



**MINUTES
OF
IOWA DOT SPECIFICATION COMMITTEE MEETING**

May 12, 2016

Members Present:	Darwin Bishop Mark Brandl Donna Buchwald Jeff Devries Eric Johnsen, Secretary Greg Mulder Wes Musgrove Gary Novey Tom Reis, Chair Brian Smith	District 3 - Construction District 6 - Davenport RCE Office of Local Systems District 1 - Materials Specifications Section Office of Construction & Materials Office of Contracts Office of Bridges & Structures Specifications Section Office of Design
Members Not Present:	Charlie Purcell Willy Sorensen	Project Delivery Bureau Office of Traffic & Safety
Advisory Members Present:	Lisa McDaniel Paul Wiegand	FHWA SUDAS
Others Present:	Mike Heller Kevin Merryman	Office of Design Office of Construction & Materials

Tom Reis, Specifications Engineer, opened the meeting. The following items were discussed in accordance with the agenda dated May 2, 2016:

The agenda is as follows:

1. Article 2412.02, Concrete Bridge Decks.

The Office of Construction and Materials requested to add requirements for air content when placing by pump.

**2. Article 2503.03, D, 2, Reinforced Concrete Pipe, Reinforced Concrete Arch Pipe, and Reinforced Concrete Elliptical Pipe.
Article 4149.03, Storm Sewer Pipe.**

The Specifications Section requested to update jointing methods to match SUDAS.

**3. Article 2525.03, E, 2, Traffic Signal and Pedestal Poles and Pedestrian Push Button Posts
Article 2554.05, A, Pipe and Fittings.**

The Specifications Section requested to add tightening methods to match SUDAS.

4. Section 2526, Construction Survey.

The Office of Construction and Materials requested to update the specification to reflect new monument preservation legislation and clarify submittal requirements at project completion.

5. Article 2554.04, A, Pipe and Fittings.

Article 2554.05, A, Pipe and Fittings.

The Specifications Section requested to add another option for bidding water service stubs to match SUDAS.

6. Article 2601.03, Placement of Erosion Control.

The Office of Design requested to add specifications for drop seeders and salt tolerant seeding and require slit seeders for rural seeding.

7. Article 4108.01, Fly Ash.

The Office of Construction and Materials requested to add specifications for natural pozzolans, a new supplementary cementitious material.

8. Article 4137.01, General Requirements (Asphalt Binder).

The Office of Construction and Materials requested to waive stress sensitivity limits for very stiff binders.

9. Article 4169.12, Perimeter and Slope Sediment Control Device.

The Office of Design requested to delete wattles and filter socks from the specifications.

Additional Items

The Office of Local Systems asked about adding a bid item for traffic control diary. Some County Engineers had indicated that they were not getting traffic control diaries turned in on time. The Office of Construction and Materials indicated that the Construction Manual gives direction on how to handle failure to submit a traffic control diary (Chapter 2.53, F, 3). The Office of Construction and Materials indicated that the Department is looking into a traffic control app, that would be updated in real time and allow the Engineer to review the traffic control without submittal of a traffic control diary.

The Office of Construction and Materials asked if the Specifications Section could create a sign-up for receiving Specification Committee Meeting agendas and minutes. That way they would get out to more than just the construction associations and heads of each office and alleviate the need to forward. The Specifications Section will develop an automated list for companies and individuals to sign up to receive future Specification Committee Meeting agendas and minutes.

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Greg Mulder		Office: Construction & Materials	Item 1
Submittal Date: May 2016		Proposed Effective Date: October 2016	
Article No.: 2412.02		Other:	
Title: Concrete Bridge Decks			
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 5/12/2016	Effective Date: 10/18/2016
Specification Committee Approved Text: See Specification Section Recommended Text.			
Comments: The Office of Bridges and Structures asked how much a higher tolerance on air could affect the strength of the concrete. The District 1 Office indicated that the theoretical loss in strength is 5% for every 1% rise in air content, but our strengths are well above our design strength.			
Specification Section Recommended Text:			
2412.02, Materials.			
Add the Article:			
G. Meet requirements of Article 2403.02, B, 3 for entrained air content. When concrete is placed by pumping, use a target value of 7.0% plus or minus 2.0%.			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight .)			
2412.02 MATERIALS.			
G. Meet requirements of Article 2403.02.B.3 for entrained air content. When concrete is placed by pumping, use a target value of 7.0% +/-2.0%.			
Reason for Revision: Now testing for air content at last point of placement. Contractor is responsible for establishing correlation through the pump. This change will allow for a wider tolerance in air content, due to variability introduced with concrete pumping.			
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: Discussed at IRMCA Technical Committee Meeting April 13, 2016.			

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Tom Reis / Eric Johnsen		Office: Specifications	Item 2
Submittal Date: 2016.04.25		Proposed Effective Date: October 18, 2016	
Article No.: 2503.03, D, 2 Title: Reinforced Concrete Pipe, Reinforced Concrete Arch Pipe, and Reinforced Concrete Elliptical Pipe Article No.: 4149.03 Title: Storm Sewer Pipe		Other:	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 5/12/2016	Effective Date: 10/18/2016
Specification Committee Approved Text: See Specification Section Recommended Text.			
<p>Comments: The Office of Construction and Materials asked if the joint wrapping detail in the Standard Road Plans needs to be revised to show the wrapping of a bell joint. The existing typical shows a 12" overlap on each side of the tongue and groove joint, which can be accomplished with a 24" wide fabric. The bell joint would lose some width as the bell can be almost 6" wider than the opposite end of the pipe. Do we need 12" coverage on both sides of the joint or would the shorter length be adequate? The Office of Design will look into this to see if the 12" was based on any data or just a nominal required width.</p> <p>The Office of Design will review other Standard Road Plans, such as DR-102 and DR-211, to see if any changes need to be made due to the change in jointing materials.</p>			
Specification Section Recommended Text:			
2503.03, D, 2, Reinforced Concrete Pipe, Reinforced Concrete Arch Pipe, and Reinforced Concrete Elliptical Pipe.			
<p>Replace the Article:</p> <p>a. Use cold applied bituminous or rubber rope gasket jointing materials unless specified otherwise.</p> <p>1) Apply joint material to entire tongue, or to top half of tongue and bottom half of groove, in sufficient quantity to fill the joint. Close the joint between pipes.</p> <p>2) Fill remaining voids in the joint, both inside and outside of pipe, with joint material. Smooth the joint material on the inside of pipes 24 inches and larger.</p> <p>b. If a rubber O-ring or profile gasket is specified for RCP, coat the rubber gasket and joint with soap based lubricant immediately prior to closing the joint.</p> <p>c a. a. If wrapped pipe joint is specified, cComply with the contract documents Standard Road Plan SW-211 for pipe joint wrapping. Secure engineering fabric in place to prevent displacement while placing backfill material.</p> <p>d c. c. Place pipe such that joint openings on the outside or inside of the pipe do not exceed 1/8 inch at the bottom and 5/8 inch at the top.</p>			
4149.03, Storm Sewer Pipe.			
<p>Replace Articles A and B:</p> <p>A. Reinforced Concrete Pipe.</p>			

1. Comply with Section 2419 and ASTM C 76.
2. Minimum Class 2000D (Class III, Wall B).
3. Tongue and groove joints with cold applied bituminous or rubber rope jointing materials, unless otherwise specified wrapped with engineering fabric. If specified, use rubber O-ring or profile gasket complying with ASTM C 443 (AASHTO M 315).
4. If specified, wrap exterior of each joint with engineering fabric use rubber O-ring or profile gasket complying with ASTM C 443.

B. Low Clearance Reinforced Concrete Pipe.

1. Comply with Section 2419 and either AASHTO M 206 (RCAP) or M 207 (RCEP).
2. Minimum Class 2000D (A-III or HE-III).
3. Use †Tongue and groove joints with cold applied bituminous or rubber rope gasket jointing materials, unless specified otherwise wrapped with engineering fabric.
4. If specified, wrap exterior of each joint with engineering fabric use rubber O-ring or profile gasket complying with ASTM C 443.

4149.03, E, Jointing Material for Concrete Apron.

Delete the Article:

~~E. Jointing Material for Concrete Apron.~~

~~1. Bituminous Jointing Material.~~

~~Use a cold-applied mastic sewer joint sealing compound recommended by the manufacturer for the intended use and approved by the Engineer. Comply with ASTM C 990.~~

~~2. Rubber Rope Gasket Jointing Material.~~

~~Comply with ASTM C 990.~~

~~3. Rubber O-Ring or Profile Gasket.~~

~~Comply with ASTM C 443 (for RCP) or ASTM C 361 (for RCPP).~~

Comments:

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

Reason for Revision: To match SUDAS. Some storm sewer pipe jointing methods were obsolete. Wrapping pipe joints is now required.

