



Addendum No. 4

To: Pre-Bid Meeting Attendees

From: Roger Washington
City of Mobile Architectural Engineering Department

Re: Arthur R. Outlaw Convention Center - Mechanical Improvements
Project #CN-015-25

Date: October 29, 2025

This Addendum forms a part of, and modifies, the Request for Bids for the above referenced project, dated October 6, 2025. Acknowledge receipt of this Addendum No. 4 and all subsequent Addenda, if any, in the space provided on the Bid Form. Failure to do so may subject Bidder to disqualification.

General:

- Item 1. Re-Bid: The City of Mobile has decided that it is in the best interest for Arthur R. Outlaw Convention Center to rebid the chiller replacement. The City of Mobile also request that Contractor's submit pre-qualifications prior to bidding, using the attached pre-qualification packet provided in Addendum No. 3. The pre-qualification submittal shall be due on or before November 19, 2025, by 3:00PM. Contractor's submitting pre-qualification proposals will be notified regarding their status on or around November 21, 2025

The intent is to pre-qualify general contractors and installers with a proven, successful record of installations on projects of similar size and scope in an existing building that will be fully occupied and operational during the work. Companies without proven records of success will not be approved for work on this project. Companies who have not met quality and/or construction schedules on previous City of Mobile projects will also not be approved for work on this project. The Contract award, if made, will be made to the low, responsive, responsible, & pre-qualified Bidder.

Important Dates:

Pre-bid: November 13, 2025

Pre-Qualification Due: November 19, 2025

Bids Due: December 3, 2025

Item 2. BID DATE: Change the bid date in all references to December 3, 2025, in all portions of the Request for Bids. All other aspects of the Bid receipt information remain the same.

Clarifications: NA

Forms and Specifications: NA

Drawings: NA

RFI's: NA

Attachments:

1. Rebid Advertisement
2. Addendum No. 3
 - a. Pre-Qualification Packet
3. Addendum No. 2
4. Addendum No. 1

END OF ADDENDUM NO. 4

CALL FOR BIDS

Arthur R. Outlaw Convention Center - Mechanical Improvements
1 South Water Street
Mobile, Alabama 36602
CN-015-25

Notice is hereby given that the City of Mobile will receive sealed bids for the above stated project on Wednesday December 3, 2025, no later than 2:15 PM. Bidders shall insert sealed Bids into a receptacle, marked "City of Mobile Bids", located in the elevator lobby outside the office of the City Clerk's Office, 9th Floor South Tower, Government Plaza, 205 Government Street, Mobile, Alabama 36602. The same will be publicly opened and read at 2:30 PM in the Atrium Lobby of Government Plaza. Additional bidding instructions are detailed in the Project Manual.

A **Mandatory Pre-Bid Conference** shall be held at the north parking garage entrance booth at 9:00AM on November 13, 2025. Meet at front entrance. This project is Tax Exempt.

Bid Documents are on file and may be examined and obtained from the following location:

www.cityofmobile.org/bids/

Disadvantaged Business Enterprise participation may be required. A Directory of DBE Vendors can be found at the following location:

<https://workwith.cityofmobile.org/>



Addendum No. 3

To: Pre-Bid Meeting Attendees

From: Roger Washington
City of Mobile Architectural Engineering Department

Re: Arthur R. Outlaw Convention Center - Mechanical Improvements
Project #CN-015-25

Date: October 21, 2025

This Addendum forms a part of, and modifies, the Request for Bids for the above referenced project, dated October 6, 2025. Acknowledge receipt of this Addendum No. 3 and all subsequent Addenda, if any, in the space provided on the Bid Form. Failure to do so may subject Bidder to disqualification.

General:

- Item 1. BID DATE: Change the bid date in all references to November 19, 2025, in all portions of the Request for Bids. All other aspects of the Bid receipt information remain the same.
- Item 2. Prequalification Request for Proposals from General Contractors
 - a. The intent is to pre-qualify general contractors and installers with a proven, successful record of installations on projects of similar size and scope in an existing building that will be fully occupied and operational during the work. Companies without proven records of success will not be approved for work on this project. Companies who have not met quality and/or construction schedules on previous City of Mobile projects will also not be approved for work on this project.

Clarifications: NA

Forms and Specifications: NA

Drawings: NA

RFI's: NA

Attachments:

1. Prequalification Request for Proposals from General Contractors (8 Pages)

END OF ADDENDUM NO. 3



October 21, 2025

Roger Washington
Capital Improvement Project Manager
Architectural Engineering Department
City of Mobile
205 Government Street
Mobile, AL 36602

RE: Project Bidder Qualifications

Roger,

Please include the following requirements for the contractor submitting a construction bid proposal for the chiller replacement project at the Arthur R. Outlaw Convention Center.

The intent of this contractor and installer qualification will be examined prior to the bid. The intent is to pre-qualify general contractors and installers with a proven, successful record of installations on projects of similar size and scope in an existing building that will be fully occupied and operational during the work. Companies without proven records of success will not be approved for work on this project. Companies who have not met quality and/or construction schedules on previous City of Mobile projects will also not be approved for work on this project.

The successful contractor for this project will need to have a fully staffed office within 75 miles of the project site in downtown Mobile AL. The project is a mechanical prime project and the successful contractor will need to have first, a mechanical contractors license and additionally mechanical contractor shall also hold a general contractor's license. The successful contractor shall have performed a minimum of four chiller replacement projects within the last two years. The contractor shall submit proof of the above indicated requirements along with contact information so that it can be verified.

If you have any questions, please do not hesitate to call or email us if we may be of further assistance in your evaluation and preparation of the referenced project.

R J Smith Mechanical Consultant, Inc.
dba: Smith Mechanical Consulting and Design

A handwritten signature in black ink, appearing to read "Roger Smith", is written over a light gray rectangular background.

Roger Smith, PE
Principal

Smith Mechanical Consulting and Design
61 St Joseph Street
Suite 1100
Mobile, AL 36602
251-402-1364

CITY OF MOBILE ALABAMA

ARTHUR R. OUTLAW CONVENTION CENTER - MECHANICAL IMPROVEMENTS PRE-QUALIFICATION REQUEST FOR PROPOSALS FROM GENERAL CONTRACTORS

Project: ARTHUR R. OUTLAW CONVENTION CENTER - MECHANICAL
IMPROVEMENTS
Owner: CITY OF MOBILE

Please provide all information requested below. Failure to provide all information requested, and failure to provide full disclosure may be cause for rejection by the Owner of any pre-qualification submittal. Attach additional pages as necessary. There are no page limitations for the proposal. However, including general marketing type information is strongly discouraged.

Only General Contractors who have been approved to bid pursuant to the pre-qualification procedures and criteria established by the Owner will be eligible to bid the project. All General Contractors must demonstrate successful completion of projects of similar size, type, and complexity.

If a General Contractor intends to rely upon the qualifications and experience of subcontractor(s) to demonstrate successful completion of projects of similar size, type, and complexity; the General Contractor's pre-qualification response shall include the information required herein for each subcontractor unless stated otherwise.

General Contractors who rely upon the qualifications and experience of subcontractor(s) to demonstrate successful completion of projects of similar size, type, and complexity, and are pre-qualified to bid, shall not change the subcontractor(s) prior to bidding without the Owner's written approval. Changing of listed subcontractor(s) prior to bid without the approval of the Owner may be cause for disqualification at the sole discretion of the Owner.

The Owner may, at the Owner's discretion, add additional General Contractors after the due date set forth below.

Submittal Deadline: 3:00 PM Central Time October 29, 2025

Proposals shall be submitted electronically in PDF document format to the following:

Roger Smith - roger@smitheng.us

Roger Washington - roger.washington@cityofmobile.org

Contractors submitting pre-qualification proposals will be notified regarding their pre-qualification status on or around November 3, 2025.

The bid documents are posted on the City of Mobile website with bids due on or before November 19, 2025.

PROJECT DESCRIPTION:

The replacement of Chiller-3. The Contactor will need to be disconnected and shifted Chiller-2 to allow room for the replacement Chiller-3 to pass by, then be reconnected. Additionally, the three chilled water pumps and three condenser water pumps are to have VFD's installed on the existing pumps.

