

Job No.: J2P3396  
Route: Various  
County: Audrain

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(Job Special Provisions shall prevail over General Special Provisions whenever in conflict therewith.)

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	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 W. CAPITOL AVE. JEFFERSON CITY, MO 65102 Phone 1-888-275-6636
	<b><i>Bartlett &amp; West, Inc.</i></b> <i>601 Monroe Street</i> <i>Jefferson City, MO 65101</i> Certificate of Authority: 000167-Eng. Consultant Phone: (573) 634-3181
	If a seal is present on this sheet, JSP's have been electronically sealed and dated.
	JOB NUMBER: J2P3396 AUDRAIN COUNTY, MO DATE PREPARED: 3/3/26
	ADDENDUM DATE:
Only the following items of the Job Special Provisions (Roadway) are authenticated by this seal: All	

JOB  
SPECIAL PROVISION

A. General - Federal JSP-09-02L

**1.0 Description.** The Federal Government is participating in the cost of construction of this project. All applicable Federal laws, and the regulations made pursuant to such laws, shall be observed by the contractor, and the work will be subject to the inspection of the appropriate Federal Agency in the same manner as provided in Sec 105.10 of the Missouri Standard Specifications for Highway Construction with all revisions applicable to this bid and contract.

**1.1** This contract requires payment of the prevailing hourly rate of wages for each craft or type of work required to execute the contract as determined by the Missouri Department of Labor and Industrial Relations and requires adherence to a schedule of minimum wages as determined by the United States Department of Labor. For work performed anywhere on this project, the contractor and the contractor's subcontractors shall pay the higher of these two applicable wage rates. State Wage Rates, Information on the Required Federal Aid Provisions, and the current Federal Wage Rates are available on the Missouri Department of Transportation web page at [www.modot.org](http://www.modot.org) under "Doing Business with MoDOT", "Contractor Resources". Effective Wage Rates will be posted 10 days prior to the applicable bid opening. These supplemental bidding documents have important legal consequences. It shall be conclusively presumed that they are in the bidder's possession, and they have been reviewed and used by the bidder in the preparation of any bid submitted on this project.

**1.2** The following documents are available on the Missouri Department of Transportation web page at [www.modot.org](http://www.modot.org) under "Doing Business with MoDOT"; "Standards and Specifications". The effective version shall be determined by the letting date of the project.

General Provisions & Supplemental Specifications

Supplemental Plans to July 2025 Missouri Standard Plans  
For Highway Construction

These supplemental bidding documents contain all current revisions to the published versions and have important legal consequences. It shall be conclusively presumed that they are in the bidder's possession, and they have been reviewed and used by the bidder in the preparation of any bid submitted on this project.

B. Contract Liquidated Damages JSP- 13-01D

**1.0 Description.** Liquidated Damages for failure or delay in completing the work on time for this contract shall be in accordance with Sec 108.8. The liquidated damages include separate amounts for road user costs and contract administrative costs incurred by the Commission.

**2.0 Period of Performance.** Prosecution of work is expected to begin on the date specified below in accordance with Sec 108.2. Regardless of when the work is begun on this contract, all

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work on all projects shall be completed on or before the date specified below. Completion by this date shall be in accordance with the requirements of Sec 108.7.1.

Notice to Proceed: June 22, 2026  
Contract Completion Date: July 1, 2027

**2.1 Calendar Days and Completion Dates.** Completion of the project is required as specified herein. The count of calendar days will begin on the date the contractor starts any construction operations on the project.

<b>Job Number</b>	<b>Calendar Days</b>	<b>Daily Road User Cost</b>
J2P3396	238	\$3200

**3.0 Liquidated Damages for Contract Administrative Costs.** Should the contractor fail to complete the work on or before the contract completion date specified in Section 2.0, or within the number of calendar days specified in Section 2.1, whichever occurs first, the contractor will be charged contract administrative liquidated damages in accordance with Sec 108.8 in the amount of **\$1500** per calendar day for each calendar day, or partial day thereof, that the work is not fully completed. For projects in combination, these damages will be charged in full for failure to complete one or more projects within the specified contract completion date or calendar days.

**4.0 Liquidated Damages for Road User Costs.** Should the contractor fail to complete the work on or before the contract completion date specified in Section 2.0, or within the number of calendar days specified in Section 2.1, whichever occurs first, the contractor will be charged road user costs in accordance with Sec 108.8 in the amount specified in Section 2.1 for each calendar day, or partial day thereof, that the work is not fully completed. These damages are in addition to the contract administrative damages and any other damages as specified elsewhere in this contract.

C. Work Zone Traffic Management JSP-02-06N

**1.0 Description.** Work zone traffic management shall be in accordance with applicable portions of Division 100 and Division 600 of the Standard Specifications, and specifically as follows.

**1.1 Maintaining Work Zones and Work Zone Reviews.** The Work Zone Specialist (WZS) shall maintain work zones in accordance with Sec 616.3.3 and as further stated herein. The WZS shall coordinate and implement any changes approved by the engineer. The WZS shall ensure all traffic control devices are maintained in accordance with Sec 616, the work zone is operated within the hours specified by the engineer and will not deviate from the specified hours without prior approval of the engineer. The WZS is responsible for managing work zone delay in accordance with these project provisions. When requested by the engineer, the WZS shall submit a weekly report that includes a review of work zone operations for the week. The report shall identify any problems encountered and corrective actions taken. Work zones are subject to unannounced inspections by the engineer and other departmental staff to corroborate the validity of the WZS's review and may require immediate corrective measures and/or additional work zone monitoring.

**1.2 Work Zone Deficiencies.** Failure to make corrections on time may result in the engineer suspending work. The suspension will be non-excusable and non-compensable regardless if road user costs are being charged for closures.

## **2.0 Traffic Management Schedule.**

**2.1** Traffic management schedules shall be submitted to the engineer for review prior to the start of work and prior to any revisions to the traffic management schedule. The traffic management schedule shall include the proposed traffic control measures, the hours traffic control will be in place, and work hours.

**2.2** The traffic management schedule shall conform to the limitations specified in Sec 616 regarding lane closures, traffic shifts, road closures and other width, height and weight restrictions.

**2.3** The engineer shall be notified as soon as practical of any postponement due to weather, material or other circumstances.

**2.4** In order to ensure minimal traffic interference, the contractor shall schedule lane closures for the absolute minimum amount of time required to complete the work. Lanes shall not be closed until material is available for continuous construction and the contractor is prepared to diligently pursue the work until the closed lane is opened to traffic.

**2.5 Traffic Congestion.** The contractor shall, upon approval of the engineer, take proactive measures to reduce traffic congestion in the work zone. The contractor shall immediately implement appropriate mitigation strategies whenever traffic congestion reaches an excess of 10 minutes to prevent congestion from escalating to 15 minutes or above threshold. If disruption of the traffic flow occurs and traffic is backed up in queues of 15-minute delays or longer, then the contractor shall immediately review the construction operations which contributed directly to disruption of the traffic flow and make adjustments to the operations to prevent the queues from reoccurring. Traffic delays may be monitored by physical presence on site or by utilizing real-time travel data through the work zone that generates text and/or email notifications where available. The engineer monitoring the work zone may also notify the contractor of delays that require prompt mitigation. The contractor may work with the engineer to determine what other alternative solutions or time periods would be acceptable.

### **2.5.1 Traffic Safety.**

**2.5.1.1 Recurring Congestion.** Where traffic queues routinely extend to within 1000 feet of the ROAD WORK AHEAD, or similar, sign on a divided highway or to within 500 feet of the ROAD WORK AHEAD, or similar, sign on an undivided highway, the contractor shall extend the advance warning area, as approved by the engineer.

**2.5.1.2 Non-Recurring Congestion.** When traffic queues extend to within 1000 feet of the ROAD WORK AHEAD, or similar, sign on a divided highway or to within 500 feet of the ROAD WORK AHEAD, or similar, sign on an undivided highway infrequently, the contractor shall deploy a means of providing advance warning of the traffic congestion, as approved by the engineer. The warning location shall be no less than 1000 feet and no more than 0.5 mile in advance of the end of the traffic queue on divided highways and no less than 500 feet and no more than 0.5 mile in advance of the end of the traffic queue on undivided highways.

**3.0 Work Hour Restrictions.**

**3.1** Except for emergency work, as determined by the engineer, and long term lane closures required by project phasing, all lanes shall be scheduled to be open to traffic during the five major holiday periods shown below, from 12:00 noon on the last working day preceding the holiday until 6:00 a.m. on the first working day subsequent to the holiday unless otherwise approved by the engineer.

- Memorial Day
- Labor Day
- Thanksgiving
- Christmas
- New Year’s Day

**3.1.1 Independence Day.** The lane restrictions specified in Section 3.1 shall also apply to Independence Day, except that the restricted periods shall be as follows:

<b>When Independence Day falls on:</b>	<b>The Holiday is Observed on:</b>	<b>Halt Lane Closures beginning at:</b>	<b>Allow Lane Closures to resume at:</b>
Sunday	Monday	Noon on Friday	6:00 a.m. on Tuesday
Monday	Monday	Noon on Friday	6:00 a.m. on Tuesday
Tuesday	Tuesday	Noon on Monday	6:00 a.m. on Wednesday
Wednesday	Wednesday	Noon on Tuesday	6:00 a.m. on Thursday
Thursday	Thursday	Noon on Wednesday	6:00 a.m. on Friday
Friday	Friday	Noon on Thursday	6:00 a.m. on Monday
Saturday	Friday	Noon on Thursday	6:00 a.m. on Monday

**3.1.2** Except for emergency work, as determined by the engineer, and long-term lane closures required by project phasing, the contractor’s working hours will be restricted for the Special Events as shown below. All lanes shall be scheduled to be open to traffic during these Special Events.

Miss Missouri Pageant – June 7-13, 2026 & mid-June 2027.

**4.0 Detours and Lane Closures.**

**4.1** At least one lane of traffic in each direction shall be maintained at all times except for brief intervals of time required when the movement of the contractor’s equipment will seriously hinder the safe movement of traffic. Periods during which the contractor will be allowed to interrupt traffic will be designated by the engineer.

**5.0 Basis of Payment.** No direct payment will be made to the contractor to recover the cost of equipment, labor, materials, or time required to fulfill the above provisions, unless specified

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elsewhere in the contract document. All authorized changes in the traffic control plan shall be provided for as specified in Sec 616.

D. Utilities JSP-93-26F

1.0 For informational purposes only, the following is a list of names, addresses, and telephone numbers of the known utility companies in the area of the construction work for this improvement:

<u>Utility Name</u>	<u>Known Required Adjustment</u>	<u>Type</u>
<b>Ameren Missouri Electric</b> Brian Blackburn 1300 W Liberty Mexico, MO 65265 Phone: (573) 473-2763 Email: <a href="mailto:bblackburn@ameren.com">bblackburn@ameren.com</a>	Yes Section 2.1	Power
<b>Ameren Missouri Gas</b> David Hagenhoff 2001 Maguire Blvd Columbia, MO 65201 Phone: (573) 876-3030 Email: <a href="mailto:dhagenhoff@ameren.com">dhagenhoff@ameren.com</a>	Yes Section 2.2	Gas
<b>ATT Distribution</b> Justin Courthouse 507 E Main St. Union, MO 63084 Phone: (636) 448-2136 Email: <a href="mailto:jc670s@att.com">jc670s@att.com</a>	Yes Section 2.3	Communications
<b>Charter Communications – Spectrum</b> Austin Becker 101 Northwest Plaza St. Ann, MO 63074 Phone: (314) 307-2116 Email: <a href="mailto:austin.becker@charter.com">austin.becker@charter.com</a>	Yes Section 2.4	Communications
<b>City of Mexico</b> Bill Raines 300 N Coal St. Mexico, MO 65265 Phone: (573) 473-0938 Email: <a href="mailto:wraines@mexicomissouri.org">wraines@mexicomissouri.org</a>	Yes Section 2.5	Sewer

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<p><b>Consolidated PWSD #2 of Audrain County</b>          Tony King          19105 MO 22          Mexico, MO 65265          Phone: (573) 473-4916          Email: <a href="mailto:districtmanager@pwsd2audrain.com">districtmanager@pwsd2audrain.com</a></p>	<p>None</p>	<p>Water</p>
<p><b>Kingdom Networks          (formerly Kingdom Telephone – Phynx          Fiber)</b>          Shawn Gilman          211 S Main St.          Auxvasse, MO 65231          Phone: (573) 386-2241  <a href="mailto:sgilman@kingdomtelco.com">sgilman@kingdomtelco.com</a></p>	<p>Yes          Section 2.6</p>	<p>Communications</p>
<p><b>Panhandle Eastern Pipeline</b>          Chad Reitingger          16151 N Route Z          Centralia, MO 65240          Phone: (573) 682-3041          Email: <a href="mailto:chad.reitingger@energytransfer.com">chad.reitingger@energytransfer.com</a></p>	<p>None</p>	<p>Gas</p>
<p><b>Lumen - National</b>          Richard Obremski          11111 Dorsett Road          Maryland Heights, MO 63043          Phone: (314) 378-9931          Email: <a href="mailto:richard.obremski@lumen.com">richard.obremski@lumen.com</a></p>	<p>None          Section 2.7</p>	<p>Communications</p>
<p><b>Missouri American Water Company</b>          Wayne Elliott          419 S Olive St          Mexico, MO 65265          Phone: (573) 301-0197          Email: <a href="mailto:wayne.elliott@amwater.com">wayne.elliott@amwater.com</a></p>	<p>Yes          Section 2.8</p>	<p>Water</p>
<p><b>MNA-Bluebird</b>          Justin Rector          10024 Office Center Ave., Suite 201          St. Louis, MO 63128          Phone: (636) 795-5787          Email: <a href="mailto:justin.rector@bluebirdnetwork.com">justin.rector@bluebirdnetwork.com</a></p>	<p>None          Section 2.9</p>	<p>Communications</p>

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<b>MoDOT Northeast District</b> Jonathan Bruner 26826 Hwy 63 Macon, MO 63552 Phone: (660) 385-8237 Email: <a href="mailto:jonathan.bruner@modot.mo.gov">jonathan.bruner@modot.mo.gov</a>	Yes Section 2.10	Power Signals Streetlights Communications
<b>Sho-me Technologies</b> Hunter Burks 301 W Jackson St Marshfield, MO 65706 Phone: (417) 399-3636 Email: <a href="mailto:hburks@shomepower.com">hburks@shomepower.com</a>	None Section 2.11	Power Communications
<b>Socket Telecom</b> Todd Pulis 2703 Clark Ln Columbia, MO 65202 Phone: (573) 818-4778 Email: <a href="mailto:tpulis@corp.socket.net">tpulis@corp.socket.net</a>	None Section 2.12	Communications
<b>Vero Fiber Networks</b> Christopher Rogers PO Box 1110 Boulder, CO 80306 Phone: (918) 218-9100 Email: <a href="mailto:crogers@veronetworks.com">crogers@veronetworks.com</a>	None Section 2.13	Communications

**1.1** The existence and approximate location of utility facilities known to exist, as shown on the plans, are based upon the best information available to the Commission at this time. This information is provided by the Commission "as-is" and the Commission expressly disclaims any representation or warranty as to the completeness, accuracy, or suitability of the information for any use. Reliance upon this information is done at the risk and peril of the user, and the Commission shall not be liable for any damages that may arise from any error in the information. It is, therefore, the responsibility of the contractor to verify the above listing information indicating existence, location, and status of any facility. Such verification includes direct contact with the listed utilities.

**2.0 Project Specific Provisions:**

**2.1 Ameren Missouri Electric** - has overhead three-phase and single-phase lines throughout the project limits. Contractors shall contact Brian Blackburn, with Ameren Electric, prior to any grading activities to ensure that construction operations will not affect their facilities.

**2.1.1 Route 22 (W Monroe St) / Route 15 (N Western) intersection** – Ameren had a power pole located at approximately station 636+69, 43' RT. This pole was within the proposed sidewalk location and has since been relocated by Ameren.

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**2.1.2 Route 15 (N Western)** – Ameren had a span guy pole and guy wire located at approximately station 721+07, 23’ LT. These facilities were within the proposed sidewalk location and have since been relocated by Ameren.

