SECTION 15400

PLUMBING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope

1. Furnish and install complete plumbing systems including piping, fixtures, equipment and appurtenances as scheduled on the Drawings or specified

B. Additional Requirements Specified Elsewhere

1. Section 01340: Shop Drawings, Product Data and Samples
2. Section 01600: Materials and Equipment
3. Section 01730: Operating and Maintenance Data

C. Related Requirements Specified Elsewhere

1. Section 02641: Valves and Accessories
2. Section 10800: Toilet and Bath Accessories
3. Section 11600: Laboratory Equipment
4. Section 11610: Fume Hood
5. Section 12345: Laboratory Casework
6. Section 15060: Pipe and Pipe Fittings
7. Section 15070: Pipe Supports
8. Section 15082: Plumbing Insulations
9. Section 15140: Domestic Water Piping
10. Section 15150: Sanitary Waste and Vent Piping
11. Section 15195: Natural Gas Piping
12. Section 15410: Miscellaneous Meters

1.2 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies

1. In accordance with all municipal codes and ordinances, laws and regulations of the state
2. In case of apparent conflict, state and local requirements govern over these specifications
3. In absence of state and local regulations, International Plumbing Code applies

1.3 SUBMITTALS

A. Shop Drawings and Product Data in accordance with Section 01340

1. On all materials, fixtures, equipment and appurtenances
2. Sufficient to verify compliance with specifications

B. Operating and Maintenance Manuals in Accordance with Section 01730

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pipe and Pipe Fittings

1. Potable water hot and cold piping, etc.: Per Section 15060 and 15140
2. Drainage and waste piping, pump discharge piping, etc.: Per Section 15060 and 15150

B. Valves and Accessories: Per Section 02641

C. Fixtures

1. Water closets
   a. Refer to Plumbing Schedule on Drawings
   b. Seat: White, open front, concealed check; Church, Olsonite or equivalent
   c. Carrier and fittings: Josam, Smith, Wade, Zurn or equivalent
   d. Flush valve: Delany, Sloan, Zurn or equivalent
2. Sinks
   a. Refer to Plumbing Schedule on Drawings
      1) Fittings: American Standard "2248.565," Kohler "K-7401-T," Eljer "555-1310," or equivalent
      2) Supplies: American Standard "2203.154," Crane "8-5002," Eljer "E-9756-W," Kohler "K-7606," or equivalent
      3) Trap: 1¼" x 1-1/5", cast brass; American Standard "4418.026," Kohler "K-9004," or equivalent
      4) Service sink supply fittings: American Standard "HB95406VB," Crane "8H2770," Kohler "K-8904," Chicago Faucet "897," Speakman "S-4815," or equivalent
      5) Service sink trap: "P" type, cast iron
3. Shower
   a. Mixing valve, equipped with integral stop: Crane "8-1365 Criterion," Powers "Series 420 Hydroguard," Speakman "S-1735-1S Model 172 Showerguard," or equivalent
   b. Shower head: Kohler "K-7350 City Club," Speakman "S-2250 Model 2," or equivalent
   c. Shower arm: American Standard "1440.017," Crane "8-2576," Kohler "K-7397," Speakman "S-2500," or equivalent
   d. Shower enclosure
      1) One piece, white polypropylene
      2) slip resistant integral base
      3) Hand rail
      4) Solid polypropylene door
      5) Comply with Code dimensional requirements
      6) Acceptable manufacturers
         a) Fiat
         b) Aqua-Glass

c) Stern-Williams

4. Water heater
   a. Electric, glass lined, magnesium anode: Refer to Plumbing Schedule on Drawings
      1) Heavy gauge steel tank with insulation pad below tank
   b. ASME-AGA temperature and pressure relief valve: Cash-Acme "Type FV," McDonnell & Miller "203 Series," Watts "Type 40L," or equivalent
5. Water hammer arrestors
   a. Tested and certified per ASSE 1010
   b. Sizes per P.D.I.-Wh 201
   c. Zurn "Z-1700" or equivalent
6. Exposed metal parts shall be chrome plated unless otherwise specified

