

DIVISION 15 – MECHANICAL

SECTION 15100 - PLUMBING

PART 1 - GENERAL

SCOPE

Plumbing work includes all domestic water, gas, and sanitary sewer systems as shown on plans. Also all fixtures and equipment which are part of these plumbing systems.

QUALITY

All work shall comply with applicable codes and ordinances. Work shall comply with the BOCA National Plumbing Code, latest edition.

SUBMITTALS

Submit shop drawings and equipment brochures for all plumbing equipment to the Architect for approval prior ordering material.

SITE CONDITIONS

This contractor shall visit the site before submitting his bid and shall verify all work necessary to provide a complete plumbing system.

OPERATION AND MAINTENANCE MANUALS

At least two (2) weeks prior to completion of the plumbing work, the Contractor shall provide three (3) bound copies of all operation and maintenance manuals to the Architect.

PART 2 - PRODUCTS

PLUMBING FIXTURES

As shown on drawings.

Domestic Water:

- Type K, soft copper, below slab with no joints.
- Type L, hard copper, above slab, with soldered fittings and joints.
- Wrought copper fittings.

Soil, Waste, Vent (Above Ground):

- Hub-less cast-iron, no-hub, CISPI 301.
- Schedule 40, galv. steel, vent piping.
- Cast Iron fittings at vents.

Soil, Waste:

Below slab - cast iron, no hub fittings.

Outside building - PVC - DWV, Schedule 40 with gasket joints.

- PVC - perforated drain pipe.

Gas Service Pressure Regulator:

Fisher, type 166-4, in size as required.

Gas (Above Grade):

Schedule 40, black steel.

Standard weight fittings.

Screwed fittings.

Gas (Below Grade):

Schedule 40, POLY-GAS.

Coated and wrapped fittings.

Hose Bibb:

Woodford, non-freezing, 3/4" connection, with anti-siphon device.

Floor Drains: Refer to drawings.

Valves: Hammond, Nibco, or Crane as suited to use.

Stop Valves: Crane, chrome plated stop valves for each hot or cold water fixture connection.

Water Hammer Arrester: Wade "SHOK STOP", one per hot or cold water fixture connection.

Accessories: (as required)

Hangers

Sleeves and Escutcheons to fit pipe.

Insulation, 1/2" thick, flexible foam tubing with taped joints.

CLEANOUTS

General: Provide cast-iron ferrule and countersunk brass cleanout plug, with round cast-iron access frame and heavy-duty, secured, scoriated cast-iron cover.

IDENTIFICATION

Plastic Underground Warning Tapes: Polyethylene plastic tape, 6 inches wide by 4 mils thick with continuously printed

caption in black letters "CAUTION - (SEWER) (GAS) (WATER) LINE BURIED BELOW."

PART 3 - EXECUTION

PREPARATION

Grade trench bottom to provide a smooth, firm, stable, and rock-free foundation, throughout the length of the pipe.

Remove unstable, soft, and unsuitable materials at the surface upon which pipes are to be laid, and backfill with clean sand or pea gravel to indicated level.

Shape bottom of trench to fit bottom of pipe. Fill unevenness with tamped sand backfill. Dig bell holes at each pipe joint to relieve the bells of all loads and to ensure continuous bearing of the pipe barrel on the foundation.

INSTALLATION, GENERAL

General Locations and Arrangements: Drawings indicate the general location and arrangement of the system piping. Location and arrangement of piping layout take into account many design considerations. Install the piping as indicated, to the extent practical.

Provide unions on each item of equipment for future maintenance.

Install sewer piping pitched down in direction of flow, at minimum slope of 2 percent, except where indicated otherwise.

Install insulation on all water piping subject to freezing.

TAP CONNECTIONS

Make connections to existing piping and underground structures so that finished work will conform as nearly as practicable to the requirements specified for new work. Coordinate all connections to municipal services with City of Stillwater and Okla. Natural Gas Co. at least 3 days prior to work.

