

This Document is for informational purposes only.

“Standard and Supplemental Specifications for Road and Bridge Construction 2020 Edition V3.1 ” can be found at the following link:

<https://www.mdt.mt.gov/other/webdata/external/const/specifications/2020/SPEC-BOOK/2020-SPEC-BOOK-V3-1.pdf>

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NO CHANGES TO THE PROPOSED DRAFT FINAL ACCEPTANCE

105.08.2 Contractor Survey and Layout

1. **Staking.** Set all stakes necessary to control all work under the contract. This includes, but is not limited to:

1. Bridges
2. Centerline stations
3. Clearing limits
4. Drainage structures
5. Fencing
6. Final pavement markings configuration and locations
- 5-7. Guardrail terminal sections
8. Pavement
- 6-9. Pipe length
- 7-10. Reference points
- 8-11. Retaining structures
12. Right-of-way lines and monuments
- 9-13. Sewers and waterlines
14. Signs, pavement markings, guardrail
- 10-15. Structure excavation
- 11-16. Surfacing courses
- 12-17. Wetland delineation
- 13-18. Any other items of work included in the contract
- 14-19. Special conditions for specific layout items

Determine the slope stake catch point and ~~provide copies of~~ submit the slope staking notes to the Department. Replace any stakes that are obliterated by the Contractor or by construction activities. Do not begin grading operations until all slope stakes within a balance or at least 20% of the project have been set.

2. Signs. Take cross sections and profiles. Adjust sign locations to match existing field conditions. Submit the list of proposed sign lengths to the Project Manager. Profiles, cross sections, adjustments, and signpost lengths must be reviewed by the Project Manager before signposts are ordered.

REASON: Clarification

COMMENTS:

PROPOSED DRAFT

107.22 PROTECTION OF ARCHEOLOGICAL AND HISTORICAL FINDINGS

~~Before construction starts. Submit-submit~~ written evidence that no historic or pre-historic sites on or eligible for listing in the National Register of Historic Places are located ~~on property used for construction activities that are outside of the Department obtained right of way, easements, material sites, or other~~ within contractor responsible areas ~~designated in the contract before construction starts. These areas include but are including but~~ not limited to staging areas, ~~Contractor contractor~~ furnished material sites, or other related areas ~~to be used for the work.~~

Submit the legal descriptions, the area involved, a description of the work activity, a site plan, a description of the ground surface of all sites not included in the contract plans to Project Manager for coordination with Department cultural staff. Within 10 business days, the Department will notify the Contractor if the presence of or potential for cultural resources exists in the areas and ~~recommend~~ determine if a professional cultural resource survey is needed ~~or not needed~~. If a survey is not ~~recommended~~ required, no further cultural resource work is ~~required~~ necessary.

If a cultural resource survey is ~~recommended~~ required, the Contractor must hire a professional cultural resource contractor to perform a survey. A directory of cultural resource contractors is available from the Department Archeologist.

If the survey does not identify any historic or pre-historic site within the area of proposed disturbance, the Department will issue a notice to proceed with-for the work. If the cultural resource contractor or the Department identifies any historic or pre-historic sites within the proposed area of disturbance, the Department, in concert with SHPO will determine whether the site(s) may be eligible for listing in the National Register of Historic Places.

Choose one of the following options if a site is eligible:

A1. Do not use or disturb the ~~proposed~~ area within the eligible site.

B2. Request the Department to proceed with the steps to comply with 36 CFR 800. Use a professional cultural resource contractor to perform all field work, surveys, etc. required to complete the process identified by the Department. No additional compensation or delay considerations are allowed under these requirements.

Immediately stop work if suspected archeological ~~or~~ historical artifacts, or human remains are encountered within the Department Right-of-Way. Immediately notify the Project Manager of the find. The Project Manager will stake the area to remain undisturbed until further notice.

REASON: Spec Update

COMMENTS:

FINAL ACCEPTANCE

107.22 PROTECTION OF ARCHEOLOGICAL AND HISTORICAL FINDINGS

~~Before construction starts. Submit-submit~~ written evidence that no historic or pre-historic sites on or eligible for listing in the National Register of Historic Places are located on property used for construction activities that are outside of the Department ~~obtained~~ right of way, ~~easements, material sites, or other areas designated in the contract before construction starts. These areas include but are not limited to staging areas, Contractor furnished material sites, or other related areas to be used for the work.~~

Submit the legal descriptions, the area involved, a description of the work activity, a site plan, a description of the ground surface of all sites not included in the contract plans to the Project Manager for coordination with Department cultural staff. Within 10 business days, the Department will notify the Contractor if the presence of or potential for cultural resources exists in the areas and ~~recommend~~determine if a professional cultural resource survey is needed ~~or not needed~~. If a survey is not ~~recommended~~required, no further cultural resource work is ~~required~~necessary.

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Choose one of the following options if a site is eligible:

A1. Do not use or disturb the ~~proposed~~area within the eligible site.

B2. Request the Department to proceed with the steps to comply with 36 CFR 800. Use a professional cultural resource contractor to perform all field work, surveys, etc. required to complete the process identified by the Department. No additional compensation or delay considerations are allowed under these requirements.

Immediately stop work if suspected archeological ~~or~~, historical artifacts, or human remains are encountered. Immediately notify the Project Manager of the find. The Project Manager will stake the area to remain undisturbed until further notice.

NO CHANGES TO THE PROPOSED DRAFT FINAL ACCEPTANCE

108.03.2 Project Schedules

2.3._____ Schedule Requirements. Submit schedules that include:

m. Adjustments to activity durations and production rates to account for weather.

Use only contractual constraints in the schedule logic.

Float is defined as the amount of time between when an activity “can start” and when it “must start”. Total float is float shared with all other activities and is defined as the amount of time an activity can be delayed without affecting the overall time of project completion. Float is a shared commodity, not for the exclusive use or financial benefit of either party. Either party has the full use of float until it is depleted. Schedules with negative float will not be accepted unless otherwise approved by the Project Manager.

The critical path is defined as the longest continuous sequence of activities through the network schedule that establishes the minimum overall project duration. The submitted activity sequence and durations must generate a CPM schedule having a critical path, using the longest path method, with zero float. Keep multiple critical paths and near-critical paths to a minimum. Describe multiple critical paths and near-critical paths with thorough and reasonable justification in the written narrative.

REASON: Project milestones, constraints, calendars, or other methods should be utilized to show zero or positive float, thus keeping the software from forcing activities to show as critical when they otherwise would not be. Time extension requests and LD calculations requirements would not be affected by this change.

