GS-23005

General Supplemental Specifications
for
Highway and Bridge Construction

Effective Date
October 21, 2025

THE STANDARD SPECIFICATIONS, SERIES 2023, ARE AMENDED BY THE FOLLOWING MODIFICATIONS, ADDITIONS, AND DELETIONS. THESE ARE GENERAL SUPPLEMENTAL SPECIFICATIONS AND SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS. REVISIONS INCLUDED IN PREVIOUS SERIES 2023 GENERAL SUPPLEMENTAL SPECIFICATIONS ARE NOT INCLUDED IN THIS EDITION.

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Division 11. General Requirements and Covenants.

Section 1107

1107.06, B, Build America, Buy America.

Replace the Article:

1. On Federal aid contracts ~~and~~ or on contracts where the Department is the Contracting Authority, all products of iron~~,~~ and steel, manufactured products, and construction materials, which are permanently incorporated into the work, shall comply with the Build America, Buy America Act (BABA) and ~~Materials I.M. 107~~ Buy America Act. ~~Construction materials for the purposes of BABA compliance are defined below.~~

~~1~~ **a.** 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~~ US. 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.

b. All manufactured products shall be produced, including final assembly, in the US. For projects let on or after October 1, 2026, the cost of the components of the manufactured product that are mined, produced, or manufactured in the US shall be greater than 55% of the total cost of all components of the manufactured product.

~~2~~ **c.** All construction materials shall be produced in the ~~United States~~ US. 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);
- fiber-optic cable (including drop cable);
- optical fiber;
- lumber;
- engineered wood; or
- drywall.

2. See Materials I.M. 107 for directions on complying with BABA and Build America.

Section 1109

1109.05, B, 2.

Replace the Article:

The Contractor may withhold up to ~~5%~~ 3% of each progress estimate on work performed by subcontractors as subcontractor retainage.

Division 21. Earthwork, Subgrades, and Subbases

Section 2102

2102.05, A, 1, c, 2.

Replace the Article:

When the contract does not contain a unit price for below grade excavation, the Engineer orders below grade excavation, and the contract documents do not indicate that below grade excavation will be required, it will be paid for based on the class of excavation involved:

- At double the contract unit price for Class 10 and Class 13 roadway and borrow excavation to a maximum depth of 3 feet.
- As extra work as provided in Article 1109.03, B, if the depth of Class 10 or Class 13 excavation exceeds 3 feet.
- At the contract unit price for Class 12 roadway and borrow excavation.

Section 2106

2106.05, Basis of Payment.

Replace the Article:

~~Furnishing, installing, and extending~~ All work necessary to complete settlement plates in compliance with the contract documents is incidental to embankment or excavation. Monitoring of settlement plates by the Contractor is incidental to Construction Survey (when item is included with the Contract).

Section 2107

2107.03, D, 1, d.

Replace the Article:

Deposit soils containing quantities of roots, sod, or other ~~vegetable~~ vegetative matter outside of the shoulder line and within the outer 3 feet of the embankment.

Division 23. Surface Courses.

Section 2301

2301.02, C, 3, Measurement of Materials.

Replace the Article:

Measurement of materials shall meet the requirements for the type of equipment used and the following additional requirements:

a. Operate cement scales within a daily delivery tolerance average of 1.0% of the mass of cement, ~~per batch~~ as described in Materials I.M. 527. When operated manually, balance scales to tare before each batch is weighed and after each batch is discharged.

b. Use cement and fly ash scales with automatic controls which meet the requirements of Article 2001.20, B, for all bid items involving more than 6000 square yards of pavement or base. Items made up of irregular areas, such as crossovers, turn lanes, and so forth, are excluded from this requirement.

c. Do not use manual controls for a period longer than 1 working day after a failure of the automatic controls, except with the Engineer's permission.

d. On work requiring automatic scales, the performance of the scale will be determined near the end of the first full day of production. Afterwards, performance of the scale will be determined at a frequency not to exceed 10,000 cubic yards of concrete produced. Performance will be determined by comparing the accumulated mass of cement proportioned with the corresponding accumulated mass of cement shipped to the project. The Contractor shall cooperate. Cement scale performance determinations are not required when a permanent, commercial ready mix plant is used to furnish less than 10,000 cubic yards of concrete for a contract.

