



**MINUTES
OF
IOWA DOT SPECIFICATION COMMITTEE MEETING**

February 8, 2018

Members Present:	Eric Johnsen, Secretary Wes Musgrove Gary Novey Tom Reis, Chair Daniel Harness	Specifications Section Office of Construction & Materials Office of Bridges & Structures Specifications Section Office of Design
Members Not Present:	Darwin Bishop Mark Brandl Donna Buchwald Jeff Devries Mark Dunn Charlie Purcell Willy Sorensen	District 3 - Construction District 6 - Davenport RCE Office of Local Systems District 1 - Materials Office of Contracts Project Delivery Bureau Office of Traffic & Safety
Advisory Members Present:	Ken Brink Andrew Zimmerman	Office of Location & Environment FHWA
Others Present:	Jeff Schmitt Joy Williams	Office of Construction & Materials Office of Design

The Specification Committee met on Thursday, February 8, 2018, at 9:00 a.m. in the NW Wing, 1st Floor Conference Room. Tom Reis, Specifications Engineer, opened the meeting. The items were discussed in accordance with the revised agenda dated January 30, 2018:

The minutes are as follows:

1. Article 2303.02, D, 4, Flexible Paving Mixture (Flexible Pavement - Materials).

The Office of Construction & Materials requested to correct an old asphalt mix reference.

2. Article 2601.03, C, Types of Seeding.

The Office of Design requested to correct urban seed mixes to match the ratios used by SUDAS and add requirements to ensure certified seed that is weed-free.

**3. Article 4137.01, General Requirements (Asphalt Binder).
DS-15057, High Performance Thin Lift Overlay.**

The District 1 Materials Office requested revisions to avoid confusion on DS-15057 binder. The District 1 Materials Office requests to update Developmental Specifications for High Performance Thin Lift Overlay.

4. DS-15051, PCC Pavement Non-Destructive Thickness Determination.

The Office of Construction & Materials requested to update Developmental Specifications for PCC Pavement Non-Destructive Thickness Determination.

5. New Products Review.

The Office of Construction & Materials and Specifications Section requested review of the new Products Evaluation Committee Policy.

The committee agreed that a formal policy and procedure would be advantageous. The policy was revised as shown in the attached and will continue to be evaluated by the committee over the next couple of meetings prior to implementation.

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove / Jeff Schmitt		Office: Construction & Materials	Item 1
Submittal Date: 1/23/2018		Proposed Effective Date: October 2018 GS	
Article No.: 2303.02, D, 4 Title: Flexible Paving Mixture (Flexible Pavement - Materials)		Other:	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 2/8/2018	Effective Date: 10/16/2018
Specification Committee Approved Text: See Specification Section Recommended Text.			
Comments: None.			
Specification Section Recommended Text: 2303.02, D, 4. Replace the third sentence: When a commercial mix is specified, use 1/2 inch 300K Standard Traffic (ST) or higher surface mixture or higher , with PG 58-28S or PG 64-22S binder, for JMF approval.			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.) 4. Use a mixture design meeting gyratory design and mixture criteria corresponding to the design level specified in the contract documents. The Engineer may approve mixtures substitutions meeting guidelines in Materials I.M. 511 . When a commercial mix is specified, use a 1/2 inch 300K Standard Traffic (ST) or higher surface mixture, with PG 58-28S or PG 64-22S binder, or higher for JMF approval.			
Reason for Revision: Iowa DOT no longer specifies asphalt mixes by ESAL's. Revise to indicate appropriate mix under current designation. This change was discussed and recommended by District Materials Engineers at their November 14, 2017 meeting.			
New Bid Item Required (X one)	Yes	No X	
Bid Item Modification Required (X one)	Yes	No X	
Bid Item Obsolescence Required (X one)	Yes	No X	
Comments:			
County or City Comments:			
Industry Comments:			

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Mike Kennerly / Joy Williams	Office: Design	Item 2
Submittal Date: 2018.01.29	Proposed Effective Date: October 2018 GS	
Article No.: 2601.03, C Title: Types of Seeding	Other:	

Specification Committee Action: Approved as recommended.

Deferred:	Not Approved:	Approved Date: 2/8/2018	Effective Date: 10/16/2018
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Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: Some more clarification will be submitted for a future meeting on when stabilizing crop for urban areas should be applied and when it is inappropriate due to hot or dry weather conditions.

Specification Section Recommended Text:

2601.03, C, 2, b, Seed Mixture.

Replace the Article:

Unless specified otherwise in the contract documents, use seeding rates shown in Table 2601.03-2 for urban areas that will be maintained as a lawn.