COMMENTS:

**NO CHANGES TO THE PROPOSED DRAFT
FINAL ACCEPTANCE**

108.08 FAILURE TO COMPLETE ON TIME

**TABLE 108-4
SCHEDULE OF LIQUIDATED DAMAGES**

ORIGINAL CONTRACT AMOUNT		DAILY CHARGE
From More Than	To and Including	Working Day or Calendar Day
\$ 0	\$ 50,000 <u>150,000</u>	\$ 1,206 <u>1,244</u>
\$ 150,000 <u>50,000</u>	\$ 400,000 <u>500,000</u>	\$ 1,344 <u>1,599</u>
\$ 400,000 <u>500,000</u>	\$ 300,000 <u>1,000,000</u>	\$ 1,497 <u>1,992</u>
\$ 300,000 <u>1,000,000</u>	\$ 900,000 <u>1,500,000</u>	\$ 1,880 <u>2,198</u>
\$ 900,000 <u>1,500,000</u>	\$ 4,500,000 <u>3,000,000</u>	\$ 2,450 <u>2,828</u>
\$ 4,500,000 <u>3,000,000</u>	\$ 3,000,000 <u>4,500,000</u>	\$ 2,528 <u>3,037</u>
\$ 3,000,000 <u>4,500,000</u>	\$ 5,000,000 <u>7,000,000</u>	\$ 2,778 <u>3,303</u>
\$ 5,000,000 <u>7,000,000</u>	\$ 8,000,000 <u>11,500,000</u>	\$ 3,468 <u>4,031</u>
\$ 8,000,000	\$ 12,000,000	\$ 3,587
\$ 12,000,000 <u>11,500,000</u>	—	\$ 3,858 <u>4,273</u>

REASON: The Federal Highway Administration (FHWA) requires MDT to establish specific liquidated damages rates applicable to projects. The rates are subject to FHWA approval and must be reviewed by MDT every 2 years. (Last updated in 2020)

COMMENTS:

**NO CHANGES TO THE PROPOSED DRAFT
FINAL ACCEPTANCE**

304.02.1 Cement

Furnish Type I or II portland cement listed on the [QPL](#), in accordance with Subsection [551.02.1](#). Blended hydraulic cement that conforms to one of the following may be substituted:

AASHTO M 240 [Type IL](#), Type IP, or Type IP (MS)

ASTM C1157 Type GU or Type MS

REASON: Allow the use of Type IL cement. (Portland-Limestone Cement)

COMMENTS:

NO CHANGES TO THE PROPOSED DRAFT FINAL ACCEPTANCE

501.02.1 Concrete

Furnish concrete in accordance with Section [551](#) for Class Pave concrete.

1. **Cement.** Furnish Type I, II, V, [IL](#), IS, IP, or IT portland cement listed on the [QPL](#), in accordance with Subsection [551.02.1](#).

REASON: Allow the use of Type IL cement. (Portland-Limestone Cement)

COMMENTS:

NO CHANGES TO THE PROPOSED DRAFT FINAL ACCEPTANCE

552.03.4 Placing Concrete

A. General. Schedule a pre-placement meeting to be held 2-14 days before the first deck or deck overlay concrete placement. The minimum required attendees are the superintendent, concrete foreman, concrete supplier, other contractor personnel that will supervise the concrete placement operations, and key Department inspection personnel. The purpose of the meeting is to review specification requirements, lines of communication, ~~discuss the placement plan, quality control, safety, sampling, and review the Bridge Deck Pre-Placement Agenda.~~

Transport and place concrete in accordance with Subsections [551.03.4](#) and [551.03.5](#) respectively.

REASON: A meeting to discuss the placement plan, quality control, safety, sampling, and review the Bridge Deck Placement Agenda, etc. In the past this requirement was by special provision.

COMMENTS:

PROPOSED DRAFT

552.03.12 Installation of Expansion and Contraction Joints

Construct expansion and contraction joints in accordance with the contract. Use methods and sequencing that prevent stress to joint header concrete resulting from thermal expansion/contraction of bridge span(s).

- C. Steel Joints.** Fabricate and paint the joints as specified. Ensure that the surface in the finished plane is true and free of warping.

Hold joints in the correct position during concrete placement.

Use the openings at expansion joints shown in the contract, correcting for installation temperature. Maintain the required clearance.

Release horizontal joint restraint mechanisms prior to bridge span thermal movement.

Provide sufficient support of the joint member within the slab to prevent settling or other undesirable movements from occurring after release.

FINAL ACCEPTANCE

552.03.12 Installation of Expansion and Contraction Joints

Construct expansion and contraction joints in accordance with the contract. Use methods and sequencing that prevent stress to fresh joint header concrete resulting from thermal expansion/contraction of bridge span(s).

- C. Steel Joints.** Fabricate and paint the joints as specified. Ensure that the surface in the finished plane is true and free of warping.

Hold joints in the correct position during concrete placement.

Use the openings at expansion joints shown in the contract, correcting for installation temperature. Maintain the required clearance.

Release horizontal joint restraint mechanisms prior to bridge span thermal expansion/contraction.

Provide sufficient support of the joint member within the slab to prevent settling or other undesirable movements from occurring after release.

REASON: To prevent stress to joint header concrete.

COMMENTS:

PROPOSED DRAFT

552.03.17 Loading of Piers and Abutments

Do not place any superstructure load on finished bents, piers, or abutments until approved. The minimum ~~requirement time~~ before any superstructure load is placed on the substructure is 80% of the specified design strength or 7 days, unless otherwise approved.

REASON: If 80% of the specified design strength is achieved before the 7 day time frame, work is allowed to continued

COMMENTS:

FINAL ACCEPTANCE

Do not place any superstructure load on finished bents, piers, or abutments until approved. Substructures must meet the minimum requirement of 80% of the specified design strength or 7 calendar days, unless otherwise approved.

**NO CHANGES TO THE PROPOSED DRAFT
FINAL ACCEPTANCE**

603.03.1 General

The locations and pipe lengths shown in the contract are an estimate only and may be revised. Order pipe using only the Project Manager furnished list of ~~sizes and~~ lengths.

REASON: The size (diameter) of pipe is from the plan sheets.

COMMENTS:

NO CHANGES TO THE PROPOSED DRAFT FINAL ACCEPTANCE

603.03.4 Backfilling

- A. **General.** Backfill material is placed above the bedding material and around the exposed pipe. Use backfill material free of sticks, sod, frozen soil, or other deleterious matter. Do not permit stones, rocks, chunks of broken concrete, or other material larger than 3 inches (75 mm) within the top 2 feet (610 mm) of the top and sides of water and sanitary sewer lines and within 1-foot (305 mm) of the pipe top and sides for all other installations.

REASON: Clarification

COMMENTS:

NO CHANGES TO THE PROPOSED DRAFT

FINAL ACCEPTANCE

612.03.1 Submittals

B. Environmental Pollution Controls.

1. **Containment.** Design a containment system in accordance with the Society for Protective Coatings (SSPC) Guide 6, *Class Guide for Containing Debris Generated during Paint Removal* requirements except that permeable wall materials cannot be used. The containment system may be located on or off the project site.

