

ITEM 502.7596 18 - RUBBLIZING EXISTING PORTLAND CEMENT CONCRETE PAVEMENT

DESCRIPTION: The Contractor shall rubblize and compact an existing portland cement concrete (PCC) pavement, including PCC shoulders, within the limits shown on the plans (or within revised limits established by the Engineer in writing) before placing an overlay.

MATERIALS:

Coarse Aggregate, Type CA1 or CA2 (Table 501-2) §703-02

EQUIPMENT REQUIREMENTS:

Rubblizing Equipment: A resonant frequency pavement breaking unit capable of producing a minimum impact energy of 2.7 kJ at a rate of 44 impacts per second. The unit must provide adjustable impact energy, traveling speed, and breaking shoe size.

Alternate equipment may be submitted to the Director, Materials Bureau, for approval consideration. Such a submission is not cause for a time extension as provided in §108-04.

Compaction equipment: Must meet the requirements of §203-3.12B, except that vibratory compaction of subgrade and subbase courses will not be allowed in repair areas.

CONSTRUCTION DETAILS: All Construction Details shall be performed by the Contractor unless stated otherwise.

Preparation: Before rubblizing, perform the following as indicated on the contract plans or as ordered by the Engineer:

- Install functional underdrains a minimum of 2 weeks before rubblizing begins.
- Remove existing hot-mix asphalt (HMA) overlays or overlay patches having areas greater than 10 m². Those less than 10 m² may remain in place during rubblizing.
- Sawcut the longitudinal joint to sever ties if the area to be rubblized abuts concrete pavement which is to remain intact.
- Construct stable, generally level, shoulders or widenings to the existing pavement elevation. These areas are needed to provide operating room and support for the rubblizing equipment. They may be used to maintain traffic if the top 125 mm are “25 mm F9 Binder Course HMA, 80 Series Compaction” or “37.5 mm F9 Base Course HMA, 80 Series Compaction”.

Test Sections: Select initial impact energy, shoe size, and traveling speed. The Engineer will then designate a 300 m test section within the rubblizing payment limits. Rubblize 75 m of the test section using the initial settings. Operate the rubblizing equipment longitudinally (parallel to the centerline), beginning at one longitudinal free edge and progressing with continuous coverage toward the opposite free edge. A longitudinal free edge is the lane/shoulder interface for pavements with flexible shoulders and the outer shoulder edge for pavements with PCC shoulders.

If the Engineer determines that an acceptable rubblizing pattern has resulted from using the initial settings, begin production rubblizing using those settings. If an acceptable rubblizing pattern is not obtained, vary the settings and resume until an acceptable pattern is obtained as determined by the Engineer. An acceptable rubblizing pattern consists of the following:

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- Surface pieces having a maximum top size of 150 mm in the largest dimension. The only exception to this top size is immediately adjacent to free edges (lane\shoulder interface or shoulder edge, transverse joints, or slab crack) where the maximum allowable top size is 300 mm,
- Full-depth rubblized pavement with a maximum top size of 450 mm at the bottom of the rubblized layer, and
- The rubblized pavement does not permanently deform under repeated passes of the equipment.

The Engineer will designate a 10 m² area as a test pit from a rubblized area of the test section having an acceptable surface gradation. Excavate the designated rubblized pavement. The Engineer will determine if rubblizing is full-depth and if top size requirements at the bottom of the rubblized pavement are met. If rubblizing is not full-depth, or the top size is exceeded, vary the settings and resume until acceptable rubblizing is obtained as verified by additional test pits selected by the Engineer. Replace PCC pavement excavated from the test pits as indicated on the contract plans or as ordered by the Engineer. The Engineer may, at any time, establish additional test sections and/or test pits if the surface gradation indicates unacceptable results are being obtained.

Production Rubblizing: Begin production rubblizing after the test section has been successfully rubblized. Operate the rubblizing equipment longitudinally, beginning at a longitudinal free edge, or where directed by the Engineer, and progressing with continuous coverage toward the opposite free edge. Rubblize across the entire pavement width or in increments, such as one lane at a time, as indicated in the contract documents or as established by the Engineer.

If rubblizing is done incrementally across the pavement width for traffic maintenance, the first rubblized increment must be at least 300 mm wider than the first overlay course. If compatible with the maintenance and protection of traffic plan as determined by the Engineer, extend the rubblizing 1 m beyond the width of the first overlay course. If the 1 m extension is established, do not operate the rubblizing equipment on the first overlay course during later rubblizing stages.

