

To Whom it May Concern,

On August 9, 2016, the Illinois Environmental Protection Agency (IEPA) received a request from the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) for a waiver from the American Iron and Steel Act requirements in order to install three duplex basket strainers within their “Westside Primary Settling Tanks 1- 9 and Aerated Grit Facility Project” aka IEPA Loan Project L173076.

The original project specifications listed four acceptable brands of strainers, including those manufactured by Keckley Company, that could be utilized along with the ability to choose other manufacturers if the products were found to be equivalent. One of project subcontractors, Independent Mechanical Industries, initiated this waiver request when they found that all four acceptable product manufacturers listed in the specifications either do not produce duplex-type basket strainers or fabricate strainers overseas. Eaton Company produces duplex basket strainers within the United States using import casting. Eaton was not included in the original list of acceptable manufacturers, but was found to be equivalent and assembles within this country. Keckley Company was the only originally listed manufacturer found to produce duplex basket strainers, but 100% of production occurs within the United Kingdom.

IEPA has reviewed the waiver request, project specifications, and supporting documents. We agree with MWRDCG that a waiver from the AIS requirements is warranted as five manufacturers were contacted, but no compliant equipment has been secured. I have attached the original waiver request from MWRDGC, correspondence between the contractor and subcontractor, and a copy of the original specifications. If you have additional questions, please contact me at 217-782-2027 or by using this e-mail address.

Sincerely,

Heidi Allen
Pre-Construction Unit Manager

This waiver request was submitted to the EPA by the state of Illinois. All supporting correspondence and/or documentation from contractors, suppliers or manufacturers included as a part of this waiver request was done so by the recipient to provide an appropriate level of detail and context for the submission. Some referenced attachments with supplier correspondence are in formats that do not meet the Federal accessibility requirements for publication on the Agency's website. Hence, these exhibits have been omitted from this waiver publication. They are available upon request by emailing SRF_AIS@epa.gov.

SECTION 15183

HYDRONIC PIPING VALVES AND SPECIALTIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Piping systems for steam heating, make-up water for these systems, valves, and steam specialties.
- B. Related Work Specified in Other Sections Includes, But is Not Limited to, the Following:
 - 1. MWRDGC General Specifications - Mechanical (GSM)
 - 2. Section 02316 - Excavation
 - 3. Section 02317 - Backfilling
 - 4. Section 09600 - Protective Coatings
 - 5. Section 15060 - Supports and Anchors
 - 6. Section 15072 - Vibration Isolation
 - 7. Section 15075 - Mechanical Identification
 - 8. Section 15080 - Mechanical Insulation
 - 9. Section 15107 - Steel Pipe and Fittings
 - 10. Section 15108 - Miscellaneous Pipe and Fittings
 - 11. Section 15109 - Erecting and Jointing Interior Pipelines
 - 12. Section 15110 - Valves
 - 13. Section 15124 - Gauges - Pressure and Vacuum
- C. CONTRACTOR is subject to the ñUse of American Iron and Steelò requirements as contained in Section 436 of the Consolidated Appropriations Act, 2014, further described in paragraph 11 of Appendix I, as well as all provisions of the ñSteel Products Procurement Actò, (30ILCS 565/1 et. seq.), and further described in paragraph 9 of the General Specifications.

1.2 REFERENCES

- A. Codes and standards referred to in this Section are:
 - 1. ASME Boiler and Pressure Vessel Code Sec 9 - Welding and Brazing Qualifications
 - 2. ASME Boiler and Pressure Vessel Code Sec 8 - Pressure Vessels
 - 3. ASME Boiler and Pressure Vessel Code Sec 4 - Heating Boilers

4. ASME B31.9 - Building Services Piping
5. AWS A5.8 - Brazing Filler Metal
6. AWS D1.1 - Structural Welding Code
7. ASTM A 126 - Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings

1.3 DEFINITIONS

- A. Pipe Sizes: Pipe sizes used in this Specification are Nominal Pipe Size (NPS).

