Iowa Department of Transportation

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

May 10, 2012

Members Present:	Roger Bierbaum	Office of Contracts
	Eric Johnsen, Secretary	Specifications Section
	Bruce Kuehl	District 6 - Construction
	Deanna Maifield	Office of Design
	Doug McDonald	District 1 - Marshalltown RCE
	Gary Novey	Office of Bridges & Structures
	Dan Redmond	District 4 - Materials
	Tom Reis, Chair	Specifications Section
	John Smythe	Office of Construction
	Willy Sorensen	Office of Traffic & Safety
Members Not Present:	Jim Berger	Office of Materials
	Donna Buchwald	Office of Local Systems
	John Selmer	Statewide Operations Bureau
Advisory Members Present:	Kevin Jones	Office of Materials
	Lisa Rold	FHWA
Others Present:	Mark Bortle	Office of Construction
	John Dostart	Office of Local Systems
	Mahbub Khoda	Office of Materials
	Mike Lauzon	Office of Materials
	Nikita Rainey	Office of Employee Services
	Scott Schram	Office of Materials
	Wayne Sunday	Office of Construction

Tom Reis, Specifications Engineer, opened the meeting. The following items were discussed in accordance with the revised agenda dated May 4, 2012:

1. Article 1102.19, F, 5, Investigation of Each Complaint with Corrective Action if Necessary.

The Specifications Section requested to revise the language regarding the Iowa DOT's investigation of civil rights violations.

2. Article 1107.06, Federal Participation.

The Office of Contracts requested to eliminate the use of prison produced materials on Federal-aid projects.

3. Article 1107.08, Public Convenience and Safety.

The Office of Design requested to prohibit the use of median crossovers unless stated in the contract documents.

4. Article 2301.03, E, 2, Placing Load Transfer Devices.

The Office of Construction requested to clarify the allowance of not cutting ties wires on load transfer devices.

5. Section 2303, Hot Mix Asphalt Mixtures.

The Office of Materials requested changes and clarifications to the PWL specifications.

6. Article 2304.02, B, HMA Option (Detour Pavement).

The Office of Materials requested to correct an inconsistency in the specifications.

7. Article 2403.03, L, Design and Construction of Forms and Falsework (Structural Concrete).

The Office of Bridges and Structures requested changes to meet the current Guide Design Specification for Temporary Works.

8. Section 2418, Temporary Stream Diversion.

The Office of Construction requested approval of a new section for Temporary Stream Diversion.

9. Section 2419, Precast Concrete Units.

The Office of Bridges and Structures requested approval of a new section for Precast Concrete Units.

10. Article 2511.03, B, 1, General (Construction of Sidewalks and Recreational Trails).

The Office of Local Systems requested to clarify compliance with ADA requirements.

11. Article 2521.03, Application (Certified Plant Inspection).

The Office of Materials requested to eliminate duplication of information that is contained in the Materials I.M.'s.

12. Section 2524, Highway Signing.

Article 4186.10, Sign Posts (Signing Materials).

The Office of Materials requested addition of specifications for perforated square steel tube posts and anchors.

13. Section 2527, Pavement Marking.

Article 4183.06, A, Removable Marking Tape (Traffic Paint and Pavement Markings).

The Office of Construction requested to incorporate SS-09012, Wet, Retroreflective Removable Tape Markings into the Standard Specifications.

14. Article 2601.05, Basis of Payment (Erosion Control).

The Office of Construction requested to remove watering as incidental to TRM; and to clarify when watering is incidental to work that mobilization for watering is also incidental.

15. Article 4100.08, Concrete Compression Test Specimens.

The Office of Materials requested to eliminate the requirement for horizontal molds.

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

The Office of Construction requested to remove reference to manufacturer's recommended installation because Standard Road Plan EC-204 was developed for October 2012 that shows installation requirements. The changes will also revise netting requirements to allow for additional manufacturers and revise description of filter material to allow use of wood.

17. **Article 2528.03, I, 2, b, Portable, Mobile Self Contained LED Floodlights (Traffic Control).**
Section 4189, Solar Power Systems.

The Office of Traffic and Safety requested approval of specifications for Solar Power Systems.

18. **DS-09061, Partial Depth Bridge Deck Patching.**

The Office of Bridges and Structures requested approval of changes to the Developmental Specifications for Partial Depth Bridge Deck Patching.

19. **Section 2435, Sanitary and Storm Sewer Structures.**
Article 4149.04, J, 1, Chimney Seal.

The Specifications Section requested to allow use of a molded infiltration barrier on sanitary sewer manholes.

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Tom Reis / Nikita Rainey	**Office:** OES-Civil Rights	**Item 1**
Submittal Date: 04/24/2012	**Proposed Effective Date:** October 2012 GS	
Article No.: 1102.19, F, 5 **Title:** Investigation of Each Complaint with Corrective Action if Necessary	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 5/10/2012	**Effective Date:** 10/16/2012

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: The revision as approved is currently being used as a proposal note until the October 16, 2012 letting.

Specification Section Recommended Text:

1102.09, F, 5, Investigation of Each Complaint with Corrective Action if Necessary.

Replace the Article:

~~An individual, group of individuals, or entity believing they have been subjected to discrimination prohibited by Title VI Nondiscrimination Provisions may file a written complaint with OES-Civil Rights. A formal, signed complaint shall be filed within 180 calendar days of the alleged occurrence.~~

~~Upon receipt of the complaint, the OES-Civil Rights Coordinator will determine its jurisdiction, acceptability, need for additional information, and investigative merit of the complaint. In cases where the complaint is against one of the Department's sub-recipients of federal highway funds or federal transition funds, the Department will assume the jurisdiction and will investigate and adjusticate the case.~~

~~Once the Coordinator decides to accept the complaint for investigation, the complainant and the respondent will be notified in writing of such determination within five calendar days. The complaint will receive a case number and be logged into the OES-Civil Rights' records identifying its basis, race, color, national origin, and gender of the complainant.~~

~~In cases where the Department assumes the investigation of the complaint, the Coordinator will provide the respondent with the opportunity to respond to the allegations in writing. The respondent will have 10 calendar days to furnish OES-Civil Rights their response to the allegations.~~

~~Within 40 calendar days of receipt of the complaint, the OES-Civil Rights investigator* will prepare an investigative report for the Director of the Department's Operations and Finance Division to review. The report will include a narrative description of the incident, identification of persons interviewed, findings and recommendations for disposition. *This may be the District/Division Title VI Liaison, Coordinator, or Title VI Specialist.~~

~~The investigative report and its finding will be sent to the Attorney General's Office for review. The Attorney General's Office will review the report and associated documentation and provide input within 10 calendar days.~~

~~Comments or recommendations from the Attorney General's Office will be reviewed by the Department's Operations and Finance Division. The Department's Operations and Finance Division will discuss the report and recommendations with the Title VI Coordinator. The report will be modified as needed and made final for its release.~~

~~Once the Department's investigative report becomes final, the parties will be properly notified of the outcome and appeal rights.~~

~~The Department's investigative report and a copy of the complaint will be forwarded to FHWA, Washington Division Office, within 60 calendar days of the receipt of the complaint.~~

~~If the complainant is not satisfied with the results of the investigation, they shall be advised of their rights to appeal the Department's determination to the FHWA – Washington Division Office, U.S. DOT or U.S. Department of Justice. Appeals shall be filed within 180 calendar days after FHWA's final resolution. Unless new facts not previously considered come to light, reconsideration of the Department's determination will not be available.~~

~~The Department will serve as appealing forum to a complainant that is not satisfied with the outcome of an investigation conducted by a Department sub-recipient. The Department will analyze the facts of the case and issue its conclusion to the appellant within 60 calendar days of the receipt of the appeal.~~

The Contractor shall promptly, within 14 calendar days, investigate complaints of alleged discrimination made to the Contractor in connection with its obligation under this contract, attempt to resolve such complaints, and take appropriate corrective action within a reasonable time. If the investigation indicates the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the Contractor shall inform complainant of their avenues of appeal.

If the complaint cannot be resolved at the contractor level, or when a contractor has a complaint against another contractor, the complainant or the Contractor can contact the Department's Office of Employee Services-Civil Rights (OES-Civil Rights) Team.

The Department has a formal Civil Rights Complaint procedure. This procedure is available at www.iowadot.gov/civilrights/documents/IowaDOTExternalComplaintProcedure.pdf. An individual, group of individuals, or contractor believing they have been subjected to discrimination may file a written complaint with the Department's OES-Civil Rights Team. A formal signed complaint shall be filed within 180 calendar days of the alleged occurrence.

Comments:

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

Replace the Article:

The Contractor shall promptly within 14 calendar days investigate all complaints of alleged discrimination made to the Contractor in connection with its obligation under this contract, shall attempt to resolve such complaints, and shall take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the Contractor will inform every complainant of all of their avenues of appeal.

If the complaint cannot be resolved at the contractor level, or when a contractor has a Complaint against another contractor, the complainant or the Contractor can contact the Department's Office of Employee Services–Civil Rights Team (OES-Civil Rights).

The Department has a formal Civil Rights Complaint procedure. This procedure is available at www.iowadot.gov/civilrights/documents/IowaDOTExternalComplaintProcedure.pdf. An individual, group of individuals, or contractor believing they have been subjected to Discrimination may file a written complaint with the Department's OES-Civil Rights. A formal signed complaint shall be filed within 180 calendar days of the alleged occurrence.

An investigation of each discrimination complaint shall be initiated within 14 calendar days following receipt of the complaint. If the investigation indicates that discrimination exists, which may affect persons other than the complainant, corrective action shall include the other persons in addition to the complainant. Upon completion of the investigation, the Contractor/subcontractor shall inform the complainant and each affected person of all their avenues of appeal.
An individual, group of individuals, or entity believing they have been subjected to discrimination prohibited by Title VI Nondiscrimination Provisions may file a written complaint with OES-Civil Rights. A formal, signed complaint shall be filed within 180 calendar days of the alleged occurrence.

Upon receipt of the complaint, the OES-Civil Rights Coordinator will determine its jurisdiction, acceptability, need for additional information, and investigative merit of the complaint. In cases where the complaint is against one of the Department's sub-recipients of federal highway funds or federal transition funds, the Department will assume the jurisdiction and will investigate and adjusticate the case.

Once the Coordinator decides to accept the complaint for investigation, the complainant and the respondent will be notified in writing of such determination within five calendar days. The complaint will receive a case number and be logged into the OES-Civil Rights' records identifying its basis, race, color, national origin, and gender of the complainant.

In cases where the Department assumes the investigation of the complaint, the Coordinator will provide the respondent with the opportunity to respond to the allegations in writing. The respondent will have 10 calendar days to furnish OES-Civil Rights their response to the allegations.

Within 40 calendar days of receipt of the complaint, the OES-Civil Rights investigator* will prepare an investigative report for the Director of the Department's Operations and Finance Division to review. The report will include a narrative description of the incident, identification of persons interviewed, findings and recommendations for disposition. *This may be the District/Division Title VI Liaison, Coordinator, or Title VI Specialist.

The investigative report and its finding will be sent to the Attorney General's Office for review. The Attorney General's Office will review the report and associated documentation and provide input within 10 calendar days.

Comments or recommendations from the Attorney General's Office will be reviewed by the Department's Operations and Finance Division. The Department's Operations and Finance Division will discuss the report and recommendations with the Title VI Coordinator. The report will be modified as needed and made final for its release.

Once the Department's investigative report becomes final, the parties will be properly notified of the outcome and appeal rights.

The Department's investigative report and a copy of the complaint will be forwarded to FHWA, Washington Division Office, within 60 calendar days of the receipt of the complaint.

If the complainant is not satisfied with the results of the investigation, they shall be advised of their rights to appeal the Department's determination to the FHWA - Washington Division Office, U.S. DOT or U.S. Department of Justice. Appeals shall be filed within 180 calendar days after FHWA's final resolution. Unless new facts not

~~previously considered come to light, reconsideration of the Department's determination will not be available.~~

~~The Department will serve as appealing forum to a complainant that is not satisfied with the outcome of an investigation conducted by a Department sub-recipient. The Department will analyze the facts of the case and issue its conclusion to the appellant within 60 calendar days of the receipt of the appeal.~~

Reason for Revision: The request submitted to the Spec Committee for the November 2011 meeting was only to include Office changes for Civil Rights contacts. The proposed change to the complaint investigations was not reviewed prior to submittal and includes internal procedures that shouldn't be in the Standard Specifications.

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

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Roger Bierbaum	**Office:** Contracts	**Item 2**
Submittal Date: April 27, 2012	**Proposed Effective Date:** October 2012	
Article No.: 1107.06 **Title:** Federal Participation	**Other:**	

Specification Committee Action: Not approved.

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

Specification Committee Approved Text:

Comments: The Office of Materials indicated that they had been tracking the usage of signs produced by Iowa Prison Industries for compliance with the federal requirement and are willing to continue. Signs were the only material produced for Iowa DOT projects by Iowa Prison Industries during the reference period in 1986 and 1987.

There was some question on whether the requirement applied to Federal-aid projects or Federal-aid routes, which would be more extensive. The FHWA will confirm the applicability of the requirement. Also, the rule does not apply to materials purchased by government agencies, only materials used on projects let by the government agencies. The rule also does not apply to materials supplied by Iowa Prison Industries, but not produced by them.

Specification Section Recommended Text:

1107.06, Federal Participation.

Add the Article:

C. On contracts involving Federal-aid, no material produced by a prison facility shall be incorporated into the project.

Comments:

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

Add new paragraph C.

C. On all contracts involving Federal-aid, no material produced by a prison facility shall be incorporated into the project.

Reason for Revision: 23 CFR 635.417 limits the amount of prison produced materials to an amount that does not exceed the amount used during the period June 30, 1986 to July 1, 1987. Rather than attempting to track that amount the determination is being made to not allow any prison produced materials on federal aid contracts.

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

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Deanna Maifield	**Office:** Design	**Item 3**
Submittal Date: 3/30/2012	**Proposed Effective Date:** 10/16/2012	
Article No.: 1107.08 **Title:** Public Convenience and Safety	**Other:**	

Specification Committee Action: The Office of Design withdrew this request.

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

Specification Committee Approved Text:

Comments: The Office of Design withdrew this request, as the standard plan note was not voided for the October letting.

Specification Section Recommended Text:

1107.08, Public Convenience and Safety.

Add the Article:

N. Use of established or other median crossovers will be prohibited unless stated elsewhere in the contract documents.

Comments: The Office of Design does not know what situations this note was originally written to cover, since U-turns at median crossovers are prohibited by law. The Office of Construction asked if this should only apply to restricted access roadways and not median crossovers intended for accessing side roads and properties. Also, Departmental policy allows use of median crossovers when both inside lanes are closed because of necessary work activity (Chapter 5.30 of the Construction Manual). The Office of Design noted that a shoulder closure would allow the contractor to enter the median and once in the median it shouldn't matter which direction the contractor leaves from. The Specifications Section noted that if we are allowing median crossovers to be used per the Construction Manual, the specifications should reflect this so that new contractors have the same information that existing contractors have. The Specifications Section proposed deferring this item to the May Specification Committee meeting.

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

1107.08, Public Convenience and Safety

Add as a new article:

N. Use of established or other median crossovers will be prohibited unless stated elsewhere in the contract documents.

Reason for Revision: This is currently Standard Note 253-1. Normal practice is that contractors not be allowed to use median crossovers unless designated in the plans. The Office of Design is requesting this be added to the Standard Specifications. The Standard Note will be voided.

253-1
10-18-11

MEDIAN CROSSOVER

The Contractor is prohibited from using any established or other type median crossover on this project unless specifically designated for the Contractor's use by this plan.

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: John Smythe / Kevin Merryman	**Office:** Construction	**Item 4**
Submittal Date: April 24, 2012	**Proposed Effective Date:** October 2012	
Article No.: 2301.03, E, 2 **Title:** Placing Load Transfer Devices	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 5/10/2012	**Effective Date:** 10/16/2012

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: None.

Specification Section Recommended Text:

2103.03, E, 2, d.

Replace the Article:

~~Cutting the tie wires of the load transfer assemblies is optional.~~ A maximum of three tie wires may remain uncut on each load transfer assembly.

Comments:

Member's Requested Change (Redline/Strikeout):

2301.03 CONSTRUCTION.

E. Placing Reinforcement and Placing Dowel Bars.

2. **Placing Load Transfer Devices.**

a. Load transfer devices may be required in the contract documents. Accurately place these assemblies as shown. To prevent their movement during subsequent concrete paving operations, securely stake or fasten to the base to line and grade. Do not use mechanical dowel bar inserters.

b. Do not use damaged assemblies. Ensure horizontal and vertical alignment of the load transfer bars does not exceed 1/4 inch (5 mm) from parallel to line and grade. Place each assembly so bars are in a horizontal plane at T/2 ± 1/2 inch (15 mm).

c. Check placement of each assembly and the position of the bars within the assembly using a suitable template or other device approved by the Engineer. If assembly is found to be placed outside the above tolerances, correct the placement.

d. ~~Cutting the tie wires of the load transfer assemblies is optional.~~ A maximum of three tie wires may remain uncut on each load transfer assembly.

Reason for Revision: When the change was made in 2003 to allow tie wires to remain uncut, it was done based upon baskets being fabricated per the Road Standard which shows three tie wires. It is very common that CD baskets will be fabricated with up to seven or eight tie wires, some with much greater diameter wire than shown in the standard. This change is intended to clarify the requirement that the tie wires may remain uncut provided the CD baskets are fabricated per the standard with three tie wires. If additional tie wires are added to aid in handling and placement of the assemblies, the added wires must be cut.

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

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

Comments: This is a clarification of current requirements. Industry representatives have requested that this clarification be made in the specification since most CD baskets are not fabricated with three tie wires per the Road Standard.

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger / Scott Schram	**Office:** Materials	**Item 5**
Submittal Date: April 27, 2012	**Proposed Effective Date:** Oct 2012	
Section No.: 2303 **Title:** Hot Mix Asphalt Mixtures	**Other:**	

Specification Committee Action: Approved with changes.

Deferred:	**Not Approved:**	**Approved Date:** 5/10/2012	**Effective Date:** 10/16/2012

Specification Committee Approved Text:

2303.02, C, 6, c, 2.

Replace Table 2303.02-1:

Mix Designation	Aggregate Quality Type	Maximum Allowance Usage[2]		
		Unclassified RAP	Certified RAP	Classified RAP
HMA 100K S	B	0%	10%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 100K I	B	10%	20%	No Limit
HMA 100 K B	B	10%	20%	No Limit
HMA 300K S	B	0%	10%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 300 K I	B	10%	20%	No Limit
HMA 300K B	B	10%	20%	No Limit
HMA 1M S L-4	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 1M S	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 1M I	B	10%	20%	No Limit
HMA 1M B	B	10%	20%	No Limit
HMA 1M B (shoulder)	B	10%	20%	No Limit
HMA 3M S L-4	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 3M S L-3	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 3M S	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 3M I	A	0%	0%	No Limit
HMA 3M B	B	10%	20%	No Limit
HMA 10M S L-3	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 10M I	A	0%	0%	No Limit
HMA 10M B	B	10%	20%	No Limit
HMA 30M S L-3	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 30M S L-2	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 30M I	A	0%	0%	No Limit
HMA 30M B	B	10%	20%	No Limit
HMA 100M S L-2	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 100M I	A	0%	0%	No Limit
HMA 100M B	B	10%	20%	No Limit

Note:

1. ~~More than 15% of Classified RAP may be used for the surface course when there is quality control sampling, testing, and reporting of the RAP meeting the requirements in~~

~~Materials I.M. 505.~~ At least 70% of the total asphalt binder in the surface mix shall be virgin.

~~2. Maximum percentages shown are not to be combined.~~

2303.02, D, Flexible Paving Mixture.

Replace Articles 6, 7, and 8:

6. Unless otherwise indicated on the contract documents, use a 1/2 inch (12.5 mm) or 3/4 inch (19 mm) 1,000,000 ESAL HMA Base mixture (or higher ESAL) for base widening. When an adjoining surface is designed for 300,000 ESALS or less and is paved during same project, use a base mixture at same ESAL level used in surface mixture.

~~6~~ **7.** Prepare gyratory mixture designs for base, intermediate, and surface mixtures. Follow the procedure outlined in Materials I.M. 510. Submit a mixture design complying with Materials I.M. 510. Propose both a production and a compaction temperature between 215ºF (102ºC) and 280ºF (138ºC) for WMA mixture designs.

~~7~~ **8.** Use gyratory compacter for design and field control meeting the AASHTO protocol for Superpave gyratory compactors. Compactors for which compliance with this protocol is pending may be used at the discretion of the District Materials Engineer.

~~**8.** Unless otherwise indicated in the contract documents, do not use WMA on interstate travel lanes for surface, intermediate, or base courses.~~

2303.02, E, 2, a.

Replace Articles 2 and 3:

2) Mixtures for Interstate and Primary highways containing quartzite, granite, or other siliceous (not a limestone or dolomite) aggregate ~~(not a limestone or dolomite)~~ obtained by crushing from ledge rock in at least 40% of the total aggregate (virgin and recycled) or at least 25% of the plus No. 4 (4.75 mm).

3) All WMA mixtures placed in travel lanes designed for 10,000,000 ESALS and higher. For the purpose of evaluating moisture sensitivity of a proposed ~~WMA~~ mix design~~s which use water injection technologies, in lieu of a lab-scaled foaming device~~, the Contractor may test the proposed JMF from plant produced material placed off-site at no additional cost to the contracting authority.

2303.03, C, 3, d, 4.

Add the Article:

e) Production temperature limits apply starting at point of discharge from mixer.

2303.03, C, 5, b, 2, b.

Add to the end of the Article:

If surface course and intermediate course are not placed the same calendar year, then place test strip at beginning of surface mix production.

2303.03, C, 5, b, 2, e

Replace the first sentence of the Article:

Only one test strip will be allowed for each mixture and shall be declared to the Engineer prior to placement.

2303.03, D, 3, a, 4.

Replace the Article:

All of the following qualify as a “significant mix change”:

- A single occurrence of an aggregate interchange of greater than 5%.
- An aggregate interchange of greater than 5% from last approved JMF.
- A single occurrence of an asphalt content change greater than 0.2%.
- An asphalt content change greater than 0.2% from last approved JMF.

