

Final Specification Revisions

2020 V5.0 January 11, 2024

This document is for informational purposes only.

The Department proposed revisions to 28 Standard Specifications. These proposed revisions were out for comment during the month of October 2023.

“Standard Specifications for Road and Bridge Construction 2020 Edition V5.0” can be found at the following link:

<https://www.mdt.mt.gov/other/webdata/external/const/specifications/2020/SPEC-BOOK/2020-SPEC-BOOK-V5-0.pdf>

Comment period ended October 31st.

Red = added text; Green = ~~deleted text~~; Blue = change from proposed

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101.02 Acronyms and Abbreviations

WZ Work zone

Reason: add WZ as an acronym as it is a common term.

Comments: No comments received

Final Draft: **No changes to the draft spec; published as shown.**

104.08 Value Engineering Proposals

104.08 VALUE ENGINEERING PROPOSALS

Cost savings generated on the contract from cost reduction proposals offered by the Contractor and approved by the Department will be shared.

The Contractor is encouraged to submit proposals for modifying the contract that reduces the total cost of construction. The cost reduction proposal must not impair the essential functions or characteristics of the project including but not limited to service life, economy of operation, ease of maintenance, reliability, desired appearance, and safety.

Schedule a meeting with the Engineer to present the proposed changes to the work. Topics discussed should include the following:

1. Cost of performing the work as bid.
2. An estimate of the cost of the proposed change; and
3. An estimated time frame for the Department to review.

The Department will determine if the proposed change will be further reviewed.

Upon agreement that the proposal will be reviewed, submit a complete proposal in writing and include the following information:

Reason: *Improve the VE process*

Comments: *No comments received*

Final Draft: **No changes to the draft spec; published as shown.**

105.02 Contractor Furnished Drawings and Submittals

105.02 Contractor ~~Furnished Drawings and~~ Submittals

All submittals are to be sent to the Project Manager unless stated otherwise.

Submit all project documents electronically unless otherwise directed by the Project Manager. This includes, but not limited to:

- Project Records
- Forms
- Correspondence
- Notifications
- Computations
- Statements
- Invoices
- Purchase Orders
- Agreements

- A. Table of Contractor Submittals.**
- B. Electronic Signatures.**

105.02.1 Contractor Furnished Drawings.

~~105.03.4 Contractor Submittals~~

This subsection is moved within 105.02 in its' entirety.

Reason: Didn't make sense to have two separate locations which discussed submittals. Rearranged 105.02 to show Contractor Submittals first, as this is more common, followed by Drawings.

Comments: No comments received

*Final Draft: **No changes to the draft spec; published as shown.***

105.03.3 Quality Incentive Allowance

E. Commercial Mix – Ride Incentive Reduction. Incentives will be reduced based on the percentage of density tests that do not meet minimum plant mix pavement density requirements as determined by Table 105-6.

**TABLE 105-6
COMMERCIAL MIX- RIDE INCENTIVE REDUCTION TABLE**

Project Size	Percent of Density Tests not Meeting Specifications		
	No Reduction of Ride Incentive	Incentive Reduced	No Incentive Allowed
500 – 5000 Tons ¹	0 to 10%	(% failing tests) * 6.667-66.67	25%

Notes: 1. Or as shown in the contract. Includes mix added by Change Order after award.
2. Final incentive reductions are rounded to 2 decimals.

Reason: the Table should not have been removed with the last updates to 401 and 105, as they were for incentive ties to non-commercial mix only. This table is being added back so that PMS density is not waived.

Comments: Internal comments received. Reorganize the table for consistency

Final Draft: Final Draft is as follows:

E. Commercial Mix – Ride Incentive Reduction. Incentives will be reduced based on the percentage of density tests that do not meet minimum plant mix pavement density requirements as determined by Table 105-6.

**TABLE 105-6
COMMERCIAL MIX- RIDE INCENTIVE REDUCTION TABLE**

Project Size	Percent of Density Tests not Meeting Specifications		
	No Reduction of Ride Incentive	Incentive Reduced ²	No Incentive Allowed
500 – 5000 Tons ¹	≤ 10%	> 10% < 25%	≥ 25%

Notes: 1. Or as shown in the contract. Includes mix added by Change Order after award.
2. Reduce the incentive by a percentage calculated by using the following formula:
(% failing tests) *6.667-66.67.
3. Final incentive reduction values are rounded to 2 decimals.

105.05 Cooperation By Contractor

A. Partnering. Implement partnering in accordance with the *Montana Partnering Field Guide*. Make a good faith effort to resolve disagreements by utilizing the partnering issue resolution ladder identified in the *Montana Partnering Field Guide* prior to submitting a notice of claim.

Partnering meetings will occur prior to beginning work on the project.

1. Level I Facilitation. Costs incurred for Level I facilitation will be paid for in accordance with Subsection 109.04.1. Items included in the cost for payment are:
 - a. Facilitator; and
 - b. Meeting room and facilities.
2. Level II Facilitation. An internal partnering meeting will be facilitated between the Project Manager and the Contractor.

105.16 Claims

105.16.1 Notice of Claim

A notice of claim may be submitted after a resolution could not be settled utilizing the partnering issue resolution ladder identified in the *Montana Partnering Field Guide*. The day of disagreement is determined at the final level. The Construction Engineer or District Administrator will notify the Contractor in writing.

Submit a notice of claim using the Department's Notice of Claim form MDT-CON-105-16-1A no later than 3 business days after the day of disagreements that are to be the subject of a claim for additional compensation, time extension, contract change, or other remedy. Provide full details in the written notice why additional compensation, time extension, contract change, or other remedy is warranted. Attach to the notice of claim all documentation showing the history of the disagreement.

Upon submission of the written notice, immediately begin keeping and maintaining complete and specific daily records using the Department's Claim Cost Record form MDT-CON-105-16-1 of all details and costs directly related to the disagreement. The form is available from the Project Manager or the Department's website. Base equipment costs on internal rates for ownership, depreciation, and operating expense. Provide the Project Manager with updates of details and costs related to the disagreement as they develop.

Failure to timely provide the written notice as required waives the Contractor's right to make any claim for the disagreement. Ensure that any notice of disagreement is fully and completely explained and documented, as the Department expects and requires early notice to mitigate costs and to fully document any potential costs.

The Project Manager will attempt to resolve the disagreement after the written notice is submitted. The Project Manager will issue a written response no more than 14 calendar days after receipt of the written notice.

The Contractor may send a written request to the CES Engineer for approval to bypass:

1. The Project Manager's attempt to resolve the disagreement after the written notice is submitted, and
2. The Project Manager's written response after receipt of the written notice, if all the following apply:
 - a. The partnering issue resolution ladder has been exhausted at all levels without a satisfactory agreement.
 - b. A notice of claim has been filed, and
 - c. A certified claim is expected.

Upon the CES Engineer's written approval of this request, the Contractor may submit a Certified Claim to the Project Manager within 14 calendar days in accordance with Subsection 105.16.2.

Reason: add Std. Special to Specs and tie in partnering language with our Claims process.