The project drawing sheets provided with the bid documents are being provided to assist interested General Contractors in evaluating the scope of work and preparing their pre-qualification proposals.

If a General Contractor intends to rely upon the qualifications and experience of subcontractor(s) to demonstrate successful completion of projects of similar size, type, and complexity; the General Contractor's prequalification response shall include the information required herein for each subcontractor unless stated otherwise.

Company Name: _____

Alabama G.C. License #: _____

(An Alabama G.C. License is not required to submit a pre-qualification proposal. However, it is required prior to submitting a bid)

Address of organizations principal place of business: _____

Phone: _____

Fax: _____

Contact Name: _____

e-mail: _____

Largest Value Similar Project: _____

Current Aggregate Value under Construction: _____

Five Year Average: _____

Surety Company: _____

1. Has your organization ever received a "Notice to Cure" letter (or equivalent) on any unfinished work and/or defective work or defaulted on a contract with any State, County, or City Governmental Agencies?

Circle one: YES / NO

(If yes, provide description of the notice and outcome)

2. Is your organization currently, or previously been, involved in a claim that has resulted in a bond claim mediation, arbitration, or litigation on any projects with any State, County, or City Governmental Agencies?

Circle one: YES / NO

(If yes, provide description of the claim and outcome)

3. Has your organization completed projects of similar type, size, scope and complexity for projects in excess of \$1,000,000.00?

Circle one: YES / NO

Include project descriptions for four projects of similar type, size, scope and complexity, which have been completed over the past two years. The project descriptions should include, at a minimum, the name, address and telephone number of Owner, Architect, Construction Manager or Program Manager; the original and final Contract value; the original contract completion date and actual completion date.

4. Does your organization have the ability to provide 100% Performance and Payment Bonds for projects up to \$5,000,000.00?

Circle one: YES / NO

(Provide a bondability letter from surety) Not required for subcontractor(s)

5. Confirmation that insurance requirements of the City of Mobile can and will be furnished and a letter of confirmation from your company's underwriter, broker, and/or agent indicating the required liability insurance is either in place or obtainable by the company submitting this pre-qualification proposal: Not required for subcontractor(s)

Workmen's Compensation Insurance: - Statutory-amount and coverage as required by all applicable laws, rules or regulations of the State of Alabama and the United States of America.

Employee's Liability Insurance shall be provided for limits of liability not less than:

- A. Bodily Injury by Accident \$1,000,000 each accident
- B. Bodily Injury by Disease \$1,000,000 each employee
- C. Bodily Injury by Disease \$1,000,000 each policy

The Contractor shall provide Broad Form (commonly termed Comprehensive) General Liability Insurance (including premises-product-completed operations, independent contractors, and blanket contractual liability), specifically covering the obligations assumed by the Contractor for limits of liability not less than:

- | | |
|--------------------------------------|--|
| A. Bodily Injury | \$1,000,000 each person
\$1,000,000 each occurrence |
| B. Property Damage | \$1,000,000 each occurrence; or |
| C. Bodily Injury and Property Damage | \$1,000,000 combined single limit |

Such comprehensive policy shall include the following:

- A. All liability of the Contractor, for the Contractor's Direct Operations.
- B. Subcontractor's Operations.
- C. Completed Operations Cover, thereby meaning any loss which shall occur after the contract has been completed, but which can be traced back to the Contract.
- D. General Aggregate Limit of \$2,000,000 shall apply on a "Per Project" Basis.
- E. Contractual Liability, meaning thereby; any risk assumed by the Contractor under Hold Harmless Agreements or any other assumption of liability, but specifically items 11.1.1.8.3G herein below
- F. Broad Form Property damage Coverage, including Completed Operations.
- G. Personal Injury Liability, with employee's exclusions removed.

The Contractor shall carry for himself and shall require that all Subcontractors and all Owners of Automobiles or trucks rented or hired on the contract carry, until the Contracts is completed, Comprehensive Automobile Liability Coverage for Bodily Injury and property. Damage for any auto in amounts not less than the minimum amounts as indicated. The Contractor and Subcontractor shall also carry for themselves insurance for all non-owned and hired automobile at the limits of liability as indicated below:

- | | |
|----------------------------|--|
| A. Bodily Injury | \$1,000,000 each person
\$1,000,000 each occurrence |
| B. Property damage | \$1,000,000 each occurrence; or, |
| C. Property damage | \$1,000,000 combined single limit |
| Umbrella/Excess Liability: | \$2,000,000 combined single limit each
occurrence for bodily injury and/or
property damage |

Circle one please: YES / NO

6. Provide resumes of key personnel anticipated to be involved in this project. Include the following key personnel.

- 1. Principal-In-Charge / Project Executive Not required for subcontractor(s)
- 2. Project Manager Not required for subcontractor(s)

3. General Superintendent

An asterisk indicates a full-time on-site position. Failure to provide the resumes requested, changing of listed key personnel prior to bid, or after contract award without the approval of the Owner may be cause for disqualification at the sole discretion of the Owner.

Has your proposed Project Manager and Project Superintendent been with your organization at least 3 years?

Project Manager: YES / NO

Project Superintendent: YES / NO

7. Provide a description of your company's safety and quality programs. Proposal may include copies of sample project plans in lieu of descriptions. Not required for subcontractor(s)

The Contract award, if made, will be made to the low, responsive, responsible Bidder.

The undersigned certifies under oath that the information provided in this Contractor's Pre-Qualification Statement is true and sufficiently complete so as not to be misleading.

Signature (Officer of the Submitting Firm)

Printed Name and Title

Date



Addendum No. 2

To: Pre-Bid Meeting Attendees

From: Roger Washington
City of Mobile Architectural Engineering Department

Re: Arthur R. Outlaw Convention Center - Mechanical Improvements
Project #CN-015-25

Date: October 14, 2025

This Addendum forms a part of, and modifies, the Request for Quotes for the above referenced project, dated October 6, 2025. Acknowledge the receipt of this Addendum No. 2 and all subsequent Addenda, if any, in the space provided on the Quote Form. Failure to do so may subject Quoter to disqualification.

General:

Item 1. Additional Contact Info.

1. Josa Silva – Smith Mechanical Consulting and Design
 - a. Email: jose@smitheng.us
 - b. Phone: (251) 923-8772

Clarifications:

Item 1. The Pre-Bid Meeting Agenda ***with Modifications*** and Pre-Bid Meeting Attendance Roster, dated October 14, 2025 are attached and form part of Addendum No. 1. Revisions to the Pre-Bid Agenda are indicated with a strike-through for deletions and ***bold italic*** typeface for additions.

Forms and Specifications: NA

Drawings: NA

RFI's: NA

Attachments:

1. Pre-Bid Meeting Agenda *with Modifications*
2. Pre-Bid Meeting Attendance Roster

END OF ADDENDUM NO. 2

**ARTHUR R. OUTLAW CONVENTION CENTER
MECHANICAL IMPROVEMENTS
CN-015-25**

PRE-BID CONFERENCE

10:30 am October 14, 2025,
1 South Water Street, Mobile, Alabama 36602

AGENDA with Modifications

1. Attendance roster. Include a contact person and an e-mail address where any Addenda should be sent. Please write legibly.
2. Introductions - Owner Contacts, Engineers & Consultants, AE Project Manager.
3. Pre-Bid requirements: In order to submit a bid, contractors shall be required to obtain a project manual to be on the attendance roster.
4. Discussion of Scope of Work.
 - a. The project consists of the replacement of chiller #3. In order to replace chiller #3, Chiller #2 will need to be disconnected and shifted to allow room for the chiller to pass by, then be reconnected. Additionally, the three chilled water pumps and three condenser water pumps are to have VFD's installed on the existing pumps.
 - b. There is a \$20,000.00 Contingency Allowance. Allowances shall be utilized only after advance written approval by the Owner. At the end of the project, remaining contingency will be returned to the City via Change Order.
 - c. Protect all existing non-moveable items through the course of construction. Verify with Project Manager if non-moveable item is in conflict with work areas.
 - d. Contractor must obtain permits and arrange for all permit inspections required by the City of Mobile. There is no charge for the Permit. Subcontractors will need to obtain their own permits.
 - e. Before Bidding, Contractor shall verify their license classification of their General Contractors license with the State of Alabama Licensing Board.
 - f. Contractor shall have access to the site seven days a week, 6:00 am until 6:00 pm unless approved differently by Project Manager and Facility Management.
 - g. Contractor shall keep an exceptionally clean site. The Convention Center will continue to operate during normal business hours. All Construction and lay down areas must be protected from public and facility staff.
 - h. The Convention Center shall provide an alternative entry into the Mechanical Room if necessary. This entry shall be coordinated with the Contractor but at no time shall the Contractor block this entry during construction.
 - i. The Contractor may utilize, without cost: power, electricity, toilet, and handwashing facilities, etc. if available in moderation.
 - j. Protect all existing equipment in and around the construction area. Contractor shall be responsible for equipment damaged throughout the course of the work. It is advised that the Contractor document the area before beginning Construction.