- A deletion or introduction of a new material into the mix.
- A change of additive dosage rate.
- A change of binder, aggregate, or additive source.

2303.03, D, 3, b, 3, a.

Add to the end of the Article:

Modify sampling location to include placement with mix stored from a prior day's production.

2303.03, D, 3, b, 3, f.

Replace the first sentence of the Article:

For PWL analysis of laboratory voids, each mixture bid item will constitute a lot. Lot size is defined as follows:

2303.03, D, 3, b, 3, i, 1.

Replace the Article:

For base widening, non-high speed ramps, non-interstate shoulders, recreational trails, and other mixture bid items not placed in travel lanes of a permanent pavement, acceptance for laboratory voids will be based on a moving average absolute ~~average~~ deviation (AAD) from target as defined in Materials I.M. 501 ~~of this specification~~. Use the production tolerance in Table 2303.03-5. At any time, if more than 100 tons (100 MG) of the bid item is placed in an area not listed above, apply Article 2303.03, D, 3, b, 3, ix, b, for entire production of bid item.

2303.03, D, 3, b, 3, i.

Add the Article:

(3) When same mix type is produced for multiple bid items in a single day from a single plant, apply all samples for that day to the lot for each bid item.

2303.03, D, 3, b, 3, j.

Replace the first paragraph of the Article:

For mixture bid items in a PWL lot, determine the pay factor using the average absolute ~~average~~ deviation (AAD) procedure described in Materials I.M. 501 for proportions of a mixture bid item which are produced in irregular intervals and placed in irregular areas. The following items qualify as such and shall be combined into ~~weekly lots~~ a single lot:

2303.03, D, 5, b, 8.

Replace the third sentence of the Article:

~~A single sample shall represent no more than 10,000 tons of mixture.~~ Each sample shall constitute a separate lot and include all quantities placed from beginning of bid item's production (or previous sampling point) to next sampling point (or 10,000 tons, whichever is less).

2303.03, E, 1, a.

Replace the Article:

An anti-stripping agent is required when TSR on mix design is less than 90%.

2303.05, D, 1.

Replace the last sentence of the Article:

For mix designs (small quantities excluded) with a TSR greater than or equal to 80%, payment will stop when the Contracting Authority's TSR results of the field produced mixture without the agent are greater than or equal to 80% and any remaining asphalt binder containing the agent in the current tank is consumed.

Comments: The FHWA asked how RAP percentage will be verified on non-PWL mixes. The Office of Materials indicated that other factors, such as film thickness, will limit the RAP percentage that can be used, so the 15% limit is unnecessary.

The Office of Local Systems asked if the last column of Table 2303.02-1 is necessary since all of them indicate "No Limit". Some of the columns still include Note 1, which indicates there is a minimum of 70% virgin binder for surface mixes.

The Office of Construction asked if some of the revisions referred to incorrect articles. The revision references were applied to the 2012 Standard Specification book which will be effective in October. In preparing the new book, it was noted that some of the Articles in Section 2303 were misnumbered. The revision references shown in the recommended and approved text reflect the renumbering. The correct numbering order for Iowa DOT specifications is:

XXXX.XX. TITLE OF ARTICLE.
A. Title of Article.
1. Title of Article.
a. Title of Article.
1) Title of Article.
a) Title of Article
(1) Title of Article.
(a) Title of Article.

The Office of Construction asked that "starting" be added to Article 2303.03, C, 3, d, 4, e, since there are temperature limits through placement on the grade.

Specification Section Recommended Text:

2303.02, C, 6, c, 2.

Replace Table 2303.02-1

Mix Designation	Aggregate Quality Type	Maximum Allowance Usage[2]		
		Unclassified RAP	Certified RAP	Classified RAP
HMA 100K S	B	0%	10%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 100K I	B	10%	20%	No Limit
HMA 100 K B	B	10%	20%	No Limit
HMA 300K S	B	0%	10%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 300 K I	B	10%	20%	No Limit
HMA 300K B	B	10%	20%	No Limit
HMA 1M S L-4	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 1M S	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 1M I	B	10%	20%	No Limit
HMA 1M B	B	10%	20%	No Limit
HMA 1M B (shoulder)	B	10%	20%	No Limit
HMA 3M S L-4	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 3M S L-3	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 3M S	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 3M I	A	0%	0%	No Limit
HMA 3M B	B	10%	20%	No Limit
HMA 10M S L-3	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 10M I	A	0%	0%	No Limit
HMA 10M B	B	10%	20%	No Limit
HMA 30M S L-3	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]

HMA 30M S L-2	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 30M I	A	0%	0%	No Limit
HMA 30M B	B	10%	20%	No Limit
HMA 100M S L-2	A	0%	0%	~~15% (min. 70% virgin binder)~~ No Limit[1]
HMA 100M I	A	0%	0%	No Limit
HMA 100M B	B	10%	20%	No Limit

Note:

3. ~~More than 15% of Classified RAP may be used for the surface course when there is quality control sampling, testing, and reporting of the RAP meeting the requirements in Materials I.M. 505.~~ At least 70% of the total asphalt binder in the surface mix shall be virgin.
4. ~~Maximum percentages shown are not to be combined.~~

2303.02, D, Flexible Paving Mixture.

Replace Articles 6, 7, and 8.

6. Unless otherwise indicated on the contract documents, use a 1/2 inch (12.5 mm) or 3/4 inch (19 mm) 1,000,000 ESAL HMA Base mixture (or higher ESAL) for base widening. When the adjoining surface is designed for 300,000 ESALS or less and is paved during the same project, use a base mixture at the same ESAL level used in the surface mixture.

~~6~~ **7.** Prepare gyratory mixture designs for base, intermediate, and surface mixtures. Follow the procedure outlined in Materials I.M. 510. Submit a mixture design complying with Materials I.M. 510. Propose both a production and a compaction temperature between 215ºF (102ºC) and 280ºF (138ºC) for WMA mixture designs.

~~7~~ **8.** Use gyratory compacter for design and field control meeting the AASHTO protocol for Superpave gyratory compactors. Compactors for which compliance with this protocol is pending may be used at the discretion of the District Materials Engineer.

~~8. Unless otherwise indicated in the contract documents, do not use WMA on interstate travel lanes for surface, intermediate, or base courses.~~

2303.02, E, 2, a.

Replace Articles 2 and 3:

2) Mixtures for Interstate and Primary highways containing quartzite, granite, or other siliceous (not a limestone or dolomite) aggregate ~~(not a limestone or dolomite)~~ obtained by crushing from ledge rock in at least 40% of the total aggregate (virgin and recycled) or at least 25% of the plus No. 4 (4.75 mm).

3) All WMA mixtures placed in travel lanes designed for 10,000,000 ESALS and higher. For the purpose of evaluating moisture sensitivity of a proposed ~~WMA~~ mix design~~s which use water injection technologies, in lieu of a lab-scaled foaming device~~, the Contractor may test the proposed JMF from plant produced material placed off-site at no additional cost to the contracting authority.

2303.03, C, 3, d, 4.

Add the Article:

e) Production temperature limits apply at the point of discharge from the mixer.

2303.03, C, 5, b, 2, b.

Add to the end of the Article:

If surface course and intermediate course are not placed the same calendar year, then place the test strip at the beginning of surface mix production.

2303.03, C, 5, b, 2, e

Replace the first sentence of the Article:

Only one test strip will be allowed for each mixture and shall be declared to the Engineer prior to placement.

2303.03, D, 3, a, 4.

Replace the Article:

All of the following qualify as a "significant mix change":

- A single occurrence of an aggregate interchange of greater than 5%.
- An aggregate interchange of greater than 5% from the last approved JMF.
- A single occurrence of an asphalt content change greater than 0.2%.
- An asphalt content change greater than 0.2% from the last approved JMF.
- A deletion or introduction of a new material into the mix.
- A change of additive dosage rate.
- A change of binder, aggregate, or additive source.

2303.03, D, 3, b, 3, a.

Add to the end of the Article:

Modify the sampling location to include placement with mix stored from a prior day's production.

2303.03, D, 3, b, 3, f.

Replace the first sentence of the Article:

For PWL analysis of laboratory voids, each mixture bid item will constitute a lot. Lot size is defined as follows:

2303.03, D, 3, b, 3, i, 1.

Replace the Article:

For base widening, non-high speed ramps, non-interstate shoulders, recreational trails, and other mixture bid items not placed in travel lanes of a permanent pavement, acceptance for laboratory voids will be based on a moving average absolute ~~average~~ deviation (AAD) from target as defined in Materials I.M. 501 ~~of this specification~~. Use the production tolerance in Table 2303.03-5. At any time, if more than 100 tons (100 MG) of the bid item is placed in an area not listed above, apply Article 2303.03, D, 3, b, 3, ix, b, for the entire production of the bid item.

2303.03, D, 3, b, 3, i.

Add the Article:

(3) When the same mix type is produced for multiple bid items in a single day from a single plant, apply all samples for that day to the lot for each bid item.

2303.03, D, 3, b, 3, j.

Replace the first paragraph of the Article:

For mixture bid items in a PWL lot, determine the pay factor using the average absolute ~~average~~ deviation (AAD) procedure described in Materials I.M. 501 for proportions of a mixture bid item which are produced in irregular intervals and placed in irregular areas. The following items qualify as such and shall be combined into ~~weekly lots~~ a single lot:

2303.03, D, 5, b, 8.

Replace the third sentence of the Article:

~~A single sample shall represent no more than 10,000 tons of mixture.~~ Each sample shall constitute a separate lot and include all quantities placed from the beginning of the bid item's production (or previous sampling point) to the next sampling point (or 10,000 tons, whichever is less).

2303.03, E, 1, a.

Replace the Article:

An anti-stripping agent is required when the TSR on the mix design is less than 90%.

2303.05, D, 1.

Replace the last sentence of the Article:

For mix designs (small quantities excluded) with a TSR greater than or equal to 80%, payment will stop when the Contracting Authority's TSR results of the field produced mixture without the agent are greater than or equal to 80% and any remaining asphalt binder containing the agent in the current tank is consumed.

Comments:

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

Replace Table 2303.02-1

Mix Designation	Aggregate Quality Type	Maximum Allowance Usage[2]		
		Unclassified RAP	Certified RAP	Classified RAP
HMA 100K S	B	0%	10%	No Limit ~~15% (min. 70% virgin binder)~~[1]
HMA 100K I	B	10%	20%	No Limit
HMA 100 K B	B	10%	20%	No Limit
HMA 300K S	B	0%	10%	No Limit ~~15% (min. 70% virgin binder)~~[1]
HMA 300 K I	B	10%	20%	No Limit
HMA 300K B	B	10%	20%	No Limit
HMA 1M S L-4	A	0%	0%	No Limit ~~15% (min. 70% virgin binder)~~[1]
HMA 1M S	A	0%	0%	No Limit ~~15% (min. 70% virgin binder)~~[1]
HMA 1M I	B	10%	20%	No Limit
HMA 1M B	B	10%	20%	No Limit
HMA 1M B (shoulder)	B	10%	20%	No Limit
HMA 3M S L-4	A	0%	0%	No Limit ~~15% (min. 70% virgin binder)~~[1]
HMA 3M S L-3	A	0%	0%	No Limit ~~15% (min. 70% virgin binder)~~[1]
HMA 3M S	A	0%	0%	No Limit ~~15% (min. 70% virgin binder)~~[1]
HMA 3M I	A	0%	0%	No Limit
HMA 3M B	B	10%	20%	No Limit
HMA 10M S L-3	A	0%	0%	No Limit ~~15% (min. 70% virgin binder)~~[1]
HMA 10M I	A	0%	0%	No Limit
HMA 10M B	B	10%	20%	No Limit
HMA 30M S L-3	A	0%	0%	No Limit ~~15% (min. 70% virgin binder)~~[1]
HMA 30M S L-2	A	0%	0%	No Limit ~~15% (min. 70% virgin binder)~~[1]
HMA 30M I	A	0%	0%	No Limit
HMA 30M B	B	10%	20%	No Limit
HMA 100M S L-2	A	0%	0%	No Limit ~~15% (min. 70% virgin binder)~~[1]
HMA 100M I	A	0%	0%	No Limit

HMA 100M B	B	10%	20%	No Limit

Note:

5. ~~More than 15% of Classified RAP may be used for the surface course when there is quality control sampling, testing, and reporting of the RAP meeting the requirements in Materials I.M. 505.~~ At least 70% of the total asphalt binder in the surface mix shall be virgin.
~~6. Maximum percentages shown are not to be combined.~~

Delete Article 2303.02, D, 8

~~**8)** Unless otherwise indicated in the contract documents, do not use WMA on interstate travel lanes for surface, intermediate, or base courses.~~

Renumber Article 2303.02, D, ~~6~~ to Article 2303.02, D, 7
Renumber Article 2303.02, D, ~~7~~ to Article 2303.02, D, 8

Add Article 2303.02, D, 6

6) Unless otherwise indicated on the contract documents, use a 1/2 inch or 3/4 inch 1,000,000 ESAL HMA Base mixture (or higher ESAL) for base widening. When the adjoining surface is designed for 300,000 ESALS or less and is paved during the same project, use a base mixture at the same ESAL level used in the surface mixture.

Replace Article 2303.02, E, 2, a, 2

2) Mixtures for Interstate and Primary highways containing quartzite, granite, or other siliceous (not a limestone or dolomite) aggregate ~~(not a limestone or dolomite)~~ obtained by crushing from ledge rock in at least 40% of the total aggregate (virgin and recycled) or at least 25% of the plus No. 4 (4.75 mm).

Replace Article 2303.02, E, 2, a, 3

3) All WMA mixtures placed in travel lanes designed for 10,000,000 ESALS and higher.
For the purpose of evaluating moisture sensitivity of a proposed ~~WMA~~ mix design~~s which use water injection technologies, in lieu of a lab-scaled foaming device~~, the Contractor may test the proposed JMF from plant produced material placed off-site at no additional cost to the contracting authority.

Add Article 2303.03, C, 3, D, 4, e

e) Production temperature limits apply at the point of discharge from the mixer.

Replace Article 2303.03, C, 5, b, 2, b

b) When the contract documents specify both intermediate and surface courses and a test strip is required, place a surface course test strip in lieu of intermediate mixture in a section of the intermediate course prior to actual surface course placement. If the surface course and intermediate course are not placed in the same calendar year, then place the test strip at the beginning of the surface mix production.

Replace Article 2303.03, C, 5, b, 2, e

e) Only one test strip will be allowed for each mixture and must be declared to the Engineer prior to placement. The Engineer may require additional test strips if a complying HMA mixture or rolling pattern was not established.

Add to Article 2303.03, D, 3, a, 4

4) All of the following qualify as a "significant mix change":

- A single occurrence of an aggregate interchange of greater than 5%.
- An aggregate interchange of greater than 5% from the last approved JMF.
- A single occurrence of an asphalt content change greater than 0.2%.
- An asphalt content change greater than 0.2% from the last approved JMF.

- A deletion or introduction of a new material into the mix.
- A change of additive dosage rate.
- A change of binder, aggregate, or additive source.

Add to Article 2303.03, D, 3, b, 3, i

i) Sample the hot HMA mixture at random locations as directed and witnessed by the Engineer according to Materials I.M. 322. Secure and test the samples according to Materials I.M. 511. Modify the sampling location to include placement with mix stored from a prior day's production.

Add to Article 2303.03, D, 3, b, 3

vi) For PWL analysis of laboratory voids, each mixture bid item will constitute a lot. ~~lot~~ Lot size is defined as follows:

Replace Article 2303.03, D, 3, b, 3, ix, a

a) For base widening, non-high speed ramps, non-interstate shoulders, recreational trails, and other mixture bid items not placed in travel lanes of a permanent pavement, acceptance for laboratory voids will be based on a moving average absolute ~~average~~ deviation (AAD) from target as defined in Materials I.M. 501 ~~of this specification~~. Use the production tolerance in Table 2303.03-5. At any time, if more than 100 tons (100 MG) of the bid item is placed in an area not listed above, apply Article 2303.03, D, 3, b, 3, ix, b for the entire production of the bid item.

Add Article 2303.03, D, 3, b, 3, ix, c

c) When the same mix type is produced for multiple bid items in a single day from a single plant, apply all samples for that day to the lot for each bid item.

Replace the first paragraph in Article 2303.03, D, 3, b, 3, x

x) For mixture bid items in a PWL lot, determine the pay factor using the average absolute ~~average~~ deviation (AAD) procedure described in Materials I.M. 501 for proportions of a mixture bid item which are produced in irregular intervals and placed in irregular areas. The following items qualify as such and shall be combined into ~~weekly lots~~ a single lot:

Replace Article 2303.03, D, 5, b, 8

8) When sampling for moisture susceptibility testing, obtain a 70 pound (35 kg) sample according to Materials I.M. 322. If the Contractor's TSR results from the mixture design are less than 90%, sample at a minimum frequency of 1/10,000 tons of plant production until a complying test result is achieved, after which the minimum frequency may be reduced to 1/50,000 tons. Each sample shall constitute a separate lot and include all quantities placed from the beginning of the bid item's production (or previous sampling point) to the next sampling point (or 10,000 tons, whichever is less). ~~A single sample shall represent no more than 10,000 tons of mixture.~~ The Engineer will select, at random, the sample location. Split the sample and deliver half to the Central Materials Laboratory.

Add Article 2303.03, E, 1, a

a. An anti-stripping agent is required when the TSR on the mix design is less than 90%.

Renumber Article 2303.04, B, 6

6~~7~~. When payment for HMA is based on area, the quantity of asphalt binder used will not be measured separately for payment.

Add after the last sentence in Article 2303.05, D, 1

1. When anti-strip agent is required, the incorporation of the anti-strip agent into the asphalt mixture will be considered as extra work ordered by the Engineer if the Contracting Authority's TSR results from the field produced mixture meet or exceed the minimum

requirement and the conditioned indirect tensile strength is improved by at least 10% over that from the plant mixture without anti-strip (or original JMF conditioned strength when plant mix without anti-strip is not available). Payment will be made at the rate of $2.00 per ton (megagram) of asphalt mixture in which the anti-strip agent is incorporated. WMA mixtures designed for 10,000,000 ESALS and higher must satisfy Articles 2303.02, E, 2, a, 1 or 2 to be eligible for anti-strip payment. For mix designs (small quantities excluded) with a TSR greater than or equal to 80%, payment will stop when the Contracting Authority's TSR results of the field produced mixture without the agent are greater than or equal to 80% and any remaining asphalt binder containing the agent in the current tank is consumed.

Reason for Revisions:

- Because PWL can capture mix variability, RAP QC is now optional instead of mandatory.
- The maximum percentages comment is misleading. Multiple RAP stockpiles may be utilized at their respective limits.
- We have no reason to prevent the use of WMA on interstate pavements. WMA is performing equal to or better than HMA.
- Base widening does not have a standard mix designation by which to approve the JMF
- We do not need to test mixes with 40% natural sand for TSR. We now stipulate a siliceous source has to be from ledge rock to warrant this testing.
- Testing plant produced mix for TSR instead of lab mix can be done on any JMF, not just WMA.
- We do not state where in the production process, the temperature is to be limited. The temperature inside the drum (or just after discharge) is the critical point.
- Surface courses may not be placed until the year following the intermediate placement
- DMEs experienced several small mix changes which add up to a significant mix change
- Mix stored overnight in a silo has been aged and may perform differently than other production. This affect cannot be captured randomly. We can use Article 1106.01, but it is also appropriate in 2303.
- Bid items have different unit prices and need to be kept in separate lots for incentive/disincentive calculations/payments.
- PWL is waived on "non-mainline" placement; however, these waivers need to be "all or none". This change clarifies the intent. A tolerance is given for isolated instances which do not require any testing under 100 tons.
- When tests are taken from a single mix going to multiple bid items in a day, it is difficult to know which samples apply to a particular bid item. Since the contractor is producing the same mix, the demand for consistency should not depend on which bid item the mix is to be paid. Therefore, all samples will count towards all bid items.
- For consistency in the IMs and 2303, the term that will be used is average absolute deviation (AAD)
- There have been cases where the contractor has misinterpreted the intent of the 10,000 ton cap on a single TSR result. If multiple TSR tests are taken less than 10,000 tons apart, they are not to be averaged like other lot-based tests. Each test is representative of the mix placed until a new test result is available.
- For small quantities, we do not want to use anti-strip (and pay for it) when we are confident it is not needed.
- We have always paid for antistrip on a tanker basis. If it is no longer needed, we let them finish out the tank.

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

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

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger / Scott Schram	**Office:** Materials	**Item 6**
Submittal Date: April 27, 2012	**Proposed Effective Date:** Oct 2012	
Article No.: 2304.02, B **Title:** HMA Option (Detour Pavement)	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 5/10/2012	**Effective Date:** 10/16/2012

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: None.

Specification Section Recommended Text:

2304.02, B, 3.

Replace the second sentence of the Article:

Apply ~~Class I~~ compaction per Section 2303.

Comments:

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

Replace Article 2304.02, B, 3

3. For median crossovers, use HMA 10,000,000 ESAL surface or intermediate course, 3/4 (19 mm), with PG 64-22 asphalt binder. Apply ~~Class I compaction~~ compaction per 2303. The surface lift requires L-4 friction aggregate.

Reason for Revisions:

- Conflicts with 2303. Compaction is Class II.

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

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

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Gary Novey	**Office:** Bridges and Structures	**Item 7**
Submittal Date: April 27, 2012	**Proposed Effective Date:** October 2012	
Article No.: 2403.03, L **Title:** Design and Construction of Forms and Falsework (Structural Concrete)	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 5/10/2012	**Effective Date:** 10/16/2012

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: The Office of Bridges and Structures will put guidance in their Design Manual.

The Office of Local Systems asked if these revisions will change how falsework is designed. The revisions are a change from what we have had, but many of the values do not change by enough that the design of the falsework will be affected.

Specification Section Recommended Text:

2403.03, L, 1, General.

Add the Article:

c. Design values for lumber and timber vary considerably depending on size and or use, species, and grade. For each type of structural member, list on the falsework plans specifications for the following if known: size or use category, species group, and minimum grade.

2403.03, L, 3, c.

Add as the first sentence of the Article:

To ensure stability for pile bents 10 feet (3 m) or less in height that are not sway braced, show pile type, size, and minimum embedment length on plans.

