ADDENDUM
NO. 3

**September 21, 2020**

**LaVille Elementary School and Jr./Sr. High School**
**2020 Improvements and Related Work**
**Lakeville, IN 46536**

## TO: ALL BIDDERS OF RECORD

This Addendum forms a part of and modifies the Bidding Requirements, Contract Forms, Contract Conditions, the Specifications, and the Drawings dated August 24, 2020, by Gibraltar Design. Acknowledge receipt of the Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of Pages ADD 3-1 through ADD 3-2 and attached Addendum No. 3 from Gibraltar Design dated September 18, 2020 and consisting of 6 pages, Specification Section 23 82 19 - Fan Coil Units, Specification Section 23 21 13 - HVAC Piping, and 9 drawings.

**A. <u>SPECIFICATION SECTION 00 00 20 - TABLE OF CONTENTS</u>**

**Under Division 23 - Heating, Venting, and Air Conditioning**

1. **Add:**

   a. Specification Section 23 82 19 - Fan Coil Units
   b. Specification Section 23 21 13 - HVAC Piping

**B. <u>SPECIFICATION SECTION 00 43 50 - SUBCONTRACTORS AND PRODUCTS LIST</u>**

**Under Article 1.04 Mechanical Work make the following adjustments:**

1. **Add:**

   a. Specification Section 23 82 19 - Fan Coil Units
   b. Specification Section 23 21 13 - HVAC Piping

## C. SPECIFICATION SECTION 01 12 00 - MULTIPLE CONTRACT SUMMARY

**Under Article 3.03 Bid Categories make the following adjustments:**

1. **BID CATEGORY NO. 3 - PLUMBING/MECHANICAL/FIRESTOPPING**

   **Add:**

   a. Specification Section 23 82 19 - Fan Coil Units
   b. Specification Section 23 21 13 - HVAC Piping

# ADDENDUM THREE

**Addendum Three (AD.03)** to the drawings and specifications prepared by Gibraltar Design for **Laville Elementary School and Jr/Sr High School 2021 Improvements and Related Work** for **Union-North United School Corporation**, Lakeville, Indiana.

All Contractors bidding on this project shall read all of the items covered below and shall comply with all of the requirements as set forth, including any necessary refinements or additions generated by this Addendum and required by the intent of the original contract documents. All Contractors shall acknowledge on their bid form that they have received this Addendum, Addendum One and Addendum Two, and include the appropriate content of same within their bid proposal.

## SPECIFICATIONS

**1. Specification Section 06 20 00 Finish Carpentry**

A. Revise Paragraph 2.2 J to read:

1. "Cork for display wall" to "Tackable wall surface"

**2. Specification Section 07 43 63**

A. Revise Paragraph 2.3 C to read:

1. "All additional supports or framing required to attach to supplied structural framing as shown on the structural drawings."

**3. Specification Section 07 53 23 Roof Insulation and Membrane Roofing - EPDM**

A. Revise Paragraph 2.1 B to read

1. "Fully Adhered Unballasted System: Fire Retardant EPDM membrane, .06 inch thick"

B. Add the following to Paragraph 2.3 C

1. "Provide painted material matching existing adjacent fascia for exposed surfaces."

**4. Specification Section 07 71 19 Aluminum Fascias and Copings**

A. Revise Paragraph 1.2 B to read

1. "Roof Insulation and Membrane Roofing"

**5. Specification Section 07 72 23 Roof Hatches**

A. Revise Paragraph 1.2 B to read

1. "Roof Insulation and Membrane Roofing"

**6. Specification Section 07 90 00 Joint Sealants**

A. Revise Paragraph 1.2 B to read

1. "Roof Insulation and Membrane Roofing"

**7. Specification Section 07 95 00 Expansion Joint Systems**

A. Revise Paragraph 1.2 B to read

1. "Roof Insulation and Membrane Roofing: For exterior roof expansion joint assemblies."

**8. Specification Section 08 81 00 Glazing**

A. Change Addendum #2, Item #10 Paragraph 2.2 F. to read:

"F. Translucent Glazing: Clear insulating glass units with internal translucent film core.

1.Product: Advanced Glazings LTD.; Solera S R5 with Aerogel.

a. External Veil: AGL-300.

b. Internal Veil: AGL-300

c. Visible Light Transmittance: 31 to 38 percent.

d. U-Value: 0.26 to 0.27.