Comments: Internal Comments

Final Draft: Published as shown with the exception of the following:

A notice of claim may be submitted after a resolution could not be agreed upon utilizing the partnering issue resolution ladder identified in the *Montana Partnering Field Guide*. The Construction Engineer or District Administrator will notify the Contractor in writing regarding the date which will be used as the day of disagreement.

Submit a notice of claim using the Department's Notice of Claim form MDT-CON-105-16-1A no later than 3 business days after the day of disagreement(s) that is to be the subject of a claim for additional compensation, time extension, contract change, or other remedy.

106.09.1 Steel Price Adjustment

106.09.1 Steel Price Adjustment

The Contractor may elect to participate in a Steel Price Adjustment to payments for selected bid items made primarily of steel. Payment adjustments will only be made for fluctuations in the cost of the steel material. No adjustment will be made for changes in the cost of manufacturing, fabrication, shipping, storage, for any products purchased from the mill prior to the letting date, or for steel that is not permanently incorporated into the work.

The price adjustment will be based on the base price per pound of steel and changes to the steel price index between the bid letting date and the steel purchase date. Payment adjustments may be positive or negative.

Steel Price Index: The Department will use the Bureau of Labor and Statistics Producer Price Index (BLS PPI) "Steel Mill Products" Series ID WPU1017 not seasonally adjusted. The index used will be the final version of the index, revised 4 months after the original publication, including any corrections to the index.

The current base price per pound of steel is specified in the contract special provision.

A. Applicable Bid Items. Notify the Project Manager in writing by the Notice to Proceed date or at the pre-construction conference, whichever comes first, of any intent to participate in the steel price adjustment. Select the bid items for participation at the time of notification to the Project Manager. No changes will be allowed after submission.

Nuts, bolts, rebar chairs, connecting bands, and other miscellaneous hardware items will not be included in the price adjustment. High strength bridge bolt assemblies may be included in the price adjustment.

B. Steel Price Index. Furnish the following documentation for all steel bid items selected for steel price adjustment regardless of whether the index increased or decreased:

1. Paid invoice or other proof of purchase showing the date the steel was purchased and the weight of the steel.
2. An affidavit signed by the Contractor stating that the information provided is true and accurate.
3. Submit all documentation prior to incorporating the steel into the work. This provision in no way modifies or cancels the requirements of Subsection 106.09.

C. Steel Price Adjustment. The Project Manager will calculate the adjustments. Adjustments may be positive, negative, or non-existent depending on the difference between the Base Index (IB) and Current Index (IC). No price adjustment will be made unless the IC is 10% higher or lower than the IB.

For Increases:

Adjustment Factor (AF) = $(IC/IB-1.10)$, rounded to the nearest 0.01

If AF is equal to or less than 0, no adjustment.

If AF is greater than 0, continue

Payment Adjustment = AF x weight x base price

For Decreases:

Adjustment Factor (AF) = $(IC/IB-0.90)$, rounded to the nearest 0.01

If AF is equal to or greater than 0, no adjustment.

If AF is less than 0, continue

Payment Adjustment= AF x weight x base price

Where:

IB = BLS PPI for month contract was let

IC = BLS PPI for month material was purchased from the mill (invoice date)

Weight = weight of steel in pounds

Reason: *Add Special Provision 106-1 Steel Price Adjustment to the Std. Specs.*

Comments: *No comments received*

Final Draft: **No changes to the draft spec; published as shown.**

107.06 Public Convenience and Safety

107.06 Public Convenience and Safety

Conduct construction with minimum obstruction to traffic. Provide safety and convenience to the public and protect persons and property including, but not limited to, items specified in Subsection 104.05 and Section 618.

High-visibility safety apparel must be worn by all workers within the R/W of all projects. Use high-visibility safety apparel that meets the Performance Class 2 or 3 requirements of the ANSI/ISEA 107 publication entitled *American National Standard for High-Visibility Safety Apparel and Headwear*. **Class 3 apparel is required for all nighttime work.**

Reason: During a construction review, it was observed that workers were not wearing class 2 or 3 apparel during nighttime operations.

Comments:

Final Draft: **No changes to the draft spec; published as shown.**

107.18 Contractor Responsibility

~~Call the Utilities Underground Location Center (1-800-424-5555) or other notification system, UDIG (1-800-551-5344) if in Flathead or Lincoln County for the marking and locating of the utilities before excavation.~~

Call (811) <https://www.montana811.org/> to have utilities marked and located prior to beginning excavation.

Reason: update contact information for Utility locations to the standard 811

Comments:

Final Draft: rewording to the proposed draft is as follows:

Call (811) or submit an electronic ticket (https://www.montana811.org) for the marking and locating of utilities before beginning excavation work.

108.01.3 Subcontractor Payments

Submit payment information for all subcontractors and suppliers to the Department within the timeframes shown. ~~Identify any payments that have been withheld from subcontractors or suppliers.~~

- Prime contractors with first tier subcontractors or suppliers within 7 calendar days of payment from ~~MDT~~ the Department.
- First tier subcontractors with second tier subcontractors or suppliers within 7 calendar days of payment from prime contractor.

Notify the Department that payments have been withheld from subcontractors or suppliers. The Department will withhold that amount from payment to the Prime until the dispute has been resolved. Failure to notify the Department that payment has been withheld from subcontractors or suppliers, the Department will withhold that amount from future progress payments until all payments to a subcontractor or supplier have been resolved.

Submit payment information at the following link: <https://app.mdt.mt.gov/spr/>

Reason: amendment to match MCA requirements

Comments: MCA had one comment to reword the last sentence, the Department clarified the statement in accordance to the law (MCA 28-2-2110)

Final Draft: Final Draft is as follows

Submit payment information for all subcontractors and suppliers to the Department within the timeframes shown. ~~Identify any payments that have been withheld from subcontractors or suppliers.~~

- Prime contractors with first tier subcontractors or suppliers within 7 calendar days of payment from ~~MDT~~ the Department.
- Subcontractors with lower tier subcontractors or suppliers within 7 calendar days of payment from their parent contractor.

Notify the Department if payments will be withheld from subcontractors or suppliers. The Department will withhold that amount from payment to the Prime until the dispute has been resolved. In accordance with MCA 28-2-2110, retainage may not be withheld from subcontractors.

Submit payment information at the following link: <https://app.mdt.mt.gov/spr/>

109.02 Scope of Payment

Receive and accept the specified compensation as full payment for furnishing all materials, performing all work under the contract in a complete and acceptable manner and for all risk, loss, damage, or expense arising from the work, subject to Subsection 107.21.

~~If the Basis of Payment clause for unit price in the contract requires that the unit price be full compensation for work or material essential to the item, this same work or material is not measured or paid for under any other pay item in the contract.~~

The basis of payment for unit price items in the contract requires that the unit price be full compensation for work or material essential to the item. This same work or material is not measured or paid for under any other pay item in the contract.

Reason: clean-up. Reword to remove the statement "Payment at the contract unit price is full compensation for all resources necessary to complete the item of work in accordance with the contract."

