SPECIFICATION: **G-8101-5**

TITLE: "FIELD COATING OF STEEL PIPE AND FITTINGS FOR BURIED INSTALLATIONS"

VOLUME: **2 (Section 1.0), 9 and Gas Service Book**

REVISIONS: (See ★)

1) Reviewed for clarity.

2) Added Section 2.0 “Environmental Impact”.

3) Revised Section 5.1 “Coal Tar Mill Coating” to address removal of coal tar wrap that may contain asbestos.

Con Edison

Gas Operations Standards

TITLE: FIELD COATING OF STEEL PIPE AND FITTINGS FOR BURIED INSTALLATIONS

EFFECTIVE DATE: December 16, 1995

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TITLE: **FIELD COATING OF STEEL PIPE AND FITTINGS FOR BURIED INSTALLATIONS**

1.0 SCOPE

1.1 This Specification for buried installations covers the field coating of all steel gas, cooling water, gasoline, and diesel pipe and fittings:

A) System A: Mastic
B) System B: Cold Applied Tape
C) System C: Hot Coal Tar Enamel (See Section 1.2)

1.2 Hot Coal Tar Enamel may only be used with approval from Corrosion Operations.

★ 2.0 ENVIRONMENTAL IMPACT

Effective coatings will result in minimizing product leaks due to corrosion on buried portions of piping systems.

3.0 MATERIAL

System	Material	Unit	Stock No.	Product	Manufacturer
				Roskote R-28 CE Mastic	Royston Labs Inc.
	Mastic	Gal.	631-1211	---------- **or** ----------	
				Thick'n Quick	Royston Labs Inc.
A					
	Felt	Roll	000-0067	15# Roofing Paper (Asphalt)	
	Thinner	Gal.	638-1149	Toluene	
	Cold Applied Tape 2" Width or 4" Width	Roll	631-1138 631-1146	Polyken No. 934-35 ---------- **or** ---------- Tapecoat CT	Kendall (Polyken Div.) Tapecoat Co.
B					
	Primer	Gal.	636-1216	Polyken No. 1029 ---------- **or** ---------- Tapecoat Coldprime	Kendall (Polyken Div.) Tapecoat Co.

Tapes and primers should be purchased from the same manufacturer.

3.0 **MATERIAL** (Continued)

System	Material	Unit	Stock No.	Product	Manufacturer
C (See Sec 1.2)	Enamel	-	-	Bitumastic 70-B, Hi-Melt, CE Grade Enamel	Koppers
				or	
				"Kaiser" Hot Service Enamel	Reilly
	Primer	-	-	Jet-Set Primer	Koppers
				or	
				Black Magic Primer (meets Rule 66)	Reilly
	Felt	-	-	Duramat	Power Marketing Group, Inc.
				or	
				Mineral Felt	Papier Kingsley-Falls, Inc.
A, B, C	Cleaning Solvent	Qt.	634-1853	PF Degreaser	PT Technologies, Inc.
				or	
				Envirosolv 655	Fine Organics Corp.

4.0 **COATING SELECTION**

4.1 Unless otherwise specified, Table 1 shall be used in selecting the proper coating system.

TABLE 1: COATING SELECTION

ITEMS TO BE COATED	PREFERRED METHOD	ALTERNATE
Welded joints, elbows, offsets, sleeves, damaged coating on pipe	System B	System C
Irregular surface fittings, all bolted fittings, valves, reinforcements, weldolets, non-bolted compression couplings and posi-hold type couplings	System A	System C

★ 5.0 SURFACE PREPARATION - ALL SYSTEMS

5.1 Coal Tar Mill Coating

A) All existing coal tar coating shall be treated as if it contains asbestos - unless a sample is taken by a Certified Asbestos Inspector, laboratory tested to determine if it contains asbestos and found to contain less than 1% asbestos.

B) If not sampled and tested, or if tested and found to contain 1% asbestos or greater, removal of existing coal tar coating shall be in accordance with Specification IP-33, "Removal and Handling of Coal Tar Wrapped Gas Mains and Services".

C) All existing loose coal tar coating and unbonded felt shall be removed from the area to be coated; in addition, 6" of Kraft paper, either side of the area to be coated, shall be removed. Coating removal shall be done by using a knife or machete with remaining edges cut on a taper. Coating shall not be removed by hammer blows.

5.2 Other Mill Coatings

All loose mill coating shall be removed by using a knife or machete. The mill coated surface, to be overlapped by the field coating, shall be abraded using sandpaper or a wire brush. All mill coating adhesive shall be removed from the pipe surface to be coated.

5.3 Power tool clean the bare pipe surface to be coated (to remove rust, mill scale, weld splatter or sharp edges). When approved by Con Edison's Field Representative, hand tool cleaning is acceptable in areas not accessible to power tool cleaning. Sandblasting of the pipe surface to a commercial gray metal finish is an acceptable alternative to power tool cleaning.

