

SECTION 15000 - BASIC MECHANICAL

PART 1 - GENERAL

- 1.1 DESCRIPTION OF WORK: Work to be performed under this Division shall include all labor, materials, equipment and services necessary to provide the complete mechanical system as shown on the drawings and herein specified.
- 1.2 DESIGN INTENT: The work contained in these documents provides general design intent. The contractor shall provide all labor, materials needed to overcome obstacles encountered during construction.
- 1.3 QUALITY ASSURANCE: All work shall be done in a workmanlike manner in accordance with good practice, manufacturer's recommendations and in compliance with the 2006 Florida Building Code including all updates and all local codes and regulations.
- 1.4 SUBMITTALS: Submittal data is required for all mechanical products specified. The contractor shall prepare five (5) individual binders with the project name listed on the front cover and binding edge. All data shall be thoroughly reviewed by the contractor before contractor submittals are prepared. Submittals and the submittal list shall be prepared and submitted to the architect no later than 21 calendar days prior to review of submittals. The Submittal shall be complete and shall contain data for all mechanical products specified for review. Specific products shall be clearly identified and all accessories shall be clearly noted. Partial submittals will be rejected unless advanced arrangements are made with SEG. Submittals that do not have performance review stamps and signatures will be rejected. If more than three submittal reviews are required from SEG, the contractor shall be back-charged for all additional engineering review time.
 - A. Include certificates for welder's to be utilized on project.

- 1.5 PERMITS: The Contractor shall apply for and obtain all permits and pay all related expenses.
- 1.6 INSPECTIONS: The Contractor shall coordinate all inspections required by the authority having jurisdiction.
- 1.7 WARRANTIES: Provide one year materials and labor warranty on all work. Provide additional warranties as required by individual product sections. Provide signed warranty letters to the owner. Letters shall include a summary of products having warranties extending beyond the one year contractor warranty period. Execute and assemble transferable warranty documents from subcontractors, suppliers, and manufacturers.
- 1.8 AS-BUILT DOCUMENTS: Maintain one set of Contract Documents with markups indicating revisions to the Work. Deliver electronic copy (in AutoCad format) of As-Built documents to Owner at conclusion of project.

- 1.9 SUBSTITUTIONS: Architect/Engineer will consider requests for Substitutions up to 10 days prior to bid date. Post-bid substitutions will only be considered when Product becomes unavailable through no fault of Contractor. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents. Submit two copies of request for Substitution for consideration. Limit each request to one proposed Substitution. The Contractor shall be responsible for all extra work resulting from the use of equipment other than the basis of design.
- 1.10 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS: Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion review. Remove underground installations to minimum depth of 2 feet. Clean and repair damage caused by installation or use of temporary work. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.
- 1.11 DAMAGE RESULTING FROM CONSTRUCTION: Repair any and all damage to existing facilities and structures resulting from execution of the work. Repairs shall be performed by qualified workmen and shall be of the same quality as the original. Resurfacing shall be repaired/replaced in like, level, take and 50d all non-paved areas affected by the work.

- 1.12 MECHANICAL CHANGE PROCEDURES: Basis for Change Order Costs: All change order requests shall be provided with complete time and materials breakout pricing that corresponds to RS Means 2004 data. Each cost and pricing item shall be fully justified and include the 12 digit RSMeans reference number for cost validation. Assembly costs may be used when the scope of the change closely matches the RSMeans item scope. Costs that lack reference numbers will be rejected.
 - A. Cost Allowances:
 - 1. 10% for "Overhead and Profit" for self performed work.
 - 2. 5% for "Overhead and Profit" for non-self performed work.
 - B. Stipulated Sum/Price Change Order: Based on Proposal Request and Contractor's fixed price quotation or Contractor's request for Change Order as approved by Architect/Engineer.
 - C. Change Order Forms: AIA G701.
 - D. Unit Price Change Order: For pre-determined unit prices and quantities. Change Order will be executed on fixed unit price basis. For unit costs or quantities of units of work which are not pre-determined, execute Work under Construction Change Directive. Changes in Contract Sum/Price of Contract Time will be computed as specified for Time and Material Change Order.

- PART 2 - PRODUCTS
 - 2.1 Refer to Section 15000 - HVAC for product requirements.
 - 2.2 DELIVERY, HANDLING, STORAGE, AND PROTECTION: Deliver, handle, store, and protect Products in accordance with manufacturer's instructions.
 - 2.3 PRODUCT SPECIFICATION OPTIONS: Products are specified by one of the following methods:
 - A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.
 - B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting Specifications, no options or substitutions allowed.
 - C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit request for substitution for manufacturers not named.

