ITEM 579.03000002 - STRUCTURAL SLAB RECONSTRUCTION PREPARATION, HYDRODEMOLITION – REINFORCEMENT EXPOSURE NOT REQUIRED

DESCRIPTION
This work shall consist of utilizing hydrodemolition to remove ¼ inch minimum depth of sound concrete and all unsound material to prepare an existing structural slab and approach slab for a specialized concrete overlay. A highly rough and bondable surface shall be provided by the hydrodemolition equipment. Exposure of reinforcement is not required but may occur depending on the condition of the existing concrete.

MATERIALS
All the provisions of §579-2.01 shall apply.

Rapid Hardening Concrete Repair Materials shall meet the requirements of §701-09.

Hydrodemolition equipment. All requirements of §579-3.04 shall apply. Hydrodemolition equipment shall be computerized, self-propelled, and utilize a high pressure water jet stream to provide a rough and bondable surface while removing unsound concrete, rust, and concrete particles with one pass.

Vacuum cleaning equipment. Vacuum cleaning equipment shall be equipped with fugitive dust control devices, capable of removing wet debris and water all in the same pass, to remove hydrodemolition debris.

CONSTRUCTION
General. Existing concrete overlays and bituminous overlays shall be removed using mechanical scarification prior to hydrodemolition surface preparation. Scarification shall be performed following the requirements §579-3.01. On structural slabs where no existing overlay is present, an initial depth of concrete may be removed using mechanical scarification. No damage shall occur to the existing reinforcing steel or the existing concrete deck that is to remain.

Calibration of Hydrodemolition Equipment. All construction debris, milling debris, and dust must be removed from the bridge deck prior to calibration and commencement of the hydrodemolition surface preparation operation.

On a 7 feet x 7 feet area of sound concrete as designated by the Engineer, calibrate the hydrodemolition equipment to remove 95% of the concrete surface in one pass, removing ¼ inch minimum depth of sound concrete and all unsound concrete. Move the hydrodemolition equipment to a second 7 feet x 7 feet area that is deemed unsound, as designated by the Engineer, to demonstrate the ability of the equipment to remove all unsound concrete and provide a highly rough and bondable surface. A rough surface shall be measured using a 10 (ten) foot straight edge, providing a minimum of five locations with a 1(one) inch deviation from the top of the exposed aggregates to the mortar line (valley) of the hydrodemolition surface.

If the equipment does not provide satisfactory results, repeat the above calibrations. If satisfactory results cannot be obtained within three attempts, the hydrodemolition equipment shall be removed from the project site and another hydrodemolition unit will be provided for calibration.
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A Representative of the hydrodemolition equipment company shall be present to provide guidance to the Contractor with the calibration. After successful calibration, the hydrodemolition equipment Representative shall provide the Engineer with a listing of the equipment settings including:

1. Water pressure gauge
2. Machine staging control (step)
3. Nozzle size
4. Nozzle speed (travel)
5. Water flow rate

The calibration procedure specified is required for each separate span of a structure or once per week, whichever is greater.

The hydrodemolition surface preparation operation shall begin after the Engineer has approved the calibration.

**Hydrodemolition.** Perform hydrodemolition over the entire top surface of the structural slab to provide a rough and bondable surface. Remove a minimum ¼ inch of concrete or to the depth specified in the plans, and any unsound concrete, using one hydrodemolition pass. Stop the surface preparation operation if it is determined that sound concrete is being removed or unsatisfactory results are being obtained. Perform recalibration or changes to equipment and method as necessary to maintain acceptable removal results.

After the hydrodemolition surface preparation operation has completed the initial pass, and the deck is dry and frost free, resound the deck to ensure all unsound material has been removed. Remove unsound materials detected by the Engineer at no additional cost to the Department. Any unsound concrete or original slab surface remaining after the hydrodemolition pass shall be removed using additional hydrodemolition passes or use of pneumatic equipment meeting the requirements of §580-3.02. Pneumatic hammers operated at no more than a 45 degree angle from horizontal, shall be used in areas that are inaccessible to the hydrodemolition equipment. Unsound concrete is defined as existing structural slab concrete that is deteriorated, unbounded, or spalled.

Clean the hydrodemolition and milling debris with a vacuum system equipped with fugitive dust control devices and capable of removing wet debris and water all in the same pass. Remove all standing water with oil-free compressed air. Perform cleaning in a timely fashion before the debris and water is allowed to dry on the deck surface. Remove any material allowed to dry at no additional cost to the Department. Splice or replace any reinforcing steel damaged or dislodged by these operations with the same size bar, at no additional cost to the Department.

Reinforcement exposed by the hydrodemolition process will not require any additional concrete removal to provide a minimum 1 (one) inch clearance around the reinforcing bars providing that the existing concrete is sound. All loose concrete shall be removed around reinforcing bars. Any exposed reinforcement shall be water blast cleaned with a 7000 psi water jet within 48 hours prior to placement of new concrete.
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Where hydrodemolition results in removal of concrete to the full depth of the structural slab, prepare the patches following the requirements of §579-3.03 except curing shall be a minimum of 24 hours prior to any other concrete placement work. For fast track project applications, the use of a rapid hardening repair material (701-09) may be considered when the area of any one full depth patch is 5 square feet or less.

When used, preparation, placement, and curing of the repair material shall follow manufacturer’s recommendations.

METHOD OF MEASUREMENT

Structural Slab Scarification. When the removal of existing concrete and bituminous overlays is necessary prior to performing hydrodemolition surface preparation, the requirements of §579-4.01 shall apply.

Structural Slab Hydrodemolition. The work will be measured as the number of square feet of concrete removed as stated in the estimate of quantities shown on the plans regardless of the number of passes or required additional removal by methods other than hydrodemolition.

BASIS OF PAYMENT

The unit price bid for this work shall include removal and disposal of all concrete and debris, vacuuming, shielding, water control, additional jack hammering and concrete removal necessary to prepare the structural slab and approach slabs for the placement of a specialized concrete overlay. All labor, materials, and equipment for full depth patching in localized areas shall also be covered by the unit price bid for this work. Scarification of concrete and bituminous overlays shall be paid for separately under Item 579.01.

Payment will be made under:

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<td>Structural Slab Reconstruction Preparation, Hydrodemolition - Reinforcement Exposure Not Required</td>
<td>Square foot</td>
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