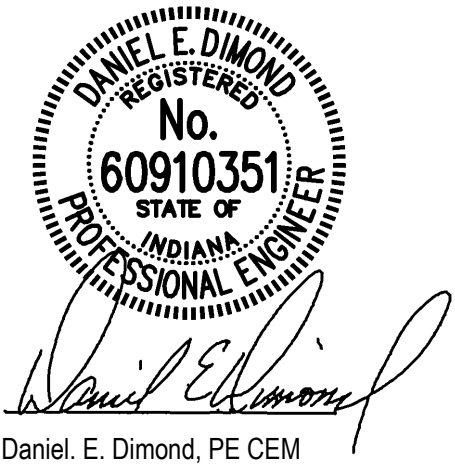
R.E. Dimond and Associates, Inc.
Consulting Engineers

ADDENDUM NO. 3

Hines and Jones Hall Refresh
ISU Bid #B0028696

01/06/2026



Daniel. E. Dimond, PE CEM

This Addendum issued prior to bidding, alters, amends, corrects or clarifies the Proposal Documents to the extent stated herein and does hereby become a part of the Proposal Documents, and will become a part of the Contract Documents of the successful bidder.

GENERAL

A. SPECIFICATIONS

1. Section 00 10 00 – Notice to Bidders
   a. Page 1
      1) Reissue to indicate a changed Bid Date to "2:00pm local time on Wednesday, January 21, 2026".

2. Section 20 00 60 – Common Pipes, Valves, and Fittings for Plumbing and HVAC
   a. General: It is acceptable to use ProPress fittings to install replacement shower valves.

3. Section 20 01 80 – Common Insulation for Plumbing & HVAC
   a. Reissue in its entirety to include steam and shell & tube heat exchanger insulation and other misc. insulation.

4. Section 23 72 01 – Energy Recovery Wheel
   a. Add this section in its entirety.

5. Section 23 82 16 – Air Coils
   a. Add this section in its entirety.

A. DRAWINGS

1. Drawing M301H – Hines Basement – Mechanical
   a. Reissue to remove plan note #2 which indicates replace pump.

2. Drawing M302H – Hines Penthouse – Mechanical
   a. Reissue sheet to include replacement of OAC-A.

3. Drawing M302J – Jones Penthouse - Mechanical
   a. Reissue sheet to include:
      1) OAC-A existing to remain. No work.
      2) Replace ERW as an alternate.

4. Drawing M401 – Schedules & Details – Mechanical
   a. Reissue to add OAC-A and ERW to misc. equipment schedule and delete chilled water pumps.

END OF ADDENDUM

00 10 00
NOTICE TO BIDDERS

Sealed proposals are requested for the 2026 Hines and Jones Refresh BID# B0028696. Proposals will be received for the above contract at the Office of the Procurement Department, Indiana State University, Facilities Management and Procurement Building, 951 Sycamore Walk, Terre Haute, Indiana 47809, until 2:00pm Local Time on Wednesday, January 21, 2026. There will be no in-person Public Bid Opening. The Bids will be opened at 2:15pm on the due date and read aloud via Teams conference call. For conference call access call 812-228-8187 and enter conference ID (652 298 975) followed by #.

Bidding Documents may be downloaded from the ISU Plan Room at http://www.indstateplanroom.com/ on **December 10, 2025,** for $5.50 per person/download which covers all downloads for that particular Project. Bidders must register for a free account the first time they access the website. Bid Documents may be ordered for purchase on CD, for $7.50 per CD, or on paper copy at applicable printing costs from Rapid Reproductions, Inc.,129 South 11th Street, Terre Haute, IN 47807 (812-238-1681 Toll Free 800-736-7084).

Proposals are to be made on the Bid Form published in the Project Manual, based on Form 96 (Revised), as prescribed by the State Board of Accounts. As a mandatory requirement the Proposal shall be accompanied by a certified check; cashier's check or a Bid Bond (AIA A310) for an amount not less than 5% of the total bid price for Base Bid(s) and all add Alternates. See Section 00 10 10 Instructions to Bidders 3.01 for Bid Bond Requirements

Bidder(s) receiving awards shall be required to provide acceptable surety in the form of a Performance and Labor and Materials Payment Bond for the full amount of the award. Include the cost of all bonds and insurance in the Bid amount.

Indiana State University is a Tax Exempt Institution and Indiana Sales Tax for products permanently incorporated in work shall not be included as part of the Bid or on any Application for Payment.

All Bidders must comply with All State and Federal Non-Discrimination laws.

Responsive bidders may not have an active dispute, claim, or litigation with Indiana State University.

Indiana State University reserves the right to accept or reject any Bid and to waive any irregularities in Bidding. Any proposal received after the time fixed herein shall be returned unopened.

No bid may be withdrawn after the opening of Bids without the consent of Indiana State University for a period of One Hundred Twenty (120) days after the time of opening Bids.

There will not be an actual Pre-Bid conference meeting for the Project. A copy of a Pre-Bid Information sheet will be included with the Bidding Documents. Bidders shall review the information sheet and the contained information will become a part of the Bidding Documents.

Pre-Bid site visits have been scheduled at 10:00 A.M. on December 17, 2025, at the Jones Hall, First Level, Terre Haute, Indiana 47809. While masks are not required on the ISU campus or in campus buildings attendees are reminded to practice social distancing whenever possible. *Representatives of each of the Bidders are strongly urged to attend.*

Contract Award shall be to a Single Prime Bidder for all single Base Bid project work or the Contract Award may be to multiple Single Prime Bidders for multiple Base Bid Package project work. The prime Bidder(s) shall be an experienced and qualified Contractor(s) having successfully completed a minimum of three (3) projects of similar size and scope. The Bid form for this Project requires the Bidder to submit evidence of successful installation of similar projects (minimum of three projects), including customer information, scope, dates, Contract dollar amounts. With their Bid the Bidder shall submit their most current audited financial statement and vendor trade credit references as evidence of financial capability to perform the work.

NOTICE TO BIDDERS

All questions relating to this Project shall be addressed to:

_Dan Dimond_____

Phone 317-634-4672_____ E-mail__dan.dimond@redimond.com_____

INDIANA STATE UNIVERSITY BOARD OF TRUSTEES

By: Seth Hinshaw
Senior Vice President for Finance and Administration and University Treasurer
Indiana State University

END OF SECTION 00 10 00

SECTION 200180 – COMMON INSULATION FOR PLUMBING AND HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to this Section.

1.2 SUMMARY

A. This section includes field applied insulation and jacket materials for all systems. These systems include:

1. System Insulation Schedule 1:
   Heating Water Pipe
   Low Pressure Steam Pipe
   Steam Condensate Pipe

2. System Insulation Schedule 1A:
   Medium and High Pressure Steam Pipe

3. System Insulation Schedule 2:
   Chilled Water Pipe

4. System Insulation Schedule 3:
   Coil Condensate Pipe
   Domestic Cold Water Pipe
   Domestic Hot Water Pipe
   Sanitary Waste & Vent

5. System Insulation Schedule 5:
   Shell and Tube Heat Exchanger

6. System Insulation Schedule 8:
   Chilled Water Pumps
   Plate & Frame Heat Exchanger

7. System Insulation Schedule 9:
   Heating and Air Conditioning:
   Supply Air Ductwork

B. Any equipment that is to be factory insulated is specified with respective equipment.

C. All PVC piping installed in a ceiling plenum shall be insulated to provide a flame-spread rating of 25 or less, and smoke-developed rating of 50 or less.

D. Any piece of equipment, pipe, or duct, installed in this contract, which is typically insulated to prevent condensation, shall be insulated unless specifically noted otherwise.

E. Internally lined sheet metal is specified in Metal Ducts, Section 233113.

F. Related sections include all applicable Mechanical Sections.

1.3 SUBMITTALS

A. Submit product data for insulation, jacket materials and fittings used in each system as required in Section 200010, “Shop Drawings”.

B. Product data shall include thermal conductivity, thickness, jacket material, insulation material, sealing compounds, flame-spread and smoke-developed ratings for each type of product to be used.

C. Submit test reports of independent testing agency showing conformance with flame-spread and smoke-developed ratings.

1.4 QUALITY ASSURANCE

A. Insulation Contractor shall have completed a minimum of two (2) projects of similar scope. Upon request, the Insulation Contractor shall provide a list of similar projects and references to the Engineer. The engineer may wish to inspect work previously installed by the Insulation Contractor.

B. Insulation Installed Indoors: Flame-spread rating of 25 or less, and smoke-developed rating of 50 or less.

C. Insulation Installed Outdoors: Flame-spread rating of 75 or less, and smoke-developed rating of 150 or less.

1.5 DELIVERY, STORAGE, AND HANDLING

A. All insulation to be shipped to site in unopened containers as packaged by Insulation Manufacturers.

B. All containers shall state contents within.

C. Store in clean dry area properly protected from weather and physical damage.

D. Open only containers required to be opened as construction progresses.

1.6 COORDINATION

A. Coordinate size and location of supports, hangers and insulation shields.

B. Coordinate hanger sizes and piping penetrations for pipes requiring insulation, wood blocking and saddles with piping installer.