Do not tap service lines without approval of provider. Provide meters for both gas and water service.

INSTALLATION OF IDENTIFICATION

Install continuous plastic underground warning tape during back-filling of trench for underground service piping. Locate 6 to 8 inches below finished grade, directly over piping.

FIELD QUALITY CONTROL

Testing: Perform testing of completed piping as follows:

Sanitary Sewer Drains: 10'-0" static head of water.

Gas Piping: 60 psig with no loss for 24 hours.

Water Piping: 150 psig with no loss for 24 hours.

Architect must be notified at least 24 hours prior to testing.

Water piping must be sterilized to meet STATE Board of Health requirements.

Sewer: Clear interior of piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed.

Place plugs in ends of uncompleted pipe at end of day or whenever work stops.

***** END OF DIVISION 15100 – PLUMBING

SECTION 15500 - HEATING, VENTILATING, AND AIR CONDITIONING

PART 1 - GENERAL

1.01 SUMMARY

A. Provide commercial mechanical systems including:

1. Central Heating and Cooling system.
2. Fan powered unit heaters
3. Systems designed for gas utility service.
4. Exhaust Fans, sheet metal work, registers, grilles and diffusers.
5. Duct insulation.
6. Temperature controls.
7. H.E.P.A. filter system
8. Testing, adjusting and balancing.

- B. Coordinate location of mechanical systems to avoid interference with location of other systems, including piping and lighting fixtures.
- C. Do not cut structural elements without prior written approval.

1.02 SUBMITTALS

- A. Submit for approval product data, operating and maintenance data, balancing reports and as-built record documents.

1.03 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Arrangement of systems indicated on the drawings is diagrammatic, and indicates the minimum requirements for mechanical work. Site conditions shall determine the actual arrangement of systems. Take field measurements before fabrication. Be responsible for accuracy of dimensions and layout. Overhead ductwork shall be laid out to obtain maximum head room.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Mechanical Equipment: As shown and called for on drawings.
- B. Valves: Provide valves required by service intended including gate,

globe, check, and ball valves. Provide valves by Kennedy, Crane, Nibco or approved equal.

C. Hangers and supports: Comply with ANSI B31.1.

D. Unit heaters: Copper tube coils with aluminum fins, baked enamel steel enclosure by Trane, Airtherm or approved equal. Refer to drawings for Equipment Models.

E. Sheet metal work and accessories: Comply with SMACNA Duct Manual and Sheet Metal Construction for Ventilating and Air Conditioning Systems.

F. Fans and air handling units: Refer to drawings for Equipment Models.

G. Grilles and registers:

Supply: Titus, Model TMSA, square ceiling diffuser, surface mount, 24 x 24, white steel, with model D-100 balancing dampers.

Return: Titus, Model 25-RL-NT, square return grille, surface mount, 24 x 24, 1/2" spacing, white steel.

H. Fan coil units: Refer to drawings for Equipment Models.

I. Controls: Seven day programmable automatic temperature control system by Honeywell, Johnson Controls or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and

building code requirements. Provide proper clearances for servicing.

- B. Provide 1" dia. copper condensate drains from refrigeration drain pan to nearest floor drain.
- C. Install shutoff valves on each piece of equipment for gas service lines.

- D. Install ductwork in accordance with SMACNA recommendations. Seal duct seams with sealer. Provide splitters and balancing dampers. Provide fire dampers and automatic smoke and fire dampers where required. Provide flexible connectors and inlet and discharge connections. Clean before testing and balancing.
- E. Insulate ductwork. Provide vapor barrier on insulated ducts operating below 60 degrees F.
- F. Conceal piping and ductwork to the greatest extent practical.
- G. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating. Provide fire dampers at all fire rated wall penetrations.
- H. Clearly label and tag all components.
- I. Test and balance all systems for proper operation.
- J. Restore damaged finishes. Clean and protect work from damage.
- K. Instruct Owner's personnel in proper operation of systems.

***** END OF DIVISION 15 – MECHANICAL
