

Connection To Manholes and Catch Basins

Connection of High Density Polyethylene (HDPE) pipe to manholes and catch basins is often required in drainage installations. Manholes and catch basins allow a change in grade or direction as well as a change in pipe size along the pipe system. They also provide cleanout access and each may serve as an inlet for water in the case of storm sewers. BOSS HDPE corrugated pipe is easily connected to these structures. For soil-tight performance the pipe or adaptor is grouted directly to the manhole or catch basin. For watertight connections, either a compression style connection or rubber gasket connection is commonly used. The connection method chosen is dependent on local regulations, project requirements, type of watertight pipe and structure.

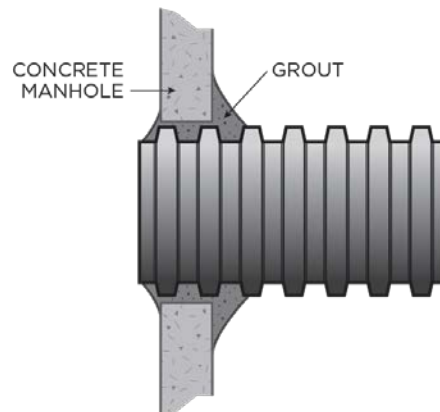
SOIL-TIGHT PERFORMANCE

When soil-tight service is required, there are two options for connecting BOSS HDPE pipe to manholes and catch basins.

1. Grouting HDPE Pipe to Structure

BOSS HDPE pipe can be inserted into the structure and a concrete collar poured around the connection, filling the void between the outside of the pipe and the structure itself (**Figure 1**). The grout mixture should be pressed between the corrugated pipe and the manhole to ensure a soil-tight connection. This method can be used when the pipe joint is near the manhole or catch basin connection. The corrugated exterior of BOSS pipe provides a surface on which grout will conform and harden, producing a positive soil-tight connection.

FIGURE 1: Grouting of HDPE pipe to manhole or catch basin



2. Grouting HDPE Adaptor to Structure

Fabricated HDPE fittings are also available for grouting directly into a new or existing manhole structure. The adaptor consists of a section of BOSS 2000 pipe with a bell end. **Figure 2a** shows the connection for a new manhole structure where the fitting is cast in-place. **Figure 2b** shows the connection into an existing manhole structure where the fitting is grouted in. Once the adaptor fitting is in place, the gasketed HDPE pipe end is inserted into the bell end of the adaptor. Fitting diameters range from 100mm to 900mm. Table 1 lists the BOSS HDPE fitting sizes available.

FIGURE 2a: Cast-in-place manhole adaptor for new manhole structure

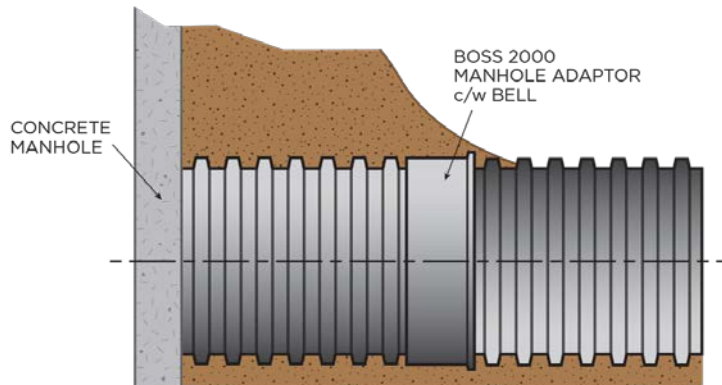


FIGURE 2b: Detail of manhole adaptor connection for existing manhole structure

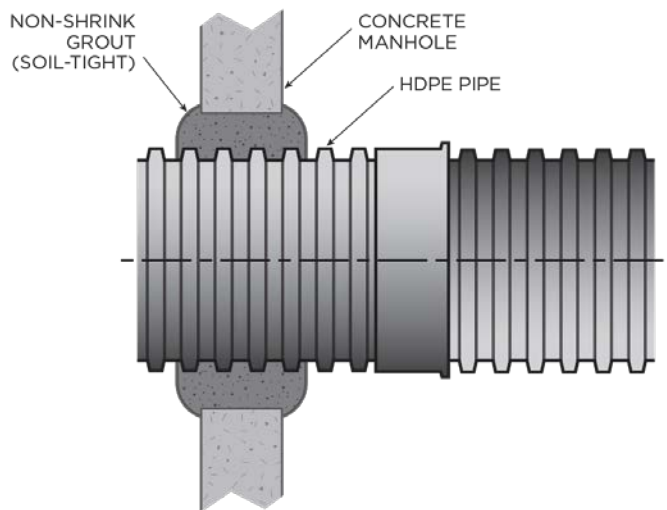


TABLE 1: Fabricated Fitting Sizes

BOSS Fitting Description	Nominal Pipe Diameter (mm)	Nominal Pipe Diameter (in)
HDPE corrugated manhole adaptor	100, 150, 200, 250, 300, 375, 450, 525, 600, 750, 900	4, 6, 8, 10, 12, 15, 18, 20, 24, 30, 36

Installation recommendations are outlined in Aqua Q Drawing No. HDPE-40102 **BOSS Stub Installation/Backfill Instructions**. Please contact an Aqua Q representative for further information.