Std. Specs already covers this statement, and the statement appears in some and not others. For consistency, it will be reworded, and the statement removed from specials and the Basis of Payment.

104.01 INTENT OF CONTRACT

Furnish all resources required to complete the work under the contract within the specified time, and for the amount bid.

Comments:

Final Draft: **No changes to the draft spec; published as shown.**

109.09.2 Mobilization Payment

109.09.2 Payment

The ~~original awarded~~ contract amount is the total price of the contract as bid. ~~The contract amount paid is the cumulative amount paid on progress estimates, excluding all price adjustments.~~ The percent of contract amount complete is based on the amount paid on all previous progress estimates plus the current progress estimate amount, excluding all price adjustments. Partial payments for mobilization will be made based on the lump sum contract unit price ~~under in accordance with~~ Table 109-3. No payments will be made for mobilization until the requirements of Subsection 108.03 have been satisfied.

**TABLE 109-3
MOBILIZATION PAYMENTS**

Percent of Contract Amount Paid Complete	Amount Paid (whichever is less)	
	Percent of Mobilization Bid Amount ¹	Percent of Original Contract Contract Awarded Contract Amount
First estimate after Notice to Proceed¹ 1	99	1
5	25	3
10	50	6
25	60	8
50	90	10
70 or Conditional Final Acceptance, whichever occurs first	99	
Final Estimate	100	

Note: 1. This percentage is the cumulative amount paid to that point, not the amount paid on the progress estimate.

Reason: Clean up

Comments: MCA had comments regarding the first payment

Final Draft: Changes to the Table are as follows:

Percent of Awarded Contract Amount Paid Complete	Amount Paid (whichever is less)	
	Percent of Mobilization Bid Amount ¹	Percent of Original Contract Awarded Contract Amount
First estimate after Notice to Proceed	99	1
5	25	3
10	50	6
25	60	8
50	90	10
70 or Conditional Final Acceptance, whichever occurs first	99	
Final Estimate	100	

Note: 1. This percentage is the cumulative amount paid to that point, not the amount paid on the progress estimate.

203.01.1(G) Digout Excavation

Digout excavation is ~~the removing removal and replacing sections~~ of material at neat lines as shown in the contract or directed by the Project Manager.

Reason: To clarify the description that digout excavation is removing material and not replacing material.

Comments:

Final Draft: **No changes to the draft spec; published as shown.**

401.04.1 Plant Mix Surfacing

Plant mix surfacing is measured by the ton (MT) ~~on approved scales~~ after complete mixing of all ingredients. The pay weight includes the asphalt cement and hydrated lime in the mixture, ~~although they are measured and paid for separately.~~

401.04.2 Commercial Plant Mix Surfacing

Commercial plant mix surfacing is measured by the ton (MT) ~~on approved scales~~ after complete mixing of all ingredients. The pay weight includes the asphalt cement and hydrated lime in the mixture ~~but are not measured and paid for separately.~~

401.04.3 Plant Mix/Commercial Plant Mix – Miscellaneous

~~Plant mix surfacing – Miscellaneous and Commercial plant mix surfacing – Miscellaneous are measured by the ton (MT) on approved scales after complete mixing of all ingredients. The pay weight includes the asphalt cement and hydrated lime in the mixture.~~

Plant Mix Surfacing – Miscellaneous is measured by the ton (MT). Asphalt cement and hydrated lime are measured and paid for separately.

Commercial Plant Mix – Miscellaneous is measured by the ton (MT). The pay weight includes asphalt cement and hydrated lime.

Quantities placed in conjunction with production (mainline) paving will not be measured separately or paid for under the Miscellaneous bid item

Reason: Approach aprons which can be paved during production paving (wing out operations) will be included and paid for under the Plant Mix Surfacing bid item and not the Plant Mix/Commercial Mix-Miscellaneous bid item. The miscellaneous paving bid item was created for fall back operations separate from production paving.

Comments: MDT and FHWA had suggested language changes

*Final Draft: **Published as shown with the exception of the following:***

Plant Mix Surfacing – Miscellaneous is measured by the ton (MT) after complete mixing of all materials. The pay weight includes the asphalt cement and hydrated lime, although they also are measured and paid for separately.

Commercial Plant Mix – Miscellaneous is measured by the ton (MT) after complete mixing of all materials. The pay weight includes asphalt cement and hydrated lime but are not measured and paid for separately.

Quantities placed in conjunction with production (mainline) paving will not be measured separately or paid for under any of the Miscellaneous bid items.

409 Seal Coat

409.03.12 Underseal

When required by the contract, perform an underseal following approval by the Project Manager of the prepared surface. Do not begin Plant Mix Surfacing operations until 3 calendar days after completion of the underseal.

409.04.2 Cover Aggregate

Cover aggregate for Type 1, Type 2, and Type 3~~“Cover – Type 1”, and aggregate for “Cover – Type 2”~~ is measured by the square yard (m²), based on the length and width of seal coat placed and accepted.

409.05 BASIS OF PAYMENT

Pay Item

Pay Unit

Cover -Type

Square Yard (m²)

Reason: Add Underseal to the specs to eliminate the need for special provisions.

Type 2 and Type 3 cover material are bid items and were missing from the measurement and payment of Section 409.

Comments: FHWA had comments

*Final Draft: **Published as shown with the exception of the following:***

409.04.2 Cover Aggregate

Cover aggregate for Type 1, Type 2, and Type 3~~“Cover – Type 1”, and aggregate for “Cover – Type 2”~~ is measured by the square yard (m²), based on the length and width of seal coat **specified** and accepted.

500 Concrete Changes

501.02.1 Concrete

B. Aggregate. Use optimized gradations **in accordance with MT 122** unless otherwise specified.

551.02.8 Aggregate Furnish aggregates **from an approved source** in accordance with Subsection 701.01.

551.03.8(C)

4. Small Concrete Quantities. The Project Manager may accept **7.9** cubic yards (~~5.4~~ **6.9** m³) or less of concrete without a formal mix design. Submit a batch proportion sheet to the Project Manager for approval before use. Classes Deck, Overlay, and Structure concrete are excluded from this exception.

In accordance with Section 3.1.1 of MT 601 the Project Manager may designate 9 cubic yards or less concrete as a "small quantity" for acceptance sampling and testing.

554.01 DESCRIPTION

This work is the furnishing ~~and installing~~, **handling, transporting, and storage of** reinforced precast concrete bridge members, precast curbs, cattle guard bases, **box culverts, pipe,** and other precast concrete products **produced by means of wet-cast, dry-cast, or machine-made (e.g., packer-head) operations.**

554.02.1 Concrete

Furnish hydraulic cement concrete in accordance with Section 551. **Furnish Class General concrete unless otherwise specified. SCC meeting the class general requirements may be used for Precast products provided they meet the additional requirements of Subsection 551.03.2(G).**

A. Cement. For precast items installed below grade, furnish low alkali hydraulic cements meeting M85/C150 Type V Portland Cement or M240/C595 Blended Cement with the (HS) designation for sulfate resistance from sources listed on the QPL.