Table 2601.03-2: Urban Stabilizing Crop Seeding Mixture and Rates for Urban Areas

Common Name	Scientific Name	Application Rate (lbs/acre)
Bluegrass, Kentucky ¹	<i>Poa pratensis</i>	126 lbs. per acre 150
Ryegrass, Perennial (turf-type variety) ²	<i>Lolium perenne</i>	40 lbs. per acre 30
Fescue, Creeping Red	<i>Festuca rubra</i>	18 lbs. per acre 20

1. Choose three different cultivars of Kentucky bluegrass listed in Table 4169.02-1, at ~~42~~ 50 lbs. per acre each.
2. Choose two different cultivars of turf-type perennial ryegrass listed in Table 4169.02-1, at ~~20~~ 15 lbs. per acre each.
3. A commercial mixture may be used if it contains at least 75% Kentucky bluegrasses: the greater amount of Kentucky bluegrass may replace creeping red fescue or perennial ryegrass.
4. Seed shall be certified Tested Class Seed "light blue tag" from Oregon, Washington or Idaho origin, and free of weeds listed on the all-state noxious weed seed list and annual bluegrass (*Poa annua*,) bentgrass (*Agrostis spp.*)
5. Do not use this mix when it is deemed inappropriate by the Engineer because of hot or dry weather conditions.

2601.03, C, 4, b, Seed Mixture.

Replace the Article:

Unless specified otherwise in the contract documents, use seeding rates shown in Table 2601.03-4 for urban areas, including areas previously that will be maintained as a lawn.

Table 2601.03-4: Permanent Seed Mixture and Rates, for Urban Areas

Common Name	Scientific Name	Application Rate (lbs/acre)
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Bluegrass, Kentucky ¹	<i>Poa pratensis</i>	126 lbs. per acre 150
Ryegrass, Perennial (turf-type variety) ²	<i>Lolium perenne</i>	40 lbs. per acre 30
Fescue, Creeping Red	<i>Festuca rubra</i>	48 lbs. per acre 20
<ol style="list-style-type: none"> Choose three different cultivars of Kentucky bluegrass listed in Table 4169.02-1, at 42 50 lbs. per acre each. Choose two different cultivars of turf-type perennial ryegrass listed in Table 4169.02-1, at 20 15 lbs. per acre each. A commercial mixture may be used if it contains at least 75% Kentucky bluegrasses: the greater amount of Kentucky bluegrass may replace creeping red fescue or perennial ryegrass. Seed shall be certified Tested Class Seed "light blue tag" from Oregon, Washington or Idaho origin, and be free of weeds listed on the all-state noxious weed seed list, annual bluegrass (<i>Poa annua</i>), or bentgrass (<i>Agrostis spp.</i>) 		

Comments: The table titles were shortened as the introductory sentences include the requirement that the mixes are for urban areas that will be maintained as lawns.

The Percentage of Mix columns were removed, as the percentages can be calculated from the application rates.

Note 5 was deleted from both tables as "fresh, clean new crop" is not a measurable definition and the seed already must meet the requirements of Section 4169.

If the stabilizing crop for urban areas mixture is deemed inappropriate, what mix shall be used?

Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)

b. Seed Mixture.

Unless specified otherwise in the contract documents, use seeding rates shown in Table 2601.03-2 for urban areas that will be maintained as a lawn.

Table 2601.03-2: Urban Stabilizing Crop Seeding Mixture and Rates for Urban Areas that will be maintained as a lawn

Common Name	Latin Name	Application Rate lbs/acre	Percentage of Mix
Bluegrass, Kentucky ¹	<i>Poa pratensis</i>	150 126 lbs. per acre	75
Ryegrass, Perennial (turf-type variety) ²	<i>Lolium perenne</i>	30 40 lbs. per acre	15
Fescue, Creeping Red	<i>Festuca rubra</i>	20 48 lbs. per acre	10

- Choose three different cultivars of Kentucky bluegrass listed in 4168.02, A, Table 4168.02-1 or corresponding Supplemental Specifications, at 42 50 lbs. per acre each.
- Choose two different cultivars of turf-type perennial ryegrass listed in 4168.02, A, Table 4168.02-1 or corresponding Supplemental Specifications, at 20 15 lbs. per acre each.
- A commercial mixture may be used if it contains an equivalent or greater amount of Kentucky bluegrasses: the greater amount of Kentucky bluegrass may replace the creeping red fescue or perennial ryegrass.
- All seed must be certified Tested Class Seed "light blue tag" from Oregon, Washington or Idaho origin, and be free of weeds on the all-state noxious weed seed list and annual bluegrass (*Poa annua*), bentgrass (*Agrostis spp.*)
- Seed must be fresh, clean new crop, complying with tolerance for germination and purity per 4168.02, A, Table 4168.02-1
- This mix shall not be used as Urban Stabilizing Crop when it is deemed inappropriate by the Engineer because of hot or dry weather conditions.

b. Seed Mixture.

