



Learning Objective: The student shall be able to identify the depth-of-cover requirements for private fire service water mains.

Underground water mains for hydrant and fire protection systems must be protected from freezing and physical damage.

In addition to jurisdictions where a water purveyor may have its own standards, or rely on the recommendations of the American Water Works Association (AWWA), the National Fire Protection Association (NFPA) publishes a standard for fire protection water main installation on private property.

The depth of cover over water pipes should be determined by the maximum depth of frost penetration in the locality where the pipe is laid. The top of the pipe should be buried not less than 1 foot (0.3 m) below the frost line. In those locations where frost is not a factor, the depth of cover should be not less than 2- 1/2 feet (0.8 m) to prevent mechanical damage.

Pipe should be buried below the frost line when entering streams and other bodies of water.

Where pipe is laid in water raceways or shallow streams, care should be taken that there will be sufficient depth of running water between the pipe and the frost line during all seasons of frost; a safer method is to bury the pipe 1 foot (0.3048 m) or more under the bed of the waterway.

Pipe under driveways should be buried at a minimum depth of 3 feet (0.9 m).

Pipe under railroad tracks should be buried at a minimum depth of 4 feet (1.2 m).

The depth of cover should be measured from the top of the pipe to finished grade, and due consideration should always be given to future or final grade and nature of soil.

Where it is impracticable to bury pipe, pipe should be permitted to be laid aboveground, provided that the pipe is protected against freezing and mechanical damage.

For additional information, refer to NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*, Chapter 10.



This trench should be deep enough that the water main will not be exposed to freezing temperatures.