1.7 SCHEDULING

A. Schedule insulation application after pipe testing and heat trace has been installed.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Refer to Insulation Material Schedules in Execution portion of this Section for Insulation types to be used for each system. When more than one is shown, contractor may choose which type is to be installed.

B. Fiberglass Insulation

1. Glass fiber bonded with a thermosetting resin with thermal conductivity of .27 or less @ 75°F. Designed for use to 650°F.

   a. Preformed Pipe Insulation with Jacket: 3 lb/ft^3, ASTM C547, Type 1, Class 1 with factory applied all-purpose, vapor-retarder ASJ jacket, 0.02 perm max water vapor permeance. Designed for use to 850°F max.
   b. Board Insulation: 3 lb/ft^3, ASTM C 612, Type IB, without facing and with FSK jacket manufactured from kraft paper, reinforcing scrim, aluminum foil and vinyl film. Verify jacketing with Engineer prior to insulating exposed ductwork with board insulation within finished spaces. Design for use to 450°F max.
   c. Blanket Insulation: 3/4 lb/ft^3, ASTM C 553, Type II, without facing and with FSK manufactured from kraft paper, reinforcing scrim, aluminum foil, and vinyl film. Designed for use to 250°F max.

2. Fire-Resistant Adhesive: Comply with MIL-A-3316C in the following classes and grades:

   a. Class 1, Grade A for bonding glass cloth and tape to un-faced glass-fiber insulation, for sealing edges of glass-fiber insulation, and for bonding lagging cloth to un-faced glass-fiber insulation.
   b. Class 2, Grade A for bonding glass-fiber insulation to metal surfaces.

3. Vapor-Retarder Mastics: Fire- and water-resistant, vapor-retarder mastic for indoor applications. Comply with MIL-C-19565C, Type II.
4. Mineral-Fiber Insulating Cements: Comply with ASTM C 195.
5. Expanded or Exfoliated Vermiculite Insulating Cements: Comply with ASTM C 196.
6. Mineral-Fiber, hydraulic-setting insulating and finishing cement: Comply with ASTM C 449/C 449M.
7. Manufacturers:

   a. CertainTeed Manson
   b. Knauf Insulation.
   c. Owens-Corning Fiberglas Corp.
   d. Schuller International, Inc.
   e. Johns Manville

C. Foamglass Insulation

1. Inorganic cellular glass insulating material with hermetically sealed cells, non-absorptive and noncombustible. Designed for use from 35ºF to 350ºF.

   a. Preformed Pipe Insulation, without Jacket: Comply with ASTM C 552, Type II, Class I.
   b. Preformed Pipe Insulation, with Jacket: Comply with ASTM C 552, Type II, Class 2.
   c. Block Insulation: ASTM C 552, Type I.

d. Special-Shaped Insulation: ASTM C 552, Type III.
e. Board Insulation: ASTM C 552, Type IV.

2. Manufacturers:

a. Pittsburgh - Corning Corporation

D. Flexible Elastomeric Insulation

1. Closed cellular or expanded rubber material of high insulating efficiency (K of .25 or better @ 75°F) and designed for use with temperatures from -40°F to 210°F. Odorless, self-extinguishing and vapor resistant in compliance with ASTM E-84, 25/50 flame smoke rating. Approved for use in return air plenums.

a. Preformed pipe insulation: ASTM C 534, Type I.
b. Sheet insulation: ASTM C 534, Type II.

2. Adhesive: As recommended by Insulation Material Manufacturer.
3. Ultraviolet – Protective Coating: As recommended by Insulation Manufacturer.
4. Manufacturers:

a. Armacell AP
b. K-Flex
c. Aeroflex

E. Calcium Silicate

1. Rigid hydrous calcium silicate heat insulating block with thermal conductivity of .4 or less @ 300°F. 15 pounds per cubic foot density. Designed for use to 1200°F. ASTM E 84 - 0 Flame Spread; 0 Smoke Developed.

a. Preformed Pipe and Block Insulation: ASTM C 533, Type I.

2. Insulating Cements: ASTM C 195.
3. Manufacturers:

a. Owens-Corning Fiberglas Corp.
b. Pabco
c. Schuller International, Inc.

F. Duct Liner: See Section 233113.

2.2 ADHESIVES

A. Adhesives or mastics used in the application or manufacture of insulating materials shall be fire retardant with UL flame rating not exceeding 25 and smoke developed rating not exceeding 50 (on dry film) when tested in accordance with ASTM E 84. All adhesives specifically designed for respective application as noted by insulation manufacturer.

2.3 JACKETS

A. PVC Jacket

1. High-impact

    a. Fittings – Gloss White, preformed, 30 Mill, PVC jacket designed for use with and provided by same manufacturer of insulation. Fiberglass insert wrapped around fitting and covered by PVC preformed jacket piping insulation system.
    b. Sheet – Gloss White, preformed, pre-cut and curled 20 mil PVC jacket designed for use with and provided by same manufacturer of piping insulation system. Ultraviolet-resistant suitable for outdoor service and temperature range 0 – 150°F. Jacket to be completely sealed with solvent weld for vapor proof barrier where noted in schedule.

B. Foil, Scrim and Kraft-Paper (FSK) Jacket

1. Laminated, glass-fiber-reinforced, flame-retardant kraft paper and aluminum foil. Maximum of .02 perms moisture vapor transmission, ASTM C 921, Type I, Max 25/50 flame smoke rating.

C. All-Service Jacket (ASJ)

1. White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C1136, Type 1.

D. Aluminum Jacket

1. Aluminum roll stock .020" thick, ready for shop or field cutting and forming. ASTM B209, 3003 alloy, H-14 temper.
2. Aluminum Fittings - Preformed - same thickness and finish as jacket.
3. Jacket Bands - Aluminum 3/4" wide.

2.4 ACCESSORIES AND ATTACHMENTS

A. Glass Cloth and Tape

1. Comply with MIL-C-20079H, Type I for cloth and Type II for tape. Woven glass-fiber fabrics, plain weave, pre-sized a minimum of 8 oz./sq. yd. (270 g/sq. m). Tape Width: 4 inches (100 mm).

B. Bands

1. 3/4 inch (19 mm) wide, in one of the following materials compatible with jacket:

    a. Stainless Steel: ASTM A 666, Type 304; 0.020 inch (0.5 mm) thick.
    b. Aluminum: 0.007 inch (0.18 mm) thick.

C. Wire

1. 0.080-inch (2.0 mm), nickel-copper alloy; 0.062-inch (1.6 mm), soft-annealed, stainless steel; or 0.062-inch (1.6 mm), soft-annealed, galvanized steel.

D. Welded-Attached Anchor Pins and Washers

1. Copper-coated steel pin for capacitor-discharge welding and galvanized speed washer. Pin length sufficient for insulation thickness indicated.

a. Welded Pin Holding Capacity: 100 lb (45 kg) for direct pull perpendicular to the attached surface.

E. Adhesive-Attached Anchor Pins and Speed Washers

1. Galvanized steel plate, pin, and washer manufactured for attachment to duct and plenum with adhesive. Pin length sufficient for insulation thickness indicated.

a. Adhesive: Recommended by the anchor pin manufacturer as appropriate for surface temperature of ducts, plenums, and breechings; and to achieve a holding capacity of 100 lb (45 kg) for direct pull perpendicular to the adhered surface.

F. Removable Insulation Jackets for Steam Applications

1. Manufacturers:

a. Thermaxx Jackets. West Haven CT
b. Megawrap. Louisville KY
c. Approved Equal

2. Materials:

a. All insulation materials shall be non-asbestos.
b. Material layers shall be selected based on location profile (Dry, Wet/Damp, Steam Pit/Vault) and operating temperature per sections 1/3(C), 1.3 (D), 1.3€ from the “Jacket Material Selections” table:

3. Jacket Materials per Operating Temperature for Dry Locations:

	100-349°F	*350-424°F*	*425-475°F*
Jacket - Hot Side	Silicone	Silicone	Silicone or EJ
Thread	Kevlar Thread	Kevlar Thread	Kevlar Thread
Insulation Layer 1	1" Tempmat	1" Utilicore	1" Utilicore
Insulation Layer 2	-	0.25" CP or 5mm Pyrogel	0.5" CP or 10mm Pyrogel
Jacket - Cold Side	Silicone	Silicone	Silicone or EJ
Fasteners	Nylon Straps	Nylon Straps	EJ Straps
Seal Flaps	Hybrid 7.0	Hybrid 7.0	Hybrid 7.0

4. Construction:

a. Sewn with lock stitch at a minimum of 4 to 6 stitches per inch. Jackets shall be sewn using specified thread in section 1.3D. The thread must be able to withstand the skin temperatures without degradation.
b. Hog rings, staples and wire are not acceptable methods of closure.
c. No raw cut jacket edges shall be exposed after install.
d. Jackets shall be fastened using a combination of hook and loop (i.e., Velcro), straps, and D-rings depending on application temperature.
e. The insulation shall be designed to minimize the convection current in the space between the hot metal surface and the inner layer of insulation.
f. All jacket pieces which match mating seams must include an extended 2" flap constructed from the exterior fabric (or equivalent) and shall be secured using hook

& loop closure (i.e., Velcro) parallel to the seam or straps and/or D-Rings depending on application temperature.

g. Insulation shall be sewn as an integral part of the jacket to prevent shifting of the insulation. Insulation pins are NOT an allowable method of preventing the insulation from shifting and shall NOT be used.

h. Steam Trap Jackets must be constructed in a box shape for removal and replacement inspection ease.

i. Exterior touch temperature shall not exceed 120°F.

j. Warranty: All materials and labor for five years.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install Insulation for each system as designated in the Insulation Material Schedules on the following pages.