Unless specified otherwise in the contract documents, use seeding rates shown in Table 2601.03-4 for urban areas, that will be maintained as a lawn, including areas previously maintained as a lawn.

Table 2601.03-4: Permanent Seed Mixture and Rates for Urban Areas Maintained as a Lawn

Common Name	Latin Name	Application Rate lbs/acre	Percentage of Mix
Bluegrass, Kentucky ¹	<i>Poa pratensis</i>	150 126 lbs. per acre	75
Ryegrass, Perennial (turf-type)	<i>Lolium perenne</i>	30 40 lbs. per acre	15

variety) ²			
Fescue, Creeping Red	<i>Festuca rubra</i>	20 48 lbs. per acre	10
<p>1. Choose three different cultivars of Kentucky bluegrass listed in 4168.02, A, Table 4168.02-1 or corresponding Supplemental Specifications, at 42 50 lbs. per acre each.</p> <p>2. Choose two different cultivars of turf-type perennial ryegrass listed in 4168.02, A, Table 4168.02-1 or corresponding Supplemental Specifications, at 20 15 lbs. per acre each.</p> <p>3. A commercial mixture may be used if it contains an equivalent or greater amount of Kentucky bluegrasses: the greater amount of Kentucky bluegrass may replace the creeping red fescue or perennial ryegrass.</p> <p>4. All seed must be certified Tested Class Seed "light blue tag" from Oregon, Washington or Idaho origin, and be free of weeds on the all-state noxious weed seed list and annual bluegrass (<i>Poa annua</i>,) bentgrass (<i>Agrostis spp.</i>)</p> <p>5. Seed must be fresh, clean new crop, complying with tolerance for germination and purity per 4168.02, A, Table 4168.02-1</p>			
<p>Reason for Revision: Correct the seed mix slightly to match the ratios used in the SUDAS Type 1 (Permanent lawn) specifications This will simplify seed mixing for the entire erosion control industry, which works with both city, county and state projects. Also, the SUDAS specification ratios are much more appropriate to adjust for the increased size of Kentucky blue grass seed with newer varieties (less seeds per pound).</p> <p>Also, add requirements to ensure certified seed that is weed-free, and with materials specifications references.</p>			
New Bid Item Required (X one)	Yes	No x	
Bid Item Modification Required (X one)	Yes	No x	
Bid Item Obsolescence Required (X one)	Yes	No x	
Comments:			
County or City Comments:			
Industry Comments:			

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jeff De Vries		Office: District 1 Materials	Item 3
Submittal Date: 12/28/17		Proposed Effective Date: October 16, 2018	
Article No.: 4137.01 Title: General Requirements (Asphalt Binder)		Other: DS 15057, High Performance Thin Lift Overlay	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 2/8/2018	Effective Date: 4/17/2018
Specification Committee Approved Text: See Specification Section Recommended Text and attached Developmental Specifications for High Performance Thin Lift Overlay.			
Comments: The DS will be effective in April along with the bid item to capture projects in that letting. The Standard Specification revision will be effective with the October 2018 GS.			
Specification Section Recommended Text: 4137.01, General Requirements. Add the Article: F. When PG 58-34E+ is specified, the binder shall comply with requirements of PG 58-34E except that a minimum percent recovery of 90% when tested at 58°C per AASHTO T 350 at 3.2 kPa is required. See attached Draft Developmental Specifications for High Performance Thin Lift Overlay.			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use <u>Strikeout</u> and <u>Highlight</u>.)			
4137.01 GENERAL REQUIREMENTS.			
<ul style="list-style-type: none"> A. Meet the requirements for the type and grade specified in the contract documents and comply with the Combined States Binder Group. B. Determine performance grade according to AASHTO R 29. C. Polyphosphoric Acid may be used as a co-modifier up to 0.4% by weight of binder. The Engineer may verify with laboratory testing. D. Except for Standard Traffic grades, meet CSBG requirements for Minimum Percent Recovery when tested per AASHTO T 350 at the high temperature identified by the PG grade. E. Waive stress sensitivity limits (Jnr Diff) for AASHTO M 332 when Jnr at 3.2 kPa is below 0.5 kPa-1. F. When PG 58-34E+ is specified the binder shall comply with all requirements of PG 58-34E except that a minimum percent recovery of 90% when tested at 58°C per AASHTO T 350 at 3.2 kPa is required. 			
15057.02 MATERIALS.			
Asphalt Binder.			
Use PG 58-34E+ with a minimum percent recovery of 90% when tested at 58°C per AASHTO T 350 at 3.2 kPa.			