★ 5.0 **SURFACE PREPARATION - ALL SYSTEMS** (Continued)

5.4 Wash the surface to be coated (to remove oil, grease, dirt, etc.) using only the cleaning solvent listed in Section 3.0. This washing shall be done by wiping the surface to be coated with clean rags soaked with the solvent. Solvent resistant gloves should be worn. The coating shall not be applied until all of the solvent has evaporated from the surface being coated.

6.0 **APPLICATION OF PRIMER**

6.1 There is no primer required with System A - **Mastic**.

6.2 System B - Cold Applied Tape and System C - Hot Coal Tar Enamel require primers. The approved primer for the coating system used shall be stirred thoroughly. Apply the primer to a clean dry pipe surface by brushing, leaving a uniform coating completely covering the surface of the pipe or fitting and overlapping the mill coating on each side by at least four inches. Allow the primer to dry. The applicable coating shall be applied immediately after the primer has dried.

7.0 **COATING APPLICATION**

7.1 System A - Mastic

A) The mastic is furnished properly formulated for application, and no thinning is usually necessary. Normal appearance is thicker than most coatings, but it can be brushed evenly. Mix mastic thoroughly prior to use. Apply mastic by **brush**, keeping generous amounts of mastic on the brush. Do not brush thin. Use only clean brushes that are not caked or hard due to prolonged use.

7.0 **COATING APPLICATION** (Continued)

B) If excessive thickening occurs (mastic cannot be spread evenly by brush), because of solvent evaporation from open containers, original consistency may be restored by adding the approved thinner. A **maximum** of 1/2 pint of thinner can be added to 1 gallon of mastic.

C) Apply a first coat of mastic and let dry for approximately 15 minutes, then apply a second coat. It takes approximately 45 minutes for the second coat to dry. Each coat of mastic shall overlap any adjacent coating.

NOTE: The drying times mentioned here are variable and dependent upon ambient temperature and relative humidity. Drying times longer than those indicated are possible.

D) Do not backfill until the mastic is completely dry. If emergency backfilling is required, as authorized by Con Edison's Field Representative, pipeline felt shall be wrapped loosely around the coating to protect it against abrasion.

E) For touch-ups of factory (mill) coated fittings with mastic follow surface preparation steps as in Section 4.0 for exposed metal and 1/2" of adjacent mill coating. Apply mastic as in Section 6.1 overlapping mill coating by 1/2". Only one coat of mastic shall be applied for touch-ups.

NOTE: All bolt threads, heads, and nuts shall be given one coat of mastic regardless of the condition of the factory coating.

7.0 **COATING APPLICATION** (Continued)

7.2 System B - Cold Applied Tape

A) Field coating of welded joints, elbows, offsets, etc. using cold applied tape shall be done as follows:

1) Use 2" wide tape for pipe 8" diameter and smaller. Use 4" wide tape for larger diameters.

2) Remove paper separator from side of tape which will be in contact with pipe.

3) The tape shall be applied by a "spiral wrap" method. Overlap each adjacent tape layer 1/2". Wrap first and last turn of tape 1 1/4 times around pipe, overlapping mill coating by 4".

4) For pipe 16" in diameter and larger, a second layer of tape shall be applied following steps "1" through "3". This second layer of tape shall be started at the opposite end, and the application angle reversed.

5) For pipe 16" diameter and larger, a "cigarette wrap" application is acceptable using wider tape as long as there are no wrinkles, bubbles, or voids in the tape. Wrap shall be 1 1/4 turns with 1/2" overlap between adjacent tape wraps and 4" on the mill coating. Two layers of tape shall be applied.

7.0 **COATING APPLICATION** (Continued)

7.3 System C - Hot Coal Tar Enamel (See Section 1.2)

A) An alternate for System A or B is System C - Hot Coal Tar Enamel. Pipe and fittings may be coated with one of the coal tar enamels specified herein. The enamel shall be heated in kettles equipped with accurate and easily read thermometers. Upon removal from its container, the enamel shall be broken into small pieces before it is placed in the heating kettle. Overheating the enamel results in green-yellow acrid smoke and will carbonize the enamel rendering it useless. Continued stirring is essential to obtain uniform heating. The heating and pouring temperatures are: Maximum Kettle Temp., 525°F. Minimum Pouring Temp., 485°F. The enamel shall be kept free flowing and above the minimum pouring temperature in the kettle and in the pouring buckets.

B) Field coating of welded joints, elbows, offsets, etc., using Hot Coal Tar Enamel, shall be done as follows:

1) Strips of felt shall be cut long enough to go around the pipe 1 1/4 times. Using the felt strips as slings, enamel shall be poured onto the surface of the pipe and felt and spread to at least 3/32 inch thickness over the area to be coated. The felt sling shall be discarded after the first coat of enamel.

2) The enamel shall be inspected for voids, thin spots, sags, wrinkles, and other defects. Defects shall be corrected before the application of the second coat.