- PART 3 - EXECUTION
 - 3.1 CLEANING: After the water piping systems have been tested and proved tight, thoroughly flush out and clean the various piping systems to remove all dirt, scale, oil, grease and other foreign substances.
 - 3.2 CLOSING, IN OF UNINSPECTED WORK: Do not cover up or enclose any work until inspected, tested and approved by the authority having jurisdiction.
 - 3.3 OWNER FURNISHED TEST AND BALANCE:
 - A. Owner's Responsibility:
 - 1. Owner will appoint, employ, and pay for services of an independent firm to perform testing, adjusting, and balancing.
 - 2. Owner shall provide a full test and balance and capacity testing per AABC National Standards. Work shall be done by a certified AABC test and balance firm. Submit one certified report for engineer review, comment, and archive purposes. Submit three certified reports to Owner for archive.
 - B. Contractor's Responsibility:
 - 1. Contractor shall clean strainers of hydronic systems.
 - 2. Contractor shall immediately correct punch list items provided by TAB agent. All work by TAB agent for any items not corrected upon a revisit shall be charged to the contractor.

- 3.4 PROJECT RECORD DOCUMENTS: Maintain on site one set of Contract Documents to be utilized for record documents. Record actual revisions to the Work. Record information concurrent with construction progress.
 - A. Record Documents and Shop Drawings: Legibly mark each item to record actual construction.
 - B. Submit documents to Architect/Engineer prior to Substantial Completion review.

END OF SECTION

SECTION 15000 - HVAC

PART 1 - GENERAL

- 1.1 QUALITY ASSURANCE
 - A. MANUFACTURERS: Firms regularly engaged in manufacture of products of types, materials, and sizes specified whose products have been in satisfactory use in similar service for not less than 5 years.
 - B. INSTALLERS: All installers shall be bonded firms with at least 5 years of successful installation experience on HVAC systems similar to those used on this project. Similar reference projects shall be submitted upon request.
- 1.2 SUBMITTALS:
 - A. Refer to 15000 for submittal requirements.
 - B. Submit manufacturer's specifications on the following:
 - 1. All manufactured products.
 - 2. Factory, fabricated ductwork.
 - 3. Welder's certifications.
 - C. Where HVAC equipment performance is specified, the equipment manufacturer shall provide adequate equipment selection data to verify equipment to be supplied meets or exceeds all the specified criteria.
- 1.3 MECHANICAL IDENTIFICATION
 - A. Valves: Brass tags, 1.5" diameter. Install with corrosion resistant metal chain.
 - B. Valve Chart: Provide a framed, laminated valve chart indicating valve number, service, and location. Mount chart in the chiller plant.

- PART 2 - PRODUCTS
 - 2.1 CHILLED WATER PIPING:
 - A. PIPE TYPES:
 - 1. Black Steel: Schedule 40, ASTM A53, or A106, except comply with ASTM A53 or A106 where close coiling or bending is required.
 - a. Pipe size 2" and smaller: Threaded Class 150 malleable iron, ANSI B16.3.
 - b. Pipe size 2-1/2" and larger: Welded fittings.
 - 2. Pre-insulated Chilled Water Piping:
 - a. Provide at all locations hydronic water piping is installed below grade.
 - b. Manufacturers: Energy Task Force, Thermacore, Permapipe, Ravaroc.
 - c. Carrier pipe: ASTM A53/A53M, Grade B; Schedule 40; black, malleable iron or forged steel.
 - d. Insulation: Factory applied ASTM C591, preformed framed urethane, k factor 0.12. Minimum thickness: 1-1/2"
 - e. Jacket: PVC, minimum thickness shall be as follows:
 - 1) Up to 6" jacket diameter: 60 mils
 - 2) 8" jacket diameter: 80 mils
 - f. Fittings, flanges, and couplings: wrought-steel butt-welded, with field installed fitting insulation kits.
 - B. PIPE/UTILITY FITTINGS: Provide factory-fabricated fittings of the type, material, grade, class and pressure rating indicated on each service and pipe size. Provide steel and types flanging pipe, tube, regulations and industry standards for selections, and with pipe manufacturer's recommendations where applicable.