2403.03, L, Design and Construction of Forms and Falsework.

Replace Articles 4 and 5:

4. Design Loads.

Design formwork and falsework for the following loads:

a. Vertical load of concrete with a density of 150 pounds per cubic foot (2400 kg/m^3).

b. Horizontal load of fresh concrete as a liquid with a density of 150 pounds per cubic foot (2400 kg/m^3) for the depth of plastic concrete, except when lesser pressures are permitted by AASHTO Guide Design Specifications for Temporary Works.

c. Vertical dead load of forms and falsework.

d. Vertical dead load of rail and walkway applied at edge of deck form equal to 75 pounds per linear foot (1.1 kN/m)

~~**d**~~ **e.** Construction live load equal to 50 pounds per square foot (2.4 kPa) of horizontal projection

f . Live load equal to 6 kips (26.69 kN) of finishing machine located along the edge of the deck form to maximize the design condition.

~~**e**~~ **g.** Wind loads ~~on walls and columns according to the requirements of the ACI~~ equal to 50 pounds per square foot (24 kPa) for elevations to 30 feet (10 m) above the ground, increased for elevations above 30 feet (10 m).

h. Other applicable loads such as horizontal loads due to equipment or construction sequence, additional live load, impact, stream flow, and snow loads specified in AASHTO Guide Design Specification for Bridge Temporary Works.

5. Design Stresses.

a. Design formwork and falsework using load groups specified in AASHTO Guide Design Specifications for Bridge Temporary Works and material working stresses ~~and a normal duration of load, as for a permanent structure~~. For structural steel and reinforced concrete use the allowable stress percentages given with load groups. For lumber and timber use appropriate load and duration factors instead of percentages. Calculate lumber strength on the basis of

dressed size ~~and, except for sheathing, a dry condition~~. Publications of the APA – The Engineered Wood Association, ACI, and the ~~National Forest Products Association~~ American Forest & Paper Association, American Wood Council will be considered standard references for design and analysis of plywood, lumber, and timber formwork and falsework.

b. Do not exceed 50 times the dimension of the least side for the unsupported length of wood~~en~~ columns and compression members. ~~Analyze the member as a column.~~

c. Unless the Contractor certifies a higher stress grade or value as allowed by AASHTO Guide Design Specification for Temporary Works, adequacy of falsework material will be ~~checked~~ reviewed on the basis of the following values:

1) Structural steel stresses ~~per AASHTO~~ for ~~30,000~~ 36,000 psi (~~207~~ 248 MPa) yield strength and ~~22,500~~ 22,000 psi (~~155~~ 151 MPa) maximum working stress.

2) Plywood sheathing stresses per ~~American Plywood Association~~ APA – The Engineered Wood Association for ~~concrete form grade~~ Plyform, Class I, wet use, ~~permanent loading~~ 7 day duration of load, span-perpendicular-to-face grain. Orientation of plywood panels must be shown on drawings if advantage is taken of greater strength with span-parallel-to-face grain.

3) ~~Stresses~~ Design values for lumber in good condition and 4 inches (100 mm) or less in thickness, in psi (MPa) as follows:

f_b, bending	= ~~1000~~ 875 (~~6.90~~ 6.03)
f_t, tension	= ~~625~~ 450 (~~4.30~~ 3.10)
f_v, shear	= ~~120~~ 135 (~~0.83~~ 0.93)
f_c, perpendicular to grain	= ~~345~~ 425 (~~2.40~~ 2.93)
f_c, parallel to grain	= ~~1050~~ 1150 (~~7.20~~ 7.93)
E, modulus	= ~~1,500,000~~ 1,400,000 (~~10,300~~ 9650)

These design values are to be modified for seven-day duration of load (except for fc, perpendicular to grain and E, modulus) and other applicable adjustment factors when determining allowable stresses.

4) ~~Stresses~~ Design values for ~~lumber~~ timber in good condition and 5 inches (125 mm) thick and thicker in psi (~~MPs~~ MPa) as follows:

f_b, bending	= ~~1200~~ 850 (~~8.30~~ 5.86)
f_t, tension	= ~~1000~~ 450 (~~6.90~~ 3.10)
f_v, shear	= ~~120~~ 125 (~~0.83~~ 0.86)
f_c, perpendicular to grain	= ~~390~~ 425 (~~2.70~~ 2.93)
f_c, parallel to grain	= ~~1000~~ 625 (~~6.90~~ 4.31)
E, modulus	= ~~1,600,000~~ 1,300,000 (~~11,000~~ 8960)

These design values are to be modified for seven-day duration of load (except for fc, perpendicular to grain and E, modulus) and other applicable adjustment factors when determining allowable stresses.

5) Safe bearing value of coarse sand, gravel, very firm clay, and other similar confined soils in thick beds at 1500 pounds per square foot (72 kPa) unless recommended otherwise by a Professional Engineer licensed in the State of Iowa. Safe bearing value of compacted berms at 2000 pounds per square foot (96 kPa).

Comments:

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

L. Design and Construction of Forms and Falsework.

1. **General.**
   - **a.** Have a Professional Engineer licensed in the State of Iowa design and certify falsework plans.
   - **b.** Materials for forms and falsework may be either new or used. It is the Contractor's responsibility to ensure that materials are suitable for the use intended. Material which the Engineer determines to be damaged, defective, or otherwise unsuitable will be rejected.
   - c. Design values for lumber and timber vary considerably depending on size and or use, species and grade. For each type of structural member, list on the falsework plans specifications for all of the following if known: size or use category, species group, and minimum grade.

2. **Construction of Forms.**
   - **a.** Use materials, and construct forms that will be in direct contact with concrete, as specified in Article 2403.03, B.
   - **b.** For wall or column forms, use studs, wales, and ties designed to withstand the maximum fluid pressure discussed below.

c. Use prefabricated form systems certified for the expected pressures.
d. Guy, shore, and/or brace forms for walls and columns to withstand wind loads and to prevent alignment shift resulting from construction live load.

3. Construction of Falsework.
a. Build falsework used to support construction of reinforced concrete superstructures, reinforced beams, and substructure cantilevers, on sufficiently strong foundations to carry the loads safely and without significant deflection. Drive ample falsework piling to support falsework which cannot be founded on rock, shale, thick deposits of compact gravels, coarse sand, or the firm clays in natural beds. On the soils materials listed above, mudsills or other spread footings may be used. Determine their sizes considering the applied loads and the bearing value of the soil.
b. Determine bearing values of all piles used to support falsework as provided in Section 2501. Bearing values are to be at least equal to the applied loads.
c. To insure stability for pile bents 10 feet (3 m) or less in height that are not sway braced, show pile type, size, and minimum embedment length on plans. Transversely sway brace pile bents exceeding 10 feet (3 m) in height to resist lateral loads. Longitudinally brace pile bents exceeding 10 feet (3 m) in height to resist construction live loads, unless the bents are secured to longitudinal members which are secured against longitudinal movement. Bracing and connections are to be shown on falsework plans. The Engineer will review adequacy of bracing and connections.
d. Secure pile caps to each pile. Ensure blocks, wedges, and jacks for height adjustment are secure and stable. The Engineer will review them before concrete placement. Hold transverse joists against individual collapse. Use a positive spreader system over each support of a longitudinal stringer.
e. Secure continuous members against uplift from unbalanced concrete placement. Place concrete in a manner which will minimize unequal loads on hanger legs.

4. Design Loads.
Design formwork and falsework for the following loads:
a. Vertical load of concrete with a density of 150 pounds per cubic foot (2400 kg/m^3).
b. Horizontal load of fresh concrete as a liquid with a density of 150 pounds per cubic foot (2400 kg/m^3) for the depth of plastic concrete., except when lesser pressures are permitted by AASHTO Guide Design Specifications for Temporary Works.
c. Vertical dead load of forms and falsework.
d. Vertical dead load of rail and walkway applied at edge of deck form equal to 75 pounds per linear foot (1.1 kN/m)
~~**d.**~~ **e.** Construction live load equal to 50 pounds per square foot (2.4 kPa) of horizontal projection
f . Live load equal to 6 kips (26.69 kN) of finishing machine located along the edge of the deck form to maximize the design condition.
~~**e.**~~**g.** Wind loads ~~on walls and columns~~ equal to 50 pounds per square foot (24 kPa) for elevations to 30 feet (10 m) above the ground, increased for elevations above 30 feet (10 m). ~~according to the requirements of the ACI.~~
h. Other applicable loads such as horizontal loads due to equipment or construction sequence, additional live load, impact, stream flow, and snow loads specified in AASHTO Guide Design Specification for Bridge Temporary Works.

5. Design Stresses.
a. Design formwork and falsework using load groups specified in AASHTO Guide Design Specifications for Bridge Temporary Works and material working stresses. For structural steel and reinforced concrete use the allowable stress percentages given with load groups. For lumber and timber use appropriate load and duration factors instead of percentages. ~~and a normal duration of load, as for a permanent structure.~~ Calculate lumber strength on the basis of dressed size ~~and, except for sheathing, a dry condition~~. Publications of the APA – The Engineered Wood Association, ACI and the American Forest & Paper Association, American Wood Council ~~National Forest Products Association~~ will be considered standard references for design and analysis of plywood, lumber, and timber formwork and falsework.
b. Do not exceed 50 times the dimension of the least side for the unsupported length of wood~~en~~ columns and compression members. ~~Analyze the member as a column.~~
c. Unless the Contractor certifies a higher stress grade or value as allowed by AASHTO Guide Design Specification for Temporary Works, adequacy of falsework material will be reviewed ~~checked~~ on the basis of the following values:
1) Structural steel stresses ~~per AASHTO~~ for 36,000 ~~30,000~~ psi (248 ~~207~~ MPa) yield strength and 22,000 ~~22,500~~ psi (151 ~~155~~ MPa) maximum working stress.

2) Plywood sheathing stresses per APA – The Engineered Wood Association ~~American Plywood Association~~ for Plyform ~~concrete form grade~~, Class I, wet use, seven day duration of load ~~permanent loading~~, span-perpendicular-to-face grain. Orientation of plywood panels must be shown on drawings if advantage is taken of greater strength with span-parallel-to-face grain.

3) Design values ~~Stresses~~ for lumber in good condition and 4 inches (100 mm) or less in thickness, in psi (MPa) as follows:

f_b, bending	= 875 ~~1000~~ (6.03 ~~6.90~~)
f_t, tension	= 450 ~~625~~ (3.10 ~~4.30~~)
f_v, shear	= 135 ~~120~~ (093 ~~0.83~~)
f_c, perpendicular to grain	= 425 ~~345~~ (2.93 ~~2.40~~)
f_c, parallel to grain	= 1150 ~~1050~~ (7.93 ~~7.20~~)
E, modulus	= 1,400,000 ~~1,500,000~~ (9,650 ~~10,300~~)

These design values are to be modified for seven-day duration of load (except for fc, perpendicular to grain and E, modulus) and other applicable adjustment factors when determining allowable stresses.

4) Design values ~~Stresses~~ for timber in good condition and ~~lumber~~ 5 inches (125 mm) thick and thicker in psi (MPa~~s~~) as follows:

f_b, bending	= 850 ~~1200~~ (5.86 ~~8.30~~)
f_t, tension	= 450~~1000~~ (3.10 ~~6.90~~)
f_v, shear	= 125 ~~120~~ (0.86 ~~0.83~~)
f_c, perpendicular to grain	= 425 ~~390~~ (2.93 ~~2.70~~)
f_c, parallel to grain	= 625 ~~1000~~ (4.31 ~~6.90~~)
E, modulus	= 1,300,000 ~~1,600,000~~ (8,960 ~~11,000~~)

These design values are to be modified for seven-day duration of load (except for fc, perpendicular to grain and E, modulus) and other applicable adjustment factors when determining allowable stresses.

5) Safe bearing value of coarse sand, gravel, very firm clay, and other similar confined soils in thick beds at 1500 pounds per square foot (72 kPa) unless recommended otherwise by a Professional Engineer licensed in the State of Iowa. Safe bearing value of compacted berms at 2000 pounds per square foot (96 kPa).

6. Deflection.

a. Ensure falsework for slab and girder bridges provides for slight settlements, deformations of members, crushing, and closing of joints. Sag in excess of 1 inch (25 mm) or 1/800 of the span length, whichever is greater, in the soffit of a girder or slab may be cause for rejection.

b. Limit deflection of sheathing and joists to 1/360 of the span length. Calculate deflection of falsework stringers. Adjust screed guides to compensate.

7. Falsework Plans.

a. Submit plans for falsework and centering on all concrete slab and cast-in-place concrete girder bridges according to Article 1105.03. Submittal of forming details for bridge decks on concrete beam and steel beam bridges is not required unless specified in the contract documents.

b. The Engineer may require calculations or evidence of adequacy. The Engineer may require revised plans later because of unforeseen site conditions, unusual construction procedures, or deviation from original falsework plans.

Reason for Revision: Update to meet the current Guide Design Specification for Temporary Works.

County or City Input Needed (X one)			**Yes**	**No** X	
Comments:					
Industry Input Needed (X one)			**Yes**	**No** X	
Industry Notified:	**Yes**	**No**	**Industry Concurrence:**	**Yes**	**No**
Comments: Industry should be notified of the update.					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: John Smythe / Wayne Sunday	**Office:** Construction	**Item 8**
Submittal Date: April 25, 2012	**Proposed Effective Date:** October 16, 2012	
Section No.: 2418 **Title:** Temporary Stream Diversion	**Other:**	

Specification Committee Action: Approved with changes.

Deferred:	**Not Approved:**	**Approved Date:** 5/10/2012	**Effective Date:** 10/16/2012

Specification Committee Approved Text:

2418, Temporary Stream Diversion.

Add the Section:

2418.01 DESCRIPTION.

Construct, maintain, and remove temporary stream diversion according to contract documents. Temporary stream diversion involves diverting flow of a perennial stream around construction site by use of either a diversion channel, pipe, or hose. Temporary stream diversion applies to projects involving installation or extensions of reinforced or precast concrete box culverts when both height and width are 6 feet (1800 mm) or larger, and to arch pipe culverts 102 inches by 62 inches (2590 mm by 1575 mm) or larger.

2418.02 MATERIALS.

A. Impervious Dike.

Use one of the following:

- Impervious fabric with earth, stone, or other fill material,
- Revetment stone meeting the requirements of Section 4130 with impervious soil or fabric behind the dike,
- Sandbags,
- Sheet piles, or
- Other as approved by Engineer.

B. Temporary Energy Dissipation.

Revetment stone meeting requirements of Section 4130.

C. Sediment Control.

Meet requirements of Section 2602 for silt fence or perimeter and slope sediment control devices.

2418.03 CONSTRUCTION.

Unless stated otherwise in contract documents, Contractor may choose which type of temporary stream diversion to construct. Construct temporary stream diversion according to Standard Road Plan RL-20.

A. Temporary Stream Diversion by use of a Pipe or Hose.

This method may include bypass pumping.

1. Set up bypass pump (if used) and temporary pipe or hose. Provide temporary energy dissipation measures at discharge point of temporary outlet pipe or hose. Firmly anchor bypass pump and pipe or hose.

2. Construct impervious dike upstream of work area. When constructing dike, place revetment or impervious fabric prior to placing soil or earth.

3. Construct impervious dike or sediment control device downstream to isolate work area.

4. Routinely inspect bypass pump and temporary pipe or hose to ensure proper operation. Inspect impervious dike(s) for leaks and repair damage. Inspect discharge point for erosion. Install additional temporary energy dissipation material as needed. Ensure flow is adequately diverted through pipe or hose and maintain all elements of temporary stream diversion throughout period of construction.

5. Immediately after completion of construction in work area, remove impervious dike(s), bypass pump, temporary pipe or hose, temporary energy dissipation material, and sediment control materials in the stream.

B. Temporary Stream Diversion by use of a Diversion Channel.

1. Excavate diversion channel without disturbing existing channel. Install sediment control along top of diversion channel.

2. Connect downstream diversion channel into downstream existing channel. Install temporary energy dissipation measures at discharge point into existing channel.

3. Connect upstream diversion channel into existing channel at upstream side to divert flow into diversion channel.

4. Construct impervious diversion dike in existing channel at upstream side to divert flow into diversion channel. When constructing dike, place revetment or impervious fabric prior to placing soil or earth.

5. Construct impervious dike or other sediment control in existing channel at downstream side to isolate work area.

6. Routinely inspect diversion channel for scour/erosion and sediment loss at channel discharge location. Install rock checks in channel and additional temporary energy dissipation material at outlet as needed. Inspect impervious dikes for leaks and repair damage. Ensure flow is adequately diverted through diversion channel and maintain all elements of temporary stream diversion throughout the period of construction.

7. Immediately after completion of construction in work area, remove impervious dike(s), temporary energy dissipation material, and sediment control materials in the stream. Divert channel back into existing channel. Backfill and compact diversion channel in accordance with Article 2107.03, E.

2418.04 METHOD OF MEASUREMENT.

A. Each Temporary Stream Diversion will be counted.

B. Sediment control and sediment control removal will be measured according to Article 2602.04 for type of device used.

2418.05 BASIS OF PAYMENT.

A. Payment will be at contract unit price for each Temporary Stream Diversion. If there is no bid item for temporary stream diversion, it will be paid for according to Article 1109.03, B. Payment is full compensation for labor, equipment, and materials necessary to construct and remove Temporary Stream Diversion. Payment of 50% of item will be made upon completion of installation of temporary stream diversion and remaining 50% will be paid upon completion of removal of temporary stream diversion and restoration of work site.

B. Sediment control and sediment control removal will be paid for according to Article 2602.05 for type of device used.

Comments: The Office of Construction indicated that the temporary stream diversion specifications will apply to installation or extension of reinforced concrete box culverts and precast box culverts when both dimensions are 6 feet (1800 mm) or greater.

The Office of Local Systems asked about compaction after a diversion channel is removed. The committee decided to add language referencing backfill and compaction of the material.

The District 4 Materials Office asked if we should specify a class of revetment to be used. Since the material is temporary, we do not have a preference, but if Class D is used, it would not be allowed for the final placement of revetment, only Class E would be.

Specification Section Recommended Text:

2418, Temporary Stream Diversion.

Add the Section:

2418.01 DESCRIPTION.

Construct, maintain, and remove temporary stream diversion according to the contract documents. Temporary stream diversion involves diverting flow of a perennial stream around the construction site by use of either a diversion channel, pipe, or hose. Temporary stream diversion applies to projects involving installation or extensions of reinforced box culverts 6 feet by 6 feet (1800 mm by 1800 mm) or larger, precast box culverts 6 feet by 6 feet (1800 mm by 1800 mm) or larger, or arch pipe culverts 102 inches by 62 inches (2590 mm by 1575 mm) or larger.

2418.02 MATERIALS.

A. Impervious Dike.

Use one of the following:

- Impervious fabric with earth, stone, or other fill material,
- Revetment stone meeting the requirements of Section 4130 with impervious soil or fabric behind the dike,
- Sandbags,
- Sheet piles, or
- Other as approved by the Engineer.

B. Temporary Energy Dissipation.

Revetment stone meeting the requirements of Section 4130.

C. Sediment Control.

Meet the requirements of Section 2602 for silt fence or perimeter and slope sediment control devices.

2418.03 CONSTRUCTION.

Unless stated otherwise in the contract documents, the Contractor may choose which type of temporary stream diversion to construct. Construct temporary stream diversion according to Standard Rood Plan RL-20.

A. Temporary Stream Diversion by use of a Pipe or Hose.

This method may include bypass pumping.

1. Set up bypass pump (if used) and temporary pipe or hose. Provide temporary energy dissipation measures at discharge point of temporary outlet pipe or hose. Firmly anchor bypass pump and pipe or hose.

2. Construct impervious dike upstream of work area. When constructing dike, place

revetment or impervious fabric prior to placing soil or earth.

3. Construct impervious dike or sediment control device downstream to isolate work area.

4. Routinely inspect bypass pump and temporary pipe or hose to ensure proper operation. Inspect impervious dike(s) for leaks and repair damage. Inspect discharge point for erosion. Install additional temporary energy dissipation material as needed. Ensure flow is adequately diverted through pipe or hose and maintain all elements of the temporary stream diversion throughout period of construction.

5. Immediately after completion of construction in the work area, remove impervious dike(s), bypass pump, temporary pipe or hose, temporary energy dissipation material, and sediment control materials in the stream.

B. Temporary Stream Diversion by use of a Diversion Channel.

1. Excavate diversion channel without disturbing existing channel. Install sediment control along top of diversion channel.

2. Connect downstream diversion channel into downstream existing channel. Install temporary energy dissipation measures at discharge point into existing channel.

3. Connect upstream diversion channel into existing channel at upstream side to divert flow into diversion channel.

4. Construct impervious diversion dike in existing channel at upstream side to divert flow into diversion channel. When constructing dike, place revetment or impervious fabric prior to placing soil or earth.

5. Construct impervious dike or other sediment control in existing channel at downstream side to isolate work area.

6. Routinely inspect diversion channel for scour/erosion and sediment loss at channel discharge location. Install rock checks in channel and additional temporary energy dissipation material at outlet as needed. Inspect impervious dikes for leaks and repair damage. Ensure flow is adequately diverted through diversion channel and maintain all elements of temporary stream diversion throughout the period of construction.

7. Immediately after completion of construction in the work area, remove impervious dike(s), temporary energy dissipation material, and sediment control materials in the stream. Divert channel back into existing channel.

2418.04 METHOD OF MEASUREMENT.

A. Each Temporary Stream Diversion will be counted.

B. Sediment control and sediment control removal will be measured according to Article 2602.04 for type of device used.

2418.05 BASIS OF PAYMENT.

A. Payment will be at contract unit price for each Temporary Stream Diversion. If there is no bid item for temporary stream diversion, it will be paid for according to Article 1109.03, B. Payment is full compensation for labor, equipment, and materials necessary to construct and remove Temporary Stream Diversion. Payment of 50% of item will be made upon completion of installation of temporary stream diversion and remaining 50% will be paid upon completion of

removal of temporary stream diversion and restoration of work site.

B. Sediment control and sediment control removal will be paid for according to Article 2602.05 for type of device used.

Comments: How do we determine what is larger than a 6 foot by 6 foot box culvert? Is it either dimension? Is it cross sectional area?