e. Determine the performance of fly ash scale, if present, as in Paragraph d above.

f. Operate aggregate scales within a daily delivery tolerance average of 1.0% for each aggregate.

g. Measure water within a daily delivery tolerance average of 1.0% of intended quantity.

h. Measure admixtures with approved equipment and procedures that assure the quantity measured is within a daily delivery tolerance average of ~~3.0~~ 5.0% of batch quantity. Clean and flush out mechanical dispensing equipment daily, and more frequently if necessary to ensure proper operation.

Section 2303

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

Replace the first sentence:

When the PWL falls below ~~80.0~~ 90.0, use the procedure outlined in Materials I.M. 501 to identify outliers with 1.80 as the quality index criterion.

2303.03, D, 6, d, 1, a, Class I Compaction.

Replace the Article:

The Engineer will obtain and test samples for each lot according to Materials I.M. 204 Appendix F. Density cores sampled as part of a field voids lot will be combined into daily lots based on cores' intended thickness. Samples for thickness not tested for G_{mb}, because they are less than 70% or greater than 150% of the intended thickness, are included for thickness. In these particular instances, do not measure the thickness of additional sufficiently thick samples used to determine field voids. ~~When measuring density of top lift from a full depth core, measure thickness before trimming core for density testing.~~ Measure core thickness prior to any trimming that may be needed for density testing.

Section 2310

2310.02, Materials.

Add the Article:

D. Fiber Reinforcement.

1. When fiber reinforcement is specified in the contract documents, use product approved in accordance with Materials I.M. 491.27, Appendix B.

2. Dose fiber reinforcement at the rate of 4 pounds per cubic yard of concrete unless stated otherwise in the contract documents.

2310.03, C, 1, General.

Add the Article:

e. Introduce fiber reinforcement into the mix in accordance with the fiber manufacturer's recommendations, unless otherwise approved by the Engineer. Ensure uniform distribution and random orientation of fibers throughout the concrete.

2310.04, Method of Measurement.

Add the Article:

G. Fiber Reinforcement.

Fiber reinforcement will be measured in pounds of fiber incorporated into the concrete mix.

2310.05, Basis of Payment.

Add the Article:

G. Fiber Reinforcement.

Per pound of fiber reinforcing. Payment shall be full compensation for supplying all materials, equipment, and labor for incorporating fiber reinforcement into the concrete mix.

Section 2317

2317.05, C, PCC Pavement.

Replace Table 2317.05-3:

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

MRI (inches per mile)	Dollars per 0.1 mile segment per lane (Design Thickness ~~Full Depth (>~~ Greater than 6")	Dollars per 0.1 mile segment per lane (Design Thickness ~~Overlay (<=~~6" or less)
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)~~ 7,187.50-(125*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

2317.05, D, HMA Pavement.

Replace Table 2317.05-5:

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

MRI (inches per mile)	Dollars per 0.1 mile segment per lane (Design Thickness ~~Full Depth (>~~ Greater than 4")	Dollars per 0.1 mile segment per lane (Design Thickness ~~Overlay (<=~~4" or less)
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

Division 24. Structures.

Section 2429

2429, Pre-Engineered Steel Truss Recreational Bridge.

Replace the Section:

2429.01 DESCRIPTION.

A. These specifications are for an engineered truss bridge of welded steel construction and are minimum standards for design and construction.

B. Install an engineered truss bridge of welded steel construction manufactured by a company on the approved manufacturer's list in Materials I.M. 557, Appendix D.

2429.02 DESIGN AND MATERIALS.

A. Design.

1. Designer Qualifications.

a. No less than 5 years experience in design and fabrication of engineered bridge trusses. In addition, provide information regarding similar projects that were previously completed, including references.

b. Professional Engineer licensed in the State of Iowa.

