MINUTES
OF
IOWA DOT SPECIFICATION COMMITTEE MEETING

November 10, 2022

Members Present:	Darwin Bishop	District 3 – DCE
	Mark Dunn	Contracts & Specifications Bureau
	Daniel Harness	Design Bureau
	Eric Johnsen, Chair	Contracts & Specifications Bureau
	Scott Nixon	District 1 – Construction
	Mike Nop	Bridges & Structures Bureau
	Donna Matulac	Contracts & Specifications Bureau
	Willy Sorenson	Traffic & Safety Bureau
	Christy VanBuskirk	Local Systems Bureau
	Bob Welper	District 2 - DME
Members Not Present:	Wes Musgrove	Construction & Materials Bureau
	Charlie Purcell	Project Delivery Division
Advisory Members Present:	Jeff Devries	Construction & Materials Bureau
	DeWayne Heintz	Jefferson County
	Lisa McDaniel	FHWA
	Paul Wiegand	SUDAS
	Brad Azeltine	Location & Environment
	Clayton Burke	District 2
	Ashley Buss	Construction & Materials Bureau
	Curtis Carter	Construction & Materials Bureau
	Desiree McClain	Construction & Materials Bureau
	Kevin Merryman	Construction & Materials Bureau
	Melissa Serio	Construction & Materials Bureau
	Scott Sommers	Construction & Materials Bureau

The Specification Committee met on Thursday, November 10, 2022, at 9:00 a.m. Eric Johnsen, Specifications Engineer, opened the meeting. The items were discussed in accordance with the agenda dated October 31, 2022.

The minutes are as follows:

1. Article 1107.06, B, Buy America.

The Construction and Materials Bureau requested to implement new Build America, Buy America requirements under the Infrastructure Investment and Jobs Act (IIJA).

2. Article 1109.10, Disputed Claims for Extra Compensation.

The Construction and Materials Bureau requested to clarify minimum requirements of a claim, including

specific details of entitlement, identification and substantiation of damages, and the affidavit language appropriate for claim certification.

3. **Section 2316, Pavement Smoothness.**

Section 2317, Primary and Interstate Pavement Smoothness.

The Construction and Materials Bureau requested to update all pavement smoothness specifications.

4. **Section 2508, Removal of Paint and Painting Steel Bridge Structures.**

The Construction and Materials Bureau requested updates based on Location and Environment review and changes to code of federal regulations on paint.

5. **Article 2523.03, G, 6, Foundations (Highway Lighting).**

The Construction and Materials Bureau requested to remove a Class B concrete reference that was missed.

6. **Article 2528.03, C, 1, b, 2, Cones, 42 Inch Channelizers, Drums, and Tubular Markers.**

The Design Bureau requested to update the tubular marker specifications.

7. **Article 4189.02, A, 1, Cables (Inductive Loop Vehicle Detector).**

Article 4189.05, C, 2, Pole Design (Traffic Signal Equipment).

The Specifications Section requested to match SUDAS specification revisions.

8. **Various Articles throughout the Standard Specifications.**

The Specifications Section requested to update all predetermined prices contained in the Standard Specifications.

9. **DS-15086, High Performance Thin Lift Overlay.**

The Construction and Materials Bureau requested revisions to the Developmental Specifications for High Performance Thin Lift Overlay.

10. **DS-15XXX, Fuel Adjustment for AASHTOWare Project.**

The Construction and Materials Bureau requested approval of Developmental Specifications for Fuel Adjustment for AASHTOWare Project.

11. **DS-15XXX, Cross Stitching of Concrete Pavement.**

The Construction and Materials Bureau requested approval of Developmental Specifications for Cross Stitching of Concrete Pavement.

12. **Article No.: 2433.03, J, Crosshole Sonic Log (CSL) Testing.**

The Construction and Materials Bureau requested to expand the options available for CSL tubes.

Form 510130 (08-15)

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove, Jeff De Vries	**Office:** Construction & Materials	**Item 1**
Submittal Date: October 2022	**Proposed Effective Date:** April 2023	
Article No.: 1107.06, B **Title:** Buy America	**Other:**	

Specification Committee Action: Approved as recommended

Deferred:	**Not Approved:**	**Approved Date:** 11/10/2022	**Effective Date:** April 2023 GS

Specification Committee Approved Text: See Specification Section Recommended Text

Comments: FHWA has reviewed and has no further comments. DOT has already applied this to projects in the December letting.

This will be an SS through the March letting and then will be added to the April GS.

It was commented that there will be future changes to BABA due to the continued discussions at the federal level. Future changes will be discussed and updated as needed.

Specification Section Recommended Text:

1107.06, B, Buy America.

Replace the title and Article:

B. Build America, Buy America.

On Federal aid contracts and contracts where the Department is the Contracting Authority, all products of iron, steel, ~~or a coating of steel~~ and construction materials, which are permanently incorporated into the work, shall ~~be of domestic origin and shall be melted and manufactured in the United States, according to~~ comply with the Build America, Buy America Act (BABA) and Materials I.M. 107. Construction materials for the purposes of BABA compliance are defined below.

1. All products of iron and steel shall be of domestic origin and shall be melted and manufactured in the United States. All coatings of iron and steel products shall be applied in the United States. ~~The Engineer may allow~~ ~~m~~Minimal amounts of these materials from foreign sources may be allowed, provided the cost does not exceed 0.1% of the contract sum or $2,500, whichever is greater. This amount shall include transportation, assembly, and testing as delivered cost of foreign products to the project.

2. All construction materials shall be produced in the United States. Construction materials are defined as an article, material, or supply that is or consists primarily of:

- non-ferrous metals;
- plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
- glass (including optic glass);
- lumber; or
- drywall.

Comments: Materials I.M. 107 attached for reference.

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

1107.06 FEDERAL REQUIREMENT.

B. **Build America, Buy America**.
On Federal aid contracts and contracts where the Department is the Contracting Authority, all products of iron, ~~or~~ steel, ~~as well as~~and construction materials, ~~all of~~ which are permanently incorporated into the work, shall comply with the Build America, Buy America Act and Materials I.M. 107. Construction materials are defined in 1107.06.B.2.

1. All products of iron ~~or~~ and steel~~, or a coating of steel which are permanently incorporated into the work~~ shall be of domestic origin and shall be melted and manufactured in the United States. All coatings of iron ~~or~~ and steel products shall be applied in the United States. All manufacturing and fabricating of iron ~~or~~ and steel products shall occur in the United States. ~~The Engineer may allow~~ Minimal amounts of these materials from foreign sources may be allowed provided the cost does not exceed 0.1% of the contract sum or $2,500, whichever is greater. This amount shall include transportation, assembly, and testing as delivered cost of foreign products to the project.
2. All construction materials shall be produced in the United States.
    a. Construction materials ~~include~~are defined as an article, material, or supply ~~other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; asphalt binders; chemical admixtures, aggregates such as stone, sand, or gravel; asphalt release agents; or aggregate binding agents or additives~~ that is or consists primarily of:
        i. non-ferrous metals;
        ii. plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
        iii. glass (including optic glass);
        iv. lumber; or
        v. drywall.

Reason for Revision: To implement new Build America, Buy America requirements under the Infrastructure Investment and Jobs Act (IIJA).

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

IOWADOT

April 19, 2023
Supersedes April 18, 2022

Construction & Materials Bureau

Matls. IM 107

BUILD AMERICA, BUY AMERICA

GENERAL

This IM is intended to provide additional instruction ~~in the acceptance of permanently incorporated steel and iron products as it relates to the Buy America requirements in 23 CFR 635.410. A manufactured product is considered subject to Buy America if it is predominantly steel or iron.~~ to the Build America, Buy America (BABA) requirements under the Infrastructure Investment and Jobs Act (IIJA) and Standard Specification 1107.06.

With the exception of the excluded items listed below, the IIJA requires the following three ~~Build America, Buy America~~ BABA preferences. An article, material, or supply shall only be classified into one of these categories, and not multiple categories.

1. **Products of Iron and Steel**
   All iron and steel ~~used~~ permanently incorporated into the project must be produced in the United States, including all manufacturing processes, from the initial melting stage through the application of coatings. A manufactured product that is predominantly steel or iron shall be treated as an item of iron and steel.

2. **Manufactured Products**
   Items that consist of two or more construction or non-construction materials that have been combined together through a manufacturing process will be treated as a manufactured product rather than a construction material. Manufactured products are exempt from the requirements of ~~Build America, Buy America~~BABA.

3. **Construction Materials**
   All construction materials must be manufactured in the United States.

4. **Excluded items**-The following items are excluded from the requirements of BABA:
   - cement and cementitious materials
   - asphalt binders
   - chemical admixtures
   - aggregates such as stone, sand, or gravel
   - asphalt release agents
   - aggregate binding agents
   - additives

PRODUCTS of Iron and Steel

The following lists of Iron and Steel products, at a minimum, are subject to the Buy America requirements.

Group 1 – Products requiring mill test reports with shipments to projects

IM 440 - Trenchless Steel Casing and/or Carrier Pipe
IM 451 – Steel Reinforcement
IM 451.02 – Galvanized Steel Bars
IM 451.03B – Epoxy-Coated Steel Reinforcement
IM 452 – Deformed and Plain Stainless Steel Bars for Concrete Reinforcement

IM 453.06B – High Strength Fasteners
IM 453.07 – Stainless Steel Fasteners
IM 453.08 – Anchor Bolts
IM 467 – Steel Piles
IM 467.01 – Steel H-Piles
IM 467.02 – Steel Sheet Piles
IM 467.03 – Steel Pipe Piles
IM 468 – Pile Points for Steel H-Piles
IM 557 – Qualification of Steel Fabrication Shops & Plants

Group 2 – Products not requiring mill test reports with shipments to projects, when the product is from an approved fabricator/supplier
IM 411 – Truncated Domes/Detectable Warning Systems
IM 441 – Corrugated Metal Culvert Pipe
IM 441.01 – Coupling devices for corrugated metal culvert pipe
IM 443.01 – Rodent Guards
IM 443.02 – Safety Grates
IM 444 – Corrugated Zinc-Coated Steel Plates for Pipes & Arches
IM 445 – Precast Concrete
IM 445.01 – Concrete Pipe & Special Sections
IM 445.02 – Precast Box Culverts
IM 445.03 – Mechanically-Stabilized Earth (MSE) Retaining Wall Panels
IM 445.06 – Precast Concrete Noise Walls
IM 449.05 – Inspection & Acceptance of Utility Access Adjustment Rings
IM 451.01 – Reinforcing Steel Supports
IM 453.04 – Steel Castings (Carbon), Gray Iron Castings, and Ductile Iron Castings
IM 453.09 – Concrete Anchors
IM 453.10 – Shear Stud Connectors
IM 454.10 – Chain-Link Fence and Field Fence
IM 455.01 – High Tension Cable Guardrail
IM 455.02 – Formed Steel Beam Railing, Cable Rail, Anchor Cable & Steel Post for Guardrail
IM 485 – Light Pole Bases
IM 485.10 – Inspection & Acceptance of Rigid Steel Conduit
IM 486.10 – Perforated Square Steel Tube Post and Anchor
IM 558 – Structural Field Welding & Inspection
IM 565 – Steel Fabrication Shop Documentation
IM 570 – Precast & Prestressed Concrete Bridge Units
IM 571 – Plants for Production of Precast Concrete Barrier
Standard Specification Section 4185 – Junction boxes, control cabinets and control boxes

REQUIRED DOCUMENTATION
The required documentation for all iron and steel products incorporated in a project will be at a minimum the mill test report and materials identification in addition to all product specific information identified in the pertinent IM.

The mill test report must include the following information: Steel mill name and location, material heat number, material grade, product specifications met, material dimensions, mechanical properties, chemical analysis, heat treatment (if applicable), certified mill signature.

The materials identification must provide traceability by heat number, grade, and type. As an example, the bill of lading may help provide this traceability.

Additionally, mill test reports must contain a certification statement indicating all steel or iron has been melted and manufactured in the USA in accordance with the Buy America requirements. All coated steel or iron must have a certification statement indicating all coatings have been applied in the USA.

Products from Approved Fabricators/Suppliers

The approved fabricator/supplier is required to maintain a file containing all required documentation for a minimum of seven years from the time the products are shipped for incorporation into a project. The required documentation will be at a minimum the information indicated above plus anything product specific identified in the pertinent IM.

Project Documentation from Approved Fabricators/Suppliers

If an item is not identified as a group 2 item, then the product is classified as a group 1 item.

Product IMs identified above in Group 1 indicate the fabricator/supplier will be required to provide mill test reports with shipments to the project.

For products in Group 2, the fabricator/supplier must provide a letter certifying all of the materials are in compliance with Buy America and the necessary supporting documentation will be retained as indicated ~~in A~~ above. Documentation shall be made available to the Engineer upon request.

Products from Unapproved Fabricators/Suppliers

All documentation from unapproved fabricators/suppliers must be provided at the time of shipment and prior to incorporation.

Construction Materials

The producer/supplier must provide a letter certifying all construction materials are in compliance with BABA in addition to all product specific information identified in the pertinent IM. Necessary supporting documentation will be retained for a minimum of seven years from the time the products are shipped for incorporation into a project. Documentation shall be made available to the Engineer upon request

Commented [MN1]: Why 7 years? Normal construction documentation has a 3 year requirement after the FMIS document is signed, per FHWA requirements.

Form 510130 (08-15)

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove	**Office:** Construction & Materials	**Item 2**
Submittal Date: 10/24/22	**Proposed Effective Date:**	
Article No.: 1109.10 **Title:** Disputed Claims for Extra Compensation	**Other:**	

Specification Committee Action: Approved as recommended			
Deferred:	**Not Approved:**	**Approved Date:** 11/10/2022	**Effective Date:** April 2023 GS
Specification Committee Approved Text: See Specification Section Recommended Text			
Comments: None			

Specification Section Recommended Text:

1109.10, Disputed Claims for Extra Compensation.

Replace Articles C and D and **add** the Articles:

C. In all cases, if this notification is not given, or if after the notification is given, the Engineer is not afforded facilities for keeping strict account of actual costs as defined for force account construction, the Contractor thereby agrees to waive the claim for extra compensation for this work. This notice by the Contractor, and the fact that the Engineer has kept account of the cost as aforesaid, shall not be construed as establishing the validity of the claim.

D. The claim, when filed with the Engineer, shall be in writing and in sufficient detail to permit auditing and an intelligent evaluation by the Engineer. ~~The claim shall be supported by such documentary evidence as the claimant has available and shall be verified by affidavit of the claimant or other persons having knowledge of the facts.~~ The claim shall include, but shall not be limited to, the following:

1. Project number and unique claim identification number.

2. The date which actions resulting in the claim occurred or conditions resulting in the claim became evident.

3. A copy of the original written notice provided to the Engineer.

4. A detailed narrative of the disputed work or project circumstance at issue. Include identification of each item of work or project circumstance for which cost and/or time is being claimed.

5. For each item of work or project circumstance being claimed, individually identify:

a. Basis or bases of entitlement. Identify the specific provisions of the contract which apply and why such provisions support the claim.

b. Specific cost of damages and the length of contract extension sought.

c. Causal link between each asserted basis of entitlement and the specific cost and/or time sought under said basis of entitlement.

6. Supporting documentation to substantiate the cost and/or contract extension claimed.
- **a.** Include complete analyses, calculations and itemized accounting used to establish the specific dollar amount of incurred damages. Provide copies of actual expense reports.
- **b.** To the extent applicable, provide copies of labor and equipment records and agreements, subcontract agreements, bid documents, project or corporate accounting records, and/or other records which would be relevant or necessary for a complete audit of the claim.
- **c.** When the claim includes request for contract extension or otherwise seeks time related recovery, submit a copy of the schedule that was in effect when the actions or conditions resulting in the claim occurred. Provide a time impact analysis and detailed narrative that accurately describes the time impacts being claimed. Identify the causation and specific calendar dates of each time impact claimed.

7. Affidavit of the claimant, in accordance with Article 1109.10, E.

E. Affidavit.

1. The claimant shall certify the claim attesting to the following:
- **a.** The claim is made in good faith, based on documented fact, and the value is not knowingly overstated.
- **b.** The supportive data is true, accurate and complete to the claimant's best knowledge and belief.

2. In complying with this requirement, the claim submittal shall include the following fully executed certification:

Under penalty of law for perjury or falsification, the undersigned,
_____,
(Name)
_____ of
(Title)
_____
(Company)

hereby certifies that the claim for extra compensation and/or time made herein is, to the best of the Contractor's knowledge and belief, a true statement of costs incurred, and time sought, and is fully documented under the Contract.

Dated _____ /s/ _____

Subscribed and sworn to before me by _____,
on this _____ day of _____, 20_____.

_____
Notary Public

F. If the Engineer determines that the claim submittal does not contain all or a portion of the information enumerated above, the Engineer will notify the Contractor in writing and the submittal will be rejected and not considered. Unless otherwise expressed in writing by the Engineer, the Engineer's rejection of a claim submission on this basis shall not be taken as a ruling on the merits of the claim.

G. If the claimant wishes an opportunity to present the claim in person, then the claim shall be accompanied by a written request to do so. Where the claimant asks an opportunity to

present the claim in person, the Engineer, within 30 calendar days of the filing of the claim, will fix a time and place for a meeting between the claimant and the Engineer.

H. The Engineer will, within a reasonable time from the filing of the claim or the meeting above referred to, whichever is later, rule upon the validity of the claim and notify the claimant, in writing, of the ruling together with the reasons therefore. In case the claim is found to be just, in whole or in part, it will be allowed and paid to the extent so found.

~~**D**~~ **I.** The Contractor shall not institute any court action against the Contracting Authority for the adjudication of any claims until the claim has been first presented to the Engineer, pursuant to and compliant with this article.

Comments:

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

1109.10 DISPUTED CLAIMS FOR EXTRA COMPENSATION.

A. In any case where the Contractor deems that extra compensation is due for work or material not clearly covered in the contract and not ordered by the Engineer as extra work as defined herein, the Contractor shall notify the Engineer in writing to make claim for this extra compensation before work begins on which the claim is based.

B. The Contracting Authority will be responsible for damages attributable to the performance, nonperformance, or delay, of any other contractor, governmental agency, utility, firm, corporation, or individual authorized to do work on the project, only when these damages result from negligence on the part of the Contracting Authority, its Engineer, or any of its officers or employees. In any case where the Contractor deems that extra compensation is due from the Contracting Authority as damages resulting from these performances, non-performances, or delays, the Contractor shall notify the Engineer in writing at the time the delay occurs.

C. In all cases, if this notification is not given, or if after the notification is given, the Engineer is not afforded facilities for keeping strict account of actual costs as defined for force account construction, the Contractor thereby agrees to waive the claim for extra compensation for this work. This notice by the Contractor, and the fact that the Engineer has kept account of the cost as aforesaid, shall not be construed as establishing the validity of the claim.

D. The claim, when filed with the Engineer, shall be in writing and in sufficient detail to permit auditing and an intelligent evaluation by the Engineer. ~~The claim shall be supported by such documentary evidence as the claimant has available and shall be verified by affidavit of the claimant or other persons having knowledge of the facts.~~The claim shall include, but shall not be limited to, the following:

1. Project number and unique claim identification number.

2. The date which actions resulting in the claim occurred or conditions resulting in the claim became evident.

3. A copy of the original written notice provided to the Engineer.

4. A detailed narrative of the disputed work or project circumstance at issue. Include identification of each item of work or project circumstance for which cost and/or time is being claimed.

5. For each item of work or project circumstance being claimed, individually identify:
   a. Basis or bases of entitlement. Identify the specific provisions of the contract which apply and why such provisions support the claim.
   b. Specific cost of damages and the length of contract extension sought.
   c. Causal link between each asserted basis of entitlement and the specific cost and/or time sought under said basis of entitlement.

6. Supporting documentation to substantiate the cost and/or contract extension claimed.
   a. Include complete analyses, calculations and itemized accounting used to establish the specific dollar amount of incurred damages. Provide copies of actual expense reports.
   b. To the extent applicable, provide copies of labor and equipment records and agreements, subcontract agreements, bid documents, project or corporate accounting records, and/or other records which would be relevant or necessary for a complete audit of the claim.
   c. When the claim includes request for contract extension, submit a copy of the schedule that was in effect when the actions or conditions resulting in the claim occurred. Provide a time impact analysis and detailed narrative that accurately describes the time impacts being claimed. Identify the causation and specific calendar dates of each time impact claimed.

7. Affidavit of the claimant, in accordance with Article 1109.10, E.

E. Affidavit.

1. The claimant shall certify the claim attesting to the following:
   a. The claim is made in good faith, based on documented fact, and the value is not knowingly overstated.
   b. The supportive data is true, accurate and complete to the claimant's best knowledge and belief.

2. In complying with this requirement, the claim submittal shall include the following fully executed certification:

Under penalty of law for perjury or falsification, the undersigned,
_____,
(Name)
_____ of
(Title)
_____
(Company)

hereby certifies that the claim for extra compensation and/or time made herein is, to the best of the Contractor's knowledge and belief, a true statement of costs incurred and time sought, and is fully documented under the Contract.

Dated _____ /s/ _____

Subscribed and sworn to before me by _____,
on this _____ day of _____, 20_____.

_____
Notary Public

F. If the Engineer determines that the claim submittal does not contain all or a portion of the information enumerated above, the Engineer will notify the Contractor in writing and the submittal will be rejected and not considered. Unless otherwise expressed in writing by the Engineer, the Engineer's rejection of a claim submission on this basis shall not be taken as a ruling on the merits of the claim.

G. If the claimant wishes an opportunity to present the claim in person, then the claim shall be accompanied by a written request to do so. Where the claimant asks an opportunity to present the claim in person, the Engineer, within 30 calendar days of the filing of the claim, will fix a time and place for a meeting between the claimant and the Engineer.

H. The Engineer will, within a reasonable time from the filing of the claim or the meeting above referred to, whichever is later, rule upon the validity of the claim and notify the claimant, in writing, of the ruling

together with the reasons therefore. In case the claim is found to be just, in whole or in part, it will be allowed and paid to the extent so found.

~~D~~**I.** The Contractor shall not institute any court action against the Contracting Authority for the adjudication of any claims until the claim has been first presented to the Engineer, pursuant to and compliant with this article.

Reason for Revision:

The contract language in Article 1109.10, C of the current specifications has been interpreted as vague in the past. There have been questions regarding what information, at a minimum, a claim needs to include to be "in sufficient detail to permit auditing and an intelligent evaluation by the Engineer." There have also been questions regarding what form of affidavit is required for proper certification of a claim.

These proposed revisions are intended to clarify certain minimum requirements of a claim, including specific details of entitlement, identification and substantiation of damages, and the affidavit language appropriate for claim certification (proposed affidavit language is in accordance with recommendations from Iowa Office of the Attorney General – Transportation Division). The proposed revisions also address how the Engineer will respond in the event a claim submission does not include sufficient information for proper evaluation.

In the case of disputed claims, it is important that the details of the claim be clearly documented, such that the Contracting Authority and Contractor have shared understanding of what specifically is being disputed and why, for purposes of facilitating fair and timely resolution.

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

Form 510130 (08-15)

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove / Jeff De Vries	**Office:** Construction & Materials	**Item 3**
Submittal Date: 10/19/2022	**Proposed Effective Date:** Dec 2022 letting/ April 2023 update	
Section No.: 2316 **Title:** Pavement Smoothness **Section No.:** 2317 **Title:** Primary and Interstate Pavement Smoothness	**Other:**	

Specification Committee Action: Approved with changes.

Deferred:	**Not Approved:**	**Approved Date:** 11/10/2022	**Effective Date:** February 2023 letting - SS

Specification Committee Approved Text: See Specification Section Recommended Text for new Section 2317. Section 2316 will not be deleted at this time.

Comments:

Need to maintain Section 2316 until the local entities have a chance to comment on the deletion of this section and to ensure section 2317 meets the needs of the locals. SUDAS can not make a formal change to delete this section until the May 2023 board meeting.

Will wait to eliminate 2316 until the October 2023 spec book is released. The deletion of Section 2316 will need to be brought back to the Specification Committee in May 2023 to formalize and approve the change.

Section 2317 will be an SS for February and March and then go into the GS in April 2023.

Specification Section Recommended Text:
2316, Pavement Smoothness.

Delete the Article:

2317, Primary and Interstate Pavement Smoothness.

Replace the title and Section:

Section 2317. ~~Primary and Interstate~~ Pavement Smoothness

2317.01 GENERAL.

Evaluate pavement smoothness for all Interstate and Primary main line pavement surfaces, and all other road surfaces included on Primary projects, except when specifically excluded or modified by the contract documents. For non-Primary projects, do not evaluate pavement smoothness unless specified in the contract documents. If this specification is required by contract documents on non-Primary projects let by the Department, it will be added in its entirety. Selected portions of the specification will not be deleted.

A. Main line pavement is defined as all permanent pavement for through lanes.

B. The index used for determining the pavement smoothness is the Mean Roughness Index (MRI) per segment as determined by the latest version of the FHWA's software, ProVAL.

C. The other measure of pavement smoothness is the Area of Localized Roughness (ALR) based on a continuous MRI computed over a 25-foot distance as determined by the latest version of ProVAL.

D. A pavement segment is defined as a continuous area of finished pavement 0.1 mile in length and one lane (10 to 12 foot nominal) in width. A partial segment may result from an interruption of the continuous pavement surface (in other words, bridge approaches, side road tie-ins, the completion of the daily paving operations, and so forth). Pay adjustments will be prorated for partial segments. If a segment is less than 100 feet in length and requires corrective work, the Engineer will waive the corrective work requirement for the segment and instead assess a prorated disincentive. The Contracting Authority will still subject the segment to ALR correction in accordance with Table 2317.05-1 and Table 2317.05-2.

2317.02 EQUIPMENT.

A. Provide and operate an inertial profiler meeting the requirements of AASHTO M328 and Materials I.M. 341, Appendix A. Ensure the operator is trained and certified to operate the profiler as required by the Contracting Authority.

B. For corrective work by diamond grinding, use grinding and texturing equipment meeting the requirements of Section 2532 of the Standard Specifications.

2317.03 TESTING AND EVALUATION.

A. Testing.

1. Obtain profiles of both wheel paths for each lane according to the procedures shown in Materials I.M. 341, Appendix A. The wheel paths are defined as 3 feet and 9 feet from the center line or lane line. Average the two wheel path profile indexes for each segment.

2. The Engineer may use an inertial profiler, 10 foot straightedge, or other means to detect irregularities in excluded surface areas or areas outside the required wheel paths for required corrective action.

3. Test bridge approaches according to Section 2428 of the Standard Specifications.

4. Test the pavement within 5 working days of completion of paving.

5. Paved shoulders will be excluded from smoothness testing. When used as a temporary driving surface, evaluate paved shoulders for ALR. Take corrective action for ALR greater than 250.0 inches/ mile.

