
Supplemental Technical Specification for

PCC Pavement Thickness Tolerance

SCDOT Designation: SC-M-503 (03/08)

1. SCOPE

- 1.1. This supplemental technical specification describes sampling, testing, and concrete pavement unit price adjustment for Portland cement concrete (PCC) pavement thickness. This specification applies to all PCC pavement, including mainline, shoulders, gore areas, and ramps unless otherwise stated in the Contract.
- 1.2. When diamond grinding and texturing is required on new pavement, requirements for pavement thickness tolerance apply after all grinding operations are complete and accepted. It is the Contractor's responsibility to consider potential loss of pavement thickness from the grinding operation and adjust initial pavement thickness accordingly to ensure that the finished product has the required thickness.

2. REFERENCED DOCUMENTS

- 2.1. SCDOT Standard Specifications Divisions 500 and 700
- 2.2. AASHTO T 148, Measuring Length of Drilled Concrete Cores
- 2.3. SC-T-100, Random Method of Sampling Highway Construction Materials

3. DETERMINATION OF LOTS FOR MEASUREMENT

- 3.1. *Normal Width Through Lanes*
 - 3.1.1. For pavements with uniform cross-sections, each 1000 linear feet, or fraction thereof, of each traffic lane is considered to be a single lot.
 - 3.1.2. For shoulder pavement four feet or less in plan width, each 3000 linear feet, or fraction thereof, is considered to be a single lot unless the shoulder is formed monolithically with the mainline. If the shoulder is four feet or less in plan width and formed monolithically with the mainline pavement, then the shoulder is included in the mainline lots. For shoulder pavement greater than four feet in plan width, the shoulder is treated as given in Subsection 3.1.1.
 - 3.1.3. If a bridge or other obstacle is encountered, the linear measurement of the lot will not include the bridge or obstacle length. If the lot adjacent to the bridge is 500 linear feet or more, the RCE may choose to either create a fractional lot and begin a new lot at the other end of the obstacle or continue measurement of a full 1000 linear foot lot beyond the obstacle. This selection is made at the RCE's sole discretion. If, at the end of the project, a fractional lot of 250 linear feet or less is remaining, that lot may be included in the adjacent full lot for payment calculation.

3.2. *Varying Width Pavement*

- 3.2.1. For intersections, entrances, crossovers, ramps, gore areas, and other pavements with varying cross-sections, each 1000 square yards of pavement, or fraction thereof, will be considered to be a single lot. If a final remaining fractional lot is less than 250 square yards, it may be included in the adjacent 1000 square yard lot. Small or irregular areas may be combined to create lots of 1000 square yards, or a fraction thereof, at the RCE's sole discretion.
- 3.2.2. For ramp pavement, any ramp of 500 square yards or greater, including shoulders, will be considered an individual lot. Ramp pavement areas of less than 500 square yards may be grouped with other ramp pavement in the same interchange to create lots no greater than 1250 square yards in area. Ramp pavement greater than 1000 square yards in area will be split to form lots of 500 to 1250 square yards at the discretion of the RCE.

4. **SAMPLING OF LOTS**

- 4.1. The Resident Construction Engineer (RCE) or the RCE's authorized representative will designate at least one random location for coring within each lot using SC-T-100. If the random location is within 18 inches of a transverse joint or 24 inches of a longitudinal joint, adjust the location away from the joint to avoid interference with dowels or tie bars. The RCE may also designate other locations within the lot where insufficient thickness is suspected.
- 4.2. At least one core per ramp leg will be taken.
- 4.3. At no expense to the Department, take a 4 inch diameter core at the designated locations and provide the core(s) to the RCE.
- 4.4. The RCE, in cooperation with Office of Materials and Research personnel, will determine the length of the cores in accordance with AASHTO T 148.

5. **ANALYSIS OF CORE LENGTH MEASUREMENTS**

- 5.1. *Cores Greater Than Plan Thickness By 0.20 Inches Or More*
 - 5.1.1. If the initial core thickness encountered in a lot is greater than the plan thickness by 0.20 inches or more, take at least two additional cores in the lot at locations designated by the RCE, for a total of at least three cores. If all the cores are greater than the plan thickness by at least 0.20 inches, but any single core is less than 0.40 inches greater, then designated thickness variance for the lot is 0.20 inches. If all the cores are greater than the plan thickness by 0.40 inches or more, then designated thickness variance for the lot is 0.40 inches. However, if any core within the lot is found to be less than the plan thickness plus 0.20 inches, then the thickness variance is based on the average thickness calculated as given below and no additional pay will be made for that lot.

5.2. *Cores Deficient By Not More Than 0.20 Inches:*

5.2.1. If all the cores within a lot are deficient by 0.20 inches or less with regard to the plan thickness, full payment will be made for the lot and the thickness variance is considered to be zero. No additional payment will be made for cores greater than the plan thickness except as given in Subsection 5.1.

5.3. *Cores Deficient By More Than 0.20 Inches, But Not More Than 0.60 Inches:*

5.3.1. If any core within a lot is found to be more than 0.20 inches deficient but less than 0.60 inches deficient in thickness when compared to the plan thickness, take a total of at least three cores within the lot at locations specified by the RCE. Average the core thicknesses to determine the overall thickness for the lot. If any core length is found to be more than 0.20 inches greater than the plan thickness, assume the core length is the plan thickness plus 0.20 inches when calculating the average. The thickness variance for the lot is the plan thickness minus the overall lot thickness calculated as given herein.

5.4. *Cores Deficient by More Than 0.60 Inches:*

5.4.1. If any core within a lot is found to be deficient in length by more than 0.60 inches, take additional exploratory cores at 25-foot intervals along the centerline of the lane in each direction from the deficient core. If the deficient core is found in varying width pavement, then exploratory cores representing approximately each 35 square yards should be taken. Adjust the core locations as necessary to avoid coring within 18 inches of a transverse joint or 24 inches of a longitudinal joint. Continue taking cores until a core is encountered that is no more than 0.20 inches deficient in length. Remove areas of deficient thickness and replace with concrete pavement of the plan thickness.

5.4.2. Calculate the average thickness for the lot based on the average of the original cores plus additional cores taken in the repaired areas. Exploratory cores are not used in calculation of lot average thickness. For areas that were removed and replaced due to thickness deficiency, take at least one additional core in the repaired areas at locations selected by the RCE, but sample at a rate no less than one core per 500 linear feet of repaired area. If a core has a thickness more than 0.20 inches above the plan thickness, that core is assumed to be the plan thickness plus 0.20 inches when calculating the average. The thickness variance for the lot is the plan thickness minus the overall lot thickness calculated as given herein.

6. DETERMINATION OF ADJUSTED UNIT PRICE

6.1. Once the thickness variance for each lot has been determined, adjust the unit price for concrete pavement as shown in Table 1.

| Table 1. – Schedule for Adjusted Payment Based on Lot Average Thickness | |
|--|----------------------------|
| Thickness Variance (Inches) | Adjusted Unit Price |
| 0.40 | 105% |
| 0.20 | 102% |
| 0.19 to -0.20 | 100% |
| -0.21 to -0.30 | 95% |
| -0.31 to -0.40 | 90% |
| -0.41 to -0.50 | 85% |
| -0.51 to -0.60 | 80% |
| -0.61 or greater | Repairs Required |