



TECHNICAL ADVICE SHEET

05-20-2022

Rigid Connections

General:

Rigid connections of pipes (such as to structures, to manholes or at the ends of encasements) create additional installation challenges to achieve buried success. The new issues caused by connections such as these include shearing at the interface, beam bending of the pipe, over rotation of joints, excessive joint pullout (draw) and differing support conditions across joint locations.

If in doubt, seek advice from: Hobas Pipe USA, Inc. | 800-856-7473



Rigid Connections

It is frequently a common practice to incorporate a joint (or two joints) immediately adjacent to the “rigid” connection to minimize the effects of potential differential settlement between the manhole or structure (or encasement) and the attached (connected) pipe(s). At first thought, this appears to be a sound engineering approach. While this practice does aid in safely accommodating differential settlements (shearing) and minimizing of pipe beam bending, it increases the risk of excessive joint angular deflection, unacceptable joint draw and differential pipe deflection across joints with different support conditions (i.e. pipe on one side rigidly supported (concrete encased – likely zero deflection) and pipe on the opposite side elastically supported (soil and backfill – likely 2% +/- deflection)). The last item (differential pipe deflection across a joint), when of sufficient magnitude (typically over 0.5”), can result in joint leakage and / or damage.

Therefore, in many instances (particularly larger diameters and deep covers), the installation may be most successful by locating the first joint away from the rigid connection by a distance of at least 2 or 3 pipe diameters. Doing this will likely create a very similar pipe support condition across all joints, which usually results in nearly equal pipe deflections on both sides of the joint, thereby maximizing the joint performance. This procedure will, however, create a cantilever configuration for the first pipe exiting the rigid connection and does little to aid potential differential settlements. Having a cantilevered pipe also increases the risk of excessive pipe beam bending and shear at the interface, however, these potential risks can be greatly minimized by adequate bedding beneath the pipe to provide proper longitudinal support.

Regardless of joint proximity to rigid connections, a successful installation must achieve similar pipe deflections across joints and avoid significant differential settlements. Joints may be located anywhere when these items are well controlled. In our experience, it is generally easier to achieve good, uniform longitudinal support than to control buried deflections to very small amounts. Therefore, for larger diameters (>36” to 42” typically), we have found it’s best to locate joints away from the rigid connection interface. For smaller diameters (<24” to 30”), one may be most successful having a joint(s) in close proximity to the rigid connection interface.

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