2.Unit Thickness: 1-inch

3.Location: Elementary Clerestory Alternate"

4.Fully temper both lights

**9. Specification Section 11 40 00 Food Service Equipment**

A. Revise Paragraph 24 to read:

1. "Provide and set in place one (1) only Exhaust hood as shown in drawings. The system is to include hood, exhaust fan, supply fan with gas fired furnace, roof curb (s), and fire suppression system. KEC to locate all curbs. Coordinate all contractors for proper drainage, water tight conditions and for warranty requirements. System shall meet all requirements as set forth by NFPA 96, UL and NSF. Installation, start-up, air balance, to be provided as noted elsewhere in the specifications.

B. Revise Paragraph 26, Mechanical Division as follows:

1. Remove text reading "(supplied with the fire suppression system)".

**10. Specification Section 23 82 19 Fan Coil Units**

A. Add Specification Section 23 82 19 Fan Coil Units.

**11. Specification Section 23 09 23 Temperature Controls Point List**

A. Revise Paragraph G. 1 to read:

1. "120-volt AC circuits used for the Facility Management System shall be taken from panel boards and circuit breakers."

**12. Specification Section 23 09 23 Temperature Controls Point List**

A. Add Paragraph 4.06 Heating and Cooling Cabinet Fan Coil Units:

1. GENERAL:

a. Control electronically with dedicated field-installed DDC controller.

b. Occupied/Unoccupied/Off: The unit shall be indexed on and off and indexed into occupied/unoccupied modes of operation by the FMS.

c. Provide room temperature sensor (type as indicated on plan) to monitor/control space temperature.

d. The hot water control valve shall remain closed in the summer cooling mode when the boiler plant is energized for dehumidification sequences.

2. OCCUPIED MODE:

a. During this mode the fan will run continuously. When the room temperature is between the occupied heating and cooling setpoints (inside of the bias), the heating valve will be closed, and the cooling valve will be closed.

b. In the cooling mode: On a rise in room temperature above the cooling setpoint, the cooling valve will modulate open and the heating valve will remain closed.

c. In the heating Mode: On a drop in room temperature below the heating setpoint, the heating valve will modulate open and the cooling valve will remain closed.

3. UNOCCUPIED (NIGHT SETBACK) MODE:

a. During this mode the fan will cycle off.

b. In the cooling mode: On a rise in room temperature above the unoccupied cooling setpoint, the fan will cycle on, the cooling valve will modulate open, and the heating valve will remain closed.

c. IN the heating Mode: On a drop in room temperature below the unoccupied heating setpoint, the fan will cycle on, the heating valve will modulate open and the cooling valve will remain closed.

4. SYSTEM STOP:

a. The unit fan shall be off. The hot water and chilled water control valves shall remain at their last commanded positions.

5. SAFETIES AND ALARMS:

a. An alarm shall be noted in the event of a low and/or high temperature limit in the zone sensor.

b. An alarm shall be noted if the command and status value of the unit fan do not match.

6. FAILURE MODE:

a. The control valves shall fail to their last commanded position.

b. The unit fan shall fail off.

c. Add fan coil monitor and control set points to control hot and chilled water control valve, space temperature, space temperature set point, alarms, etc.

**13. Specification Section 23 21 13 HVAC Piping**

A. Add Specification Section 23 21 13 HVAC Piping.

**14. Specification Section 26 05 00 Basic Electrical Requirements**

A. Revise Paragraph 3.4 A. to read:

1. "The Contractor is responsible for all cutting indicated on the Architectural

drawings related to installation or removal of work of the Mechanical and Electrical Trades. All required cutting may not be shown. Any additional cutting and patching required, which is not indicated on the Architectural Drawings, is the responsibility of the contractor requiring the access, as provided for the specifications."

B. Revise Paragraph 3.8 5. To read"

1. "At their option, this Contractor may install conduit, etc., in advance of earth fills by the contractor. Install such conduit with backfill material adjacent to the conduit and with the compaction requirements, as specified under Section 31 20 00.

## DRAWINGS – LaVille Elementary School

**15. Sheets G-301**

A. Revise General Project Note H. to read:

1. "Contractors responsible for all cutting indicated on the Architectural drawings regardless of trade assigned noted in the specifications. Reference, Civil, Mechanical, Electrical, Plumbing and Fire Protection drawings for additional cutting and patching not shown on architectural drawings. Any additional cutting and patching required, which is not indicated on the Architectural Drawings, shall be the responsibility of the contractor requiring a class.