**2.1.3 Route BUS 54 (W Blvd St)** – Ameren has two street lighting poles located at approximately stations 2+97, 31’ LT and 5+57, 23’ LT. These facilities are within the proposed sidewalk location and will be removed by Ameren.

Ameren has two power poles located at approximately stations 4+56, 29’ LT and 5+49, 26’ LT. These facilities are within the proposed sidewalk location and will be relocated by Ameren.

Ameren has guy wires and anchors located at approximately stations 7+94, 35’ LT and 9+37, 38’ LT. Ameren will modify these facilities to pedestrian guy anchors to provide a minimum vertical clearance of 80 inches over the proposed sidewalk.

Relocation, removal and modification of these facilities are anticipated to be completed prior to the Notice to Proceed.

**2.1.4 Route BUS 54 (E Blvd St)** - Ameren has guy wires and anchors located at approximately station 713+94, 29’ LT. Ameren will modify these facilities to pedestrian guy anchors to provide a minimum vertical clearance of 80 inches over the proposed sidewalk. Modification of these facilities is anticipated to be completed prior to the Notice to Proceed.

**2.1.5 Power Services** – Contractors shall contact the Ameren Construction Hotline at 866-992-6619 at least 30 days in advance to schedule an appointment for disconnection of the old service, connection of the new service, and/or transfer of the existing meter to the new power supply location.

Route 22 (W Monroe St) / Route 15 (N Western) intersection - MoDOT will utilize the existing power service from the junction box at the current signal controller.

BUS 54 (W Blvd St) / BUS 54 (S Clark St) intersection - Ameren will provide a new power service from the power pole that located at approximately BUS 54 (W Blvd St) station 783+03, 43’ RT. The existing power service, located on the northeast corner of the intersection, will be removed by Ameren in coordination with the work.

BUS 54 (E Blvd St) / Hwy J intersection - MoDOT will utilize the existing power service from the power pole located at the current signal controller.

**2.1.6 Guardrail replacement** – Ameren Electric has overhead three-phase lines on the west side of BUS 54 near the existing guardrail locations. Ameren will cover any portion of these lines if required by the contractor. The contractor shall contact Ameren at least three weeks in advance to request line coverage.

**2.2 Ameren Missouri Gas** - has facilities located throughout the project limits. Buried gas lines are at approximate depths from 30 inches to 36 inches. While the proposed sidewalk and new signal work are near these facilities, relocation is not anticipated. Contractors shall contact David Hagenhoff, with Ameren Gas, prior to any grading activities to ensure that construction operations will not affect their facilities.

**2.2.1 Route 15 (N Western)** - It is anticipated that the gas valve covers located at approximately stations 717+03, 28' LT; 721+58, 24' RT; and 735+03, 22' LT will be adjusted to match the proposed sidewalk grade in coordination with the work. Contractor shall contact Ameren Missouri Gas at least three weeks in advance of when the facility adjustments are required. Once proposed grade has been established by the contractor, a minimum of two working days shall be allowed for coordination and adjustment of the utility facilities.

**2.2.2 Guardrail replacement** – Ameren Missouri Gas has buried facilities located near the existing guardrail locations. A 6-inch coated steel line runs along the west side of BUS 54. Additionally, there are 2-inch PE service lines crossing the route, one located on the north side of the Mizzou Urgent Care entrance, and another on the south side of Cunningham Road. Contractors shall use caution when working near these facilities and must request a MOCS ticket prior to any work at these locations.

**2.3 ATT Distribution** - has facilities located throughout the project limits. Buried communication lines are at approximate depths from 30 inches to 36 inches. While the proposed sidewalk is near these facilities, relocation is not anticipated. Contractors shall contact Justin Courtoise, with ATT Distribution, prior to any grading activities to ensure that construction operations will not affect their facilities.

**2.3.1 Route 22** – ATT Distribution had two telephone risers located at approximately stations 636+69, 43' RT and 636+91, 26' RT. These facilities were within the proposed sidewalk location and have since been removed by ATT Distribution. A pull box was located at approximately station 636+71, 40' RT. This pull box was within the proposed sidewalk location and has since been relocated by ATT Distribution.

**2.3.2 Route BUS 54 (S Clark St.)** – ATT Distribution had one telephone riser located at approximately station 920+37, 28' LT. This riser was within the proposed sidewalk location and has since been removed by ATT Distribution.

**2.3.3 Route BUS 54 (W Blvd St.)** – ATT Distribution had three telephone risers located at approximately stations 3+15, 31' LT; 4+52, 28' LT; and 5+46, 25' LT. These facilities were within the proposed sidewalk location and have since been removed by ATT Distribution.

**2.4 Charter Communications** – has overhead communication facilities located throughout the project limits. These facilities are attached to Ameren Missouri Electric power poles. Some of these facilities are located within the proposed sidewalk locations. Relocation of Charter facilities is anticipated to be completed in coordination with Ameren Electric's adjustment work. Contractors shall contact Austin Becker, with Charter Communications, prior to any grading activities to ensure that construction operations will not affect their facilities.

**2.4.1 Charter communications** has communication poles located at approximately BUS 54 (W Blvd St) station 0+48, 31' LT and BUS 54 (S Clark St) station 920+34, 28' LT. These facilities are within the proposed sidewalk location and require adjustment. Charter will remove these facilities, and removal is anticipated to be completed prior to the Notice to Proceed.

**2.5 City of Mexico** – has buried sewer facilities located throughout the project limits. While manholes are present within the proposed sidewalk and resurfacing routes, relocation of these facilities is not anticipated. Contractors shall contact Bill Raines, with the City of Mexico, prior to any grading activities to ensure that construction operations will not affect their facilities.

**2.5.1** It is anticipated that the manhole covers located within the proposed sidewalk will be adjusted to match the proposed sidewalk grade in coordination with the work. These manholes located at approximately Route 15 (N Western) station 713+63, 17' LT, BUS 54 (Green Blvd) station 40+95, 23' RT, BUS 54 (Green Blvd) station 44+00, 17' RT and BUS 54 (S. Clark St) station 917+74, 28' LT. It is anticipated that the manhole covers located within the proposed resurfacing routes will be adjusted to match the proposed resurfacing grade in coordination with the work. Contractor shall contact the City of Mexico at least two weeks in advance of when the facility adjustments are required. Once proposed grade has been established by the contractor, a minimum of two working days shall be allowed for coordination and adjustment of the utility facilities.

**2.6 Kingdom Networks** - has facilities located throughout the project limits. Buried communication lines are at approximate depths from 30 inches to 36 inches. While the proposed sidewalk is near these facilities, relocation is not anticipated. Contractors shall contact Shawn Gilman, with Kingdom Networks, prior to any grading activities to ensure that construction operations will not affect their facilities.

**2.6.1 Route BUS 54 (E Blvd St)** – Kingdom Networks had a pull box located at approximately station 12+12, 25' RT and a telephone riser located at approximately station 16+28, 26' RT. These facilities were within the proposed sidewalk location and have since been relocated by Kingdom Networks.

**2.6.2 Rout 15 (N Western)** – Kingdom Networks had a telephone riser located at approximately station 735+03, 31' RT. This riser was within the proposed sidewalk location and has since been relocated by Kingdom Networks.

**2.6.3 Route BUS 54 (W Blvd St)** – Kingdom Networks had telephone risers located at approximately stations 2+08, 31' LT; 3+26, 31' LT; and 4+47, 27' LT. These facilities were within the proposed sidewalk location and have since been relocated by Kingdom Networks.

**2.6.4 Guardrail replacement** – Kingdom Networks has buried facilities located near the existing guardrail locations. Their facilities run along the west side of BUS 54 from approximately station 910+00, RT to 1001+00, RT. At approximately station 1001+00, approximately 900 ft north of Cunningham Rd, the facilities cross the route to the east and continue southward. This crossing is located within the limits of the proposed guardrail replacement; however, relocation is not anticipated. Contractors shall use caution when working near these facilities and must request a MOCS ticket prior to any work at these locations.

**2.7 Lumen** – has buried facilities located near the existing guardrail locations. Their facilities run along the west side of BUS 54 from approximately station 910+00, RT to 1028+00, RT. At approximately station 1028+00, the facilities cross the route to the east and continue southward. Relocation of these facilities is not anticipated. Contractors shall use caution when working near these facilities and must request a MOCS ticket prior to any work at these locations.

**2.8 Missouri American Water Company (MAWC)** - has buried water lines located throughout the project limits at approximate depths from 36 inches to 48 inches. While the proposed sidewalk and new signal work are near these facilities, relocation is not anticipated. Contractors shall contact Wayne Elliott, with Missouri American Water Company, prior to any grading activities to ensure that construction operations will not affect their facilities.

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Route BUS 54 (S Clark St) - MAWC has a fire hydrant located at approximately station 921+51, 23' LT. This fire hydrant is within the proposed sidewalk location and will require adjustment. Relocation of the fire hydrant is anticipated to be completed prior to the Notice to Proceed. It is anticipated that the water meter/valve covers located at stations 921+24, 23' LT; 920+31, 28' LT; and 921+51, 23' LT will be adjusted to match the proposed sidewalk grade in coordination with the work.

Route 15 (N Western) - It is anticipated that the water meter/valve covers located at approximately stations 711+98, 30' RT; 713+53, 25' LT; 714+55, 24' LT; 715+75, 24' LT; 716+43, 24' LT; 719+67, 23' LT; and 721+10, 15' LT will be adjusted to match the proposed sidewalk grade in coordination with the work.

Route 22 - It is anticipated that the water valve cover located at approximately station 636+74, 93' LT will be adjusted to match the proposed sidewalk grade in coordination with the work.

Route BUS 54 (W Blvd St) - It is anticipated that the water valve covers located at approximately stations 5+57, 46' RT and 12+60, 35' RT will be adjusted to match the proposed sidewalk grade in coordination with the work.

Contractor shall contact Missouri American Water Company at least two weeks in advance of when the facility adjustments are required. Once proposed grade has been established by the contractor, a minimum of two working days shall be allowed for coordination and adjustment of the utility facilities.

**2.8.1 Resurfacing routes** – MAWC has water valve covers located within the proposed resurfacing routes and will require adjustment to match the resurfacing grade. Contractor shall contact Missouri American Water Company at least two weeks in advance of when the facility adjustments are required. Once proposed grade has been established by the contractor, a minimum of two working days shall be allowed for coordination and adjustment of the utility facilities.

**2.8.2 Guardrail replacement** – MAWC has buried facilities located near the existing guardrail locations. Their facilities run along the west side of BUS 54 from approximately station 920+00, RT to station 1035+00, RT. There is also a water line on the east side of the route, extending from approximately station 920+00, LT to just north of Cunningham Road. In addition, there are three service line crossings along the route: one at the AT&T store, a second just north of the entrance to Best Western Teal Lake Inn, and a third just north of Cunningham Road. Contractors shall use caution when working near these facilities and must request a MOCS ticket prior to any work at these locations.

**2.9 MNA-Bluebird** - has buried facilities located throughout the project limits at approximate depths from 30 inches to 36 inches. While the proposed sidewalk and new signal work are near these facilities, relocation is not anticipated. Contractors shall contact Justin Rector, with MNA-Bluebird, prior to any grading activities to ensure that construction operations will not affect their facilities.

**2.9.1 Guardrail replacement** – Bluebird has buried facilities located near the existing guardrail locations. Their facilities run along the west side of BUS 54, relocation of these facilities is not

anticipated. Contractors shall use caution when working near these facilities and must request a MOCS ticket prior to any work at these locations.

**2.10 MoDOT Northeast District** - has electric, communication, signals, and lighting facilities throughout the project limits. Removal, replacement, temporary signals/lighting, and new facilities have been incorporated into the contract plans. Contractors shall contact the Ameren Construction Hotline (866-992-6619) 30 days prior to removals being needed at these locations to disconnect power service to signal/lighting controllers. Contractor questions on signals and lighting may be directed to Jonathan Bruner, MoDOT Traffic Operations Engineer, (660) 385-8237.

**2.11 Sho-Me Technologies** - has buried facilities located throughout the project limits at approximate depths from 30 inches to 48 inches. While the proposed sidewalk and new signal work are near these facilities, relocation is not anticipated. Contractors shall contact Hunter Burks, with Sho-Me Technologies, prior to any grading activities to ensure that construction operations will not affect their facilities.

**2.12 Socket Telecom** - has buried facilities located throughout project limits at approximate depths from 40 inches to 48 inches. While the proposed sidewalk and new signal work are near these facilities, relocation is not anticipated. Contractors shall contact Todd Pulis, with Socket Telecom, prior to any grading activities to ensure that construction operations will not affect their facilities.

**2.13 Vero Fiber Networks** - has buried facilities located throughout the project limits at approximate depth 36 inches. While the proposed sidewalk and new signal work are near these facilities, relocation is not anticipated. Contractors shall contact Christopher Rogers, with Vero Fiber Networks, prior to any grading activities to ensure that construction operations will not affect their facilities.

E. Emergency Provisions and Incident Management JSP-90-11A

**1.0** The contractor shall have communication equipment on the construction site or immediate access to other communication systems to request assistance from law enforcement or other emergency agencies for incident management. In case of traffic accidents or the need for law enforcement to direct or restore traffic flow through the job site, the contractor shall notify law enforcement or other emergency agencies immediately as needed. The area engineer's office shall also be notified when the contractor requests emergency assistance.

**2.0** In addition to the 911 emergency telephone number for ambulance, fire or law enforcement services, the following agencies may also be notified for accident or emergency situation within the project limits.

Missouri Highway Patrol-Troop F: (573) 751-1000
Audrain County Sheriff: (573) 473-5801
Mexico Fire Department: (573) 581-2100
Mexico Police Department: (573) 473-5800
Farber Volunteer Fire Department: (573) 249-3473

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**2.1** This list is not all inclusive. Notification of the need for wrecker or tow truck services will remain the responsibility of the appropriate law enforcement agency.

**2.2** The contractor shall notify law enforcement and emergency agencies before the start of construction to request their cooperation and to provide coordination of services when emergencies arise during the construction at the project site. When the contractor completes this notification with law enforcement and emergency agencies, a report shall be furnished to the engineer on the status of incident management.

**3.0** No direct pay will be made to the contractor to recover the cost of the communication equipment, labor, materials or time required to fulfill the above provisions.

F. Project Contact for Contractor/Bidder Questions JSP-96-05A

**1.0** All questions concerning this project during the bidding process shall be forwarded to the project contact listed below.

Brian Untiedt, P.E., Project Contact  
MoDOT - Northeast District  
P.O Box 1067  
Hannibal, MO 63401

Telephone Number: 573-248-2442  
Email: [brian.untiedt@modot.mo.gov](mailto:brian.untiedt@modot.mo.gov)

**1.1** All questions concerning the bid document preparation can be directed to the Central Office – Design as listed below.

Telephone Number: (573) 751-2876  
Email: [BCS@modot.mo.gov](mailto:BCS@modot.mo.gov)

**2.0** Upon award and execution of the contract, the successful bidder/contractor shall forward all questions and coordinate the work with the engineer listed below:

Marty Lincoln, P.E., Resident Engineer  
MoDOT - Northeast District  
P.O Box 1067  
Hannibal, MO 63401

Telephone Number: 573-406-6534  
Email: [martin.lincoln@modot.mo.gov](mailto:martin.lincoln@modot.mo.gov)

G. Temporary Construction Easements

**1.0 Description.** MODOT has obtained temporary construction easements from property owners in order to construct improvements for the project. Businesses within the project limits will continue utilizing those construction easements to conduct their day-to-day business. The

contractor shall coordinate with the business owners to minimize the amount of time and space needed to construct the improvements located inside each temporary construction easement.

**2.0 Construction Requirements.** The contractor shall not disturb any business improvements, besides the entrance or parking lot, located inside each temporary construction easement, unless shown as such on the plans. Business improvements include such things as, but not limited to, business signs and their electrical connections, landscaping, or sprinkler systems. The Contractor will be solely responsible to repair or replace any improvements disturbed that are not specifically marked on the plans for removal or adjustment, at the Contractor's cost.

