

8. Article 4153.06, A, Non-High strength Bolts and Nuts.

The Construction and Materials Bureau requests to remove an unnecessary requirement for non-high strength fasteners.

**9. Article 4169.07, B, Hydraulic Mulches (Erosion Control Materials).
Article 4169.12, A, Perimeter and Slope Sediment or Ditch Check Sediment Control Device.
(Erosion Control Materials).**

The Construction and Materials Bureau requests to add ASTM test reference for bonded fiber matrix products and provide a specification reference for wire staples.

**10. Article 4186.03, Retro Reflective Sheeting.
Article 4188.04, 42 Inch Channelizers.**

The Construction and Materials Bureau requests to update sheeting requirements for signs to align with ASTM.

11. Article 4189.01, B, 3, a, 1, HDPE Conduit (Traffic Signal Equipment).

The Specifications Section requests to update HDPE conduit for traffic signals.

12. DS-15XXX, Void Reducing Asphalt Membrane.

The Construction and Materials Bureau requests approval of Developmental Specifications for Void Reducing Asphalt Membrane.

13. DS-15XXX, Deep Soil Injection for Pavement Leveling.

The Specifications Section requests approval of Developmental Specifications for Deep Soil Injection for Pavement Leveling.

14. DS-15097, Multi-Component Liquid Pavement Markings.

The Maintenance Bureau and Specifications Section request approval of revisions to Developmental Specifications for Multi-Component Liquid Pavement Markings.

15. DS-15088, Construction or Maintenance Work on Railroad Right-of-Way (Dakota, Minnesota, & Eastern Railroad Corporation dba Canadian Pacific)

The Specifications Section request approval of revisions to Developmental Specifications for Construction or Maintenance Work on Railroad Right-of-Way (Dakota, Minnesota, & Eastern Railroad Corporation dba Canadian Pacific).

16. Section 4171, Detectable Warnings.

The Construction and Materials Bureau requests to update impact resistance testing for cast iron and steel detectable warnings.



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Nikita Rainey/Wes Musgrove		Office: Civil Rights Bureau	Item 1
Submittal Date: 04/26/2023		Proposed Effective Date: October 2023	
Article No.: 1102.19 TITLE: Equal Employment Opportunity And Affirmative Action Requirements.		Other:	
Specification Committee Action:			
Deferred:	Not Approved:	Approved Date:	Effective Date:
Specification Committee Approved Text:			
Comments:			
Specification Section Recommended Text:			
<p>1102.19, E, 5, a.</p> <p>Replace the Article:</p> <p>The Contractor shall place the following notices and posters on a bulletin board at the project site in areas readily accessible to employees and potential employees.</p> <ol style="list-style-type: none"> 1) Notice provided by the Iowa DOT listing the names, addresses, and phone numbers of the Contractor and all approved subcontractors. 2) EEOC P/E 1 Publication OFCCP 1420, stating "Equal Employment Opportunity is THE LAW". Know Your Rights: Workplace Discrimination is Illegal. 3) Mandatory Supplement to EEOC P/E 1 "EEO is the Law" Mandatory Poster Supplement. Conozca sus Derechos: La Discriminacion en el Lugar de Trabajo es ilegal (Know Your Rights Spanish version). 4) Form FHWA-1022, regarding any false statement, false representation, false report, or false claim made in connection with any Federal or Federal-aid highway or related project. 5) Form WH-1321, Employee Rights Under the Davis-Bacon Act, required only if Davis/Bacon predetermined wage rates apply to the project. 6) All wage rate decisions required by the contract. The wage rate decision shall be arranged on a bulletin board so that all wage rate and classification information is visible. 7) Form 70-8025 Job Safety and Health. 8) WH-1420 Your Rights Under the FMLA Act of 1993. 9) WH-1462 Notice: Employee Polygraph Protection Act. 10) Pay Transparency Nondiscrimination Provision. 11) USERRA Poster, "Your Rights Under USERRA". 12) WH-1321 SPA (Spanish version of Form WH-1321) stating "DERECHOS DEL EMPLEADO BAJO LA LEY DAVIS-BACON" recommended only if Davis/Bacon predetermined wage rates apply to the project.* 13) Form EEOC P/S 1 (Spanish version of form EEOC P/E 1), stating "La Igualdad de Oportunidades De Empleo Es LA LEY".* <p>* These forms are This form is not required, but it is strongly recommended that these two this Spanish notices be posted whenever the company employs and/or anticipates receiving applications from those who speak Spanish.</p>			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use <u>Strikeout</u> and <u>Highlight</u>.)			

Make the following changes and additions to Article 1102.19 Section E5(a)

5. Placement of EEO/AA Notices and Posters.

- a. The Contractor shall place the following notices and posters on a bulletin board at the project site in areas readily accessible to employees and potential employees.
 - 1) Notice provided by the Iowa DOT listing the names, addresses, and phone numbers of the Contractor and all approved subcontractors.
 - 2) EEOC P/E-1 Publication OFCCP 1420, stating "Equal Employment Opportunity is THE LAW". Know Your Rights: Workplace Discrimination is Illegal
 - 3) **Mandatory Supplement to EEOC P/E-1 "EEO is the Law" Mandatory Poster Supplement Conozca sus Derechos: La Discriminacion en el Lugar de Trabajo es Ilegal (Know Your Rights Spanish version)**
 - 4) Form FHWA-1022, regarding any false statement, false representation, false report, or false claim made in connection with any Federal or Federal-aid highway or related project.
 - 5) Form WH-1321, Employee Rights Under the Davis-Bacon Act, required only if Davis/Bacon predetermined wage rates apply to the project.
 - 6) All wage rate decisions required by the contract. The wage rate decision shall be arranged on a bulletin board so that all wage rate and classification information is visible.
 - 7) Form 70-8025 Job Safety and Health.
 - 8) WH-1420 Your Rights Under the FMLA Act of 1993.
 - 9) WH-1462 Notice: Employee Polygraph Protection Act.
 - 10) Pay Transparency Nondiscrimination Provision.
 - 11) USERRA Poster, "Your Rights Under USERRA".
 - 12) WH-1321 SPA (Spanish version of Form WH-1321) stating "DERECHOS DEL EMPLEADO BAJO LA LEY DAVIS-BACON" recommended only if Davis/Bacon predetermined wage rates apply to the project.*
 - 13) Form EEOC P/S-1 (Spanish version of form EEOC P/E-1), stating "La Igualdad de Oportunidades De Empleo Es LA LEY".*

* These forms are not required, but it is strongly recommended that these two Spanish notices be posted whenever the company employs and/or anticipates receiving applications from those who speak Spanish.

Reason for Revision: To replace EEO is the Law and EEO is the Law Supplement Posters with the newly required posters per federal regulations (Posters dated November 2022 by DOL)

New Bid Item Required (X one)	Yes	No X
Bid Item Modification Required (X one)	Yes	No X
Bid Item Obsolescence Required (X one)	Yes	No X

Comments:

County or City Comments:

Industry Comments:



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove / Ashley Buss		Office: Construction & Materials	Item 2
Submittal Date: 4/20/2023		Proposed Effective Date: October 2023	
Article No.: 2303.02,E,1 Title: Flexible Pavement (Materials – Other materials – Tack Coat.)		Other:	
Specification Committee Action:			
Deferred:	Not Approved:	Approved Date:	Effective Date:
Specification Committee Approved Text:			
Comments:			
Specification Section Recommended Text: 2303.02, E, 1, Tack Coat.			
Add to the end of the Article: The cement mixing test will be waived for tack coat emulsions.			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and <u>Highlight</u>.)			
E. Other Materials.			
1. Tack Coat. Tack coat may be SS-1, SS-1H, CSS-1, CSS-1H, CQS-1, or CQS-1H. Do not mix CQS, CSS, and SS grades. RC-70 and MC-70 may also be used prior to May 1 and after October 1, at the Contractor's option. The cement mixing test will be waived for tack coat emulsions.			
Reason for Revision: A supplier requested the cement mixing test requirement for asphalt emulsion be waived for tack coat emulsion requirements. Requesting a waiver for cement mixing test for tack coat emulsions is reasonable because the cement mixing test purpose is to ensure a slow set for coating aggregates in a mixing situation. Passing the cement mixing test necessitates a slower-set in the formulation to ensure coating of aggregates in emulsion-aggregate mixtures and the slower set is often not as desirable for tack coat applications. The cement mixing test is important for emulsion applications where mixing action occurs (slurry seal, microsurfacing, CIR, etc.) but not necessary for tack coat applications.			
New Bid Item Required (X one)	Yes	No	X
Bid Item Modification Required (X one)	Yes	No	X
Bid Item Obsolescence Required (X one)	Yes	No	X
Comments:			

County or City Comments:

Industry Comments:



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove, Ashley Buss		Office: Construction & Materials	Item 3
Submittal Date: 4/20/2023		Proposed Effective Date: October 2023	
Article No.: 2303.02, E, 2, a., 1) Title: Flexible Pavement (MATERIALS, Other Materials: Anti-strip Agent)		Other:	
Specification Committee Action:			
Deferred:	Not Approved:	Approved Date:	Effective Date:
Specification Committee Approved Text:			
Comments:			
Specification Section Recommended Text: 2303.02, E, 2, a, 1.			
Replace the Article: Mixtures for Interstate and Primary highways designed for Very High Traffic (VT), and or			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)			
<p>2. Anti-strip Agent.</p> <p>a. Perform a moisture sensitivity evaluation of the proposed asphalt mixture design in accordance with Materials I.M. 319 for the following mixtures when placed in travelled lanes:</p> <ol style="list-style-type: none"> 1) Mixtures for Interstate and Primary highways designed for Very High Traffic (VT), and or 2) Mixtures for Interstate and Primary highways containing quartzite, granite, or other siliceous (not a limestone or dolomite) aggregate 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. <p>For the purpose of evaluating moisture sensitivity of a proposed mix design, Contractor may test proposed JMF from plant produced material placed off-site at no additional cost to the Contracting Authority.</p>			
Reason for Revision: Change is needed to clarify that a moisture sensitivity evaluation is needed on all (1) VT mixes <u>OR</u> (2) all mixtures with quartzite, granite, or other siliceous aggregate (not a limestone or dolomite) aggregate 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.			
New Bid Item Required (X one)	Yes	No X	
Bid Item Modification Required (X one)	Yes	No X	
Bid Item Obsolescence Required (X one)	Yes	No X	
Comments:			

County or City Comments:

Industry Comments:



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove / Ashley Buss	Office: Construction & Materials	Item 4
Submittal Date: 4/20/2023	Proposed Effective Date: October 2023	
Article No.: 2303.03,D,6,b,1,e. Title: Flexible Pavement- Construction (Quality Assurance Program- Acceptance of Asphalt Mixtures – Field Voids- Class I) Article No.: 2303.05 Title: Basis of Payment (Flexible Paving Mixture – Laboratory Voids and Field Voids)	Other:	

Specification Committee Action:

Deferred:	Not Approved:	Approved Date:	Effective Date:
------------------	----------------------	-----------------------	------------------------

Specification Committee Approved Text:

Comments:

Specification Section Recommended Text:

2303.03, D, 6, b, 1, e, 2.

Replace the first sentence:

For all other areas of Class I compaction, determine PWL as defined in Materials I.M. 501. The PWL limits shall be between 91.5% of G_{mm} (8.5% voids) and ~~96.5%~~ 100% of G_{mm} (~~3.5%~~ 0% voids).

2303.05, A, 3, a, 1.

Replace the Article:

Payment when PWL is used for acceptance:

PWL	Pay Factor
100.0	1.060
95.1 – 100.0 90.1 - 99.9	0.006000*PWL + 0.430 0.4600
80.0 – 95.0 90.0	1.000
50.0 – 79.9 89.9	0.008333*PWL + 0.3333 0.00625*PWL + 0.4375
Less than 50.0	0.750 maximum

2303.05, A, 3, b, 1.

Replace the Article:

Payment when PWL is used for acceptance:

PWL	Pay Factor
100.0	1.060
95.1 – 100.0 90.1 - 99.9	0.008000*PWL + 0.240 0.00600*PWL + 0.4600
80.0 – 95.0 90.0	1.000
50.0 – 79.9 89.9	0.008333*PWL + 0.3333 0.00625*PWL + 0.4375
Less than 50.0	0.750 maximum

Comments:

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

(2) For all other areas of Class I compaction, determine PWL as defined in Materials I.M. 501. The PWL limits shall be between 91.5% of G_{mm} (8.5% voids) and ~~96.5%~~ 100% of G_{mm} (~~3.5%~~ 0% voids). Use maximum specific gravity (G_{mm}) results in field voids calculations as follows:

2303.05 BASIS OF PAYMENT.

The costs of designing, producing, placing, and testing bituminous mixtures and the cost of furnishing and equipping the QM-A field laboratory will not be paid for separately, but are included in the contract unit price for the HMA mixes used. The application of tack coat and sand cover aggregate are incidental and will not be paid for separately. Pollution testing is at the Contractor's expense. The installation of temporary Stop Sign Rumble Strips will not be paid for separately, but is incidental to the price bid for the HMA course for which it is applied.

The quality control requirements for small quantities are incidental to the items of HMA mixtures in the contract.

A. Flexible Paving Mixture.

1. Payment will be the contract unit price for Asphalt Mixture of the type specified per ton or square yard.
2. Payment for test strips will be the contract unit price for the test strip mixture bid item per ton regardless of lift placement.
3. Payment will be adjusted by the following Pay Factor for field voids, laboratory voids, and film thickness determined for the lot.

Multiply the unit price for the HMA bid item by the Pay Factor rounded to three decimal places.

a. Laboratory Voids.

- 1) Payment when PWL is used for acceptance:

PWL	Pay Factor
95.1 - 100.0	$PF = 0.006000 * PWL + 0.430$
80.0 - 95.0	1.000
50.0 - 79.9	$PF = 0.008333 * PWL + 0.3333$
Less than 50.0	0.750 maximum

PWL	Pay Factor
100.0	1.060
90.1-99.9	$0.00600 * PWL + 0.4600$
90	1.000
50.0-89.9	$0.00625 * PWL + 0.4375$
Less than 50.0	0.750 maximum

When PWL is less than 50.0, the Engineer may declare the lot or parts of the lot deficient or unacceptable.

- 2) Payment when PWL lots are incomplete:

AAD from Target Air Void	Pay Factor
0.0 to 1.0	1.000
1.1 to 1.5	0.900
1.6 to 2.0	0.750
Over 2.0	0.500 maximum

When the AAD is more than 2.0, the Engineer may declare the lot or parts of the lot deficient or unacceptable.

- 3) Use the following payment schedule when a test strip is constructed:

AAD from Target Air Void	Pay Factor
0.0 to 1.5	1.000
1.6 to 2.0	$PF = 2.5 - AAD$

Over 2.0

0.500 maximum

When the AAD is more than 2.0, the Engineer may declare the lot or parts of the lot deficient or unacceptable.

b. Field Voids.

1) Payment when PWL is used for acceptance:

PWL	Pay Factor
95.1 – 100.0	$PF = 0.008000 * PWL + 0.240$
80.0 – 95.0	1.000
50.0 – 79.9	$PF = 0.008333 * PWL + 0.3333$
Less than 50.0	0.750 maximum

PWL	Pay Factor
100.0	1.060
90.1-99.9	$0.00600 * PWL + 0.4600$
90	1.000
50.0-89.9	$0.00625 * PWL + 0.4375$
Less than 50.0	0.750 maximum

When PWL is less than 50.0, the Engineer may declare the lot or parts of the lot deficient or unacceptable.

Reason for Revision: A review of Iowa DOT’s PWL specification led by FHWA provided the following observation:

Specification limit range for field voids appears to be tighter than necessary. It may be un-necessarily discouraging he contractor’s ability to achieve higher density.

A review of past projects showed Iowa DOT flexible pavement lots are very rarely compacted to lower than 3.5% field voids. To encourage increased field compaction on PWL projects, the Iowa DOT will remove the 96.5% of Gmm maximum and allow up to 100% of Gmm. The Iowa DOT will monitor field performance and field density of flexible paving mixtures under the updated PWL specification.

FHWA recommended to remove the 1.000 (full payment) Pay Factor for less than 90 percent within limits and create a pay schedule that reflects continuous examples from AASHTO R9 Standard Practice for Acceptance Sampling Plans for Highway Construction. A 5 year analysis of PWL projects was used to develop the updated pay equations to balance the incentive and disincentive dollars.

These equations were discussed in a joint working group with members from Iowa DOT, FHWA, and APAI in January 2023, presented at the Greater Iowa Asphalt Conference in early March 2023, and at the Strategic Asphalt Committee Meeting March 16th, 2023.

New Bid Item Required (X one)	Yes	No X
Bid Item Modification Required (X one)	Yes	No X
Bid Item Obsolescence Required (X one)	Yes	No X

Comments:

County or City Comments:

Industry Comments:



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove		Office: Construction & Materials	Item 5
Submittal Date: March 2023		Proposed Effective Date: October 2023	
Article No.: 2416.03, D, 5, c Title: Rigid pipe culverts Article No.: 2503.03, D, 2, c Title: Storm Sewers		Other:	
Specification Committee Action:			
Deferred:	Not Approved:	Approved Date:	Effective Date:
Specification Committee Approved Text:			
Comments:			
Specification Section Recommended Text: 2416.03, D, 5, c Replace the Article: For pipe with an internal diameter of more than 24 inches, ensure maximum joint openings on the outside or inside of the bottom half of the pipe do not exceed 1/8 1/2 inch per foot of internal diameter, with a maximum allowable joint opening of 5/8 inch.			
2503.03, D, 2, c. Replace the Article: Place pipe such that maximum joint openings on the outside or inside of the pipe do not exceed 1/8 1/2 inch at the bottom and 5/8 inch at the top.			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.) 2416.03.D.5.c c. For pipe with an internal diameter of more than 24 inches, ensure maximum joint openings on the outside or inside of the bottom half of the pipe do not exceed 1/2 inch 1/8 inch per foot of internal diameter, with a maximum allowable joint opening of 5/8 inch.			
2503.03.D.2.c C. Place pipe such that maximum joint openings on the outside or inside of the pipe do not exceed 1/8 1/2 inch at the bottom and 5/8 inch at the top.			
Reason for Revision: To follow ASTM C443-21			
New Bid Item Required (X one)	Yes	No X	
Bid Item Modification Required (X one)	Yes	No X	
Bid Item Obsolescence Required (X one)	Yes	No X	

Comments:
County or City Comments: SUDAS approved the change
Industry Comments: Precast Association agreed with the change



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Willy Sorenson/Dan Sprengeler		Office: Traffic & Safety	Item 6
Submittal Date: 4/24/2023		Proposed Effective Date: October 2024	
Article No.: 2528.03, F, 2 Title: Remote Communications Article No.: 2528.03, G, 2 Title: Equipment (Temporary Traffic Signals) Article No.: 4188.11 Title: Connected Portable Traffic Signals		Other:	
Specification Committee Action:			
Deferred:	Not Approved:	Approved Date:	Effective Date:
Specification Committee Approved Text:			
Comments:			
Specification Section Recommended Text: 2528.03, F, 2, Remote Communications. Replace the Article: When using an Arrow Board for stationary work zones on Interstate or Primary roadways, remote communication capabilities meeting requirements of Article 4188.10, F 4188.11 are required.			
2528.03, G, 2, a, Trailer, Span Wire, or Flagger Station Mounted Systems. Replace the title: Trailer, Portable or Span Wire, or Flagger Station Mounted Systems.			
2528.03, G, 2, b, Trailer Mounted Systems. Replace the title and Article: Trailer Mounted Systems Portable Traffic Signals.			
<ol style="list-style-type: none"> 1) Provide a system consisting of two or more self-contained trailer or pedestal mounted units each containing two signal heads. Two signal heads shall be visible for each approach. <ol style="list-style-type: none"> a) Trailer systems shall have one signal head mounted on a mast arm capable of extending over the center of the travel lane and the other signal head mounted on the same trailer. b) Pedestal systems shall have a signal head mounted on each side of the roadway. Pedestal systems may only be used up to 3 continuous days. 2) When using portable traffic signals for stationary work zones on Primary roadways, remote communication capabilities meeting requirements of Article 4188.11 are required. 			

2528.02, G, 2, d, Flagger Station Systems.

Delete the Article:

d. ~~Flagger Station Systems.~~

~~Provide a traffic signal system, for one-lane/two-way operation in conjunction with a flagger and/or pilot car operation in order to provide greater advance visibility to the flagging operations.~~

- ~~• Two or more self-contained trailer mounted units each consisting of one or two signal heads.~~
- ~~• Single signal head systems shall have a signal head mounted on each side of the roadway~~
- ~~• Two signal head systems shall have one signal head mounted on a mast arm capable of extending over the center of the travel lane and the other signal head mounted on the same trailer.~~

4188.10, F, GPS and Remote Communications (When Required).

Renumber, Retitle, and Replace the Article:

F. ~~4188.11 GPS and Remote Communications (When Required).~~

~~1 A. Arrow board~~ When specified, device shall have the ability to receive and transmit its GPS coordinates (latitude and longitude) within a 30 foot diameter of its true location.

~~2 B. Electronic communications between arrow board device or arrow board's device's~~ central server and the Department shall follow communication protocol defined in [Materials I.M. 486.12](#) or Materials I.M. 488.01.

~~3 C. Arrow boards~~ Device shall transmit status and location as follows:

- a. Mode change within 2 minutes.
- b. Location (if moved more than 500 feet) within 2 minutes.
- c. Health check every 30 minutes.

4188.10, G, Portable Dynamic Message Signs as an Arrow Board.

Renumber the Article:

G F. Portable Dynamic Message Signs as an Arrow Board.

Comments:

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

2528.G.2. Equipment.

a. ~~Trailer Portable or~~; Span Wire, ~~or Flagger Station Mounted Systems.~~

2528.G.2.b. ~~Trailer Mounted Systems.~~ Portable Traffic Signals

1) Provide a system consisting of two or more self-contained trailer or pedestal mounted units. ~~containing two signal heads.~~ Two signal heads shall be visible for each approach.

a) Trailer systems shall have one signal head mounted on a mast arm capable of extending over the center of the travel lane and the other signal head mounted on the same trailer.

b) Pedestal systems shall have a signal head mounted on each side of the roadway. Pedestal systems may only be used up to three continuous days.

2) When using Portable Traffic Signals for stationary work zones on Primary roadways, remote communication capabilities meeting requirements of 4188.11 are required.

2528.G.2.d Flagger Station Systems.

Provide a traffic signal system, for one lane/two way operation in conjunction with a flagger and/or pilot car operation in order to provide greater advance visibility to the flagging operations.

- Two or more self-contained trailer mounted units each consisting of one or two signal heads.
- Single signal head systems shall have a signal head mounted on each side of the roadway
- Two signal head systems shall have one signal head mounted on a mast arm capable of extending over the center of the travel lane and the other signal head mounted on the same trailer.

A. GPS and Remote Communications (When required).

1. Connected Portable Traffic Signals shall have the ability to receive and transmit its GPS coordinates (latitude and longitude) within a 30 foot diameter of its true location.
2. Electronic communications between the Connected Portable Traffic Signal or the Connected Portable Traffic Signal's central server and the Department shall follow communication protocol defined in Materials I.M. 488.01
3. Connected Portable Traffic Signals shall transmit status and location as follows:
 - a. Mode change within 2 minutes.
 - b. Location (if moved more than 500 feet) within 2 minutes.
 - c. Health check every 30 minutes.

Reason for Revision: For better situational awareness of when work zones are active. Similar to how all Arrow Boards (operating on the Primary Highway System) are now required to transmit their mode and position, Trailer Mounted Traffic Signals will have similar requirements.

Yes, we don't want to implement this until Oct 2024. We want to approve 4188.11 for Oct '23 to vendors have 1 year to design and manufacture equipment that will then be put into use by contractors after Oct 2024.

New Bid Item Required (X one)	Yes	No X
Bid Item Modification Required (X one)	Yes	No X
Bid Item Obsolescence Required (X one)	Yes	No X
Comments: Industry has been in the notified.		
County or City Comments:		
Industry Comments:		



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove/Melissa Serio		Office: Construction & Materials	Item 7																								
Submittal Date: 4/21/23		Proposed Effective Date: October 2023 GS																									
Article No.: 2601.03, H, 2, a Title: Seeding (Special Ditch Control)		Other:																									
Specification Committee Action:																											
Deferred:	Not Approved:	Approved Date:	Effective Date:																								
Specification Committee Approved Text:																											
Comments:																											
Specification Section Recommended Text:																											
2601.03, H, 2, a, 2.																											
<p>Renumber Table 2601.03-7 and renumber and replace Table 2601.03-8: Table 2601.03-7 8: Ditches - Outside Shoulder Adjacent to Native Grass Seedings</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Oats</td><td>25 lbs/Acre</td></tr> <tr><td>Grain Rye</td><td>25 lbs/Acre</td></tr> <tr><td>Switchgrass (Panicum virgatum)</td><td>3 lbs PLS/Acre</td></tr> <tr><td>Side-oats grama (Bouteloua curtipendula)</td><td>4 lbs PLS/Acre</td></tr> <tr><td>Canada wildrye (Elymus canadensis)</td><td>9 lbs PLS/Acre</td></tr> <tr><td>Virginia wildrye (Elymus virginicus)</td><td>5 lbs PLS/Acre</td></tr> <tr><td>Partridge pea (Chamaecrista fasciculata)</td><td>4 lbs PLS/Acre</td></tr> <tr><td colspan="2">Note: Canada wildrye shall be debarbed or equal to facilitate the application.</td></tr> </table> <p style="text-align: center;">Table 2601.03-8 9: Medians and Ditches - Outside Shoulder Adjacent to Rural Seedings</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Fescue, Tall¹ (Fawn)</td><td>100 lbs. per acre</td></tr> <tr><td>Ryegrass, Perennial² (Linn)</td><td>75 lbs. per acre</td></tr> <tr><td>Bluegrass, Kentucky</td><td>20 lbs. per acre</td></tr> <tr><td colspan="2">1. All tall fescue shall be endophyte free. 2. Perennial ryegrass shall be cultivars Linn, Amazon, Norlea, or Nui, or a combination thereof.</td></tr> </table>				Oats	25 lbs/Acre	Grain Rye	25 lbs/Acre	Switchgrass (Panicum virgatum)	3 lbs PLS/Acre	Side-oats grama (Bouteloua curtipendula)	4 lbs PLS/Acre	Canada wildrye (Elymus canadensis)	9 lbs PLS/Acre	Virginia wildrye (Elymus virginicus)	5 lbs PLS/Acre	Partridge pea (Chamaecrista fasciculata)	4 lbs PLS/Acre	Note: Canada wildrye shall be debarbed or equal to facilitate the application.		Fescue, Tall ¹ (Fawn)	100 lbs. per acre	Ryegrass, Perennial ² (Linn)	75 lbs. per acre	Bluegrass, Kentucky	20 lbs. per acre	1. All tall fescue shall be endophyte free. 2. Perennial ryegrass shall be cultivars Linn, Amazon, Norlea, or Nui, or a combination thereof.	
Oats	25 lbs/Acre																										
Grain Rye	25 lbs/Acre																										
Switchgrass (Panicum virgatum)	3 lbs PLS/Acre																										
Side-oats grama (Bouteloua curtipendula)	4 lbs PLS/Acre																										
Canada wildrye (Elymus canadensis)	9 lbs PLS/Acre																										
Virginia wildrye (Elymus virginicus)	5 lbs PLS/Acre																										
Partridge pea (Chamaecrista fasciculata)	4 lbs PLS/Acre																										
Note: Canada wildrye shall be debarbed or equal to facilitate the application.																											
Fescue, Tall ¹ (Fawn)	100 lbs. per acre																										
Ryegrass, Perennial ² (Linn)	75 lbs. per acre																										
Bluegrass, Kentucky	20 lbs. per acre																										
1. All tall fescue shall be endophyte free. 2. Perennial ryegrass shall be cultivars Linn, Amazon, Norlea, or Nui, or a combination thereof.																											
Comments:																											
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)																											
2601.03, H, 2, a, 2)																											
<p>Replace Table 2601.03-9:</p> <p style="text-align: center;">Table 2601.03-9: Medians and Ditches - Outside Shoulder Adjacent to Rural Seedings</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Fescue, Tall¹ (Fawn)</td><td>100 lbs. per acre</td></tr> <tr><td>Ryegrass, Perennial² (Linn)</td><td>75 lbs. per acre</td></tr> <tr><td>Bluegrass, Kentucky</td><td>20 lbs. per acre</td></tr> <tr><td colspan="2">1. All tall fescue shall be endophyte free. 2. Perennial ryegrass shall be cultivars Linn, Amazon, Norlea, or Nui, or a</td></tr> </table>				Fescue, Tall ¹ (Fawn)	100 lbs. per acre	Ryegrass, Perennial ² (Linn)	75 lbs. per acre	Bluegrass, Kentucky	20 lbs. per acre	1. All tall fescue shall be endophyte free. 2. Perennial ryegrass shall be cultivars Linn, Amazon, Norlea, or Nui, or a																	
Fescue, Tall ¹ (Fawn)	100 lbs. per acre																										
Ryegrass, Perennial ² (Linn)	75 lbs. per acre																										
Bluegrass, Kentucky	20 lbs. per acre																										
1. All tall fescue shall be endophyte free. 2. Perennial ryegrass shall be cultivars Linn, Amazon, Norlea, or Nui, or a																											

combination thereof.

