Commerce St Chillers 6 & 7 Replacement Project

SAWS Job No. 14-7503
SAWS Solicitation No. B-14-058-MR

ADDENDUM NO. 1
September 15, 2014

To Bidder of Record:

This addendum, applicable to work referenced above, is an amendment to the bidding documents and as such will be a part of and included in the Contract Documents. Acknowledge receipt of this addendum by entering the addendum number and issue date in the space provided in submitted copies of the proposal. Failure to do so may subject Bidder to disqualification.

This addendum includes responses to questions, as well as revisions to the RFQ.

A copy of the Pre-Proposal Meeting Notes and Sign-In sheets are included in this addendum.

Item 1: QUESTIONS AND ANSWERS:

1. The reason I am contacting you today is to find out what type of refrigerant, and how much is in each of the chillers being replaced in the project?

   Response: Refrigerant is R-123. There is approximately 5,000 pounds between the two chillers.

2. Will SAWS be selling this refrigerant off separately, or does the wining contractor take this material as part of their work?

   Response: The successful contractor shall be responsible for the legal evacuation and removal or salvage of the refrigerant in Chillers 6 and 7. The contractor shall also legally evacuate the existing R-123 refrigerant recovery tank in the vicinity of Chillers 6 and 7 and remove the recovery tank from the site. (There will be approximately 5,000 pounds of R-123 to be removed from the site.)

3. What is the job duration Substantial and Final Completion?

   Response: See “Price Proposal Form”, page PP-2 in Project Specifications manual.

4. Is there a cost estimate?

   Response: A detailed cost estimate is not provided.

   An estimate project cost can be found at the website for this project: http://www.saws.org/business_center/contractsol/Drill.cfm?id=1228&View=Yes

5. Is there a pre-qual for the Controls Portion on this project?

   Response: See Section 23 0923, page 5, paragraph 1.7, "Qualifications". System shall comply in all respects with Section 23 0923 – Industrial Control System.

6. Will SAWS recover the refrigerant & oils from the existing de-commissioned Chillers before Demo, or are the Contractors supposed to take care of this?

   Response: See Responses to 1. and 2. above.

7. Do you have a recommended Roofer we can contact for Roof patching/sealing/flashing after installation of the Roof Top Unit?

   Response: The roof is no longer under warranty. SAWS has no recommended roofer.

8. Do you know the thickness of the concrete roof deck?

   Response: 4"

9. My apologies, but we have one more RFI. There is no Piping Specification in Division 23. We really need this. See attached TOC.

   Response: See Item 2 below; Revisions to Contract Documents and Technical Specifications.

END OF QUESTIONS AND ANSWERS

Item 2: REVISIONS TO CONTRACT DOCUMENTS, DRAWING SHEETS AND TECHNICAL SPECIFICATIONS

Bidding and Contract Documents:

Supplementary Instructions to Respondents; C. Response Format; Project Safety & Quality Control (Page SIR 3)

Item 1: Add sub section "f.: Indicate how your FIRM's proposal has reduced cost to SAWS by utilizing the value from salvage of the removed materials including but not limited to copper wiring, refrigerant, decommissioned chiller equipment."

Proposal Certification (Page PC 1)

Item 1: Replace proposal certification with attached proposal certification.

General Conditions, Paragraph 5.7 – Contractor's Standard Commercial Insurance Specifications and Certificate of Liability Insurance Requirements (Page GC-23)

Item 1: Add "Contractor shall also provide an Installation Floater. This shall provide Physical Damage Insurance which insures SAWS and the City for damages to all Property Purchased for, or Assigned to, the Project commencing on the start date through completion. Policy limits shall be in an amount equal to the total contract cost contracted herewith. The policy form shall be an All Risk form and shall include coverage for both during transit and while stored at the work site."

Wage Decisions

Item 1: Delete Wage Rates for Construction Types 'Heavy and Highway", "On-Shore Pipeline Construction" and "Heavy Tunnel".

Drawings and Technical Specifications:

DRAWING SHEETS

RE: Drawing Sheet M1.1 – Mechanical Floor Plan – New Work

Item 1: Delete General Note #9.

SPECIFICATION ITEMS

RE: Specification Section 23 2113 – Hydronic Piping

Item 1: Add attached specification section in its entirety.

RE: Specification Section 23 2116 – Hydronic Piping Specialties:

Item 1: Add attached specification section in its entirety.