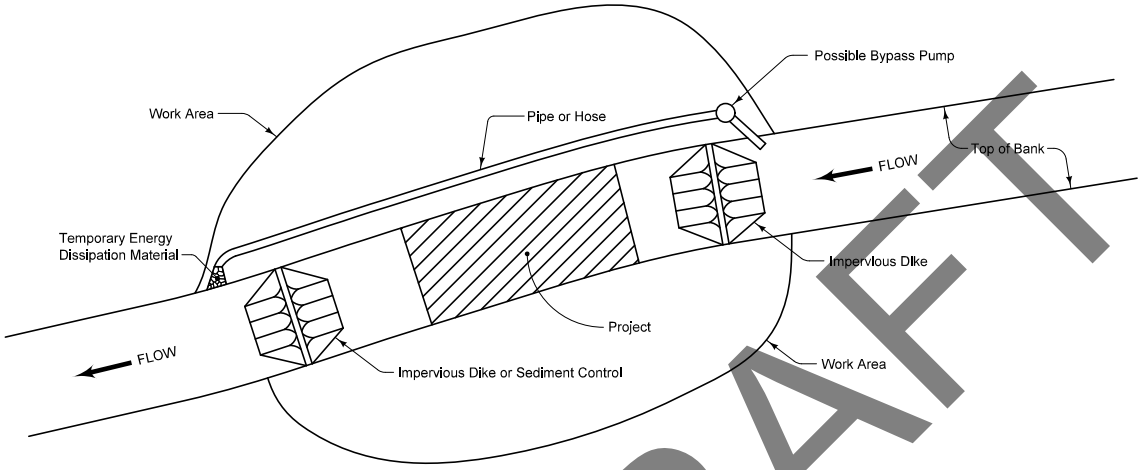
Member's Requested Change: **(Do not use 'Track Changes', or 'Mark-Up'.Use ~~Strikeout~~ and Highlight.**
See attached draft and draft standard road plan RL-20.

Reason for Revision: The Offices of Design, Construction, and Bridges & Structures have developed a specification for use with a standard road plan. The specification and standard road plan are based on practices used by the North Carolina DOT.

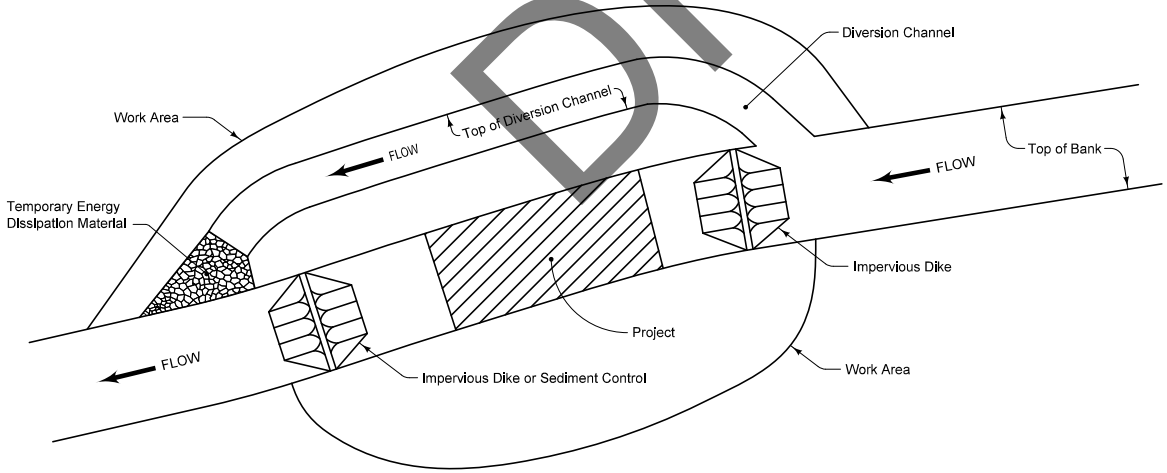
The most common application will be for projects involving installation or extension of box culverts 6 feet by 6 feet or larger, precast box culverts 6 feet by 6 feet or larger, or arch pipe culverts 102 inches by 62 inches or larger. The Design Office has developed guidance that will be placed in the Design Manual.

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:					

DESIGNER INFO



PIPE OR HOSE



DIVERSION CHANNEL

Possible Contract Items:

Temporary Stream Diversion
Silt Fence
Removal of Silt Fence or Silt Fence for Ditch Check
Perimeter and Slope Sediment Control Device

Possible Tabulations:

100-26
100-17

Iowa Department of Transportation

REVISION	
New	10-16-12

STANDARD ROAD PLAN — **RL-20**

SHEET 1 of 1

REVISIONS: New.

Deanna Maifield
APPROVED BY DESIGN METHODS ENGINEER

TEMPORARY STREAM DIVERSION

~~DS-090XXX~~
(New)

Iowa Department of Transportation

DEVELOPMENTAL SPECIFICATIONS
FOR
TEMPORARY STREAM DIVERSION

Effective Date
Month Day, 2012

THE STANDARD SPECIFICATIONS, SERIES 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

090XXX DESCRIPTION.
Construct, maintain, and remove a temporary stream diversion according to the contract documents. A temporary stream diversion involves diverting the flow of a perennial stream around a construction site by use of either a diversion channel or a pipe or hose. Temporary stream diversion applies to projects involving installation or extensions of reinforced box culverts 6 feet by 6 feet or larger, precast box culverts 6 feet by 6 feet or larger, or arch pipe culverts 102 inches by 62 inches or larger.

090XXX MATERIALS.

A. Impervious Dike.
Use one of the following:
- Impervious fabric with earth, stone, or other fill material.
- Revetment stone meeting the requirements of Section 4130 with impervious soil or fabric behind the dike.
- Sandbags.
- Sheet piles.
- Other as approved by the Engineer.

B. Temporary Energy Dissipation.
Revetment stone meeting the requirements of Section 4130.

C. Sediment Control.
Meet the requirements of Section 2602 for silt fence or perimeter and slope sediment control devices.

090XXX CONSTRUCTION.
Unless stated otherwise in the contract documents, the Contractor has the option of which type of temporary stream diversion to construct. The temporary stream diversion shall be constructed in accordance with Standard Raod Plan RL-20.

A. Temporary Stream Diversion by use of a Pipe or Hose.
This method may include bypass pumping.

1. Set up bypass pump (if used) and temporary pipe or hose. Provide temporary energy dissipation measures at discharge point of temporary outlet pipe or hose. Firmly anchor bypass pump and pipe or hose.

2. Construct impervious dike upstream of work area. When constructing dike, place revetment or impervious fabric prior to placing soil or earth.

3. Construct an impervious dike or sediment control device downstream to isolate work area.

4. Routinely inspect the bypass pump and temporary pipe or hose to ensure proper operation. Inspect impervious dike(s) for leaks and repair any damage. Inspect discharge point for erosion. Install additional temporary energy dissipation material as needed. Ensure flow is adequately diverted through the pipe or hose and maintain all elements of the temporary stream diversion throughout the period of construction.

5. Immediately after completion of construction in the work area, remove impervious dike(s), bypass pump, temporary pipe or hose, temporary energy dissipation material, and sediment control materials in the stream.

B. Temporary Stream Diversion by use of a Diversion Channel.

1. Excavate the diversion channel without disturbing the existing channel. Install sediment control along the top of the diversion channel.

2. Connect the downstream diversion channel into the downstream existing channel. Install temporary energy dissipation measures at the discharge point into the existing channel.

3. Connect the upstream diversion channel into the existing channel at the upstream side to divert the flow into the diversion channel.

4. Construct an impervious diversion dike in the existing channel at the upstream side to divert the flow into the diversion channel. When constructing dike, place revetment or impervious fabric prior to placing soil or earth.

5. Construct an impervious dike or other sediment control in the existing channel at the downstream side to isolate work area.

6. Routinely inspect the diversion channel for scour/erosion and sediment loss at the channel discharge location. Install rock checks in the channel and additional temporary energy dissipation material at the outlet as needed. Inspect impervious dikes for leaks and repair any damage. Ensure flow is adequately diverted through the diversion channel and maintain all elements of the temporary stream diversion throughout the period of construction.

7. Immediately after completion of construction in the work area, remove impervious dike(s), temporary energy dissipation material, and sediment control materials in the stream. Divert the channel back into the existing channel.

090XXX METHOD OF MEASUREMENT.

A. Each Temporary Stream Diversion will be counted.

B. Sediment control and sediment control removal will be measured according to Article 2602.04 for the type of device used.

090XXX BASIS OF PAYMENT.

A. Payment will be at the contract unit price for each Temporary Stream Diversion. If there is no bid item for temporary stream diversion, it will be paid for as extra work in accordance with Article 1109.03 B. Payment is full compensation for all labor, excavation, and materials necessary to construct and remove a Temporary Stream Diversion. Payment of 50 percent of the item will be

made upon completion of the installation of the temporary stream diversion and the remaining 50 percent of the item will be paid upon completion of removal of the temporary stream diversion and restoration of the work site.

B. Sediment control and sediment control removal will be paid for according to Article 2602.05 for the type of device used.

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger / Mahbub Khoda	**Office:** Materials	**Item 9**
Submittal Date: 2012.04.27	**Proposed Effective Date:** October 2012	
Section No.: 2419 (proposed) **Title:** Precast Concrete Units	**Other:**	

Specification Committee Action: Approved with changes.

Deferred:	**Not Approved:**	**Approved Date:** 5/10/2012	**Effective Date:** 10/16/2012

Specification Committee Approved Text:

2407.01, Description.

Replace Articles C and D:

C. Apply the provisions of this section to production and construction of prestressed precast concrete bridge units and nonprestressed precast concrete ~~as defined in Section 1101~~ bridge units.

D. Unless modified elsewhere in the contract documents, all fabrication is required to be done only in precast fabrication plants that are approved prior to the letting as per Materials I.M. ~~445~~ 570 and 570 LRFD.

2407.03, J, 1, Precast Nonprestressed Units.

Replace the title of the Article:

Precast Nonprestressed Bridge Units.

2407.03, J, 2, Precast Prestressed Units.

Replace the title of the Article:

Precast Prestressed Bridge Units.

2415.01, B, Precast.

Replace the Article:

1. ~~Precast box culverts may be accepted when shown in the contract documents.~~ Apply Section 2419.

2. Use culvert sections that meet the requirements of ASTM ~~1433~~ C 1577.

3. The contract documents will designate the span, rise, and either the design earth cover, or the design loading, both defined in ASTM ~~1433~~ C 1577.

4. ~~Apply section 2407 to the aggregates used in the concrete.~~ Use coarse aggregate in concrete mixture from an approved source meeting requirements of Section 4115, with Class 2 or better durability rating.

~~**5.** Apply the appropriate requirements of Section 2407 to manufacturing process inspection.~~

~~**6**~~ **5.** Concrete strength will be based on cylinder tests.

2416.02, Materials.

Replace the Article:

~~Meet the requirements of Section 4145 for the type and strength (class) of pipe specified in the contract documents.~~ Apply Section 2419.

2419, Precast Concrete Units.

Add the Section

2419.01 DESCRIPTION.

A. Provide precast concrete units produced in a plant for which equipment, procedures, and quality of concrete have been approved by the Contracting Authority.

B. Provide, or have fabricator provide, technical personnel experienced and skilled in application of precast system being used. Ensure technical personnel cooperate with Engineer in technical aspects of the work.

C. Apply provisions of this section to production and construction of precast concrete as defined in Section 1101.

D. Unless modified elsewhere in the contract documents, perform fabrication in precast fabrication plants that are approved prior to letting.

E. Requirements for specific precast units are found in the Materials I.M. 445 series, Materials I.M. 571, and in the following specification sections:

- Section 4145: Concrete Culvert Pipe
- Section 2415: Concrete Box, Arch, and Circular Culverts
- Section 2416: Rigid Pipe Culverts
- Section 2430: Modular Block Retaining Wall
- Section 2431: Segmental Retaining Wall
- Section 2432: Mechanically Stabilized Earth (MSE) Retaining Wall
- Section 2513: Concrete Barrier (Precast)

2419.02 MATERIALS.

Use materials meeting requirements of Division 41 for respective material, and the following:

A. Aggregates.

1. Apply Sections 4110, 4111, 4115, and 4117, except gradation requirements of Articles 4110.02 and 4115.03.

2. Submit aggregate gradations and proportions with mix design to District Materials Engineer for approval.

3. Use aggregates similar to Class V only when 30% or more of total weight (mass) of aggregate is limestone.

B. Admixtures.

When authorized by Engineer, approved admixtures complying with Section 4103 may be used and shall be from an approved source identified in Materials I.M. 403.

C. Reinforcing Steel and Wire Fabric.

Comply with requirements of Section 4151 and ensure materials are from an approved source identified in Materials I.M. 451. Precast fabricator shall accept reinforcing steel with certified mill test reports for each heat delivered.

D. Cement.

Apply Section 4101, unless otherwise specified. If the use of Type III Portland cement has been authorized, use it in same proportions as specified for Type I Portland cement. Cement with total equivalent sodium oxide between 0.61% and 0.75% may be used, provided it is non-reactive with

proposed aggregate when tested according to ASTM C 1260, C 1567, or C 1293.

E. Supplementary Cementitious Materials.

1. Apply Section 4108.

2. Fly ash may be substituted for Portland cement. Use a substitution rate of no more than 25% by weight (mass) for wet cast concrete only. Fly ash shall be from an approved source identified in Materials I.M. 491.17.

3. GGBFS may be substituted for Portland cement. Use a substitution rate of no more than 35% by weight (mass) for GGBFS as a mineral admixture. GGBFS shall be from an approved source identified in Materials I.M. 491.14.

4. The maximum total supplementary cementitious materials substitution shall not exceed 50%.

2419.03 Construction.

A. Equipment.
Use equipment meeting requirements of Section 2001 and the following:

1. Forms: Use forms for precast concrete true to dimensions shown in contract documents, true to line, mortar tight, and of sufficient rigidity to not sag or bulge out of shape under placement and vibration of concrete. Ensure inside surfaces are smooth and free of projections, indentations, or offsets that might restrict differential movements of forms and concrete.

2. Weighing and Proportioning Equipment.
Apply Article 2001.20, except that a vibrator will not be required on cement batch hopper.

3. Mixing Equipment.
Apply Article 2001.21.

4. Bins.
Apply Article 2001.06

B. Concrete.

1. For precast construction, use at least 610 pounds (360 kg) of total cementitious material per cubic yard (cubic meter) of concrete. Do not exceed maximum water-cementitious ratio, including free moisture in aggregate, of 0.450 pound per pound (0.450 kg/kg).

2. Intended air entrainment of finished wet cast concrete is 6%. To allow for loss during placement, use a target value of 6.5% for air content of fresh unvibrated concrete, with a maximum variation of ± 1.0%.

C. Proportioning, Mixing, and Placing Concrete.

1. Proportion and mix concrete according to applicable requirements of Article 2403.02, D, 3.

2. Do not place concrete when ambient temperature is below 35°F (2°C) unless Engineer has approved plant for cold weather concrete placement. When necessary, heat aggregate or water, or both, so temperature of concrete when deposited in forms is 40°F to 90°F (4°C to 32°C). Do not use frozen material in concrete.

3. When a series of units is cast in a line, cast entire series in one continuous operation, or as directed by Engineer. Place successive batches before preceding batch has perceptibly

hardened or dried. Do not allow more than 45 minutes to pass between placement of successive batches of concrete in a unit. Do not retemper concrete or add water to interface of the concrete between batches.

4. Carefully work and consolidate concrete around reinforcement without displacing it. Ensure formation of honeycomb, stone pockets, or similar defects have not occured. Consolidate concrete using small diameter vibrators or by other means approved by Engineer. Overfill forms during consolidation. Screed off excess concrete and finish surface to desired texture.

D. Curing.

1. Use a method of curing that prevents loss of moisture and maintains an internal concrete temperature at least 40°F (4°C) during curing period. Obtain Engineer's approval for this method.

2. In all cases, cover concrete and leave covered until curing is completed. Side forms and pans forming underside of channel shapes may be removed during this period if cover is immediately replaced. Do not, under any circumstances, remove units from casting bed until strength requirements are met.

3. When accelerated heat is used to obtain temperatures above 100°F (38°C):

a. Record temperature of interior of concrete using a system capable of automatically producing a temperature record at intervals of no more than 15 minutes during entire curing period.

b. Space systems at a minimum of one location per 100 feet (30 m) of length per unit or fraction thereof, with a maximum of three locations along each line of units being cured.

c. Ensure all units, when calibrated individually, are accurate within ± 5°F (3°C).

d. Do not artificially raise temperature of concrete above 100°F (38°C) for a minimum of 2 hours after units have been cast. After 2 hour period, temperature of concrete may be raised to a maximum temperature of 160°F (71°C) at a rate not to exceed 25°F (15°C) per hour.

e. Hold maximum temperature for a period sufficient to develop strength required for release of prestress or for post tensioning, as the case may be.

f. Lower temperature of concrete at a rate not to exceed 40°F (22°C) per hour by reducing amount of heat applied until interior of concrete has reached the temperature of surrounding air.

E. Placing Reinforcement.

Place reinforcement carefully, accurately, and secure in proper position according to contract documents. Apply Article 2404.03.

F. Removal of Forms.

If forms are removed before concrete has attained strength which will permit units to be moved or stressed, remove protection only from immediate section from which forms are being removed. Immediately replace protection and resume curing following form removal. Do not remove protection any time before units attain specified compressive strength when surrounding air temperature is below 20°F (-7°C).

G. Tolerances.

Limit variation from dimensions shown in contract documents to no more than 1/8 inch (3 mm). For overruns, greater deviation may be accepted if, in Engineer's opinion, it does not impair suitability of member for its intended use.

H. Handling and Storage.

During fabrication, storage, handling, and hauling take care to prevent cracking, twisting, unnecessary roughness, or other damage. In particular, do not allow tiedowns to come in direct

contact with concrete surfaces. Do not subject units to excessive impact. Replace, at no additional cost to Contracting Authority, units that are, in Engineer's opinion, damaged in a way to impair their strength or suitability for their intended use.

l. Finish.
Finish surfaces which will be exposed in finished structure as provided in Article 2403.03, P, 2, b.

2419.04 METHOD OF MEASUREMENT.
For precast units, Engineer will determine quantity of each of the various respective sizes, lengths, and types per the sections listed in Article 2419.01, E.

2419.05 BASIS OF PAYMENT.
Payment will be per the sections listed in Article 2419.01, E.

2430.02, B, 1, Concrete Units.
Add the Article:
e. Apply Section 2419.

2431.02, B, 1, Concrete Units.
Add the Article:
j. Apply Section 2419.

2432.02, B, 1, Concrete Panels.
Add the Article:
n. Apply Section 2419.

2432.02, B, 1, a, 2.
Delete the Article:
~~2) Cement content per cubic yard (cubic meter)of concrete for face panels and precast coping sections no less than 600 pounds(360kg) nor more than 700 pounds(420kg).~~

2432.02, B, 1, b, 4.
Replace the Article:
Test ~~two~~ three specimens at 7 days and ~~two~~ three at 28 days. A test will be average compressive strength of ~~2~~ three cylinders.

2513.02, Materials.
Add to the end of the first paragraph of the Article:
Apply Section 2419 for precast concrete barrier rail.

2513.02, D, Bolts, Anchors, and Other Metal Fastenings.
Replace the Article:
Apply Article ~~2407.02, G~~ 2419.02, F.

2513.03, A, 1, a.
Replace the first sentence of the Article:
Use concrete specified in Section ~~2407~~ 2419.

2513.03, C, 1.
Replace the Article:
Apply Article ~~2407.03, D, except apply the finishing requirements in Article 2403.03, P, 2, b, only to temporary barrier rail~~ 2419.03, C.

2513.03, D, 1, a.
Replace the second sentence of the Article:
Apply Article ~~2407.03, D~~ 2419.03, D, when elevated temperature cure is used.

2513.03, F, 1.

Replace the Article:

For permanent precast and cast-in-place concrete barrier, apply Article ~~2407.03, L~~ 2419.03, I, except do not commence the finishing operation until completion of the initial wet cure period.

2513.03, F, 4.

Replace the last sentence of the Article:

Complete patching operations only as directed by the Engineer ~~and according to Article 2407.03, L~~.

4145.03, Materials.

Replace the Article:

~~Comply with the applicable requirements of Division 41.~~ Apply Section 2419.

Comments: The District 6 Office asked if we need to specify the grade of bolts, nuts, washers, and other metal fasteners in Article 2419.02, F. The committee decided that the individual sections will cover the metal fasteners and that this article can be deleted.

The District 6 Office asked if the Method of Measurement and Basis of Payment are correct. The method of measurement and basis of payment will be written more generically to refer to the sections listed in Article 2419.01, E.

The District 6 Office asked if these revisions should be presented to the industry before they are incorporated. The Office of Construction felt that if the new section does not change the specifications, there would be nothing to present to the industry. The Office of Materials stated the only significant change with the new section was that all precast fabrication plants must be approved prior to letting. Previously, this only applied to some precast products. The committee decided that since the revisions would not go into effect until the October letting, we could inform the industry of the changes and they would have time to adjust prior to implementation. The Specifications Section will prepare a letter to send to the AGC outlining the revisions to the precast specifications.

The Office of Materials asked if all of the specifications apply for dry cast units. The air content would not apply, so “for wet cast concrete” was added.

Specification Section Recommended Text:

2407.01, Description.

Replace Articles C and D:

C. Apply the provisions of this section to production and construction of prestressed precast concrete bridge units and nonprestressed precast concrete ~~as defined in Section 1101~~ bridge units.

D. Unless modified elsewhere in the contract documents, all fabrication is required to be done only in precast fabrication plants that are approved prior to the letting as per Materials I.M. ~~445~~ 570 and 570 LRFD.

2407.03, J, 1, Precast Nonprestressed Units.

Replace the title of the Article:

Precast Nonprestressed Bridge Units.

2407.03, J, 1, Precast Prestressed Units.

Replace the title of the Article:

Precast Prestressed Bridge Units.

2415.01, B, Precast.

Replace the Article:

1. ~~Precast box culverts may be accepted when shown in the contract documents.~~ Apply Section

2419.