2. Design Loads and Related Requirements.

a. Design shall comply with “LRFD Bridge Design Specifications” and “LRFD Guide Specifications for the Design of Pedestrian Bridges” as adopted by AASHTO.

b. Loads and Load Combinations:

- Pedestrian load: 90 pounds per square foot applied to the complete width of the deck area shown in the contract documents.
- Vehicle load: apply an H5 design vehicle when clear deck width is 7 feet to 10 feet, apply an H10 design vehicle when clear deck width exceeds 10 feet. Vehicle load need not be placed in combinations with pedestrian load.
- Buoyancy and stream pressure due to submergence when indicated in the drawings.
- Wind loads~~.~~ for pedestrian bridges shall be designed as specified in AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals, Articles 3.8 and 3.9. The loading shall be applied over the exposed area in front elevations of both trusses including all enclosures.
- Fatigue shall be considered. ~~Fracture critical requirements may be waived if indicated in the drawings.~~ The fatigue loading shall be as specified in AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals. The Natural Wind Gust and the Truck-Induced Gust specified in AASHTO only need to be considered as appropriate.
- Fracture critical requirements are waived except for Charpy V-notch (CVN) testing. Main tension members shall meet CVN toughness requirements for fracture critical members in Article 4152.02.
- Other AASHTO loads, including seismic, as appropriate.
- Load combinations as designated by AASHTO.

c. Bridge camber to offset full dead load deflections. ~~For flat, single span bridges, camber at center of bridge span should ordinarily be 1% of the total bridge span.~~ Parallel chord single span bridges not on grade shall be cambered an additional 1% of the total bridge span. Bowstring trusses, multi-span bridges, and bridges on grade shall be cambered an additional 0.2% of each bridge span.

d. Bridge designed for expansion and contraction with a temperature range of -25°F to 125°F.

e. Teflon or other approved slip pads placed between the bearing and setting plates provided by the bridge manufacturer. At least 1 inch clearance provided between the bridges and the abutments.

f. ~~Welded Tubular Connection Design: according to the Structural Welding Code from ANSI/AWS D1.1, Chapter 10 Tubular Structures.~~ Welded tubular connection design shall be in accordance with chapter K of the specifications and commentary of the AISC Steel Construction Manual.

g. Shop Drawings (Manufacturer’s standard schematic drawings and diagrams):

1) Unique drawings prepared to illustrate the specific portion of the project.

2) All relative design information such as member sizes, bridge reactions, and general notes clearly specified.

3) Accurately prepared to be complete in every respect. Include cross referenced details and sheet numbers. Signed and sealed by a Professional Engineer licensed in the State of Iowa.

4) Submit shop drawings according to Article 1105.03.

h. Maximum deflection due to pedestrian load not to exceed that specified in AASHTO.

i. Vibration not to exceed that specified in AASHTO.

j. If intermediate piers are required for the bridge over a railroad, a minimum 25 foot horizontal and vertical clearance, or a distance as specified elsewhere in the contract documents, from the track is required.

3. Geometry.

a. Low profile (pony truss) half through truss design or as designated in plans.

b. Provide one diagonal per panel. ~~Chords, diagonals, verticals, and bracing shall be tube steel.~~

c. All members of the truss and deck support system shall be fabricated from square or rectangular hollow structural shapes (HSS), with the exception that floor beams may be wide flange shapes.

4. Railings and Accessories.

a. All railings:

- Located on the inside surface of the trusses.
- Smooth inside surface with no protrusions or depressions.

b. Top railings: a minimum of 48 inches above the floor for bicycle applications (AASHTO requires a minimum of 42 inches).

c. Safety railings: a maximum railing opening size shall not allow passage of a 4 inch sphere. All ends of angles and HSS welded and ground smooth.

d. Custom railings may be permitted as shown in the plans.

5. Curbs and Toe ~~Plates~~ Rails.

a. A curb, barrier or toe ~~plate~~ rail shall be provided that prevents the passage of a 4 inch sphere, where any portion of the sphere is within 4 inches of the walking surface.

b. Trail bridges over roadways shall prevent water runoff over the side of the bridge. Minimum curb height shall be by analysis, but no less than 3 inches.

c. Toe ~~plates~~ rails, when required, shall be located 2 inches above the floor decks and shall ordinarily have a minimum 4 inch vertical projection.

