Iowa Department of Transportation

MINUTES
OF
IOWA D.O.T. SPECIFICATION COMMITTEE MEETING

August 14, 2008

Members Present:	John Adam	Statewide Operations Bureau
	Jim Berger	Office of Materials
	Daniel Harness, Secretary	Specifications Section
	Doug McDonald	District 1-Marshalltown RCE
	Dan Redmond	District 4-District Materials
	Tom Reis, Chair	Specifications Section
	John Smythe	Office of Construction
Members Not Present:	Roger Bierbaum	Office of Contracts
	Troy Jerman	Office of Traffic & Safety
	Larry Jesse	Office of Local Systems
	Bruce Kuehl	District 6-District Construction
	Mike Kennerly	Office of Design
	Gary Novey	Office of Bridges & Structures
Advisory Members Present:	Paul Wiegand	SUDAS
Others Present:	Kevin Jones	Office of Materials
	Ed Kasper	Office of Contracts
	Brian Smith	Office of Design

Tom Reis, Specifications Engineer, opened the meeting. The following items were discussed according to the agenda dated August 7, 2008:

1. Article 1108.02, L, Notification of Traffic Impacts.
The Office of Construction requested a change to add a new article requiring the Contractor to provide a 10 day advance notice before commencing or resuming work.

2. Article 2303.02, B, 1, Individual Aggregates.
The Office of Materials requested a change to match the percent of Type 2 aggregate used in the higher traffic L-2 classification.

3. Article 2530.03, B, 4, e, Calcium Chloride.
The Office of Materials requested a change to correct values for calcium chloride solutions.

4. Article 4109.02, Gradation.
The Office of Materials requested a change to satisfy the requirements of 23 CFR 637(B).

5. DS-011XX, Global Positioning Machine Control Grading.
The Office of Design requested changes to reflect how the Contractor obtains electric file data.

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: John Smythe	**Office:** Construction	**Item 1**
Submittal Date: July 29, 2008	**Proposed Effective Date:** April, 2009	
Article No.: 1108.02, L **Title:** Notification of Traffic Impacts	**Other:**	

Specification Committee Action: Deferred.

Deferred: X	**Not Approved:**	**Approved Date:**	**Effective Date:**

Specification Committee Approved Text:

Comments: The Office of Construction requested this item be deferred until the Department has had had experience with this language in construction contracts.

Specification Section Recommended Text:

1108.02, L, Notification of Traffic Impacts.

Add as a new article:

Notification of Traffic Impacts.
The Contractor shall provide the Engineer with a 10 calendar day notice before commencing or resuming work on a Primary or Interstate road or bridge that is open to traffic.

Comments:

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

Add new paragraph 1108.02L, Notification of Traffic Impacts

The Contractor shall provide the Engineer with 10 calendar days advance notice before commencing or resuming any work on a Primary or Interstate road or bridge that is opened to traffic. This notification is needed to suspend the issuance of permits for oversized loads when width or vertical clearance restrictions occur during construction.

Reason for Revision: To provide Motor Carrier Services with notice so that oversized loads are not routed through construction zones.

County or City Input Needed (X one)	**Yes**	**No** X
Comments:		

Industry Input Needed (X one)			**Yes** X	**No**	
Industry Notified:	**Yes** X	**No**	**Industry Concurrence:**	**Yes**	**No**
Comments: No comments have been received.					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger	**Office:** Materials	**Item 2**
Submittal Date: July 11, 2008	**Proposed Effective Date:** April, 2009	
Article No.: 2303.02 B, 1 **Title:** Individual Aggregates	**Other:**	

Specification Committee Action: Approved as is.

Deferred:	**Not Approved:**	**Approved Date:** 8/14/08	**Effective Date:** 4/21/09

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: The Office of Materials noted this change will affect the DS for HMA Mixtures.

Specification Section Recommended Text:

2303.02, B, 1, Individual Aggregates.

Replace 30% with 25% in the second sentence of the fourth paragraph.

Comments: Does this change also need to be made to the DS for HMA Mixtures from the July 10, 2008 Specification Committee Meeting?