2. Use culvert sections that meet the requirements of ASTM ~~1433~~ C 1577.

3. The contract documents will designate the span, rise, and either the design earth cover, or the design loading, both defined in ASTM ~~1433~~ C 1577.

4. ~~Apply section 2407 to the aggregates used in the concrete.~~ Use coarse aggregate in concrete mixture from an approved source meeting requirement of Section 4115, with class 2 or better durability rating.

~~5. Apply the appropriate requirements of Section 2407 to manufacturing process inspection.~~

~~6~~ 5. Concrete strength will be based on cylinder tests.

2416.02, Materials.

Replace the Article:

~~Meet the requirements of Section 4145 for the type and strength (class) of pipe specified in the contract documents.~~ Apply Section 2419.

2419, Precast Concrete Units.

Add the Section

2419.01 DESCRIPTION.

A. Provide precast concrete units produced in a plant for which equipment, procedures, and quality of concrete have been approved by the Contracting Authority.

B. Provide, or have fabricator provide, technical personnel experienced and skilled in application of the precast system being used. Ensure technical personnel cooperate with Engineer in technical aspects of the work.

C. Apply provisions of this section to production and construction of precast concrete as defined in Section 1101.

D. Unless modified elsewhere in the contract documents, perform fabrication in precast fabrication plants that are approved prior to the letting.

E. Requirements for specific precast units are found the in the Materials I.M. 445 series, Materials I.M. 571 and in the following specification sections:

- Section 4145: Concrete Culvert Pipe
- Section 2415: Concrete Box, Arch, and Circular Culverts
- Section 2416: Rigid Pipe Culverts
- Section 2430: Modular Block Retaining Wall
- Section 2431: Segmental Retaining Wall
- Section 2432: Mechanically Stabilized Earth (MSE) Retaining Wall
- Section 2513: Concrete Barrier (Precast)

2419.02 MATERIALS.

Use materials meeting requirements of Division 41 for respective material, and the following:

E. Aggregates.

4. Apply Sections 4110, 4111, 4115, and 4117, except gradation requirements of Articles 4110.02 and 4115.03.

5. Submit aggregate gradations and proportions with mix design to District Materials Engineer for approval.

6. Use aggregates similar to Class V only when 30% or more of total weight (mass) of aggregate is limestone.

B. Admixtures.
When authorized by Engineer, approved admixtures complying with Section 4103 may be used and shall be from an approved source identified in Materials I.M. 403.

C. Reinforcing Steel and Wire Fabric.
Comply with requirements of Section 4151 and ensure materials are from an approved source identified in Materials I.M. 451. Precast fabricator shall accept reinforcing steel with certified mill test reports for each heat delivered.

D. Cement.
Apply Section 4101, unless otherwise specified. If the use of Type III Portland cement has been authorized, use it in the same proportions as specified for Type I Portland cement. Cement with total equivalent sodium oxide between 0.61% and 0.75% may be used, provided it is non-reactive with the proposed aggregate when tested according to ASTM C 1260, C 1567, or C 1293.

E. Supplementary Cementitious Materials.

1. Apply Section 4108.

2. Fly ash may be substituted for Portland cement. Use a substitution rate of no more than 25% by weight (mass) for wet cast concrete only. Fly ash shall be from an approved source identified in Materials I.M. 491.17.

3. GGBFS may be substituted for Portland cement. Use a substitution rate of no more than 35% by weight (mass) for GGBFS as a mineral admixture. GGBFS shall be from an approved source identified in Materials I.M. 491.14.

4. The maximum total supplementary cementitious materials substitution shall not exceed 50%.

F. Use bolts, nuts, and washers and other metal fasteners that have been galvanized as specified for steel structures in Article 4100.07

2419.03 Construction.

A. Equipment.
Use equipment meeting the requirements of Section 2001 and the following:

5. Forms: Use forms for precast concrete true to the dimensions shown in the contract documents, true to line, mortar tight, and of sufficient rigidity to not sag or bulge out of shape under placement and vibration of concrete. Ensure inside surfaces are smooth and free of projections, indentations, or offsets that might restrict differential movements of forms and concrete.

6. Weighing and Proportioning Equipment.
Apply Article 2001.20, except that a vibrator will not be required on the cement batch hopper.

7. Mixing Equipment.
Apply Article 2001.21.

8. Bins.
Apply Article 2001.06

F. Concrete.

1. For precast construction, use at least 610 pounds (360 kg) of total cementitious material per cubic yard (cubic meter) of concrete. Do not exceed the maximum water-cementitious ratio, including free moisture in the aggregate, of 0.450 pound per pound (0.450 kg/kg).

2. Intended air entrainment of finished concrete is 6%. To allow for loss during placement, use a target value of 6.5% for air content of fresh unvibrated concrete, with a maximum variation of ± 1.0%.

G. Proportioning, Mixing, and Placing Concrete.

1. Proportion and mix concrete according to applicable requirements of Article 2403.02, D, 3.

2. Do not place concrete when ambient temperature is below 35°F (2°C) unless Engineer has approved the plant for cold weather concrete placement. When necessary, heat the aggregate or water, or both, so the temperature of concrete when deposited in forms is 40°F to 90°F (4°C to 32°C). Do not use frozen material in concrete.

3. When a series of units is cast in a line, cast entire series in one continuous operation, or as directed by the Engineer. Place successive batches before preceding batch has perceptibly hardened or dried. Do not allow more than 45 minutes to pass between placement of successive batches of concrete in a unit. Do not retemper concrete or add water to the interface of the concrete between batches.

4. Carefully work and consolidate concrete around reinforcement without displacing it. Ensure the formation of honeycomb, stone pockets, or similar defects have not occured. Consolidate concrete using small diameter vibrators or by other means approved by the Engineer. Overfill forms during consolidation. Screed off excess concrete and finish surface to desired texture.

H. Curing.

1. Use a method of curing that prevents loss of moisture and maintains an internal concrete temperature at least 40°F (4°C) during curing period. Obtain Engineer's approval for this method.

2. In all cases, cover concrete and leave covered until curing is completed. Side forms and pans forming underside of channel shapes may be removed during this period if cover is immediately replaced. Do not, under any circumstances, remove units from casting bed until strength requirements are met.

3. When accelerated heat is used to obtain temperatures above 100°F (38°C):
- **a.** Record temperature of interior of concrete using a system capable of automatically producing a temperature record at intervals of no more than 15 minutes during entire curing period.
- **b.** Space systems at a minimum of one location per 100 feet (30 m) of length per unit or fraction thereof, with a maximum of three locations along each line of units being cured.
- **c.** Ensure all units, when calibrated individually, are accurate within ± 5°F (3°C).
- **d.** Do not artificially raise temperature of concrete above 100°F (38°C) for a minimum of 2 hours after the units have been cast. After the 2 hour period, temperature of concrete may be raised to a maximum temperature of 160°F (71°C) at a rate not to exceed 25°F (15°C) per hour.
- **e.** Hold maximum temperature for a period sufficient to develop strength required for release

of prestress or for post tensioning, as the case may be.

f. Lower temperature of concrete at a rate not to exceed 40°F (22°C) per hour by reducing amount of heat applied until interior of concrete has reached the temperature of surrounding air.

E. Placing Reinforcement.

Place reinforcement carefully and accurately, and secure in the proper position according to the contract documents. Apply Article 2404.03.

F. Removal of Forms.

If forms are removed before concrete has attained strength which will permit units to be moved or stressed, remove protection only from immediate section from which forms are being removed. Immediately replace protection and resume curing following form removal. Do not remove protection any time before units attain specified compressive strength when surrounding air temperature is below 20°F (-7°C).

G. Tolerances.

Limit variation from dimensions shown in the contract documents to no more than 1/8 inch (3 mm). For overruns, greater deviation may be accepted if, in the Engineer's opinion, it does not impair the suitability of the member for its intended use.

H. Handling and Storage.

During fabrication, storage, handling, and hauling take care to prevent cracking, twisting, unnecessary roughness, or other damage. In particular, do not allow tiedowns to come in direct contact with concrete surfaces. Do not subject units to excessive impact. Replace, at no additional cost to the Contracting Authority, units that are, in the Engineer's opinion, damaged in a way to impair their strength or suitability for their intended use.

I. Finish.

Finish surfaces which will be exposed in the finished structure as provided in Article 2403.03, P, 2, b.

2419.04 METHOD OF MEASUREMENT.

For precast units, Engineer will determine number of units of each of the various respective sizes, lengths, and types from actual count or measurement will be done as specified in the contract documents.

2419.05 BASIS OF PAYMENT.

Payment will be the contract unit price for number of approved precast units of each size incorporated in the project or as specified in the contract documents.

2430.02, B, 1, Concrete Units.

Add the Article:

e. Apply Section 2419.

2431.02, B, 1, Concrete Units.

Add the Article:

j. Apply Section 2419.

2431.02, B, 1, Concrete Panels.

Add the Article:

n. Apply Section 2419.

2432.02, B, 1, a, 2.

Delete the Article:

~~2) Cement content per cubic yard (cubic meter)of concrete for face panels and precast coping sections no less than 600 pounds(360kg) nor more than 700 pounds(420kg).~~

2432.02, B, 1, b, 4.
Replace the Article:
Test ~~two~~ three specimens at 7 days and ~~two~~ three at 28 days. A test will be average compressive strength of ~~2~~ three cylinders.

2513.02, Materials.
Add to the end of the first paragraph of the Article:
Apply Section 2419 for precast concrete barrier rail.

2513.02, D, Bolts, Anchors, and Other Metal Fastenings.
Replace the Article:
Apply Article ~~2407.02, G~~ 2419.02, F.

2513.03, A, 1, a.
Replace the first sentence of the Article:
Use concrete specified in Section ~~2407~~ 2419.

2513.03, C, 1.
Replace the Article:
Apply Article ~~2407.03, D, except apply the finishing requirements in Article 2403.03, P, 2, b, only to temporary barrier rail~~ 2419.03, C.

2513.03, D, 1, a.
Replace the second sentence of the Article:
Apply Article ~~2407.03, D~~ 2419.03, D, when elevated temperature cure is used.

2513.03, F, 1.
Replace the Article:
For permanent precast and cast-in-place concrete barrier, apply Article ~~2407.03, L~~ 2419.03, I, except do not commence the finishing operation until completion of the initial wet cure period.

2513.03, F, 4.
Replace the last sentence of the Article:
Complete patching operations only as directed by the Engineer ~~and according to Article 2407.03, L~~.

4145.03, Materials.
Replace the Article:
~~Comply with the applicable requirements of Division 41.~~ Apply Section 2419.

Comments:

2407.01

C. Apply the provisions of this section to production and construction of prestressed precast concrete bridge units and nonprestressed precast concrete bridge units ~~as defined in Section 1101.~~

D.

Unless modified elsewhere in the contract documents, all fabrication is required to be done only in precast fabrication plants that are approved prior to the letting as per Materials I.M. ~~445~~ 570 and 570 LRFD.

2407.03 J. Tolerances

1. Precast Nonprestressed Bridge Units.

2. Precast Prestressed Bridge Units.

2415.01.B

1. Apply section 2419.

~~1. Precast box culverts may be accepted when shown in the contract documents.~~

2. Use culvert sections that meet the requirements of ASTM ~~1433~~ 1577.

3. The contract documents will designate the span, rise, and either the design earth cover, or the design loading, both defined in ASTM ~~1433~~ 1577.

~~4. Apply section 2407 to the aggregates used in the concrete~~.

4. Use coarse aggregates in concrete mixture from an approved sources meeting requirement of section 4115, with class 2 or better durability rating.

5. ~~Apply the appropriate requirements of Section 2407 to manufacturing process inspection~~.

~~6.~~ 5. Concrete strength will be based on cylinder tests.

2416.02

Apply section 2419.

Section 2419. Precast Concrete Units

2419.01 DESCRIPTION.

A. Provide precast concrete units produced in a plant for which equipment, procedures, and quality of concrete have been approved by the Contracting Authority.
B. Provide, or have the fabricator provide, technical personnel experienced and skilled in the application of the precast system being used. Ensure technical personnel cooperate fully with the Engineer in all technical aspects of the work.
C. Apply the provisions of this section to production and construction of precast concrete as defined in Section 1101.
D. Unless modified elsewhere in the contract documents, all fabrication is required to be done in precast fabrication plants that are approved prior to the letting.
E. Requirements for specific precast units are found the in the IM 445 series, IM 571 and in the following specification sections:

Section 4145: Concrete Culvert Pipe
Section 2415: Concrete Box, Arch, and Circular Culverts
Section 2416: Rigid Pipe Culverts
Section 2430: Modular Block Retaining Wall
Section 2431: Segmental Retaining Wall
Section 2432: Mechanically Stabilized Earth (MSE) Retaining Wall
Section 2513: Concrete Barrier (Precast)

2419.02 MATERIALS.
Use materials in precast concrete meeting the requirements of Division 41 for the respective material, and the following:

I. Aggregates.

7. Apply sections 4110, 4111, 4115 and 4117, except the gradations requirements of Articles 4110.02 and 4115.03.

8. Submit aggregate gradations and proportions with the mix design to the District Materials Engineer for approval.

9. Use aggregates similar to Class V only when 30% or more of the total weight (mass) of aggregate is limestone.

B. Admixtures.

When authorized by the Engineer, approved admixtures complying with Section 4103 may be used and shall be from an approved source identified in IM 403.

C. Reinforcing Steel and Wire Fabric.

Reinforcing steel and wire fabric shall meet the requirements of section 4151 of the Standard Specifications and shall be from an approved source identified in IM 451. The precast fabricator shall accept reinforcing steel with certified mill test reports for each heat delivered.

D. Cement.

Apply Section 4101, unless otherwise specified. If the use of Type III Portland cement has been authorized, use it in the same proportions as specified for Type I Portland cement. Cement with total equivalent sodium oxide between 0.61% and 0.75% may be used, provided it is non-reactive with the proposed aggregate when tested according to ASTM C 1260, C 1567, or C 1293.

E. Supplementary Cementitious Materials.

1. Apply Section 4108.
2. Fly ash may be substituted for Portland cement. Use a substitution rate of no more than 25% by weight (mass) for wet cast concrete only. Fly ash shall be from an approved sources identified in 491.17.
3. GGBFS may substituted for Portland cement. Use a substitution rate of no more than 35% by weight (mass) for GGBFS as a mineral admixture. GGBFS shall be from an approved sources identified in 491.14.
4. The maximum total supplementary cementitious materials substitution shall not exceed 50%.

F. Use bolts, nuts and washers and other metal fasteners that have been galvanized as specified for steel structures in Article 4100.07

2419.03 Construction

A. Equipment.

Use equipment meeting the requirements of Section 2001 and the following:

9. Forms: Use forms for precast concrete true to the dimensions as shown in the contract documents, true to line, mortar tight, and of sufficient rigidity to not sag or bulge out of shape under placement and vibration of concrete. Ensure inside surfaces are smooth and free of any projections, indentations, or offsets that might restrict differential movements of forms and concrete

2. Weighing and Proportioning Equipment.
Apply Article 2001.20, except that a vibrator will not be required on the cement batch hopper.

3. Mixing Equipment.
Apply Article 2001.21.

4. Bins.
Apply Article 2001.06

J. Concrete

1. For precast construction, use at least than 610 pounds (360 kg) of total cementitious material per cubic yard (cubic meter) of concrete. Do not exceed the maximum water-cementitious ratio, including free moisture in the aggregate, of 0.450 pound per pound (0.450 kg/kg).
2. The intended air entrainment of the finished concrete is 6%. To allow for loss during placement, use a target value of 6.5% for the air content of fresh unvibrated concrete, with a maximum variation of ± 1.0%.

C. Proportioning, Mixing, and Placing Concrete.

1. Proportion and mix concrete according to the applicable requirements of Article 2403.02, D, 3.
2. Do not place concrete when the ambient temperature is below 35°F (2°C) unless the Engineer has approved the plant for cold weather concrete placement. When necessary, heat the aggregate or water, or both, so that the temperature of concrete when deposited in the forms is 40°F to 90°F (4°C to 32°C). Do not use frozen material in concrete.
3. When a series of units is cast in a line, cast the entire series in one continuous operation, or as directed by the Engineer. Place successive batches before the preceding batch has perceptibly hardened or dried. Do not allow more

than 45 minutes to pass between the placement of successive batches of concrete in a unit. Do not retemper the concrete or add water to the interface of the concrete between batches.
4. Carefully work and consolidate concrete around reinforcement without displacing it. Ensure the formation of honeycomb, stone pockets, or similar defects has not occured. Consolidate the concrete using small diameter vibrators or by other means the Engineer approves. Overfill the forms during consolidation. Screed off excess concrete and finish the surface to the desired texture.

D. Curing.
1. Use a method of curing that prevents loss of moisture and maintains an internal concrete temperature at least 40°F (4°C) during the curing period. Obtain the Engineer's approval for this method.
2. In all cases, cover the concrete and leave covered until curing is completed. Side forms and pans forming the underside of channel shapes may be removed during this period if the cover is immediately replaced. Do not, under any circumstances, remove units from the casting bed until the strength requirements are met.
3. When accelerated heat is used to obtain temperatures above 100°F (38°C):
a. Record the temperature of the interior of the concrete using a system capable of automatically producing a temperature record at intervals of no more than 15 minutes during the entire curing period.
b. Space the systems at a minimum of one location per 100 feet (30 m) of length per unit or fraction thereof, with a maximum of three locations along each line of units being cured.
c. Ensure all units, when calibrated individually, are accurate within ± 5°F (3°C).
d. Do not artificially raise the temperature of the concrete above 100°F (38°C) for a minimum of 2 hours after the units have been cast. After the 2 hour period, the temperature of the concrete may be raised to a maximum temperature of 160°F (71°C) at a rate not to exceed 25°F (15°C) per hour.
e. Hold the maximum temperature for a period sufficient to develop the strength required for release of prestress or for post tensioning, as the case may be.
f. Lower the temperature of the concrete at a rate not to exceed 40°F (22°C) per hour by reducing the amount of heat applied until the interior of the concrete has reached the temperature of the surrounding air.

E. Placing Reinforcement.
1. Place all reinforcement carefully and accurately and secure in the proper position according to the contract documents. Apply Article 2404.03.
F. Removal of Forms.
If forms are removed before the concrete has attained the strength which will permit the units to be moved or stressed, remove protection only from the immediate section from which forms are being removed. Immediately replace the protection and resume curing after the forms are removed. Do not remove protection any time before the units attain the specified compressive strength when the surrounding air temperature is below 20°F (-7°C).
F. **Tolerances.**
Limit variation from dimensions shown in the contract documents to no more than 1/8 inch (3 mm). For overruns, greater deviation may be accepted if, in the Engineer's opinion, it does not impair the suitability of the member for its intended use.
G. Handling and Storage.
During fabrication, storage, handling, and hauling take care to prevent cracking, twisting, unnecessary roughness, or other damage. In particular, do not allow tiedowns to come in direct contact with concrete surfaces. Do not subject units to excessive impact. Replace at no additional cost to the Contracting Authority units that are, in the Engineer's opinion, damaged in a way to impair their strength or suitability for their intended use.
H. Finish.
Finish all surfaces which will be exposed in the finished structure as provided in Article 2403.03, P, 2, b,

2419.04 METHOD OF MEASUREMENT.
For precast units, the Engineer will determine the number of units of each of the various respective sizes, lengths, and types from actual count or measurement will be done as specified in the contract documents.

2419.05 BASIS OF PAYMENT.
A. Payment will be the contract unit price for the number of approved precast s units of each size incorporated in the project or as specified in the contract documents.

2430.02.B

Apply section 2419.

2431.02.B

Apply section 2419.

2432.02.B,

Apply section 2419.

2432.02 B.1.a.2

~~Cement content per cubic yard (cubic meter)of concrete for face panels and precast coping sections no less than 600 pounds(360kg) nor more than 700 pounds(420kg).~~

2432.02 B.1.b.4

Test ~~two~~ three specimens at 7 days and ~~two~~ three at 28 days. A test will be average compressive strength of ~~2~~ three cylinders.

2513.02 Materials.

Apply section 2419 for precast concrete barrier rail

2513.02 D

Bolts, Anchors, and other Metal fastenings

Apply Article 2419.02, F. ~~Apply article 2407.02,G.~~

2513.03. A.1.a

Use concrete specified in Section 2419 ~~2407.~~

2513.03.C.1

Apply article ~~2407.03D~~ 2419.03D, except apply the finishing requirements in Article 2403.03, P,2,b, only to temporary barrier rail.

2513.03.D.1.a

Cure using a method preventing loss of moisture and maintaining an internal concrete temperature of no less than 40 F(4 C) during the curing period. Apply Article ~~2407.03,D~~, 2419.03.D, when elevated temperature cure is used.

2513.03.F.1

For permanent precast and cast-in-place concrete barrier, apply Article ~~2407.03,L~~, 2419.03H, except do not commence the finishing operation until completion of the initial wet cure period.

2513.03.F.4 last sentence

Complete patching operations only as directed by the Engineer and according to Article ~~2407.03, L~~, 2419.03H.

4145.03

Apply section 2419.

Reason for Revision: To organize all the precast concrete specifications and separate it from precast

and prestressed concrete spec.					
County or City Input Needed (X one)			**Yes**	**No** X	
Comments:					
Industry Input Needed (X one)			**Yes**	**No** X	
Industry Notified:	**Yes**	**No** X	**Industry Concurrence:**	**Yes**	**No** X
Comments:					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Donna Buchwald	**Office:** Local Systems	**Item 10**
Submittal Date: 2012.04.27	**Proposed Effective Date:** October 16, 2012	
Article No.: 2511.03, B, 1 **Title:** General (Construction of Sidewalks and Recreational Trails)	**Other:**	

Specification Committee Action: Approved with changes.

Deferred:	**Not Approved:**	**Approved Date:** 5/10/2012	**Effective Date:** 10/16/2012

Specification Committee Approved Text:

2511.03, B, 1, General.

Replace the Article:

Widths shown in contract documents are minimums, excluding curbs or flares.

The contract documents will contain ~~staking diagram~~ sheets for construction of ~~pedestrian~~ curb ramps, ~~landings, sidewalk~~ turning spaces, and transitions. Measure or stake as required to construct features. If either of the following is met, Engineer will provide staking for that quadrant and verify slopes during finishing:

- Longitudinal Slope. Tolerance between design slope and maximum allowable slope is less than 1.0%.
- Transverse Slope. Tolerance of ±0.5% from design slope would exceed minimum or maximum allowable slope.