RE: Specification Section 26 2419:

Item 1: On page 6, paragraph 2.4.B.1. – add the subparagraph: 'e. Phase failure, phase reversal, undervoltage and overvoltage protection'.

Item 2: On page 10, delete paragraph 2.7 in its entirety.

Item 3: On page 10, delete paragraphs 2.8.A and 2.8.C.

Item 5: On page 11, delete paragraphs 2.8.D.1, 2.8.D.2 and 2.8.D.3.

Item 6: On page 11, revise paragraph 2.10.A. to read 'Indoor Enclosures: Freestanding steel cabinets...NEMA 250, Type 1 gasketed with drip shield,'

Item 7: On page 12, delete paragraph 2.11.B.

END OF REVISIONS TO CONTRACT DOCUMENTS AND TECHNICAL SPECIFICATIONS

This Addendum, including this page, is nineteen (19) pages in its entirety.
The remainder of the bid documents remained unchanged.

Each bidder is requested to acknowledge receipt of this Addendum No. 1 by his/her signature affixed hereto and to file same as an attachment to his/her bid.

Steven E. Huck, P.E.
Project Engineer
Alderson & Associates, Inc.

9/15/14
PH 1008

The Undersigned acknowledges receipt of this Addendum No. 1 and the bid submitted herewith is in accordance with the information and stipulation set forth.

Date **Signature of Bidder**

END OF ADDENDUM

Meeting Notes: Mandatory Pre-Proposal Meeting

1San Antonio Water System

Commerce St. Chillers 6 & 7 Replacement

SAWS Job No. 14-7503 SAWS Solicitation No.: B-14-058-MR

Date: September 9, 2014, 9:00 a.m.

Location: SAWS, Heating and Cooling Building, 900 E. Commerce St., S.A., Tx. 78205

I. Project Discussion

a. Request that attendees sign the Attendance Sheet

b. **Introductions**

Ismael Rosales, P.E., PRT Engineering, SAWS,
Marc Ripley, Contract Administrator, SAWS,
Mark Villarreal, Chilled Water Plant Manager, SAWS
Carl Bain, P.E., Design Engineer, Bain Medina Bain
Steve Huck, P.E., Design Engineer, Alderson Inc.
Lon Culbertson, P.E., Design Engineer, Alderson Inc.
Julian Perales, Inspector, SAWS
Marisa Palmer, P.E., PRT Engineering, SAWS

c. Nothing discussed during the pre-proposal meeting conference changes anything in the Bidding/Contract documents. Bidder is to strictly bid the written documents. Any changes to these Contract documents will be issued by written addendum. The meeting minutes will be for information purposes only.

d. **Project Description:**

This project consists of the following:

1. Replacement of Chillers 6 & 7 and associated medium voltage (4160 Volt) remote starters with two new chillers incorporating remote variable frequency drives.

2. Replacement of variable speed drives serving Glycol-Chilled Water Pumps 16, 17 and 18 and installation of new variable speed drives for same pumps.

3. Replacement of starter for Glycol-Chilled Water Pump 19 and installation of new starter for same pump.

4. Installation of cooling-only packaged rooftop unit to serve existing Electrical Room.

5. Replacement of Automated Logic controls system serving Chillers 6 and 7 and associated glycol-chilled water pumps, condenser water pumps, district-cooling chilled water pumps, associated control valves, cooling tower fan, and other ancillary pieces of equipment with programmable logic controllers (PLC's) and system hardware as specified.

6. Electrical system modifications to accommodate reconnection of replaced equipment to include both medium voltage (4160 Volt) and low voltage (480 and 120 volt).

7. Note: Two plate and frame heat exchangers isolate the chilled water/ice generating Chillers 6 and 7 from the district chilled water cooling loop. This will allow Chillers 6 and 7 and associated glycol-chilled water pumps and Automated Logic controls to be shut down without affecting the remaining plant. The Contractor shall schedule such shutdown so as to coordinate sufficient time for equipment demolition prior to arrival of the new equipment. All work described in the documents shall transpire during one shutdown period. The duration of the shutdown shall be coordinated between all trades to minimize the outage period to the greatest extent possible.

e. Project Permitting: Trade permits will be required. Bid proposal includes an allowance for permits.