Achieve continuous coverage with successive passes of the rubblizing equipment. Overlapping passes are permitted. Rubblized areas within 1 m of free edges having surface pieces larger than specified may be re-rubblized or jackhammered until top size requirements are met. Areas requiring full-depth removal and replacement are as ordered by the Engineer.

Uneven or Poor Subbase Support: The Engineer will identify areas of uneven or poor subbase and/or subgrade support encountered during rubblizing. These areas are generally characterized by large rubblized pieces away from free edges, permanent rutting or deformation under repeated passes of the equipment, and/or rubblized pieces being driven into the subbase. Where directed by the Engineer, excavate the rubblized pavement, subbase, and/or subgrade. Replace these areas as indicated on the contract plans or as directed by the Engineer. When HMA is used to replace rubblized pavement, use a minimum of two lifts of approximately equal compacted thickness. Compact HMA lifts in accordance with §402-3.07, Compaction. Compact subgrade and subbase courses in accordance with §203-3.12, Compaction, except vibratory compactors will not be allowed to compact these courses in repair areas.

Pavement Hardware: Wire fabric reinforcement, bar reinforcement, load transfer devices, joint ties, joint sealant material, and expansion material shall remain in place with the following exceptions. First, any reinforcement exposed at the surface as a result of rubblizing or compaction must be cut flush with

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the surface and removed from the site. Second, loose sealant material and expansion material must be removed from the site after rubblizing. Loose material can be easily lifted without disturbing the rubblized surface. Cut loose material from embedded material that would disturb the rubblized surface if pulled out.

Compaction: Fill surface depressions 25 - 75 mm deep with CA1 Coarse Aggregate. Fill deeper depressions with CA1 or CA2 Coarse Aggregate. Compact the complete width of rubblized pavement and any longitudinal asphalt\rubblized pavement interface in accordance with §203-3.12, Compaction. A longitudinal asphalt\rubblized pavement interface typically results when a widening is constructed or a shoulder is used to maintain traffic. The Engineer may require additional passes of the compaction equipment if the compacted rubblized pavement is disturbed before paving or coarse aggregate is used to meet tolerance requirements described below.

Tolerance: The compacted surface shall meet a 20 mm in 5 m tolerance before paving. If, in the opinion of the Engineer, the pavement has not been rubblized and compacted to this tolerance based on visual observation, he or she may test the surface with a 5 m straightedge or stringline placed normal or parallel to the pavement centerline on any portion of the pavement. Correct variations exceeding 20 mm using CA1 coarse aggregate. Obtain final cross slope through the use of HMA courses.

Traffic Maintenance: Ensure rubblizing and first overlay course placement are completed within the traffic maintenance plan timeframe. Do not maintain traffic on a rubblized pavement before placing the first overlay course. If it rains between rubblizing and paving, delay paving until a surface dry condition exists as determined by the Engineer. The first HMA overlay course shall have a compacted thickness of 75 -100 mm for traffic maintenance. Maintain crossovers, ramp crossings, and access points as detailed in the contract documents or as ordered by the Engineer.

METHOD OF MEASUREMENT:

The Engineer will compute the number of square meters of rubblized pavement from the payment lines shown on the plans or from revised limits established in writing before performing the work. No deduction will be made for minor areas not rubblized at catch basins, manholes, water valves, etc. Measurement for payment shall include areas where rubblized pavement was removed and replaced in accordance with the "Construction Details" provisions of this specification.

BASIS OF PAYMENT:

In the unit price bid per square meter, include the cost of furnishing all labor, materials, and equipment necessary to rubblize, compact, dig all test pits, jackhammer, fill depressions, remove reinforcing steel and debris, and maintain the compacted condition of the rubblized pavement before placing overlays.

Pay for the following under their respective items: Maintenance and protection of traffic, milling HMA, underdrains, sawcutting longitudinal joint ties, constructing widenings, reconstructing shoulders, excavating areas of poor support, correcting the subbase and\or subgrade, replacing excavated pavement, and overlay courses.

Payment will be made under:

<u>ITEM NO.</u>	<u>ITEM</u>	<u>PAY UNIT</u>
502.7596 18	Rubblizing Existing Portland Cement Concrete Pavement	Square Meter