Submit shop drawings and design calculations for containment systems attached to the structure. Include design calculations that address all load conditions on the structure resulting from the containment system including debris. Specify ventilation and negative pressure equipment capacity, layout, and related calculations. The structural design of ~~the~~ containment systems attached to the structure must be ~~designed and~~ stamped by a professional engineer registered and licensed to conduct engineering in the State of Montana.

612.03.5 Weather Conditions

Apply paint using manufacturer's recommendations for temperature (air, substrate and paint material), dew point and relative humidity or as follows, whichever is more restrictive.

Do not apply paint when ambient temperature is at or expected to drop below 40 °F (4 °C) within 2 hours. Do not apply paint when rain, snow or condensation is expected within 2 hours after application at the location where paint is applied. Do not apply paint when the ~~relative humidity is greater than 85% or when~~ temperature and humidity cause condensation on the surface to be painted. Do not apply paint to metal with surface temperatures over 110 °F (43 °C) or when the surface temperature causes the paint to blister or produce a porous paint film.

612.03.7 Inspection Equipment, Quality Assurance and Lighting

Inspection Equipment. ~~Furnish~~ Have available the minimum following equipment for the QC/QA observations of the cleaning and painting operations. Maintain, calibrate, and verify the equipment in a condition that is satisfactory to the Project Manager. ~~The equipment will remain the property of the Contractor at the conclusion of the Contract.~~

19. Measuring tape and stick/pole to measure platform under clearance. The stick/pole must be collapsible and have a minimum measuring height for the required clearance established by the MDT.

612.03.8 Quality Control (QC) Plan, Inspection Procedures, and Recording Systems

QC Inspectors. A Contractor provided QC inspector must be on site full time during cleaning and painting operations. Provide documentation that personnel performing quality control related functions are experienced and qualified to perform the work and have completed ~~the training through The AMPP CIP level 1 certification or equal. (Formerly NACE/SSPC), Minimum SSPC PCI Level 1 or NACE CIP Level 1.~~

REASON: Changes based off late comments received for Spec Book V3.0

NO CHANGES TO THE PROPOSED DRAFT FINAL ACCEPTANCE

620.03.6 Interim Pavement Markings

Interim pavement markings consist of all longitudinal striping (centerlines, edge lines ~~(shoulder lines)~~, lane lines, etc.) and words and symbols identical to the final pavement marking configuration. Use the material specified in the contract.

Apply interim pavement markings no later than 10 calendar days after the application of temporary striping ~~on intermediate lifts, and before opening to traffic on top lift~~. Do not apply interim pavement markings when the ambient air temperature is lower than 40 °F (4 °C).

~~Stripe newly constructed pavements, including partially completed sections.~~ 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.

REASON: To allow temp striping to be used on top lift until interim pavement markings can be applied.

COMMENTS:

NO CHANGES TO THE PROPOSED DRAFT FINAL ACCEPTANCE

620.03.7 Final Pavement Markings

Apply final pavement markings a minimum of 30 calendar days, and a maximum of 45 calendar days for the following:

1. After concrete is placed.
2. After microsurfacing operations.
3. New asphalt pavement that will not receive a surface treatment.
4. After seal coat operations through initial sweeping are completed.

Fog sealed surfaces must be free of excess asphalt emulsions and oils.

When final pavement markings are the only remaining item of work on the project, contract time assessment will be suspended for 45 days calendar or until either beginning final pavement marking applications, whichever is less.:

- ~~5. Beginning final pavement markings application, or~~
- ~~B. 45 calendar days elapse after seal coat operations are completed, or~~
- ~~C. Microsurfacing operations completed, or~~
- ~~D. New asphalt pavement that will not receive a surface treatment is completed, or~~
- ~~E.B. Concrete placement is completed.~~

REASON: Clarification, the intent of the spec is not changing.

COMMENTS:

NO CHANGES TO THE PROPOSED DRAFT FINAL ACCEPTANCE

624.03.3 Submittals

For all employees who will be welding on Department projects and who may have obtained certifications, submit ~~4 copy of~~ certification records and continuity information to the Project Manager ~~at least 30 calendar days prior to that~~ in accordance with the Table of Contractor Submittals, individual welding. Include the following information:

REASON: To not have duplicate information in both the Table of Contractor Submittals and the Spec book.

COMMENTS:

NO CHANGES TO THE PROPOSED DRAFT FINAL ACCEPTANCE

701.04.2 Foundation Material

Foundation material is one or more aggregate material courses to provide a stable foundation for culvert and drainage structure installations in unstable areas.

Use shot rock, pit-run aggregate, crushed aggregate, or any combination of these materials. The largest rock or rock fragment allowed may be as great in dimension as the thickness of the lift being placed. In the top 1-foot (305 mm) of the foundation, the largest rock or rock fragment cannot exceed 8 inches (200 mm). Use well-graded material in the top 1-foot (305 mm) of foundation material. ~~A maximum 40% by weight of the foundation material must pass a~~ Not more than 40% by weight of the foundation material can pass the No. 4 (4.75 mm) sieve.

REASON: Clarification.

COMMENTS: .

**NO CHANGES TO THE PROPOSED DRAFT
FINAL ACCEPTANCE**

711.14 ELASTOMERIC BEARING DEVICES

Furnish elastomeric bearings listed on the QPL, and in accordance with AASHTO M 251, and the contract. For reinforced elastomeric devices, furnish steel laminates in accordance with AASHTO M 270 Grade 36 or ASTM A1011.

REASON: Required to be on the QPL list.

COMMENTS:

NO CHANGES TO THE PROPOSED DRAFT FINAL ACCEPTANCE

711.18 MECHANICAL REBAR CONNECTORS

Furnish any type mechanical connector meeting a yield strength minimum of 125% of the reinforcement and be of a type commonly used and readily available. Splice ~~epoxy-coated~~ reinforcement with ~~epoxy-coated~~ mechanical connectors of the same material properties and finish.

REASON: The Departments recent expanded use of other corrosion resistant rebar types.

COMMENTS:

NO CHANGES TO THE PROPOSED DRAFT FINAL ACCEPTANCE

713.11 SOD

Furnish commercially manufactured sod that is a living, vigorous growth of grass of the type and thickness specified.

Sod that shows signs of stress from mishandling or lack of water will be rejected.

Provide sod adapted to the general locality of the project, having a dense root system, is free of noxious weeds, and other foreign substances harmful to the development and maintenance of the sod.

Furnish a product data sheet ~~to the Project Manager that~~ in accordance with the Table of Contractor Submittals specifying the origin of the sod.

REASON: To not have duplicate information in both the Table of Contractor Submittals and the Spec book.

