



**SPECIAL PROVISIONS  
FOR  
GROOVING PCC PAVEMENT SURFACE**

**Adair County  
IMX-080-2(272)73--02-01**

**Effective Date  
October 17, 2023**

**THE STANDARD SPECIFICATIONS, SERIES 2023, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.**

**Replace Section 2532 of the Standard Specifications with the following:**

**2532.01 DESCRIPTION.**

- A.** Use a diamond grinder to grind and/or groove an existing PCC pavement surface, used as traffic surface, for profile improvement. Perform grinding and texturing at the locations shown in the contract documents. Refer to Article 2532.03, B, 3 for grinding bridge decks.
- B.** The existing surface and the coarse aggregate will be described in the contract documents.
- C.** This work may involve using a diamond grinder to grind a newly constructed deck surface for temporary surface texture. Perform grinding prior to opening the deck segment to traffic.

**2532.02 MATERIALS.**

None.

**2532.03 CONSTRUCTION.**

**A. Equipment.**

- 1.** Perform grinding and texturing using diamond blades mounted on a self propelled machine that has been designed for grinding and texturing concrete surfaces. Ensure the equipment will not cause strain or damage to the underlying pavement.
- 2.** Do not use grinding and texturing equipment that causes excessive ravels, aggregate fractures, spalls, or disturbance of the transverse and/or longitudinal joints.
- 3.** Use grinding equipment with a minimum effective head width of 36 inches.

4. Select the blade type and number of blades per foot to provide proper surface texture based on the concrete being ground, in particular, the coarse aggregate type.

**B. Pavement Surface Repair and Pavement Grooving.**

**1. General.**

- a. Grind and texture the concrete surface in a longitudinal direction.
- b. Ensure the surface, after grinding, is of uniform texture.
- c. When using more than one grinding machine in the same travel lane, use similar blade segment thicknesses, blade spacings, and blade diameters on all machines so the texture of the ground surface is reasonably uniform across the lane.
- d. To be in compliance, the land area and the texture depth shall be within the specified ranges. It may be necessary to adjust the blade spacing during a project to stay within specified ranges.
- e. For multiple passes, carefully control the equipment to minimize the overlap. Ensure overlaps do not exceed 1 inch.
- f. Ensure that, after grinding, the transverse slope of the concrete surface is uniform to a degree that there are no depressions or misalignment of slope greater than 1/4 inch in 12 feet when tested by stringline or straightedge placed perpendicular to the center line.
- g. In order to match the outside edge of the pavement, grind adjacent paved areas (for example shoulders, curb and gutter, turn lanes, tapers, paved crossovers, and so forth) to minimize vertical projections.
- h. The Contractor is responsible for quality control of the texture. The Engineer will conduct random Quality Assurance inspections.
- i. When the coarse aggregate used in the existing pavement is limestone, longitudinally groove the surface after grinding.

**2. PCC Pavement.**

- a. Grind and texture entire surface area of the pavement until:
  - The pavement surface on both sides of the transverse joints and all cracks are substantially in the same plane with no greater than 1/16 inch difference between adjacent sides of joints or cracks, and
  - The pavement surface meets the smoothness required.
- b. In each lane, ensure at least 95% of the area in each 100 foot section has a newly textured surface. Depressed pavement areas and areas of excess faulting as identified in 2532.03, C, 1, b, 4 will be exempt from this requirement.
- c. Meet the following requirements for grinding:
  - 1) Ensure all construction traffic entering or leaving the work area moves in the direction of traffic of the open lane.
  - 2) Begin and end at lines normal to the pavement center line within any one ground area and at the project limits. This will not be required at the end of each shift.
  - 3) Maintain good transverse drainage at all times.
  - 4) Assemble the grinding head to produce the tolerances in Table 2532.03-1 on pavements with the indicated coarse aggregates.

**Table 2532.03-1: Grinding Head Tolerances**

	<b>Limestone</b>	<b>Gravel/Quartzite</b>
Land area between grooves <sup>(a)</sup>	0.090 to 0.110 inches	0.080 to 0.095 inches
Texture depth <sup>(b)</sup>	Target of 1/8 inch with average between 1/16 inch to 3/16 inches	
(a) Based on an average of a minimum of ten measurements across the ground width for one pass.		
(b) Based on an average of a minimum of six measurements across the ground width for one pass.		

- 5) A test area 500 feet long and the width of the grinding head will be allowed for each new or restacked head, provided a surface texture in reasonable conformance with the specification is being produced.
- d. When required, meet the following requirements for longitudinal grooving:
  - 1) Use equipment meeting Article 2532.03, A, with longitudinal grooving blades 0.095 ± 0.05 inches wide.
  - 2) Cut grooves meeting the following:
    - a) 1/8 inch ±1/16 inch wide,
    - b) 1/8 inch to 3/16 inch deep and,
    - c) Uniformly spaced at 3/4 inch intervals, measured center to center or groove.
  - 3) Ensure grooves are parallel to centerline of the roadway.
  - 4) Do not groove within 3 inches of longitudinal joint or edge of pavement.
  - 5) Complete grooving after smoothness has been determined.

