



**SPECIAL PROVISIONS
FOR
SURFACE TEXTURING OF EXISTING BRIDGE DECK USING HYDRODEMOLITION**

**Cass County
BRF-092-2(44)--38-15**

**Effective Date
September 20, 2022**

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

150885.01 DESCRIPTION.

- A. Create a textured surface of acceptable roughness on sound, hardened bridge deck concrete using hydrodemolition. The purpose of the textured surface is to develop a rough, bondable surface to receive a bridge deck overlay.
- B. The riding profile and cross slope of the textured surface shall be as specified in the contract documents. Final surface roughness shall be between 1/8 inch and 1/2 inch amplitude, in general accordance with International Concrete Repair Institute (ICRI) Concrete Surface Profile (CSP) 7 – 10. Average removal depth, measured from the original hardened concrete surface to mid-depth of the texture amplitude, shall be 1/4 inch as a target value.

150885.02 QUALIFICATIONS.

Operation of the hydrodemolition equipment shall be performed and supervised by an operator trained and certified by the equipment manufacturer and having a minimum of 2 years of experience with the equipment being used.

150885.03 CONSTRUCTION.

A. General.

- 1. Coordinate with the hydrodemolition subcontractor to implement measures, if required, to provide interim texture to the bridge deck base course for purposes of facilitating hydrodemolition removals. Methods for providing interim texture to the bridge deck base course may include establishing texture to the hardened base course concrete by milling, subject to the Engineer's approval. If interim texture is established, texture shall be uniform across the entire deck surface and maximum texture depth shall be limited to 1/4 inch.

2. Ensure all water run-off and debris associated with milling, hydrodemolition, and cleaning is contained within the work area and collected for proper disposal.
3. Clean potable water shall be provided for hydrodemolition removals, and the excess water shall be reclaimed using vacuum methods of collection, then filtered and reused as much as practical.
4. Disposal of excess water, contained run-off, and debris shall meet all applicable federal, state, and local regulations.

B. Equipment.

1. At least 10 working days before start of work, submit to the Engineer a Method Statement, including a list of all equipment to be used in the hydrodemolition process, and certification from the manufacturer that the hydrodemolition equipment is suitable for use on bridge decks and can complete the work as described. Hydrodemolition shall not begin until the Engineer has provided approval of the Method Statement.
2. Hydrodemolition equipment shall consist of a water supply system, a high-pressure water pumping system, a self-propelled demolition unit capable of autonomous advancement in accordance with calibration parameters, and a vacuum system capable of quickly removing all debris generated by the demolition unit and water supply system.
3. The demolition unit shall utilize a high-pressure water jet stream capable of removing and texturing the sound concrete to the specified depth and amplitude. Operating pressures of the high-pressure water jet(s) shall be in the range of 13,000 to 20,000 PSI. The high-pressure water jet(s) shall be capable of autonomously rotating, cycling or oscillating in a controlled and calibrated manner to achieve uniform removal depth and texture when operated on concrete of consistent strength and composition.

C. Calibration.

1. Prior to the commencement of the hydrodemolition surface texturing operation, the equipment shall be calibrated on one or two section(s) of the bridge deck base course as designated by the Engineer to demonstrate the equipment, personnel, and methods of operation can produce results in accordance with the contract requirements.
2. The total area of the trial section(s) will be up to approximately 200 square feet. Document the following initial settings:
 - Water Pressure Gauge (13,000 PSI minimum).
 - Water usage (Anticipated 55 gallons per minute, minimum).
 - Machine Staging Control (Step).
 - Nozzle Size.
 - Nozzle Speed (Travel).
 - Approximate removal depth and surface roughness profile achieved at the current calibration settings.
3. Calibration of the hydrodemolition equipment shall be conducted for every day of operation.

D. Wastewater Disposal

1. Contain and collect all wastewater generated by the hydrodemolition and cleaning processes. Wastewater shall be disposed of in a manner which satisfies all applicable federal, state, and local regulations. Maintain documentary evidence of legal disposal.