B. Materials.

1. Structural Thickness.

- Structural tubing: minimum nominal material thickness of 1/4 inch.
- All other structural members: minimum nominal material thickness of at least 5/16 inch except the web thickness of rolled beams or channel shall not be less than 1/4 inch. Railing members are not subject to minimum thickness requirements.

2. Unpainted Bridges.

- Unpainted and fabricated from high strength weathering steel.
- ~~All fabrications produced from high strength, low alloy, atmospheric corrosion resistant ASTM A 606 or ASTM A 242 plate and structural shapes.~~ Structural steel material shall be cold-formed welded and seamless high strength, low-alloy structural tubing with improved atmospheric corrosion resistance meeting the requirements of ASTM A 847, and plates and structural shapes meeting the requirements of ASTM A 588 with a minimum corrosion index of 6.0 per ASTM G 101.
- Minimum yield (F_y) greater than 50,000 psi.

3. Field Splices.

- ~~Bolted with high strength bolts according to ASTM A 325.~~ High strength bolts shall conform to ASTM F 3125 Grade A 325 or ASTM A 449.
- Type 3 bolts are required for Weathering Steel bridges~~, according to ASTM A 325 or A 490~~.
- Field connection bolts shall be tightened by the “turn-of-nut method” to obtain proper ~~torque~~ tension. See Articles 2408.03, S, 5, b and 2408.03, S, 5, c.

4. Welding.

- Materials: according to AWS D1.1.
- Welders: certified according to AWS D1.1.

5. Railings and Accessories.

- Railings (except rub rail): fabricated from steel.
- Rub rail: shall have 5.5 inch vertical projection and be fabricated from treated wood, or naturally durable wood~~, or steel~~. Steel rub rails shall have 4 inch minimum vertical projection.

6. Toe ~~Plates~~ Rails.

Toe ~~plates~~ rails, when required, shall be fabricated from plate, HSS, or channel.

7. Anchor Bolts.

Provided by the manufacturer.

2429.03 CONSTRUCTION.

A. Fabrication.
Ensure quality, fabrication, and shop connections comply with AASHTO Specifications for Highway Bridges noted in this specification.

B. Welding.

1. Welding.
- Comply with Article 2408.03, B.
- Use E70 or E80 series electrodes that have the same weathering characteristics as corrosion-resistance steel~~, or the gas metal arc welding process (Short Circuiting Transfer) with Carbon Dioxide/Argon shielding gas with ER80-D2 filler material conforming to AWS A5.28~~.

2. Welding Operators.
- Properly accredited experienced operators, each of whom must:
- Submit satisfactory evidence of experience and skill in welding structural steel with the kind of welding to be used in the project, and
- Have demonstrated the ability to make uniform good welds meeting the size and type of weld required.

C. Quality Assurance.
The Manufacturer pays all costs associated with the following inspection requirements for fabrication and finishes:

~~**1.** Welded tubular connections qualified per AWS D1.1-94 using short circuited gas metal arc process.~~

~~**2**~~ **1.** All welds to be visually inspected.

~~**3**~~ **2.** Base material certifications to be supplied by the material suppliers.

D. Weld Testing.
Have nondestructive weld testing performed by an independent agency. The Manufacturer pays for nondestructive weld testing.

1. Ten percent of all welds are to be magnetic particle tested.

2. Ultrasonic testing is to be performed on all top and bottom chord, full penetration welds. Materials less than 5/16 inches in thickness may need modified test methods.

E. Finishes.
~~Sandblast unpainted weathering steel bridges according to SSPC Surface Preparation Specification No. 6.~~ All surfaces of weathering steel shall be cleaned in accordance with Steel Structures Painting Council Surface Preparation Specifications No. 6, SSPC-SP6 commercial blast cleaning. The steel will be allowed to form a protective weathering patina over time.

F. Delivery and Erection.

1. Manufacturer's Responsibilities.
- Deliver the bridge by truck to a location nearest to the site accessible by roadways.
- Notify the Contractor in advance of the expected arrival time.
- Provide the Contractor information regarding delays after the truck departs the plant, such as inclement weather, delays in permits, rerouting by public agencies, or other circumstances, as soon as possible.
- Advise the Contractor of the actual lifting weights, attachment points, and all other pertinent information needed to install the bridge.