1.4 SUBMITTALS

- A. General: Provide all submittals, including the following, as specified in Division 1.
- B. Operation and Maintenance Data: Submit operation and maintenance data for steam specialties and special duty valves, for inclusion in the operation and maintenance manual as specified in Division 1. Include installation instructions, assembly views, lubrication instructions, and replacement parts list.
- C. Welders' Certificates: Submit welders' certificates certifying that welders meet the quality requirements specified in Quality Assurance below.
- D. Certification: Submit certification of compliance with ASTM and ANSI manufacturing requirements for pipe, fittings, and specialties.
- E. Shop Drawings: Submit shop drawings detailing dimensions, required clearances for connection to equipment, complete piping layouts and details indicating the amount of expansion and provisions for system expansion, component details and location of miscellaneous fittings, including anchors, end seals, gland seals, expansion joints, guides, and field closures. Submit drawings indicating location of field joints with respect to permanent structures or markers. Submit shop drawings sealed by a professional engineer licensed in the state of Illinois. Include shop drawing information for piping expansion compensation in shop drawings.
- F. Product Data: Submit product data for manufactured products and assemblies specified. Include component sizes, rough-in requirements, service sizes, and finishes. Include product description, model, and dimensions. Indicate maximum temperature and pressure rating, and maximum expansion compensation.
- G. Pressure Settings: Submit system calculations appurtenances required for proper system operation.

- H. Submit thermal stress calculations for the steam and condensate piping systems.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Conform to ASME - Boiler and Pressure Vessel Code Section 8D for the manufacture of tanks.
- B. Valves: Provide the manufacturer's name and pressure rating marked on the valve body.
- C. Welding Materials and Procedures: Conform to ASME Section 9 for welding and brazing qualifications.
- D. Welders Certification: Provide welders and brazers certification in accordance with ASME Boiler and Pressure Vessel Code Section 9.
- E. Manufacturer: Provide steam specialties of the same manufacturer throughout if available. Company to be specializing in manufacturing the products specified in this section with minimum three years experience. Design expansion compensating system under direct supervision of a professional engineer experienced in design of this work and licensed in the state of Illinois.
- F. Thermal Calculations: Perform thermal stress calculations for the steam and condensate piping systems to determine actual requirements for piping expansion and placement of steam traps based on the submitted piping layouts per the field conditions. Provide the calculations stamped by a registered professional S.E. licensed in the state of Illinois.

1.6 DELIVERY, STORAGE AND HANDLING

- A. General: Deliver, store and handle all products and materials as specified in Division 1:
- B. Delivery and Storage: Deliver and store piping and specialties in shipping containers with labeling in place. Store indoors in a clean, dry place.
- C. Protection: Protect piping and specialties from entry of contaminating material by leaving end caps and plugs in place until installation.

1.7 SEQUENCING AND SCHEDULING

- A. General: Coordinate the size and location of concrete equipment pads. Cast anchor bolt inserts into pads. Concrete, reinforcement and formwork requirements are specified in Division 3. Coordinate the installation of pipe sleeves for foundation wall penetrations.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable manufacturers are listed below. Other manufacturers of equivalent products may be submitted.

1. Valves

- a. Steam Valves

(1) Refer to General Specification Mechanical (GSM)

2. Relief Valves

- a. Bell & Gossett ITT
- b. Amtrol, Inc.
- c. Spirax Sarco
- d. Watts Regulator Co.

3. Diverting Fittings

- a. Bell & Gossett ITT
- b. Armstrong Pumps, Inc.
- c. Amtrol, Inc.
- d. Taco, Inc.

4. Dielectric Waterway Fittings

- a. Victaulic Company of America

5. Y-Pattern Strainers

- a. Armstrong Machine Works
- b. Hoffman Specialty ITT
- c. Metraflex Co.
- d. Spirax Sarco
- e. Trane Co.
- f. Victaulic Co. of America
- g. Watts Regulator Co.