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: Tom Reis / Eric Johnsen	Office: Specifications	Item 3
Submittal Date: 2016.04.25	Proposed Effective Date: October 18, 2016	
Article No.: 2525.03, E, 2 Title: Traffic Signal and Pedestal Poles and Pedestrian Push Button Posts Article No.: 4189.05, D, 2 Title: Traffic Signal Pedestal Poles	Other:	

Specification Committee Action: Approved with changes.

Deferred:	Not Approved:	Approved Date: 5/12/2016	Effective Date: 10/18/2016
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Specification Committee Approved Text:

2525.03, E, 2, Traffic Signal and Pedestal Poles and Pedestrian Push Button Posts.

Replace the Article:

- a. Erect poles and posts vertically under normal load.
- b. Securely bolt bases to the cast-in-place concrete foundations using the procedures in Articles 2522.03, H, 2, a through h.
 - ~~1) Mast Arm Poles: Provide footing type (A through F) as specified in the contract documents. Level by using two nuts on each anchor bolt or according to the manufacturer's recommendations.~~
 - ~~2) Pedestal Poles: Level by using metal shims and one nut on each anchor bolt or according to the manufacturer's recommendations.~~
 - ~~3) Pedestrian Push Button Posts: Weld the post to the base plate using a minimum 3/16 inch weld. Level by using two nuts on each bolt.~~
- c. Use a torque wrench to verify that a torque at least equal to the computed verification torque, T_v , is required to additionally tighten the top nuts. An inability to achieve this torque shall be interpreted to indicate the threads have stripped and shall be reported to the Engineer.

$$T_v = 0.12d_b F_I$$

Where:

T_v = verification torque (inch-kips)

d_b = nominal body diameter of the anchor rod (inches)

F_I = installation pretension (kips) equal to 50% of the specified minimum tensile strength of ASTM F 1554, Grade 36 rods, and 60% for the rest of threaded fasteners.

- ~~d.~~ After leveling the poles, use non-shrink grout or a rodent guard between the pole base and foundation. When non-shrink grout is used, neatly finish exposed edges of grout to present a pleasing appearance, and place a weep hole in the grout.
- ~~e.~~ Apply anti-seize compound to all mechanical fasteners on pole access doors.
- ~~f.~~ Install pedestrian push button post caps with tamper-proof set screws per manufacturer's direction or by driving the cap a minimum of 1/2 inch onto the post.

4189.05, D, 2.

Replace the Article:

Anchor Bolts: Four 3/4 inch by 15 inch steel, hot dip galvanized anchor bolts complying with ASTM F 1554, Grade 36, with right angle bend at the bottom end, complete with all hardware required for installation.

Comments: The Office of Bridges and Structures indicated that they will review the use of these methods for sign trusses, tower lighting, and lighting poles.

The Office of Bridges and Structures asked if we should remove leveling nuts from the torque verification, since you may not be able to get a torque wrench on the leveling nut. This was done.

The Davenport RCE asked if we could hyperlink the guidelines or include the calculation for verification torque in the specifications so that the inspector did not need to go out and find it. The calculation was added.

The Davenport RCE asked if the threads below the leveling nut should be stripped after the leveling nut is made snug tight so that the leveling nut cannot loosen over time. The committee felt that the torque placed on the top nut and friction should keep the leveling nut from moving.

Specification Section Recommended Text:

2525.03, E, 2, Traffic Signal and Pedestal Poles and Pedestrian Push Button Posts.

Replace the Article:

- a. Erect all poles and posts vertically under normal load.
- b. Securely bolt the bases to the cast-in-place concrete foundations using the procedures in Articles 2522.03, H, 2, a through h.
 - 1) ~~Mast Arm Poles: Provide footing type (A through F) as specified in the contract documents. Level by using two nuts on each anchor bolt or according to the manufacturer's recommendations.~~
 - 2) ~~Pedestal Poles: Level by using metal shims and one nut on each anchor bolt or according to the manufacturer's recommendations.~~
 - 3) ~~Pedestrian Push Button Posts: Weld the post to the base plate using a minimum 3/16 inch weld. Level by using two nuts on each bolt.~~
- c. Use of a torque wrench to verify that a torque at least equal to the computed verification torque, *T_v*, according to paragraph 6.9 of *FHWA Guidelines for the Installation, Inspection, Maintenance, and Repair of Structural Supports for Highway Signs, Luminaires, and Traffic Signals*, is required to additionally tighten the leveling nuts and the top nuts. An inability to achieve this torque shall be interpreted to indicate the threads have stripped and shall be reported to the Engineer.
- d. After leveling the poles, use non-shrink grout or a rodent guard between the pole base and the foundation. When non-shrink grout is used, neatly finish exposed edges of grout to present a pleasing appearance, and place a weep hole in the grout.
- e. Apply anti-seize compound to all mechanical fasteners on pole access doors.
- f. Install pedestrian push button post caps with tamper-proof set screws per manufacturer's direction or by driving the cap a minimum of 1/2 inch onto the post.

4189.05, D, 2.

Replace the Article:

Anchor Bolts: Four 3/4 inch by 15 inch steel, hot dip galvanized anchor bolts complying with ASTM F 1554, Grade 36, with right angle bend at the bottom end, complete with all hardware required for installation.

Comments: Should these tightening procedures be used for highway lighting poles also?

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

Reason for Revision: To match SUDAS. Previously no tightening requirements were given for traffic signal poles.		
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:		

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Greg Mulder / Kevin Merryman		Office: Construction & Materials	Item 4
Submittal Date: 2016.04.22		Proposed Effective Date: October 2016	
Section No.: 2526 Title: Construction Survey		Other:	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 5/12/2016	Effective Date: 10/18/2016
Specification Committee Approved Text: See Specification Section Recommended Text.			
<p>Comments: The Davenport RCE asked what the definition of a monument was. He indicated that some surveyors have a difference of opinion on what qualifies as a monument, such as PC's and PT's. The bill defines a monument as "a physical structure which marks the location of a corner or other survey point". The committee decided to go ahead with the recommended language and review whether additional language needs to be added to clarify monument preservation. Hopefully, the Iowa Code will be clarified and take care of this issue for us. The Office of Construction and Materials indicated that Department surveyors were included in the review of this section and agreed with the revisions.</p> <p>This work has to be done under the supervision of a Professional Land Surveyor and not just a Professional Engineer.</p>			
Specification Section Recommended Text:			
2526, Construction Survey.			
<p align="center">Replace the Section:</p>			
<p>2526.01 DESCRIPTION. Perform survey for construction projects.</p>			
<p>2526.02 MATERIALS. None.</p>			
<p>2526.03 SURVEY.</p>			
<p>A. Furnish all survey necessary for construction of the project before work begins in the area. Comply with Iowa Code requirements, including monument preservation, under the direct supervision of an Iowa licensed land surveyor. Do not apply the provisions of Article 1105.15 to this work, except to preserve the original stakes set by the Engineer. Refer to Article 1105.16 for requirements when AMG is utilized. If, in the opinion of the Engineer, the Contractor has destroyed or disturbed any of the original survey stakes or benchmarks, the cost of replacing will be charged to the Contractor. Bring design errors discovered to the Engineer's attention for review prior to staking. Construction survey includes qualified personnel, equipment, and supplies required for, but not limited to, the following items:</p>			
<p>1. Monument Preservation Preserve existing monuments as required by Iowa Code.</p>			
<p>2. Project Control.</p>			
<p>a. Primary Control Monuments. A primary control monument is a survey point the Contracting Authority establishes prior to project commencement. These are shown in the contract documents. The point will be established by placing a monument in the ground.</p>			
<p>b. Secondary Control Monuments. A secondary control monument is a survey point the Contractor establishes on grading or other projects specified in the plans, and preserves on all other projects.</p>			
<p>1) The Engineer will provide monuments, similar to those the Department uses for GPS control.</p>			
<p>2) Place secondary permanent horizontal control monuments, under the Engineer's direction,</p>			

at locations likely to survive project construction and at intervals not to exceed 2640 feet. Place the monuments in the ground along the project corridor. Place at higher elevations along the corridor to provide a view of the immediate project topography and to provide for visible clear line of sight to the nearest secondary permanent control monument in either direction. Primary project monuments may be substituted if appropriate.

