

STORMWATER MAINTENANCE MANUAL

FOR

**THE ESTATE
BLOCK 151 LOT 17.01
TOWNSHIP OF WEST ORANGE
ESSEX COUNTY, NEW JERSEY**

SUBMITTED TO:

**TOWNSHIP OF WEST ORANGE
PLANNING [REDACTED] BOARD**

PREPARED FOR:

**THE ESTATE
111 PROSPECT AVENUE
WEST ORANGE, NEW JERSEY 07052**

PREPARED BY:

**PETRY ENGINEERING, LLC
155 PASSAIC AVENUE
FAIRFIELD, NEW JERSEY 07004
973-227-7004**



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DECEMBER 27, 2024**



I. INTRODUCTION

This Manual presents specific maintenance information about structural and nonstructural stormwater management measures that shall be used to address stormwater quality and quantity requirements of the NJDEP Stormwater Management Rules at N.J.A.C. 7:8, as applied to the proposed site. One specific structural measure, also known as a Best Management Practices (BMPs), included in this manual is:

1. HDPE Pipe Repair Options

The specific maintenance plans for the structural/non-structural BMPs included in this Manual will be followed by those parties responsible for their operation and maintenance. To assist the operator and maintenance inspector of the on-site stormwater management facilities, copies of tables, sample checklists, and logs from the NJDEP Stormwater Management Facilities Maintenance Manual are included in the Appendix of this Manual.

The responsible party for the subject site operation and maintenance is:

**The Estate
111 Prospect Avenue
West Orange, New Jersey 07052
(201) 394-1572**

The party responsible for maintenance shall perform all of the following requirements:

- i I Retain and make available, upon request by any public entity with administrative, health, environmental, or safety authority over the site, the maintenance plan and the documentation required by the Ordinance.
- ii Evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed.

In the event that the stormwater management facility becomes a danger to the public safety or public health, or it is in need of maintenance or repair, the municipality shall so notify the responsible person in writing. Upon receipt of that notice, the responsible person shall have 14 days to effect maintenance and repair of the facility in a manner that is approved by the municipal engineer or his designee. The municipality, at its discretion, may extend the time allowed for effecting maintenance and repair for a good cause. If the responsible person fails or refuses to perform such maintenance and repair, the municipality or the County may immediately proceed to do so and shall bill the cost thereof to the responsible person. Nonpayment of such bill may result in a lien on the property.



General maintenance for all stormwater management measures include:

- a. Inspection of inlets (in parking lot areas) and riprap aprons for clogging and excessive debris and sediment accumulations at least 4 times annually as well as after every storm exceeding 1 inch of rainfall.
- b. Disposal of debris, trash, sediment and other waste material must be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.
- c. Parking lot and lawn areas within the site to be kept free of trash/debris and maintained to the greatest extent possible to prevent clogging of stormwater systems.
- d. All structural components must be inspected for cracking, subsidence, spalling erosion and deterioration at least annually and repaired as required to restore components to their original condition.
- e. Inspection of all underground systems shall be in strict accordance with OSHA recommendations for confined space entry and shall be performed during periods of dry weather.
- f. In no instance shall inspection of an underground system be performed less than 72 hours after the end of a rainfall event to allow proper drain time of the systems.

II. MAINTENANCE COST ESTIMATE

Storm Sewers and Inlets.....\$2,000 per year

Maintenance cost estimate includes all maintenance tasks, including inspection, sediment, trash and debris removal. Maintenance cost estimates are based on engineering assumptions, manufacturer's recommendations as well as the relative frequency of maintenance. Actual costs may differ from estimate.

III. APPENDIX

HDPE PIPE REPAIR OPTIONS



HDPE PIPE REPAIR OPTIONS





TECHNICAL NOTE

HDPE Pipe Repair Options

TN 5.03
January 2010

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, resulting in damaged pipe or joints. This technical bulletin discusses some of the products available that can be used to repair damaged HDPE pipe or joints in the field.

Repair Options

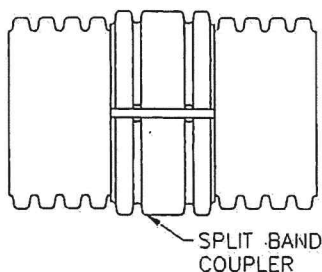
One of the primary considerations in selecting a repair method is the degree of joint performance required. Watertight repairs are generally used on pipe with watertight joints, and soil-tight repairs on pipe with soil-tight joints. This helps keep costs in line and prevents the repair from being the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

The way in which a pipe can be accessed is another primary consideration which influences what type of repair alternative is selected. Pipe that is not yet buried, or can be easily excavated, can be repaired from the exterior. If the pipe is buried and cannot be conveniently excavated, an internal repair may 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 must be considered individually.

The repair options addressed below are divided into external repairs and internal repairs. During any pipe repair, backfill should be placed and compacted per project specifications to provide proper support for the pipe and coupler.