- k. Remove waste, spoils, surplus materials, rubbish, from the site daily. Any equipment removed should be hauled away and not left on site at the end of the work day.
- l. Storm and Wastewater:
 - i. Comply with City of Mobile and Alabama Department of Environmental Management requirements. Pay attention to Water Regulations and Allowable Discharges.
 - ii. See City of Mobile Code, Chapter 17, Storm Water Management and Flood Control.
- m. Any observed discrepancies, omissions or errors in any part of the contract documents shall be submitted as written RFIs to Roger Smith at roger@smitheng.us and Roger Washington at roger.washington@cityofmobile.org.
- n. Cut off time for submission of RFIs is by 3:00 pm 7 days before the bid opening date. All requests are to be submitted via e-mail to Roger Smith and Roger Washington.
- o. Cut off time for substitution requests is by 3:00 pm 7 days before the bid opening date. Substitution approvals are Pre-Bid only. All requests are to be submitted via e-mail to Roger Smith and Roger Washington.
- p. Official clarifications or corrections will be made by written addendum sent to all registered prospective bidders via e-mail. Only clarifications immortalized in Addendums are valid.
- q. Contractor shall be responsible for contacting line locators where necessary.

5. Special Instructions or conditions.

- a. Equal Opportunity:
 - i. The City of Mobile, Alabama is an Equal Opportunity Employer and requires that all Contractors comply with the Equal Employment Opportunity laws and the provisions of the Bid Documents in this regard.
 - ii. The City of Mobile also encourages and supports the utilization of Minority Business Enterprises on these and all other publicly solicited Bids and shall be in compliance with the City of Mobile's Minority Utilization Plan as adopted by the City Council.
 - iii. The Contractor shall provide an appropriately completed copy of the "City of Mobile Subcontracting and Major Supplier Plan" in the envelope with their Bid Form. Form shall document DBE Subcontractors participating in the project and, should the total % of DBE participation not meet the 15% minimum, all efforts to obtain DBE Subcontractors shall be documented on or attached to the DBE Form when submitted.
 - iv. During construction, contractors are required to submit a "DBE Utilization Report" with every Pay Application.
 - v. Contractors should contact the City of Mobile, Supplier Diversity Manager for assistance with DBE Subcontractor information and any questions regarding the DBE Compliance Forms. Contact Archnique Kidd at 251-208-7967.
- b. City of Mobile permits are required for the construction, but are available without cost to the Contractor. General Contractor, Plumbing Contractor, and Electrical Contractor shall have a current \$10,000 Surety Bond on file with the City of

Mobile Permitting Division prior to issuance of permits and throughout the contract duration.

6. Bidding instructions, forms, special requirements and time.
 - a. Sealed Bids will be received and clocked in until 2:15 PM local time, Wednesday, the 29th day of October 2025.
 - i. Due to restricted access to Government Plaza offices, it is recommended that Bids be sent by U.S. Postal Service to Office of the City Clerk, PO Box 1827, 36633-1827, if sent by regular mail. Bidders are responsible for ensuring their bids arrive by the bid time and date.
 - ii. Or, if sent by another carrier, addressed to the City Clerk, 9TH floor South Tower, Government Plaza, 205 Government Street, Mobile, Alabama 36602. Bidders are responsible for ensuring their bids arrive by the bid time and date.
 - iii. Bidders delivering Bids in person shall insert sealed Bids into a receptacle, marked "City of Mobile Bids", located in the elevator lobby outside the office of the City Clerk Office, 9th Floor South Tower, Government Plaza, 205 Government Street, Mobile, Alabama 36602.
 - b. All Bids not clocked in by the City Clerk's Office prior to the specified time, or Bids received after the specified time, will be automatically rejected, and returned immediately, unopened.
 - c. Bids will be publicly opened and read at 2:30 PM local time, in the Atrium Lobby of Government Plaza.
 - d. This is a tax-exempt project. As per the State of Alabama ACT 2013-205, the Alabama Department of Revenue (ADOR) has been granted the authority to issue a "Certificate of Exemption from Sales and Use Tax for Governmental Entities" on construction projects. Therefore, this project shall qualify for State of Alabama Sales and Use Tax Exemptions under this ACT. It is the responsibility of the Bidder to confirm the potential tax-exempt status of their bid with the ADOR and include any such savings in their bid, as well as accounting for same on their bid form attachment Sales Tax Form C-3A.
7. Additional Requirements at time of Contract execution:
 - a. A valid City of Mobile business license for the duration of the contract period
 - b. E-verify Documentation: The Beason-Hammond Taxpayer Protection Act applies to this project. Contractor shall comply with the requirements of this Act and show proof of enrollment in the E-verify program by submitting the electronically generated Federal E-verify document prior to signing the construction contract. (see Project Manual)
 - c. Performance Bond and Labor & Material Payment Bond are required.
 - d. Certificate of Insurance in amounts and with endorsements as required by the City of Mobile (see Project Manual or Request for Quotes documents).
 - e. Builder's Risk Insurance:
 - i. ALL RISK Builder's Risk coverage shall be provided for the Contractor, Owner and all SubContractors for the full amount of the Contract during construction, fabrications, storage, transport and erection of any equipment.
 - ii. Policy provisions and the Certificate of Insurance shall be provided to the Owner.

8. Payment requirements.
 - a. Retainage withheld at 5% of the first 50% of Construction Completed until the amount equals 2.5% of the full contract amount.
 - b. The final 2.5% of the full contract amount is withheld as retainage until all close out requirements are met, proof of advertisement, warranties, Consent of Surety, and release of liens, etc. By State of Alabama Law, notice of final completion of the contract shall be published four times in a local newspaper of general circulation.
 - c. The City of Mobile is unable to issue payment or deposits on materials that are not on the project site, or in the City of Mobile stored in a climate controlled, bonded warehouse where a City representative can verify their presence and proper storage.
9. Owner/City of Mobile contacts and phone numbers:
 - a. Roger Smith: 251-402-1364 (Smith Mechanical Consulting & Design)
 - b. Roger Washington: 251-208-7812 (Capital Improvement Project Manager)
10. Walk of Site
11. Adjourn

[illegible]



Addendum No. 1

To: Pre-Bid Meeting Attendees

From: Roger Washington
City of Mobile Architectural Engineering Department

Re: Arthur R. Outlaw Convention Center - Mechanical Improvements
Project #CN-015-25

Date: October 9, 2025

This Addendum forms a part of, and modifies, the Request for Quotes for the above referenced project, dated October 6, 2025. Acknowledge the receipt of this Addendum No. 1 and all subsequent Addenda, if any, in the space provided on the Quote Form. Failure to do so may subject Quoter to disqualification.