554.03.1 Fabrication Drawings

Prior to casting members, submit fabrication drawings and design calculations. ~~to the Project Manager.~~

Include on/with the fabrication drawings the following information:

1. An erection layout with each member assigned a production number.
2. A tentative fabrication schedule.
- ~~3. The proposed mix design, including admixtures, and~~
4. All other information necessary to fabricate and install the product.

~~Submit 5 copies of shop drawings on 11" x 17" or larger sheets and 5 copies of welding procedures and design calculations on 8½" x 11" or larger sheets to the Project Manager. Shop drawings, design calculations, and welding procedures may be furnished in Adobe Acrobat Reader (.pdf) format in lieu of the hard copies.~~ Ensure the submittal includes all information required to check the structural accuracy and fabrication procedures for the structure.

554.03.2 Design of Concrete Mixtures

Submit a proposed mix design meeting all the requirements of MT 100 ~~with the shop drawings~~ for approval annually, between November 15th and April 15th of each year. Any changes to the approved mix design will require resubmittal and approval prior to production.

Project specific mix designs not submitted for annual approval will need to be submitted and approved before production begins.

For self-consolidating concrete, the 28-day strength may vary with the class of concrete specified in Table 551-2 or contract provisions.

554.03.5 Transporting and Placing Concrete

Transport and place concrete in accordance with Subsections 551.03.5 and 552.03.4.

554.03.6 Curing and Testing Concrete

Cure precast concrete products by water curing, impervious membrane curing, elevated temperature curing, or a combination of these methods.

Perform water curing and impervious membrane curing in accordance with Subsection 551.03.7(A).

Perform elevated-temperature steam process curing in accordance with Subsection ~~553.03.10~~ 551.03.7(C).

Submit procedures for curing by the elevated-temperature electric coil process or a combination of methods in writing for approval before use.

Perform at least 1 test per 50 cubic yards (35 m³) or per each day's production if less than 50 cubic yards (35 m³) to verify ~~reaching the fresh properties and~~ compressive strength required to discontinue curing.

A test is the average strengths of 3 cylinders, each cast from different batches of concrete used in the day's production. Take the 3 samples from as many different batches as possible if more than 2 batches are used.

Sample and cast cylinders in accordance with MT 101.

Cure until the compressive strength of the standard 6 x 12-inch (152 x 305 mm) or 4 x 8-inch (102 x 203 mm) cylinders, cured under the same conditions as the concrete represented, reaches the required strength for the class of concrete or the specified strength.

Field-cure cylinders a maximum 28 days and test for compressive strength within 24 hours after removal from the field curing conditions. Perform strength testing in accordance with AASHTO T 22. Furnish ~~the certified laboratory~~ test results by an ACI certified strength testing technician or equivalent that has been verified by the Department or arrange for the tests to be witnessed by the Department. The Department will verify technicians during monthly and annual plant inspections.

Test results are acceptable if the average of the 3 cylinder strengths exceed the strength for the concrete class, or the specified strength and no individual cylinder tested has a strength less than 90% of the specified strength.

Continue un-interrupted curing until test results are obtained. Should all cylinders be tested without reaching the specified strength, the concrete represented by the cylinders may be rejected.

554.03.7 ~~Cold-weather Concreting~~ Weather and Temperature Limitations

Submit a written plan for hot or cold weather concreting in accordance with Subsection 551.03.6 when temperature extremes are anticipated.

~~554.03.11 Placement. Place precast concrete members as specified.~~

Reason: Section 500 changes are proposed for general clarification of concrete and precast items:

- To address sampling and testing frequency changes (upping it to 30 yards from 24 yards)*
- Small quantity clarification (also, a special provision has been drafted to address mix designs for low-risk applications)*
- Adding language to clarify allowable precast processes.*

Comments:

Final Draft: **No changes to the draft spec; published as shown.**

500 Submittals

552.03.18 Silane Sealer

~~Temporarily plug any deck drains and take any other precautions as necessary to ensure that the sealer is not allowed to drip off the deck.~~

Submit the method and materials used to contain, collect, and dispose of all debris generated by the cleaning and surface preparation process.

Final Draft: Final Draft is as follows

Submit the method and materials used to contain, collect, and dispose of all debris generated by the application, cleaning, and surface preparation processes.

552.03.19 Bridge Deck Crack Sealing

Furnish bridge deck sealant in accordance with Subsection 717.02.

A. Submittals. Submit ~~2 copies of the following to the Project Manager~~ for review prior to beginning work:

6. The method and materials used to contain, collect, and dispose of all debris generated by the cleaning and surface preparation process.

Final Draft: Published as shown with the exception of the following

6. Submit the method and materials used to contain, collect, and dispose of all debris generated by the application, cleaning, and surface preparation processes.

561.03.1 Submittals

~~At least 2 weeks before beginning construction, submit to the Project Manager for approval a written plan detailing the methods, materials, equipment, and personnel to be used. If hydrodemolition is used, include in the submittal how wastewater will be managed for each hydrodemolition site and controlling the wastewater from the time it leaves the hydro-milling machinery until its final disposal. Do not begin concrete removal until receiving approval.~~

~~Ensure adequate capacity to handle the amount of wastewater generated.~~

Submit for approval the following:

1. A written plan detailing the methods, materials, equipment, and personnel to be used.
2. The method and materials used to contain, collect, and dispose of all debris generated by the removal, cleaning, and surface preparation process.

Ensure adequate capacity to handle the amount of wastewater generated.

Do not begin concrete removal until receiving approval.

562.03.1 Submittals

Submit for review ~~a minimum of 14 calendar days before placement~~, the following:

1. Any proposed rapid set or polymeric concrete product data sheets.
2. Description of deck preparation measures that will be used to promote a competent bond between existing and new concrete.

3. The method and materials used to contain, collect, and dispose of all debris generated by the removal, cleaning, and surface preparation process.

563.03.1 Submittals

~~Submit the following items to the Project Manager for approval at least 10 business days before concrete placement:~~

Submit for approval the following:

1. The method and materials used to contain, collect, and dispose of all debris generated by the **removal**, cleaning, and surface preparation process.

Reason: Following a project review, it was found that deck drains were not properly plugged. Although it was not directly stated in Subsection 552.03.19, Section 208 clearly states throughout the Section to prevent material from entering waterways.

The clarification for these subsections is requiring the submittals of these methods. An update to the Table of Contractor Submittals has also been completed.

Comments:

Final Draft: **No changes to the draft spec; published as shown.**

601.04 Water Service Lines

601.04 METHOD OF MEASUREMENT

Water service lines are measured by the foot (m). **Excavation to install service lines is not measured for payment.**

~~Excavation is measured by the cubic yard (m³) in accordance with Subsection 207.04.~~

601.05 BASIS OF PAYMENT

Payment for the completed and accepted quantities is made under the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Excavation	Cubic Yard (m³)
Water Service Line	Foot (m)

Reason: An overlook for several years. Excavation to install waterlines is not measured for payment. This change matches that of the Public Works Specifications.

