

# PVC PIPE ASSOCIATION TECHNICAL BRIEF

## PVC PIPE EXCELS IN DEEP BURY APPLICATIONS

Some engineers mistakenly contend that PVC pipe is not suitable for deep-bury projects. The concern is that the pipe will not hold up under large earth loads. However, installations throughout North America have shown otherwise and have demonstrated that PVC pipelines perform long-term at depths of more than 40 feet.

## BURIAL DEPTH NOT A DESIGN CONSIDERATION FOR PVC PRESSURE PIPE

Pressure pipe does not need to be laid on a slope to provide positive drainage. It typically follows ground contours while maintaining a minimum depth of cover based on frost-depth requirements. For this reason, the maximum typical burial is about seven feet – this is not considered deep burial.

## PVC NON-PRESSURE PIPE AT MORE THAN 40-FOOT BURIAL

Non-pressure pipe, on the other hand, is laid on a slope to provide drainage. This means that sewer pipe can sometimes be more than 50 feet below the ground surface.

Two notable projects where deep-bury PVC pipe has stood the test of time:

- Monroe Township, NJ: 1995 project – more than two miles of 30-inch sanitary sewer pipe was installed at depths that ranged from 20 to 52 feet. [Click here.](#)
- Arlington, TX: 1986 project – more than 18,000 feet of 18” through 27” sewer was installed at average burial depth of 35 feet, with maximum depth of 45 feet. [Click here.](#)



## PIPE DEFLECTION NOT A CONCERN FOR DEEP BURY PVC SEWER PIPE

Since gravity sewer pipes are often limited by project specifications to a maximum installed deflection (ovalization) of 7.5%, and failure by reverse curvature occurs at 30% deflection or more, pipe deflection is not a concern with PVC sewer pipe. A deflection limit of 7.5% provides at least a 4:1 safety factor against failure and a 5% deflection a minimum of 6:1. Engineering design should consider deflection limits and corresponding safety factors for all flexible pipe materials.

Additional engineering and research information:

- *Uni-Bell Technical Report UNI-TR-1 “Deflection: the Pipe/Soil Mechanism,”* [Click here.](#)
- *Handbook of PVC Pipe,* [Click here.](#)
  - Chapter 6 – “External Loads on Buried Pipe” explains the difference between rigid and flexible pipes’ response to loads and shows how live loads are transmitted to buried pipe.
  - Chapter 7 – “Design of Buried PVC Pipe” provides a detailed explanation of concepts such as pipe stiffness, soil/structure interaction and PVC pipe performance limits.