TAPPING OF CONCRETE PRESSURE PIPE

Regardless of the type of Concrete Pressure Pipe being used or where it is being used, outlets in the pipe are frequently needed. The application may be for a customer service line, a fire hydrant, an air release valve, or a branch line on a transmission main. If the location is known before the pipeline is constructed, the outlet can be fabricated into a standard section of pipe.

However, in the "real world," it is unrealistic to believe that the locations of all necessary outlets will be known at the time that a pipeline is being designed. Also, the need for some outlets, especially those on distribution mains, may not exist until long after the line has been installed. In such cases, it is possible to install an outlet in the field by tapping the pipe. "Dry" tapping is possible, but that procedure may require dewatering the line and removing it from service. Since a disruption in service will inconvenience customers in the area, "wet" or pressure tapping is usually the preferred field procedure.

TYPES OF PRESSURE TAPS

There are two types of pressure taps available for Concrete Cylinder Pipe: a smaller threaded outlet version for taps with diameters of 2" (50 mm) and smaller, and a flanged outlet version for taps with diameters of 3" (75 mm) and greater. The threaded outlet tapping assembly is available in a range of diameters from 0.75" (19 mm) through 2" (50 mm) with either iron pipe or AWWA (Mueller) threads. Many users stock only the 1" (25 mm) and 2" (50 mm) outlet assemblies, since they can be bushed down for smaller diameter taps as needed and the cost of inventory is reduced.

AMERICAN Concrete Pressure Pipe ASSOCIATION

FIG. 1.1

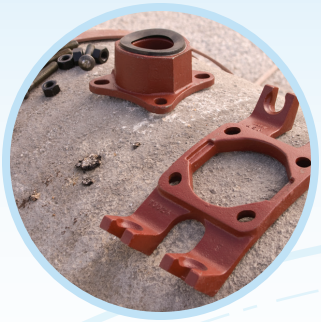

FIG. 1.2

FIG. 1.3

FIG. 1.4

FIG. 1.5

FIG. 1.6

FIG. 1.7

FIG. 1.8

THE THREADED OUTLET PROCESS

The procedure for making threaded outlet taps is the same for all pipe diameters. The tapping system consists of a tapping saddle with bolt-on steel bands, rubber gasket, tapping gland, and a corporation stop. To begin the tapping operation, the saddle is placed over the location of the tap and the location of the tapping gland is marked on the pipe wall *(See Fig. 1.1)*. The mortar coating is removed from an area slightly larger than the base of the tapping gland *(1.2)*. The tapping saddle is bolted into position on the pipe using the steel straps provided and the rod or wire is removed from the opening to expose the steel cylinder *(1.3)*. The tapping gland is bolted securely into the saddle so that the rubber gasket held in the base of the gland is compressed against the steel cylinder to form a watertight seal *(1.4)*. The corporation stop is installed in the tapping gland and left in the closed position. The corporation stop must be closed to ensure that the tapping machine can be completely withdrawn after completing the tap *(1.5)*. The tapping machine is then connected to the corporation stop; with the corporation stop open, the tapping machine is advanced to make contact with the concrete core or the steel cylinder depending on the type of pipe being tapped. The cut is made through the pipe wall and the tapping machine is withdrawn *(1.6)*. The entire assembly is covered with portland cement mortar *(1.7)* and a grout mixture of 2.5:1 sand to portland cement is poured into the space between the tapping assembly and the pipe *(1.8)*. To aid in filling this space, a joint wrapper may be useful. Threaded outlet tapping assemblies may also be used as a repair kit if the pipe experiences a small puncture from adjacent excavation or other activity.

THE FLANGED OUTLET PROCESS

The procedure for using the flanged outlet tap to make larger diameter taps is similar to that used for threaded outlet taps; however, power equipment is required. Larger taps are made using a flanged outlet pressure tapping assembly which consists of three major parts: the tapping saddle, U-bolt straps, or the clamp-style "half back," and the tapping gland.

First, the tapping saddle is placed in the proper location and orientation on the pipe to be tapped and the location of the tap is marked on the pipe wall *(See Figure 2.1)*. The portland cement mortar coating is removed from an area slightly larger than the base of the tapping gland *(2.2)*. Next, the saddle assembly is

centered over the location of the tap and bolted into place over the pipe. Quick-setting portland cement mortar is used to fill the annular space between the pipe and saddle and "half-back," if used *(2.3)*.

After the grout has set, the wire or bar wrap is cut and removed (along with the outer concrete core if a Prestressed Concrete Embedded Cylinder Pipe is being tapped) to expose the steel cylinder *(2.4)*.

The tapping gland *(2.5)* is mounted and bolted *(2.6)* in place. The compression of the rubber gasket at the base of the tapping gland can be checked with a feeler gauge. At this point, a blind flange with

FIG. 2.1

FIG. 2.2

FIG. 2.3

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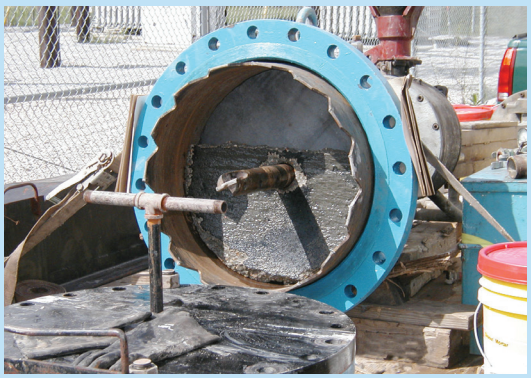
FIG. 2.7

FIG. 2.8



pressure gauge and air connection would normally be attached to the tapping gland to check for leakage. A tapping valve is bolted to the tapping gland flange *(2.7)*. The tapping valve must be supported to prevent shifting during the tapping operation that could breach the rubber gasket seal. The valve should be in the closed position so that, as the tapping machine is connected, it can be assured that the shell cutter and pilot bit can be completely removed after the cut has been completed. The valve is then opened and the entire assembly is hydrostatically tested. The shell cutter is advanced by hand until contact is made with the steel cylinder and the position of the machine's travel indicator is noted. The cutter is then advanced under power until it has traveled a predetermined distance to clear the inside of the pipe wall. The cutter is withdrawn by hand and the valve is closed. The tapping machine is then disconnected and the concrete and steel coupons *(2.8)* can be recovered from the shell cutter. The final steps of the process are to place a portland cement grout (2.5:1 sand to portland cement mixture) into the space between the tapping assembly and the pipe, if not already performed, and then to cover the entire assembly (tapping saddle, steel straps, bolts, etc.) with the same portland cement grout or portland cement concrete.

The flanged outlet tapping assembly can also be used as a repair assembly when a relatively small hole has been accidently punched through the pipe wall due to adjacent excavation or tunneling activity. The diameter of the flanged outlet used should be a minimum of 2 inches greater than that of the puncture, subject to the limitation of the outlet being no larger than the next standard pipe size smaller than the pipe being repaired.

SUMMARY

While tapping Concrete Pressure Pipe requires a number of steps to perform, it can be done quickly and competently, without any harm to the original pipe. More than 50,000 taps have been made on Concrete Pressure Pipe throughout the United States and Canada.

From the largest to the smallest pipe sizes, a pressure tap on Concrete Pressure Pipe is a quality tap. The manufacturers of Concrete Pressure Pipe are available to assist water system owners with any aspect of pipe tapping.

LEARN MORE

For more information about tapping Concrete Pressure Pipes, speak with your Concrete Pressure Pipe supplier, or contact the American Concrete Pressure Pipe Association at **714.801.0298** or **www.acppa.org**.

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