Pipe and Joint Repair Options

Introduction

High-density polyethylene (HDPE) pipe is lightweight and very easy to handle. The attributes that make the pipe easy to use can also make it easy to abuse, and result in damaged pipe or joints. This technical bulletin discusses some of the products available that can be used to repair damaged Hancor pipe or joints in the field.

Repair Options

One of the primary considerations in selecting a repair method is the degree of tightness that results. Watertight repairs are generally used on pipe with watertight joints, and silt-tight repairs on pipe with silt-tight joints. This helps keep costs in line and prevents the repair from being the weak area of the pipe.

The way in which a pipe can be accessed is another primary consideration that will influence what type of repair alternative is selected. Pipe that is not yet buried, or can be easily excavated if it is covered, can be repaired from the outside of the pipe. If the pipe is buried and cannot be conveniently excavated, an internal repair will likely be the best alternative. If the pipe is too small to enter, there are companies with remote controlled equipment that can install the product. Each situation has to be considered individually.

The repair options addressed below are divided into external mechanical repairs, internal mechanical repairs, and chemical grouting.

External Mechanical Repairs

Hancor snap couplers (4- to 8-inch or 100 – 200 mm) and split band couplers (10- to 30-inch or 250 – 750 mm) will provide a soil-tight repair without gaskets or a silt-tight repair if gaskets are used. They are a convenient, low-cost repair alternative, and are typically used to repair Hancor Hi-Q® or Sure-Lok® F477.

Concrete collars also provide a soil- or silt-tight repair, depending on the integrity of the installation. Installing a concrete collar involves building a form around the area to be repaired and encasing it in concrete. A geotextile is usually wrapped around the repair area prior to pouring the collar to keep the concrete from seeping into the pipe. If the pipe itself is damaged, the damaged area will need to be removed and a new pipe section spliced in before pouring a collar around both ends. Concrete collars are more expensive and time consuming than snap couplers or split band couplers but are usually reasonable repair options for Hi-Q or Sure-Lok F477.
Mar Mac Polyseal Pipe Coupler (4- to 60-inch or 100 to 1500 mm) is made of high strength polypropylene fabric with a cross-laminated polyethylene outer cover. The coupler incorporates a self-adhering rubberized bonding mastic and securing bands to insure a positive seal around the pipe. If the pipe itself is damaged, the damaged area will need to be removed and a new pipe section spliced in before installing a coupler around both ends. This repair produces a very tight joint, but may not be pressure-testable. Polyseal Pipe Couplers are reasonably priced, especially when considering the quality of the finished repair, and are typically used with Sure-Lok F477 and BLUE SEAL™ products.

Hancor PVC Repair Kits (10- to 30-inch or 250 – 750 mm) provide a watertight repair that will meet most pressure testing requirements. If the damage is close to the end of an exposed piece of pipe, one kit will be required. If the damage is in the middle of a pipe, it will need to be removed and a new section spliced in. Two kits, one at either end, will be required. Each kit includes two gaskets and a PVC sleeve. The gaskets are placed in the valleys on either side of the section to be repaired and the sleeve is then slid over the gaskets. PVC repair kits are most commonly used with BLUE SEAL products.

Internal Mechanical Repairs

Internal mechanical repair products generally consist of a flexible cylindrical gasket that is inserted into the pipe and held in place with metal bands. The NPC Internal Joint Seal and Lineal Industries Hy-Flex are examples.

NPC Internal Joint Seal (18- to 60-inch or 450 – 1500 mm) uses an EPDM rubber seal and stainless steel bands. The rubber seal is inserted into the pipe and positioned over the joint. A torque wrench is used to expand the bands against the inner wall of the pipe. The Internal Joint Seal is designed to seal joints – not repair damaged pipe sections (note it can be used to cover small cracks.). The damaged area of the pipe must be removed and a new section spliced in if necessary in order to use the Internal Joint Seal. The Seal will provide a very tight joint when installed as recommended. If pressure tests are required, NPC should be contacted to ensure that the product is suitable for the specific test criteria.

Lineal Industries Hy-Flex Internal Sealing System is similar to the NPC Internal Joint Seal although the bands used to hold the seal to the pipe are expanded somewhat differently. The System provides a high quality, tight joint when installed according to the recommended procedure but the manufacturer should be contacted if pressure testing is involved to ensure that the product will meet the requirements.

Link Pipe Grouting Sleeve (4 to 60 inch or 100 – 1500 mm) is a stainless steel grouting sleeve that is installed with an inflating plug. The sleeve can be used to seal a joint or repair small sections of damaged pipe.
Both internal mechanical seals slightly restrict the inside diameter of the pipe. This should be considered when assessing the risk of debris obstruction.

**Chemical Grouting**

*Chemical grouting* is another type of internal repair method that uses chemical grouts that turn into a gel to eliminate or minimize joint leakage. The grout can be applied with hand-held or remote-controlled equipment. Test/seal packer is used to remotely seal a joint. The grouting chemicals are forced through the joint out into the surrounding soil where they gel with the soil. The gelled mass forms a waterproof collar around the pipe. The result is significantly reduced leakage or none at all. There are several types of chemical grouts available and the manufacturer should be contacted to review the specific situation and any joint tightness or pressure test criteria. Companies such as Avanti International, Strata Tech Inc., and Carylon Corporation manufacture and/or install chemical grout. Any pipe size can be chemically grouted provided the company has the appropriate equipment.

**Manufacturer Contact Information**

Hancor cannot anticipate all unique situations encountered on specific installations; however, several common repair methods are addressed in this text. Contact Hancor’s Application Engineering Department for answers to other unique conditions or for contact information regarding any companies listed in this technical bulletin, at 800-2HANCOR (242-6267) ext. 809.

Note: Hancor products are solely intended for the conveyance of fluids. Access into this product for maintenance, inspection, repair, or other reason should be done in strict accordance with OSHA recommendations for confined space entry.