- 3) Plant secondary control monuments 1 to 4 inches below existing ground. Drive a metal fence post within 1 foot to mark their location.
- 4) Carefully determine project coordinates relative to the nearest primary project control monument using project coordinate values the Engineer has provided. Ensure the resulting error radius of the secondary monument does not exceed 0.10 feet \pm 2 ppm relative to the primary control. ~~Provide the Engineer with all the field data of the survey. The data may be either unedited printed or electronic formatted field data, or both. Provide the Engineer with an ASCII comma delineated file of the coordinates formatted as (Point Number, Northing, Easting, Elevation, Point Description, Feature).~~
- 5) Perform an independent traverse check between the secondary control monuments by observing distance and angular measurements or by use of GPS. ~~Provide the Engineer with all the field data for the traverse check. The data may be either unedited printed or electronic file, or both.~~ Provide the Engineer with a diagram indicating horizontal ground distances to nearest 0.01 foot and angles to at least the nearest 10 seconds between each secondary control monument. Ensure inverses between the coordinate pairs as determined in the previous paragraph do not exceed 0.10 feet of the direct measurements.
- 6) Replace secondary control monuments disturbed during construction activities using procedures outlined above, at no additional cost to the Contracting Authority.

c. Durable Physical Objects.

- 1) ~~Using measurements to the nearest 0.10 foot, reference each control monument to a minimum of three durable physical objects located 20 to 100 feet away from the monument. Durable physical objects could include trees, poles, fence posts, station marks in new roadway pavement, or metal fence posts.~~
- 2) ~~Provide the Engineer with either a printed or electronic reference image (for example JPEG, TIFF, etc), or both, including each reference and project coordinate.~~

d c. Benchmarks.

- 1) Establish permanent vertical control benchmarks at all bridges and reinforced concrete box culverts within the project. Use an Iowa DOT brass plug on bridge barrier rail or headwall of reinforced concrete box culvert to indicate the benchmark. If the Engineer approves, a sawn "X" on bridge barrier rail or headwall of reinforced concrete box culvert may be used.
- 2) Transfer all benchmark elevations from construction plan benchmarks to the permanent benchmarks using the three-wire method or by trigonometric leveling. Use temporary benchmarks of reasonable stability to preserve the plan benchmarks.
- 3) ~~Provide the Engineer with all field benchmark elevation data. The data may be either unedited printed or electronic formatted, or both. Provide the Engineer with the project x and y coordinates of all benchmarks along with an ASCII comma delineated file of the coordinates formatted as (Point Number, Northing, Easting, Elevation, Point Description, Feature).~~
- 4) 3) Ensure benchmark level loops do not exceed an error of 0.05 feet times the square root of the loop's length in miles. Distribute the error equally along the loop on all intermediate traverse/benchmark points.

2 3. Grading.

a. General.

- 1) Survey right-of-way line between permanent right-of-way corners at 100 foot intervals, or less if needed, including borrows, temporary easements, and right of entry. Mark these points by placement of a metal pin or wood hub, flat, and lath at the same location as the slope stakes. Clearly mark the flat with the station number, distance from centerline, and elevation (cut or fill) to subgrade.
- 2) Take original and final elevations of all borrows. Provide original and final ~~graphical cross sections at 100 foot intervals, or less if needed~~ digital terrain model (DTM) in LandXML format, suitable for use by the Engineer to calculate excavation quantities.
- 3) Set bridge berm slope stakes to establish all transitions, including the face of the berm. Set finish grade stakes (blue tops) on all roadway shoulder lines and roadway centerlines to project down the face of the bridge berm at the top, face of berm bench, and toe.
- 4) When Class 12 excavation is an item, ~~take cross section elevations at 100 foot intervals, or less if needed, and plot cross sections~~ provide original and final DTM in LandXML format for

use by the Engineer to calculate the excavation quantities.

- 5) Use a lath to locate, on each side of roadway at the right-of-way line, agricultural drain tile shown in the contract documents. Clearly mark lath to show station location, distance from centerline, tile size and type, and flowline elevation.

b. Areas Constructed Without AMG.

- 1) Set slope stakes at 100 foot intervals, or less if needed, for embankment and excavation work including roadway, channel changes, and borrow areas. Interpolations may be necessary to match cross-sections. Set stakes at toe of foreslope or top of backslope, or both. Mark slope stakes with a flat and lath. Clearly mark flat with station location, distance, slope, and cut or fill information.
- 2) Set grade check stakes at 100 foot intervals for bottoms of subgrade treatments. Set stakes on centerline for two-lane roads and in median for four-lane roads. Mark grade check stakes with a lath. Clearly mark lath with station location and cut or fill information.
- 3) Set finish grade stakes (blue tops) at 100 foot intervals, or less if needed. Set blue tops at each shoulder line and each point where there is a change in cross slope. Mark blue tops with a wood hub and stake chaser or similar type tassel.

c. Areas Constructed With AMG.

- 1) Establish elevation of secondary control points using differential leveling from project benchmarks, forming closed loops. Provide a copy of new control point information to Engineer prior to construction work. Contractor is responsible for errors resulting from their efforts. Correct deficiencies to the satisfaction of the Engineer at no additional cost to Contracting Authority.
- 2) Set hubs at top of finished subgrade at hinge points on cross section at 1000 foot intervals on mainline and at least two cross sections on side roads and ramps. Establish these hubs, using means other than the machine guidance surface (such as plan typicals and cross sections), for use by Engineer to check accuracy of construction.
- 3) Provide grade stakes at critical transition points such as, but not limited to, PC's, PT's, super elevation points, and other critical points required for construction of drainage and roadway structures.

3 4. Bridges.

- a. Mark locations and elevations with metal pin or tack in a wood hub, flat, and lath. Clearly mark flat with the pier/abutment station location, design number, and offset distance from centerline of the approach roadway.
- b. Establish a minimum of three temporary benchmarks.
- c. Mark location of test pile with a wood hub.
- d. Perform an independent check of the above stakes. Independent check shall be performed by a second survey crew using their own calculations and equipment entries for staking bridge. Results and staking layout shall be sent to the Engineer prior to starting structure construction.
- e. Submit elevations of all completed substructure beam seats to the Engineer for review prior to installation of bearings and superstructure elements.
- f. Take elevations of beams as erected. Develop proposed final deck grades for review by the Engineer on an Excel spreadsheet format. Provide proposed final deck grades to the Engineer for determination of required deck grade adjustments and approval of final deck grades for deck construction. Locations for determining beam elevations are to be according to the plans.
- g. Provide the Engineer with a copy of the staking diagram prior to commencing work.

4 5. Reinforced Concrete Box Culverts.

- a. Mark locations and elevations with metal pin or tack in a wood hub, flat, and lath. Clearly mark the flat with the station location, design number, cut/fill elevation, and offset distance from the centerline of the culvert and back of parapet.
- b. Perform an independent check of the above stakes.
- c. Provide the Engineer with a copy of the staking diagram prior to commencing work.
- d. Report to the Engineer questionable flow lines and alignments that do not match existing drainage.

5 6. Pipe Culverts.

- a. Mark locations and elevations with metal pin or a wood hub, flat, and lath. Clearly mark the flat with the station location, cut/fill elevation, and offset distance to both ends or centerline of pipe.
- b. Report to the Engineer questionable flow lines and alignments that do not match existing drainage.

6 7. Sanitary and Storm Sewers.

Mark locations and elevations with metal pin or tack in a wood hub, flat, and lath. Clearly mark the flat with the station location, pipe number, cut/fill elevation, and offset distance to centerline of pipe.

7 8. Water Mains.

Mark locations and elevations with metal pin or tack in a wood hub, flat, and lath. Clearly mark the flat with the station location, pipe number, cut/fill elevation, and offset distance to centerline of pipe.

8 9. Intakes and Utility Accesses.

Mark locations and elevations with metal pin or tack in a wood hub, flat, and lath. Clearly mark the flat with the station location, intake or utility access number, cut/fill elevation (including bottom of well and form grade), and offset distance to the Station Location.

9 10. Pavements (PCC & HMA) and Overlays (PCC).

a. General.

- 1) Obtain elevations of adjacent pavement and bridges at centerline, edge of pavement, and other locations necessary to characterize existing profile and cross slope. Obtain elevations at maximum 10 foot intervals for a minimum of 100 feet. Adjust design profile grade and cross slope to provide a smooth transition, free of bumps and dips, from the new pavement to the existing pavement or bridge. Notify the Engineer when a smooth profile cannot be provided. Submit final elevations to the Engineer before paving begins.
- 2) For PCC and HMA pavements, ~~W~~ when a new profile grade is not included in the contract documents:
 - a) Obtain elevations of the existing pavement and bridges at 100 foot intervals on straight and level sections and 50 foot intervals on horizontal and vertical curves.
 - b) Using these elevations, design a profile grade and cross slopes to provide a smooth transition, free of bumps and dips, from the new pavement to the existing pavement or bridge. Design a smooth profile grade line to provide the required pavement or shoulder thickness as detailed in the contract documents. Notify the Engineer when a smooth profile cannot be provided. Submit final elevations to the Engineer before paving begins.
- 3) For PCC overlays, when a new profile grade is not included in the contract documents:
 - a) Obtain elevations of existing pavement at centerline and both pavement edges for bonded overlays and projects including mainline stress relief course and/or pavement scarification.
 - b) Obtain elevations of existing pavement at centerline, quarter points, and both pavement edges for unbonded overlays and whitetopping projects when a stress relief course and/or pavement scarification are not included.
 - c) Obtain elevations at maximum 50 foot intervals on straight and level sections and at maximum 25 foot intervals on horizontal and vertical curves.
 - d) Using these elevations, design a profile grade and cross slopes to provide a smooth transition, free of bumps and dips, from the new pavement to the existing pavement or bridge. Design a smooth profile grade line to provide the required pavement or shoulder thickness as detailed in the contract documents. Notify the Engineer when a smooth profile cannot be provided. Submit final elevations to the Engineer before paving begins.

b. Areas Constructed Without AMG.

