SECTION 22 10 05 – PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe, pipe fittings, specialties, and connections for piping systems.
   1. Sanitary sewer.
   2. Domestic water.
   3. Flanges, unions, and couplings.
   4. Pipe hangers and supports.
   5. Manufactured sleeve-seal systems.
   6. Valves.

1.02 REFERENCE STANDARDS


PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

PART 3 EXECUTION

A. General Standards

   1. All underground plumbing utility piping shall have a minimum of 12” sand encasement.
   2. All underground plumbing utility piping shall have a minimum depth of 24” unless otherwise approved by the administrative authority after all existing utilities have been potholed by the contractor.

B. Design Documentation

   1. Programming; For wet laboratories, studios, dark rooms, commercial kitchens, laundries, and other special use rooms requiring plumbing utilities to accommodate special functions, the Design Professional shall gather and
document all information required to confirm Plumbing requirements as part of room programming. This information shall be included with the Design Development Submittal. Obtain and document the following information for each building room where special use plumbing services will be required.

- Room name
- Person requesting the plumbing services, Interviewer, Date
- Room use
- A list of required plumbing services. Include qualitative and quantitative data if available.
- Functions / processes which the required plumbing services are intended to accommodate. Provide sufficient information to ascertain the need for special plumbing provisions such as back flow prevention, pressure regulation, drain sediment traps, etc.
- A list of all equipment / apparatus which will require plumbing services. Include equipment manufacturer's data (connection size, use rate, etc.) if available.
- The above programming information may be omitted for rest rooms and residential kitchens where all required design data is covered by applicable codes.

C. Plumbing Calculations:

1. The Design Professional shall include final plumbing calculations with the 50% Working Drawing submittal. These calculations shall include the following:
   a. The room programming documents covered above.
   b. All assumptions clearly stated. In particular, document assumptions that had to be made in order to proceed with the design in the case of insufficient data being provided by the users. The intent here is to flag assumptions which the University should verify as correct.
   c. Applicable code requirements
   d. Tabulated design criteria for each plumbing service by system including:
      1) System
      2) Location of Service (Room number)
3) Required flow quantity for each location including: water use fixture units, drainage fixture units, GPM flow rates for specialized equipment, natural gas load by both BTU/HR and CFH, CFH for air, vacuum and specialized gasses.

e. Calculated data as required to select each piece of plumbing equipment including:
   1) Hot water heater demand and storage capacity.
   2) Sump pump sizing data,
   3) Lift station sizing data,
   4) Circulation pump sizing data.

f. Pipe sizing data including: combined flow for each pipe run, developed length for each pipe run, selected pipe size based on stated criteria (sizing chart, pressure drop, fluid velocity, etc. This data may be either in tabulated form or rough pipe schematic.

g. Rainwater leader calculations

D. Plumbing Working Drawings

1. General: Plumbing Working Drawings shall be sufficiently complete to assure high quality, fully functional plumbing systems, no contractual ambiguity, and also shall serve as a long-term record of the building's plumbing systems. The following guidelines apply to all Plumbing.

a. No work shall be called out in a manner which is not contractually enforceable. Plumbing quality level shall be fully identified to assure fair competitive bidding as well as a quality installation.

b. Design / build format for the plumbing section of the work as is sometimes used in residential plumbing construction shall not be used on Cal Poly projects. An exception to this guideline shall be the case of the entire building project being design / build format when approved by the University's Representative.

c. All points of connection to existing piping systems shall be identified. Verify points of connection by potholing where required.

d. All piping shall be sized.

e. The routing of all piping shall be indicated. The indicated routing shall be verified to be feasible within the furring spaces indicated in the architectural drawings.

f. All equipment and fixtures shall be located. Maintenance access space as recommended by the manufacturer shall be indicated on the drawings.
g. All piping penetrations of the building shell shall be indicated.

h. Concrete core drills of existing structures shall be identified.

E. Provide a Plumbing Legend covering all symbols and abbreviations used in the plumbing drawings in order to have a fully enforceable contract.

F. Provide a Plumbing Schedule covering factory assembled plumbing equipment and fixtures. The intent should be the easy determination of the plumbing equipment included in the project to encourage competition among comparable product suppliers. Note that when a product manufacturer's name and model are called out on the schedule to serve as the basis of design, the specifications must be also be coordinated so that the same manufacturer is the first specified. See Section 01630; Product Options and Substitutions of Cal Poly's standard Division 1 for further information.

G. Provide Plumbing Floor Plans to scale for each level where plumbing services are to be provided. Provide enlarged partial plans for congested areas such as public rest rooms where the normal scale plans will not adequately depict the work.

H. Sections to scale should be provided when the vertical arrangement of equipment and piping relative to other building components is critical for proper function or adequate maintenance clearance, as well as to assure the feasibility of pipe routing through tight spaces.

I. Plumbing Riser Diagrams: Plumbing riser diagrams shall be provided for multi-story buildings whenever the relative configuration of piping components cannot be depicted in the plan view alone without ambiguity. As a minimum, riser diagrams shall be provided in the Plumbing Working Drawings for the following systems: all drain waste & vent systems including lab waste, all hot water systems with circulation, all pure water systems, and any other system which includes forced circulation by pumping.

J. Plumbing Details: Plumbing details shall be provided as necessary to contractually assure a given level of quality. As a minimum, details shall be provided to cover all pipe penetrations of roofs, equipment supports, piping supports on roofs, backflow preventers, equipment installations where the relative position of plumbing appurtenances such as valves, unions, thermometer, drains, etc. are important to function, ease of service, and future replacement, pipe crossings of building expansion joints, pressure reducing assemblies, backflow prevention assemblies, roof drainage assemblies, floor drain assemblies, all pipe penetrations of exterior walls above and below grade.

K. Piping Diagrams (Schematics) shall be provided whenever the relative arrangements of plumbing components and equipment cannot be clearly depicted in the plans. As a minimum, piping diagrams shall be provided for in the Plumbing Working Drawings for water heating systems with circulation, pure water systems, and lift stations.

END OF SECTION 22 10 05