B. When more than one type of insulation system is specified, contractor may choose which type is installed.

C. Reference Products, Part 2 of this Section for specifications and manufacturers of insulation materials designated to be installed in Insulation Material Schedules.

3.1 EXECUTION (Continued)

SYSTEM INSULATION SCHEDULE 1:
HEATING WATER PIPE
LOW PRESSURE STEAM PIPE
STEAM CONDENSATE PIPE

1	Install insulation materials as designated in this schedule for system(s) listed.				
2	LOCATION	INSIDE			
3	INSULATION				
3.1	Pipe	Fiberglass-Preformed with Jacket			
3.2	Fitting	Fiberglass Blanket			
4	INSULATION THICKNESS				
4.1	Pipe Size	≤2"	2 ½ ", 3"	≥4"	≤2"
4.2	Insulation Thickness	1 ½"	1 ½"	2 ½"	1 ½"
5	JACKETS				
5.1	Pipe	Integral to Insulation			
5.2	Fittings	Preformed PVC (See Note 6.3)			
5.3	Vapor-Retardant	No			

6 NOTES

6.1 Steam Valves, PRV’s, traps, and similar devices which require service shall have removable insulation jacket. Refer to product requirements within this specification.

3.1 EXECUTION (Continued)

SYSTEM INSULATION SCHEDULE 1A:
MEDIUM AND HIGH PRESSURE STEAM PIPE

1 Install insulation materials as designated in this schedule for system(s) listed.

2	LOCATION	INSIDE				
3	INSULATION					
3.1	Pipe	Fiberglass-Preformed with Jacket				
3.2	Fitting	Fiberglass Blanket				
4	INSULATION THICKNESS					
4.1	Pipe Size	≤2"	2 ½ ", 3"	≥4"	≤2"	≥4"
4.2	Insulation Thickness	1 ½"	2 ½"	3"	1 ½"	3"
5	JACKETS					
5.1	Pipe	Integral to Insulation				
5.2	Fittings	Preformed PVC (See Note 6.3)				
5.3	Vapor-Retardant	No				
6	NOTES					

6.1 Where pipe insulation is to be painted, install glass cloth jacket. Prior to finish paint, paint with one coat of fire retardant, washable, white liquid plastic coating. Confirm compatibility with finish paint prior to painting.

6.2 Steam Valves, PRV's, traps, and similar devices which require service shall have removable, reusable insulation covers, fabricated with core insulation that are manufactured from fabrics, suitable for high steam temperatures, fiberglass blanket rated to 1000ºF, securement systems consisting of Velcro flap at parting seam, circumferential belts, and rope draw cords at terminal ends. Removable covers as manufactured by Mega-Wrap by MINCO, Louisville KY, or equal.

3.1 EXECUTION (Continued)

SYSTEM INSULATION SCHEDULE 2:
CHILLED WATER PIPE

1 Install insulation materials as designated in this schedule for system listed.

2	LOCATION	INSIDE
3	INSULATION	
3.1	Pipe	Fiberglass-Preformed with Jacket
3.2	Fitting	Fiberglass Blanket
4	INSULATION THICKNESS	
4.1	Pipe Size	All
4.2	Thickness	1"
5	JACKETS	
5.1	Pipe	Integral to Insulation
5.2	Fittings	Preformed PVC
5.3	Vapor-Retardant	Yes

6 NOTES

6.1 All chilled water pump bodies, air separators, miscellaneous chilled water equipment, and terminal unit coil specialties (valves, strainers, coil packs, etc.) to be insulated.

6.2 Where pipe insulation is to be painted, install glass cloth jacket. Prior to finish paint, paint with one coat of fire retardant, washable, white liquid plastic coating. Confirm compatibility with finish paint prior to painting.

3.1 EXECUTION (Continued)

SYSTEM INSULATION SCHEDULE 3:
COIL CONDENSATE PIPE
DOMESTIC COLD WATER PIPE
DOMESTIC HOT WATER PIPE
SANITARY WASTE & VENT

1 Install insulation materials as designated in this schedule for system(s) listed.

2	LOCATION	INSIDE
3	INSULATION	
3.1	Pipe	Fiberglass-Preformed with Jacket
3.2	Fitting	Fiberglass Blanket
4	INSULATION THICKNESS	
4.1	Pipe Size	All
4.2	Thickness	1"
5	JACKETS	
5.1	Pipe	Integral to Insulation
5.2	Fittings	Preformed PVC
5.3	Vapor-Retardant	Yes

6 NOTES

6.1 Application of insulation on sanitary waste pipe shall be as follows:

6.1.1 Piping installed above ground floor.

6.1.2 Serving discharge from cooling coils or electric water coolers.

6.1.3 Piping installed in return air plenum.

6.1.4 Where insulation is required, install along pipe lengths connecting fixture to waste stack/main building drain only.

3.1 EXECUTION (Continued)

SYSTEM INSULATION SCHEDULE 5:
SHELL AND TUBE HEAT EXCHANGER

1 Install insulation materials as designated in this schedule for system(s) listed.

2	LOCATION	INSIDE		INSIDE		
3	INSULATION MATERIAL	Calcium Silicate		9# Rigid Fiberglass		
4	INSULATION THICKNESS					
4.1	Temperature	300°F	500°F	200°F	300°F	500°F
4.2	Thickness	2"	4"	2"	3"	4"
5	JACKETS					
5.1	Type	Glass Cloth		Glass Cloth		
5.2	Vapor-Retardant	No		No		

6 NOTES

6.1 Where pipe insulation is to be painted, install glass cloth jacket. Prior to finish paint, paint with one coat of fire retardant, washable, white liquid plastic coating. Confirm compatibility with finish paint prior to painting.

3.1 EXECUTION (Continued)

SYSTEM INSULATION SCHEDULE 8:
CHILLED WATER PUMPS
PLATE & FRAME HEAT EXCHANGER

1 Install insulation materials as designated in this schedule for system(s) listed.

2	LOCATION	INSIDE
3	INSULATION MATERIAL	Elastomeric
4	INSULATION THICKNESS	3/4"
5	JACKETS	
5.1	Pipe	
5.2	Fittings	
5.3	Vapor-Retardant	Yes

3.1 EXECUTION (Continued)

SYSTEM INSULATION SCHEDULE 9:
HEATING AND AIR CONDITIONING:
SUPPLY AIR DUCTWORK

1 Install insulation materials as designated in this schedule for system.

2	LOCATION	INSIDE	INSIDE	INSIDE
3	INSULATION MATERIAL	Flexible Fiber-glass	Rigid Fi-berglass	Flexible Elastomeric
4	INSULATION THICKNESS	1 1/2"	1 1/2"	3/4"
5	JACKETS	FSK	FSK	FSK
5.1	Vapor-Retardant	Yes	Yes	Yes

6 NOTES

6.1 Use rigid or flexible elastomeric insulation in mechanical rooms. All other areas may be flexible fiberglass.

6.2 Where smaller diameter round ductwork is to be insulated and then painted, utilize pre-formed pipe insulation of required thickness with paper jacketing.

3.2 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.

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

3.3 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.4 GENERAL APPLICATION REQUIREMENTS

A. All insulation that is to be painted shall be covered with glass cloth jacket unless noted otherwise.

B. Apply insulation only after pipes, ducts and equipment have been tested and cleaned.

C. Protect furniture, equipment, ducts, pipes, etc. with tarpaulins. Keep premises clean.

D. Apply insulation materials, accessories and finishes according to the manufacturer's written instructions; with smooth, straight, and even surfaces; and free of voids throughout the entire length.

E. Refer to schedules at the beginning of this Section for insulation materials and thickness, jackets, and fittings required for each system. Unless otherwise indicated, insulation shall be the same type throughout the same service.

F. Use accessories compatible with insulation materials and suitable for the service. Use accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

G. Where insulation is applied on ducts, pipes and equipment which are against columns, walls or other equipment without adequate space for insulation, finish off insulation in workmanlike manner to meet approval of Engineer.

H. Apply multiple layers of insulation with longitudinal and end seams staggered.

I. Seal joints, seams and ends of insulation with vapor-retardant mastic on insulation with a compound recommended by the insulation material manufacturer on systems indicated to receive a vapor retardant.