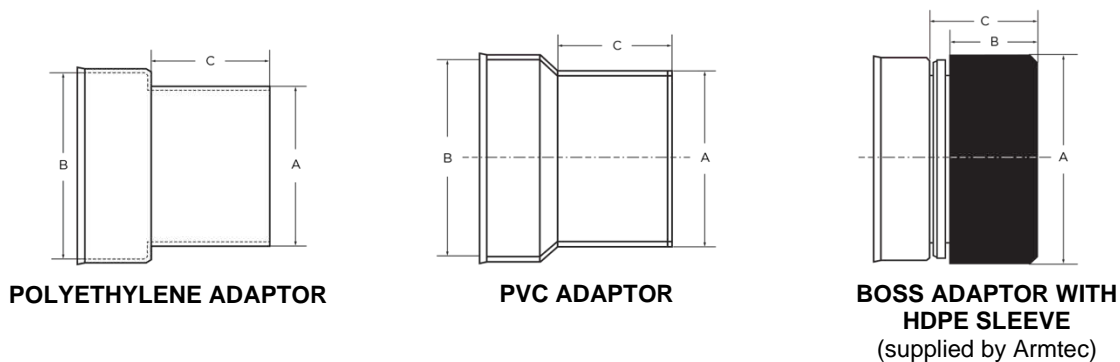
WATERTIGHT PERFORMANCE

Manhole connection systems are also available from a variety of manufacturers for watertight service. These include compression connectors and grout-in connectors.

1. Compression Connector

A flexible compression connector provides a watertight seal between the pipe and the wall of the concrete structure. Pipe adaptors are required to provide a smooth outer pipe surface for a sealed connection to the structure. There are three types of adaptors available for BOSS HDPE pipe (**Figure 3**):

FIGURE 3: Pipe adaptors for BOSS HDPE pipe



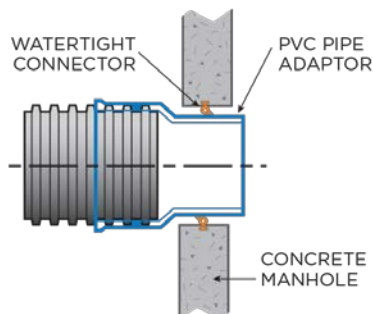
Each adaptor is available in a range of nominal pipe diameters. These are listed in Table 2. The BOSS pipe adaptor wrapped in an HDPE sleeve can also be used for connection of BOSS HDPE pipe to BOSS HDPE manholes.

TABLE 2: BOSS HDPE Pipe adaptor size availability

BOSS Fitting Description	Nominal Pipe Diameter (mm)	Nominal Pipe Diameter (in)
Polyethylene	450, 525, 600, 750, 900	18, 20, 24, 30, 36
PVC	100, 150, 200, 250, 300, 375, 450, 525, 600	4, 6, 8, 10, 12, 15, 18, 20, 24
BOSS HDPE Sleeve	525, 600, 750, 900	20, 24, 30, 36

The appropriate fitting is used in conjunction with a watertight connector which is cast in place to the concrete manhole or catch basin structure (**Figure 4**).

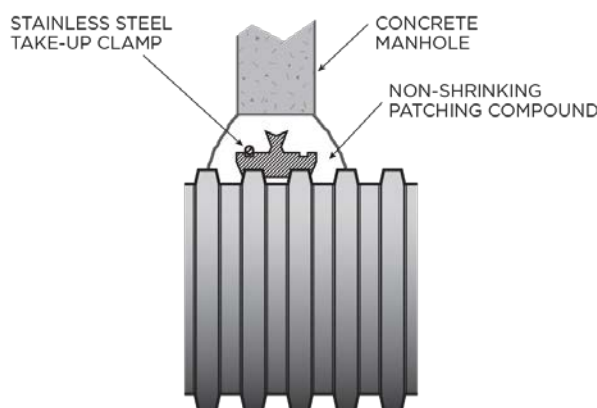
FIGURE 4: Compression connection



2. Gasket Connector

Gasket connectors are an alternative watertight connection option for BOSS HDPE pipe. A rubber gasket is compressed around the pipe circumference using stainless steel clamps, preventing infiltration and exfiltration between the gasket and the pipe. It is then either grouted into an existing structure (**Figure 5**), or has a new structure poured around it. When grouted, the HDPE Waterstop becomes a monolithic part of the manhole.

FIGURE 5: Gasket connection



Compression and gasket connectors for watertight service should be manufactured to meet or exceed all material and test requirements set forth in ASTM C923, ASTM C1478 and ASTM F2510. They should also meet the connector requirements of ASTM D2321 for installation of thermoplastic pipe. Refer to the applicable manufacturer's website for full installation instructions.

The governing standard for corrugated HDPE pipe-manhole connections is ASTM F2510/F2510M, "Standard Specifications for Resilient Connectors Between Reinforced Concrete Manhole Structures and Corrugated High Density Polyethylene Drainage Pipes". Performance requirements should be verified on a project by project basis. All adaptors, gaskets and flexible fittings (apart from BOSS HDPE manhole adaptors) are provided by other manufacturers. Fitting dimensions should be supplied to the manufacturer to ensure correct sizing for your pipe system.