f. **Safety Requirements**

Contractor shall comply with all requirements in the contract documents, including, but not limited to:

i. General Conditions, 5.3 CONTRACTOR'S RESPONSIBILITIES, item 2;
ii. General Conditions, 5.28 SAFETY PRECAUTIONS AND PROGRAMS;

g. **Project Schedule**
i. Project Duration 240 Calendar Days
ii. Sequence of Construction, *Specification Section 01 1000.1.5*

h. **Underground Utilities**

i. Contractor shall comply with all requirements in the contract documents, including, but not limited to:

ii. General Conditions, 5.16 PUBLIC UTILITIES;

i. **Contract Documents**
(Mark Ripley)

j. **Certified Payroll Requirements**
(Sandra Rios)

II. Questions

Sign-In Sheet

Mandatory Pre-Bid Meeting
COMMERCE ST. CHILLERS 6 & 7 REPLACEMENT
PROJECT | Job# 14-7503
Solicitation No.: B-14-058-MR
9/9/14 9:00 AM

	Print Name	Company	Address	Phone	Fax	E-mail	Contractor Type
1	Derek Brown	Carrier	12625 Westmere Rd. #419 San Antonio TX 78247	210-238-3313		derek.brown@carrier.utc.com	☐ General Contractor ☐ Sub-Contractor ☑ Supplier
2	P. Smith	JCI	3460 Thousand Oaks #216 SA TX 78247	210 649-8634		peter.a.smith@jci.com	☐ General Contractor ☐ Sub-Contractor ☑ Supplier
3	MIKE BACHOFER	LC MOSEL	18980 RED LAND RD S.A. TX 78259	210-494-9311	494-8878	MIKE-LCM@SWBELL.NET	☐ General Contractor ☑ Sub-Contractor ☐ Supplier
4	Jose Caballos	LC Mosl	18980 Red Channel Rd. San Antonio TX 78259	210 669-2111		Jose-Lcm@swbell.net	☐ General Contractor ☑ Sub-Contractor ☐ Supplier
5	Scott Heun	Brandt	6230 Condor Pkwy Schertz, TX	210-793-8224		sheun@brandtcompanies.com	☑ General Contractor ☐ Sub-Contractor ☐ Supplier
6	JEREMY BILBREY	BRANDT	16025 CORRIDOR PKWY. SCHERTZ. TX	210-383-0761		JBILBREY@BRANDT-COMPANIES.COM	☐ General Contractor ☑ Sub-Contractor ☐ Supplier
7	BRIAN POTTERFIELD	JS ELECTRIC	4702 FM 1327 BUDA TX 78610	512-243-2700		BPOTTERFIELD@JSELECTRIC.COM	☐ General Contractor ☑ Sub-Contractor ☐ Supplier
8	Richard Gutierrez	Hot Rod Mechanical Inc.	3415 E 5th St Austin Tx 78702	512 386 8686	512 386 8788	hotrodmech@sbcglobal.net	☑ General Contractor ☐ Sub-Contractor ☐ Supplier
9	Pete MARTINEZ	RAIN FOR Rent	3744 SE Loop 410 SA, TX 78222	210-452-1745		PMARTINEZ@rainforrent.com	☐ General Contractor ☒ Sub-Contractor ☑ Supplier

Sign-In Sheet

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PROJECT | Job# 14-7503
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9/9/14 9:00 AM

	Print Name	Company	Address	Phone	Fax	E-mail	Contractor Type
1	Mike Furst	Brandt	6023 Corridor Parkway	210. 599-6120	210. 946-1694	MFurst@BrandtEng.com	☐ General Contractor ☐ Sub-Contractor ☐ Supplier
2	Babet Motes	MEI	6417 TRI County	210- 569-~~25~~ 2607	210-25/485	babet.motes@meilk.com	☐ General Contractor ☐ Sub-Contractor ☐ Supplier
3	Todd Hollis	MEI	6417 TRI County Parkway	210-243-3509	210-251-4959	todd.Hollis@meillc.com	☐ General Contractor ☐ Sub-Contractor ☐ Supplier
4	Tommy Olson	US. Stars	147 Seale Rd SA TX 78219	(210) 378 8388	(210) 333 0151	Olson.Tommy@Ymail.Com	☐ General Contractor ☐ Sub-Contractor ☐ Supplier
5	Marc Miles	US STARS	147 Seale Rd SA TX 78219	210 391-6752	210 333 0151	MARCMiles@SATX.RR.com	☐ General Contractor ☐ Sub-Contractor ☐ Supplier
6	Bobby Robishaux	BRANDT	6023 Corridor Pkwy Schertz, Tx	210-599 6120	210 946 1694	bobbyr@brandt-companies.com	☐ General Contractor ☐ Sub-Contractor ☐ Supplier
7	Javier Villarreal	Robles 1 LLC	2331 Bolton Rd Marion TX 78~~1~~24	210-566-8787	210 568-2611	Javier@Robles1.net	☐ General Contractor ☑ Sub-Contractor ☐ Supplier
8	Andrew Brumgard	Robles I LLC	2331 Bolton Rd Marion Tx 78124	210 566 8787	210 568 2611	abrumgard@Robles1.net	☐ General Contractor ☑ Sub-Contractor ☐ Supplier
9	Nelson Poorman	Dynamic Systems	28845 IH10 W Boerne, TX 78006	210 239 1516	210 239 1499	Npoorman@dynamicsystemsusa.com	☐ General Contractor ☐ Sub-Contractor ☐ Supplier

