SECTION 221500 - GENERAL SERVICE COMPRESSED AIR SYSTEMS

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. Provide all compressed air materials for, or incidental to, installation of complete compressed air system, as required by drawings and these specifications.

B. Section Includes:

1. Piping systems from air compressor to terminal devices.
2. Air compressor system.
3. Hose reels.

C. Related Sections:

1. Section 23 05 03.00 “Submittals for HVAC”

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for water softeners.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
3. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

A. Source quality-control reports.

B. Field quality-control reports.

C. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For water softeners to include in emergency, operation, and maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1.7 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended application.

1.8 COORDINATION

A. Coordinate sizes and locations of concrete bases with actual equipment provided.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of compressed air systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

    a. Structural failures of mineral and brine tanks.
    b. Faulty operation of controls.
    c. Deterioration of metals, metal finishes, and other materials beyond normal use.

PART 2 - PRODUCTS

2.1 COMPRESSED AIR PIPING

A. Interior compressed air piping:

1. Piping size 2” and smaller: Schedule 40, Black iron steel pipe.
2. Fittings: Class 125 cast iron, threaded.

2.2 AIR COMPRESSOR SYSTEM

A. Description: Compressor system shall be piped as seen in project plans and details and in accordance with manufacturer’s guidelines.

B. Compressors:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

    a. Ingersoll Rand
    b. Atlas Copco

c. Quincy
d. Champion

2. Provide rotary screw, air-cooled compressors as scheduled with the following options and features:

a. Aftercooler
b. 460v Inverter
c. Blower VSD,
d. 75dBA Enclosure
e. Timed Solenoid Drain
f. 65-145 PSI Range
g. At 115 PSIG Flow Rate is 65-224 CFM

3. Controls:

a. Intellisys SGNe Control.
b. VSD Infinite Start & Stop Control.
c. Remote Start-Stop Control.
d. Percent of Load.
e. Percent of Energy Savings.

4. Refrigerated air dryer.
5. Filters.
6. Receiver.
7. Pressure gauges and safety valves

C. Valves

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Nibco
b. Milwaukee
c. Watts
d. Apollo

2.3 HOSE REELS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Reelcraft
2. Hannay
3. Coxreels

PART 3 - EXECUTION

3.1 GENERAL

A. Appropriate compression shutoff valve and ground joint unions shall be used at each fixture and piece of equipment to facilitate removal of equipment.

B. Adapters used for screwed valves and any connection to steel shall be insulated to prevent electrolysis.

C. Use dielectric unions where dissimilar metals are joined together.

3.2 INSTALLATION

A. Basic piping installation requirements are specified in Division 22 Section "Common Work Results for Plumbing."

B. Basic piping joint construction requirements are specified in Division 22 Section "Common Work Results for Plumbing."

C. Locate group of pipes parallel to each other, spaced to permit servicing of valves. Branch takeoffs shall be off of the top of the main, main shall be sloped back towards compressor or shall be provided with a drip leg and clean out.

D. Shutoff Valves: Install on inlet of each mechanical equipment item and hose outlet.

E. Outlets unless otherwise noted, shall be turn down the wall to 3' above floor finish. Provide terminal with valve and quick connect fitting. Coordinate fitting with owner.

F. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight.

G. Install compressed air piping level with 0.25 percent slope downward toward drain and plumb.

3.3 VALVE SELECTIONS

A. Steel Pipe Sizes 2 Inch and Smaller: threaded.

3.4 VALVE INSTALLATION

A. General Application: Use ball and butterfly valves for shut-off duty. Use butterfly for throttling duty.

B. Locate valves for easy access and provide separate support where necessary.

C. Install valves and unions for each fixture and item of equipment in a manner to allow equipment removal without system shut-down. Unions are not required on flanged

devices. Isolation valves shall be installed on branch lines serving two or more pieces of equipment and every 100 feet.

D. Install valves in horizontal piping with stem at or above the center of the pipe.

E. Note the internal length of threads in valve ends, and proximity of valve internal seat or wall, to determine how far pipe should be threaded into valve.

F. Align threads at point of assembly.

G. Apply appropriate tape or thread compound to the external pipe threads (except where dry seal threading is specified).

H. Assemble joint wrench tight. Wrench on valve shall be on the valve end into which the pipe is being threaded.

3.5 HANGER AND SUPPORT INSTALLATION

A. and support devices are specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment." Install the following:

B. Support vertical piping and tubing at base and at each floor.

C. Rod diameter may be reduced 1 size for double-rod hangers, to a minimum of 3/8 inch.

D. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/4 and Smaller: 84 inches with 3/8-inch rod.
2. NPS 1-1/2: 108 inches with 3/8-inch rod.
3. NPS 2: 10 feet with 3/8-inch rod.

E. Install supports for vertical steel piping every 15 feet.

F. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructio

3.6 CONNECTIONS

A. Connect piping system to mechanical equipment as indicated, and comply with equipment manufacturer's instructions where not otherwise indicated. Install shutoff valve and quick connect fitting at each terminal outlet.

3.7 FLUSHING AND CLEANING

A. Clean and flush system of all dirt, metal chips, sand, and foreign matter. After flushing remove, clean, and replace all strainer baskets or screens. Inspect each run of each system for completion of joints, supports, accessory items, and obvious leaks.

3.8 TESTING

A. Provide temporary equipment for testing, including pump and gages. Subject entire piping systems to leak tests, either as a whole, or in sections; but leave no part untested.

B. Fill piping systems with air, and pressurize at 150% of operating pressure, (but not less than 150 psi) for 2 hours. Test fails if leakage is observed, or pressure drop exceeds 5% of test pressure.

C. Notify Architect/Engineer at least 24 hours before performing leak test.

D. Repair piping systems which fail required piping test, by disassembly and re-installation, using new materials to extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.

3.9 IDENTIFICATION

A. Identify system components. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.10 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.

3.11 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain compressed air system.

END OF SECTION 221500