**3.0 Basis of Payment.** No direct payment will be made for compliance with this provision.

H. Property Owner Notification

**1.0 Description.** It shall be the contractor's responsibility to inform and notify the adjacent property owner 48 hours prior to starting any construction activities that may impact driveway access or occur along the frontage of the property owner's parcel. Notification shall be in written form and include the contractor's contact information, the engineer's contact information, and an estimated schedule of work and the associated impacts.

**2.0 Basis of Payment.** No direct payment will be made to the contractor for the labor, equipment, material, or time required to comply with this provision.

I. ADA Compliance and Final Acceptance of Constructed Facilities JSP-10-01C

**1.0 Description.** The contractor shall comply with all laws pertaining to the Americans with Disabilities Act (ADA) during construction of pedestrian facilities on public rights of way for this project. An ADA Checklist is provided herein to be utilized by the contractor for verifying compliance with the ADA law. The contractor is expected to familiarize himself with the plans involving pedestrian facilities and the ADA Post Construction Checklist prior to performing the work.

**2.0 ADA Checklist.** The contractor can locate the ADA Checklist form on the Missouri Department of Transportation website:

<https://www.modot.org/forms-contractor-use>

**2.1** The ADA Checklist is not to be considered all-inclusive, nor does it supersede any other contract requirements. The ADA checklist is a required guide for the contractor to use during the construction of the pedestrian facilities and a basis for the commission's acceptance of work. Prior to work being performed, the contractor shall bring to the engineer's attention any planned work that is in conflict with the design or with the requirement shown in the checklist. This notification shall be made in writing. Situations may arise where the checklist may not fully address all requirements needed to construct a facility to the full requirements of current ADA law. In those situations, the contractor shall propose a solution to the engineer that is compliant with current ADA law using the following hierarchy of resources: 2010 ADA Standards for Accessible Design, Draft Public Rights of Way Accessibility Guidelines (PROWAG) dated

November 23, 2005, MoDOT's Engineering Policy Guidelines (EPG), or a solution approved by the U.S. Access Board.

**2.2** It is encouraged that the contractor monitor the completed sections of the newly constructed pedestrian facilities in attempts to minimize negative impacts that his equipment, subcontractors or general public may have on the work. Completed facilities must comply with the requirements of ADA and the ADA Checklist or have documented reasons for the non-compliant items to remain.

### **3.0 Coordination of Construction.**

**3.1** Prior to construction and/or closure on an existing pedestrian path of travel, the contractor shall submit a schedule of work to be constructed, which includes location of work performed, the duration of time the contractor expects to impact the facility and an accessible signed pedestrian detour compliant with MUTCD Section 6C that will be used during each stage of construction. This plan shall be submitted to the engineer for review and approval at or prior to the pre-construction conference. Accessible signed detours shall be in place prior to any work being performed that has the effect of closing an existing pedestrian travel way.

**3.2** *When consultant survey is included in the contract, the contractor shall use their survey crews to verify that the intended design can be constructed to the full requirements as established in the 2010 ADA Standards. When 2010 ADA Standards do not give sufficient information to construct the contract work, the contractor shall refer to the PROWAG.*

**3.3** When consultant survey is not included in the contract, the contractor shall coordinate with the engineer, prior to construction, to determine if additional survey will be required to confirm the designs constructability.

**4.0 Final Acceptance of Work.** The contractor shall provide the completed ADA Checklist to the engineer at the semi-final inspection. ADA improvements require final inspection and compliance with the ADA requirements and the ADA Checklist. Each item listed in the checklist must receive either a "YES" or an "N/A" score. Any item receiving a "NO" will be deemed non-compliant and shall be corrected at the contractor's expense unless deemed otherwise by the engineer. Documentation must be provided about the location of any non-compliant items that are allowed to remain at the end of the construction project. Specific details of the non-compliant items, the ADA requirement that the work was not able to comply with, and the specific reasons that justify the exception are to be included with the completed ADA Checklist provided to the engineer.

**4.1** Slope and grade measurements shall be made using a properly calibrated, 2 foot long, electronic digital level approved by the engineer.

**5.0 Basis of Payment.** The contractor will receive full pay of the contract unit cost for all sidewalk, ramp, curb ramp, median, island, approach work, cross walk striping, APS buttons, pedestrian heads, detectible warning systems and temporary traffic control measures that are

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completed during the current estimate period as approved by the engineer. Based upon completion of the ADA Checklist, the contractor shall complete any necessary adjustments to items deemed non-compliant as directed by the engineer.

**5.1** No direct payment will be made to the contractor to recover the cost of equipment, labor, materials, or time required to fulfill the above provisions, unless specified elsewhere in the contract documents.

J. Detectable Pedestrian Channelizing Barricade

**1.0 Description.** This work shall consist of utilizing Detectable Pedestrian Channelizing Barricades as shown on the plans and in accordance with the Manual for Uniform Traffic Control Devices. The pedestrian barricade is similar to the Type 2 Barricade indicated in Section 6F.63.

**2.0 Basis of Payment.** Payment for furnishing and installing the pedestrian barricades shall be completely covered by the contract unit price for Item No. 616-99.02, ADA Compliant Moveable Barricade, per each.

K. Access to Commercial and Private Properties

**1.0 Description.** This improvement is located within a commercial and residential area. While working on entrances or adjacent properties, the contractor shall make every reasonable effort to minimize any interference to the properties and to pursue the work diligently. Under no circumstances shall the contractor completely block ingress/egress to and from businesses during the normal business hours of each business unless as approved in advance by the property owner and the engineer.

**1.1** The contractor shall notify the engineer seven (7) calendar days prior to any area of sidewalk or entrance construction. After notification from the contractor, the engineer will contact each property owner at least one week prior to any sidewalk or entrance construction within their property limits to advise them of the work that will take place and the timeframe of the work.

**2.0 Construction Requirements.** If there exists more than one entrance to the property, the contractor shall always keep a minimum of one entrance to that property completely open unless approved in advance by the property owner and the engineer. If there is only one entrance, the contractor shall only construct one half of the entrance at a time. The minimum compressive strength of the concrete shall be 2500 psi for light traffic (residential) and 3000 psi for commercial traffic before allowing access.

**3.0 Liquidated Damages Specified.** If the entire entrance is not complete and open to traffic within **seven (7) calendar days**, the Commission, the traveling public, and state and local police and governmental authorities will be damaged in various ways, including but not limited to, increased construction administration cost, potential liability, traffic and traffic flow regulation cost, traffic congestion and motorist delay, with its resulting cost to the traveling public. These damages are not reasonably capable of being computed or quantified. Therefore, the contractor will be charged with liquidated damages specified in the amount of **\$250.00 per day**

for each full day that an entrance is not complete and open to traffic in excess of the limitation as specified elsewhere in the special provision.

**4.0 Basis of Payment.** No direct payment will be made to the contractor to recover the cost of equipment, labor, materials, or time required to fulfill the above provisions, unless specified elsewhere in the contract documents.

L. Damage to Existing Pavement, Side Roads and Entrances

**1.0 Description.** This work shall consist of repairing any damage to existing pavement, curb, ramps and/or shoulders caused by contractor operations. This shall include damage caused either directly or indirectly by contractor operations, including but not limited to, damage caused by the traffic during contractor operations.

**2.0 Construction Requirements.** Any cracking, gouging, or other damage to the existing pavement, curb, ramps and/or shoulders, side roads, or entrances from general construction shall be repaired within twenty-four (24) hours of the time of damage at the contractor's expense. Repair of the damaged pavement, shoulders, side roads, or entrances shall be as determined by the engineer.

**3.0 Method of Measurement.** No measurement of damaged pavement, curb, ramps, or shoulder areas as described above shall be made.

**4.0 Basis of Payment.** No payment will be made for repairs to existing pavement, curb, ramps and/or shoulders damaged by contractor operations

M. Pavement Edge Treatment for Drop Off Conditions

**1.0 Description.** The contractor shall conduct construction operations so that there will be no drop off exceeding 2 inches adjacent to traffic. Treatment of any drop off greater than 2 inches shall be considered incidental to and completely covered by the other items in the contract. There will be no direct payment for Pavement Edge Treatment on this project.

N. Contractor Quality Control NJSP-15-42

**1.0** The contractor shall perform Quality Control (QC) testing in accordance with the specifications and as specified herein. The contractor shall submit a Quality Control Plan (QC Plan) to the engineer for approval that includes all items listed in Section 2.0, prior to beginning work.

**2.0 Quality Control Plan.**

- (a) The name and contact information of the person in responsible charge of the QC testing.
- (b) A list of the QC technicians who will perform testing on the project, including the fields in which they are certified to perform testing.
- (c) A proposed independent third-party testing firm for dispute resolution, including all contact information.

- (d) A list of Hold Points, when specified by the engineer.
- (e) The MoDOT Standard Inspection and Testing Plan (ITP). This shall be the version that is posted at the time of bid on the MoDOT website ([www.modot.org/quality](http://www.modot.org/quality)).

**3.0 Quality Control Testing and Reporting.** Testing shall be performed per the test method and frequency specified in the ITP. All personnel who perform sampling or testing shall be certified in the MoDOT Technician Certification Program for each test that they perform.

**3.1 Reporting of Test Results.** All QC test reports shall be submitted as soon as practical, but no later than the day following the test. Test data shall be immediately provided to the engineer upon request at any time, including prior to the submission of the test report. No payment will be made for the work performed until acceptable QC test results have been received by the engineer and confirmed by QA test results.

**3.1.1** Test results shall be reported on electronic forms provided by MoDOT. Forms and Contractor Reporting Excel2Oracle Reports (CRE2O) can be found on the MoDOT website. All required forms, reports and material certifications shall be uploaded to a Microsoft SharePoint® site provided by MoDOT and organized in the file structure established by MoDOT.

**3.2 Non-Conformance Reporting.** A Non-Conformance Report (NCR) shall be submitted by the contractor when the contractor proposes to incorporate material into the work that does not meet the testing requirements or for any work that does not comply with the contract terms or specifications.

**3.2.1** Non-Conformance Reporting shall be submitted electronically on the Non-Conformance Report form provided on the MoDOT Website. The NCR shall be uploaded to the MoDOT SharePoint® site and an email notification sent to the engineer.

**3.2.2** The contractor shall propose a resolution to the non-conforming material or work. Acceptance of a resolution by the engineer is required before closure of the non-conformance report.

#### **4.0 Work Planning and Scheduling.**

**4.1 Two-week Schedule.** Each week, the contractor shall submit to the engineer a schedule that outlines the planned project activities for the following two-week period. The two-week schedule shall detail all work and traffic control events planned for that period and any Hold Points specified by the engineer.

**4.2 Weekly Meeting.** When work is active, the contractor shall hold a weekly project meeting with the engineer to review the planned activities for the following week and to resolve any outstanding issues. Attendees shall include the engineer, the contractor superintendent or project manager and any foreman leading major activities. This meeting may be waived when, in the opinion of the engineer, a meeting is not necessary. Attendees may join the meeting in person, by phone or video conference.

**4.3 Pre-Activity Meeting.** A pre-activity meeting is required in advance of the start of each new activity, except when waived by the engineer. The purpose of this meeting is to review construction details of the new activity. At a minimum, the discussion topics shall include safety precautions, QC testing, traffic impacts, and any required Hold Points. Attendees shall include

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the engineer, the contractor superintendent and the foreman who will be leading the new activity. Pre-activity meetings may be held in conjunction with the weekly project meeting.

**4.4 Hold Points.** Hold Points are events that require approval by the engineer prior to continuation of work. Hold Points occur at definable stages of work when, in the opinion of the engineer, a review of the preceding work is necessary before continuation to the next stage.

**4.4.1** A list of typical Hold Point events is available on the MoDOT website. Use of the Hold Point process will only be required for the project-specific list of Hold Points, if any, that the engineer submits to the contractor in advance of the work. The engineer may make changes to the Hold Point list at any time.

**4.4.2** Prior to all Hold Point inspections, the contractor shall verify the work has been completed in accordance with the contract and specifications. If the engineer identifies any corrective actions needed during a Hold Point inspection, the corrections shall be completed prior to continuing work. The engineer may require a new Hold Point to be scheduled if the corrections require a follow-up inspection. Re-scheduling of Hold Points require a minimum 24-hour advance notification from the contractor unless otherwise allowed by the engineer.

**5.0 Quality Assurance Testing and Inspection.** MoDOT will perform quality assurance testing and inspection of the work, except as specified herein. The contractor shall utilize the inspection checklists provided in the ITP as a guide to minimize findings by MoDOT inspection staff. Submittal of completed checklists is not required, except as specified in 5.1.

**5.1** Inspection and testing required in the production of concrete for the project shall be the responsibility of the contractor. Submittal of the 501 Concrete Plant Checklist is required.

**6.0 Basis of Payment.** No direct payment will be made for compliance with this provision.

O. Contractor Furnished Surveying and Staking

In addition to the requirements of Section 627 of the Missouri Standard Specifications for Highway Construction, the following shall apply:

**1.0 Description.** The contractor will be responsible for all layout required on the project. Any and all staking required to ensure that improvements installed on this project meet the ADA requirements is the sole responsibility of the contractor. This responsibility will include, but not limited to the following: Construction signs, curb ramp, landing, and sidewalk construction, truncated dome installation, quantity verification, curb construction, pavement marking, pedestrian signal modifications, median strip/island construction and modifications, etc.

**1.1** The above list is not all inclusive. The contractor will have the primary responsibility for these operations. Concerning the traffic control devices, the contractor shall provide the Resident Engineer with a layout plan for approval prior to the installation of signs. The RE will provide assistance for this layout provided a request is submitted to the RE or Construction Project Manager 48 hours in advance. This will ensure that all permanently mounted traffic control devices remain consistent with District policy and avoid re-staking. If the contractor installs any signs without engineer approval, all costs associated with re-staking and/or relocation will be at the contractor's expense.

**1.2** The intent of this provision is to increase the quality of our work zones and minimize negative impacts to the contractor's schedule that can result from delays in staking.

**1.3** Any adjustments to the plan quantities or line numbers established in the contract shall be approved by the Engineer.

**2.0 Basis of Payment.** No direct payment will be made to cover the costs associated with these additional requirements. All costs will be considered completely covered by the unit bid price submitted for Contractor Furnished Surveying and Staking.

P. Curb Ramps and Sidewalk

**1.0 Description.** Construction of concrete curbs, aprons, curb ramps, transition areas, sidewalk and landings shall be in accordance with applicable portions of Sections 608 & 609 of the Standard Specification and Standard Plans for Highway Construction 608.10, as shown on the plans, and meet ADA requirements.

**2.0 Construction Requirements.** This work shall include, but is not limited to, sidewalk construction including landings, joint construction, aggregate base, compaction, apron modifications, transition area, curb ramp construction, Type S Curb or Type A Curb installation (as required), tie bars or dowel bars (as required), clean-up, etc. for each location shown on the plans.

The following requirements shall be applicable to construction of this project:

- Existing curb, curb and gutter, sidewalk, shoulders, etc. that are adjacent to a designated curb ramp and/or sidewalk improvement area that is damaged during construction shall be replaced/repared to match existing materials and condition.
- Variable height curb along the roadside may be constructed monolithic or separate depending on construction operations. Integral curb shall be doweled to the existing gutter or pavement. - Integral or Type S-curb shall be used along the existing right-of-way when constructing curb ramps as shown on the plans. The cost of the curb is included in pay limits of the curb ramp.
- The transition area shall be 8" thick and tied to the existing roadway pavement and existing paved approach or sidewalk it is matching.
- Curing compound for all concrete construction shall be a clear or translucent color. The white pigmented option or other colored compound will not be allowed.
- Adjacent grass areas, landscaping, irrigation lines, pavement, etc. disturbed by curb ramp or sidewalk construction shall be repaired or replaced to match or exceed existing conditions. Sod quantities are included for adjacent areas. More or less sod may be required depending on actual field conditions.

**3.0 Method of Measurement.** Curb ramps and concrete sidewalk will be measured to the nearest 1/10 square yard. Measurement of incidental items required to complete all aspects of

construction for the above noted items at each new curb ramp and sidewalk location will not be made individually unless specified elsewhere in the contract.