J. Keep insulation materials dry during application and finishing.

K. Insulation shall be applied by craftsmen who are qualified to install insulation.

L. Apply insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by the insulation material manufacturer.

M. Apply insulation with the least number of joints practical.

N. Apply insulation over fittings and specialties, with continuous thermal and vapor-retardant integrity, on systems noted to have vapor-retardant jacket.

O. Provide removable sections of insulation or insulation boxes at all points where access is required for servicing of equipment on systems not requiring vapor-retardant jacket.

P. Exposed is defined to mean visible from working zones of finished building. Concealed signifies opposite. Pipes and ducts above ceilings and in crawl tunnels are considered to be concealed. Finished rooms are defined as office, workrooms, instruction, storeroom areas, equipment rooms, walking tunnels, etc.

Q. Aluminum jackets shall be installed in high traffic areas subject to damage.

R. On systems not requiring vapor-retardant, neatly bevel insulation at all flanges, access cover plates, etc. so that bolts may be removed without disturbing insulation.

S. All hangers used on lines requiring insulation and vapor barrier shall have hangers oversized and insulation cradles to allow insulation to pass thru hanger.

T. Cut insulation according to manufacturer's written instructions to prevent compressing insulation to less than 75 percent of its nominal thickness.

U. Whenever Insulation Jacket is noted as Vapor Retardant: Overlap insulation facing at seams a minimum of one inch and secure with pressure-sensitive tape or adhesive as recommended by Manufacturer.

V. Roof Penetrations: Apply insulation for interior applications to a point even with top of roof flashing.

W. Seal penetrations with vapor-retardant mastic.

X. Apply insulation for exterior applications tightly joined to interior insulation ends.

Y. Seal insulation to roof flashing with vapor-retardant mastic.

Z. Interior Wall and Partition Penetrations: Apply insulation continuously through walls and partitions.

AA. Insulation Terminations: For insulation application where vapor retardants are indicated, taper insulation ends. Seal tapered ends with a compound recommended by the insulation material manufacturer to maintain vapor retardant.

BB. Do not insulate over equipment name plate data.

CC. Seal all punctures in vapor retardant jacket with vapor-barrier adhesive on cooling piping and air conditioning ducts.

DD. Apply adhesives and mastics at the manufacturer's recommended coverage rate.

EE. Do not weld brackets, clips, or other attachment devices to item being insulated unless specifically noted to do so.

3.5 DUCTWORK AND EQUIPMENT INSULATION

A. Blanket Insulation Application

1. Apply insulation with integral jackets as follows:

a. Pull jacket tight and smooth.

b. Install anchor pins and speed washers to keep insulation from sagging when duct width exceeds 22”.
c. Joints and Seams: Cover with tape and vapor retardant as recommended by insulation material manufacturer to maintain vapor seal.
d. Vapor-Retardant Mastics: Where vapor retardants are indicated, apply mastic on seams and joints and at ends adjacent to duct flanges and fittings.

2. Fire-Rated Wall and Partition Penetrations: Terminate insulation at fire-rated wall and partition penetrations. Maintain vapor-retardant barrier.
3. Floor Penetrations: Terminate insulation at underside of floor assembly and at floor support at top of floor. Provide vapor-retardant mastic on insulation indicated to receive vapor-retardant.

B. Board and Block Insulation Application

1. Blankets, Board, and Block Applications: Secure insulation with adhesive and anchor pins with speed washers.

a. Apply adhesives according to manufacturer’s recommended coverage rates per square foot, for 100 percent coverage of surfaces to be insulated.
b. Groove and score insulation materials to fit as closely as possible to the surfaces, including contours. Bevel insulation edges for cylindrical surfaces for tight joint. Stagger end joints.
c. Protect exposed corners with secured corner angles.
d. Install adhesive-attached or self-adhesive anchor pins and speed washers on sides and bottoms of surfaces to be insulated as follows:

1) Do not weld anchor pins to ASME-labeled pressure vessels.
2) 3 inches (75 mm) maximum from insulation end joints, and 16 inches (400 mm) o.c. in both directions.
3) Do not over-compress insulation during installation.
4) Cut and miter insulation segments to fit curved sided and dome heads of tanks and vessels.

2. Impale insulation over anchor pins and attach speed washers.
3. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
4. Secure each layer of insulation with stainless-steel bands.
5. Stagger joints between insulation layers at least 3 inches (75 mm).
6. Apply insulation in removable segments on access doors and other elements that require removal for service.
7. Bevel and seal insulation ends around access panels, manholes, hand holes, ASME stamps, and nameplates.
8. Apply vapor-retardant mastic to open joints, breaks, and punctures for insulation indicated to receive vapor retardant.

C. Flexible Elastomeric Thermal Insulation Applications:

1. Apply insulation over entire surface to be insulated according to the manufacturer’s written instructions.
2. Apply 100 percent coverage of adhesive to surface with manufacturer’s recommended adhesive.
3. Seal longitudinal seams and end joints for Vapor Retardant installation.

3.6 FIELD-APPLIED JACKET APPLICATION

A. Apply glass-cloth jacket, where indicated, directly over bare insulation or insulation with factory-applied jackets.

1. Apply jacket smooth and tight to surface with 2-inch (50-mm) overlap at seams and joints.
2. Embed glass cloth between two 0.062-inch- (1.6-mm-) thick coats of jacket manufacturer's recommended adhesive.
3. Completely encapsulate insulation with jacket, leaving no exposed raw insulation.

3.7 PIPING APPLICATION REQUIREMENTS

A. Apply insulation with integral jackets as follows:

1. Pull jacket tight and smooth.
2. Circumferential Joints: Cover with 3-inch- (75-mm-) wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip and spaced 4 inches (100mm) o.c.
3. Longitudinal Seams: Overlap jacket seams at least 1-1/2 inches (40 mm). Apply insulation with longitudinal seams at bottom pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches (100 mm) o.c.

    a. Exception: Do not staple longitudinal laps on insulation having a vapor retardant.

4. Vapor-Retardant Mastics: Where vapor retardants are indicated, apply mastic on seams and joints and at ends adjacent to flanges, unions, valves, and fittings.
5. At penetrations in jackets for thermometers and pressure gages, fill and seal voids with vapor-retardant mastic.

B. Apply insulation to fittings and elbows as follows:

1. Apply pre-molded insulation sections of the same material as straight segments of pipe insulation where scheduled. Secure according to manufacturer's written instructions.
2. Apply mitered sections of pipe insulation, or glass-fiber blanket insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire, tape, or bands.
3. Apply jacket material overlapping seams at least 1 inch (25 mm) at each end. Secure with manufacturer's recommended adhesive, attachments and accessories. Seal seams with tape. Use vapor-retardant mastic on insulation indicated to receive vapor-retardant.

C. Apply insulation to valves and specialties as follows:

1. Apply pre-molded insulation sections of the same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
2. When pre-molded insulation sections are not available, apply glass-fiber blanket insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation. For strainers, arrange insulation for access to strainer basket without disturbing insulation.
3. Use preformed standard PVC fitting covers for valve sizes where available. Secure fitting covers with manufacturer's attachments and accessories. Seal seams with tape. Also, seal seams with vapor-retardant mastic on insulation indicated to receive vapor-retardant.
4. On piping 3" and smaller, not requiring vapor-retardant, fittings may be insulated with insulating cement equal in thickness to adjoining pipe insulation and troweled to smooth even finish. Do not insulate heating water pipe valves or unions.
5. For larger sizes where PVC fitting covers are not available, seal insulation with canvas jacket and sealing compound recommended by the insulation material manufacturer.

6. For steam and steam condensate piping, install removable, reusable insulation covers. Secure according to manufacturer's written instructions.

D. Floor Penetrations: Apply insulation continuously through floor assembly. Seal insulation with vapor-retardant mastic where floor supports penetrate vapor-retardant.

E. Exterior Wall Penetrations: For penetrations of below-grade exterior walls, terminate insulation flush with mechanical sleeve seal. Seal terminations with vapor-retardant mastic.

F. Hangers and Anchors: All hangers used on lines requiring insulation shall have hangers oversized and insulation support shield to allow insulation to pass continuously thru hanger.

1. Install insert materials on all piping 1 1/2" and larger. Apply insulation to tightly joint the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by the insulation material manufacturer.
2. Fabricate inserts of heavy density insulating material suitable for temperature. Insulation inserts shall not be less than the following lengths:

1 1/2" to 2 1/2" pipe size	10" long
3" to 6" pipe size	12" long
8" to 10" pipe size	16" long
12" and over	22" long

3. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect the jacket from tear or puncture by the hanger, support, and shield.

G. Apply insulation to flanges as follows:

1. Apply preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation segment the same as overall width of the flange and bolts, plus twice the thickness of the pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
4. Apply jacket material with manufacturer's recommended adhesive, overlapping seams at least 2 inch (50 mm), and seal joints with vapor-retardant mastic.