Reason for Revision: When changes to permanent rural seed mix were made to Table 2601.03-3 (effective with the October 2022 GS), we neglected to make the same changes to Table 2601.03-9 (Medians and Ditches – Outside Shoulder Adjacent to Rural Seedings). This revision will make both seed mixes the same again.

New Bid Item Required (X one)	Yes	No x
Bid Item Modification Required (X one)	Yes	No x
Bid Item Obsolescence Required (X one)	Yes	No x

Comments: None

County or City Comments:

Industry Comments:



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove/ Kyle Frame		Office: Construction and Materials	Item 8
Submittal Date: 4/24/2023		Proposed Effective Date: October 2023	
Article No.: 4153.06, A Title: Non-High strength Bolts and Nuts		Other:	
Specification Committee Action:			
Deferred:	Not Approved:	Approved Date:	Effective Date:
Specification Committee Approved Text:			
Comments:			
Specification Section Recommended Text: 4153.06, A, 3. Replace the first sentence: Where galvanized fasteners are specified, zinc is applied by hot dipped galvanizing to meet the requirements of ASTM F 2329 with a zinc bath temperature not exceeding 850°F.			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)			
A. Non-High Strength Bolts and Nuts. Ensure the following:			
<ol style="list-style-type: none"> 1. Bolts and nuts meet the requirements of ASTM A 307, Grade A or Grade B, with full diameter body. Hexagonal bolt heads and nuts. 2. Threads meet the requirements of ANSI B1.1, Unified Coarse Thread Series, Class 1A and Class 1B fit. 3. Where galvanized fasteners are specified, zinc is applied by hot dipped galvanizing to meet the requirements of ASTM F 2329 with a zinc bath temperature not exceeding 850°F. Fasteners may be mechanically galvanized to meet the requirements of ASTM B 695, Class 55 Type 1. 			
Reason for Revision: Removing galvanization bath temperature limit for Non-high strength fasteners since embrittlement is not a concern for lower strength material.			
New Bid Item Required (X one)	Yes	No X	
Bid Item Modification Required (X one)	Yes	No X	
Bid Item Obsolescence Required (X one)	Yes	No X	
Comments:			
County or City Comments:			

Industry Comments:



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove/Melissa Serio		Office: Construction & Materials	Item 9
Submittal Date: 4/21/23		Proposed Effective Date: October 2023 GS	
Article No.: 4169.07, B. Title: Hydraulic Mulches (Erosion Control Materials) Article No.: 4169.12, A. Title: Perimeter and Slope Sediment or Ditch Check Sediment Control Device. (Erosion Control Materials)		Other:	
Specification Committee Action:			
Deferred:	Not Approved:	Approved Date:	Effective Date:
Specification Committee Approved Text:			
Comments:			
Specification Section Recommended Text:			
4169.07, B, 2, c, 1. Replace the Article: Contain non-toxic tackifiers that upon drying become insoluble and non-dispersible to eliminate direct raindrop impact on soil according to ASTM D 7101 and EPA 2021.0-1 or ASTM D 8151.			
4169.07, B, 3, c, 1. Replace the Article: Contain non-toxic tackifiers that upon drying become insoluble and non-dispersible to eliminate direct raindrop impact on soil according to ASTM D 7101 and EPA 2021.0-1 or ASTM D 8151.			
4169.12, A, General. Add the Article: 6. Use wire staples meeting the requirements of special ditch control and slope protection staples in Article 4169.10, A.			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)			
4169.07, B, 2, c, 1) Replace the Article: 1) Contain non-toxic tackifiers that upon drying become insoluble and non-dispersible to eliminate direct raindrop impact on soil according to ASTM D 7101 and EPA 2021.0-1 or ASTM D 8151.			
4169.07, B, 3, c, 1)			

Replace the Article:

- 1) Contain non-toxic tackifiers that upon drying become insoluble and non-dispersible to eliminate direct raindrop impact on soil according to ASTM D 7101 and EPA 2021.0-1 or ASTM D 8151.

4169.12, A.

Add the Article:

6. Use wire staples meeting the requirements of special ditch control and slope protection staples in Article 4169.10, A.

Reason for Revision:

- Include new ASTM test method reference for Bonded Fiber Matrix and Mechanically Bonded Fiber Matrix hydraulic mulches.
- Wire staples were added to EC-204 Perimeter, Slope and Ditch Check Sediment Control Devices in 2021. This revision is providing a reference to the staple material requirements.

New Bid Item Required (X one)

Yes

No x

Bid Item Modification Required (X one)

Yes

No x

Bid Item Obsolescence Required (X one)

Yes

No x

Comments: None

County or City Comments:

Industry Comments:



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove, Brian Worrel		Office: Construction & Materials	Item 10
Submittal Date: April 2023		Proposed Effective Date: October 2023	
Article No.: 4186.03 Title: Retro Reflective Sheeting		Other:	
Article No.: 4188.04 Title: 42 Inch Channelizers			
Specification Committee Action:			
Deferred:	Not Approved:	Approved Date:	Effective Date:
Specification Committee Approved Text:			
Comments:			
Specification Section Recommended Text:			
4186.03, A, 3.			
Replace Table 4186.03-1:			
Table 4186.03-1: Retro Reflective Sheeting Classification			
Type IV	A high intensity retroreflective sheeting. This sheeting is typically an unmetallized microprismatic retroreflective element material.		
Type VI (Iowa)	A flexible, very high intensity retroreflective sheeting for use on roll-up signs. This sheeting is typically a vinyl microprismatic retroreflective material.		
Type VIII (Iowa)	A prismatic, very high intensity retroreflective sheeting. This sheeting is typically a unmetallized cube corner microprismatic retroreflective material.		
Type XI	A prismatic, very high intensity retro reflective sheeting having highest retro reflective characteristics at wide range of distances.		
4186.03, A, 4.			
Replace the Article:			
For Type VI (Iowa) and Type VIII (Iowa) sheeting, meet the requirements of Materials I.M. 486.03 .			
4186.03, B, 2, a, Interstate and Primary Highways.			
Replace the Article:			
Meet the following requirements:			
1) Type VIII (Iowa) or Type XI sheeting is used for all rigid signs with orange backgrounds. The legend is fabricated using black nonreflective sheeting that is applied directly or by silk screening with black opaque ink.			

- 2) Type VI (Iowa) sheeting is used for all flexible roll-up signs with orange backgrounds. The legend is fabricated by silk screening with black opaque ink.
- 3) Type VIII (Iowa) or Type XI sheeting is used for STOP/SLOW paddles. The black legend is fabricated using black nonreflective sheeting that is applied directly or by silk screening with black opaque ink on orange Type VIII (Iowa) sheeting. The white legend is fabricated using transparent red ink that is reverse silk screened on white Type VIII (Iowa) sheeting.
- 4) Type VIII (Iowa) non-fluorescent or Type XI sheeting is used for barricades, vertical panels, and all other work zone traffic control devices that use premanufactured barricade sheeting.
- 5) Type VIII (Iowa) fluorescent orange and Type IV white sheeting is used for drums, 42 inch channelizers, tubular markers, and all other work zone traffic control devices that use horizontal sheeting.
- 6) For reboundable traffic control devices, Type IV or Type VIII (Iowa) sheeting designed for this application is used.

4188.04, B, 1.

Replace the Article:

Minimum of two orange 6 inch bands of Type VIII Iowa reflective sheeting and two white 6 inch bands of Type IV reflective sheeting.

Comments:

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

4186.03 RETRO REFLECTIVE SHEETING.

A. General.

1. Meet the requirements of ASTM D 4956, including supplementary requirements, except when modified in the contract documents or this specification. Comply with [Materials I.M. 486.03](#) for inspection and acceptance of reflective sheeting.
2. Retro Reflective sheeting is to be uniform in color and reflectivity. In a single sign, or traffic control device, variations in color or reflectivity noticeable at a distance of 50 feet or more, under daytime or nighttime lighting conditions, is cause for rejection of the sign.
3. Retro Reflective sheeting is classified as shown in Table 4186.03-1.

Table 4186.03-1: Retro Reflective Sheeting Classification

Type IV	A high intensity retroreflective sheeting. This sheeting is typically an unmetallized microprismatic retroreflective element material.
Type VI (Iowa)	A flexible, very high intensity retroreflective sheeting for use on roll-up signs. This sheeting is typically a Vinyl microprismatic retroreflective material.
Type VIII (Iowa)	A prismatic, very high intensity retroreflective sheeting. This sheeting is typically a unmetallized cube corner microprismatic retroreflective material.
Type XI	A prismatic, very high intensity retro reflective sheeting having highest retro reflective characteristics at wide range of distances.

4. For Type VI (Iowa) and Type VIII (Iowa) sheeting, meet the requirements of [Materials I.M. 486.03](#).

B. Utilization of Reflective Sheeting.

1. **Permanent Signs and Devices.**
 - a. Meet the following requirements:

- 1) Type XI sheeting is used for all signs with white, green, red, blue, or brown background, unless otherwise specified.
 - 2) Type XI yellow sheeting is used for portions of a green sign requiring yellow sheeting.
 - 3) Type XI Fluorescent sheeting is used for signs with yellow or yellow-green background.
 - 4) The legend on white, yellow, and yellow-green signs is fabricated using black nonreflective sheeting that is applied directly, or by silk screening with black opaque ink.
 - 5) The legend on green signs is fabricated using white Type XI sheeting that is applied directly.
 - 6) The legend on red signs is fabricated using transparent red ink that is reverse silk screened on white Type XI sheeting, or fabricated using white Type XI sheeting that is applied directly on a red Type XI sheeting background, or transparent film, as approved by the retro reflective sheeting manufacturer.
 - 7) The legend on blue and brown signs is fabricated using transparent ink that is reverse silk screened on white Type XI sheeting, or white Type XI sheeting that is applied directly, or transparent film, as approved by the retro reflective sheeting manufacturer.
- b. Use Type XI sheeting for permanent road closure barricades.

2. Work Zone Signs and Devices.

a. Interstate and Primary Highways.

Meet the following requirements:

- 1) Type VIII (Iowa) or Type XI sheeting is used for all rigid signs with orange backgrounds. The legend is fabricated using black nonreflective sheeting that is applied directly or by silk screening with black opaque ink.
- 2) Type VI (Iowa) sheeting is used for all flexible roll-up signs with orange backgrounds. The legend is fabricated by silk screening with black opaque ink.
- 3) Type VIII (Iowa) or Type XI sheeting is used for STOP/SLOW paddles. ~~The black legend is fabricated using black nonreflective sheeting that is applied directly or by silk screening with black opaque ink on orange Type VIII (Iowa) sheeting. The white legend is fabricated using transparent red ink that is reverse silk screened on white Type VIII (Iowa) sheeting.~~
- 4) Type VIII (Iowa) or Type XI non-fluorescent sheeting is used for barricades, vertical panels, and all other work zone traffic control devices that use premanufactured barricade sheeting.
- 5) Type VIII (Iowa) fluorescent orange and Type IV white sheeting is used for drums, 42 inch channelizers, tubular markers, and all other work zone traffic control devices that use horizontal sheeting.
- 6) For reboundable traffic control devices, Type IV or Type VIII (Iowa) sheeting designed for this application is used.

4188.04 42 INCH CHANNELIZERS.

Furnish reboundable channelizing devices made for use in traffic control zones. Ensure channelizing devices meet the requirements of the MUTCD and the following requirements:

A. Properties.

1. Channelizer body is made from an impact resistant, flexible, and reboundable material that is highway orange meeting Federal Color Standards.
2. Material is specifically formulated with ultraviolet stabilizers to provide satisfactory weatherability characteristics and resist fading.

B. Visibility.

1. Minimum of two orange 6 inch bands of Type VIII (Iowa) reflective sheeting and two white 6 inch bands of Type IV reflective sheeting.
2. Retroreflective sheeting for the bands meeting the requirements of [Article 4186.03](#) and recommended by the manufacturer for use on drums.
3. The first (top) and third bands orange, and the second and fourth (bottom) bands white.
4. Nonreflective spaces between the bands no wider than 2 inches.

Reason for Revision: Current language is outdated. ASTM D4956 has been updated and TYPE VII

sheeting has been replaced with TYPE VIII. Additionally TYPE VII Iowa is not a classification as defined in ASTM D4956, removing this language to bring our reflective sheeting requirements in line with the Current ASTM D4956 version.

New Bid Item Required (X one)	Yes	No x
Bid Item Modification Required (X one)	Yes	No x
Bid Item Obsolescence Required (X one)	Yes	No x
Comments:		
County or City Comments:		
Industry Comments:		



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Eric Johnsen		Office: Specifications	Item 11
Submittal Date: 4/24/2023		Proposed Effective Date: October 2023	
Article No.: 4189.01, B, 3, a, 1 Title: HDPE Conduit (Traffic Signal Equipment)		Other:	
Specification Committee Action:			
Deferred:	Not Approved:	Approved Date:	Effective Date:
Specification Committee Approved Text:			
Comments:			
Specification Section Recommended Text: 4189.01, B, 3, a, 1.			
<p>Replace the Article: PVC Schedule 40 plastic conduit and fittings complying with NEMA TC-2 (pipe), NEMA TC-3 (fittings), and UL 651 for Schedule 40 heavy wall type 80.</p>			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)			
Reason for Revision: To match SUDAS revision.			
New Bid Item Required (X one)	Yes	No X	
Bid Item Modification Required (X one)	Yes	No X	
Bid Item Obsolescence Required (X one)	Yes	No X	
Comments:			
County or City Comments:			
Industry Comments:			



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove / Ashley Buss		Office:	Item 12
Submittal Date: 4/20/2023		Proposed Effective Date:	
Article No.: Title:		Other: DS-15XXX, Void Reducing Asphalt Membrane	
Specification Committee Action:			
Deferred:	Not Approved:	Approved Date:	Effective Date:
Specification Committee Approved Text:			
Comments:			
Specification Section Recommended Text: See attached Developmental Specifications for Void Reducing Asphalt Membrane.			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight .) New developmental specification. See attached.			
Reason for Revision: A new DS for Void Reducing Asphalt Membrane (VRAM) is needed for flexible pavements that would benefit from additional binding material at the longitudinal joint. Examples include: <ul style="list-style-type: none"> • Centerline rumble strips, • Flexible pavements with expensive pavement markings (e.g. epoxy markings) along the longitudinal joint, especially urban interstates. • Pavements where traffic conditions are such that maintenance along the longitudinal joint/centerline is particularly dangerous or problematic. Two new bid items required: VRAM full width and VRAM half width.			
New Bid Item Required (X one)	Yes X	No	
Bid Item Modification Required (X one)	Yes	No X	
Bid Item Obsolescence Required (X one)	Yes	No X	
Comments:			
County or City Comments:			
Industry Comments:			



**DEVELOPMENTAL SPECIFICATIONS
FOR
VOID REDUCING ASPHALT MEMBRANE**

Effective Date
August 15, 2023

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

15XXX.01 DESCRIPTION.

- A.** These specifications describe requirements for void reducing asphalt membrane (VRAM). Apply Section 2303 of the Standard Specifications unless otherwise directed in these specifications. Do not use this specification in combination with Supplemental Specifications for Evaluation of Longitudinal Joint Quality for Flexible Paving Mixtures, Developmental Specifications for High Performance Thin Lift Overlay, or Developmental Specifications for Evaluation of Longitudinal Joint Quality for Flexible Paving Mixtures with Incentive/Disincentive.
- B.** The VRAM is applied underneath the longitudinal construction joint(s) prior to paving the final lift of a flexible paving mixture.

15XXX.02 MATERIALS.

Provide VRAM material meeting the criteria in Table 1. VRAM material shall consist of elastomers added to the base asphalt by an approved asphalt supplier. Styrene-butadiene diblock or triblock copolymer are acceptable elastomers.

Table 15XXX.02-1: Void Reducing Asphalt Membrane Criteria

TEST	CRITERIA	TEST METHOD
Dynamic shear @ 88°C (unaged), G*/sin δ	1.00 kPa minimum	AASHTO T 315
Creep stiffness @ -18°C (unaged) Stiffness (S) m-value	300 MPa maximum 0.300 MPa minimum	AASHTO T 313
Ash, %	1.0% - 4.0%	AASHTO T 111
Elastic Recovery, 100 mm elongation, cut immediately, 25°C	70% minimum	ASTM D6084 Method A
Separation of Polymer, difference in ring and ball	3°C maximum	ASTM D7173

15XXX.03 CONSTRUCTION.

- A. Equipment.**

1. Distributor/Spray Applicator – Provide a distributor or spray applicator capable of applying material at the specified application rate and width. Apply the VRAM in a single pass. The distributor shall be equipped with a heating and recirculating system along with a functioning auger agitating system or vertical shaft mixer in the hauling tank to prevent localized overheating. The distributor shall be equipped with a guide or laser system to aid in proper placement and location of the VRAM.
2. Melter kettle – A melter kettle may be used if approved by the Engineer. Provide a melter kettle capable of applying VRAM material at the specified application rate and width. Apply the VRAM in a single pass. Material from the kettle may be dispensed through a pressure feed wand with an applicator shoe or with a spray bar. Use an oil jacketed double-boiler type with agitating and recirculating systems.

B. Material Handling.

Provide the Engineer with a copy of the manufacturer's recommendations for heating, re-heating, and applying the VRAM material at the pre-construction meeting.

C. Preparation of the Surface.

1. Prior to the application of the VRAM, ensure the area of the intended longitudinal asphalt pavement joint is thoroughly cleaned and free of debris. The area may be cleaned by sweeper/vacuum truck, power broom, air compressor or hand to the satisfaction of the Engineer. Ensure the existing surface is dry and free of moisture. Low speed roadways, less than 45 miles/hour, shall require the use of compressed air to clean the surface where the VRAM will be placed. Final cleaning will occur within 24 hours of the placement of VRAM and be performed to the Engineer's approval.
2. Milled surfaces may require the use of compressed air to remove dust and fine materials from the area where VRAM will be applied. When applying VRAM on a milled surface, apply the tack coat before VRAM placement.
3. If tack coat is applied prior to placement of the VRAM, the tack shall be fully cured. Tack coat may be placed over the VRAM at the Engineer's discretion. Do not use VRAM with or in proximity to cutback asphalts.
4. At the time of VRAM application, the pavement surface temperature and the ambient temperature shall be a minimum of 40°F and rising unless otherwise approved by the District Materials Engineer. Flexible paving mixture placement of the surface course lift is governed by Article 2303.03, C, 4 of the Standard Specifications. Do not use VRAM when Article 2303.03, F of the Standard Specifications applies, unless approved by the District Materials Engineer.

D. Application of VRAM.

1. Apply the VRAM in a single pass placed by any application method listed in Article 15XXX.03, A. Use a stringline or paint mark as a guide for the application to maintain a uniform edge alignment.
2. Apply the VRAM centered within 2 inches of the project's established centerline or established lane edge. If the VRAM material flows more than 2 inches from the initial placement width, stop VRAM application and take remedial action subject to the Engineer's approval. Figure 1 provides an example illustration of VRAM application at the center line.

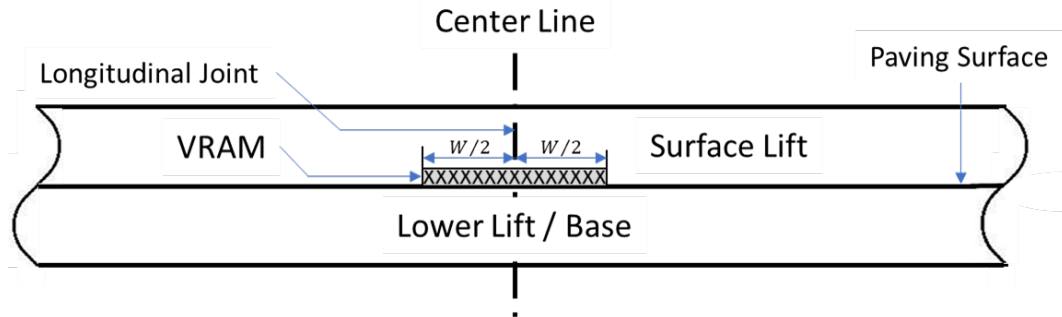


Figure 1: Example to illustrate VRAM application. Drawing not to scale. Cross sections will vary. Refer to plans.

- When a notched-wedge joint is placed over VRAM, ensure the VRAM material is under the joint area. Figure 2 provides an example illustration of notched wedge joint placement over VRAM. Before paving the adjacent lanes over the notched wedge joint, apply tack coat to fully cover the wedge and coat the vertical face of the notch.

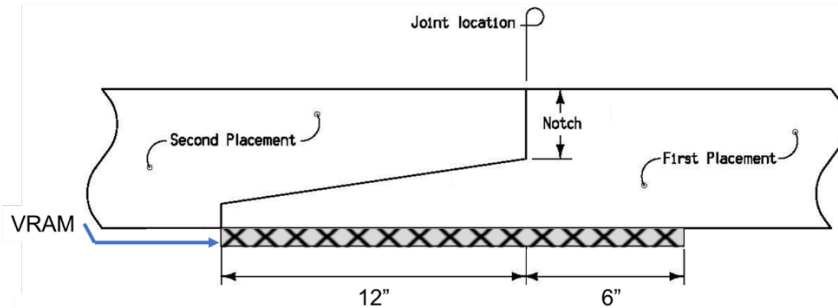


Figure 2: Example illustration of VRAM with a compacted notched-wedge joint. Drawing not to scale. Cross sections will vary. Refer to plans.

- When resuming placement of VRAM or re-applying VRAM to localized areas (e.g. where application rates were verified per Article 15XXX.03, E), place release paper (such as 30 pound roofing felt) over the previous application of VRAM to prevent double application of VRAM materials. Ensure release paper does not adhere to the previously placed VRAM material.
- The application rate of VRAM shall be determined from the JMF of the mixture to be paved over the VRAM material. From the JMF, determine the mixture size and categorize the mixture as "Coarse-Graded" or "Fine-Graded" based on Table 15XXX.03-1.

Table 15XXX.03-1: Definition of Fine and Coarse-Graded HMA Mixtures

Mixture Size per IM 510 Appendix A	Coarse-Graded	Fine-Graded
3/4 inch	< 35% Passing #8	≥ 35% Passing #8
1/2 inch	< 40% Passing #8	≥ 40% Passing #8
3/8 inch	< 45% Passing #8	≥ 45% Passing #8

- The VRAM, meeting the requirements specified herein, shall be applied to the existing surface at the width and target application rate as specified in Table 15XXX.03-2.

Table 15XXX.03-2: VRAM Width and Application Rate based on Intended Surface Thickness and Mixture Gradation

VRAM Application Table¹		
Intended Surface Thickness, in.	VRAM Width (W), in.	Application Rate, lb/ft.
Coarse-Graded HMA Mixtures		
1	18	1.15
1 1/4	18	1.31
1 1/2	18	1.47
1 3/4	18	1.63
≥ 2	18	1.80
Fine-Graded HMA Mixtures		
1	18	0.80
1 1/4	18	0.88
≥ 1 1/2	18	0.95
1. Each application rate has a surface demand for liquid included. Therefore, do not increase the VRAM application rate when a required overlay thickness is greater than the values shown here.		

7. When only one-half of the joint is exposed, such as a mill and inlay project, apply the VRAM one-half the prescribed width and rate, adjacent to the center of the joint, and coat the vertical face of the cold joint left in place.
8. VRAM application temperature shall not exceed 350°F. Determine the application rate of VRAM based on the nominal maximum aggregate size of the mixture. Apply the VRAM at the application rate and width listed in Table 15XXX.03-2. Ensure the applied width of VRAM is within ±1.5 inches of the width application required in Table 15XXX.03-2.
9. Exclude the area 1.0 foot on either side of the longitudinal joint from density measurement and density-related pay adjustment.
10. The VRAM shall be suitable for construction traffic to drive on without pick up or tracking of the VRAM within 30 minutes of placement. If pick up or tracking occurs, stop placement of VRAM and take remedial action subject to the Engineer's approval.
11. Prior to paving over VRAM, ensure the paver end plate and grade control devices are not in contact with the VRAM. If flushing or bleeding is noted in the asphalt surface, immediately stop placement of asphalt mixture and VRAM until the issue is corrected.
12. Asphalt mixture placed over VRAM must have a minimum laydown temperature of 250°F and a minimum plant mix production temperature of 260°F unless otherwise approved by the District Materials Engineer.

E. Quality Assurance/Quality Control of VRAM Material.

1. Acceptance of the VRAM is based on the certification by the manufacturer that the material meets the requirements listed in Table 15XXX.02-1. Field sampling will be used to verify that the delivered VRAM meets the requirements of the specification. Notify the engineer prior to sampling. The Contractor shall take a sample in the presence of the Engineer. Sample from the sample valve, spray bar, or applicator shoe during the first 20 minutes of placing VRAM on the project. After the first sample is taken, sample for every 25,000 gallons of material used on the project. Each sample shall consist of a one-quart aluminum or steel sample container. Refer to Materials I.M. 323 Method of Sampling Asphaltic Materials. Label the sample container with the project number, date, time, location, manufacturer, and bill of lading number of the VRAM material.
2. The Contractor will check the application rate of VRAM within the first 1000 linear feet of the day's application length and every 12,000 linear feet the remainder of the day. Check the rate twice for projects less than 12,000 linear feet in length. Check the rate by weight per foot. Place

a paper or pan (such as 30 pound roofing felt or oil drip tray/pan) of known weight and dimension at a random location in the path of the VRAM application. Pick up and weigh the paper or pan after application of the VRAM. Calculate the weight per foot. Replace the VRAM in the area where the application rate was checked. The tolerance for the target application rate per foot from Table 15XXX.03-2 is $\pm 10\%$. Notify the Engineer if the application rate falls outside of the tolerance.

15XXX.04 METHOD OF MEASUREMENT.

The Engineer will measure the VRAM by the linear foot, for both full width and half width applications.

15XXX.05 BASIS OF PAYMENT.

Payment per contract unit price for VRAM, in both full width and half width, shall be full compensation for equipment, materials, surface preparation, and labor required to complete the work.



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Eric Johnsen		Office: Specifications	Item 13
Submittal Date: 4/20/2023		Proposed Effective Date:	
Article No.: Title:		Other: DS-15XXX, Deep Soil Injection for Pavement Leveling	
Specification Committee Action:			
Deferred:	Not Approved:	Approved Date:	Effective Date:
Specification Committee Approved Text:			
Comments:			
Specification Section Recommended Text: See attached Developmental Specifications for Deep Soil Injection for Pavement Leveling.			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight .)			
Reason for Revision: Specification has been used as a special provision for several years and is ready to be transitioned to a developmental specification.			
New Bid Item Required (X one)	Yes X	No	
Bid Item Modification Required (X one)	Yes	No X	
Bid Item Obsolescence Required (X one)	Yes	No X	
Comments: New bid items required.			
County or City Comments:			
Industry Comments:			



**DEVELOPMENTAL SPECIFICATIONS
FOR
DEEP SOIL INJECTION FOR PAVEMENT LEVELING**

Effective Date
August 15, 2023

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

15XXX.01 DESCRIPTION.