Mark locations and elevations with metal pin or tack in wood hub (only tack one side), flat, and lath. Mark elevations on both sides of pavement at 50 foot intervals on straight and level sections and 25 foot intervals on horizontal and vertical curves. Clearly mark flat with station location, cut or fill information, and offset distance to edge of pavement. Include pavement cross slope information in superelevated curves.

c. Areas Constructed With AMG.

- 1) When total stations are used for the AMG paving system, set additional control points at maximum 500 foot intervals on each side of pavement. Furnish x,y,z coordinates and station offset information for each point.
- 2) Set paving hubs with cut or fill to finish pavement elevation at A, B, C, and D points along superelevated curve transitions and at station equation locations. Additional paving hubs will not be required for mainline pavement.

10. HMA Overlays

- a. ~~Reference and preserve existing control points located at each Point of Intersection (P.I.).~~

- b. Obtain the Engineer's approval for the method used to reference points.
- c. Reset Control Points after the work is complete.

11. PCC Overlays

a. General.

- 1) Obtain elevations of adjacent pavement and bridges at centerline, edge of pavement, and other locations necessary to characterize existing profile and cross slope. Obtain elevations at maximum 10-foot intervals for a minimum of 100 feet. Adjust design profile grade and cross slope to provide a smooth transition, free of bumps and dips, from the new pavement to the existing pavement or bridge. Notify the Engineer when a smooth profile cannot be provided. Submit final elevations to the Engineer before paving begins.
- 2) When a new profile grade is not included in the contract documents:
 - a) Obtain elevations of adjacent pavement and bridges per Article 2526.03, A, 11, a, 1.
 - b) Obtain elevations of existing pavement at centerline and both pavement edges for bonded overlays and projects including mainline stress relief course and/or pavement scarification.
 - c) Obtain elevations of existing pavement at centerline, quarter points, and both pavement edges for unbonded overlays and whitetopping projects when a stress relief course and/or pavement scarification are not included.
 - d) Obtain elevations at maximum 50-foot intervals on straight and level sections and at maximum 25-foot intervals on horizontal and vertical curves.
 - e) Using these elevations, design a profile grade and cross slopes to provide a smooth transition, free of bumps and dips, from the new pavement to the existing pavement or bridge. Design a smooth profile grade line to provide the required pavement or shoulder thickness as detailed in the contract documents. Notify the Engineer when a smooth profile cannot be provided. Submit final elevations to the Engineer before paving begins.
- 3) Reference and preserve existing control points located at each Point of Intersection (P.I.).
- 4) Obtain Engineer's approval for method used to reference points.
- 5) Reset Control Points after work is complete.

b. Areas Constructed Without AMG:

Mark locations and elevations with metal pin or tack in wood hub (only tack one side), flat, and lath. Mark elevations on both sides of pavement at 50-foot intervals on straight and level sections and 25-foot intervals on horizontal and vertical curves. Clearly mark flat with station location, cut or fill information, and offset distance to edge of pavement. Include pavement cross slope information in superelevated curves.

c. Areas Constructed With AMG:

- 1) When total stations are used for the AMG paving system, set additional control points at maximum 500-foot intervals on each side of pavement. Furnish x,y,z coordinates and station offset information for each point.
- 2) Set paving hubs with cut or fill to finish pavement elevation at A, B, C, and D points along superelevated curve transitions and at station equation locations. Additional paving hubs will not be required for mainline pavement.

12 11. Structural Walls.

- a. Survey requirements for structural walls includes the following work types:
 - 1) Mechanically Stabilized Earth (MSE) Walls.
 - 2) Cast in Place (CIP) Retaining Walls.
 - 3) Soil Nail Walls.
 - 4) Tie Back Walls.
 - 5) Noise Walls.
 - 6) Modular Block Retaining Walls.
 - 7) Segmental Retaining Walls.
- b. Mark locations and elevations with a metal pin or a wood hub, flat, and lath. Clearly mark the flat with the station location, cut/fill elevation, and offset distance to face of wall.

- B. Submit the method used to preserve project control to the Engineer for approval. Format the survey work documentation in a manner acceptable to the Engineer. Ensure monument preservation work is completed by a Professional Land Surveyor licensed in the State of Iowa in responsible charge, according to the provisions of Iowa Code 542B. Ensure all other survey work is completed by a Professional Engineer licensed in the State of Iowa in responsible charge or a Professional Land Surveyor licensed in the State of Iowa in responsible charge, according to the provisions of Iowa Code 542B. Submit a resume

to the Engineer identifying the field survey personnel and their capabilities to perform the intended requirements.

C. Obtain the Engineer's approval for the method of determining alignments and elevations and the method of preserving control points. This approval does not act to relieve the Contractor of the responsibility for the correctness of the survey work. Do not use plan cross-sections for vertical or horizontal control.

~~**D.** The Engineer will provide bench mark elevations, right of way corners, and reference control points on the original survey as shown in the contract documents. A GeoPak alignment will be provided if available.~~

E D. Check tie-ins with existing roadways for correctness of alignment prior to construction staking.

~~**F.** When survey work is done under traffic, detail sheets in the contract documents will establish the required signing.~~

G E. Establish benchmarks in the adjacent area before installing settlement plates in accordance with Article 2526.03, A, 4 2, d c.

~~1. Obtain Engineer's approval for method of determining alignments and elevations and the method of preserving control points. This approval does not relieve Contractor of the responsibility for correctness of survey work.~~

~~2. Do not use plan cross-sections for vertical or horizontal control.~~ The Engineer will locate and determine elevations of settlement plates.

~~**H.** Replace land corners and permanent reference markers unless stated otherwise in the contract documents.~~

I F. All survey work documentation becomes the property of the Contracting Authority. Assemble required documentation into a single electronic package upon completion of the project and furnish to the Engineer. The work of this specification will be considered finished complete when the following documentation is furnished to and accepted by the Engineer:-

1. ASCII comma delineated file of the coordinates formatted as (Point Number, Northing, Easting, Elevation, Point Description, Feature). Identify coordinate system used.

2. Monument preservation certificates.

3. Secondary control monument coordinates including traverse check.

4. Reference monument drawings.

5. Benchmark coordinates.

6. Required DTMs.

7. Bridge and box culvert staking diagrams.

8. Final profile grades.

J G. For the purpose of subcontracting, this item will be considered a specialty item.

2526.04 METHOD OF MEASUREMENT.

None. Lump sum item.

2526.05 BASIS OF PAYMENT.

A. Payment for Construction Survey will be paid for at the lump sum contract price.

B. Payment is full compensation for the survey work required for the project as let, including any interpolations that may be necessary between cross-section and field staking.

C. Payment for revisions after the letting will be paid for according to Article 1109.03, B.

Comments:

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

Section 2526. Construction Survey

2526.01 DESCRIPTION.

Perform survey for construction projects.

2526.02 MATERIALS.

None.

2526.03 SURVEY.

- A. Furnish all survey necessary for construction of the project before work begins in the area. ~~Comply with applicable Iowa Code requirements including monument preservation under the direct supervision of an Iowa licensed land surveyor~~ Do not apply the provisions of Article 1105.15 to this work, except to preserve the original stakes set by the Engineer. Refer to Article 1105.16 for requirements when AMG is utilized. If, in the opinion of the Engineer, the Contractor has destroyed or disturbed any of the original survey stakes or benchmarks, the cost of replacing will be charged to the Contractor. Bring design errors discovered to the Engineer's attention for review prior to staking. Construction survey includes qualified personnel, equipment, and supplies required for, but not limited to, the following items:

2. Monument Preservation

~~Preserve existing monuments as required by Iowa Code.~~

2. Project Control.

a. Primary Control Monuments.

A primary control monument is a survey point the Contracting Authority establishes prior to project commencement. ~~These are shown in the contract documents.~~ The point will be established by placing a monument in the ground.

b. Secondary Control Monuments.