6. Basket Strainers

- a. Keckley
- b. Metraflex Co.
- c. Spirax Sarco
- d. Victaulic Company of America

7. Thermometers
 - a. Moeller
 - b. Weksler
8. Pipe Sleeves
 - a. Thunderline Corporation, "Link Seal" Model WS
9. Vacuum Breakers
 - a. Bell & Gossett
 - b. Johnson Corporation
10. Air Vents (manual)
 - a. Bell & Gossett ITT
 - b. Armstrong Machine Works
 - c. Hoffman Specialty ITT
 - d. Spirax Sarco.
11. Air Vents (Automatic)
 - a. Hoffman No. 79
 - b. Armstrong I-AV
12. Steam Traps
 - a. Hoffman Pump
 - b. Armstrong Machine Works
13. Steam Safety Relief Valves
 - a. Kunkle
 - b. Crane
14. Condensate Return Units
 - a. ITT Bell & Gossett
 - b. Hoffman Pump
15. Externally Pressurized Expansion Joints (Flanged)
 - a. US Bellows
 - b. Hyspan

- 16. Pipe Alignment Guides
 - a. US Bellows
 - b. Hyspan
- 17. Gaskets for Steam Pipe Flanges
 - a. Flexitallic Series CG

2.2 MATERIALS

- A. Pipe, Tubing and Fittings: Provide pipe, tubing and fitting materials in accordance with the General Specifications Mechanical (GSM) and as follows:
 - 1. Provide steel pipe and fittings complying with requirements specified in Section 15107.
 - 2. Refer to specification section 15109 for piping materials, finishes, and performance data.
- B. Hangers and Supports: Provide hangers and supports in accordance with the General Specifications Mechanical (GSM) and as specified in Sections 15060 and 15109.
- C. Pipe Identification: Comply with requirements specified in Section 15075.
- D. Flexible Connectors: Comply with requirements specified in Section 15072.
- E. Pressure Gauges: Comply with requirements specified in Section 15124.

Provide steam pressure gauges as specified for water systems, except that a siphon to be installed below the gauge.

- F. Valves: Provide valves as follows:
 - 1. General: Provide valves in accordance with the General Specifications Mechanical (GSM) and as recommended by their manufacturer for the conditions of use as installed, capable of tight shutoff under those conditions, and recommended for fluid operating temperature up to 250 degrees F.

Equip valves in insulated pipes with an extended neck to clear the insulation.

Provide screwed pattern and soldered pattern valves with unions to facilitate removal from the pipe.

Provide accessible pressure rated 3/4-inch hose end gate valves at low points for draining each piping system.

2. Butterfly Valves: Provide butterfly valves complying with requirements specified in Section 15110.
 3. Gate Valves: Provide gate valves complying with requirements specified in Section 15110.
 4. Globe and Check Valves: Provide globe and swing type check valves complying with requirements specified in Section 15110.
 5. Steam Check Valves: Provide valves of the spring loaded swing type and recommended for low and high pressure steam service. Provide check valves comprised of steel or cast iron body, steel closure plates, stainless steel trim, and resilient seating, arranged for mounting between standard gasketed flanges. Provide valves of the low head loss type with not more than 0.5 psi pressure drop at a steam flow velocity of 25 feet per second.
- G. Relief Valves: Provide valves suitable for 150 psig working pressure and 250 degrees F maximum operating temperature; designed, manufactured, tested and labeled in accordance with the requirements of Section IV of the ASME Boiler and Pressure Vessel Code. Fabricate valve body of cast iron, with all wetted internal working parts made of brass and rubber. Provide test lever. Select valve to suit actual system pressure and Btu capacity.
- H. Diverting Fittings: Provide cast-iron body fittings with threaded ends, or wrought copper with solder ends for 125 psig working pressure, and 250 degrees F maximum operating temperature. Indicate the flow direction on the fittings.
- I. Dielectric Waterway Fittings: Provide threaded or soldered end connections for the pipe materials in which installed; constructed to isolate dissimilar metals, prevent galvanic action, and prevent corrosion.
- J. Manual Air Vents: Provide air vents constructed of bronze body and nonferrous internal parts; 150 psig working pressure, 225 degrees F operating temperature; manually operated with screwdriver or thumbscrews having a 1/8-inch discharge connection and a 1/2-inch inlet connection.
- K. Automatic Air Vents: Provide air vents constructed of brass with stainless steel valve and valve seat suitable for a 75 psig working pressure, 250 degrees F operating temperature, automatic float type, having a 1/8-inch drain connection and a 3/4 inch inlet connection.
- L. Y-Pattern Strainers: Provide strainers suitable for a 125 psig working pressure with a cast-iron body (ASTM A 126, Class B), flanged ends for 2-1/2 inch and larger, threaded connections for 2-inch and smaller, bolted cover, perforated Type (304)