General: NA

Clarifications: NA

Forms and Specifications:

- Section 230000 - HVAC General Specification
- Section 230553 - HVAC Identification Specification
- Section 232113 - Hydronic Piping Specification

Drawings: NA

RFI's: NA

Attachments:

1. 230000 - HVAC General
2. 230553 - HVAC Identification
3. 232113 - Hydronic Piping

END OF ADDENDUM NO. 1

SECTION 230000 – HVAC GENERAL

PART 1 - GENERAL

- 1.1 The work covered by this division consists of providing all labor, equipment and materials and performing all operations necessary for the installation of the mechanical work as herein called for and shown on the drawings. The work shall include but shall not be limited to the following:

Provide all HVAC (Heating, Ventilating, and Air Conditioning) and associated controls systems for the project. Fully coordinate all mechanical requirements with work by other Divisions under this construction contract. All systems shall be complete and fully functional.

1.2 Related Documents:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.
- B. Provisions of this section apply to work of all Division 23 sections.
- C. Review all other contract documents to be aware of conditions affecting work herein.

1.3 Definitions:

- A. Provide: Furnish and install, complete and ready for intended use.
- B. Furnish: Supply and deliver to the project site, ready for subsequent requirements.
- C. Install: Operations at project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar requirements.

- 1.4 Permits and Fees: Contractor shall obtain all necessary permits, meters, and inspections required for Division 23 work and pay all fees and charges incidental thereto.

- 1.5 Verification of Owner's Survey Data: Prior to commencing any work, the Contractor shall verify the accuracy of all survey data as indicated in these plans and specifications and/or as provided by the Owner. Should the Contractor discover any inaccuracies, errors, or omissions in the data, such items shall immediately be notified to the Architect/Engineer so that proper adjustments can be anticipated and ordered. Commencement by the Contractor of work shall be held as an acceptance of the data after which time the Contractor has no claim against the Owner resulting from alleged errors, omissions or inaccuracies of the said data.

- 1.6 Delivery and Storage of Materials: Materials delivered to site shall be inspected for damage,

unloaded, and stored with a minimum of handling. All material shall be stored to provide protection from the weather and accidental damage.

- 1.7 Extent of work is indicated by the drawings, schedules, and the requirements of the specifications. Singular references shall not be construed as requiring only one device if multiple devices are shown on the drawings or are required for proper system operation.

1.8 Field Measurements and Coordination:

- A. The intent of the drawings and specifications is to obtain a complete and satisfactory installation. Separate divisional drawings and specifications shall not relieve the Contractor or subcontractors from full compliance of work of his trade indicated on any of the Drawings or in any Section of the Specifications. Report conflicts prior to start of work.
- B. Verify all field dimensions and locations of equipment to ensure close, neat fit with other trades' work. Make use of all contract documents and approved shop drawings to verify exact dimension and locations.
- C. Coordinate work in this division with all other trades in proper sequence to ensure that the total work is completed within contract time schedule and with minimum cutting and patching.
- D. Locate all equipment, ductwork, piping, and apparatus symmetrical with architectural elements. Install to exact height and locations when shown on architectural drawings. When locations are shown only on mechanical drawings, be guided by architectural details and conditions existing at job and correlate this work with that of others. Provide all required work clearances as defined by code and manufacturer's recommendations.
- E. Install work as required to fit structure, avoid obstructions, and retain clearance, headroom, openings and passageways. Cut no structural members without written approval from Engineer or Architect.
- F. Carefully examine any existing conditions, piping, ductwork, and premises. Compare drawings with existing conditions. Report any observed discrepancies. It shall be the Contractor's responsibility to properly coordinate the work and to identify problems in a timely manner. Written instructions will be issued by the Engineer to resolve discrepancies.
- G. Because of the small scale of the drawings, it is not possible to indicate all offsets and fittings or to locate every accessory. Drawings are essentially diagrammatic. Study carefully the sizes and locations of structural members, wall and partition locations, trusses, and room dimensions and take actual measurements on the job. Locate piping, ductwork, equipment and accessories with sufficient space for installing and servicing. Contractor is responsible for accuracy of his measurements and for coordination with all trades. Contractor shall not order materials or perform work without verification. No extra compensation will be allowed because field measurements vary from the dimensions on the drawings. If field measurements show that equipment or material cannot be fitted, the Engineer shall be consulted. Remove and relocate, without additional compensation, any item that is installed and is later found to encroach on space assigned to another use.

1.9 Guarantee and Service:

- A. The Contractor shall guarantee labor, materials and equipment for a period of one (1) year from Substantial Completion, or from Owner's occupancy, whichever is earlier. Contractor shall make good any defects and shall include all necessary adjustments to and replacement of defective items without expense to the Owner. Manufacturer warranties do not relieve the Contractor of this responsibility.
- B. Owner reserves the right to make emergency repairs as required to keep equipment in operation without voiding Contractor's Guarantee Bond or relieving Contractor of his responsibilities during guarantee period.
- C. Contractor shall provide service of all new equipment during the guarantee period without additional expense to the Owner.

1.10 Approval Submittals:

- A. Shop drawings, product literature, and other approved submittals will only be reviewed if they are submitted in full accordance with the General and Supplementary Conditions and Division 1 Specification sections and the following:
 - 1. Submittals shall not include items from more than one specification section in the same submittal package.
 - 2. Submittals shall be properly identified by a cover sheet showing the project name, Architect and Engineer names, submittal control numbers, specification section, a list of products or item names with model numbers in the order they appear in the package, and spaces for approved stamps. A sample cover sheet is included at the end of this section.
 - 3. Submittals shall have been reviewed and approved by the General Contractor (or Prime Contractor). Evidence of this review and approval shall be an "Approved" stamp with a signature and date on the cover sheet.
 - 4. The electrical design shown on the drawings supports the mechanical equipment basis of design specifications at the time of design. If mechanical equipment is submitted with different electrical requirements, it is the responsibility of the mechanical contractor to resolve all required electrical design changes (wire and conduit size, type of disconnect or overload protection, point(s) of connection, etc.) and clearly show the new electrical design on the mechanical submittal with a written statement that this change will be provided at no additional cost. Mechanical submittals made with no written reference to the electrical design will be presumed to work with the electrical design. Any corrections required will be at no additional cost. It is expected for this project that the electrical power requirements are generally limited to disconnect and reconnection of the circuits for the chilled water pumps. See plan notes for additional information and requirements.
- B. Before ordering any materials or equipment, and within 30 days after the award of the contract, the Contractor shall submit to the Architect/Engineer one complete schedule showing the make, type, manufacturer's name and trade designation of all equipment.

1. This schedule shall be accompanied by the required number of copies of the manufacturer's printed specifications and shop drawings for each piece of equipment or specialty and shall give dimensions, diagrams, descriptive literature, capacity or rating, kind of material, finish, guarantee, etc., and such other detailed information as the Architect/Engineer may require.
 2. When approved, such schedule shall be an addition to these specifications, and shall be of equal force in that no deviation will be permitted except with the approval of the Architect/Engineer.
- C. If the shop drawings show variation from the requirements of the contract documents, the Contractor shall make specific mention of such variation in his letter of transmittal. If acceptable, Contractor will not be relieved of the responsibility for executing the work in accordance with the contract.
- D. Review of shop drawings, descriptive literature, catalog data, or schedules shall not relieve the Contractor from responsibility for deviations from Contract Drawings or Specifications, unless he has in writing called to the attention of the Architect/Engineer such deviation at the time of submission, nor shall it relieve him from responsibility for errors of any sort in shop drawings, descriptive literature, catalog data, or schedules. Any feature or function specified but not mentioned in the submittal shall be assumed to be included per the specification.
- E. Submit shop drawings and any other drawings called for in other sections. Shop drawings shall consist of plans, sections, elevations and details to scale (not smaller than 1/4" per foot), with dimensions clearly showing the installation. Direct copies of small-scale project drawings issued to the Contractor are not acceptable. Drawings shall take into account equipment furnished under other sections and shall show space allotted for it. Include construction details and materials.
- F. Submit product data after award of the contract and before any equipment or materials are purchased. Product data are defined as manufacturer's printed literature specifically marked to indicate size and model and accompanied by rating sheets listing values showing that equipment meets scheduled or specified values. Properly coded stamp from the Engineer on returned submittal is required before ordering equipment.
- G. Coordinate with other divisions supplying equipment prior to submitting shop drawings.
- H. Shop drawings shall be submitted in one package unless approved otherwise by the Engineer. Provide an index of sections listing manufacturers and "as-specified" or not. Each specification section shall be tabbed with equipment inserted.
- 1.11 Test Reports and Verification Submittals: Submit test reports, certifications and verification letters as called for in other sections. Contractor shall coordinate the required testing and documentation of system performance such that sufficient time exists to prepare the reports, review the reports, and take corrective action within the scheduled contract time.
- 1.12 O&M Data Submittals: Submit Operations and Maintenance data as called for in other sections when a copy of approved submittals is included in the O&M Manual, only the final "Furnish as Submitted" or "Furnish as Corrected" copy shall be used. Contractor shall organize these later

in the O&M Manuals tabbed by specification number. Prepare O&M Manuals as required by Division 1 and as described herein. Submit manuals at the Substantial Completion inspection.

