53:171 Water Resources Engineering
Lesson 27: Distribution Network Design

Guidelines

Maximum Velocity (Pipe supply mains)

- 3 ft/s (ordinarily)
- 6 ft/s (during fire)

Minimum Pipe Diameter

- Supply mains: 12 to 36 inches
- Distribution mains: 12 inches
- Street mains: 6 inches (ordinarily); 8 inches (high value districts)
- Service connection: 2 to 4 inches

Pipe Materials

- Steel, cast iron, reinforced concrete, etc.

Required Pressures (Check Local Codes)

- Residential: 40 psi normal; 20 psi minimum
- Business: 50 to 80 psi
- High-rise Buildings (> 3 stories): Water pumped to storage tanks located on intermediate floors, on the roof, or in towers.

Valves

- Air-relief valves at high points
- Drain valves at low points
- Gate valves at intervals of 1000 to 1200 feet
- Pressure regulating valves to divide the distribution system in various pressure zones

Fire Hydrants

- Not more than 500 feet apart (to avoid excessive headloss in small diameter fire hoses)
- Place at intersections (so they can be reached from all directions)
- Types: Flush (in pits below ground); Wall (project from walls of buildings – commercial districts); Post (at curbs – placed on concrete blocks to avoid settling)