# Hot-Mix Asphalt Overlay on Rubblized Concrete JSP-02-02

**1.0 Description**.

**1.1** This work shall consist of installing geocomposite pavement edge drains, rubblizing and compacting the existing reinforced or non-reinforced Portland cement concrete (PCC) pavement to create a base, and placing a hot-mix asphalt (HMA) overlay as shown on the plans or directed by the engineer.

**1.2** Dynamic cone penetrometer test results on the subgrade material beneath the pavement, as well as original soil data obtained under previous projects, will be available from the project contact person upon the bidder’s request. This information will be considered as non-contractual subsurface information, and the provisions under Sec 102.5.1 shall apply.

**2.0 Material**. Filler aggregate shall be Type 1 or 5 aggregate and compacted in all applications in accordance with Sec 304.3.4.2. All material shall be in accordance with Division 1000, Material Details, and specifically as follows:

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| --- | --- |
| **Item** | **Section** |
| Type 1 or 5 Aggregate Base  | 1007 |
| Geocomposite Pavement Edge Drain | 1012 |

**3.0 Equipment.**

**3.1** Rubblizing shall be accomplished with a multi-head breaker, a resonant breaker or other suitable equipment that breaks the PCC pavement into the required particle sizes without excessively displacing the rubblized material into the base or subgrade. The rubblization equipment shall be a self-contained, self-propelled unit. The unit shall provide a positive means of protecting vehicles in the adjacent lane from flying debris during rubblization operations. Other methods and equipment may be used when approved by the engineer.

**3.2** Vibratory rollers shall weigh (have a mass of) no less than 10 tons (9 Mg). A Z-pattern steel grid roller shall be capable of providing additional particle breakdown by reducing flat and elongated material into more uniform pieces of material.

**4.0 Construction Requirements**.

**4.1 Preparation for Rubblization.**

**4.1.1** Partial depth asphalt patches shall be removed and replaced with filler aggregate.

**4.1.2** Full-depth relief joints shall be cut and load transfer devices shall be severed at all termini where the rubblized pavement abuts concrete pavement that is to remain intact.

**4.1.3** When shown on the plans, geocomposite pavement edge drains shall be installed in accordance with Sec 605 and shall be functional, at minimum, two weeks prior to rubblizing the existing PCC pavement.

**4.2** **Rubblization Requirements.** Uniform breaking of the existing PCC pavement shall be maintained as much as possible throughout the project limits. The existing PCC pavement shall be broken into pieces meeting the following requirements:

|  |  |  |
| --- | --- | --- |
| **Location Within Pavement** | **Sieve Size** | **Percent Passing** |
| Full Depth | 18 inches (450 mm) | 100 |
| Full Depth | 12 inches (225 mm) | 95 |
| At the Surface | 3 inches (75 mm) | 95 |
| Above Reinforcing Steel or Upper One-Half of Pavement | 6 inches (150 mm) | 75 |
| Below Reinforcing Steel or Lower One-Half of Pavement | 9 inches (225 mm) | 75 |

**4.2.1** Conditions, such as subgrade stability, may warrant rubblized particle sizes to vary from the above requirements. Such variance in particle sizes will be allowed as approved by the engineer.

**4.2.2** Reinforcement steel shall be debonded from the rubblized PCC pavement.

**4.2.3** When the roadway must be overlaid one lane at a time, the first lane shall be rubblized at minimum 12 inches (300 mm) beyond the centerline or 12 inches (300 mm) beyond the extent of the first HMA lift, whichever is greater.

**4.2.4** Rubblizing equipment shall not be used within 2 feet (600 mm) of an existing joint to a bridge approach slab. Equipment suitable for small areas in these restricted areas shall be used adjacent to the approach slabs to prevent damage to the sleeper pads at these locations.

**4.2.5** The contractor shall not damage any underground utilities, drainage structures, adjacent pavement not planned to be rubblized, the aggregate base layer or any other structures. Repair or replacement shall be as approved by the engineer and shall be at the contractor’ expense.

**4.2.6** Large unstable areas or areas that cannot be adequately rubblized to the specified particle size shall be removed and replaced with filler aggregate as directed by the engineer. Rubblized pavement less than or equal to 10 square feet (1 m2) dislodged by construction traffic shall be repaired with filler aggregate and compacted prior to the paving operation. Rubblized pavement greater than 10 square feet (1 m2) dislodged by construction traffic shall be repaired with HMA mix approved for the HMA overlay.

**4.2.7** The contractor’s rubblization operation shall comply with federal, state and local environmental laws including those restricting particulate matter dispersion to the ambient air beyond the project limits.

* 1. **Acceptance of Rubblization.**

**4.3.1** At the start of the rubblization operation, a 300 foot (90 m) test section at a location designated by the engineer shall be rubblized. The contractor shall rubblize the test section using varying energy and striking patterns as deemed necessary by the contractor to successfully achieve a rubblized pavement in accordance with Section 4.2. The test section shall also be used to establish the rolling pattern to achieve compaction in accordance with Section 4.4. The engineer will select a 4 x 4 foot (1.3 m x 1.3 m) area in the test strip for excavation and visual evaluation. The top half shall be manually removed and the bottom half below the steel shall be manually or mechanically removed to verify conformance with Section 4.2. The extent of rubblization of the test section shall be used as a guide for rubblizing the remainder of the pavement.