B. Evaluation.

1. Determine an MRI using the latest version of the ProVAL "Ride Quality" or "Smoothness Assurance" analysis and following the procedures shown in Materials I.M. 341, Appendix A for each segment of finished pavement surface with a posted speed over 45 mph except for:
- **a.** Roads intersecting the mainline pavement less than 600 feet in length.
- **b.** Road connections 150 feet before an intersection that end at a stop sign (or a yield sign at roundabouts).
- **c.** Twenty feet on either side of bridges, bridge approaches, existing EF joints, manholes, or water valve boxes in the lane that the obstruction is located.
- **d.** Ramps and loops.
- **e.** Bridge approaches (evaluated according to Section 2428 of the Standard Specificatons).

f. Storage lanes, turn lanes, and other auxiliary lanes less than 1000 feet.
g. Pavement less than 8.5 feet in width.
h. Single lift pavement overlays 2 inches thick or less, unless the existing surface has been corrected by milling or scarification.
i. Single lift pavement overlays 2 inches thick or less placed directly on PCC pavement.
j. Paved shoulders.
k. Detour pavement.
l. Crossovers.
m. Individual sections of pavement less than 100 feet in length.
n. Roundabouts

2. Determine ALR using the latest version of the ProVAL "Smoothness Assurance" analysis and following the procedures shown in Materials I.M. 341, Appendix A for each segment of finished pavement surface with a posted or advisory speed over 35 mph except for:
a. Side road connections 150 feet before an intersection that end at a stop sign (or a yield sign at roundabouts).
b. Twenty feet on either side of bridges, bridge approaches, manholes, existing EF joints, or water valve boxes in the lane that the obstruction is located.
c. Bridge approaches (evaluated according to Section 2428 of the Standard Specifications).
d. Pavement less than 8.5 feet in width.
e. Paved shoulders (unless used as a temporary driving surface).
f. Detour pavement.
g. Crossovers.
h. Individual sections of pavement less than 50 feet in length.

3. The Engineer may determine and identify irregularities of 1/8 inch or more in 10 feet longitudinally for excluded surface areas or areas outside the required wheel paths.

4. Submit all final profile summary sheets and all ALR graphs to the engineer within 14 calendar days following completion of paving on the project. If requested by the engineer, provide the ProVAL files. When all the testing is done at the completion of paving on the project, provide the engineer the ProVal files along with the profile summary sheets.

5. Submit all preliminary profile summary sheets on provided form (https://iowadot.gov/Construction_Materials/materialsforms/ProfileSummarySheet.xlsx) and final ProVAL compatible files to the Construction and Materials Bureau via email to smoothness.cmb@iowadot.us following completion of paving on the project.

2317.04 CORRECTIVE ACTIONS.

A. General.

1. Pavement will be evaluated in 0.1 mile segments using the inertial profiler, to determine pavement segments where corrective work or pay adjustments will be necessary.

2. Within each 0.1 mile segment, correct all ALR identified as grind in table 2317.05-1 or table 2317.05-2 regardless of the MRI value. Take corrective action.

3. Separately identify ALR.

4. On lanes over 8.5 feet in width, for through traffic which requires matching the surface of the new pavement to the surface of an existing pavement, Determine the MRI and ALR for the existing lane. Compare the MRI values and ALR areas according to Materials I.M. 341, Appendix A. If the MRI and ALR for the new pavement are less than the MRI and ALR for the existing surface, no negative payment adjustment or correction for MRI or ALR will be required.

B. MRI Correction.
Correct all 0.1 mile segments having an initial MRI of greater than those tolerances shown in Article 2317.05. Correct these segments to reduce the MRI to that shown in Table 2317.05-3 through Table 2317.05-6. The Contractor has the option to replace these segments. On segments where corrections are made, test the entire 0.1 mile segment of pavement to verify that corrections have met the MRI as shown in Table 2317.05-3 through Table 2317.05-6.

C. ALR Correction.
Correct ALR greater than those tolerances shown in Article 2317.05. Correct these segments to reduce the ALR to that shown in Table 2317.05-1 or Table 231705-2. The Contractor has the option to replace these areas. On segments where corrections are made, test the entire 0.1 mile segment of pavement to verify that corrections have met ALR level shown in Table 2317.05-1 or Table 2317.05-2.
Provide the engineer an image file for each area of ALR greater than 250 Inches per mile. Use the 0.1 mile scale setting and label the file with the station location, lane, and direction.

D. Engineer Identified Irregularities.
Correct areas over 1/8 inch in 10 feet identified by the Engineer.

E. Bridge Approach Sections.
Correct bridge approach sections according to Section 2428 of the Standard Specifications.

F. Corrective Work.
When the Contractor is not responsible for the adjoining surface, ALR in the Twenty feet at the end of a section will be reviewed by the Engineer. Correct ALR determined to be under the control of the Contractor and resulting from the Contractor's operations. Correction of ALR determined to be beyond the control of the Contractor will be paid according to Article 1109.03, B of the Standard Specifications. Complete the corrective work prior to determining pavement thickness. Do not use bush hammers or other impact devices.

1. PCC Pavement.
On PCC pavement, make corrections using an approved profiling device or by removing and replacing the pavement. Apply corrective methods to the full lane width. Ensure, when completed, the corrected area (full lane width) has uniform texture and appearance, with the beginning and ending of the corrected area squared normal to centerline of the paved surface. Where surface corrections are made, grooving will not be required.

2. HMA Pavement.
- **a.** On HMA pavement, make corrections by diamond grinding, by overlaying the area, by replacing the area, or by inlaying the area. If the surface is corrected by diamond grinding, perform the same work and use the same equipment as specified for PCC pavement.
- **b.** If the surface is corrected by overlay, replacement, or inlay, begin and end the surface correction with a transverse saw cut normal to the pavement lane lines or edge lines within any one area. The profile of the surface must be smooth with no bumps or dips at the beginning or end of correction.
- **c.** Overlay correction must be for the entire pavement width. Pavement cross slope must be maintained through the corrected areas.

G. Verification Testing.

1. The Engineer will perform verification testing to validate the Contractor's certified quality control testing. If the Engineer's verification test results validate the Contractor's test results, the Contractor's results will be used for acceptance. Disputes between the Contractor's and Engineer's test results will be resolved according to Materials I.M. 341, Appendix A.

2. The Engineer may test the entire project length if it is determined that the Contractor certified test results are inaccurate, The Contractor will be charged for this work at a rate of $800.00 per lane-mile, with a minimum charge of $1500.00.

3. Furnishing inaccurate tests may result in decertification of the Contractor's certified operator.

2317.05 PAY ADJUSTMENTS.

A. General.

1. Pay adjustments will be based on the initial MRI determined for the segments prior to performing any corrective work. Areas excluded from Inertial profiler testing and bridges approaches will not be subject to price adjustments.

2. If the Contractor elects to remove and replace the segments, the Contractor will be paid the price adjustment that corresponds to the initial index obtained on the pavement segments after replacement.

3. When the plans dictate that an area of pavement is to be hand finished, the area will not be subject to reduced payment. However, the area is to be profiled and corrected as necessary to meet these specifications.

B. Areas of Localized Roughness

The payment for areas of localized roughness will be adjusted as shown in Table 2317.05-1 and Table 2317.05-2.

Table 2317.05-1: Schedule for Adjustment Payment for Areas of Localized Roughness for Primary and Interstate Projects

ALR in 25 Foot Continuous Mean International Roughness Index (MRI) Inches per mile	Dollars per foot of pavement length per lane
200.0 to 250.0	-30.00 or grind[1]
Greater than 250.0	Grind[1]
1. Correct these areas to below 200.0 inches per mile	

Table 2317.05-2: Schedule for Adjustment Payment for Areas of Localized Roughness for Non-Primary Projects

Segment Speed/Type	ALR in 25 Foot Continuous Mean International Roughness Index (MRI) Inches per mile	Dollars per foot of pavement length per lane
Speed greater than 45mph	200.0 to 250.0	-15.00 or grind[1]
	Greater than 250.0	Grind[1]
	1. Correct these areas to below 200.0 inches per mile	
Speed less than or equal to 45mph or curbed	250.0 to 300.0	-15.00 or grind[1]
	Greater than 300.0	Grind[1]
	1. Correct these areas to below 250.0 inches per mile	

C. PCC Pavement.

The payment for mean International Roughness Index for PCC pavement will be adjusted as shown in Table 2317.05-3 and Table 2317.05-4.

Table 2317.05-3: Schedule for Adjustment Payment for PCC Pavements for Primary and Interstate Projects

Mean International Roughness Index (MRI) inches per mile	Dollars per 0.1 mile segment per lane	
	Design Thickness	
	Full Depth (>6")	Overlay (<=6")

Less than 47.5	1,500.00	1,250.00
47.5 to 57.5	8,625.00-150*MRI	5,226.596-133.2623*MRI
57.5 to 75	Unit Price	Unit Price
75 to 90	7,500.00-100*MRI (or grind[1])	6,250.00-83.333*MRI (or grind[1])
Greater than 90	Grind[1]	Grind[1]
1. Correct these areas below 75.0 inches per mile		

Table 2317.05-4: Schedule for Adjustment Payment for PCC Pavements for Non-Primary Projects

Mean International Roughness Index (MRI) Inches per mile	Dollars per 0.1 mile segment per lane
Less than 60.0	300.00
60.0 to70.0	2,100.00-30*MRI
70.0 to 80.0	0.00
80.0 to 95.0	1,600.00-20*MRI or grind[1]
Greater than 95.0	Grind[1]
1. Correct these areas to below 80.0 inches per mile	

D. HMA Pavement.

The payment for mean International Roughness Index for HMA pavement will be adjusted as shown in Table 2317.05-5 and Table 2317.05-6.

Table 2317.05-5: Schedule for Adjustment Payment for HMA Pavements for Primary and Interstate Projects

Mean International Roughness Index (MRI) inches per mile	Dollars per 0.1 mile segment per lane	
	Design Thickness	
	Full Depth (>4")	Overlay (≤4")
Less than 29.84	1,500.00	1,250.00
29.84 to 39.22	6,271.915-159.915*MRI	5,226.596-133.2623*MRI
39.22 to 75	Unit Price	Unit Price
75 to 90	7,500.00-100*MRI or grind[1]	6,250.00-83.333*MRI or grind[1]
Greater than 90	Grind[1]	Grind[1]
1. Correct these areas below 75.0 inches per mile		

Table 2317.05-6: Schedule for Adjustment Payment for HMA Pavements for Non-Primary Projects

Mean International Roughness Index (MRI) Inches per mile	Dollars per 0.1 mile segment per lane
Less than 35.0	300.00
35.0 to 45.0	1,350.00-30*MRI
45.0 to 80.0	0.00
80.0 to 95.0	1,600.00-20*MRI or grind[1]
Greater than 95.0	Grind[1]
1. Correct these areas to below 80.0 inches per mile	

Comments: Revisions will be issued as an SS for the January letting until the GS is released for the April letting. The SS will only apply to Primary and Interstate projects.

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

Section 2317. Pavement Smoothness

2317.01 GENERAL.

Evaluate pavement smoothness for all Interstate and Primary main line pavement surfaces, and all other road surfaces included on Primary projects, except when specifically excluded or modified by the contract documents. For non-Primary projects, do not evaluate pavement smoothness unless specified in the contract documents. If this specification is required by contract documents on non-Primary projects let by the Department, it will be added in its entirety. Selected portions of the specification will not be deleted.

A. Main line pavement is defined as all permanent pavement for through lanes.

B. The index used for determining the pavement smoothness is the Mean Roughness Index (MRI) per segment as determined by the latest version of the FHWA's software, ProVAL.

C. The other measure of pavement smoothness is the Area of Localized Roughness (ALR) based on a continuous MRI computed over a 25-foot distance as determined by the latest version of ProVAL.

D. A pavement segment is defined as a continuous area of finished pavement 0.1 mile in length and one lane (10 to 12 foot nominal) in width. A partial segment may result from an interruption of the continuous pavement surface (in other words, bridge approaches, side road tie-ins, the completion of the daily paving operations, and so forth). Pay adjustments will be prorated for partial segments. If a segment is less than 100 feet in length and requires corrective work, the Engineer will waive the corrective work requirement for the segment and instead assess a prorated disincentive. The Contracting Authority will still subject the segment to ALR correction in accordance with Table 2317.05-1 and Table 2317.05-2.

2317.02 EQUIPMENT.

A. Provide and operate an inertial profiler meeting the requirements of AASHTO M328 and Materials I.M. 341, Appendix A. Ensure the operator is trained and certified to operate the profiler as required by the Contracting Authority.

B. For corrective work by diamond grinding, use grinding and texturing equipment meeting the requirements of Section 2532 of the Standard Specifications.

2317.03 TESTING AND EVALUATION.

A. Testing.

1. Obtain profiles of both wheel paths for each lane according to the procedures shown in Materials I.M. 341, Appendix A. The wheel paths are defined as 3 feet and 9 feet from the center line or lane line. Average the two wheel path profile indexes for each segment.

2. The Engineer may use an inertial profiler, 10 foot straightedge, or other means to detect irregularities in excluded surface areas or areas outside the required wheel paths for required corrective action.

5. Test bridge approaches according to Section 2428 of the Standard Specifications.

6. Test the pavement within 5 working days of completion of paving.

5. Paved shoulders will be excluded from smoothness testing. When used as a temporary driving surface, evaluate paved shoulders for ALR. Take corrective action for ALR greater than 250.0 inches/ mile.

B. Evaluation.

1. Determine a MRI using the latest version of the ProVAL "Ride Quality" or "Smoothness Assurance" analysis and following the procedures shown in Materials I.M. 341, Appendix A for each segment of finished pavement surface with a posted speed over 45 mph except for:

- **a.** Roads intersecting the mainline pavement less than 600 feet in length.
- **b.** Road connections 150 feet before an intersection that end at a stop sign (or a yield sign at roundabouts).
- **c.** Twenty feet on either side of bridges, bridge approaches, existing EF joints, manholes, or water valve boxes in the lane that the obstruction is located.
- **d.** Ramps and loops.
- **e.** Bridge approaches (evaluated according to Section 2428 of the Standard Specificatons).
- **f.** Storage lanes, turn lanes, and other auxiliary lanes less than 1000 feet.
- **g.** Pavement less than 8.5 feet in width.
- **h.** Single lift pavement overlays 2 inches thick or less, unless the existing surface has been corrected by milling or scarification.
- **i**. Single lift pavement overlays 2 inches thick or less placed directly on PCC pavement.
- **j.** Paved shoulders.
- **k.** Detour pavement.
- **l.** Crossovers.
- **m.** Individual sections of pavement less than 100 feet in length.

n. Roundabouts

2. Determine ALR using the latest version of the ProVAL "Smoothness Assurance" analysis and following the procedures shown in Materials I.M. 341, Appendix A for each segment of finished pavement surface with a posted or advisory speed over 35 mph except for:
- **a.** Side road connections 150 feet before an intersection that end at a stop sign (or a yield sign at roundabouts).
- **b.** Twenty feet on either side of bridges, bridge approaches, manholes, existing EF joints, or water valve boxes in the lane that the obstruction is located.
- **c.** Bridge approaches (evaluated according to Section 2428 of the Standard Specifications).
- **d.** Pavement less than 8.5 feet in width.
- **e.** Paved shoulders (unless used as a temporary driving surface).
- **f.** Detour pavement.
- **g.** Crossovers.
- **h.** Individual sections of pavement less than 50 feet in length.

6. The Engineer may determine and identify irregularities of 1/8 inch or more in 10 feet longitudinally for excluded surface areas or areas outside the required wheel paths.

7. Submit all final profile summary sheets and all ALR graphs to the engineer within 14 calendar days following completion of paving on the project. If requested by the engineer, provide the ProVAL files. When all the testing is done at the completion of paving on the project, provide the engineer the ProVal files along with the profile summary sheets.

8. Submit all preliminary profile summary sheets on provided form (https://iowadot.gov/Construction_Materials/materialsforms/ProfileSummarySheet.xlsx) and final ProVAL compatible files to the Construction and Materials Bureau via email to smoothness.cmb@iowadot.us following completion of paving on the project.

2317.04 CORRECTIVE ACTIONS.

A. General.

1. Pavement will be evaluated in 0.1 mile segments using the inertial profiler, to determine pavement segments where corrective work or pay adjustments will be necessary.

2. Within each 0.1 mile segment, correct all ALR identified as grind in table 2317.05-1 or table 2317.05-2 regardless of the MRI value. Take corrective action.

3. Separately identify ALR.

4. On lanes over 8.5 feet in width, for through traffic which requires matching the surface of the new pavement to the surface of an existing pavement, Determine the MRI and ALR for the existing lane. Compare the MRI values and ALR areas according to Materials I.M. 341, Appendix A. If the MRI and ALR for the new pavement are less than the MRI and ALR for the existing surface, no negative payment adjustment or correction for MRI or ALR will be required.

B. **MRI Correction.**
Correct all 0.1 mile segments having an initial MRI of greater than those tolerances shown in Article 2317.05. Correct these segments to reduce the MRI to that shown in Table 2317.05-3 through Table 2317.05-6. The Contractor has the option to replace these segments. On segments where corrections are made, test the entire 0.1 mile segment of pavement to verify that corrections have met the MRI as shown in Table 2317.05-3 through Table 2317.05-6.

C. ALR Correction.
Correct ALR greater than those tolerances shown in Article 2317.05. Correct these segments to reduce the ALR to that shown in Table 2317.05-1 or Table 231705-2. The Contractor has the option to replace these areas. On segments where corrections are made, test the entire 0.1 mile segment of pavement to verify that corrections have met ALR level shown in Table 2317.05-1 or Table 2317.05-2.
Provide the engineer an image file for each area of ALR greater than 250 Inches per mile. Use the 0.1 mile scale setting and label the file with the station location, lane, and direction.

D. Engineer Identified Irregularities.
Correct areas over 1/8 inch in 10 feet identified by the Engineer.

E. **Bridge Approach Sections.**
Correct bridge approach sections according to Section 2428 of the Standard Specifications.

F. **Corrective Work.**
When the Contractor is not responsible for the adjoining surface, ALR in the Twenty feet at the end of a section will be reviewed by the Engineer. Correct ALR determined to be under the control of the Contractor and resulting from the Contractor's operations. Correction of ALR determined to be beyond the control of the Contractor will be paid according to Article 1109.03, B of the Standard Specifications. Complete the corrective work prior to determining pavement thickness. Do not use bush hammers or other impact devices.

1. PCC Pavement.
On PCC pavement, make corrections using an approved profiling device or by removing and replacing the pavement. Apply corrective methods to the full lane width. Ensure, when completed, the corrected area (full lane width) has uniform texture and appearance, with the beginning and ending of the corrected area squared normal to centerline of the paved surface. Where surface corrections are made, grooving will not be required.

2. HMA Pavement.
- **a.** On HMA pavement, make corrections by diamond grinding, by overlaying the area, by replacing the area, or by inlaying the area. If the surface is corrected by diamond grinding, perform the same work and use the same equipment as specified for PCC pavement.
- **b.** If the surface is corrected by overlay, replacement, or inlay, begin and end the surface correction with a transverse saw cut normal to the pavement lane lines or edge lines within any one area. The profile of the surface must be smooth with no bumps or dips at the beginning or end of correction.
- **c.** Overlay correction must be for the entire pavement width. Pavement cross slope must be maintained through the corrected areas.

G. **Verification Testing.**

1. The Engineer will perform verification testing to validate the Contractor's certified quality control testing. If the Engineer's verification test results validate the Contractor's test results, the Contractor's results will be used for acceptance. Disputes between the Contractor's and Engineer's test results will be resolved according to Materials I.M. 341, Appendix A.

2. The Engineer may test the entire project length if it is determined that the Contractor certified test results are inaccurate, The Contractor will be charged for this work at a rate of $800.00 per lane-mile, with a minimum charge of $1500.00.

2. Furnishing inaccurate tests may result in decertification of the Contractor's certified operator.

2317.05 PAY ADJUSTMENTS.

A. **General.**

1. Pay adjustments will be based on the initial MRI determined for the segments prior to performing any corrective work. Areas excluded from Inertial profiler testing and bridges approaches will not be subject to price adjustments.

2. If the Contractor elects to remove and replace the segments, the Contractor will be paid the price adjustment that corresponds to the initial index obtained on the pavement segments after replacement.

3. When the plans dictate that an area of pavement is to be hand finished, the area will not be subject to reduced payment. However, the area is to be profiled and corrected as necessary to meet these specifications.

B. Areas of Localized Roughness
The payment for areas of localized roughness will be adjusted as shown in Table 2317.05-1 and Table 2317.05-2.

Table 2317.05-1: Schedule for Adjustment Payment for Areas of Localized Roughness for Primary and Interstate Projects

ALR in 25 Foot Continuous Mean International Roughness Index (MRI) Inches per mile	Dollars per foot of pavement length per lane
200.0 to 250.0	-30.00 or grind*
Greater than 250.0	Grind*
*Correct these areas to below 200.0 inches per mile	

Table 2317.05-2: Schedule for Adjustment Payment for Areas of Localized Roughness for Non-Primary Projects

Segment Speed/Type	ALR in 25 Foot Continuous Mean International Roughness Index (MRI) Inches per mile	Dollars per foot of pavement length per lane
Speed greater than 45mph	200.0 to 250.0	-15.00 or grind*
	Greater than 250.0	Grind*
	*Correct these areas to below 200.0 inches per mile	
Speed less than or equal to 45mph or curbed	250.0 to 300.0	-15.00 or grind*
	Greater than 300.0	Grind*
	*Correct these areas to below 250.0 inches per mile	

C. PCC Pavement.

The payment for mean International Roughness Index for PCC pavement will be adjusted as shown in Table 2317.05-3 and Table 2317.05-4.

Table 2317.05-3: Schedule for Adjustment Payment for PCC Pavements for Primary and Interstate Projects

Mean International Roughness Index (MRI) inches per mile	Dollars per 0.1 mile segment per lane	
	Design Thickness	
	Full Depth (>6")	Overlay (<=6")
Less than 47.5	1,500	1,250
47.5 to 57.5	=8625-150*MRI	=5226.596-133.2623*MRI
57.5 to 75	Unit Price	Unit Price
75 to 90	=7500-100*MRI (or Grind*)	=6250-83.333*MRI (or Grind*)
Greater than 90	Grind*	Grind*
* Correct these areas below 75 inches per mile		

Table 2317.05-4: Schedule for Adjustment Payment for PCC Pavements for Non-Primary Projects

Mean International Roughness Index (MRI) Inches per mile	Dollars per 0.1 mile segment per lane
Less than 60.0	300
60.0 to70.0	2100-30 X MRI
70.0 to 80.0	0.00
80.0 to 95.0	1600 – 20 X MRI or grind*
Greater than 95.0	Grind*
*Correct these areas to below 80.0 inches per mile	

D. HMA Pavement.

The payment for mean International Roughness Index for HMA pavement will be adjusted as shown in Table 2317.05-5 and Table 2317.05-6.

Table 2317.05-5: Schedule for Adjustment Payment for HMA Pavements for Primary and Interstate Projects

Mean International Roughness Index (MRI)	Dollars per 0.1 mile segment per lane
	Design Thickness

inches per mile	Full Depth (>4")	Overlay (<=4")
Less than 29.84	1,500	1,250
29.84 to 39.22	=6271.915-159.915*MRI	=5226.596-133.2623*MRI
39.22 to 75	Unit Price	Unit Price
75 to 90	=7500-100*MRI (or Grind*)	=6250-83.333*MRI (or Grind*)
Greater than 90	Grind*	Grind*
* Correct these areas below 75 inches per mile		

Table 2317.05-6: Schedule for Adjustment Payment for HMA Pavements for Non-Primary Projects

Mean International Roughness Index (MRI) Inches per mile	Dollars per 0.1 mile segment per lane
Less than 35.0	300
35.0 to 45.0	1350-30 X MRI
45.0 to 80.0	0.00
80.0 to 95.0	1600 – 20 X MRI or grind*
Greater than 95.0	Grind*
*Correct these areas to below 80.0 inches per mile	

New Bid Item Required (X one)	**Yes**	**No** X
Bid Item Modification Required (X one)	**Yes**	**No** X
Bid Item Obsoletion Required (X one)	**Yes**	**No** X

Comments: Major rewrite to move forward from PI to MRI- changes not tracked.

County or City Comments:

Industry Comments: Industry input from both ICPA and APAI has been solicited, received, and incorporated.

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove / Brad Azeltine	**Office:** Construction & Materials	**Item 4**
Submittal Date: October 20 2022	**Proposed Effective Date:** April 2023	
Article No.: 2508 **Title:** Removal of Paint and Painting Steel Bridge Structures	**Other:**	

Specification Committee Action: Approved as recommended

Deferred:	**Not Approved:**	**Approved Date:** 11/10/2022	**Effective Date:** April 2023 GS

Specification Committee Approved Text: See Specification Section Recommended Text

Comments: None

Specification Section Recommended Text:
2508, Removal of Paint and Painting Steel.

Replace the Section:

Section 2508. Removal of Paint and Painting Steel Bridge Structures

2508.01 REMOVAL OF PAINT.

A. Non-Hazardous Paint Removal.

1. General.

a. Apply Article 2508.01, A, only to structures previously painted with "non-lead based" paints and to structures with ~~scratch~~ scrape tests indicating a non-hazardous waste (as identified in 40 CFR 261) is expected to be generated during the project. Structures where scrape test results of total lead content of 5000 milligrams per kilogram (mg/kg) or greater will be handled under Article 2508.01, B unless additional sampling and analysis by Toxicity Characteristic Leaching Procedure (TCLP) is less than 5.0 mg/L for lead. OSHA may regulate other issues. Take whatever precautions are necessary to comply with Federal and State safety and health regulations.

b. To comply with Iowa Code 89B.8(1) ~~scratch~~ scrape tests are provided elsewhere in the contract documents for information.

2. Bridge Cleaning.

This work involves removing accumulated foreign material and loose paint. It also involves water washing areas designated elsewhere in the contract documents.

a. Removal of Accumulated Foreign Material.

1) Prior to water washing, remove all accumulated foreign material from:

- Beams, member flanges, and gusset plates,
- Abutment bridge seats, pier tops, truss joints, and deck drains, and
- Other locations the Engineer orders.

2) Remove the accumulated foreign material using hand brooms, hand shovels, vacuum cleaners or other methods the Engineer considers acceptable. Collect the removed material and dispose of at an approved waste area according to Federal, State, and local regulations. Apply appropriate measures to ensure that at no time does removed material fall or be disposed in the water or on the land below the bridge.

b. Loosely Adherent Paint.
Prior to water washing, use hand tool methods, complying with SSPC-SP2, to remove loosely adherent paint in areas designated for painting. All paint removal operations will require containment as specified in Article 2508.01, A, 4.

c. Water Washing.

1) Prior to abrasive blast cleaning, use high-pressure water to wash steel surfaces to be repainted, abutment seats, pier caps, and other surfaces that may be designated elsewhere in the contract documents. Limit water pressure so that no paint is removed.

2) Ensure salt contaminants, dirt, bird excrement, and other detrimental foreign material are removed. Detergents or cleaners and scrubbing may be needed in conjunction with water washing. Use clear fresh water that is free of sediments and salt contaminants. After water cleaning, remove all oily or greasy residues using solvent according to SSPC-SP1.

3) Remove chalking from existing painted surfaces onto which paint is to be applied. Examples are transition zones for spot or zone painting and surfaces that will receive a top coat over an existing prime or top coat. In those areas, remove the chalked pigment by water washing.

4) Detergents or cleaners and scrubbing may be needed in conjunction with water washing. Use detergents or cleaners that are compatible with the existing paint system and pre-approved by the new paint manufacturer. Apply according to the product manufacturer's recommendations.

5) Submit ~~M~~SDS and any technical field guides for any detergent or cleaner to the Engineer for review and approval before using. If detergents or cleaners are used, thoroughly rinse the surface with water to remove all residue prior to painting.

3. Blast Cleaning and Surface Preparation.

a. Abrasive Blast Cleaning.