<p>Reason for Revision: To avoid confusion on DS-15057 binder District 3 recently had a thin lift overlay project where the binder supplier was not informed of the type of use nor of the 90% recovery requirement at the time of bid. The binder supplier quoted a 58-34E but was required to supply a 58-34E with 90% recovery.</p>		
New Bid Item Required (X one)	Yes X	No
Bid Item Modification Required (X one)	Yes	No X
Bid Item Obsolescence Required (X one)	Yes	No X
Comments: Tied to DS 15057 submittal		
County or City Comments:		
Industry Comments:		

DS-15063
(Replaces DS-15057)



**DEVELOPMENTAL SPECIFICATIONS
FOR
HIGH PERFORMANCE THIN LIFT OVERLAY**

**Effective Date
April 17, 2018**

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

15063.01 DESCRIPTION.

These specifications describe requirements for a highly polymer modified asphalt thin lift surface course. Apply Section 2303 of the Standard Specifications unless otherwise directed in these specifications.

15063.02 MATERIALS.

A. Asphalt Binder.

Use PG 58-34E+ with a minimum percent recovery of 90% when tested at 58°C per AASHTO T 350 at 3.2 kPa.

B. Mix Design.

1. Design Gyration 50
Design Target (%Gmm) 3.0
Film Thickness 8.0 – 13.0
Aggregate Quality A
Crushed Content (minimum) 50%
FAA (minimum) 40
Sand Equivalency (minimum) 50
VMA (minimum) 16%
2. **Friction Aggregate.**
Interstates: minimum 30% of Total Aggregate shall be Type 2 or better
Non-Interstates: minimum 50% of Total Aggregate shall be Type 4 or better
3. **Hamburg Testing (AASHTO T324).**
Compact to 3.5% air voids. No more than 4 mm rutting in the first 8000 passes.
4. Do not use more than 15.0% binder replacement. Do not use RAS.

5. Gradation.

Table DS-15063: Thin Lift Overlay Gradation

Sieve Size	Min % Passing	Max % Passing
1½ inch		
1 inch		
3/8 inch	91	100
#4		90
#8	27	63
#16		
#30		
#50		
#100		
#200	2	10

15063.03 CONSTRUCTION.

- A.** Apply tack coat prior to placement of thin lift overlay according to Section 2303 of the Standard Specifications.
- B.** Pave when ambient temperatures are at least 60°F and rising.
- C.** Compact with steel wheeled roller.
- D.** Do not open to traffic until the entire mat has cooled below 150°F.
- E. Quality Assurance/Quality Control.**
 - 1. Field Voids Acceptance.**
Acceptance for field voids shall be Class II compaction defined in Section 2303 of the Standard Specifications.
 - 2. Lab Voids Acceptance.**
Sample from windrow or hopper. Apply Article 2303.05, A, 3, a, 2 of the Standard Specifications for AAD acceptance. Air void target is based on approved JMF.
 - 3.** Take at least one cold feed for gradation control each day of production.

15063.04 METHOD OF MEASUREMENT.

Hot Mix Asphalt Thin Lift Overlay will be measured according to Article 2303.04 of the Standard Specifications.

15063.05 BASIS OF PAYMENT.

Hot Mix Asphalt Thin Lift Overlay will be paid for according to Article 2303.05 of the Standard Specifications.

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove / Kevin Jones		Office: Construction & Materials	Item 4
Submittal Date: December 2017		Proposed Effective Date: April 17, 2018	
Article No.: Title:		Other: DS-15051, PCC Pavement Non-Destructive Thickness Determination	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 2/8/2018	Effective Date: 4/17/2018
Specification Committee Approved Text: See attached Developmental Specifications for PCC Non-Destructive Thickness Determination.			
Comments:			
Specification Section Recommended Text: See attached Draft Developmental Specifications for PCC Non-Destructive Thickness Determination.			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)			
DS-15051 Attached			
Reason for Revision: Updated the target location selection to make the process simpler.			
New Bid Item Required (X one)	Yes	No X	
Bid Item Modification Required (X one)	Yes	No X	
Bid Item Obsolescence Required (X one)	Yes	No X	
Comments:			
County or City Comments:			
Industry Comments:			

DS-15064
(Replaces DS-15051)



**DEVELOPMENTAL SPECIFICATIONS
FOR
PCC PAVEMENT NON-DESTRUCTIVE THICKNESS DETERMINATION**

**Effective Date
April 17, 2018**

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

Replace all of Articles 2301.04 and 2301.05 of the Standard Specifications with the following. Differences from the Standard Specifications are highlighted.