This work consists of raising, filling voids, or densification of base soils under Portland cement concrete or bituminous pavements by furnishing and injecting high density polyurethane material into the base soils at locations shown on the plans.

15XXX.02 MATERIALS.

A. High Density Polyurethane.

1. Material for raising and undersealing pavements shall be a closed cell, high density polyurethane (HDP) system with the following physical characteristics:

Table DS-15XXX.02-1: HDP Characteristics

Technical Property	Requirement
Density, min., per ASTM D 1622	3.5 – 4.5 lbs/ft ³
Compressive strength, min., per ASTM D 1621	55 psi
Flexural Strength, min., per ASTM D 790	90 psi
Shear Strength, min., per ASTM C 273	45 psi
Tensile Strength, min., per ASTM D-1623	90 psi
Closed Cell Content, per ASTM D 6226	>85%
Curing Rate	90% of compressive strength within 30 minutes after injection

2. Material shall be hydro-insensitive in the material's component reaction such that the injected product is not significantly compromised by soil moisture or free water under the pavement. Hydro-insensitivity shall be verified by submittal of a certificate from an independent testing lab showing that the materials meets or exceeds the limits of the Test Procedure for Hydro-Insensitivity of High Density Polyurethane Grout – Panel Test (NYSDOT GTP-9) - Appendix A.

3. The material shall be a two-part 1:1 by volume high density polyurethane. The material shall be water blown, not chemical blown. The material shall be a polyurethane-foaming mixture, having a water insoluble diluent, which permits the formation of polyurethanes in excess water. The presence of a water insoluble diluent and the characteristics listed above must be certified by the manufacturer.
4. Acceptance of the polyurethane material will be based on certification and test results.
 - a. A certification from the polyurethane manufacture must be submitted prior to the preconstruction conference that the HDP meets the specification requirements. The certification must have independent test results that show the materials properties meeting the specification requirements. These tests must be from the same material components proposed to be used in the project.
 - b. Testing for compliance with ASTM 1621 and ASTM D1622 must be completed.
 - 1) Prior to beginning work and with the inspector observing, the Contractor must prepare five machine mixed field samples for density and compressive strength determination. The samples shall then be transported to an independent third-party testing laboratory at the contractor's expense. At the laboratory, a nominal 2 inch by 2 inch sample shall be taken from the center of each of the field samples and the density of the material shall be determined in accordance with ASTM D1622. The compressive strength shall then be determined by testing in accordance with ASTM D1621.
 - 2) The Contractor shall submit electronic copies of the stress strain curves (ASTM D1621 showing force, lbs. vs. deflection, %) as well as density calculations, including measured specimen dimensions (ASTM D1622) for each specimen tested.
 - 3) Field samples shall be prepared and sent for testing for each individual batch/lot number of resin component used on the project.
 - c. The compressive strength and density determined from ASTM D1621 and ASTM D1622 shall be used to determine the percent of pay for this item as outlined in Measurement and Payment.
5. Provide the Engineer certification from the manufacturer stating that the material provided is in accordance with this special provision. The MSDS for all pertinent production material shall be included with the certification.
6. All stored polyurethane material shall be sealed and protected from contamination by dust or any foreign material.

B. Nonshrink Grout.

Per Materials I.M. 491.13.

15XXX.03 CONSTRUCTION.

A. General.

1. The Contractor, as well as the project supervisor, shall have at least 3 years of experience in stabilization of pavement foundation soils by injecting high density polyurethane. Prior to the preconstruction conference, provide a list of at least five projects of similar size and scope completed by the Contractor in the last 3 years.
2. Submit written documentation to the Engineer at least 5 working days before preconstruction conference the following:
 - Details of proposed means of establishing and controlling line and grade of stabilized pavement.
 - Details of methods for control and disposal of waste materials.
 - Details of chemical spill control and cleanup.
 - Details of methods to prevent scorching or self-igniting when injecting into large voids.

- Details of the curing period and open to traffic times.
3. Submit an injection plan at least 10 working days before the start of any injection work. The plan shall include the details of the proposed hole spacing, propose injection depth(s), diameter, drilling methods and hole injection sequence for the stabilization process. Injection plans shall be prepared and certified by a Professional Engineer licensed in the State of Iowa.
 4. Do not perform deep soil injection for pavement leveling when the subgrade is frozen or if daytime temperatures are below 35°F unless material is kept above 40°F until it gets to the injection location.

B. Equipment.

1. Portable Dynamic Cone Penetrometer.

- a. Provide a portable dynamic cone penetrometer (DCP) for on-site soils investigation to assist in location and depth of weak foundation soils and determination of correct injection pattern and injection elevations through tubes to densify weak soils. The DCP is to be capable of taking readings up to 30 feet below grade. DCP testing may be required as directed by the Engineer to confirm existing sub-grade soil conditions. The name, model and description of the DCP unit intended for use must be submitted prior to the preconstruction meeting.
- b. The DCP testing equipment shall conform to the following properties
 - Diameter of Cone Tip = 35.6 mm (1.40 inches)
 - Angle of Cone Tip = 60 degrees
 - Area of Cone Tip = 10 square cm (1.55 square inches)
 - Diameter of Rods = 20 mm (0.7874 inches)
 - Length of Rods = 1 m (39.37 inches)
 - Weight of Rods = 2.4 kg (5.29 pounds)
 - Weight of Drop Hammer = 30 kg (66 pounds)
 - Free Fall Drop Height = 20 cm (7.874 inches)
 - Capable of Reaching = 30 Feet below grade
- c. A manufacturers data sheet or certification of the DCP equipment showing the properties shall be provided prior to the preconstruction conference.

2. Pumping Units.

As a minimum, a truck with two mounted pumping units capable of injecting the polyurethane material at a controlled rate into the aggregate base, subbase, or foundation soils to the required depth(s). Ensure the pumping units are equipped with certified flow meters to precisely measure the amount of each component injected, so that the ratio by volume is maintained for quality control and a certified volume of injected polymer material obtained for proper payment. Ensure that the units are equipped with pressure and temperature control devices capable of maintaining proper temperature and proportionate mixing of the two chemical components. Certification from the manufacturer (or independent third party) demonstrating that each flow meter intended for use has been tested within the past 12 months and must be submitted prior to the preconstruction meeting.

3. Drills.

Pneumatic or electric drills are required, capable of efficiently drilling injection holes through the pavement and granular base or subbase without damaging the structural integrity of the existing pavement. Drill host holes for the placement of injection tubing cut to proper length(s) as per the plans, or as indicated on the field QC plan and DCP testing, as approved by the Engineer. (Depth of granular material should be available from As-Built information included in the project plans.)

4. Equipment for Monitoring Movement.

Supply satisfactory equipment such as rotating laser levels and receivers to monitor movement of pavement to within 0.01 foot, to verify that the injected foundation soils have been properly densified and to ensure proper lift of pavement to grade if required. Supply satisfactory equipment to monitor differential movement of bridge approach at abutment walls and for correction of faulted jointed pavement. Supply satisfactory horizontal movement monitoring equipment when injecting in the vicinity of MSE walls.

C. Preparation.

1. Establish a target profile in the presence of the Engineer using an elevation measuring device or string line.
2. Locate reinforcing steel by ferro scan survey, ground penetrating radar or other non-destructive method approved by the Engineer. Do not damage existing reinforcing steel during preparation and installation. (Existing reinforcing steel placement on bridge approaches should be available from As-Built information included in the project plans.)
3. **Deep Soil Injection.**
 - a. Have a Professional Engineer licensed in the State of Iowa prepare and certify injection plans.
 - b. Perform a DCP test(s) to determine the strength of the existing soils.
 - c. A testing report of the DCP tests summarizing the stability of the soil layers shall be created. The reports shall be submitted as part of the injection plan. The plan shall contain:
 - 1) Test Location – Highway, Milepost and Station and location in pavement
 - 2) Test date
 - 3) DCP blow counts by depth
 - 4) Equipment operator
 - 5) Evaluation of blow count and a determination of stability needs
 - 6) Certification of the test report
 - d. Finalize injection plan using the DCP test results.
 - 1) Verify injection locations and pattern.
 - 2) Develop the injection depth(s).
 - 3) If the depth of injection(s) to stabilize soils exceeds 8 feet, the injection plan shall include multiple injection depths separated by approximately 4 foot increments working from the top (4 feet under the pavement slab) down to the depth of soils to be stabilized or to stabilize the lowest poor soils then work up. All injection holes at one depth (horizontal 4 foot grid) shall be filled before beginning the injections at the next depth. The initial and subsequent injection depth(s) may raise the pavement or approach slab, but the final injection depth shall be used to raise the pavement or approach slab to the target profile. Note: this may require multiple injection ports at each location in the horizontal 4 foot grid.
 - 4) Plan should prevent filling of granular base or subbase with high density polyurethane foam.
4. Unless otherwise approved by the engineer, saw cut longitudinal joints between panels to be stabilized and lifted as necessary to prevent damage while lifting. A plan of sawing should be submitted for approval to the engineer before any sawing operations start.
5. Joints shall be clear of debris before starting the slab lifting process.
6. Protect the integrity of roadway and approach slab drains.
7. **Drill Injection Holes.**
 - a. Drill round vertical holes with a diameter no greater than 1 inch.
 - b. Evenly space holes according to the finalized injection plan, but not greater than 4 feet by 4 feet on center, or as directed by the Engineer.

8. Insert injection tubes according to the authorized injection plan. Injection tubes must be countersunk a minimum of 4 inches into the pavement.

D. Injection.

1. Inject the amount of high density polyurethane foam required to stabilize soils and lift the pavement or approach.
 - a. Lift the pavement or approach slab to within ± 0.01 feet from the target profile.
 - b. Injection below a bridge approach slab.
 - 1) Continually monitor movement of the approach slab at the bridge deck end utilizing a differential fault meter.
 - 2) Cease injection and move injection to holes further way from the backwall if the approach slab begins to lift off the backwall.
 - c. Monitor retaining walls and wingwalls for movement. Cease injections to the hole if movement of the wall is detected.
 - d. Perform operations such that, if necessary, alternating adjacent areas are filled and lifted to minimize cracking or other damage to the pavement. Any damage to the pavement as a result of poor installation practices shall be repaired as directed by the Engineer.
2. Prevent material and debris from falling into streams, pedestrian areas, live traffic, or railroad tracks.
3. Clean injection holes and work area.
 - a. Remove high density polyurethane foam material from the injection holes down to the top of the recessed tubes.
 - b. Clean the pavement surface adjacent to the injection holes with a wire brush if necessary to remove excess polymer.
 - c. The pavement work area must be cleaned of all loose material.
4. Fill all injection holes with non-shrink grout. Return to the site after 24 hours to verify that the hole grouting is adequate and to perform additional grouting if necessary. Strike patches flush with the surface of the surrounding pavement.

- E.** All drill tailings, excess polyurethane material and other debris shall be cleaned up at the end of each working day or before the lane is opened to traffic. When adjacent lanes are open to traffic, provisions shall be made to prevent material from encroaching onto the open lane or squirting onto passing vehicles. Polyurethane material shall not enter into gutters or closed drainage systems. Suitable means to restrict the infiltration of the residue into a closed drainage system shall be provided by the Contractor. Polyurethane material shall be removed from the pavement surface before any residue is blown by traffic action or wind. All removed material shall be disposed of according to federal, state, and local regulations.

- F.** Repair or replace pavement and approach slabs damaged as a result of the work, including cracks that develop, to the satisfaction of the Engineer. Cost of repairs or replacement are incidental to the work.

G. Opening to Traffic.

Injected pavement may be opened to traffic after 30 minutes of final injection of polyurethane material as material is at a minimum 90% strength within 30 minutes. Pavement shall be free of debris and swept clean prior to opening to traffic.

H. Safety.

The Contractor shall have a comprehensive Safety Manual pertaining to the equipment, material, and process, demonstrating capability of safely conducting the work specific to stabilizing foundation soils with high density polyurethane.

I. Warranty.

Material shall have a warranty against shrinkage and deterioration for a period of 2 years. If settlement of more than 1/4 inch in the injected areas occurs, Contractor shall return to inject the affected area to lift to proper grade at no additional charge to the Contracting Authority.

15XXX.04 METHOD OF MEASUREMENT.

A. Deep Soil Injection.

The amount of high density polyurethane material necessary to accomplish the deep soil stabilization, void filling, and pavement lifting will be measured by certified flow meters, in pounds, and reported in writing to the Engineer daily.

B. DCP Testing.

The DCP testing will be paid for each location that testing is completed and an acceptable testing report is submitted.

15XXX.05 BASIS OF PAYMENT.

A. Deep Soil Injection.

1. The Contractor will be paid the contract unit price for the pounds of raw polyurethane material used and accepted by the Engineer. This payment shall be full compensation for furnishing all labor, equipment, and materials to level the pavement. Drilling and grouting of injection holes shall be incidental to this item.
2. Payment per pound shall be determined and/or adjusted per the following:
 - a. Failure to provide a passing Hydro-Insensitivity Panel Test (Article 15XXX.02, A, 2) prior to the work will result in the rejection of the material and no payment shall be made for any work completed.
 - b. **Payment Adjustment for Density.**

Table DS-15XXX.05-1: Payment Adjustment for Density

Density, lb./cu. ft.	< 3.5	3.5 to 4.5	>4.5
% Pay ¹	0%	100%	See formula below ²

¹ The adjustment in pay for density shall be applied to the pounds of material used as based on the unit price of the polyurethane material indicated by batch/lot number.
² Percent Pay = (4.5 / Density) * 100
Density = average density (lb./cu. ft.) per individual batch/lot number per ASTM D1622 (round to 1 decimal place)

c. Payment Adjustment for Unconfined Compressive Strength.

Table DS-15XXX.05-2: Payment Adjustment for Unconfined Compressive Strength

Unconfined Compressive Strength, psi	< 55	≥ 55
% Pay ¹	0%	100%

¹ The adjustment in pay for unconfined compressive strength shall be applied to the pounds of material used as based on the unit price of the polyurethane material indicated by batch/lot number.

B. DCP Testing.

The Contractor will be paid the contract unit price for each DCP test location. This payment shall be full compensation for furnishing all labor, equipment, testing, evaluation and reporting for each location.

TEST PROCEDURE FOR HYDRO- INSENSITIVITY OF HIGH DENSITY POLYURETHANE GROUT – PANEL TEST



GEOTECHNICAL TEST PROCEDURE

GTP-9

Revision #1

AUGUST 2015

GEOTECHNICAL TEST PROCEDURE:
HYDRO-INSENSITIVITY OF HIGH DENSITY POLYURETHANE GROUT –
PANEL TEST

GTP-9
Revision #1

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING BUREAU

AUGUST 2015

TABLE OF CONTENTS

1. SCOPE3

2. APPLICABLE DOCUMENTS.....3

3. TERMINOLOGY3

4. SUMMARY OF METHOD.....4

5. SIGNIFICANCE AND USE.....4

6. APPARATUS4

7. PROPORTIONING EQUIPMENT6

8. PROCEDURE.....6

9. DOCUMENTATION.....9

APPENDIX.....10

Hydro-Insensitivity of High Density Polyurethane Grout - Panel Test Data Sheet A-1

1. SCOPE

- 1.1 This procedure is used to demonstrate that the high density polyurethane material meets the 90% density and compressive strength requirements in dry and wet conditions.

2 APPLICABLE DOCUMENTS

- 2.1 ASTM D 1622 Standard Test Method for Apparent Density of Rigid Cellular Plastics.
2.2 ASTM D 1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
2.3 ASTM D 1623 Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.
2.4 NYSDOT Geotechnical Test Procedure (GTP-8) Test Procedure for Hydro-Insensitivity of High Density Polyurethane Grout – Barrel Test.

3 TERMINOLOGY

- 3.1 **Slabjacking** is used to correct settlement and stability problems associated with concrete slabs positioned over unstable ground materials. As defined in *Ground Improvement Technology Manual*, FHWA DP-3 (1996), slabjacking procedures include:

- ✓ Raising or leveling;
- ✓ Under-slab void filling (no raising);
- ✓ Grouting slab joints; and
- ✓ Asphalt subsealing.

Proprietary methods for slabjacking utilize chemical grouts to create a reaction to fill the void, seal the crack, or create uplift pressure to realign the slab.

- 3.2 **Hydrophilic** chemical grouts can produce either closed cell foam or a non-cellular gel when mixed with water. Hydrophilic chemical grout attracts water and is able to bond to wet surfaces. This product seeks out water as it reacts and allows the resin to work its way into water filled pores. Hydrophilic chemical grouts are flexible and resilient after full cure and will allow movement to occur in the structure without damaging the seal or bond.
- 3.3 **Hydrophobic** chemical grouts require a catalyst that is blended into the resin prior to installation. The dosage of catalyst added to the resin controls the reaction time and the volume of foam produced. Hydrophobic chemical grouts repel water after activation. Hydrophobic resins cure rigid and do not recover from compression. Hydrophobic chemical grout is low viscosity and permeates loose and non-consolidated soils readily.

4 SUMMARY OF METHOD

- 4.1 This laboratory test procedure is used to ensure that the High Density Polymer Material maintains 90% of the density of the dry polyurethane grout when injected directly into water.
- 4.2 Hydro-insensitivity is the inherent chemical property of a material to be unaffected by water (i.e. to behave in such a manner as if there was no water present). For hydro-insensitive polyurethanes (hydrophobic), the reacting components will polymerize even in the presence of water. This procedure tests and compares dry injection shots and wet injection shots.

5 SIGNIFICANCE AND USE

- 5.1 Polyurethane grouting is a grouting technique that employs a high density expanding polymer used as fill to densify and stabilize low-density compressible soils. The process may be used to fill voids beneath concrete slabs, or behind walls, or may be used to cutoff water flow through concrete joints. The grout, injected through predrilled injection ports, or “packers”, expands under reaction to fill the crack or void. Polyurethane grouts can be single or multi-component grouts and can react when coming in contact with water or require a reactant.

6 APPARATUS

- 6.1 Provide a wood box constructed of 2” x 4” framing and ¾” thick plywood on the top and bottom as indicated in the detail. The box dimensions will be 48” in length and 48” in width by 3” in depth. Ensure that the bottom seams of the box are sealed with latex caulk so that the box is capable of holding water. Provide an injection tube with ½” diameter steel or copper tubing on the top in the center of the box for injecting HDP material. The plywood on the top of the box will be fixed with 1½” long wood screws. The inside of the box will also contain four 2” x 4” blocks (3½” by 9” by 1½” in dimension) spaced equidistant at 9½” from the injection tube and parallel to the sides of the box.
- 6.2 Provide a stop watch to keep time.
- 6.3 Provide axle grease to coat the inside of the box so that the HDP material can be easily removed.

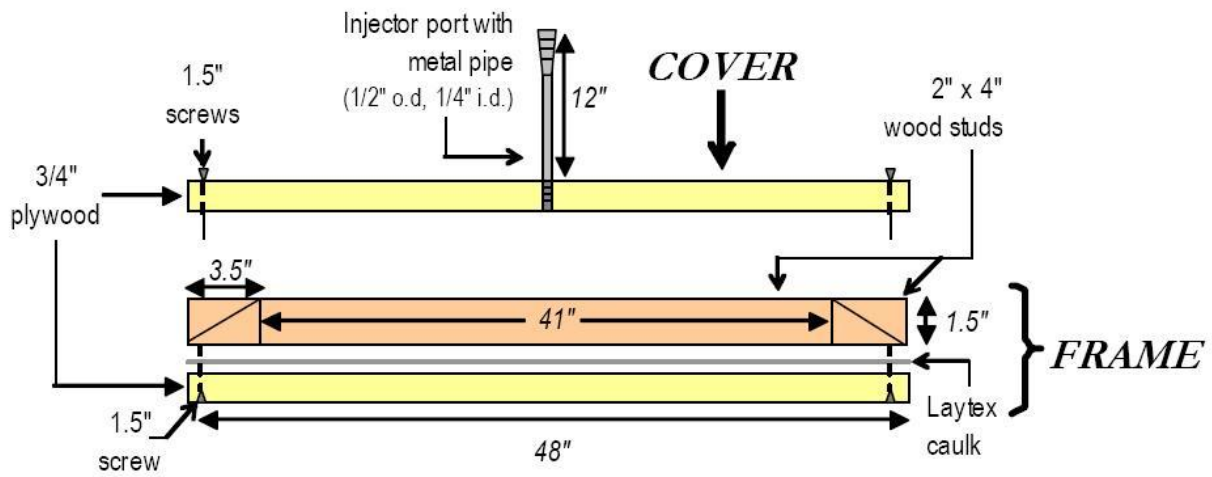


Figure 1 Apparatus - Side View

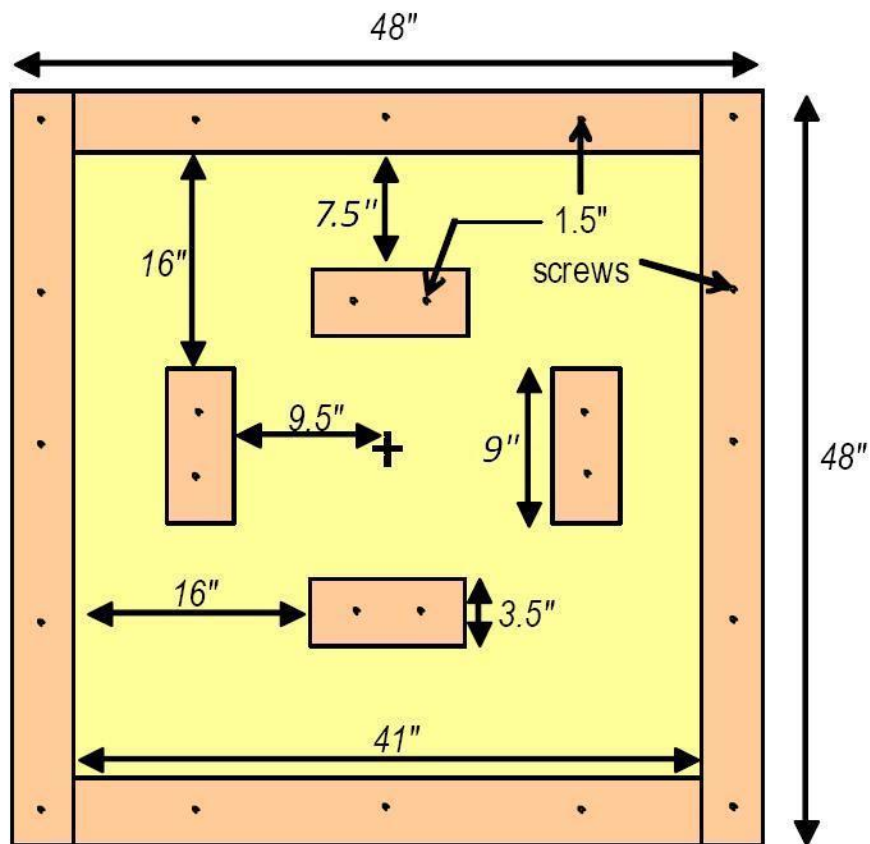


Figure 2 Apparatus – Top View (Frame)

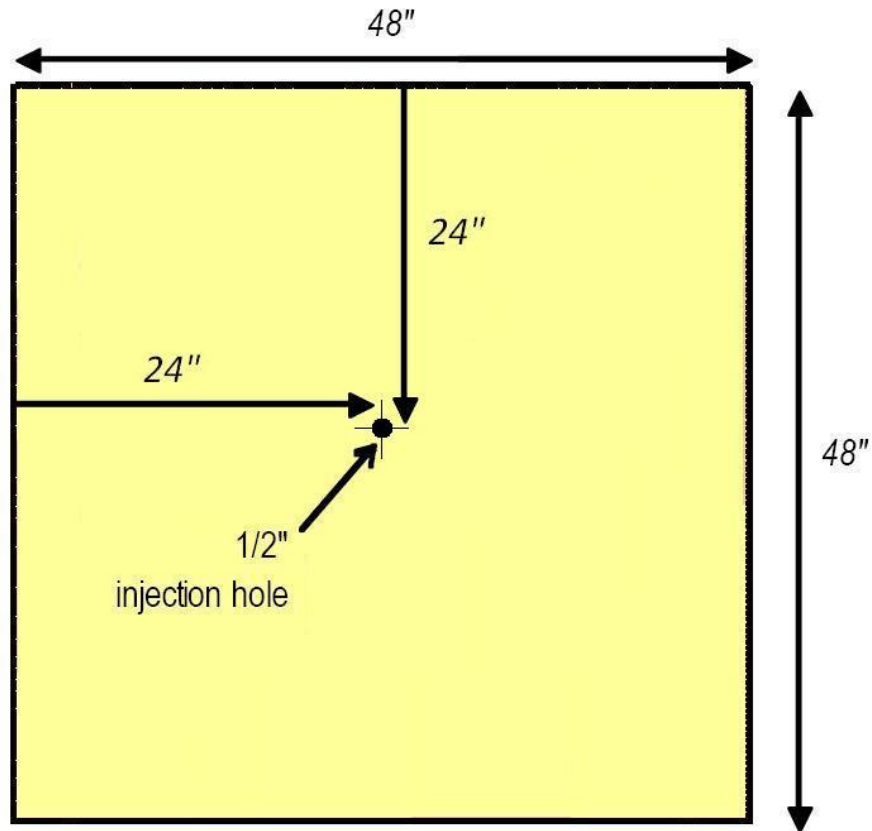


Figure 3 Apparatus – Top View (Cover)

7 PROPORTIONING EQUIPMENT

- 7.1 Record the type and setting of the metering and proportioning equipment for the HDP material.
- 7.2 Record the temperature of components A and B, air temperature and water temperature.
- 7.3 Record the pressure settings for components A and B.

8 PROCEDURE

- 8.1 Place the box on a flat and level surface.
- 8.2 Coat the inside surface with a light coating of axle grease so that the HDP material can be easily removed.
- 8.3 Fix the top cover of the box with 1½” wood screws to provide the necessary confinement for the HDP material.

- 8.4 Perform a calibration injection of the HDP material and record the time required to inject 5 lbs. of material. Record the time. Weigh the sample to check against the certified flow meter weights to ensure correct calibration.
- 8.5 Inject the HDP material into the box using 5 lbs. of material. After 10 minutes of completing the injection, remove the top cover off the box. After 30 minutes, sample the HDP material for density (ASTM D1622) and compressive strength (ASTM D1621) testing. Density and compressive strength samples shall be taken from the center portion of the box in the interior of the 2" x 4" blocks.
- 8.6 Repeat steps 8.2 and 8.3. Add 15 lbs. of water to the box and repeat step 8.5.



Figure 4 Frame Assembly



Figure 5 Sampling Area



Figure 6 Injector



Figure 7 Cover

9 DOCUMENTATION

Report the following:

- 9.1 Type and settings of the metering and proportioning equipment.
- 9.2 Temperatures and pressures of components A, B, air and water during test.
- 9.3 Density and compressive strength results of the HDP in the dry and wet conditions.
- 9.4 Percent of density: **PASS** or **FAIL**.