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

B. Aggregates.

1. Individual Aggregates.
Virgin mineral aggregate shall meet the following requirements:

VIRGIN MINERAL AGGREGATES		
Mixture	**Aggregate Type**	**Aggregate Requirements**
Base	Type B	Section 4127
Intermediate and Surface	Type B	Section 4127
Intermediate and Surface	Type A	Section 4127

When frictional classification of the coarse aggregate is required, the contract documents will specify the friction level and location. The friction aggregate shall be furnished from sources identified in Materials I.M. T203.

For friction classification L-2, at least 80% of the combined aggregate retained on the No. 4 (4.75 mm) sieve shall be Type 4 or better friction aggregate; and at least 25% of the combined aggregate retained on the No. 4 (4.75 mm) sieve shall be Type 2 or better friction aggregate.

For friction classification L-3, at least 80% of the combined aggregate retained on the No. 4 (4.75 mm) sieve shall be Type 4 or better friction aggregate; and at least 45% of the combined aggregate retained on the No. 4 (4.75 mm) sieve shall be Type 3 or better friction aggregate. If Type 2 is used in place of Type 3, the minimum shall be 25 ~~30~~% of the combined aggregate retained on the No. 4 (4.75 mm)

sieve. For friction classification L-4, at least 50% of the combined aggregate retained on the No. 4 (4.75 mm) sieve shall be Type 4 or better friction aggregate.					
Reason for Revision: To match the percent Type 2 aggregate used in the higher traffic L-2 classification.					
County or City Input Needed (X one)			**Yes**	**No**	
Comments:					
Industry Input Needed (X one)			**Yes**	**No**	
Industry Notified:	**Yes**	**No**	**Industry Concurrence:**	**Yes**	**No**
Comments:					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger	**Office:** Materials	**Item 3**
Submittal Date: July 11, 2008	**Proposed Effective Date:** April, 2009	
Article No.: 2530.03, B, 4, e **Title:** Calcium Chloride	**Other:**	

Specification Committee Action: Approved as is

Deferred:	**Not Approved:**	**Approved Date:** 8/14/08	**Effective Date:** 4/21/09

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: None.

Specification Section Recommended Text:

2530.03, B, 4, e, Calcium Chloride.

Replace the two tables following the first paragraph:

PROPORTIONS FOR 32% CALCIUM CHLORIDE SOLUTIONS (ENGLISH)		
Type of Solid Calcium Chloride	Pounds Solid per gallon of water	Solution produced per gallon of water
Type 1 - Regular Flake (77% material)	~~7~~ 6	~~1.35~~ 1.3
Type 2 - Concrete Flake or pellets (94% material)	~~5~~ 4.5	~~1.18~~ 1.2

PROPORTIONS FOR 32% CALCIUM CHLORIDE SOLUTIONS (METRIC)		
Type of Solid Calcium Chloride	Grams Solid per liter of water	Solution produced per liter of water
Type 1 - Regular Flake (77% material)	~~840~~ 720 g/L	~~1.35~~ 1.3
Type 2 - Concrete Flake or pellets (94% material)	~~600~~ 540 g/L	~~1.18~~ 1.2

Replace the second paragraph:

The solution concentration will be checked by the Engineer with a hydrometer according to Materials I.M. 373. The solution shall be added at the rate of ~~2.75~~ 3.0 gallons per cubic yard (~~13.6~~ 14.8 L/m^3) of concrete. Calcium chloride solutions of different concentrations may be approved by the Engineer, provided appropriate adjustments in the total concrete composition are made.

Delete the second sentence of the third paragraph:

~~The calcium chloride will crystallize out of a 32% solution at 20°F (-7°C), so the solution must be maintained at a higher temperature at all times.~~

Comments:

e. Calcium Chloride.

Where calcium chloride is required, it shall be furnished in water solution form and added to the mix, at the job site. The calcium chloride solution shall be a commercial 32% solution, or equivalent, prepared by the Contractor:

PROPORTIONS FOR 32% CALCIUM CHLORIDE SOLUTIONS (ENGLISH)		
Type of Solid Calcium Chloride	Pounds Solid per gallon of water	Solution produced per gallon of water

Type 1 - Regular Flake (77% material) Type 2 - Concrete Flake or pellets (94% material)	67 4.5	1.35 1.218

	Grams Solid per liter of water	Solution produced per liter of water
	720840 g/L 540600 g/L	1.35 1.218

The solution concentration will be checked by the engineer with a hydrometer according to Materials I.M. 373. The solution shall be added at the rate of 3.02.75 gallons per cubic yard (14.813.6 L/m^3) of concrete. Calcium chloride solutions of different concentrations may be approved by the Engineer, provided appropriate adjustments in the total concrete composition are made.

