## STANDARD SPECIFICATION SECTION 09957 POLYETHYLENE TAPE PIPE COATING

## PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. This section includes materials, application, and testing of a polyethylene tape pipe coating complying with AWWA C209 and AWWA C214 with a 3/4-inch-thick reinforced cement-mortar armor coat in accordance with AWWA C205 for steel pipe sizes 4 inches and larger.
- B. Supervisors of tape coating and cement-mortar coating operations shall have at least two years' continuous recent experience in the application of tape and cement-mortar coating systems for steel pipe. The manufacturer of the tape coatings shall demonstrate a minimum of five years' successful application of this product on large diameter steel water pipelines.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Standard Drawings.
- B. Record Drawings and Submittals: STD SPEC 01300.
- C. Steel Transmission Pipe: STD SPEC 15061.
- D. Steel Pipe for Minor Applications: STD SPEC 15253.

#### 1.03 SUBMITTALS

- A. Submit submittal packages in accordance with Standard Specification Section 01300.
- B. Submit certificates of tests of physical and performance characteristics of each batch of primer and tape wraps.
- C. Submit method approved by tape manufacturer to minimize voids at weld seams. Submit method approved by tape manufacturer to minimize disbondment of free ends of tape during shipping and storage.
- D. Submit application procedure approved by tape manufacturer, including the pattern of distribution and method of application of the weld seam tape system.
- E. Submit an affidavit of compliance with AWWA C209 and AWWA C214.
- F. Submit schedule for application of tape coating. Schedule coating to be accomplished during normal working hours. Provide a minimum two weeks notice to the District's Representative prior to commencing or rescheduling work.
- G. Submit the names and qualifications of the workers and supervisors to be employed on the coating operation a minimum of 14 days prior to the start of taping operations.

- H. Submit material description and certificates of tests of physical and performance characteristics of heat shrinkable pipe joint sleeves.
- 1.04 INSPECTION

The District's Representative or his authorized representative will inspect the entire procedure of applying the protective coating material as herein described from surface preparation to completion of coating. Such inspection shall not relieve the Contractor of responsibility to furnish material and perform work in accordance with this specification. All coating work shall be done in the presence of the District's Representative. All coating work done in the absence of the District's Representative will be subject to rejection.

## PART 2 - MATERIALS

- 2.01 POLYETHYLENE TAPE COATING
  - A. Provide polyethylene tape coating in accordance with AWWA C209, AWWA C214, and as specified herein. Furnish plant and field applied primer and polyethylene tape, and plant and field applied repair tape by a single manufacturer. Meet or exceed the physical properties of tape materials for plant and field application criteria listed when tested in accordance with the methods described in AWWA C209 and AWWA C214, Section 4.12, "Coating System Tests."
  - B. The exterior tape coating system shall consist of a primer on the blast cleaned bare metal surface of steel pipe, a multiple-layer cold-applied polyethylene tape coating system and a protective cement-mortar coating applied over the tape system. Tape width shall not exceed 12 inches regardless of pipe diameter. This system shall be applicable to:
    - 1. Plant applications on straight run of pipe.
    - 2. Plant applications on special sections, connections and fittings, and plant repairs of cold-applied tape.
    - 3. Field applications to pipe joints, field coated fittings and repair of field cold-applied tape.

## 2.02 PRIMER

Primer shall be comprised of 100 percent Butyl rubber with resins for adhesion, cathodic disbonding and stress corrosion cracking inhibitors. The primer shall be Polyken No. 1039 or District approved equal.

# 2.03 STORAGE PRIMER

Storage primer on the exposed steel at the tape cutbacks shall be Polyken No. 924 or District approved equal. Color to be black.

- 2.04 PLANT COLD-APPLIED POLYETHYLENE TAPE COATING SYSTEM FOR STRAIGHT RUN PIPE
  - A. Anti-corrosion inner layer tape shall be Polyken No. 989 or District approved equal with the following properties.

Tape Color: Black.

