Item 483
Concrete Bridge Deck Surfacing

1. DESCRIPTION

Surface concrete bridge deck as specified to provide prepared substrate for concrete overlay or to remediate a finished surface.

2. EQUIPMENT

Use equipment within the maximum allowed legal load or provide analysis showing equipment will not overstress the bridge. Use machines equipped with dust controls measures and shielding to prevent flying debris from leaving the work area.

2.1. **Milling**. Use concrete milling equipment capable of maintaining constant depth of cut as specified. Equip machine with automated debris collection system.

2.2. **Hydro-Demolition**. Use equipment consisting of ultra-high pressure water jets (> 10,000 psi) capable of removing concrete to depth specified. Provide machine that can to be calibrated to remove an incremental depth of uniform strength concrete.

2.3. **Shot Blasting**. Use self-propelled shot blasting equipment utilizing steel abrasive being propelled at the concrete surface and equipped with a self-contained vacuum system to collect all removed debris.

2.4. **Diamond Grinding**. Use self-propelled diamond grinding equipment capable of removing concrete surface and producing corduroy type texture. Provide machine equipped with dual longitudinal controls capable of operating on both sides automatically from any longitudinal grade reference and have cutting wheel containing 50 to 60 diamond blades per foot. Minimize dust escaping into environment by equipping machine with self-contained vacuum system to collect all debris removed.

2.5. **Saw Grooving**. Use sawing equipment capable of cutting grooves in completed bridge slabs and top slabs of direct traffic culverts. Provide grooves that are 1/8 to 3/16 in. deep, nominally 1/8 in. wide, and spaced at 1 in. Use sawing equipment capable of cutting grooves in hardened concrete to within 18 in. of the barrier rail or curb.

3. CONSTRUCTION

Protect bridge joints, drains, and other appurtenances from surfacing operations. Following surfacing, clean the surface to remove all cuttings and debris. Dispose of all cuttings and debris properly.

Use chipping tools and other smaller approved concrete surfacing equipment in small areas not accessible to the large surfacing equipment.

Approval to begin work is not an endorsement of proposed equipment. If equipment fails to meet specification requirements, replacing equipment may be required. No additional time or compensation to adjust or replace equipment will be granted.

Perform concrete bridge deck surfacing as specified in accordance with the following listed methods:

3.1. **Milling**. Mill the existing deck to remove concrete to the depth specified. Provide a uniformly rough surface with a chipped appearance suitable for bonding a concrete overlay. Scarify at locations shown on the plans

or as directed to the depths shown on the plans. Measure the depth from the level of the existing surface to the high points on the scarified surface.

Ensure damage does not occur to the bridge slab reinforcing steel, armored joints, slab joints, drainage hardware, and other appurtenances. Stop milling operations if reinforcing steel is encountered. Proceed with further milling only when approved to do so.

Establish and maintain independent grade control for concrete scarifying operations when appropriate or required.

Use chipping tools to remove concrete in small areas not accessible to the mechanical scarifier.

3.2. **Hydro-Demolition**. Submit for approval water disposal plan associated with the work. Follow all water disposal requirements per federal, state, and local law. Temporarily plug all bridge drains near the area of work to prevent runoff as a result of the work from being released. Protect surrounding property and traffic from water spray and material dislodged.

Demonstrate hydro-demolition on test areas as designated to calibrate machine to obtain concrete removal depth and finish as specified and as approved. At a minimum, calibrate machine to remove all unsound concrete and sound concrete to the specified depth.

Remove additional concrete to obtain a minimum of 3/4 in. around the bars by hydro-demolition or other approved method if reinforcing steel is exposed.

Stop and recalibrate machine when depth of removal or surface roughness is different than approved.

3.3. **Shot Blasting**. Demonstrate shot blasting on test areas as designated to calibrate machine to obtain depth of surface removal required and to obtain finish as specified and as approved.

Do not alter grade or cross slope unless shown otherwise.

Maintain and adjust machine calibration to produce surfacing required.

3.4. **Diamond Grinding**. Demonstrate diamond grinding on designated area and obtain approval of finish produced.

Perform grinding in longitudinal direction. Grind surfaces on both sides of transverse joints to be flush (same elevation). Eliminate minor depressions by extra grinding as directed.

Produce a uniform surface with a longitudinal corduroy type texture that eliminates joint and crack faults. Maintain transverse cross slope to provide drainage across surface.

Repeat grinding until surface grade and cross slope satisfies ride requirements. Minimum ride requirements are 1/4 in. in 10 ft. unless shown otherwise.

Saw-cut transversely the ground areas to provide grooved surface in accordance with Section 483.3.5., “Sawing Grooving,” unless otherwise directed.

3.5. **Sawing Grooving**. Cut grooves into concrete surface perpendicular to the structure centerline. Cut grooves across the slab to within 18 in. of the barrier rail, curb, or median divider. At skewed metal expansion joints in bridge slabs, adjust groove cutting by using narrow-width cutting heads so all grooves end within 6 in. of the joint, measured perpendicular to the centerline of the metal joint. Leave no ungrooved surface wider than 6 in. adjacent to either side of the joint. Ensure the minimum distance to the first groove, measured perpendicular to the edge of the concrete joint or from the junction between the concrete and the metal leg of the joint, is 1 in. Cut grooves continuously across construction joints or other joints in the concrete less than 1/2 in. wide. Apply the same procedure described above where barrier rails, curbs, or median dividers are

not parallel to the structure centerline to maintain the 18-in. maximum dimension from the end of the grooves to the gutter line. Cut grooves continuously across formed concrete joints.

4. MEASUREMENT

This Item will be measured by the square yard of concrete bridge deck surfaced.

5. PAYMENT

The work performed and equipment furnished in accordance with the Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Milling Concrete Slab" to the depth required, "Hydro-Demolition" to the depth required, "Shot Blasting," "Diamond Grinding Slab," and "Saw Grooving." This price is full compensation for removing all material to the depths shown; preparing the surface; texturing the surface; saw grooving the surface; loading, hauling, unloading, and disposing of the cuttings; and equipment, labor, tools, and incidentals.