PART 2 - PRODUCTS

- 2.1 All materials shall be new or Owner-supplied reused as shown on the Drawings, the best of their respective kinds, suitable for the conditions and duties imposed on them. The description, characteristics, and requirements of materials to be used shall be in accordance with qualifying conditions established in the following sections.
- 2.2 Equipment and Materials:
- A. Equipment and materials furnished under this division shall be the product of a manufacturer regularly engaged in the manufacture of such items for a period of three years. Where practical, all of the components shall be products of a single manufacturer in order to provide proper coordination and responsibility. Where required, Contractor shall furnish proof of installation of similar equipment or materials.
 - B. Each item of equipment shall bear a nameplate showing the manufacturer's name, trade name, model number, serial number, ratings and other information necessary to fully identify it. This plate shall be permanently mounted in a prominent location and shall not be concealed, insulated or painted.
 - C. The label of the approving agency, such as UL, ASME, AHRI, or AMCA, by which a standard has been established for each particular item, shall be in full view.
 - D. The equipment shall be essentially the standard product of a manufacturer regularly engaged in the production of such equipment and shall be a product of the manufacturer's latest design.
 - E. A service organization with personnel and spare parts shall be available within two hours for each type of equipment furnished.
 - F. Install in accordance with manufacturer's recommendations. Place in service by a factory trained representative where required.
 - G. Materials and equipment are specified herein by a single or by multiple manufacturers to indicate quality, material and type of construction desired. Manufacturer's products shown on the drawings have been used as basis for design; it shall be the Contractor's responsibility to ascertain that alternate manufacturer's products meet detailed specifications and that size and arrangement of the equipment are suitable for installation.
 - H. Model Numbers: Catalog numbers and model numbers indicated in the drawings and specifications are used as a guide in the selection of the equipment and are only listed for the Contractor's convenience. The Contractor shall determine the actual model numbers for ordering equipment and materials in accordance with the written description of each item and with the intent of the drawings and specifications.

- I. All equipment and material shall be manufactured and assembled in the United States.

2.3 Requests for Substitution:

- A. Where a particular system, product or material is specified by name, consider it as standard basis for bidding, and base proposal on the particular system, product or material specified. Other systems, products, equipment or materials may be accepted only if in the opinion of the Engineer, that they are equivalent in quality and workmanship and will perform satisfactorily its intended purpose. The Engineer shall approve all such substitutions in materials or equipment in writing. This shall occur prior to bidding.
- B. In making requests for substitutions, the Contractor shall list the particular system, product, equipment or material he wishes to substitute and, at bid time, the Contractor shall state the amount he will add or deduct from his base bid if the substitution is approved by the Engineer. If the Contractor allows no deduction or addition to the base bid for such substitution, it shall be stated on the request.
- C. Requests by the Contractor for substitution will be considered only when reasonable, timely, fully documented, and qualifying under one or more of the following circumstances.
 1. Required product cannot be supplied in time for compliance with Contract time requirements.
 2. Required product is not acceptable to governing authority, or determined to be non-compatible, or cannot be properly coordinated, warranted or insured, or has other recognized disabilities as certified by the Contractor.
 3. Substantial cost advantage is offered to the Owner after deducting offsetting disadvantages including delays, additional compensation for redesign, investigation, evaluation and other necessary services and similar considerations.
- D. All requests for substitution shall contain a "Comparison Schedule" and clearly and specifically indicate any and all differences and omissions between the product specified as the basis of design and the product proposed for substitution. Differences shall include, but not limited to, data as follows for both the specified and substituted products:
 1. Principle of operation.
 2. Materials of construction or finishes.
 3. Thickness or gauge of materials.
 4. Weight of item.
 5. Deleted features or items.
 6. Added features or items.
 7. Changes in other work caused by the substitution.
 8. Performance and rating data.
- E. If the approved substitution contains differences or omissions not specifically called to the attention of the Engineer, the Owner reserves the right to require equal or similar features to be added to the substituted products at the Contractor's expense.

- 2.4 Prior Approval: Prior Approval shall be required for any manufacturer other than those listed for all specified items in the Drawings and Specifications. Submit all requests for approval of the alternate manufacturer's products two weeks prior to bid opening. Approval will be in the form of an Addendum to the Specifications and Drawings. Clearly indicate all differences between the specified and proposed product following the guidelines for substitution herein. This requirement may be waived if, in the opinion of the Engineer, it is in the best interest of the Owner. Submittals received after award of the bid for equipment that has not be Prior Approved shall be subject to immediate rejection.

PART 3 - EXECUTION

- 3.1 Workmanship: All materials and equipment shall be installed and completed in a first-class workmanlike manner and in accordance with the best modern methods and practice. Any materials installed which do not present an orderly and reasonably neat and/or workmanlike appearance, or do not allow adequate space for maintenance, shall be removed and replaced when so directed by the Architect/Engineer.
- 3.2 Coordination:
- A. The Contractor shall be responsible for full coordination of the mechanical systems with shop drawings of the building construction so the proper openings and sleeves or supports are provided for piping, ductwork, or other equipment passing through slabs or walls.
 - B. Any additional steel supports required for the installation of any mechanical equipment, piping, or ductwork shall be furnished and installed under the section of the specifications requiring the additional supports.
 - C. It shall be the Contractor's responsibility to verify all equipment such as valves, dampers, filters and such other apparatus or equipment that may require maintenance and operation are made easily accessible, regardless of the diagrammatic location shown on the drawings.
 - D. All connections to devices and equipment shown on the drawings shall be considered diagrammatic unless otherwise indicated by detail. The actual connections shall be made to fully suit the requirements of each case and adequately provide for expansion and servicing.
 - E. The Contractor shall protect equipment, material, and fixtures at all times during storage and construction. The Contractor shall replace all equipment, material, and fixtures which are damaged as a result of inadequate protection.
 - F. Prior to starting and during progress of work, examine work and materials installed by others as they apply to work in this division. Report conditions which will prevent satisfactory installation.
 - G. Start of work will be construed as acceptance of suitability of work of others.
- 3.3 Interruption of Service: Before any equipment is shut down for disconnection or tie-ins,

arrangements shall be made with the Architect/Engineer and this work shall be done at the time best suited to the Owner. This will typically be on weekends and/or holidays and/or after normal working hours. Services shall be restored the same day unless prior arrangements are made. All overtime or premium costs associated with this work shall be included in the base bid.