A secondary control monument is a survey point the Contractor establishes on grading or other projects specified in the plans, and preserves on all other projects.

- 1) The Engineer will provide monuments, similar to those the Department uses for GPS control.
- 2) Place secondary permanent horizontal control monuments, under the Engineer's direction, at locations likely to survive project construction and at intervals not to exceed 2640 feet. Place the monuments in the ground along the project corridor. Place at higher elevations along the corridor to provide a view of the immediate project topography and to provide for visible clear line of sight to the nearest secondary permanent control monument in either direction. Primary project monuments may be substituted if appropriate.
- 3) Plant secondary control monuments 1 to 4 inches below existing ground. Drive a metal fence post within 1 foot to mark their location.
- 4) Carefully determine project coordinates relative to the nearest primary project control monument using project coordinate values the Engineer has provided. Ensure the resulting error radius of the secondary monument does not exceed 0.10 feet \pm 2 ppm relative to the primary control. ~~Provide the Engineer with all the field data of the survey. The data may be either unedited printed or electronic formatted field data, or both. Provide the Engineer with an ASCII comma delineated file of the coordinates formatted as (Point Number, Northing, Easting, Elevation, Point Description, Feature).~~
- 5) Perform an independent traverse check between the secondary control monuments by observing distance and angular measurements or by use of GPS. ~~Provide the Engineer with all the field data for the traverse check. The data may be either unedited printed or electronic file, or both.~~ Provide the Engineer with a diagram indicating horizontal ground distances to nearest 0.01 foot and angles to at least the nearest 10 seconds between each secondary control monument. Ensure inverses between the coordinate pairs as determined in the previous paragraph do not exceed 0.10 feet of the direct measurements.
- 6) Replace secondary control monuments disturbed during construction activities using procedures outlined above, at no additional cost to the Contracting Authority.

c. Durable Physical Objects.

~~1) Using measurements to the nearest 0.10 foot, reference each control monument to a minimum of three durable physical objects located 20 to 100 feet away from the monument. Durable physical objects could include trees, poles, fence posts, station marks in new roadway pavement, or metal fence posts.~~

~~2) Provide the Engineer with either a printed or electronic reference image (for example JPEG, TIFF, etc), or both, including each reference and project coordinate.~~

d. Benchmarks.

1) Establish permanent vertical control benchmarks at all bridges and reinforced concrete box culverts within the project. Use an Iowa DOT brass plug on bridge barrier rail or headwall of reinforced concrete box culvert to indicate the benchmark. If the Engineer approves, a sawn "X" on bridge barrier rail or headwall of reinforced concrete box culvert may be used.

2) Transfer all benchmark elevations from construction plan benchmarks to the permanent benchmarks using the three-wire method or by trigonometric leveling. Use temporary benchmarks of reasonable stability to preserve the plan benchmarks.

~~3) Provide the Engineer with all field benchmark elevation data. The data may be either unedited printed or electronic formatted, or both. Provide the Engineer with the project x and y coordinates of all benchmarks along with an ASCII comma delineated file of the coordinates formatted as (Point Number, Northing, Easting, Elevation, Point Description, Feature).~~

4) Ensure benchmark level loops do not exceed an error of 0.05 feet times the square root of the loop's length in miles. Distribute the error equally along the loop on all intermediate traverse/benchmark points.

2. Grading.

a. General.

1) Survey right-of-way line between permanent right-of-way corners at 100 foot intervals, or less if needed, including borrows, temporary easements, and right of entry. Mark these points by placement of a metal pin or wood hub, flat, and lath at the same location as the slope stakes. Clearly mark the flat with the station number, distance from centerline, and elevation (cut or fill) to subgrade.

2) Take original and final elevations of all borrows. Provide original and final ~~graphical cross sections at 100 foot intervals, or less if needed digital terrain model (DTM) in LandXML format,~~ suitable for use by the Engineer to calculate excavation quantities.

3) Set bridge berm slope stakes to establish all transitions, including the face of the berm. Set finish grade stakes (blue tops) on all roadway shoulder lines and roadway centerlines to project down the face of the bridge berm at the top, face of berm bench, and toe.

~~4) When Class 12 excavation is an item, take cross section elevations at 100 foot intervals, or less if needed, and plot cross sections provide original and final DTM in LandXML format for use by the Engineer to calculate the excavation quantities.~~

5) Use a lath to locate, on each side of roadway at the right-of-way line, agricultural drain tile shown in the contract documents. Clearly mark lath to show station location, distance from centerline, tile size and type, and flowline elevation.

b. Areas Constructed Without AMG.

1) Set slope stakes at 100 foot intervals, or less if needed, for embankment and excavation work including roadway, channel changes, and borrow areas. Interpolations may be necessary to match cross-sections. Set stakes at toe of foreslope or top of backslope, or both. Mark slope stakes with a flat and lath. Clearly mark flat with station location, distance, slope, and cut or fill information.

2) Set grade check stakes at 100 foot intervals for bottoms of subgrade treatments. Set stakes on centerline for two-lane roads and in median for four-lane roads. Mark grade check stakes with a lath. Clearly mark lath with station location and cut or fill information.

3) Set finish grade stakes (blue tops) at 100 foot intervals, or less if needed. Set blue tops at each shoulder line and each point where there is a change in cross slope. Mark blue tops with a wood hub and stake chaser or similar type tassel.

c. Areas Constructed With AMG.

1) Establish elevation of secondary control points using differential leveling from project benchmarks, forming closed loops. Provide a copy of new control point information to Engineer prior to construction work. Contractor is responsible for errors resulting from their efforts. Correct deficiencies to the satisfaction of the Engineer at no additional cost to Contracting Authority.

2) Set hubs at top of finished subgrade at hinge points on cross section at 1000 foot intervals on mainline and at least two cross sections on side roads and ramps. Establish these hubs,

using means other than the machine guidance surface (such as plan typicals and cross sections, for use by Engineer to check accuracy of construction.

- 3) Provide grade stakes at critical transition points such as, but not limited to, PC's, PT's, super elevation points, and other critical points required for construction of drainage and roadway structures.

3. Bridges.

- a. Mark locations and elevations with metal pin or tack in a wood hub, flat, and lath. Clearly mark flat with the pier/abutment station location, design number, and offset distance from centerline of the approach roadway.
- b. Establish a minimum of three temporary benchmarks.
- c. Mark location of test pile with a wood hub.
- d. Perform an independent check of the above stakes. Independent check shall be performed by a second survey crew using their own calculations and equipment entries for staking bridge. Results and staking layout shall be sent to the Engineer prior to starting structure construction.
- e. Submit elevations of all completed substructure beam seats to the Engineer for review prior to installation of bearings and superstructure elements.
- f. Take elevations of beams as erected. Develop proposed final deck grades for review by the Engineer on an Excel spreadsheet format. Provide proposed final deck grades to the Engineer for determination of required deck grade adjustments and approval of final deck grades for deck construction. Locations for determining beam elevations are to be according to the plans.
- g. Provide the Engineer with a copy of the staking diagram prior to commencing work.

4. Reinforced Concrete Box Culverts.

- a. Mark locations and elevations with metal pin or tack in a wood hub, flat, and lath. Clearly mark the flat with the station location, design number, cut/fill elevation, and offset distance from the centerline of the culvert and back of parapet.
- b. Perform an independent check of the above stakes.
- c. Provide the Engineer with a copy of the staking diagram prior to commencing work.
- d. Report to the Engineer questionable flow lines and alignments that do not match existing drainage.

5. Pipe Culverts.

- a. Mark locations and elevations with metal pin or a wood hub, flat, and lath. Clearly mark the flat with the station location, cut/fill elevation, and offset distance to both ends or centerline of pipe.
- b. Report to the Engineer questionable flow lines and alignments that do not match existing drainage.

6. Sanitary and Storm Sewers.

Mark locations and elevations with metal pin or tack in a wood hub, flat, and lath. Clearly mark the flat with the station location, pipe number, cut/fill elevation, and offset distance to centerline of pipe.

7. Water Mains.

Mark locations and elevations with metal pin or tack in a wood hub, flat, and lath. Clearly mark the flat with the station location, pipe number, cut/fill elevation, and offset distance to centerline of pipe.

8. Intakes and Utility Accesses.

Mark locations and elevations with metal pin or tack in a wood hub, flat, and lath. Clearly mark the flat with the station location, intake or utility access number, cut/fill elevation (including bottom of well and form grade), and offset distance to the Station Location.

9. Pavements (PCC & HMA) and Overlays (PCC).

a. General.