Caution. The mixture shall be agitated until the calcium chloride is completely in solution, and agitation shall be continued, as necessary, to maintain uniformity. The calcium chloride will crystallize out of a 32% solution at 20°F (7°C), so the solution must be maintained at a higher temperature at all times

County or City Input Needed (X one)			**Yes**	**No**	
Comments:					
Industry Input Needed (X one)			**Yes**	**No**	
Industry Notified:	**Yes**	**No**	**Industry Concurrence:**	**Yes**	**No**
Comments: The original table values were for a 35% solution.					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger	**Office:** Materials	**Item 4**
Submittal Date: July 11, 2008	**Proposed Effective Date:** April, 2009	
Section No.: 4109.02 **Title:** Gradation	**Other:**	

Specification Committee Action: Approved with change as noted.

Deferred:	**Not Approved:**	**Approved Date:** 8/14/08	**Effective Date:** 4/21/09

Specification Committee Approved Text: See Specification Section Recommended Text. Add the following additional instruction:

Add a reference to Note 7 for Gradation 12b in both the English and Metric Aggregate Gradation Tables.

Comments: The Office of Materials explained this affects non-proportion aggregate. This change should help bring uniformity through the Districts, though District 2 will still do their own acceptance.

The Office of Construction asked to what the 90% criteria applies. The Office of Materials explained it applies to producer's results. Ninety percent of their test results need to be within gradation limits. Producers are required to perform tests at specified intervals, so the number of tests run will depend on the number of tons produced. Once a stockpile is certified, it may be used on multiple projects. The test results would need to be sent to each project.

The Office of Materials noted that an additional change to add a reference to Note 7 in Gradation 12b was omitted from the Specifications Section Recommended Text.

Specification Section Recommended Text:

4109.02, Gradation.

Add a reference to Note 7 for Gradation 12b in both the English and Metric Aggregate Gradation Tables.

Add a reference to Note 12 for each of the following gradations in both the English and Metric Aggregate Gradation Tables:
10, 11, 12a, 12b, 14, 19, 20, 21, 22, 23, 29, 30, 31, 32, 35, 36.

Add as Note 12 to both the English and Metric Aggregate Gradation Tables:

12. When Producer gradation test results are used for acceptance, test results representing at least 90% of the material being produced shall be within the gradation limits and the average of all gradation results shall be within the gradations limits. Stockpiled material not meeting the criteria may, at the District Materials Engineer's discretion, be resampled using Materials I.M. 301 procedures. One hundred percent of the stockpile quality control and verification test results shall be within the gradation limits.

Comments:

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

Attached

Reason for Revision: The FHWA has re-evaluated 23CFR 637(B) and released some additional guidelines. In one guideline, it states that aggregate is considered a project produced material rather than a manufactured material and falls under 23CFR 637(B). To meet all the requirements, some changes to the aggregate quality assurance program were needed (primarily for the non-proportioned aggregates). The proposed specification change formalizes the current acceptance processes used by the Districts for non-proportioned aggregates.

The 90% within limits is higher than what some Districts were using in the past. It is also slightly higher than the mid range on the HMA PWL for 100% pay for lab and field voids (80-95% and 75-90%). Some of the reasoning for 90% was that the acceptance is being done during production rather than on the road after placement. There are opportunities for the producer to adjust production and what gets shipped to a project. There is also the "second chance" provision to stockpile sample where production results are close to compliance.

County or City Input Needed (X one)			**Yes**	**No**	
Comments:					
Industry Input Needed (X one)			**Yes** X	**No**	
Industry Notified:	**Yes** X	**No**	**Industry Concurrence:**	**Yes**	**No**

Comments:

The ILPA has stated that for modified subbase, granular subbase, and granular surfacing; it can be difficult to stay within all the gradation limits for some sources. To stay within the finer sieve limits, they need to stay coarser on the larger sieves. The more control sieves, the more chances for a material to fail. They feel 80 to 85% within limit would be more reasonable.