COMMENTS:

NO CHANGES TO THE PROPOSED DRAFT FINAL ACCEPTANCE

714.07.4 Physical Requirements

- Reflectivity.** Meet the reflective values listed in Table 714-5. Reflective values are measured ~~on a 2 x 2½-foot (610 x 762 mm) panel~~ in accordance with ~~the instrumental photometric measurements of retro-reflective materials and retroreflective devices, Federal test method Standard 370, ASTM E1710.~~

TABLE 714-5

~~MINIMUM SIA⁴ (CANDELAS PER FOOTCANDLE PER SQUARE FOOT (m²))~~
~~MILLICANDELAS PER SQUARE METER PER LUX~~
PLASTIC PAVEMENT MARKING MATERIAL

Observation Angle	Entrance Angle	White	Yellow
0.21.05°	8688.76°	0.20 (2.1)500	0.15 (1.6)300
0.5°	86°	0.15 (1.6)	0.10 (1.0)

REASON: Outdated measurement geometry, the testing equipment is no longer available for Standard 370.

COMMENTS:

NO CHANGES TO THE PROPOSED DRAFT FINAL ACCEPTANCE

622.02.3 ~~Sampling~~Reserved

~~Cut a sample from the geotextile roll with the minimum dimensions of 4 feet (1.2 m) by the full width of the roll beyond the first wrap. After the sample and the required information have been submitted to the Project Manager, allow 30 calendar days for evaluation.~~

GEOTEXTILES

~~. Furnish Geotextile Mmaterials listed on the QPL.~~

716.01 GENERAL PHYSICAL REQUIREMENTS

716.02 SEPARATION GEOTEXTILE

~~Do not use woven slit film geotextiles (i.e. geotextiles made from yarns of a flat, tape-like character).~~ Provide geotextile in accordance with the strength requirements from Table [716-1](#) for the level of survivability specified in the contract or special provisions. Provide geotextile in accordance with the permittivity, apparent opening size, and ultraviolet stability requirements of Table [716-2](#).

REASON Required to be on the QPL list.

COMMENTS:

NO CHANGES TO THE PROPOSED DRAFT FINAL ACCEPTANCE

SECTION 401

PLANT MIX SURFACING

401.01 DESCRIPTION

This work is producing, furnishing, placing, and compacting plant mix asphalt pavement.

Plant mix pavement is 1 or more courses of plant mixed aggregate, hydrated lime, chemical additive if used, and bituminous material, ~~constructed-placed, and compacted~~ on a prepared foundation.

Warm mix surfacing (warm mix) is plant mix surfacing which has been modified with additives or processes that allow a reduction in the temperature at which plant mix surfacing is produced, ~~and placed, and compacted.~~

401.02 MATERIALS

Provide aggregate from sources meeting the Section [106](#) requirements.

The Contractor is responsible for all sampling, ~~quality control~~ testing, and control of the aggregate. Furnish the Project Manager the quality control test results upon request.

Ensure that the aggregate, when combined at the job mix formula (JMF), meets Table [701-15](#), and Subsection [701.03.1](#).

401.02.1 Aggregate

Meet aggregate requirements in accordance with Subsection [701.03](#).

For commercial ~~and non-commercial~~ mix, when no aggregate size is specified, use either ½-inch (12.5 mm) or ¾-inch (19 mm) nominal aggregate sizes.

When ¾-inch non-commercial plant mix is specified, the Contractor may request to substitute ½-inch non-commercial plant mix for the ¾-inch non-commercial plant mix prior to submitting a mix design. The Department will execute a no cost change order replacing the ¾-inch plant mix item with the ½-inch plant mix item.

401.02.2 Hydrated Lime

Furnish hydrated lime ~~from a supplier listed on the Department's QPL and~~ in accordance with Subsection [713.02](#).

~~Sample fillers and hydrated lime in accordance with~~ **Error! Hyperlink reference not valid.-**

401.02.4 Additives for Warm Mix

Comply with the warm mix technology manufacturer's recommendations for incorporating additives and/or processes when producing warm mix. Comply with manufacturer's recommendations regarding receiving, storage, and delivery of warm mix additives. Mix warm mix at a minimum temperature of 220 °F (104 °C) and within the range recommended by the manufacturer and approved by the Department. Use asphalt additives listed on the [QPL](#) ~~for the production of to produce~~ warm mix.

401.02.5 Binder Replacement

A portion of the asphalt binder may be obtained from either RAP and/or recycled asphalt shingles (RAS). Do not use RAS when producing warm mix. Inclusion of recycled materials will be evaluated by “percent binder replacement”, defined as the ratio of the recycled binder to the total binder. Meet the requirements of the Table 401-1.

**TABLE 401-1
MAXIMUM ALLOWABLE PERCENT BINDER REPLACEMENT**

Recycled Material	Replacement Allowed	
	Lower Layers	Upper Layer (top 0.15-feet)
RAS (used alone)	15	15
RAP	35	25
RAP and RAS (combination) ¹	25	25

Note 1: When using RAS in combination with RAP, ensure the RAS does not exceed 3% by weight of the total aggregate blend.

If binder replacement is included in the job mix formula and the final mix, meet all of the plant mix requirements. Utilize separate stockpiles and feeds for each recycled component.

It is recommended that at least 2 separate RAP stockpiles be produced.

Furnish RAS in accordance with AASHTO MP 23-145. The specific gravity of the RAS may be obtained in accordance with AASHTO PP-78R 114. If RAS is used, meet the requirements of Table 401-2:

401.03.1 Mix Design

Submit to the Project Manager ~~4 copies of an plant asphalt~~ mix design following AASHTO R 35 and meeting AASHTO M 323, as modified in section 701. Use form MDT-MAT-009 as a mix design cover sheet. Ensure all fields are completed. The mix design and cover sheet may be submitted electronically. Mix designs submitted without the cover sheet or submitted with a cover sheet that doesn't contain all the applicable information will be rejected. Include the asphalt binder supplier's recommended mixing and compaction temperature ranges. This compaction temperature range is for testing purposes only. Choose the design air voids target to be the lowest value, within the range of 3.4 to 4.0, as long as ensuring all other criteria are met. Report the dust-asphalt ratio (D/A) for the target asphalt content. The mix design is to be produced on a total weight of mix basis. On contracts with multiple gravel sources, or combination of gravel sources, provide a mix design and meet all the requirements for each source or combination of sources and suppliers. For mix designs using binder replacement, furnish the asphalt content and gradation of each recycled component and furnish the total asphalt content and Job Mix Formula gradation including the RAP/RAS. Furnish all specific gravities.