APPENDIX

Hydro-Insensitivity of High Density Polyurethane Grout - Panel Test Data Sheet

Polymer Type & Manufacturer _____

Lot # & Date on Component Containers _____

PROPORTIONING EQUIPMENT

Proportioner _____ Hose Length (ft.) _____

Gun _____ Gun Set-up _____

A/B/H Temperature (°F) _____ A/B Pressure (psi) _____

CALIBRATION TEST

_____ Time at Beginning of Injection (HH:MM:SS)

_____ Time at End of Injection (HH:MM:SS)

_____ Sample Weight (lbs.) vs. _____ Certified Flow Meter Weight (lbs.)

INJECTION PROCEDURE – DRY

- _____ (✓) 5 lbs. of Material Injected into Box
- _____ (✓) After 10 minutes, Remove Top Cover
- _____ (✓) After 30 minutes, Sample the HDP Material

INJECTION PROCEDURE - WET

- _____ (✓) Add 15 lbs. of Water into Box
- _____ (✓) 5 lbs. of Material Injected into Box
- _____ (✓) After 10 minutes, Remove Top Cover
- _____ (✓) After 30 minutes, Sample the HDP Material

MATERIAL ANALYSIS

Dry Injection Shots

	Density (pcf)	Compressive Strength (psi)
Sample 1	_____	_____
Sample 2	_____	_____

Wet Injection Shots

	Density (pcf)	Compressive Strength (psi)
_____	_____	_____
_____	_____	_____

% Retention
of Density

Sample 1 _____
Sample 2 _____

Technician _____
Date _____



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Ben Hucker/Eric Johnsen		Office: Maintenance/Specifications	Item 14
Submittal Date: 4/21/2023		Proposed Effective Date:	
Article No.: Title:		Other: DS-15097, Multi-Component Liquid Pavement Markings	
Specification Committee Action:			
Deferred:	Not Approved:	Approved Date:	Effective Date:
Specification Committee Approved Text:			
Comments:			
Specification Section Recommended Text: See attached Draft Developmental Specifications for Multi-Component Liquid Pavement Markings.			
Comments: May need to make this effective for the June letting and change by addendum to address the issues with the current DS. Contracts will see if there are any projects in the June letting using the DS.			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.) See attached.			
Reason for Revision: Address an issue with a contractor requesting to use a polyurea product that does not allow repainting without grinding. The polyurea product is on a different Materials I.M. approved list.			
New Bid Item Required (X one)	Yes	No X	
Bid Item Modification Required (X one)	Yes	No X	
Bid Item Obsolescence Required (X one)	Yes	No X	
Comments:			
County or City Comments:			
Industry Comments:			



**DEVELOPMENTAL SPECIFICATIONS
FOR
MULTI-COMPONENT LIQUID PAVEMENT MARKINGS**

Effective Date
July 18, 2023

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

15XXX.01 DESCRIPTION.

Provide reflectorized white and yellow multi-component, 100% solids multi-component liquid pavement markings that are free of toxic heavy metals for installation on asphalt and PCC pavement surfaces.

15XXX.02 MATERIALS.

A. General.

1. Apply multi-component liquid pavement markings in accordance with [Article 2527.01](#) of the Standard Specifications.
2. Use materials capable of producing pavement markings with a wet-film thickness (WFT) of at least 20 mils. Apply at a greater WFT as recommended by the material manufacturer based on pavement type, pavement composition, environmental conditions, placement within a rumble, and other relevant factors. ~~The following is a list of approved products. Approved products are listed in Materials I.M. 483.04, Appendix B. The Contractor may use propose an approved equal equivalent product pursuant to meeting all other areas requirements of this specification, but the Engineer reserves the right to approve or deny the proposal. Multi-component Polyurea products will not be considered for usage.~~
 - ~~• HPS 4 manufactured by Ennis-Flint, Inc.~~
 - ~~• 3180 Series MFUA-10 manufactured by SWARCO~~
 - ~~• LS65qs manufactured by Epoplex~~
3. Provide materials in accordance with the retroreflectivity requirements below.

Table 15XXX.02-1: Minimum Initial Retroreflectivity Requirements

Minimum Coefficient of Retroreflected Luminance	
White lines, Symbols, and Legends	400 mcd/sq. m/lux
Yellow lines	250 mcd/sq. m/lux

4. Provide yellow markings distinguishable from white markings in the dark.

5. Mix individual components before use if stored for more than 12 months.

B. Multi-Component Liquid Material.

1. Provide multi-component liquid material meeting the following requirements and characteristics:
 - a. Composed only of multi-component liquids and pigments,
 - b. Does not emit or leach solvents into the environment upon application to a pavement surface,
 - c. The infrared spectrum for all components shall match the reference sample provided by the manufacturer for the product tested and approved by the Department,
 - d. Free of lead, cadmium, mercury, hexavalent chromium, and other toxic heavy metals as defined by the EPA,
 - e. White material no darker than or no yellower than 17778 of Federal Standard Number 595C Colors,
 - f. Daytime color of the yellow epoxy meeting the following CIE chromaticity limits using illuminant "D65/2":

Table 15XXX.02-2: Daytime Chromaticity Coordinates

Daytime Chromaticity Coordinates (Corner Points) - Yellow				
	1	2	3	4
x	0.470	0.485	0.520	0.480
y	0.440	0.460	0.450	0.420

- g. White daylight directional reflectance (Y) of least 83%,
- h. Yellow daylight directional reflectance (Y) of at least 50%,
- i. Nighttime color of yellow meeting the following chromaticity limits in ASTM D 6628:

Table 15XXX.02-3: Nighttime Chromaticity Coordinates

Nighttime Chromaticity Coordinates (Corner Points) - Yellow				
	1	2	3	4
x	0.575	0.508	0.473	0.510
y	0.425	0.415	0.453	0.490

- j. Contrast ratio of 0.98 or greater when measured on a black/white drawdown card at 15 mils WFT application rate.
2. Provide shadow lane line markings (legend BLB6 or BLC6) according to attached modified Standard Road Plans. Black epoxy should satisfy color chip 37038 of Federal Standard 595B and have similar quality as the white and yellow multi-component pavement markings. An anti-skid material shall be incorporated with the shadow line marking at a minimum rate of 15 pounds per gallon.
3. **Adhesion Capabilities.**
Provide material meeting the adhesion requirements of the ACI Committee 403 when tested on PCC. Apply multi-component liquid pavement markings during the test to concrete pavements with a tensile strength of at least 300 psi and ensure the failure of the system occurs in the concrete during testing.
4. **Abrasion Resistance.**
Provide material with an abrasion resistance wear index no greater than 82 when tested in accordance with ASTM C 501 with a CS 17 wheel under a load of 1000 g for 1000 cycles. The Department defines the wear index as the weight in milligrams of material abraded from

the sample under the test conditions.

5. Hardness.

Provide material with a Type D durometer hardness from 75 to 90 when tested in accordance with ASTM D 2240 after curing for 72 hours at 73°F ±4°F.

6. Tensile Strength.

For epoxy-amine based multicomponent systems, including variations of this base chemistry, provide material with a tensile strength of at least 6000 psi when tested in accordance with ASTM D 638 after curing for 72 hours at 73°F ±4°F. For polyurea based multicomponent systems provide material with a tensile strength of at least 3000 psi when tested in accordance with ASTM D 638 after curing for 72 hours at 73°F ±4°F.

7. Compressive Strength.

For epoxy-amine based multicomponent systems, including variations of this base chemistry, provide material with a compressive strength of at least 12,000 psi when tested in accordance with ASTM D 695 after curing for 72 hours at 73°F ±4°F.

C. Retroreflective Media.

1. Provide first drop wet media per the minimum rate shown for each product below. Use one of the following products for all grooved: edge lines, white broken lines, ramp edge lines, and lane drop lines:

- 3M Connected Roads All Weather Elements Series 70E or 50E: Minimum rate 5 pounds per gallon
- Potters VisiUltra 455: Minimum rate 8 pounds per gallon
- SWARCO DURALUX 334/ 334 Plus: Minimum rate 8 pounds per gallon

2. Provide second drop glass spheres with the following gradation on all lines except for black broken lane lines:

Table 15089.02-4: Utah Blend Gradation

Sieve Size	% Passing
No. 18	65-80
No. 30	30-50
No. 50	0-5

- a. Glass spheres shall be dual coated.
- b. Apply glass spheres at a minimum rate of 15 pounds per gallon. Application rate shall provide required minimum levels of retroreflectivity in accordance with Table 15XXX.02-1.

3. Provide beads packaged in moisture-proof, multi-wall shipping bags, and in containers marked with the following information:

- a. Manufacturer name,
- b. Manufacturer address,
- c. Type of treatment,
- d. Batch number, and
- e. Date of manufacture.

D. Sampling and Testing.

- 1. Test daylight directional reflectance and color meeting the requirements of ASTM E 1349.
- 2. Provide 1 pint samples of each manufacturer's lot or batch of material when manufactured to

an independent lab for this testing. NTPEP data may be substituted if the product has not changed from initial submittal to NTPEP for evaluation of these products.

3. Submit to the Engineer a manufacturer's Certificate of Compliance for all components of the multi-component liquid pavement marking system.
4. Mark containers with the following information:
 - a. Name of manufacturer,
 - b. Product identification number,
 - c. Lot or batch number,
 - d. Date of manufacture,
 - e. Color, and
 - f. Net weight of contents.

15XXX.03 CONSTRUCTION.

A. General.

1. The contract documents will specify quantity, locations, and type of pavement markings required.
2. Allowable painting dates will be from April 8th to October 22nd. Minimum pavement surface temperatures for application of pavement markings shall be 40°F and rising.
3. For all pavement markings, ensure pavement surface is dry and free from dirt, dust, oil, curing compound, and other contaminants which may interfere with markings properly bonding to the surface. Ensure the clean surface is at least 1 inch wider than anticipated marking. Shoot an air blast on the pavement surface immediately prior to placing new marking. Air blast is not intended to remove large amounts of dust, but only a very small amount of residue that might be left from removal and cleaning operation.
4. For pavement markings placed on a new asphalt surface, install any necessary temporary pavement markings, and wait a minimum of 2 weeks from the day the surface is completed before installing permanent markings.
5. Ensure the following for all painted pavement markings:
 - Uniform thickness
 - Uniform distribution of glass beads throughout the line width,
 - Line widths as specified, with a tolerance of $\pm 1/2$ inch for all lines,
 - Markings have sharp edges and cutoffs at the ends.

B. Grooving.

1. Perform grooving after surface corrections for pavement smoothness, shouldering, and fog sealing have been completed.
2. Grooved in lines shall be at a depth of 80 mils on PCC pavements and 100 mils on HMA pavements with a tolerance of ± 10 mils in depth and the width of the line plus 1 inch with a tolerance of $\pm 1/8$ inch.
3. Equipment shall be capable of recessing the total width of the recess in one pass. Ensure the bottom of the groove has a fine corduroy-like texture. The maximum allowable rise between the high and low points across the width of the groove is 10 mils.
4. Do not place temporary pavement markings within grooves.

C. Traffic Control.

Apply the provisions of [Section 2528 of the Standard Specifications](#) to traffic control for removing and placing painted and taped pavement markings, along with the following additional requirements:

1. Place traffic control devices on the roadway before removal operations have commenced. Leave traffic control devices in place through the completed curing time of the newly applied pavement markings.
2. Do not close any longer length of lane than can be adequately removed and replace in a single working day.
3. For painted pavement markings, do not remove traffic control devices until the newly applied pavement markings are tack free.

D. Final Inspection

Provide an acceptable, calibrated 30 meter geometry (100 feet), retroreflectometer to use on the project which will remain the property of the Contractor. In the presence of the Engineer, measure the retro-reflectivity of the pavement markings. Take a minimum of five randomly spaced readings per line type every 1 mile. The average minimum retro-reflectivity per mile shall be as per table 1 from Article 15XXX.02, A, 3.

E. Defective Pavement Markings.

1. Markings that are low on initial retroreflectivity up to 20% may, at the discretion of the Engineer, be accepted with a price adjustment.
2. Repair, at no additional cost to the Contracting Authority, all pavement markings which, after application and curing, the Engineer determines to be defective and not in conformance with these specifications. Remove the defective markings completely and clean to the underlying pavement surface according to the requirements of [Article 2527.03, C of the Standard Specifications](#). Remove the defective area plus all adjacent marking material extending 1 foot in any direction. After surface preparation work is complete, finish the repair by reapplying new marking material over the cleaned pavement surface according to the requirements of these specifications.

15XXX.04 METHOD OF MEASUREMENT.

A. Measurement for pavement markings and grooves cut, satisfactorily placed, or approved, will be as follows:

1. Painted Pavement Markings, Multi-Component Liquid.
Stations placed.

2. Grooves Cut for Pavement Markings.
Stations. This quantity will be equivalent to the number of stations measured for the pavement markings. Additional width and transition length will be incidental.

B. The Engineer will measure the number of stations, based on a single 6 inch width of line. The length of markings will be determined using beginning and ending points, and adjusting for breaks at ramps, station equations, or other locations shown in the contract documents. The measurement for dashed and dotted lines will be adjusted to exclude skips. Measurement of lines wider than 6 inches will be adjusted by the quantity factor to a 6 inch line.

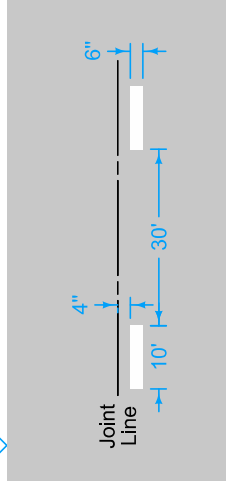
15XXX.05 BASIS OF PAYMENT.

Painted Pavement Markings, Multi-Component Liquid and Grooves Cut for Pavement Markings will be

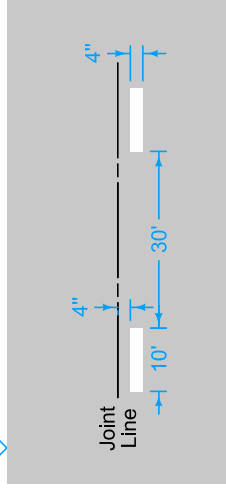
paid for per [Article 2527.05](#) of the Standard Specifications.

DESIGNER INFO

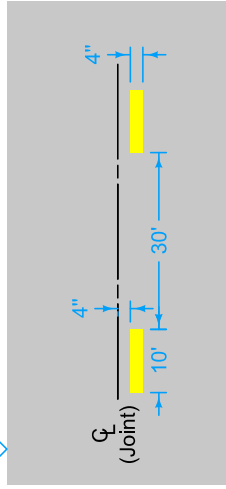
BLW6 > BROKEN LANE LINE (White)



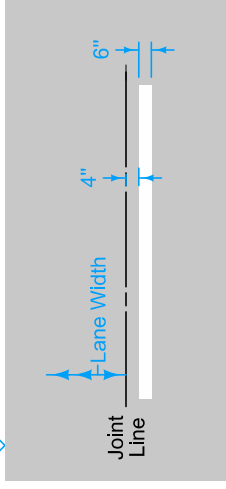
BLW4 > BROKEN LANE LINE (White)



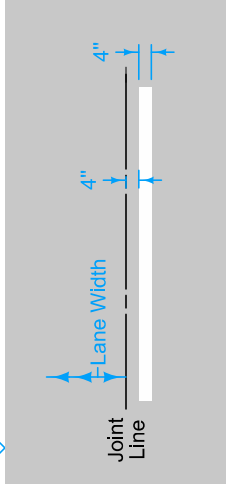
BCY4 > BROKEN CENTERLINE (Yellow)



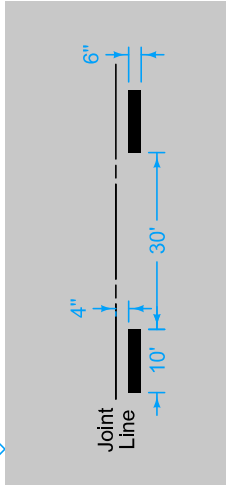
SLW6 > SOLID LANE LINE (White)



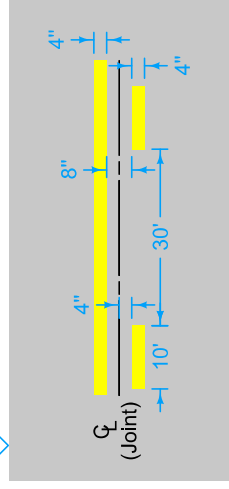
SLW4 > SOLID LANE LINE (White)



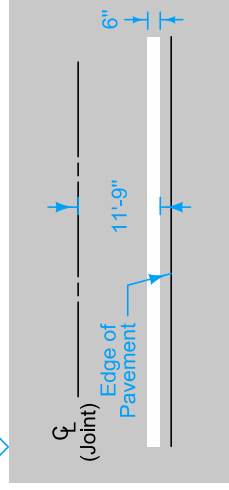
BLB6 > BROKEN LANE LINE (Black)



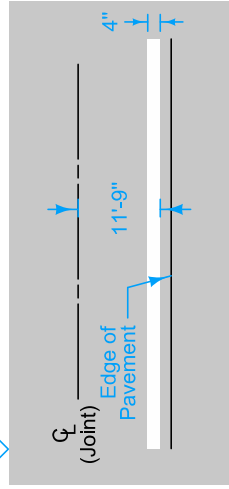
NPY4 > NO PASSING ZONE LINE (Yellow)



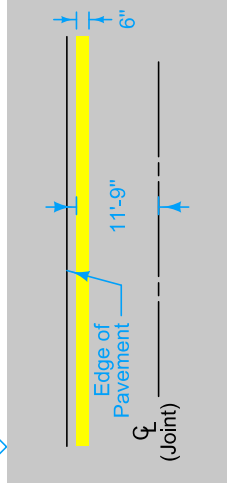
ELW6 > EDGE LINE RIGHT (White)



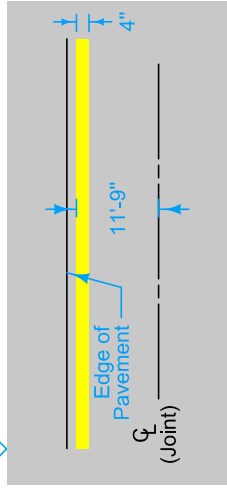
ELW4 > EDGE LINE RIGHT (White)



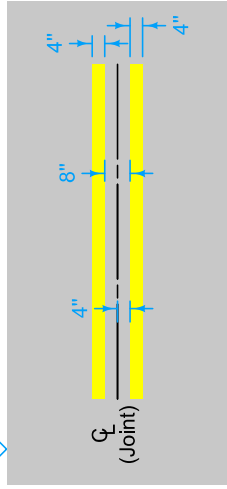
ELY6 > EDGE LINE LEFT (Yellow)



ELY4 > EDGE LINE LEFT (Yellow)



DCY4 > DOUBLE CENTERLINE (Yellow)

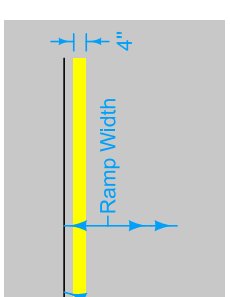
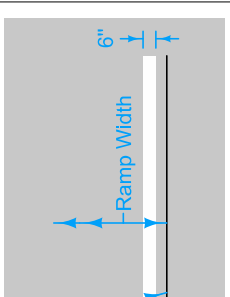
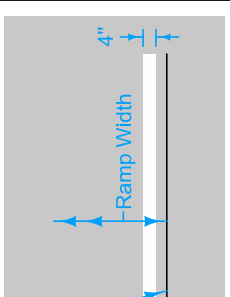
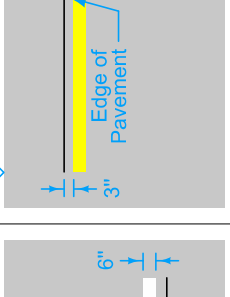
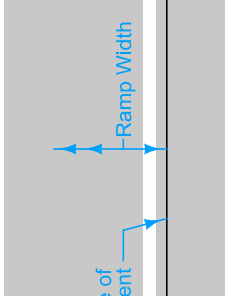
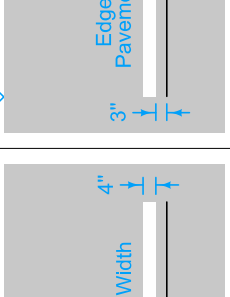
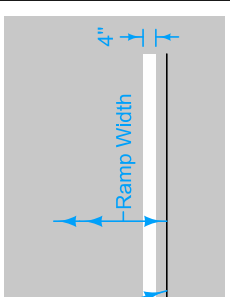
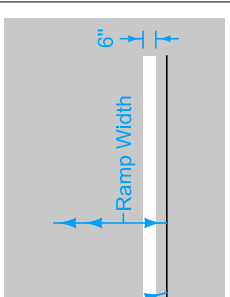
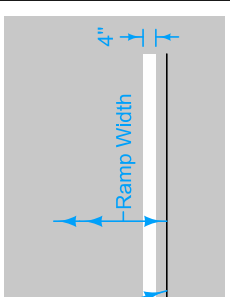
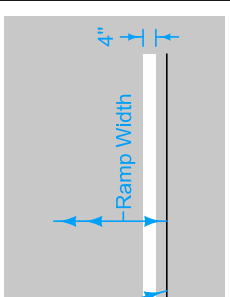
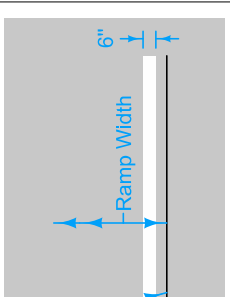


Lane layouts shown are typical. Centerlines and lane lines may be painted either side of centerline.

Drawings on sheets 1 to 3 are oriented to represent direction of traffic moving from left to right.

Possible Contract Item: Pavement Marking Line Items
Possible Tabulation: 108-22

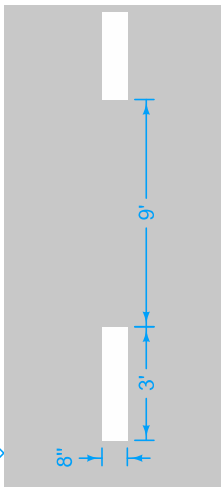
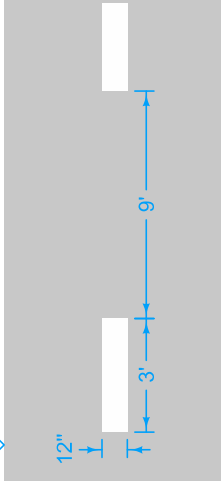
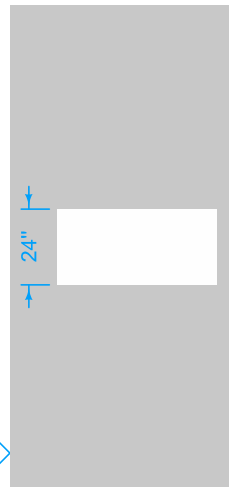
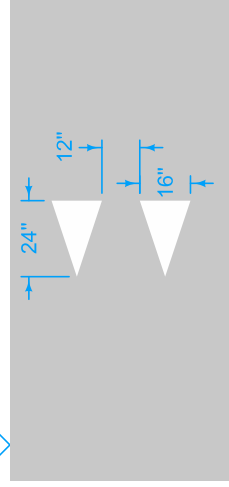
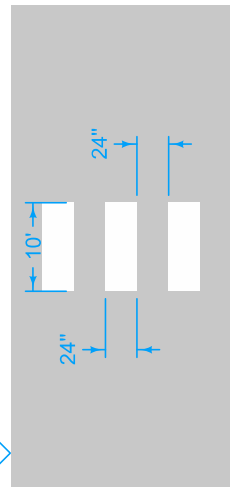
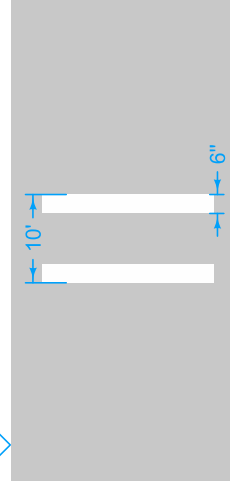
MODIFIED	REVISION
	2 10-18-18
STANDARD ROAD PLAN	PM-110
SHEET 1 of 4	
MODIFICATIONS: Added BLW6, BLW8, SLW6, ELW6, RLY6, RLW6, DLW6, CHW12, and LDW12.	
LINE TYPES	

<p>RLW4 RAMP EDGE LINE RIGHT (White)</p> 	<p>RLW6 RAMP EDGE LINE RIGHT (White)</p> 	<p>RLY4 RAMP EDGE LINE LEFT (Yellow)</p> 
<p>RLY6 RAMP EDGE LINE LEFT (Yellow)</p> 	<p>DLY4 DOTTED LINE (Yellow)</p> 	<p>DDY4 DOUBLE DOTTED LINE (Yellow)</p> 
<p>DLW4 DOTTED LINE (White)</p> 	<p>DLW6 DOTTED LINE (White)</p> 	<p>CHY8 CHANNELIZING LINE (Yellow)</p> 
<p>CHW8 CHANNELIZING LINE (White)</p> 	<p>CHW12 CHANNELIZING LINE (White)</p> 	<p>LINE TYPES</p>

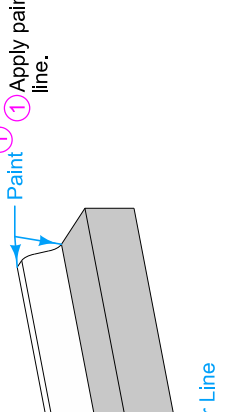
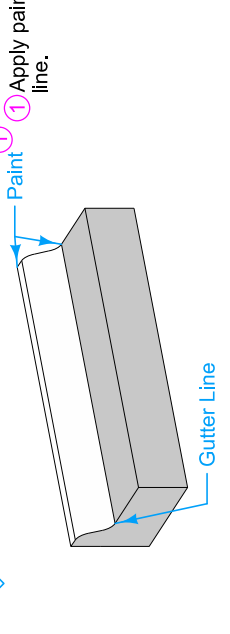
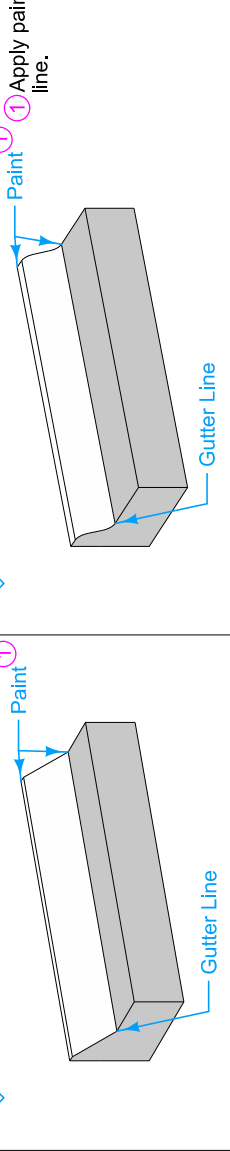
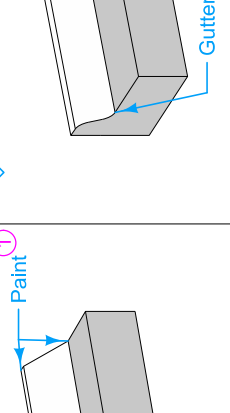
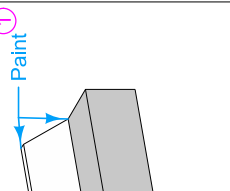
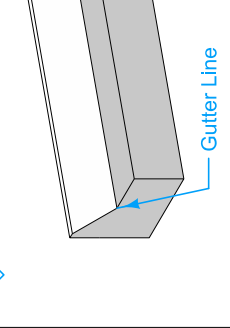
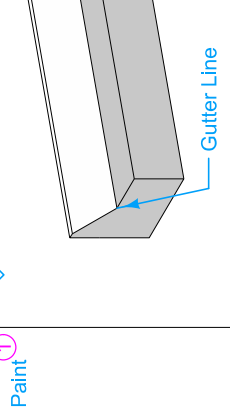
REVISION
2 10-18-18

MODIFIED
STANDARD ROAD PLAN

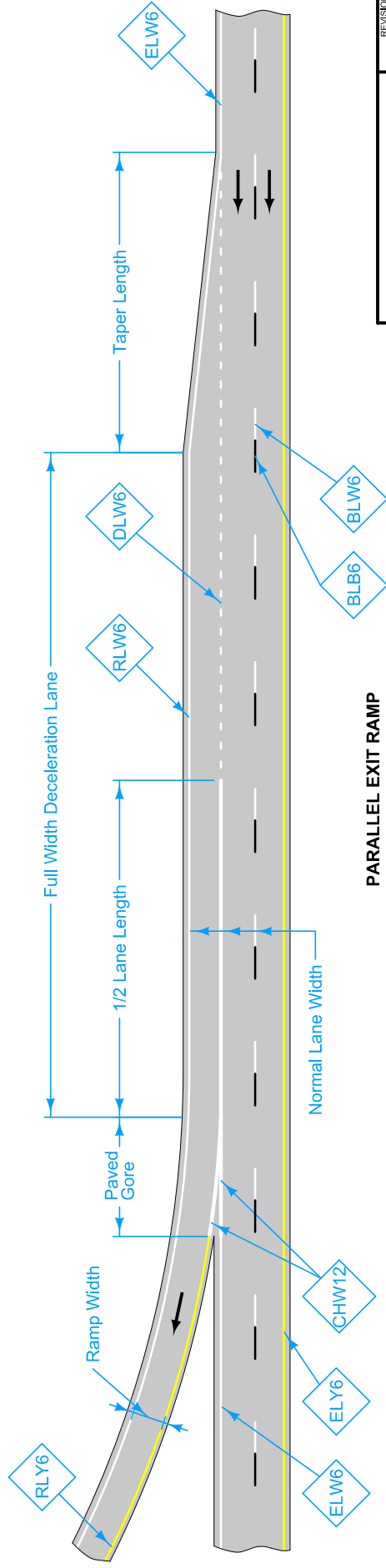
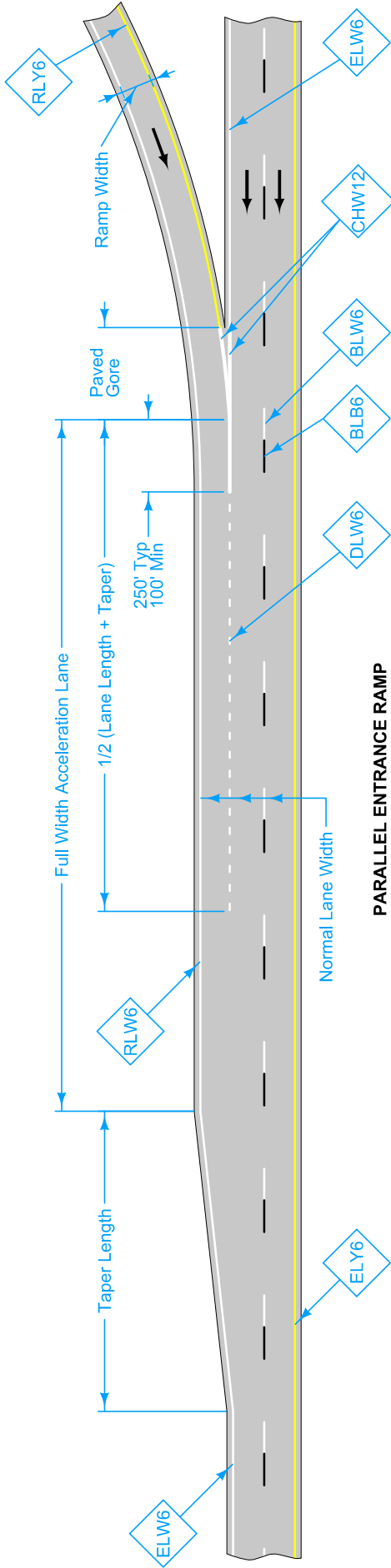
PM-110
SHEET 2 of 4
MODIFICATIONS: Added DLW6, DLW8, SLW6, SLW8, ELW6, ELW8, RLY6, RLY8, DLW6, CHW12, and LDW12.