Section 4109. Aggregate Gradations

4109.01 DESCRIPTION.

A. Coarse Aggregate
Particles retained on the No. 4 (4.75 mm) or larger sieve.

B. Fine Aggregate.
Particles passing the No. 4 (4.75 mm) sieve.

4109.02 GRADATION.
Refer to the Aggregate Gradation Tables.

4109.03 UNACCEPTABLE MATERIALS.

A. Article 1106.04 applies. Stockpiles contaminated with organic or other foreign materials may be cause for rejection of the aggregate. The Engineer will determine acceptability by visual examination or other methods.

B. The Engineer may reject the use of material from ledges or beds that individually do not pass the quality requirements for the intended aggregate product. Specific production methods may be required to permit the use of material from marginal ledges or beds.

AGGREGATE GRADATION TABLE - ENGLISH														
Grad No.	**Section No.**	**Std. Sieve Sz.**	**1 1/2”**	**1.00”**	**3/4”**	**1/2”**	**3/8”**	**4**	**8**	**30**	**50**	**100**	**200**	**Notes**
		Intended Use	**Percent Passing**											
1	4110, 4125, 4133	PCC FA, Cover Agg.					100	90-100	70-100	10-60			0-1.5	1
3	4115 (57, 2-8)	PCC CA	100	95-100		25-60		0-10	0-5				0-1.5	2, 11
4	4115 (2-8)	PCC CA	100	50-100	30-100	20-75	5-55	0-10	0-5				0-1.5	11
5	4115 (67, 2-8)	PCC CA		100	90-100		20-55	0-10	0-5				0-1.5	11
6	4115.06 (Repair & Overlay)	PCC CA			100	97-100	40-90	0-30					0-1.5	11
7	4117, (Class V)	PCC FA & CA	100					80-92	60-75	20-40				
8	4117.03 (Class V)	Fine Limestone					100	90-100					0-30	
10	4120.02, 4120.03 (C gravel)	Granular Surface			100			50-80	25-60					3,12
11	4120.02, 4120.04, 4120.05, 4120.07, (A, B Cr. St.)	Granular Surface & Shoulder		100	95-100	70-90		30-55	15-40				6-16	4, 5,12
12a	4121 (Cr. St.)	Granular Subbase	100			40-80			5-25				0-6	6,12
12b	4121 (Cr. Gravel)	Granular Subbase	100			50-80			10-30		5-15		3-7	7,12
13	4122.02 (Cr. St.)	Macadam St. Base	3” nominal maximum size screened over 3/4” or 1.00” screen.											
14	4123	Modified Subbase	100		70-90				10-40				3-10	5, 7,12
19	4125 (1/2”) Cr. Gr. Or Cr. St.	Cover Aggregate			100	97-100	40-90	0-30	0-15				0-2	12
20	4125 (1/2” Scr. Gr.)	Cover Aggregate			100	95-100	40-80	0-15	0-7				0-1.5	12
21	4125 (3/8”)	Cover Aggregate				100	90-100	10-55	0-20	0-7			0-1.5	12
22	4124.02, B	Fine Slurry Mixture					100	85-100	40-95	20-60	14-35	10-25	5-25	10,12
23	4124.02, B (Cr. St.)	Coarse Slurry Mixture					100	70-90	45-70	19-34	12-25	7-18	5-15	12
29	4131	Porous Backfill			100	95-100	50-100	0-50	0-8					12
30	4132.02 (Cr. St.)	Special Backfill	100						15-45				0-10	5,12
31	4132.03 (Gravel)	Special Backfill		100	90-100	75-100			30-55				3-7	12
32	4133 (Sand/Gr./Cr. St.)	Granular Backfill	100% passing the 3” screen						20-100				0-10	8, 9,12
35	4133.05 (Natural Sand/Gr.)	Floodable Backfill	100						20-90				0-4	12
36	4133.05 (Natural Sand)	Floodable Backfill							100				0-2	12

Notes: (Gradations No. 2, 9, 12, 15, 16, 17, 18, 24, 25, 26, 27, 28, 33, and 34 have been deleted)

1. For Section 4110, when the fine aggregate is sieved through the following numbered sieves - 4, 8, 16, 30, 50, and 100 - no more than 40% is to pass one sieve and be retained on the sieve with the next highest number.