**4.0 Basis of Payment.** All costs incurred by the contractor by reason of compliance to satisfy the above requirements shall be considered incidental to and completely covered by the contract unit price for each of the pay items within the contract.

Q. Reinforced Sidewalk

**1.0 Description.** This work shall be done in accordance with Section 608, and as shown in the Reinforced Sidewalk Detail in the proposed typical sections.

**2.0 Basis of Payment.** Payment for sidewalk, complete and in place, including the #4 bars for sidewalk reinforcement, will be considered completely covered by the contract unit price for Item No. 608-99.05, REINFORCED SIDEWALK, per square yard.

R. Macro-Synthetic Fibers for Concrete

**1.0 Description.** This work shall consist of producing and placing macro-synthetic fiber reinforced (MSFR) concrete as shown on the plans or as directed by the engineer. The MSFR pavement shall be in accordance with Sec 502, except as modified herein.

**2.0 Materials.** All materials shall be in accordance with Division 1000 Material Details, unless otherwise noted.

**2.1 Macro-Synthetic Fiber.** The macro-synthetic fibers shall be manufactured from virgin polyolefins (polypropylene and polyethylene) and shall comply to ASTM D7508/D7508M with the following additional criteria:

Property	Minimum Criteria
Fiber Length, in., minimum	1.50 in.
Aspect Ratio (length divided by equivalent diameter)	45-150
Relative Tensile Strength, ksi., minimum	50 ksi

**2.2 Macro-Synthetic Fiber Reinforced Concrete.** The MSFR concrete shall be a Type III Synthetic Fiber-Reinforced concrete mixture in accordance with ASTM C 1116.4.1.3.

**2.3 Submittals.** The fiber manufacturer shall submit ASTM C1609/C1609M test results from a 4000/600 psi (28-Day Compressive Strength / 28-Day Flexural Strength, respectively) mix design for MSFR concrete with a minimum equivalent flexural strength ratio ( $R_{T,150}^D$ ) of 30 percent at the recommend fiber dosage rate. The  $R_{T,150}^D$  results along with the fiber dosage rate shall be submitted with the mix design in accordance with Sec 501. Under no circumstances shall the fiber dosage rate be less than 3 pounds per cubic yard or greater than 20 pounds per cubic yard.

**3.0 Construction Requirements.** Fiber material shall be delivered, stored, handled, and mixed in accordance with manufacturer's guidelines. The fiber shall be added at the concrete plant at the addition rate specified in the mix design. The fiber manufacture shall be on site during the first day's production and shall specify the mixing time required to ensure adequate dispersion of the fibers and achieve a homogenous and workable mixture. All other requirements shall be in accordance with Sec 502.

**4.0 Basis of Payment.** No direct payment will be made to the contractor for the use of Macro-Synthetic Fiber Reinforced Concrete. All labor, equipment, and materials necessary for compliance with this provision shall be completely covered under the unit bid price for item 608-99.05 - Reinforced Concrete Sidewalk (4 Inch).

S. Guardrail Grading Requirements JSP-17-02B

**1.0 Description.** Guardrail installation and grading shall be in accordance with Missouri Standard Specifications for Highway Construction, Missouri Standard Plans for Highway Construction, and as described herein.

**2.0 Construction Requirements.** When guardrail and/or end treatment removal and replacement requires grading of the shoulder and/or slopes, Section 606.3.1(b), (c), and 606.3.1.1 of the Missouri Standard Specifications shall be waived and the following shall apply:

- a) Along roadways and shoulders, remove no more guardrail than can be reconstructed within seven (7) calendar days, including weekends and holidays. The seven day counting period shall start when the first piece of safety hardware is removed.
- b) The active work zone area that encompasses the guardrail and/or end treatment reconstruction, shall not exceed one (1) mile in length. The contractor shall be required to provide and maintain approved channelizing devices adjacent to the reconstruction area.
- c) Only one-side of the roadway shall be worked on at the same time. Divided facilities shall be limited to work on one-side of each direction at the same time.
- d) When the removal of any existing safety hardware device exposes non-breakaway obstacles, the reconstruction of the safety hardware device protecting the obstacle shall be replaced within 48 hours of removal or an approved temporary crashworthy device shall be provided, installed and maintained at the contractor's expense until the non-breakaway obstacle is permanently protected. The 48 hour counting period shall start when the first piece of safety hardware is removed.
- e) Areas where guardrail and/or end treatments have been removed, but not yet replaced, shall be delineated in accordance with plans or as directed by the Engineer.

**3.0 Non-Compliance.** Non-compliance with this provision shall result in the immediate suspension of work in accordance with Sec 105.1.2. No work, including but not limited to additional guardrail removal and grading, shall be allowed to proceed except for work necessary to restore guardrail installation.

**4.0 Basis of Payment.** No direct payment will be made for compliance with this provision. Guardrail items, grading, and temporary traffic control devices will be paid for as provided in the contract.

T. Miscellaneous Construction Requirements

The Contractor shall be required to provide the following project coordination efforts and miscellaneous project requirements for the successful completion of this project:

1. Saw cuts for pavement and sidewalks shall be full depth or a minimum of 6 inches, whichever is less.
2. A set number of ADA compliant barricades is included in the pay items. No direct pay will be made for additional ADA compliant barricades due to the contractor's preferred method of construction or acceleration of work.
3. Some signs will be removed from their existing sign supports and relocated to new sign supports. STOP signs shall always remain visible. Therefore, they will need to be temporarily mounted on supports, similar to temporary traffic control sign supports, until they can be moved to their ultimate location. No direct pay will be made to remove signs from their existing sign support, temporarily mount the signs, and move them to the ultimate location. Any signs damaged due to the contractor's construction activities will be replaced in kind at the contractor's expense.
4. A one (1) inch joint filler shall be placed between all new sidewalk and existing immovable improvements to remain in place such as power poles, fire hydrants, building foundations, pull boxes, manholes, etc.
5. Extreme care shall be taken when removing sidewalk adjacent to existing building foundations. This may require additional cutting, hand work, time, equipment, materials etc. to not damage building foundations. The engineer shall approve the contractor's proposed method to remove sidewalk adjacent to buildings. All foundations damaged due to the contractor's activities will be completely repaired in kind as approved by the engineer. Payment for compliance with the above requirements will be considered completely included in the items provided for in the contract.

U. Liquidated Damages for Winter Months JSP-04-17A

Delete Sec 108.8.1.3 (a)

Liquidated damages for failure to complete the work on time shall not be waived from December 15 to March 15, both dates inclusive.

V. Linear Grading for ADA Facilities

**1.0 Description.** This work shall consist of altering the existing roadside features to the required grade and cross sections shown in the plans (if applicable), or to comply with typical sections,

running slopes, drop-off and side-slope standards, consistent with the guidelines set forth in the Americans with Disabilities Act (ADA). This work shall be in accordance with Sections 202 and 207 and accompanying provisions except as modified herein.

**2.0 Construction Requirements.** The roadside shall be brought to the required grade and cross section as established in Section 1.0 of this provision, to a uniform appearance, free of sharp breaks or humps. Minor deviations will be allowed to take advantage of favorable topography, as approved by the engineer.

**2.1** The contractor shall remove all existing roadside improvements necessary to facilitate the new sidewalk and curb ramp construction, along with any other roadside removal items at, or adjacent to the pedestrian pathway, as noted in the plans or as approved by the engineer. This shall include the removal and/or saw cutting at existing raised islands or median strips to construct the pedestrian pathway. The contractor shall pay special care to existing utility facilities to be used in place or relocated by others.

**2.2** The contractor shall be responsible for all excavation and embankment work necessary to facilitate construction of new ADA compliant facilities; normally consisting of subgrade and subsequent finished grading for sidewalks, curbs, curb ramps; and may include miscellaneous grading work for items such as ditches, entrances, paved approaches, driveways and pipes, at or adjacent to proposed new sidewalk facilities.

**2.3** By this provision, it may be necessary to excavate, stockpile, and haul some material within the project limits. Due to staging and/or Right-of-Way constraints, it may be necessary to waste unusable material off Right-of-Way, and/or haul a replacement volume of material back to achieve the desired grades.

**2.4** All removals of Portland or Asphaltic Concrete performed under this provision will require saw-cutting a neat/clean edge along the removal lines at no direct pay, unless provided for in the contract.

**3.0 Method of Measurement.** Measurement of Linear Grading for ADA Facilities will be made along the length of the new sidewalk and/or curb ramp installed, along each side of the roadway where sidewalk work is to be performed. Measurement will be made to the nearest 0.01 station for each sidewalk work area, totaled, and paid to the nearest 0.1 station for final pay. Final field measurements will not be required except where appreciable errors are found, or authorized changes have been made.

**4.0 Basis of Payment.** The accepted quantities of Linear Grading for ADA Facilities will be paid for at the contract unit price for item 207-99.09, Linear Grading, Class 2, (Linear Grading for ADA Facilities), Station, and will be considered as full compensation for all labor, equipment, material, waste fees, disposal agreements, material acquisition, or other construction costs involved to complete the described work.

W. Adjusting Manholes, Water Meters and Valves

**1.0 Description.** This work shall consist of adjusting existing manholes, water valves and water meters that are within the new sidewalk, curb ramps, paved approaches, pavements, and project grading limits that are to be constructed or replaced.

**2.0 Construction Requirements.** Adjustments, extensions, and/or lowering of utility and any related excavation and backfill shall be constructed as approved by the Engineer. For City owned facilities, installation requirements shall be completed in accordance with the requirements stated in the City's specifications and standards. For Commission owned facilities adjustments shall conform to current Missouri Standard Specifications for Highway Construction. Adjustments shall be completed to ensure the finished sidewalks, curb ramps, paved approaches and pavement surfaces will meet current ADA standards.

**3.0 Basis of Payment.** Payment for all labor, equipment, and material cost necessary for adjusting the height of existing utility covers and valves to be flush with the surface of the sidewalk, ramp, or proposed pavement grade shall be considered completely covered by the contract unit price for Item No. 604-99.02, "Adjusting Manholes, Water Meters and Valves", per each.

**3.1** No direct payment will be made for any required cutting or joining of material, adjusting rings, hauling off or furnishing materials, or any other requirements necessary to fulfill this provision.

X. Positive Drainage

**1.0 Description.** The contractor is made aware that this project may alter the drainage collection and routing near any new improvements. Care shall be taken during construction to provide proper drainage.

**2.0 Construction Requirements.** The contractor shall maintain positive drainage for all properties and locations affected by the work and shall not create locations of ponding or other drainage concerns to property owners. The contractor shall alert the engineer of any potential concerns during construction that may affect the ability to maintain positive drainage.

**3.0 Basis of Payment.** No direct payment will be made for compliance with this provision. All equipment and labor necessary for the work described shall be considered incidental to and completely covered by other items in the contract.

Y. Tree Removal

**1.0 Description.** Tree Removal shall consist of any necessary work to fully remove trees from the project as identified on the plan sheets.

**2.0 Construction Requirements.** The work shall be accomplished such that the tree is removed from the site and the remnants will not re-grow. Tree trunks and stumps shall be ground to a minimum of four (4) inches below the existing grade/elevation of the surrounding landscaping. Damage to the surrounding landscaping, including ruts and holes, shall be repaired by the Contractor as directed by the Engineer. All tree limbs, brush, limb wood and trunk cuts shall be removed by the Contractor from the project and disposed of properly, as approved by the Engineer. Tree removal shall also be in accordance with the Tree Clearing Restrictions JSP as specified elsewhere in these specifications.

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**3.0 Method of Measurement.** Measurement will be made per each tree removed within the project limits and will be measured per each.

**4.0 Basis of Payment.** All labor, equipment, and materials necessary for Tree Removal and restoration of the disturbed areas as described in this provision will be made at the contract unit price for:

Item Number	Unit	Description
202-99.02	Each	Tree Removal

Z. Sodding

**1.0 Description.** The contractor shall install sod on all disturbed areas except for surfaced areas, solid rock, and slopes consisting of primarily broken rock.

**2.0 Construction Requirements.** The contractor shall use sodding as specified for all disturbed areas shown in the plans. Seedbed preparation will be in accordance with Sec 801 and placement shall be accomplished in accordance with Sec 803. The contractor shall place the sodding **within 14 calendar days** of ground disturbance to reduce soil erosion or as approved by engineer. Disturbed area shall be limited to less than a maximum of 1 acre at one time.

**2.1** Temporary seeding may be utilized to fulfill maximum land disturbance requirement or at the discretion of the contractor. No direct payment will be made for temporary seeding.

**2.2** Acceptance will be in accordance with Sec 803.4.

**3.0 Basis of Payment.** Payment for sod, including seedbed preparation will be considered completely covered by the contract unit price for Item No. 803-10.00A, "Turf Type Tall Fescue Sodding", per square yard. Disturbed areas outside of authorized construction limits shall be sodded at the contractor's expense at the direction of the Engineer.

AA. Combination Pad Mounted 120V/240V Power Supply And Lighting Controller

**1.0 Description.** This work shall consist of furnishing and installing combination 120/240-volt signal and lighting power supply and uninterruptible power supply (UPS) at signalized intersections utilizing a TS2 traffic signal control cabinet.

**2.0 Construction Requirements.** A combination pad mounted 120V/240V Power supply and Lighting Controller shall be provided that meets the specifications and requirements of a Type 2 Power Supply and also meets the specifications and requirements of a Base Mounted Lighting Control Station.

**3.0 Method of Measurement.** Method of measurement shall conform to Sec 902.

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**4.0 Basis of Payment.** Payment for furnishing and installing pad mounted combination units shall include all excavation, materials, equipment, tools, labor, CAT-5 cable and work incidental thereto, and shall be considered to be completely covered by the contract unit price for:

Item No.	Type	Description
902-99.02	Each	Combination Pad Mounted 120V/240V Power Supply and Lighting Controller

BB. Combined Lighting Pole Assembly

**1.0 Description.** This work shall consist of furnishing, installing, and making operational a complete lighting assembly at the locations shown on the plans. The assembly includes the lighting pole, bracket arm, foundation, and any other incidental items under one combined pay item. All labor, equipment, materials, and incidentals necessary to complete the installation shall be included.

**2.0 Material Requirements.** The contractor shall furnish all components meeting applicable requirements of Section 901 of the Missouri Standard Specifications and project plans, including:

- **Pole:** As specified on the plans, including height, finish, breakaway features (if required), and mounting configuration.
- **Bracket Arm:** Length, rise, and orientation as shown on the plans.
- **Luminaire:** LED type, wattage, optical distribution, voltage, shielding, and controls per the project lighting schedule.
- **Foundation:** Concrete foundation reinforced per standard drawings or approved design.
- **Additional:** Any additional miscellaneous hardware or equipment needed to install or erect.

Materials shall be stored, handled, and protected according to manufacturer recommendations.

**3.0 Construction Requirements.** The contractor shall:

- Install all components in accordance with the plans, applicable standard drawings, and manufacturer specifications.
- Provide all excavation, backfill, grounding, conduit, wiring, anchor bolts, hardware, and incidentals required for a complete and functioning installation.
- Ensure proper orientation, plumbness of poles, bracket arm alignment, and luminaire aiming according to lighting design intent.
- Coordinate inspections with the engineer prior to foundation concrete placement and before system energization.

- Restore all disturbed areas to pre-construction condition.

**4.0 Electrical and Wiring.** All electrical work, including wiring, splicing, grounding, connectors, fusing, and terminations, shall be considered incidental to the pay item. The contractor shall make all necessary connections to existing or new circuits as shown in the plans.

**5.0 Method of Measurement.** Measurement for the completed lighting assembly will be on a per-each basis for the installed unit, regardless of component quantities or installation complexity. The luminaire, conduit and cable/wire are paid under separate pay items in the contract.

**6.0 Basis of Payment.** Payment for accepted work will be made at the contract unit price for: Lighting Pole Assembly (Complete with foundation), 901-99.02, per each.

**6.1** Such payment shall be full compensation for furnishing and installing the lighting pole, bracket arm, luminaire, foundation, grounding, hardware, excavation, backfill, labor, equipment, tools, testing, and all incidentals necessary to complete the work. No separate payment will be made for individual components. All luminaires, conduit and cable/wiring for the lighting pole assembly will be paid for by other pay items in the contract.