- Backing: Consists of a 98% blend of high and low density polyethylene with the remaining portion a blend of colorants and stabilizers.
- Adhesive: Consists of a 100% Butyl based elastomers with resins for adhesion, cathodic disbonding, and long-term in-ground performance.
- Thickness: Total thickness 20 mils: Backing, 9 mils; Adhesive, 11 mils. Tolerance: -5%, + 10%.
- B. First mechanical outer layer shall be Polyken No. 955 or District approved equal, with the following properties:

Color: Black.

- Thickness: Total thickness 30 mils: Backing, 25 mils; Adhesive, 5 mils. Tolerance: -5%, + 10%.
- C. Second mechanical outer layer shall be Polyken No. 956 UV1 or District approved equal, having ultraviolet radiation protection properties as follows:

Color: White.

Thickness: Total thickness 30 mils: Backing, 25 mils; Adhesive, 5 mils. Tolerance: -5%, + 10%.

- D. Total system shall be Polyken YGIII or District approved equal.
- 2.05 PLANT COLD-APPLIED POLYETHYLENE TAPE COATINGS FOR SPECIALS, FITTINGS, AND PLANT REPAIR OF COLD-APPLIED TAPE
  - A. Anti-corrosion inner layer shall be Polyken No. 932-35 (Black) or District approved equal. Total thickness 35 mils.
  - B. Mechanical layer outer tape shall be Polyken No. 932-50 (White) or District approved equal. Total thickness 50 mils.
- 2.06 FIELD JOINT, FIELD COATED FITTINGS, AND FIELD REPAIR OF COLD-APPLIED TAPE
  - A. Joint filler tape to be Polyken No. 939 or District approved equal. Color to be black. Thickness 125 mils.

- B. Field joint, field coated fitting and field repair outer layer shall be Polyken No. 932-50 or District approved equal. Total thickness 50 mils.
- 2.07 FIELD JOINT USING ALTERNATIVE HEAT -SHRINKABLE PIPE JOINT SLEEVES
  - A. The sleeve shall consist of an irradiated and cross-linked polyethylene backing and a heatactivated adhesive layer that bonds to the pipe surface and common tape pipe coating such as polyethylene, polyurethane, and coal tar based coatings.
  - B. Sleeves shall be provided in strip form pre-cut to length by the manufacturer specifically for the pipe diameter on which it is to be used. The width of the sleeve shall be such that it will overlap the tape pipe coating by 3 inches on each side of the joint.
  - C. Packaging shall protect individual sleeves from damage and prevent adherence to other sleeves or the packaging material. Store the product away from extremes in temperature and out of the rain or other moisture sources.
  - D. The product manufacturer shall demonstrate conformance with AWWA C216. The product manufacturer shall demonstrate that the sleeve will retain its corrosion protection properties when applied prior to internal joint welding. The manufacturer must demonstrate that the sleeve has been tested on large diameter pipe after three internal weld beads have been fully laid down. Use heat-shrinkable pipe joint sleeves manufactured by Canusa, Raychem, or District approved equal.

## 2.08 MORTAR OVERCOAT

- A. Cement shall be Type II, low alkali conforming to ASTM C 150. Mortar overcoat thickness shall be 3/4 inch.
- B. Sand shall conform to ASTM C 33 with 100 percent of the sand passing through a No. 4 sieve.
- C. Water shall be free of organic materials and shall have a pH of 7.0 to 9.0, a maximum chloride concentration of 500 mg/l, and a maximum sulfate concentration of 500 mg/l.
- D. Reinforcement shall be welded wire fabric 2- by 4-inch mesh, ungalvanized conforming to ASTM A 185 or spiral ribbon wire per AWWA C205 Section 4.5.5.. Wire with excessive rusting shall not be used.

# PART 3 - EXECUTION

- 3.01 GENERAL
  - A. Apply plastic tape coating in accordance with AWWA C209, AWWA C214, and as modified herein.
  - B. Certificate of Compliance: Prior to shipment of pipe, provide a certificate of compliance stating that tape materials and work for all pipe delivered complies with the requirements of these Specifications and AWWA C209 and AWWA C214. This certification shall be submitted by the pipe manufacturer and endorsed by the tape manufacturer.