- 3.4 Phasing: Provide all required temporary valves, piping, ductwork, equipment and devices as required. Maintain temporary services to areas as required. Remove all temporary material and equipment on completion of work unless Engineer concurs that such material and equipment would be beneficial to the Owner on a permanent basis.
- 3.5 Cutting and Patching: Contractor shall be responsible for cutting and patching of all holes, chases, sleeves, and other openings required for installation of equipment furnished and installed under these Specifications. Utilize experienced trades for cutting and patching. Obtain permission from Architect/Engineer before cutting any structural items.
- 3.6 Equipment Setting: Bolt equipment directly to concrete pads or vibration isolators as required, using hot-dipped galvanized anchor bolts, nuts and washers. Level equipment.
- 3.7 Painting: Touch-up factory finishes on equipment located inside and outside shall be done under the Division 23. Obtain matched color coatings from the manufacturer and apply as directed. If corrosion is found during inspection on the surface of any equipment, clean, prime, and paint as required. If corrosion is found to be extensive by the Engineer, the equipment shall be removed and replaced with factory new at the expense of the Contractor.
- 3.8 Cleanup: Thoroughly clean all exposed parts of apparatus and equipment of cement, plaster, and other materials and remove all oil and grease spots. Repaint or touch up as required to look like new. During progress of work, Contractor is to carefully clean up and leave premises and all portions of building free from debris and in a clean and safe condition.
- 3.9 Startup and Operational Test: Start each item of equipment in strict accordance with the manufacturer's instructions; or where noted under equipment specification, startup shall be done by a qualified representative of the manufacturer. Alignment, lubrication, safety, and operating control shall be included in startup check.
- 3.10 Climate Control: Operate heating and cooling systems as required after initial startup to maintain temperature and humidity conditions to avoid freeze damage and warping or sagging of ceilings and carpet. Operate ventilation systems as required after initial startup in coordination with interior building finishes. Provide and maintain temporary filter media at return air and exhaust air inlets as required to prevent circulation of construction dust / debris through ductwork, coils, and related system components; this filter media is in addition to construction filters protecting coils at air handling equipment.

3.11 Record Drawings:

- A. During the progress of the work, the Contractor shall record on his field set of drawings the exact location, as installed, of all piping, ductwork, equipment, and other systems which are not installed exactly as shown on the contract drawings.
- B. Upon completion of the work, record drawings shall be prepared as described in the General Conditions, Supplementary Conditions, and Division 1 sections.

3.12 Acceptance:

- A. Request inspections as required under the Supplementary or General Conditions. Conceal no work until inspected.
- B. Punch List: Submit written confirmation that all punch lists have been checked and the required work completed. The Contractor shall pay, at the Engineer's current billing rate, for additional field time required by the Engineer to report or check on previous punch list deficiencies.
- C. Instructions: At completion of the work, provide a competent and experienced person who is thoroughly familiar with project, for a period deemed necessary by the Owner to instruct permanent operating personnel in the operation of equipment and control systems.
- D. Operation and Maintenance Manuals: Furnish complete manuals electronically and organized by system or section. Manuals shall contain:
 - 1. Detailed operating instructions and instructions for making minor adjustments.
 - 2. Complete wiring and control diagrams.
 - 3. Routine maintenance operations.
 - 4. Manufacturer's catalog data, service instructions, and parts lists for each piece of operating equipment.
 - 5. Copies of approved submittals.
 - 6. Copies of all manufacturers' warranties.
 - 7. Copies of test reports and verification submittals.
- E. Control Diagrams: Frame under glass and mount on equipment room wall.
- F. Test and Balance Report: Submit electronic copies. Report shall be submitted for review prior to Substantial Completion, unless otherwise required by Division 1.
- G. Warranties: Submit copies of all manufacturers' warranties.
- H. Record Drawings: Submit record drawings.
- I. Acceptance will be made on the basis of tests and inspections of the work. A representative of firm that performed test and balance work shall be in attendance to assist. Contractor shall furnish necessary mechanics to operate system, make any necessary adjustments and assist with final inspection.

Authur R. Outlaw Convention Center
Mechanical Improvements
Project No: CN-015-25

Smith Mechanical Consulting & Design

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Mechanical Improvements
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Smith Mechanical Consulting & Design

This is a sample cover
sheet. Use one for
each shop drawing.

PROJECT NAME
PROJECT NUMBER

SAMPLE

ARCHITECT/ENGINEER: Smith Mechanical Consulting & Design

CONTRACTOR: XYZ Construction

SUBCONTRACTOR: ABC Mechanical Contractor

SUPPLIER: Supply Company

MANUFACTURER: Manufacturer

DATE: MM/DD/YYYY

SECTION: 23 XX XX / Section Name

1. Description: Manufacturer, Model

2. Description: Manufacturer, Model

3. Description: Manufacturer, Model

4. Description: Manufacturer, Model

5. Description: Manufacturer, Model

Any standard
heading is
acceptable

List each item
separately;
include
manufacturer name
and model number

General
Contractor's
APPROVAL stamp
must be on this
sheet.

END OF SECTION

Authur R. Outlaw Convention Center
Mechanical Improvements
Project No: CN-015-25

Smith Mechanical Consulting & Design

SECTION 230553 – HVAC IDENTIFICATION

PART 1 - GENERAL

1.1 Related Documents:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to this section.
- B. This section is a Division 23 Common Work Results for HVAC section, and is part of each Division 23 section making reference to or requiring identification devices specified herein.
- C. Extent of HVAC identification work required by this section is indicated on drawings and/or specified in other Division 23 sections.
- D. Refer to Division 26 sections for identification requirements of electrical work (not work of this section). Refer to other Division 23 sections for identification requirements for HVAC controls (not work of this section).

1.2 Codes and Standards: Comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

PART 2 - PRODUCTS

2.1 General: Provide manufacturer's standard products of categories and types required for each application as referenced in other Division 23 sections. Where more than a single type is specified for application, selection is the Contractor's option, but provide single selection for each product category.

2.2 Painted Identification Materials:

- A. Stencils: Standard fiberboard stencils, prepared for required applications with letter sizes generally complying with recommendations of ANSI A13.1 for piping and similar applications, but not less than 1-1/4" high letters for ductwork and not less than 3/4" high letters for access door signs and similar operational instructions.
- B. Stencil Paint: Standard exterior type stenciling enamel; black, except as otherwise indicated; either brushing grade or pressurized spray-can form and grade.
- C. Identification Paint: Standard identification enamel.

2.3 Plastic Pipe Markers:

- A. Pressure-Sensitive Type: Provide manufacturer's standard pre-printed, permanent adhesive,

color-coded, pressure-sensitive vinyl pipe markers.

- B. Lettering: Manufacturer's standard pre-printed nomenclature which best describes piping system in each instance, as selected by Architect/Engineer in cases of variance with name as shown or specified.
- C. Arrows: Print each pipe marker with arrows indicating direction of flow, either integrally with piping system service lettering (to accommodate both directions), or as separate unit of plastic.

2.4 Engraved Plastic-Laminate Signs:

- A. General: Provide engraving stock melamine plastic laminate, in the sizes and thicknesses indicated, engraved with engraver's standard letter style a minimum of 3/4" tall and wording indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate.
- B. Thickness: 1/16" for units up to 20 square inches or 8" length; 1/8" for larger units.
- C. Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.

2.5 Stamped Nameplates: Provide equipment manufacturer's standard stamped nameplates for motors, AHUs, pumps, etc.

PART 3 - EXECUTION

3.1 Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.

3.2 Ductwork Identification:

- A. General: Identify air supply, return, exhaust, outside air intake, and relief ductwork with stenciled signs and arrows, showing ductwork service and direction of flow, in black or white.
- B. Location: In each space where ductwork is exposed, or concealed only by removable ceiling system, locate signs near points where ductwork originates or continues into concealed enclosures, and at 50' spacing along exposed runs.
- C. Access Doors: Provide stenciled signs on each access door in ductwork and housings, indicating purpose of access (to what equipment) and other maintenance and operating instructions and appropriate and procedural information.

3.3 Mechanical Equipment Identification:

- A. General: Install engraved plastic laminate sign on or near each major item of mechanical equipment and each operational device. Label shall indicate type of system and area served. Provide signs for the following general categories of equipment and operational devices:
1. Main control and operating valves, including safety devices.
 2. Meters, gauges, thermometers, and similar units.
 3. Fuel-burning equipment including boilers, furnaces, and heaters.
 4. Pumps, compressors, chillers, condensers, and similar equipment.
 5. Heat exchangers, coils, evaporators, cooling towers, heat recovery units and similar equipment.
 6. Fans, blowers, primary balancing dampers and VAV boxes.
 7. HVAC air handlers, ductless units, and fan coil units.
 8. Tanks and pressure vessels.
 9. Air conditioning indoor and outdoor units.
- B. Above-Ceiling Identification: Provide additional engraved plastic laminate sign attached to ceiling to indicate location of concealed equipment installed above ceiling. Coordinate size, location, and attachment of above-ceiling equipment identification with Architect / Engineer.