2301.04 METHOD OF MEASUREMENT.

Measurement will be as follows:

A. Portland Cement Concrete Pavement.

1. Square yards, of the type specified, shown in the contract documents. The area of manholes, intakes, or other fixtures in the pavement will not be deducted from the measured pavement area.
2. The measurement requirements for thickness do not apply to detour pavements, paved drives, and temporary pavements. The thickness of pavement constructed will be determined from thickness measurements as follows:
 - a. The division of sections, lots, and measurement locations will be according to Appendix A.
 - b. At locations determined by the Engineer.
 - c. ~~Measurement work for thickness determination may be waived by mutual agreement for sections of the same design thickness less than 5000 square yards.~~ Determine thickness for sections of the same design thickness 3500 square yards or less by probing plastic concrete in accordance with Materials I.M. 396.
 - d. Only sections which are measured for thickness will be included in the thickness index determination. Areas not measured for thickness will be paid for at the contract unit price.

B. Integral Curb.

Incidental to the other items of work. Not measured for payment.

C. Concrete Median.

Square yards shown in the contract documents. This will be calculated to the nearest 0.1 foot of the length along the surface and the overall width of median when no integral curb is involved, or the width from back to back of curb when integral curb is involved.

D. Bridge Approach Sections.

Square yards shown in the contract documents.

E. Excavation.

1. When the contract provides a unit price per station for earth shoulder finishing and a price per cubic yard for excavation, the excavation required for preparation of natural subgrade will be measured as provided in Article 2102.04. The volume measured for payment will include only the materials actually removed above the elevation of the pavement subgrade and between vertical planes 1 foot outside the edge of the finished pavement.
2. Other work connected with preparation of natural subgrade will not be measured for payment.
3. When the contract provides a unit price for earth shoulder construction (whether or not a unit price per cubic yard of excavation is provided in the contract), excavation required for preparation of natural subgrade will not be measured for payment. Unless otherwise provided in the contract documents, work connected with preparation of natural subgrade will not be measured for payment.

F. Driveway Surfacing Material.

Tons or cubic yards, as provided in the contract and in Section 2315, placed at intersecting roads, drives, and turnouts. Excavation required for placement of this material will not be measured for payment.

H. Saw Cut and Joint Sealing.

1. Saw cut for constructing joints in new pavement will not be measured for payment.
2. Saw cut for cutting old existing pavement, which is to be abutted with new pavement, will not be measured for payment.
3. Joint sealing will not be measured for payment.

I. Safety Fence for Pavement.

Not measured for payment.

J. Rumble Strip Panel (PCC Surface)

By count for Rumble Strip Panels properly installed at locations designated in the contract documents.

2301.05 BASIS OF PAYMENT.

Payment will be as follows:

A. Portland Cement Concrete Pavement.

1. Contract unit price for Standard or Slip-Form Portland Cement Concrete Pavement of the type specified per square yard.
2. Payment for the quantities of pavement in square yards will be at a percentage of the contract unit price according to Table 2301.05-1.

Table 2301.05-1: Payment Schedule for Quantities of Pavement

Thickness Index Range	Percent Payment	Thickness Index Range	Percent Payment
0.00 or more	103	-0.56 to -0.60	91
-0.01 to -0.05	102	-0.61 to -0.65	90
-0.06 to -0.10	101	-0.66 to -0.70	89
-0.11 to -0.15	100	-0.71 to -0.75	88
-0.16 to -0.20	99	-0.76 to -0.80	87
-0.21 to -0.25	98	-0.81 to -0.85	86
-0.26 to -0.30	97	-0.86 to -0.90	85
-0.31 to -0.35	96	-0.91 to -0.95	84
-0.36 to -0.40	95	-0.96 to -1.00	83

-0.41 to -0.45	94	-1.01 to -1.05	82
-0.46 to -0.50	93	-1.06 to -1.10	81
-0.51 to -0.55	92	-1.11 or less	80

3. Use the following formula to determine the thickness index for the section of pavement thickness:

$$TI = (\bar{X} - S) - T$$

Where:

TI = thickness index for the section.

\bar{X} = mean thickness for the section.

T = see Table 2301.05-2.

S = measurement thickness standard deviation (of the sample) for the section.

