

Pipe Selection for Municipal Facilities

Purpose and Background

There are many choices in pipe material when designing a municipal facility such as a water system, a sanitary sewer system or a storm sewer system. Do you know what the “best” pipe material is? Many designs now call for PVC pipe. But what kind of PVC should you use – C900, Schedule 40, 200 psi, or maybe SDR 35 or SDR 41? What about use of ductile iron pipe – is it an outdated material with no applications? Or how about concrete pipe, corrugated steel pipe or high density polyethylene (HDPE)? Once you’ve decided on a pipe material, what kind of joints should you require? Are all joints “created equal?”

Proper selection of a pipe material can save your client or municipality money. Improper selection of a pipe material can cost your client or municipality money. It can also lead to premature (or immediate) failure, and create a liability that could be avoided. This seminar will provide you with information needed to make a more educated decision on the appropriate selection of pipe material for a variety of applications.

The seminar includes instruction in many of the common pipe materials that are available for water and sewer applications. It also provides information on the wide variety of joint types (such as gasket joints, flanged joints and restrained joints) that are available for the different material types and the purposes for some of the special joint types. It provides information on appropriate selection of design pressures for various types of PVC, HDPE steel and ductile iron pipe. It also provides information on selection of materials for gravity systems, including PVC, HDPE, CCFRPM and corrugated steel. Finally, it provides information on the basics of flexible pipe theory and rigid pipe theory to help you understand the structural requirements of the various types of pipe. Design examples are presented for pressure calculations and structural calculations. Participants should bring a calculator for class problems.

Continued development means more water lines, sewer lines and storm sewers. In addition, many municipalities have ongoing programs to replace pipes that are at or beyond their expected useful life. Proper selection of pipe material can ensure adequate future service life at the most economical cost.

Seminar Instructor

Mark Peterson, P.E., M.ASCE, has a BS and an MS degree from Montana State University. He has been practicing engineering for 30 years and is a registered engineer in Montana, Wyoming, North Dakota, South Dakota and Minnesota. He has worked in state government in highway design and subdivision review. He has also worked as a consultant for over 14 years. He is currently a senior design engineer with Advanced Engineering and Environmental Services in Helena, MT with primary responsibility for municipal pipelines, rural water system design, and storm water design. He has taught five other seminars for ASCE, including “Introduction to Detention Pond Design,” “Pipe Selection for Municipal Facilities,” “Storm Sewer Design using SWMM,” “Practical Hydrology for Rural and Urban Watersheds” and “Storm Water Treatment using Detention Ponds and Commercial Devices,” and has been published in the ASCE Journal of Hydraulic Engineering.

● For group training, contact John Wyrick (JWyrick@asce.org)
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Summary Outline

Day One

- Introduction and Welcome
- PVS Pressure pipe—so many choices
- Other pressure pipes—ductile iron, HDPE and steel
- Safety factors for pressure pipes
- Gravity pipes—PVC, concrete, corrugated steel, HDPE and CCFRPM
- Thrust blocks and joint restraint

Day Two

- Joints—push on, mechanical joint, flanged, restrained, solvent and heat welded
- Friction factors for pressure and gravity pipes
- Structural requirements to resist live loads and dead loads

Who Should Attend?

- This course is for those involved with the design of projects that include pipes made with PVC, ductile iron, concrete, corrugated steel or HDPE, including design engineers, technicians, regulatory officials, and architects. The course is technical in nature but the equations used are not complicated.

Seminar Benefits

At the conclusion of the course, you will be able to select appropriate:

- PVC pipe for use in pressure applications on municipal projects
- PVC pipe for use in gravity applications on municipal projects
- Ductile iron or HDPE pipe for use in pressure applications on municipal projects
- Concrete, corrugated steel or HDPE pipe for use in gravity applications on municipal projects
- Joint types for special applications, such as bends in pressure pipes

You will also be able to compute:

- The real factor of safety for various pressure pipes and understand the difference between pressure pipe classifications
- The allowable cover for a flexible pipe based on live and dead loads

Upon completion of this seminar, you will be able to:

- Learn about four different types of PVC pipe that are used for pressure applications on municipal projects
- Learn about five different types of joints for pressure pipes and three different types of joints for gravity pipes
- Learn to select an appropriate friction factor for pressure and gravity pipes
- Examine the difference in safety factors for pressure pipes

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