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- C. The pipe manufacturer shall retain the services of a representative of the tape manufacturer to ensure proper installation of all tape materials in the pipe manufacturer's shop.
- D. The Contractor shall retain the services of a representative of the tape manufacturer to ensure that the application of tape to field joints and the coating repairs made in the field are done properly and in accordance with the manufacturer's recommendations.
- E. Training Certification: The tape manufacturer shall submit certification that the Contractor has been properly trained to apply tape coatings in the field and that the procedures used by the Contractor in the field meet the tape manufacture's requirements. This certification shall be received by the District's Representative within two weeks of the beginning of pipe laying operations.

# 3.02 STRAIGHT RUN PIPE APPLICATION

- A. Cold-applied polyethylene tape coating applied in the plant on straight run pipe shall be a four-layer system consisting of: (1) primer; (2) anti-corrosion inner layer tape; (3) mechanical protective tape (first outer layer); and (4) mechanical protective tape (second outer layer).
- B. Large Diameter Pipe (Greater than 36 in.):The entire coating operation on each pipe section shall be performed as a one-station operation where the pipe is supported at the ends in a manner which will permit the application of the specified coatings. No additional handling following the initial setup of the pipe section, from application of primer, tape coating, and cement-mortar coating, will be allowed. No application involving rollers to support the pipe during the primer application, tape coating, or cement-mortar coating will be permitted. The pipe shall be of sufficient stiffness or have sufficient internal bracing to keep pipe cylindrical during taping. Maintain the axis of pipe during application without rocking, pitching, or yawing.
- C. Small Diameter Pipe (less than 36 in.): Small diameter pipe may be coated in a two station process either at one facility or at a different facility provided tape damage due to handling is repaired by approved tape vendor procedures with complete encirclement of the repair by the repair tape and retested by the approved holiday detection method. The roller-supported process shall be subject to the review and approval of the District's Representative prior to the process inception. There must be sufficient support and uniform drive to smoothly apply the tape without creating folds, creases, or air entrapment and to not scar the tape with drive rollers during the application process. The interim storage of tape coated pipe must be on protected berms prohibiting any tape indentation or penetration by foreign objects. At the inception of the cement mortar coating process, the tape coated pipe must be retested by an approved holiday detection procedure and any repair must be performed as above.
- D. The pipe shall be of sufficient stiffness or have sufficient internal bracing to keep pipe cylindrical during taping. Maintain the axis of pipe during application without rocking, pitching, or yawing.
- E. Perform the coating operation in an environmentally controlled area such that it is protected from direct sunlight, wind, rain, snow, mist, fog, dust, and hail.

- F. Remove the exterior weld bead along the entire exterior surface of the pipe. The exterior weld bead shall be flush with the exterior surface of the pipe with a tolerance of plus 1/64 inch. Removal of the weld bead is to be conducted in such a manner that no gouging or nicking of the plate surface will occur. This operation is to result in a smooth exterior surface with no ridges or valleys which may result in bridging or disbonding of the tape from the surface of the pipe.
- G. Surface preparation shall conform to AWWA C214 and the following:
  - 1. Bare pipe shall be clean of all foreign matter such as mud, mill scale, dirt, organic matter, weld slag and splatter, wax, coal tar, asphalt, oil, grease, or any contaminants. Wash pipe with hot water and allow the surface to dry.
  - 2. Prior to blast cleaning, inspect surfaces and, if required, preclean in accordance with the requirements of SSPC SP-1, Solvent Cleaning, to remove oil, grease, and all foreign deposits.
- H. Blast cleaning shall conform to AWWA C214 and the following:
  - 1. Prior to primer and coating application, blast pipe surface using a commercially available shot grit mixture to achieve a prepared surface equal to that which is specified in SSPC SP-6, Commercial Blast Cleaning.
  - 2. For plant mortar-lined pipe, perform blast cleaning of pipe exterior surfaces after the initial curing of the spun mortar lining. Perform the exterior blast cleaning in such a manner as not to damage the mortar lining in the pipe. Completely remove corrosion and foreign substances from the exterior of the pipe in the blast cleaning operation, and apply primer immediately after completion of blast cleaning.
  - 3. The shot grit mixture shall not exceed 40 to 60 percent grit. The shot grit mixture is to be determined prior to start of blast cleaning operations and this mixture ratio is not to be modified throughout the duration of the blast cleaning operations without the written approval of the District's Representative.
  - 4. Achieve from abrasive blasting an anchor pattern profile a minimum of 1.0 mil, but not exceeding 2.0 mils. Use NACE No. 3 Surface Profile Standard per NACE TM-01-75 as a visual comparison to define the acceptable anchor pattern profile during blast cleaning operations.
  - 5. Inspect the blast cleaned exterior of each pipe section for adequate surface preparation prior to application of the primer. Surface comparitor tapes are to be used by the pipe manufacturer in three (3) random areas along any given 40-foot length of pipe. The results of the surface comparitor tapes are to be included in the quality control records.
  - 6. Coat each pipe section with primer and tape within the same day of being blast cleaned. Do not allow blasted and/or blasted and primed pipe to sit overnight. All blasted and primed pipe must be coated by the end of the day. No coating will be permitted on pipe sections showing evidence of rust.
- I. Primer application shall conform to AWWA C214 and the following:

