Standard Structural Precast Concrete Repair Procedure #3: Major Surface Defect

Description

This structural precast concrete repair plan is for major surface defects defined to have a minimum patch depth of 1.5 inches. This repair plan is in accordance with the following subsections of the 2012 Michigan Department of Transportation Standard Specifications for Construction (MDOT SSC):

- 712.03.F.2 - Hand Chipping Concrete Other Than Deck Concrete;
- 712.03.O - Mixing, Placing, Finishing, and Curing Concrete Patches;
- 712.03.R - Cold Weather Limitations for Placing SFMC or LMC Overlay Mixtures; and
- 712.03.S - Hot Weather Limitations for Placing Overlay Mixtures.

The latex bonding agent and cement used for patching mixtures must be selected from an Approved Manufacturer in the MDOT Materials Source Guide (MSG). The aggregate must be from a MDOT prequalified source or tested for acceptance.

Procedure

Below is the standard repair procedure for major surface defect:

1. Remove unsound or loose concrete with air hammers (15 pound class or smaller) or grinding. Saw-cut areas requiring patching to an edge depth of at least ½ inch. Patch area must have vertical edges (normal to the surface) and re-entrant corners rounded with a minimum 1 inch radius. Ensure there are no voids or delaminated concrete by sounding. Clean exposed areas by sandblasting to provide an anchor profile.

2. Do not damage any prestressing strand or mild steel reinforcement. If mild steel reinforcement is exposed, remove concrete to provide ¾ to 1 inch of clearance around the steel for anchoring.

3. Remove loose material from patch area by blasting with minimum 90 psi oil-free compressed air. Flush the area with minimum 3000 psi pressurized clean water. Remove excess water from patch area by blasting with oil-free compressed air immediately prior to application of patching material.

4. Drill galvanized or epoxy coated anchors into the repair area spaced 2-3 inches apart and use coated tie wire to create a floating mesh with spaces large enough for latex repair mixture to flow through. Provide at least 3/4 inch concrete clear cover over the anchors and tie wire. Use extreme care not to damage mild reinforcing steel or prestressing strand.

5. Repair damaged epoxy coating in accordance with subsection 706.03.E.8 of the MDOT SSC.

6. Patch the area with a C-L patching mixture in accordance to Table 703-1 (Structures Patching Mixtures) of the 2012 MDOT Standard Specifications for Construction. Maintain a SSD (saturated

surface dry) condition prior to placing patching mixture. Vibrate forms or use a tamping rod to consolidate the concrete patch.

7. Place a layer of wet burlap immediately over the finished concrete patch. Burlap must be soaked in water for at least 12 hours prior to placing patching mixture. Place a 4-mil thick layer of polyethylene film immediately over the burlap to protect the top surfaces from evaporation.

8. Wet cure patches using burlap and polyethylene for 48 hours and allow concrete to air cure for an additional 48 hours.

9. Air and concrete substrate temperatures must be at least 40° F and rising, but below 85°F. The forecast air temperature during the curing period must be 35°F or higher. Use insulating blankets if the curing period forecasted (or actual) air temperature is below 45°F.