**16. Sheet A-105**

A. Refer to attached, revised full-size drawing, included in this Addendum, for the following revisions:

1. Roller Shades shall be included in the following rooms as noted by "RS"

a. E-108, E-109 and E-112.

**17. Sheet AD-101, AD-103, AD-104**

A. Revise General Demolition Note B. to read:

1. "Reference all drawings and specifications for demolition information and responsibilities."

**18. Sheet A-101, A-103, A-104, A-105, A-106**

A. Revise General Plan Note Y. to read:

1. "All faucets and sinks shall be coordinated with casework, countertop and electrical and plumbing requirements at each location prior to fabrication and installation."

**19. Sheet A-201**

A. Replace sheet A-201 with the attached in its entirety.

# DRAWINGS – LaVille Jr/Sr High School

**20. Sheets G-301**

A. Revise General Project Note H to read:

1. "Contractors responsible for all cutting indicated on the Architectural drawings regardless of trade assigned noted in the specifications. Reference, Kitchen, Mechanical, Electrical, Plumbing and Fire Protection drawings for additional cutting and patching not shown on architectural drawings. Any additional cutting and patching required, which is not indicated on the Architectural drawings, shall be the responsibility of the contractor requiring access."

**21. Sheet A-102 and A-104**

A. Refer to attached, revised full-size drawing, included in this Addendum, for the following revisions:

1. Roller Shades shall be included in the following rooms: C-129, C-130, C-131, E-101 and E-104.
2. Provide a 12"x12" access panel painted to match adjacent surfaces. Field locate C-129, C-130, C-131, E-101, E-104.

**22. Sheet AD-101, AD-102, AD-103, AD-104, AD-105, AD-106**

A. Revise General Demolition Note: B. to read:

1. "Reference all drawings and specifications for demolition information and responsibilities."

**23. Sheet A-101, A-102, A-103, A-104, A-105, A-106**

A. Revise General Note: X. to read:

1. "All faucets and sinks shall be coordinated with casework, countertop and electrical and plumbing requirements at each location prior to fabrication and installation."

**24. Sheets A-201**

A. Revise Roof Plan Note 16 detail bubble to read as follows:

1. "1/A210 SIM", the body of text for Roof Plan Note 16 shall remain.

**25. Sheet M-001**

A. Replace Sheet M-001 with the attached in its entirety.

1. Add existing air handling unit information, thermostats and sheet notes detailing work.

**26. Sheet M-102**

A. Replace Sheet M-102 with the attached in its entirety.

1. Add carbon dioxide sensors to rooms with VUVs, add hot water coils and piping notes.

**27. Sheet M-104**

A. Replace Sheet M-104 with the attached in its entirety.

1. Add carbon dioxide sensors to rooms with VUVs, add hot ware coils and piping notes, adjust hot water pipe size on VUV-5.

**28. Sheet M-200**

A. Replace Sheet M-200 with the attached in its entirety.

1. Add hot water heating coil schedule, add FC-1, FC-2 to mechanical equipment schedule, add sheet note for heat coil to mechanical equipment schedule, modify vertical unit ventilator schedule and sheet notes, add carbon dioxide sensor to symbols and abbreviations list.

**29. Sheet M-201**

A. Replace Sheet M-201 with the attached in its entirety.

1. Add hot water coil piping diagram.

**30. Sheet M-401**

A. Replace Sheet M-401 with the attached in its entirety.

1. Add existing air handling unit information, change size of chilled water piping for VUV-1.

**31. Sheet P-001**

A. Replace P-001 with the attached in its entirety.

**32. Sheet P-200**

A. Replace P-200 with the attached in its entirety.

**33. Sheets E-401**

A. Add Plan Note 9 to Room E-113.

B. Add Plan Note 9 to new panel 1L14 in Boiler Room E-113.

C. Add Plan Note 9 to new transformer in Boiler Room E-113.

D. Add Plan Note 1 to new main disconnect in Boiler Room E-113.

Pages 1 through 6, inclusive, nine (9) full-size drawings, and two (2) specification sections constitute the total makeup of **Addendum Three**.

GIBRALTAR DESIGN

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DIVISION 23 – MECHANICAL
Section 23 21 13 – HVAC Piping

1.00 PART 1 – GENERAL

1.01 RELATED DOCUMENTS:

A. Conform to applicable provisions of Section 23 05 00.

1.02 DESCRIPTION OF WORK:

A. Supply labor, equipment and material required for the complete installation and testing of the chilled water, condenser water and hot water heating system.