2. When used in precast and prestressed concrete bridge beams, 100% is to pass the 1.00" sieve.

3. When compaction of the material is a specification requirement, the minimum percent passing the No. 200 sieve is 6%.

4. See specifications for combination of gravel and limestone.

5. Unwashed air dried samples of crushed composite material is to be tested for gradation compliance, except that no gradation determination will be made for material passing the No. 200 sieve.

6. The gradation requirement for the No. 8 sieve is to be 5% to 20% when the recycled material is supplied.

7. For Section 4121 gravel, one fractured face on 30% or more of the particles retained on the 3/8 inch sieve. For Section 4123 gravel, one fractured face on 75% or more of the particles retained on the 3/8 inch sieve.

8. Crushed stone is to have 100% passing the 1.00" sieve.

9. When granular backfill is used in floodable applications, use gradation No. 35 or No. 36. When granular backfill is used under flowable mortar, one of the following alternative materials is to be used: natural sand compliant with Section 4110, except the percent passing the No. 200 sieve is not to exceed 4%: gravel, crushed stone, or crushed concrete meeting the gradation requirements of Section 4121.

10. Gradation limitations for the 30, 50, and 100 sieves do not apply when slurry mixture is applied by hand lutes, such as for slurry leveling.

11. Maximum of 2.5% passing the No. 200 sieve allowed if generated from the parent material when documented production is 1% or less as determined by the Office of Materials.

12. When Producer gradation test results are used for acceptance, test results representing at least 90% of the material being produced shall be within the gradation limits and the average of all gradation results shall be within the gradations limits. Stockpiled material not meeting the criteria may, at the District Materials Engineer's discretion, be resampled using Materials I.M. 301 procedures. 100% of the stockpile quality control and verification test results shall be within the gradation limits.

AGGREGATE GRADATION TABLE - METRIC														
Grad No.	Section No.	Std. Sieve Sz.	37.5mm	25mm	19mm	12.5mm	9.5mm	4.75mm	2.36mm	600µm	300µm	150µm	75µm	Notes
		Intended Use	Percent Passing											
1	4110, 4125, 4133	PCC FA, Cover Agg.					100	90-100	70-100	10-60			0-1.5	1
3	4115 (57, 2-8)	PCC CA	100	95-100		25-60		0-10	0-5				0-1.5	2, 11
4	4115 (2-8)	PCC CA	100	50-100	30-100	20-75	5-55	0-10	0-5				0-1.5	11
5	4115 (67, 2-8)	PCC CA		100	90-100		20-55	0-10	0-5				0-1.5	11
6	4115.06 (Repair & Overlay)	PCC CA			100	97-100	40-90	0-30					0-1.5	11
7	4117, (Class V)	PCC FA & CA	100					80-92	60-75	20-40				
8	4117.03 (Class V)	Fine Limestone					100	90-100					0-30	
10	4120.02, 4120.03 (C gravel)	Granular Surface			100			50-80	25-60					3,12
11	4120.02, 4120.04, 4120.05, 4120.07, (A, B Cr. St.)	Granular Surface & Shoulder		100	95-100	70-90		30-55	15-40				6-16	4, 5,12
12a	4121 (Cr. St.)	Granular Subbase	100			40-80			5-25				0-6	6,12
12b	4121 (Cr. Gravel)	Granular Subbase	100			50-80			10-30		5-15		3-7	7,12
13	4122.02 (Cr. St.)	Macadam St. Base	75 mm nominal maximum size screened over 19 mm or 25 mm screen.											
14	4123	Modified Subbase	100		70-90				10-40				3-10	5, 7,12
19	4125 (12.5 mm) Cr. Gr. or Cr. St.	Cover Aggregate			100	97-100	40-90	0-30	0-15				0-2	12
20	4125 (12.5 mm Scr. Gr.)	Cover Aggregate			100	95-100	40-80	0-15	0-7				0-1.5	12
21	4125 (9.5 mm)	Cover Aggregate				100	90-100	10-55	0-20	0-7			0-1.5	12
22	4124.02, B	Fine Slurry Mixture					100	85-100	40-95	20-60	14-35	10-25	5-25	10,12
23	4124.02, B (Cr. St.)	Coarse Slurry Mixture					100	70-90	45-70	19-34	12-25	7-18	5-15	12
29	4131	Porous Backfill			100	95-100	50-100	0-50	0-8					12
30	4132.02 (Cr. St.)	Special Backfill	100						15-45				0-10	5,12
31	4132.03 (Gravel)	Special Backfill		100	90-100	75-100			30-55				3-7	12
32	4133 (Sand/Gr./Cr. St.)	Granular Backfill	100% passing the 76.2 mm screen						20-100				0-10	8, 9,12
35	4133.05 (Natural Sand/Gr.)	Floodable Backfill	100						20-90				0-4	12
36	4133.05 (Natural Sand)	Floodable Backfill							100				0-2	12