END OF SECTION 200180

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Replacement Energy Recovery Wheel (ERW):

a. Wheel with Frame and Rotation Motor

1.2 TRANSPORT

A. All units to be shrink wrapped for shipping and have a method of humidify control installed at the factory (desiccant bags, electric heater, etc.) and removed after installation.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1. Unit dimensions and weight.
2. Frame material, metal thickness, finishes, insulation, and accessories.
3. Heat Transfer Media:

B. Shop Drawings: For energy recovery wheel. Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Wiring Diagrams: For power, signal, and control wiring.

C. Delegated-Design Submittal: For air-to-air energy recovery equipment indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Detail fabrication and assembly of energy recovery wheel.

D. Operation and maintenance data.

1.4 QUALITY ASSURANCE

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. ARI Compliance: Capacity ratings for air-to-air energy recovery equipment shall comply with ARI 1060, "Rating Air-to-Air Energy Recovery Equipment."

C. ASHRAE Compliance: Capacity ratings for air-to-air energy recovery equipment shall comply with ASHRAE 84, "Method of Testing Air-to-Air Heat Exchangers."

D. UL Compliance: Packaged heat recovery ventilators shall comply with requirements in UL 1812, "Ducted Heat Recovery Ventilators"; or UL 1815, "Nonducted Heat Recovery Ventilators."

1.5 WARRANTY

A. See Equipment Warranty and Early Equipment Startup, Common Work Results for Fire Suppression, Plumbing and HVAC, Section 200010.

PART 2 - PRODUCTS

2.1 ENERGY RECOVERY WHEEL

A. Manufacturers

1. Airxchange (Split wheel – Model ERC-99)
2. Greenheck
3. SEMCO Incorporated.
4. Systemair Topvex

B. Energy Wheel

1. The rotor media shall be made of aluminum, which is coated to prohibit corrosion. All surfaces shall be coated with a non-migrating adsorbent specifically developed for the selective transfer of water vapor. The desiccant shall utilize a 3A molecular sieve certified by the manufacturer to have an internal pore diameter distribution which limits adsorption to materials not larger than the critical diameter of a water molecule (2.8 angstroms). In addition, the face of the media shall be coated with an acid resistant coating to provide maximum protection against face oxidation. Equal sensible and latent recovery efficiencies shall be clearly documented through a certification program conducted in accordance with ASHRAE 84 and ARI 1060 standards. The media shall be cleanable with lower temperature steam, hot water or light detergent, without degrading the latent recovery. Dry particles up to 600 microns shall freely pass through the media. Wheel media shall be independently tested and shown to conform to the requirements of NFPA-90A, documenting a flame spread of less than 25 and a smoke generation rating of less than 50.
2. Manufacturers using wheels with a rotor based on non-aluminum materials (i.e., paper, plastic or Mylar) that require periodic replacement, shall provide the owner with a spare wheel or equivalent wheel segments for future use and storage.
3. Cross-Contamination: The cross-contamination characteristics of the selected desiccant shall also be certified by an independent third party of good repute. If said certification is not available, the outside air requirement for each specified unit shall be multiplied by a factor given in the table below for each desiccant. It shall be the contractor's responsibility to resize the duct work/air conditioning equipment and take responsibility for proper system operation at the higher OA CFM if a desiccant other than 3A is used. This factor has been determined by the research performed at the Georgia Institute of Technology.

		With Purge	
Desiccant	3A*	4A*	Silica Gel
Ventilation Factor	1.00	1.16	1.40

		Without Purge	
Desiccant	3A*	4A*	Silica Gel
Ventilation Factor	1.03	1.20	1.46

3A* = 3 Angstrom Molecular Sieve
4A* = 4 Angstrom Molecular Sieve

Note: Any desiccant not listed above requires manufacturer to contact the engineer for the correct Ventilation Factor.

C. Rotor Cassette

1. The rotor cassette shall be a metal framework, which limits the deflection of the rotor due to air pressure. The cassette shall be made of painted steel to prevent corrosion. The rotor cassette shall be easily removable from the Energy Recovery Unit to facilitate rigging (if necessary) and ease of service. The wheel cassette design shall use pillow block bearings for long life. A non-adjustable purge sector shall be included in the cassette. Belt shall be replaceable without wheel removal.

D. Rotation Detector

1. Unit shall be equipped with a rotation sensor and controller such that should the energy recovery wheel not rotate during a signaled run period, the controller shall send a 24 volt AC signal suitable for operating a relay to be used as an alarm contact. The controller shall not initiate an alarm during a stop/jog function. In addition, this controller shall be equipped with an outdoor air temperature sensor such that the energy recovery wheel can be stopped during moderate temperature periods. The controller shall perform a stop/jog function for the wheel long enough to promote the self-cleaning features of the wheel but not long enough to induce energy recovery. This same temperature controller shall allow the energy recovery wheel to be operated in stop/jog mode during very low temperature periods to prevent freezing of the wheel while still delivering outdoor air through the unit.

E. Electrical

1. Units shall have a single point power connection for wheel rotation motor.

F. Wheel Warranty

1. Manufacturer shall warrant to the buyer for a period of 60 months that the wheel contained in the energy recovery unit in all material respects to be free from defects in material and workmanship when used in a proper and normal manner. For warranty purposes the wheel includes, media, desiccant coating, wheel hub, wheel rim and spokes.

G. Verification of Fit

1. Manufacturer shall verify fit of energy recovery unit and confirm fit prior to bidding. Fit is the responsibility of the manufacturer if size is other that what is shown on drawings. If unit is of different configuration than designed, then all engineering cost of redesign shall be born by ERV manufacturer. Engineer will have final say on fit after unit is installed.

H. Extra Materials

1. One extra belt for wheel.

I. Controls

1. Reconnect existing by Control Contractor.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install energy recovery wheel so supply and exhaust airstreams flow in opposite directions and rotation is away from exhaust side to purge section to supply side – same as existing ERW.

B. Note: This is a replacement of existing energy recovery wheel. Field verify all conditions prior to pricing.

3.2 CONNECTIONS

A. Comply with requirements for ductwork specified in Division 23 Section "Metal Ducts."

END OF SECTION 23 72 01

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes air coils.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each air coil. Include rated capacity and pressure drop for each air coil.

B. Shop Drawings: Diagram power, signal, and control wiring.

C. Field quality-control test reports.

D. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 2 - PRODUCTS

2.1 COIL - INTEGRAL FACE AND BYPASS (IFB)

A. Capacity, heating medium, mounting and discharge arrangement all as shown on Drawings.

B. Heating Element: .035 wall copper tube, in vertical or horizontal arrangement, flat aluminum fins at maximum 10 fins per inch. Each tube free to expand and contract without damaging header connection or adjacent tubes. Fins securely fastened to tubes and fins to have integral collars fitting snugly to tube.

C. Supply and return headers constructed of steel with tubes silver brazed to header.

D. Face and Bypass Damper Control:

1. Dampers factory furnished and mounted by manufacturer. Damper actuators by others.

E. Integral Face Bypass Damper

1. Shall maintain $\pm$2°F discharge air temperature over entire face of coil area 2' down stream of coil.
2. Designed to operate on full steam pressure on coil over entire heating range. They shall completely isolate coil from air flow when not calling for heat.

3. Air flow across coil shall not change more than ±5% when supplied at constant static pressure over operating range of face and bypass dampers.
4. Dampers shall be a minimum of 16-gauge construction.

F. Unit casing shall be 14 gauge minimum. All components shall be galvanized steel.

G. Manufacturers:

1. Control Air, Inc.
2. Isomix
3. Wing

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install coils level and plumb.

B. Install coils in metal ducts and casings constructed according to SMACNA's "HVAC Duct Construction Standards, Metal and Flexible."

C. Straighten bent fins on air coils.

D. Clean coils using materials and methods recommended in writing by manufacturers, and clean inside of casings and enclosures to remove dust and debris.