- 1) Obtain elevations of adjacent pavement and bridges at centerline, edge of pavement, and other locations necessary to characterize existing profile and cross slope. Obtain elevations at maximum 10 foot intervals for a minimum of 100 feet. Adjust design profile grade and cross slope to provide a smooth transition, free of bumps and dips, from the new pavement to the existing pavement or bridge. Notify the Engineer when a smooth profile cannot be provided. Submit final elevations to the Engineer **before paving begins.**
- 2) **For PCC and HMA pavements, W**hen a new profile grade is not included in the contract documents:
 - a) Obtain elevations of the existing pavement and bridges at 100 foot intervals on straight

- and level sections and 50 foot intervals on horizontal and vertical curves.
- b) Using these elevations, design a profile grade and cross slopes to provide a smooth transition, free of bumps and dips, from the new pavement to the existing pavement or bridge. Design a smooth profile grade line to provide the required pavement or shoulder thickness as detailed in the contract documents. Notify the Engineer when a smooth profile cannot be provided. Submit final elevations to the Engineer **before paving begins.**

3) For PCC overlays, When a new profile grade is not included in the contract documents:

- a) Obtain elevations of adjacent pavement and bridges per Article 2526.03, A, 11, a, 1.
- b) Obtain elevations of existing pavement at centerline and both pavement edges for bonded overlays and projects including mainline stress relief course and/or pavement scarification.
- c) Obtain elevations of existing pavement at centerline, quarter points, and both pavement edges for unbonded overlays and whitetopping projects when a stress relief course and/or pavement scarification are not included.
- d) Obtain elevations at maximum 50 foot intervals on straight and level sections and at maximum 25 foot intervals on horizontal and vertical curves.
- e) Using these elevations, design a profile grade and cross slopes to provide a smooth transition, free of bumps and dips, from the new pavement to the existing pavement or bridge. Design a smooth profile grade line to provide the required pavement or shoulder thickness as detailed in the contract documents. Notify the Engineer when a smooth profile cannot be provided. Submit final elevations to the Engineer **before paving begins.**

b. Areas Constructed Without AMG.

Mark locations and elevations with metal pin or tack in wood hub (only tack one side), flat, and lath. Mark elevations on both sides of pavement at 50 foot intervals on straight and level sections and 25 foot intervals on horizontal and vertical curves. Clearly mark flat with station location, cut or fill information, and offset distance to edge of pavement. Include pavement cross slope information in superelevated curves.

c. Areas Constructed With AMG.

- 1) When total stations are used for the AMG paving system, set additional control points at maximum 500 foot intervals on each side of pavement. Furnish x,y,z coordinates and station offset information for each point.
- 2) Set paving hubs with cut or fill to finish pavement elevation at A, B, C, and D points along superelevated curve transitions and at station equation locations. Additional paving hubs will not be required for mainline pavement.

10. HMA Overlays

- a. Reference and preserve existing control points located at each Point of Intersection (P.I.).
- b. Obtain the Engineer's approval for the method used to reference points.
- c. Reset Control Points after the work is complete.

11. PCC Overlays

a. General.

- 1) Obtain elevations of adjacent pavement and bridges at centerline, edge of pavement, and other locations necessary to characterize existing profile and cross slope. Obtain elevations at maximum 10 foot intervals for a minimum of 100 feet. Adjust design profile grade and cross slope to provide a smooth transition, free of bumps and dips, from the new pavement to the existing pavement or bridge. Notify the Engineer when a smooth profile cannot be provided. Submit final elevations to the Engineer **before paving begins.**
- 2) When a new profile grade is not included in the contract documents:
 - a) Obtain elevations of adjacent pavement and bridges per Article 2526.03, A, 11, a, 1.
 - b) Obtain elevations of existing pavement at centerline and both pavement edges for bonded overlays and projects including mainline stress relief course and/or pavement scarification.
 - c) Obtain elevations of existing pavement at centerline, quarter points, and both pavement edges for unbonded overlays and whitetopping projects when a stress relief course and/or pavement scarification are not included.
 - d) Obtain elevations at maximum 50 foot intervals on straight and level sections and at maximum 25 foot intervals on horizontal and vertical curves.
 - e) Using these elevations, design a profile grade and cross slopes to provide a smooth transition, free of bumps and dips, from the new pavement to the existing pavement or

bridge. Design a smooth profile grade line to provide the required pavement or shoulder thickness as detailed in the contract documents. Notify the Engineer when a smooth profile cannot be provided. Submit final elevations to the Engineer before paving begins.

3) Reference and preserve existing control points located at each Point of Intersection (P.I.).

4) Obtain Engineer's approval for method used to reference points.

5) Reset Control Points after work is complete.

b. Areas Constructed Without AMG:

Mark locations and elevations with metal pin or tack in wood hub (only tack one side), flat, and lath. Mark elevations on both sides of pavement at 50 foot intervals on straight and level sections and 25 foot intervals on horizontal and vertical curves. Clearly mark flat with station location, cut or fill information, and offset distance to edge of pavement. Include pavement cross slope information in superelevated curves.

c. Areas Constructed With AMG:

1) When total stations are used for the AMG paving system, set additional control points at maximum 500 foot intervals on each side of pavement. Furnish x,y,z coordinates and station offset information for each point.

2) Set paving hubs with cut or fill to finish pavement elevation at A, B, C, and D points along superelevated curve transitions and at station equation locations. Additional paving hubs will not be required for mainline pavement.

12. Structural Walls.

a. Survey requirements for structural walls includes the following work types:

1) Mechanically Stabilized Earth (MSE) Walls.

2) Cast in Place (CIP) Retaining Walls.

3) Soil Nail Walls.

4) Tie Back Walls.

5) Noise Walls.

6) Modular Block Retaining Walls.

7) Segmental Retaining Walls.

b. Mark locations and elevations with a metal pin or a wood hub, flat, and lath. Clearly mark the flat with the station location, cut/fill elevation, and offset distance to face of wall.

B. Submit the method used to preserve project control to the Engineer for approval. Format the survey work documentation in a manner acceptable to the Engineer. Ensure monument preservation work is completed by a Professional Land Surveyor licensed in the State of Iowa in responsible charge, according to the provisions of Iowa Code 542B. Ensure all other survey work is completed by a Professional Engineer licensed in the State of Iowa in responsible charge or a Professional Land Surveyor licensed in the State of Iowa in responsible charge, according to the provisions of Iowa Code 542B. Submit a resume to the Engineer identifying the field survey personnel and their capabilities to perform the intended requirements.

C. Obtain the Engineer's approval for the method of determining alignments and elevations and the method of preserving control points. This approval does not act to relieve the Contractor of the responsibility for the correctness of the survey work. Do not use plan cross-sections for vertical or horizontal control.

D. The Engineer will provide bench mark elevations, right of way corners, and reference control points on the original survey as shown in the contract documents. A GeoPak alignment will be provided if available.

E. Check tie-ins with existing roadways for correctness of alignment prior to construction staking.

F. When survey work is done under traffic, detail sheets in the contract documents will establish the required signing.

G. Establish benchmarks in the adjacent area before installing settlement plates in accordance with Article 2526.03, A, 1, d.

1. Obtain Engineer's approval for method of determining alignments and elevations and the method of preserving control points. This approval does not relieve Contractor of the responsibility for correctness of survey work.

2. Do not use plan cross-sections for vertical or horizontal control.

The Engineer will locate and determine elevations of settlement plates.

~~H. Replace land corners and permanent reference markers unless stated otherwise in the contract documents.~~

I. All survey work documentation becomes the property of the Contracting Authority. Assemble all required documentation into a single electronic package upon completion of the project and furnish to the Engineer. The work of this specification will be considered finished complete when the following required documentation is furnished to and accepted by the Engineer:

1. ASCII comma delineated file of the coordinates formatted as (Point Number, Northing, Easting, Elevation, Point Description, Feature). Identify coordinate system used.
9. Monument preservation certificates
10. Secondary control monument coordinates including traverse check
11. Reference monument drawings
12. Benchmark coordinates
13. Required DTMs
14. Bridge and box culvert staking diagrams
15. Final profile grades

J. For the purpose of subcontracting, this item will be considered a specialty item.

2526.04 METHOD OF MEASUREMENT.

None. Lump sum item.

2526.05 BASIS OF PAYMENT.

- D. Payment for Construction Survey will be paid for at the lump sum contract price.
- E. Payment is full compensation for the survey work required for the project as let, including any interpolations that may be necessary between cross-section and field staking.
- F. Payment for revisions after the letting will be paid for according to Article 1109.03, B.

Reason for Revision: To update the spec. to reflect new monument preservation legislation. Revisions also clarify submittal requirements at project completion.

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: This was sent to AGC prior to submittal. They were generally OK with the proposed changes, but they do have some issues with the independent check language. They had a few suggestions to modify the proposed changes. Some suggested modifications were included.