Notes: (Gradations No. 2, 9, 12, 15, 16, 17, 18, 24, 25, 26, 27, 28, 33, and 34 have been deleted)

1. For Section 4110, when the fine aggregate is sieved through the following numbered sieve sizes – 4.75 mm, 2.36 mm, 1.18 mm, 600 µm, 300 µm and 150 µm - no more than 40% is to pass one sieve and be retained on the sieve with the next highest number.

2. When used in precast and prestressed concrete bridge beams, 100% is to pass the 25 mm sieve.

3. When compaction of the material is a specification requirement, the minimum percent passing the 75 µm sieve is 6%.

4. See specifications for combination of gravel and limestone.

5. Unwashed air dried samples of crushed composite material is to be tested for gradation compliance, except that no gradation determination will be made for material passing the 75 µm sieve.

6. The gradation requirement for the 2.36 mm sieve is to be 5% to 20% when the recycled material is supplied.

7. For Section 4121 gravel, one fractured face on 30% or more of the particles retained on the 9.5 mm sieve. For Section 4123 gravel, one fractured face on 75% or more of the particles retained on the 9.5 mm sieve.

8. Crushed stone is to have 100% passing the 25 mm sieve.

9. When granular backfill is used in floodable applications, use gradation No. 35 or No. 36. When granular backfill is used under flowable mortar, one of the following alternative materials is to be used: natural sand compliant with Section 4110, except the percent passing the 75 µm sieve is not to exceed 4%: gravel, crushed stone, or crushed concrete meeting the gradation requirements of Section 4121.

10. Gradation limitations for the 600 µm, 300 µm, and 150 µm sieves do not apply when slurry mixture is applied by hand lutes, such as for slurry leveling.

11. Maximum of 2.5% passing the 75 µm sieve allowed if generated from the parent material when documented production is 1% or less as determined by the Office of Materials.

12. When Producer gradation test results are used for acceptance, test results representing at least 90% of the material being produced shall be within the gradation limits and the average of all gradation results shall be within the gradations limits. Stockpiled material not meeting the criteria may, at the District Materials Engineer's discretion, be resampled using Materials I.M. 301 procedures. 100% of the stockpile quality control and verification test results shall be within the gradation limits.

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Mike Kennerly / Kent Nicholson	**Office:** Design	**Item 5**
Submittal Date: 8/1/08	**Proposed Effective Date:** 11/18/2008	
Article No.: DS-01103 **Title:** Global Positioning System Machine Control Grading	**Other:**	

Specification Committee Action: Approved.

Deferred:	**Not Approved:**	**Approved Date:** 8/14/08	**Effective Date:** 11/18/08

Specification Committee Approved Text: See attached Draft DS-01XXX

Comments: The Office of Construction asked if there will be a fee every time a contractor accesses the plan room for data. The Office of Contracts explained the only fee applied would be when subscribing to the plan room.

The Office of Construction expressed concern with contractors wanting electronic files when this DS does not apply. They would like to know how the Department informs prospective bidders what information is available in electronic form before the letting, and how can they access it. The Office of Construction noted availability of electronic data and the level of detail they can get may affect bids. SUDAS noted they are considering a change to their Design manual to include a statement that when filing a set of plans, an electronic version is to be included if requested. That way, the data is available prior to the letting.

The Office of Design explained that in the past, if a contractor called, they would give them the information they needed. The Office of Construction asked if the Office of Design if they would consider using a procedure similar to the one used for Machine Controlled Grading for providing electronic data to contractors. They felt it would be advantageous to both the contractors and the Department to have some kind of procedure in place. The Office of Design indicated the procedure used for Machine Control Grading would be a good place to start.