If adequate construction tolerances are allowed, Engineer will not provide staking for construction of sidewalk or recreation trail. If field adjustments outside the acceptable range indicated in the contract documents are necessary, notify the Engineer prior to construction.

At locations other than curb ramps, turning spaces, and transitions, ensure cross slope is between 0.5% and 2.0%. Ensure grade is not more than 2.0% steeper than profile grade of adjacent roadway, or does not exceed 5.0%, whichever is steeper.

~~Field adjustments shall comply with the following requirements.~~

~~**a.** Construct sidewalks and recreational trails to a longitudinal slope not to exceed 5.0% and a cross slope not less than 1.5% or greater than 2.0%. A cross slope less than 1.5% will be allowed in tie-in areas.~~

~~**b.** Construct ramps as follows:~~

- ~~5.0 feet (1.5 m) minimum width, exclusive of curbs or flares.~~
- ~~Longitudinal slope not to exceed 8.0%.~~
- ~~Cross slope not to exceed 2.0%.~~

~~**c.** Construct landings as follows:~~

- ~~5.0 foot (1.5 m) minimum width by 5.0 foot (1.5 m) minimum length.~~
- ~~Longitudinal slope not to exceed 2.0%.~~
- ~~Cross slope not to exceed 2.0%.~~

~~**d.**~~ Install detectable warnings according to manufacturer's recommendations. Install detectable warnings for full width of curb ramp, excluding curbs and flares.

Comments: The Office of Design/Office of Contracts requested adding a bid item for staking/layout of sidewalk and recreational trail. The committee decided that the bid item would pay for something that needs to be done anyway. If we are not going to require construction survey, what level of

staking/layout would be required. The contractor can always survey the sidewalk if they want, but it won't be paid for separately.

The Office of Design/Office of Contracts requested that if the design slopes are less than 0.5% from the slope maximums, the Engineer will provide staking and verify slopes during finishing for the sidewalk/recreational trail. If the design slopes are 0.5% or greater, the Engineer will not provide survey for the sidewalk/recreational trail. The designer can always request to increase the maximum allowable slopes due to construction restraints. The committee decided that 1.0% would be a better tolerance. The Office of Design will add a column on the sidewalk tabulation that indicates that the Engineer will need to survey and verify that quadrant.

Specification Section Recommended Text:

2511.03, B, 1, General.

Replace the Article:

Widths shown in the contract documents are minimums, excluding curbs or flares.

The contract documents will contain ~~staking diagram~~ sheets for construction of ~~pedestrian~~ curb ramps, ~~landings, sidewalk~~ turning spaces, and transitions. Measure or stake as required to construct features. If field adjustments outside the acceptable range indicated in the contract documents are necessary, notify the Engineer prior to construction.

At locations other than curb ramps, turning spaces, and transitions, ensure cross slope is between 0.5% and 2.0%. Ensure grade is not more than 2.0% steeper than profile grade of adjacent roadway, or does not exceed 5.0%, whichever is steeper.

~~Field adjustments shall comply with the following requirements.~~

~~**a.** Construct sidewalks and recreational trails to a longitudinal slope not to exceed 5.0% and a cross slope not less than 1.5% or greater than 2.0%. A cross slope less than 1.5% will be allowed in tie-in areas.~~

~~**b.** Construct ramps as follows:~~

- ~~5.0 feet (1.5 m) minimum width, exclusive of curbs or flares.~~
- ~~Longitudinal slope not to exceed 8.0%.~~
- ~~Cross slope not to exceed 2.0%.~~

~~**c.** Construct landings as follows:~~

- ~~5.0 foot (1.5 m) minimum width by 5.0 foot (1.5 m) minimum length.~~
- ~~Longitudinal slope not to exceed 2.0%.~~
- ~~Cross slope not to exceed 2.0%.~~

~~**d.**~~ Install detectable warnings according to manufacturer's recommendations. Install detectable warnings for full width of curb ramp, excluding curbs and flares.

Comments:

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

B. Construction of Sidewalks and Recreational Trails.

1. General.

All widths shown in the contract documents are minimums, excluding curbs or flares.

The contract documents will contain ~~staking diagram~~ sheets for construction of ~~pedestrian~~ curb ramps, ~~landings, sidewalk,~~ turning spaces, and transitions. Measure or stake as required to construct the features. If field adjustments outside of the Acceptable Range indicated in the contract documents are necessary, notify the Engineer prior to construction.

At locations other than curb ramps, turning spaces, and transitions, ensure the cross slope is between 0.5% and 2.0%. Ensure the grade is not more than 2.0% steeper than the profile grade of the adjacent roadway, or does not exceed 5.0%, whichever is steeper.

~~Field adjustments shall comply with the following requirements.~~

~~**a.** Construct sidewalks and recreational trails to a longitudinal slope not to exceed 5.0% and a cross slope not less than 1.5% or greater than 2.0%. A cross slope less than 1.5% will be allowed in tie-in areas.~~

~~**b.** Construct ramps as follows:~~
~~5.0 feet (1.5 m) minimum width, exclusive of curbs or flares.~~
~~Longitudinal slope not to exceed 8.0%.~~
~~Cross slope not to exceed 2.0%.~~

~~**c.** Construct landings as follows:~~
~~5.0 foot (1.5 m) minimum width by 5.0 foot (1.5 m) minimum length.~~
~~Longitudinal slope not to exceed 2.0%.~~
~~Cross slope not to exceed 2.0%.~~

~~**d.**~~ Install detectable warnings according to manufacturer's recommendations. Install detectable warnings for the full width of the curb ramp, excluding curbs and flares.

Reason for Revision: A major change in this section of the specifications was made with GS-09004, effective October 16, 2011. Those changes were written and submitted in early 2011 when the Department and SUDAS were just beginning work to develop standards for the design and construction of curb ramps, landings, and transitions. Those changes were focused on Department applications, and did not anticipate the outstanding working relationship we have developed with SUDAS in developing the standards. Also since that time, a Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG) was made available by the Access Board on July 26, 2011.

With the development of the standards and the requirements in PROWAG, some of the text in GS-09004 does not apply to what is allowed in non-Primary right-of-way and we will be requiring S Sheets in all plans let through the Department that will specify range requirements for different segments of the curb ramps without need to notify the engineer. The S Sheets will also indicate a reason from the designer why something might be outside the standard requirements.

The changes requested in this submittal have been developed and agreed to by Paul Wiegand, SUDAS Director; Beth Richards, SUDAS Program Coordinator; Mark Bortle, Office of Construction; Deanna Maifield, Methods Engineer, Office of Design; Mike Ross, ADA Design Coordinator, Office of Design; and myself.

County or City Input Needed (X one)	**Yes** X	**No** X
Comments: We have worked with SUDAS on this change. This change will make the specifications more generic and rely on the S Sheets which are now required.		

Industry Input Needed (X one)			**Yes**	**No** X	
Industry Notified:	**Yes**	**No**	**Industry Concurrence:**	**Yes**	**No**
Comments: This change will make the specifications more generic and rely on the S Sheets which are now required.					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger	**Office:** Materials	**Item 11**
Submittal Date: 4/26/12	**Proposed Effective Date:** October, 2012	
Article No.: 2521.03 **Title:** Application (Certified Plant Inspection)	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 5/10/2012	**Effective Date:** 10/16/2012

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: The District 6 Office asked why Certified Plant Inspection does not apply to local systems projects (per Article 2521.01). The Office of Local Systems will verify whether the cities and counties want CPI on their projects.

Specification Section Recommended Text:

2521.03, Application.

Replace the Article:

~~**A.**~~ This specification applies to all HMA, HMA patching material, PCC, structural concrete, and flowable mortar, except where excluded by a note in the contract documents.

~~**B.** The Engineer may waive aggregate gradations, moisture, and specific gravity tests based on previous satisfactory experience with the plant for PCC which is furnished at a maximum rate of 25 cubic yards (25 m^2) per day, whether from one or more sources. This may be based on quantities planned by the Contractor several days ahead of placement.~~

Comments:

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

2521.03 APPLICATION.

A. This specification applies to all HMA, HMA patching material, PCC, structural concrete, and flowable mortar, except where excluded by a note in the contract documents.

~~**B.** The Engineer may waive aggregate gradations, moisture, and specific gravity tests based on previous satisfactory experience with the plant for PCC which is furnished at a maximum rate of 25 cubic yards (25 m_2) per day, whether from one or more sources. This may be based on quantities planned by the Contractor several days ahead of placement.~~

Reason for Revision: The information is in I.M. 528 where the PCC CPI requirements are covered in much more detail.

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

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger	**Office:** Materials	**Item 12**
Submittal Date: 2012.04.27	**Proposed Effective Date:** October, 2012	
Section No.: 2524 **Title:** Highway Signing **Article No.:** 4186.10 **Title:** Signing Materials	**Other:**	

Specification Committee Action: Approved with changes.

Deferred:	**Not Approved:**	**Approved Date:** 5/10/2012	**Effective Date:** 10/16/2012

Specification Committee Approved Text:

2524.03, B, Erection of Signs, Milepost Markers, and 6 Inch by 6 Inch (150 mm by 150 mm) Route Markers.

Add the Article:

3. Perforated Square Steel Tube (PSST) Posts and Anchors.

a. Position posts within anchor at furthest corner from likely point of impact from an errant vehicle.

b. Embed post within anchor without any play.

c. Provide minimum insertion length as required by manufacturer.

d. Ensure inside of break-away and slip base anchors installed in concrete are free of concrete to allow drainage.

e. Install triangular slip base assembly as required by manufacturer.

2524.04, Method of Measurement.

Add the Articles:

G. Perforated Square Steel Tube Posts.

Linear feet (meters), to nearest foot (0.3 m), measured from top of anchor to top of post. Embedded length will not be measured separately, but included in price bid for Perforated Square Steel Tube Posts.

H. Perforated Square Steel Tube Post Anchors.

By count of each type installed.

2524.05, Basis of Payment.

Renumber and **Replace** Article G:

~~**G**~~ **I. Excavation in Unexpected Rock.**

Excavation in unexpected rock for wood posts for Type A or B signs, steel posts for Type A or B signs, concrete footings for Type A or B signs, delineators, perforated square steel tube posts, and milepost marker posts will be paid for as extra work. Unexpected rock will be considered as rock encountered during post erection, but neither visible from the roadway nor indicated in the contract documents.

Add the Articles:

G. Perforated Square Steel Tube Posts.

1. Per linear foot (meter).

2. Payment is full compensation for furnishing, fabricating, and erecting posts.

H. Perforated Square Steel Tube Post Anchors.

1. Each, by type.

2. Payment is full compensation for providing and installing anchor, coring pavement, backfilling with concrete, slip base hardware, and other details necessary to provide anchor complete and erected in place.

4186.10, Sign Posts.

Add the Article:

D. Perforated Square Steel Tube (PSST) Posts and Anchors

Use PSST posts and anchors on the approved list in Materials I.M. 4XX and meet the following. When not specified elsewhere in the contract documents, the post and anchor system shall meet the minimum manufacturer's size requirements for 90 mph (145 km/hr) wind load criteria and be approved by the Engineer.

1. PSST Posts.

a. Provide PSST posts of the dimensions and gauge required by the contract documents.

b. Posts shall be designated "crashworthy" as defined by NCHRP Report 350 Category 2, Level 3 or by AASHTO *Manual for Assessing Safety Hardware* (MASH) for post systems evaluated after January 1, 2011 and be FHWA accepted.

c. Galvanized posts shall conform ASTM A 653, SS, Grade 50, Designation G-90 or greater.

d. Cross section of post shall be a square tube roll formed and corner welded. Corner weld shall be zinc coated after scarfing operation.

e. Pre-punch 7/16 inch (11 mm) holes on 1 inch (25 mm) centers on all sides, vertically aligned and centered horizontally.

f. Furnished post shall be straight and have a smooth uniform finish. It must be possible to freely insert post into anchors and telescope consecutive sizes with a minimum amount of play.

g. If post is to be field cut, cut ends shall be coated with zinc rich paint as required per specification.

2. PSST Post Anchors.

a. Break-away, soil installation.
42 inch (1065 mm) minimum length, 7 gauge (4.76 mm) heavy duty winged anchor.

b. Break-away, concrete installation.
Posts installed in a concrete island, use a 48 inch (1220 mm) minimum length, 7 gauge (4.76 mm) heavy duty anchor. Core an 8 inch (200 mm) diameter hole through pavement at least 8 inches (200 mm) deep. After placing anchor, fill hole with concrete mix approved by the Engineer and level off top of concrete.

c. Triangular Slip Base Assembly.

1) Ensure design is in accordance with the AASHTO Standards and Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, current edition and meets or exceeds NCHRP Report 350 or the AASHTO MASH criteria for any assembly system evaluated after January 1, 2011 and be FHWA accepted.

2) Triangular Slip Base Assembly consists of four parts: one-piece anchor, top half slip base, hardware, and concrete foundation.

a) One-piece anchor shall meet the following requirements:

- Anchor shall have a triangular slip plate (1 inch (25 mm) thick) welded directly to anchor leg.
- Anchoring portion shall be 3 inches (75 mm) square 7 gauge (4.76 mm) material and 42 inches (1065 mm) long.
- Galvanize by hot dip process, complying with ASTM A 123, grade 85.

b) Top-half slip base shall meet the following requirements:

- Cast unit from Ductile Iron meeting ASTM A 536 Class 65-45-12.

- Top half slip base shall have a triangular dimension to match 8 inch (200 mm) standard triangular slip plate, and shall receive 2.5 inch (63 mm) square sign support.

c) Hardware shall meet requirements of Article 4186.09.

d) Concrete Footings: Apply Section 2403.

Comments: The District 6 Office asked if Article 2524.05, G needs to be revised. This article will be revised to include perforated square steel tube posts.

The Office of Design asked about Article 4186.10, D and how this would apply if the posts are specified. "When not specified elsewhere in the contract documents" was added back into the sentence for clarification.

Specification Section Recommended Text:

2524.03, B, Erection of Signs, Milepost Markers, and 6 Inch by 6 Inch (150 mm by 150 mm) Route Markers.

Add the Article:

3. Perforated Square Steel Tube Posts and Anchors.

a. Position posts within anchor at furthest corner from likely point of impact from an errant vehicle.

b. Embed post within anchor without any play.

c. Provide minimum insertion length as required by manufacturer.

d. Ensure inside of break-away and slip base anchors installed in concrete are free of concrete to allow drainage.

e. Install triangular slip base assembly as required by manufacturer.

2524.04, Method of Measurement.

Add the Articles:

G. Perforated Square Steel Tube Posts.

Linear feet (meters), to nearest foot (meter), measured from top of anchor to top of post. Embedded length will not be measured separately, but included in price bid for Perforated Square Steel Tube Posts.

H. Perforated Square Steel Tube Post Anchors.

By count of each type installed.

2524.05, Basis of Payment.

Add the Articles:

H. Perforated Square Steel Tube Posts.

1. Per linear foot (meter).

2. Payment is full compensation for furnishing, fabricating, and erecting posts.

I. Perforated Square Steel Tube Post Anchors.

1. Each, by type.

2. Payment is full compensation for providing and installing anchor, coring pavement, backfilling with concrete, slip base hardware, and other details necessary to provide anchor complete and erected in place.

4186.10, Sign Posts.

Add the Article:

D. Perforated Square Steel Tube (PSST) Posts and Anchors

Use PSST posts and anchors on the approved list in Materials I.M. 4XX and meet the following. Ensure post and anchor system meets minimum manufacturer's size for 90 mph

(145 km/hr) wind load and be approved by Engineer.

1. PSST Posts.

h. Provide PSST post of the dimensions and gauge required by the contract documents.

i. Post shall be designated "Crashworthy" as defined by NCHRP Report 350 category 2, level 3 or by the AASHTO *Manual for Assessing Safety Hardware* (MASH) for any post system evaluated after January 1, 2011 and be FHWA accepted.

j. Galvanized post shall conform ASTM A 653, SS, Grade 50, designation G-90 or greater.

k. Cross section of post shall be a square tube roll formed and corner welded. Corner weld shall be zinc coated after scarfing operation.

l. Pre-punch 7/16 inch (11 mm) holes on 1 inch (25 mm) centers on all sides, vertically aligned and centered horizontally.

m. Furnished post shall be straight and have a smooth uniform finish. It must be possible to freely insert post into anchors and telescope consecutive sizes with a minimum amount of play.

n. If post is to be field cut, cut ends shall be coated with zinc rich paint as required per specification.

2. PSST Post Anchors.

d. Break-away, soil installation.
42 inch (1065 mm) minimum length, 7 gauge (4.76 mm) heavy duty winged anchor.

e. Break-away, concrete installation.
Posts installed in a concrete island, use a 48 inch (1220 mm) minimum length, 7 gauge (4.76 mm) heavy duty anchor. Core an 8 inch (200 mm) diameter hole through pavement at least 8 inches (200 mm) deep. After placing anchor, fill hole with concrete mix approved by the Engineer and level off top of concrete.

f. Triangular Slip Base Assembly.

3) Ensure design is in accordance with the AASHTO Standards and Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, current edition and meets or exceeds NCHRP Report 350 or the AASHTO MASH criteria for any assembly system evaluated after January 1, 2011 and be FHWA accepted.

4) Triangular Slip Base Assembly consists of four parts: one-piece anchor, top half slip base, hardware, and concrete foundation.

a) One-piece anchor shall meet the following requirements:

- Anchor shall have a triangular slip plate (1 inch (25 mm) thick) welded directly to anchor leg.
- Anchoring portion shall be 3 inches (75 mm) square 7 gauge (4.76 mm) material and 42 inches (1065 mm) long.
- Galvanize by hot dip process, complying with ASTM A 123, grade 85.

b) Top-half slip base shall meet the following requirements:

- Cast unit from Ductile Iron meeting ASTM A 536 Class 65-45-12.
- Top half slip base shall have a triangular dimension to match 8 inch (200 mm) standard triangular slip plate, and shall receive 2.5 inch (63 mm) square sign support.

c) Hardware shall meet requirements of Article 4186.09.

d) Concrete Footings: Apply Section 2403.

Comments: Changes from the April Specification Committee meeting are shown in yellow.

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

C. Perforated Square Steel Tube (PSST) Posts and Anchors

Use PSST posts and anchors that are on the approved list in Materials I.M. 4XX and meet the following. When not specified elsewhere in the contract documents, the post and anchor system shall meet the minimum manufacturer's size requirements for 90 mph (145 km/hr) wind load criteria and be approved by the engineer.

A. PSST Posts.

o. Provide perforated square steel tubular post of the dimensions and gauge required by the contract documents.
p. Post shall be designated as "Crashworthy" as defined by NCHRP Report 350 category 2, level 3 or by the AASHTO *Manual for Assessing Safety Hardware* (MASH) for any post system evaluated after January 1, 2011 and be FHWA accepted.
q. Galvanized post shall conform ASTM A-653, SS, Grade 50, designation G-90 or greater.
r. The cross section of the post shall be a square tube roll formed and corner welded with the corner weld to be zinc coated after the scarfing operation.
s. Perforations shall be pre-punched 7/16" holes on 1" centers on all four sides, vertically aligned and centered horizontally.
t. Furnished post shall be straight and have a smooth uniform finish. It shall be possible to freely insert post into the anchors and to telescope consecutive sizes with a minimum amount of play.
u. If post is to be field cut, cut ends must be coated with zinc rich paint as required per specification.

B. PSST Post Anchors.

g. Break-away, soil installation.
42 inch (1065 mm) minimum length, 7 gauge (4.76 mm) heavy duty winged anchor.
h. Break-away, concrete installation.
Posts installed in a concrete island, use a 48 inch (1220 mm) minimum length, 7 gauge (4.76 mm) heavy duty anchor. Core an 8 inch (200 mm) diameter hole through the pavement at least 8 inches (200 mm) deep. After placing anchor, fill the hole with concrete mix approved by the Engineer and level off the top of the concrete.
i. Triangular Slip Base Assembly.

5) Shall be designed in accordance with the AASHTO Standards and Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, current edition and shall meet or exceed NCHRP Report 350 or the AASHTO *Manual for Assessing Safety Hardware* (MASH) criteria for any assembly system evaluated after January 1, 2011 and be FHWA accepted.

6) Triangular Slip Base Assembly consists of four parts: one-piece anchor, top half slip base, hardware, and concrete foundation.

a) One-piece anchor shall meet the following requirements:

- Anchor shall have a triangular slip plate (1 inches (25 mm) thick) welded directly to anchor leg.
- Anchoring portion shall be 3 inch (75 mm) square 7 gauge (4.76 mm) material and 42 inches (1065 mm) in length.
- Galvanizing is by the hot dip process, complying with ASTM A 123, grade 85.

b) Top-half slip base shall meet the following requirements:

- Cast unit from Ductile Iron ASTM A 536 Class 65-45-12.
- Top half slip base shall have a triangular dimension to match 8 inch (200 mm) standard triangular slip plate, and shall receive 2.5 inch (63 mm) square sign support.

c) Hardware shall meet the requirements of Article 4186.09 of the Standard

Specifications. **d)** Concrete Footings: Apply the provisions of Section 2403 of the Standard Specifications.					
Reason for Revision: To include a new section for perforated square steel posts and anchors.					
County or City Input Needed (X one)			**Yes** X	**No**	
Comments:					
Industry Input Needed (X one)			**Yes**	**No** X	
Industry Notified:	**Yes**	**No**	**Industry Concurrence:**	**Yes**	**No**
Comments:					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: John Smythe / Mark Bortle	**Office:** Construction	**Item 13**
Submittal Date: 2012.04.25	**Proposed Effective Date:** October 16, 2012	
Section No.: 2527 **Title:** Pavement Marking **Article No.:** 4183.06, A **Title:** Removable Marking Tape (Traffic Paint and Pavement Markings)	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 5/10/2012	**Effective Date:** 10/16/2012

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: None.

Specification Section Recommended Text:

2527.02, D, 1, Removable Marking Tape.

Retitle the Article:

Wet, Retroreflective Removable ~~Marking~~ Tape Markings.

2527.02, D, 1, b.

Replace the Article:

Complying with the following:

1) Preformed markings consist of white or yellow films providing immediate and continuing retroreflection during dry, wet, and rainy conditions.