1) This work involves preparing all designated surfaces to be painted by either:
- abrasive blasting using conventional equipment, and/or
- vacuum blasting equipment.

2) Some hand-tool and/or power-tool cleaning may be required in areas not fully accessible to the other methods.

3) Use an abrasive blasting system that incorporates abrasive recycling ~~in order~~ to reduce waste volume to the greatest extent possible.

b. Standards For Surface Preparation.

1) Abrasive Blasting.

a) Prepare areas to be painted using a dry abrasive blast method to a level (SSPC-SP6 and/or SSPC-SP10) as designated elsewhere in the contract documents. The current SSPC-VIS1, Visual Standard for Abrasive Blast Cleaned Steel, will be used in conjunction with the appropriate written SSPC Standard for acceptance of final surface preparation. Prepare the surface profile (etched height) to be 1.5 to 2.5 mils as measured by replica tape or surface profile comparator.

b) Use hand-tool or power-tool methods, or both, to prepare small areas that cannot be cleaned using abrasive blasting equipment. SSPC Standards applicable to the method(s) applied will be used to evaluate surface preparation.

c) After blasting or mechanical preparation, thoroughly clean the surface to be painted with either HEPA vacuums or dry, oil free, compressed air, or both, to remove all adhering blast residue. Remove all oily or greasy residues with solvent complying with SSPC-SP1, Solvent Cleaning.

2) Removal of Existing Deteriorated Paint by Mechanical Methods.

a) The contract documents may designate areas to be painted which are to be cleaned by mechanical methods. These will be:

(1) Areas of deteriorated paint where the existing top coat is peeled or deteriorated and the underlying existing primer is in sound condition. In these cases, remove only the existing top coat by manual methods complying with SSPC-SP2 so the underlying existing primer is left in place. Remove the deteriorated top coat back to the boundary of soundly adhering top coat. A soundly adhering top coat is defined as that which cannot be lifted from the primer with a putty knife.

(2) Spot areas deemed too small to be effectively prepared by abrasive blasting.

b) Remove the deteriorated paint back to the boundary of soundly adhering existing primer. Regardless of the method used for cleaning, feather all edges of sites cleaned to a smooth transition between the existing paint and the cleaned area.

c) Use mechanical methods of surface preparation complying with SSPC-SP2 or SSPC-SP3, or both~~, as modified below~~.

~~**d)** Replace Article 3.5 of SP2, Hand Tool Cleaning, with the following:~~

~~3.5 SSPC-VIS3, Visual Standards for Power and Hand-Tool Cleaned Steel, shall be used to evaluate the degree of cleaning.~~

~~**e)** Replace Articles 2.2, 2.3, and 5.3 of SSPC-SP3, Power Tool Cleaning, with the following:~~

~~2.2 It is intended that power tool cleaning remove rust, deteriorated paint, detrimental foreign material, and loose mill scale that can be removed by vigorous use of the power tools.~~

~~2.3 SSPC-VIS3, Visual Standard for Power and Hand-Tool Cleaned Steel, shall be used to evaluate the degree of cleaning.~~

~~5.3 Use power wire brushing, power abrading, power impact, or other power rotary tools to remove rust, deteriorated paint, and loose mill scale. Do not burnish the surface.~~

~~**f**~~ **d)** After mechanical preparation, thoroughly clean the surface to be painted with either HEPA Vacuums or dry, oil free, compressed air, or both, to remove all adhering blast residue. Remove all oily or greasy residues with solvent complying with SSPC-SP1, Solvent Cleaning.

3) Galvanized Elements.

Protect galvanized elements such as deck drain pipes and bearings. Blast clean only if directed by the Engineer. All galvanized elements which are to be cleaned and painted will be paid for as extra work according to Article 1109.03,B.

4) Rust ~~Blume~~ Bloom or Flash Rust.

Rust ~~blume~~ bloom or flash rust is defined as the development of visible rust on bare metal surfaces after cleaning. Reblast the surface, or brush blast the surface and blow it down, just prior to the application of the first coat of paint if:

- Flash rust or rust ~~blume~~ bloom occurs after removal of existing paint, or
- A surface is cleaned and left unpainted for more than 24 hours

5) Pin Hole Rusting.

a) Pinhole rust areas may be designated for painting in the contract documents. In areas where there is pin hole rusting and associated staining, abrasive blasting may not be required if the existing paint is sound other than at the pin holes. Mechanical cleaning, according to SSPC-SP2, may be used in these areas prior to applying the spot primer.

b) If the mechanical methods do not remove heavy staining of sound paint adjacent to the pinholes, remove the stain to the degree recommended by the manufacturer of the primer. Use methods of removal recommended by the manufacturer. Provide a written copy of the recommendations to the Engineer prior to performing the work.

6) Feathering of Repair Areas.

For spot and zone painting work, feather the existing coating surrounding each repair location. A smooth, tapered transition of 1 to 2 inches onto the existing intact coating is required around each repair area. Roughen the existing coating by hand sanding or a solvent wipe in the feathered area to assure proper adhesion for the new paint. Verify soundness of the existing paint by probing the edges of coating around the periphery of the repair areas with a putty knife, according to the requirements of SSPC-SP3.

7) Protection of Unpainted Surfaces.

a) Use whatever precaution is necessary to ensure vehicular traffic, equipment, hardware, fixtures, concrete, and other surfaces are protected against abrasive impact, paint spillage, over-spray, and other damage during the project.

b) For spot or zone painting work, use protective coverings, shields, or masking as necessary to protect surfaces that are outside the designated painting areas. Maintain protection during the entire period work is being performed which could damage those surfaces.

c) Exercise extra care to avoid over-blast damage to the existing coating in non-designated areas. Correct damage to non-designated areas by cleaning, repairing, and repainting at no additional cost to the Contracting Authority. Repair procedures will be approved by the coating manufacturer's technical representative. Submit the manufacturer's approval to the Engineer for review and approval before the repair work is started.

8) Abrasives.

a) Use steel shot and/or grit, aluminum oxide, or garnet abrasives. This is to ensure hard durable abrasives are used, to encourage abrasive recycling, and to minimize waste generated by the project. Use clean, dry abrasives that are free from contamination. Do not use sand or coal slag.

b) If blasting with previously used or recycled abrasive:

- Obtain a representative sample of that abrasive,
- Have that sample analyzed for TCLP leachable levels of arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver, and
- Submit the laboratory's analytical report to the Engineer for approval prior to use.

c) The Engineer will accept used or recycled abrasives only if the leachable quantity of each metal tested is equal to, or less than, ~~one part per million~~ 1 ppm or 1 mg/L.

d) Clean and recycle abrasive used during this project to the greatest extent possible. Provide a written abrasive recycling workplan to the Engineer for approval. In this proposal list the equipment and process used for recycling and recovery of the abrasive and monitoring air dispelled from the recycling process.

e) Employ a method to monitor dispelled air from the recycling system that samples and tests for total lead and particulate matter of ~~0.4 mils and smaller~~ 10 microns or less (PM_{10}). Blasting will be suspended immediately if the Engineer deems visible dust or particulate matter is in the air expelled from recycling equipment.

9) Chloride Testing.

a) The Engineer reserves the option to test the blasted surface(s) for residual chloride ions. Chloride ions after blasting and blow down shall be less than 15 µg of chloride per 100 mm^2. Areas that are not equal to, or below, these criteria will need to be re-washed, brush blasted, and retested.

b) The Engineer will measure chloride contamination by using a Surface Contamination Analysis Kit~~, marketed by KTA-Tator Inc.~~ or an equivalent analytical process.

4. Containment.

a. General.

1) Abrasive blasting using conventional equipment will require a system for total containment of the blast area. Containment includes all containment enclosures (where applicable), monitoring, recovery, and temporary storage of waste. For vacuum blasting, the "contained area" is defined as the area around the blast nozzle and any other connections or equipment where waste, dust, or exhausted air may exit into the environment.

2) Submit to the Engineer a plan for containment enclosures, an analytical report of the abrasives to be used, and a plan for monitoring air quality prior to starting work. A general guideline for containment evaluation abrasive blasting and/or vacuum blasting will be:

No visual or noticeable dust is to be observed escaping into the atmosphere or onto the ground from the contained area during blasting, blow down, or ~~prior to the~~ daily clean-up operations.

3) Suspend blasting if the Engineer determines that air expelled from containment or from the vacuum nozzle has noticeable dust or particulate matter. If the Engineer determines the containment measures are inadequate, alter the removal operation or the containment to meet the Engineer's requirement.

b. Abrasive Blast Cleaning.

1) Use a system which ensures total containment and recovery of the material removed from the structure. Construct bridge containment enclosures over other roadways to allow traffic to be maintained on the bridge being cleaned as well as on the road under the bridge, according to traffic control requirements in the contract documents.

2) Removed material will be defined as paint chips, abrasive particles, and other blasting residues. Ensure the containment prevents removed material and abrasive from drifting or being deposited, or both, other than within the containment enclosure. The blasting operation will be suspended immediately if the Engineer deems waste cleanup or house keeping measures, or both, to be inadequate. If the Engineer rules the containment measures inadequate, alter the operation or the containment to meet the Engineer's requirement.

3) Use impermeable cover materials, such as tarpaulins, drop cloths, or other approved materials, on or above the ground, waterways, and other surfaces. Recover removed material from the covering materials. Highway pavements and paved surfaces under a structure may be used as a portion of the collection cover for that area providing traffic is maintained on the bridge and on the pavement under the bridge according to traffic control requirements in the contract documents.

4) All areas used for containment and recovery shall be thoroughly cleaned of all debris before work is begun. Close containment areas to the public. If paved surfaces are used for recovery areas, use only areas that are continuous and free of open cracks. Seal cracks to prevent infiltration of blast residue prior to commencing any blasting in that area.

5) Turn the edges of the impermeable cover material upward a minimum of 1 foot to minimize loss of waste materials. Ensure covers on or over roadways, railways, or waterways do not present a hazard nor remain in place overnight without the Engineer's written permission. Fasten the edges of the impermeable cover to the vertical drapes to ensure no loss of waste materials. Ensure overlaps of the cover material are a minimum of 3 feet, securely tied together, and continuously taped to prevent loss of removed material.

6) Extend vertical drapes from above the blasting area to the bottom of the enclosure. Securely anchor them top and bottom and at the laps to prevent spilling or loss of removed material. Use material capable of withstanding wind forces without tearing or having a breach of integrity.

7) Containment enclosures shall be anchored to prohibit enclosure encroachment on open traffic lanes, railroad lanes, and waterways. Ensure removed material will not fall on to surface waters.

c. Monitoring.

1) During abrasive blasting, monitor air quality by conducting air sampling and testing. Perform this work under the direction of a certified Industrial Hygienist. Use a minimum sampling frequency of one sample of 8 hour duration per week.

2) One purpose of the sampling is to allow ~~for~~ the Engineer to determine the effectiveness of the containment. Samples will be obtained from at least two locations outside and immediately down wind from the containment, according to 40 CFR~~, Part~~ 50.

3) Employ an air monitoring that identifies total lead and total suspended particulate (TSP) to evaluate site compliance with the requirements of 40 CFR 50. Provide the results of this monitoring to the Engineer as soon as they become available. Abrasive blasting will be suspended immediately if the Engineer determines expelled air quality measures to be above EPA standards for particulate matter.

4) Air quality sampling and testing will not be required for small localized containments when:

- Blasting operations have an expected duration of less than approximately 3 hours, or
- The expected duration of the total amount of blasting on the project is less than approximately 8 hours.

d. Cleaning by Other Methods.

1) At locations where abrasive blasting is not used, use a waste collection system that ensures containment and collection of the material removed from the structure. Removed material will be defined as paint chips and other residues. Ensure the containment prevents removed material from drifting or being deposited, or both, other than on the containment portion provided.

2) Use impermeable cover materials, such as tarpaulins or drop cloths, on or above the ground, waterways, surface waters, and other surfaces. Use these covering materials to recover removed material.

e. Clean-up Contingency.

1) Clean up any spills that result from the operations at no additional cost to the Contracting Authority. Provide a written plan for clean up of spills to the Engineer prior to removing paint.

2) For removal activities over water, have floating boom devices in place during removal operations. Ensure these devices are capable of preventing waste material from moving away from the site in the event of a breach in the containment system.

f. Recovery and Temporary Storage of Waste.

1) Deposit accumulated bridge cleaning waste in appropriately sized clean new or reconditioned containers with securely sealed lids meeting the requirements of 49 CFR 173.24. Recover wastes daily and deposit the wastes into these temporary storage containers. Securely seal the containers to shield the contents from the elements at all times. Consolidate all waste material to a minimum number of containers.

2) Recover all residues and carefully transfer, ensuring no release of residues into the air or contamination of surrounding surfaces. Keep all containers containing residue closed and secured, except during the addition of waste. Ensure residues do not remain on bridge surfaces or on the containment material overnight.

3) Clearly mark all bridge cleaning waste containers in no less than 1 1/2 inch block letters stating:

PAINT WASTE
NONHAZARDOUS

(Date)

The date shall indicate when waste was first put into the container.

4) Construct or furnish a secured temporary storage area of sufficient size for the contained waste material. Enclose temporary storage areas with an 8 foot chain link fence or a roll-off box with a lockable cover. Plans for other secured temporary storage areas may be submitted to the Engineer for approval.

5) Locate the temporary storage area within the right-of-way of the Contracting Authority at a location the Engineer approves. Ensure the base for waste storage is above the extreme high water elevation, if constructed within a flood plain.

6) For projects that will generate less than 55 gallons of waste, the fenced temporary storage area or roll-off box will not be required and the Contractor is responsible for securely storing the paint waste containers on-site during the project.

7) At, or prior to the conclusion of the work, obtain one representative sample of the waste material from each container. Combine samples so that one representative composite sample is made for every five waste containers. Submit composite sample(s) to a lab for a ~~Toxic Character Leachate~~ Toxicity Characteristic Leaching Procedure (TCLP) test for the eight priority metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Provide the ~~results of this~~ laboratory analysis results to the Engineer upon receipt. Maintain wastes on site and do not dispose of them until the Engineer has reviewed analytical data and approved of the disposal method.

g. Disposal of Removed Material (Waste).

1) Transport waste materials in approved containers from temporary storage to a lined Subtitle D landfill (for non-hazardous wastes) or Subtitle C, Treatment, Storage, and Disposal Facility (TSDF for hazardous wastes) which accepts bridge painting wastes. Transport the wastes to the landfill facility within 5 calendar days of completion of surface preparation operations.

2) Provide the Engineer with copies of delivery tickets and landfill invoices for all waste material generated by this project.

3) Dispose of all bridge cleaning wastes according to Federal, State, and local regulations.

4) This project is based on the best information available that wastes generated will be non-hazardous for disposal per 40 CFR 261. Disposal of hazardous bridge cleaning wastes will be by extra work according to Article 1109.03.

h. Final Clean up.

1) Apply Article 1104.08.

2) In no case allow any foreign material or other painting related wastes to mix with the wastes generated from abrasive blast cleaning or paint cleaning by other methods.

5. Protection and Clean up.

a. For all work, use every reasonable means to protect the environment, human health and safety, adjacent property, and vehicles from damage resulting from the paint removal operations, according to Article 1107.07. Keep the project site in a neat, clean, and safe working condition.

b. At the end of each working day, clean up and properly containerize all waste material. Special attention is drawn to steel abrasive and its preponderancy to rust and stain surfaces where material is allowed to accumulate.

c. Clean up abrasive on a daily basis and remove any staining which occurs.

d. Protection and clean up will not be measured for payment, but will be considered incidental to all other pay items in this specification.

B. Hazardous Paint Removal.

1. General.

a. Apply Article 2508.01, B, only to structures previously painted with lead based paints and for structures with ~~Scratch Tests~~ a scrape test for total lead of 5000 mg/kg or greater indicating a hazardous waste is expected to be generated during the project. ~~Scratch~~ Scrape tests are provided elsewhere in the contract documents for information per Iowa Code 89B.8(1).

b. Take responsibility for whatever precautions are necessary, to comply with Federal and State ~~safety and~~ health, safety, and waste regulations.

2. Bridge Cleaning.

Apply Article 2508.01, A, 2.

3. Blast Cleaning of Structural Steel.

a. Waste Notification.

1) Evidence suggests ~~T~~this structure has previously been painted with coating materials which contained lead pigments or chromium pigments, or both. Analytical results from scrape tests of the existing paint system are provided elsewhere in the contract documents.

2) The waste produced is expected to contain paint chips with heavy metal constituents, spent abrasive, rust, and possible mill scale. Take whatever measures are deemed necessary to assure protection for human health and the environment.

b. Preconstruction Sampling and Testing.

1) Obtain representative waste samples from the existing paint system using the selected production blasting system and equipment. Have an accredited laboratory test waste material with the TCLP using EPA test method SW-6010B, TCLP; or an approved equal. Laboratories accredited by the American Industrial Hygiene Association of National Environmental Laboratory Accreditation Program, or any US EPA certified laboratory may perform the paint waste testing.

2) Have waste samples analyzed for, at a minimum, the eight priority metals. These metals are: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. No later than 12 calendar days following the first day of production blasting, provide the Engineer with the laboratory's analytical ~~results of these tests~~ reports as well as reasonable estimated quantities of waste that are expected to be generated per month.

3) Conduct preconstruction and post-construction soil and river sediment sampling in the areas potentially impacted by blasting activities. At least 3 weeks prior to commencing work, provide a written program for sampling to the Engineer for review and comment. On the program, identify the number of samples proposed, the sampling locations, and sampling procedure to ensure all areas of potential impact are evaluated and that a statistical basis has been developed.

4) All sampling should be tested for total lead and chromium content using EPA Method SW-6010B, Totals, or approved equal. Locations where it is recommended to take samples include:

- At locations under and within the shadow of the structure,
- Storm sewer intakes and curb drains,
- Areas where ditches could carry debris laden storm water run-off to the river,
- Locations of equipment and waste storage, and
- Sediments along the bank and in water less than 5 feet deep.

5) Preconstruction sampling locations need to be marked and resampled at the same location upon completion of work. Refer to Article 2508.01, B, 6, for additional information.

6) Provide the Engineer with preconstruction analytical results from soil and sediment sampling at least 3 weeks prior to commencing production blasting or other paint removing activities. After final clean up, but before final acceptance of the project, provide the Engineer with post-construction analytical results from soil and sediment sampling.

c. Environmental Regulatory Permits.

1) The Contracting Authority will obtain and provide an US EPA hazardous waste generator identification number for this project if project specific waste sampling and testing indicate a hazardous waste will be generated.

2) The Engineer will use actual waste analytical results and estimated waste quantity data received from the Preconstruction Sampling and Testing to identify which type of identification number, if any, is required.

3) Obtain all other permits including any required for waste disposal. Apply Article 1107.03.

d. Site Working Documents.

Submit to the Engineer, for review and comment, ~~three copies~~ an electronic copy of ~~all~~ each site working document~~s~~ required in this section. Write each site working document to be specific for the issues associated with the blast cleaning alternatives selected. Revise any indicated sections of the site working documents to comply with the Engineer's comments and resubmit, if necessary.

1) Site Work Plan.

A minimum of 3 weeks prior to commencing work, provide a written site work plan to the Engineer for review and comment. On the site work plan include, at a minimum, a complete description of:

a) Paint removal methods selected, refer to Article 2508.01, B, 3, e.

b) The equipment and processes to be used including equipment catalog information from the manufacturers for major pieces of equipment.

c) The environmental protection plan including waste sampling procedures and methods used to control emissions into the air, water, and onto the soil.

d) Waste handling, storage, and disposal plan.

e) A preconstruction soil and river sediment sampling plan, refer to Article 2508.01, B, 3, b.

f) The Site Air Monitoring Plan. In this plan, describe the air sampling protocol and analytical procedures, sampling locations, frequency of sampling, and equipment, refer to Article 2508.01, B, 4, c. Use 40 CFR 50 as guidance when locating air monitoring equipment. Use a minimum frequency for sampling and monitoring that is in accordance with Federal and State requirements, and this specification.

2) Site Health and Safety Plan.

a) A minimum of 3 weeks prior to commencing work, provide a written Health and Safety Plan (~~H&SP~~ HASP) to the Engineer for review and comment. In this plan detail the compliance program with regulatory requirements including, but not limited to:

- OSHA 29 CFR, 1910 and 1926,
- Resource Conservation Recovery Act (RCRA) and CERCLA 40 CFR, 261 through 300,
- TSCA 40 CFR, 700 – end, and
- Transportation 49 CFR, 100 through 199.

b) Give attention to 29 CFR~~, Section~~ 1926.62, Lead in Construction Standard. In addition, ensure the ~~H&SP~~ HASP specifically identifies:

(1) The Project Site Safety Officer who is to be on site at all times when work is in progress, and who has the Contractor's authority to effect an immediate operational change or to shut down production until a specification, regulatory, or safety deficiency is corrected. The Project Site Safety Officer has continuous site responsibility for assuring that ~~worker health, safety, and U.S. EPA~~ all regulatory requirements are being met including, but not limited to, worker health and safety and waste management. This includes the duties of the "competent person" as required by 29 CFR 1926.62.

(2) The compliance program as required by 29 CFR 1926.62 which includes the following at a minimum:

(a) A description of each activity in which lead and/or chromium is emitted including the equipment and processes involved,

(b) Standard operating procedures for activities involving hazardous constituents,

(c) Maintenance schedules of equipment utilized for filtration of potentially hazardous constituents,

(d) Crew size and responsibilities,

(e) Description of engineering controls and processes used to control lead exposure or chromium exposure, or both,

(f) A report of the technology considered in meeting the ~~Personal~~ Permissible Exposure Limit (PEL),

(g) Air monitoring protocol which will be used to document personnel exposure,

(h) Schedule for implementing the program,

(i) Work practice program including the personal protective equipment,

(j) Housekeeping and hygiene practices,

(k) An administrative control (job rotation) schedule if used, and

(l) A description of ~~H&SP~~ HASP compliance arrangements made between the Contractor and their subcontractors.

(3) Hazardous substances, that are expected to be encountered, PELs for these substances, and site personnel medical monitoring expected.

(4) The levels of personnel training, protection, and protective equipment required for different tasks performed at the site.

(5) Site control and restricted access policy to ensure unauthorized personnel or untrained personnel, or both, are not exposed to unnecessary risks.

c) The signature of a Certified Industrial Hygienist trained in worker environmental health and safety issues is required on the ~~H&SP~~ HASP.

3) Site Contingency Plan.

a) A minimum of 3 weeks prior to commencing work, provide, for the Engineer's review and comment, a written Site Contingency Plan (SCP) as discussed in 40 CFR 261 D. In this plan:

(1) Detail the procedures that will be implemented and corrective action that will be taken, should an emergency or unforeseen situation arise.

(2) Specify procedures to minimize hazards to human health and the environment should there be fires, explosions, vandalism, or any other unplanned sudden or non-sudden release of hazardous waste or hazardous constituents to the air, soil, or surface water.

(3) Detail contingency measures that will be available on site to prevent accidental releases and provide safety to the general public. For example: Security, preventative, and containment measures which will be used to prevent and/or contain:

(a) Spillage or loss of paint wastes.
(b) Spillage of bulk paint, solvents, and thinners during the painting operations,
(c) Spillage or leakage of equipment fuel, oil, or other fluids,
(d) River traffic from encountering floating booms or barge mounted equipment,
(e) Inadvertent public exposure to job site hazards, and
(f) Waste material, or spills on water, from migrating off site and to contain that material until it is cleaned up.

b) Follow current Federal and State regulations in preparing this plan. Have it on file in the locations specified by regulation.

e. Paint Removal.

1) Submit to the Engineer in writing the type of blasting equipment that will be used for the paint removal operations before starting work. Achieve the level of surface preparation specified. In no case will unproven technology or untested technology, or both, be allowed without prior review, testing, and written approval from the Engineer.

2) The blasting process and equipment is required to be part of the Site Work Plan, and the plan shall describe in detail the:

- Method of blasting,
- Work procedures and tasks for this removal method,
- The estimated production rate~~,~~ in ~~other words,~~ square ~~foot (square meter)~~ feet per hour,
- Estimated quantity of blasting abrasive utilized per production rate (hour or square foot), and
- Procedure and protocols for abrasive recycling.

3) Contain and collect all waste material generated during blast cleaning. Contain any fugitive emissions (solid particulate, fugitive dust). Protect the health and welfare of the public. Protect the environment. Employ adequate administrative and engineering controls to reduce worker exposures to all hazardous constituents present at the site to levels as low as feasible according to industry standards. Refer to Article 2508.01, B, 4, b for additional details.

f. Standards for Surface Preparation.

Apply Article 2508.01, A, 3, b.

4. Containment.

a. General.

1) This work includes the design, erection, maintenance, and removal of the enclosure or containment used to contain wastes generated during the surface preparation. The work also includes characterizing, collecting, and containing wastes generated during the project.

2) Ensure any enclosure complying with, or comparable to, an SSPC Class 3 or better is designed and sealed by a Professional Engineer licensed in the State of Iowa who is qualified in structures. Ensure ventilation in a Class 2 or better containment is designed and sealed by a Professional Engineer licensed in the State of Iowa who is qualified in ventilation.

3) Work required to decontaminate, clean, and test equipment and non-expendable materials or supplies shall be included in this section. Ensure, at a minimum, decontamination and cleaning do not allow debris or dust, or both, to be dislodged by winds or physical contact during handling and movement of a containment structure. In addition, establish a procedure to ensure all equipment and materials are essentially free from hazardous substances when delivered to and removed from the project site.

b. Enclosure.

1) Perform paint removal activities, except for vacuum blasting, within a full enclosure. Design the full enclosure as a system including:

- The frame work and outer covering,
- Attachments to the structure and supporting foundations,
- Waste handling, and

- Ventilation, if required.

2) Include in the enclosure submittal a method or process to catch, accumulate, and ultimately contain all spent abrasive and all paint waste. Include in the enclosure details a description and catalogue cuts of:
- Containment materials and equipment used,
- Material strengths, permeability, and necessary seam closure details,
- Drawings of attachments to the bridge including abutments, piers, deck, parapet rails, and beams, and
- Calculations of superimposed dead and wind loadings.

3) Submit ~~three copies~~ an electronic copy of this design to the Engineer for review and approval at least 3 weeks prior to erecting the enclosure. Use an enclosure that is:
- **a)** Designed to transfer added wind and static loading safely to the bridge. Analyze the structure for gravity and wind loadings from the containment. Provide a copy of this analysis and all supporting calculations in the submittal. If the Engineer determines that the proposed enclosure could have detrimental effects on the structural integrity of the bridge, modify the design of the enclosure at no additional cost to the Contracting Authority. A copy of the existing bridge plan is available from the Contracting Authority.
- **b)** Designed and constructed to maintain negative pressures inside the enclosure during production blasting and to include an air filtering and dust collection system for all exhausted air, unless site specific data collected during actual blasting operations conclusively show a tight containment with negative air is not required.
- **c)** Designed to employ adequate engineering controls, including ventilation, to reduce airborne contamination to levels as low as feasible.
- **d)** Equal to, or comparable with, SSPC Class 2 or better for Conventional Open Abrasive Blasting.

4) Contamination of the ground, water, or river sediment from project activities is strictly prohibited. Project activities that shall be carefully monitored and controlled to avoid environmental contamination include, but are not limited to:
- The containment,
- Dust collector,
- Abrasive reclaimer,
- Waste accumulation points (storage areas),
- Satellite accumulation points,
- Refueling locations,
- Boat or barge access points, and
- Paint handling, transfer, and mixing operations.

