

## **SECTION 33 11 41**

### **V-BIO® POLYETHYLENE ENCASEMENT OF DUCTILE IRON PIPE**

#### **PART 1 – GENERAL**

##### **1.01 WORK INCLUDED**

- A. Work under this Section includes furnishing and installing polyethylene encasement tube over all pipe and fittings installed by the contractor and SFPUC-CDD personnel including service laterals and water main connections.

##### **1.02 RELATED SECTIONS**

- A. Section 33 10 00 – Water Utility Piping Materials
- B. Section 33 11 00 – Installation of 16-Inch and Smaller Water Mains and Appurtenances

##### **1.03 CITED REFERENCES**

- A. Contractor shall install the polyethylene encasement in strict conformance with the latest edition of the AWWA C105 Standard.

##### **1.04 QUALITY ASSURANCE**

- A. All work shall be accomplished by experienced personnel working under competent supervision.
- B. All materials shall be new and of the highest quality and shall be supplied by a vendor who is regularly engaged in procurement of polyethylene encasement products for water pipes.
- C. For work to be accepted by the City Representative, there shall be no pinholes, no tear in the polyethylene encasement, and no water collected inside the polyethylene encasement.

##### **1.05 SUBMITTALS**

- A. Contractor shall submit the following:
  1. Polyethylene encasement product data sheet, dimensions, thickness.
  2. Installation procedures: including spacing of adhesive tapes on pipe barrels, Encasement of pipes installed by SFPUC-CDD, termination of encasement at epoxy coated appurtenances, installation of adhesive tape at corporation stops, and repair details of the polyethylene encasement.

3. Submit an affidavit stating compliance with the requirements and practices of AWWA C105 and AWWA C600.

## **PART 2 – PRODUCTS**

### **2.01 MATERIAL**

- A. The polyethylene encasement shall consist of three layers of co-extruded linear low density polyethylene (LLDPE), fused into a single thickness of not less than 8 mils.
- B. The inside surface of the polyethylene wrap to be in contact with the pipe exterior shall be infused with a blend of anti-microbial biocide to mitigate microbiologically influenced corrosion and a volatile corrosion inhibitor to control galvanic corrosion.
- C. The polyethylene encasement shall meet AWWA C105 Standard and shall be furnished by one of the manufacturers specified in 2.01.D or approved equal.
- D. V-Bio® polyethylene encasement manufactured by Ductile Iron Pipe Research Association (DIPRA) and sold through US Pipe and American Ductile Iron Pipe Company.
- E. The tape shall be blue polyethylene adhesive tape or approved equal.

## **PART 3 – EXECUTION**

### **3.01 EXECUTION OF WORK**

- A. Install polyethylene encasement tubing as per the approved procedures. Any deviation from the approved procedures shall be re-evaluated and approved by the City Representative before proceeding. Installation “Method A” from AWWA C105 is included herewith for information only.
- B. Each polyethylene encasement tube shall have sufficient length to cover one pipe segment and overlap the pipe joints one foot minimum at both ends of the segment.
- C. The intervals of the adhesive tape shall not exceed the intervals that have been approved. Install additional tape as required to ensure good quality of the pipe Encasement. Any wrap at tap locations shall be taped tightly prior to tapping and inspected for any needed repairs following the tap.
- D. For pipes installed by SFPUC-CDD, the Contractor shall install sufficient extra polyethylene encasement at the end of the pipe installed by him/her to encase the connecting pipe and fittings after these are installed by SFPUC-CDD personnel.

- E. The Contractor shall remove any sharp edges or materials, which can penetrate or create cuts in the polyethylene encasement when the pipe is lowered into the trench.
- F. At 1-inch and 2-inch service connections to the new main, the Contractor shall install adhesive tape over the polyethylene encasement on the entire circumference of the pipe before performing the tapping for corporation stop.
- G. Polyethylene encasement shall be installed over all pipe and fittings installed by the contractor and SFPUC-CDD personnel including service laterals and water main connections.

### **3.02 ACCEPTANCE OF WORK**

- A. Work will be accepted only if there is no tear or pinhole in the polyethylene encasement.
- B. During the water pressure test, if any leaks exist, Contractor shall remove the polyethylene encasement; fix the leaks; allow all water to escape; and retape the polyethylene encasement with the tape per the approved repair procedures.

**END OF SECTION**

## INSTALLATION OF POLYETHYLENE ENCASEMENT (AWWA C105)

(Not part of the specifications, for information only)

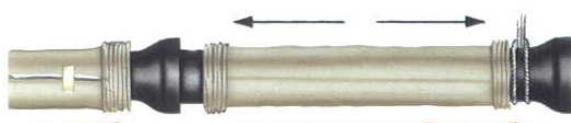
### *Method A for Normal Dry Trench Conditions*



**Step 1.**  
Cut a section of polyethylene tube approximately two feet longer than the pipe section. Remove all lumps of clay, mud, cinders, or other material that might have accumulated on the pipe surface during storage. Slip the polyethylene tube around the pipe, starting at the spigot end. Bunch the tube accordion-fashion on the end of the pipe. Pull back the overhanging end of the tube until it clears the pipe end.



**Step 2.**  
Dig a shallow bell hole in the trench bottom at the joint location to facilitate installation of the polyethylene tube. Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe.



**Step 3.**  
Move the cable to the bell end of the pipe and lift the pipe slightly to provide enough clearance to easily slide the tube. Spread the tube over the entire barrel of the pipe. Note: Make sure that no dirt or other bedding material becomes trapped between the wrap and the pipe.



**Step 5.**  
Overlap the secured tube end with the tube end of the new pipe section. Secure the new tube end in place.



**Step 6.**  
Take up slack in the tube along the barrel of the pipe to make a snug, but not tight, fit. Fold excess polyethylene back over the top of the pipe.



**Step 7.**  
Secure the fold at several locations along the pipe barrel (approximately every three feet).



**Step 8.**  
Repair all small rips, tears, or other tube damage with adhesive tape. If the polyethylene is badly damaged, repair the damaged area with a sheet of polyethylene and seal the edges of the repair with adhesive tape.



**Step 4.**  
Make the overlap of the polyethylene tube by pulling back the bunched polyethylene from the preceding length of pipe and securing it in place. Note: The polyethylene may be secured in place by using tape, string, plastic tie straps, or any other material capable of holding the polyethylene encasement snugly against the pipe.



**Step 9.**  
Carefully backfill the pipe according to the AWWA C600 standard for backfill procedure. To prevent damage during backfilling, allow adequate slack in the tube at the joint. Backfill should be free of cinders, rocks, boulders, nails, sticks, or other materials that might damage the polyethylene. Avoid damaging the polyethylene when using tamping devices.