Table 2301.05-2: Thickness Value for determining Thickness Index

Type of Base, Subbase, Subgrade just below the concrete	Value of T in Inches
Natural Subgrade or Soil Aggregate Subbase	Design Thickness
HMA Base, PCC Base, or Asphalt or Cement Treated Base	Design Thickness
Modified Subbase or Special Subbase	Design Thickness minus 0.25 inches
Granular Subbase	Design Thickness minus 0.35 inches

4. Replace pavement represented by cores deficient from design thickness by 1 inch or greater. The deficient areas and the replacement of the deficient cores will be determined according to Appendix A. The cost for coring that confirms deficient pavement or determines deficient areas shall be incidental to the price paid for Portland Cement Concrete Pavement. The cost for coring that indicates that pavement is sufficient shall be paid as extra work, according to Article 1109.03, B of the Standard Specifications. The cost for coring replacement pavement to verify compliance shall be incidental to the price paid for Portland Cement Concrete Pavement.
5. At the Contractor's option, measurement readings that are larger than the thickness value (from Table 2301.05-2) by three standard deviations or greater may be removed from analysis for thickness index determination. Do not remove more than 10% of the total measurements in a section. Do not replace measurements removed from the analysis.
6. Gaps in the pavement less than 500 feet, required by staging, will be considered irregular areas for analysis of pavement thickness determinations.
7. The percent payment for projects which have all measurement readings greater than T in Table 2301.05-2 will be at least 100%.

B. Integral Curb.

Not paid for separately.

C. Concrete Median.

Contract unit price per square yard.

D. Bridge Approach Sections.

1. Contract unit price for bridge approach pavement per square yard (~~square meter~~).
2. Payment is full compensation for:
 - Excavation for modified subbase and subdrain.
 - Furnishing and installing subdrain.
 - Furnishing and installing subdrain outlet.
 - Furnishing and installing polymer grid.
 - Furnishing and placing porous backfill material.
 - Furnishing and placing modified subbase backfill material.
 - Saw cutting.
 - Furnishing and installing reinforcing steel, tie bars, and dowel assemblies.
 - Placing, finishing, texturing, grooving, and curing.

- All joint construction.
- All other materials and labor to construct the Bridge Approach Section as shown in the contract documents.

E. Excavation.

1. When the contract provides a unit price per station for earth shoulder finishing and the contract also provides a price per cubic yard for excavation, payment will be the contract unit price per cubic yard for excavation in connection with subgrade preparation and building shoulders.
2. When the contract provides a unit price for earth shoulder construction, the excavation required for preparation of subgrade and construction of shoulders will not be paid for as a separate item. It is incidental to pavement construction and earth shoulder construction and is to be included in those contract prices.
3. When no price per cubic yard for excavation is provided in the contract and no unit price is provided for earth shoulder finishing or earth shoulder construction, excavation necessary for subgrade preparation is incidental to pavement construction and is to be included in that contract unit price.

F. Driveway Surfacing Material.

Contract unit price as provided in Section 2315 for the quantity of driveway surfacing placed.

H. Saw Cut and Joint Sealing

Incidental to the price for pavement.

I. Safety Fence for Pavement.

Incidental to the price for pavement.

J. Rumble Strip Panel (PCC Surface)

Each. Payment is full compensation for construction of the panels as detailed in the contract documents.

K. General.

1. When any of the types of additional protection described in Article 2301.03, K, 3, is necessary, additional payment will be made as extra work at the rate of \$1.00 per square yard of surface protected. Payment will be limited to protection necessary within the contract period. Protection necessary after November 15 will be paid for only when the Engineer authorizes the work.
2. Furnish concrete for test specimens and transport the specimens and molds between the grade and plant as directed by the Engineer, at no additional cost to the Contracting Authority.
3. The above prices are full compensation for furnishing all tools, equipment, labor, and materials necessary for construction of the pavement in accordance with the contract documents.
4. The cost of furnishing, installing, and monitoring vibrators, as well as the vibrator monitoring device itself, is incidental to the contract unit price for PCC pavement.

**APPENDIX A
EVALUATING PORTLAND CEMENT
CONCRETE PAVEMENT THICKNESS**

SCOPE

Thickness measurements will be taken on Portland Cement Concrete (PCC) pavement, to determine the pavement thickness and the thickness index for each section. Refer to Specification DS-15064.

APPARATUS

1. An MIT Scan T2 gauge will be used to perform thickness measures.
2. Steel Targets will be 11.81 inches in diameter, 24 gauge, meeting ASTM A 653, commercial steel with a G90 coating (about 275 g/m² total both sides).

DEFINITIONS

Section: All Portland Cement Concrete in a project of the same bid item. Irregular areas, as defined herein, of the same bid item shall form a separate section.

Lot: A portion of a section normally 200 feet in length and 2 traffic lanes wide.

Regular area pavement sections:

- All mainline pavement for normal travel lanes. Includes middle (both direction) turn lanes
- Paved shoulder – if same thickness as pavement and part of pavement bid item include with pavement. If separate bid item, treat as separate section.
- Paved median - if same thickness as pavement and part of pavement bid item, and longer than 300 feet, include with pavement.
- Auxiliary lanes of full width longer 300 feet.
- Widening greater than 6 feet.

