

# Installation

PVC SANITARY SEWER AND DRAINAGE

PVC PIPE FOR THE 21<sup>st</sup> CENTURY®



## Preparation

PRO-21™ is a flexible conduit. The embedment should be designed to limit deflection to 7.5%. The long term deflection chart on the adjacent page may be used to easily determine acceptable burial conditions. Additional design information may be obtained from the Uni-Bell Handbook of PVC Pipe Design and Construction. PRO-21™ should be installed using the same good construction practices as those currently used for SDR35. Additional installation information may be obtained from Uni-PUB-6, Installation Guide for PVC Sewer Pipe, or ASTM D2321, Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.

## Foundation

Foundation preparation is only required when the trench bottom is unstable. Any foundation that will support a rigid pipe without causing loss of grade or flexural breaking of pipe, will be more than adequate for PRO-21™.

## Bedding

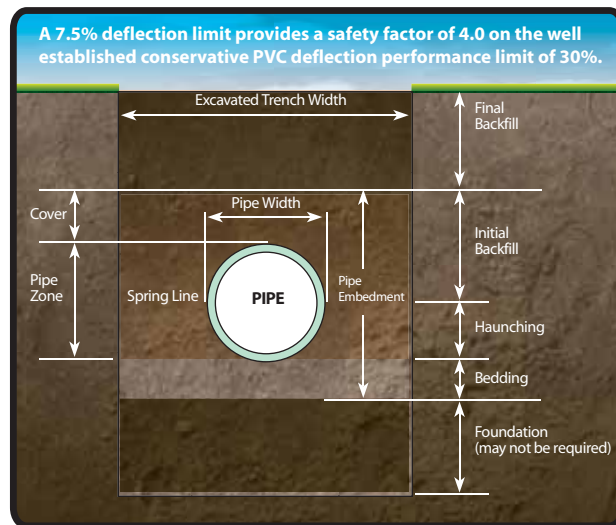
The bedding directly underneath the pipe is required only to bring the trench bottom up to grade and provide uniform longitudinal support for the pipe. It should not be so thick or soft that the pipe will settle and lose grade. A layer of material from 4" to 6" thick is typically placed to establish line, grade and support. Bell holes should be excavated to insure uniform bearing.

## Haunching

The haunching area is the most important in terms of limiting the deflection of a flexible pipe. This is the area that should be compacted to the Proctor densities shown in the long term deflection chart on the adjacent page. Material which may be adequately placed and compacted to required levels for the specific application is suitable. It is important that no voids exist in this area. The installer has sole responsibility for proper placement and compaction of the haunching material, which is the key to controlling deflection.

## Initial Backfill

The initial backfill protects the pipe from the final backfill placement and compaction. It begins at approximately the spring line of the pipe (the top of the haunching) and stops about 6" to 12" above the crown. The initial backfill provides no additional support for the pipe and therefore, the material requirements are relaxed. The material used should not be capable of filtering down into the lower pipe zones.



Trench Cross-Section Showing Terminology

## Final Backfill

The material used and densities required in this area should be based on the structure which lies above the pipe. This area provides no additional support to the pipe. Where the line runs through a backyard or open field, native material dumped or lightly compacted may be sufficient. Under a road surface, a material which can be highly compacted is required, and the initial backfill should be compacted as well. This material should be free of large rocks and boulders.

## Compactive Effort

The compactive effort will be reduced if moisture content is controlled to optimum levels. Never contact the pipe with compactors. At all points in the pipe zone, adequate compaction of approved materials can be achieved using portable vibrators. For applications where minimum cover conditions exist (a minimum cover of one foot can be recommended for loads up to and including H20), Class I materials are needed to reduce compactive effort required over the pipe to achieve a high level of compaction (typically 95% Std. Proctor under a road surface). Heavier equipment, such as Hydro Hammers, should only be used when needed to achieve required densities, and not less than 3' above the pipe.