(316) stainless steel basket, and bottom (globe valved blowdown) (drain) connection. Provide strainers with a free area of at least 4 times the pipe cross-sectional area, with pressure drop through clean strainers not exceeding 0.6 psig to the design flow.

M. Basket Strainers

1. Provide strainers suitable for 125 psig working pressure with high tensile cast-iron body (ASTM A 126, Class B) flanged end connections, bolted cover, perforated Type 316 stainless steel basket, and bottom globe valves blowdown drain connection. Provide strainers with 20 mesh or smaller opening.
2. Where duplex basket strainers are specified on the drawings, provide duplex basket strainer assembly with two separate strainer basket chambers that operate independently and permit one basket strainer to be removed for cleaning while other basket is in operation. The duplex basket strainers shall operate continuously and never have to be shut down for cleaning and permit.

N. Thermometers: Provide 3-inch diameter bimetal dial thermometers or 9-inch scale red reading industrial thermometers suitable for temperature ranges of approximately 50 to 350 degrees F in 2-degree F increments, complete with fumeproof stainless steel or cast case and glass face, 6-inch stem, and 2-1/2-inch extension neck separable well.

O. Pipe Sleeves: Provide pipe sleeves constructed of heavy gauge seamless steel pipe with a full circle continuously welded water stop plate to provide positive water sealing and to prevent any thrust movement. Provide pipe sleeves to mate with modular mechanical type seals, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and construction opening.

P. Vacuum Breakers: Provide vacuum breakers 1-inch pipe size on steam-to-water heat exchangers. Provide vacuum breakers which have a brass body and screen, cap, collar, stainless steel ball or disc, and Viton O-ring.

Q. Thermostatic Air Vents: Provide air vent valves for the shells of steam-to-water heat exchangers to be balanced pressure thermostatic air vents which open to relieve vacuum slightly below atmospheric pressure, and on warm-up discharge air until steam temperature is sensed. Provide vents of 1/2-inch pipe size, with stainless steel hemispherical valve and seat, beryllium copper bellows caged in stainless steel, and cast bronze or cast iron body, all of pressure rating at least equal to steam pressure for the application. Pipe outlet to a floor drain.

- R. Steam Traps: Provide traps to be float and thermostatic type for all services. Provide bodies of cast iron or bronze with all stainless steel float mechanisms, heat treated chrome steel valves and stainless steel seats.

Provide sufficient steam traps to drain the steam condensate from each item equipment at a rate equal to twice the rated steam load. Select steam traps based on SHEMA ratings at 1/4 psi differential across the trap.

Each trap and each automatic steam control valve to be preceded by a wye strainer, be isolated with gate valves and have a globe valve bypass. Size the valved bypass no less than half the cross-sectional area to the normal flow pipe in each case.

- S. Steam Safety Relief Valves: Provide steam safety relief valves with the required capacity and setting to maintain 15 psig system pressure. Provide valves to be ASME and National Board approved, with a cast iron nozzle stainless steel trim and a test level. Connect each relief valve as directly as possible through a drip pan elbow discharging to a full size vent pipe extended waterproof above the roof. Provide piping arrangement to permit expansion without strain upon the relief valve. Pipe the drain connection from the drip pan elbow to a floor drain.