1. HVAC Piping demolition work
2. Chilled Water and Hot Water heating piping systems
3. Condensate drain piping
4. Piping connections to equipment

1.03 SHOP DRAWING SUBMITTALS:

A. Submittals shall be required for the following items, and for additional items where required for a complete and operational system:

1. Piping Expansion Joints and Anchors
2. Pipe Hangers and Supports
3. Pipe material, joints, and fitting.
4. Pipe Valves.
5. Pipe Service Marking.
6. Thermometer and Pressure Gauges.
7. Piping Distribution System Plans.
8. Pipe Test Reports.

2.00 PART 2 – PRODUCTS

2.01 ANCHORS:

A. Type of anchors and method of securing same to structural framing of the building shall be subject to review.

B. Piping shall be installed free from building structure to allow for movement without noise. Install fire spread and smoke developed rating insulation as required by code and acceptable to local authorities around pipes when they pass through floor slabs or walls.

2.02 ESCUTCHION PLATES:

A. In general, piping shall be concealed in walls and in ceilings. Where exposed pipes pass through finished floors, ceilings or walls, the floor plates shall be equal to Crane 13-BC.

2.03 PIPE SLEEVES:

A. Supply and install sleeves for piping where pipes pass through floors, partitions, etc., use pipe sleeves made of standard weight steel pipe. Supply and install, around each pipe passing through sleeve, pre-formed insulation of fire spread and smoke developed rating as required by Code and acceptable to local authorities to fill out remainder of sleeve.

B. Sleeves for piping passing through walls and partitions shall finish flush with surfaces on both faces. Floor sleeves shall finish 1-1/2" above finished floor line.

C. Sleeves may be omitted for piping less than 1-1/4" size that pass through interior partitions. Where sleeves are omitted, piping shall be wrapped with fiberglass insulation at the point where partition occurs.

D. Be responsible for location of required sleeves prior to concrete pouring or fabrication of precast panels. Obtain approval for required chases and openings required through columns and poured concrete walls.

2.04 PIPE HANGERS:

A. Hangers, brackets, and clamps shall be of standard weight or malleable iron as specified for each use. Pipes supported from concrete construction shall use approved concrete inserts. Perforated strap hangers are not permitted.

B. Supports and hangers shall be so constructed and adjusted as to allow for proper pitch and expansion of pipes.

C. Provide necessary structural supports for piping to properly transmit load to building structure. Hangers shall not be supported from bottom chord of truss or lightweight metal flooring or roof decking.

D. Where three (3) or more pipes are run parallel, they shall be supported on trapeze hangers. Use trapeze hangers where ducts interfere with piping. There shall be at least one (1) hanger for each section of pipe.

E. Except as noted elsewhere, install pipe hangers equal to Anvil, Midwest Hanger Supply Co., or Bergen-Paterson. Pipe hangers for insulated piping shall be sized such that insulation will pass through hanger uninterrupted. Pipe hangers installed in corrosive areas, or exposed to moisture, or exposed to the outside elements shall be galvanized finish. Provide temporary wood blocks of same thickness as pipe insulation to support piping on hangers prior to insulation. Provide piping hangers as follows:

1. Adjustable clevis hanger for stationary steel pipe lines:

a. Anvil Fig. 260

b. Erico Fig.400

c. Bergen-Paterson Part 6750

2. Adjustable clevis hanger for stationary insulated steel pipe lines:

a. Anvil Fig. 300

b. Erico #415

c. Bergen-Paterson Part 6752

3. Adjustable clevis hanger for copper piping:

a. Anvil Fig. CT-99C

b. Erico #101

c. Bergen-Paterson Part 6755

F. Pipe hangers shall be supported by mild steel hanger rods affixed to the building structure with approved steel fasteners. Rods, nuts, and fasteners shall be provided in accordance with hanger manufacturer's requirements. Hangers and rods shall not penetrate piping insulation. Vertical risers shall be supported by riser clamps at each floor line.