**4.3.2** In addition, one test hole per 0.5 lane-mile (0.8 km) shall be excavated and inspected, except when waived by the engineer. The engineer may require additional test sections any time during the course of the work when rubblization is in question.

**4.3.3** Test holes shall be backfilled and compacted with filler aggregate or other approved material by the engineer.

**4.4 Rolling of Rubblized Pavement.** At minimum, two passes with a vibratory roller, with a pass being defined as down and back on the same path, shall be made over the rubblized pavement. The roller shall be in the vibratory mode and at a speed not to exceed 6 feet/second (1.8 m/s). In addition, when a multi-head breaker is used, a minimum of two passes shall be made first with a Z-pattern steel grid roller. A rolling pattern shall be used that will ensure that the entire area of the rubblized pavement is well seated and is thoroughly and uniformly compacted. The rolling pattern shall not result in rutting, pumping or de-densification of the rubblized material. Rolling shall be done in such a manner as to prevent the outside edges of the pavement from shoving.

**4.4.1** Reinforcement steel projecting above the rubblized surface shall be cut off below the surface and removed prior to compaction. All loose bituminous material, joint filler material, expansion material or other similar items shall be removed prior to compaction.

**4.4.2** Water may used to aid the compaction effort.

**4.4.3** The rolling pattern shall be established when conducting the initial test section.

**4.5 Finished Surface of Rubblized Pavement.** The finished surface, after rolling, shall be a relatively level grade and be to the satisfaction of the engineer. Rubblized pieces projecting 2 inches (50 mm) above the surface shall be removed and replaced with filler aggregate. The contractor shall not trim the rubblized pavement or otherwise attempt to grade the rubblized pavement to improve grade lines. Cross-slope corrections shall be made with the first HMA overlay lift.

**4.6** **Opening to** **Traffic.** On dual lane facilities, rubblized pavement shall not be opened to traffic until the entire HMA overlay as required by the plans is in place, unless stated otherwise. On two lane facilities, rubblized pavement shall not be opened to traffic until at least 4 inches (100 mm) of compacted HMA mix is in place, unless stated otherwise. The engineer may increase the required minimum thickness of compacted HMA in place as deemed necessary to handle traffic. Rubblized crossover or access points may be opened to traffic for 24 hours without any HMA overlay in place. Crossovers and access points shall be maintained in the same compacted state as the other areas until the HMA overlay is in place. Construction traffic shall be limited to delivery of material directly ahead of the paver.

**4.7 Contractor Staking.** After rubblizing and compacting the existing PCC pavement, the contractor shall establish the existing roadway profile and set the final HMA overlay profile in accordance with Sec 627. The engineer may adjust the final profile as needed. The tons (mg) of HMA mix required will be determined by the engineer from the set or adjusted profile. This quantity will be the field established plan quantity.

* 1. **Construction of the Hot-Mix Asphalt Overlay.**

**4.8.1** Placement of the first HMA overlay lift shall follow the rubblizing and rolling operations as closely as practicable, and in no case shall the rubblized pavement remain exposed for more than 48 hours unless approved otherwise by the engineer. In the event of rain, the engineer may waive this time limitation to allow sufficient time for the rubblized pavement to dry to the satisfaction of the engineer. If this 48-hour requirement is not met, rubblizing operations shall be suspended until all rubblized pavement has been covered.

**4.8.2** A final pass with a vibratory smooth drum roller shall be made immediately prior to paving the rubblized pavement. The HMA overlay shall be placed in accordance with Sec 403 and as shown on the plans or as directed by the engineer.

**5.0 Method of Measurement**.

**5.1** Rubblizing the existing PCC pavement will be measured by area in square yards (m2).

**5.2** Measurement for furnishing and placing HMA mixes for the HMA overlay will be made to the nearest 0.1 ton (0.1 mg) in accordance with Sec 403 and will be based on the field established plan quantity, except for authorized changes during construction or where appreciable errors are found in the field established plan quantity. The revision or correction will be computed and added to or deducted from the field established plan quantity.

**6.0 Basis of Payment.**

**6.1** Rubblizing existing PCC pavement will be paid for at the contract unit price per square yard (m2). Payment will be considered full compensation for cutting relief joints at PCC pavement termini, rubblizing the pavement; excavating and backfilling test holes, dust suppression, removing and backfilling partial depth asphalt patches, repair or replacement of underground utilities and drainage structures damaged during rubblization, removing exposed steel, rolling the rubblized surface, furnishing and adding water, correcting out-of-tolerance surface elevations, furnishing and compacting filler aggregate, maintaining the stabilized condition of the rubblized pavement until overlaid, and all labor, equipment and material to complete the described work.

**6.2**  Payment for contractor staking will be in accordance with Sec 617.

**6.3** The HMA mixes will be paid for at the unit price for each of the pay items included in the contract and in accordance with Sec 403.