5) Uncontrolled dumping of wastes is strictly prohibited. Immediately clean up spills at no additional cost to the Contracting Authority.

c. Air Emissions and Monitoring.

1) **General.**
- **a)** Monitor air quality by using high-volume air monitoring equipment. Perform sampling protocol according to the provisions of 40 CFR 50 and its appendices. At a minimum, perform monitoring for total lead and total suspended particulate (TSP) and ~~particulate matter 0.4 mils and smaller (~~PM_{10}~~)~~.
- **b)** Use properly calibrated high-volume air sampling equipment at locations of maximum potential impact to the public plus at areas to provide background ambient samples.
- **c)** Identify anticipated monitoring locations and monitoring protocol in the Site Air Monitoring Plan.
- **d)** Have an American Industrial Hygiene Association (AIHA) accredited laboratory analyze all air samples collected.
- **e)** Filter all containment and process air exhausted from air handling equipment or the abrasive recycling process, or both, to remove particulates and regulated constituents to a level below current air quality standards.
- **f)** Capture and contain filtered material using a system designed for this purpose.
- **g)** Establish regulated areas around the dust collector, abrasive reclaimer, containment, and other operations that potentially generate lead emissions or chromium emissions, or both.
- **h)** Properly identify, post, and establish the perimeter of the regulated areas at the OSHA Action Level of 30 $\mu g/m^3$. Limit access within these areas to only those personnel who are properly trained and monitored according to the site Health and Safety Plan.

2) Site Air Monitoring Plan.

a) Ensure compliance with 29 CFR 1926; 40 CFR 50; 40 CFR 60; and 567 IAC 22 and 23, by including nomenclature in the plan for:
- Sampling equipment,
- Sampling procedure and protocol,
- Sampling frequency,
- Locating criteria, and
- Laboratory analysis of air samples.

b) Submit ~~the laboratory~~ analytical ~~results~~ report to the Engineer within 1 week of being received from the testing laboratory. ~~An electronically generated version containing, at a minimum, the information on the standard laboratory reporting form will be an acceptable substitute.~~

3) Containment Efficiency.

a) The Engineer will not routinely use opacity testing to evaluate a containment's efficiency, but will generally use a "no visible dust or blast media is to be observed escaping into the atmosphere or onto the ground from the contained area during blasting, cleaning, or blow down" criteria.

b) The Engineer may conduct random opacity tests or use high volume or personal cassette samplers for verification monitoring. This monitoring, positioning of equipment, and times are at the discretion of the Engineer. Verification monitoring will be outside of the Contractor's regulated areas and involve the Engineer's sampling equipment. The Engineer's sampling equipment will not be made available for the Contractor's use.

c) Ensure the National Ambient Air Quality Standards for lead or PM_{10} or visible dust are not violated. If it is violated, an issuance of a Suspension of Work notice will be used until appropriate corrective action is taken.

d) Shut downs for noncompliance with environmental regulations or standards will not be cause for extensions in time, or considered for delay costs.

d. Paint Waste.

1) Paint wastes include all wastes generated by the project. These wastes include, but are not limited to:
- Blast waste,
- Material accumulated from filtering exhausted air,
- Spent abrasive,
- Containment material that cannot be decontaminated for reuse,
- Material containers such as paint and solvent containers, and
- Other wastes that fail the TCLP test ~~as modified below~~ and are categorized as a RCRA hazardous waste.

2) Consider all paint wastes as hazardous until after appropriate analytical data or ~~Materials Safety Data Sheets~~ SDS are available showing conclusive evidence that the waste is below any regulated level for hazardous constituents, or is not initially regulated. ~~Further reduce any waste regulatory value listed in the CFRs by a factor of 20%. For example: 40 CFR 261.24, identifies lead (D008) as a characteristic hazardous waste if the toxic characteristic is equal to, or greater than, 5.0 mg/L. Wastes containing lead that have leachable levels greater than 4.0 mg/L are considered hazardous and are to be disposed of in a Subtitle C landfill.~~

3) During generation, accumulate all paint wastes and segregate by individual waste stream. Place in properly labeled storage containers. Use containers that comply with 49 CFR requirements. Follow the handling and storage requirements of 40 CFR 262 and 265. Waste streams may be combined after each has been sampled, tested, and characterized, provided wastes are compatible and combining is acceptable to the disposal facility.

4) As required by the ~~Site Contingency Plan~~ SCP, have a designated, responsible, and trained person available for 24 hour emergency response ~~around the clock any time~~ when wastes are stored on the project. It is recommended the Site Health and Safety Officer be so designated. Ensure this person is available during non-working hours and work shutdowns within a reasonable response time whenever wastes are being stored. Post this person and an alternate's name, telephone numbers, and other required information ~~on~~ in a prominent location at the accumulation point~~'s fence~~ and list in the ~~Site Contingency Plan~~ SCP.

a) Accumulation Point.

(1) Erect and maintain an accumulation point, or storage area, sized to accommodate the accumulation of wastes awaiting shipment to a disposal facility. Enclose the accumulation point with an 8 foot high chain link security fence with barbed wire top, lockable access gates, bermed sides, and properly posted warning signs. A

secured and enclosed trailer or shipping container is an acceptable alternative to a fenced area. Obtain the Engineer's approval for the location of this accumulation point. Construct it within the existing right-of-way at the project, but out of areas prone to flooding.

(2) For projects that will generate minimal quantities of waste, make a detailed written request to modify this storage security requirement. Submit all requests to modify the security requirement to the Engineer a minimum of 3 weeks prior to commencing production blasting. The Engineer will respond to the Contractor within two weeks following the request. The Engineer will evaluate the proposal based on:

- The Contractor's estimated waste quantities,
- The proposal's intent to comply with storage regulations and these specifications,
- Expected waste classification (i.e., hazardous or non-hazardous), and
- Other site specific considerations and details which the Contractor provides.

b) Satellite Accumulation Point.

(1) If the Contractor requests in writing, the Engineer will consider a small satellite accumulation point, or points, in the work zone. ~~Properly label containers stored in any satellite area. Tightly close containers to the elements and secure to prevent accidental spillage or loss.~~ The management of satellite accumulation areas is to comply with 40 CFR 262.15. At the conclusion of any working day, remove all containers containing accumulated wastes from any satellite accumulation point and place in the accumulation point storage area.

(2) Equipment which incorporates temporary storage of accumulation of wastes during operation will be considered a satellite accumulation point. As such, the equipment will be subject to proper labeling requirements. Waste materials contained within this type of equipment will not be subject to the requirement for daily transfer to the accumulation point storage area.

(3) Secure all materials stored at the accumulation point and satellite accumulation points to prevent spillage or vandalism. Securely cover to protect from the elements. Ensure the Site Health and Safety Officer maintains a permanent record to account for the accumulation of all waste materials and to report the cumulative weekly volumes at the project's progress meetings. Ensure the volume of materials located in the accumulation points and the condition of the storage containers are recorded weekly in the log.

(4) Remove accumulation point and satellite accumulation points (if used) when the Engineer orders, or at the end of the project. Apply Article 2508.01, B, 6.

e. Decontamination Plan.

1) Provide the Engineer with a written Decontamination Plan a minimum of 3 weeks prior to commencing work. In this plan, outline procedures to follow to ensure non-expendable materials and equipment have been properly decontaminated prior to arriving on the project and before being demobilized from the site. Prior to in-bound mobilization, provide the Engineer with a written statement which includes the following:

a) Identification of project, location, owner reference, and contact information and type of wastes generated (hazardous or non-hazardous) at the previous project.

b) Certification that all equipment and non-expendable materials have been decontaminated and are clean. In this certification include analytical data verifying items have been decontaminated and are clean.

2) Before off-loading (or allowing in the right-of-way) equipment or non-expendable material, or both, that: 1) is mobilized to the site without being included in the certification; or 2) arrives at the site in an unacceptable condition, ensure it is:

- Decontaminated,
- Adequately sampled and tested, and
- Accepted as clean by the Engineer.

3) Evaluation of equipment and non-expendable material clean-up used on projects that generate hazardous wastes should include sampling (~~s~~wipe or destructive) ~~and TCLP testing as an integral part of this plan~~. ~~It is recommended to follow OSHA's Field Operation's Manual, CPL 2.0 - 2.58 and HUD's Clearance Criteria for Post Abatement Clean-up when developing sampling procedures and protocol for a decontamination plan.~~

4) For projects that generate no hazardous waste, use equipment that is, at a minimum, judged as visually clean. In addition, perform non-expendable material cleanup in a manner

that is, at a minimum, judged as visually clean. No special testing will be required. Sample and test, or dispose of, items that cannot be visually evaluated.

5) If a particular waste stream can be identified as the sole source of hazardous materials, in an otherwise non-hazardous project, the Engineer has the discretion to:

- Separate out that process for a higher level of evaluation (for example sampling and testing), and
- Minimize visual evaluation on the other non-hazardous processes.

5. Paint Waste Transport and Disposal.

a. Waste Sampling and Testing.

1) Sample each waste stream during the project to ensure project goals are being maintained and that a disposal facility's need for waste characterization is being met.

2) Obtain all samples properly, prepare for shipment, and offer for transport using Chain-of-Custody procedures and protocol. Have an accredited laboratory~~, or a laboratory that participates in EPA's Contract Laboratory program,~~ analyze all samples. Refer to Article 2508.01, B, 3, b, for additional information.

3) Provide all laboratory ~~results~~ reports to the Engineer as soon as they are received. Obtain an adequate number of samples and analyze them to ensure any waste stream generated during this contract is fully characterized.

4) Sample solid wastes and analyze using TCLP ~~test~~ analysis for the eight RCRA priority metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Perform any additional analytical methods required by the disposal facility.

b. Disposal.

1) A minimum of 3 weeks prior to commencing production blasting, provide the Engineer with a written request to approve a designated disposal facility. Determine which of the following options or combinations are applicable to the job and selected removal process, or processes:

a) Permitted, Subtitle C, TSDF for any hazardous waste generated at the site.

b) Permitted, geosynthetic lined, Subtitle D landfill for non-hazardous waste generated at the site.

c) Treatment and disposal facility for waste water generated from personal decontamination wash water.

2) With this request include a letter of tentative commitment from the facility to accept and dispose of the project's waste or selected waste streams. Dispose of hazardous waste only in a permitted TSDF that has obtained and currently holds an US EPA, TSDF identification number. The Engineer ~~will~~ may evaluate any facility submitted by conducting an environmental audit, records review, and reference check of that facility.

3) After receiving the Engineer's approval of the facility (or facilities), begin the formal process of obtaining final disposal ~~permits which may be required by~~ authorization from that facility. Provide the Engineer with copies of all final documents pertaining to the disposal ~~permit~~. ~~Obtain a signed contract with the approved TSDF or other facility for wastes produced at the site before accumulating waste (hazardous or non-hazardous) in the amount of 1000 pounds or within 1 month of beginning paint removal operations.~~

4) Clean all shipping containers for regulated raw materials or consumable supplies received at the project to "RCRA empty" as defined in 40 CFR 261.7. Properly recycle or dispose of at the appropriate disposal facility.

5) The Engineer, on a case-by-case basis, will consider proposals for beneficial reuse, reclamation, or recycling of waste products generated during ~~the course of~~ the project. A minimum of 3 weeks prior to commencing work, provide a written Value Engineering Incentive Proposal, according to Article 1105.14, identifying a waste recycling program to the Engineer for consideration. In the submittal, provide the Engineer with ample detail to thoroughly and completely review and research the proposal.

c. Transportation and Manifesting.

1) Ensure that no waste leaves the site without a properly prepared waste manifest. Manifest all hazardous waste shipments using a Uniform Hazardous Waste Manifest, obtainable from ~~EPA or~~ the approved disposal facility. For all shipments of non-hazardous waste, propose a manifest. Obtain the Engineer’s approval for the manifest.

2) Have the Site Health and Safety Officer sign the manifest ~~prior to shipment~~. ~~Signatures will be on behalf of the Contracting Authority, according to 40 CFR 262. At the conclusion of each shipment, h~~Have the Site Health and Safety Officer ~~deliver to~~ provide the Engineer and appropriate agencies, electronic copies of ~~the required pages from the Uniform Hazardous Waste Manifests, according to the instructions included on the manifest~~ each

manifest along with any supporting documents such as land disposal restriction forms and waste profiles within 1 working day of shipment.

3) When material is being transported or readied for transport, ensure all waste containers are properly labeled and marked according to ~~Federal regulations (~~40 CFR 262 and 49 CFR 172~~)~~. Ship all wastes with a permitted transporter holding a current EPA transporters identification number. ~~Provide the Engineer with the required emergency response telephone number for the Uniform Hazardous Waste Manifest.~~

4) Maintain a file of all waste shipped for disposal or recycling. Have ~~the Site Health and Safety Officer immediately notify the Engineer if a waste shipment (hazardous or non-hazardous) does not reach the designated facility. Further, have~~ the Site Health and Safety Officer coordinate with the Engineer to assure that the signed original of each Uniform Hazardous Waste Manifest is received from the designated facility by the Engineer within 35 calendar days of the date the waste was accepted by the initial transporter. For shipments of hazardous waste, if the signed TSDF copy is not received in 10 additional calendar days (45 calendar days total) have the Site Health and Safety Officer immediately:

a) Prepare and submit an Exception Report in accordance with 40 CFR 262.42 to the EPA Region VII Administrator, ~~901 North 5th Street, Kansas City, KS 66101-2728~~ 11201 Renner Blvd, Lenexa, KS, 66219. Provide a copy of this report to the Engineer.

b) Initiate actions to track and locate that shipment (applicable for both hazardous and non-hazardous waste shipments).

5) Provide the Engineer with ~~a photocopy~~ an electronic copy of~~:~~

- ~~The signed Generator Copy page from the Uniform Hazardous Waste Manifest on the day of waste shipment, and~~
- ~~T~~the fully signed ~~Return~~ Designated Facility to Generator page from the Uniform Hazardous Waste Manifest ~~on the~~ within 1 working day of it ~~is~~ being received from the disposal facility.

6. Protection and Clean-up.

a. General.

1) For all work, use every reasonable means to protect the environment, human health and safety, adjacent property, and vehicles from damage resulting from the paint removal operations, according to Article 1107.07.

2) Keep the project site in a neat, clean, and safe working condition.

3) At the end of each working day, clean up and properly containerize all waste material. Special attention is drawn to steel abrasive and its preponderancy to rust and stain surfaces where material is allowed to accumulate.

4) Clean up abrasive on a daily basis and remove any staining which occurs.

b. Site Environmental Evaluation.

1) Do not contaminate the soil or bodies of water with lead or other hazardous materials.

2) Soil or river sediments are considered to have been contaminated with lead or chromium from the project if either of the following two conditions occurs. Return the soil or river sediments to back-ground levels by methods acceptable to the Engineer and all applicable regulatory authorities (at no additional cost to the Contracting Authority).

a) If the geometric mean pre-project level is less than or equal to 200 ppm (totals), and an increase in the post-geometric mean total content of 100 ppm or more occurs.

b) If the geometric mean pre-project level is greater than 200 ppm, and the post-geometric mean concentration exceeds the pre-job geometric mean plus two standard deviations, or increases in the post-geometric mean level of 100 ppm occurs, whichever is greater.

c. Final Clean-up.

1) Perform final cleanup of all work on this project according to Article 1104.08 and procedures established in Article 2508.01, B, 4.

2) No separate payment will be made for furnishing protection and cleanup. The costs for protection and cleanup are included in the contract unit prices bid for the various items of work in the contract.

7. Project Submittals and Written Plans.

The Contractor and Engineer shall adhere to the following requirements to ensure appropriate project paper work is submitted in a timely manner. No work will be allowed or progress payments made unless these items have been submitted, reviewed, corrected, and approved as necessary.

a. Three weeks prior to commencing work.

1) Site Soil and River Sediment Sampling Program, as described in Article 2508.01, B, 3, b.

2) Site Work Plan, as described in Article 2508.01, B, 3, d.

a) Environmental Protection Plan.
b) Waste Handling, Storage, and Disposal Plan.
c) Site Air Monitoring Plan.

3) Site Health and Safety Plan.
4) Site Contingency Plan.
5) Decontamination Plan, as described in Article 2508.01, B, 4, e.
6) Written proposal for Beneficial Waste Reuse, as described in Article 2508.01, B, 5, b.

b. Prior to in-bound mobilization.
Certification of Equipment Decontamination, as described in Article 2508.01, B, 4, e.

c. Three weeks prior to erecting containment.
Containment Design, as described in Article 2508.01, B, 4, b.

d. Three weeks prior to commencing production blasting.
1) Analytical results from soil and river sediment sampling, as described in Article 2508.01, B, 4, b.
2) Request to Modify Accumulation Point Security, if applicable, as described in Article 2508.01, B, 4, d.
3) Written request for Disposal Facility Approval, as described in Article 2508.01, B, 5, b.

e. Twelve calendar days following 1st day of production blasting.
1) Furnish analytical data from project sampling paint waste, as described in Article 2508.01, B, 3, b.
2) Furnish estimated waste production quantities.

f. Prior to painting.
1) Written paint mixing procedure, as described in Article 2508.02, E, 4.
2) Manufacturer's Recommendations, as described in Article 2508.02, B, 2.
3) Written designation of the paint manufacturer's technical representative, as described in Article 2508.02, E, 7.

2508.02 PAINTING OF STRUCTURAL STEEL.

A. General.
This work consists of fully repainting, zone painting, or spot painting (or any combination of these) structural steel at designated locations using a paint system designated elsewhere in the contract documents. The work includes:

- Furnishing the coating system specified,
- Application, protection, and curing of paint coatings,
- Protection of all parts of the structure from paint spatter,
- Environmental protection,
- Final cleanup, and
- Supplying all equipment, scaffolding and rigging, labor, and materials.

B. Material Acceptance.

1. Use paints that:
- Are equal to or less than 3.2 pounds per gallon for VOC. Calculation of VOC content shall account for thinning necessary for field application, and
- Contain pigments which are free from or have constituents at levels below a threshold that when disposed of would be regulated by ~~the~~ 40 CFR 261.

2. Furnish ~~three copies~~ an electronic copy of the coating manufacturer’s certification document for each shipment intended for use on this project. Ensure the document includes the following information:
- Date of shipment to the project,
- Name of painting Contractor or company to which the shipment was made,
- Brand names and product identification numbers,
- The most current Technical Data sheets and ~~M~~SDS for coatings, thinners, and tints,
- Batch or lot numbers, and
- Batch or lot numbers and producer mill certificate for any zinc pigment, certifying compliance to at least the purity requirements of ASTM D 520 Type II.

3. Provide the Engineer with ~~three copies~~ an electronic copy of the latest Technical Data Sheets, MSDS sheets, and coating manufacturer's written approval for caulking material to be used on this project.

4. Provide the Engineer with ~~two copies~~ an electronic copy of the certification document prior to starting work. Make an additional copy available on-site.

C. Paint System.

The paint system, Epoxy, Moisture Cured Urethane, or Zinc Silicate, for this project is designated elsewhere in the contract documents. The different systems are as follows:

1. Primer Coat.

a. Use a Zinc-rich Epoxy, Zinc-rich Aromatic Moisture Cured Urethane, or Zinc-rich Silicate applied at a rate that results in a targeted dry film thickness (dft) of:
- 3 to 5 mils for Epoxy.
- 3 to 4 mils for Moisture Cured Urethane.
- 3 to 5 mils for Zinc Silicate.

b. There is no color specified for the primer.

c. Dry film thickness listed assumes a surface profile of 1.5 to 2.5 mils. If this is not the case, either because of previous blast cleaning operations or improper quality control on this job, additional dft of primer may be required. In those cases, contact the paint manufacturer to provide a written alternate primer and possible application modifications. Prior to applying additional alternate primer, provide the written alternative to the Engineer for review and approval. Ensure that in no case do surface peaks project above the primer coverage.

d. The use of penetrating sealer, if required, will be designated elsewhere in the contract documents. A penetrating sealer may be required in any of the following areas:
- Where there are cracks and seams,
- In feathered (transition) areas,
- Areas with surfaces prepared by mechanical methods.

e. Apply the sealer at a rate that results in a targeted dft recommended by the paint manufacturer.

2. Intermediate Coat.

a. Use an Aluminum Epoxy Mastic or Aromatic Moisture Cured Urethane applied at a rate that results in a targeted dft of:
- 5 to 7 mils for Aluminum Epoxy Mastic.
- 3 to 4 mils for Moisture Cured Urethane, pigmented with micaceous iron oxide.
- No intermediate coat is required for a zinc-rich silicate system.

b. Tint the intermediate coat to a different color than the primer and finish coats.

3. Finish Coat.

a. Use an Aliphatic Polyurethane, Aliphatic Moisture Cured Urethane, or Waterborne Acrylic applied at a rate that results in a targeted dft of:
- 3 to 5 mils of Aliphatic Polyurethane for the Epoxy system.
- 2 to 3 mils of Aliphatic Moisture Cured Urethane.
- 2 to 3 mils of Waterborne Acrylic for the Zinc Silicate system.

b. For the top coat use Federal Color Number 14223 for highway bridges or the color specified in the contract documents.

D. Acceptable Products.

1. General.

a. Refer elsewhere in the contract documents for the system specified for this project. Acceptable suppliers and products for each system are listed in Materials I.M.s 482.02 through 482.06. Choose material for the paint system specified (including thinners, tinting, etc.) from one of the coating manufacturers.

b. When specified in the contract documents, use a penetrating sealer that is:
- Designated by the paint manufacturer for the system specified, and
- Tinted to a different color than that of the primer.

2. Epoxy System.

Use a three coat epoxy paint system consisting of:
- A Zinc-rich Epoxy primer,
- A High-solids Aluminum Epoxy Mastic intermediate coat, and
- An Aliphatic Polyurethane top coat.

3. Moisture Cured Urethane.
Use a three coat moisture cured urethane paint system consisting of:
- A Zinc-rich Aromatic Moisture Cured Urethane primer,
- A Moisture Cured Urethane - pigmented with micaceous iron oxide intermediate coat, and
- An Aliphatic Moisture Cured Urethane top coat.

4. Zinc Silicate.
Use a paint system consisting of a single coat of Zinc Silicate primer with a Waterborne Acrylic top coat system.

E. Application.

1. General.
Apply paint using brush, roller, or spray methods. Apply paint in strict compliance with the coating manufacturer's latest written recommendations. Regardless of the method of application, ensure the specified minimum dft is achieved. Ensure the manufacturer's recommended maximum dft requirement for each coat is not exceeded without approval of the paint manufacturer's technical representative. Additionally:
a. Ensure product parameters, such as application, thinning, mixing, pot life, ventilation, curing, and so forth comply with the manufacturer's recommendations.
b. Ensure the prime, intermediate, and finish coats have a smooth, uniform appearance free from runs, sags, cracks, dry spray, over-spray, or other defects.
c. Shield concrete and galvanized products so that paint application on steel is full and complete without over-spray.
d. Upon completion, permanently stencil the word "painted" followed by the Contractor's name, the month, year, coating system, and manufacturer of the coating system applied. Stencil this information on an inconspicuous surface in a manner and location the Engineer approves.
e. Provide OSHA compliant access for the Engineer to check the surface preparation before painting and the dft after each coat is applied.

2. Painting.
a. Penetrating Sealer.
Apply penetrating sealer to areas designated in the contract documents. Allow to cure according to the coating manufacturer's recommendations before the prime coat is applied.
b. Prime Coat.
1) Apply a prime coat to all areas blasted clean or mechanically cleaned, or both. Apply this coat to areas of bare metal within 24 hours of being blast cleaned. Brush blast the entire prepared area before paint is applied if:
- The prepared surface shows any sign of flash rust, or
- The prime coat is not applied within 24 hours after blast cleaning.

2) Use methods acceptable to the Engineer to re-prepare areas which were prepared by mechanical methods and are showing flash rust.
3) Pay special attention to all rivets, bolts, edges of connections, areas of pack rust, and areas which may be difficult to access. These areas may require ringing/stripping.
4) Allow the prime coat to cure according to the coating manufacturer's recommendations before the intermediate coat is applied.
c. Intermediate Coat.
1) Apply the intermediate coat to all areas that received a prime coat. Allow to cure according to the coating manufacturer's recommendations before the finish coat is applied.
2) The Zinc Silicate system does not require an intermediate coat.
d. Finish Coat.
Fully cover the intermediate coat with the finish coat. Fully cover other surfaces with the finish coat if designated in the contract documents.

3. Recoating.
a. Surface Condition.
1) Ensure surfaces are free of dirt, oxidation products, oil, and other detrimental material prior to painting. Perform cleaning which may be necessary according to the coating manufacturer’s recommendations.
2) Protect all painted surfaces to prevent soiling or detrimental weather conditions during painting and through the tack-free stage.
b. Minimum Time.

1) No additional coat(s) of paint may be applied until the preceding coat has dried. Recoat according to the coating manufacturer's recommendations for time, temperature (ambient and/or surface), and weather conditions.

2) If minimum recoat times are not given by the coating manufacturer, wait at least 24 hours, and until the previous coat is tack-free, before applying the next coat.

c. Maximum Time.

Do not exceed the coating manufacturer's maximum time between coats. If the maximum recoat time is exceeded for any coat, provide the Engineer with a written correction procedure, or approval to proceed without correction, obtained from the coating manufacturer's technical representative.

4. Mixing.

a. Mix paint according to the coating manufacturer's recommendations. Do not use previously opened or partially used containers of paint. Partial kit mixing will not be allowed.

b. Together with the coating manufacturer, provide a specific mixing procedure for the Engineer's review prior to performing the work. Follow this procedure unless the Engineer approves a written request to modify it.

5. Dry Film Thickness.

a. The Engineer will determine the dft of each coat and the total paint system using procedures described in SSPC-PA 2. Excessive coating thickness is as equally undesirable as unacceptably thin coating thickness, and both will be sufficient cause for rejection.

b. Targeted dft is specified herein. Touch up areas having less than specified dft to increase dft to at least that specified in this Article for the system specified. Depending on the condition of the steel substrate and paint system being used, it is possible these areas will require reblasting and repainting.

c. Excessive thickness will be evaluated on a case-by-case basis in consultation with the coating manufacturer. Depending on the condition of the steel substrate and paint system being used, it is possible these areas will require reblasting and repainting.

6. Cracks and Seams.

a. Use a best effort combination of blasting and possible hand or power tool cleaning to clean cracks and seams that are formed by junctions of joining members, splices, gusset plates, rivets, bolts, nuts, and similar surface irregularities. After application of any penetrating sealer and prior to application of the prime coat, caulk all cracks and seams that are equal to, or greater than, 3/16 inch wide with a durable caulking compound recommended by the paint manufacturer.

b. Seal cracks and seams less than 3/16 inch wide with the prime coat. Seal cracks and seams that cannot be sealed with the prime coat using caulk before the intermediate coat is applied. In the case of Zinc Silicate, this will be before the top coat is applied.

c. Use lead free caulking compound, supplied with the latest technical data and ~~M~~SDS sheets. Obtain the paint manufacturer's and the Engineer's approval prior to incorporation into the project.

7. Technical Assistance.

a. Have the coating manufacturer whose products are used on this contract designate a qualified technical representative to support this project. The technical representative shall be available for on-site assistance and project coating consultation as may be required.

b. Difficulties in scheduling on-site technical assistance will not be considered a sufficient reason for approving time extensions to the contract period.

c. Ensure that, in all cases, application parameters are according to the product's Technical Data Sheet or the manufacturer's written recommendations, unless superseded elsewhere in this specification or in the contract documents.