~~**1**~~ **2)** Nominal width of 4 inches (100 mm).

~~**2) Yellow or white, weather and traffic resistant film, precoated on one side with a pressure sensitive adhesive.**~~

3) Flexible and formable.

4) ~~Capable of remaining in place during its useful life.~~ Ensure tape is capable of performing for the duration of a normal construction season and being removed intact or in large pieces. Ensure tape is reflective throughout its useful life. Normal construction season is defined as the time between the last snowplowing in the spring and the first snowplowing in the fall/winter.

5) ~~Easily removed from the pavement at any time.~~ Ensure tape design and manufacture allows it to be readily removed when markings are no longer needed.

2527.03, J, 2.

Replace the Article:

Use wet, retroreflective removable tape markings for temporary pavement markings which extend diagonally across a final traffic lane.

2527.04, A, 3, Removable Tape Markings.

Retitle and **Replace** the Article:

3. Wet, Retroreflective Removable Tape Markings.

Stations (meters) placed. Removing wet, retroreflective removable tape markings will not be measured separately for payment.

2527.05, A, 3, Removable Tape Markings

Retitle and **Replace** the Article:

3. Wet, Retroreflective Removable Tape Markings.

a. Per station (meter) placed.

b. Payment includes removing the wet, retroreflective removable ~~marking~~ tape markings,

when required.

4183.06, A, Removable Marking Tape.

Retitle and **Replace** the Article:

Wet, Retroreflective Removable ~~Marking~~ Tape Markings.

Comply with Materials I.M. 483.06 and meet the following requirements:

~~**1. Thickness.**~~

~~Average thickness of the film, including glass spheres, no less than 30 mils (0.76 mm) or more than 70 mils (1.78 mm).~~

~~**2. Retroreflectance.**~~

~~For white or yellow tapes, meet the following initial minimum retroreflectance values at 1.05 degree observation angle and 88.76 degree entrance angle, measured by a LTL 2000 retroreflectometer.~~

	~~White~~	~~Yellow~~
~~Specific luminance, mcd/sq.ft./ft. cdl. (lux•m^2)~~	~~550~~	~~325~~

1. Ensure film is free of lead, chrome, and other heavy metals as defined by the EPA.

2. Precoat markings with pressure sensitive adhesive capable of adhering to the pavement at temperatures as low as 50°F (10°C) in accordance with the manufacturer's recommendations.

3. Retroreflectance.

a. Ensure white and yellow markings have initial expected retroreflectance values as shown in Table 1 under dry, wet, and rainy conditions.

b. Measure wet retroreflectance values under a “condition of wetness” according to ASTM E 2177. Test may be performed with marking installed on road. Perform laboratory measurements using a 3 to 5 degree lateral slope. Use wetting agent to improve wetting of pavement marking with water. Use of a 0.1% (by volume) liquid soap solution is recommended. Report measurements as an average for each roll tested, in a minimum of three locations.

c. Measure wet retroreflectance values under a “condition of continuous wetting” (simulated rain) according to ASTM E 2176, in a controlled laboratory environment while the marking is positioned with a 3 to 5 degree lateral slope. Use wetting agent to improve wetting of pavement marking with water. Use of a 0.1% (by volume) liquid soap solution is recommended. Report measurements as an average for each roll tested, in a minimum of three locations.

Table 4183.06-1: Expected Initial R_L under dry, wet, and rainy conditions

WHITE	**Dry, Wet, & Rainy**
Entrance Angle	88.76 degrees
Observation Angle	1.05 degrees
Retroreflected Luminance R_L [(mcd • ft^{-2}) • fc^{-1}] (R_L [(mcd • m^{-2}) • lx^{-1}])	150
YELLOW	**Dry, Wet, & Rainy**
Entrance Angle	88.76 degrees
Observation Angle	1.05 degrees
Retroreflected Luminance R_L [(mcd • ft^{-2}) • fc^{-1}] (R_L [(mcd • m^{-2}) • lx^{-1}])	100

4. Removability.

Pavement markings shall be removable from the pavement intact or in large pieces, at temperatures above freezing without the use of heat, solvents, grinding, or blasting; and with no permanent scarring of the roadway surface.

5. Patchability.

Pavement marking material shall be capable of being patched in accordance with manufacturer's instructions.

Comments:

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

Delete the following:

2527.02.D.1. ~~Removable Marking Tape.~~

- **a.** ~~Meet the requirements of Article 4183.06, A. and prequalified for use according to Materials I.M. 483.06.~~
- **b.** ~~Complying with the following:~~
  - **1)** ~~Nominal width of 4 inches (100 mm).~~
  - **2)** ~~Yellow or white, weather and traffic resistant film, precoated on one side with a pressure sensitive adhesive.~~
  - **3)** ~~Flexible and formable.~~
  - **4)** ~~Capable of remaining in place during its useful life.~~
  - **5)** ~~Easily removed from the pavement at any time.~~

2527.03.J LIMITATIONS

2. ~~Use removable tape for temporary pavement markings which extend diagonally across a final traffic lane.~~

2527.04A. 3. METHOD OF MEASUREMENT.

3. ~~Removable Tape Markings.~~

~~Stations (meters) placed. Removing removable tape will not be measured separately for payment.~~

~~2527.05.A.03 BASIS OF PAYMENT~~

3. ~~Removable Tape Markings.~~

- **a.** ~~Per station (meter) placed.~~
- **b.** ~~Payment includes removing the removable marking tape, when required.~~

4183.06.A PAVEMENT MARKING TAPE.

~~A. Removable Marking Tape.~~

~~Comply with Materials I.M. 483.06 and meet the following requirements:~~

~~1. Thickness.~~

~~Average thickness of the film, including glass spheres, no less than 30 mils (0.76 mm) or more than 70 mils (1.78 mm).~~

~~2. Retroreflectance.~~

~~For white or yellow tapes, meet the following initial minimum retroreflectance values at 1.05 degree observation angle and 88.76 degree entrance angle, measured by a LTL 2000 retroreflectometer.~~

	White	**Yellow**
Specific luminance, mcd/sq.ft./ft. cdl. (lux•m^2)	550	325

Add the following:

2527.02.D.1. Wet, Retroreflective Removable Tape Markings

- **a.** Meet the requirements of Article 4183.06, A. and prequalified for use according to Materials I.M. 483.06.
- **b.** Complying with the following:
  1) Preformed markings consist of white or yellow films providing immediate and continuing retroreflection during dry, wet, and rainy conditions.

2) Nominal width of 4 inches (100 mm).
3) Flexible and formable.
4) Ensure tape is capable of performing for the duration of a normal construction season and being removed intact or in large pieces. Ensure tape is reflective throughout its useful life. Normal construction season is defined as the time between the last snowplowing in the spring and the first snowplowing in the fall/winter.
5) Ensure tape design and manufacture allows it to be readily removed when markings are no longer needed.

2527.03. J.2. LIMITATIONS

2. Use wet, retroreflective removable tape markings for temporary pavement markings which extend diagonally across a final traffic lane.

2527.04A. 3. METHOD OF MEASUREMENT.

3. Wet, Retroreflective Removable Tape Markings
Stations (meters) placed. Removing wet, retroreflective removable tape markings will not be measured separately for payment.

2527.05.A.03 BASIS OF PAYMENT

3. Wet, Retroreflective Removable Tape Markings
a. Per station (meter) placed.
b. Payment includes removing the wet, retroreflective removable tape markings, when required.

4183.06. PAVEMENT MARKING TAPE

A. Wet, Retroreflective Pavement Tape Markings

Comply with Materials I.M. 486.03 and meet the following requirements:

Ensure film is free of lead, chrome, and other heavy metals as defined by the EPA.
Precoat markings with pressure sensitive adhesive capable of adhering to the pavement at temperatures as low as 50°F (10°C) in accordance with the manufacturer's recommendations.

a. Retroreflectance.
White and yellow markings shall have initial expected retroreflectance values as shown in Table 1 under dry, wet, and rainy conditions.
Measure retroreflectance values under wet conditions according to ASTM E 2176 or ASTM E 2177.
Measure wet retroreflectance values under a “condition of continuous wetting” (simulated rain) according to ASTM E 2176, and to reduce variability between measurements, ensure test is performed in a controlled laboratory environment while the marking is positioned with a 3 to 5 degree lateral slope. Use wetting agent to improve wetting of pavement marking with water. Use of a 0.1% (by volume) liquid soap solution is recommended. Report measurements as an average for each roll tested, in at least three locations.
Measure wet retroreflectance values under a “condition of wetness” according to ASTM E 2177. Test may be performed with the marking installed on the road. Test new markings using a wetting agent previously described. Perform laboratory measurements using a 3 to 5 degree lateral slope. Report measurements as an average for each roll tested, in a minimum of three locations.

Table 09012.02-1: Expected Initial R_L under dry, wet, and rainy conditions

WHITE	**Dry, Wet, & Rainy**
Entrance Angle	88.76 degrees
Observation Angle	1.05 degrees
Retroreflected Luminance R_L [(mcd • ft^{-2}) • fc^{-1}] (R_L [(mcd • m^{-2})	150

• lx^{-1}])	
YELLOW	**Dry, Wet, & Rainy**
Entrance Angle	88.76 degrees
Observation Angle	1.05 degrees
Retroreflected Luminance R_L [(mcd • ft^{-2}) • fc^{-1}] (R_L [(mcd • m^{-2}) • lx^{-1}])	100

b. Removability.
Pavement markings shall be removable from the pavement intact or in large pieces, at temperatures above freezing without the use of heat, solvents, grinding, or blasting; and with no permanent scarring of the roadway surface.

c. Patchability.
Pavement marking material shall be capable of being patched in accordance with manufacturer's instructions.

Reason for Revision: To place SS-09012: Wet, Retroreflective Removable Tape Markings into the General Supplemental Specifications

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

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: John Smythe / Melissa Serio	**Office:** Construction	**Item 14**
Submittal Date: 4/26/12	**Proposed Effective Date:** October 16, 2012	
Article No.: 2601.05 **Title:** Basis of Payment (Erosion Control)	**Other:**	

Specification Committee Action: Approved with changes.

Deferred:	**Not Approved:**	**Approved Date:** 5/10/2012	**Effective Date:** 10/16/2012

Specification Committee Approved Text:

2601.05, A, 9, b.

Replace the Article:

Payment is full compensation for the Turf Reinforcement Mat, preparation, and materials including shaping channels, ditches and slopes, soil fill, seed and fertilizing, and wood excelsior mat ~~and watering~~.

Comments: The Office of Contracts asked why watering is sometimes paid for (when a large area is to be watered) and sometimes incidental (when an item for watering is not included) and what is to keep a designer from not including a bid item just to avoid paying for it. If "large area" was defined, the specifications would cover when watering would have to be added by extra work order. If we are not going to define "large area", the Office of Contracts would like incidental watering (and mobilization) to be listed in the incidental items tabulation. The Office of Construction withdrew the requested revision to Article 2601.05, A, 11. Incidental watering (and mobilization) will be addressed in the future.

Specification Section Recommended Text:

2601.05, A, 9, b.

Replace the Article:

Payment is full compensation for the Turf Reinforcement Mat, preparation, and materials including shaping channels, ditches and slopes, soil fill, seed and fertilizing, and wood excelsior mat ~~and watering~~.

2601.05, A, 11.

Replace the last sentence of the Article:

When an item for watering is not included, the cost of watering (including mobilization) is included in the amount paid for the item to be watered.

Comments:

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

Revise the following sections in 2601.05, A.

9. Squares (square meters) of Turf Reinforcement Mat:
- **a.** Contract unit price per square (square meter).
- **b.** Payment is full compensation for the Turf Reinforcement Mat, preparation and materials including shaping channels, ditches and slopes, soil fill, seed and fertilizing, and wood excelsior mat ~~and watering~~.

11. When a large area is to be watered, the contract documents will include an item for watering. For the quantity of water applied to sod, Article 2601.03, G, 3, e, and to special ditch control and slope protection, Article 2601.03, Q, payment will be the predetermined contract unit price per 1000 gallons (kiloliter). When an item for watering is not included, the cost of watering (including mobilization) is included in the amount paid for the item to be watered.

Reason for Revision: To remove watering as incidental to TRM. To clarify that when watering is

incidental to work, that mobilization for watering is also incidental.					
County or City Input Needed (X one)			**Yes**	**No X**	
Comments:					
Industry Input Needed (X one)			**Yes**	**No X**	
Industry Notified:	**Yes**	**No** x	**Industry Concurrence:**	**Yes**	**No**
Comments:					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Jim Berger	**Office:** Materials	**Item 15**
Submittal Date: 4/26/12	**Proposed Effective Date:** October, 2012	
Article No.: 4100.08 **Title:** Concrete Compression Test Specimens.	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 5/10/2012	**Effective Date:** 10/16/2012

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: None.

Specification Section Recommended Text:

4100.08, Concrete Compression Test Specimens.

Replace the Article:

~~**A.**~~ Cast concrete compression test specimens ~~may be cast:~~

- ~~A~~ according to Materials I.M. 315~~, or~~ unless otherwise specified in the contract documents.
- ~~Horizontally in molds with a diameter of 4 1/2 inches (114.3 mm) and length of 9 inches (228.6 mm) or a diameter of 6 inches (152.4 mm) and length of 12 inches (304.8 mm).~~

~~**B.** When compressive strength is a specification requirement, use of horizontal molds is subject to agreement of the Contractor.~~

Comments:

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

4100.08 CONCRETE COMPRESSION TEST SPECIMENS.

~~A.~~ Cast ~~C~~concrete compression test specimens ~~may be cast:~~

~~A~~according to Materials I.M. 315 unless otherwise specified in the contract documents.~~, or~~

~~Horizontally in molds with a diameter of 4 1/2 inches (114.3 mm) and length of 9 inches (228.6 mm) or a diameter of 6 inches (152.4 mm) and length of 12 inches (304.8 mm).~~

~~**B.** When compressive strength is a specification requirement, use of horizontal molds is subject to agreement of the Contractor.~~

Reason for Revision: Development of plastic disposable molds for making specimens and unbounded caps for testing specimens have eliminated to need for horizontal molds.

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

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: John Smythe / Melissa Serio	**Office:** Construction	**Item 16**
Submittal Date: April 26, 2012	**Proposed Effective Date:** October 16, 2012	
Article No.: 4169.12 **Title:** Perimeter and Slope Sediment Control Device	**Other:**	

Specification Committee Action: Approved as recommended.

Deferred:	**Not Approved:**	**Approved Date:** 5/10/2012	**Effective Date:** 10/16/2012

Specification Committee Approved Text: See Specification Section Recommended Text.

Comments: The District 6 Office asked if a section on removal of these devices could be added to the specifications. The Office of Construction will look into this for the next GS.

Specification Section Recommended Text:

4169.12, Perimeter and Slope Sediment Control Device.

Replace Articles A and B:

A. Wattles and Sediment Logs.
Wood excelsior or straw contained in a tube of photodegradable open weave fabric (synthetic netting). ~~Install according to manufacturer's recommendations.~~

B. Filter Socks.
Continuous, tubular, knitted, photodegradable, synthetic mesh netting with a maximum 3/8 inch (10 mm) opening ~~fabricated~~ ~~using 5 mil (0.125 mm) thickness photodegradable HDPE~~ and filled with a compost/wood blend filter material consisting of compost from an approved source meeting Article 4169.08. Fill sock by blowing filter material into tube with a pneumatic blower truck or similar device. Hand filling will not be allowed. ~~Install according to manufacturer's recommendations.~~

Comments:

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

Revise **4169.12 Perimeter and Slope Sediment Control Device.**

A. Wattles and Sediment Logs.
Wood excelsior or straw contained in a tube of photodegradable open weave fabric (synthetic netting). ~~Install according to manufacturer's recommendations.~~

B. Filter Socks.
Continuous, tubular, knitted, photodegradable, synthetic mesh netting with a maximum 3/8 inch (10 mm) opening ~~fabricated~~ ~~using 5 mil (0.125 mm) thickness photodegradable HDPE~~ and filled with a compost/wood blend filter material consisting of compost from an approved source meeting Article 4169.08. Fill sock by blowing filter material into tube with a pneumatic blower truck or similar device. Hand filling will not be allowed. ~~Install according to manufacturer's recommendations.~~

Reason for Revision: Remove reference to manufacturer's recommended installation because Standard Road Plan EC-204 was developed for Oct. 2012 that shows installation requirements. Revise netting requirements to allow for additional manufacturers. Revise description of filter material to allow use of wood.

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

Industry Notified:	**Yes**	**No** x	**Industry Concurrence:**	**Yes**	**No**
Comments:					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Willy Sorenson	**Office:** Traffic & Safety	**Item 17**
Submittal Date: 2012.04.30	**Proposed Effective Date:** October 2012	
Article No.: 2528.03, I, 2, b **Title:** Portable, Mobile Self Contained LED Floodlights (Traffic Control) **Article No.:** 4189 **Title:** Solar Power Systems	**Other:** Proposed Developmental Specifications for Solar Power Systems	

Specification Committee Action: Deferred to a future Specification Committee meeting.

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

Specification Committee Approved Text:

Comments: The Office of Traffic & Safety noted that the word “absorbent” should be “absorbed”.

The Office of Construction noted that parts of the specifications appear to be intended for purchasing and not construction specifications. The Specifications Section wondered if we should be specifying the contractor’s equipment that is used on our projects. Many committee members felt that some minimum specifications would be beneficial, since these items will be left on the project overnight, perhaps far from the contractor’s home location.

The Office of Traffic & Safety agreed to defer this item to a future meeting so that it can be reviewed more closely.

Specification Section Recommended Text:

2528.03, I, 2, b, Portable, Mobile Self Contained LED Floodlights.

Add the Article:

5) Meet solar power system requirements of Section 4189.

4189, Solar Power Systems.

Add the Section:

4189.01 DESCRIPTION.

Applies to rental and purchase of photovoltaic systems with battery power storage and their deployment. System uses include both mobile and permanent installations, such as: portable dynamic message sign trailers, portable highway advisory radio trailers, portable camera and sensor trailers, permanent cameras, permanent traffic sensors, portable roadway lighting, stationary flashing amber beacons, etc.

4189.02 RENTAL EQUIPMENT.

Following requirements apply to rented photovoltaic systems.

A. Battery.

1. Ensure battery banks accommodate maximum electrical load of device.

2. Ensure battery banks provide “normal” load for at least 7 calendar days, without recharging from solar panels or from other external power source (shore power).

B. Solar Panel.

1. Ensure solar panel systems are designed to recharge battery bank from the point of low voltage cutoff to full capacity within 7 calendar days while device is under “normal” electrical load.

2. Arrange solar panels and other equipment in a manner not casting shadows on solar panels.

3. Ensure solar panels are capable of south-facing installation and sloped at 50 degrees (plus or minus 10 degrees) from horizontal.

C. Charge Controller.

1. Ensure charge controller is capable of receiving maximum current output from solar panels.

2. Ensure charge controller can output power to batteries at a rate within specifications of batteries.

3. Ensure charge controller has a low-voltage cutoff to device.

4. Ensure charge controller continues to charge batteries after low-voltage cutoff has been triggered.

5. Provide a diode to prevent reverse power flow to solar panels.

4189.03 PURCHASED EQUIPMENT.

The following requirements are for equipment purchased by the Department and are in addition to the requirements of Article 4189.02.

A. General.

Provide a system that is permanently mounted and capable of withstanding wind speeds of 90 mph (145 km/hr) without deformation.

B. Battery.

Supply batteries that are absorbent glass mat.

C. Solar Panel.

Size and design solar panels according to a sizing report.

D. Charge Controller.

Ensure charge controller is capable of accepting a charge from AC power using a standard extension cord.

4189.04 EQUIPMENT DEPLOYMENT AND USAGE.

A. Orient solar panels facing south without any shading and angled to at least 45 degrees to optimize sun exposure and minimize buildup of dirt or snow.

B. Extend trailer outriggers if present.

Comments:

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

A. Solar Power Systems

These specifications apply to the rental and purchase of photovoltaic systems with battery power storage and their deployment. System uses include both mobile and permanent installations, such as: portable dynamic message sign trailers, portable highway advisory radio trailers, portable camera and sensor trailers, permanent cameras, permanent traffic sensors, portable roadway lighting, stationary flashing amber beacons, etc.

B. Requirements for Rental Equipment

The following requirements apply to rented photovoltaic systems.

D. Battery Requirements

3. Battery banks must accommodate the maximum electrical load of the device.
4. Battery banks must provide "normal" load for a period of 7 days, without recharging from solar panels or from any other external power source (shore power).

E. Solar Panel Requirements
4. Solar panel systems must be designed to recharge the battery bank from the point of the low voltage cutoff to full capacity within 7 days while the device is under "normal" electrical load.
5. Solar panels and any other equipment must be arranged in a manner that does not cast shadows on any of the solar panels.
6. Solar panels must be capable of south-facing installation and sloped at 50 degrees (plus or minus 10 degrees) from horizontal.
7.

F. Charge Controller Requirements
6. Charge controller must be capable of receiving the maximum current output from the solar panels.
7. Charge controller must output power to the batteries at a rate within the specifications of the batteries.
8. Charge controller must have a low-voltage cutoff to the device.
9. Charge controller must continue to charge the batteries after the low-voltage cutoff has been triggered.
10. A diode must be used to prevent reverse power flow to the solar panels.

C. Requirements for Permanent Equipment
The following requirements are for equipment purchased by the Iowa DOT and are in addition to the requirements in Section 1 for rental equipment.

E. General Requirements
a. Permanently mounted photovoltaic systems must be capable of withstanding wind speeds of 90 mph without deformation.
b. Portable photovoltaic systems must be capable of withstanding wind speeds of 90 mph without deformation.

F. Battery Requirements
a. All batteries must be Absorbent Glass Mat.

G. Solar Panel Requirements
a. Solar panels must be sized and designed according to a sizing report.

H. Charge Controller Requirements
a. Charge controllers must be capable of accepting a charge from AC power using a standard extension cord.

3. Equipment Deployment and Usage

b. General Requirements
A. Solar panels must be oriented facing south without any shading and angled to at least 45 degrees slope to optimize sun exposure and minimize buildup of dirt or snow.
B. Trailer outriggers must be extended if present.