Furnish samples of material from each stockpile, ~~ensure~~ Ensure samples represent the stockpiles and mix design to be used on the project, including any recycled materials (RAP/RAS). Provide at least 800 pounds of aggregate, which can be appropriately proportioned to match the mix design and JMF according to MT 336. If the aggregate submitted cannot be appropriately proportioned to the submitted JMF, the mix design will be ~~rejected~~ rejected, and the mix design verification process will start over. A total weight of 600 pounds (272 kg) is allowed if the mix design includes Hamburg testing results. Furnish 5 gallons (19 L) of the specified asphalt binder or indicate consent to use binder of the same source and grade

provided from the Department's supply. Furnish 5 pounds (2.27 kg) of hydrated lime or indicate consent to use lime of the same source provided from the Department's supply.

The Department has 30 calendar days from receipt of the mix design materials and signed mix design documents to review/verify the mix design. Mix design verification consists of:

- ~~Ensuring-Verifying~~ less than 13.0 mm of rut at 15,000 passes during Hamburg testing;
- A review of the submitted mix design documents to ensure all applicable design and aggregate requirements have been met;
- Testing of the submitted aggregate for conformance with Subsection 701.03.

Hamburg test results may be submitted with the mix design. Ensure Hamburg testing is done in accordance with MT 334. The Department reserves the right to verify any Hamburg results.

Use AASHTO T 283 to determine the mixture resistance to moisture induced damage, modified to compact the 6-inch (150 mm) diameter specimens to 3.75 inches ± 0.20-inch (95 mm ± 5 mm), at 7 ± 1.0% air voids. Meet a tensile strength ratio of 0.7 or greater.

Tensile strength ratio test results do not have to be submitted with the signed mix design documents but must be received and reviewed before a mix design will be considered verified.

If the Department does not complete its review/verification within 30 days, -Ccontract time will be extended for the actual contract time the Contractor's paving start date was delayed, as verified by their most recent submitted schedule, and only for contract time assessed after the 30-day verification time frame. No additional compensation is allowed for these Department-caused delays. Contract time will not be extended if the delay occurs between November 1st and April 15th.

~~Use AASHTO T 283 to determine the mixture resistance to moisture induced damage, modified to compact the 6-inch (150 mm) diameter specimens to 3.75 inches ± 0.20-inch (95 mm ± 5 mm), at 7 ± 1.0% air voids. Meet a tensile strength ratio of 0.7 or greater.~~

A change in the asphalt supplier or aggregate source(s) will not require a new mix design, provided no change in the established job mix targets is requested, and the aggregate and Hamburg requirements are met. Furnish QC data for review and/or material samples for testing as requested by the Department. If a change in the asphalt supplier or aggregate source is requested after original mix design verification by the Department but before production begins, a new mix design is not required however targets must be set before laydown operations begin and all mix will be considered production mix. During start up, establish job mix targets immediately if changing asphalt supplier or aggregate source prior to setting initial targets on non-commercial mix projects. For commercial mix, any mix produced after a change in supplier will be considered production mix and subject to full disincentives. Provide the apparent and bulk dry specific gravities and absorption for the aggregate, and the specific gravity for asphalt cement when there are changes in the source(s).

In the event a stockpile from the original aggregate source is depleted during production and the stockpile is replenished by additional crushing from the original source, furnish aggregate QC data for review and submit aggregate samples as requested by the Department. If the crusher used for the additional aggregate must be mobilized to perform additional crushing, cease all paving operations until enough aggregate has been crushed to finish production. The Department reserves the right to require re-verification testing, or a new mix design based on a

review of the submitted QC data and Department aggregate test results. Any paving after stockpile depletion and before the Department's review is at the Contractor's risk.

In lieu of developing a new mix design, a previous Department verified mix design may be requested for transfer. To be eligible for transfer, ~~the a transferred~~ mix design must:

- utilize the same material ~~constituents~~properties,
- the material properties must come from the same sources,
- the material properties must be ~~and~~ in the same proportions as the original mix design, and
- the mix design must have been verified or re-verified within three years prior to the transfer request.

Any request for transfer must be made at least 10 business days in advance of paving. Mix design transfers will not be considered if the design traffic warrants different mix design criteria. Approval for transferring a mix design is at the discretion of the Department and may require Hamburg testing or aggregate consensus properties re-verification. Proposed transfers with variations to the original mix design such as asphalt supplier, binder grade, or other factors such as changes to the crushing operation which could create uncertainty in the performance of the mix design will be subject to re-verification testing. When submitting a request for a mix design transfer, furnish quantities from each stockpile to produce a 300-pound (136 kg) sample if the Department determines Hamburg or aggregate consensus properties~~testing~~ re-verification is necessary. Submit form MDT-MAT-009 with any mix transfer request.

401.03.2 Hamburg Wheel Track (Hamburg) Testing and Acceptance

A. Hamburg Testing. Furnish plant mix that complies with subsection 401.03.2(B). Furnish a sample of plant mix surfacing material for Hamburg acceptance after initial job mix targets have been established for non-commercial mix and as directed for commercial mix. Furnish additional samples as directed by the Project Manager. The Department may require Hamburg samples at any time. Hamburg samples may be run on the applicable gyratory pucks and/or in-place mix represented by the pucks. At the time of initial target set the Department will perform Hamburg testing on the applicable gyratory pucks first as a screening tool. If Hamburg results from the gyratory pucks meet the specifications the material is considered acceptable, and paving may continue. If Hamburg results from the gyratory pucks do not meet specifications, the Department will perform Hamburg testing on representative in-place mix using 6-inch or 10-inch cores. If Hamburg results from the representative cores meet specifications the material is considered acceptable and paving operations may continue. If Hamburg results from the representative cores do not meet specifications the material is considered unacceptable and will be evaluated according to 401.03.2(B). Hamburg test results for the initial target set will be furnished to the Contractor within 7 business days. Hamburg test results in all other cases will be furnished to the Contractor as soon as they are available.

~~If plant mix exceeds 13.0 mm of rut in 10,000 passes during production Hamburg testing, make adjustments to produce plant mix meeting the requirements specified in the contract. After a failing Hamburg no more than 300 tons (300 MT) of plant mix may be produced until passing Hamburg results are received.~~

~~When 2 consecutive Hamburg samples do not meet the requirements, suspend production and submit a revised mix design and samples for verification and Hamburg testing. The~~

~~initial mix design requirements will be used for verification. Do not resume production until the revised mix design is verified and Hamburg mix design requirements are met. Plant mix lots represented by samples that do not meet Hamburg specifications are not eligible for QA incentives including ride and density incentives. Remove and replace any plant mix represented by a failing Hamburg test. Plant mix removal and replacement is at no cost to the Department.~~

B. Hamburg Acceptance. Furnish plant mix that does not exceed 13.0 mm of rut within 10,000 passes during production Hamburg testing. Plant mix that exceeds 13.0 mm of rut within 10,000 passes is considered failing material. Remove and replace failing material, as directed, at Contractor expense. The Department may take additional Hamburg samples to determine the extent of the failure and the amount of material to be removed and replaced. Adjust operations to produce plant mix meeting specifications after a failing Hamburg test and produce no more than 300 tons (300 MT) of plant mix until passing Hamburg results are achieved. When 2 consecutive Hamburg samples do not meet specifications suspend production and submit a revised mix design and samples for verification and Hamburg testing. The initial mix design requirements will be used for verification. Do not resume production until the revised mix design is verified and Hamburg mix design requirements are met. Plant mix lots represented by samples that do not meet Hamburg specifications are not eligible for QA incentives including ride and density incentives. Plant mix removal and replacement is at no cost to the Department.

