



As labor and overhead costs have increased and project schedules have shortened, the use of precast concrete inlets and manholes has become increasingly common in storm drainage systems. Plant manufactured precast concrete products offer consistent quality, precise fitment and greatly reduced time of delivery and installation when compared to a cast in place alternative. These benefits are magnified when jobsite changes occur. Changes can be made with the exchange of a component or two rather than the demolition and replacement of an entire cast in place structure. However, the use of precast inlets and manholes is not as simple as accepting precast as an alternate to cast in place. There are some differences in the cast in place installation process v. the installation process for precast structures.



Pipelines connecting to structures are installed on a designed foundation and bedding. To eliminate differential settlement the foundation under both types of structures and the backfill surrounding the structures must be properly compacted. While cast in place structures are poured over installed pipe, precast structures are often installed before the pipe is laid or the structure is slid over the exposed end of an installed pipe. Both methods typically leave the area underneath the pipe extending out from the structure, devoid of backfill. Failure to compact the backfill material under the pipe and provide adequate support may lead to differential settlement between the structure and the adjacent pipe. While the

differential settlement generally does not have any significant structural effect on the precast structure it can have serious effects on streets, curbs sidewalks and pipelines connected to or in the near proximity of the structure.

There are two methods to seal the penetration where a pipe enters a precast structure: grouted or rubber seal connections. Grouted connections are rigid and work well with a similarly rigid pipe. Flexible pipe products are not good candidates for a rigid sealing material like a grout. As the flexible pipe deflects and changes shape, a void often develops between the rigid grout and the reshaped flexible pipe. A rubber sealed connection by means of a boot or gasket is acceptable for rigid and flexible pipe materials. Many flexible seals are available to the industry from a number of highly regarded manufacturers. These seals, when installed per manufacturers' recommendations, can be expected to retain an excellent soil and water resistant seal. Many such seals are pressure rated for watertight seals. Often, it is necessary to increase the size of the precast structure to allow room for the insertion of the rubber connector.



The Texas Department of Transportation has a good resource for precast inlets & manholes at the following link. <http://ftp.dot.state.tx.us/pub/txdot-info/cmd/cserve/standard/bridge/preguide.pdf>. The TxDOT guide addresses some basic issues such as the following comments about sizing a base unit:

## Size

*The size of the base is determined by the pipe that must connect into it. For the precast bases, the connecting pipe will always frame into the base unit wall, meaning the entire pipe sits in the wall. As such, it is imperative to take into consideration the O.D. of the pipe, not just the I.D., when sizing the base. Pg 11*

As well as providing best practices comments regarding the use of flexible connectors when using flexible pipe products:

*Flexible connectors are required when using alternate pipe materials such as HDPE or CMP; they may be used on RCP. Pg 27*

By recognizing the differences between precast and cast in place structures a designer of a storm drainage system can be confident of achieving a long-term, cost effective solution when specifying precast structures. Please contact your local precaster regarding specific products available in your market area.