7.0 **COATING APPLICATION** (Continued)

3) A second coat of enamel, at least 1/32 inch thick, shall be applied over the first coat using new strips of felt. The second enamel coat with a felt wrapper shall extend over the area being coated and overlap previously applied mill coatings by at least four inches.

4) Excess enamel shall be evident along all felt edges to get good sealing properties.

5) The inside face of all felt strips shall be sealed with enamel to keep out moisture.

6) Where hot enamel overlaps mill coatings other than coal tar, a transition area forms between the mill and field coatings. After the enamel is applied, this area shall be wrapped with cold applied tape, System "B", 1 1/4 times around the pipe.

C) Field coating of irregular fittings, using Hot Coal Tar Enamel, shall be done using two separate coats of enamel. The first coat of enamel shall be at least 3/32-inch thick. It shall be inspected for voids, thin spots, wrinkles, sags, blisters and other defects which shall be repaired prior to the application of the second coat. The second coat of enamel shall be at least 1/32-inch thick. The working parts of valves shall be coated in accordance with Sections 5.0 and 7.1 of this Specification using System A - **Mastic**.

8.0 REPAIRS OF DAMAGED COATING

8.1 Repairs of damaged coating on fittings only using System A - **Mastic** shall be done in accordance with Sections 5.0 and 7.1 of this Specification.

8.2 Repair of damaged coating using:

A) Cold Applied Tape - System "B"

1) Follow all applicable steps in accordance with Sections 5.0 and 6.2.

2) Cut a piece of tape (patch) large enough to cover damaged area, overlapping mill coating by at least 2".

3) Cut a second piece of tape long enough to wrap around the pipe 1 1/4 times.

4) Remove the paper separator from side of tape which will be in contact with pipe.

5) Apply the patch.

6) Wrap the second piece of tape around the pipe 1 1/4 times, covering the patch. Avoid too much handling and stretching of tape, which will result in wrinkles and bubbles in the tape.

B) Hot Coal Tar Enamel - System "C" (See Section 1.2)

1) Follow all applicable steps in Sections 5.0, 6.2, and 7.3 with the following exceptions:

a) This coating shall be used only to repair hot coal tar enamel coatings.

8.0 **REPAIRS OF DAMAGED COATING** (Continued)

b) Where the coating has been damaged, the Kraft Paper outer wrap shall be removed for an additional 4" in all directions.

c) The loose or disbonded coating shall be sliced away by a knife from the damaged area until grey unrusted metal shows along the edges of exposed pipe. The edges of the coating shall be cut on a taper.

d) When the primer has become dry, hot enamel shall be poured on the primed metal, and a first piece of felt shall be carefully applied over the opening.

e) After a second application of hot enamel, a second piece of felt, larger than the first by not less than 4" in any direction, shall be immediately placed over the patched area.

9.0 **INSPECTIONS**

9.1 For System A - **Mastic**, no electrical inspections shall be performed. A thorough visual inspection of the finished coating shall be performed in order to insure that no holidays are present in the coating.

9.0 **INSPECTIONS** (Continued)

9.2 For System B - **Cold Applied Tape**, an Electrical Spark Inspection, using an approved Holiday Detector, shall be made on all coated pipe just prior to backfilling. The peak voltage of the Holiday Detector shall be between 12,000 and 15,000 volts measured with the electrode in contact with the coated pipe. Exceptions to this electrical inspection are service lines and distribution mains less than 100 feet in length, which only require a thorough visual inspection.

9.3 For System C - **Hot Coal Tar Enamel**, an Electrical Spark Inspection, shall be made on all coated pipe and fittings just prior to backfilling. The peak voltage of the Holiday Detector shall be as in Section 9.2. There are no exceptions to this electrical inspection.

9.4 All coating defects found from the inspections described in Sections 9.1, 9.2, and 9.3 shall be repaired as per Section 8.0 and inspected again.

10.0 **PROTECTION, PRECAUTIONS, QUALITY CONTROL**

10.1 The mastic, thinner, and primers are flammable materials and must be kept away from open flames, sparks or high temperatures. Avoid breathing vapors and use only with adequate ventilation. Keep containers closed when not in use. Contact with the skin shall be avoided.

10.2 The enamel pieces, placed in the heating kettles, shall be kept clean, dry and free of dirt, grass, weeds, or foreign matter.

10.3 All heating kettles, pouring buckets, daubers, etc., shall be cleaned once a day and kept in a workmanlike condition. Enamel left in the kettle overnight or from a previous day will be removed and discarded.

10.0 **PROTECTION, PRECAUTIONS, QUALITY CONTROL** (Continued)

10.4 Rolls of pipeline felt and cold applied tape shall be stored in sheds or on platforms under suitable cover to keep them dry. All rolls shall be carefully handled to prevent distortion of the rolls and damage to the edges which may interfere with their use.

10.5 When practical do not coat in rain, snow, fog, or windy weather which may cause moisture, dust or dirt to collect on the surface to be coated. Wet or dirty pipe or fittings shall not be coated until properly cleaned as per Section 5.0 and dried.