F. Application Conditions.

1. Apply the manufacturer's published weather restrictions for each coating, except as modified below.

2. Paint only when weather conditions are such that the surfaces to be painted are entirely free from moisture, frost, ice, and snow. When painting in an area protected from the above conditions, protect the surface under cover until the paint is dry.

3. If wet paint is exposed to humidity, rain, snow, or condensation, allow it to dry. Remove damaged paint, reclean the surface, and repaint.

4. Moisture Cured Urethane coating may only be applied when:
- Surface temperatures are between 38°F and rising and 100°F.
- Relative humidity is less than or equal to 95%.

5. Bubbling or pinholing which may occur in Moisture Cured Urethane will be evaluated using SSPC-VIS2. Bubbling or pinholing shall be less than 0.1% as defined by SSPC-VIS2, Photographic Standard No. 8.

2508.03 COAST GUARD REQUIREMENTS.

Apply the following for contracts that require work in and over navigable waters.

A. Comply with the following requirements:
- Established by the Corps of Engineers, the US Coast Guard, and others relative to construction work in and over navigable waters, and
- Applicable to this project, but not covered by existing permits.

B. Construction work includes, but not necessarily limited to:
- Bridge washing, paint removal, cleaning structural steel by blasting, and painting structural steel,
- Containment enclosures, safeguards and temporary falsework or platforms, and lighting during construction, and
- Anchorage of barges and construction equipment, temporary restriction of channel width, and the removal of all temporary construction.

C. Ensure operations within or over the river comply with the requirements or directions of the US Coast Guard District Engineer.

D. The following precautionary measures shall be taken during the performance of this work:

1. Perform work so that the free flow of navigation is not interfered with and navigable depths are not impaired.

2. Ensure floating equipment working in the channel displays lights and signals as required by the current Inland Navigational Rules.

3. If scaffolding or nets are suspended below low steel in the navigation span, contact the Coast Guard Office in St. Louis, Missouri, so that the temporary reductions in clearance for river traffic can be checked and appropriate notices can be published. Remove such scaffolding or nets at night, if required by the Coast Guard.

4. Take positive precautions to prevent spark producing, flame producing, lighted, or other damaging objects from accidentally dropping onto barges or vessels passing beneath the bridge. Cease all flame cutting, welding, and similar spark-producing operations over the channel when vessels are passing beneath the bridge.

5. Ensure work does not interfere with displaying navigation lights on the bridge at night.

6. Immediately remove any material, machinery, plant, or appliance which is lost, thrown from the bridge, sunken, or misplaced during the progress of the work, and which in the Engineer's opinion may be dangerous or obstructive to navigation. Immediately notify the Engineer and provide a description and location of the obstruction. When required, mark or buoy such obstructions until the obstruction is removed.

E. The Federal Water Pollution Control act, as amended, prohibits the discharge of oil, including oil based paints, or hazardous substances into the waters of the United States. The law requires any person in charge of a vessel or facility from which oil or a hazardous substance is discharged shall immediately report the discharge to the US Coast Guard National Response Center at 800.424.8802.

F. The owner/operator of a vessel or facility from which the pollutant is discharged is subject to ~~a~~ civil ~~penalty of up to $5,000~~ penalties and is liable for cleanup costs, if any.

G. Inform the US Coast Guard office in St. Louis, Missouri, the status of this work to enable them to issue cautionary notices to mariners. If the Contractor has a marine radio at the job site, furnish the Coast Guard the call sign and operating frequency so that the information can be included in their notices.

H. No changes in channel conditions or in river bank conditions from natural causes or by reason of channel improvements or other construction, nor methods of river control by the United States or the state are to be considered as having any bearing or effect on the obligations of the contract nor justification for any claim for additional payments or extensions of time.

I. In the event that the US Coast Guard or other constituted authorities should, during the progress of work, issue directions or orders affecting the Contractor's operations or order of procedure, promptly file with the Engineer a copy of such order or restrictions from the Corps of Engineers, US Army, US Coast Guard, and/or other authority having jurisdiction.

2508.04 METHOD OF MEASUREMENT.
Lump sum items. No method of measurement.

2508.05 BASIS OF PAYMENT.

A. Payment for the items below will be the lump sum contract price.

1. Bridge Cleaning for Painting.
Payment is full compensation for furnishing materials, labor, and equipment to perform the work in accordance with contract documents.

2. Blast Cleaning of Structural Steel.
Payment is full compensation for furnishing materials, labor, and equipment to perform the work in accordance with contract documents.

3. Containment.
a. Payment is full compensation for furnishing materials, labor, and equipment necessary to install and maintain the containment during blast cleaning operations or paint removal by other methods.
b. For non-hazardous paint removal, payment is also full compensation for monitoring, sampling, testing, reporting, temporary enclosures, temporary storage of waste, and disposal of waste.
c. For hazardous paint removal, payment is full compensation for:
- Furnishing all materials, labor, and equipment to perform all work necessary for containment enclosures,
- Air monitoring, sampling, and testing,
- Decontamination,
- Handling, sampling and testing, containerizing, and storage of paint waste, and
- Installing, maintaining, and removing the waste accumulation points.

4. Paint Waste Transport and Disposal.
Payment is full compensation for furnishing materials, labor, and equipment to perform all work necessary for:
- The proper transport of paint waste,
- The proper disposal of paint waste,
- Analytical testing of paint waste,
- Obtaining all necessary permits and manifests, and
- Preparation of permits and manifests.

5. Painting of Structural Steel.
Payment is full compensation for:
- All materials, labor, equipment,
- Providing material acceptance documents, and
- Providing technical assistance in accordance with contract documents.

B. Coast Guard Requirements will be incidental to the items of work for which they apply.

Comments:		
Member's Requested Change: **(Do not use 'Track Changes', or 'Mark-Up'. Use ~~Strikeout~~ and Highlight.)** See Attached Document		
Reason for Revision: Updates based on Location and Environment review and changes to code of federal regulations on paint.		
New Bid Item Required (X one)	**Yes**	**No** x
Bid Item Modification Required (X one)	**Yes**	**No** x
Bid Item Obsoletion Required (X one)	**Yes**	**No** x
Comments:		
County or City Comments:		
Industry Comments:		

Section 2508. Removal of Paint and Painting Steel Bridge Structures

2508.01 REMOVAL OF PAINT.

A. Non-Hazardous Paint Removal.

1. General.

a Apply Article 2508.01, A, only to structures previously painted with "non-lead based" paints and to structures with ~~scratch~~ scrape tests indicating a non-hazardous waste (as identified in 40 CFR 261) is expected to be generated during the project. Structures where scrape test results of total lead content of 5,000 milligrams per kilogram (mg/kg) or greater will be handled under Article 2508.01, B unless additional sampling and analysis by Toxicity Characteristic Leaching Procedure (TCLP) is less than 5.0 milligrams per liter (mg/L) for lead. OSHA may regulate other issues. Take whatever precautions are necessary to comply with Federal and State safety and health regulations.

b To comply with Iowa Code Section 89 B.8, 1, ~~scratch~~ scrape tests are provided elsewhere in the contract documents for information.

2. Bridge Cleaning.

This work involves removing accumulated foreign material and loose paint. It also involves water washing areas designated elsewhere in the contract documents.

a Removal of Accumulated Foreign Material.

1) Prior to water washing, remove all accumulated foreign material from:
- Beams, member flanges, and gusset plates,
- Abutment bridge seats, pier tops, truss joints, and deck drains, and
- Other locations the Engineer orders.

2) Remove the accumulated foreign material using hand brooms, hand shovels, vacuum cleaners or other methods the Engineer considers acceptable. Collect the removed material and dispose of at an approved waste area according to Federal, State, and local regulations. Apply appropriate measures to ensure that at no time does removed material fall or be disposed in the water or on the land below the bridge.

b Loosely Adherent Paint.

Prior to water washing, use hand tool methods, complying with SSPC-SP2, to remove loosely adherent paint in areas designated for painting. All paint removal operations will require containment as specified in Article 2508.01, A, 4.

c Water Washing.

1) Prior to abrasive blast cleaning, use high-pressure water to wash steel surfaces to be repainted, abutment seats, pier caps, and other surfaces that may be designated elsewhere in the contract documents. Limit water pressure so that no paint is removed.

2) Ensure salt contaminants, dirt, bird excrement, and other detrimental foreign material are removed. Detergents or cleaners and scrubbing may be needed in conjunction with water washing. Use clear fresh water that is free of sediments

and salt contaminants. After water cleaning, remove all oily or greasy residues using solvent according to SSPC-SP1.

3) Remove chalking from existing painted surfaces onto which paint is to be applied. Examples are transition zones for spot or zone painting and surfaces that will receive a top coat over an existing prime or top coat. In those areas, remove the chalked pigment by water washing.

4) Detergents or cleaners and scrubbing may be needed in conjunction with water washing. Use detergents or cleaners that are compatible with the existing paint system and pre-approved by the new paint manufacturer. Apply according to the product manufacturer's recommendations.

5) Submit ~~MSDS~~ a Safety Data Sheet (SDS) and any technical field guides for any detergent or cleaner to the Engineer for review and approval before using. If detergents or cleaners are used, thoroughly rinse the surface with water to remove all residue prior to painting.

3. Blast Cleaning and Surface Preparation.

a Abrasive Blast Cleaning.

1) This work involves preparing all designated surfaces to be painted by either:
- abrasive blasting using conventional equipment, and/or
- vacuum blasting equipment.

Commented [AB1]: "Scratch" and "scrape" seem to be used interchangeably. "Scrape" is a more accurate sample method description. All scratch references are changed to scrape for consistency.

Commented [AB2]: Without TCLP testing I propose using the 5000 mg/kg Total lead as a default to the hazardous paint specs.

Commented [AB3]: "MSDS" sheets are now referred to just as "SDS" sheets.

2) Some hand-tool and/or power-tool cleaning may be required in areas not fully accessible to the other methods.
3) Use an abrasive blasting system that incorporates abrasive recycling ~~in order~~ to reduce waste volume to the greatest extent possible.

Commented [AB4]: Unnecessary language/grammatical correction.

b **Standards For Surface Preparation.**

1) **Abrasive Blasting.**
   a) Prepare areas to be painted using a dry abrasive blast method to a level (SSPC-SP6 and/or SSPC-SP10) as designated elsewhere in the contract documents. The current SSPC-VIS1, Visual Standard for Abrasive Blast Cleaned Steel, will be used in conjunction with the appropriate written SSPC Standard for acceptance of final surface preparation. Prepare the surface profile (etched height) to be 1.5 to 2.5 mils as measured by replica tape or surface profile comparator.
   b) Use hand-tool or power-tool methods, or both, to prepare small areas that cannot be cleaned using abrasive blasting equipment. SSPC Standards applicable to the method(s) applied will be used to evaluate surface preparation.
   c) After blasting or mechanical preparation, thoroughly clean the surface to be painted with either HEPA vacuums or dry, oil free, compressed air, or both, to remove all adhering blast residue. Remove all oily or greasy residues with solvent complying with SSPC-SP1, Solvent Cleaning.
2) **Removal of Existing Deteriorated Paint by Mechanical Methods.**
   a) The contract documents may designate areas to be painted which are to be cleaned by mechanical methods. These will be:
      (1) Areas of deteriorated paint where the existing top coat is peeled or deteriorated and the underlying existing primer is in sound condition. In these cases, remove only the existing top coat by manual methods complying with SSPC-SP2 so the underlying existing primer is left in place. Remove the deteriorated top coat back to the boundary of soundly adhering top coat. A soundly adhering top coat is defined as that which cannot be lifted from the primer with a putty knife.
      (2) Spot areas deemed too small to be effectively prepared by abrasive blasting.
   b) Remove the deteriorated paint back to the boundary of soundly adhering existing primer. Regardless of the method used for cleaning, feather all edges of sites cleaned to a smooth transition between the existing paint and the cleaned area.
   c) Use mechanical methods of surface preparation complying with SSPC-SP2 or SSPC-SP3, or both~~, as modified below~~.
   ~~d) Replace Article 3.5 of SP2, Hand Tool Cleaning, with the following:~~
      ~~3.5 SSPC-VIS3, Visual Standards for Power and Hand- Tool Cleaned Steel, shall be used to evaluate the degree of cleaning.~~
   ~~e) Replace Articles 2.2, 2.3, and 5.3 of SSPC-SP3, Power Tool Cleaning, with the following:~~
      ~~2.2 It is intended that power tool cleaning remove rust, deteriorated paint, detrimental foreign material, and loose mill scale that can be removed by vigorous use of the power tools.~~

      ~~2.3 SSPC-VIS3, Visual Standard for Power and Hand- Tool Cleaned Steel, shall be used to evaluate the degree of cleaning.~~

      ~~5.3 Use power wire brushing, power abrading, power impact, or other power rotary tools to remove rust, deteriorated paint, and loose mill scale. Do not burnish the surface.~~

   f) After mechanical preparation, thoroughly clean the surface to be painted with either HEPA Vacuums or dry, oil free, compressed air, or both, to remove all adhering blast residue. Remove all oily or greasy residues with solvent complying with SSPC-SP1, Solvent Cleaning.

Commented [SS5]: I think we are covered by citing SSPC-SP2 or SSPC-SP3 without modification. I looked at SSPC Vol 2 2005 edition for verification. If the newer edition has other info please advise.

Commented [AB6]: It appears SP2 and SP3 have been revised since this spec language was included. Does this language need to be amended or deleted?

3) **Galvanized Elements.**

Protect galvanized elements such as deck drain pipes and bearings. Blast clean only if directed by the Engineer. All galvanized elements which are to be cleaned and painted will be paid for as extra work according to Article 1109.03,B.

4) **Rust Blume or Flash Rust.**

Rust ~~blume~~ bloom or flash rust is defined as the development of visible rust on bare metal surfaces after cleaning. Reblast the surface, or brush blast the surface and blow it down, just prior to the application of the first coat of paint if:

- Flash rust or rust ~~blume~~ bloom occurs after removal of existing paint, or

Commented [AB7]: Spelling correction.

- A surface is cleaned and left unpainted for more than 24 hours

5) Pin Hole Rusting.

a) Pinhole rust areas may be designated for painting in the contract documents. In areas where there is pin hole rusting and associated staining, abrasive blasting may not be required if the existing paint is sound other than at the pin holes. Mechanical cleaning, according to SSPC-SP2, may be used in these areas prior to applying the spot primer.

b) If the mechanical methods do not remove heavy staining of sound paint adjacent to the pinholes, remove the stain to the degree recommended by the manufacturer of the primer. Use methods of removal recommended by the manufacturer. Provide a written copy of the recommendations to the Engineer prior to performing the work.

6) Feathering of Repair Areas.

For spot and zone painting work, feather the existing coating surrounding each repair location. A smooth, tapered transition of 1 to 2 inches onto the existing intact coating is required around each repair area. Roughen the existing coating by hand sanding or a solvent wipe in the feathered area to assure proper adhesion for the new paint. Verify soundness of the existing paint by probing the edges of coating around the periphery of the repair areas with a putty knife, according to the requirements of SSPC-SP3.

7) Protection of Unpainted Surfaces.

a) Use whatever precaution is necessary to ensure vehicular traffic, equipment, hardware, fixtures, concrete, and other surfaces are protected against abrasive impact, paint spillage, over-spray, and other damage during the project.

b) For spot or zone painting work, use protective coverings, shields, or masking as necessary to protect surfaces that are outside the designated painting areas. Maintain protection during the entire period work is being performed which could damage those surfaces.

c) Exercise extra care to avoid over-blast damage to the existing coating in non-designated areas. Correct damage to non-designated areas by cleaning, repairing, and repainting at no additional cost to the Contracting Authority. Repair procedures will be approved by the coating manufacturer's technical representative. Submit the manufacturer's approval to the Engineer for review and approval before the repair work is started.

8) Abrasives.

a) Use steel shot and/or grit, aluminum oxide, or garnet abrasives. This is to ensure hard durable abrasives are used, to encourage abrasive recycling, and to minimize waste generated by the project. Use clean, dry abrasives that are free from contamination. Do not use sand or coal slag.

b) If blasting with previously used or recycled abrasive:

- Obtain a representative sample of that abrasive,
- Have that sample analyzed for TCLP leachable levels of arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver, and
- Submit the laboratory's analytical report to the Engineer for approval prior to use.

c) The Engineer will accept used or recycled abrasives only if the leachable quantity of each metal tested is equal to, or less than, one part per million (1 ppm) or one milligram per liter (1 mg/L).

d) Clean and recycle abrasive used during this project to the greatest extent possible. Provide a written abrasive recycling workplan to the Engineer for approval. In this proposal list the equipment and process used for recycling and recovery of the abrasive and monitoring air dispelled from the recycling process.

e) Employ a method to monitor dispelled air from the recycling system that samples and tests for total lead and particulate matter of ~~0.4 mils and smaller~~ 10 microns or less (PM_{10}). Blasting will be suspended immediately if the Engineer deems visible dust or particulate matter is in the air expelled from recycling equipment.

9) Chloride Testing.

a) The Engineer reserves the option to test the blasted surface(s) for residual chloride ions. Chloride ions after blasting and blow down shall be less than 15 µg of chloride per 100 mm^2. Areas that are not equal to, or below, these criteria will need to be re-washed, brush blasted, and retested.

b) The Engineer will measure chloride contamination by using a Surface Contamination Analysis Kit~~, marketed by KTA- Tator Inc.~~ or an equivalent analytical process.

Commented [AB8]: Leachable results are reported by the lab in mg/L which does equate to ppm but this proposed change is for clarification for the field.

Commented [AB9]: PM10 is defined as particles 10 microns or less. It's not evident which regulation or standard references "0.4 mils and smaller".

Commented [AB10]: Other vendors offer this equipment.

4. Containment.

a General.

1) Abrasive blasting using conventional equipment will require a system for total containment of the blast area. Containment includes all containment enclosures (where applicable), monitoring, recovery, and temporary storage of waste. For vacuum blasting, the "contained area" is defined as the area around the blast nozzle and any other connections or equipment where waste, dust, or exhausted air may exit into the environment.

2) Submit to the Engineer a plan for containment enclosures, an analytical report of the abrasives to be used, and a plan for monitoring air quality prior to starting work. A general guideline for containment evaluation abrasive blasting and/or vacuum blasting will be:
   No visual or noticeable dust is to be observed escaping into the atmosphere or onto the ground from the contained area during blasting, blow down, or ~~prior to the~~ daily clean-up operations.

3) Suspend blasting if the Engineer determines that air expelled from containment or from the vacuum nozzle has noticeable dust or particulate matter. If the Engineer determines the containment measures are inadequate, alter the removal operation or the containment to meet the Engineer's requirement.

b Abrasive Blast Cleaning.

1) Use a system which ensures total containment and recovery of the material removed from the structure. Construct bridge containment enclosures over other roadways to allow traffic to be maintained on the bridge being cleaned as well as on the road under the bridge, according to traffic control requirements in the contract documents.

2) Removed material will be defined as paint chips, abrasive particles, and other blasting residues. Ensure the containment prevents removed material and abrasive from drifting or being deposited, or both, other than within the containment enclosure. The blasting operation will be suspended immediately if the Engineer deems waste cleanup or house keeping measures, or both, to be inadequate. If the Engineer rules the containment measures inadequate, alter the operation or the containment to meet the Engineer's requirement.

3) Use impermeable cover materials, such as tarpaulins, drop cloths, or other approved materials, on or above the ground, waterways, and other surfaces. Recover removed material from the covering materials. Highway pavements and paved surfaces under a structure may be used as a portion of the collection cover for that area providing traffic is maintained on the bridge and on the pavement under the bridge according to traffic control requirements in the contract documents.

4) All areas used for containment and recovery shall be thoroughly cleaned of all debris before work is begun. Close containment areas to the public. If paved surfaces are used for recovery areas, use only areas that are continuous and free of open cracks. Seal cracks to prevent infiltration of blast residue prior to commencing any blasting in that area.

5) Turn the edges of the impermeable cover material upward ~~a minimum of~~ 1 foot to minimize loss of waste materials. Ensure covers on or over roadways, railways, or waterways do not present a hazard nor remain in place overnight without the Engineer's written permission. Fasten the edges of the impermeable cover to the vertical drapes to ensure no loss of waste materials. Ensure overlaps of the cover material are a minimum of 3 feet, securely tied together, and continuously taped to prevent loss of removed material.

6) Extend vertical drapes from above the blasting area to the bottom of the enclosure. Securely anchor them top and bottom and at the laps to prevent spilling or loss of removed material. Use material capable of withstanding wind forces without tearing or having a breach of integrity.

7) Containment enclosures shall be anchored to prohibit enclosure encroachment on open traffic lanes, railroad lanes, and waterways. Ensure removed material will not fall on to surface waters.

c Monitoring.

1) During abrasive blasting, monitor air quality by conducting air sampling and testing. Perform this work under the direction of a certified Industrial Hygienist. Use a minimum sampling frequency of one sample of 8 hour duration per week.

2) One purpose of the sampling is to allow ~~for~~ the Engineer to determine the effectiveness of the containment. Samples will be obtained from at least two locations outside and immediately down wind from the containment, according to Title 40 of the Code of Federal Regulations (CFR), Part 50.

3) Employ an air monitoring that identifies total lead and total suspended particulate (TSP) to evaluate site compliance with the requirements of ~~Title~~ 40 ~~Code of Federal Regulations~~ CFR, Part 50. Provide the results of this monitoring to the Engineer as soon as they become available.

Commented [AB11]: Daily clean up within containment should not produce noticeable dust escaping to the atmosphere. The "prior to" appears to allow visible emissions during clean up.

Commented [AB12]: This reads as requiring exactly one foot (no more, no less) and it should be acceptable if it is at least one foot.

Commented [AB13]: Language not needed.

Commented [AB14]: This is the first reference to 40 CFR so it should be spelled out.

Commented [AB15]: A subsequent reference to 40 CFR can be abbreviated.

Abrasive blasting will be suspended immediately if the Engineer determines expelled air quality measures to be above EPA standards for particulate matter.

4) Air quality sampling and testing will not be required for small localized containments when:
   - Blasting operations have an expected duration of less than approximately 3 hours, or
   - The expected duration of the total amount of blasting on the project is less than approximately 8 hours.

d Cleaning by Other Methods.

1) At locations where abrasive blasting is not used, use a waste collection system that ensures containment and collection of the material removed from the structure. Removed material will be defined as paint chips and other residues. Ensure the containment prevents removed material from drifting or being deposited, or both, other than on the containment portion provided.
2) Use impermeable cover materials, such as tarpaulins or drop cloths, on or above the ground, waterways, surface waters, and other surfaces. Use these covering materials to recover removed material.

e Clean-up Contingency.

1) Clean up any spills that result from the operations at no additional cost to the Contracting Authority. Provide a written plan for clean up of spills to the Engineer prior to removing paint.
2) For removal activities over water, have floating boom devices in place during removal operations. Ensure these devices are capable of preventing waste material from moving away from the site in the event of a breach in the containment system.

f Recovery and Temporary Storage of Waste.

1) Deposit accumulated bridge cleaning waste in appropriately sized clean new or reconditioned containers with securely sealed lids meeting the requirements of ~~Title~~ 49 ~~Code of Federal Regulations~~ CFR 173.24. Recover wastes daily and deposit the wastes into these temporary storage containers. Securely seal the containers to shield the contents from the elements at all times. Consolidate all waste material to a minimum number of containers.
2) Recover all residues and carefully transfer, ensuring no release of residues into the air or contamination of surrounding surfaces. Keep all containers containing residue closed and secured, except during the addition of waste. Ensure residues do not remain on bridge surfaces or on the containment material overnight.
3) Clearly mark all bridge cleaning waste containers in no less than 1 1/2 inch block letters stating:

   PAINT WASTE NONHAZARDOUS
   (Date)

   The date shall indicate when waste was first put into the container.
4) Construct or furnish a secured temporary storage area of sufficient size for the contained waste material. Enclose temporary storage areas with an 8 foot chain link fence or a roll- off box with a lockable cover. Plans for other secured temporary storage areas may be submitted to the Engineer for approval.
5) Locate the temporary storage area within the right-of-way of the Contracting Authority at a location the Engineer approves. Ensure the base for waste storage is above the extreme high water elevation, if constructed within a flood plain.
6) For projects that will generate less than 55 gallons of waste, the fenced temporary storage area or roll-off box will not be required and the Contractor is responsible for securely storing the paint waste containers on-site during the project.
7) At, or prior to the conclusion of the work, obtain one representative sample of the waste material from each container. Combine samples so that one representative composite sample is made for every 5 waste containers. Submit composite sample(s) to a lab for a ~~Toxic Character Leachate~~ Toxicity Characteristic Leaching Procedure (TCLP) test for the eight priority metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Provide the ~~results of this~~ laboratory analysis reports to the Engineer upon receipt. Maintain wastes on site and do not dispose of them until the Engineer has reviewed analytical data and approved of the disposal method.

g Disposal of Removed Material (Waste).

1) Transport waste materials in approved containers from temporary storage to a lined Subtitle D landfill (for non- hazardous wastes) or Subtitle C, Treatment, Storage, and Disposal Facility (TSDF for hazardous wastes) which accepts bridge painting wastes. Transport the wastes to the landfill facility within 5 calendar days of completion of surface preparation operations.
2) Provide the Engineer with copies of ~~delivery tickets~~ manifests or bills of lading and landfill

Commented [AB16]: Another subsequent reference to 40 CFR which can be abbreviated. Container requirements are noted within 173.24.

Commented [AB17]: Correcting terminology.

Commented [AB18]: Should specify the actual lab reports and not just analytical results.

Commented [AB19]: Should require the actual shipping document and not just a landfill receipt.

invoices for all waste material generated by this project.

3) Dispose of all bridge cleaning wastes according to Federal, State, and local regulations.

4) This project is based on the best information available that wastes generated will be non-hazardous for disposal per 40 CFR 261. Disposal of hazardous bridge cleaning wastes will be by extra work according to Article 1109.03.

h **Final Clean up.**

1) Apply Article 1104.08.

2) In no case allow any foreign material or other painting related wastes to mix with the wastes generated from abrasive blast cleaning or paint cleaning by other methods.

5. **Protection and Clean up.**

a For all work, use every reasonable means to protect the environment, human health and safety, adjacent property, and vehicles from damage resulting from the paint removal operations, according to Article 1107.07. Keep the project site in a neat, clean, and safe working condition.

b At the end of each working day, clean up and properly containerize all waste material. Special attention is drawn to steel abrasive and its preponderancy to rust and stain surfaces where material is allowed to accumulate.

c Clean up abrasive on a daily basis and remove any staining which occurs.

d Protection and clean up will not be measured for payment, but will be considered incidental to all other pay items in this specification.

B. **Hazardous Paint Removal.**

1. **General.**

a Apply Article 2508.01, B, only to structures previously painted with lead based paints and for structures with ~~Scratch Tests~~ a scrape test for total lead of 5,000 mg/kg or greater indicating a hazardous waste is expected to be generated during the project. ~~Scratch~~ Scrape tests are provided elsewhere in the contract documents for information per Iowa Code Section 89B.8, Subsection 1.

b Take responsibility for whatever precautions are necessary, to comply with Federal and State ~~safety and~~ health, safety and waste management regulations.

2. **Bridge Cleaning.**

Apply Article 2508.01, A, 2.

