

March 18, 2019

## **SPECIAL PROVISIONS FOR SECTION 533-B: EMBEDDED GALVANIC ANODES**

The 2019 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

### **533-B.1 DESCRIPTION**

Embedded galvanic anodes are designed to provide localized corrosion protection. When placed at the appropriate spacing along the perimeter of the concrete patches or along the interface between new and existing concrete, the anodes mitigate the formation of new corrosion sites in the existing concrete in adjacent areas.

The Contractor shall furnish all Materials, storage, handling, tools, Equipment, labor, and other appurtenances necessary to complete the Work.

### **533-B.2 MATERIALS**

#### **533-B.2.1**

The Contractor shall furnish pre-manufactured galvanic anodes designed for cathodic protection when embedded in concrete and tied to steel reinforcing. The core of the anode shall consist of a minimum of 100 grams (3.5 oz) of electrolytic high grade zinc in compliance with ASTM B 418 Type II cast around a pair of steel tie wires and encased in a highly alkaline cementitious shell with a pH of 14, or encased in a Material that uses activation methods to assure performance. The anodes shall have one side that is less than 1-1/2" in height.

#### **533-B.2.2**

The Contractor shall use repair mortars and concretes in accordance with Standard Specifications Section 533, "Concrete Structure Repair" and shall be Portland cement based Material with suitable electrical conductivity less than 15,000 ohm-cm. Repair mortars shall be tested and approved Acceptable, by the manufacturer of the galvanic anodes or independent testing agency, for use as a low resistive conductive Material meeting the requirements of <15,000 ohm-cm. Non-conductive repair Materials such as epoxy, urethane, or magnesium phosphate shall not be permitted. The repair mortars or concretes shall be submitted to the Project Manager for approval. The repair mortar and concrete Material will be paid for under Standard Specifications Section 533, "Concrete Structure Repairs".

### **533-B.3 CONSTRUCTION REQUIREMENTS**

#### **533-B.3.1 Galvanic Anode Installation**

The Contractor shall install the galvanic anodes per the manufacturer's installation instructions. The manufacturer's installation instructions shall be the governing document. If manufacturer installation instructions do not exist, the following shall apply:

1. The Contractor shall install anodes along the perimeter of the repair or interface at a maximum

- spacing of 24 inches. The spacing may be reduced to match the spacing of the existing rebar;
2. The Contractor shall install anodes and repair Material immediately following preparation and cleaning of steel reinforcement. The Contractor shall pre-wet the concrete surface and the anode units to achieve a saturated surface dry condition before completing the repair. The Contractor shall not soak the anode units for greater than 20 minutes;
  3. The Contractor shall provide sufficient clearance between anodes and substrate to allow repair Material to encase anode;
  4. The Contractor shall secure the galvanic anodes as close as possible to the patch edge using the anode tie wires. The tie wires shall be wrapped around the cleaned reinforcing steel and twisted tight to allow little or no free movement and
  5. Electrical Continuity
    - 5.1 The Contractor shall confirm electrical connection between anode tie wire and reinforcing steel by measuring DC resistance (ohm) or potential (mV) with a multi-meter;
    - 5.2 Electrical connection is Acceptable if the DC resistance measured with multi-meter is less than 1 ohm or the DC potential is less than 1 mV;
    - 5.3 The Contractor shall confirm electrical continuity of the exposed reinforcing steel within the repair area. If necessary, electrical continuity shall be established with steel tie wire;
    - 5.4 Electrical continuity is Acceptable if the DC resistance measured with multi-meter is less than 1 ohm or the DC potential is less than 1 mV and
    - 5.5 The Contractor shall furnish the Department with a multi-meter to independently check the electrical connection. The multi-meter will be retained by the Department.

#### **533-B.4 METHOD OF MEASUREMENT**

The Embedded Galvanic Anodes will be measured by each.

#### **533.B.5 BASIS OF PAYMENT**

<b>Pay Item</b>	<b>Pay Unit</b>
Embedded Galvanic Anodes	Each

##### **533-B.5.1 Work Included in Payment**

The following item will be considered as included in the payment and will not be measured or paid for separately:

1. Multi-meter