Sign-In Sheet

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PROJECT | Job# 14-7503
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	Print Name	Company	Address	Phone	Fax	E-mail	Contractor Type
1	Michael Cervera	JCI - York	3460 Thousand Oaks Suite 216, S.A. TX 78247	(210) 524-7085	210 394-2987	Michael.a.cervera@jci.com	☐ General Contractor ☐ Sub-Contractor ☑ Supplier
2	DARREN HARRIS	Accu-Aire Mech.	1441 S. W.W. White Rd SA, TX 78220	210 455 9003	210 648 7377	BIDS@ ACCUAIREONLINE.COM	☑ General Contractor ☐ Sub-Contractor ☐ Supplier
3	Mike Andreason	Texas Chiller Systems	9807 McCullough SA TX 78216	210 650 9972	210 650 9973	mandreason@ TexasChillerSystems.com	☐ General Contractor ☐ Sub-Contractor ☐ Supplier
4	FRED BEHRENFELD	EZ MECHANICAL INC	7364 CARIBOU SA TX 78236	210 521-5515	210 521-5517	fbehrenfeld@ EZMECH.COM	☑ General Contractor ☐ Sub-Contractor ☐ Supplier
5	RANDY HUNTER	REC IND	332 NORTH AZLE S.A. TX 78216	210 490 3700	210 490-3700	randyhunter@ RECIND.COM	☑ General Contractor ☐ Sub-Contractor ☐ Supplier
6	DeWane Schott	Tezel + Cotter	2730 Castroville rd SA. TX 78237	210 508 9834	210 734 5199	dschott@TezelandCotter.com	☐ General Contractor ☑ Sub-Contractor ☐ Supplier
7	ROBERT RIORDON	MUELLER & WILSON	CIMARRON PATH SAN ANTONIO TX	210 824-9461	210 824-6577	rriordon@MWIUSA.COM	☐ General Contractor ☑ Sub-Contractor ☐ Supplier
8	Carl YOUNG	cyoung + Co. Inc.	P.O. Box 1629 Round Rock, TX 78680	512-244-3723	512-244-0494	carl@cyoung.Net	☐ General Contractor ☑ Sub-Contractor ☐ Supplier
9	Dillon Young	Cyoung + CO. Inc	P.O. Box 1629 Round Rock, TX 78680	512-244-3723	512-244-0494	Dillon@cyoung.net	☐ General Contractor ☑ Sub-Contractor ☐ Supplier

21	David Schad	Victoria Air	201 Profit St Victoria Tx	(404) 456 8777		davidschad @victoriaair.com	☐ General Contractor ☒ Sub-Contractor ☐ Supplier
22	Arthur Kleck	International Mech Services	1914 Breeden SAT 78212	210-732-6188		EKLECKIII@ IMS.com.	☐ General Contractor ☐ Sub-Contractor ☐ Supplier
23	Edgar R. Kleck Jr	International Mech Service	1914 Breeden SAT 78212	210-732-6188		E KLECKiii@ IMS.COM	☐ General Contractor ☐ Sub-Contractor ☐ Supplier
24	Jeff Shrader	~~B~~ Big State Elec	2727 N. St Mary's SAT 78212	(210) 735-1051		Jeff@ BigState Electric.com	☐ General Contractor ☑ Sub-Contractor ☐ Supplier
25	Steve Huck	Alderson & Asso, Inc	7700 Torino S.A Tx 78229	210 614 1110 Ext 22		Shuck @ Alderson-Inc. Com	☐ General Contractor ☐ Sub-Contractor ☐ Supplier
26	Marisa Palmer	SAWS	2800 US Hwy 281	233 3595		marimar.palmer @saws.org	☐ General Contractor ☐ Sub-Contractor ☐ Supplier
27	Lon Culbertson	Alderson & Associates	7700 Torino San Antonio, Texas 78229	210. 614.1110 x13		lculbertson@ alderson-inc.com	☐ General Contractor ☐ Sub-Contractor ☐ Supplier
28	Carl Bain	Bain Medina Bain, Inc	7073 San Pedro SA, TX 78216	210-494-7223		cbain@ bmbi.com	☐ General Contractor ☐ Sub-Contractor ☐ Supplier
29							☐ General Contractor ☐ Sub-Contractor ☐ Supplier
30							☐ General Contractor ☐ Sub-Contractor ☐ Supplier