2.3 CONDENSATE RETURN UNITS

- A. Provide condensate return units of quantities as shown on the drawings and schedules. Provide each complete unit to consist of one condensate receiver, condensate pumps as scheduled, float switches, control panels, and all accessories as hereafter specified.
- B. Condensate receiver: Provide condensate receiver of horizontal, welded steel construction elevated on fabricated steel frame with a net working capacity of not less than that shown on the drawings. Equip receiver with inlet cascade baffle. Receiver heads to be convex (dished). Head and shell thickness to be minimum 3/16". Provide accessories as follows:
 - 1. water level gauge,
 - 2. dial thermometer,
 - 3. companion flanges
 - 4. float switch(es).
- C. Install an isolation valve between each pump suction and receiver to permit servicing the pumps without draining the receiver. Size receiver for 3 minute net storage based upon the system return rate. Receiver to have an inlet, vent and an overflow opening to provide a means of secondary venting.
- D. One inlet strainer with bronze screen and large dirt pocket to be mounted on the receiver. The screen to be removable for cleaning, requiring no additional floor space for servicing.

- E. Install float switch(es) in the receiver to control the pumps. Float switches to be double pole, heavy duty type with externally adjustable setting.
- F. Condensate pumps: Provide condensate pumps of centrifugal design, permanently aligned and factory assembled to the fabricated steel frame, including the pipe fittings and shut-off valve between each pump and the receiver. Each pump to be bronze fitted with one enclosed bronze impeller(s), renewable bronze wearing rings, and stainless steel shaft. The carbon/ceramic mechanical seal to be rated 250°F for maximum life. Each pump to be close coupled to a vertical drip-proof motor. Capacities and electrical characteristics to be as scheduled on the drawings. Each pump gpm to be sized for 2 times the system return rate.
- G. Controls: Provide receiver mounted completely wired NEMA 4X stainless steel control cabinet (NEMA 7 Class 1, Div 2, Group D in the Pump Gallery, and NEMA 7 Class 1, Div 1, Group D in the Grit Chamber and Screen House) with drip lip and piano hinged door enclosing as follows:
 - 1. Combination magnetic starter (with 3 overload relays) with fused disconnect and cover interlock for each condensate pump.
 - 2. Selector switch for each condensate pump - "Auto-Off-Hand."
 - 3. Fused control circuit transformer for each motor control circuit.
 - 4. Electrical alternator (when 2 condensate pumps are required).
 - 5. Numbered terminal block.
- H. All Control Cabinet Components and Assembly to be U.L. Listed with NEMA rated starters. All interconnecting wiring between the pumps, controls and control panel to be enclosed in liquid tight flexible conduit.
- I. Factory test the unit as a complete unit. Furnish complete elementary and connection wiring and piping diagrams and installation and operation instructions. Ship the unit completely assembled, except when oversize dimensions for shipping necessitate some disassembly.

2.4 EXTERNALLY PRESSURIZED EXPANSION JOINTS AND GUIDES

- A. Provide Externally Pressurized Expansion Joints of quantities as shown on the drawings and schedules.
- B. Expansion Joints to be all welded construction, using 304 SS bellows, ASTM A106 Gr B or A 516 Gr70 covers; A 516 Gr 70 integral internal guide rings and ASTM A53 Gr B pipe. For flanged expansion joints, flange to be ASTM A105 and of weight classification appropriate for service.

- C. Design the bellows and fabricate so that the pressure is external to the convolution to eliminate possible of squirm.
- D. Provide expansion joints rated at 150 PSIG and 400 degrees F.
- E. The full protection carbon steel cover to be capable of withstanding the design pressure at temperature.
- F. Construct the expansion joints so that the pipe itself serves as an integral liner or sleeve.
- G. All double expansion joints to have a support foot for ease of installation. The support foot to serve as an intermediate sub-anchor, which will absorb only the small forces created by friction, windage and minor misalignment.
- H. Provide expansion joints with drain and/or purge connections.
- I. Expansion joints to be capable of withstanding a hydrostatic test pressure equal to 1.5 times the design pressure.
- J. Provide pipe alignment guides of two piece welded stainless steel with zinc rich primer, bolted, with spider to fit standard pipe, frame with four mounting holes, clearance for minimum 1-1/2 inch thick insulation, minimum 3 inch travel.