G. The maximum spacing between hangers and supports, measured along the piping, shall be as follows:

| Pipe Material | Pipe Size | Rod Dia. | Max Spacing |
|---|---|---|---|
| Steel Pipe | Up to 1 ¼" | 3/8" | 8' |
| | 1 ½" & 2" | 3/8" | 10' |
| | 2 ½" & 3" | ½" | 15' |
| | 4" & Up | 5/8" | 15' |
| Copper Tubing | Up to 1" | 3/8" | 6' |
| | 1 ¼" & 1 ½" | 3/8" | 8' |
| | 2" | 3/8" | 9' |
| | 2 ½" | ½" | 9' |
| | 3" & 4" | ½" | 10' |

H. Materials shall be as follows:

1. Trapeze Hangers: 1-1/2 x 1-1/2" x 1/8" angle with 3/4" rods.

2. Pipe Shields:

a. Anvil Fig. 168 Rib-Loc shield

b. Erico #125 for IPS and copper non-rib type

3. Riser Clamps:

a. Anvil Fig. 261

b. Erico #510

c. Bergen-Paterson Part 6302

4. Riser Clamps for Copper Tubing:

a. Anvil Fig. CT-121

b. Erico #511

c. Bergen-Paterson Part 6303

5. Beam Clamps, Rods, Supports, etc. for attachment to steel beams and bar joist: Anvil, Erico, or Bergen-Paterson.

2.05 PIPE AND FITTINGS:

A. Pipe for the services listed below shall be ASTM A53.

1. The following pipe shall be standard weight, Schedule 40, except 12" size and larger. Pipe

a. Hot water heating (black steel)

b. Chilled water (black steel)

c. Condensate drain (galvanized steel)

B. Seamless Type "L" copper tubing, conforming to ASTM Specification B-88 and Federal Specification WW-T-799, of approved manufacturer may be used in lieu of black steel pipe for the heating water and condensate drain system. Fittings for copper tubing 2-1/2" and smaller shall be wrought sweat type fittings. Fittings in copper tubing 3" and larger may be cast red bronze solder type fittings. Fittings shall have tubing stops.

C. Black steel pipe 2-1/2" and larger shall have welded joints except at valves and connections to apparatus, where flanges must be installed. Use butt welding fittings specifically made by manufacturers for elbows and tees for branches, except as noted.

1. Welded Fittings:

a. Welded fittings shall be Tube-Turn or equal, 125 psi design. Use groove type welding rings on 4" or larger equal to or larger than one-half (1/2) the nominal diameter of the main.

b. Use weldolets or welding tees for branches less than one-half (1/2) nominal diameter of the main. Welding heavy weight steel coupling into any mains instead of using a weldolet (where permitted above) only on low-pressure mains under 50 psi working pressure is acceptable.

D. Steel pipe 2-1/2" and smaller, except as noted above, may have screwed joints with long lengths connected by couplings. Where fittings are necessary, they shall be standard weight malleable iron screwed fittings of approved make and ground joint brass lined unions shall be used where necessary and at connections with apparatus. No field fabricated fittings will be permitted unless specifically noted otherwise.

E. Where copper pipe connections are made to piping or an item of equipment of a dissimilar metal, provide dielectric fitting as herein specified.

F. Pipes shall be straight, true, and parallel and supported at intervals specified above or as indicated on the contract documents. Run piping with proper slope to drain and vent. Branch pipes shall have greater slope.

G. No bull headed tees shall be used on water piping.

2.06 JOINTS:

A. Solder joints in copper pipe shall be 95/5 lead free silfoss solder.

B. Make joints between copper pipe and galvanized pipe with dielectric isolating couplings or bushings.

C. Ream threaded joints carefully and joint with compound on male thread only.

D. Underground copper piping shall be silfossed.

E. At contractor's option, the Rigid Pro-Press, Apollo, or Viega copper pipe valves, joining and fitting system may be used for hot water heating and chilled water systems in lieu of as specified above. Pipe fittings to conform to the material and sizing requirements of ASME B16.18 or ASME B16.22. O-rings for copper press fittings shall be EDPM. Copper press fitting shall be installed in accordance with the manufacturer's installation instructions.

2.07 VALVES:

A. Supply and install valves on main branches and at equipment, and elsewhere as shown or as required. Valves shall have minimum 125 psi pressure rating and shall be as shown or as required to suit job conditions.

B. Valves shall be of same make and figure number. Valves shall be NIBCO, Milwaukee Valve, Stockham, Crane, Watts or approved equal and shall be of domestic manufacture.

C. Piping to and from equipment shall have necessary shutoff valves, full size of line for isolating such equipment on system side of unions or flanges. Provide shutoff valves to isolate each item of equipment, pipe riser or pipe branch.