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Tom Reis / Eric Johnsen		Office: Specifications	Item 5
Submittal Date: 2016.04.25		Proposed Effective Date: October 18, 2016	
Article No.: 2554.04, A Title: Pipe and Fittings Article No.: 2554.05, A Title: Pipe and Fittings		Other:	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 5/12/2016	Effective Date: 10/18/2016
Specification Committee Approved Text: See Specification Section Recommended Text.			
Comments: None.			
Specification Section Recommended Text: 2554.04, A, Pipe and Fittings. Replace Article 4 title: Water Service Stubs by Each. Add the Article: 5. Water Service Stubs by Length. a. Water Service Pipe. Each type and size of water service pipe will be measured in linear feet along the centerline of the pipe. b. Water Service Corporation. Each type and size of water service corporation will be counted. c. Water Service Curb Stop and Box. Each type and size of water service curb stop and box will be counted.			
2554.05, A, Pipe and Fittings. Replace Article 4 title: Water Service Stubs by Each. Add the Article: 5. Water Service Stubs by Length. a. Water Service Pipe. Payment will be the contract unit price per linear foot for each type and size of water service stub. b. Water Service Corporation. Payment will be made at the contract unit price for each type and size of water service corporation. c. Water Service Curb Stop and Box. Payment will be made at the contract unit price for each type and size of water service curb stop and box.			
Comments:			

Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)		
Reason for Revision: To match SUDAS. Some designers requested the option to bid water service stubs by length instead of each.		
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:		
County or City Comments:		
Industry Comments:		

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Brian Smith		Office: Design	Item 6
Submittal Date: 3/22/2016		Proposed Effective Date: 10/18/2016	
Article No.: 2601.03 Title: Placement of Erosion Control		Other:	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 5/12/2016	Effective Date: 10/18/2016
Specification Committee Approved Text: See Specification Section Recommended Text.			
Comments: None.			
Specification Section Recommended Text:			
2601.03, A, Equipment.			
Add the Article:			
19. Drop Seeder.			
One piece of equipment containing the following:			
<ul style="list-style-type: none"> • Pulverizer rollers in front of the seed tubes. • Ground driven seed meters. • Max seed tube spacing of 3 inches delivering seed between the pulverizer rollers and packer wheels. • Packer wheels pressing and firmly packing seed into the soil. 			
2601.03, B, 4, c, 1.			
Replace the Article:			
For Seed mixing, shall meet comply with the requirements of Materials I.M. 469.02. Use P permanent rural, permanent urban, urban stabilizing, salt tolerant seeding, Native Grass, Wetland Grass, and Wildflower seeding mixtures shall be mixed off-site by a seed conditioner approved by the Iowa Crop Improvement Association or other state's Crop Improvement Association.			
2601.03, C, 3, a, 3.			
Replace the first sentence:			
In areas with existing stabilized crop residue, apply seed with a native grass seed drill with a no till attachment through the small seed box slit seeder.			
2601.03, C, Types of Seeding.			
Add the Article:			
9. Salt Tolerant Seeding.			
a. Preparation and Application.			
1) Prepare seed according to Article 2601.03, B, 4, c.			
2) Prepare seedbed according to Article 2601.03, B, 4, a, and apply seed according to Article 2601.03, B, 4, d using only a drop seeder according to Article 2601.03, A, 19.			
b. Seed Mixture.			
Use seeding rates in Table 2601.03-7 for permanent seeding of rural areas, unless otherwise specified in the contract documents:			
Table 2601.03-7: Salt Tolerant Seed Rates			
Alkali grass		109 lbs. per acre	

Turf-type Tall Fescue ¹	109 lbs. per acre
Perennial ryegrass	66 lbs. per acre
Crested wheatgrass	66 lbs. per acre
Hard fine fescue	44 lbs. per acre
Sheep fine fescue	44 lbs. per acre
1. Turf-type Tall Fescue will contain a minimum 36 lbs. of each cultivar Inferno and Quest.	

c. Fertilizing.

- 1) Spread over the areas at the rate of 300 pounds per acre of 6-24-24 (or equivalent).
- 2) Apply provisions of Article 2601.03, B, 4, b.

d. Application Dates.

Normal permanent seed application dates are March 1 through May 31, and August 10 through September 30.

Comments: Do we need to add a bid item for Salt Tolerant Seeding?

Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use **Strikeout** and **Highlight**.)
2601.03, A, 19, Drop Seeder.

Add as a new article:

One piece of equipment that contains the following:

- Pulverizer rollers in front of the seed tubes.
- Ground driven seed meters.
- Max seed tube spacing of three inches that delivers seed between the pulverizer rollers and the packer wheels.
- Packer wheels that press and firmly pack seed into the soil.

2601.03, B, 4, c, 1.

Replace the article:

For Seed mixing, ~~shall meet~~ comply with the requirements of Materials I.M. 469.02. Use ~~P~~permanent rural, permanent urban, urban stabilizing, salt tolerant seeding, Native Grass, Wetland Grass, and Wildflower seeding mixtures ~~shall be~~ mixed off-site by a seed conditioner approved by the Iowa Crop Improvement Association or other state's Crop Improvement Association.

2601.03, C, 3, a, 3.

Replace the first sentence:

In areas with existing stabilized crop residue, apply seed with a ~~native grass seed drill with a no till attachment through the small seed box~~ slit seeder.

2601.03, C, 9, Salt Tolerant Seeding.

Add as a new article:

a. Preparation and Application.

- 1) Prepare seed according to Article 2601.03, B, 4, c.
- 2) Prepare seedbed according to Article 2601.03, B, 4, a, and apply seed according to Article 2601.03, B, 4, d using only a drop seeder according to Article 2601.03, A, 19.

b. Seed Mixture.

Use seeding rates in Table 2601.03-7 for permanent seeding of rural areas, unless otherwise specified in the contract documents:

Table 2601.03-7: Salt Tolerant Seed Mix

Alkali grass	109 lbs/acre
Turf-type Tall Fescue ¹	109 lbs/acre
Perennial ryegrass	66 lbs/acre
Crested wheatgrass	66 lbs/acre
Hard fine fescue	44 lbs/acre
Sheep fine fescue	44 lbs/acre
2. Turf-type Tall Fescue will contain a minimum 36 lbs of each cultivar Inferno and Quest.	

c. Fertilizing.

- 1) Spread over the areas at the rate of 300 pounds per acre of 6-24-24 (or equivalent).
- 2) Apply provisions of Article 2601.03, B, 4, b.

d. Application Dates.

Normal permanent seed application dates are March 1 through May 31, and August 10 through September 30.

Reason for Revision: Add in specifications for drop seeders. Change specifications for rural seeding to require applying seed using a slit seeder rather than a native grass seed drill. Add in specifications for salt tolerant seeding.

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: Greg Mulder		Office: Construction & Materials	Item 7
Submittal Date: March 30, 2016		Proposed Effective Date: October 2016	
Article No.: 4108.01 Title: Fly Ash		Other:	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 5/12/2016	Effective Date: 10/18/2016
Specification Committee Approved Text: See Specification Section Recommended Text.			
Comments: None.			
Specification Section Recommended Text:			
4108.01, Fly Ash.			
<p>Replace the Article and title: FLY ASH AND NATURAL POZZOLANS.</p> <p>A. Comply with AASHTO M 295, either Class N, Class F, or Class C; except the value of available total equivalent alkalis is are not to exceed 4.50% 3.80% as determined by Materials I.M. 491.17. Sources with fly ash between 1.5% and 2.5% available alkalis may be approved based on satisfactory results of the mortar bar expansion test specified in Materials I.M. 491.17. For Class C fly ash, the pozzolanic activity test with lime will not be required.</p> <p>B. When Class F is required, a Class C fly ash with minimum total oxides (SiO₂ + Al₂O₃ + Fe₂O₃) of 66% and minimum SiO₂ of 38% may be used.</p> <p>C. Approval of the source of fly ash will be required. This shall be based on fly ash produced when the power plant is using specific materials, equipment, and processes. Any change in materials, equipment, and processes voids the source approval, and a new approval of the source will be required. Initial approval of Class N pozzolans will be based on meeting the additional requirements of Materials I.M. 491.17</p> <p>D. Inspection and acceptance of fly ash and natural pozzolans will be according to Materials I.M. 491.17.</p>			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)			
4108.01 FLY ASH AND NATURAL POZZOLANS.			
<p>A. Comply with AASHTO M 295, either Class N, Class F or Class C, except the value of available total equivalent alkalis is are not to exceed 4.50% 3.80% as determined by Materials I.M. 491.17. Sources with fly ash between 1.5% and 2.5% available alkalis may be approved based on satisfactory results of the mortar bar expansion test specified in Materials I.M. 491.17. For Class C fly ash, the pozzolanic activity test with lime will not be required.</p> <p>B. When Class F is required, a Class C fly ash with minimum total oxides (SiO₂ + Al₂O₃ + Fe₂O₃) of 66% and</p>			

