

**SECTION 00630 – RUBBLIZING CONCRETE PAVEMENT**

*(Follow all instructions and make all edits with “Track Changes” turned on. This Section is not published in the Oregon Standard. If there are no instructions [purple text] above a subsection, paragraph, sentence, or bullet, then include it in the project, unless the item(s) that are included in the subsection, paragraph, sentence, or bullet are not required on the Project and then they should be deleted. In general do not re-number or re-letter subsections when item(s) are deleted. Delete all purple text before preparing the final document. All other modifications to this Section will require ODOT Technical Resource and State Specifications Engineer approval.)*

Section 00630 is not a Standard Specification and is included in this Project by Special Provision.

**Description**

**00630.00 Scope** - This Work consists of rubblizing and seating existing PCC Pavement and PCC patches prior to the placement of ACP.

**00630.01 Lines, Grades, and Typical Sections** - Conform all finished rubblizing and seating to the lines, grades, and Typical Sections established, shown, or directed.

**Materials**

**00630.10 General** - Furnish Materials meeting the following requirements:

Aggregate Base.....	00641
ACP .....	00745
Subgrade Stabilization .....	00331

**Equipment**

**00630.20 Rubblizing Equipment** - Provide rubblizing Equipment with multiple independent hammers, capable of uniformly rubblizing a 12-foot concrete panel from the longitudinal joint to the edge of the concrete slab in one Pass.

*(In the following paragraph, insert the maximum rubble size (typically between 3 and 12 inches) and the minimum rubble size. Obtain information from the Designer.)*

Provide energy and striking patterns that are adjustable to produce rubble with a majority of pieces having a maximum size of \_\_\_\_ inches, a minimum size of \_\_\_\_ inches, and no piece larger than 18 inches. Prevent Equipment from penetrating the existing adjacent PCC surface.

Provide adequate lighting to illuminate rubblizing Equipment and Work areas in front of and behind the rubblizing Equipment according to 00745.24(d).

**00630.24 Compactors** - Provide rollers capable of reversing without backlash, as follows:

**(a) Grid Roller** - Provide grid-type metal twin-drum rollers meeting the following requirements:

- Drums with an outside diameter of at least 5 feet.
- Maximum drum width of 32 inches.
- Capable of a 15 Ton loading. The specific loaded weight is as specified, shown, or directed.

Use self-propelled or tractor pulled rollers capable of operating at 15 miles per hour. Do not use a perforated type unless directed by the Engineer.

**(b) Pneumatic Roller** - Use a pneumatic-tired roller weighing a minimum of 33 Tons and meeting either of the following requirements:

**(1) Pulled Roller** - Provide tractor-pulled rollers that have four rubber-tired wheels equally spaced across the full width of the machine, mounted in-line on a rigid steel frame such that all wheels carry equal loads, regardless of surface irregularities. Ensure roller tires are capable of satisfactory operation at a minimum inflation pressure of 100 psi. Inflate tires to such pressure as to satisfactorily seat the rubblized Material. At the Contractor's option, tires may contain liquid.

Provide rollers that have a weight body suitable for ballasting to a minimum gross load of 33 Tons. Provide a ballast and ballasting procedure so that the gross roller weight can be readily determined and controlled. Tow the roller with a rubber-tired prime mover.

**(2) Self-Propelled Roller** - Provide self-propelled rollers that have two axles mounting no more than seven tires, and that meet the requirements in 00630.24(b)(1) concerning tire inflation pressure, surface contact pressure, and gross weight.

**(c) Smooth Drum Roller** - Provide a self-propelled vibratory roller with a gross static weight of at least 8 Tons.

## **Construction**

*(Use one of the following two options for subsection .40.)*

*[ Option 1. Use this subsection.40 if not using Option 2 below. Fill in the blanks. Obtain information from the Designer. ]*

**00630.40 Test Strips** - Before beginning rubblizing operations, construct one test strip for each direction of travel. The Engineer will designate locations in the outside travel lane for test strips. Construct test strips between 200 and 820 feet in length. Remove any existing AC Pavement covering the PCC on the test strip. Rubblize the concrete Pavement using varying energy and striking patterns as directed, to create test sections within the strips with Materials

varying from a majority of pieces \_\_\_\_ inch in size to a majority of pieces \_\_\_\_ inch in size, with a maximum size of 18 inches for all sections. For each variation in energy and striking pattern, rubblize a section approximately 3 feet long by the full lane width, to full depth of the concrete. Backfill all excavated areas with Aggregate Base according to Section 00641.

The Engineer will conduct falling weight deflectometer (FWD) deflection testing directly on the rubblized Material surface, prior to rolling, after each one-way Pass of the roller and on the first Lift of ACP approximately 24 hours after the first Lift is completed. These test areas are used to determine whether proper breakage is obtained and to assist in determining the most suitable rubblizing procedure. The FWD deflection data is used to determine the minimum particle size that will provide a structurally adequate foundation for the ACP overlay.

