Iowa Department of Transportation

MINUTES
OF
IOWA DOT SPECIFICATION COMMITTEE MEETING

June 14, 2007

Members Present:	John Adam	Statewide Operations Bureau
	Tom Reis, Chair	Specifications Section
	Daniel Harness, Secretary	Specifications Section
	Gary Novey	Office of Bridges & Structures
	Larry Jesse	Office of Local Systems
	Jim Berger	Office of Materials
	Doug McDonald	District 1-Marshalltown RCE
	John Smythe	Office of Construction
Members Not Present:	Keith Norris	District 2-District Materials
	Bruce Kuehl	District 6-District Construction
	Troy Jerman	Office of Traffic & Safety
	Mike Kennerly	Office of Design
	Roger Bierbaum	Office of Contracts
Advisory Members Present:	Lisa Rold	FHWA
	Larry Stevens	SUDAS
Others Present:	Deanna Maifield	Office of Design
	Ed Kasper	Office of Contracts
	Steve Thompson	Specifications Section

Tom Reis, Specifications Engineer, opened the meeting. The following items were discussed in accordance with the agenda sent June 8, 2007:

1. DS-01077, Global Positioning System Machine Control Grading.

The Office of Design requests changes to DS-01077 that will eliminate the Contractor's requirement to submit electronic as-builts as this technology is not yet developed.

2. Imperative Mood - Active Voice Rewrite Review Process.

The Specifications Engineer would like to discuss the plan to review the content of the Imperative Mood – Active Voice rewrite.

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Mike Kennerly	**Office:** Design	**Item 1**
Submittal Date: 06.04.2007	**Proposed Effective Date:** As soon as possible.	
Article No.: DS-01077 **Title:** Global Positioning System Machine Control Grading	**Other:**	

Specification Committee Action: Approved.

Deferred:	**Not Approved:**	**Approved Date:** 6/14/07	**Effective Date:** 9/18/07

Specification Committee Approved Text: See the attached DS for approved revisions.

Comments: The Office of Construction noted one of Industry's concerns is being held to same tolerance for ditches as for grade. They wanted to know if different tolerances for areas outside of shoulder were going to be addressed in the DS. The Office of Design stated they haven't discussed it at this time. The Office of Construction noted they are satisfied with the proposed changes, but would like to see tolerances for areas outside of shoulder addressed at some point in the future.

Specification Section Recommended Text:

See member's requested change.

Comments:

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

Page 4
Delete Paragraph 12:
~~The Contractor shall provide the Engineer with electronic as-built construction data for the final roadway TIN surface models in ASCII format.~~

Reason for Revision: The current state of technology in the area of developing final surface files of the final embankment construction by the machine control equipment is not currently ready for deployment. Specifying that the final grading surface be created requires the contractor to use other survey methods to generate the surface which would create additional work for the contractor and not necessarily obtain the information (as-built embankment surface files) that we would like to have created.

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

Comments: Obtaining the as-built final embankment construction surface in an electronic format will be beneficial for the IDOT at a point in the future. This will mutually beneficial to the contractor and the IDOT when this information can be obtained on-the-fly with the machine control technology while the contractor finishes the embankment construction.

Industry Input Needed (X one)			**Yes**	**No**	
Industry Notified:	**Yes**	**No**	**Industry Concurrence:**	**Yes**	**No**

Comments: The vendors developing and providing machine control technology to grading contractors are currently working on this technology.

DS-010XXX
(Replaces DS-01077)

Iowa Department of Transportation

DEVELOPMENTAL SPECIFICATIONS
FOR
GLOBAL POSITIONING SYSTEM MACHINE CONTROL GRADING

Effective Date
September 18, 2007

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.

010XXX.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 ~~IDOT~~ 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.

010XXX.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.

010XXX.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 the data listed below in an electronic format with the proposal form.

   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 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 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 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.

11. 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.

12. 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.

~~13. The Contractor shall provide the Engineer with electronic as-built construction data for the final roadway TIN surface models in ASCII format.~~

13. 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.

010XXX.04 METHOD OF MEASUREMENT.
The bid item for GPS Machine Control Grading will be measured and paid for at the lump sum contract price.

010XXX.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 ~~the~~ Article DS-010XXX.03, B ~~Contractors Responsibilities section~~ of this Developmental Specification.

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.

Item 2. Imperative Mood - Active Voice Rewrite Review Process.

The rewrite of the specifications to the Imperative Mood – Active Voice is nearly complete. Now the process must begin to review the new specifications with the existing specifications to ensure the intent of the specifications remains the same. In the past this has been done by a committee meeting on a weekly basis for anywhere from four to eight hours. We plan to use a different approach this time to allow individuals as much flexibility as possible on when they review the material, however we will still need to have some meetings to ensure that we have incorporated the complete intent of the existing specifications into the rewrite. The intent of the rewrite was not to update the existing material, only to convert it to the new style of writing. If there were changes to be made they are intended to be made separately.