~~B.~~ At the Department's discretion, failing material may be left in place at a reduced price according to the criteria listed below. In these situations, the Department will evaluate and consider volumetric and density test results as well as applicable pavement design criteria to determine an acceptable course of action.

- ~~3.4.~~ For PG 70-XX binder grades on NHS routes:- Plant mix exceeding 13.0 mm of rut depth within 10,000 passes during production Hamburg testing is considered failing material. Remove and replace any plant mix represented by a failing Hamburg test.
5. For PG 70-XX binder grades not on NHS routes and A all other PG Grades: -
The number of wheel passes ~~reached~~ when the rut depth reaches 13.0 mm will be used to determine the reduced price pay factor. The pay factor for the material represented by each test is determined from Table 401-3:
6. For the following areas, materials represented by Hamburg tests exceeding 13.0 mm of rut between 6000 and 8000 passes may remain in place at a 0.5 pay factor:
 - Roadway shoulders, if the entire width of the paver pass occurred within the width of the shoulder.
 - Plant mix layers below 0.25 feet from the finished surface of plant mix.
7. Remove and replace all plant mix exceeding 13.0 mm of rut in less than 6000 passes.
8. Non-vehicular paths (bicycle, pedestrian, or shared use) are not subject to Hamburg testing.

**TABLE 401-3
HAMBURG TESTING PAY FACTORS**

PG 58-XX and 64-XX	
# of wheel passes	Pay factor
$x \geq 10,000$	PF = 1.0
$10,000 > x \geq 8,000$	$PF = 1.00 - \frac{0.50(10000 - x)}{2000}$
$x < 8,000$	PF = 0, Remove and Replace ⁴

Note 1: In the areas listed below, material represented by Hamburg tests exceeding 13.0 mm of rut between 6,000 and 8,000 passes, may remain in place at a 0.5 pay factor:

- ~~Bicycle, pedestrian, or shared use (non-vehicular) paths~~
- ~~Roadway shoulders, only if the entire width of the paver pass occurred within the width of the shoulder.~~
- ~~Lower layers below 0.25 feet from the finished surface of plant mix.~~
- ~~Remove and replace plant mix exceeding 13.0 mm of rut in less than 6,000 passes.~~

~~Table 401-3 is not applicable if the entire plan thickness section of plant mix is not completed prior to winter suspension. Table 401-3 does not apply and all mix will be evaluated in accordance with Subsection 401.03.2(B)1.~~

401.03.3 Test Procedures

Plant mix will be evaluated in accordance with the following test procedures:

[MT 303](#) - Sampling Bituminous Materials

AASHTO T 166 - Method of Test for Bulk Specific Gravity of Compacted Bituminous Mixtures

[MT 319](#) - Ignition Oven Burn Procedure

[MT 320](#) - Gradation of Aggregate Recovered by [MT 319](#)

[MT 321](#) - Maximum Specific Gravity of Bituminous Mixtures (Rice Method)

[MT 328](#) - Method of Establishing Field Target Density for Plant Mix Surfacing Density Control

[MT 332](#) - Gyratory Compaction of Bituminous Mixtures

[MT 334](#) - Wheel Tracking Test Procedure (Hamburg Device)

[MT 336](#) – Method of Batching Asphalt Aggregate for Mix Design Verification

- B. Sampling.** Furnish samples of plant mix surfacing in accordance with [MT 601](#) as directed by the Project Manager. The Project Manager will randomly select when plant mix samples are taken. Sample in accordance with [MT 303](#). A Department Inspector will witness plant mix sampling. Furnish the sample to the Inspector immediately after it is

taken or, upon Project Manager directive, deliver the sample to the Department's designated test location after the Inspector seals the sample in a tamper proof container.

Plant mix sampling will begin as soon as plant mix is delivered to the project after the initial daily 100 tons (100 MT) of plant mix has been produced or when a hot plant is cleaned out and 100 tons (100 MT) of plant mix has been produced. No sampling delay will be permitted at any other time, unless approved by the Project Manager.

401.03.25 Approaches

Furnish the same plant mix surfacing and asphalt binder as specified in the contract for approaches. Produce plant mix in accordance with this Section 401. The Contractor has the option of providing submitting a plan for the use of non-polymer modified asphalt cement in plant mix surfacing for private approaches, sidewalks, parking lots, bike paths and other miscellaneous handwork not subject to mainline traffic. Provide Submit the plan to the Project Manager for approval a minimum of 7 calendar days prior to the scheduled start of the work. The plan must list the specific areas within the Right of Way R/W where the use of non-polymer modified asphalt cement is proposed. The Contractor may use the approved production mix design with non-polymer modified binder provided no changes are made to the gradation and no net cost increase is applied to the price of the plant mix surfacing. In lieu of using the approved production mix design, a previous Department verified mix design may be requested for transfer. The Department may direct the Contractor to revert to the use of modified asphalt at any time.

Non-modified asphalt will be paid at the invoice price plus freight under Miscellaneous Work for actual quantities used. Quality Assurance for non-modified asphalt will be tested on a separate lot basis.

1- Plant mix surfacing with non-modified asphalt cement will be paid at the unit bid price. Quantities of plant mix surfacing designated as "Miscellaneous" by contract line item will not be subject to lot by lot Quality Assurance evaluation.

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

401.04.3-4 Asphalt Cement

When not included in another item, asphalt cement is measured by the ton (MT) as specified to the nearest ton (MT), in accordance with Subsection [402.04](#), excluding anti-stripping additive.

401.04.4-5 Hydrated Lime

When not included in another item, hydrated lime is measured by the ton (MT) in accordance with Subsection [109.01](#). Hydrated lime exceeding 1.6% by total weight of mix is not measured for payment as hydrated lime.

401.04.5-6 Rumble Strips

Rumble strips are measured by the mile (km) along the centerline of the roadway, less all gaps in the rumble strips due to ramp terminals, objects, etc. Each individual line of rumble strips is measured separately.

Fog seal for rumble strips is not measured for payment.

401.04.6-7 Tack Coat

Tack coat is measured for payment in accordance with Subsection [407.04](#).

REASON Section update.

COMMENTS:

SECTION 618
TRAFFIC CONTROL
PROPOSED DRAFT

618.03.2 Traffic Control Plan

The [Detailed Drawings](#) and the MUTCD provide traffic control requirements for the contract.