<p><LDW8> LANE DROP (White)</p> 	<p><LDW12> LANE DROP (White)</p> 
<p><SLW2> STOP LINE (White)</p> 	<p><YLW2> YIELD LINE (White)</p> 
<p><CBW6> CROSSWALK BAR (White)</p> 	<p><CLW6> CROSSWALK LINE (White)</p> 

<p>MODIFIED</p> <p>STANDARD ROAD PLAN</p> <p><small>MODIFICATIONS: Added BLW6, BLB6, SLW6, ELW6, RLW6, RLW6, DLW6, CLW6, CHW12 and LDW12.</small></p>	<p>REVISION</p> <p>2 10-16-18</p>
	<p>PM-110</p> <p>SHEET 3 of 4</p>
<p>LINE TYPES</p>	

<p>SPW4 SLOPED CURB 4" (White)</p>  <p>Gutter Line</p>	<p>SPW6 SLOPED CURB 6" (White)</p>  <p>Gutter Line</p>	<p>STW6 STANDARD CURB 6" (White)</p>  <p>Gutter Line</p>	<p>Apply paint from back of curb to gutter line.</p>
<p>SPY4 SLOPED CURB 4" (Yellow)</p>  <p>Gutter Line</p>	<p>SPY6 SLOPED CURB 6" (Yellow)</p>  <p>Gutter Line</p>	<p>STY6 STANDARD CURB 6" (Yellow)</p>  <p>Gutter Line</p>	
<p>MNY4 MEDIAN NOSE (Yellow)</p> 			

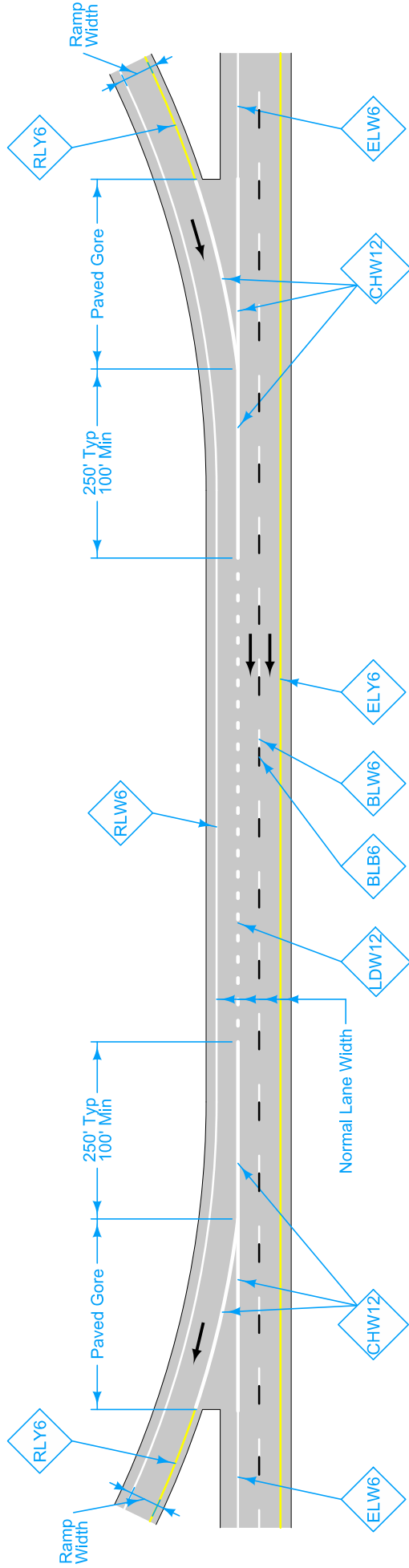
REVISION	2	10-18-18
MODIFIED		
STANDARD ROAD PLAN		
PM-110		
SHEET 4 of 4		
MODIFICATIONS: Added BLW6, BLB6, SLW6, ELW6, RLW6, RLW6, DLW6, CHW12, and LDW12.		
LINE TYPES		



LEGEND

BLW6	Broken Lane Line (White)	BLB6	Broken Lane Line (Black)	RLW6	Ramp Edge Line Right (White)
DLW6	Dotted Line (White)	ELW6	Edge Line Right (White)	RLY6	Ramp Edge Line Left (Yellow)
CHW12	Channelizing Line (White)	ELY6	Edge Line Left (Yellow)	LDW12	Lane Drop (White)
←	Direction of Traffic				

MODIFIED	REVISION	3	04-19-16
	STANDARD ROAD PLAN		
	SHEET 2 of 3		
MODIFICATIONS: Changed ELW4 to ELW6, ELY4 to ELY6, BLW4 to BLW6, DLW4 to DLW6, RLY4 to RLY6, RLY4 to RLY6, CHW8 to CHW12, and LDW8 to LDW12, Added BLB6.			
ENTRANCE AND EXIT RAMP			



AUXILIARY LANE BETWEEN RAMP

LEGEND

BLW6	Broken Lane Line (White)	BLB6	Broken Lane Line (Black)	RLW6	Ramp Edge Line Right (White)
DLW6	Dotted Line (White)	ELW6	Edge Line Right (White)	RLY6	Ramp Edge Line Left (Yellow)
CHW12	Channelizing Line (White)	ELY6	Edge Line Left (Yellow)	LDW12	Lane Drop (White)
←	Direction of Traffic				

MODIFIED	REVISION 3 04-19-16
STANDARD ROAD PLAN	PM-310
SHEET 3 of 3 MODIFICATIONS: Changed ELW4 to ELW6, ELY4 to ELY6, BLW4 to BLW6, DLW4 to DLW6, RLW4 to RLW6, RLY4 to RLY6, CHW8 to CHW12, and LDW8 to LDW12, Added BLB6.	
ENTRANCE AND EXIT RAMP	



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Eric Johnsen		Office: Specifications	Item 15
Submittal Date: 4/24/2023		Proposed Effective Date: July 18, 2023	
Article No.: Title:		Other: DS-15088, Construction or Maintenance Work on Railroad Right-of-Way (Dakota, Minnesota, & Eastern Railroad Corporation dba Canadian Pacific)	
Specification Committee Action:			
Deferred:	Not Approved:	Approved Date:	Effective Date:
Specification Committee Approved Text:			
Comments:			
Specification Section Recommended Text: See attached Developmental Specifications for Construction or Maintenance Work on Railroad Right-of-Way (Dakota, Minnesota, & Eastern Railroad Corporation dba Canadian Pacific).			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight .)			
Reason for Revision: Update requirements of the DME RR and the Department.			
New Bid Item Required (X one)	Yes	No X	
Bid Item Modification Required (X one)	Yes	No X	
Bid Item Obsolescence Required (X one)	Yes	No X	
Comments:			
County or City Comments:			
Industry Comments:			



**DEVELOPMENTAL SPECIFICATIONS
FOR
CONSTRUCTION OR MAINTENANCE WORK ON RAILROAD RIGHT-OF-WAY
(DAKOTA, MINNESOTA, & EASTERN RAILROAD CORPORATION dba CANADIAN PACIFIC)**

Effective Date
July 18, 2023

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

15100.01 DESCRIPTION.

This specification applies to projects on the Interstate, Primary, Secondary, and Local Road systems involving construction or maintenance of roadways and structures on Dakota, Minnesota & Eastern Railroad Company dba Canadian Pacific ("CP") Right-of-way (ROW).

This specification describes the following:

- Requirements when work is within the ROW or properties of CP and adjacent to tracks, wire lines, and other facilities.
- Coordination with CP when work by the Contractor will be performed upon, over, or under the CP ROW, or may impact current or future CP operations.

The CP representatives will be the persons identified by the CP Public Works Manager to handle specific tasks related to the project. The attachments specify the contact information for these individuals.

Prior to advertising the project for letting, the Contracting Authority will negotiate and obtain an agreement with CP for the work on CP ROW. The Contractor will also be required to enter into a Right of Entry agreement with CP for the purpose of coordinating Contractor work and CP train activities. A copy of this agreement is attached as DS-15100, Attachment A.

Contractor shall provide physical barriers approved by CP to protect track and ballast from damage and contamination when Contractor's equipment is operating within ~~25~~ 50 feet from nearest rail.

15100.02 REQUESTS FOR INFORMATION.

Requests for information involving work within CP ROW shall be in accordance with the procedures listed in the contract documents. Requests shall be submitted to the Engineer. Engineer will forward the request to CP as necessary.

15100.03 CONSTRUCTION AND AS-BUILT SUBMITTALS.

- A. Submittals are required for construction materials and procedures as outlined below. Submittals shall include all review comments from the Engineer. Design submittals shall be stamped and signed by a Professional Engineer registered in the State of Iowa.

- B. The tables below provide CP's minimum submittal requirements for the construction items noted. Submittal requirements are in addition to those specified elsewhere in the contract documents. The minimum review times indicated below represent CP's requirements only. Contractor shall allow additional time for CP's review time as stated elsewhere in the contract documents.

For this specification the following definitions shall apply:

- Overpass: when the roadway bridges over the railroad.
- Underpass: when the roadway crosses under the railroad.

- C. Submittals will be made by the Engineer to CP. Items in Table DS-15100.04-1 shall be submitted for both railroad overpass and underpass projects, as applicable. Items in Table DS-15100.04-2 shall be submitted for underpass projects only.

Prior to or during construction of underpass structures, CP requires the review and approval of drawings, reports, test data, and material data sheets to determine compliance with the specifications. Product information for items noted in Table DS-15100.04-2 shall be submitted to CP through the Engineer for their review and approval. The signed submittal and the Engineer's review comments will be reviewed and approved by CP. Review of the submittals by CP will not be conducted until after review by the Engineer.

Table DS-15100.04-1: Review Sets and Minimum Time for Review

Description	Sets Required	CP's Minimum Review Time
Shoring design and details	2	4 weeks
Falsework design and details	2	4 weeks
Drainage design provisions	2	4 weeks
Erection diagrams and sequence	2	4 weeks
Demolition diagram and sequence	2	4 weeks

Table DS-15100.04-2: Sets Required

Description	Sets Required	Notes
Shop drawings	4	Steel and Concrete members
Bearings	4	For entire structures
Concrete Mix Designs	4	For entire structures
Rebar & Strand certifications	4	For superstructure only
28 day concrete strength	4	For superstructure only
Waterproofing material certifications and installation procedure	4	Waterproofing & protective boards
Structural steel certifications	4	All fracture critical members & other members requiring improved notch toughness
Fabrication and Test reports	4	All fracture critical members & other members requiring improved notch toughness.
Welding Procedures and Welder Certification	4	AWS requirements
Foundation Construction Reports	4	Pile driving, drilled shaft construction, bearing pressure test reports for spread footings.
Compaction testing reports for backfill at abutments	4	Must meet 95% maximum dry density, Modified Proctor ASTM D 1557.

D. As-Built Records will be submitted to CP within 1 year of completion of the structures. These records shall consist of the following items:

1. Overpass Projects:

- Electronic files of all structure design drawings with as-constructed modifications shown in Auto-Cad Civil 3D or Acrobat .PDF format.
- Hard copies of all structure design drawings with as-constructed modifications shown.

2. Underpass Projects:

- Electronic files of all structure design drawings with as-constructed modifications shown, in Auto-Cad Civil 3D or Acrobat .PDF format.
- Hard copies of all structure design drawings with as-constructed modifications shown.
- Final approved copies of shop drawings for concrete and steel members.
- Foundation Construction Reports
- Compaction testing reports for backfill at abutments

15100.04 SITE INSPECTIONS BY CP.

Site inspections may be performed by CP at any point during construction, including but not limited to the following:

- Preconstruction meetings
- Pile driving, drilling of caissons or drilled shafts
- Reinforcement & concrete placement for railroad bridge substructure or superstructure
- Erection of precast concrete or steel bridge superstructure
- Placement of waterproofing (prior to placing ballast on bridge deck)
- Completion of the bridge structure

A detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to be performed, shall be provided to the Engineer for submittal to CP for review and approval prior to commencement of work. This schedule shall also include the anticipated dates when the above listed events will occur. This schedule shall be updated for the above listed events as necessary, but at least monthly so that site visits may be scheduled.

15100.05 CP REPRESENTATIVES.

CP representatives will be provided at the expense of the ~~Contracting Authority~~ Contractor to protect CP facilities, property, and movements of its trains or engines. CP may, at the Contractor's sole cost, risk and expense, furnish whatever protective services it considers necessary, including, but not limited to, flagger(s), inspector(s), and stand-by personnel.

In general, CP will furnish such personnel or other protective services as follows:

- Flagging protection will be required during any operation involving direct and potential interference with CP's tracks or traffic. This may include but is not limited to fouling of railroad operating clearances, reasonable proximity of accidental hazard to railroad traffic, work within ~~25~~ 50 feet horizontally of the nearest centerline, any work over any railroad track, or in any other condition that CP deems protective services necessary, which may include work on or off CP's property more than ~~25~~ 50 feet from the nearest centerline of a railroad track, such as any equipment extension (including but not limited to a crane boom) that will reach or has the potential to reach within ~~25~~ 50 feet of any track.
- For any excavation below elevation of track subgrade if, in the opinion of CP, track or other CP facilities may be subject to settlement or movement.
- During any clearing, grubbing, excavation, or grading, or other construction activity in proximity to CP facilities, which, in the opinion of CP, may endanger CP facilities or operations.
- During the Contractor's operations when, in the opinion of CP, CP facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.
- Contractor shall arrange with CP to provide the adequate number of flag persons to accomplish the work.

Contractor shall be required to pay CP in advance for the cost of personnel or other protective services. Prepayment will be based on the Contractor's estimated time for needing protective services, and if that prepayment will be exhausted prior to the expiration of the contractor's need for protective services, additional prepayment funds will be needed to cover the new projected completion of the project.

In the event CP is unable to furnish flagging protection, inspection services, or standby personnel at the desired time or on the desired date(s), Contractor shall not perform the said operation or work until such time and date(s) that appropriate CP services can be made available. CP shall not be liable for any delay or increased costs incurred by Contractor owing to CP's inability or failure to have appropriate CP services available at the time or on the date requested.

15100.06 INSURANCE.

Before the contract is awarded, Contractor shall submit to the Department a certificate of insurance evidencing the coverage. The certificate shall identify the insurance company firm name and address, Contractor firm name, policy period, type of policy, limits of coverage, and scope of work covered (including project number). Policies shall provide no less than 30 calendar days prior written notice to Contracting Authority and Railroad of cancellation or material change in policies. Following award of the Contract, Contractor shall submit a certificate of insurance evidencing the foregoing coverage to the Railroad and Contracting Authority (if other than the Department), and a certified, true, and complete copy of policy or policies to the Contracting Authority and Railroad. Upon request from either the Contracting Authority or Railroad, a certified duplicate original of any required certificate or policy shall be furnished at no cost to the Contracting Authority or Railroad.

Insurance shall be kept in full force and effect during the performance of work and thereafter until the Contractor removes all tools, equipment, and material from CP's property and cleans the premises in a manner reasonably satisfactory to CP.

If the Contractor uses a subcontractor(s), the Contractor shall provide the required insurances and shall provide either: equivalent to that described herein or (ii) obtain endorsements to the required policies naming the subcontractor(s) as additional insured parties.

A. Commercial General Liability Insurance.

Commercial general liability (CGL) (occurrence based) with a combined single limit of not less than ~~\$1,000,000.00~~ \$10,000,000.00 each occurrence. CGL insurance shall be written on ISO occurrence form CG 00 01 12 04 (or a substitute form providing equivalent coverage).

The policy shall also contain the following endorsement, which shall be stated on the certificate of insurance:

- Contractual Liability Railroads ISO form CG 24 17 10 01 (or a substitute form providing equivalent coverage) showing "Dakota, Minnesota & Eastern Railroad Corporation Property" as the Designated Job Site.
- Designated Construction Project(s) General Aggregate Limit ISO Form CG 25 03 03 97 (or a substitute form providing equivalent coverage) showing the project on the form schedule.

B. Business Automobile Coverage Insurance.

Business auto coverage written on ISO form CA 00 01 (or a substitute form providing equivalent liability coverage) with a combined single limit of not less ~~\$1,000,000.00~~ \$2,000,000.00 for each accident; covering owned, non-owned, and hired vehicles engaged in or about the work.

The policy shall contain the following endorsements, which shall be stated on the certificate of insurance:

- Coverage For Certain Operations In Connection With Railroads ISO form CA 20 70 10 01 (or a substitute form providing equivalent coverage) showing "Dakota, Minnesota & Eastern Railroad Corporation" as the Designated Job Site.
- Motor Carrier Act Endorsement - Hazardous materials clean up (MCS-90), if required by law.

C. Railroad Protective Liability Insurance.

Railroad protective liability insurance (occurrence form), in the name of the Dakota, Minnesota, & Eastern Railroad Company d/b/a Canadian Pacific, with limits of \$5,000,000.00 per occurrence and \$10,000,000.00 aggregate for bodily injury (including death) and property damage.

Contractor shall use the website listed below to acquire Railroad train movement information for the purpose of obtaining Railroad Protective Liability Insurance:

<http://safetydata.fra.dot.gov/OfficeofSafety/PublicSite/Crossing/Crossing.aspx>

The US DOT Crossing Inventory Number will be located in the project plans. Zero trains per day will be displayed on the crossing inventory report for locations with grade separated crossings or at-grade crossings when there is less than one train per day. In these situations generating a map to find alternative crossing locations may be used to provide the number of trains per day and speed nearest the project location.

D. Workers Compensation and Employers Liability Insurance.

Coverage shall include, but not limited to: Contractor's statutory liability under the workers' compensation laws of the State of Iowa including requirements of any occupational disease law with limits of not less than \$1,000,000.00.

If Contractor is self-insured, evidence of the State of Iowa's approval and excess workers compensation coverage shall be provided. Coverage shall include liability arising out of the U. S. Longshoremen's and Harbor Workers' Act, the Jones Act, and the Outer Continental Shelf Land Act, if applicable.

The policy shall contain the following endorsement, which shall be stated on the certificate of insurance:

Alternate Employer endorsement ISO form WC 00 03 01 A (or a substitute form providing equivalent coverage) showing CP in the schedule as the alternate employer (or a substitute form providing equivalent coverage).

E. Umbrella Insurance.

If Contractor utilizes umbrella policies, these policies shall "follow form" and afford no less coverage than the primary policy. Excess coverage is not allowed.

F. Pollution Liability Insurance.

Pollution liability coverage shall be written on ISO form Pollution Liability Coverage Form Designated Sites CG 00 39 12 04 (or a substitute form providing equivalent liability coverage), with limits of at least ~~\$1,000,000.00 per occurrence and an aggregate limit of \$2,000,000.00 per occurrence.~~

If the scope of work as defined in this contract includes disposal of hazardous or non-hazardous materials from the job site, Contractor shall furnish to CP evidence of pollution legal liability insurance maintained by the disposal site operator for losses arising from the insured facility accepting the materials, with coverage in minimum amounts of \$1,000,000.00 per loss, and an annual aggregate of \$2,000,000.00.

G. Policy(ies) required above (except worker's compensation and employers liability) shall include CP and its Parents as "Additional Insured" using ISO Additional Insured Endorsements CG 20 26, and CA 20 48 (or substitute forms providing equivalent coverage). The coverage provided to CP and its Parents as additional insured shall, to the extent provided under ISO Additional Insured Endorsement CG 20 26, and CA 20 48 provide coverage for CP's negligence whether sole or

partial, active or passive, and shall not be limited by Contractor's liability under the indemnity provisions contained in the specifications.

- H. Punitive damages exclusion, if any, shall be deleted (and the deletion indicated on the certificate of insurance), unless the law governing prohibits all punitive damages that might arise in connection with this contract.
- I. Contractor waives all rights of recovery, and its insurers also waive all rights of subrogation of damages against Railroad and its agents, officers, directors, and employees. This waiver shall be stated on the certificate of insurance.
- J. Prior to commencing the work, Contractor shall furnish Railroad with a certificate(s) of insurance, executed by a duly authorized representative of each insurer, showing compliance with the insurance requirements in this contract.
- K. Insurance policies shall be written by a reputable insurance company acceptable to CP or with a current Best's Insurance Guide Rating of A- and Class VII or better, and authorized to do business in the State of Iowa.
- L. The fact that insurance is obtained by the Contractor or by CP on behalf of the Contractor shall not be deemed to release or diminish the liability of the Contractor, including, without limitation, liability under the indemnity provisions of this contract. Damages recoverable by CP from the Contractor or any third party shall not be limited by the amount of the required insurance coverage.

15100.07 ASSIGNMENT, SUBCONTRACTING, AND INSURANCE ENDORSEMENTS.

Contractor shall not assign or subcontract the provisions of this specification, or any interest therein, without the written consent of the Engineer. Contractor shall be responsible for the acts and omissions of all subcontractors. Before Contractor commences any work, they shall, except to the extent prohibited by law; (1) require each subcontractor to include the Contractor and CP as "Additional Insureds" in the subcontractor's Commercial General Liability policy and Business Automobile policies with respect to all liabilities arising out of the subcontractor's performance of work on behalf of the Contractor by endorsing these policies with ISO Additional Insured Endorsements CG 20 26, and CA 20 48 (or substitute forms providing equivalent coverage); (2) require each subcontractor to endorse their Commercial General Liability Policy with "Contractual Liability Railroads" ISO Form CG 24 17 10 01 (or a substitute form providing equivalent coverage) for the job site; and (3) require each subcontractor to endorse their Business Automobile Policy with "Coverage For Certain Operations In Connection With Railroads" ISO Form CA 20 70 10 01 (or a substitute form providing equivalent coverage) for the job site.

15100.08 ADDITIONAL SAFETY REQUIREMENTS.

Personnel employed by the Contractor or subcontractors shall complete the course "CP Contractor Security/Safety Course", and be registered prior to working on CP property, except that such personnel are not required to execute the Right of Entry form for contractors, it being understood that all contractors or subcontractors shall instead execute the Right of Entry Agreement attached to this specification. The CP orientation course is available at: www.contractororientation.com. This course shall be completed annually.

CP has exempted from this requirement those it classifies as "Delivery Persons" from this training, such as UPS, FedEx, trucking companies, etc. who merely access the property to supply materials or equipment.

Contractor shall require its employees to be suitably dressed to perform their duties safely. Contractor shall require workers to wear personal protective equipment as specified by CP rules and regulations. All personal protective equipment will be of safe design and construction for the work to be performed and shall be maintained in a sanitary and reliable condition. Protective equipment shall include, but not be

limited to the following PPE listed below that meet the U.S. ANSI standards (American National Standards Institute):

- Eye and face protection ANSI Z 87.1
- Head protection ANSI Z 89.1
- Foot protection ANSI Z 41.1
- High Visibility apparel ANSI / ISEA Z 107

Additional eye protection shall be provided to meet specific job situations such as welding, grinding, burning, etc.; and hearing protection which affords enough attenuation to give protection from noise levels that will be occurring on the job site. Only waist length shirts with sleeves and trousers covering the entire leg shall be worn. Flare-legged trouser bottoms shall be tied to prevent catching.

CP requires that the Contractor provide their personnel with the proper training, and that the Contractor's personnel are provided with 1) a sticker to be affixed visibly on their hard hat and 2) a qualification card so that CP employees know that the Contractor's personnel are familiar with CP safety practices and proof of having successfully completed the "CP Contractor Security/Safety Course" course. If a Contractor's employee does not have the sticker and qualification card, that Contractor employee will not be allowed on CP property.

Heavy equipment operating within CP ROW shall be equipped with audible back-up warning devices. If in the opinion of CP the Contractor's equipment is unsafe for use on CP's ROW, the Contractor shall remove such equipment from the CP ROW.

Contractor shall promptly notify CP of any U.S. OSHA reportable injuries occurring to any employee that arises during the work performed on the work site within CP ROW.

If at any time the Engineer or CP is of the opinion that any work of the Contractor is being or is about to be done or prosecuted without due regard and precaution for safety and security, or in violation of any applicable safety rule, the Engineer may suspend the work until proper protective measures are adopted and provided. In addition, if CP has a reasonable, good faith belief that the Contractor is engaging, or is about to engage, in any activity that poses a substantial risk of causing great bodily injury or death to any person, or significant property damage, CP may suspend the work of the Contractor and shall as soon as possible thereafter contact the Engineer to review the circumstances of the work stoppage. CP shall thereafter abide by the decision of the Engineer as to the necessity of the work stoppage.

15100.09 SAFETY MEASURES-PROTECTION OF OPERATIONS.

Contractor shall perform work in a safe manner and in conformity with the following standards:

A. Explosives.

Contractor shall not discharge any explosives on or in the vicinity of CP's property without the prior consent of CP, which shall not be given if, in the sole discretion of CP, such discharge would be dangerous or would interfere with CP's property or facilities. For the purposes hereof, the "vicinity of CP's property" shall be deemed to be any place on CP's property or in such close proximity to CP's property that the discharge of explosives could cause injury to CP's employees or other persons, or cause damage to or interference with the facilities or operations on CP's property. CP reserves the right to impose limitations on the transportation, handling, storage, security, and use of explosives as CP, in CP's sole discretion, may deem to be necessary, desirable, or appropriate. In addition to any limitations as may be specifically imposed:

1. Contractor shall provide no less than 48 hours written notice, excluding weekends and holidays, before discharging any explosives.
2. Explosives loaded in holes, placed or otherwise readied for discharge, shall be discharged the same day during daylight hours, and at mutually acceptable times.

3. Contractor, at its own expense, shall take all precautionary measures and construct all temporary shelters necessary to guard against danger of damage, destruction, or interference arising out of or connected with any blasting or any transportation, handling, storage, security, or use of explosives.

B. Obstructions to View.

Except as otherwise provided herein, Contractor shall not cause or permit the view along the tracks of CP to be obstructed, nor place any combustible material on the crossing area, nor erect any structures thereon except as allowed by the contract documents.