CC. Lump Sum Temporary Traffic Control JSP-22-01B

**1.0 Delete Sec 616.11 and insert the following:**

**616.11 Method of Measurement.** Measurement for relocation of post-mounted signs will be made to the nearest square foot of sign area only for the signs designated for payment on the plans. All other sign relocations shall be incidental. Measurement for construction signs will be made to the nearest square foot of sign area. Measurement will be made per each for each of the temporary traffic control items provided in the contract.

**616.11.1 Lump Sum Temporary Traffic Control.** No measurement will be made for temporary traffic control items grouped and designated to be paid per lump sum. The list of lump sum items provided in the plans or contract is considered an approximation and may be subject to change based on field conditions. This is not a complete list and may exclude quantities for duplicate work zone packages used in simultaneous operations. The contractor shall provide all traffic control devices required to execute the provided traffic control plans for each applicable operation, stage, or phase. No measurement will be made for any additional signs or devices needed except for changes in the traffic control plan directed by the engineer.

**2.0 Delete Sec 616.12 and insert the following:**

**616.12 Basis of Payment.** All temporary traffic control devices authorized for installation by the engineer will be paid for at the contract unit price for each of the pay items included in the contract. Whether the devices are paid individually, or per lump sum, no direct payment will be made for the following:

- (a) Incidental items necessary to complete the work, unless specifically provided as a pay item in the contract.

- (b) Installing, operating, maintaining, cleaning, repairing, removing, or replacing traffic control devices.
- (c) Covering and uncovering existing signs and other traffic control devices.
- (d) Relocating temporary traffic control devices, including permanent traffic control devices temporarily relocated, unless specifically included as a pay item in the contract.
- (e) Worker apparel.
- (f) Flaggers, AFADs, PFDs, pilot vehicles, and appurtenances at flagging stations.
- (g) Furnishing, installing, operating, maintaining, and removing construction-related vehicle and equipment lighting.
- (h) Construction and removal of temporary equipment crossovers, including restoring pre-existing crossovers.
- (i) Provide and maintaining work zone lighting and work area lighting.

**616.12.1 Lump Sum Temporary Traffic Control.** Traffic control items grouped together in the contract or plans for lump sum payment shall be paid incrementally per Sec 616.12.1.1. Alternately, upon request from the contractor, the engineer will consider a modified payment schedule that more accurately reflects completion of traffic control work. No payment will be made for any additional signs or devices needed except for changes in the traffic control plan directed by the engineer. Additional items directed by the engineer will be paid for in accordance with Sec 109.4. No adjustment to the price will be made for overruns or underruns of other work or for added work that is completed within existing work zones.

**616.12.1.1 Partial payments.** For purposes of determining partial payments, the original contract amount will be the total dollar value of all original contract line items less the price for Lump Sum Temporary Traffic Control (LSTTC). If the contract includes multiple projects, this determination will be made for each project. Partial payments will be made as follows:

- (a) The first payment will be made when five percent of the original contract amount is earned. The payment will be 50 percent of the price for LSTTC, or five percent of the original contract amount, whichever is less.
- (b) The second payment will be made when 50 percent of the original contract amount is earned. The payment will be 25 percent of the price for LSTTC, or 2.5 percent of the original contract amount, whichever is less.
- (c) The third payment will be made when 75 percent of the original contract amount is earned. The payment will be 20 percent of the price for LSTTC, or two percent of the original contract amount, whichever is less.
- (d) Payment for the remaining balance due for LSTTC will be made when the contract has been accepted for maintenance or earlier as approved by the engineer.

**616.12.1.2** Temporary traffic control will be paid for at the contract lump sum price for Item:

Item No.	Unit	Description
616-99.01	Lump Sum	Misc. Lump Sum Temporary Traffic Control

DD. Modified Type S Concrete Curb (over 12")

**1.0 Description.** This work includes furnishing and constructing a modified "Type S" concrete curb, as shown in the plans.

**2.0 Construction Requirements.** The dimensions of the modified curb shall be in accordance with the plans and as approved by the engineer.

**2.1** Modified Type S Curb shall be constructed per section 609 of the standard specifications for concrete curb. Reinforcing steel bars shall be in accordance with Sec 703.

**3.0 Method of Measurement:** No field measurement of the modified curb will be made, except in the instance of significant revisions to the design as approved by the Engineer. The contract quantity will be used for payment and will be measured along the top of the curb at the curb face.

**4.0 Basis of Payment:** All costs associated with this work shall be considered completely covered by Item No. 609-99.03 "Modified Type S Curb (12 in.- 30 in.), per linear foot. No direct payment shall be made for reinforcing steel.

EE. Accessible Pedestrian Pushbuttons

**1.0 Description.** Audible pedestrian pushbuttons will be required for all signalized pedestrian crosswalks at all intersections. Each audible pedestrian signaling system shall include all electronic control equipment, mounting hardware and pushbuttons necessary to provide audible tone and speech indications as well as a vibrating tactile indication for specific pedestrian signal functions. Each audible pedestrian system will also include the hardware and software needed for programming the system operational parameters.

**2.0 Installation, Programming and Functionality.** The contractor shall install the audible pedestrian system following manufacturer's recommendations and Sec 902, and program each component for operation to provide the following functionality. Prior to activating each audible pedestrian system, the contractor shall submit a listing of the values programmed for all variable system parameters to the engineer for review and approval. Use also Section 4K.01 – 4K.05 of the MUTCD (11<sup>th</sup> Edition) for additional guidance of initial values for each programmable parameter.

**2.1 Audible Locator Tone.** The Locator tone tells the pedestrian that the intersection is equipped with an APS and where it is. The locator tone shall operate during the DON'T WALK and flashing DON'T WALK intervals only and shall be deactivated when the pedestrian signal is not operative. Push button locator tones shall be intensity responsive to ambient sound and be audible 6 to 12 feet from the pushbutton, or the building line, whichever is less.

**2.2 Verbal Wait Message.** This acknowledgement message confirms for the pedestrian that their button press has placed a call. Each actuation shall be accompanied by the speech message "wait."

**2.3 Walk Message.** Where two accessible pedestrian signals are separated by a distance of at least 10 feet, the audible walk indication shall be a percussive tone. Where two accessible pedestrian signals on one corner are not separated by a distance of at least 10 feet, the audible walk indication shall be a speech walk message.

**2.3.1 Audible tone.** Walk indications shall repeat at eight to ten ticks per second. Audible tones used as walk indications shall consist of multiple frequencies with a dominant component at 880 Hz.

**2.3.2 Verbal Walk.** Message provides a clear message that the walk interval is in effect, as well as to which crossing it applies. The message shall be audible from the entrance of the associated crosswalk. Walk messages that are used at intersections having pedestrian phasing that is concurrent with vehicular phasing shall be patterned after the model: "Broadway. Walk sign is on to cross Broadway." Walk messages that are used at intersections having exclusive pedestrian phasing shall be patterned after the model: "Walk sign is on for all crossings."

**2.4 Vibrotactile Message.** Vibrotactile indications shall be provided by a tactile arrow on the pushbutton that vibrates during the walk interval only. The arrow shall be located on the pushbutton, have high visual contrast and shall be aligned parallel to the direction of travel on the associated crosswalk.

**2.5 Volume.** Automatic volume adjustment in response to ambient traffic sound level will be provided up to a maximum volume of 100 dB. The units shall be responsive to ambient noise level changes up to no more than 5 dB louder than ambient sound. Tone or voice volume measured at 36 inches from the unit shall be 2 dB minimum and 5 dB maximum above ambient noise level. At installation, signal system is to be adjusted to be audible at no more than 5 to 12 feet from the system.

**3.0 Equipment requirements.** The audible pedestrian system and its components, in form and functionality, shall meet or exceed the requirements of the following documents and standards:

- MUTCD (11<sup>th</sup> Edition), Section 4K.01 – 4K.05
- NEMA 250 – 4X
- NEMA TS1, TS2, TS4, Type 170, Type 2070

**4.0 Documentation and Support.** Two copies of the operation and maintenance manuals for each installed system shall be included.

**5.0 Construction Requirements.** Construction requirements shall conform to Sec 902, 1061, and 1092.

**6.0 Method of Measurement.** Method of measurement shall conform to Sec 902.

**7.0 Payment.** Payment for the audible signals will be for each unit per bid item, 902.49-21, "Accessible Pedestrian Signal", per each. This will include all wiring, power adaptors, and installation hardware needed.

FF. Controller Assembly Housing, NEMA, TS1 (No Controller)

**1.0 Description.** This work shall consist of providing and installing a new NEMA traffic signal cabinet at each intersection shown in the plans.

**2.0 Material Requirements.** The traffic signal controllers will be provided by the Commission. The contractor shall be responsible for installation of the controllers. It is anticipated that the controllers installed with this project will consist of ATC eX 2070 controllers with OMNI-eX software as manufactured by McCain, Inc. placed inside the cabinet.

**3.0 Communications.** The contractor shall be responsible for providing all necessary items (except for the controller) to make the new signal controllers operational. This includes but is not limited to the, the OMNI-eX software, and the cabinet. The engineer will provide the existing cycle lengths, but the contractor shall ultimately be responsible for programming the timings into the new controllers.

**4.0 Method of Measurement.** Method of measurement will be made per cabinet installed by the contractor and acceptable by the engineer.

**5.0 Basis of Payment.** Accepted signal cabinets will be paid for at the contract unit price for item 902-99.02, "Misc. {Controller Assembly Housing, NEMA, TS1 (No Controller})", per each.

GG. Push Button Extension

**1.0** This work includes adding 3/4-inch galvanized pipe extensions to pedestrian pushbuttons, so they meet offset and height requirements per ADA specifications.

**1.1** The contractor is advised that various push buttons will require extensions from the pedestrian signal pole or vehicular signal post so the button is located meeting the requirement of ADA specifications. Extensions shall not exceed 18-inches.

**2.0 Method of Measurement:** Measurement of the pedestrian pushbutton extensions shall be made per each.

**3.0 Basis of Payment:** All costs associated with this work shall be considered completely covered by Item No. 902-99.02 "Push Button Extension", per each.

HH. Cable, Video

**1.0 Description.** This work shall consist of installing new video detection cable as indicated on the plans.

**1.1** The video detection cable installed shall be appropriate for the video detection cameras installed at the intersection.

**2.0 Method of Measurement.** Measurement of the video cable shall be made per linear foot.

**3.0 Basis of Payment.** All costs associated with this work shall be considered completely covered by item 902.99-03, "Misc. {Cable, Video}", per linear foot.

II. Removal and Replacement of Traffic Signs

**1.0 Description.** Existing traffic signs that have to be removed prior to proposed traffic signs being installed and that are determined essential to the safe and orderly flow of traffic by the Engineer shall be temporarily re-erected immediately by the Contractor at temporary locations in a manner approved by the Engineer. The existing signs shall remain temporarily erected until the final permanent signing has been installed. The Contractor shall maintain the existing signs in a straight and neat condition for the duration of the temporary mounting.

**2.0 Basis of Payment.** No direct payment shall be made for compliance with this provision.

JJ. ADA Material Testing Frequency Modifications JSP-23-01A

**1.0 Description.** This provision revises the Inspection and Testing Plan (ITP) for the construction of ADA compliant features to better match the nature of the work. The minimum Quality Control (QC) testing frequencies shall be as stated in these provisions.

**2.0 Compaction Test on Base Rock Under Sidewalk, Curb Ramps and Paved Approaches.** (Revises ITP Sec 304.3.4) The required test frequency shall be one per 600 tons.

**3.0 Gradation Test on Base Rock Under Sidewalk, Curb Ramps and Paved Approaches.** (Revises ITP Sec 304.4.1) The required frequency shall be one per 500 tons.

**4.0 Concrete Plant Checklists.** (Revises ITP Sec 501) Submittal of the 501 Concrete Plant Checklist shall be once per week when the contractor is only pouring curb, sidewalk, paved approaches, and curb ramps.

**5.0 Concrete Median, Median Strip, Sidewalk, Curb Ramps, Steps and Paved Approaches.** The required frequency shall remain as stated in ITP Sec 608 and further detailed in Sec 608.3.7.

**6.0 Concrete Curb.** (Revises ITP Sec 609 only for Concrete Curb) For concrete curb, the required frequency shall be equivalent to ITP Sec 608 (concrete median, median strip, sidewalk, curb ramps, steps, and paved approaches), and Sec 608.3.7.

KK. Tree Clearing Restrictions

**1.0 Description.** The project is within the known range of several federally protected bat species. These bats are known to roost in trees with suitable habitat characteristics during summer months.

**1.1** MoDOT has determined that suitable trees for one or more of these bat species exist within the project area.

**1.2** To avoid negative impacts to these bat species, removal of any trees/limbs greater than three (3) inches in diameter shall only occur between October 16 and March 31.

**2.0 Basis of Payment.** No direct pay shall be provided for any labor, equipment, time, or materials necessary to complete this work.

LL. The Canadian Pacific Kansas City Railway Company (CPKC) Requirements

To report an emergency on The Canadian Pacific Kansas City Railway Company right-of-way call: (800) 527-9464. This Project is located on Audrain County Route 15 on the CPKC Mexico Subdivision, MP 326.0, designated as DOT# 293343P in Mexico, MO. **Current FRA data shows 2 daytime trains and 1 nighttime train and 0 passenger trains per day.**

**1.0 Authority of Railroad Engineer and State Engineer.**

**1.1** The authorized representative of The Canadian Pacific Kansas City Railway Company, herein called "Railroad Engineer", shall have final authority in all matters affecting the safety of employees of The Kansas City Southern Railway Company, herein called "Railroad", the public, and the safe maintenance and operation of railroad traffic including the adequacy of the foundations and structures supporting the railroad tracks. The Railroad designates the following individual as the Railroad Engineer for this project. Except as otherwise provided in this document, herein called "Railroad Requirements", the Missouri Highway and Transportation Commission's Contractor, herein called "Contractor", shall address all notices to the Railroad concerning this Project to the following person:

Mr. Justin Meyer  
Senior Vice President, Engineering and Mechanical  
The Kansas City Southern Railway Company  
427 West 12<sup>th</sup> Street  
Kansas City, MO 64105  
c/o Mr. Charles Kretchman  
Office: (612) 247-0706  
E-mail: [Charles.Kretchman@CPKCR.com](mailto:Charles.Kretchman@CPKCR.com)

**1.2** The authorized representative, herein called "Engineer", of the Missouri Highways and Transportation Commission, herein called "Commission", shall have authority over all other matters as prescribed herein and in the project plans and specifications.

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**1.3** The Railroad's right of way (hereinafter, "Railroad ROW") is located within this Project, which requires the Contractor to perform work on Railroad ROW. Therefore, the Contractor shall coordinate its work activities with the activities of the Railroad as required in this document.

#### **1.4 Indemnification of Railroad by Contractor.**

**1.4.a.** The term Contractor as used herein includes any and all subcontractors.

**1.4.b.** The Contractor agrees to defend, indemnify and hold harmless Railroad, its directors, officers, employees, agents, successors and assigns from and against any injury or death of persons whomsoever or from any loss or damage to the Railroad's property, right of way, tracks and other facilities, herein called "Railroad's property," and from the Railroad's liability or loss incurred for damage to any other property in Railroad's care, custody or control in or upon Railroad's property, caused by acts or omissions of the Contractor in performing work on this Project, whether on, over, under or in the vicinity of the Railroad's property.

**1.4.c.** In the event the Contractor shall fail to restore the Railroad's property immediately to a condition acceptable to the Railroad when any such loss or damage to the Railroad's property is called to the Contractor's attention by the Railroad, then the Railroad may perform such corrective work at the cost of the Contractor. The term "loss or damage" as used herein shall include, but not be limited to, the erosion and silting of, water damage to, and the accidental or intentional placing or dropping of objects on the Railroad's property.