E. Pipe coils as detailed on drawings.

F. Install piping adjacent to coils to allow service and maintenance.

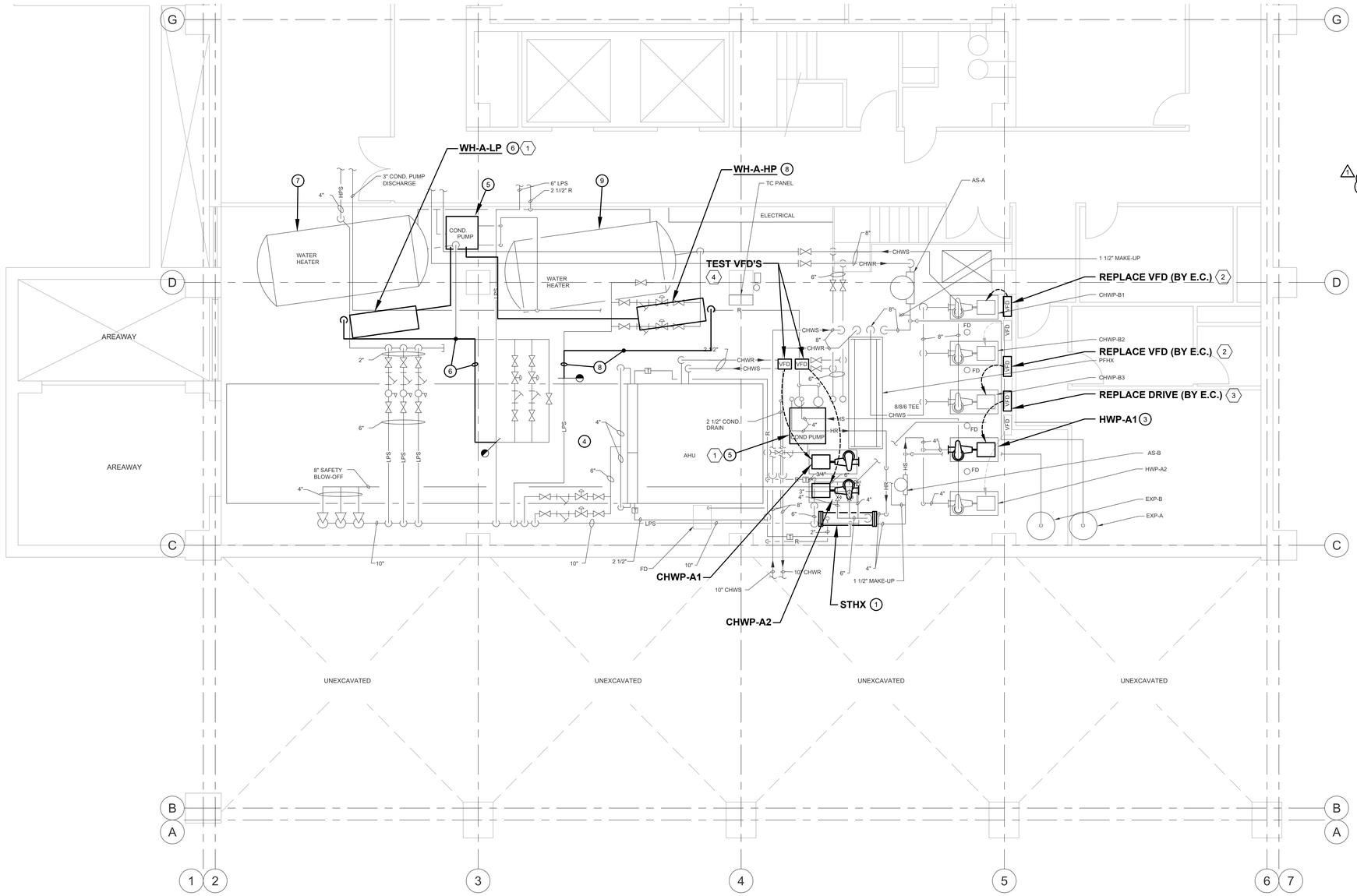
G. Connect water piping with unions and shutoff valves to allow coils to be disconnected without draining piping. Control valves are specified in Division 23 Section “Instrumentation and Control for HVAC”.

3.2 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

END OF SECTION 23 82 16



RENOVATION LEGEND:

WORK TO BE INSTALLED

WORK TO REMAIN

GENERAL NOTES

1. TYPICAL DUAL DUCT AIR HANDLING UNIT AND MAKE-UP AIR UNIT WORK DESCRIPTION.

   THERE ARE TWO (2) DUAL DUCT AIR HANDLING UNITS. ONE IS IN HINES HALL BASEMENT, (M301H), AND ONE IS IN JONES HALL BASEMENT, (M301J). THERE ARE TWO (2) 100% OUTSIDE AIR MAKE-UP AIR UNITS. ONE IS IN HINES HALL PENTHOUSE, M302H), AND THE OTHER IS IN JONES HALL PENTHOUSE (M302J).

   TYPICAL WORK FOR THESE AIR HANDLING UNITS TO INCLUDE THE FOLLOWING:

   - CLEAN OUTSIDE AIR INTAKE LOUVERS AND PLENUM.
   - VACUUM OUT ALL DEBRIS FROM INSIDE AIR HANDLING UNIT.
   - INSTALL / REPLACE ALL PRE-FILTERS AND FINAL FILTERS. FILTERS WILL BE PROVIDED BY OWNER.
   - GREASE UNITS.
   - CHEMICALLY CLEAN COILS AND COMB OUT FINS.
   - REPLACE SEALS ON ALL ACCESS DOORS.
2. ANY ADDITIONAL WORK IN THIS MECHANICAL ROOM IS DENOTED BY PLAN NOTES.
3. REFER TO SPEC SECTIONS 01 23 00 ALTERNATES AND 01 23 70 UNIT PRICES FOR DESCRIPTION OF ADDITIONAL WORK.
4. SEE ALSO PM001.

PLAN NOTES - MECHANICAL

1. REPLACE SHELL & TUBE HEAT EXCHANGER - SEE A/M401
2. NOT USED.
3. TEST PUMP, CONFIRM OPERATION.
4. REPLACE SUPPLY FAN DRIVE BELTS. CHECK FAN BEARINGS.
5. CHECK CONDENSATE PUMP FOR PROPER OPERATION: IF REQUIRED, REPLACE CONDENSATE PUMP. SEE 01 23 60 UNIT PRICES FOR DESCRIPTION OF WORK.
6. **ALTERNATE**
   CONNECT TO EXISTING 6" LPS AND PIPE TO WH-A-LP. INSTALL TRAP AT BOTTOM OF 6". RUN 2 1/2" CONDENSATE FROM WH-A-LP TO CONDENSATE PUMP.
7. **ALTERNATE**
   REMOVE EXISTING LP WATER HEATER TANK.
8. **ALTERNATE**
   CONNECT TO EXISTING 6" LPS AND PIPE TO WH-A-HP. INSTALL TRAP AT BOTTOM OF 6". RUN 2 1/2" CONDENSATE FROM WH-A-HP TO CONDENSATE PUMP.
9. **ALTERNATE**
   REMOVE EXISTING HP WATER HEATER TANK.

PLAN NOTES - ELECTRICAL

1. DISCONNECT AND RECONNECT ELECTRICAL AS REQUIRED.
2. REPLACE VFD FOR 30 HP, 208V, 3Ø PUMP (VERIFY). DISCONNECT AND RECONNECT FEEDER WIRING. REWORK AS REQUIRED. REPLACE WIRING FROM VFD TO PUMP WITH VFD-RATED CABLES IN CONDUIT, 3#1, 1#6G, 1-1/2"C.
3. REPLACE VFD FOR 10 HP, 208V, 3Ø PUMP (VERIFY). DISCONNECT AND RECONNECT FEEDER WIRING. REWORK AS REQUIRED. REPLACE WIRING FROM VFD TO PUMP WITH VFD-RATED CABLES IN CONDUIT, 3#6, 1#10G, 1"C.
4. VERIFY VFD OPERATION. DOCUMENT ANY DEFICIENCIES.

HINES BASEMENT - MECHANICAL

SCALE: 1/4" = 1'-0"

NORTH

0 1 2 3 4 8 12 16

1 2 3 4

D&A #25104

R.E. Dimond and Associates, Inc.

Consulting Engineers

732 North Capitol Avenue
Indianapolis, IN 46204
Phone: (317) 634-4672
Fax: (317) 638-8725

CERTIFIED BY:

DANIEL E. DIMOND REGISTERED No. PE60910351 STATE OF INDIANA PROFESSIONAL ENGINEER

12/10/25

REVISIONS:

NO.	DESCRIPTION	DATE
1	ADDENDUM NO. 3	1/6/2026

PROJECT DESCRIPTION:

INDIANA STATE UNIVERSITY
2026 HINES AND JONES HALL REFRESH
ISU BID #B0028696
TERRE HAUTE, INDIANA

KEYPLAN

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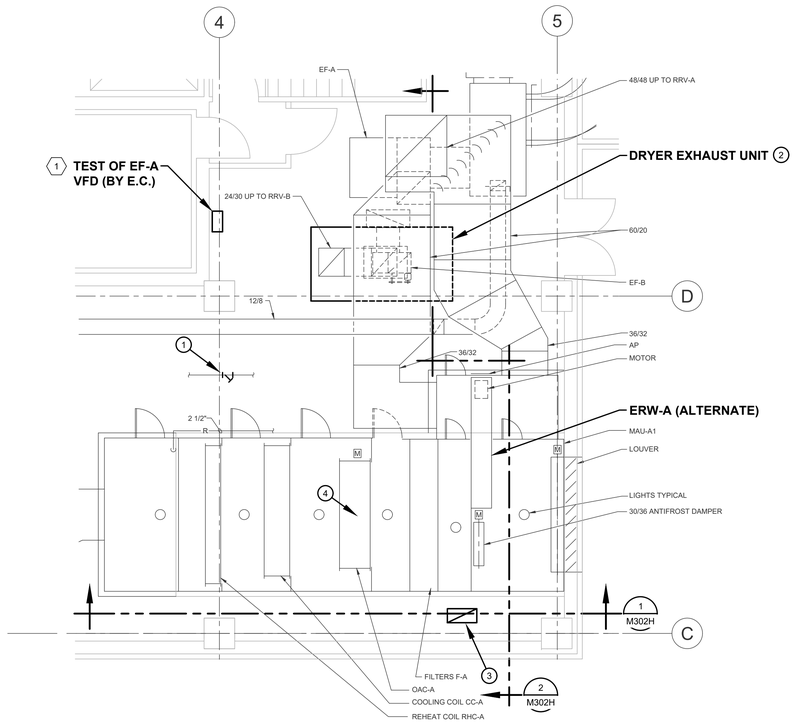
DRAWN BY: DED	DESIGNED BY: DED
SCALE: REFER TO DRAWING	CHECKED BY: DED
DATE: 12/10/25	JOB NO.: D&#25104