D. Valves shall be placed to permit easy operation and access. Provide chain wheel operator with sufficient chain to operate valve for valves mounted above 7'-0".

E. Valves for Chilled Water services shall be as listed below:

1. Gate Valves:

a. Valves 2" and smaller shall be of Class 125, body and bonnets of ASTM B-62 cast bronze composition, threaded ends, solid disc, gland packed, N.A. packing.

Recommended Valves:

RS

NIBCO #T-111

Milwaukee Valve #148

Hammond IB640

NRS

NibCO #T-113

Milwaukee Valve #105

Hammond IB645

2. Globe Valves:

a. Valves 2" and smaller shall be Class 125, body, and bonnet of ASTM B-62, threaded and solder ends, gland packed, N.A. packing.

Recommended Valves:

THD

NIBCO #T-211-B

Milwaukee #502

Hammond IB440

SJE

NIBCO #T-211-B

Milwaukee #502

Hammond IB418

3. Ball Valves:

   a. Valves shall have cast bronze bodies, replaceable teflon seats, conventional port, blowout-proof stem, adjustable packing gland, chrome plated ball and threaded ends, 600 WOG.

      Recommended Valves:

      NIBCO #T-585/580-70

      Milwaukee Valve #BA-100/150

      Apollo 70-100/200 Series

      Hammond 8501

4. Check Valves:

   a. Valves 2" and smaller shall be Class 125, threaded or solder ends, body and caps shall be ASTM B 62 cast bronze, swing type design:

      Recommended Valves:

      <u>THD</u>

      NIBCO #T-413-B

      Milwaukee Valve #509

      Hammond IB904

      <u>SJE</u>

      NIBCO #S-413B

      Milwaukee Valve #1509

      Hammond IB912

5. Drain Valves: NIBCO #74CL, NIBCO #T-585-HC, Milwaukee BA-100H or Hammond 8501-H with 3/4" hose connection and threaded cap.

F. Valves for hot water heating systems shall be as listed below:

   1. Gate Valves:

      a. Valves 2" and smaller shall be of Class 150, body and bonnets of ASTM B-62 cast bronze composition, threaded ends, solid disc, disc, gland packed, N.A. packing.

b. Recommended Valves:

RS

NIBCO #T-131

Milwaukee Valve #1150

Hammond IB641

O S & Y

NIBCO #F-617-0

Milwaukee Valve #F2885-A

Hammond IR 1140

2. Globe Valves:

a. Valves 2" and smaller shall be of Class 150 with body and union bonnet of ASTM B-62 bronze, gland packed, N.A. packing. Bronze trim, composition disc.

Recommended Valve:

THD

NIBCO #T-235-Y

Milwaukee Valve #590T

Hammond IB413T

SJE

NIBCO #S-235-Y

Milwaukee Valve #1590-T

Hammond IB423-T

3. Ball Valves:

a. Valves shall have cast bronze bodies, replaceable teflon seats, conventional port, blowout-proof stem, adjustable packing gland, chrome plated ball and threaded ends, 600 WOG.

b. Recommended Valves:

NIBCO #T-585/580-70

Milwaukee Valve #BA-100/150

Apollo 70-100/200 Series

Hammond 8501

4. Check Valves:

a. Valves 2" and smaller shall be of Class 150 with bodies and caps of ASTM B-62 cast bronze with threaded ends. Valves shall be of the swing type design.

Recommended Valves:

NIBCO #T-433-Y

Milwaukee Valve #510-T

Hammond IB 946T

2.08 VALVE TAGS AND SCHEDULE:

A. Tag each valve with 1" diameter heavy brass tags secured to valve with brass hook. Prepare schedule giving the number of each valve, its service and general location.

2.09 PETE'S PLUGS:

A. Pete's Plugs shall be installed in the following locations and where indicated on contract documents:

1. Inlet and outlet of coils

2. Across control valves

B. Pete's Plugs shall consist of a 1/4" MPT fitting to receive either a temperature or pressure probe 1/8" outside diameter. Fittings shall be solid brass with two (2) valve cores of Nordel maximum 275° F at 500 psi, fitted with a color coded and marked cap with gasket.

C. Upon completion of testing and balancing, present to the Owner one (1) Series 1500 test kit consisting of 0-100 psi, 0-230' of water pressure gauge with No. 500 gauge adapter attached, a 25-125° F and a 0-220° F pocket testing thermometer, a No. 500 gauge adapter and a protective carrying case.