- 3.4 Stamped Nameplates: Equipment manufacturers to provide standard stamped nameplates on all major equipment items such as motors, pumps, boilers, chillers, AHUs, etc. Where motors are hidden from view (within equipment casing, or otherwise not easily accessible, etc.), the equipment supplier shall furnish a duplicate motor data nameplate to be affixed to the equipment casing in an easily visible location, unless data is already included on the equipment nameplate.

3.5 Adjusting and Cleaning:

- A. Relocate any mechanical identification device which has become visually blocked by work of this division or other divisions.
- B. Clean face of each identification device and glass frame of each valve chart.

END OF SECTION

SECTION 232113 - HYDRONIC PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes pipe and fitting materials, joining methods, special-duty valves, and specialties for the following:
 - 1. Condenser-water piping.
 - 2. Makeup-water piping.
 - 3. Condensate-drain piping.
- B. See Section 232123 "Hydronic Pumps" for pumps, motors, and accessories for hydronic piping.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of the following:
 - 1. Plastic pipe and fittings with solvent cement.
 - 2. Pressure-seal fittings.
 - 3. Steel Pipe and Fittings.
 - 4. Valves.
 - 5. Hydronic specialties.

1.3 INFORMATIONAL SUBMITTALS

- A. Field quality-control test reports.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

- A. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation. Safety valves and pressure vessels shall bear the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

PART 2 - PRODUCTS

2.1 STEEL PIPE AND FITTINGS

- A. Steel Pipe: ASTM A 53/A 53M, black steel with plain ends; type, grade, and wall thickness as indicated in Part 3 "Piping Applications" Article.
- B. Cast-Iron Threaded Fittings: ASME B16.4; Classes 125 and 250 as indicated in Part 3 "Piping Applications" Article.
- C. Malleable-Iron Threaded Fittings: ASME B16.3, Classes 150 and 300 as indicated in Part 3 "Piping Applications" Article.
- D. Malleable-Iron Unions: ASME B16.39; Classes 150, 250, and 300 as indicated in Part 3 "Piping Applications" Article.
- E. Cast-Iron Pipe Flanges and Flanged Fittings: ASME B16.1, Classes 25, 125, and 250; raised ground face, and bolt holes spot faced as indicated in Part 3 "Piping Applications" Article.
- F. Wrought Cast- and Forged-Steel Flanges and Flanged Fittings: ASME B16.5, including bolts, nuts, and gaskets of the following material group, end connections, and facings:
 - 1. Material Group: 1.1.
 - 2. End Connections: Butt welding.
 - 3. Facings: Raised face.
- G. Grooved Mechanical-Joint Fittings and Couplings:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 3. Basis-of-Design Product: Subject to compliance with requirements, provide [the product indicated on Drawings] <Insert manufacturer's name; product name or designation> or a comparable product by one of the following:
 - a. Anvil International, Inc.
 - b. Central Sprinkler Company; a division of Tyco Fire & Building Products.
 - c. National Fittings, Inc.
 - d. S. P. Fittings; a division of Star Pipe Products.
 - e. Victaulic Company.
 - f. <Insert manufacturer's name.>

4. Joint Fittings: ASTM A 536, Grade 65-45-12 ductile iron; ASTM A 47/A 47M, Grade 32510 malleable iron; ASTM A 53/A 53M, Type F, E, or S, Grade B fabricated steel; or ASTM A 106, Grade B steel fittings with grooves or shoulders constructed to accept grooved-end couplings; with nuts, bolts, locking pin, locking toggle, or lugs to secure grooved pipe and fittings.
5. Couplings: Ductile- or malleable-iron housing and synthetic rubber gasket of central cavity pressure-responsive design; with nuts, bolts, locking pin, locking toggle, or lugs to secure grooved pipe and fittings.

2.2 PLASTIC PIPE AND FITTINGS

- A. PVC Plastic Pipe: ASTM D 1785, Schedules 80, plain ends as indicated in Part 3 "Piping Applications" Article.
- B. PVC Plastic Pipe Fittings: Socket-type pipe fittings, ASTM D 2467 for Schedule 80 pipe.

2.3 JOINING MATERIALS

- A. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
 1. ASME B16.21, nonmetallic, flat, asbestos free, 1/8-inch (3.2-mm) maximum thickness unless thickness or specific material is indicated.
 - a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
 - b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
- B. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.
- C. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
- D. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- E. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for joining copper with copper; or BAg-1, silver alloy for joining copper with bronze or steel.
- F. Solvent Cements for Joining Plastic Piping:
 1. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
 - a. PVC solvent cement shall have a VOC content of 510 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

- b. Adhesive primer shall have a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - c. Solvent cement and adhesive primer shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- G. Gasket Material: Thickness, material, and type suitable for fluid to be handled and working temperatures and pressures.

2.4 TRANSITION FITTINGS

A. Plastic-to-Metal Transition Fittings:

- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Charlotte Pipe and Foundry Company.
 - b. IPEX Inc.
 - c. KBi.
- 3. PVC one-piece fitting with one threaded brass or copper insert and one Schedule 80 solvent-cement-joint end.

B. Plastic-to-Metal Transition Unions:

- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Charlotte Pipe and Foundry Company.
 - b. IPEX Inc.
 - c. KBi.
 - d. NIBCO INC.
- 3. MSS SP-107, PVC union. Include brass or copper end, Schedule 80 solvent-cement-joint end, rubber gasket, and threaded union.

2.5 DIELECTRIC FITTINGS

- A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.

2.6 VALVES

- A. Gate, Globe, Check, Ball, and Butterfly Valves: Comply with requirements specified in Section 230523 "General-Duty Valves for HVAC Piping."

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

- A. Condenser-water piping, aboveground, NPS 2-1/2 (DN 65) and larger, shall be any of the following:
 - 1. Type L (B), drawn-temper copper tubing, wrought-copper fittings, and brazed joints.
 - 2. Schedule 80 steel pipe, wrought-steel fittings and wrought-cast or forged-steel flanges and flange fittings, and welded and flanged joints.
 - 3. Schedule 80 steel pipe; grooved, mechanical joint coupling and fittings; and grooved, mechanical joints.
- B. Condenser-Water Piping Installed Belowground and within Slabs: Type K (A), annealed-temper copper tubing, wrought-copper fittings, and brazed joints. Use the fewest possible joints.
- C. Makeup-water piping installed aboveground shall be either of the following:
 - 1. Type L (B), drawn-temper copper tubing, wrought-copper fittings, and soldered joints.
 - 2. Schedule 80 CPVC plastic pipe and fittings, and solvent-welded joints.
- D. Makeup-Water Piping Installed Belowground and within Slabs: Type K (A), annealed-temper copper tubing, wrought-copper fittings, and soldered joints. Use the fewest possible joints.
- E. Condensate-Drain Piping: Type M, drawn-temper copper tubing, wrought-copper fittings, and soldered joints or Schedule 80 PVC plastic pipe and fittings and solvent-welded joints.

- F. Condensate-Drain Piping: Schedule 40 PVC plastic pipe and fittings and solvent-welded joints.
- G. Blowdown-Drain Piping: Same materials and joining methods as for piping specified for the service in which blowdown drain is installed.

3.2 VALVE APPLICATIONS

- A. Install shutoff-duty valves at each branch connection to supply mains, and at supply connection to each piece of equipment.

3.3 PIPING INSTALLATIONS

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicate piping locations and arrangements if such were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- B. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping to permit valve servicing.
- E. Install piping at indicated slopes.
- F. Install piping free of sags and bends.
- G. Install fittings for changes in direction and branch connections.
- H. Install piping to allow application of insulation.
- I. Select system components with pressure rating equal to or greater than system operating pressure.
- J. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.
- K. Install drains, consisting of a tee fitting, NPS 3/4 (DN 20) ball valve, and short NPS 3/4 (DN 20) threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.