### 3. Bridge Deck.

- a. When specified in the contract documents, grind and longitudinally groove the entire surface of the bridge deck according to Article 2412.03, D, 4, a. No areas greater than 2 feet in length shall be left without texture. Total depth of concrete surface ground shall not exceed 1/4 inch. For other projects, re-establish transverse grooving through corrected areas using diamond blades to provide a surface similar to a new deck except the area within approximately 2 feet from the curb.
- b. Assemble the grinding head to produce the tolerances in Table 2532.03-1 on bridge decks.

## C. Smoothness.

### 1. PCC Pavement.

- a. The Engineer may partly profile the pavement using an inertial profiler. The latest inventory average international roughness index (IRI) for each area may be shown in the contract documents. The bidder is also advised that any available profile information is available electronically from the Office of Contracts by contacting the Contracts Engineer. This information represents a summary of conditions found to exist at the time the survey was made. The availability of this information will not constitute a guarantee that a profile other than that indicated will not be encountered at the time of milling.
- b. Prior to performing grinding work, provide a profile using an inertial profiler meeting the requirements of Materials I.M. 341. This control profile will be used to identify the required smoothness for the project if a percent improvement is the controlling factor. Obtain a final average IRI for each 0.1 lane-mile segment as follows:
  - 1) For speeds greater than 45 mph: 65.0 in/mile or less and no bumps exceeding 0.5 inches in 25 feet.
  - 2) For speeds 45 mph or less: 115.00 in/mile and or less and no bumps exceeding 0.5 inches in 25 feet.
  - 3) For extremely rough conditions: the greater of 35% of the pre-grind profile or the aforementioned requirement shall be the required smoothness or less and no bumps exceeding 0.5 inches in 25 feet.
  - 4) Identify depressed pavement areas and localized areas with excess faulting greater than 1 inch. Review these areas with the Engineer to determine the limits for exclusion from the profile index calculation.
- c. Obtain the profile in both wheel paths of each mainline lane using a certified operator. A pavement segment is defined in Article 2317.03. Compute an average IRI for each segment of each lane by averaging the two wheel path IRI values. The wheel paths are at 3 feet and 9 feet from center line or lane line.
- d. Verification testing requirements will be according to Article 2317.04, F.

### 2. Bridge Deck.

Ensure the smoothness requirements of Section 2428 are met prior to performing the

texturing. After texturing, test the bridge deck again according to Article 2428.02, C. Ensure the resulting profile index does not exceed the corrected profile index prior to the texturing.

**D. Limitations.**

**1. General.**

- a. When nighttime work is required, include lighting at each work area. Ensure lighting does not glare into oncoming motorists.
- b. Continuously remove all slurry or residue resulting from the grinding or grooving operations. Do not deposit on the slab or shoulder. Leave pavement and paved shoulders in a clean condition. Ensure residue from grinding or grooving operations does not flow across lanes occupied by public traffic or into gutters or other drainage facilities. This residue may be spread on the foreslope or removed according to Article 1104.08.

**2. PCC Pavements.**

- a. Uncompleted sections may be opened to traffic without completion of grinding across an entire lane.
- b. During nighttime grinding operations, progress in the direction with normal traffic flow.
- c. When the following work is included in the contract, sequence the operations in the following order:
  - 1) Undersealing,
  - 2) Longitudinal subdrains,
  - 3) Patching,
  - 4) Retrofit load transfer,
  - 5) Diamond grinding, grooving, and then
  - 6) Crack and joint sealing.

**3. Bridge Decks.**

Prior to opening to traffic, complete the work under this specification and meet the smoothness requirements.

**2532.04 METHOD OF MEASUREMENT.**

Measurement will be as follows:

**A. PCC Pavement.**

1. Square yards of Pavement Surface Repair, of the type specified, shown in the contract documents.
2. Adjacent paved areas ground to minimize vertical projections will be measured for payment. Payment will be in square yards of Pavement Surface Repair based upon a width of 2 feet times the length of the required feather pass.
3. Square yards of Pavement Grooving, shown in contract documents.

**B. Bridge Deck.**

Square yards of Pavement Surface Repair, of the type specified, shown in the contract documents.

**2532.05 BASIS OF PAYMENT.**

Payment will be as follows:

- A. Contract unit price per square yard for Pavement Surface Repair (Grinding Limestone) or Pavement Surface Repair (Grinding Gravel).
- B. Payment is full compensation for furnishing all equipment, materials, and labor to:

- Grind the concrete surface,
- Test for smoothness according to the contract documents, and
- Remove slurry and residue from this operation.

C. In addition to the payments above, the Contractor may receive an incentive payment based upon the number of qualifying segments. The incentive payment will be based upon the following schedule:

**Table 2532.05-1: Incentives for Pavement Surface Repair (Diamond Grinding)**

<b>International Roughness Index for greater than 45 mph</b>	<b>International Roughness Index for 45 mph or less</b>	<b>Dollars per 0.1 mile segment per lane</b>
Inches per mile	Inches per mile	
0.00 – 30.00	-	400
30.01 - 50.00	-	1000-(20 X IRI)
50.01 - 65.00	0.00 - 115.00	Contract Unit Price
>65.01*	>115.01*	Grind

\* For extremely rough conditions, this limit may be higher as noted above.

D. Contract unit price per square yard for Pavement Grooving. Payment is full compensation for furnishing all equipment, materials, and labor to groove the concrete surface and remove slurry and residue from this operation.