2.10 PIPE SERVICE MARKING:

A. Pipes shall be identified as to their service after application of insulation and/or final painting, by color code banding and stenciling. Marking shall indicate pipe content and direction of fluid flow to fully comply with requirements of schedule for the identification of piping system ANSI-A13.1 including the following minimum requirements:

1. Markers shall be stenciled in positions visible to personnel. Marking shall conform to pipe service identification (abbreviations) as noted on the contract documents.

2. Paint pipe content banding, legend, and flow direction marker at each valve, at every point of pipe entry and exit where a line goes through a wall, on each riser and tee joint and at 50' intervals on long continuous runs of pipe. Arrows (flow direction markers) shall point away from content marking and in direction of flow. If flow can be in both directions, apply double-headed arrows.

3. In lieu of stenciling, semi-rigid plastic identification markers equal to SETMARK Pipe Markers as manufactured by Seton Name Plate Corporation. Equivalent marker as manufactured by MSI, Kolbi, or Brady will be acceptable. Each such marker shall be in full compliance with other requirements of the contract documents.

3.00 PART 3 – EXECUTION

3.01 GENERAL:

A. Clearances: Give careful consideration to clearances under beams, joists, over windows, to provide maximum headroom and the locations of lines and type of fittings used to obtain these clearances.

B. Ascertain from the contract documents the heights of suspended ceilings and the size of shafts in which piping is to be concealed and the location and size of structural members in and adjacent to pipe shafts.

C. Coordinate the piping, ductwork, and lighting work with one another and with other equipment. Where insufficient room is provided for piping above suspended ceilings or in vertical shafts, obtain clarification in writing before work is installed.

D. Cutting: Cut pipe accurately to measurements established at the building, work into place without springing or forcing, and properly secure to structure in an approved manner.

E. Cutting or other weakening of the building structure to facilitate piping installation will not be permitted, unless approved. Ream piping to remove burrs and install so as to permit free expansion and contraction without causing damage. Make changes in direction with fittings and changes in main sizes through eccentric reducing fittings.

F. Dielectric couplings or unions shall be provided at the junction of two (2) pipes or of pipe to equipment of two (2) different metals to eliminate electrolytic action.

G. Piping conveying water shall be installed with a pitch, in the direction of flow of not less than 1" in 40'. In cases where branches are installed and connected into vertical risers, the branches shall pitch back to the respective risers. Horizontal branches from mains shall be taken off the top of respective risers. Horizontal branches from mains shall be taken off the top of the mains by means of 90° ells. It shall be possible to drain separately each part of the system; drain valves shall be provided in the systems wherever required for this purpose.

H. Before piping is installed, it shall be opened and pounded to remove foreign matter present. Ends of piping and tubing shall be sealed with caps or plugs during construction. Paper or rags will not be permitted. After installation and before final connections are made, piping systems shall be flushed with a material that is not injurious to either the pipe or material to be conveyed by the pipe.

I. Threaded pipe shall be cut square and full threaded and shall be made with approved pipe thread compound, applied to the wall threads only, and shall be made up so that no more than two (2) threads will be exposed.

3.02 PIPING INSTALLATION:

A. Install piping as required for a complete and operational system. Provide accessories, elbows, etc. based on actual pipe routing requirements.

B. Piping shall be brought to equipment connections in such a manner so as to prevent the possibility of loads or stresses being applied to the connections.

C. Piping shall be isolated from building structure, walls, furring, other piping, etc., to avoid noise transmission.

D. Provide valves, couplings, expansion loops, etc., at run-outs to equipment, devices and other points requiring same to provide flexible piping systems.

E. Provide shutoff valves and unions or flanges at each branch or in supply and return to each item of equipment. Valves and unions or flanges shall be suitably located to isolate each unit, branch circuit, or section of piping to facilitate maintenance and for removal of equipment and apparatus.

F. Provide air vents in high points in the system to permit proper filling and venting.

3.03 PIPE TESTS:

A. Piping shall be tested with hydrostatic pressure or other means, as directed, and shall be proved tight, as hereinafter specified before it is enclosed or covered, and before insulation is applied. The piping shall be tested in sections.

B. During these tests, pressure shall not be transferred to a tank, shell or other manufacturing or process equipment that may be connected to the line under test. Full physical disconnection shall be made at or near the final connection to the equipment and the line capped or plugged.