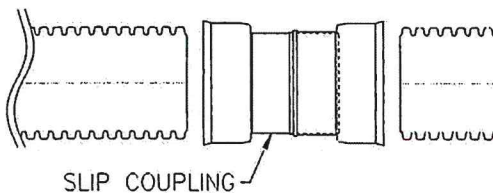
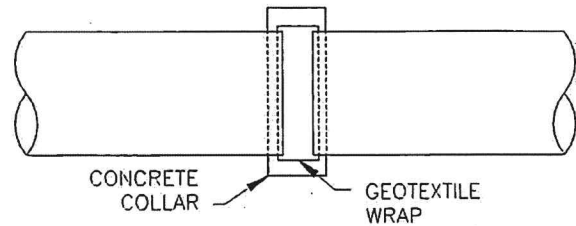
External Mechanical Repairs

Mar Mac Polyseal Pipe Coupler, 4- through 60-inch (100 - 1500 mm), consists of a mastic adhesive base layer, a cross-laminated polyethylene middle layer with a spun-bonded geotextile polypropylene cloth outer layer. 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. Polyseal Pipe Couplers are reasonably priced, especially when considering the quality of the finished repair, and are typically used with soil-tight smooth interior corrugated HDPE pipe products. *Note: Mar-Mac bands shall be installed in accordance with manufacturer's recommendations.*



Snap couplers, 4- through 8-inch (100 – 200 mm), and *split band couplers*, 10- through 30-inch (250 – 750 mm), will provide a soil-tight repair with or without gaskets. This repair method should only be used if the damaged area is in a non-trafficked green area, is cosmetic in nature, confined to a single corrugation, and is not defined as structural damage. The coupler shall be centered around the damaged area of pipe and tightened down with the nylon straps. If the damaged area is large or significant, the damaged area is to be cut out, and replaced with a new section of pipe. The replacement section is to be 'spliced' in place using snap or split band couplers. They are a convenient, low-cost repair alternative, and are typically used to repair soil-tight smooth interior corrugated HDPE pipe products.

Concrete collars also provide a soil-tight repair, dependent 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. Typically, approximately 6" (0.15m) is excavated beneath the pipe to allow for proper application of the geotextile and concrete encasement. If the pipe itself is damaged, the damaged area shall be removed and a replacement pipe section spliced in prior to pouring the collar. In order to provide a greater level of joint performance, a gasket can be installed on the pipe in the concrete encasement. Concrete collars are typically more costly and time consuming than snap couplers or split band couplers but are reasonable repair options for soil-tight smooth interior corrugated HDPE pipe products. .



Slip Couplings 4- through 24-inch (100 – 600 mm), provides a watertight repair that will meet most pressure testing requirements, when installed correctly. The slip coupling uses PVC bells with gaskets. The gaskets are placed in the valleys on either side of the section to be repaired and slip couplings are then slid over the gaskets. PVC slip couplings are most commonly used with watertight smooth interior corrugated HDPE pipe products. .

Internal Repairs

Internal mechanical repair products generally consist of a flexible cylindrical gasket sleeve, which is expanded to conform to the inner wall of the pipe. The feasibility of this repair method depends on the size of the damaged section or joint and available access into the pipe. Internal mechanical seals slightly restrict the inside diameter of the pipe. This should be considered when assessing the risk of debris obstruction.

NPC Internal Joint Seal, 18- through 60-inch (450 – 1500 mm), consists of 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. The damaged area of the pipe must be removed and a replacement section spliced in if necessary in order to use the Internal Joint Seal. This system may provide a watertight joint when installed as recommended. The manufacture should be contacted to verify the product meets the specific application requirements including test requirements, if specified. If pressure tests are required, NPC should be contacted to ensure that the product is suitable for the specific test criteria.

Internal mechanical seals will slightly restrict the inside diameter of the pipe. This should be considered when assessing the risk of debris obstruction.

Link Pipe Grouting Sleeve™, 4 through 60 inch (100 – 1500 mm), is a stainless steel grouting sleeve that is installed with an inflatable plug. The sleeve may be used to seal a joint or repair short sections of damaged pipe. The manufacture should be contacted to verify the product meets the specific application requirements including test requirements, if specified.

Internal chemical sealing is another method of internal joint repair using chemically activated gel or grout to minimize joint leakage. The grout is typically applied with specialized 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. 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 Caryl Corporation manufacture and/or install chemical grout. Stephen's Technologies *New Life Coatings* and *NewLife Liner Systems* as well as Avast Hydro-Lining International, are examples of companies that offer cured in place epoxy lining systems that have been effectively used with HDPE pipe. Most pipe diameters can be chemically grouted provided the grouting contractor has the appropriate equipment.

Manufacturer Contact Information

Contact the Regional Engineer or Application Engineering Department for assistance with other unique conditions or for contact information regarding any companies listed in this technical note.

Note: The HDPE pipe 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.