The Specifications Section asked if there are certain work types for which providing electronic data would be more beneficial. Designers could focus their efforts for creating models for those types of work. The Office of Design noted they are looking into developing a policy stating how much information should go into their electronic files they are sharing with contractors.

The Specifications Section will set up a meeting with the Offices of Design, Construction, and Contracts, as well as representatives from the AGCI representing engineering and land surveying firms, to discuss what types of projects the Department should provide electronic data for, what data should be made available, and in what form.

Specification Section Recommended Text:

Comments:

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

See attached Draft DS.

Reason for Revision: The Department has stopped providing the Contractor with the information contained in the Machine Control Grading specifications. Now the Contractor is required to subscribe to a plan room that provides these services.

County or City Input Needed (X one)			**Yes**	**No**	
Comments:					
Industry Input Needed (X one)			**Yes**	**No**	
Industry Notified:	**Yes**	**No**	**Industry Concurrence:**	**Yes**	**No**
Comments:					

DRAFT **DS-011XX**
(Replaces DS-01103)

Iowa Department of Transportation

DEVELOPMENTAL SPECIFICATIONS
FOR
GLOBAL POSITIONING SYSTEM MACHINE CONTROL GRADING

Effective Date
November 18, 2008

THE STANDARD SPECIFICATIONS, SERIES 2001, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

011XX.01 GENERAL.
This specification contains requirements for grading construction utilizing Global Positioning System (GPS) machine control grading techniques and shall be used in conjunction with Section 2526, of the Standard Specifications.

The Contractor may utilize grading equipment controlled with a GPS machine control system in the construction of the roadway embankment.

The plans indicate the areas of the project where the Contracting Authority is providing electronic surface models of the roadway embankment construction. The remaining areas may be constructed with conventional construction survey techniques unless the Contractor chooses to build the required surface models to facilitate GPS machine control grading for those areas at no additional cost to the Contracting Authority.

The Contractor may use any type of GPS machine control equipment and systems that results in achieving the existing grading requirements. The Contractor shall convert the electronic data provided by the Contracting Authority into the format required by their system.

011XX.02 EQUIPMENT.
All equipment required to accomplish GPS machine control grading shall be provided by the Contractor and shall be able to generate end results that meet the Standard Specifications.

011XX.03 CONSTRUCTION.

A. Contracting Authority Responsibilities.

1. The Engineer will set the initial horizontal and vertical control points in the field for the project as indicated in the contract documents.

2. The Engineer will provide the project specific localized coordinate system. The control information utilized in establishing the localized coordinate system, specifically the rotation, scaling, and translation can be obtain from the Engineer upon request.

3. The Contracting Authority will ~~provide~~ make available the data listed below in an electronic format ~~with the proposal form~~. This information is available for a fee at: http://www.ia.bidx.com/main/index.html. The Contractor will be required to purchase an online account to obtain the electronic data.

No guarantee is made that the data systems used by the Engineer will be directly compatible with the systems used by the Contractor.

Article 1105.04 of the Standard Specifications shall apply with the additional clarification that information shown on the plans shall govern over the provided electronic data.

This information shall not be considered a representation of actual conditions to be encountered during construction. Furnishing this information does not relieve the Contractor from the responsibility of making an investigation of conditions to be encountered including, but not limited to site visits, and basing the bid on information obtained from these investigations, and the professional interpretations and judgment of the Contractor. The Contractor shall assume the risk of error if the information is used for any purposes for which the information was not intended.

Any assumptions the Contractor makes from this electronic information shall be at their risk. The Contracting Authority will develop and ~~provide~~ make available electronic data to the Contractor for review as part of the contract documents. The Contractor shall independently ensure that the electronic data will function in their machine control grading system.

