

## SECTION 1530 – LINEAR LOW-DENSITY POLYETHYLENE ENCASUREMENT INSTALLATION

### PART 1 - GENERAL

#### 1.1 SCOPE OF WORK:

Provide all labor, materials, equipment and services required for installing linear low-density polyethylene (LLDPE) encasement of ductile iron pipe and associated appurtenances.

### PART 2 - EXECUTION

#### 2.1 INSTALLATION OF LINEAR LOW-DENSITY POLYETHYLENE ENCASUREMENT:

The LLDPE encasement shall prevent contact between the pipe and the surrounding backfill and bedding material but is not intended to be a completely air and watertight enclosure. Overlaps shall be secured by the use of polyethylene adhesive tape, plastic string or other nondegradable material approved by the ENGINEER and capable of holding the encasement in place until backfilling operations are completed. Pipe and fittings shall be wrapped with polyethylene prior to pouring concrete thrust blocks.

##### A. Method A - For use with LLDPE Tubes:

1. Cut polyethylene tube to a length approximately two feet (2') longer than the pipe section.
2. Slip the tube around the pipe, centering it to provide a one foot (1') overlap on each adjacent pipe section, and bunching it accordion-fashion lengthwise until it clears the pipe ends.
3. Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at joints to facilitate installation of the LLDPE tube.
4. After assembling the pipe joint, make the overlap of the LLDPE tube. Pull the bunched LLDPE from the preceding length of pipe, slip it over the end of the new length of pipe, and secure it in place. Then slip the end of the LLDPE from the new pipe section over the end of the first wrap until it overlaps the joint at the end of the preceding length of pipe. Secure the overlap in place. Take up the slack width at the top of the pipe to make a snug, but *not* tight, fit along the barrel of the pipe, securing the fold at quarter points.
5. Any cuts, tears, punctures, or other damage to the LLDPE shall be repaired in accordance with Paragraph 2.1 E.

##### B. Method B - For use with LLDPE Tubes:

1. Cut LLDPE tube to a length approximately one foot (1') shorter than that of the pipe section. Slip the tube around the pipe, centering it to provide six inches (6") of bare pipe at each end. Take up the slack at the top of the pipe to make a snug, but *not* tight, fit along the barrel of the pipe, securing the fold at quarter points; secure the ends as described herein under Method A.
2. Before making a joint, slip a three foot (3') length of LLDPE tube over the end of the preceding pipe section, bunching it accordion-fashion lengthwise. After completing the joint, pull the three foot length of LLDPE over the joint, overlapping the LLDPE previously installed on each adjacent section of pipe by at least one foot (1').
3. Any cuts, tears, punctures, or other damage to the LLDPE shall be repaired in accordance with Paragraph 2.1 E.

##### C. Method C - For use with LLDPE Sheets:

1. Cut LLDPE sheet to a length approximately two feet (2') longer than that of the pipe section. Center the cut length to provide a one foot (1') overlap on each adjacent pipe section,

bunching it until it clears the pipe ends. Wrap the LLDPE around the pipe so that it circumferentially overlaps the top quadrant of the pipe. Secure the cut edge of LLDPE sheet at intervals of approximately three feet (3').

2. Lower the wrapped pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at joints to facilitate installation of the LLDPE. After completing the joint, make the overlap and secure the ends as described herein under Method A.
3. Any cuts, tears, punctures, or other damage to the LLDPE shall be repaired in accordance with Paragraph 2.1 E.

D. Appurtenances:

Pipe-Shaped Appurtenances:

1. Cover bends, reducers, offsets, and other pipe-shaped appurtenances with LLDPE in the same manner as the pipe.

Odd-Shaped Appurtenances:

1. When it is not practical to wrap valves, tees, crosses and other odd-shaped pieces in a tube, wrap with a flat sheet or split length of LLDPE tube by passing the sheet under the appurtenance and bringing it up around the body. Make seams by bringing the edges together, folding over twice, and taping down.
2. Tape LLDPE securely in place at valve stem and other penetrations.

E. Repair any cuts, tears, punctures, or damage to LLDPE with LLDPE adhesive tape or with a short length of LLDPE sheet or a tube cut open, wrapped around the pipe to cover the damaged area, and secured in place.

F. Openings in the encasement shall provide for branches, blowoffs, air valves, and similar appurtenances by making an X-shaped cut in the LLDPE and temporarily folding back the film. After the appurtenance is installed, tape the slack securely to the appurtenance and repair the cut with tape. Service taps and other taps without tapping sleeves should be made directly through the LLDPE after wrapping the pipe with 2-3 layers of LLDPE tape, with any resulting damaged areas being repaired as described herein.

G. Where LLDPE-wrapped pipe joins an adjacent pipe that is not wrapped, extend the LLDPE wrap to cover the adjacent pipe for a distance of at least three feet (3'). Secure the end with circumferential turns of tape. Service lines and other attached lines of dissimilar metals shall be wrapped with LLDPE or a suitable dielectric tape for a minimum clear distance of three feet (3') away from the ductile-iron pipe.

H. Two layers of polyethylene is required within 100 feet of cathodically protected gas mains.

I. Backfilling for LLDPE-Wrapped Pipe

1. Use the same backfill material as specified for pipe without LLDPE wrap, exercising care to prevent damage to the LLDPE wrapping when placing backfill material.
2. Backfill material shall be free from cinders, refuse, boulders, rocks, stones, or other material that could damage the LLDPE. Backfill shall be as specified for the pipe without LLDPE encasement.

**PART 3 - BASIS OF PAYMENT**

Installation of LLDPE encasement shall be included in the unit bid price per linear foot (for LLDPE specified in Section 1520).

END OF SECTION