

PVC PIPE JOINTS – TRENCHLESS OPTIONS

Open-cut construction is the standard method of installing PVC pipe. However, in many cases trenchless construction may be more socially and economically viable. The pushing or pulling of pipe in trenchless installation causes loads on a pipe that are not typical for open-cut construction. As a result, the PVC pipe industry has developed several different types of restrained-joint systems for trenchless projects.

Information on trenchless construction of PVC pipe is provided in Uni-Bell's *Handbook of PVC Pipe*, Chapter 13. Joining methods are discussed in section 13.3. The section also provides installation guidance for each of the joint types discussed below. Although these restraint systems are necessary for trenchless installations, they are also used in open-cut situations where restraint is required.

INTERNALLY RESTRAINED GASKETED JOINT

This joint consists of a metal casing that is molded into the gasket raceway of the bell adjacent to the gasket; a C-shaped grip-ring with several rows of uni-directional serrations is later inserted into the metal casing. In the field the spigot is inserted as a typical push-on joint.



Internally Restrained Gasketed Joint

PIN-AND-GROOVE GASKETED JOINT

In this joining system, when the pipe is assembled, a groove on the outside of the pipe spigot aligns with holes spaced around the pipe bell. Pins are hammered through an external ring, through the holes in the bell, and bottomed out in the spigot groove. Pin-and-groove (also known as "ring-and-pin") joints have no metallic components.



Pin-and-Groove Gasketed Joint

SPLINE-LOCK GASKETED JOINT

This joint uses a nylon locking spline that is inserted into mating grooves in the pipe spigot and the bell/coupling. Spline-lock joints form a non-metallic mechanically restrained joining system that can be disassembled and reused if necessary.



Spline-Lock Gasketed Joint

BUTT-FUSED JOINT

This joining system uses PVC pipe that is specially formulated to facilitate the fusion process. Butt-fusion provides monolithic, fully restrained joints with little or no exterior joint profile.



Butt-Fused Joint

References: *Handbook of PVC Pipe*, Uni-Bell, 2013.