Comments:

Final Draft: **No changes to the draft spec; published as shown.**

606 Guardrail

606.02 MATERIALS

Furnish ~~metal~~ steel beam guardrail, cable guardrail, and box beam guardrail materials in accordance with the following section and subsection requirements:

Reason: require steel beam guardrail which is listed on the QPL. There are inconsistencies with the term "steel" and "metal" throughout the specs and our Detailed Drawings. This language was carryover from the past. "Steel" is a more appropriate term when referring to guardrail items, fence posts, and other items. The Detailed Drawings will be updated to reflect the term "steel" moving forward.

Comments:

Final Draft: No changes to the draft spec; published as shown.

608.03.2 Concrete Sidewalks

608.03.2 Concrete

Construct sidewalks in accordance with Subsections 501.03.15 and 501.03.16. For PCCP and sidewalks subject to traffic loads (i.e., approaches) refer to Subsection 501.03.13 before opening to traffic.

Reason: Section 608 did not have any reference for opening to traffic to account for sidewalk approaches. This helps clarify the requirements for opening approaches to traffic.

Comments:

Final Draft: **No changes to the draft spec; published as shown.**

**SECTION 613
RIPRAP AND
SLOPE ~~AND BANK~~ PROTECTION**

613.01 DESCRIPTION

This work is the construction of protective rock, stones, gravel, or concrete coverings as specified.

Riprap is **rock protection and is** a cover of stone or fragmented rock, with or without grout, placed along embankment slopes, stream banks, culvert inlets and outlets, foundations, bridge berms, dikes, and other specified locations.

~~Bank protection is a cover of rock or coarse gravel placed on the side slopes of structure channels and other specified locations.~~ **Ancillary Armor is rock protection used in low-risk applications such as culvert outlet protection or lined ditches.**

Concrete slope protection is a cover of hydraulic cement concrete placed on slopes at structure ends.

613.02 MATERIALS

Furnish materials in accordance with the following section and subsection requirements:

Bank Protection Ancillary Armor	701.07 701.06
Bedding Material	701.04.1
Hydraulic Cement Concrete	551
Hand-laid, Random, and Grouted Riprap	701.06
Sand-gravel Cushion	701.08

613.03 CONSTRUCTION REQUIREMENTS

613.03.1 Riprap **and Ancillary Armor**

A. General. Place the ~~riprap~~ **rock protection** at the locations specified in the contract.

Key the ~~riprap~~ **rock protection** ends into the embankment slopes at least 2 feet (610 mm) from the outer face ~~of the riprap~~ for the full height of the ~~riprap~~ **rock protection**.

~~**B. Hand-laid Riprap.** Bed the stones at right angles to the slope with the larger stones used in the lower courses. Lay the stones in close contact with staggered vertical joints and placed so each stone rests on the embankment slope instead of the underlying stones. Fill the spaces between the stones with smaller stones or rock, securely placed.~~

~~Finish the work to present an even, tight plane varying no more than 3 inches (75 mm) from the general contour of the revetment.~~

~~Provide a minimum riprap thickness of 12 inches (305 mm), measured perpendicular to the slope, or as specified.~~

B. Random Riprap. Place the stones on the slopes to form the specified cross section. Uniformly distribute the smaller stones throughout the work. Manipulate the stones by hand or machine to provide a uniform surface and stable mass.

Provide the riprap thickness specified in the contract.

Place the riprap around pipe openings without damaging the pipe. Repair damaged pipe at Contractor expense.

C. Grouted Riprap. Provide a minimum riprap thickness of 9 inches (230 mm) measured perpendicular to the slope, or as specified.

Place one or more layers of bedding material before placing the riprap as specified. Place each bedding layer on the prepared surface to the specified thickness in one operation without segregating the layer. Finish the top layer to produce an even surface free from mounds or ridges. Do not inter-mix the materials of each layer.

Fill the voids between stones with spalls or small stones so all stones are wedged or keyed. Prevent earth and sand from filling the spaces between the stones.

Finish the final surface to provide an even, tight surface with the plane not varying more than 3 inches (75 mm) from the general contour.

Wet the riprap surface and fill the crevices and openings with at least 3 inches (75 mm) of mortar. Immediately sweep the surface with a stiff broom.

Grouting may begin when the ambient temperature is at least 35 °F (2 °C) and rising and must stop when the ambient temperature is 30 °F (-1 °C) and falling.

Keep finished grout work moist for 3 days.

613.03.2 Bank Protection

~~Bank protection Ancillary armor may be hand placed, or machine placed and leveled. Construct the finished bank protection to be stable with no voids larger than the smallest stone used in the work.~~

~~Use rock spalls or gravel to fill the voids. Not more than 5% of the total bank protection volume may be earth, sand, or rock material smaller than $\frac{3}{4}$ inch (5 mm) for filling voids.~~

~~Bed the bank protection ancillary armor as shown in the contract.~~

D. Acceptance. Ensure riprap and ancillary armor placement is uniformly distributed. Gradation acceptance is determined by visual analysis and use of optical granulometry software and will be verified in the final placement location. Prior to final placement the Contractor may request a maximum of 3 courtesy tests of the riprap and ancillary armor gradation.

Once in place, and prior to covering or revegetating the riprap and ancillary armor, notify the Project Manager for in-place gradation testing.

613.03.3 2 Concrete Slope Protection

Trench, shape, compact, and trim the slopes as specified before starting concrete work. Excess excavated material may be used elsewhere in the work or disposed of by the Contractor.

Construct the concrete slope protection as specified or directed.

613.03.3 Drainage Chutes

~~Construct drainage chutes as shown in the Detailed Drawings.~~

613.04 METHOD OF MEASUREMENT

613.04.1 Riprap and Ancillary Armor

A. ~~Hand-laid and~~ Random Riprap. ~~Hand-laid and~~ random riprap is measured by the cubic yard (m³) complete in place. The volume measured for payment is that bounded by the staked length and height and the plan thickness.

Excavation is incidental to the riprap and not measured for payment.

B. Grouted Riprap. Grouted riprap is measured by the square yard (m²) on the face of the revetment.

Excavation is incidental to the riprap and not measured for payment.

Bedding material is measured by the cubic yard (m³).

~~613.04.2 Bank Protection~~ C. Ancillary Armor

~~Bank protection~~ Ancillary armor is measured by the cubic yard (m³) complete in place. The volume measured for payment is that bounded by the staked length and height and the plan thickness.

Excavation and bedding material are not measured for payment.

~~613.04.3~~ 2 Concrete Slope Protection

Concrete slope protection is measured by the square yard (m²). Measurement is made parallel to the surface of the exposed surface area including the surfaces of curbs and head walls.

Excavation is incidental to the item and not measured for payment.

Sand-gravel cushion is measured by the cubic yard (m³) compacted in place.