**2.0 Right of Entry.** At least forty-five (45) days in advance of the date the contractor proposes to begin work on the Railroad's Property, the contractor shall enter into a Right of Entry Agreement with Railroad prior to working on Railroad property. Request application for Right of Entry Agreement from:

Denise Case – Permit Manager  
JLL – Rail Practice Group  
4200 Buckingham Road, Suite 110  
Fort Worth, TX 76155  
Phone: (817) 230-2614  
Email: [denise.case@am.jll.com](mailto:denise.case@am.jll.com)

Online Permit Application: [https://jllrpg.360works.com/fmi/webd/rpo\\_web\\_kcs.fmp12](https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12)

**2.1 Right of Entry Fee.** A Two Thousand Dollar (\$2,000) non-refundable fee must accompany the application, made payable to CPKC, or the application will be returned.

**3.0 Construction Requirements.** The Contractor's work on the Railroad's ROW shall be performed in accordance with these Railroad Requirements. The Contractor shall supply adequate equipment, labor and materials to perform the proposed work at the job site. The Contractor shall take special precaution and care to prevent any debris or material from falling on the Railroad's right of way. The safe operation of the Railroad shall take precedence over all work and nothing shall be done by the Contractor that will endanger the Railroad's operations. The Contractor shall protect the Railroad property from any damage resulting from the Contractor's acts or omissions during the highway Project.

**4.0 Contractor Plans and Procedures.** Before performing any excavation, demolition, blasting, lifting of structural members or construction of falsework on or over Railroad's ROW or

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adjacent to the Railroad's ROW that may interfere with the safe operation of the trains, the Contractor shall submit its excavation, shoring, demolition, blasting, lifting of structural members and falsework plans and relevant procedures to the Engineer for review, and to the Railroad Engineer for review and approval. These plans and procedures shall be signed and sealed by a Professional engineer licensed in the State of Missouri. However, such approval shall not relieve the Contractor from any liability relating to this Project. During the course of the Project, the Contractor shall submit any proposed changes to the approved plans or procedures to the Engineer for review and to the Railroad Engineer for review and approval. Any clearing and grubbing to increase the sight distance for a safer construction operation, or erection of temporary structures within the Railroad property shall not be done prior to the approval of the Railroad. The Railroad Engineer shall make a decision within 30 days. Should the Railroad Engineer deny the plans and requires a resubmittal, the Railroad Engineer shall provide approval or denial and requirement for resubmittal within 30 days after receipt of the revised plans.

**4.1** The Contractor shall be required to take special precautions and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of OSHA, AREMA and Section IV, Design and Construction of Shoring Adjacent to and on Railroad Right-Of-Way contained within the "KCS Guidelines for the Design and Construction of Railroad Overpasses and Underpasses".

**4.2** The Contractor shall abide by the following minimum temporary clearances during the course of construction:

- (a) 14 feet horizontal from centerline of track
- (b) 22 feet vertical above top of rail.

**4.3** The Contractor shall comply with the Railroad's rules and regulations concerning protection of persons and property and the Contractor shall consult with the Railroad Engineer concerning the Railroad's rules and regulations. Any questions arising about coordination of work between the Contractor and the Railroad Engineer or between the Contractor and others shall be taken up with the Engineer and the Contractor, Railroad Engineer and Engineer shall agree upon a method of coordination before commencing the work.

**4.4** Prior to commencing any work upon, over or under the Railroad's ROW, the Contractor shall furnish to the Railroad Engineer evidence that the Contractor's insurance is in compliance with Section 6 of this special provision.

**4.5** The Contractor shall be required to maintain all ditches and drainage structures free of silt or other obstructions which may result from Contractor's operations; to promptly repair eroded areas within Railroad's ROW and to repair any other damage to the property of the Railroad or its tenants which may result from Contractor's operations. All such maintenance and repair of damages due to the Contractor's operations shall be done at the Contractor's expense. If the Contractor's method of erosion control differs from the approved plans, the Contractor shall submit a proposed method of erosion control and have the method reviewed by the Railroad and Commission prior to beginning any grading work on the Project site. Erosion control methods must comply with all applicable local, state and federal regulations.

**4.6** The Contractor shall, reasonably throughout each work day and at the end of each work day when performing work near the Railroad's tracks, inspect the track area and clean up any debris that may have been dropped on or within ten (10) feet of Railroad's tracks. Upon completion of the Project, the Contractor shall return the Railroad ROW and all other Railroad property to a condition equal to or better than existed prior to commencement of the work. Contractor shall remove all waste, excess materials, false work and other temporary structures, and equipment, leaving the location of the work cleaned to the reasonable satisfaction of Railroad. The Contractor shall repair to the reasonable satisfaction of Railroad Engineer, and at the Contractor's sole cost and expense, any and all damages to the Railroad's property caused during construction of the Project.

## **5.0 Site Inspections By Railroad's Designated Representative.**

**5.1** In addition to the office review of construction submittals, site inspections may be performed by Railroad's Designated Representative at milestone events during construction, including but not limited to the following:

- (a) Preconstruction meetings.
- (b) Excavations, shoring placement/removal, pile driving, drilling of caissons or drilledshafts adjacent to tracks.
- (c) Reinforcement and concrete placement for near track piers.
- (d) Erection of precast concrete or steel overpass bridge superstructure.
- (e) Reinforcement and concrete placement of overpass bridge decks.
- (f) Completion of the bridge structure.

**5.2** The Railroad Designated Representative can either be an employee of the Railroad or a hired outside consultant. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

**5.3** In addition to the project schedule required by the Commission, the Contractor shall provide to the Engineer a detailed construction schedule for its work on Railroad ROW, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to be performed on Railroad ROW. The Contractor shall submit a copy of this detailed construction schedule to Railroad's Designated Representative for review prior to the start of the work. This schedule shall also include the anticipated dates when the milestone events listed in subsection 5.1 will occur. The Contractor shall update the schedule for these milestone events as necessary, but at least monthly, and shall provide a copy of all updates to the Railroad so that site visits may be scheduled. The Commission shall reimburse the Railroad all costs associated with Site Inspection work by the Railroad.

## **6.0 Safety and Railroad Flagging.**

**6.1** The safe operation of the Railroad shall take precedence over Commission's work on, under and above the Railroad ROW. Contractor shall not, without Railroad's prior consent,

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come within 50 feet of Railroad's tracks. All work of the Contractor to be performed on, above, below or adjacent to the Railroad ROW shall be coordinated with Railroad so as to avoid, to the greatest extent possible, interference with railroad operations and to assure, at a minimum, sufficient advance notice to Railroad to ensure operational safety. Contractor shall be solely responsible with complying with any applicable laws, rules and regulations, including but not limited to OSHA regulations governing multi-employer work sites.

**6.2** While on the Railroad's ROW, Contractor shall comply with Railroad's rules and regulations concerning protection of persons and property. Railroad shall make its applicable rules available to the Contractor for review and copying.

**6.3** Except as authorized by Railroad the Contractor shall not work within the "Minimum Clearance Zone" of any track. The "Minimum Clearance Zone" is defined as an area measured 50 feet, horizontally, on either side of the centerline of track with unlimited vertical distance within the horizontal limits. Additionally, Contractor will locate all equipment, devices, and materials at a sufficient distance from any track to ensure that no apparatus or part of any equipment, device, or material, such as the boom of a crane or a dragline, could under any circumstances encroach on the "Minimum Clearance Zone" of any track. A railroad flagger will also be required when any equipment or its attachment or booms, even though stationed outside the above-mentioned 50 feet of the nearest rail but within the railroad ROW, has a potential to come within the 50 feet of the nearest rail.

**6.4** Flagging services provided by a Railroad-qualified flagging contractor will be required whenever agents, employees or equipment of the Contractor or any of its contractors or subcontractors on this Project shall be within Fifty (50') of the nearest rail or if conditions as noted in item 6.3 above arise, unless specifically waived in writing by the Railroad.

**6.5** Contractor shall notify the Railroad concerning any flagging services that will be required during the course of the Project, but the Contractor shall make all arrangements for flagging protection directly with a Railroad-qualified flagging contractor. Railroad's designation of a flagging contractor as a "Railroad-qualified" flagging contractor shall be construed solely as Railroad's willingness to allow that flagging contractor to provide flagging services on Railroad's property without further proof of qualification, and shall not be construed as an endorsement or other verification of the abilities or qualifications of that flagging contractor. Under these Railroad Requirements, all flagging contractors utilized on the Project shall be treated solely as independent contractors of the Contractor for all purposes under these Railroad Requirements.

**6.6** The Contractor shall contract directly with any of the Railroad-qualified flagging contractors and pay them directly. The Contractor shall provide at least one month's notice prior to the first use of flaggers. Current Railroad-qualified flagging contractors are:

**Railpros Field Services**

Joel Ashcraft 417-362-9007 [joel.ashcraft@railpros.com](mailto:joel.ashcraft@railpros.com)

Jon Norris 601-502-6985 [jon.norris@railpros.com](mailto:jon.norris@railpros.com)

**6.7** Contractor may also obtain a list of Railroad-qualified flagging contractors together with their address and telephone numbers for flagging purposes at the proposed site by written request, sent at least 30 (thirty) days in advance, by U.S. mail or by e-mail addressed to:

Mr. Charles Kretchman

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County: Audrain

Supervisor of Public Works  
The Canadian Pacific Kansas City Railway Company  
120 South 6<sup>th</sup> Street Suite 500  
Minneapolis, MN 55402  
Office: 612-247-0706  
E-mail: [Charles.Kretchman@CPKCR.com](mailto:Charles.Kretchman@CPKCR.com)

**6.8** Contractor shall clear the tracks when directed to do so by the flagger. The presence of the flagger will not relieve Contractor of its duty to keep all of its agents, employees and contractors clear of the tracks when trains are in dangerous proximity to the area where construction is occurring.

**6.9** All railroad tracks within and adjacent to the Project site are active, and rail traffic over these facilities shall be maintained throughout the Project. Railroad signal facilities within the project limits shall be protected at all times. CPKC shall be notified if any of its facilities are in conflict with the planned work. Activities may include both through moves and switching moves to local customers. Railroad traffic and operations will occur continuously throughout the day and night on the tracks. The Contractor shall coordinate and schedule the work so that construction activities do not interfere with railroad operations. Any and all costs associated with delays caused to the train traffic by the Contractor shall be reimbursed by the Contractor. The Commission or the Contractor may audit these costs.

**6.10** The Contractor shall notify Railroad of the completion of work on Railroad ROW within 30 days after the completion of work on Railroad ROW. Railroad shall inspect Railroad's property within 30 days after the Contractor has given this notice, to verify the Contractor's compliance with these Railroad Requirements. Railroad shall notify the Engineer of any outstanding issues to be addressed on Railroad ROW. Engineer will notify the Contractor of work to be completed.

**7.0 Insurance Requirements.** The amount of work to be performed upon, over or under Railroad's right of way is estimated to be one percent of the Contractor's total bid for the Project. In addition to any other forms of insurance or bonds required under the terms of the contract and specifications, the Contractor shall be required to carry insurance of the following kinds:

(a) Commercial General Liability Insurance, including contractual liability and products completed/operations, against claims arising out of bodily injury, illness and death and from damage to or destruction of property of others, including loss of use thereof, with minimum limits for bodily injury and property damage of \$2,000,000 for each occurrence, with an aggregate of \$10,000,000.

1. The definition of "insured contract" shall be amended to remove any exclusion or other limitation for any work being done within 50 feet of railroad property.

2. No other endorsement limiting the coverage required by paragraph (a) of section 7.0 of these Railroad Requirements shall be included on the policy with regard to the work being performed under the contract between the contractor and the Commission.

(b) Business Automobile Policy Insurance, including owned, non-owned, and hired vehicles with minimum limits for bodily injury and property damage of \$2,000,000 per

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occurrence, on all vehicles used on Railroad's property during the term of the contract between the contractor and the Commission.

(c) Worker's Compensation Insurance or coverage as required under the Worker's Compensation Act of the State of Missouri. The policy shall include occupational disease to required statutory limits, employer's liability of \$1,000,000 to include FELA, if appropriate, and an "all states" endorsement.

(d) A Railroad Protective Liability policy issued in the name of the Railroad with limits of \$2,000,000 for bodily injury and property damage per occurrence, with an aggregate of \$10,000,000. The policy shall remain in force during the construction phase of the Project and shall be provided prior to start of work. The following provisions apply to the endorsements to this policy:

1. The policy shall be endorsed to include the Pollution Exclusion Amendment (ISO form CG 28 31 10 93).
2. The policy shall be endorsed to include the Limited Seepage and Pollution Endorsement.
3. The policy shall be endorsed to remove any exclusion for punitive damages.
4. The policy shall be endorsed to include Evacuation Expense Coverage Endorsement.
5. No other endorsements restricting coverage shall be added to the policy, except as authorized by paragraph 7.1.2 of these Railroad Requirements.
6. The Contractor shall provide the original policy to the Railroad before performing any work or services under the contract between the Contractor and the Commission.

**7.1 Evidence of Insurance.** The Declarations shall include the description of operations matching the Project description in the Contractor's contract with the Commission and shall include the appropriate Commission project and contract identification numbers. The job number and Project location shall appear on the Declarations and shall include the city, state and appropriate highway designation as follows:

Route 15 Audrain County in Mexico, MO.  
Job No. J2P3396, Resurfacing (mill/fill) under CPKC bridge.  
Mexico Subdivision, MP 326.0, DOT# 293343P.

**7.1.1** The name and address of the Contractor shall appear on the Declarations. The name and address of the Commission shall be identified on the Declarations as the "Involved Governmental Authority or Other Contracting Party".

**7.1.2** Other endorsements/forms that will be accepted are:

- (a) Broad Form Nuclear Exclusion – Form IL 00 21.

- (b) 30-day Advance Notice of Non-renewal or cancellation.
- (c) Required State Cancellation Endorsement.
- (d) Quick Reference or Index Form CL/IL 240.

**7.1.3** Endorsements/forms that will NOT be acceptable are:

- (a) Any Pollution Exclusion Endorsement except CG 28 31.
- (b) Any Punitive or Exemplary Damages Exclusion.
- (c) Known injury or Damage Exclusion form CG 00 59.
- (d) Any Common Policy Conditions form.
- (e) Any other endorsement/form not specifically authorized in this special provision.

**7.1.4** If any part of the work is sublet, similar insurance and evidence thereof as specified above, shall be provided by or on behalf of the subcontractor to cover the subcontractor's operations on the Railroad ROW, including such operations by any Railroad-qualified flagging contractor.

**7.1.5** Prior to entry on the Railroad's ROW, the Contractor shall submit the original Railroad Protective Liability Insurance Policy to the Commission and to the Railroad at the addresses below, for review by the Commission and approval by the Railroad. In addition, the Contractor shall submit certificates of insurance evidencing the Contractor's and any subcontractor's Commercial General Liability Insurance to the Railroad and the Commission at the addresses below, for review by the Commission and approval by the Railroad. The certificates of insurance shall state that the insurance coverage shall not be suspended, voided, canceled or reduced in coverage or limits without 30 days advance written notice to the Railroad and the Commission. No work shall be permitted on the Railroad's right-of-way until the Railroad has reviewed and approved the evidence of insurance required herein.

Railroad  
Mr. Charles Kretchman  
CPKC Limited  
120 South 6<sup>th</sup> Street Suite 500  
Minneapolis, MN 55402  
P.O. Box 219335  
Kansas City, MO 64121-9335

Commission  
Ms. Brandi Baldwin  
State Construction & Material Engineer  
MoDOT  
P.O. Box 270  
Jefferson City, MO 65102

**8.0 Failure to Comply.** If the Contractor violates or fails to comply with any of these Railroad Requirements, then the provisions in paragraphs (a) and (b) of this section shall apply, and shall remain in effect until the Contractor has remedied the situation to the satisfaction of the Railroad Engineer and the Engineer.

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(a) The Railroad Engineer may require that the Contractor shall vacate the Railroad's property.

(b) The Engineer may withhold all monies due to the Contractor until the Contractor has remedied the situation to the satisfaction of the Railroad Engineer and the Engineer.

**9.0 Payment for Cost of Compliance.** No separate payment will be made for any extra cost incurred by the Contractor on account of compliance with these Railroad Requirements. The Contractor shall include all such costs in its contract unit price for other items included in its contract with the Commission.