C. Excavation.

Contractor shall not excavate from existing slopes nor construct new slopes which are excessive and may create hazards of slides or falling rock, impair, or endanger the clearance between existing or new slopes and the tracks of CP. Contractor shall not perform any work that may disturb the stability of any area or adversely affect CP's tracks or facilities. Contractor, at its own expense, shall install and maintain adequate shoring and cribbing for all excavation or trenching performed by them in connection with construction, maintenance, or other work. Shoring and cribbing shall be constructed and maintained with materials and in a manner approved by CP to withstand all stresses likely to be encountered, including any stresses resulting from vibrations caused by CP's operations in the vicinity.

D. Drainage.

Contractor, at its expense, shall provide and maintain suitable facilities for draining the highway and its appurtenances, and shall not suffer or permit drainage water to flow or collect upon property of CP that may adversely affect any of CP's operations, equipment or any third parties with permitted facilities on CP's ROW. Contractor, at its own expense, shall provide adequate passageway for the waters of any streams, bodies of water, and drainage facilities (either natural or artificial, and including water from CP's culverts and drainage facilities), so that said waters may not, because of any facilities or work of the Contractor, be impeded, obstructed, diverted or caused to back up, overflow or damage the property of CP or any part thereof, or property of others. Contractor shall not obstruct or interfere with existing ditches or drainage facilities.

E. Clearances.

Contractor shall provide a minimum vertical clearance of 22.0 feet above top of rails and a minimum lateral clearance of 12.5 feet from centerline to the closest rail of track nearest temporary construction falsework. No materials, supplies, or equipment will be stored within 25 50 feet from the centerline of any railroad track, measured at right angles thereto.

Proposed changes to the specified minimum clearances shall be submitted in writing to CP, through the Engineer, at least 30 calendar days in advance of the work. No work shall commence until the Engineer receives concurrence, in writing, from CP that approval is given and that arrangements have been made for flagging service, as may be necessary. CP will have 15 calendar days to respond to the request.

F. Demolition of Existing Structures.

Contractor shall submit demolition plans to the Engineer for review and approval. The Engineer will forward such plans to CP as identified in the project agreement for CP to review and approve. Demolition performed over or near CP track will require proper protective shielding or other measures (as identified on the plans) as maybe required by CP, and the Contractor shall be required provide signed plans, signed by a Professional Engineer licensed in the State of Iowa, and schedule for review and approval by CP. Such protective shielding or measures shall be designed for immediate removal by Contractor whenever instructed to do so by CP. Demolition shall not be undertaken until CP has advised Engineer of its approval of the plans and schedule, and the Contractor has received the Engineer's and CP's written approval of such demolition plans and schedule. All such reviews and approvals or rejections will be completed by the Engineer and CP within 45 calendar days of receipt from the Contractor.

15100.10 WALKWAYS.

Along the outer side of each exterior track of multiple operated track, and on each side of single operated track, an unobstructed continuous space suitable for CP's use in walking along trains, extending to a line not less than 12 feet from centerline of track, shall be maintained. Any temporary impediments to walkways and track drainage encroachments or obstructions allowed during work hours while CP's flagging service is provided shall be removed before the close of each work day. Walkways with railings shall be constructed by Contractor over open excavations when in close proximity of track, and railings shall not be closer than 8.5 feet horizontally from center line of tangent track or 9.5 feet horizontally from centerline of curved track.

15100.11 EXCAVATIONS IN CLOSE PROXIMITY TO CP FACILITIES.

Contractor shall take special precaution in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls, or other facilities that require shoring shall comply with the following requirements: OSHA, AREMA, and CP "Guidelines for Temporary Shoring".

Contractor shall contact CP for facility locates at least 5 working days prior to commencing work at 1.248.740.6227 during normal business hours (7:00 a.m. to 3:00 p.m. C.S.T., Monday through Friday, except holidays). Contractor shall pay CP in advance for the cost of CP locates. The cost for a cable locate is \$250.00. If a telecommunications system is buried anywhere on or near CP property, the Contractor shall coordinate with CP and the telecommunication company to arrange for relocation or other protection of the system prior to beginning any work on or near CP property.

15100.12 NO INTERFERENCE WITH CP'S OPERATION.

Contractor shall not interfere with the constant, continuous, and uninterrupted use of the tracks, property, and facilities of CP its lessees, licensees, or others, unless specifically permitted and authorized in advance by CP. When not in use, Contractor's machinery and materials shall be kept at least 50 feet from the centerline of CP's nearest active track, and there shall be no crossings of CP's tracks except at existing open public crossings or as provided by private construction crossing agreement between CP and the Contractor. CP may require the Contractor to furnish detailed plans prior to entry upon the premises and to view and inspect any activity or work on or above CP's property.

15100.13 TRAFFIC CONTROL.

Contractor's operations that control traffic across or around CP facilities shall be coordinated with and approved by CP.

15100.14 INDEMNITY.

As used in this Article, "CP" includes other railroad companies using CP's property at or near the location of the Contractor's work and CP's and their officers, agents, and employees; "Loss" includes loss, damage, claims, demands, actions, causes of action, penalties, costs, and expenses of whatsoever nature, including court costs and attorneys' fees, which may result from the following:

- Injury to or death of persons whomsoever (including CP's officers, agents, and employees, the Contractor's officers, agents, and employees, as well as any other person); and
- Damage to or loss or destruction of property whatsoever (including Contractor property, damage to the roadbed, tracks, equipment, or other property of CP, or property in its care or custody).

Contractor shall indemnify, hold harmless, and defend to the extent allowed by law CP from any loss which is due to or arises from any cause and is associated in whole or in part with the work covered herein, a breach of the contract or the failure to observe the health and safety provisions herein, or any activity or omission arising out of performance or nonperformance; except to the extent caused by the gross negligence or willful misconduct of CP.

15100.15 MAINTENANCE OF CP FACILITIES.

Contractor shall maintain ditches and drainage structures free of silt or other obstructions which may result from its operations, promptly repair eroded areas within CP's ROW, and repair any other damage to CP property, or its tenants; at no cost to CP. Contractor will be required upon the completion of the work

to remove from within the limits of CP's property all machinery, equipment, surplus materials, false work, rubbish or temporary buildings, and to leave said property in a condition satisfactory to the Engineering Manager of CP or their authorized representative.

15100.16 COMMUNICATIONS AND SIGNAL LINES.

No digging, trenching or boring activities shall be conducted in the proximity of any known buried Railroad Company signal cables without Railroad Company's Signal Department representative being present. If required, CP will rearrange its communications and signal lines, grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by CP's forces in connection with its operation at the expense of the Contracting Authority. This work will be performed by CP and it is not a part of the contract.

15100.17 FIBER OPTIC CABLE SYSTEMS.

Fiber optic cable systems may be buried on CP's property. Protection of the fiber optic cable systems is of extreme importance since any break could disrupt service to users resulting in business interruption and loss of revenue and profits. Contractor shall contact Iowa One Call (1.800.292.8989 (a 24-hour number)) to determine if fiber optic cable is buried anywhere on CP's ROW to be used by the Contractor. If it is, Contractor shall telephone the telecommunications company involved, arrange for a cable locator, and make arrangements for relocation or other protection of the fiber optic cable prior to beginning any work on CP's ROW.

In addition to the liability terms elsewhere in this specification, Contractor shall indemnify and hold harmless CP against and from all cost, liability, and expense whatsoever (including, without limitation, attorney's fees, court costs, and expenses) arising out of or in any way contributed to by any act or omission of the Contractor, agents, or employees, that causes or contributes to (1) any damage to or destruction of any telecommunications system on CP's property, and (2) any injury to or death of any person employed by or on behalf of any telecommunications company, its contractor, agents, or employees, on CP's property. Contractor shall not have or seek recourse against CP for any claim or cause of action for alleged loss of profits, revenue, loss of service, or other consequential damage to a telecommunication company using CP's property or a customer or user of services of the fiber optic cable on CP's property.

15100.18 COOPERATION.

CP will cooperate with the Contractor so that work may be conducted in an efficient manner, and will cooperate with the Contractor in enabling use of CP's ROW in performing the work.

15100.19 WAIVER OF BREACH.

The waiver by CP of the breach of any condition, covenant, or specification herein contained to be kept, observed and performed by the Contractor shall in no way impair the right of CP to avail itself of any subsequent breach thereof.

15100.20 CP OPERATIONS.

Contractor shall be advised that trains or equipment are expected on any track, at any time, in either direction. Contractor shall become familiar with the train schedules in this location and structure its bid assuming intermittent track windows in this period, as defined below.

Railroad tracks within and adjacent to the work are active and rail traffic over these tracks shall be maintained throughout the contract. Activities may include both through moves and switching moves to local customers. Railroad traffic and operations may occur continuously throughout the day and night on these tracks and shall be maintained at all times. Contractor shall coordinate and schedule the work so that construction activities do not interfere with CP operations.

Work windows for this contract shall be coordinated with the Engineer, who shall receive CP's approval before advising the Contractor of the availability of any work window. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

A. Conditional Work Window: A period of time that CP operations have priority over construction activities. At the direction of the CP flag person, upon approach of a train, and when trains are present, the tracks shall be cleared (i.e., no construction equipment, materials, or personnel within ~~25~~ 50 feet, or as directed by CP, from the tracks). Conditional Work Windows are available for the contract.

B. Absolute Work Window: A period of time that construction activities are given priority over CP operations. During this time frame the designated tracks will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window the tracks or signals shall be completely operational for train operations and all CP, Public Utilities Commission, and Federal Railroad Administration requirements, codes, and regulations for operational tracks shall be met. In the situation where the operating tracks or signals have been affected, CP will perform inspections of the work prior to placing back into service. CP flag persons will be required for construction activities requiring an Absolute Work Window.

Absolute Work Windows will not generally be granted, and any provided shall require the express written approval by CP's Transportation Department. Any request will require a detailed explanation for CP review and approval.

C. Work on CP's ROW shall be done at such times and in such manner so as not to interfere with or endanger the operations of CP. Whenever work may affect the operations or safety of trains, the method of doing such work shall first be submitted to CP for approval, but such approval shall not relieve the Contractor from liability. Any work to be performed by the Contractor that requires flagging or inspection service shall be deferred until the flagging protection required by CP is available at the job site.

D. Contractor shall make requests in writing for both Absolute and Conditional Work Windows, at least 2 weeks in advance of any work. The written request shall include:

- Exactly what the work entails.
- The days and hours that work will be performed.
- The exact location of work, and proximity to the tracks.
- The type of window requested and the amount of time requested.
- The designated contact person.

Contractor shall provide written notice to CP at least 48 hours before commencing work in connection with approved work windows when work will be performed within 50 feet of any track center line.

E. Should a condition arising from, or in connection with the work, require that immediate and unusual provisions be made to protect operations and property of CP, Contractor shall make such provisions. If in the judgment of CP such provisions are insufficient, CP may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense. CP or Engineer will have the right to order Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of CP, Contractor's operations could endanger CP's operations. In the event such an order is given, Contractor shall immediately notify the Engineer of the order.

15100.21 RAILROAD FLAGGING.

A. Notification.

Contractor shall notify CP and Engineer at least 30 working days in advance of commencement of any work on CP property and at least 10 working days in advance of proposed performance of any work by the Contractor in which any person or equipment will be within 50 feet of any track, or near enough to any track that any equipment extension (such as, but not limited to, a crane boom) will reach to within 50 feet of any track. Notice shall be made using CP's "Request for Flagging Services" form attached as DS-15100, Attachment B.

The services of a flagman will be required during any operation involving direct interference with CP's tracks or traffic, fouling of railroad operating clearances, or reasonable proximity of accidental hazard to railroad traffic, when work takes place within 50 feet horizontally of the nearest centerline, any work over any railroad track, or in any other condition that CP deems the services of a flagman necessary, which may include work on or near CP's property more than 50 feet from the nearest centerline of a railroad track. Additional flagmen will also be furnished whenever in the opinion of CP such protection is needed.

Upon receipt of 10 working day notice, CP will determine and inform Contractor whether a railroad flagger need be present and whether the Contractor need implement any special protective or safety measures. If flagging or other special protective or safety measures are performed by CP, such services will be provided at Contractor's expense with the understanding that if CP provides any flagging or other services, the Contractor shall not be relieved of any of its responsibilities or liabilities set forth herein. Contractor shall be required to pay CP in advance for the cost of personnel or other protective services. CP shall not be liable for any increased costs incurred by the Contractor or Contracting Authority owing to CP's inability or failure to have appropriate CP personnel available at the time or on the date requested.

To enable orderly flagger reassignment to other projects the Contractor shall notify CP 5 working days prior to the termination of flagging need or 5 working days prior to completion of the Contractor's work, whichever is sooner. Contractor shall inform CP when work requiring flaggers is complete.

CP will notify the Engineer and Contractor when non-compliance is reported by CP train crews or other CP employees. Contractor work performed without proper flagging services, when such flagging is required, will be subject to a \$5,000.00 per day price adjustment to Contractor, and may result in the removal of Contractor by CP or Engineer from the project.

B. Flagger Hours and Rate of Pay.

There is an 8 hours of flagging minimum per day. Please note that flagging charges are approximately \$1200.00 per day for an 8 hour day. Overtime will need to be authorized. Additional overtime hours will be paid at the appropriate rate. Weekends and Holidays will be billed at the overtime rate. Normal flagman hours are currently from 8:00 am to 4:00 pm. Rates are subject to change, at any time, by law or by agreement between CP, its employees or contractors, and may be retroactive as a result of negotiations or a ruling of an authorized Governmental Agency. Additional charges on labor are also subject to change. If the wage rate or additional charges are changed, Contractor shall pay on the basis of the new rates and charges.

A flagman has to perform many functions in conjunction with a flagging project. The hours start once the flagman reaches the local yard. Any needed safety materials must be collected and other railroad employees that may come into the area must be well informed of the project that will be taking place. The commute time from the local yard to the actual project is included in an invoice. Once on site the individual must set up warning devices several miles away from the site (in both directions) in order to assure locomotive engineers are properly warned of additional safety precautions necessary. Once the day is over, the flagman must collect these warning devices and return them to the local yard. In CP terminal areas, this employee is compensated for a full eight hour day regardless if the employee was physically flagging at the location or not, therefore, the full day is charged back to the contractor. If CP must pay the employee for hours in excess of their daily scheduled time or on a holiday in order to accomplish the flagging project, those costs are passed onto the contractor as well.

Occasionally it is necessary for the flagman to leave the project for various reasons. Some of these are to throw a manual switch in order to divert an oncoming train, or to meet a train that is approaching.

C. Reimbursement to CP.

Contractor shall reimburse the CP for railroad flagger services provided within 15 days of billing from the CP. In the event the Contractor fails to reimburse or pay CP for hours of flagman protection provided, the Contracting Authority will reimburse CP within 30 calendar days of the Contractor defaulting on the payment (default is defined as non-payment within 30 calendar days of billing by CP to the Contractor). Failure of the Contractor to reimburse CP may result in a reduction or suspension of the Contractors bidding qualifications according to Article 1102.03 of the Standard Specifications.

D. Documentation and Reimbursement to the Contractor.

Contractor shall initially pay CP for all flagging costs in conjunction with railroad flaggers when any of the conditions identified in Article DS-15100.05, warrant a flagger. The Contracting Authority will reimburse the Contractor for any daily cost that exceeds ~~\$1,000.00~~ \$1,200.00 per day for the cost of flagger services provided by CP. The Contracting Authority will reimburse the Contractor 100% of the total cost of flagger services, as deemed necessary by CP, that does not meet any of the conditions identified in Article DS-15100.05, unless the flagger's presence on the project was a result of the Contractor's communication, or lack of communication, with CP. The Contracting Authority will reimburse the Contractor following completion of all work necessitating flagging operations by CP and receipt of documentation verifying CP invoices have been paid.

For each day that railroad flaggers have been provided, the Contractor shall document daily the conditions on the project site that warrant the flagger. The Contractor shall submit the daily records to the Engineer each week. The Engineer will review the daily logs and promptly notify the Contractor if any information in the daily log is believed to be incorrect.

Contractor shall forward copies of the invoices received from CP for flaggers and a summary of the flagging costs incurred that exceed the Contractors' requirements described in Article DS-15100.05, to the Engineer with a request for payment for the additional railroad flagger costs. The Engineer will review the Contractor's daily logs against CP's invoice and make payment for the eligible costs in accordance with Article 1109.03, of the Standard Specifications.

Contractor shall be responsible to CP for all flagging costs. Flagging costs for subcontracted work shall be the responsibility of the Contractor. Reimbursement from subcontractors to the Contractor shall be the sole responsibility of the Contractor.

Contractor shall forward, to the Engineer, copies of payments made to CP for flagging costs.

The Contracting Authority may award multiple contracts for work in the same general area. Contractor shall try to stage work to minimize the need for railroad flaggers. In the event of multiple projects in a particular location, the Contractor initially requiring flagging on a daily basis shall be responsible for all flagging costs for that day.

15100.22 TEMPORARY CROSSINGS.

At other than established public road crossings, the Contractor shall not move any equipment or materials across CP's tracks until written permission has been obtained from CP.

If the Contractor requires a temporary railroad crossing the Contractor shall arrange for the crossing installation at a location acceptable to the Contractor and CP at the Contractor's expense to include all CP costs of installation, maintenance, removal, and track restoration. The temporary crossing shall be gated and locked at all times when not required for use by the Contractor. Flagging will always be required during use of a temporary crossing. The billing, Contractor payment provisions, and final Contractor payment requirements for crossing costs except flagging are to be covered as agreed to in a separate private construction crossing agreement between the Contractor and CP. Prior notice of need for a temporary crossing is required to allow for CP site review, cost estimating, securing material, and work crew scheduling and will vary. The Contractor should contact CP prior to making a bid when a temporary crossing is required.

15100.23 LIMITATION OF RIGHTS GRANTED.

The Contract, any Temporary Easement, and Permanent Easement are all subject to the prior and continuing right and obligation of CP to use and maintain its property, not inconsistent with highway purposes, including the right and power of CP to construct, maintain, repair, renew, use, operate, change, modify, or relocate CP tracks, roadways, signal, communication, fiber optics, or other wirelines, pipelines, and other facilities upon, along, or across any or all parts of its property, all or any of which may be freely done at any time or times by CP, not inconsistent with highway purposes and at CP's sole cost and expense.

The Contract, Temporary Construction Easement, and Permanent Easement, whether recorded or unrecorded, are subject to all outstanding rights (including those in favor of licensees and lessees of CP's property, and others) and the right of CP to renew and extend the same, and is made without covenant of title or for quiet enjoyment.

15100.24 MECHANIC'S LIENS.

Contractor shall not permit or suffer any mechanic's or material supplier's liens of any kind or nature to be enforced against any property of CP for any work performed. Contractor shall indemnify and hold harmless CP from and against any liens, claims, demands, costs or expenses of whatsoever nature in any way connected with or growing out of such work done, labor performed, or materials furnished. It is understood that this specification may be recorded in the county in which the work is to be performed and such recording shall serve as public notice that no Contractor, subcontractor, or material supplier shall file any notice of a mechanic's or material supplier's lien or permit or suffer any mechanic's lien or material supplier's lien on the property of CP to the extent permitted by law.

15100.25 METHOD OF MEASUREMENT AND BASIS OF PAYMENT.

Railroad Protective Liability Insurance for Dakota, Minnesota & Eastern Railroad Corporation ~~doing business as Canadian Pacific~~; will be paid for as a Lump Sum bid item. The Contractor will be paid 100% of the Lump Sum bid item once the Engineer has received all necessary certificates of insurance.

Attachments to this specification:

- DS-15100, Attachment A: Right of Entry Agreement
- DS-15100, Attachment B: Canadian Pacific Flagman Request Form
- DS-15100, Attachment C: Minimum Safety Requirements for Contractors Working on CP Property in the United States

RIGHT OF ENTRY AGREEMENT

This Right of Entry Agreement ("Agreement") is made between _____ (hereafter Contractor) and Dakota, Minnesota & Eastern Railroad Corporation dba Canadian Pacific (hereafter Railroad) in order to permit Contractor to enter onto Railroad's property, for the purposes of performing work in connection with the following project for the Contracting Authority:

Project _____, as further identified in the attached project documents.

Contractor shall pay to Railroad upon execution of this Agreement the sum of \$1,500.00 as consideration for the right of entry awarded under this Agreement and to cover preparation and administration of this Agreement.

Contractor and Railroad hereby agree as follows:

1. Contractor shall enter Railroad's property (identified in the attached project documents) only in connection with the above-referenced project;
2. Contractor shall give Railroad at least 15 working days' advance notice of the date Contractor plans to start any work on the project;
3. Upon request, Contractor shall provide Railroad with detailed plans of the project at no cost to Railroad;
4. Contractor shall comply with all terms and requirements set forth in Iowa Department of Transportation Developmental Specifications for Construction or Maintenance Work on Railroad Right-of-Way (Dakota, Minnesota, & Eastern Railroad Corporation dba Canadian Pacific), including but not limited to the insurance requirements set forth in such specification. Contractor shall provide Railroad with certificates and declarations sheets that prove or show compliance with such insurance requirements;
5. As used in this paragraph, "CP" includes other railroad companies using CP's property at or near the location of the Contractor's work and CP's and their officers, agents, and employees; "Loss" includes loss, damage, claims, demands, actions, causes of action, penalties, costs, and expenses of whatsoever nature, including court costs and attorneys' fees, which may result from the following:
 - Injury to or death of persons whomsoever (including CP's officers, agents, and employees, the Contractor's officers, agents, and employees, as well as any other person); and
 - Damage to or loss or destruction of property whatsoever (including Contractor property, damage to the roadbed, tracks, equipment, or other property of CP, or property in its care or custody).

Contractor shall indemnify, hold harmless, and defend to the extent allowed by law CP from any loss which is due to or arises from any cause and is associated in whole or in part with the work covered herein, a breach of the contract or the failure to observe the health and safety provisions herein, or any activity or omission arising out of performance or nonperformance; except when caused by the sole negligence of CP, or except to the extent caused by the gross negligence or willful misconduct of CP;

6. The insurance requirements set forth in this Agreement shall not relieve or limit Contractor's liability to Railroad under the indemnity provisions of this Agreement;
7. Contractor shall comply with any federal, state or local laws, statutes, codes, ordinances, rules and regulations applicable to its construction and maintenance of the project. Contractor shall

defend, indemnify and hold railroad and its affiliates harmless with respect to any fines, penalties, liabilities or other consequences arising from contractor's failure to comply with any such federal, state or local laws, statutes, codes, ordinances, rules and regulations;

8. Contractor shall promptly notify Railroad of any loss, damage, injury or death arising out of or in connection with the project work;
9. The provisions of this Agreement shall survive the termination or expiration of the Agreement;
10. Railroad certifies that it has carefully reviewed the project plans and that it agrees to permit the Contractor and its employees, officers and subcontractors to enter onto and work upon its property for the purpose of completing said project under the terms of this Agreement;
11. Any notices or communications concerning this agreement shall be delivered to the following designated individuals:

Matthew Miller
~~Real Estate Department~~ Manager Public Works
CP Plaza – 120 South 6th Street, Suite 700
Minneapolis, MN 55402
Telephone Number: 612.330.4555
Email: matthew_miller@cpr.ca

For Contractor _____

Address: _____

IN WITNESS WHEREOF, Contractor and Railroad have executed and delivered this agreement as of the date set forth below.

Date

Contractor

Date

Railroad

CANADIAN PACIFIC FLAGMAN REQUEST FORM

(All blanks below must be completely filled in before any flagman request will be processed)

Work Authorization

Right of Entry/Formal Agreement/Utility Permit No.: _____ Executed Date: _____

You must have an agreement with CP such as a Right of Entry or Utility Permit in addition to flagging before you may enter CP property

Prior to excavation on CP property or ROW you must contact the following CP CBYD number to (866) 291-0741 and the State-One call number

Project Information

Submit a detailed map of the location where protection is being requested.

Street Location/Intersection: _____ City/State: _____

Railroad Subdivision & Milepost: _____ GPS Lat/Long: _____ DOT Crossing # _____

Description of work, including type of equipment (Continued on page 2): _____

Location for flagman to report: (Address): _____

Name of Site Contact: _____ Site Contact Phone: (____) ____ - _____ 24/7 Emergency Contact: (____) ____ - _____

Requested Dates/Times

Minimum 15 business days advance notice required.

Dates requested are subject to flagman availability Total Days of Flagging Needed to Complete Project: _____

Preferred Dates for Flagging Protection: _____ to _____ or _____ to _____

Anticipated Starting time: _____ Anticipated Ending Time: _____ Anticipated # Hours per Day: _____

Flagmen start and end time may vary based on type of protection required

IMPORTANT: Amount of time to be clear of track (15' FROM TRACK) upon request: (Minutes) _____

NO TRACK OUTAGES ALLOWED

ROE/License/Utility Agreement fees MUST be received before Flagman Protection will be provided.

There is an 8 hours of flagging minimum per day. Please note that flagging charges are approximately \$1200.00 per day for an 8 hour day. Invoices will be sent after the project is completed. Checks should be made payable to the railroad D/B/A listed on your Right of Entry/Permit/License or Formal Agreement.

Overtime will need to be authorized. Additional overtime hours will be paid at the appropriate rate. Weekends and Holidays will be billed at the overtime rate. Normal flagman hours are currently from 8:00 am to 4:00 pm.

Prior to ANY excavation on CP property or ROW you must contact the following CP CBYD number to (866)291-0741 and the State-One call number to ensure that all underground facilities are located. Prior to flagging contractor must provide State One Call Ticket Number and CP Call Before You Dig Ticket Number.

Billing Information

All blanks spaces must be filled out

Company Name: _____ Contact Name: _____

Billing Address: _____

City: _____ State: _____ Zip: _____

Company Phone: _____ Company Fax: _____ E-Mail: _____

THIS COMPLETED FORM MUST BE EMAILED WITH A MAP, AND COI TO: **Kyle_Spree@CPR.CA**
PAYMENT CHECK(S) be mailed to Kyle Spree - 120 South 6th St, Suite 700 Minneapolis, MN 55402

I agree to pay for flagging services as requested: _____

(Signature)

CANADIAN PACIFIC FLAGMAN REQUEST FORM

(Page 2 of 2)

Prior to any project being started, Canadian Pacific requires a “Flagman Request Form” to be completed and submitted. You must have an agreement with a CP railroad, such as but not limited to a Right of Entry, Utility Permit, License, Easement, or Formal Agreement in addition to any necessary flagging before you may enter CP property. All Right of Entry, Permit, License, or Utility Agreement fees MUST be received before Flagman Protection will be provided.

All Utilities or Third-Party Contractor’s must follow the policies laid out in “Canadian Pacific’s Minimum Safety Requirements for Contractors Working on CP Property in the United States.” Please refer to the attachments of your ROE, Permit, or formal agreement for that document.

In Case of Emergency on or near CP property, please contact 1-800-716-9132.

Utility and Gas Line Locates on CP Property

A Utility locate on CP may be required prior to the start of any work based on disturbance of soil on CP property. The purpose of Utility locates is to identify and protect Signal & Communication cables that have been installed to provide power, signal control, and wayside communications. These cables are vital to a safe and reliable railroad operation. The Utility locate will be performed by a qualified CP Signal & Communications employee. A CP CBYD ticket number will last 14 days.

Prior to excavation on CP property or ROW you must contact the following CP CBYD number (866) 291-0741 and the appropriate State-One call number to ensure that all underground facilities are located and marked.

Work Description (Continued from Page 1)

Please provide a detailed description of work you are seeking to perform. Also, please submit a detailed map of the location where protection is being requested: _____

General Information

Outside contractors are prohibited from driving on, along, or across any track that does not have a CP installed crossing. They may utilize an existing public crossing. The practice of allowing rubber tired equipment to operate over track with no crossing is strictly prohibited. Exceptions to this rule will require the express approval from CP Engineering Department.

A utility or contractor shall not commence, or carry on, any work for installation, maintenance, repair, changing or renewal of any facility, under, over, on, or near railroad property at any United State CP location without giving notice to the CP Public Works Department at the railroad’s office located at Minneapolis, MN.