~~613.04.4~~ 3 Concrete Drainage Chute

~~Concrete drainage chutes are measured by the cubic yard (m³) and include the excavation, concrete placement, and bank protection at the chute ends.~~

613.05 BASIS OF PAYMENT

Payment for the completed and accepted quantities is made under the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Bank Protection Ancillary Armor	Cubic Yard (m ³)
Bedding Material	Cubic Yard (m ³)
Concrete Drainage Chute	Cubic Yard (m³)
Concrete Slope Protection	Square Yard (m ²)
Grouted Riprap	Square Yard (m ²)
Hand-laid and Random Riprap	Cubic Yard (m ³)
Sand-gravel Cushion	Cubic Yard (m ³)

~~Payment at the contract unit price is full compensation for all resources necessary to complete the item of work in accordance with the contract.~~

Reason: Create a separate item from Class Riprap (Ancillary Armor) which meets the needs of bank protection without the acceptance requirements of Riprap.

Comments:

Final Draft: **No changes to the draft spec; published as shown.**

617 Traffic Signals and Lighting

617.03.11 Service and Control Assembly

Seat, backfill, and compact around the poles. Compact backfill in ~~9-inch (230 mm)~~ 8-inch (200 mm) lifts. Plumb and rake the pole as directed.

617.04.1 Traffic Signals and Lighting

- Radar Detector, & Advanced

617.05 Basis of Payment

Radar Detector, Advanced Each

Reason: Cleanup. Add the radar detector and advanced radar detector to the method of measure and basis of payment.

Comments:

Final Draft: No changes to the draft spec; published as shown.

618 Traffic Control Units – Measurement

618.04 Method of Measurement. The contractor, upon receiving written or verbal notification, will be given 24 hours to make the traffic control operation compliant. Traffic Control directly affecting the safety of the public must be attended to immediately. The Project Manager may apply deducts as shown below due to traffic control operations not meeting the requirements set forth in Section 618.

- 10% of the daily traffic control units or \$500 per calendar day, whichever is greater.
- \$~~250~~ 500 per day for lump sum contracts.

Reason: Ensure that required, directed, or compliant work is completed.

Comments: MCA members had comments

*Final Draft: **Published as shown with the exception of the following:***

618.04 Method of Measurement. The contractor, upon receiving written and verbal notification, will be given 24 hours to make the traffic control operation compliant. Traffic Control directly affecting the safety of the public must be attended to immediately. The Project Manager may apply deducts as shown below due to traffic control operations not meeting the requirements set forth in Section 618.

619 Signs and Delineators

619.03.2 Design Calculations and Shop Drawings

The Department will furnish the sign design calculations for the project at the pre-construction conference. The ~~furnished~~ sign design calculations ~~must include the calculations for the specified guide signs, special design signs, and other signs shown in the Montana Sign and Sign Materials book but not include those signs in the~~ **will only be provided for signs not listed within the** FHWA *Standard Highway Signs Book*.

Submit Contractor approved (stamped) shop drawings and welding procedures for sign bridges and overhead cantilever sign structures. ~~Submit shop drawings on minimum size 11" x 17" sheets (A3 paper), welding procedures on 8½" x 11" (A4 paper) sheets.~~

~~The Department has 15 business days upon receipt of the drawings for drawing review. Drawings returned to the Contractor for corrections or additional information must be re-submitted within 15 business days of receipt.~~

After the structural steel shop drawings and welding procedures have been reviewed and checked by the Department, all required corrections will be returned to the Contractor who must make the corrections and re-submit ~~10 copies of~~ the corrected drawings and welding procedures for final review and approval within 15 business days. All final drawings must be stamped "Approved" by the Department before fabrication begins.

~~Submit shop drawings and current approved weld procedures for tubular sign posts and structural steel sign posts.~~

~~The Department Inspector will compare the drawings and weld procedures to the posts during post inspection at the point of fabrication. Submit weld procedures for approval every 6 months or whenever they are changed or modified.~~

Submit shop drawings and welding procedures at one time in a complete package for the Department's initial and subsequent reviews. Individual parts of the submittals will not be accepted for review.

Reason: cleanup of carryover language. Submittals are to be electronic.

619.03.3 Fabrication and Erection

~~Submit 2 copies of the manufacturer's installation instructions for all sign post breakaway devices installed on the project to the Project Manager at least 15 calendar days prior to installation.~~

~~Excavate or bore foundation holes for sign supports at least 8 inches (200 mm) larger than the largest diameter of post or pole placed in each hole.~~

Reason: cleanup. Bore hole excavation diameters are shown in Detailed Drawing.

619.03.4 Inspection

The completed signs will be inspected ~~at the fabricator's plant and~~ on the project before they are installed.

619.03.8 Definitions

H. Type-1 Delineator. Delineators designated as Type-1 will be Design A, B, D, F, G, H, J, GJ, and BJ.

I. Type-2 Delineator. Delineators designated as Type-2 will be Design C.

619.05 Basis of Payment

Delineator (Type and Design)	Each
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619.03.10 Acceptance

Signs and traffic guide devices are accepted for payment individually ~~or in lots as completed work~~ once installed.

~~Delineator posts with reflectors are accepted in lots of 100 or more units.~~

~~Guide, directional, and warning signs with a surface area of up to 10 square feet (0.93 m²) on one side are accepted in lots of 25 or more.~~

~~Signs with a surface area of up to 30 square feet (2.8 m²) on one side are accepted in lots of 5 or more.~~

~~Overhead structures and signs larger than 30 square feet (2.8 m²) in sheeting area are accepted individually.~~

The Department will assume maintenance responsibility for signs and other traffic guide devices once accepted and ~~in place~~ **installed**.

Repair or replace signs and devices, at Contractor expense, that are damaged or destroyed by the Contractor's operations.

Reason: cleanup of carryover language. signs and delineators are paid for as installed.

619.03.14 Linear Delineation Systems

~~**A. W-Beam Guardrail.** Install 26 to 36 inch long by 1½ inch wide delineation panels that meet one of the following:~~

- ~~1. Panels fabricated from ASTM type XI retro reflective sheeting laminated onto a thin gauge of aluminum and formed to a unique shape, or~~
- ~~2. Bond an angular retro reflective coating onto a structural substrate.~~

Reason: Move to 704.04. material requirements are all in the 700 series. Requirements match that of concrete barrier delineation systems.

619.04.1 Aluminum ~~and Plywood~~ Signs

Aluminum sheet, **and** aluminum sheet increment, ~~and plywood signs~~ are measured by the square foot (m²) of sign face.

Aluminum and Plywood Signs	Square Foot (m ²)
---------------------------------------	-------------------------------

Needs to be addressed in Detailed Drawings:

Reason: Plywood signs are no longer optional.

620 Pavement Markings

620.02 Materials

~~High Durability Waterborne Traffic Paint~~ — 714.05

620.03.1 General

Furnish a manufacturer's material certification or data sheet for the product to be used. Do not apply materials that do not meet the contract requirements. The Project Manager may request a manufacturer's sample or take field samples for testing. Furnish a material sample weighing at least 2 pounds (0.91 kg). Furnish temporary waterborne traffic paint, waterborne traffic paint, ~~high durability waterborne traffic paint~~, epoxy traffic paint, and glass beads listed on the QPL.

620.03.6 Interim Pavement Markings

Apply interim pavement markings no later than ~~10~~ 14 calendar days after the application of temporary striping. Do not apply interim pavement markings when the ambient air temperature is lower than 40 °F (4 °C).