- 1. Apply the primer in a uniform thin film at the coverage rate and thickness recommended by the manufacturer. Apply the inner layer of tape only after the primer is dried as specified by the tape manufacturer.
- 2. Apply primer only to those sections of pipe that can be taped within the same workday. Pipe coated with primer which was not taped within the same workday may be rejected at the discretion of the District's Representative. The primer shall be removed from rejected pipe sections and the surface shall be re-primed.
- 3. Protect primer-coated pipe sections from moisture, dirt, sand, and other potentially contaminating materials. Suspend primer application operations or provide full protection for the pipe during high wind periods. Pipe sections not adequately protected shall be rejected by the District's Representative. If rejection occurs due to contamination of the primer, completely remove the primer from the exterior of the pipe section and re-application of the primer will be required.
- 4. Store, mix and apply primer in strict compliance with the manufacturer's recommendations.
- J. Inner layer tape application:
  - 1. Apply the inner layer of tape directly onto the primed surface using mechanical dispensing equipment recommended and approved by the tape manufacturer. Rollers shall be used to apply pressure on the tape as it comes in contact with the pipe. Tape shall be applied with uniform tension such that the surface is tight, smooth and wrinkle-free. The tape shall be overlapped a nominal 1-inch with a 3/4-inch minimum overlap.
  - 2. The application of tension shall be such that the width of tape will be reduced between 1-1/2 to 2 percent of tape width prior to the pull. Provide instrumentation to measure and record tape tension throughout the tape application operation. Documentation of tape tension data shall be suitable to the District's Representative.
  - 3. Apply inner layer tape at a minimum roll temperature of 70°F. Continuously monitor and record the temperature of the tape within 12 inches of the point of contact with the pipe surface. Document the temperature of the tape during application suitable to the District's Representative. Pipe sections where the tape application tension and temperature is not maintained within manufacturer's recommendations shall be rejected and the tape removed from the entire pipe section and re-applied.
  - 4. Provide continuous electronic holiday testing of the inner tape layer at 6000 volts. The holiday test equipment shall be permanently mounted to the tape application station such that the tape is tested immediately after the tape is applied. The test equipment shall be equipped with an indicator light and audio buzzer suitable to the District's Representative to alert the workmen of the presence of holidays in the coating system. Holidays shall be marked as found and repaired after the inner tape layer is completely applied to the pipe section but before the mechanical protection tape layers are applied.
  - 5. Splice each new roll with an overlap of at least 6 inches over the end of the previous roll. Provide cutbacks 10 inches from and parallel to the end of the pipe. Perform

cutbacks using a cutting device that is guided from the end of the pipe to ensure a uniform, straight cutback.