- L. Install piping at a uniform grade of 0.2 percent upward in direction of flow.
- M. Reduce pipe sizes using eccentric reducer fitting installed with level side up.
- N. Install branch connections to mains using mechanically formed tee fittings in main pipe, with the branch connected to the bottom of the main pipe. For up-feed risers, connect the branch to the top of the main pipe.
- O. Install valves according to Section 230523 "General-Duty Valves for HVAC Piping."
- P. Install unions in piping, NPS 2 (DN 50) and smaller, adjacent to valves, at final connections of equipment, and elsewhere as indicated.
- Q. Install flanges in piping, NPS 2-1/2 (DN 65) and larger, at final connections of equipment and elsewhere as indicated.
- R. Install strainers on inlet side of each control valve, pressure-reducing valve, solenoid valve, in-line pump, and elsewhere as indicated. Install NPS 3/4 (DN 20) nipple and ball valve in blowdown connection of strainers NPS 2 (DN 50) and larger. Match size of strainer blowoff connection for strainers smaller than NPS 2 (DN 50).
- S. Install expansion loops, expansion joints, anchors, and pipe alignment guides as specified in Section 230516 "Expansion Fittings and Loops for HVAC Piping."
- T. Identify piping as specified in Section 230553 "Identification for HVAC Piping and Equipment."
- U. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."
- V. Install sleeve seals for piping penetrations of concrete walls and slabs.
- W. Install escutcheons for piping penetrations of walls, ceilings, and floors.

3.4 HANGERS AND SUPPORTS

- A. Hanger, support, and anchor devices are specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment." Comply with the following requirements for maximum spacing of supports.
- B. Seismic restraints are specified in Section 230548 "Vibration and Seismic Controls for HVAC Piping and Equipment."
- C. Install the following pipe attachments:

1. Adjustable steel clevis hangers for individual horizontal piping less than 20 feet (6 m) long.
 2. Adjustable roller hangers and spring hangers for individual horizontal piping 20 feet (6 m) or longer.
 3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet (6 m) or longer, supported on a trapeze.
 4. Spring hangers to support vertical runs.
 5. Provide copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.
 6. On plastic pipe, install pads or cushions on bearing surfaces to prevent hanger from scratching pipe.
- D. Install hangers for steel piping with the following maximum spacing and minimum rod sizes:
1. NPS 3/4 (DN 20): Maximum span, 7 feet (2.1 m); minimum rod size, 1/4 inch (6.4 mm).
 2. NPS 1 (DN 25): Maximum span, 7 feet (2.1 m); minimum rod size, 1/4 inch (6.4 mm).
 3. NPS 1-1/2 (DN 40): Maximum span, 9 feet (2.7 m); minimum rod size, 3/8 inch (10 mm).
 4. NPS 2 (DN 50): Maximum span, 10 feet (3 m); minimum rod size, 3/8 inch (10 mm).
 5. NPS 2-1/2 (DN 65): Maximum span, 11 feet (3.4 m); minimum rod size, 3/8 inch (10 mm).
 6. NPS 3 (DN 80): Maximum span, 12 feet (3.7 m); minimum rod size, 3/8 inch (10 mm).
 7. NPS 4 (DN 100): Maximum span, 14 feet (4.3 m); minimum rod size, 1/2 inch (13 mm).
- E. Install hangers for drawn-temper copper piping with the following maximum spacing and minimum rod sizes:
1. NPS 3/4 (DN 20): Maximum span, 5 feet (1.5 m); minimum rod size, 1/4 inch (6.4 mm).
 2. NPS 1 (DN 25): Maximum span, 6 feet (1.8 m); minimum rod size, 1/4 inch (6.4 mm).
 3. NPS 1-1/2 (DN 40): Maximum span, 8 feet (2.4 m); minimum rod size, 3/8 inch (10 mm).
 4. NPS 2 (DN 50): Maximum span, 8 feet (2.4 m); minimum rod size, 3/8 inch (10 mm).
 5. NPS 2-1/2 (DN 65): Maximum span, 9 feet (2.7 m); minimum rod size, 3/8 inch (10 mm).
 6. NPS 3 (DN 80): Maximum span, 10 feet (3 m); minimum rod size, 3/8 inch (10 mm).

- F. Plastic Piping Hanger Spacing: Space hangers according to pipe manufacturer's written instructions for service conditions. Avoid point loading. Space and install hangers with the fewest practical rigid anchor points.
- G. Support vertical runs at roof, at each floor, and at 10-foot (3-m) intervals between floors.

3.5 PIPE JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
- D. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
- E. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- F. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
- G. Plastic Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
 - 2. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
 - 3. PVC Pressure Piping: Join ASTM D 1785 schedule number, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule number PVC pipe and socket fittings according to ASTM D 2855.
 - 4. PVC Nonpressure Piping: Join according to ASTM D 2855.

- H. Grooved Joints: Assemble joints with coupling and gasket, lubricant, and bolts. Cut or roll grooves in ends of pipe based on pipe and coupling manufacturer's written instructions for pipe wall thickness. Use grooved-end fittings and rigid, grooved-end-pipe couplings.
- I. Mechanically Formed, Copper-Tube-Outlet Joints: Use manufacturer-recommended tool and procedure, and brazed joints.

3.6 HYDRONIC SPECIALTIES INSTALLATION

- A. Install manual air vents at high points in piping, at heat-transfer coils, and elsewhere as required for system air venting.
- B. Install piping from boiler air outlet, air separator, or air purger to expansion tank with a 2 percent upward slope toward tank.
- C. Install in-line air separators in pump suction. Install drain valve on air separators NPS 2 (DN 50) and larger.
- D. Install bypass chemical feeders in each hydronic system where indicated, in upright position with top of funnel not more than 48 inches (1200 mm) above the floor. Install feeder in minimum NPS 3/4 (DN 20) bypass line, from main with full-size, full-port, ball valve in the main between bypass connections. Install NPS 3/4 (DN 20) pipe from chemical feeder drain, to nearest equipment drain and include a full-size, full-port, ball valve.
- E. Install expansion tanks above the air separator. Install tank fitting in tank bottom and charge tank. Use manual vent for initial fill to establish proper water level in tank.
 - 1. Install tank fittings that are shipped loose.
 - 2. Support tank from floor or structure above with sufficient strength to carry weight of tank, piping connections, fittings, plus tank full of water. Do not overload building components and structural members.

3.7 TERMINAL EQUIPMENT CONNECTIONS

- A. Sizes for supply and return piping connections shall be the same as or larger than equipment connections.
- B. Install control valves in accessible locations close to connected equipment.
- C. Install bypass piping with globe valve around control valve. If parallel control valves are installed, only one bypass is required.

- D. Install ports for pressure gages and thermometers at coil inlet and outlet connections according to Section 230519 "Meters and Gages for HVAC Piping."

3.8 FIELD QUALITY CONTROL

- A. Prepare hydronic piping according to ASME B31.9 and as follows:

1. Leave joints, including welds, uninsulated and exposed for examination during test.
2. Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure. If temporary restraints are impractical, isolate expansion joints from testing.
3. Flush hydronic piping systems with clean water; then remove and clean or replace strainer screens.
4. Isolate equipment from piping. If a valve is used to isolate equipment, its closure shall be capable of sealing against test pressure without damage to valve. Install blinds in flanged joints to isolate equipment.
5. Install safety valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.

- B. Perform the following tests on hydronic piping:

1. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
2. While filling system, use vents installed at high points of system to release air. Use drains installed at low points for complete draining of test liquid.
3. Isolate expansion tanks and determine that hydronic system is full of water.
4. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the system's working pressure. Test pressure shall not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength or 1.7 times "SE" value in Appendix A in ASME B31.9, "Building Services Piping."
5. After hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
6. Prepare written report of testing.

- C. Perform the following before operating the system:

1. Open manual valves fully.
2. Inspect pumps for proper rotation.

3. Set makeup pressure-reducing valves for required system pressure.
4. Inspect air vents at high points of system and determine if all are installed and operating freely (automatic type), or bleed air completely (manual type).
5. Set temperature controls so all coils are calling for full flow.
6. Inspect and set operating temperatures of hydronic equipment, such as boilers, chillers, cooling towers, to specified values.
7. Verify lubrication of motors and bearings.

END OF SECTION 232113