1. **Traffic Control Plan Requirements.** ~~Submit a traffic control plan in accordance with the Table of Contractor Submittals. Furnish a traffic control plan addressing the proposed operations to take place a minimum of 2 weeks prior to beginning the associated construction activities.~~ Address the proposed operations and contingencies in the submitted plan. Deviations or modifications from the submitted traffic control plan may be made to address field conditions if approved by the Project Manager. Limit inconvenience to the traveling public as much as practicable and account for the safety of both the traveling public and project personnel. The Detailed Traffic Control Plan for the proposed activities must consist of the following:
 - a. **Contract Specific Drawings.** ~~Provide-Submit~~ contract specific traffic control drawings that include proposed traffic control configurations. Submit project specific traffic control plans on aerial overlays for intersection work, detours, diversions, crossovers, truck turn arounds, median crossings, interchanges, and other advanced traffic control elements. Provide traffic control aerial overlays for other traffic control elements when requested by the EPM. Provide drawings with the same level of detail as in the MUTCD and the [Detailed Drawings](#). Identify the type and location of work zone traffic control devices proposed for use.
2. **Traffic Control Plan Updates.** Submit an updated traffic control plan that represents proposed activities. If the traffic control plan previously provided to the Project Manager is current and changes to traffic control operations are not anticipated, provide written notification to the Project Manager of this information. Failure to submit an updated traffic control plan on time is cause for the Project Manager to stop-suspend work on the project and in the manner required renders the traffic control plan unacceptable. Submit updates to the traffic control plan to the Project Manager at the following times:

FINAL ACCEPTANCE

618.03.2 Traffic Control Plan

The [Detailed Drawings](#) and the MUTCD provide traffic control requirements for the contract.

1. **Traffic Control Plan Requirements.** ~~Submit a traffic control plan in accordance with the Table of Contractor Submittals. Furnish a traffic control plan addressing the proposed operations to take place a minimum of 2 weeks prior to beginning the associated construction activities.~~ Address the proposed operations and contingencies in the submitted plan. Deviations or modifications from the submitted traffic control plan may be made to address field conditions if approved by the Project Manager. Limit inconvenience to the traveling public as much as practicable and account for the safety of both the traveling public and project personnel. The Detailed Traffic Control Plan for the proposed activities must consist of the following:
 - a. **Contract Specific Drawings.** Provide contract specific traffic control drawings that include proposed traffic control configurations. Submit project specific traffic control plans on aerial overlays for urban areas. Provide traffic control aerial overlays for other traffic control elements when requested by the EPM Project Manager. Provide drawings with the same level of detail as in the MUTCD and the [Detailed Drawings](#). Identify the type and location of work zone traffic control devices proposed for use.
2. **Traffic Control Plan Updates.** Submit an updated traffic control plan that represents proposed activities. If the traffic control plan previously provided to the Project Manager is current and changes to traffic control operations are not anticipated, provide written notification to the Project Manager of this information. Failure to submit an updated traffic control plan on time is cause for the Project Manager to stop-suspend work on the project and in the manner required renders the traffic control plan unacceptable. Submit updates to the traffic control plan to the Project Manager at the following times:

PROPOSED DRAFT

618.03.4 Traffic Control Reviews

Designate personnel to be responsible for traffic control work and its continuous surveillance. The designees must be available 24 hours a day to respond to calls concerning damage to traffic control devices from any cause. Provide the names and telephone numbers of the persons responsible for the surveillance. The Project Manager may apply a \$1000 deduct due to designees not responding on site within 2 hours

The Project Manager and the designees will conduct periodic reviews of the traffic control throughout the work to ensure compliance with the traffic control plan. The reviews will be conducted at night, during adverse weather conditions, when construction work is active and inactive, and at other times as necessary.

FINAL ACCEPTANCE

618.03.4 Traffic Control Reviews

Designate personnel to be responsible for traffic control work and its continuous surveillance. The designees must be available 24 hours a day to respond to calls concerning damage to traffic control devices from any cause. Provide the names and telephone numbers of the persons⁴ designees at the pre-construction conference. Designees, upon notification of a traffic control issue, must respond to the project within 2 hours. ~~responsible for the surveillance.~~

The Project Manager and the designees will conduct periodic reviews of the traffic control throughout the work to ensure compliance with the traffic control plan. The reviews will be conducted at night, during adverse weather conditions, when construction work is active and inactive, and at other times as necessary.

NO CHANGES TO THE PROPOSED DRAFT

FINAL ACCEPTANCE

618.03.5 Traffic Control General Requirements

Meet all traffic control plan requirements before starting work affecting the roadway. Furnish and maintain traffic control devices that meet the “acceptable” category described in Quality Guidelines for Temporary Traffic Control Devices and Features published by ATSSA. Repair or remove and replace “marginal” devices with 24 hours; and repair or remove and replace “unacceptable” devices immediately. Anything in the worse-than-marginal conditions is not acceptable. Do not deliver devices in the “unacceptable” category to the jobsite.

Properly maintain, clean, and operate devices when in use. Immediately remove the devices when they are no longer applicable to the work.

Install traffic control devices in accordance with manufacturer’s recommendations or instructions.

Immediately remove or cover the entire sign face of non-applicable signs. Use coverings that are opaque, non-reflective, and securely fastened to eliminate visibility of the sign face. Cover signs with shapes having a specific meaning, such as STOP and YIELD, from both sides in a manner that masks the shape. Use materials of sufficient durability to resist deterioration due to weathering and atmospheric conditions. Do not use tape, paper, garbage bags, or cardboard for the covering. Do not rotate signs.

Remove **portable** traffic control devices when not in use.

Limit the number of portables towed at a single time as necessary for safe travel.

Immediately remove existing signs and other traffic control devices on the present traveled way or on connecting state or federal routes to be abandoned when they no longer apply. Ensure roadways are always appropriately signed. Turn removed signs over to the Department.

Provide functional traffic lanes with signing and channelizing appropriate to the roadway condition at the close of each work day.

For long-term stationary operations (greater than 3 days), remove pavement markings in the traveled way that are no longer applicable in accordance with Subsection [620.03.10](#). Minimize pavement scarring when removing pavement marking material. Do not paint over existing pavement markings with black paint or spray with asphalt as a substitute for removal or obliteration.

Always provide the traffic an un-obscured view of traffic control devices.

Store or park construction equipment, vehicles, materials, and debris at least 10 feet (3 m) behind guardrail or outside the clear zone. When this is impractical, use approved warning devices and protective measures to delineate the item. Only equipment and materials for immediate use or incorporation into the work may be placed within the clear zone.

Store unused traffic control devices outside the clear zone **in an approved staging area**.

Contractor furnished traffic control devices are the Contractor’s property. Traffic control devices furnished by the Department or installed on a force account basis are the Department’s property.