The files that are ~~provided~~ made available were originally created with the computer software applications MicroStation (CADD software) and GEOPAK (civil engineering software). The data files will be ~~provided~~ in the native formats and other software formats as described below. The Contractor shall perform necessary conversion of the files for their selected grade control equipment. The Contracting Authority will ~~furnish~~ make available to the Contractor ~~with~~ the following electronic data files:

a. CAD Files:
- GEOPAK TIN files representing the design surfaces.
- GEOPAK GPK file containing all horizontal and vertical alignment information.
- GEOPAK documentation file describing all of the chains and profiles.
- MicroStation primary design file.
- MicroStation cross section files.
- MicroStation ROW data file.
- MicroStation photogrammetry and text files.

b. Machine Control Surface Model Files:
- ASCII format.
- LandXML format.
- Trimble Terramodel format.

Note: TIN files and surface model files of the proposed finish grade include the topsoil placement where required in the plans.

c. Alignment Data Files:
- ASCII format.
- LandXML format.
- Trimble Terramodel format.

4. The Engineer may perform spot checks of the Contractor's machine control grading results, surveying calculations, records, field procedures, and actual staking. If the Engineer determines that the work is not being performed in a manner that will assure accurate results,

the Engineer may order the Contractor to redo such work, to the requirements of the contract documents, at no additional cost to the Contracting Authority.

B. Contractor's Responsibilities.

1. The Contractor shall provide the Engineer with a GPS rover for use during the duration of the contract. At the end of the contract, the GPS rover unit will be returned to the Contractor. This unit shall have the same capabilities as units utilized by the Contractor. The Contractor shall provide 8 hours of formal training on the Contractor's GPS machine control systems to the Engineer.

2. The Contractor shall review and apply the data provided by the Contracting Authority to perform GPS machine control grading.

3. The Contractor shall bear all costs, including but not limited to the cost of actual reconstruction of work, that may be incurred due to errors in application of GPS machine control grading techniques. Grade elevation errors and associated quantity adjustments resulting from the Contractor's activities shall be at no cost to the Contracting Authority.

4. The Contractor shall convert the electronic data provided by the Contracting Authority into a format compatible with their system.

5. The Contractor understands that any manipulation of the electronic data provided by the Contracting Authority shall be taken at their own risk.

6. The Contractor shall check and recalibrate, if necessary, their GPS machine control system at the beginning of each work day.

7. The Contractor shall meet the same accuracy requirements as conventional grading construction as detailed in the Standard Specifications.

8. The Contractor shall establish secondary control points at appropriate intervals and at locations along the length of the project and outside the project limits and/or where work is performed beyond the project limits as required at intervals not to exceed 1000 feet (300 m). The horizontal position of these points shall be determined by static GPS sessions or by traverse connection from the original baseline control points. The elevation of these control points shall be established using differential leveling from the project benchmarks, forming closed loops. A copy of all new control point information shall be provided to the Engineer prior to construction activities. The Contractor shall be responsible for all errors resulting from their efforts and shall correct deficiencies to the satisfaction of the Engineer and at no additional cost to the Contracting Authority.

9. The Contractor shall preserve all reference points and monuments that are established by the Engineer within the project limits. If the Contractor fails to preserve these items they shall be reestablished by the Contractor shall reestablished at no additional cost to the Contracting Authority.

10. The Contractor shall set hubs at the top of the finished subgrade at all hinge points on the cross section at 1000 foot (300 m) intervals on mainline and at least two cross sections on the side roads and ramps. These hubs shall be established using conventional survey methods for use by the Engineer to check the accuracy of the construction.

11. The Contractor shall provide controls points and conventional grade stakes at critical points such as, but not limited to, PC's, PT's, super elevation points, and other critical points required for the construction of drainage and roadway structures.

12. At least one week prior to the preconstruction conference, the Contractor shall submit to the

Engineer for review a written machine control grading work plan which shall include the equipment type, control software manufacture and version, and the proposed location of the local GPS base station used for broadcasting differential correction data to rover units.

011XX.04 METHOD OF MEASUREMENT.
The bid item for GPS Machine Control Grading will be measured and paid for at the lump sum contract price.

011XX.05 BASIS OF PAYMENT.
The bid item for GPS Machine Control Grading will be paid for at the lump sum contract price. This payment shall be full compensation for all work associated with preparing the electronic data files for use in the Contractor's machine control system, the required system check and needed recalibration, training for the Engineer, and all other items described in Article DS-011XX.03, B.

Delays due to satellite reception of signals to operate the GPS machine control system will not result in adjustment to the "Basis of Payment" for any construction items or be justification for granting contract extensions.