Sign-In Sheet

Mandatory Pre-Bid Meeting
COMMERCE ST. CHILLERS 6 & 7 REPLACEMENT
PROJECT | Job# 14-7503
Solicitation No.: B-14-058-MR
9/9/14 9:00 AM

	Print Name	Company	Address	Phone	Fax	E-mail	Contractor Type
1	Jason Ford	Prime Controls	10400 West ~~office~~ Houston pr. 104	281-253 2126	713-244-9717	Jford@prime-controls.com	☐ General Contractor ☐ Sub-Contractor ☐ Supplier
2							☐ General Contractor ☐ Sub-Contractor ☐ Supplier
3							☐ General Contractor ☐ Sub-Contractor ☐ Supplier
4							☐ General Contractor ☐ Sub-Contractor ☐ Supplier
5							☐ General Contractor ☐ Sub-Contractor ☐ Supplier
6							☐ General Contractor ☐ Sub-Contractor ☐ Supplier
7							☐ General Contractor ☐ Sub-Contractor ☐ Supplier
8							☐ General Contractor ☐ Sub-Contractor ☐ Supplier
9							☐ General Contractor ☐ Sub-Contractor ☐ Supplier

PROPOSAL CERTIFICATION

Accompanying this proposal is a Bid Bond or Certified or Cashier's Check payable to the Order of the San Antonio Water System for _____ dollars ($_____), which amount represents five percent (5%) of the total bid price. Said bond or check is to be returned to the bidder unless the proposal is accepted and the bidder fails to execute and file a contract within **10** calendar days after the award of the Contract, in which case the check shall become the property of said San Antonio Water System, and shall be considered as payment for damages due to delay and other inconveniences suffered by said San Antonio Water System due to the failure of the bidder to execute the contract. The San Antonio Water System reserves the right to reject any and all bids.

It is anticipated that the Owner will act on this proposal within **60** calendar days after the bid opening. Upon acceptance and award of the contract to the undersigned by the Owner, the undersigned shall execute standard San Antonio Water System Contract Documents and make Performance and Payment Bonds for the full amount of the contract within **10** calendar days after the award of the Contract to secure proper compliance with the terms and provisions of the contract, to insure and guarantee the work until final completion and acceptance, and the guarantee period stipulated, and to guarantee payment of all lawful claims for labor performed and materials furnished in the fulfillment of the contract.

It is anticipated that the Owner will provide written Authorization to Proceed within **30** days after the award of the Contract.

The work called for in this Contract shall commence on the date indicated in the SAWS written Authorization to Proceed Under no circumstances shall the work commence prior to the date provided for in the SAWS issued, written Authorization to Proceed. Work shall be completed in full within **240** consecutive calendar days.

The undersigned certifies that the bid prices contained in the proposal have been carefully checked and are submitted as correct and final.

The undersigned further acknowledges compliance with "Wage and Labor Standard Provisions" of this contract and the use of the Blue Book rental rates for establishment of equipment rental rates whether owned or leased during the course of this Contract.

In completing the work contained in this proposal the undersigned certifies that bidder's practices and policies do not discriminate on the grounds of race, color, religion, sex or national origin and that the bidder will affirmatively cooperate in the implementation of these policies and practices.

Signed: _____
Company Representative

_____
Company Name

_____

_____
Address

Please return bidder's check to: _____
Company Name

_____

_____
Address

SECTION 23 2113
HYDRONIC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes pipe and fitting materials and joining methods for the following:
   1. Condenser-water piping.
   2. Glycol cooling-water piping.
   3. Safety valve outlet piping.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of the following:
   1. Condenser and glycol cooling-water pipe and fittings.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Piping layout, drawn to scale.

