

307.3 Outline Specification Example – Plumbing

Division 220000

1.1 CODES AND STANDARDS

A. Codes:

1. The Kentucky Building Code (KBC)
2. Applicable Local Codes and Ordinances
3. National Electrical Code (NEC)
4. Occupational Safety and Health Administration (OSHA)

B. Standards:

1. American National Standards Institute (ANSI)
2. American Society for Mechanical Engineers (ASME)
3. American Society for Testing and Materials (ASTM)
4. American Water Works Association (AWWA)
5. National Electrical Manufacturers Association (NEMA)
6. National Fire Protection Association (NFPA)
7. Underwriters' Laboratories (UL)

1.2 DESIGN CRITERIA

A. Domestic Water Supply System:

1. Operating pressure - 60 PSI
2. Pressure drop due to friction - 2 psi/100 feet
3. Velocity -- Copper - mains - 5 fps maximum
 - risers -- 5 fps maximum
 - branches - 5 fps maximum
4. Pipe sizing will be in accordance with the Williams and Hazen formulae. "C" factor will be as follows:
 - a. Copper 130
 - b. Steel 100
 - c. Cast iron 100
5. Water flow requirements will be developed in accordance with the fixture unit method and Hunter's curve code
6. Main dual backflow preventer will be provided at the main potable water connection to the building.

B. Domestic Hot Water System:

1. Steam fired domestic hot water heaters as follows:

	<u>General Use</u>	<u>Equipment Use</u>
a. Temperature	120°F.	140°F.

C. Sanitary Waste and Vent System:

1. Sanitary and waste minimum slope 1/8"/1'-0" or as permitted by Code
2. Vents sloped to drain.

D. Storm Drainage System:

1. Minimum slope 1/8"/1'-0", or as permitted by Code.

E. Sub-Soil Drainage System:

1. Will be provided as required by Soils Report to efficiently prevent accumulations of ground water around the perimeter of the building and minimize the potential for filtration.

1.3 PLUMBING SYSTEMS

A. Water Supply

1. Run new 6 inches water service (60 PSI) from existing city water main.
2. Provide an external meter pit to include a 6 inches domestic water service with meter and a 6 inches fire service with detector check meter.
3. Run separate domestic and fire services into the mechanical room and provide an approved type backflow prevention device for each.
4. A complete potable domestic cold water and hot water supply and return system to serve plumbing fixtures and equipment will be provided. This system will include two steam fired instantaneous water heaters using medium pressure steam.
5. A complete non-potable domestic cold water system for the building including dual backflow preventers to all laboratory plumbing fixtures and equipment will be provided.
6. A complete non-potable domestic hot water supply and return system for the building laboratory plumbing fixtures and equipment will be provided. This system will include two steam fired instantaneous water heaters using medium pressure steam.

B. Sanitary Waste and Vent System

1. Run new 8 inches gravity building sewer from east side of building and connect to existing sewer in street.
2. A complete sanitary waste and vent system for the building connecting to all plumbing fixtures and equipment arranged for gravity flow to the building sewer.

3. A complete acid waste and vent system for the building connecting to all laboratory plumbing fixtures and equipment arranged for gravity flow to exterior acid neutralizing chambers.
4. Sewage Ejector: A duplex sewage ejector will be provided for the basement.

C. Storm Drainage System

1. A complete storm drainage system for the building connecting all roof drains arranged for gravity flow from building to point five feet outside the building.
2. Sump Pumps: A duplex sump pump system will be provided for the basement under floor drainage system.

D. Natural Gas System

1. Connect new service from existing gas main in street. Pressure regulator and meter will be included.
2. A complete natural gas system for the building connecting all outlets and equipment will be provided. Natural gas zone valve boxes will be provided at each laboratory requiring gas.

E. RO Water System

1. A complete reverse osmosis water system for the building providing RO water for laboratories will be provided. The system will be designed for Class 2, 1 megohm water. Areas requiring 10 megohm water will have dedicated equipment at the use points for additional polishing of 1 megohm water to achieve the high level of purity needed and will be provided by others. The RO water system will be located in the mechanical equipment room. A complete supply and recirculating system will be provided.

F. Vacuum System

1. A complete vacuum system for the building connecting all outlets and equipment will be provided. A new duplex vacuum pump with receiver located in the mechanical equipment room will be included.

G. Compressed Air System

1. A complete 50 psi compressed air system for building connecting all outlets and equipment will be provided. A new duplex compressor with receiver, filters and desiccant air dryer or refrigerated air dryer will be included. The duplex compressor and receiver shall be located in the mechanical equipment room. Instrument grade air will be provided.

END