- K. Mechanical outer layer tape application:
  - 1. The first mechanical outer layer of tape shall be applied using the same mechanical equipment used in the application of the inner layer tape. Longitudinal tape splices shall be at least 6 inches away from a longitudinal tape splice on the inner tape layer. Apply two mechanical outer layers of tape. The inner layer tape shall be electrically tested, inspected, and approved prior to the application of the first mechanical outer layer. Visually inspect the first mechanical outer layer prior to the application of the second mechanical outer tape layer. Both mechanical outer tape layers shall be smooth, tight, and wrinkle-free.
  - 2. Apply the outer layer mechanical protection tapes in a similar manner to the inner protective tape except that the minimum tape roll application temperature shall be 90°F. Monitor tension and temperature during the application of the mechanical outer layer tapes. The use of rollers to apply pressure on the outer tape layers is not required during application. Holiday testing of the mechanical outer layer tapes in not required.
- L. Storage primer application shall conform to AWWA C214 as modified herein:
  - 1. Clean the pipe surface free from foreign matter such as sand, grease, oil, grit, rust particles, and dirt prior to storage primer application.
  - 2. Store, mix and apply storage primer in strict accordance with the primer manufacturer's recommendations.
  - 3. Apply storage primer to the exposed steel pipe at tape cutbacks to prevent oxidation of the cleaned metal surface. Spray apply a minimum of 1.5 mils and maximum of 2.5 mils of storage primer to exposed steel per the manufacturer's recommendations. Do not place storage primer on the edge of the steel plate.
- M. Mortar Overcoat:
  - 1. Apply cement-mortar overcoating in accordance with AWWA C205 immediately after the application of the tape coating layers. Allow 3-1/2-inch cutback beyond the edge of the tape coating
  - 2. Allow the mortar to cure properly before the pipe section is removed from the coating fixture and placed on rollers or timbers.

# 3.03 FITTINGS COATED AT THE PLANT

A. Coat fittings which cannot be machine coated in accordance with AWWA C209 using materials as specified herein. Weld bead preparation, surface preparation, blast cleaning, primer and tape application shall be as specified for straight run pipe. Apply an inner layer tape of Polyken No. 932-50 or District approved equal, with a 1-inch nominal, 3/4-inch minimum, tape overlap on all plant coated fittings. Apply an outer layer of cold-applied polyethylene tape as specified herein with a 55 percent overlap on all plant coated fittings.

Provide a minimum thickness of 110 mils for the total tape coat system for plant coated fittings.

- B. Test all completed tape coated fittings in the presence of the District's Representative with an electrical holiday detector prior to installation of cement-mortar coating. Applied voltage shall be in the range of 11,000 to 15,000 volts. Repair any holidays found.
- C. Follow the procedure described herein for field tape coating repairs on fittings and for coating field joints.
- D. Apply cement-mortar coating in accordance with AWWA C205 immediately after completion of tape coating, holiday testing indicating no holidays and inspections.
- 3.04 REPAIR DAMAGE TO PIPE COATING DURING IN-PLANT APPLICATION AND HANDLING
  - A. If there is any damage to the tape pipe coating that is larger than 36 square inches in any one area of a pipe section or special as determined by the District's Representative, of if there is damage to the tape pipe coating on a single pipe section or special at more than four separate locations of any size, the entire pipe section or special shall be subject to rejection.
  - B. If there is any damage to the tape pipe coating that is larger than 16 square inches, but less than 36 square inches, in any one area of a pipe section or special as determined by the District's Representative, the tape pipe coating shall be repaired per tape manufacturer's recommendations with a patch that wraps around the pipe circumferentially.
  - C. If there is any damage to the tape pipe coating that is smaller than 16 square inches in any one area of a pipe section or special as determined by the District's Representative, the tape pipe coating shall be repaired per tape manufacturer's recommendations with a local area patch.
- 3.05 COATING OF FIELD JOINTS USING POLYETHYLENE TAPE
  - A. Field cold-applied polyethylene tape pipe coating shall be in accordance with AWWA C209, as modified herein.
  - B. Protect the tape pipe coating from heat and weld splatter damage at welded joints by wrapping an 18-inch-wide strip of heat resistance material completely around the coated pipe sections covering the exposed tape on each side of the joint prior to welding. Do not use the coated portion of the pipe for grounding.
  - C. For exterior welded lap joints, remove the storage primer and wire brush areas to be welded immediately prior to welding.
  - D. No field tape coating will be permitted until the welding has been completed and the pipe section has cooled sufficiently so as to not damage the integrity of the tape coating system.
  - E. Do not permit trapped air under the tape in the joint.