2. Contractor's Responsibilities.
- Provide proper lifting equipment.
- Unload the bridge from the truck at the time of arrival.
- Splice and bolt the components.

2429.04 METHOD OF MEASUREMENT.

Measurement will be by count for each Pre-engineered Steel Truss Recreational Trail Bridge installed.

2429.05 BASIS OF PAYMENT.

A. Payment for each Pre-engineered Steel Truss Recreational Trail Bridge furnished and erected will be the contract unit price.

B. Payment is full compensation for:

- Designing, manufacturing, delivering, erecting, and assembling the unit complete as shown in the contract documents, and
- Bearing plates, pads, bolts, anchor bolts, grouting, decking, railing, and any other materials, labor, and equipment necessary to complete the bridge in place. Foundations, footings, abutments, piers, and pier caps will be paid for separately.

Division 25. Miscellaneous Construction.

Section 2504

2504.03, L, 2, a, General.

Add the Article and **renumber** Articles:

3) Complete inspections under the supervision of a competent employee who has completed NASSCO's Pipeline Assessment Certification Program.

~~**3**~~ **4)** Notify the Engineer of the extent of noncompliance with the low spot depth tolerances.

~~**4**~~ **5)** Re-inspect sewers after any corrective action has been completed.

2504.03, L, 2, Video Inspection.

Add the Article:

d. Inspection Acceptance.

The Engineer may reject low quality videos or videos failing to meet specifications.

Section 2527

2527.02, D, 2, b, 2.

Replace Tables 2527.02-1 and 2527.02-2:

Table 2527.02-1: Waterborne Paint

Line Width	Wet-Film Thickness	Paint	Spheres
4”	14 mils	343.7 ft. of solid line per gallon of paint.	9.0 lb./gal.
6”	18 mils	178.2 ft. of solid line per gallon of paint.	11.0 lb./gal.
8”	18 mils	134 ft. of solid line per gallon of paint.	11.0 lb./gal.
10”	18 mils	107 ft. of solid line per gallon of paint.	11.0 lb./gal.

Table 2527.02-2: Solvent-based Paint

Line Width	Wet-Film Thickness	Paint	Spheres
4"	16 mils	300.8 ft. of solid line per gallon of paint	9.0 lb./gal.
6”	18 mils	178.2 ft. of solid line per gallon of paint.	11.0 lb./gal.
8”	18 mils	134 ft. of solid line per gallon of paint.	11.0 lb./gal.
10”	18 mils	107 ft. of solid line per gallon of paint.	11.0 lb./gal.

2527.02, D, 2, b, Waterborne or Solvent-based Paint.

Add the Article:

3) For all waterborne paint markings applied to Interstates and Primary Highways, on contracts where the Department is the Contracting Authority, or other contracts when specified in the contract documents; ensure the application of paint and glass beads will allow for at least 80% of the beads to achieve at least 50% to 60% embedment in the dry paint and meet the following minimum retroreflectivity requirements:

Table 2527.02-3: Retroreflectivity of Waterborne Paint Markings

Marking Type	Minimum Coefficient of Retroreflected Luminance ($mcd/m^2/lx$)
White line, symbols, and legends	300
Yellow line	200

4) The Contractor is responsible for placement of a quality product that meets or exceeds these specifications. Prior to commencing work, demonstrate to the Engineer that the equipment and methods to be used on the project will achieve or exceed these requirements. When retroreflectivity readings are performed, use the procedure in Materials I.M. 386. Solvent-based paints will be exempt from reflectivity and embedment requirements when applied as allowed in Table 2527.03-1.

2527.02, D, 2, c, 4.

Replace the unnumbered table:

Table 2527.02-4: Retroreflectivity of Durable Paint Markings

Marking Type	Minimum Coefficient of Retroreflected Luminance ~~mcd/sq.ft./ft. cdl.~~ ($mcd/m^2/lx$)
White line, symbols, and legends	300
Yellow line	200

2527.02, D, 2, d, 4.