PART 3 EXECUTION

3.1 EXAMINATION

- A. General: Examine all and steam specialties at the time of delivery for damaged or missing components. Do not proceed with installation of equipment until all items found defective have been corrected.

3.2 INSTALLATION

- A. General: Install specialties in accordance with the manufacturer's recommendations and approved shop drawings and as specified in Division 1. Make all necessary adjustments to provide a complete and satisfactory operation upon completion of the installation.
- B. Relief Valves: Install safety relief valves as required by ASME Boiler and Pressure Vessel Code. Pipe the discharge without valves, to a floor drain. Comply with ASME Boiler and Pressure Vessel Code Section VIII, Division 1 for installation requirements.
- C. Dielectric Waterway Fittings: Install dielectric unions to join dissimilar metals.

- D. Strainers: Install strainers on the supply side of each control valve, pressure reducing valve, pressure regulating valve, solenoid valve, in-line pump, and elsewhere as indicated. Install a nipple and ball valve in the blow down connection of strainers 2-inch and larger.
- E. Thermometers: Install thermometers with ranges from 50 to 350 degrees F on steam pipes. Position thermometers so that they can be easily read from a normal standing position.
- F. Pipe Sleeves: Provide pipe sleeves for pipes penetrating concrete and masonry construction.
- G. Pipe Anchors: Anchors to be designed to control movement in piping. Weld anchors to ferrous piping and braze to non-ferrous piping. Provide the additional materials to adapt the anchors to the building structure and to strengthen the structure to take the imposed loads. These loads include, but are not limited to, pressure thrust (if not absorbed by devices on the expansion joint), spring force, and dead weight of the pipe and fluid. Anchor location and design to follow the guidelines given in the Standards of the Expansion Joint Manufacturers Association Inc. (EJMA).
- H. Pipe Guides: Provide pipe guides so movement is directed along axis of pipe only. Location and quantity of pipe guides shall be determined from the EJMA. Erect piping such that strain and weight is not on cast connections or apparatus.
- I. Escutcheons: Install chrome-nickel plated brass escutcheons, sized to fit over the pipe and its insulation, at locations where exposed pipes penetrate finished surfaces.
- J. Noise Transmission: Arrange and install equipment and piping to avoid noise transmission to the structure or to other piping. Correct unacceptable noise or vibration as required, at no additional cost.
- K. Flexible Connectors: Install flexible piping connectors to vibration isolated equipment. Provide flexible connectors in accordance with Section 15072.
- L. Steam Trap: Provide steam traps where shown and called out on the drawings unless otherwise required. Placement of traps to be based on thermal requirements, location of bends and expansion joints, and piping configuration. Provide traps more frequently than indicated on steam pipes in tunnels and where necessary to accommodate long piping runs and to provide for complete condensate removal from the steam distribution piping systems.
- M. Steam Pipe Slopes: Slope steam pipes 1/4 inch per 10 feet away from the steam source and condensate pipes 1/4 inch per 10 feet toward the condensate receiver. Provide milder pipe slopes on long pipe runs where not practical to use the typical

slopes in conjunction with additional steam traps as required. Assure that the pipes DO NOT slope against the direction of the flow.

- N. Install Condensate Return Units according to manufacturer's instructions.
- O. Install Externally Pressurized Expansion Joints where shown on the contract drawings and as required for proper piping system expansion. Install the joints according to manufacturer's instructions.

3.3 FIELD QUALITY CONTROL

- A. Inspections: Inspect the specialties as follows:
 - 1. Remove and clean strainers.
 - 2. Lubricate motors and bearings.
- B. Manufacturer's Field Services: Provide the services of a qualified representative of the manufacturer as specified in Division 1 to inspect the installation of equipment, and certify that it meets the manufacturer's recommendations. Provide 6 training hours including hands on training.

END OF SECTION

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