SHEET DESCRIPTION:

HINES BASEMENT - MECHANICAL

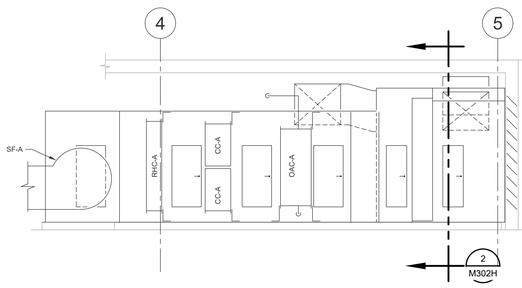
SHEET NUMBER:

M301H



PLAN VIEW

SCALE: 1/4" = 1'-0"



SECTION - 1

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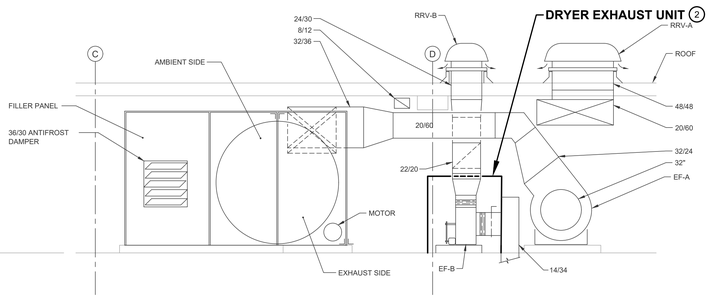

SECTION - 2

SCALE: 1/4" = 1'-0"

HINES PENTHOUSE - MECHANICAL

SCALE: 1/4" = 1'-0"

NORTH

0 1 2 3 4 8 12 16

1 2 3 4

RENOVATION LEGEND:

WORK TO BE INSTALLED

WORK TO REMAIN

GENERAL NOTES

1. SEE M301H FOR ADDITIONAL MAU (MAKE-UP AIR HANDLER) WORK WHICH IS TYPICAL FOR ALL FOUR (4) AIR HANDLING UNITS.
2. ALL ADDITIONAL WORK ON THIS DRAWING IS DENOTED BY PLAN NOTES.
3. REFER TO SPEC SECTIONS O1 23 00 ALTERNATES AND 01 23 70 UNIT PRICES FOR DESCRIPTION OF ADDITIONAL WORK.
4. SEE ALSO PM001.

PLAN NOTES

1. REPAIR 4" FLANGED GASKET ON STEAM STRAINER THAT IS LEAKING IN THIS AREA. THIS TRAINER IS IN PIPE SERVING STEAM TO OAC-A.
2. REPLACE FAN BELT ON DRYER EXHAUST UNIT. REPLACE ROLL FILTER. FILTER PROVIDED BY OWNER. VERIFY OPERATION OF DPT, FILTER ADVANCE AND EXHAUST FAN. CLEAN UNIT OF ALL LINT INCLUDING DUCT TO UNIT.
3. DRYER EXHAUST DUCT ACCESS FOR CLEANING VERTICAL DOWN DUCT IS AVAILABLE IN THIS AREA. CLEAN DRYER EXHAUST DUCT COMPLETE.
4. REPLACE INTEGRAL FACE AND BYPASS STEAM COIL. RE-USE ALL EXISTING TRIM INCLUDING CONTROL VALVES AND CONDENSATE TRAP.

PLAN NOTES - ELECTRICAL

1. VERIFY VFD OPERATION. DOCUMENT ANY DEFICIENCIES.

D&A #25104

R.E. Dimond and Associates, Inc.

Consulting Engineers

732 North Capitol Avenue
Indianapolis, IN 46204
Phone: (317) 634-4672
Fax: (317) 638-8725

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2026 HINES AND JONES HALL REFRESH
ISU BID #B0028696
TERRE HAUTE, INDIANA

PROJECT DESCRIPTION:

KEYPLAN

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DRAWN BY: DED	DESIGNED BY: DED
SCALE: REFER TO DRAWING	CHECKED BY: DED
DATE: 12/10/25	JOB NO.: DA#25104

SHEET DESCRIPTION:

HINES PENTHOUSE - MECHANICAL

SHEET NUMBER:

M302H

RENOVATION LEGEND:

- WORK TO BE INSTALLED
- WORK TO REMAIN

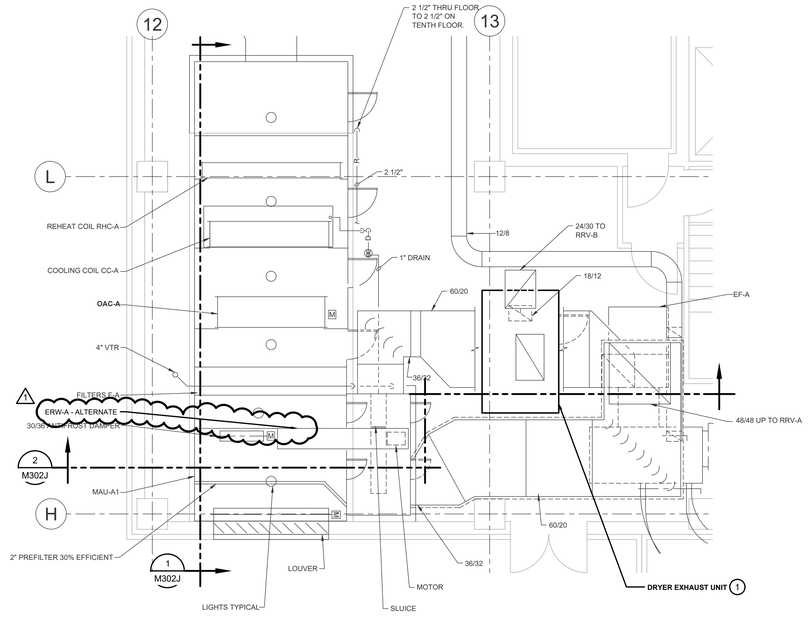
GENERAL NOTES

1. SEE M301J FOR ADDITIONAL MAU (MAKE-UP AIR HANDLER) WORK WHICH IS TYPICAL FOR ALL FOUR (4) AIR HANDLING UNITS.
2. ALL ADDITIONAL WORK ON THIS DRAWING IS DENOTED BY PLAN NOTES.
3. REFER TO SPEC SECTIONS O1 23 00 ALTERNATES AND 01 23 70 UNIT PRICES FOR DESCRIPTION OF ADDITIONAL WORK.
4. SEE ALSO PM001.

PLAN NOTES

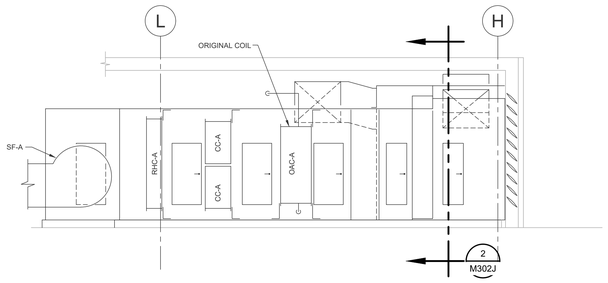
(1) REPLACE FAN BELT ON DRYER EXHAUST UNIT. REPLACE ROLL FILTER. FILTER PROVIDED BY OWNER. VERIFY OPERATION OF DPT, FILTER ADVANCE AND EXHAUST FAN. CLEAN UNIT OF ALL LINT INCLUDING DUST TO UNIT.

(1) (2) NOT USED.