- F. After joint welding, remove flash rusting by mechanical means, such as a wire brush. Wire brush the weld, storage primed steel and all exposed steel. Remove all burrs and weld slag to achieve a smooth surface.
- G. Clean the pipe surface free of dirt, mud, mill scale, wax, tar, grease, or any foreign matter. Remove visible oil or grease using an approved solvent that will not leave any residue on the pipe surfaces. The pipe surface shall be free of any moisture and all foreign matter prior to the application of primer.
- H. Pack irregular surfaces in the joint with elastomeric joint filler.
- I. Apply primer immediately after surface is cleaned by brush or roller (4 mils wet, 1 mil dry). Overlap primer onto plant applied tape coating.
- J. After primer has dried, apply tape to the joint and extend a minimum of 3 inches onto the plant applied tape coat. End splices shall be a minimum of 6 inches and shall be staggered. Maintain 55 percent overlap on all field joint tape to produce a minimum thickness of 100 mils.
- K. Apply tape with sufficient tension to conform with the surface irregularities. The finished tape wrap shall be smooth and wrinkle-free.
- L. Test the final applied joint tape coating in the presence of the District's Representative with an electrical holiday detector. Repair all holidays and physical damage to the final applied tape coating prior to application of the mortar coating.
- M. Apply mortar joint coating and reinforcement over tape coating using fabric diapers to retain the mortar. Apply the mortar coating immediately upon completion of tape wrapping, testing and inspections. Mortar at field joints shall overlap the shop-applied mortar overcoat a distance of not less than 5 inches. The thickness of the mortar shall be 1-inch minimum.
- 3.06 COATING OF FIELD JOINTS USING ALTERNATIVE HEAT-SHRINKABLE PIPE JOINT SLEEVES
  - A. Field installed heat-shrinkable pipe joint sleeves shall be in accordance with AWWA C216, as modified herein.
  - B. Protect the tape pipe coating from heat and weld splatter damage at welded joints by wrapping an 18-inch-wide strip of heat resistance material completely around the coated pipe sections covering the exposed tape pipe on each side of the joint prior to welding. Do not sue the coated portion of the pipe for grounding.
  - C. Do not apply the joint sleeve until all welding has been completed and the pipe has cooled sufficiently so as to not damage the heat-shrinkable pipe joint sleeve.
  - D. After joint welding, remove all weld slag, flash rusting and storage primer on the exposed steel by mechanical means, such as a wire brush. Remove all burrs and weld slag to achieve a smooth surface.
  - E. Lightly abrade the tape pipe coating with course sandpaper to a distance of 2 inches beyond the end of the sleeve or up to the mortar overcoat.