A qualified CP flagman is required any time any work is performed; under or across any railroad track, regardless of whether a contractors work involves a physical presence on the surface of the railroad property; on the surface of the railroad property within fifty (50) feet horizontally of the centerline of any CP railroad track; or on, near, or over railroad property if the work may potentially encroach (intentionally or unintentionally) within fifty (50) feet from the centerline of any CP railroad track. Causes of potential encroachment include but are not limited to equipment that has the potential to SWING, pivot, extend or mechanically fail. Potential encroachment must also account for a distance of one-half the length of the largest load that any equipment may lift. Additionally, CP reserves the right to require a flagman for work on Railroad property not meeting the above criteria when there are other conditions or considerations that would indicate the need for a flagman to safeguard Railroad’s operations, property, and safety of any person.

Best Regards,

Kyle Spree
Supervisor Public Works
120 South Sixth Street, Suite 700
Minneapolis Minnesota 55402
651.495.9521 - Kyle_Spree@cpr.ca



Minimum Safety Requirements for Contractors Working on CP Property in the United States



Approval Authority:	Corporate Risk	Effective Date:	October 1, 2018
Version:	3.0	Revision Date:	October 1, 2021

Table of Contents

Table of Contents	2
Introduction	3
1 Application	3
2 Definitions and Interpretation.....	3
3 Contractor Compliance & Responsibilities	5
4 Site Safety Plans	7
5 Safety Training.....	7
6 Safety Orientation.....	7
7 Safety Job Briefing	7
8 Applicable Legislation.....	8
9 Security Access to CP Property	9
10 Personal Conduct.....	10
11 Personal Protection.....	12
12 Railroad Track Protection.....	133
13 HAZCOM.....	17
14 Operation of Highway Vehicles	18
15 Tools, Equipment and Machinery	19
16 Emergency Response	21
17 Confined Space	23
18 Reportable Accidents, Incidents and Injuries	23
19 Reporting	24
20 Contractor & Contractor Personnel Acknowledgement	25
21 Attachment A - Emergency Information Sheet	27

Introduction

At Canadian Pacific (CP), safety is an integral part of the way we do business. We expect everyone working on Canadian Pacific's property to be unconditionally committed to safety. Safety must be given top priority and will take precedence over deadlines, production schedules, and all other considerations.

1 Application

1.1 Application

- 1.1.1 These Minimum Safety Requirements are applicable to all who work on CP property (except as noted in 1.13 and 1.14 below) including Contractors and other persons performing Work or otherwise providing services to Canadian Pacific on CP Property in the United States.
- 1.1.2 These Minimum Safety Requirements cannot be waived or altered, in whole or in part, without a prior Risk Assessment specific to the Work being conducted, and written consent has been provided by Manager-in-Charge.
- 1.1.3 Notwithstanding the foregoing, these Minimum Safety Requirements do not apply to other railroad companies who only operate trains on CP Property under various trackage or interchange agreements.
- 1.1.4 Further notwithstanding the foregoing, these Minimum Safety Requirements may not apply to Work or services provided in CP office premises, in which case, CP's Minimum Safety Requirements for Contractors Working in CP Offices may apply.

2 Definitions and Interpretation

2.1 Definitions

- 2.1.1 In these Minimum Safety Requirements, the following capitalized terms shall have the ascribed meaning below:
 - (a) **"Applicable Legislation"** means all applicable legislation, regulations, by-laws, codes, rules, standards, policies, procedures, promulgated by any federal, state, and municipal governmental body, including those of its agencies, having authority over CP and, or a Contractor in relation to the Work in the matter of health and safety of the person, property and, or the environment;
 - (b) **"Canadian Pacific"** or **"CP"** means Canadian Pacific Railway Company Ltd., and its subsidiaries and affiliates, and includes each of their respective directors, officers, employees, agent, and representatives;
 - (c) **"CP Personnel"** means CP's employees, agents, and representatives;
 - (d) **"CP Property"** means any building, facility, yard, track, right of way or other property owned or controlled by CP;
 - (e) **"Contractor"** means the company or person, and their respective employees and authorized agents, representative and subcontractors who are providing goods or services to CP; or on behalf of a third party working on CP property.
 - (f) **"Contractor Personnel"** means the Contractor's employees, and authorized agents, representative and subcontractors;
 - (g) **"Co-mingled Work"** means Work where Contractor Personnel works directly with or, in close proximity (time or space) to CP Personnel;

- (h) **“eTest”** an efficiency test. It is a planned procedure to evaluate compliance with rules, instructions and procedures, with or without the employee's knowledge.
- (i) **“Foul of Track”** means the placement of an individual or equipment within 4’ feet of the outside rail of a railway track that could be struck by a moving train or on- track work equipment (e.g. Hi-rail equipment).
- (j) **“Hazardous Materials”** means any substance, which is hazardous to persons or property and includes, without limiting the generality of the foregoing:
 - (i) radioactive, explosive, poisonous, or toxic substances;
 - (ii) any substance that if added to any water, would degrade or alter the quality of the water to the extent that it is detrimental to its use by man or by any animal, or plant;
 - (iii) any solid, liquid, gas or odor or combination of any of them that, if emitted into the air, would create or contribute to the creation of a condition of the air that endangers the health, safety, or welfare of persons, or the health of animal life, or causes damage to plant life or to property; and
 - (iv) substances declared to be hazardous, toxic or dangerous under any law or regulation now or hereafter enacted by any governmental authority having jurisdiction.
- (k) **“Manager-in-Charge”** means a CP manager as designated or otherwise identified by CP as being responsible for overseeing the Work to be performed, such Manager-in-Charge may include, but is not limited to Local CP Management, Superintendents, Chief Engineers, and Project Managers.
- (l) **“Mobile Equipment”** means any motorized and self-propelled equipment, excluding railroad equipment and highway vehicles, but including, for example, forklifts, tractors, cranes, ATVs, mules, motorized scissor lifts, telescopic boom lifts, and similar equipment that are not designed to operate or move on railroad tracks;
- (m) **“Office Premises”** means any building, facility, or portion thereof, or other premises, whether owned or controlled by CP, which is used solely for clerical or administrative purposes and which does not contain heavy equipment or machinery, as designated by CP from time to time;
- (n) **“Qualified and Authorized”** means a status attained by a person who has successfully completed any required training and demonstrated proficiency in the duties of a particular position or function and who has been given the right to act.
- (o) **“Railroad Equipment”** means trains, locomotives, railcars, on track equipment (track units), hi-rail vehicles and any other equipment designed to operate or move on railroad tracks;
- (p) **“Site Safety Plan”** means a documented plan which set out how Work is to be conducted in a safe manner, as required by Applicable Legislation, see 3.15 c);
- (q) **“Third Party Project”** means any work being performed on CP property that CP is not managing (i.e, road authority, utility company, commuter agency, or other similar entity, are on CP property for their own purposes, and not a project sponsored or managed by CP.
- (r) **“Work”** means the provision of products and services and related activities;
- (s) **“Work Site”** means any CP Property where CP Personnel or Contractor Personnel are present, or permitted to be present, while engaged in any Work, including any railroad equipment, mobile equipment and highway vehicles operated by or used to convey a person engaged in such Work. This applies also to work immediately adjacent to CP property which can pose a risk to safe railway operations (i.e., blasting, excavation next to ROW, etc).

2.2 Interpretation & Application

- 2.2.1 Where legislation is referred to in these Minimum Safety Requirements, it shall include all amendments and replacements thereto as promulgated from time to time.
- 2.2.2 Where standards, such as those of the American National Standards Institute (ANSI), are referred to in these Minimum Safety Requirements, they shall include all amendments and replacements thereof from time to time.
- 2.2.3 Where there is any ambiguity, inconsistencies, or omissions between or among any agreements with CP, expressed or implied; any Applicable Legislations; any applicable CP policies and practices; and any applicable industrial standards and practices, Contractor and Contractor Personnel shall adhere to that which is most stringent and current.

3 Contractor Compliance & Responsibilities

3.1 General Compliance

- 3.1.1 Contractor shall be fully and solely responsible for ensuring the health and safety of Contractor Personnel and for ensuring that its Work and other activities do not compromise the health and safety of CP Personnel or any other party, the protection of the environment, the protection of CP's property and those of any other party, and do not interfere with the safety of CP's railroad operations.
- 3.1.2 Contractor shall comply with and shall ensure all of Contractor Personnel are trained and qualified to safely perform the Work and that they comply with all Applicable Legislation pertaining to the protection against fire, safety, health, and environmental hazards, and with any license, permits, authorizations issued by the respective authority. Contractor shall provide CP with written certification that Contractor's safety program required by 49 CFR Part 243 has been approved by the Federal Railroad Administration (FRA) where applicable.
- 3.1.3 Contractor shall comply with and shall ensure all of Contractor Personnel comply with all terms and conditions of all agreements, expressed or implied, between Contractor and CP, and all applicable CP policies and practices.
- 3.1.4 Subject to the requirements of CP's Access Control Procedures, the contractor shall provide CP eRailsafe training for each employee engaged in work on CP property. Where there is no agreement between CP and the Contractor, the Contractor is responsible for meeting the additional requirements outlines within CP's Access Control Procedures.
- 3.1.5 Contractor shall provide Contractor Personnel, at its own expense, any and all safety equipment required to protect against injuries during the performance of the Work and shall ensure that Contractor Personnel are knowledgeable of and utilize safe practices in performing the Work.
- 3.1.6 The Contractor shall have a copy of the following documents at the Work Site at all times, and shall produce them as and when requested by CP:
 - (a) These Minimum Safety Requirements for Contractors Working on CP Property;
 - (b) Licenses, certifications, permits, training records or other documents required by Applicable Legislation or these Minimum Safety Requirements;
 - (c) Contractor's Site Safety Plan;
 - (d) Contractor's Emergency Information Sheet (see Attachment A); and
 - (e) Any additional documents required by Contract or by agreement with Manager-in-Charge.
 - (f) Employee identification (eRailsafe badge – see 9.1.1).

3.2 Compliance Assurance

- 3.2.1 CP reserves the right to observe, inspect, test and audit Contractor and Contractor Personnel for compliance with all requirements herein, and to demand and receive all relevant records, documentation, and materials evidencing compliance, at any time, and from time to time.
- 3.2.2 Failure of the Contractor or Contractor Personnel to comply with any applicable provisions herein may be considered a material breach, and in addition to all other remedies available, CP may without prejudice:
 - (a) take over control of that Work or activity;
 - (b) order the Work to stop; and/or
 - (c) order Contractor Personnel to leave CP Property.
- 3.2.3 Upon the earlier of the completion of the Work, the expiration of the applicable agreement, or the request of a Manager-in-Charge, Contractor and Contractor Personnel shall return all identification, badges, access cards, and decals, issued or provided by CP to the Manager-in-Charge.

4 Site Safety Plans

4.1 General Requirements

- 4.1.1 Prior to starting any Work on CP Property, the Contractor must have a written Site Safety Plan that identifies:
 - (a) All applicable legislation, rules, policies and work practices in relation to the work being performed;
 - (b) Specific hazards that are associated with the Work being performed on CP property for CP, and Work being performed not for CP:
 - for example:
 - (i) Construction, maintenance or inspections of buildings;
 - (ii) Working on or adjacent to railroad tracks;
 - (iii) Maintenance or inspection or railroad tracks, crossings or signal systems;
 - (iv) Operating Railroad Equipment on CP tracks; or
 - (v) When/where Contractor Personnel work directly with or in proximity (time or space) to CP Personnel; and
 - (c) Methods of verifying compliance.
- 4.1.2 The Contractor will provide Manager-In-Charge with a copy of this Site Safety Plan on reasonable request.
- 4.1.3 The Contractor must be able to demonstrate an awareness of applicable legislation, rules, policies and work practices in relation to the work being performed.

5 Safety Training

5.1 Minimum Training & Qualifications

- 5.1.1 At its sole cost and expense, Contractor shall ensure that all Contractor Personnel be fully trained and qualified for the Work they will be performing. Contractors and Contractor Personnel shall meet, or exceed, all Applicable Legislation requirements relating to training and qualification, including but not limited to the requirements of 49 CFR Part 243.
- 5.1.2 Additionally, Contractor Personnel training and qualification shall meet or exceed all applicable industry standards.

5.2 Proof of Training & Qualification

- 5.2.1 Contractor Personnel shall at all times have proof of such training and qualifications and shall produce them as and when requested by the Manager-in-Charge.
- 5.2.2 CP reserves the right to inspect qualification certificates, licenses, training records and/or Work-history records for any Contractor Personnel, and, or to be provided with copies thereof, on reasonable request. In addition, CP reserves the right to perform eTests on contractor employees, and request discipline for non-conformance.

6 Safety Orientation

6.1 General Requirements

- 6.1.1 Prior to beginning Work, all Contractor Personnel shall participate in a CP authorized safety orientation, including on-site orientation presented by the Manager-in-Charge or designate.
- 6.1.2 Any time the scope of Work, location, condition or supervision changes, Contractor Personnel may be required to attend additional safety orientation sessions.
- 6.1.3 After successful completion of such safety orientation, Contractors must be able to produce company identification or an eRailsafe photo identification badge authorizing access to CP property unescorted for the purposes of conducting work. Managers have the ability to enter the tracking code into CM (Compliance management). Third parties who hire subcontractors must ensure required compliance while on CP property. The eRailsafe identification card shall be worn or be made visible at all times, or produced upon request and cannot be transferred under any circumstances.

7 Job Safety Briefing

- 7.1.1 Contractor Personnel shall attend all Job Safety Briefings as and when conducted. Contractor Personnel shall be solely and fully responsible for understanding the content of the Job Safety Briefing, and at a minimum shall:
 - (a) have an understanding of the scope of Work to be performed and an appreciation of the nature of the location, environment, and conditions where such Work is to be performed;
 - (b) be aware of specific or unusual hazardous condition, existing or potential and the control measures required to protect against, control, mitigate, or where possible, avoid said hazard; and
 - (c) have an emergency response plan/evacuation procedures.

- 7.1.2 Where Contractor Personnel are working directly with or in proximity (time or space) to CP Personnel, job safety briefings must include both CP Personnel and Contractor Personnel, and any other affected third parties. The job safety briefing shall identify nature and extent of the interaction between the Work being performed by Contractor Personnel, and those performed by CP Personnel or other third parties. Contractor Personnel shall inform CP Personnel, and any other third parties of known or potential unsafe conditions and hazards that may be created by, resulting from, or inherent in their Work and the corresponding preventative, mitigation, and/or control measures at all job briefings prior to commencing Work, or as soon as Contractor Personnel becomes aware of such conditions.
- 7.1.3 In all situations, all Contractor Personnel are expected to:
- (a) continually identify hazards and assess risk of hazards and to continually and clearly communicate all hazards to the Manager-in-Charge and to all other parties that may be affected at job safety briefings, and at any other time as and when appropriate or necessary;
 - (b) take actions that are within their assigned responsibility to eliminate or control hazards and risks; and
 - (c) immediately notify their supervisor or the Manager-in-Charge of hazards that pose unacceptable risk that they are unable to eliminate or control.
- 7.1.4 Where Contractor Personnel are unable to eliminate or control a hazard, Contractor Personnel shall take interim measures to protect people, property, equipment and the environment until the hazard can be properly assessed and appropriate corrective actions taken.

8 Applicable Legislation

8.1 General Requirements

- 8.1.1 Contractor and Contractor Personnel shall be solely responsible for identifying and complying with all Applicable Legislation. At a minimum, Contractor and Contractor Personnel shall comply with the federal legislations set out below which list is intended solely for general guidance, and not as a comprehensive list of all Applicable Legislation.
- 8.1.2 Additionally, the Association of American Railroads (AAR) is an industry association which can provide support and guidance on matters related to railroad safety and the transportation of hazardous materials.

8.2 Transportation of Hazardous Materials

- 8.2.1 When Work involves the handling or transportation of hazardous materials (hazmat), that Work must comply with Hazardous Materials Transportation Act and regulations administered by the Pipeline and Hazardous Materials Safety Administration (PHMSA).
- 8.2.2 Contractors shall be solely responsible for ensuring that all Contractor Personnel who handles, offers for transport and/or transports hazmat by any transportation mode are trained and hold a valid training certificate or is working under the direct supervision of someone who is trained and holds a valid training certificate. That training must be based on the Work that the person is expected to perform and the hazmat that the person is expected to handle, offer for transport or transport.
- 8.2.3 All U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) regulations are published in Chapter I of title 49 of the Code of Federal Regulations (49 CFR).

8.3 Railroad Work

- 8.3.1 When Work involves the construction, alteration, operation, inspection and maintenance of any part of the general railroad system of transportation, that Work must comply with the Federal Railroad Safety Act and regulations administered by the Federal Railroad Administration (FRA).
- 8.3.2 Contractors shall be solely responsible for ensuring that all Contractor Personnel who perform railroad Work are trained and qualified in accordance with those regulations and hold valid certificates when required.
- 8.3.3 All FRA regulations are published in Chapter II of title 49 of the Code of Federal Regulations (49 CFR).

8.4 Occupational Safety & Health

- 8.4.1 Any Work being performed that may create a risk to the health and safety of any person, including CP Personnel and Contractor Personnel, when not covered by FRA regulations shall be governed by U.S. Department of Labor regulations administered by Occupational Safety and Health Administration (OSHA).
- 8.4.2 All OSHA regulations are published in Chapter XVII of title 29 of the Code of Federal Regulations (29 CFR).

8.5 Environmental Protection

- 8.5.1 Where Work is being performed that may impact the environment, that Work must comply with all applicable federal state, and local government legislation, regulations and standards.
- 8.5.2 Federal legislation is generally administered by the Environmental Protection Agency. A compilation of those laws and regulations can be accessed at <http://www.epa.gov/lawsregs/>

9 Security Access to CP Property

- 9.1.1 All Contractor Personnel must have personal identification and/or eRailsafe credentials authorizing access and in their possession at all times while on CP Property, and present them for review to any Manager-in-Charge, other CP managers and employees, Police Officer, security guard, or regulatory officer upon request:
 - (a) photo identification (e.g. driver's license); and
 - (b) proof of employment, document or card; and
 - (c) CP safety orientation certificate; or
 - (d) building access pass issued by CP or third party having control over CP premises; or
 - (e) CP security photo ID card or badge; or
 - (f) other proof of safety orientation and access authorization issued by CP.
 - (g) Valid eRailsafe card
- 9.1.2 Where any Work requires Contractor Personnel to ride in locomotive or other non-passenger railroad equipment, the Contractor must also possess a CP ACCESS PASS for riding non-passenger railroad equipment, signed by the responsible operating manager. Such a signed pass must be presented to the train crew or operator when boarding the equipment. Failure to possess such a pass will result in the equipment not moving, removal from the equipment, and/or the filing of trespasser charges.

9.2 Security Awareness

- 9.2.1 Contractor shall conduct employee background checks as is necessary to ensure that Contractor Personnel do not pose a security risk to CP, such security risk includes the risk of the commission of terrorist activities, sabotage, vandalism, theft, and violence. CP reserves the right, at all times, to require that Contractors undertake certain security training and/or performs background checks on Contractor Personnel, prior to allowing such Contractor Personnel to enter onto CP Property.
- 9.2.2 On request CP can make available a copy of CP's Railway Security Awareness Program for use by Contractor Personnel.

9.3 Firearms & Explosives

- 9.3.1 Firearms (loaded or empty) are not permitted on CP Property, except for Police officers and other designated government officials when authorized to do so.
- 9.3.2 No explosives will be permitted on CP Property without written approval by the Manager-in-Charge.

9.4 Reporting

Contractor Personnel must report any security concern, security incident, criminal activity (known or suspected), suspicious happenings and/or suspicious persons on CP Property to the Manager-in-Charge or to CP Police Services in accordance with Section 18.

10 Personal Conduct

10.1 Drug and Alcohol Prohibition

CP recognizes the problem of alcohol and substance abuse in today's society. This problem poses particular concerns to an employer who is subject to governmental regulations and seeks to promote the safety of the general public. CP has a concern for the safety, health and well-being of its employees as well as an obligation to comply with the United States Department of Transportation (DOT) and Federal Railroad Administration (FRA) regulations. CP will comply with all statutes and regulations administered by the FRA in implementing the required 49 CFR §219 Drug and Alcohol Program. CP also expects employees of other railroads, visitors or contractors to comply with this regulation while on CP property, consistent with federal regulations. If subject to this regulation, Contractor shall be solely responsible for compliance with the 49 CFR Part 219. Contractor shall provide CP with proof of its compliance prior to performing services for CP and continued proof of compliance must be provided to CP immediately upon request. This proof of compliance will include, but will not be limited to, a copy of the 49 CFR §219 Drug and Alcohol Program Plan and FRA Approval Letter and Continued Certification of Compliance and Statistical Reporting. Periodic audits to ensure compliance with these regulations may be performed and cooperation and compliance is expected upon request.

If subject to other DOT modalities and regulations, such as the Federal Motor Carriers Safety Administration (FMCSA), compliance of that modality's drug and alcohol program guidelines will be required and periodic audits to ensure compliance with these regulations may be performed and cooperation and compliance is expected upon request.

- 10.1.1 Entry onto CP Property when in possession of, or under the influence of alcohol, intoxicants, narcotics, or controlled substances is strictly prohibited. Controlled substances include all Schedule 1 drugs (such as marijuana and "medical marijuana") and synthetic/designer drugs and/or any intoxicants or products labeled "not intended for human consumption".
- 10.1.2 The sale, trade, and/or offer for sale alcohol or controlled substances are prohibited.

- 10.1.3 Additionally, Contractor Personnel shall be free of any condition which may in any way adversely affect alertness, concentration, responsiveness, or the ability react calmly and responsibly to safety hazards.
- 10.1.4 CP reserves the right to request drug and/or alcohol tests for Contractor Personnel as and where required or permitted by law.

10.2 Inappropriate Behavior

- 10.2.1 CP is committed to maintaining a work environment that supports the dignity of all individuals. No person working at CP may be subjected to any form of discrimination or harassment, including sexual harassment.
- 10.2.2 Acts or threats of violence are unacceptable at all times on CP Property. Uttering of threats or committing acts of violence will result in the removal of the responsible Contractor Personnel from CP Property, termination of the Contract, and/or criminal charges.
- 10.2.3 Horseplay, practical jokes, fighting or any other activity that may create a safety hazard is not permitted.

10.3 Electronic Entertainment and Communication Devices

- 10.3.1 The use of personal entertainment devices, including portable audio and video devices such as compact DVD, CD, video game players, tablets, SMART watches and MP3 players, is prohibited:
 - (a) while Working on CP Property;
 - (b) while transporting CP Personnel, whether on and off CP Property; and
 - (c) while operating any CP highway vehicle, railroad equipment or mobile equipment, whether on and off CP Property.
- 10.3.2 The use of electronic communication devices, including cell phones, Smart Phones, Blackberries, walkie-talkies, PDAs, iPads, Tablets, GPS navigation units, portable computers, and similar devices, is prohibited:
 - (a) while operating any highway vehicle, unless it is stopped and parked in a safe location;
 - (b) while transporting CP Personnel, whether on and off CP Property;
 - (c) while operating or assisting in the operation of any railroad equipment or mobile equipment;
 - (d) while operating power tools, equipment or machinery;
 - (e) when Foul of Track for any reason;
 - (f) wherever use is prohibited by signage or by a CP manager; or
 - (g) whenever use of such a device creates an unsafe condition.
- 10.3.3 Notwithstanding the foregoing, company cell phones, radios, walkie-talkies, GPS units, iPads, tablets and other communication devices may be used solely for the conduct of business when authorized by the CP Manager-in-Charge and where not prohibited by state or municipal legislation. Any electronic communication device may be used when it is necessary to communicate an emergency condition.

10.4 Smoking

- 10.4.1 Smoking, including the use of e-cigarettes is prohibited on all CP Property, and in or on all highway vehicles, Railroad Equipment, and Mobile Equipment, except for CP designated outdoor smoking areas.

11 Personal Protection

11.1 Work Clothing

11.1.1 The Contractor must ensure that Contractor Personnel wear clothing that meets applicable legislation and is suitable to perform the work safely. This includes at minimum ankle length pants and waist length shirts with a minimum quarter-length sleeves at all times. Clothing must not interfere with vision, hearing or use of hands and feet.

11.2 Personal Protective Equipment (PPE)

11.2.1 The Contractor shall ensure that Contractor Personnel wear personal protective equipment required by applicable legislation, regulations, codes and industry standards as necessary to protect against personal injuries while on railroad property. All personal protective equipment shall meet applicable legislation and American National Standards Institute (ANSI) standards and shall be in good condition and be properly fitted.

11.2.2 The following mandatory personal protective equipment (“PPE”) shall be supplied by the Contractor at its own expense, and shall be worn at all times by Contractor Personnel while on CP Property:

- (a) safety hard hat, meeting ANSI 89.1 standards, except in office buildings or in enclosed vehicles or equipment;
- (b) safety footwear with protective toe caps and puncture resistant soles, meeting ASTM F2413 standards.
- (c) safety glasses with permanently attached side shields meeting ANSI Z87.1 standards in office buildings or enclosed highway vehicles. Note- transition lenses are not permitted;
- (d) high visibility fluorescent outerwear with retro reflective striping meeting ANSI 107 Class 2 standards not covered by other clothing or equipment, except where necessary for safety reasons such as where fall protection or pole climbing equipment is being used; and
- (e) any other PPE as required by applicable legislation or referenced standard, or as otherwise required to protect Contractor Personnel from injuries.

Type of Protection	Additional Recommendations
Hard Hats	Have hi-visibility characteristics which are not obscured by markings or decals
Safety Eyewear	Tinted safety eyewear must meet military standards for red signal recognition if operating railroad equipment (safety eyewear meeting this requirement is available from ORR Safety; ask for CP approved tinted safety eyewear) Transition lenses are discouraged and should be worn with caution when working in changing light conditions Personal sunglasses are discouraged and must not be worn when operating Railway Equipment Wear mesh face shields over top safety glasses when using any striking tool while performing on track maintenance work (e.g. spiking, snapping on/off anchors, etc.). If working alongside CP employees you will be required to comply with this practice.
Safety Footwear	Have defined heels Be laced and tied securely for ankle support When snow and ice conditions are present wear anti-slip winter footwear
High-Visibility Apparel	Lime-green is recommended when working on, or near tracks, or when performing Co-mingled Work

- 11.2.3 Contractor and Contractor Personnel shall be solely and fully responsible for assessing the risks related to the work and determining whether additional PPE may be required such as:
- (a) Nomex or Proban fire-retardant protective gear when performing certain Transportation of Dangerous Goods (TDG) work and/or handling certain Hazardous Materials, or performing specialized work.
 - (b) hearing protection when working in any area where noise exposure levels:
 - (i) are consistently equal to or greater 85 dBA;
 - (ii) exceed 115 dBA at any time; and
 - (iii) any other work areas where posted, or so notified by CP management.
 - (c) respiratory protection where Contractor Personnel may be exposed to occupational dusts/particulates, fumes, mists, gases and vapors, in which case, in which case Contractors must have a written Respiratory Protection Program that meets or exceeds applicable legislation;
 - (d) additional eye and face protection meeting ANSI standard Z87.1 (i.e. face shields, impact/splash goggles, welding/cutting goggles and welding helmets); and
 - (e) fall protection systems and equipment meeting appropriate ANSI Z359 standards as required by applicable legislation and as appropriate for the related fall hazards.
 - (f) fall protection when working on an unguarded surface over water, where the water is deeper than 4 feet, or where there is a hazard of drowning due to terrain, winter conditions, water velocity or current; contractors must use a fall protection system or a personal floatation device (PFD) meeting approved standards.

12 Railroad Track Protection

12.1 Contractor's Responsibilities for the Protection of Railroad Traffic and Property

- 12.1.1 Where the Work Site is in close proximity to, or is located on, above, or below railroad tracks, special attention, care and precautions shall be taken to ensure the safety of all Contractor Personnel, CP Personnel, all other third parties and to protect CP's property and railroad operations.
- 12.1.2 Contractor shall ensure that Contractor Personnel is made aware of all unique and inherent hazards in working near, on, above or below railroad tracks and shall ensure that all Contractor Personnel are fully trained and equipped to work safely.
- 12.1.3 Contractors who perform inspection, maintenance or repair to railroad tracks or track structures must be trained in accordance with FRA On Track Safety Rules (FRA 49 CFR Part 214, Subpart C - Roadway Worker Protection Regulations).
- 12.1.4 Contractors will not be allowed to foul a track unless:
- (a) They have been properly advised of the On Track Safety awareness procedures;
 - (b) A railroad employee who is qualified to provide protection is present at the work site, or.
 - (c) The Contractor has personnel present who are specifically trained, qualified and authorized to provide that protection.
- 12.1.5 All work shall be organized or executed in such a manner as to ensure no interference with the regularity and safety of railroad operations. No step or sequence of any Work that might directly

or indirectly affect the safe movement of railroad traffic shall be started without the approval of the Manager-in-Charge.