Apply the interim pavement markings matching the final pavement marking configurations and locations. Interim pavement markings placed prior to chip seal may be offset as approved by the Project Manager.

The Project Manager will suspend all remaining contract work if the interim striping is not applied within the time specified above.

A. Waterborne Traffic Paint. Apply a 16 ± 1 mil (0.406 ± 0.025 mm) thick wet film immediately followed by applying at least 8.0 pounds per gallon (0.96 kg/L) of Montana Type ~~1~~ or 2 glass beads.

~~**B. High Durability Waterborne Traffic Paint.** Apply a 16 ± 1 mil (0.406 ± 0.025 mm) thick wet film immediately followed by applying at least 8.0 pounds per gallon (0.96 kg/L) of Montana Type 1 or 2 glass beads.~~

620.03.7 Final Pavement Markings

A. Epoxy or other Polymeric Traffic Paint.

Immediately terminate striping application if the applied stripe(s) are less than 18 mils thick. ~~Grind all 18-mil and thinner striping~~ **Grind all striping less than 18-mils** in accordance with Subsection 620.03.4 and replace the striping in accordance with the contract at Contractor expense.

620.03.8 Concrete Curbs

Apply ~~Type 1 or~~ Type 2 reflective glass beads at a minimum rate of 8.0 pound per gallon (0.96 kg/L) immediately following the application of epoxy to concrete curbs.

714.04 Waterborne Traffic Paint

Furnish waterborne traffic paint in accordance with Table 714-2. Where the NTPEP method is specified, recorded NTPEP results must be within the specifications shown. Blue, red, or black paint may be used without being NTPEP tested if the base paint is the same chemical composition as a NTPEP tested paint.

TABLE 714-2
WATERBORNE TRAFFIC PAINT COMPOSITION

Table 714-2 is Deleted~~**714.05 HIGH DURABILITY WATERBORNE TRAFFIC PAINT**~~

~~Furnish high durability waterborne traffic paint in accordance with Table 714-3. Where the NTPEP method is specified, recorded NTPEP results must be within the specifications shown. Blue, red or black paint may be used without being NTPEP tested if the base paint is the same chemical composition as a NTPEP tested paint.~~

~~TABLE 714-3
HIGH DURABILITY WATERBORNE TRAFFIC PAINT COMPOSITION~~

Table remains the same, no changes. Will now be Table 714-2

Reason: The Department will move toward the requirements of Table 714-3 but will only be referred to as Waterborne Traffic Paint. This change removes Table 714-2 along with references to High Durable.

Comments:

Final Draft: **No changes to the draft spec; published as shown.**

701.06 Riprap

701.06 RIPRAP AND ANCILLARY ARMOR

Furnish hard, durable, angular stone that is resistant to weathering and water action, and free of organic or other unsuitable material.

Angular stone is characterized by sharp, clean edges at the intersections of relatively flat surfaces.

Do not use stone with the following characteristics:

1. Rounded stone or boulders from a streambed source.
2. Shale or stone with shale seams.
3. Fissile or fractured stone that may break into smaller pieces.
4. Flat or plate-like in shape.

~~Furnish hard, durable, angular, stone that is resistant to weathering and water action, and free of organic or other unsuitable material.~~

~~Angular stone is characterized by sharp, clean edges at the intersections of relatively flat surfaces. Furnish stone that is environmentally safe.~~

~~Do not use rounded stone or boulders from a streambed source as riprap. Do not use shale or stone with shale seams, or other fissile or fractured stone that may break into smaller pieces into the process of handling and placing.~~

701.06.1 RipRap

~~The stone must meet~~ Furnish riprap meeting the requirements of Table 701-21 and 701-21A ~~22~~.

**TABLE 701-21A
RIPRAP REQUIREMENTS**

Riprap (Class I, II, and III)	
Specific gravity (AASHTO T 85)	2.40 min.
Absorption (AASHTO T 85)	4.0% max
Los Angeles abrasion (ASTM C535)	50% max
Gradation (Optical Granulometry)	Table 701-21 22
Soundness of aggregate using sodium sulfate (AASHTO T 104)	12% loss max
The longest dimension (length) of each stone is no longer than 3 times the shortest dimension (width) of stone.	

Obtain riprap from sources in accordance with Section 106 requirements to produce material in accordance with Subsection 701.06. Each material source proposed for use as riprap is subject to approval prior to placement. If the riprap source is approved, it may be limited to certain areas, layers, or locations within the source. Approval of the source does not preclude the Department from retesting the material once it is delivered to the project.

~~Ensure the riprap's placement is uniformly distributed. Acceptance for gradation will be determined by visual analysis and use of optical granulometry software and will be~~

~~verified in the riprap's final placement location. Prior to final placement the Contractor may request a maximum of 3 courtesy tests of the riprap gradation.~~

~~Once in place, and prior to covering or revegetating the riprap, notify the Project Manager for in-place gradation testing.~~

701.06.1 Handlaid Riprap

~~Furnish stone or rock fragment at least 3 inches (75 mm) thick, a minimum .5 cubic foot (0.014 m³) in volume, weighing at least 75 pounds (34 kg), excluding rock spalls.~~

~~Extend all stones and fragments through the revetment, except spalls used to check larger stones and fill voids between the larger stones.~~

701.06.2 Random Riprap

Furnish the specified random riprap in accordance with Table 701-21 and 701-21A22.

TABLE 701-2122

TABLE OF GRADATIONS - RANDOM RIPRAP

Class	Mean Particle Size Inches (mm)	% of Mean Particle Size Passing
I	13 (330)	100
	11 (280)	70-90
	8 (205)	40-60
	3 (75)	0-10
II	24 (610)	100
	21 (530)	70-90
	16 (405)	40-60
	7 (175)	0-10
III	36 (915)	100
	30 (760)	70-90
	24 (610)	40-60
	9 (230)	0-10

Notes: Mean Particle Size is the average of the dimensions for the length, width, and depth of each stone.

701.06.3 Grouted Riprap

Furnish stone for grouted riprap in accordance with Table 701-21 and 701-21A22.

701.07 BANK PROTECTION 701.06.4 ANCILLARY ARMOR

~~Furnish rock that is hard, dense, and durable. Use either quarried rock or natural coarse gravel. Rock may be obtained from adjacent roadway excavation. Do not use rock obtained from streambeds.~~

Submit samples before placing Ancillary Armor. The stone must meet the requirements of Table 701-23.