3. **Blast Cleaning of Structural Steel.**

a **Waste Notification.**

1) Evidence suggests this ~~This~~ structure has previously been painted with coating materials which contained lead pigments or chromium pigments, or both. Analytical results from scrape tests of the existing paint system are provided elsewhere in the contract documents.

2) The waste produced is expected to contain paint chips with heavy metal constituents, spent abrasive, rust, and possible mill scale. Take whatever measures are deemed necessary to assure protection for human health and the environment.

b **Preconstruction Sampling and Testing.**

1) Obtain representative waste samples from the existing paint system using the selected production blasting system and equipment. Have an accredited laboratory test waste material with the ~~Toxic Characteristic Leachate~~ Toxicity Characteristic Leaching Procedure (TCLP) using EPA test method SW-6010B, TCLP; or an approved equal. Laboratories accredited by the American Industrial Hygiene Association of National Environmental Laboratory Accreditation Program, or any U.S. EPA certified laboratory may perform the paint waste testing.

2) Have waste samples analyzed for, at a minimum, the 8 Resource Conservation and Recovery Act (RCRA) priority metals. These metals are: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. No later than 12 calendar days following the first day of production blasting, provide the Engineer with the laboratory's analytical ~~results of these tests~~ report as well as reasonable estimated quantities of waste that are expected to be generated per month.

3) Conduct preconstruction and post-construction soil and river sediment sampling in the areas potentially impacted by blasting activities. At least 3 weeks prior to commencing work, provide a written program for sampling to the Engineer for review and comment. On the program, identify the number of samples proposed, the sampling locations, and sampling procedure to ensure all

Commented [AB20]: Refer back to A.1a revision (scrape rather than scratch).

Commented [AB21]: Should also recognize waste management regulations.

Commented [AB22]: Change of wording to allow wiggle room.

Commented [AB23]: Correcting terminology.

Commented [AB24]: The environmental regulatory agency in some states (e.g. Illinois) is identified as their environmental protection agency (EPA).

Commented [AB25]: Clarification for the priority metals.

Commented [AB26]: Should require the actual lab report and not just "analytical results".

areas of potential impact are evaluated and that a statistical basis has been developed.

4) All sampling should be tested for total lead and chromium content using EPA Method SW-6010B, Totals, or approved equal. Locations where it is recommended to take samples include:
   - At locations under and within the shadow of the structure,
   - Storm sewer intakes and curb drains,
   - Areas where ditches could carry debris laden storm water run-off to the river,
   - Locations of equipment and waste storage, and
   - Sediments along the bank and in water less than 5 feet deep.

5) Preconstruction sampling locations need to be marked and resampled at the same location upon completion of work. Refer to Article 2508.01, B, 6, for additional information.

6) Provide the Engineer with preconstruction analytical results from soil and sediment sampling at least 3 weeks prior to commencing production blasting or other paint removing activities. After final clean up, but before final acceptance of the project, provide the Engineer with post-construction analytical results from soil and sediment sampling.

c **Environmental Regulatory Permits.**

1) The Contracting Authority will obtain and provide an U.S. EPA hazardous waste generator identification number for this project if project specific waste sampling and testing indicate a hazardous waste will be generated.

2) The Engineer will use actual waste analytical results and estimated waste quantity data received from the Preconstruction Sampling and Testing to identify which type of identification number, if any, is required.

3) Obtain all other permits including any required for waste disposal. Apply Article 1107.03.

d **Site Working Documents.**

Submit to the Engineer, for review and comment, ~~three copies~~ an electronic copy of ~~all~~ each site working documents required in this section. Write each site working document to be specific for the issues associated with the blast cleaning alternatives selected. Revise any indicated sections of the site working documents to comply with the Engineer's comments and resubmit, if necessary.

1) **Site Work Plan.**

A minimum of 3 weeks prior to commencing work, provide a written site work plan to the Engineer for review and comment. On the site work plan include, at a minimum, a complete description of:

~~a~~ Paint removal methods selected, refer to Article 2508.01, B, 3, e.

~~b~~ The equipment and processes to be used including equipment catalog information from the manufacturers for major pieces of equipment.

~~c~~ The environmental protection plan including waste sampling procedures and methods used to control emissions into the air, water, and onto the soil.

~~d~~ Waste handling, storage, and disposal plan.

~~e~~ A preconstruction soil and river sediment sampling plan, refer to Article 2508.01, B, 3, b.

~~f~~ The Site Air Monitoring Plan. In this plan, describe the air sampling protocol and analytical procedures, sampling locations, frequency of sampling, and equipment, refer to Article 2508.01, B, 4, c. Use ~~Title 40 Code of Federal Regulations, Part 50 (~~40 CFR~~,~~ 50~~)~~ as guidance when locating air monitoring equipment. Use a minimum frequency for sampling and monitoring that is in accordance with Federal and State requirements, and this specification.

2) **Site Health and Safety Plan.**

a) A minimum of 3 weeks prior to commencing work, provide a written Health and Safety Plan (~~H&SP~~ HASP) to the Engineer for review and comment. In this plan detail the compliance program with regulatory requirements including, but not limited to:
   - OSHA 29 CFR, 1910 and 1926,
   - Resource Conservation Recovery Act (RCRA) and CERCLA 40 CFR, 261 through 300,
   - TSCA 40 CFR, 700 – end, and
   - Transportation 49 CFR, 100 through 199.

b) Give attention to 29 CFR, Section 1926.62, Lead in Construction Standard. In addition, ensure the ~~H&SP~~ HASP specifically identifies:

(1) The Project Site Safety Officer who is to be on site at all times when work is in progress, and who has the Contractor's authority to effect an immediate operational change or to shut down production until a specification, regulatory, or safety deficiency is corrected.

Commented [AB27]: The environmental regulatory agency in some states (e.g. Illinois) is identified as their environmental protection agency (EPA). "U.S." added to avoid confusion.

Commented [AB28]: Added for clarification.

Commented [AB29]: Should require an electronic copy rather than 3 paper copies.

Commented [AB30]: Another subsequent reference to 40 CFR which can be abbreviated.

Commented [AB31]: The correct acronym is HASP.

The Project Site Safety Officer has continuous site responsibility for assuring ~~that worker health, safety, and U.S. EPA~~ all regulatory requirements are being met including, but not limited to, worker health and safety and waste management. This includes the duties of the "competent person" as required by 29 CFR, Section 1926.62.

(2) The compliance program as required by 29 CFR, Section 1926.62 which includes the following at a minimum:

- **(a)** A description of each activity in which lead and/or chromium is emitted including the equipment and processes involved,
- **(b)** Standard operating procedures for activities involving hazardous constituents,
- **(c)** Maintenance schedules of equipment utilized for filtration of potentially hazardous constituents,
- **(d)** Crew size and responsibilities,
- **(e)** Description of engineering controls and processes used to control lead exposure or chromium exposure, or both,
- **(f)** A report of the technology considered in meeting the ~~Personal~~ Permissible Exposure Limit (PEL),
- **(g)** Air monitoring protocol which will be used to document personnel exposure,
- **(h)** Schedule for implementing the program,
- **(i)** Work practice program including the personal protective equipment,
- **(j)** Housekeeping and hygiene practices,
- **(k)** An administrative control (job rotation) schedule if used, and
- **(l)** A description of ~~H&SP~~ HASP compliance arrangements made between the Contractor and their subcontractors.

(3) Hazardous substances, that are expected to be encountered, PELs for these substances, and site personnel medical monitoring expected.

(4) The levels of personnel training, protection, and protective equipment required for different tasks performed at the site.

(5) Site control and restricted access policy to ensure unauthorized personnel or untrained personnel, or both, are not exposed to unnecessary risks.

c) The signature of a Certified Industrial Hygienist trained in worker environmental health and safety issues is required on the ~~H&SP~~ HASP.

3) Site Contingency Plan.

a) A minimum of 3 weeks prior to commencing work, provide, for the Engineer's review and comment, a written Site Contingency Plan (SCP) as discussed in 40 CFR Subpart D – Contingency Plan and Emergency Procedures. In this plan:

- **(1)** Detail the procedures that will be implemented and corrective action that will be taken, should an emergency or unforeseen situation arise.
- **(2)** Specify procedures to minimize hazards to human health and the environment should there be fires, explosions, vandalism, or any other unplanned sudden or non-sudden release of hazardous waste or hazardous constituents to the air, soil, or surface water.
- **(3)** Detail contingency measures that will be available on site to prevent accidental releases and provide safety to the general public. For example: Security, preventative, and containment measures which will be used to prevent and/or contain:
  - **(a)** Spillage or loss of paint wastes.
  - **(b)** Spillage of bulk paint, solvents, and thinners during the painting operations,
  - **(c)** Spillage or leakage of equipment fuel, oil, or other fluids,
  - **(d)** River traffic from encountering floating booms or barge mounted equipment,
  - **(e)** Inadvertent public exposure to job site hazards, and
  - **(f)** Waste material, or spills on water, from migrating off site and to contain that material until it is cleaned up.

b) Follow current Federal and State regulations in preparing this plan. Have it on file in the locations specified by regulation.

e Paint Removal.

1) Submit to the Engineer in writing the type of blasting equipment that will be used for the paint removal operations before starting work. Achieve the level of surface preparation specified. In no case will unproven technology or untested technology, or both, be allowed without prior review, testing, and written approval from the Engineer.

2) The blasting process and equipment is required to be part of the Site Work Plan, and the plan shall describe in detail the:

- Method of blasting,

Commented [AB32]: Changed to add emphasis and include waste management.

Commented [AB33]: Corrected to reflect accurate terminology.

Commented [AB34]: Code reference added for clarification.

- Work procedures and tasks for this removal method,
- The estimated production rate~~, in other words,~~ in square ~~foot~~ feet per hour,
- Estimated quantity of blasting abrasive utilized per production rate (hour or square foot), and
- Procedure and protocols for abrasive recycling.

3) Contain and collect all waste material generated during blast cleaning. Contain any fugitive emissions (solid particulate, fugitive dust). Protect the health and welfare of the public. Protect the environment. Employ adequate administrative and engineering controls to reduce worker exposures to all hazardous constituents present at the site to levels as low as feasible according to industry standards. Refer to Article 2508.01, B, 4, b for additional details.

f Standards For Surface Preparation.

Apply Article 2508.01, A, 3, b.

4. Containment.

a General.

1) This work includes the design, erection, maintenance, and removal of the enclosure or containment used to contain wastes generated during the surface preparation. The work also includes characterizing, collecting, and containing wastes generated during the project.

2) Ensure any enclosure complying with, or comparable to, an SSPC Class 3 or better is designed and sealed by a Professional Engineer licensed in the State of Iowa who is qualified in structures. Ensure ventilation in a Class 2 or better containment is designed and sealed by a Professional Engineer licensed in the State of Iowa who is qualified in ventilation.

3) Work required to decontaminate, clean, and test equipment and non-expendable materials or supplies shall be included in this section. Ensure, at a minimum, decontamination and cleaning do not allow debris or dust, or both, to be dislodged by winds or physical contact during handling and movement of a containment structure. In addition, establish a procedure to ensure all equipment and materials are essentially free from hazardous substances when delivered to and removed from the project site.

b Enclosure.

1) Perform paint removal activities, except for vacuum blasting, within a full enclosure. Design the full enclosure as a system including:

- The frame work and outer covering,
- Attachments to the structure and supporting foundations,
- Waste handling, and
- Ventilation, if required.

2) Include in the enclosure submittal a method or process to catch, accumulate, and ultimately contain all spent abrasive and all paint waste. Include in the enclosure details a description and catalogue cuts of:

- Containment materials and equipment used,
- Material strengths, permeability, and necessary seam closure details,
- Drawings of attachments to the bridge including abutments, piers, deck, parapet rails, and beams, and
- Calculations of superimposed dead and wind loadings.

3) Submit ~~three copies~~ an electronic copy of this design to the Engineer for review and approval at least 3 weeks prior to erecting the enclosure. Use an enclosure that is:

a) Designed to transfer added wind and static loading safely to the bridge. Analyze the structure for gravity and wind loadings from the containment. Provide a copy of this analysis and all supporting calculations in the submittal. If the Engineer determines that the proposed enclosure could have detrimental effects on the structural integrity of the bridge, modify the design of the enclosure at no additional cost to the Contracting Authority. A copy of the existing bridge plan is available from the Contracting Authority.

b) Designed and constructed to maintain negative pressures inside the enclosure during production blasting and to include an air filtering and dust collection system for all exhausted air, unless site specific data collected during actual blasting operations conclusively show a tight containment with negative air is not required.

c) Designed to employ adequate engineering controls, including ventilation, to reduce airborne contamination to levels as low as feasible.

d) Equal to, or comparable with, SSPC Class 2 or better for Conventional Open Abrasive

Commented [AB35]: Extra language not needed.

Commented [AB36]: Should require an electronic copy rather than 3 paper copies.

Blasting.

4) Contamination of the ground, water, or river sediment from project activities is strictly prohibited. Project activities that shall be carefully monitored and controlled to avoid environmental contamination include, but are not limited to:
   - The containment,
   - Dust collector,
   - Abrasive reclaimer,
   - Waste accumulation points (storage areas),
   - Satellite accumulation points,
   - Refueling locations,
   - Boat or barge access points, and
   - Paint handling, transfer, and mixing operations.

5) Uncontrolled dumping of wastes is strictly prohibited. Immediately clean up spills at no additional cost to the Contracting Authority.

c **Air Emissions and Monitoring.**

1) **General.**
   a) Monitor air quality by using high-volume air monitoring equipment. Perform sampling protocol according to the provisions of 40 CFR, Part 50 and its appendices. At a minimum, perform monitoring for total lead and total suspended particulate (TSP) and particulate matter ~~0.4 mils and smaller~~ 10 microns or less (PM_{10}).
   b) Use properly calibrated high-volume air sampling equipment at locations of maximum potential impact to the public plus at areas to provide background ambient samples.
   c) Identify anticipated monitoring locations and monitoring protocol in the Site Air Monitoring Plan.
   d) Have an American Industrial Hygiene Association (AIHA) accredited laboratory analyze all air samples collected.
   e) Filter all containment and process air exhausted from air handling equipment or the abrasive recycling process, or both, to remove particulates and regulated constituents to a level below current air quality standards.
   f) Capture and contain filtered material using a system designed for this purpose.
   g) Establish regulated areas around the dust collector, abrasive reclaimer, containment, and other operations that potentially generate lead emissions or chromium emissions, or both.
   h) Properly identify, post, and establish the perimeter of the regulated areas at the OSHA Action Level of 30 µg/m^3. Limit access within these areas to only those personnel who are properly trained and monitored according to the site Health and Safety Plan.

2) **Site Air Monitoring Plan.**
   a) Ensure compliance with 29 CFR~~,~~ 1926; 40 CFR~~,~~ 50; 40 CFR~~,~~ 60; and 567 IAC~~,~~ Chapters 22 and 23, by including nomenclature in the plan for:
      - Sampling equipment,
      - Sampling procedure and protocol,
      - Sampling frequency,
      - Locating criteria, and
      - Laboratory analysis of air samples.
   b) Submit the laboratory analytical ~~results~~ report to the Engineer within 1 week of being received from the testing laboratory. ~~An electronically generated version containing, at a minimum, the information on the standard laboratory reporting form will be an acceptable substitute.~~

3) **Containment Efficiency.**
   a) The Engineer will not routinely use opacity testing to evaluate a containment's efficiency, but will generally use a "no visible dust or blast media is to be observed escaping into the atmosphere or onto the ground from the contained area during blasting, cleaning, or blow down" criteria.
   b) The Engineer may conduct random opacity tests or use high volume or personal cassette samplers for verification monitoring. This monitoring, positioning of equipment, and times are at the discretion of the Engineer. Verification monitoring will be outside of the Contractor's regulated areas and involve the Engineer's sampling equipment. The Engineer's sampling equipment will not be made available for the Contractor's use.
   c) Ensure the National Ambient Air Quality Standards for lead or PM_{10} or visible dust are not violated. If it is violated, an issuance of a Suspension of Work notice will be used until

Commented [AB37]: PM10 is defined as particles 10 microns or less. It's not evident which regulation or standard references "0.4 mils and smaller".

Commented [AB38]: Correct code citations do not contain a comma.

Commented [AB39]: Should require the actual lab report and not just "analytical results".

appropriate corrective action is taken.

d) Shut downs for noncompliance with environmental regulations or standards will not be cause for extensions in time, or considered for delay costs.

d Paint Waste.

1) Paint wastes include all wastes generated by the project. These wastes include, but are not limited to:

- Blast waste,
- Material accumulated from filtering exhausted air,
- Spent abrasive,
- Containment material that cannot be decontaminated for reuse,
- Material containers such as paint and solvent containers, and
- Other wastes that fail the TCLP test ~~as modified below~~ and are categorized as a RCRA hazardous waste.

2) Consider all paint wastes as hazardous until after appropriate analytical data or ~~Materials~~ Safety Data Sheets are available showing conclusive evidence that the waste is below any regulated level for hazardous constituents, or is not initially regulated. ~~Further reduce any waste regulatory value listed in the CFRs by a factor of 20%. For example: 40 CFR, 261.24, identifies lead (D008) as a characteristic hazardous waste if the toxic characteristic is equal to, or greater than, 5.0 mg/L. Wastes containing lead that have leachable levels greater than 4.0 mg/L are considered hazardous and are to be disposed of in a Subtitle C landfill.~~

3) During generation, accumulate all paint wastes and segregate by individual waste stream. Place in properly labeled storage containers. Use containers that comply with ~~Federal DOT~~ 49 CFR requirements. Follow the handling and storage requirements of 40 CFR~~.~~ 262 ~~and 40 CFR, 265~~. Waste streams may be combined after each has been sampled, tested, and characterized, provided wastes are compatible and combining is acceptable to the disposal facility.

4) As required by the Site Contingency Plan, have a designated, responsible, and trained person available for 24-hour emergency response ~~around the clock any time~~ when wastes are stored on the project. It is recommended the Site Health and Safety Officer be so designated. Ensure this person is available during non- working hours and work shutdowns within a reasonable response time whenever wastes are being stored. Post this person and an alternate's name, telephone numbers, and other required information ~~on~~ in a prominent location at the accumulation point~~'s fence~~ and list in the Site Contingency Plan.

a) Accumulation Point.

(1) Erect and maintain an accumulation point, or storage area, sized to accommodate the accumulation of wastes awaiting shipment to a disposal facility. Enclose the accumulation point with an 8 foot high chain link security fence with barbed wire top, lockable access gates, bermed sides, and properly posted warning signs. A secured and enclosed trailer or shipping container is an acceptable alternative to a fenced area. Obtain the Engineer's approval for the location of this accumulation point. Construct it within the existing right-of-way at the project, but out of areas prone to flooding.

(2) For projects that will generate minimal quantities of waste, make a detailed written request to modify this storage security requirement. Submit all requests to modify the security requirement to the Engineer a minimum of 3 weeks prior to commencing production blasting. The Engineer will respond to the Contractor within 2 weeks following the request. The Engineer will evaluate the proposal based on:

- The Contractor's estimated waste quantities,
- The proposal's intent to comply with storage regulations and these specifications,
- Expected waste classification (i.e., hazardous or non-hazardous), and
- Other site specific considerations and details which the Contractor provides.

b) Satellite Accumulation Point.

(1) If the Contractor requests in writing, the Engineer will consider a small satellite accumulation point, or points, in the work zone. The management of satellite accumulation areas is to comply with 40 CFR 262.15. ~~Properly label containers stored in any satellite area. Tightly close containers to the elements and secure to prevent accidental spillage or loss.~~ At the conclusion of any working day, remove all containers containing accumulated wastes from any satellite accumulation point and place in the accumulation point storage area.

(2) Equipment which incorporates temporary storage of accumulation of wastes during

Commented [AB40]: See following comment.

Commented [AB41]: Having a safety factor appears to make sense but the more hazardous waste the Department generates the more the Department remains liable for into perpetuity. The Department's liability doesn't end upon waste disposal. If the waste tests as nonhazardous (i.e. below 5.0 mg/L) per EPA rules it should be handled as nonhazardous.

Commented [AB42]: Language not needed. 49 CFR is the US DOT regulations.

Commented [AB43]: 40 CFR 265 is meant for permitted treatment, storage and disposal facilities.

Commented [AB44]: Wastes need to be compatible (chemically) to combine.

Commented [AB45]: Language tweak – less awkward.

Commented [AB46]: Some accumulation points may not have a fence.

Commented [AB47]: The intent should be to have the waste properly secured in an acceptable manner. Stringent enclosure requirements such as the barbed wire fencing appears to be overkill.

Commented [AB48]: 40 CFR 262.15 identifies all the requirements of satellite accumulation areas.

operation will be considered a satellite accumulation point. As such, the equipment will be subject to proper labeling requirements. Waste materials contained within this type of equipment will not be subject to the requirement for daily transfer to the accumulation point storage area.

(3) Secure all materials stored at the accumulation point and satellite accumulation points to prevent spillage or vandalism. Securely cover to protect from the elements. Ensure the Site Health and Safety Officer maintains a permanent record to account for the accumulation of all waste materials and to report the cumulative weekly volumes at the project's progress meetings. Ensure the volume of materials located in the accumulation points and the condition of the storage containers are recorded weekly in the log.

(4) Remove accumulation point and satellite accumulation points (if used) when the Engineer orders, or at the end of the project. Apply Article 2508.01, B, 6.

e Decontamination Plan.

1) Provide the Engineer with a written Decontamination Plan a minimum of 3 weeks prior to commencing work. In this plan, outline procedures to follow to ensure non-expendable materials and equipment have been properly decontaminated prior to arriving on the project and before being demobilized from the site. Prior to in-bound mobilization, provide the Engineer with a written statement which includes the following:

a) Identification of project, location, owner reference, and contact information and type of wastes generated (hazardous or non-hazardous) at the previous project.

b) Certification that all equipment and non-expendable materials have been decontaminated and are clean. In this certification include analytical data verifying items have been decontaminated and are clean.

2) Before off-loading (or allowing in the right-of-way) equipment or non-expendable material, or both, that: 1) is mobilized to the site without being included in the certification; or 2) arrives at the site in an unacceptable condition, ensure it is:

- Decontaminated,
- Adequately sampled and tested, and
- Accepted as clean by the Engineer.

3) Evaluation of equipment and non-expendable material clean-up used on projects that generate hazardous wastes should include sampling (~~swipe~~ wipe or destructive) ~~and TCLP testing as an integral part of this plan. It is recommended to follow OSHA's Field Operation's Manual, CPL 2.0 - 2.58 and HUD's Clearance Criteria for Post Abatement Clean-up when developing sampling procedures and protocol for a decontamination plan.~~

4) For projects that generate no hazardous waste, use equipment that is, at a minimum, judged as visually clean. In addition, perform non-expendable material cleanup in a manner that is, at a minimum, judged as visually clean. No special testing will be required. Sample and test, or dispose of, items that cannot be visually evaluated.

5) If a particular waste stream can be identified as the sole source of hazardous materials, in an otherwise non-hazardous project, the Engineer has the discretion to:

- Separate out that process for a higher level of evaluation (for example sampling and testing), and
- Minimize visual evaluation on the other non-hazardous processes.

5. Paint Waste Transport and Disposal.

a Waste Sampling and Testing.

1) Sample each waste stream during the project to ensure project goals are being maintained and that a disposal facility's need for waste characterization is being met.

2) Obtain all samples properly, prepare for shipment, and offer for transport using Chain-of-Custody procedures and protocol. Have an accredited laboratory~~, or a laboratory that participates in EPA's Contract Laboratory program,~~ analyze all samples. Refer to Article 2508.01, B, 3, b, for additional information.

3) Provide all laboratory ~~results~~ reports to the Engineer as soon as they are received. Obtain an adequate number of samples and analyze them to ensure any waste stream generated during this contract is fully characterized.

4) Sample solid wastes and analyze using TCLP ~~test~~ analysis for the 8 Resource Conservation and Recovery Act (RCRA) priority metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Perform any additional analytical methods required by the disposal facility.

Commented [AB49]: "Wipe" sample is a more appropriate description.

Commented [AB50]: TCLP testing may not be possible if enough sample volume is not available.

Commented [AB51]: I was unable to identify or locate OSHA CPL 2.0-2.58 and it may be an outdated reference. The HUD clearance standards for housing seems like overkill.

Commented [AB52]: EPA's contract laboratory program is meant more for superfund site sampling.

Commented [AB53]: Should require submittal of a copy of the laboratory's reports.

Commented [AB54]: "Analysis" is better terminology.

Commented [AB55]: Clarification of the priority metals.

b Disposal.

1) A minimum of 3 weeks prior to commencing production blasting, provide the Engineer with a written request to approve a designated disposal facility. Determine which of the following options or combinations are applicable to the job and selected removal process, or processes:
   a) Permitted, Subtitle C, Treatment, Storage, and Disposal Facility (TSDF) for any hazardous waste generated at the site.
   b) Permitted, geosynthetic lined, Subtitle D landfill for non- hazardous waste generated at the site.
   c) Treatment and disposal facility for waste water generated from personal decontamination wash water.
2) With this request include a letter of tentative commitment from the facility to accept and dispose of the project's waste or selected waste streams. Dispose of hazardous waste only in a permitted TSDF that has obtained and currently holds an U.S. EPA, TSDF identification number. The Engineer ~~will~~ may evaluate any facility submitted by conducting an environmental audit, records review, and reference check of that facility.
3) After receiving the Engineer's approval of the facility (or facilities), begin the formal process of obtaining final disposal ~~permits which may be required by~~ authorization from that facility. Provide the Engineer with copies of all final documents pertaining to the disposal ~~permit~~. ~~Obtain a signed contract with the approved TSDF or other facility for wastes produced at the site before accumulating waste (hazardous or non-hazardous) in the amount of 1000 pounds or within 1 month of beginning paint removal operations.~~
4) Clean all shipping containers for regulated raw materials or consumable supplies received at the project to "RCRA empty" as defined in 40 CFR 261.7. Properly recycle or dispose of at the appropriate disposal facility.

Commented [AB56]: The environmental regulatory agency in some states (e.g. Illinois) is identified as their environmental protection agency (EPA). "U.S." added to avoid confusion.

Commented [AB57]: Make this an option for the DOT rather than a requirement. A permitted TSDF must comply with a multitude of EPA regulations and "should" be up to par.

Commented [AB58]: A TSDF does not typically generate a permit or contract for waste disposal. A written disposal authorization from the facility would suffice.

Commented [AB59]: Code citation added.

5) The Engineer, on a case-by-case basis, will consider proposals for beneficial reuse, reclamation, or recycling of waste products generated during ~~the course of~~ the project. A minimum of 3 weeks prior to commencing work, provide a written Value Engineering Incentive Proposal, according to Article 1105.15, identifying a waste recycling program to the Engineer for consideration. In the submittal, provide the Engineer with ample detail to thoroughly and completely review and research the proposal.

c Transportation and Manifesting.

1) Ensure that no waste leaves the site without a properly prepared waste manifest. Manifest all hazardous waste shipments using a Uniform Hazardous Waste Manifest, obtainable from ~~EPA or~~ the approved disposal facility. For all shipments of non-hazardous waste, propose a manifest. Obtain the Engineer's approval for the manifest.

2) Have the Site Health and Safety Officer sign the manifest ~~prior to shipment~~. ~~Signatures will be on behalf of the Contracting Authority, according to 40 CFR, 262.~~ ~~At the conclusion of each shipment, have~~ Have the Site Health and Safety Officer ~~deliver to~~ provide the Engineer and appropriate agencies, electronic copies of each manifest along with any supporting documents such as land disposal restriction forms and waste profiles within one working day of shipment ~~the required pages from the Uniform Hazardous Waste Manifests, according to the instructions included on the manifest~~.