MM. Protection of the Norfolk Southern Railroad Interests

To report an emergency on The Norfolk Southern Railroad right-of-way call: (800) 453-2530. This resurfacing (mill/fill) Project is located on Audrain County Route 15 on the Midwest Division, MP S-110.4, designated as DOT # 483642W in Mexico, MO. **Current FRA data shows 6 daytime trains, 3 nighttime trains and 0 passenger trains daily.**

**1.0** This project requires the Contractor to go through the NON-Environmental Right of Entry Process to secure protective services for Norfolk Southern Railroad's Property. The link to the website is as follows: <https://www.norfolksouthern.com/en/rail-development-property/ns-property/projects-on-ns-property/access-ns-property> and includes the necessary insurance requirements.

**1.1** *Once on the website use the non-Environmental Right of Entry link to download the NON-Environmental Right of Entry Instructions and obtain the correct access to RailPros for Norfolk Southern <https://ns.railprosperting.com/>. There is a non-refundable application fee of \$1,600. Once the Right of Entry is approved, and issued to the contractor for signature, a separate processing fee of \$700 will also be invoiced if there is an active rail at the proposed location which will require railroad flaggers (See paragraph 2.1 below). This fee is separate from any railroad flagging fees. Questions for any railroad requirements may be directed to:*

**Angela McLean**  
**Real Estate Manager – RailPros**  
**402-965-0443**  
[angela.mclean@railpros.com](mailto:angela.mclean@railpros.com)

**2.0 Flagging Services.**

**2.1 When Required.** Under the terms of the agreement between the Commission and the Railroad, the Railroad has sole authority to determine the need for flagging required to protect the Railroad's operations. In general, the requirements of such services will be whenever the contractor's personnel or equipment are, or are likely to be, working on the Railroad's right of way within 25 feet of the centerline of any track, or across, over, adjacent to, or under a track, or when such work has disturbed or is likely to disturb a railroad structure or the railroad roadbed or surface and alignment of any track to such extent that the movement of trains must be controlled by flagging, or reasonable probability of accidental hazard to Railroad's operations or personnel. Normally, the Railroad will require one flagger per project; but in some cases, more

than one may be necessary, such as yard limits where 3 flaggers may be required. However, if the contractor works within distances that violates instructions given by the Railroad Engineer or performs work that has not been scheduled with the Railroad Engineer, flaggers may be required full time until the project has been completed.

**2.2** The Contractor will pay the Railroad or appropriate flagging contractor directly for the cost of flagging services associated with the project and notify the MoDOT Resident Engineer of such payments.

**3.0 Failure to Comply.** If the contractor violates or fails to comply with any of the requirements of these Railroad Requirements, then the Railroad Engineer may require that the contractor vacates the Railroad's property and the MoDOT Engineer may withhold all monies due to the contractor until the contractor has remedied the situation to the satisfaction of the Railroad Engineer and the MoDOT Engineer.

**4.0 Payment for Cost of Compliance.** No separate payment will be made for any extra cost incurred on account of compliance with this special provision. All such costs shall be included in the contract unit price for other items included in the contract. Railroad will not be responsible for paying the contractor for any work performed under this special provision.

NN. Supplemental Revisions JSP 18-01KK

- Compliance with [2 CFR 200.216 – Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment](#).

The Missouri Highways and Transportation Commission shall not enter into a contract (or extend or renew a contract) using federal funds to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as substantial or as critical technology as part of any system where the video surveillance and telecommunications equipment was produced by Huawei Technologies Company, ZTE Corporation, Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).

- Stormwater Compliance Requirements

**1.0 Description.** This provision requires the contractor to provide a Water Pollution Control Manager (WPCM) for any project that includes land disturbance on the project site and the total area of land disturbance, both on the project site, and all Off-site support areas, is one (1) acre or more. Regardless of the area of Off-site disturbance, if no land disturbance occurs on the project site, these provisions do not apply. When a WPCM is required, all sections within this provision shall be applicable, including assessment of specified Liquidated Damages for failure to correct Stormwater Deficiencies, as specified herein. This provision is in addition to any other stormwater, environmental, and land disturbance requirements specified elsewhere in the contract.

**1.1 Definitions.** The project site is defined as all areas designated on the plans, including temporary and permanent easements. The project site is equivalent to the "permitted site", as

defined in MoDOT's State Operating Permit. An Off-site area is defined as any location off the project site the contractor utilizes for a dedicated project support function, such as, but not limited to, staging area, plant site, borrow area, or waste area.

**1.2 Reporting of Off-Site Land Disturbance.** If the project includes any planned land disturbance on the project site, prior to the start of work, the contractor shall submit a written report to the engineer that discloses all Off-site support areas where land disturbance is planned, the total acreage of anticipated land disturbance on those sites, and the land disturbance permit number(s). Upon request by the engineer, the contractor shall submit a copy of its land disturbance permit(s) for Off-site locations. Based on the total acreage of land disturbance, both on and Off-site, the engineer shall determine if these Stormwater Compliance Requirements shall apply. The Contractor shall immediately report any changes to the planned area of Off-site land disturbance. The Contractor is responsible for obtaining its own separate land disturbance permit for Off-site areas.

**2.0 Water Pollution Control Manager (WPCM).** The Contractor shall designate a competent person to serve as the Water Pollution Control Manager (WPCM) for projects meeting the description in Section 1.0. The Contractor shall ensure the WPCM completes all duties listed in Section 2.1.

**2.1 Duties of the WPCM:**

- (a) Be familiar with the stormwater requirements including the current MoDOT State Operating Permit for construction stormwater discharges/land disturbance activities; MoDOT's statewide Stormwater Pollution Prevention Plan (SWPPP); the Corps of Engineers Section 404 Permit, when applicable; the project specific SWPPP, the Project's Erosion & Sediment Control Plan; all applicable special provisions, specifications, and standard drawings; and this provision;
- (b) Successfully complete the MoDOT Stormwater Training Course within the last 4 years. The MoDOT Stormwater Training is a free online course available at MoDOT.org;
- (c) Attend the Pre-Activity Meeting for Grading and Land Disturbance and all subsequent Weekly Meetings in which grading activities are discussed;
- (d) Oversee and ensure all work is performed in accordance with the Project-specific SWPPP and all updates thereto, or as designated by the engineer;
- (e) Review the project site for compliance with the Project SWPPP, as needed, from the start of any grading operations until final stabilization is achieved, and take necessary actions to correct any known deficiencies to prevent pollution of the waters of the state or adjacent property owners prior to the engineer's weekly inspections;
- (f) Review and acknowledge receipt of each MoDOT Inspection Report (Land Disturbance Inspection Record) for the Project within forty eight (48) hours of receiving the report and ensure that all Stormwater Deficiencies noted on the report are corrected as soon as possible, but no later than stated in Section 5.0.

**3.0 Pre-Activity Meeting for Grading/Land Disturbance and Required Hold Point.** A Pre-Activity meeting for grading/land disturbance shall be held prior to the start of any land

disturbance operations. No land disturbance operations shall commence prior to the Pre-Activity meeting except work necessary to install perimeter controls and entrances. Discussion items at the pre-activity meeting shall include a review of the Project SWPPP, the planned order of grading operations, proposed areas of initial disturbance, identification of all necessary BMPs that shall be installed prior to commencement of grading operations, and any issues relating to compliance with the Stormwater requirements that could arise in the course of construction activity at the project.

**3.1 Hold Point.** Following the pre-activity meeting for grading/land disturbance and subsequent installation of the initial BMPs identified at the pre-activity meeting, a Hold Point shall occur prior to the start of any land disturbance operations to allow the engineer and WPCM the time needed to perform an on-site review of the installation of the BMPs to ensure compliance with the SWPPP is met. Land disturbance operations shall not begin until authorization is given by the engineer.

**4.0 Inspection Reports.** Weekly and post run-off inspections will be performed by the engineer and each Inspection Report (Land Disturbance Inspection Record) will be entered into a web-based Stormwater Compliance database. The WPCM will be granted access to this database and shall promptly review all reports, including any noted deficiencies, and shall acknowledge receipt of the report as required in Section 2.1 (f.).

**5.0 Stormwater Deficiency Corrections.** All stormwater deficiencies identified in the Inspection Report shall be corrected by the contractor within 7 days of the inspection date or any extended period granted by the engineer when weather or field conditions prohibit the corrective work. If the contractor does not initiate corrective measures within 5 calendar days of the inspection date or any extended period granted by the engineer, all work shall cease on the project except for work to correct these deficiencies, unless otherwise allowed by the engineer. All impact costs related to this halting of work, including, but not limited to stand-by time for equipment, shall be borne by the Contractor. Work shall not resume until the engineer approves the corrective work.

**5.1 Liquidated Damages.** If the Contractor fails to complete the correction of all Stormwater Deficiencies listed on the MoDOT Inspection Report within the specified time limit, the Commission will be damaged in various ways, including but not limited to, potential liability, required mitigation, environmental clean-up, fines, and penalties. These damages are not reasonably capable of being computed or quantified. Therefore, the contractor will be charged with liquidated damages specified in the amount of \$2,000 per day for failure to correct one or more of the Stormwater Deficiencies listed on the Inspection Report within the specified time limit. In addition to the stipulated damages, the stoppage of work shall remain in effect until all corrections are complete.

**6.0 Basis of Payment.** No direct payment will be made for compliance with this provision.

- **Delete Sec 106.9 in its entirety and substitute the following:**

**106.9 Buy America Requirements.**

Buy America Requirements are waived if the total amount of Federal financial assistance applied to the project, through awards or subawards, is below \$500,000.

**106.9.1 Buy America Requirements for Iron or Steel Products.**

The contractor's attention is directed to Title 23 CFR 635.410 *Buy America Requirements*. Where articles, materials or supplies that consist wholly or predominantly of iron or steel or a combination of both are to be permanently incorporated into the contract work, steel and iron material shall be manufactured, from the initial melting stage through the application of coatings, in the USA except for "minimal use" as described herein. Predominantly of iron or steel or a combination of both means that the cost of the iron and steel content exceeds 50 percent of the total cost of all its components. Under a general waiver from FHWA the use of pig iron and processed, pelletized, and reduced iron ore manufactured outside of the USA will be permitted in the domestic manufacturing process for steel or iron material.

**106.9.1.1** Any sources other than the USA as defined will be considered foreign. The required domestic manufacturing process shall include formation of ingots and any subsequent process. Coatings shall include any surface finish that protects or adds value to the product.

**106.9.1.2** "Minimal use" of foreign steel, iron or coating processes will be permitted, provided the cost of such products does not exceed 1/10 of one percent (0.1 percent) of the total contract cost or \$2,500.00, whichever is greater. If foreign steel, iron, or coating processes are used, invoices to document the cost of the foreign portion, as delivered to the project, shall be provided and the engineer's written approval obtained prior to placing the material in any work.

**106.9.1.3** Buy America requirements include a step certification for all fabrication processes of all steel or iron materials that are accepted per Sec 1000. The AASHTO Product Evaluation and Audit Solutions compliance program verifies that all steel and iron products fabrication processes conform to 23 CFR 635.410 Buy America Requirements and is an acceptable standard per 23 CFR 635.410(d). AASHTO Product Evaluation and Audit Solutions compliant suppliers will not be required to submit step certification documentation with the shipment for some selected steel and iron materials. The AASHTO Product Evaluation and Audit Solutions compliant supplier shall maintain the step certification documentation on file and shall provide this documentation to the engineer upon request.

**106.9.1.3.1** Items designated as Category 1 will consist of steel girders, piling, and reinforcing steel installed on site. Category 1 items require supporting documentation prior to incorporation into the project showing all steps of manufacturing, including coating, as being completed in the United States and in accordance with CFR Title 23 Section 635.410 Buy America Requirements. This includes the Mill Test Report from the original producing steel mill and certifications documenting the manufacturing process for all subsequent fabrication, including coatings. The certification shall include language that certifies all steel and iron materials permanently incorporated in this project was procured and processed domestically and all manufacturing processes, including coating, as being completed in the United States and in accordance with CFR Title 23 Section 635.410.

**106.9.1.3.2** Items designated as Category 2 will include all other steel or iron products not in Category 1 and permanently incorporated in the project. Category 2 items shall consist of, but not be limited to items such as fencing, guardrail, signing, lighting and signal supports. The prime contractor is required to submit a material of origin form certification prior to incorporation into the project from the fabricator for each item that the product is domestic. The Certificate of Materials Origin form ([link to certificate form](#)) from the fabricator must show all steps of manufacturing, including coating, as being completed in the United States and in accordance with CFR Title 23 Section 635.410 Buy America Requirements and be signed by a fabricator

representative. The engineer reserves the right to request additional information and documentation to verify that all Buy America requirements have been satisfied. These documents shall be submitted upon request by the engineer and retained for a period of 3 years after the last reimbursement of the material.

**106.9.1.3.3** Any minor miscellaneous steel or iron items that are not included in the materials specifications shall be certified by the prime contractor as being procured domestically. Examples of these items would be bolts for sign posts, anchorage inserts, etc. The certification shall read "I certify that all steel and iron materials permanently incorporated in this project during all manufacturing processes, including coating, as being completed in the United States and in accordance with CFR Title 23 Section 635.410 Buy America Requirements procured and processed domestically in accordance with CFR Title 23 Section 635.410 Buy America Requirements. Any foreign steel used was submitted and accepted under minor usage". The certification shall be signed by an authorized representative of the prime contractor.

**106.9.1.4** When permitted in the contract, alternate bids may be submitted for foreign steel and iron products. The award of the contract when alternate bids are permitted will be based on the lowest total bid of the contract based on furnishing domestic steel or iron products or 125 percent of the lowest total bid based on furnishing foreign steel or iron products. If foreign steel or iron products are awarded in the contract, domestic steel or iron products may be used; however, payment will be at the contract unit price for foreign steel or iron products.

**106.9.2 Buy America Requirements for Construction Materials other than iron or steel products.**

Construction materials mean articles, materials, or supplies that consist of only one of the items listed. Minor additions of articles, materials, supplies, or binding agents to a construction material do not change the categorization of the construction material. Upon request by the engineer, the contractor shall submit a domestic certification for all construction materials listed that are incorporated into the project.

- (a) Non-ferrous metals
- (b) Plastic and Polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables)
- (c) Glass (including optic glass)
- (d) Fiber optic cable (including drop cable)
- (e) Optical fiber
- (f) Lumber
- (g) Engineered wood
- (h) Drywall

**106.9.3 Buy America Requirements for Manufactured Products.**

Manufactured products mean articles, materials or supplies that have been processed into a specific form and shape, or combined with other articles, materials or supplies to create a product with different properties than the individual articles, materials or supplies. If an item is classified as an iron or steel product, an excluded material, or other product category as specified by law or in 2 CFR part 184, then it is not a manufactured product. However, an article, material or supply classified as a manufactured product may include components that are iron or steel products, excluded materials, or other product categories as specified by law or

in 2 CFR part 184. Mixtures of excluded materials delivered to a work site without final form for incorporation into a project are not a manufactured product.

**106.9.3.1** Produced in the United States, in the case of manufactured products, means:

(A) For projects obligated on or after October 1, 2025, the product was manufactured in the United States; and

(B) For projects obligated on or after October 1, 2026, the product was manufactured in the United States and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product.

**106.9.3.2** (i) With respect to precast concrete products that are classified as manufactured products, components of precast concrete products that consist wholly or predominantly of iron or steel or a combination of both shall meet the requirements of paragraph (b) of this section. The cost of such components shall be included in the applicable calculation for purposes of determining whether the precast concrete product is produced in the United States.

(ii) With respect to intelligent transportation systems and other electronic hardware systems that are installed in the highway right of way or other real property and classified as manufactured products, the cabinets or other enclosures of such systems that consist wholly or predominantly of iron or steel or a combination of both shall meet the requirements of paragraph (b) of this section. The cost of cabinets or other enclosures shall be included in the applicable calculation for purposes of determining whether systems referred to in the preceding sentence are produced in the United States.