C. Piping shall be tested with pressure equal to 1-1/2 times the normal working pressure, but not less than 100 pounds per square inch, except where specified otherwise. The duration of pressure tests shall be sufficient to permit observation of joints (minimum twelve (12) hours). Submit reports for review.

D. Pinhole leaks which develop in welded joints shall be chipped out and rewelded. Caulking will not be permitted. A general sweating at joints shall be cause of rejection. It shall be completely removed and rewelded.

E. Threaded joints which develop leaks shall be rejected. Either the thread, fitting, or both shall be removed and replaced. No caulking will be permitted.

END OF SECTION

DIVISION 23 - MECHANICAL
Section 23 82 19 - Fan Coil Units

1.00 PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Conform to all applicable provisions of Section 23 05 00.

1.02 DESCRIPTION:

A. This section of the work includes the furnishing and installing, by the mechanical contractor, of the packaged fan coil units of the size, capacity, and configuration where and as denoted on the drawings.

1.03 QUALITY ASSURANCE:

A. Unit performance shall be rated in accordance with ARI Standards 440-81.

B. Unit shall be constructed in accordance with UL regulations and shall carry the UL label of approval.

C. Insulation and adhesive shall comply with NFPA 90A requirements for flame spread and smoke generation.

D. All coils shall be factory tested for leakage at 300 psig air pressure with the coils submerged in water. After testing, direct-expansion coils shall be dehydrated and charged with dry air.

1.04 PRODUCT HANDLING:

A. Protection: Use all means necessary to protect units before, during, and after installation.

B. Replacement and Repair: All scratched, dented, and otherwise damaged units shall be repaired or replaced as directed by the Engineer.

2.00 PART 2 - MATERIALS

2.01 MANUFACTURERS:

A. Unit specified is manufactured by Applied Environmental Air. Equivalent unit manufactured by Johnson Controls, Trane, or IEC will be acceptable if equal in all respects (including dimensional arrangement).

2.02 EQUIPMENT:

A. General:

1. Indoor-mounted draw-thru, packaged fan coil unit semi recessed horizontal configuration. Unit shall consist of a fan and motor mounting bracket and a cooling and heating coil, drain pan and filter tracks.

B. Unit Cabinet:

1. Cabinet shall be constructed of mill galvanized steel painted with a corrosion-resistant enamel finish. Submit color samples for selection.

2. Cabinet panels shall be fully insulated with a fire-retardant material.

3. Cabinets shall be provided with removable access panels. All exposed units shall have key-operated locking device.

4. Provide recessed units with recessing flanges.

5. Units shall be provided with discharge and return air grilles as indicated on the drawings.

C. Fan Section:

1. Double-inlet fan wheels with forward-curved blades shall be selected to operate at least 25% below the first critical speed and shall be designed for continuous operation at maximum rated fan speed. Fan wheels and scrolls shall be constructed of mill galvanized steel. The fan shaft shall be steel, coated with a hydrocarbon rust inhibitor. Fan wheels shall be statically and dynamically balanced at the factory and shall run on permanently lubricated bearings.

2. Resiliently mounted motor bracket shall be provided to absorb vibration. Motor and drive shall be factory supplied and installed. All motors to have integral thermal overload protection.

D. Coil Section:

1. Coil track extending the full width of the unit shall be provided to facilitate easy installation and removal of the coil.

2. Condensate drain pan shall be fully insulated and shall extend under the entire coil area. Drain pans shall be arranged for either horizontal or vertical installation, as required.

3. Water heating and cooling coils shall be of the size and type required for scheduled capacity and service. Coils shall be suitable for working pressures up to 200 psig. Each coil shall be factory leak tested at 300 psig air pressure under water.

E. Filters:

1. A filter frame designed to accept 1" throw-away filters shall be installed upstream of the cooling coil. Filters shall be supplied by unit manufacturer and shall be removable without displacing front panels.

3.00 PART 3 - INSTALLATION

3.01 GENERAL:

A. Manufacturer shall prepare schedule for approval listing/identifying unit number and noting size, style, capacity, and other requirements for each unit.

B. Reconnect existing hot, chilled and condensate drain piping to new fan coil units.

C. Temperature controls shall be field installed.

D. Mechanical contractor shall furnish and install all supports and other such related items as required to complete the system. Coordinate installation and building penetrations with existing building structure. Verify existing conditions in field.

END OF SECTION