Irregular areas:

- Widening less than 6 feet.
- Side street connections.
- Ramps, including gore areas, and collector distributor roads.
- Deceleration and acceleration lanes.
- Turn lanes, including taper sections.
- Tapers.
- Radiuses.
- Median crossovers

PROCEDURES

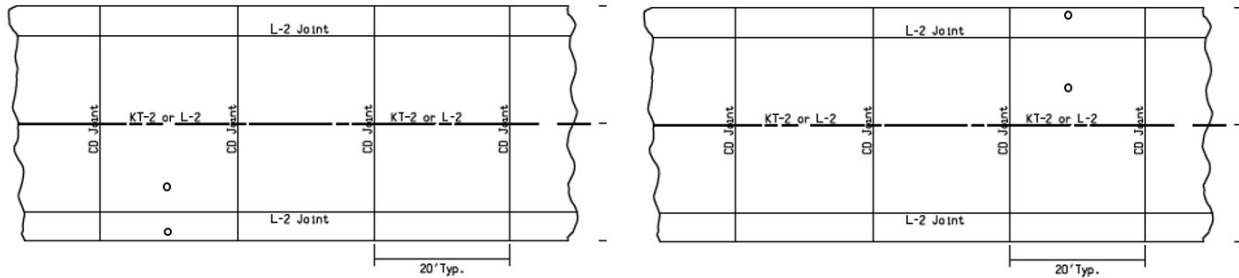
The District Materials Engineer will determine the location of each lot, the random location of each metal target, and the random thickness measuring scheme for each section using an Iowa DOT developed MSEXcel spreadsheet.

A. Target Location for Regular Areas

1. Divide the section longitudinally into 200 foot long lots. One target will be located in each lot based on the spreadsheet selection. Beginning with the first station at +00, place a target from the edge of the pavement (The targets should be placed half way between dowel baskets). See Figure 1. If the +00 station falls on a basket, move the target location ahead halfway between the dowel baskets. A minimum of ten targets will be tested. If a target location falls on a bridge or in an approach section, it will be eliminated.
2. The transverse location of the targets will be randomly determined by the spreadsheet program. The random locations will be either 6 4 or 10 8 feet from edge of pavement left or right of centerline. When tie steel is present at the edge of the pavement or lane, the locations will be 5 or 9 feet.
3. The program will randomly determine which targets to measure. If a measurement location falls on a bridge or bridge approach pavement, it will be eliminated and the next closest target not in the original random selection will be used for measurement.

4. Shoulders. Divide the section into 200 foot long lots. Beginning with the first station at +00, locate a target every 200 feet, alternating between the inside and outside shoulder (or every 400 feet on one side). Place targets approximately mid-point transversely on shoulders wider than 6 feet. On 6 foot shoulders or wider, the targets should be 4 feet from the edge of the pavement. On 4 foot shoulders, the targets should be 3 feet from the edge of the pavement.

Figure1. Target Location



B. Target Location for Irregular Areas

1. All irregular areas of the same design thickness will be grouped together for determining the number of lots. The Engineer may waive sections of the same design thickness that total less than 5000 square yards.
2. Place targets randomly in all irregular areas larger than 100 square feet yards. One target will be randomly located in each selected irregular area, unless one or more of the areas are significantly larger than the others, then more than one target may be located in the large area. For irregular areas greater than 1000 square yards, randomly place a minimum of two targets. Targets must be placed at least 2 feet away from tie steel and 4 feet from dowel bars. A minimum of ten targets will be tested to represent each section of irregular areas. For projects with less than ten irregular areas larger than 100 square yards, select a minimum of three areas to place targets. All targets will be measured. If more than 20 targets are located in irregular areas, randomly select 50% to be tested.

C. Testing

Follow the manufacturer's instructions for operating the thickness gauge. It is important to avoid testing close to any steel including vehicles, equipment, steel toed shoes as well as tie bars, dowel bars and baskets, and manhole covers. When wearing steel toed shoes, always keep both toes at least 2 feet from the gauge during the test. Three repeat readings will be taken. The readings should all be within 1 to 2 mm of each other. If the difference between any of the readings is more than 3 mm, take 2 additional readings. If the two additional readings are within 3 mm of any of the first 3 readings, the measurement is valid for that location. If not, note that the location is not valid and select the next target location not originally selected for testing.

D. Section Evaluation

1. Use the following formula to determine the mean thickness for the section:

$$\bar{X} = \frac{\sum X}{n}$$

Where: \bar{X} = mean length for the section

$\sum X$ = sum of core lengths for the section

n = number of cores taken within the section

Round the mean thickness to two decimal places.