D. Drains

1. Floor drains
   a. Refer to Plumbing Schedules on Drawings
   b. Bronze top
2. Cleanouts
   a. Interior floor cleanouts: Refer to Plumbing Schedules on Drawings
   b. Exterior floor cleanouts: Refer to Plumbing Schedules on Drawings
   c. Interior wall cleanouts: Refer to Plumbing Schedules on Drawings
3. Trench drains
   a. Precast polymer, refer to Plumbing Schedules on Drawings
4. Vent flashing sleeves: Cast iron; Josam Series 1870, Zurn "Z-195," or equivalent

E. Backflow Preventer

1. Refer to Plumbing Schedule on Drawings

2.2 HYDROPNEUMATIC TANKS

A. Well Water Supply

1. Quantity: 2
2. Size: 119 gallons total, each
3. Factory precharged
4. Accessories
   a. Air fill valve
   b. Air pressure gauge
   c. Drain valve
   d. Isolation valve
   e. Replaceable flexible membrane
5. Tank shall be fully lined such that water does not come in contact with the metal walls of the tank
6. Design basis: Well-X-Trol Model WX350 or equivalent

PART 3 - EXECUTION

3.1 GENERAL

A. Keys

1. Deliver yard hydrant keys, hose bib keys, stop keys, valve wrenches, etc. to Owner at project completion

B. Disinfect all potable water systems in accordance with requirements of Section 02708

3.2 INSTALLATION

A. Drainage Piping

1. Conform, in general, to locations indicated on Drawings
2. Slope horizontal soil and waste pipes at ¼"/ft where possible, but never less than ⅛"/ft
3. Provide cleanouts in finished floors or in partition walls with a nickel-bronze access cover and frame, with securing screw
4. Install bell-ups flush with floor surface
5. Lay on uniformly descending grades
6. Trenching, embedment and backfill per Section 02200
7. Encase buried drainage piping beneath slabs in concrete at least 6" thick all around
8. Handle and store pipe properly with premolded joints
9. Properly lubricate joints before installation

B. Pipe Joints

1. General: In accordance with Section 15060
2. Lead joints in drainage piping
   a. In accordance with the best standard practice
   b. Apply lead in one pouring and completely fill
   c. Do not repeat pour or drive in cold lead
   d. Thoroughly caulk for watertightness but do not overstress bell
   e. Install sleeve type per manufacturer's recommendations

C. Vent Roof Flashings

1. Adequately flash all vents passing through roofs
2. Extend vents 2' above roof, unless noted otherwise
3. All vents passing through roofs shall be adequately flashed as detailed on the Drawings

D. Floor Drains and Trench Drains

1. Per Drawings
2. Cap, plug or tape openings to prevent concrete from entering drain during placement. Leave in place until all work in area is completed
3. Floor drains
   a. Adjust floor drains to correct elevation for proper drainage
4. Trench drains
   a. Adjust to correct elevation
   b. Rigidly anchor and block; prevent flotation during concrete placement

E. Prohibited practices

1. Bushing not allowed
2. Vents within 24" of parapet, roof edge, crickets or adjacent wall not allowed (This is to permit proper installation of cant strips, etc.)

F. Cleanouts

1. Provide where shown and required for proper cleaning of entire drainage system
2. Provide full size of pipe on which installed, 4" maximum

G. Water Hammer Arrestors

1. Provide as required by code in hot and cold water piping and non-potable water piping

H. Supports and Fastenings

1. Support fixtures and accessories securely and rigidly; set level and plumb
2. Conceal ends of bolts with hexagonal, round chromium-plated cap nuts
3. Conceal fasteners for mounting accessories and use toggle bolts or expansion anchors

3.3 CLEANING AND ADJUSTMENT

A. General

1. Thoroughly clean all parts after installation
2. Remove grease, metal cuttings and sludge
3. Repair at Contractor's expense any stoppage or damage caused by unclean pipe
4. Adjust flush valves and other devices for quiet operation

3.4 ADJUSTMENTS

A. At project completion, adjust all plumbing systems, fixtures and equipment for proper operation under maximum flow/demand conditions

END OF SECTION