Add as the third sentence:

Use the procedure in Materials I.M. 386 to determine retroreflectivity.

Replace the unnumbered table:

Table 2527.02-5: Retroreflectivity of High-Build Waterborne Paint Markings

Marking Type	Minimum Coefficient of Retroreflected Luminance ~~mcd/sq.ft./ft. cdl.~~ ($mcd/m^2/lx$)
White longitudinal lines	300
Yellow longitudinal lines	225

2527.03, C, 6.

Replace the Article:

Removal will not be required prior to being covered by a construction process unless specified in the contract documents. Utilize high pressure water blasting for ~~R~~removal of pavement markings ~~may be by vacuum blasting, vacuum dry grinding, wet grinding, shot blasting, or high pressure water blasting~~. Engineer approval is required for alternate pavement marking removal processes. Containment is required if ~~O~~open abrasive blasting or dry grinding ~~without containment will not be~~ is allowed by the Engineer. No additional compensation will be allowed for contractor requested and Engineer approved alternate pavement marking removal processes.

2527.03, G, Defective Pavement Markings.

Replace the Article:

~~**1.** Markings that are low on initial retroreflectivity up to 20% may, at the discretion of the Engineer, be accepted with a price adjustment.~~

2. Pavement markings will be evaluated by the Engineer for acceptance following installation. The Engineer will notify the Contractor of any pavement markings that fail to meet acceptance. Reasons for failure could include, but are not limited to, failed retroreflectivity readings, incorrect color, incorrect location, poor alignment, poor adherence to the pavement surface, insufficient thickness, width or length and insufficient bead embedment. ~~Repair~~ Replace, at no additional cost to the Contracting Authority, all pavement markings which~~, after application and curing,~~ the Engineer determines to be defective and not in conformance with ~~these~~ this specification~~s~~. Remove the defective markings completely and clean to the underlying pavement surface according to the requirements of Article 2527.03, C. Remove the defective area plus all adjacent marking material extending 1 foot in any direction. After surface preparation work is complete, finish the repair by reapplying new marking material over the cleaned pavement surface according to the requirements of ~~these~~ this specification~~s~~.

Section 2529

2529.03, H, 2, Patches 50 feet to 100 feet in length.

Replace the Article:

a. General.

Test the patch length, and the existing pavement in that lane, for a distance of three times the patch length on both ends of the patch. If a patch occurs near a bridge, an intersection, and so forth, where the proper distance cannot be tested, make up the required total on the other end of the patch. If interference occurs on both ends, test only to the points of interference.

b. Standard Method.

~~**b.** **1)** Establish a Mean Roughness Index for the patch, MRI_{patch}.

~~**c.** **2)** Establish a Mean Roughness Index for the existing pavement on both ends of the patch, $MRI_{preexisting\ pavement}$.

~~**d.** **3)** Compare the MRI_{patch} to $MRI_{preexisting\ pavement}$. Perform surface correction according to Article 2317.04 so that the MRI is less than the $MRI_{preexisting\ pavement}$ when either of the below listed conditions exists:

~~**1** **a)** MRI_{patch} exceeds 75.0 inches per mile and exceeds $MRI_{preexisting\ pavement}$ by more than 7.5 inches per mile.

~~**2** **b)**MRI_{patch} exceeds 90.0 inches per mile and exceeds $MRI_{preexisting\ pavement}$.

c. Alternate Method.

1) General.

a) Utilize a Profile Index.

b) Utilize zero blanking band.

2) Establish one Average Base Index (ABI) of the pavement for both ends of patch.

3) Calculate a new index for the entire length of the patch.

4) Calculate a profile index for the entire length. Perform surface correction according to Article 2317.04 to a profile index less than the ABI when either of the below listed conditions exists:

a) New profile index exceeds 12.0 inches per mile and exceeds ABI by more than 2.0 inches per mile.

b) New profile index exceeds 30.0 inches per mile and exceeds ABI

~~**e** **d.** Corrective action involves correction of areas of localized roughness, if identified from the trace, plus appropriate surface correction within the patch and existing pavement, or both, on either end of the patch within the limits tested.