I envision having a singular person as the principle contact on each section of the new manual. This will ensure continuity in the review as it progresses. Please come prepared to identify your representative (if applicable) for each section of the manual.

The timeframe that I have developed for this process is as follows:

Review individual sections	June - October 2007
Compile changes and publish revised sections	September - October 2007
Final review of sections by groups	October - November 2007
Specification Committee approval by section	December 2007 - February 2008
Final proofing by Specifications Section	December 2007-March 2008
Ready for print	April 15, 2008
Electronic copy ready for use by designers	April 15, 2008
Hard copy ready for distribution	July 15, 2008

Discussion:

The Specifications Section informed the Committee that the specifications manual has been converted to the Imperative Mood/Active Voice, as have Developmental Specifications and Supplemental Specifications. They would like comments received and incorporated into the new book by early 2008. The Specifications Section emphasized that the review is to ensure intent has not changed. The focus should be on content, not on formatting or grammatical errors, unless they change the intent. They noted that as a part of the rewrite, they would like to get all patching specifications in one section and all traffic control specifications in one section.

The Office of Construction noted it's important to review the book only one time. They wanted to know if the latest General Supplemental Specifications will be in the book. The Specifications Section noted they will include corrections in the rewritten sections. The Office of Construction asked if the Specifications Section knew which Developmental Specifications and Supplemental Specifications are going into new book. The Specifications Section responded that which ones should go into the book is up to the Committee. They noted that several are probably ready to go into the book. Some won't go into the book and will remain Developmental Specifications.

The Specifications Section is sending out a spreadsheet of all the sections in the specifications manual, Developmental Specifications, and Supplemental Specifications. Office directors can decide who will be responsible from their respective offices for the various sections. Those individuals become the contact people for the Specifications Section if questions come up.

The Office of Bridges and Structures asked if it is important for reviewers to be familiar with the Imperative Mood/Active Voice style of writing. They were curious to know how important it is for reviewers to comment on the Imperative Mood/Active Voice writing style. The Specifications Section noted that they could meet face-to-face with reviewers to explain how Imperative Mood/Active Voice style specifications work and what will be asked of reviewers. Reviewers will be asked to review content only; they will not be

asked to do perform writing tasks. The Specifications Section wants to be sure ensure that nothing is left out of the content and that the intent of the specifications is not lost.

The Office of Design asked when new Developmental Specifications should be written in the Imperative Mood/Active Voice style. The Specifications Section noted that Developmental Specifications and Supplemental Specifications effective with the October 2008 letting will need to be in the Imperative Mood/Active Voice style. The October 2008 General Supplemental Specification will be developed in the Imperative Mood/Active Voice style of writing.

The Office of Construction noted it would be helpful if at the next meeting the Specifications Section could present which Developmental Specifications and Supplemental Specifications are being proposed to be included in the new book. They also noted it would be nice to able to access files containing the changes effective with a General Supplemental Specification as soon as possible so offices have the most recent text when they submit changes. There have been instances in the past where out of date language has been used for submittals. The Specifications Section noted that they have converted the book into MSWord format. The goal is to have updated text available before the first meeting after a General Supplemental Specification has been finalized so Committee members will have access to the most recent text for their proposed changes. They also noted that by the time Committee members start looking at changes for the October 2008 General Supplemental Specification, the new book should be far enough along that Committee members can use that text for their submittals.

The Office of Construction asked for a timetable for new patching and traffic control sections. The Specifications Section is hoping that patching will be ready for the August Specification Committee meeting.

The Specifications Section also proposed issuing specification manuals every other year in lieu of the current practice of approximately every 4-7 years. This would help the Specifications Section with staffing resources by making preparing the book more a part of daily operations. They also proposed issuing the General Supplemental Specifications once per year. The Office of Design noted they would prefer to stay on the current schedule of issuing their changes every six months; many of their changes are not related to the specifications. The Office of Materials noted that six months also works best for them, though if necessary they could issue changes on the web. The Specifications Section asked if issues that need to be addressed quickly could be handled by Developmental Specifications and Supplemental Specifications. These changes could be put into the General Supplemental Specification that is issued once per year. The Office of Construction was agreeable to that. The Statewide Operations Bureau suggested producing the General Supplemental Specification for the October letting since lettings taper off after April. The following process has been proposed:

- Developmental Specifications as needed.
- Supplemental Specifications every six months with the Electronic Reference Library.
- General Supplemental Specification once per year in October.
- New book every two years.

The Office of Construction asked if Division 11 would be rewritten into the Imperative Mood/Active Voice style. The Specifications Section noted that they are not planning to rewrite Division 11. They explained that other states have had difficulties changing the front end of their specifications manuals to another style of writing. Attorneys are generally not in favor of the conversion.

The Specifications Section is currently inserting changes associated with GS-01013 into the rewritten sections. This should be completed before the end of June. These will replace the files currently in the W:\Highway\Specifications\Exchange folder. They will send out a notification to Committee members when the updated rewritten sections are available on the ‘W’ drive.