SECTION 1061 -- REPAIR OF DAMAGED METALLIC COATINGS

1061.01 -- Description

1. This Section describes methods that are used to repair damaged zinc coatings, aluminum coatings, and aluminum-zinc alloy coatings on surfaces that have been damaged in fabrication, transporting, handling, installation, or welding. Damaged surfaces shall be repaired by the Contractor without additional cost to the Department.

2. The material used for repair shall provide a minimum coating thickness of at least 50 mm with one application.

3. The coating material may be applied under shop or field conditions.

1061.02 -- Material Characteristics

1. Repair Method 1 -- Zinc-Based Solder Alloys:

a. The Contractor shall use zinc alloy solders for this repair method. The most common types of solder are zinc-cadmium and zinc-tin-lead alloys having liquidus temperatures in the ranges from 270°C to 275°C and 230°C to 260°C, respectively. (The liquidus temperature is that temperature above which an alloy is completely molten.) The solders can be used in rod form or as powders.

b. Surface Preparation:

(1) The Contractor shall clean the surface to be reconditioned using a wire brush, a light grinding action, or mild blasting so a smooth reconditioned coating will adhere. Surface preparation shall extend into the surrounding, undamaged coating.

(2) If the area to be reconditioned includes welds, the Contractor shall remove all flux residue and weld spatter by blast cleaning or mechanical means (chipping).

(3) The Contractor shall preheat the area to be reconditioned to at least 315°C and shall not overheat (beyond 400°C) or allow the surrounding coating to be burned. The Contractor shall wire brush the surface that is to be reconditioned during preheating.

(4) The Contractor shall rub the cleaned, preheated area with the repair stick to deposit an evenly distributed layer of the zinc alloy. When powdered zinc alloys are used, the powder shall be sprinkled on the cleaned, preheated surface and spread out with a spatula or similar tool. The minimum thickness of the coating shall be as specified.

(5) When the repair has been made, the Contractor shall remove the flux residue by rinsing with water or wiping with a damp cloth.

(6) The thickness measurements shall be made with either a magnetic or electromagnetic gauge to ensure the proper thickness was applied.

2. Repair Method 2 -- Zinc-Rich Paint:

a. Zinc-rich paints are usually based on organic binders that are pre-mixed and formulated specifically for use on steel surfaces. Zinc-rich paint is suitable for repairing damaged coatings, provided the dried film contains a minimum of 65 percent zinc dust by mass.

b. Surface Preparation:

(1) The Contractor shall clean the surfaces to be reconditioned so that the surface is dry, free of oil, grease, and corrosion products.

(2) Where anticipated field service conditions include immersion, the Contractor shall blast clean the surface in accordance with SSPC-SP5, white metal. For less critical field exposure conditions, the surface shall be blast-cleaned to near-white metal in accordance with SSPC-SP10 to a 25 to 50 µm anchor pattern, as a minimum.

(3) Where circumstances do not allow blast cleaning, it is permissible to power disk-sand areas to be repaired to bright metal. To ensure that a smooth reconditioned coating can be achieved, surface preparation shall extend into the surrounding undamaged coating.

(4) If the area to be reconditioned includes welds, the Contractor shall remove all flux residue and weld spatter by blast cleaning or mechanical means (chipping).

(5) The Contractor shall spray or brush-apply the zinc-rich paint to the prepared area. The paint shall be applied as recommended by the paint manufacturer in a single application employing multiple spray passes to achieve the dry film thickness specified.

(6) Coating thickness measurements are made with either a magnetic or electromagnetic gauge to ensure the proper thickness was applied.

3. Repair Method 3 -- Sprayed Zinc (Metallizing):

a. This method involves the application of a zinc or aluminum coating by spraying the surface to be repaired with droplets of molten metal using wire, ribbon, or powder processes.

b. When an aluminum coating is to be metallized, metallizing shall be done with an aluminum wire or ribbon containing not less than 99 percent aluminum.

c. When a zinc coating is to be metallized, it shall be done with zinc wire, ribbon, or powder containing not less than 99.9 percent zinc.

d. Surfaces to be reconditioned by metallizing shall be clean, dry, and free of oil, grease, and corrosion products.

e. If the area to be reconditioned includes welds, all flux residue and weld spatter of a size or type that cannot be removed by blast cleaning or mechanical means, i.e., chipping, etc., shall first be removed.

f. The surface to be reconditioned shall be blast cleaned in accordance with SSPC-SP5, white metal.

g. To ensure that a smooth reconditioned coating can be achieved, surface preparation shall extend into the surrounding undamaged coating.

h. The coating shall be applied to the clean and dry surface by means of metal spraying pistols fed with either zinc wire, ribbon, zinc powder, or aluminum wire or ribbon. The sprayed coating shall be applied as soon as possible after surface preparation and before visible deterioration of the surface has occurred.

i. The surface of the sprayed coating shall be of uniform texture and free of lumps, coarse areas, and loosely adherent particles.

j. The minimum thickness of the sprayed coating shall be as specified.

k. Coating thickness measurements shall be made with either a magnetic or electromagnetic gauge to ensure that the proper thickness was applied.