- 12.1.6 No temporary structure, materials, or equipment shall be permitted closer than 12 feet to the nearest rail of any track without prior approval in writing of the Manager-in-Charge.

Contractor Personnel shall at all times remain alert to the movement of trains, rolling stock and other railroad equipment.

- 12.1.7 Contractor Personnel shall be especially alert in yards and terminal areas as

- (a) Railroad equipment that appears to be stationary may be moving;
- (b) the rate of movement of railroad equipment may be faster than it appears;
- (c) Railroad equipment change tracks often; and movements may be occurring simultaneously on adjacent tracks.

- 12.1.8 The Contractor shall, at all times, conduct its operations in a wholly responsible manner to avoid damage to the CP's tracks or property.

12.2 50 feet Clearance Requirement

- 12.2.1 All work shall be performed as far away from railroad tracks as possible.

- 12.2.2 Unless authorized by CP, Contractor Personnel, equipment, and vehicles are not permitted to be within 50 feet of the closest track centerline.

- 12.2.3 In the event work must be carried out within 50 feet of the closest track written authorization must be obtained from the Manager-in-Charge, and Contractor Personnel must still remain at the maximum practicable distance from all railroad tracks at all times.

- 12.2.4 When crossing tracks, Contractor Personnel shall ensure a minimum of 50 feet separation between standing railroad equipment, stay at least 15 feet away from the end of the nearest equipment, and look both ways before crossing tracks, and if clear, walk at a right angle to the tracks.

- 12.2.5 No work activities or processes are allowed within 50 feet of the track while trains are passing through the work site unless specifically authorized.

12.3 Flagging Protection

- 12.3.1 When the Work requires Contractor Personnel to be within 50 feet of any railroad tracks, Contractor or Contractor Personnel shall notify and obtain the written approval of the Manager-in-Charge in advance of the intended start date, and when approved, shall only perform Work strictly in accordance with all terms and conditions of that approval.

- 12.3.2 Unless otherwise indicated by the Manager-in-Charge, proper protection against the movement of trains, rolling stock and other railroad equipment shall be deemed required at all times whenever Work or Contractor Personnel must be within 50 feet of the closet track. Protection may be provided only by a qualified CP employee through use of a flag person.

- 12.3.3 Where CP determines that flagging is required, then Work must be strictly conducted under the direction of a CP flag person or such other person designated by the Manager-in-Charge.

- 12.3.4 Contractor Personnel shall ensure that there is clear communication at all times between Contractor Personnel and any CP flag person. Contractor Personnel shall ensure that they are aware of:

- (a) flagging distance limits;
- (b) time limits; and
- (c) any adjacent tracks where movement of railroad equipment may still occur.

- 12.3.5 Contractor Personnel shall not assume that a train movement is being stopped or cleared unless clear communication is received directly from the CP flag person.
- 12.3.6 A job briefing between the CP flag person and all Contractor Personnel must occur before beginning any Work on or Foul of Track.
- 12.3.7 Blue signal protection is used to indicate that CP or Contractor Personnel are working on, under or between railroad equipment and movement of trains or other railroad equipment is prohibited. Blue signals must not be tampered with or obstructed. Blue signals can only be removed by the person or group of persons who originally applied it. Application, use, and removal of blue signals, when appropriate, may only be done under the authorization and guidance of the Manager-in-Charge.
- 12.3.8 Red flag protection is used to indicate that CP or Contractor Personnel are working on or foul of track, or the track is out of service and movement of trains or other railroad equipment is prohibited. Red flags must not be tampered with or obstructed. Application, use, and removal of red flags, when appropriate, may only be done under the authorization and guidance of the Manager-in-Charge.

12.4 Working on or near Tracks

- 12.4.1 When authorized to perform Work foul of track or otherwise be near railroad tracks, Contractor Personnel shall ensure all Contractor Personnel, equipment, and vehicles are kept as far away from railroad tracks as practicable, and shall at all times:
- (a) be alert to train movements and shall expect the movement of trains, engines, cars, or other mobile railroad equipment at any time, on any track, and in any direction, even if they appear to be stationary or in storage;
 - (b) not rely on others to protect them from train movement;
 - (c) stay at least 15 feet away from the ends of railroad equipment when crossing the track;
 - (d) ensure a minimum of 50 feet separation prior to crossing between Railroad Equipment;
 - (e) look both ways before crossing tracks, and if clear, walk at a right angle to them.
 - (f) never climb on, under or between railroad equipment;
 - (g) be aware of the location of structures or obstructions where track clearances are close;
 - (h) not stand on the track in front of an approaching engine, car or other equipment;
 - (i) stand at least 20 feet from the track(s) when there is a passing movement of trains, engines, cars, or other mobile railroad equipment, to prevent injury from flying debris or loose rigging and shall observe the train as it passes and be prepared to take evasive action in the event of an emergency;
 - (j) not stand on or between adjacent tracks in multiple track territory when a train is passing;
 - (k) not walk, stand or sit on the rails, between rails or on the end of ties, unless absolutely necessary. As the rail surface can be extremely slippery, personnel must step over the rails when crossing tracks. Personnel shall also be aware railroad ties can also be slippery and that railroad ballast can shift while walking on top of it. Situational awareness and use of proper footwear is important;
 - (l) not remain in a vehicle that is within 50 feet of a passing train unless specifically authorized, or where this is not possible.
 - (m) keep away from track switches as remotely operated switch points can move unexpectedly with enough force to crush ballast rock. Personnel shall stay away from any other railroad devices they are unsure of. Personnel shall not disturb or foul the ballast at any time.

- (n) Third party work that has a potential to impact rail traffic must take into account machine swing radius, vertical grade differences, overhead work, etc to ensure it will not impact a passing train; work and equipment must maintain a distance of 50 feet of a passing train.
- (o) When exiting on track machinery as trains are passing; exit on the opposite side.
 - (a) use 3-point contact when getting on/off any vehicle, equipment or track unit;
 - (b) face the vehicle or equipment/track unit when getting on/off
 - (c) place handheld items onto equipment/track unit or seek help prior to getting on/off
 - (d) get on/off on the operators side when possible

12.5 Equipment on or near tracks

- 12.5.1 Contractor Personnel shall not be Foul of Track with any piece of equipment without a CP flag person or other authorized track protection;
- 12.5.2 Contractor Personnel shall not move equipment across the tracks except at established road crossings, or unless under the protection and authorization of a CP flag person and only if the Work Site has been properly prepared for such a move. Tracked equipment will require a CP flag person any time railroad tracks are crossed.
- 12.5.3 Contractor Personnel shall not move equipment across railroad bridges or through tunnels, except as expressly authorized and only under such conditions as stipulated by the Manager-in-Charge.
- 12.5.4 When there is passing rail traffic, Contractor Personnel shall move equipment away from the tracks at least 50 feet, or where not possible, park the equipment as far away from the tracks as possible, exit to the side away from the track where the movement is taking place, and walk to a safe a distance.
- 12.5.5 When there is passing rail traffic, buckets, shovels, and loads on cranes must be lowered to the ground to rest, and cranes without a load must have their load line tightened or retracted to prevent movement.

12.6 Railroad Signs, Signals, Flags and other Communication Infrastructure

- 12.6.1 Signs, signals and flags shall not be obstructed, removed, relocated, disabled or altered in any way without proper authorization and qualification.
- 12.6.2 Only qualified Contractor Personnel who are authorized by CP are permitted to operate switches, derails, electric track mechanisms, signal and communication systems or other track control appliances.
- 12.6.3 Railroad pole lines carry electric power and should be treated as any other power lines.
- 12.6.4 The Contractor shall keep all Contractor Personnel informed of current weather conditions. Personnel shall stay alert for possible high water conditions, or flash floods. During severe weather conditions:
 - a) Personnel shall be prepared to take cover in the event of a tornado
 - b) Personnel shall not work while lightning is occurring
 - c) If storm conditions arise unexpectedly, Contractor Personnel shall ensure that equipment is in the clear of the tracks and secured before seeking cover. Contractor Personnel shall stay away from railroad tracks when visibility is poor, such as during fog or blizzard conditions.

Any Contractor personnel discovering a hazardous or potentially unsafe condition, which may affect the safe passage of railroad traffic, must advise CP Police immediately by calling the CP Police Communications Centre – 1-800-716-9132

12.7 Excavation

- 12.7.1 Before starting excavation operations, the Contractor shall ascertain that there are no underground wires, fiber optic cables, pipelines or other utilities which could be damaged or, if present, that such installations are properly protected. Fiber optic cables are present on most segments of the right-of-way. Prior to commencing any excavation, the Contractor shall contact the proper authority CP and/or public utility to obtain the necessary permit and to locate and protect such cables or other underground utilities.
- 12.7.2 Excavations shall not be left unattended unless they are properly protected; and the Manager-in-Charge shall be notified.
- 12.7.3 Contractors MUST obtain and maintain utility locates in accordance with applicable law.

13 HAZCOM

13.1 General Requirements

- 13.1.1 If at any time Contractor's Work involves the use, handling, storage, or disposal of Hazardous Materials ("Handling of Hazardous Materials"), Contractor Personnel must inform the Manager-in-Charge.
- 13.1.2 Contractors shall ensure that all Contractor Personnel are fully trained in the Handling of Hazardous Materials and that Contractor and Contractor Personnel are in full compliance with all Applicable Legislation, and as directed by the Manager-in-Charge.
- 13.1.3 Contractor Personnel shall have appropriate processes, systems and controls in place to prevent or otherwise mitigate potential environmental, health and safety risks associated with the Handling of Hazardous Materials.

13.2 Access to Safety Data Sheets (SDS)

- 13.2.1 Prior to beginning any Work that may expose CP Personnel to Hazardous Materials, Contractor or Contractor Personnel shall:
 - (a) provide a copy of the respective SDS to the Manager-in-Charge; and
 - (b) keep a copy of the SDS at the work site and ensure that it is readily available at all times.

13.3 Hazardous Material Incident or Spill

- 13.3.1 In the event of a hazardous material incident or spill, the Contractor must:
 - (a) ensure that no Contractor or CP Personnel have or will be exposed;
 - (b) take all reasonable actions to contain the spill;
 - (c) respond in accordance with its emergency response plan; and
 - (d) notify CP immediately in accordance with Section 18 below.

14 Operation of Highway Vehicles

14.1 Highway Vehicles

14.1.1 The following requirements apply to all highway vehicles, when operated on CP Property; or used to transport CP Personnel.

14.2 Regulations and Inspection

14.2.1 Before using a highway vehicle, Contractor Personnel shall:

- (a) complete a pre-trip inspection;
- (b) maintain an inspection log;
- (c) ensure periodic inspections are completed at official testing locations as required;
- (d) ensure the vehicle is maintained and in safe operating conditions at all times; and
- (e) ensure the vehicle is in compliance with applicable motor vehicle regulations and license requirements.

14.2.2 Vehicle maintenance, inspection records and logs must be made available to the Manager-in-Charge on request.

14.3 Vehicle Operator Requirements

14.3.1 Operation of highway vehicles is restricted to those Contractor Personnel who are licensed, qualified and authorized to do so. Such Contractor Personnel shall be responsible for the safety of all passengers at all times. For greater certainty, such Contractor Personnel shall:

- (a) hold a valid license for the class of vehicle being operated, in accordance with applicable local, state and federal requirements, and
- (b) strictly comply with all posted traffic signs, signals, and all shall obey all applicable legislation; and
- (c) maintain the required driver log, and make the log available to the Manager-in-Charge on request, and
- (d) comply with the requirements on the use of electronic devices as set out in Section 10 above.

14.4 Driving on CP Property

14.4.1 In addition to the requirements set out above, while on CP Property, Contractor Personnel shall:

- (a) travel only on designated roadways unless otherwise instructed;
- (b) keep daytime running lights on (if so equipped);
- (c) not exceed 15 mph unless otherwise posted;
- (d) come to a full stop at all blind corners, rail and roadway crossings;
- (e) yield the right of way to all Mobile Equipment and other non-highway equipment or service vehicles;
- (f) not operate vehicles (or any internal combustion equipment) inside buildings or enclosed structures unless adequate ventilation is provided;
- (g) not park Foul of Track unless on-track protection is provided;
- (h) not leave vehicles running unnecessarily;

- (i) park only in pre-determined or designated areas;
- (j) always use the parking brake (or wheel chocks) when leaving an unoccupied vehicle running; and
- (k) prior to operation of a vehicle the driver must conduct a walk around of the vehicle to identify any obstacles, clearance restrictions, or adjacent vehicles that may interfere with executing a safe movement.
- (l) where safe and practicable, pull vehicles through or back into marked parking spaces to avoid reverse collisions when exiting.
- (m) If a passenger is present, he exit the vehicle prior to a reverse movement to provide guidance and direction to the driver during the reverse movement and applies to commercial vehicles and vehicles with restricted rear views

14.4.2 All Contractor Personnel who will be operating a highway vehicle or Mobile Equipment in any CP intermodal facilities must complete a Driver Safety Orientation program prior to first entry, and from time to time thereafter as directed by the Manager-in-Charge.

14.5 Seat Belts

14.5.1 Seat belts must always be worn while operating or riding in any equipped vehicle unless Contractor personnel is actively engaged in inspections requiring said Contractor Personnel to be free of such restraint, and then only when the vehicle is operating at less than 15 mph.

14.6 Loads

14.6.1 Contractor Personnel shall ensure vehicles are loaded according to weight and dimensional requirements as authorized by state regulations and permits, and properly load and secure tools, material, equipment and freight to avoid shifting, falling, leaking or otherwise escaping from vehicles during operation.

14.7 Riding in CP Vehicles

14.7.1 Contractor Personnel are prohibited from operating or riding in any CP vehicles unless authorized to do so, or in case of emergency.

15 Tools, Equipment and Machinery

15.1 General Safety Requirements Respecting All Tools, Equipment and Machinery

15.1.1 Contractor Personnel shall ensure that all tools, equipment, and machinery used be:

- (a) in compliance with all Applicable Legislation;
- (b) in good working order, properly serviced and maintained;
- (c) safe for their proposed use and used only for purposes specified by the manufacturer;
- (d) operated and maintained only by persons properly trained and qualified for that duty;
- (e) seat belts (if present on equipment) must be worn while operating or riding any such equipped mobile equipment;
- (f) if mobile, equipped with appropriate safety devices (e.g. lights, horns, back-up alarms, safety beacons); and prevented from moving, through use of the hand brake, wheel blocking, wheel chocking and/or a derail, where applicable.

15.1.2 The Contractor shall provide adequate lighting when performing work between sunset and sunrise.

15.1.3 Use of CP tools, equipment and machinery by Contractor Personnel is prohibited unless specifically authorized by local CP management.

15.2 Hazardous Energy Control- Lockout

15.2.1 Contractor Personnel shall employ lockout/tagout procedures as required to eliminate the accidental or unexpected start-up, energizing, or release of stored (residual) energy during maintenance, repair and/or servicing activities.

15.2.2 All tools, equipment and machinery must be made safe and isolated from all energy sources rendering the machine, equipment, or process inoperative prior to performing maintenance, repair or servicing related tasks.

15.2.3 No Contractor Personnel can remove any CP applied lock or tag, including bad-order tag.

15.2.4 Notwithstanding the foregoing, if Contractor's Work may create an energy hazard to any CP Personnel, then all affected parties must follow the requirements set forth in CP's Lockout – Hazardous Energy Control Policy and Code of Practice.

15.2.5 If CP Personnel and Contractors are jointly performing maintenance, repair or servicing activities on the same machine, equipment or using the same energy source, then a multi-lock hasp must be applied with individual locks and tags affixed (as per CP's Lockout – Hazardous Energy Control Policy and Code of Practice).

15.3 Electrical Safety Requirements

15.3.1 In addition to the hazardous energy control lockout requirements above, all electrical Work must comply with Applicable Legislation, National Electrical Code (NEC), and National Fire Protection Association (NFPA) requirements.

15.3.2 Contractor Personnel Working on electrical systems must:

- (a) if in proximity to CP Personnel, inform them of:
 - (i) existing or potential electrical hazards;
 - (ii) any specific additional personal protective equipment that may be required;
 - (iii) applicable safe work practices;
 - (iv) applicable emergency and evacuation procedures; and
 - (v) apply lock out procedures as per section above on Hazardous Energy Control-Lockout
- (b) have practices, procedures and training that comply with:
 - (i) Applicable sections of the NEC and NFPA electrical safety standards;
 - (ii) Any other Applicable Legislation; and
- (c) not operate or allow cranes or other mobile equipment to approach closer to any live electrical power line than is permitted by OSHA regulations (29 CFR 1910.333).

15.4 Lifting Devices

15.4.1 All lifting devices, including but not limited to jacks, cranes, cables, slings, chains and hooks shall:

- (a) meet Applicable Legislation governing design, inspection, maintenance and operation;
- (b) be safety certified and labeled or tagged with load capacity limits where required;

- (c) have sufficient capacity for the planned lift;
- (d) have sufficient footing or support area to properly distribute the load during a lift.

15.5 Welding and Torch Cutting

15.5.1 When welding or torch cutting, Contractor Personnel shall:

- (a) be properly trained and qualified;
- (b) ensure that all closed containers have been properly purged;
- (c) direct flame or sparks away from other Workers, equipment and flammable material;
- (d) have a fire extinguisher readily available;
- (e) keep compressed gas and oxygen cylinders stored in a secure, vertical position, with regulators removed and caps applied, labeled properly and located in vented cabinets or other designated locations.

15.6 Explosive Actuated Tools

15.6.1 Only Contractor Personnel who are qualified and licensed in accordance with Applicable Legislation, and authorized by CP, may use explosives or explosive actuated tools.

15.7 Unattended Equipment or Machinery

15.7.1 Tools, Equipment and Machinery shall not be left unattended at any time and shall not be stored on CP Property, unless expressly permitted pursuant to a written agreement with CP or by the Manager-in-Charge in writing, and where so permitted, Contractor shall ensure that:

- (a) storage shall be restricted to the designated area, or as otherwise specified by CP.
- (b) all such tools, equipment and machinery shall be secured in a safe position well clear of all tracks to prevent accidental contact with trains and moving equipment and to not restrict train crew sightlines;
- (c) as much as possible, tools, equipment and machinery shall be stored in locations out of public view.
- (d) Machines must be secured in accordance with on-track machinery rules.

16 Emergency Response

16.1 Emergency Response Plan

16.1.1 The Contractor must maintain a current emergency response plan and make it available to CP on request. Emergency response plans must include at a minimum:

- (a) contractor reporting procedures in the event of an incident or spill;
- (b) emergency response contacts and phone numbers, including phone numbers for CP incident reporting and local CP managers (See Attachment A); and
- (c) containment measures to be taken in the event of an incident or spill.

16.2 Initial Response

16.2.1 Initial response to any emergency condition must follow the following sequence:

- (a) Protect the safety and security of all individuals and communities
- (b) Provide environmental protection and mitigation
- (c) Conduct incident investigation and evidence preservation
- (d) Restore railroad operations

16.3 First Aid

16.3.1 Contractor Personnel must have sufficient First Aid qualified personnel and the required First Aid kit and any other required First Aid equipment at the Work Site, suitable for the crew size, nature of Work being performed and location, all of which shall, at a minimum, comply with OSHA regulations (29 CFR 1910.266).

16.4 Fire Protection

16.4.1 The Contractor must have appropriate fire extinguishers suitable (i.e., type, size and quantity) for nature of the work being done, in compliance with applicable legislation, and be readily available at all times on:

- (a) the work site; and
- (b) all Contractor equipment, machinery and highway vehicles.

16.4.2 Contractor Personnel shall ensure that all necessary precautions are taken to prevent fires, including the following:

- (a) storing flammable material (e.g., paper, rubbish, sawdust, oily or greasy rags, etc.) in proper containers;
- (b) storing and transporting fuel, gasoline or other flammable liquids in approved containers. Use of unapproved containers is prohibited;
- (c) proper disposal of flammable material daily;
- (d) preventing static electricity when dispensing or transferring flammable liquids by using proper grounding and bonding techniques;
- (e) avoid using cutting or welding torches during the last one-half hour of shifts, if possible;
- (f) taking special precautions with fusees, including:
 - (i) store and transport in approved containers;
 - (ii) do not allow fusees to come in contact with any combustible material, including railroad ties or wooden timbers; and
 - (iii) fully extinguish fusees before leaving the location where used;
- (g) promptly advise CP management of any fire on CP Property; and
- (h) fully extinguish or provide protection for any fire prior to leaving the Work Site.

16.4.3 Contractors Working on the CP right-of-way where a high risk of fire exists (e.g., during rail grinding, rail welding) must have:

- (a) appropriate fire prevention and suppression plans (including emergency numbers for CP, local firefighters and fire control districts); and
- (b) additional firefighting equipment and trained Contractor Personnel on site, as required by Applicable Legislation or the Manage In Charge.

17 Confined Space

17.1 Confined Space

- 17.1.1 Qualified and authorized Contractor Personnel must follow all required confined space entry procedures in accordance with applicable legislation and standards prior to entering into a confined space.
- 17.1.2 Rescue procedures and equipment must readily available when required to enter a confined space.

18 Reportable Accidents, Incidents and Injuries

18.1 Reportable Injuries

18.1.1 Reportable injuries include any personal injury to:

- (a) Contractor Personnel;
- (b) any CP Personnel; or
- (c) to any third party on CP Property.

18.2 Reportable Accidents

18.2.1 Reportable accidents include any occurrence that results in:

- (a) damage to railroad tracks, right of way, buildings or other CP Property;
- (b) damage to railroad equipment;
- (c) damage to CP highway vehicles;
- (d) release of hazardous material;
- (e) spill or loss of transported commodities; and
- (f) any threat to the environment.

18.3 Reportable Incidents

18.3.1 Reportable incidents include:

- (a) unintended movement of railroad equipment;
- (b) failure to provide track protection for Workers when required;
- (c) movement of railroad equipment beyond authorized limits;
- (d) operation of railroad equipment by an unqualified person;
- (e) unauthorized handling of a track switch;
- (f) damage, vandalism or tampering with any railroad signals, structures or railroad safety device;

- (g) seepage, leakage, spills of, or other contamination from, Hazardous Materials;
- (h) actual, threaten or suspected security related incidents;
- (i) slides, washouts or other on-track obstructions; or
- (j) any occurrence that may disrupt the movement of trains or affect safe rail operations.

19 Reporting

19.1 Emergency Reporting

19.1.1 In the case of an emergency, Contractor Personnel must call:

- (a) 911, where this emergency response system exists, or
- (b) the local police, fire or emergency department in all cases; and
- (c) CP Police Services Communication Center- 1-800-716-9132.

19.2 Accident, Incident, Injury Reporting

19.2.1 When an accident, incident or injury occurs on CP Property, the Contractor must:

- (a) immediately report it to the
 - (i) CP Police Services Communication Center 1-800-716-9132; and
 - (ii) CP Manager-in-Charge
- (b) follow all instructions given to protect the scene.

19.2.2 CP is obligated to report Contractor Personnel injuries occurring on CP property to the Federal Railroad Administration (FRA). Any state or required regulatory reporting remains the Contractor's responsibility.

19.3 Information to Report

19.3.1 Information required with the initial report includes:

- (a) type of incident;
- (b) date and time of occurrence;
- (c) location (mileage, subdivision, building, yard or other physical description);
- (d) identity of person(s) involved or injured (company & name);
- (e) description of any hazardous materials involved;
- (f) type & unit number of any railroad equipment or vehicle involved;
- (g) description of occurrence, damage and/or injury, and cause if known;
- (h) description of any emergency response;
- (i) name and contact information of person making the report; and
- (j) any such other information that CP may require.

19.4 Environmental Incidents and Spills

19.4.1 In the event of an environmental incident or spill that could have a negative impact on the environment, the Contractor must immediately:

- (a) report the incident to the Operations Center, the Manager-in-Charge, and the designated CP Contact as per the governing agreement relating to the Work;
- (b) take all reasonable actions to contain the spill;
- (c) respond in accordance with its emergency response plan; and

- (d) provide CP with the following information;
 - (i) description of location and surrounding area, including any sensitive environmental areas nearby (e.g., rivers, parks, sewers);
 - (ii) type and quantity of substance released;
 - (iii) cause of spill or deposit, if known; and
 - (iv) details of any immediate action taken or action proposed to be taken to contain spill and recover substance.

19.5 Additional Contractor Requirements

19.5.1 Contractor and Contractor Personnel must:

- (a) ensure an appropriate emergency response is initiated;
- (b) protect any evidence until released by the CP Manager-in-Charge;
- (c) cooperate fully with any CP investigation;
- (d) cooperate fully with any investigating government agency; and
- (e) notify CP if information is requested by any investigating government agency.

20 Contractor & Contractor Personnel Acknowledgement

Acknowledgement

- 20.1.1 Contractor and Contractor Personnel who Work on CP Property shall be deemed to have read and understood the content of these Minimum Safety Requirements for Contractors While Working on CP Property in the United States, as amended from time to time, and to agree to be bound by them.
- 20.1.2 These Minimum Safety Requirements for Contractors While Working on CP Property in the United States are subject to change without prior notice. The most current version of these Minimum Safety Requirements can be viewed at www.cpr.ca or by contacting the Manager-in-Charge.



***Home Safe™ is a commitment to be vigilant about personal safety
and the safety of co-workers.***

WORK SITE INFORMATION		
	PHONE	LOCATION
Work Site Location Name		
Railroad Subdivision & Mileage		
Address, Number and Street		
Nearest Town		
CP Manager-in-Charge		
Emergency Site Access Route (Describe route from nearest emergency services location in detail including access roads & physical landmarks OR provide sketch on back.)		
Contractor Supervisor		
Site Telephone		
Certified First Aid Attendant		
Location of First Aid Supplies at Site		
Location of Fire Extinguishing Equipment:		
Location of WHIMS data sheets		
UTILITY INFORMATION		
UTILITIES CONTACT	PHONE	LOCATION
Natural Gas:	()	
Electrical:	()	
Fiber Optic Line:	()	
Water & Sewer:	()	
Telephone:	()	
Cable System:	()	
Qualified employee(s) in:	()	
Confined Space Entry, (if applicable):	()	
Equipment requirements for Confined Space Entry, (if applicable):	()	
Other:		



SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove		Office: Construction & Materials	Item 16
Submittal Date: April 2023		Proposed Effective Date: October 2023	
Article No.: 4171		Other:	
Title: Detectable Warnings			
Specification Committee Action:			
Deferred:	Not Approved:	Approved Date:	Effective Date:
Specification Committee Approved Text:			
Comments:			
Specification Section Recommended Text:			
4171.04, Cast Iron Detectable Warning Panels.			
<p>Replace the second bullet:</p> <p>Impact resistance - Resistance to impact from Falling Tub NCHRP Report 670: Draft T4-33, Part II per AASHTO T388-22 section 10. No Substantial damage or damage to surface texture and coating only.</p>			
4171.04, Steel Detectable Warning Panels.			
<p>Replace the second bullet:</p> <p>Impact resistance - Resistance to impact from Falling Tub NCHRP Report 670: Draft T4-33, Part II per AASHTO T388-22 section 10. No Substantial damage or damage to surface texture and coating only.</p>			
Comments:			
Member's Requested Change: (Do not use 'Track Changes', or 'Mark-Up'. Use Strikeout and Highlight.)			
4171.04 and 4171.05			
Impact resistance - Resistance to impact from Falling Tub NCHRP Report 670: Draft T4-33, Part II . as per AASHTO T388-22 section 10. No Substantial damage or damage to surface texture and coating only.			
Reason for Revision: To follow test method AASHTO: T388-22			
New Bid Item Required (X one)	Yes	No X	
Bid Item Modification Required (X one)	Yes	No X	
Bid Item Obsolescence Required (X one)	Yes	No X	
Comments:			
County or City Comments:			
Industry Comments:			