Section 2544

2544.04, B, Hot Mix Asphalt for Crack Filling.

Replace the article

1. Weight of hot mixture used for filling cracks larger than 1 inch. Mixture not used in the work will be deducted, based on actual scaled weights or estimates.

2. Tack-coat material will not be measured separately for payment.

2544.02, C, 2.

Replace the article

Blotting material ~~and tack-coat material~~ will not be measured separately for payment

2544.05, Basis of Payment.

Replace the article

~~**A.**~~ Payment for cleaning and filling cracks will be the contract unit price as follows:

~~**1**~~ **A.Cleaning and Filling Cracks (Pavement Maintenance) or Cleaning and Filling Cracks (Shoulder Maintenance).**

1. Per mile for pavement or shoulders on which the cracks were cleaned and filled.

2. Includes all equipment and labor necessary for cleaning cracks as well as filling cracks and placing any necessary blotting material.

~~**2**~~ **B.Hot Mix Asphalt for Crack Filling.**

1. Per ton for HMA used in filling cracks over 1 inch.

2. Includes furnishing the hot mix asphalt including tack coat to the project site.

~~**3**~~ **C.Filler Material (Maintenance).**

1. Per gallon.

2. Includes furnishing filler material to project site as well as blotting material.

~~**B.** Payments are full compensation for:~~

- ~~Cleaning the cracks,~~
- ~~Furnishing and placing the HMA,~~
- ~~Filler material,~~
- ~~All blotting material and tack-coat material that is necessary, and~~
- ~~Furnishing all equipment and labor.~~

Section 2552

2552.04, Method of Measurement.

Add the Articles and **renumber** Article:

E. PCC Pipe Support Over Existing Utility.
Measurement will be by each location.

F. Reinforced PCC Beam Utility Line Support.
Measurement will be by each location.

~~**E**~~ **G.Trench Compaction Testing.**

2552.05, Basis of Payment.

Add the Articles and **renumber** Article:

F. PCC Pipe Support Over Existing Utility.

1. Payment will be at the unit price per each for each pipe support specified.

2. Payment is full compensation for furnishing and placing all required PCC pipe supports and associated materials.

G. Reinforced PCC Beam Utility Line Support.

1. Payment will be at the unit price per each for each reinforced PCC beam utility line support specified.

2. Payment is full compensation for furnishing and placing the required length of reinforced PCC beam utility line support and associated materials.

~~**F**~~ **H.Trench Compaction Testing.**

Division 41. Construction Materials.

Section 4109

4109, Aggregate Gradations.

Replace the Section title:

Aggregate ~~Gradations~~ General

Add the Article:

4109.05 Limits.

For purposes of determining conformance with aggregate specifications, all specified limits are absolute limits, as defined in ASTM Practice E 29, for Using Significant Digits in Test Data to Determine Conformance with Specifications.

Section 4130

4130.01, A.

Replace the second bullet:

~~A minimum of 10% of the beds or slabs are to be thick enough to produce the required weight of either the stone or concrete. with the greatest dimension not more than two times the smallest dimension.~~ At least 90% of the revetment shall be produced so that the smallest dimension of the stone is at least 1/2 of the largest dimension for each revetment stone. Production ledges shall not contain excessive shale, chert, clay, or beds containing breccia. Secondary bedding planes may be cause for rejection.

Section 4132

4132.01, Description.

Replace the second bullet:

Crushed PCC, crushed composite pavement, or reclaimed HMA (per Materials I.M. 210),

Section 4136

4136.02, A, Poured Joint Sealer.

Replace the first sentence:

Approved sources for poured joint sealers are listed in Materials I.M. 436.01, Appendix A and B.

Add the Article:

3. For bridge end (BE) joints utilize fast cure 100% silicone products meeting ASTM C 920, Type M, Grade P, Class 100/50, Use T products. Tack-free time in accordance with ASTM C 679, 60 minutes maximum. Curing evaluation in accordance with ASTM D 5893, pass at 8 hours maximum. Approved sources are listed in Materials I.M. 436.01 Appendix B.

Section 4149

4149.02, A, 2, Solid Wall Polyvinyl Chloride Pipe 18 inch to 27 inch.