PLAN VIEW

SCALE: 1/4" = 1'-0"



SECTION - 1

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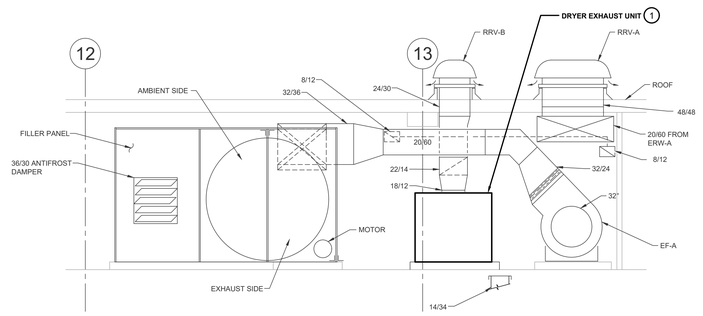

SECTION - 2

SCALE: 1/4" = 1'-0"

JONES PENTHOUSE - MECHANICAL

SCALE: 1/4" = 1'-0"

NORTH

0 1 2 3 4 8 12 16

1 2 3 4

D&A #25104

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DRAWN BY: DED	DESIGNED BY: DED
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DATE: 12/10/25	JOB NO.: DA#25104

SHEET DESCRIPTION:

JONES PENTHOUSE - MECHANICAL

SHEET NUMBER:

M302J

FAN COIL SCHEDULE

MARK NO.	DRAWING NAME &/OR PURPOSE	SPEC. NAME	MFGR. & MODEL NUMBER	FAN LOW CFM / ESP / AMPS	FAN MED CFM / ESP / AMPS	FAN HIGH CFM / ESP / AMPS	VOLTAGE	HP	COOLING COIL MIN. BTU	EAT DB WB	LAT DB WB	CHILLED WATER EWT	CHILLED WATER LWT	WATER FLOW (GPM)	MIN. ROWS DEEP	MAX. FPI	MAX. FACE VELOCITY	MAX. APD	MAX. WPD	HEATING COIL MIN. BTU	EAT	LAT	HEATING WATER EWT	HEATING WATER LWT	WATER FLOW (GPM)	MIN. ROWS	MAX. FPI	MAX. FACE VELOCITY	MAX. APD (IN.)	MAX. WPD (F+)	REMARKS
FC-A	TYPICAL ROOM	FAN COIL	INTERNATIONAL CPY-04	270 .07" .57	460 .22" 1.07	560 .3" 1.69	120	1/12	6885 @ 260 CFM	75 60	54.5 53	46.0	56.0	1.4	3	144	300	.2"	10'	10,500 @ 260 CFM	70	110	180	149	.7	1	144	-	.05	10'	UNIT WIRED TO RUN ON LOW AND MEDIUM SPEED ONLY. CONTROLS BY T.C. HIGH PERFORMANCE COOLING COIL.
FC-B	TYPICAL FLOOR LOBBY	FAN COIL	INTERNATIONAL CPY-10	400 .07" -	650 .22" -	850 .3" -	120	2@ 1/12	19,200	76 63	54.5 53	46.0	56.0	4.2	3	144	300	.2"	10'	15,000	-	-	180	149	1.0	1	-	-	.05	10'	3 SPEED SELECTOR SWITCH MOUNTED ON UNIT FOR MANUAL SPEED SELECTION. - INITIAL SETTING MEDIUM SPEED. HIGH CAPACITY COOLING COIL.

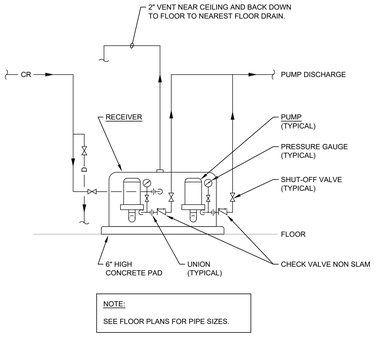
EQUIPMENT TYPE — SIZE, FLOOR, NUMBER IDENTIFICATION — FC-AX1

MISCELLANEOUS EQUIPMENT SCHEDULE

MARK NO.	DRAWING NAME &/ OR PURPOSE	SPECIFICATION NAME	MANUFACTURER & MODEL #	ELECT. DATA HP/KW	ELECT. DATA VOLT	ELECT. DATA PH.	WT.	REMARKS
STHX	BUILDING HEAT HIINES	SHELL & TUBE HEAT EXCHANGER	B&G MODEL: SU106-2	-	-	-		3,200 MBH, 3332 PPH, 5LB. STEAM, 150°F EWT, 180°F LWT, 218 GPM, 1.1' DIFFERENTIAL PRESSURE, 5.06 FPS, 2 PASS, 10" SHELL DIAMETER, 6" FLANGED STM., 1.5" NPT COND., 4.0" NPT TRAP.
OAC-A	MAU-A1 OUTSIDE AIR COIL	OUTSIDE AIR COIL	CONTROL AIR ISOMIX 3 ROW E6	-	-	-	1,010	14,580 CFM, -20°F EAT, 80°F LAT, 1,575 MBH, 1640 PPH, 5 PSIG STM., INTEGRAL FACE & BYPASS TYPE COIL, ACTUATOR BY TCC. 0.80" MAX APD ACROSS COIL, 800 FPM COIL FACE VELOCITY, 3 ROW COIL, 84" WIDE x 60" TALL. TOP CENTER INLET AND BOTTOM CENTER OUTLET.
ERW-A ALTERNATE	ENERGY RECOVERY WHEEL MAKE-UP AIR UNIT	-	AIRXCHANGE ERC 99	3/4 HP	208	3	1,700	15,000 CFM O.A., 12,240 CFM EXHAUST 26.0 SF FACE AREA. WINTER TO BLDG: O.A. 0°F DB/ 0°F WB TO 49.3/ 49.3., EXH: 70/ 66 TO 10.7/ 10.7. SUMMER TO BLDG: O.A. 95/ 76 TO 80/ 67, EXH: 75/ 62 TO 91.9/ 74.2.

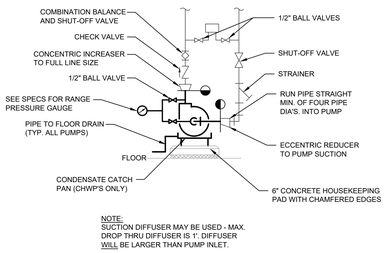
PUMP SCHEDULE

MARK NO.	DRAWING NAME &/ OR PURPOSE	SPECIFICATION NAME	MANUFACTURER & MODEL #	CIRCULATING FLUID FLUID	GPM	PUMP HEAD FT. FLUID	TEMP °F	% EFF.	MOTOR DATA HP/KW	VOLT	PH.	WT. LBS.	REMARKS
HWP-A	HEATING WATER PUMP	BASE MOUNTED END SUCTION	B&G 1510 2E	WATER	210	115'	180	69.5	10 HP	208	3	385#	1750 RPM, MOTOR DESIGNED FOR VFD SERVICE. ONE PUMP STANDBY.
DCP-A	DUPLEX CONDENSATE PUMP	BASE MOUNTED END SUCTION	SKIDMORE VCS-406	HOT CONDENSATE	60	138'	50	-	5 HP	480	3	-	65 GALLON CAST IRON RECEIVER. ELECTRIC ALTERNATOR WITH H-O-A, STARTERS AND DISCONNECTS. HIGH LEVEL ALARM CONTACT.



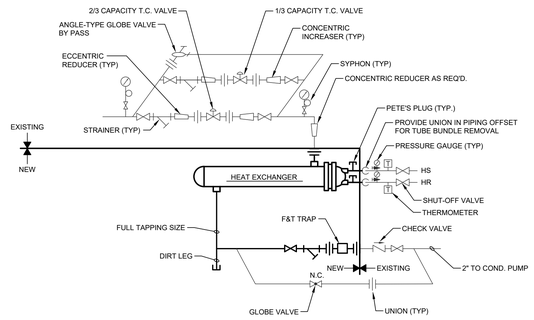
NOTE:
SEE FLOOR PLANS FOR PIPE SIZES.

DETAIL 'C'
DUPLEX CONDENSATE PUMP PIPING
NO SCALE



NOTE:
SUCTION DIFFUSER MAY BE USED - MAX. DROP THRU DIFFUSER IS 1'. DIFFUSER WILL BE LARGER THAN PUMP INLET.

DETAIL 'B'
TYPICAL END SUCTION PUMP PIPING SCHEMATIC FOR CLOSED SYSTEM
NO SCALE



DETAIL 'A'
STEAM & TUBE HEAT EXCHANGER PIPING SCHEMATIC
NO SCALE

RISER 'G'
EXHAUST FOR CLOTHES DRYER VENTS
NO SCALE

DETAIL 'D'
END OF MAIN DRIP STEAM TRAP
NO SCALE

NOTE:
1. THE LOW PRESSURE AND HIGH PRESSURE WATER HEATERS TO HAVE SAME SCHEMATIC.

DETAIL 'E'
STEAM DOMESTIC WATER HEATER PIPING SCHEMATIC
NO SCALE

D&A #25104

R.E. Dimond and Associates, Inc.
Consulting Engineers

732 North Capitol Avenue
Indianapolis, IN 46204
Phone: (317) 634-4672
Fax: (317) 638-8725

CERTIFIED BY:
DANIEL E. DIMOND REGISTERED No. PE60910351 STATE OF INDIANA PROFESSIONAL ENGINEER
12/10/25

REVISIONS:

NO.	DESCRIPTION	DATE
1	ADDENDUM NO. 3	1/6/2026

PROJECT DESCRIPTION:
INDIANA STATE UNIVERSITY
2026 HINES AND JONES HALL REFRESH
ISU BID #B0028696
TERRE HAUTE, INDIANA

KEYPLAN

DRAWN BY: DED	DESIGNED BY: DED
SCALE: REFER TO DRAWING	CHECKED BY: DED
DATE: 12/10/25	JOB NO.: D&#25104

SHEET DESCRIPTION:
SCHEDULES AND DETAILS - MECHANICAL

SHEET NUMBER:
M401