B. Qualification Data: For Installer.

C. Welding certificates.

D. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Pipe Welding: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code: Section IX.
   1. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.
   2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Hydronic piping components and installation shall be capable of withstanding the following minimum working pressure and temperature unless otherwise indicated:
   1. Condenser-Water and Glycol Cooling-Water Piping: 150 psig at 150 deg F.
   2. Safety-Valve-Inlet and -Outlet Piping: Equal to the pressure of the piping system to which it is attached.

2.2 STEEL PIPE AND FITTINGS

A. Steel Pipe: ASTM A 53/A 53M, black steel with plain ends; welded and seamless, Grade B, and wall thickness as indicated in "Piping Applications" Article.

B. 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 "Piping Applications" Article.

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 maximum thickness unless otherwise indicated.
a. 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. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

A. Condenser-water piping, aboveground, shall be the following:
1. Schedule 80 steel pipe, wrought-steel fittings and wrought-cast or forged-steel flanges and flange fittings, and welded and flanged joints.

B. Glycol cooling-water piping, aboveground, shall be the following:
1. Schedule 40 steel pipe, wrought-steel fittings and wrought-cast or forged-steel flanges and flange fittings, and welded and flanged joints.

C. Safety Valve Outlet Piping: Same materials and joining methods as for piping specified for the service in which safety valve is installed with metal-to-plastic transition fittings for plastic piping systems according to piping manufacturer's written instructions.

3.2 PIPING INSTALLATIONS

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

B. 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.

C. Install fittings for changes in direction and branch connections.

D. Install piping to allow application of insulation.

E. Select system components with pressure rating equal to or greater than system operating pressure.

F. Install groups of pipes vertically parallel to each other, spaced to permit applying insulation and servicing of valves.

G. Install drains, consisting of a tee fitting, NPS 3/4 ball valve, and hose thread fitting at low points in piping system mains and elsewhere as required for system drainage.

H. Install piping at a uniform grade of 0.2 percent upward in direction of flow.

I. Reduce pipe sizes using eccentric reducer fitting installed with level side up.

J. Install flanges in piping, NPS 2-1/2 and larger, at final connections of equipment and elsewhere as indicated.

K. Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for identifying piping.

3.3 PIPE SUPPORTS

A. Comply with requirements in Section 230529 "Hangers and Supports for HVAC Piping and Equipment" for hanger, support, and anchor devices. Comply with the following requirements for maximum spacing of supports.

B. Install pipe supports for steel piping with the following maximum spacing
   1. NPS 3 and Larger: Maximum span, 12 feet.

3.4 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. Welded Joints:
   1. Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.

D. Flanged Joints:
   1. Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.5 TERMINAL EQUIPMENT CONNECTIONS

A. Sizes for supply and return piping connections shall be the same as or larger than equipment connections.

B. Install ports for pressure gages and thermometers at coil inlet and outlet connections. Comply with requirements in Section 230519 "Meters and Gages for HVAC Piping."

3.6 CHEMICAL TREATMENT

A. Coordinate and schedule chemical treatment of condenser water and glycol water piping systems with SAWS' contracted chemical treatment provider.

3.7 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. Flush hydronic piping systems with clean water; then remove and clean or replace strainer screens.
3. 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.
4. 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.
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 (100 psi for condenser water piping and 110 psi for glycol/chilled water piping). 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 the "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 in accordance with Section 01 4000.

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. Inspect and set operating temperatures of chillers.
6. Verify lubrication of motors and bearings.

END OF SECTION

SECTION 23 2116
HYDRONIC PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes special-duty valves and specialties for the following:
   1. Air-Control Devices
      a. Automatic Air Vents

1.3 ACTION SUBMITTALS

A. Product Data: For each type of the following:
   1. Air-control devices.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data:
   1. For air-control devices to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

2.2 AIR-CONTROL DEVICES

A. Automatic Air Vents:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. AMTROL, Inc.
      b. Armstrong Pumps, Inc.
      c. Bell & Gossett; a Xylem brand.
      d. Nexus Valve, Inc.
      e. Taco, Inc.
   2. Body: Cast iron.
   3. Internal Parts: Nonferrous.
   4. Operator: Noncorrosive metal float.
   5. Inlet Connection: NPS 3/4.
   6. Discharge Connection: NPS 3/4.
   7. CWP Rating: 150 psig.
   8. Maximum Operating Temperature: 240 deg F.

PART 3 - EXECUTION

3.1 HYDRONIC SPECIALTIES INSTALLATION

A. Install automatic air vents at high points of system piping in mechanical equipment rooms only. Extend air vent discharge to nearest floor drain, full size of air vent outlet.

END OF SECTION