Replace the title:

Solid Wall Polyvinyl Chloride Pipe 18 inch to ~~27~~ 48 inch.

4149.02, A, 4, Closed Profile Polyvinyl Chloride Pipe 21 inch to 36 inch.

Replace the title:

Closed Profile Polyvinyl Chloride Pipe 21 inch to ~~36~~ 60 inch.

4149.04, H, 1, c, 3.

Replace the Article:

~~Do not use when heat shrinkable infiltration barrier is used.~~ If a heat shrinkable infiltration barrier is used, ensure surface temperature does not exceed 300°F during installation process.

4149.04, J, 1, d, Heat Shrink Sleeve.

Replace the first paragraph:

Heat-shrinkable wrap around sleeve designed for protection of buried and exposed sanitary sewer manholes. Do not use with ~~polypropylene or~~ polyethylene adjustment rings.

Section 4183

4183.03, B, 1, a, Pigment Content.

Replace the Article:

Percent pigment by weight of the finished product to be from ~~58.0~~ 55.0% to ~~63.0~~ 65.0% as tested by ASTM D 3723. The white paint must contain a minimum of 1 pound per gallon of TiO2 ASTM D 476 Type II Rutile 92% minimum TiO2 tested in accordance with ASTM D 1394 or ASTM D 4764. The total solids of high build paint when tested in accordance with ASTM D 2369 must be a minimum of 76% by weight.

Section 4188

4188.07, A, Sign Design.

Add the Articles and **renumber** subsequent articles:

3. All fonts loaded into the PDMS shall consist of at least glyphs for ASCII characters 32-96 and 123-126 (0x20-0x60 and 0x7B-0x7E). This includes uppercase alphabetic characters, numeric digits, the space character, and all standard ASCII 7-bit symbols. If any lower-case alphabetic characters are included, glyphs for all characters 97-122 (0x61-0x7A) shall also be included.

~~3~~ 4.

~~4~~ 5.

6. The font configured as the sign's default font shall be able to display a message consisting of at least three lines of eight characters at a size compatible with NEMA TS-4 2016 standards.

~~5~~ 7.

~~6~~ **8.**

~~7~~ **9.**

4188.07, B, 3.

Replace the Article:

3. Submittals.

a. Upon deployment of PDMS and confirmation that remote communication has been successfully setup; the following information shall be supplied to the Traffic Management Center (TMC) via email ~~at DOT-IWZ@iowadot.us~~ to IowaDOT.Traffic@iowadot.us or by phone at (515) 237-3300 for integration into the statewide ATMS software:

- IP address
- Port number (may not use default, 161)
- Protocol used (TCP or UDP)
- SNMP community name (may not use default names, i.e., “public” or “administrator”)
- Sign Number
- Latitude and Longitude Coordinates
- Route PDMS is on and direction of traffic flow that can view PDMS

b. Modem and PDMS credentials shall not be default values or recorded on any part of the trailer.

c. Upon relocation or removal of PDMS, send email to ~~DOT-IWZ@iowadot.us~~ the TMC at IowaDOT.Traffic@iowadot.us or call (515) 237-3300, with the PDMS sign number and new location so it can be updated or released by the TMC’s software.

4188.07, C, NTCIP Compliance.

Replace the Article:

1. PDMS onboard computer and operating firmware shall be compliant with at least NTCIP 1203 ~~v1.15 supplemented with NTCIP 1203 Amendment 1v07, (dated July 1, 2001)~~ v03 (dated September 2014) for the following commands:

- Read configuration data from sign,
- Send configuration data to sign,
- Poll sign (retrieve sign status) both manual and automated with software,
- Activate a message,
- Blank or remove a message,
- Upload fonts, and
- Reset controller/onboard computer.

2. The firmware must fully implement all “mandatory” NTCIP requirements identified in the PRL (Protocol Requirements List) in section 3.3 of the NTCIP 1203 v03 document.

3. Any NTCIP requirements identified as “optional” or “conditional” in that PRL, that are implemented by the firmware, must be compliant with the implementation of those requirements described in the NTCIP 1203 v03 document.