- C. VALVES:
 - 1. GENERAL: Except as otherwise indicated, provide factory-fabricated valves of the type, body material and pressure class indicated. Where type or body material is not indicated, provide proper selection as determined by installer for installation requirements, and tested by manufacturer with pressure class selected from and complying with MSS SP-67 or ANSI standards based on the maximum pressure and temperature in the piping system. Except as BUTTERFLY VALVES: Valves suitable for 200 psi WOG at temperature ranges from 25°F through 230°F. Bubble tight closure. Fully replaceable EPDM seats. Ductile iron or semi-steel body, one piece. Type 416 stainless steel shaft. Aluminum/bronze alloy disc shall be anchored to shaft with stainless steel drive pins. Provide 2" extension neck to receive insulation. Lever lock type handle operator on valves to 6" gear operators on sizes over 6". Valves used for balancing shall have infinite position lever or gear operators with adjustable open position "memory" stop.
 - 3. BALL VALVES: Blow-out proof bottom loaded stem constructed of ASTM B-371 Alloy 694 or other approved low zinc material. TFE packing. TFE thrust washer, chrome plated ball and reinforced elastomer stem. Stem extensions shall be furnished for use in insulated lines where installation elevation is below ground.
 - a. Over 2": Conventional port, Class 150 valves constructed of ASTM B-594 Alloy 944 or ASTM B-124 Alloy 377.
 - b. 2" and smaller: Full port, threaded ends, Class 125, bronze two-piece body, bronze ball, bronze stem.
- D. PIPING SPECIALTIES:
 - 1. FLANGES, UNIONS, AND COUPLINGS:
 - a. Pipe Size 2 inches and Under: Malleable iron unions for threaded ferrous piping, bronze unions for copper pipe, soldered joints.
 - b. Pipe Size over 2 inches: Forged steel flanges for ferrous piping, bronze flanges for copper pipe. Soldered necks, forged steel flanges for pipe sizes up to 6 inches.
 - c. Diabetic Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

- PART 3 - EXECUTION
 - 3.1 INSTALLATION
 - A. PIPING:
 - 1. Install pipe, tube and fittings in accordance with recognized industry practices to achieve permanently leak-proof piping systems, capable of performing each indicated service without undue stress. All piping shall be installed in accordance with applicable codes and standards. Accessible unions for disassembly and maintenance/replacement of valves and equipment. Reduce sizes (where indicated) by use of reducing fittings. Align piping accurately at connections, within 1/16" misalignment tolerance. Comply with ANSI B31 Codes for Pressure Piping.
 - 2. WELD PAINTING: Coat all pipe welds with two coats of zinc chromate or equal rust preventative paint prior to installation of insulation.
 - 3. CLEANING, FLUSHING, INSPECTING: Clean exterior surfaces of installed piping systems of superfluous materials, and prepare for application of specified coatings (if any). Thoroughly chemically clean and flush piping systems prior to providing chemical treatment. Outline openings 6 to 8 inches then drain and flush until the flow alkalinity of the wash water is equal to the pH of the water. Repeat until the pH is neutral. Repeat until the water is clear. Inspect for corrosion during operation of the water systems. Inspect each unit of each system for completion of joints, supports and accessory items. Inspect piping in accordance with procedures of ANSI B31.
 - 4. HYDROSTATIC TESTING: Pressure test new piping to 150% of working pressure, or 150 psi, whichever is greater. Pressure test with water. Remove air from system before start of test. Pressure must hold for a minimum of 24 hours with a 4-psi maximum drop. During a 24-hour pressure holding period, valve oil system being tested and completely disconnected method of system pressurization.
 - B. VALVE BONDING: Provide aluminum engraved tags permanently attached to the valve box lid. Tag shall indicate pipe service and valve numbers.

END OF SECTION

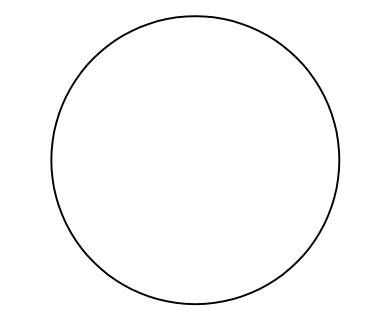
Construction Documents - 04/29/2009

Revisions

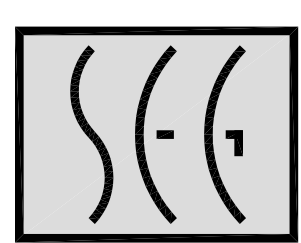
Project
Discovery Middle School
Chilled Water Piping Replacement

Owner
 School District of Osceola County Florida

Engineer of Record
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Sheet Title
Mechanical Specifications

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