The test area is used to verify the appropriate roller pattern to provide satisfactory seating. The number of roller Passes are determined by the Engineer based on the breakover point in the FWD deflections and visual effects of seating the rubblized Materials. Up to seven one-way Passes may be required. Place the first Lift of ACP over the test strips within 48 hours of rubblizing the PCC.

Do not begin rubblization outside the test strip area until a sequence of operations has been established to the satisfaction of the Engineer. Once a sequence of operations has been approved, use this sequence unless field conditions or testing shows a need for modification. Excavate random test sections as directed each Day to verify that the breaking pattern approved in the test strips is maintained. The Engineer may also conduct random FWD deflection testing. Backfill all excavated areas with Aggregate Base according to Section 00641.

The Engineer may require additional test strips any time the breaking pattern, the particle size produced, or the deflections change from those established in the selected test sections.

*[ End Option 1. ]*

*[ Option 2. Use this subsection .40 if required in the pavement design report (typically on small projects). ]*

**00630.40 Test Strip** - Use the first 200 feet of rubblization as a test strip. Remove any existing asphalt concrete covering the PCC on the test strip, if present. Use the test strip to develop a pattern to achieve specified size of pieces. Stop the rubblization process at the end of the test strip, and do not continue until directed by the Engineer. Excavate the rubblized Material in a section 3 feet long by the full lane width at a representative location or where directed. Backfill all excavated areas with Aggregate Base according to Section 00641.

Conduct additional test strips as directed. Random falling weight deflectometer (FWD) testing may be conducted by the Engineer.

*[ End Option 2. ]*

**00630.41 Rubblization** - Remove all existing asphalt material layers, if present, to expose bare PCC Pavement prior to beginning the rubblizing operation. Remove all joint filler material that debonds during the rubblizing operation and is left loose and exposed on the rubblized

surface. Place and compact adjacent roadway materials shown up to the top of existing concrete Pavement elevation prior to rubblization.

Sawcut joints to full depth prior to rubblization where the rubblizing abuts any concrete Pavement or approach slabs that are to remain in place. Keep rubblization hammers at least 1 foot away from adjacent concrete Pavement or approach slabs.

Follow the same sequence of operations and breaking pattern, and produce the same particle size, as approved in the test sections.

Conduct rubblization in a manner that will produce the desired particle size without displacing the concrete more than 1/2 inch vertically.

Protect passing traffic from flying debris during rubblizing operations.

Leave undisturbed reinforcement in place. However, cut off below the surface and remove from the site, any reinforcement exposed as a result of rubblizing or compaction operations. Dispose of reinforcement according to 00290.20.

Prior to placing surfacing, compact the entire width of rubblized Pavement with the approved number of Passes. In the order below, use all three rollers with at least the number of Passes given, unless otherwise approved by the Engineer.

Grid Roller .....	4 Passes
Pneumatic Roller .....	2 Passes
Smooth Drum Roller .....	4 vibratory Passes

Fill in depressions 2 inches or more in depth with dense Base Course ACP according to Section 00745 and strike off level with the surrounding area. Compact ACP leveling according to Section 00745.

In areas showing visible signs of subgrade pumping during rubblization or seating, perform subgrade stabilization according to Section 00331 and as directed.

*(Fill in the blanks with the appropriate thickness of ACP and number of days. Obtain the information from the Pavement Design Engineer.)*

Do not allow traffic, including Contractor's vehicles and Equipment, on the rubblized Pavement before placing \_\_\_\_ inches of ACP Base Course. Place the first Lift of Base Course within 48 hours after rubblizing the PCC. Place the wearing Course within \_\_\_\_ Days before opening to Public Traffic.

### **Maintenance**

**00630.60 Care of Work** - After rubblizing, seating, and backfilling, maintain the surface in the same condition it was in upon completion of the roller pattern. Prevent or repair segregation, raveling, or rutting as directed, until placement of ACP surfacing.

### **Measurement**

**00630.80 Measurement** - The quantities of rubblized concrete Pavement will be measured on the area basis. The surface area will be determined by horizontal measurements.

Subgrade stabilization will be measured according to 00331.80.

ACP will be measured according to 00745.80.

### **Payment**

**00630.90 Payment** - The accepted quantities of rubblized Pavement will be paid for at the Contract unit price, per square yard, for the item "Rubblize PCC Pavement".

Payment will be payment in full for furnishing and placing all Materials, and for providing all Equipment, labor, and Incidentals necessary to complete the Work as specified.

No separate or additional payment will be made for:

- Constructing test strips
- Excavating and backfilling test sections
- Aggregate Base
- Water
- Illumination of rubblizing Equipment
- Cutting, removing, and disposing of exposed reinforcement, joint fillers, and other similar material
- Compacting and maintaining the compacted condition of the existing Pavement

Subgrade stabilization will be paid for according to 00331.90.

ACP will be paid for according to 00745.90.