3) When material is being transported or readied for transport, ensure all waste containers are properly labeled and marked according to ~~Federal regulations~~ (40 CFR~~,~~ 262 and 49 CFR~~,~~ 172). Ship all wastes with a permitted transporter holding a current U.S. EPA transporter~~s~~ identification number. ~~Provide the Engineer with the required emergency response telephone number for the Uniform Hazardous Waste Manifest.~~

4) Maintain a file of all waste shipped for disposal or recycling. Have ~~the Site Health and Safety Officer immediately notify the Engineer if a waste shipment (hazardous or non-hazardous) does not reach the designated facility within allotted timeframes. Further, have~~ the Site Health and Safety Officer coordinate with the Engineer to assure that the signed original of each Uniform Hazardous Waste Manifest is received from the designated facility by the Engineer within 35 calendar days of the date the waste was accepted by the initial transporter. For shipments of hazardous waste, if the signed TSDF copy is not received in 10 additional calendar days (45 calendar days total) have the Site Health and Safety Officer immediately:

a) Prepare and submit an Exception Report in accordance with 40 CFR 262.42 to the EPA Region VII Administrator, ~~901 North 5th Street, Kansas City, KS 66101-2728~~ 11201 Renner Blvd, Lenexa, KS, 66219. Provide a copy of this report to the Engineer.

b) Initiate actions to track and locate that shipment (applicable for both hazardous and non-hazardous waste shipments).

5) Provide the Engineer with ~~a photocopy~~ an electronic copy of:

- ~~The signed Generator Copy page from the Uniform Hazardous Waste Manifest on the day of waste shipment, and~~
- The fully signed ~~Return~~ Designated Facility to Generator page from the Uniform Hazardous Waste Manifest ~~on the~~ within one working day of it ~~is~~ being received from the disposal facility.

6. Protection and Clean-up.

a General.

1) For all work, use every reasonable means to protect the environment, human

Commented [AB60]: Extra language.

Commented [AB61]: The EPA does not provide manifests.

Commented [AB62]: Manifests should only be signed at the time of shipment, not prior to.

Commented [AB63]: EPA views both the owner (the Department) and the contractor as generators. The contractor should not be signing on behalf of the Department.

Commented [AB64]: The "conclusion" of shipment seems vague (at the time of shipment from the site or when it reaches the TSDF?). Listed standard shipping documents to be provided.

Commented [AB65]: Language tweaks and grammatical corrections.

Commented [AB66]: The manifest will be provided by either the hazardous waste transporter or the disposal facility and will have the emergency response information noted.

Commented [AB67]: Redundant language based on the specific timeframes noted in the following sentences.

Commented [AB68]: Provides code citation.

Commented [AB69]: Updated office address.

Commented [AB70]: Provide electronic copy rather than paper copy.

Commented [AB71]: Already covered by 2) above.

Commented [AB72]: Corrected terminology and allowed one working day for submittal.

health and safety, adjacent property, and vehicles from damage resulting from the paint removal operations, according to Article 1107.07.

2) Keep the project site in a neat, clean, and safe working condition.
3) At the end of each working day, clean up and properly containerize all waste material. Special attention is drawn to steel abrasive and its preponderancy to rust and stain surfaces where material is allowed to accumulate.
4) Clean up abrasive on a daily basis and remove any staining which occurs.

b Site Environmental Evaluation.

1) Do not contaminate the soil or bodies of water with lead or other hazardous materials.
2) Soil or river sediments are considered to have been contaminated with lead or chromium from the project if either of the following two conditions occurs. Return the soil or river sediments to back-ground levels by methods acceptable to the Engineer and all applicable regulatory authorities (at no additional cost to the Contracting Authority).
   a) If the geometric mean pre-project level is less than or equal to 200 ppm (totals), and an increase in the post-geometric mean total content of 100 ppm or more occurs.
   b) If the geometric mean pre-project level is greater than 200 ppm, and the post-geometric mean concentration exceeds the pre-job geometric mean plus two standard deviations, or increases in the post-geometric mean level of 100 ppm occurs, whichever is greater.

c Final Clean-up.

1) Perform final cleanup of all work on this project according to Article 1104.08 and procedures established in Article 2508.01, B, 4.
2) No separate payment will be made for furnishing protection and cleanup. The costs for protection and cleanup are included in the contract unit prices bid for the various items of work in the contract.

7. Project Submittals and Written Plans.

The Contractor and Engineer shall adhere to the following requirements to ensure appropriate project paper work is submitted in a timely manner. No work will be allowed or progress payments made unless these items have been submitted, reviewed, corrected, and approved as necessary.

a Three weeks prior to commencing work.

1) Site Soil and River Sediment Sampling Program, as described in Article 2508.01, B, 3, b.
2) Site Work Plan, as described in Article 2508.01, B, 3, d.
   a) Environmental Protection Plan.
   b) Waste Handling, Storage, and Disposal Plan.
   c) Site Air Monitoring Plan.
3) Site Health and Safety Plan.
4) Site Contingency Plan.
5) Decontamination Plan, as described in Article 2508.01, B, 4, e.
6) Written proposal for Beneficial Waste Reuse, as described in Article 2508.01, B, 5, b.

b Prior to in-bound mobilization.

Certification of Equipment Decontamination, as described in Article 2508.01, B, 4, e.

c Three weeks prior to erecting containment.

Containment Design, as described in Article 2508.01, B, 4, b.

d Three weeks prior to commencing production blasting.

1) Analytical results from soil and river sediment sampling, as described in Article 2508.01, B, 4, b.
2) Request to Modify Accumulation Point Security, if applicable, as described in Article 2508.01, B, 4, d.
3) Written request for Disposal Facility Approval, as described in Article 2508.01, B, 5, b.

e Twelve calendar days following 1st day of production blasting.

1) Furnish analytical data from project sampling paint waste, as described in Article 2508.01, B, 3, b.
2) Furnish estimated waste production quantities.

f Prior to painting.

1) Written paint mixing procedure, as described in Article 2508.02, E, 4.
2) Manufacturer's Recommendations, as described in Article 2508.02, B, 2.
3) Written designation of the paint manufacturer's technical representative, as described in Article 2508.02, E, 7.

2508.02 PAINTING OF STRUCTURAL STEEL.

A. General.

This work consists of fully repainting, zone painting, or spot painting (or any combination of these) structural steel at designated locations using a paint system designated elsewhere in the contract documents. The work includes:

- Furnishing the coating system specified,
- Application, protection, and curing of paint coatings,
- Protection of all parts of the structure from paint spatter,
- Environmental protection,
- Final cleanup, and
- Supplying all equipment, scaffolding and rigging, labor, and materials.

B. Material Acceptance.

1. Use paints that:
   - Are equal to or less than 3.2 pounds per gallon for VOC. Calculation of VOC content shall account for thinning necessary for field application, and
   - Contain pigments which are free from or have constituents at levels below a threshold that when disposed of would be regulated by ~~the~~ 40 CFR~~,~~ 261.

2. Furnish ~~three copies~~ an electronic copy of the coating manufacturer's certification document for each shipment intended for use on this project. Ensure the document includes the following information:
   - Date of shipment to the project,
   - Name of painting Contractor or company to which the shipment was made,
   - Brand names and product identification numbers,
   - The most current Technical Data sheets and ~~M~~SDS for coatings, thinners, and tints,
   - Batch or lot numbers, and
   - Batch or lot numbers and producer mill certificate for any zinc pigment, certifying compliance to at least the purity requirements of ASTM D 520 Type II.

3. Provide the Engineer with ~~three copies~~ an electronic copy of the latest Technical Data Sheets, ~~M~~SDS sheets, and coating manufacturer's written approval for caulking material

Commented [AB73]: Grammatical corrections.

Commented [AB74]: Electronic copy rather than 3 paper copies.

to be used on this project.

4. Provide the Engineer with ~~two copies~~ an electronic copy of the certification document prior to starting work. Make an additional copy available on-site.

Commented [AB75]: Electronic copy rather than paper copies.

C. Paint System.

The paint system, Epoxy, Moisture Cured Urethane, or Zinc Silicate, for this project is designated elsewhere in the contract documents. The different systems are as follows:

1. **Primer Coat.**

   a. Use a Zinc-rich Epoxy, Zinc-rich Aromatic Moisture Cured Urethane, or Zinc-rich Silicate applied at a rate that results in a targeted dry film thickness (dft) of:
      - 3 to 5 mils for Epoxy.
      - 3 to 4 mils for Moisture Cured Urethane.
      - 3 to 5 mils for Zinc Silicate.

   b. There is no color specified for the primer.

   c. Dry film thickness listed assumes a surface profile of 1.5 to 2.5 mils. If this is not the case, either because of previous blast cleaning operations or improper quality control on this job, additional dft of primer may be required. In those cases, contact the paint manufacturer to provide a written alternate primer and possible application modifications. Prior to applying additional alternate primer, provide the written alternative to the Engineer for review and approval. Ensure that in no case do surface peaks project above the primer coverage.

   d. The use of penetrating sealer, if required, will be designated elsewhere in the contract documents. A penetrating sealer may be required in any of the following areas:
      - Where there are cracks and seams,
      - In feathered (transition) areas,
      - Areas with surfaces prepared by mechanical methods.

   e. Apply the sealer at a rate that results in a targeted dft recommended by the paint manufacturer.

2. **Intermediate Coat.**

   a. Use an Aluminum Epoxy Mastic or Aromatic Moisture Cured Urethane applied at a rate that results in a targeted dft of:
      - 5 to 7 mils for Aluminum Epoxy Mastic.
      - 3 to 4 mils for Moisture Cured Urethane, pigmented with micaceous iron oxide.
      - No intermediate coat is required for a zinc-rich silicate system.

   b. Tint the intermediate coat to a different color than the primer and finish coats.

3. **Finish Coat.**

   a. Use an Aliphatic Polyurethane, Aliphatic Moisture Cured Urethane, or Waterborne Acrylic applied at a rate that results in a targeted dft of:
      - 3 to 5 mils of Aliphatic Polyurethane for the Epoxy system.
      - 2 to 3 mils of Aliphatic Moisture Cured Urethane.
      - 2 to 3 mils of Waterborne Acrylic for the Zinc Silicate system.

   b. For the top coat use Federal Color Number 14223 for highway bridges or the color specified in the contract documents.

D. Acceptable Products.

1. **General.**
   a. Refer elsewhere in the contract documents for the system specified for this project. Acceptable suppliers and products for each system are listed in Materials I.M.s 482.02 through 482.06. Choose material for the paint system specified (including thinners, tinting, etc.) from one of the coating manufacturers.
   b. When specified in the contract documents, use a penetrating sealer that is:
      - Designated by the paint manufacturer for the system specified, and
      - Tinted to a different color than that of the primer.

2. **Epoxy System.**

   Use a three coat epoxy paint system consisting of:
   - A Zinc-rich Epoxy primer,
   - A High-solids Aluminum Epoxy Mastic intermediate coat, and
   - An Aliphatic Polyurethane top coat.

3. **Moisture Cured Urethane.**

   Use a three coat moisture cured urethane paint system consisting of:
   - A Zinc-rich Aromatic Moisture Cured Urethane primer,
   - A Moisture Cured Urethane - pigmented with micaceous iron oxide intermediate coat, and
   - An Aliphatic Moisture Cured Urethane top coat.

4. **Zinc Silicate.**

   Use a paint system consisting of a single coat of Zinc Silicate primer with a Waterborne Acrylic top coat system.

E. **Application.**

1. **General.**
   Apply paint using brush, roller, or spray methods. Apply paint in strict compliance with the coating manufacturer's latest written recommendations. Regardless of the method of application, ensure the specified minimum dft is achieved. Ensure the manufacturer's recommended maximum dft requirement for each coat is not exceeded without approval of the paint manufacturer's technical representative. Additionally:
   a. Ensure product parameters, such as application, thinning, mixing, pot life, ventilation, curing, and so forth comply with the manufacturer's recommendations.
   b. Ensure the prime, intermediate, and finish coats have a smooth, uniform appearance free from runs, sags, cracks, dry spray, over- spray, or other defects.
   c. Shield concrete and galvanized products so that paint application on steel is full and complete without over-spray.
   d. Upon completion, permanently stencil the word "painted" followed by the Contractor's name, the month, year, coating system, and manufacturer of the coating system applied. Stencil this information on an inconspicuous surface in a manner and location the Engineer approves.
   e. Provide OSHA compliant access for the Engineer to check the surface preparation before painting and the dft after each coat is applied.

2. **Painting.**
   a. **Penetrating Sealer.**
   Apply penetrating sealer to areas designated in the contract documents. Allow to cure according to the coating manufacturer's recommendations before the prime

coat is applied.

b. Prime Coat.

1) Apply a prime coat to all areas blasted clean or mechanically cleaned, or both. Apply this coat to areas of bare metal within 24 hours of being blast cleaned. Brush blast the entire prepared area before paint is applied if:
- The prepared surface shows any sign of flash rust, or
- The prime coat is not applied within 24 hours after blast cleaning.

2) Use methods acceptable to the Engineer to re-prepare areas which were prepared by mechanical methods and are showing flash rust.

3) Pay special attention to all rivets, bolts, edges of connections, areas of pack rust, and areas which may be difficult to access. These areas may require ringing/stripping.

4) Allow the prime coat to cure according to the coating manufacturer's recommendations before the intermediate coat is applied.

c. Intermediate Coat.

1) Apply the intermediate coat to all areas that received a prime coat. Allow to cure according to the coating manufacturer's recommendations before the finish coat is applied.

2) The Zinc Silicate system does not require an intermediate coat.

d. Finish Coat.

Fully cover the intermediate coat with the finish coat. Fully cover other surfaces with the finish coat if designated in the contract documents.

3. Recoating.

a. Surface Condition.

1) Ensure surfaces are free of dirt, oxidation products, oil, and other detrimental material prior to painting. Perform cleaning which may be necessary according to the coating manufacturer’s recommendations.

2) Protect all painted surfaces to prevent soiling or detrimental weather conditions during painting and through the tack-free stage.

b. Minimum Time.

1) No additional coat(s) of paint may be applied until the preceding coat has dried. Recoat according to the coating manufacturer's recommendations for time, temperature (ambient and/or surface), and weather conditions.

2) If minimum recoat times are not given by the coating manufacturer, wait at least 24 hours, and until the previous coat is tack-free, before applying the next coat.

c. Maximum Time.

Do not exceed the coating manufacturer's maximum time between coats. If the maximum recoat time is exceeded for any coat, provide the Engineer with a written correction procedure, or approval to proceed without correction, obtained from the coating manufacturer’s technical representative.

4. Mixing.

a. Mix paint according to the coating manufacturer's recommendations. Do not use previously opened or partially used containers of paint. Partial kit mixing will not be allowed.

b. Together with the coating manufacturer, provide a specific mixing procedure for the Engineer’s review prior to performing the work. Follow this procedure unless the Engineer approves a written request to modify it.

5. **Dry Film Thickness.**

   a. The Engineer will determine the dft of each coat and the total paint system using procedures described in SSPC-PA 2. Excessive coating thickness is as equally undesirable as unacceptably thin coating thickness, and both will be sufficient cause for rejection.
   b. Targeted dft is specified herein. Touch up areas having less than specified dft to increase dft to at least that specified in this Article for the system specified. Depending on the condition of the steel substrate and paint system being used, it is possible these areas will require reblasting and repainting.
   c. Excessive thickness will be evaluated on a case-by-case basis in consultation with the coating manufacturer. Depending on the condition of the steel substrate and paint system being used, it is possible these areas will require reblasting and repainting.

6. **Cracks and Seams.**

   a. Use a best effort combination of blasting and possible hand or power tool cleaning to clean cracks and seams that are formed by junctions of joining members, splices, gusset plates, rivets, bolts, nuts, and similar surface irregularities. After application of any penetrating sealer and prior to application of the prime coat, caulk all cracks and seams that are equal to, or greater than, 3/16 inch wide with a durable caulking compound recommended by the paint manufacturer.
   b. Seal cracks and seams less than 3/16 inch wide with the prime coat. Seal cracks and seams that cannot be sealed with the prime coat using caulk before the intermediate coat is applied. In the case of Zinc Silicate, this will be before the top coat is applied.
   c. Use lead free caulking compound, supplied with the latest technical data and ~~M~~SDS sheets. Obtain the paint manufacturer's and the Engineer's approval prior to incorporation into the project.

7. **Technical Assistance.**

   a. Have the coating manufacturer whose products are used on this contract designate a qualified technical representative to support this project. The technical representative shall be available for on-site assistance and project coating consultation as may be required.
   b. Difficulties in scheduling on-site technical assistance will not be considered a sufficient reason for approving time extensions to the contract period.
   c. Ensure that, in all cases, application parameters are according to the product's Technical Data Sheet or the manufacturer's written recommendations, unless superseded elsewhere in this specification or in the contract documents.

F. **Application Conditions.**

1. Apply the manufacturer's published weather restrictions for each coating, except as modified below.
2. Paint only when weather conditions are such that the surfaces to be painted are entirely free from moisture, frost, ice, and snow. When painting in an area protected from the above conditions, protect the surface under cover until the paint is dry.
3. If wet paint is exposed to humidity, rain, snow, or condensation, allow it to dry. Remove damaged paint, reclean the surface, and repaint.
4. Moisture Cured Urethane coating may only be applied when:
   - Surface temperatures are between 38°F and rising and 100°F.
   - Relative humidity is less than or equal to 95%.

5. Bubbling or pinholing which may occur in Moisture Cured Urethane will be evaluated using SSPC-VIS2. Bubbling or pinholing shall be less than 0.1% as defined by SSPC-VIS2, Photographic Standard No. 8.

2508.03 COAST GUARD REQUIREMENTS.

Apply the following for contracts that require work in and over navigable waters.

A. Comply with the following requirements:
- Established by the Corps of Engineers, the U. S. Coast Guard, and others relative to construction work in and over navigable waters, and
- Applicable to this project, but not covered by existing permits.

B. Construction work includes, but not necessarily limited to:
- Bridge washing, paint removal, cleaning structural steel by blasting, and painting structural steel,
- Containment enclosures, safeguards and temporary falsework or platforms, and lighting during construction, and
- Anchorage of barges and construction equipment, temporary restriction of channel width, and the removal of all temporary construction.

C. Ensure operations within or over the river comply with the requirements or directions of the U.S. Coast Guard District Engineer.

D. The following precautionary measures shall be taken during the performance of this work:

1. Perform work so that the free flow of navigation is not interfered with and navigable depths are not impaired.

2. Ensure floating equipment working in the channel displays lights and signals as required by the current Inland Navigational Rules.

3. If scaffolding or nets are suspended below low steel in the navigation span, contact the Coast Guard Office in St. Louis, Missouri, so that the temporary reductions in clearance for river traffic can be checked and appropriate notices can be published. Remove such scaffolding or nets at night, if required by the Coast Guard.

4. Take positive precautions to prevent spark producing, flame producing, lighted, or other damaging objects from accidentally dropping onto barges or vessels passing beneath the bridge. Cease all flame cutting, welding, and similar spark-producing operations over the channel when vessels are passing beneath the bridge.

5. Ensure work does not interfere with displaying navigation lights on the bridge at night.

6. Immediately remove any material, machinery, plant, or appliance which is lost, thrown from the bridge, sunken, or misplaced during the progress of the work, and which in the Engineer's opinion may be dangerous or obstructive to navigation. Immediately notify the Engineer and provide a description and location of the obstruction. When required, mark or buoy such obstructions until the obstruction is removed.

E. The Federal Water Pollution Control act, as amended, prohibits the discharge of oil, including oil based paints, or hazardous substances into the waters of the United States. The law requires any person in charge of a vessel or facility from which oil or a hazardous substance is discharged shall immediately report the discharge to the U.S. Coast Guard National Response Center at 800.424.8802.

F. The owner/operator of a vessel or facility from which the pollutant is discharged is subject to ~~a~~ civil ~~penalty of up to $5000~~ penalties and is liable for cleanup costs, if any.

Commented [AB76]: Civil penalties can vary and are subject to change. Delete any specific penalty amount.

G. Inform the U.S. Coast Guard office in St. Louis, Missouri, the status of this work to enable them to issue cautionary notices to mariners. If the Contractor has a marine radio at the job site, furnish the Coast Guard the call sign and operating frequency so that the information can be included in their notices.

H. No changes in channel conditions or in river bank conditions from natural causes or by reason of channel improvements or other construction, nor methods of river control by the United States or the state are to be considered as having any bearing or effect on the obligations of the contract nor justification for any claim for additional payments or extensions of time.

I. In the event that the United States Coast Guard or other constituted authorities should, during the progress of work, issue directions or orders affecting the Contractor's operations or order of procedure, promptly file with the Engineer a copy of such order or restrictions from the Corps of Engineers,
U.S. Army, U.S. Coast Guard, and/or other authority having jurisdiction.

2508.04 METHOD OF MEASUREMENT.

Lump sum items. No method of measurement.

2508.05 BASIS OF PAYMENT.

A. Payment for the items below will be the lump sum contract price.

1. **Bridge Cleaning for Painting.**

   Payment is full compensation for furnishing materials, labor, and equipment to perform the work in accordance with contract documents.

2. **Blast Cleaning of Structural Steel.**

   Payment is full compensation for furnishing materials, labor, and equipment to perform the work in accordance with contract documents.

3. **Containment.**

   a. Payment is full compensation for furnishing materials, labor, and equipment necessary to install and maintain the containment during blast cleaning operations or paint removal by other methods.
   b. For non-hazardous paint removal, payment is also full compensation for monitoring, sampling, testing, reporting, temporary enclosures, temporary storage of waste, and disposal of waste.
   c. For hazardous paint removal, payment is full compensation for:
   - Furnishing all materials, labor, and equipment to perform all work necessary for containment enclosures,
   - Air monitoring, sampling, and testing,
   - Decontamination,
   - Handling, sampling and testing, containerizing, and storage of paint waste, and
   - Installing, maintaining, and removing the waste accumulation points.

4. **Paint Waste Transport and Disposal.**

   Payment is full compensation for furnishing materials, labor, and equipment to perform all work necessary for:

- The proper transport of paint waste,
- The proper disposal of paint waste,
- Analytical testing of paint waste,
- Obtaining all necessary permits and manifests, and
- Preparation of permits and manifests.

5. Painting of Structural Steel.

Payment is full compensation for:

- All materials, labor, equipment,
- Providing material acceptance documents, and
- Providing technical assistance in accordance with contract documents.

B. Coast Guard Requirements will be incidental to the items of work for which they apply.

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IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove	**Office:** Construction & Materials	**Item 5**
Submittal Date: 10/25/2022	**Proposed Effective Date:** April 2023	
Article No.: 2523.03, G, 6 **Title:** Foundations (Highway Lighting)	**Other:**	

Specification Committee Action: Approved with changes.

Deferred:	**Not Approved:**	**Approved Date:** 11/10/2022	**Effective Date:** April 2023 GS

Specification Committee Approved Text:

2123.03, B, 8

Delete the second sentence**:**

~~In additional to age requirements, Class A, C. or M Portland cement concrete must show a flexural strength of 500 psi or more and Class B Portland cement concrete places after September 15 must show a flexural strength of 400 psi or more.~~

2523.03, G, 6.

Replace the fourth sentence:

Place backfill consisting of Class ~~B~~ A concrete.

Comments: Construction and Materials found an additional reference to Class B concrete that they asked to remove from Article 2123.03, B, 8

Specification Section Recommended Text:

2523.03, G, 6.

Replace the fourth sentence:

Place backfill consisting of Class ~~B~~ A concrete.

Comments:

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

2523.03, G, 6

G. Foundations.

6. When precast foundations are used, drill the hole a minimum 1 foot larger than the diameter of the foundation. Leave bottom of hole as undisturbed as possible. If caving soil or groundwater is present, remove prior to placing foundation. Place backfill consisting of Class ~~B~~ A concrete.

Reason for Revision: Class B concrete was eliminated from IM 529 and specifications. This spec was missed.

New Bid Item Required (X one)	**Yes**	**No** x

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

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Mike Kennerly/Daniel Harness/Dan Sprengeler	**Office:** Design	**Item 6**
Submittal Date: 10/29/2022	**Proposed Effective Date:** April 2023	
Article No.: 2528.03,C,1,b, 2 **Title:** Cones, 42 Inch Channelizers, Drums, and Tubular Markers	**Other:**	

Specification Committee Action: Approved as recommended

Deferred:	**Not Approved:**	**Approved Date:** 11/10/2022	**Effective Date:** April 2023 GS

Specification Committee Approved Text: See Specification Section Recommended Text

Comments: None

Specification Section Recommended Text:

2528.03, C, 1, b, 2.

Replace the Article:

a) ~~A nominal 36~~ Minimum 28 inch height and maximum 36 inch height from pavement surface.
b) Diameter facing traffic at least 2 inches in width.
c) ~~Completely faced with~~ Two bands of reflectorized white ~~and orange~~ sheeting, ~~that is in two bands 4~~ each a nominal 3 inches wide with a maximum of 6 inches between bands, with the top band no more than 2 inches from the top of the tubular marker.

Comments:

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

b. Cones, 42 Inch Channelizers, Drums, and Tubular Markers.
1) Ensure cones, 42 inch channelizers, drums, tubular markers, and other traffic control devices meet the current requirements of the MUTCD, and Section 4188.
2) Ensure tubular markers meet the following:
a) ~~A nominal~~ Minimum 28 ~~36~~ inch height, Max 36 inch height attached to the pavement.
b) Diameter facing traffic at least 2 inches in width.
c) ~~Completely faced with reflectorized white and orange sheeting that is in two bands~~ Two bands of reflectorized white sheeting each a nominal 3 inches wide with maximum 6 inches between bands, with the top band no more than 2 inches from the top of the tubular marker.

Reason for Revision: This change will bring Iowa closer to what surrounding states require. Taller tubular markers (over 28") are difficult to maintain due to slender cross section. Tubular markers do not remain upright and therefor they do not provide adequate delineation. Also, fully reflectorized tubes do not add significant target value compared with only two white reflectorized bands. Fully reflectorized tubes add significant cost. Sheeting is much brighter now than when Iowa DOT started to require full reflectorization.

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

Bid Item Obsoletion Required (X one)	**Yes**	**No** X
Comments: Industry initiated this discussion		
County or City Comments:		
Industry Comments:		

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IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Eric Johnson / Donna Matulac	**Office:** Specifications	**Item 7**
Submittal Date:	**Proposed Effective Date:** April 2023 GS	
Article No.: 4189.02, A, 1 **Title:** Cables (Inductive Loop Vehicle Detector) **Article No.:** 4189.05, C, 2 **Title:** Pole Design (Traffic Signal Equipment)	**Other:**	

Specification Committee Action: Approved as recommended

Deferred:	**Not Approved:**	**Approved Date:** 11/10/2022	**Effective Date:** April 2023 GS

Specification Committee Approved Text: See Specification Section Recommended Text

Comments: These items will be in the 2023 SUDAS update

Specification Section Recommended Text:

4189.02, A, 1, Cables.

Delete the first sentence:

~~All cables must be UL approved.~~

4189.05, C, 2, Pole Design.

Replace the last sentence:

Install vibration mitigation devices that mechanically or statically minimizes vibration on the mast arm caused by wind on all traffic signal pole mast arms over 60 feet in length as shown in the standard details.