<p>minimum SiO₂ of 38% may be used.</p> <p>C. Approval of the source of fly ash will be required. This is to be based on fly ash produced when the power plant is using specific materials, equipment, and processes. Any change in materials, equipment, and processes voids the source approval, and a new approval of the source will be required. Initial approval of Class N pozzolans will be based on meeting the additional requirements of Materials I.M. 491.17</p> <p>D. Inspection and acceptance of fly ash and natural pozzolans will be according to Materials I.M. 491.17.</p>		
<p>Reason for Revision: Changing from available alkali to total equivalent alkali was based research from ISU research project TR-628. The available alkali test takes 28 days to run and currently is only determined using a formula based on equivalent alkali result. Research showed the level could be set based on the total equivalent alkali test.</p> <p>A new source, produced with natural pozzolans, is being developed by an Iowa company. The natural pozzolan can be used to reduce permeability and increase durability for HPC bridges and other concrete items.</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: Greg Mulder		Office: Construction and Materials	Item 8
Submittal Date: 4/28/2016		Proposed Effective Date: October 2016	
Article No.: 4137.01 Title: General Requirements (Asphalt Binder)		Other:	
Specification Committee Action: Approved as recommended.			
Deferred:	Not Approved:	Approved Date: 5/12/2016	Effective Date: 10/18/2016
Specification Committee Approved Text: See Specification Section Recommended Text.			
Comments: None.			
Specification Section Recommended Text: 4137.01, General Requirements.			
Add the Article: E. Waive stress sensitivity limits (J_{nr} Diff) for AASHTO M 332 when J_{nr} at 3.2 kPa is below 0.5 kPa^{-1} .			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)			
4137.01 GENERAL REQUIREMENTS.			
E. Waive stress sensitivity limits (J_{nr} Diff) for AASHTO M332 when J_{nr} at 3.2 kPa is below 0.5 kPa^{-1}			
Reason for Changes: The stress sensitivity is meaningless for very stiff binders. The CSBG will address this in the future.			
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: Industry in support			

Form 510130 (08-15)



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Brian Smith		Office: Design	Item 9
Submittal Date: 3/22/2016		Proposed Effective Date: 10/18/2016	
Section No.: 4169		Other:	
Title: Erosion Control Materials			
Specification Committee Action: Approved with changes.			
Deferred:	Not Approved:	Approved Date: 5/12/2016	Effective Date: 10/18/2016
Specification Committee Approved Text:			
4169.07, B, Hydraulic Mulches.			
<p>Add as the first sentence of the Article: Materials used shall be safe to the applicator and adjacent workers, and nontoxic to plants, fish, and other wildlife when properly applied according to EPA and other regulatory agencies.</p>			
4169.12, Perimeter and Slope Sediment Control Device.			
<p>Add as the first sentence of the Article: Interstate and Primary highway projects shall use sediment logs only.</p>			
4169.12, A, 5.			
<p>Replace the Article: Approved perimeter and slope sediment control devices sediment logs are listed in Materials I.M. 469.10, Appendix E. Wattles and filter socks will be accepted based on the manufacturer's certification.</p>			
<p>Comments: The Office of Local Systems indicated that Cities still use wattles and filter socks for certain applications. The Office of Design noted that wattles and filter socks are not as effective as sediment logs, but there could be situations where they were appropriate in an urban setting. The Committee agreed to tier the specifications to require sediment logs on Interstate and Primary projects. The Office of Construction and Materials indicated that they did not want to maintain an approved list for products the Department was not using. Wattles and filter socks will be allowed by manufacturer certification, which in some cases, could be the installer also. The Office of Design requested an additional revision to the hydraulic mulch specifications due to some incidences in Minnesota of toxic materials showing up.</p>			
Specification Section Recommended Text:			
4169.12, Perimeter and Slope Sediment Control Device.			
<p>Replace the article:</p> <p>A. General.</p> <ol style="list-style-type: none"> 1. Provide wattles, sediment logs, and filter socks consisting of the following materials wood excelsior fibers, with 80% of the wood excelsior fibers being 6 inches long or longer, contained in a tube of photo degradable fabric or synthetic netting. <ol style="list-style-type: none"> a. Wattles: Cereal straw or native grass straw certified by the Iowa Crop Improvement Association or other state's Crop Improvement Associations as 			

~~Certified Noxious Weed Seed Free Mulch. Wattles with observed seed heads will not be accepted.~~

~~b. Sediment logs: Wood excelsior fibers with 80% of the wood excelsior fibers being 6 inches long or longer.~~

~~c. Filter socks: Compost (from an approved source meeting Article 4169.08) wood chips, or mulch.~~

2. Fill ~~wattles, sediment logs, and filter socks~~ using a mechanical device. Hand filling of ~~wattles, sediment logs, and filter socks~~ will not be allowed.

3. Ensure ~~wattles, sediment logs, and filter socks~~ do not contain:

- A visible admixture of refuse or other physical contaminants,
- Germination or growth inhibiting factors, or
- Material toxic to plant growth.

4. Ensure ~~wattles, sediment logs, and filter socks~~ have waterproof identification tags that:

- Are printed using permanent ink, and
- eContaining manufacturer's name and address, and. ~~For wattles and sediment logs, tags shall be~~
- Are attached to the inside of the netting of each wattle or sediment log. ~~For filter socks, tags shall be attached to the outside of each sock.~~

5. Approved perimeter and slope sediment control devices are listed in Materials I.M. 469.10, Appendix E.

B. ~~Wattles and Sediment Logs.~~

Meet the following minimum weight requirements:

- 20 inch sediment logs ~~and straw wattles~~: 3 pounds per foot with tolerance of 0.25 pounds per foot.
- 12 inch sediment logs ~~and straw wattles~~: 2 pounds per foot with tolerance of 0.25 pounds per foot.
- 9 inch sediment logs ~~and straw wattles~~: 1 pound per foot with a tolerance of 0.1 pounds per foot.

C. ~~Filter Socks.~~

~~Provide filter socks with a maximum 3/8 inch opening.~~

Comments:

Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use ~~Strikeout~~ and ~~Highlight~~.)
4169.12, A, General.

Replace the article:

1. Provide ~~wattles, sediment logs, and filter socks~~ consisting of ~~the following materials~~, wood excelsior fibers, with 80% of the wood excelsior fibers being 6 inches long or longer, contained in a tube of photo degradable fabric or synthetic netting.:

~~a. Wattles: Cereal straw or native grass straw certified by the Iowa Crop Improvement Association or other state's Crop Improvement Associations as Certified Noxious Weed Seed Free Mulch. Wattles with observed seed heads will not be accepted.~~

~~b. Sediment logs: Wood excelsior fibers with 80% of the wood excelsior fibers being 6 inches long or longer.~~

~~c. Filter socks: Compost (from an approved source meeting Article 4169.08) wood chips, or mulch.~~

2. Fill ~~wattles, sediment logs, and filter socks~~ using a mechanical device. Hand filling of

~~wattles, sediment logs, and filter socks~~ will not be allowed.

3. Ensure ~~wattles, sediment logs, and filter socks~~ do not contain:
 - A visible admixture of refuse or other physical contaminants,
 - Germination or growth inhibiting factors, or
 - Material toxic to plant growth.

4. Ensure ~~wattles, sediment logs, and filter socks~~ have waterproof identification tags that:
 - Are printed using permanent ink, ~~and~~
 - ~~e~~Containing the manufacturer's name and address, ~~and. For wattles and sediment logs, tags shall be~~
 - Are attached to the inside of the netting of each wattle or sediment log. ~~For filter socks, tags shall be attached to the outside of each sock.~~

5. Approved perimeter and slope sediment control devices are listed in Materials I.M. 469.10, Appendix E.

4169.12, B, Wattles and Sediment Logs.

Replace the title and article:

~~Wattles and Sediment Logs.~~

Meet the following minimum weight requirements:

- 20 inch sediment logs ~~and straw wattles~~: 3 pounds per foot with tolerance of 0.25 pounds per foot.
- 12 inch sediment logs ~~and straw wattles~~: 2 pounds per foot with tolerance of 0.25 pounds per foot.
- 9 inch sediment logs ~~and straw wattles~~: 1 pound per foot with a tolerance of 0.1 pounds per foot.

4169.12, C, Filter Socks.

Delete the article:

~~Filter Socks.~~

~~Provide filter socks with a maximum 3/8 inch opening.~~

Reason for Revision: Delete wattles and filter socks from the specifications. These products typically aren't applicable to our projects.

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:		