~~Furnish the specified bank protection in accordance with Table 701-22.~~

TABLE 701-22-23
SIZE REQUIREMENTS - ~~BANK PROTECTION~~ ANCILLARY ARMOR

Type	1	2	3	4
Nominal thickness	24-inch (610 mm)	18-inch (455 mm)	12-inch (305 mm)	Coarse gravel
Overall thickness including bedding	30-inch (760 mm)	24-inch (610 mm)	18-inch (455 mm)	As specified in the contract
Largest rock permissible	¼ cubic yd. (0.19 m ³)	⅙ cubic yd. (0.09 m ³)	1 cubic ft. (0.03 m ³)	⅓ cubic ft. (0.003 m ³)
Smallest rock permissible	¼ ₁₀ cubic ft. (0.003 m ³)	¼ ₁₀ cubic ft. (0.003 m ³)	1½ inch (38 mm)	¾ ₁₆ inch (5 mm)

Class	Mean Particle Size Inches (mm)	% of Mean Particle Size Passing
I	13 (330)	100
	11 (280)	70-90
	8 (205)	40-60
	3 (75)	0-10
II	24 (610)	100
	21 (530)	70-90
	16 (405)	40-60
	7 (175)	0-10

Notes: Mean Particle Size is the average of the dimensions for the length, width, and depth of each stone.

Reason: Create a separate item from (Ancillary Armor) which meets the needs of slope protection without the acceptance requirements of Riprap for low-risk installations.

Comments:

Final Draft: **No changes to the draft spec; published as shown.**

704 Signing Materials

704.01.3 Plywood

~~Use Douglas fir meeting the Commercial Standard 45 for Douglas Fir plywood, B-B high density overlay, 60/60 with plastic overlay, both sides, 3/4 inch (19 mm) thick. Do not use plywood on multiple post installations.~~

704.01.9 Hardware

- A. Miscellaneous.** Use bolts, washers, nuts, lock washers, incidental hardware, and angles for erecting aluminum sheet ~~and plywood~~ signs that are:

704.02.2 Plywood Signs

~~Provide a reflective background. Seal all wood edges, including interior joints, before fabrication using one coat of exterior aluminum paint followed by one coat of enamel, colored to match the reflective background sheeting. Apply the reflective sheeting and seal the edges following the sheeting manufacturer's recommendations.~~

- ~~**A. Screen-processed Legend and Borders.** Screen process or reverse screen process the legend and borders on reflectorized backgrounds meeting the contract requirements. Use the process and paints recommended by the sheet manufacturer.~~

- ~~**B. Reflective Sheeting Legend and Borders.** Cut the legend and borders from Type III sheeting.~~

~~Do not splice legend characters. Apply legends following the sheeting manufacturer's recommendations. Do not use water to float the reflective sheeting or legend into place during fabrication.~~

- ~~**C. Demountable Reflective Legend and Borders.** Fabricate demountable legend in accordance with Subsection 704.01.10(B). Furnish the letter type specified in the contract. Letters cannot be spliced. Make borders and median sections in the longest pieces possible. Butt all joints with no overlap.~~

Reason: remove Plywood requirements

704.03 FLEXIBLE DELINEATORS

Furnish flexible delineators listed on the QPL.

Flexible delineators must meet NCHRP 350 or Mash requirements. Delineator material ~~that is~~ **must be** impact resistant within a temperature range of -30 to +130 °F (-34.4 to +54.4 °C). Ensure the material from which the vertical tube post is fabricated flexes upon impact and results in little or no damage to impacting vehicles. ~~Use a~~ Delineator ~~that is~~ **must be** ultra violet stabilized and resistant to ozone and hydrocarbons. Ensure the delineator design allows for quick and easy removal and replacement of delineator tube with only the use of common hand tools. ~~Use delineators that are listed on the QPL and in accordance with NCHRP 350 or MASH requirements.~~

Ensure the delineator is flexible, self-erecting to original position and capable of withstanding numerous impacts from a direction without splitting, breaking or detachment from the base or the surface to which the base is attached.

~~Use~~ Delineators ~~with~~ **must have** a minimum height of 36 inches (915 mm) and width configuration that allows a minimum of 46.5 square inches (300 cm²) of retro-reflective sheeting to be affixed at the top of the post. ~~Place~~ Retro-reflective sheeting **must be placed completely** within the top 9 inches (230 mm) of the delineator. Ensure color, area and configuration of retro-reflective sheeting equals that required by the standard drawings for the type of delineator specified. ~~Use a~~ **Ensure the** post color ~~that~~ matches the attached sheeting.

Provide the mounting as specified in the contract.

- A. Surface Mount Flexible Delineators.** Ensure base material is flexible, high impact composite material with a maximum of 72 square inches (464 cm²) surface area and capable of being mechanically attached to the mounting surface.
- B. Driveable Flexible Delineators.** Ensure anchor is made of rigid materials and cannot collapse or buckle when driven into dense soil. Metallic materials must be galvanized. Ensure anchor is driveable with manual or common installation tools.

704.04 LINEAR DELINEATION SYSTEMS

Furnish a product that produces retro-reflection and high visibility across a very wide range of entrance and observation angles. ~~Furnish panels that are a minimum 31 inches long and 6 inches high.~~ Furnish a product that meets one of the following:

- Fabricate the panels from Diamond Grade Reflective Sheeting, laminated onto a thin gauge of aluminum and formed to a unique shape, or
- Bond an angular retro-reflective coating onto a structural substrate.

704.04.1 Concrete Barrier Rail

Furnish panels that are a minimum 31 inches long and 6 inches high.

704.04.2 W-Beam Guardrail

Furnish panels 26 to 36 inches long by 1½-inch wide.

Reason: Cleanup. Delineators are listed on the QPL. A new supplier may supply delineators that meet the requirements above.

Comments:

Final Draft: **No changes to the draft spec; published as shown.**

705.01 Guardrail

Furnish ~~metal~~ steel beam and cable guardrail materials in accordance with the contract. **Manufacturers of steel beam guardrail must be listed on the QPL.**

Reason: require manufacturers be listed on the QPL.

Comments:

*Final Draft: **No changes to the draft spec; published as shown.***

706.04. Treated Timber and Lumber**706.04.01 Treating**

Furnish timber and lumber that is pressure treated meeting the preservative retention and penetration requirements found in AWPA Standards U1 and T1, Commodity Specification A, B or D, use category 4A, appropriate for the application of material.

Use one of the following preservatives:

5) 4,5-Dichloro-2-N-Octyl-4-Isothiazolin-3-One (DCOI) meeting AWPA Standard P39.

Reason: Add the approved use.

Comments: MCA commented that Pentachlorophenol is banned from the U.S. Upon follow-up, Penta is not currently banned and is still an acceptable treatment.

Final Draft: additions to the proposed draft are as follows:

703.14 CLASS 4 TREATED TIMBER POLES

Furnish the pole length and place as specified in the contract.

Furnish ANSI Class 4 poles as specified in the contract. **Pressure treat poles in accordance with Subsection 706.04.1.** ~~Pressure treat poles with Ammoniacal Copper Zinc Arsenate (ACZA) or Chromated Copper Arsenate (CCA), a 5% solution of pentachlorophenol or copper naphthenate (CuN) in accordance with AWPA Standards and Commodity Specification D and use Category 4A.~~

706.04.01 Treating

Furnish timber and lumber that is pressure treated meeting the preservative retention and penetration requirements found in AWPA Standards U1 and T1, Commodity Specification A, B or D, use category 4A, appropriate for the application of material.

Use one of the following preservatives:

5) 4,5-Dichloro-2-N-Octyl-4-Isothiazolin-3-One (DCOI) meeting AWPA Standard P39.