2. Use the following formula to determine the sample standard deviation of the thickness of the section:

$$S = \sqrt{\frac{\sum (X - \bar{X})^2}{n - 1}}$$

Where:

- S = thickness standard deviation for the section.
 \bar{X} = mean thickness for the section
 X = individual thickness values for the section.
 n = number of tests representing the section.

$$\sum = \text{sign indicating the sum of all values of } (X - \bar{X})^2$$

Round the sample standard deviation to two decimal places.

NOTE: Calculations of the standard deviation are best made with an electronic calculator with standard deviation capability that uses the formula containing the quantity (n-1).

3. Use the following formula to determine the thickness index for the section of pavement thickness.

$$TI = (\bar{X} - S) - T$$

Where:

- TI = thickness index for the section
 \bar{X} = mean thickness length for the section
 T = from Table 2301.05-2
 S = measurement thickness standard deviation (of the sample) for the section

Round the thickness index to two decimal places.

NOTE: If the mean thickness minus the standard deviation is less than T of the section, the thickness index will be a negative number.

4. Basis of Payment. Payment for the quantities of pavement in square yards in each section will be as shown in Article 2301.05 of the Standard Specifications and based on the thickness index as determined in accordance with these instructions.

E. Deficient Areas

1. If any measurement is deficient from T by 1 inch or more, the measurement should be rechecked to confirm the reading and the equipment. If the repeat measurement is also 1 inch or more below T, mark the location directly over the target. The Contractor shall drill a 4.0 inch diameter core at that location. If the core length confirms the pavement is deficient by 1 inch or more, continue to drill cores as described below.
2. Deficient areas, represented by cores deficient in length by 1 inch or more from design thickness, are to be replaced. These areas will be determined by drilling a core 60 feet in each direction longitudinally at the same transverse location from the deficient core. Drilling will be continued at 60 feet intervals until a core is obtained which is not deficient by 1 inch or more from design thickness. Interpolate between this core and the adjacent core to determine the limits of the deficient area. This is the area to be removed and replaced at contractor's expense. These additional cores are to be used to define the deficient area and will not be used in the thickness index calculation. When an obstruction, such as a bridge, intersection, previous work, etc., prevents drilling a core at the required 60 feet interval in either direction longitudinally, continue the balance of the distance on the other side of the obstruction.
3. Any readings taken in the area for removal will be eliminated from the analysis for the entire section. After replacement, the contractor will take cores as directed by the engineer to verify the thickness.

Forms:

650075 – *On-line application and database for manufacturers and suppliers to submit data for a new product, material or procedure for evaluation. The application will have a public facing page where the status of all reviews will be available.*

Policy and Procedure:

I. Purpose

- A. The Specifications Committee is responsible for a thorough and fair evaluation of newly developed products, materials and procedures for potential use in highway construction and maintenance.
- B. The Specifications Committee has the authority to accept, reject or determine the status of new products, materials and procedures submitted for Department use.

II. Procedure

- A. Department offices that receive new product information directly shall forward the ~~information through~~ vendor to the on-line system.
- B. Once a submittal has been made, the Specification Committee members will receive notification as well as the responsible reviewing office(s).
- C. The responsible reviewing office(s) will determine if the submittal meets the criteria as a new product. They will notify the Specifications Engineer for items that should go through a different process at the Department. The Specification Engineer will contact the submitter and archive the item in the database. Items that are already covered by a Materials I.M. will be forwarded to the Construction and Materials Office for action.
- D. The responsible office(s) will review the submittal for completeness and if further information or clarification of the intent is needed, they will attempt to obtain this information from the contact provided on the submittal.
- E. After all the needed information is obtained, the responsible office(s) will review and make one of the following recommendations within 30 days to the Specifications Engineer.
 - 1. Immediate adoption.
 - 2. Referral to the initiator for additional information.
 - 3. Referral to another Department office for evaluation or recommendation.
 - 4. Referral for testing and evaluation by AASHTO Product Evaluation List (APEL).
 - 5. Field trial for further evaluation.

6. Referral to the Strategic Performance Division for formal research and development.
 7. Defer until additional performance information is available from lead adoption agencies.
 8. Deferral due to current unavailability of technology or equipment.
 9. Deferral because the item is not currently cost-effective.
 10. Rejection.
- F. The Specifications Engineer will update and maintain the status of all items submitted and will forward the recommendations to the Specification Committee for review and approval. After Specification Committee approval, the Specification Engineer will notify the suppliers, manufacturers or persons who submitted the item of the decision of the Specifications Committee. The Specification Engineer will finalize the item record in the database and the record will remain on the public facing web page.