2. Prevent wastewater generated by hydrodemolition and cleaning from entering surface waters, storm sewers, floodplains, wetlands, and railroad right-of-way. If wastewater runoff or contamination is identified or suspected, suspend hydrodemolition equipment immediately and notify the Engineer.
3. At least 30 days prior to the beginning of the work, submit to the Engineer details for a collection and disposal plan.
 - a. Define how the wastewater will be contained, stored, and disposed of.
 - b. Define the process for preventing wastewater from leaving the deck surface, inclusive of preventing wastewater loss via roadway gutters, deck drains and deck joints.

E. Traffic and Safety Considerations.

1. Traffic operation shall be maintained in accordance with contract requirements.
2. Provide shielding, as necessary, to ensure containment of all dislodged concrete and water spray within the removal area to protect against flying debris during hydrodemolition and cleaning.
3. If nighttime work is approved by the Engineer, provide adequate lighting as required for nighttime removal. Care should be taken to avoid any hazardous glare that may affect operating traffic.

F. Hydrodemolition.

1. After calibration of the equipment, establish the specified surface texture by means of hydrodemolition to the full accessible top surface area of the bridge deck base course.
2. The final textured surface shall be roughened to a profile which is compatible with the intended bridge deck overlay material, considering roughness peak-to-valley amplitude, frequency, and shape. Avoid over-roughening to the extent which would impede complete consolidation and full-contact bond of the overlay material.
3. Verify the hydrodemolition equipment settings as necessary to maintain consistent material removal depth and surface texture.
4. Provide the initial equipment calibration settings and daily calibration settings to the Engineer. Notify the Engineer if and when revisions to the calibration settings are needed over the course of the work day to maintain consistent material removal depth and texture.
5. Hand operated hydrodemolition equipment, or hand powered or mechanically driven chipping tools (15 pounds maximum), operated in accordance with Article 2413.03 of the Standard Specifications, shall be used to create surface texture in areas that are inaccessible to the self-propelled hydrodemolition equipment, such as adjacent to the gutterline. These manual texturing operations shall be considered incidental to the hydrodemolition bid item.
6. If removals after equipment calibration exceed the calibrated removal depth by 1" or more, promptly stop the equipment and notify the Engineer.
7. Any damage or excess removal resulting from hydrodemolition, to any portion of the structure outside the designated removal limits, shall be restored as directed by the Engineer at no additional cost to the Contracting Authority. Nominal instances of overdepth removal not extending more than ½ inch beyond the target removal surface may be addressed with localized thickening of the overlay at no additional cost to the Contracting Authority.

G. Vacuuming and Cleanup.

1. Vacuum all debris, slurry, and wastewater resulting from the hydrodemolition process.
2. Vacuuming shall be performed concurrent with or immediately following hydrodemolition work. Vacuuming and cleanup shall be completed before debris and slurry are allowed to dry on the bridge deck.
3. Vacuuming equipment shall be equipped with dust control devices and shall be capable of removing wet debris and water in the same pass.
4. A separate high-pressure water washing process may be required in conjunction with the vacuuming process to dislodge debris and slurry from the bridge deck surface if vacuuming alone is insufficient to remove all debris and slurry.
5. Vacuuming and cleanup operations will not be accepted as complete until all debris, slurry and wastewater are removed to the Engineer's satisfaction. Repeat passes of water washing equipment or vacuuming equipment, as may be required for complete cleaning, shall be completed at no additional cost to the Contracting Authority.

150885.04 METHOD OF MEASUREMENT.

Measurement of Surface Texturing of Existing Bridge Deck Using Hydrodemolition will be the quantity shown in the contract documents in square yards.

150885.05 BASIS OF PAYMENT.

Payment will be for the contract unit price of Surface Texturing of Existing Bridge Deck Using Hydrodemolition. Payment is full compensation for furnishing all work, materials, water, and equipment required to prepare the bridge deck for overlay including milling, calibration of hydrodemolition equipment, removal by hydrodemolition, removal and disposal of debris and wastewater, vacuuming, washing and cleanup, shielding, water quality control, and roughening by means of hand-operated tools or equipment in areas adjacent to the gutterline and other areas inaccessible to the milling or hydrodemolition equipment.