SECTION 03934

STRUCTURAL POTHOLE PATCHING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Repair potholes and delaminated areas on bridge decks and approach slabs.

1.2 RELATED SECTIONS

A. Section 01571: Temporary Environmental Controls

B. Section 03055: Portland Cement Concrete

C. Section 03390: Concrete Curing

1.3 REFERENCES

A. AASHTO M 235: Epoxy Resin Adhesives

1.4 SUBMITTALS

A. Submit a plan for handling water approved by the Engineer before the water blasting operation begins.

PART 2 PRODUCTS

2.1 MATERIALS

A. Portland Cement Concrete: Class AA(AE), 3/4 inch maximum aggregate. Refer to Section 03055.

B. Cement: Refer to Section 03055.

C. Epoxy Resin Adhesive:
   1. Type II.
   2. Choose class rating consistent with the application temperature.
   3. AASHTO M 235.

D. Water: Use water containing no hazardous or toxic materials.

2.2 EQUIPMENT

A. Jackhammer: 30 pound class.

B. Water Blast Equipment:
   1. Provide a complete concrete removal system capable of removing concrete to the specified depth.
   2. Equipped with a full rotation water jet. Use a water jet having an angle of impingement of 60 degrees or less as measured from the deck surface.

2.3 TESTING AND CALIBRATING HYDRODEMOLITION EQUIPMENT

A. The Engineer designates a trial area to demonstrate that the equipment, personnel, and method of operations are capable of producing results satisfactory to the Engineer.

B. Do not change parameters once the operation parameters of the hydrodemolisher are defined and satisfactorily demonstrated.

C. Maintain an inventory of common wear parts and replacement accessories for the equipment on the job site.

PART 3 EXECUTION

3.1 PREPARATION

A. Locate all unsound concrete in the deck and approach slabs and mark a rectangular area surrounding each pothole in the presence of the Engineer.
   1. Refer to pothole patching plan.
   2. Remove any asphalt surfacing prior to sounding survey.

3.2 CONCRETE REMOVAL

A. Use either the jackhammer or hydrodemolition method described below.

B. Jackhammer Method:
   1. Saw Cuts: Make saw cuts 1 inch deep at the rectangular limits of the repair areas.
   2. Remove concrete using 30 pound class jackhammer.
   3. Operate jackhammer at an angle greater than 45 degrees as measured from the deck surface. Protect any reinforcing steel encountered.
   4. Pneumatic hammers heavier than 15 pound class will not be permitted for removals in areas directly below the top reinforcing steel.

C. Hydrodemolition Method:
   1. Remove delaminated concrete to the required depth using hydrodemolition methods. Required depth depends on the delamination depth.
   2. Provide the water necessary for the hydrodemolition operation. Use water containing no hazardous or toxic materials.
   3. Collect water and debris from the removal operations retention basins or sediment traps. Refer to Section 01571 and EN series Standard Drawings.
      a. Use pond liners to limit the amount of water leached into the soil from retention basins at the ends of the bridge. Contain waste water, along with concrete debris from the removal operation, in holding ponds for 12 hours before discharging of the water.
      b. The ponds must be equipped with a turn-down elbow to eliminate oil or floatables from being discharged. Dispose of remaining material in the holding ponds in the proper manner.
      c. Clean all water that is returned to the stream bed of sediments and debris. Use temporary slope drains to return water to the stream. Do not allow water to run across traveled lane.
   4. Light Jackhammer Removal Method:
      a. Use a jackhammer to remove concrete that cannot be removed with the water blast equipment.
      b. Operate jackhammer at an angle greater than 45 degrees as measured from the deck surface. Protect any reinforcing steel encountered.
      c. Pneumatic hammers heavier than 15 pound class will not be permitted for removals in areas directly below the top reinforcing steel.

D. Blow Through:

1. If removal blows completely through the bridge deck, immediately stop the equipment and make the necessary adjustments to limit the area of complete concrete removal. Use sandbags to limit the flow of water through the hole, if necessary.
2. Lower a rope through the hole and lift a 3/4 inch thick piece of plywood large enough to cover the hole with a 2 inch overlap on all sides.
3. Secure the plywood tightly against the bottom of the slab using 1/4 inch to 1/2 inch threaded tie rods fastened to 2 x 4 studs at the top of the deck. Remove the forms as soon as the concrete is set and patch the hole.
4. Use treated plywood to facilitate stripping.

3.3 BONDING CONCRETE

A. Apply an epoxy resin adhesive to the repair area to assist in bonding the fresh concrete to the hardened concrete.

1. Apply the material according to the manufacturer's specifications.
2. Keep the repair area clean until new concrete has been placed.

3.4 PATCHING CONCRETE

A. Sandblast clean all exposed concrete surfaces and reinforcing steel prior to placing new concrete. Place concrete within four hours after sandblasting has been completed.

B. Provide new rebar splices to existing rebars, equivalent size, wherever a section loss greater than 50 percent occurs.

C. Place concrete and strike off level with deck surface. Cure a minimum of four days using the water method. Refer to Section 03390.

D. Patch failure: if the patch fails to bond to the existing concrete, remove the patch completely and repair the pothole again.

3.5 PROTECTION

A. Prevent debris from falling into streams, pedestrian areas, traffic areas, or railroad tracks.

END OF SECTION