NO CHANGES TO THE PROPOSED DRAFT

FINAL ACCEPTANCE

Repair or replace all damaged traffic control devices. Damages caused by at Contractors are not eligible for payment expense.

If the Contractor fails to provide the required traffic control, the Project Manager will provide the work and deduct the costs from monies due or that may become due the Contractor.

Contractors' employees need to obey all traffic control requirements.

Meet the requirements of subsection 703.08(C) for all temporary signals.

618.03.9 Traffic Control for Paving and Milling Operations

Provide flaggers at paving and milling machines. Locate the flagger 100 to 150 feet (30 to 46 m) upstream from the machines.

Meet the following requirements for night paving operations:

- Place a 48 x 48-inch (1,220 x 1,220 mm) "NIGHT PAVING AHEAD" warning sign in advance of each warning sign series.
- Ensure all personnel working on or adjacent to traveled lanes are wearing Class 3 apparel in accordance with Subsection [107.06](#).

618.03.12 Traffic Control for Striping and Sweeping Operations

Provide the following traffic control for striping and final sweep and broom operations not performed under closed lane or pilot car situations.

- Furnish and operate a shadow vehicle equipped with a truck or trailer -mounted attenuator in accordance with Subsection [618.02](#) conforming to appropriate test levels. Position the truck to follow within 150 to 1,000 feet (45 - 305 m) on pavement marking removal and application and sweeping and brooming. When placing or removing traffic cones that protect the pavement markings, use a vehicle with a truck-mounted attenuator or follow with a shadow vehicle possessing a truck mounted attenuator.
- Equip shadow vehicles with an arrow board facing rear-approaching traffic.
- On multiple-lane roadways, place the arrow board display in lane shift mode (sequential arrow mode).
- On two-lane two-way roadways, place the arrow board in a hazard warning mode not displaying the lane-shift mode
- If peak hours are specified in the contract, provide the Project Manager a schedule of striping and final sweep and broom operations at least 48 hours prior to work. Perform work during off-peak hours in order to minimize impacts to the traveling public unless approved differently by the Project Manager.
- For Striping operations, include all costs associated with this work in the striping bid item.
- If requested by the Project Manager, provide a WN identifying the proposed traffic control devices to be used for striping or final sweep and broom operations. If the Contractor and Project Manager agree that additional traffic control devices not listed in items 1 through 3 are warranted; the additional traffic control devices will be measured and paid in accordance with Subsections [618.04](#) and [618.05](#).

NO CHANGES TO THE PROPOSED DRAFT

FINAL ACCEPTANCE

Failure to properly notify the Project Manager or provide adequate traffic control renders the striping or final sweep and broom operation unacceptable and unauthorized. Unacceptable or unauthorized work will be addressed in accordance with Subsection [105.12](#).

618.03.13 Traffic Control Device Location and Installation

Lay out the standard distances for traffic control devices to within an accuracy $\pm 5\%$. The Project Manager may direct adjustments to the device locations to fit site conditions.

Display all signs with the legend not more than 5° (1-inch per foot) (25 mm per 305 mm) from the horizontal plane.

Display the signs at the required mounting height with the hinged signs closed or non-hinged signs removed when not applicable.

The bottom of signs mounted on barricades or other portable devices must be at least 1-foot (305 mm) above the shoulder of the travelled way.

Use only one type of reflective sheeting in each sequence or group of signs or devices.

Stabilize sign trailers to prevent movement by wind or passing vehicles.

Mount work zone traffic control signs to posts when they are to remain at the same location for more than 3 consecutive days. Trailer-mounted W20-7a (flagger ahead) signs with generators are excluded from this requirement.

Ensure the G20-1 (ROAD WORK NEXT (X) MILES) and G20-2 (END ROAD WORK) signs do not conflict with other construction signing. Remove these signs when no longer needed or when directed by the EPM.

618.03.14 Flagging Operations

- **Illuminated Flagging Stations.** Furnish portable balloon light(s) to illuminate flagging stations meeting the requirements of Subsection 210.03.8 Locate the illumination source so as not to create a hazard to the travelling public and to minimize glare to oncoming drivers. Shield light as necessary to prevent overflow onto adjacent properties.
- **Illuminated Flagger Paddles.** Flagging paddles must be of octagonal shape at least 18 inches (455 mm) wide with letters at least 6 inches (150 mm) high, fixed to a rigid handle. Use signs having red colored flashing LED lights inside the STOP face and amber colored flashing lights inside the SLOW face, having a flash rate of 50 to 60 flashes per minute. LED arrangement must display an octagonal shape for STOP and a diamond shape for SLOW. The power source must be fully enclosed within the pole section.
- **Garments.** Use high visibility safety apparel that meets the Performance Class 3 requirements of the current ANSI/SEA 107 publication entitled *American National*
-

NO CHANGES TO THE PROPOSED DRAFT

FINAL ACCEPTANCE

Standard for High-Visibility Safety Apparel and Headwear. Hard hats must be illuminated and visible in all directions for 1000 feet.

- **Flashing Flagger Sign.** The W20-7a sign must be illuminated with amber LEDs in accordance with Subsection [715.05](#). Subsection [715.02](#) requirements apply for mounting the portable signs and the illumination power source.
- **Temporary Transverse Portable Rumble Strips.** Place 3 temporary transverse portable rumble strips 3 to 4 feet (1 to 1.2 m) in accordance with the manufactures recommendations based on the posted speed limit ~~apart~~ at the location of the W3-4 “Be Prepared to Stop” sign. Use temporary transverse portable rumble strips that meet the following:
 - Provide significant audible and vibratory alerts to drivers;
 - Dimensions are a minimum of 10 feet (3 m) long, 1-foot (305 mm) wide and 3/4-inch (19 mm) thick;
 - ~~Maintains position on roadway without the use of adhesives or fasteners;~~
 - Maintains rigidity with no curling;
 - A bevel on the leading edge within the range of 11-13 degrees;
 - Made of flexible polymer material with a non-slip surface;
 - Able to function on wet surfaces; and
 - Capable of being installed and removed without any auxiliary equipment or machinery.

618.04 METHOD OF MEASUREMENT

Failure to submit an updated traffic control plan on time and in the manner required is cause for the Project Manager to suspend work. ~~renders the traffic control plan unacceptable.~~ The Department may withhold 10% of each monthly progress estimate for failure to submit an updated traffic control plan on time and in the manner required. Payment withheld for violation of the traffic control plan requirements will be included in the next progress estimate following the Contractor’s submission and the Project Manager’s approval of the updated traffic control plan.

618.04.6 Items Not Eligible for Separate Payment

The following items are not measured or paid for separately:

- Amber flashing or strobe lights on equipment, vehicles, and hauling units;
- Impact attenuators for median barrier openings not shown in the contract;

REASON Section update.

COMMENTS: