00 160 3/4" COPPER 4-1/4" ALUM 40 1 5 -1/4" 14" 10'-6" 6" SLANT / FIN JA-14 1, 2, 3, 4, 5, 6

BB-1 SEE PLAN 975 9'-0" 1.00 160 3/4" COPPER 4-1/4" ALUM 40 1 5-1/4" 14" 10'-11" 6" SLANT / FIN JA-14 1, 2, 3, 4, 5, 6

HWP-1 MECHNAICAL ROOM INLINE 40 65' WATER 7.8" 45.0% 1.6 2.0 1760 208 / 1 EC VFD NO

2 PROVIDE CONDENSATE DRAIN NEUTRALIZING KIT

4 AHRI MIN. EFF = 95%

3 CONTROLS TO BE SELF-CONTAINED WITH BMS INTERFACE CARD

HWB-1 MECH ROOM NAT. GAS 6" 399.00 395.00 8 to 1 40 80 100 6 .1 psig 125 # MFGR NO MFGR 208V / 1 AERCO AM 399 310 1, 2, 3 , 4, 5, 6

1. CASTIRON BODY WITH BRONZE IMPELLER AND WEAR-RING.

2. DISCONNECT SWITCH / 120V CONVENIENCE OUTLET

3. FULL ECONOMIZER WITH INTAKE HOOD AND BIRDSCREEN

4. MOUNT UNIT MINIMUM 6" ABOVE THE FINISH FLOOR

5. COIL HAIL GUARDS

6. DISCONNECT SWITCH / 120V CONVENIENCE OUTLET

7. CONTROL TRANSFORMER AND INTERFACE CARD FOR TRANE "TRACER" DDC SYSTEM. REQUIRED FOR ALL RTU's.

8. OUTSIDE AIR QUANTITY REFLECTS 15 CFM/PERSON

9. NO OF FANS

10. ELECTRICAL DATA

11. MFR. MODEL NO.

12. WGT.
GENERAL NOTES:
1. SEE SHEETS E3-5, E3-6 AND E3-2 FOR ADDITIONAL INFORMATION.

PLAN NOTES:
1. EXISTING TO REMAIN. PROTECT DURING CONSTRUCTION.
2. PROVIDE SKELETAL CONDUIT SYSTEM MINIMUM 8' IN LENGTH CONSIDERING THE LENGTHS OF THE CORRIDOR CONSISTING OF 10' - 0" LENGTHS OF 4" EMT CONDUIT WITH 18" TO 24" GAPS BETWEEN LENGTHS OF CONDUIT. SKELETAL CONDUITS ABOVE HARD OR INACCESSIBLE CEILINGS SHALL BE CONTINUOUS. DEBURY CONDUITS AND DO NOT INSTALL BUSHINGS. SKELETAL SYSTEM TO BE LOCATED SUCH THAT IT IS ACCESSIBLE FROM CORRIDOR CEILING AND SHOULD NOT BE MOUNTED ABOVE ANY NEW OR EXISTING EQUIPMENT THAT WILL MAKE IT DIFFICULT TO REACH.
3. COORDINATE LOCATION OF SKELETAL CONDUIT SYSTEM WITH PIPING AND DUCTWORK. EXACT LOCATION OF SKELETAL CONDUIT SYSTEM TO BE APPROVED BY ENGINEER/OWNER BEFORE INSTALLATION.
4. PROVIDE SKELETAL CONDUIT TO REMAIN. PROTECT DURING CONSTRUCTION.
5. PROVIDE WEATHERPROOF AUDIO/VISUAL DEVICE FOR SPRINKLER SYSTEM.
6. PROVIDE FIRE ALARM VISUAL DEVICE ON MEZZANINE. COORDINATE LOCATION IN THE FIELD.
7. RECONNECT HWCP-1 TO EXISTING CIRCUIT FOR PUMP THAT WAS REMOVED. EXTEND CONDUIT AND WIRING AS REQUIRED.
8. PROVIDE 3P-15 AMP CIRCUIT BREAKER IN EXISTING SPACE IN PANEL MDP-2. CIRCUIT BREAKER TO BE OF SAME MANUFACTURER, TYPE, AND INTERRUPTING CAPACITY AS EXISTING CIRCUIT BREAKERS.
9. PROVIDE CONNECTION TO HWP-1. CONNECT TO NEW 3P-15 AMP CIRCUIT BREAKER IN EXISTING PANEL MDP-2 WITH 3/4" 2#12 AND #12 GND.