- F. Clean the exposed steel pipe and adjacent tape pipe coatings free of dirt, mud, mill scale, wax, tar, grease, or any foreign matter. Remove visible oil or grease using an approved solvent that will not leave any residue on the pipe surfaces.
- G. Pack irregular surfaces in the joint with elastomeric joint filler. The edges of bell ends or butt-strapped joints shall be beveled to remove sharp edge. Apply a compatible elastomeric filler tape to provide a 2:1 slope such that there is a smooth transition across the step. More than one strip of filler tape may be required. The elastomeric tape shall be pressed into the joint to eliminate voids.
- H. Pre-heat the pipe surface using two workers with minimum 300,000 BTU propane torches with a flame spreader tip. The target pipe steel temperature is 140°F and 100°F for the coating. Apply sleeve quickly after heating to minimize heat loss. Apply the sleeve with the release liner attached.
- I. With the sleeve (in strip form) rolled up from both ends, center over top of pipe. Center the sleeve over the weld such that it overlaps the pipe tape coating by 3-inches on both sides. Allow material to drape over both sides of pipe.
- J. Adjust the sleeve so that the two ends meet (overlap per manufacturer's instructions) at the 4 o'clock position allowing a gap of no more than 1 inch between the sleeve and the pipe at the bottom. Pull the lower sections of material around the bottom quadrant of the pipe and bring up to the top of the pipe.
- K. Pull back the release liner 2-3 feet from the underlap end and apply heat gently to the adhesive from the top of the pipe to the underlap end and press down to pipe surface.
- L. Remove release liner from entire sleeve and ensure that sleeve is still properly positioned. Drape over pipe and insure that it is centered properly and that there is proper overlap at the closure. Gently heat the closure and press down firmly all corners.
- M. Continue heating the closure and press down with gloved hand or roller until a good bond is realized. Use a roller to firmly press down this area and ensure that no air is trapped.
- N. Once the closure is established use torches to anchor the sleeve by heat and pressure at the 5 and 7 o'clock positions. Begin shrinking the sleeve in the center from below first and gradually working to the top quadrant. Slowly spread to the ends of the sleeve until full recovery is achieved and the sleeve is taught.
- O. While shrinking press down the sleeve with gloved hand or roller to push out air and insure that the adhesive begins to ooze out from the edges. Do not permit trapped air under the sleeve. Finish off area of closure and underlap with a roller.
- P. Inspect the final applied joint sleeve in the presence of the District's Representative. A properly completed application will have no trapped air pockets and no scorched or overheated areas. Repair all damage to the final applied joint sleeve and tape pipe coatings prior to application of the mortar coating.
- Q. Apply mortar joint coating and reinforcement over heat-shrink joint sleeve and tape pipe coatings using fabric diapers to retain the mortar. Apply the mortar coating immediately upon completion of joint sleeve and inspection. Mortar at field joints shall overlap the

shop-applied mortar overcoat a distance of not less than 5 inches. The thickness of the mortar across the joint shall be 1-inch minimum.

## 3.07 INSPECTION OF TAPE PIPE COATING

- A. Inspection: The District's Representative shall have access to witness the application of coatings on all pipe sections at his or her discretion.
  - 1. Provide the District's Representative with reasonable facilities and space at the pipe fabrication plant for the inspection and testing of the tape pipe coating. Assist the District's Representative in obtaining any information required to determine the characteristics of the material to be used. Furnish to the District's Representative at least two electrical pipe coating flaw detectors at the plant and one electrical pipe coating flaw detectors at the plant and one electrical pipe coating flaw detector per pipe installation heading in the field to aid in the inspection of the tape pipe coating.
  - 2. Provide free access to the District's Representative to plants of the manufacturer furnishing the materials and to mill or the worksite.
- B. Holiday detection for tape coating:
  - Prior to the application of the mechanical outer layer tapes, electrically test the inner layer tape for any flaws in the coating with a suitable holiday detector as approved by the District's Representative. The detector shall impress a voltage conforming to NACE Standard RP-02. The voltage to be used to electrically test the tape shall be fully documented.
  - 2. Clearly mark all holidays electrically or otherwise detected and immediately repair. Do not start wrapping the first mechanical outer layer tape until all detected holidays have been repaired. Perform repairs per tape manufacturer's recommendations. After the repair, retest the affected areas with the holiday detector prior to the application of the outer layer wrap. This process will be done until the coating has successfully passed the test.

# 3.08 PROTECTING COATED PIPE

- A. The mortar overcoat provides mechanical protection for the underlying tape pipe coating; however, normal precautions are required to protect the mortar from damage and additional care must be taken to protect the exposed tape at the ends of each pipe section. At the fabrication plant, handle the coated pipe sections only after application of the cement-mortar coating using minimum 12-inch-wide belt slings with spreader bars or padded forklifts.
- B. Apply a storage wrap to the exposed tape ends to protect against ultraviolet exposure. Remove the storage wrap prior to completing the field joint. Tape exposed to ultraviolet light for more than 90 days without protection is subject to being rejected by the District's Representative.

END OF SECTION