Reason for Revision: New section to address solar power systems.					
County or City Input Needed (X one)			**Yes** X	**No**	
Comments:					
Industry Input Needed (X one)			**Yes**	**No** X	
Industry Notified:	**Yes**	**No**	**Industry Concurrence:**	**Yes**	**No**
Comments:					

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Gary Novey	**Office:** Bridges and Structures	**Item 18**
Submittal Date: May 2, 2012	**Proposed Effective Date:** July 2012	
Article No.: **Title:**	**Other:** Developmental Specifications for Partial Depth Bridge Deck Patching	

Specification Committee Action: Approved with changes.

Deferred:	**Not Approved:**	**Approved Date:** 5/10/2012	**Effective Date:** 7/17/2012

Specification Committee Approved Text: See attached Draft DS for Partial Depth Bridge Deck Patching.

Comments: The District 6 Office asked if extended lane closures should be specified or allowed. The Committee decided that we should use allowed. Extended lane closures will only be allowed on 4 lane divided roadways.

The Specifications Section asked if Class O or HPC-O will be required or allowed when extended lane closures are allowed. The Committee decided to give the contractor the option of using Class O or HPC-O with extended lane closures or using the standard partial depth mix with short lane closures.

Specification Section Recommended Text: See attached Draft DS for Partial Depth Bridge Deck Patching.

Comments:

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

See attached.

Reason for Revision: Update to the current DS to modify allowable patching materials

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

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

DRAFT DS-09XXX
(Replaces DS-09061)

Iowa Department of Transportation

DEVELOPMENTAL SPECIFICATIONS
FOR
PARTIAL DEPTH BRIDGE DECK PATCHING

Effective Date
July 17, 2012

THE STANDARD SPECIFICATIONS, SERIES 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

09XXX.01 DESCRIPTION.
Partial depth bridge deck patching consists of removing deteriorated bridge deck concrete in areas designated by the contract documents. This includes furnishing and placing patching material to provide a new traffic surface. This work is in areas where the size, shape, and depth of patch depends on the extent of deck deterioration and will be determined during the removal operation.

09XXX.02 MATERIALS AND EQUIPMENT.

A. Materials.

1. When extended lane closures are allowed by the contract documents, a Class O or HPC-O mix in accordance with Material I.M. 529 may be utilized. Curing times are shown in the following table. Do not use these mixes if average daily temperature drops below 40°F (5°C) for more than three consecutive days or stays below 50°F (10°C) for more than one half of any 24 hour period.

Table 09XXX.02-1: Curing Times

Ambient temperature	Curing period
Greater than 85°F (30°C)	24 hours
70 to 84°F (21 to 29°C)	36 hours
50 to 69°F (10 to 20°C)	48 hours

2. Use materials described below if extended lane closures are not allowed in the contract documents.

~~**1**~~ **a.** Use ~~M~~materials listed in Materials I.M. 491.20, Appendix ~~A~~ B~~, are approved for patching bridge decks~~.

~~**2**~~ **b.** Follow manufacturer's recommendations for patching material except as modified by this specification. Furnish two copies of manufacturer's product information, mixing procedures, placement procedures and curing procedures to the Engineer at least 14 calendar days prior

to Preconstruction Conference.

~~3~~ **c.** Calcium chloride shall not be added to patching mix.

~~4~~ **d.** Patching materials may be used with or without coarse aggregate in accordance with manufacturer's recommendations.

~~5~~ **e.** Aggregate for extending grout shall be pea gravel with a minimum durability of Class 2 meeting the following gradation:

Sieve Size	Percent Passing
0.5 inch (12.5 mm)	100
0.375 inch (9.5 mm)	85 - 100
No. 8 (2.36 mm)	0 – ~~8~~ 10

~~6~~ **f.** Manufacturer's recommendations shall be followed for adding aggregates to these mixes.

B. Equipment.

1. Remove existing deck surface material by wet or dry saws, jack hammers, or similar equipment. Hand equipment may be necessary to achieve a vertical edge and designated shape.

2. The following additional equipment will be required:
- Sandblasting equipment for cleaning the prepared patch area before placing the patch.
- Preparation of the patch area shall be completed using equipment no heavier than a 15 pound (7 kg) air chisel. With the approval of the Engineer, a ~~30~~ 35 pound (~~14~~ 16 kg) air chisel or jackhammer, may be used if its use does not result in significant damage to patch area and edges.
- Compressed air for cleaning the prepared area shall be oil and moisture free.
- An on-site mortar or paddle type concrete mixer shall be used for mixing patching material from Materials I.M. 491.20, Appendix B and also Class O and HPC-O mixes. When patch sizes, concrete volume, and deposition rate are appropriate, and the Contractor ensures adequate labor and equipment will be available, the Engineer may approve use of ready mixed Class O or HPC-O concrete.

09XXX.03 CONSTRUCTION.

Tabulations for partial depth bridge deck finish patches shown in the contract documents are for estimating purposes only. The Engineer will designate the location and limits of the patches. The shape and depth may be irregular, thus requiring the use of hand-operated equipment for some or all removal. Existing deck material shall be removed within the designated area to sound concrete as determined by the Engineer. Material removed and not designated for salvage shall become the property of the Contractor and removed in accordance with Article 1104.08 of the Standard Specifications.

Visually survey the bottom of the deck over open roadways or railroads prior to beginning removal operations. Care shall be taken to prevent material from falling onto traffic below. Lane closures below the bridge deck being patched may be required.

A. Preparation of Patch Area.

1. Area to be Patched.
The Engineer will determine areas to be patched by hand sounding. The patching area will normally include 2 to 3 inches (50 mm to 75 mm) of sound concrete around patch edges. Efforts will be made to mark the patching area to accommodate sawing patch edges by using a square, triangle, rectangle, or similar straight edged shape. The minimum depth of patch

shall be 1 inch (25 mm).

2. **Sawing.**
   - **a.** Determine the depth of existing reinforcing bars before sawing.
   - **b.** Saw at a depth of 0.75 to 1 inch (20 to 25 mm) around the designated area. Care shall be taken to avoid cutting into reinforcing bars.
   - **c.** Keep areas where concrete has been removed free of slurry produced from wet sawing.

3. **Removal.**
   - **a.** Remove unsound concrete to a minimum depth of 1 inch (25 mm) and no deeper than 1 inch (25 mm) below the top mat of reinforcing steel. Avoid jack hammering on reinforcing steel to prevent damage to reinforcing bars. Care shall to be taken to avoid breaking through the bridge deck. Keep patch edges as straight and square as possible when removal depth exceeds the initial sawcut.
   - **b.** Within 24 hours prior to placing patching material, thoroughly clean all reinforcing bars and newly exposed concrete by sand blasting or shot blasting. Where the bond between existing concrete and reinforcing steel has been broken, remove the concrete adjacent to the reinforcing bar to a depth that will permit new concrete to bond to the entire periphery of the exposed bar. A minimum of 0.75 inch (20 mm) clearance will be required around the bar. Exercise care to prevent cutting, stretching, or damaging reinforcing steel. Do not sand blast or shot blast epoxy coated reinforcing steel. Clean epoxy coated reinforcing steel with hand tools and compressed air to avoid damaging the epoxy coating. Repair damage to the epoxy coating by a method approved by the Engineer.
   - **c.** After sand blasting, remove all loose material with compressed air.

4. **Mixing of Patch Material.**
   - **a.** Mix material in accordance with manufacturer's recommendations and subject to approval of the Engineer. For Class O and HPC-O mixes, mix material in accordance with Materials I.M. 529. For Class O and HPC-O concrete mixed on-site, slump at time of placement shall be 3 inches (75 mm) with a variation not to exceed +/-1 inch (25 mm). For ready mixed Class O and HPC-O concrete, slump at time of placement shall be 3 inches (75 mm) with a variation not to exceed +/-1 inch (25 mm) and air content of fresh, unvibrated concrete at the time of placement, as determined by Materials I.M. 318, shall be 6.5%, with a maximum variation of plus 2.0% and minus 1.0%.
   - **b.** Organize work so all personnel and equipment are in place before mixing.
   - **c.** Mix according to patch material manufacturer's recommendations and subject to approval of the Engineer. Mix only the amount of material that can be placed in the time frame designated by manufacturer. For Class O and HPC-O mixes, mix material in accordance with Materials I.M. 529 and only the amount of material that can be placed in the working time frame for the mix.
   - **d.** Add ingredients to mixer in order of manufacturer's recommendations for materials listed in Materials I.M. 491.20 Appendix B.
   - **e.** Amount of mix water is important. Use a properly graduated measuring device to measure required amount of water. Never exceed maximum recommended water content.

5. **Patching Material Placement.**
   - **a.** Place patching mix according to the patching material manufacturer's recommendations and subject to the approval of the Engineer. Place Class O and HPC-O mix according to Article 2426.03, C.
   - **b.** When Class O or HPC-O concrete is used bonding grout is required. Bonding grout and placement shall be in accordance with Section 2426.
   - ~~**b**~~ **c.** Thoroughly trowel patching material into patch edges to ensure a good bond and seal. Ensure that all saw cuts extending beyond the patch area are filled with patching material to prevent water from getting around or under the patch.
   - ~~**c**~~ **d.** Protect and cure patches according to the manufacturer's recommendations. Cure Class

O and HPC-O mix in accordance with Article 2426.03, D.

~~d~~ **e.** Match profile of patches to the existing deck grade and cross slope. Texture the surface of patches to match the adjacent deck surface.

~~e~~ **f.** Prior to final acceptance, the patch shall be level with the adjacent pavement and have a smooth riding surface.

B. Limitations of Operations.

1. When patching material, as listed in Materials I.M. 491.20, Appendix B is used, ~~A~~a manufacturer's representative ~~of the manufacturer of~~ for the patch material being used shall be present at the Preconstruction Conference and at the job site on the first day of patch material placement. Contractor is responsible for notifying manufacturer's representative of these dates and ensuring the representative will attend.

2. Maintain traffic during construction unless the road is closed. Conduct operations with minimum inconvenience to traffic. Lane closures shall be in accordance with the Traffic Control Plan. On two-lane roadways, limit work to one traffic lane at a time except for minor encroachment in the adjacent lane for sawing and patch preparation when traffic is maintained. For multiple lane roadways, the work area may include one lane in each direction.

3. When approved by the Engineer, patch areas may extend up to 2 feet (0.6 m) into an adjacent lane as allowed by the Traffic Control Plan.

4. Place patch material within 24 hours of sawing operations.

5. ~~I~~f When patching material, as listed in Materials I.M. 491.20, Appendix B is being used and unforeseen conditions result in excavated areas being left open overnight, furnish a sufficient number of flaggers to warn motorists and direct traffic until patches are complete and the roadway is open to normal traffic. The cost of providing these flaggers shall be at no additional cost to the Contracting Authority.

6. Place concrete patching material only when the ambient air and pavement temperatures are in accordance with the manufacturer's recommendations. Place Class O and HPC-O mix only when ambient air temperatures are greater than 50°F (10°C) for more than one half day and concrete repair surface temperature is 40°F (5°C) or greater.

7. Open patched areas to traffic as soon as the manufacturer's recommended patch strength is achieved. For Class O and HPC-O mixes opening times are stated in the table under 09XXX.02 A.

C. Area Restoration.
Keep bridge deck surface and areas immediately adjacent to patch areas clean of slurry and excess patch materials.

09XXX.04 METHOD OF MEASUREMENT.

A. The Engineer will calculate the area of each Partial Depth Bridge Deck Finish Patch in square feet (square meters) from surface measurements.

B. The area of each patch less than 1 square foot (0.1 m^2) will be counted as 1 square foot (0.1 m^2) for payment purposes.

09XXX.05 BASIS OF PAYMENT.

A. Payment for Partial Depth Bridge Deck Finish Patch will be at the contract unit price per square foot (square meter).

B. Payment is full compensation for sawing, removal of bridge deck concrete, preparing patch area, furnishing and placing patch material, finishing, curing, and restoration of the area.

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Tom Reis / Eric Johnsen	**Office:** Specifications	**Item 19**
Submittal Date:	**Proposed Effective Date:** October 2012	
Section No.: 2435 **Title:** Sanitary and Storm Sewer Structures **Article No.:** 4149.04, J, 11 **Title:** Chimney Seal	**Other:**	

Specification Committee Action: Approved with changes.

Deferred:	**Not Approved:**	**Approved Date:** 5/10/2012	**Effective Date:** 10/16/2012

Specification Committee Approved Text:

2435.03, A, 11, Chimney Seal.

Retitle and **Replace** the Article:

11. ~~Chimney Seal~~ Infiltration Barrier.

For sanitary sewer manholes, install an ~~internal or external rubber chimney seal~~ infiltration barrier.

a. Internal or External Chimney Seal.

~~a.~~1) Do not use external chimney seal if seal will be permanently exposed to sunlight.

~~b.~~2) Extend seal 3 inches (75 mm) below the lowest adjustment ring.

~~c.~~3) Extend seal to 2 inches (50 mm) above the flange of the casting for a standard two piece casting, or 2 inches (50 mm) above the top of the base section of the casting for an adjustable three piece casting.

~~d.~~4) Use multiple seals, if necessary.

~~e.~~5) Install compression bands (external chimney seal) or expansion bands (internal chimney seal) to lock the rubber sleeve or extension into place and to provide a positive watertight seal. Once tightened, lock bands into place. Use only manufacturer recommended installation tools and sealants.

b. Molded Shield.

1) Clean surface of structure cone section.

2) Apply sealant to top surface of cone section. Use sufficient sealant to accommodate flaws in surface of cone section.

3) Cut molded shield to height by adding dimensions of adjustment rings and casting height. Be sure not to interfere with seating of lid into casting frame.

4) Seat molded shield against sealant on cone section.

5) Add adjustment rings and casting to meet final grade.

2435.03, D, 2, d.

Replace the Article:

Replace ~~chimney seal~~ infiltration barrier for sanitary sewer manhole using only new materials.

2435.03, D, 3, e.

Replace the Article:

Replace ~~chimney seal~~ infiltration barrier for sanitary sewer manhole using only new materials.

2435.05, A, 2.

Replace the Article:

Payment is full compensation for excavation, placing bedding and backfill material, compaction, base, structural concrete, reinforcing steel, precast units (if used), inverts, pipe connections, ~~chimney seals~~ infiltration barriers, castings, and adjustment rings.

2435.05, E, 2.

Replace the fourth bulleted item:

Installing new ~~chimney seal~~ infiltration barrier (sanitary sewer manholes only).

2435.05, F, 2.

Replace the fifth bulleted item:

Installing new ~~chimney seal~~ infiltration barrier (sanitary sewer manholes only).

2549.01, C.

Replace the second sentence of the Article:

Includes construction of structural liners, protective liners, and ~~chimney seals~~ infiltration barriers.

2549.03, B, 2, Rubber Chimney Seal.

Rename the Article:

~~Rubber Chimney Seal~~ Infiltration Barrier.

2549.04, D, Rubber Chimney Seal.

Rename and **Replace** the Article:

~~Rubber Chimney Seal~~ Infiltration Barrier.

Each ~~rubber chimney seal~~ infiltration barrier installed on an existing manhole will be counted.

2549.05, D, Rubber Chimney Seal.

Rename and **Replace** the Article:

~~Rubber Chimney Seal~~ Infiltration Barrier.

1. Payment will be made at the contract unit price for each ~~chimney seal~~ infiltration barrier.

2. Payment is full compensation for all necessary compression or expansion bands and extension sleeves as necessary to complete ~~chimney seal~~ infiltration barrier.

4149.04, J, 1, Chimney Seal.

Retitle and **Replace** the Article:

1. ~~Chimney Seal~~ Infiltration Barrier.

a. External ~~Rubber~~ Chimney Seal.

1) Rubber Sleeve and Extension.

a) Corrugated; minimum thickness of 3/16 inches (5mm), according to ASTM C 923/C 923M.

b) Minimum allowable vertical expansion of at least 2 inches (50 mm).

2) Compression Bands.

a) One-piece band assembly to compress sleeve or extension against manhole and casting surfaces.

b) 16 gage ASTM A 240/A 240M, Type 304 stainless steel, minimum 1 inch (25 mm) width, minimum adjustment range of 4 inches (100 mm) more than the manhole outside diameter.

c) For standard two-piece castings, shape top band to lock sleeve to manhole frame's base flange. For three-piece adjustable castings, shape top band to lock sleeve to upper piece of adjustable frame.

d) Stainless steel fasteners complying with ASTM F 593 and ASTM F 594, Type 304.

b. Internal ~~Rubber~~ Chimney Seal.

1) Rubber Sleeve and Extension.

a) Double pleated, minimum thickness 3/16 inch (5 mm) thick, according to ASTM C 923/C 923M.

b) Minimum allowable vertical expansion of at least 2 inches (50 mm).

c) Integrally formed expansion band recess top and bottom with multiple sealing fins.

2) Expansion Bands.

a) One-piece band assembly to compress sleeve or extension against manhole and casting surfaces.

b) 16 gage ASTM A 240/A 240M, Type 304 stainless steel, minimum 1 3/4 inch (45 mm) width, minimum adjustment range of 2 inches (50 mm) more than the manhole inside diameter.

c) Stainless steel locking mechanism of studs and nuts complying with ASTM F 593 and ASTM F 594, Type 304.

c. Molded Shield.

1) Barrier Shield.

a) Medium Density polyethylene, according to ASTM D 1248.

b) Certified for 40,000 pound (18,150 kg) proof-load according to AASHTO M 306.

c) Diameter to match cone section and internal dimension of casting.

2) Sealant.
Butyl material according to AASHTO M 198.

Comments: Additional changes were required to Section 2549, Pipe and Manhole Rehabilitation

Specification Section Recommended Text:

2435.03, A, 11, Chimney Seal.

Retitle and **Replace** the Article:

11. ~~Chimney Seal~~ Infiltration Barrier.
For sanitary sewer manholes, install an ~~internal or external rubber chimney seal~~ infiltration barrier.

a. Internal or External Chimney Seal.

~~a.~~1) Do not use external chimney seal if seal will be permanently exposed to sunlight.

~~b.~~2) Extend seal 3 inches (75 mm) below the lowest adjustment ring.

~~c.~~3) Extend seal to 2 inches (50 mm) above the flange of the casting for a standard two piece casting, or 2 inches (50 mm) above the top of the base section of the casting for an adjustable three piece casting.

~~d.~~4) Use multiple seals, if necessary.

~~e.~~5) Install compression bands (external chimney seal) or expansion bands (internal chimney seal) to lock the rubber sleeve or extension into place and to provide a positive watertight seal. Once tightened, lock bands into place. Use only manufacturer recommended installation tools and sealants.

b. Molded Shield.

1) Clean surface of structure cone section.

2) Apply sealant to top surface of cone section. Use sufficient sealant to accommodate flaws in surface of cone section.

3) Cut molded shield to height by adding the dimensions of the adjustment rings and casting height. Be sure not to interfere with seating of lid into casting frame.

4) Seat molded shield against sealant on cone section.

5) Add adjustment rings and casting to meet final grade.

2435.03, D, 2, d.

Replace the Article:

Replace ~~chimney seal~~ infiltration barrier for sanitary sewer manhole using only new materials.

2435.03, D, 3, e.

Replace the Article:

Replace ~~chimney seal~~ infiltration barrier for sanitary sewer manhole using only new materials.

2435.05, A, 2.

Replace the Article:

Payment is full compensation for excavation, placing bedding and backfill material, compaction, base, structural concrete, reinforcing steel, precast units (if used), inverts, pipe connections, ~~chimney seals~~ infiltration barriers, castings, and adjustment rings.

2435.05, E, 2.

Replace the fourth bulleted item:

Installing new ~~chimney seal~~ infiltration barrier (sanitary sewer manholes only).

2435.05, F, 2.

Replace the fifth bulleted item:

Installing new ~~chimney seal~~ infiltration barrier (sanitary sewer manholes only).

4149.04, J, 1, Chimney Seal.

Retitle and **Replace** the Article:

1. ~~Chimney Seal~~ Infiltration Barrier.

a. External ~~Rubber~~ Chimney Seal.

1) Rubber Sleeve and Extension.

a) Corrugated; minimum thickness of 3/16 inches (5mm), according to ASTM C 923/C 923M.

b) Minimum allowable vertical expansion of at least 2 inches (50 mm).

2) Compression Bands.

a) One-piece band assembly to compress sleeve or extension against manhole and casting surfaces.

b) 16 gage ASTM A 240/A 240M, Type 304 stainless steel, minimum 1 inch (25 mm) width, minimum adjustment range of 4 inches (100 mm) more than the manhole outside diameter.

c) For standard two-piece castings, shape top band to lock sleeve to manhole frame's base flange. For three-piece adjustable castings, shape top band to lock sleeve to upper piece of adjustable frame.

d) Stainless steel fasteners complying with ASTM F 593 and ASTM F 594, Type 304.

b. Internal ~~Rubber~~ Chimney Seal.

1) Rubber Sleeve and Extension.

a) Double pleated, minimum thickness 3/16 inch (5 mm) thick, according to ASTM C 923/C 923M.

b) Minimum allowable vertical expansion of at least 2 inches (50 mm).

c) Integrally formed expansion band recess top and bottom with multiple sealing fins.

2) Expansion Bands.

a) One-piece band assembly to compress sleeve or extension against manhole and casting surfaces.

b) 16 gage ASTM A 240/A 240M, Type 304 stainless steel, minimum 1 3/4 inch (45 mm) width, minimum adjustment range of 2 inches (50 mm) more than the manhole inside diameter.

c) Stainless steel locking mechanism of studs and nuts complying with ASTM F 593 and ASTM F 594, Type 304.

c. Molded Shield.

1) Barrier Shield.

a) Medium Density polyethylene, according to ASTM D 1248.

b) Certified for 40,000 pound (18,150 kg) proof-load according to AASHTO M 306.

c) Diameter to match cone section and internal dimension of casting.

2) Sealant.

Butyl material according to AASHTO M 198.

Comments: Revisions are to match SUDAS changes for their 2013 edition. The molded shield is commonly referred to as a “top hat”, which is already being used by contractors in Iowa.

Do we need to create a Materials I.M. for approved products?

Member’s Requested Change: (Do not use ‘Track Changes’, or ‘Mark-Up’. Use ~~Strikeout~~ and Highlight.)					
Reason for Revision:					
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:					