Comments:

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

Reason for Revision: To match SUDAS. Apparently cables are not something that UL approves.

Request was discussed and approved at the October 19, 2022 SUDAS District 1 meeting to add text to specify that either a mechanical or static device is acceptable to mitigate vibration.

New Bid Item Required (X one)	**Yes**	**No** X
Bid Item Modification Required (X one)	**Yes**	**No** X
Bid Item Obsoletion Required (X one)	**Yes**	**No** X

Comments: None

County or City Comments: Pending approval by SUDAS Board of Directors.

Industry Comments:

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IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Eric Johnsen	**Office:** Specifications	**Item 8**
Submittal Date: 10/21/2022	**Proposed Effective Date:** April 2023 GS	
Article No.: 1107.07, E **Title:** Safety, Health, Pollution, and Sanitation (Legal Relations and Responsibility to the Public) **Article No.:** 2102.05, A, 5, c **Title:** Water for Embankment Construction (Roadway and Borrow Excavation) **Article No.:** 2107.05, A, 6, b **Title:** Water for Embankment Construction (Embankments) **Article No.:** 2301.05, K, 1 **Title:** General (Portland Cement Concrete) **Article No.:** 2303.05, D, 1 **Title:** Anti-Strip Agent (Flexible Pavement) **Article No.:** 2303.05, H, 1 **Title:** Cold Weather Paving (Flexible Pavement) **Article No.:** 2318.03, I, 5 **Title:** Quality Control (Cold In-Place Recycled Asphalt Pavement) **Article No.:** 2403.05, A, 3 **Title:** Basis of Payment (Structural Concrete) **Article No.:** 2403.05, A, 4 **Title:** Basis of Payment (Structural Concrete) **Article No.:** 2501.05, J, 2 **Title:** Pile Loading Tests (Piles and Pile Driving) **Article No.:** 2501.05, L, 1 **Title:** Dynamic Pile Test (Piles and Pile Driving) **Article No.:** 2510.05, C **Title:** Removal of Anchor Lugs (Removal of Pavement) **Article No.:** 2529.05, F, 2 **Title:** Removal of Anchor Lugs (Full Depth Finish Patches) **Article No.:** 2602.05, B, 1, **Title:** Mobilizations, Erosion Control (Water Pollution Control (Soil Erosion)) **Article No.:** 2602.05, B, 2 **Title:** Mobilizations, Emergency Erosion Control (Water Pollution Control (Soil Erosion))	**Other:**	

Specification Committee Action: Approved as recommended			
Deferred:	**Not Approved:**	**Approved Date:** 11/10/2022	**Effective Date:** April GS 2023
Specification Committee Approved Text: See Specification Section Recommended Text			
Comments: None			

Specification Section Recommended Text:

1107.07, E.

Replace the second sentence:

On Primary Roads and Primary Road extensions, on temporary Primary Road haul roads, and when designated in the contract documents construction areas adjacent to Primary Roads on which traffic is maintained, the Contractor will be paid for watering ordered by the Engineer at the rate of ~~$60~~ $75.00 per ~~thousand~~ 1000 gallons.

2102.05, A, 5, c.

Replace the Article:

If the contract does not contain a unit price for water, and moistening of the material is authorized or ordered, water will be paid for as extra work at the rate of ~~$12.00~~ $75.00 per 1000 gallons.

2107.05, A, 6, b.

Replace the Article:

In case the contract does not contain a unit price for water, and moistening of the material is authorized or ordered, payment for water will be as extra work at the rate of ~~$12.00~~ $75.00 per 1000 gallons.

2301.05, K, 1.

Replace the first sentence:

When any of the types of additional protection described in Article 2301.03, K, 3, is necessary, additional payment will be made at the rate of ~~$2.00~~ $2.50 per square yard of surface protected.

2303.05, D, 1.

Replace the Article:

When anti-strip agent is required, payment will be made at the rate of ~~$2.00~~ $3.00 per ton of asphalt mixture in which the anti-strip agent is incorporated, if the Contracting Authority's test results from the field produced mixture meet or exceed the minimum requirement established in Article 2303.02, E, 2, d.

2303.05, H, 1.

Replace the Article:

When cold weather paving is permitted by the Engineer, payment will be made at the rate of ~~$2.00~~ $3.00 per ton of flexible paving mixture in which the warm mix additive is incorporated.

2318.03, I, 5.

Replace the fourth sentence:

Payment will be ~~$400~~ $550.00 per lane-mile for profiling the length directed by the Engineer.

2403.05, A, 3.

Replace the second and third sentences:

For concrete proportioned and mixed at the site, the additional payment for heating will be ~~$5.00~~ $8.00 per cubic yard. For ready mixed concrete, the additional payment for heating will be the customary amount charged for heating, and separately identified on the invoice, with a maximum of ~~$5.00~~ $8.00 per cubic yard.

2403.05, A, 4.

Replace the second sentence:

The additional payment for protection will be $17.00 per cubic yard.

2501.05, J, 2.

Replace the first and second sentences:

For pile loading tests ordered by the Engineer, payment will be a lump sum price of ~~$3000~~ $6,000.00. When this test is performed within a cofferdam, the lump sum price will be ~~$6000~~ $12,000.00.

2501.05, L, 1.

Replace the Article:

When required by the contract documents, or ordered as directed by the Engineer, payment will be a lump sum price of ~~$250~~ $500.00 per test pile.

2510.05, C, Removal of Anchor Lugs.

Replace the Article:

Each. If removal of anchor lugs is not a bid item in the contract documents, payment will be ~~$600~~ $750.00 per lane for each anchor lug removed.

2529.05, F, 2.

Replace the second sentence:

If removal of anchor lugs is not a bid item in the contract documents, payment will be paid ~~$1200~~ $1,500.00 per lane in which an anchor lug, or portion of anchor lug, is removed.

2602.05, B, 1, Mobilizations, Erosion Control.

Replace the Article:

The quantity will be paid for at the unit price of ~~$500.00~~ $600.00 each for Mobilizations, Erosion Control, which is full compensation for staged movement of labor, equipment, and materials; and labor, tools, equipment, and incidentals necessary to complete the movement.

2602.05, B, 2, Mobilizations, Emergency Erosion Control.

Replace the Article:

The quantity will be paid for at the unit price of ~~$1000.00~~ $1,200.00 each for Mobilizations, Emergency Erosion Control, which is full compensation for movement of labor, equipment and materials; and for labor, tools, equipment, and incidentals necessary to complete the movement.

Comments: The additional two items are not included in the Standard Specifications, but will be updated. Flaggers and Pilot cars were not reviewed at this time, but the Department plans to review these rates when additional information is submitted by industry.

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

Fixed Unit Prices in IDOT Specifications for Further Review

Article	Current Price	Proposed Price	Unit	Item of Work
1107.07.E	$ 60.00	$ 75.00	MGAL	Dust Control Watering
2102.05.A.5.c	$ 12.00	$ 75.00	MGAL	Water for Embankment
2107.05.A.6.b	$ 12.00	$ 75.00	MGAL	Water for Embankment
2301.05.K.1	$ 2.00	$ 2.50	SY	Cold Weather Protection
2303.05.D.1	$ 2.00	$ 3.00	TON	Asphalt w/ Anti-Strip Agent
2318.03.I.5	$ 400.00	$ 550.00	LANE-MILE	Profiling
2403.05.A.3	$ 5.00	$ 8.00	CY	Heating Structural Concrete
2403.05.A.4	$ 7.00	$ 17.00	CY	Cold Weather Protection of Structural Concrete
2501.05.J.2	$ 3,000.00	$ 6,000.00	LUMP SUM	Pile Loading Test
2501.05.J.2	$ 6,000.00	$ 12,000.00	LUMP SUM	Pile Loading Test Inside Cofferdam
2501.05.L.1	$ 250.00	$ 500.00	EACH	Dyanamic Pile Test
2510.05.C	$ 600.00	$ 750.00	LANE/LUG	Removal of Anchor Lug
2529.05.F.2	$ 1,200.00	$ 1,500.00	LANE/LUG	Removal of Anchor Lug associated with patch
2602.05.B.1	$ 500.00	$ 600.00	EACH	Erosion Control Mobilization
2602.05.B.2	$ 1,000.00	$ 1,200.00	EACH	Erosion Control Emergency Mobilization
Additional fixed price items for discussion				
2601	$ 60.00	$ 75.00	MGAL	Watering Sod
2601	$ 350.00	$ 450.00	EACH	Mobilization for Watering

Reason for Revision: Update all the predetermined prices in the Standard Specifications.

New Bid Item Required (X one)	**Yes**	**No** X
Bid Item Modification Required (X one)	**Yes**	**No** X
Bid Item Obsoletion Required (X one)	**Yes**	**No** X

Comments:

County or City Comments:

Industry Comments: AGC originally requested revisions to some of our predetermined prices. All prices have been updated and AGC was given a chance to respond to the updated prices prior to the meeting.

Form 510130 (08-15)

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove/Ashley Buss/Jeff Schmitt	**Office:** Construction & Materials	**Item 9**
Submittal Date: 10/21/2022	**Proposed Effective Date:**	
Article No.: **Title:**	**Other:** DS-15086, Developmental Specifications for High Performance Thin Lift Overlay	

Specification Committee Action: Approved as recommended			
Deferred:	**Not Approved:**	**Approved Date:** 11/10/2022	**Effective Date:** February 2023
Specification Committee Approved Text: See attached Developmental Specifications for High Performance Thin Lift Overlay.			
Comments: None			
Specification Section Recommended Text: See attached Draft Developmental Specifications for High Performance Thin Lift Overlay.			
Comments: None			

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

15086.03 CONSTRUCTION.

A. Apply tack coat prior to placement of thin lift overlay according to Section 2303 of the Standard Specifications.

B. Keep the production temperature of HMA mixtures between 225ºF and 335ºF until placed on the grade.

~~**B.**~~ **C.** Compact with static steel wheeled roller.

~~**C.**~~ **D.** Do not open to traffic until the entire mat has cooled below 150°F.

~~**D.**~~ **E. Quality Assurance/Quality Control.**

Reason for Revision: The update increases allowable production temperatures from 330 ºF to 335 ºF. The increase will help with constructability issues some contractors are having with placing the highly elastic E+ binder. This update was discussed with DMEs and APAI's Strategic Asphalt Committee.

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

DS-15103
(Replaces DS-15086)

DEVELOPMENTAL SPECIFICATIONS
FOR
HIGH PERFORMANCE THIN LIFT OVERLAY

Effective Date
February 21, 2023

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

15102.03 DESCRIPTION.
These specifications describe requirements for a highly polymer modified asphalt thin lift surface course. Apply Section 2303 of the Standard Specifications unless otherwise directed in these specifications.

15102.03 MATERIALS.

A. Asphalt Binder.
Use PG 64-34E+ with a minimum percent recovery of 90% when tested at 64°C per AASHTO T 350 at 3.2 kPa.

B. Mix Design.

1.

Design Gyrations	50
Design Voids Target (Based on %Gmm)	≤ 2.0
Film Thickness	8.0 – 15.0
Aggregate Quality	A
Crushed Content (minimum)	50%
FAA (minimum)	40
Sand Equivalency (minimum)	50

2. Friction Aggregate.
- Interstates: minimum 30% of Total Aggregate shall be Type 2 or better
- Non-Interstates: minimum 50% of Total Aggregate shall be Type 4 or better

3. Hamburg Testing (AASHTO T324).
Required only for Interstate paving mixes. Compact to 3.5% air voids. No more than 4 mm rutting in the first 8000 passes.

4. Do not use more than 15.0% binder replacement. Do not use RAS.

5. Gradation.

Table DS-15103: Thin Lift Overlay Gradation

Sieve Size	Min % Passing	Max % Passing
1½ inch		
1 inch		
3/8 inch	91	100
#4		90
#8	27	63
#16		
#30		
#50		
#100		
#200	2	10

15103.03 CONSTRUCTION.

A. Apply tack coat prior to placement of thin lift overlay according to Section 2303 of the Standard Specifications.

B. Keep the production temperature of HMA mixtures between 225ºF and 335ºF until placed on the grade.

~~**B**~~ **C.** Compact with static steel wheeled roller.

~~**C**~~ **D.** Do not open to traffic until the entire mat has cooled below 150°F.

~~**D**~~ **E. Quality Assurance/Quality Control.**

1. Field Voids Acceptance.
Acceptance for field voids shall be Class II compaction defined in Section 2303 of the Standard Specifications.

2. Lab Voids Acceptance.
Sample from windrow or hopper. Apply Article 2303.05, A, 3, a, 2, of the Standard Specifications for AAD acceptance. Air void target is based on approved JMF.

3. Take at least one cold feed for gradation control each day of production.

15103.04 METHOD OF MEASUREMENT.
Hot Mix Asphalt Thin Lift Overlay will be measured according to Article 2303.04 of the Standard Specifications.

15103.05 BASIS OF PAYMENT.
Hot Mix Asphalt Thin Lift Overlay will be paid for according to Article 2303.05 of the Standard Specifications.

Form 510130 (08-15)

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove	**Office:** Construction & Materials	**Item 10**
Submittal Date: 10/22/22	**Proposed Effective Date:** 1st possible Letting	
Article No.: **Title:**	**Other:** DS-15XXX, Fuel Adjustment for AASHTOWare Project	

Specification Committee Action: Approved as recommended

Deferred:	**Not Approved:**	**Approved Date:** 11/10/2022	**Effective Date:** December 2022

Specification Committee Approved Text: See attached Developmental Specifications for Fuel Adjustment for AASHTOWare Project.

Comments: Will be done on pilot projects to start – Kevin Merryman will be the controller of this on the administrative side – Kevin will add to projects after January letting – will need to request to Contracts this be added to any December or January projects.

Specification Section Recommended Text: See attached Draft Developmental Specifications for Fuel Adjustment for AASHTOWare Project.

Comments:

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

See attached developmental specifications that would replace Section 2120 – Fuel Adjustment.

Reason for Revision: To allow for AASHTOWare Project implementation, some changes to fuel adjustment application and administration will be required. DS will be applied initially on select contracts that will use AASHTOWare Project. In the future, a change to Section 2120 will be submitted for when all projects where DOT is the Contracting Authority are using AASHTOWare Project.

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

Comments: None

County or City Comments:

Industry Comments:

DS-15102
(New)

DEVELOPMENTAL SPECIFICATIONS
FOR
FUEL ADJUSTMENT FOR AASHTOWARE PROJECT

Effective Date
December 20, 2022

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.

This specification replaces Section 2120 of the Standard Specifications for Fuel Adjustment.

2120.01 DESCRIPTION.
Fuel Adjustment (FA) is an adjustment to monthly progress payments for cost changes in diesel fuel used on specific items of work identified.

2120.02 PRICE INDEX DEFINITION.

A. A Current Price Index (CPI) in dollars per gallon will be established by the Department of Transportation for each month. The CPI will be the price of No. 2 High Sulfur Diesel, as reported by the Oil Price Information Service, using the first weekday of the month and the average of all prices reported for Des Moines. This information will be available on the Departments' website.

B. The Base Price Index (BPI) for each contract will be the CPI in effect during the month previous to the month of letting of that contract.

2120.03 APPLICATION.

A. Applied to eligible items as the work is done~~, when the contract quantity of that eligible item is 50,000 cubic yards or more~~.

B. Fuel adjustment using a fuel adjustment factor (FUF) of 0.20 gallon per cubic yard will be applied to:

1. Selected Backfill (including Stockpile)

2. Class 10 (Roadway & Borrow, Unsuitable, Waste, Stockpile, and Channel)

3. Class 12 (Roadway & Borrow, Channel, and Waste)

4. Class 13 (Roadway & Borrow, Channel, and Waste)

5. Topsoil, Furnish and Spread

6. Topsoil, Spread

7. Topsoil, Strip, Salvage, and Spread

8. Topsoil, Strip and Stockpile

9. Select Treatment, Contractor Furnished

C. Fuel adjustment using a FUF of 0.27 gallon per cubic yard will be applied to Embankment-in-Place, Contractor Furnished, and Embankment-in-Place ~~(non-dredge material)~~.

~~**D.** Fuel adjustment will also be applied to Embankment-In-Place (dredge material). The fuel usage will be based on billed gallons (liters) of fuel used.~~

2120.04 METHOD OF MEASUREMENT.

~~**A.** Provide the Engineer with a monthly spreadsheet (the Engineer will provide the format) with quantities, and the fuel adjustment for the month (even if there will be no adjustment).~~

~~**B.** If the contract quantity for an item is in tons, convert the quantity to cubic yards using an appropriate conversion factor the Engineer approves. The total quantity of cubic yards for each month (Y) is the sum of these quantities.~~

~~**C**~~ **A.** If the work is not completed within the contract period or authorized extensions thereof, the CPI to be used for work done after the contract period is to be the CPI that applied during the last working day within the contract period, including authorized extensions.

~~**D**~~ **B.** A fuel adjustment factor that accounts for the estimated amount of fuel used per cubic yard of work covered by this specification will be applied to items of work covered in Article 2120.03, B or 2120.03, C.

~~**E**~~ **C.** A fuel adjustment will be made for items of work covered in this specification when the CPI for the month the work is performed is more than ~~$0.15 per gallon~~ 5% different than the BPI established at the beginning of the project.

1. ~~For items of work covered in Article 2120.03, B or 2120.03, C:~~

~~a.~~ If the CPI is greater than the BPI plus ~~$0.15~~ 5%, then the fuel adjustment will be positive which warrants additional payment to the Contractor. The following formula will be used to calculate the additional payment:

~~FA = FUF(CPI - (BPI + 0.15))Y~~ FA = FUF(CPI – (BPI x 1.05))Y

~~b~~ 2. If the CPI is less than the BPI minus ~~$0.15~~ 5%, then the fuel adjustment will be negative and a credit will be due to the contracting authority. The following formula will be used to calculate the credit:

~~FA = FUF(CPI - (BPI - 0.15))Y~~ FA = FUF(CPI – (BPI x 0.95))Y

~~**2.** For the item of work covered in Article 2120.03, D:~~

~~**a.** If the CPI is greater than the BPI plus $0.15, then the fuel adjustment will be positive which warrants additional payment to the Contractor. The following formula will be used to calculate the additional payment:~~

~~FA = (CPI - (BPI + 0.15)) x (billed gallons of fuel used per month)~~

b. If the CPI is less than the BPI minus $0.15, then the fuel adjustment will be negative and a credit will be due to the contracting authority. The following formula will be used to calculate the credit:

FA = (CPI - (BPI - 0.15)) x (billed gallons of fuel used per month)

2120.05 BASIS OF PAYMENT.

A. Payment will be the Fuel Adjustment (FA) for each month, subject to the deduction for partial payments described in Article 1109.05. Should the Fuel Adjustment (FA) be negative, an equal amount will be deducted on payments made to the Contractor from sums otherwise due. This payment or deduction will be made by change order automatically in each pay estimate.

B. On completion of the work of the contract:,

1. For all items covered in Article 2120.03, B or 2120.03, C the sum of the total quantities (Y) for each monthly period will be adjusted by pro-rating, if necessary, to agree with the final quantities to be paid.

2. For the item covered in Article 2120.03, D, the sum of the total quantities for billed gallons of fuel used for each monthly period will be adjusted, if necessary, to agree with the final quantities to be paid. This adjustment will be made by either:

- Subtracting the proper quantity from the last adjustment made, or
- Adding the proper quantity and computing the adjustment on the basis of the CPI in effect on the last working day any of this work was done.

C. On completion of the work of the contract, the monthly fuel adjustment will be revised by pro-rating any variance from the plan quantity.

D C. Payment or deduction is full compensation for all fluctuations in fuel prices during the time the contract work is being done.

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove	**Bureau:** Construction & Materials	**Item 11**
Submittal Date: October 2022	**Proposed Effective Date:**	
Article No.: **Title:**	**Other:** DS-15XXX, Cross Stitching of Concrete Pavement	

Specification Committee Action: Approved as recommended

Deferred:	**Not Approved:**	**Approved Date:** 11/10/2022	**Effective Date:** February 2023

Specification Committee Approved Text: See attached Developmental Specifications for Cross Stitching of Concrete Pavement.

Comments: add a bid item in the DBR (dowel bar retrofit) section – controller – Elijah Gansen

Specification Section Recommended Text: See attached Draft Developmental Specifications for Cross Stitching of Concrete Pavement.

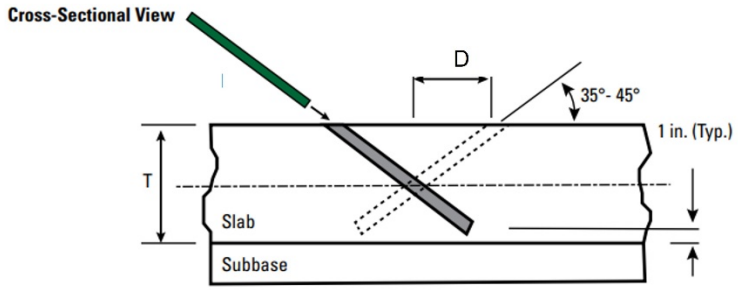
Comments:

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

DS Attached

Figure 1 to be included in the plans.

Figure 1. – Drilling Cross Sectional View



Reason for Revision: There are a fair number of pavements with longitudinal cracking with the widened lanes. This DS may be utilized when letting repair on these projects.

New Bid Item Required (X one)	**Yes X (see comments)**	**No**
Bid Item Modification Required (X one)	**Yes**	**No**
Bid Item Obsoletion Required (X one)	**Yes**	**No**

Comments: Currently, a 2599 bid item has been used. Cross stitching could probably be added to the standard specifications not too much time after being used. Need to work on getting some of the drawings in the design standards.

County or City Comments:

Industry Comments: ICPA has reviewed and comments were included in the DS.

DS-15104
(New)

DEVELOPMENTAL SPECIFICATIONS
FOR
CROSS STITCHING OF CONCRETE PAVEMENT

Effective Date
February 21, 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.

15104.01 DESCRIPTION.

Drill holes and anchor deformed tie bar reinforcement diagonally across cracks or longitudinal joints in concrete pavement in accordance with the details shown on the plans. Do not use on transverse cracks or joints.

15104.02 MATERIALS.

A. Reinforcing Steel.
Use an epoxy coated No. 6 deformed steel bar meeting Article 4151 of the Standard Specifications.

B. Epoxy Grout.
Use epoxy grout in accordance Materials I.M. 491.11, Appendix A.

15104.03 CONSTRUCTION.

A. Equipment
Use a low impact hydraulic drill with a tungsten carbide bit. Do not damage the surface or crack the concrete when drilling. Demonstrate the process prior to use on the repair pavement.

B. Drilling Holes.

1. Drill a 7/8 inch diameter hole transversely across the joint at an angle and distance as described in Table 15104.03-1.

Table 15104.03-1: Drill Angle, Distance, and Bar Length by Slab Thickness

Angle	Slab Thickness (T) inches				
	8	9	10	11	12
Distance from Joint to Hole (D) inches					
35º	5.75	6.50	7.25	7.75	8.50
40º	-	-	-	6.50	7.25
45°					6.00
Length of Bar (inches)					

35º	9.50	11.00	12.50	14.50	16.00
40º	-	-	-	12.50	14.00
45°					12.00

2. Use a drilling guide to ensure the angle and distance are correct and consistent. Cross sectional view of drilling into slab is shown in the plans.

3. Drill holes on alternating sides of the joint line at 24 inch spacing, avoiding any in-place bars.

4. Do not drill completely through the slab. Leave approximately 1 inch undrilled at the bottom of the slab. If hole punches through bottom of slab, fill with epoxy and move 6 inches.

5. Maintain at least 18 inches from load transfer devices.

C. Cleaning Holes.
Blow air into holes to remove dust and debris. The air must be free of oil and other contaminants.

D. Insert Tie Bar.

1. Pour the epoxy into the hole, leaving some volume for the bar to occupy the hole.

2. Insert the tie bar into the hole, remove excess epoxy and finish flush with the pavement surface.

3. Leave approximately 1 inch of cover at the surface of the slab when using the dimensions in Table 1.

E. Opening to Traffic.
The pavement may be opened to traffic after the epoxy is tack free.

15104.04 METHOD OF MEASUREMENT.
The number of each installed cross-stitched tie bar location will be counted.

15104.05 BASIS OF PAYMENT.
The Contractor will be paid the contract unit price for each installed cross-stitched bar. This price is full compensation for furnishing all materials, tools, labor, equipment and incidentals necessary to complete the work.

Form 510130 (08-15)

IOWA DOT

SPECIFICATION REVISION SUBMITTAL FORM

Submitted by: Wes Musgrove/ Desiree McClain	**Office:** Construction & Materials	**Item 12**
Submittal Date: October 31st, 2022	**Proposed Effective Date:**	
Article No.: 2433.03, J **Title:** Crosshole Sonic Log (CSL) Testing.	**Other:**	

Specification Committee Action: Approved as recommended

Deferred:	**Not Approved:**	**Approved Date:** 11/10/2022	**Effective Date:** April GS 2023

Specification Committee Approved Text: See Specification Section Recommended Text

Comments: None

Specification Section Recommended Text:

2433.03, J, 3.

Replace the first bullet:

- 1.5 to 2 inch diameter, Schedule 40 pipe conforming to ASTM A 53, Grade A or B, Type E, F, or S. Alternate pipe types, caps, and connectors manufactured for the purpose of CSL testing may be allowed, these alternate pipe types must have a minimum wall thickness of 0.145 inches.

Add bullet to end:

- Use caps and connectors that comply with the manufacturer's recommendations and are capable of withstanding forces that are incidental to construction.

Comments: Item is a revision to the proposed language from last month to give more guidance on what alternative pipe types may be allowed.

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

2433.03 CONSTRUCTION.

J. Crosshole Sonic Log (CSL) Testing.

3. Furnish and install one access pipe per 1 foot of shaft diameter, ~~but no less than four per shaft, except for three tubes if the reinforcing cage is 2.5 feet in diameter or less~~ while following minimum and maximum numbers of access pipes stated in ASTM D 6760 and exceptions stated in Article 2433.03, J, 2, b. Furnish access pipes complying with the following:

- 1.5 to 2 inch diameter, Schedule 40 pipe conforming to ASTM A 53, Grade A or B, Type E, F, or S. Alternate pipe types, caps, and connectors manufactured for the purpose of CSL testing may be allowed , these alternate pipe types must have a minimum wall thickness of 0.145 inches.
- CSL pipes and connectors must comply with IM 107.
- Round, regular inside diameter free of defects and obstructions, including all pipe joints, in order to permit the unobstructed passage of 1 3/8 inch maximum diameter source and receiver probes used for the CSL tests.
- Watertight and free from corrosion with clean internal and external faces to ensure a good bond between the concrete and the access pipes.
- Fitted with a watertight cap on the bottom and a removable, watertight cap on the top to prevent debris from entering the pipes.
- Watertight joints to achieve the specified length.

• Use external couplings for CSL testing tubes. • Use caps and connectors that comply with the manufacturer's recommendations and are capable of withstanding forces that are incidental to construction.		
Reason for Revision: Have tested some new CSL tubes recently with success and are trying to expand the options available for CSL tubes.		
New Bid Item Required (X one)	**Yes**	**No** x
Bid Item Modification Required (X one)	**Yes**	**No** x
Bid Item Obsoletion Required (X one)	**Yes**	**No** x
Comments: The grey highlighted section has been approved at a previous spec meeting for April 2023. The only new unapproved change is highlighted in yellow, at the first bullet point.		
County or City Comments:		
Industry Comments:		