**106.9.4 Waiver for De Minimis Costs for Manufactured and Construction Materials other than iron or steel products.**

“The total value of the non-compliant products is no more than the lesser of \$1,000,000 or 5% of total applicable costs for the project.” The contractor shall submit to the engineer any non-domestic materials and their total material cost to the engineer. The contractor and the engineer will both track these totals to assure that the minimal usage allowance is not exceeded.

- Third-Party Test Waiver for Concrete Aggregate

**1.0 Description.** Third party tests may be allowed for determining the durability factor for concrete pavement and concrete masonry aggregate.

**2.0 Material.** All aggregate for concrete shall be in accordance with Sec 1005.

**2.1** MoDOT personnel shall be present at the time of sampling at the quarry. The aggregate sample shall be placed in an approved tamper-evident container (provided by the quarry) for shipment to the third-party testing facility.

**2.2** AASHTO T 161 Method B Resistance of Concrete to Rapid Freezing and Thawing, shall be used to determine the aggregate durability factor. All concrete beams for testing shall be 3-inch wide by 4-inch deep by 16-inch long or 3.5-inch wide by 4.5-inch deep by 16-inch long. All beams for testing shall receive a 35-day wet cure fully immersed in saturated lime water prior to initiating the testing process.

**2.3** Concrete test beams shall be made using a MoDOT approved concrete pavement mix design.

**3.0 Testing Facility Requirements.** All third-party test facilities shall meet the requirements outlined in this provision.

**3.1** The testing facility shall be AASHTO accredited.

**3.1.1** For tests ran after January 1, 2025, accreditation documentation shall be on file with the Construction and Materials Division prior to any tests being performed.

**3.1.2** Construction and Materials Division may consider tests completed prior to January 1, 2025, to be acceptable if all sections of this provision are met, with the exception of 3.1.1. Accreditation documentation shall be provided with the test results for tests completed prior to January 1, 2025. No tests completed prior to September 1, 2024, will be accepted.

**3.2** The testing facility shall provide their testing process, list of equipment, equipment calibration documentation, and testing certifications or qualifications of technicians performing the AASHTO T 161 Procedure B tests. The testing facility shall provide details on their freezing and thawing apparatus including the time and temperature profile of their freeze-thaw chamber. The profile shall include the temperature set points throughout the entirety of the freeze-thaw cycle. The profile shall show the cycle time at which the apparatus drains/fills with water and the cycle time at which the apparatus begins cooling the specimens.

**3.3** Results, no more than five years old, from the third-party test facility shall compare within  $\pm 2.0$  percent of an independent test from another AASHTO accredited test facility or with MoDOT test records, in order to be approved for use (e.g. test facility results in a durability factor of 79, MoDOT's recent durability test factor is 81; this compared within +2 percent). The independent testing facility shall be in accordance with this provision. The comparison test can be from a different sample of the same ledge combination.

**3.4** When there is a dispute between the third party durability test results and MoDOT durability test results, the MoDOT durability test result shall govern.

**3.5** Test results shall be submitted to MoDOT's Construction and Materials division electronically for final approval. Test results shall include raw data for all measurements of relative dynamic modulus of elasticity and percent length change for each individual concrete specimen. Raw data shall include initial measurements made at zero cycles and every subsequent measurement of concrete specimens. Raw data shall include the cycle count and date each measurement was taken. Test results shall also include properties of the concrete mixture as required by AASHTO T 161. This shall include the gradation of the coarse aggregate sample. If AASHTO T 152 is used to measure fresh air content, then the aggregate correction factor for the mix determined in accordance with AASHTO T 152 shall also be included.

**4.0 Method of Measurement.** There is no method of measurement for this provision. The testing requirements and number of specimens shall be in accordance with AASHTO T 161 Procedure B.

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**5.0 Basis of Payment.** No direct payment will be made to the contractor or quarry to recover the cost of aggregate samples, sample shipments, testing equipment, labor to prepare samples or test samples, or developing the durability report.

- **Delete paragraph 15.0 of the General Provision Disadvantaged Business Enterprise (DBE) Program Requirements and substitute the following:**

**15.0 Bidder's List Quote Summary.** MoDOT is a recipient of federal funds and is required by 49 CFR 26.11 to provide data about its DBE program. All bidders who seek to work on federally assisted contracts must submit data about all DBE and non-DBEs in accordance with Sec 102.7.9. MoDOT will not compare the submitted Bidder's List Quote Summary to any other documents or submittals, pre or post award. All information will be used by MoDOT in accordance with 49 CFR 26.11 for reporting to USDOT and to aid in overall DBE goal setting.

- **Add Sec 102.7.9 to include the following:**

**102.7.9 Bidder's List Quote Summary.** Each bidder shall submit with each bid a summary of all subcontractors, material suppliers, and service providers (e.g. hauling) considered on federally funded projects pursuant to 49 CFR 26.11. The bidder will provide the firm's name, the corresponding North American Industry Classification System (NAICS) code(s) the firm(s) were considered for, and whether or not they were used in the bid. The information submitted should be the most complete information available at the time of bid. The information shall be disclosed on the Bidder's List Quote Summary form provided in the bidding documents and submitted in accordance with Sec 102.10. Failure to disclose this information may result in a bid being declared irregular.

OO. Balanced Mix Design Requirements for Sec 403 Asphalt JSP-24-01C

**1.0 Description.** Balanced Mix Design (BMD) and Paver-Mounted Thermal Profiles (PMTP), as specified herein, are required on this project for all Sec 403 asphaltic concrete pavement surface and base course mixes. BMD shall be in accordance with section 2.0. PMTP shall be in accordance with section 3.0. No additional payment will be made for compliance with these provisions.

**1.1 Rapid Penetrating Emulsion.** Should use of Rapid Penetrating Emulsion (RPE) be necessary for corrective action of longitudinal joint density, as specified elsewhere in section 2.0, RPE shall be in accordance with MoDOT JSP2303 Rapid Penetrating Emulsion (available at: [https://epg.modot.org/index.php/Job\\_Special\\_Provisions](https://epg.modot.org/index.php/Job_Special_Provisions)), except that no payment will be made for use of RPE.

**2.0 Delete Sec 403 in its entirety and substitute the following:**

**403 ASPHALTIC CONCRETE PAVEMENT with Balanced Mix Design**

**403.1 Description.** This work shall consist of providing a bituminous mixture to be placed in one or more courses on a prepared base or underlying course as

shown on the plans or as directed by the engineer. The contractor shall be responsible for QC of the bituminous mixture, including the design, and control of the quality of the material incorporated into the project. The engineer will be responsible for QA, including testing, to assure the quality of the material incorporated into the project.

**403.1.1 Naming Convention.** The nomenclature of Superpave bituminous mixture names, such as SP125CLP, will be as follows. When only the aggregate size is shown, such as SP125, the specifications shall apply to all variations of that size, such as SP125B, SP125C, SP125CLP, etc. When "x" is indicated, such as SP125xLP, specifications shall apply to all variations of mixture designs. Stone Matrix Asphalt will be generally referred to as SMA and designated by SM or SMR.

<b>Superpave Nomenclature</b>	
<b>SP</b>	<b>Superpave</b>
048	4.75mm (No. 4) nominal aggregate size
095	9.5 mm (3/8 inch) nominal aggregate size
125	12.5 mm (1/2 inch) nominal aggregate size
190	19.0 mm (3/4 inch) nominal aggregate size
250	25.0 mm (1 inch) nominal aggregate size
x	Mixture design: B, C, E or F (as described below)
LP	Limestone porphyry (when designated)
SM	Stone Matrix Asphalt (when designated)
SMR	Stone Matrix Asphalt limestone/non-carbonate (when designated)

**403.1.2 Design Levels.** The following cumulative equivalent single axle loads (ESALs) shall be used for the specified mix design. The same size aggregate mix design at a higher design traffic may be substituted at the contractor's expense for the contract specified mixture design with the approval from the engineer. Substitutions shall be done uniformly and project mixing of various designs for the same work will not be permitted. For example, an SP125B mixture may be substituted for an SP125C mixture, or SP190C for SP190E, etc. Mixture design substitution will be limited to one design level higher than that specified in the contract.

<b>Design Traffic (ESALs)</b>	<b>Design</b>
< 300,000	F
300,000 to < 3,000,000	E
3,000,000 to < 30,000,000	C
≥ 30,000,000	B

**403.2 Material.** All material shall be in accordance with Division 1000, Material Details, and specifically as follows:

<b>Item</b>	<b>Section</b>
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Aggregate	1002
Asphalt Binder, Performance Graded (PG)*	1015
Fiber Additive	1071
Anti-Strip Additive	1071

\*The grade of asphalt binder will be specified in the contract.

**403.2.1 Stone Matrix Asphalt.** In addition to other requirements, material for SMA mixtures shall meet the following. Coarse aggregate shall consist of crushed limestone and either porphyry or steel slag in accordance with the quality requirements of Sec 1002, except as follows. The Los Angeles (LA) abrasion, when tested in accordance with AASHTO T 96, shall not exceed 40 percent based on initial ledge approval and source approval. The percent absorption, when tested in accordance with AASHTO T 85, shall not exceed 3.5 percent based on the individual fractions. The amount of flat and elongated particles, measured on material retained on a No. 4 sieve, of the blended aggregate shall not exceed 20 percent based on a 3:1 ratio or 5 percent based on a 5:1 ratio.

**403.2.2 Filler Restriction.** Rigden void content determined in accordance with MoDOT Test Method TM-73 shall be no greater than 50 percent.

**403.2.3 Fibers.** A fiber additive shall be used as a stabilizer in SMA Mixtures. Fibers shall be uniformly distributed by the end of the plant mixing process. The dosage rate for fibers shall be no less than 0.3 percent by weight of the total mixture for cellulose and no less than 0.4 percent by weight for mineral fibers.

**403.2.4 Reclaimed Asphalt.** A maximum of 30 percent virgin effective binder replacement may be used in mixtures without changing the grade of binder. The asphalt binder content of recycled asphalt materials shall be determined in accordance with AASHTO T 164, ASTM D 2172 or other approved method of solvent extraction. A correction factor for use during production may be determined for binder ignition by burning a sample in accordance with AASHTO T 308 and subtracting from the binder content determined by extraction. The aggregate specific gravity shall be determined by performing AASHTO T 209 in accordance with Sec 403.19.3.1.2 and calculating the  $G_{se}$  to which a 0.98 correction factor will be applied to obtain the  $G_{sb}$  as follows:

$$G_{se} = \frac{100 - P_b}{\frac{100}{G_{mm}} - \frac{P_b}{G_b}}$$

$$RAP G_{sb} = RAP G_{se} \times 0.98$$

**403.2.5 Reclaimed Asphalt Pavement.** Reclaimed Asphalt Pavement (RAP) may be used in any mixture, except SMA mixtures. Mixtures may be used with more than 30 percent virgin effective binder replacement provided testing according to AASHTO M 323 is included with the job mix formula that ensures the combined binder meets the grade specified in the contract. All RAP material, except as noted below, shall be tested in accordance with AASHTO T 327, *Method of Resistance of Coarse Aggregate Degradation by Abrasion in the Micro-Deval Apparatus*. Aggregate shall have the asphalt coating removed either by extraction

or binder ignition during production. The material shall be tested in the Micro-Deval apparatus at a frequency of once per 1500 tons. The percent loss shall not exceed the Micro-Deval loss of the combined virgin material by more than five percent. Micro-Deval testing will be waived for RAP material obtained from MoDOT roadways. All RAP material shall be in accordance with Sec 1002 for deleterious and other foreign material.

**403.2.6 Reclaimed Asphalt Shingles.** Reclaimed Asphalt Shingles (RAS) may be used in any mixture specified to use PG 64-22 in accordance with AASHTO PP 53 except as follows: When the ratio of virgin effective binder to total binder in the mixture is between 60 and 70 percent, the grade of the virgin binder shall be PG 52-28 or PG 58-28. Shingles shall be ground to 3/8-inch minus. Waste, manufacturer or new, shingles shall be essential free of deleterious materials. Post-consumer RAS shall not contain more than 1.5 percent wood by weight or more than 3.0 percent total deleterious by weight. Post-consumer RAS shall be certified to contain less than the maximum allowable amount of asbestos as defined by national or local standards. The gradation of the aggregate may be determined by solvent extraction of the binder or using the following as a standard gradation:

<b>Shingle Aggregate Gradation</b>	
<b>Sieve Size</b>	<b>Percent Passing by Weight</b>
3/8 in.	100
No. 4	95
No. 8	85
No. 16	70
No. 30	50
No. 50	45
No. 100	35
No. 200	25

**403.3 Composition of Mixtures.**

**403.3.1 Gradation.** Prior to mixing with asphalt binder, the combined aggregate gradation, including filler if needed, shall meet the following gradation for the type of mixture specified in the contract. A job mix formula may be approved which permits the combined aggregate gradation during mixture production to be outside the limits of the master range when the full tolerances specified in Sec 403.5 are applied.

<b>Percent Passing by Weight</b>							
<b>Sieve Size</b>	<b>SP250</b>	<b>SP190</b>	<b>SP125</b>	<b>SP095</b>	<b>SP048</b>	<b>SP125xSM(R)</b>	<b>SP095xSM(R)</b>
1 1/2 in.	100	---	---	---	---	---	---
1 in.	90 - 100	---	---	---	---	---	---
3/4 in.	90	90 - 100	---	----	100	---	

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	max.	100					
1/2 in.	---	90 max.	90 - 100	100	---	90-100	100
3/8 in.	---	---	90 max.	90-100	100	50-80	70-95
No. 4	---	---	---	90 max.	90- 100	20 - 35	30-50
No. 8	19 - 45	23 - 49	28 - 58	32-67	---	16 - 24	20-30
No. 16	---	---	---	---	30-60	---	21 max.
No. 30	---	---	---	---	---	---	18 max.
No. 50	---	---	---	---	---	---	15 max.
No. 100	---	---	---	---	---	---	---
No. 200	1 - 7	2 - 8	2 - 10	2-10	7-12	8.0-11.0	8.0-12.0

**403.3.2 Anti-Strip Agent.** An anti-strip will be allowed by the engineer to improve resistance to stripping. Anti-strip agents and application rates shall be from a list approved in accordance with Sec 1071.

**403.3.3 Porphyry Mixtures.** For LP and SMA mixtures, at least 50 percent by volume of the aggregate shall be crushed porphyry retained on the following sieves: No. 30 for SP048, No. 16 for SP095 and No. 8 for SP125. Depending on the actual gradation of porphyry aggregate furnished, the amount of crushed porphyry required may vary, however at least 40 percent by weight of crushed porphyry will be required. Steel slag may be substituted for porphyry in LP and SM mixtures, except at least 45 percent by weight of crushed porphyry and/or slag will be required. The engineer may approve the use of other hard, durable aggregate in addition to porphyry and steel slag. When an SMR mixture is designated, the mixture shall contain aggregate blends with at least 30 percent non-carbonate material in accordance with Sec 403.3.5.

**403.3.4 Minimum Stone Matrix Asphalt Binder.** The percent asphalt binder for SMA mixtures shall not be less than 6.0 percent unless otherwise allowed by the engineer.

**403.3.5 Surface Mixtures.** Design level B surface mixtures and SP048NC, except as described in Sec 403.15.3, containing limestone coarse aggregate shall contain a minimum amount of non-carbonate aggregate. The LA abrasion values, AASHTO T 96, of the limestone will determine the type and amount of non-carbonate aggregate required as shown in the table below. The LA abrasion value will be determined from the most recent source approval sample. In lieu of the above requirements, the aggregate blend shall have an acid insoluble residue (AIR), MoDOT Test Method TM 76, meeting the plus No. 4 criteria of crushed non-carbonate material. Non-carbonate aggregate shall have an AIR of at least 85 percent insoluble residue.

Coarse Aggregate (+ No. 4)	Minimum Non-Carbonate by Volume
Limestone, LA ≤ 30	30% Plus No. 4
Limestone, LA > 30	20% Minus No. 4*
Dolomite	No Requirement

\*Use for all SP095 and SP048NC containing limestone.

**403.4 Job Mix Formula.** At least 30 days prior to placing any mixture on the project, the contractor shall submit a mix design for approval to Construction and Materials. The mixture shall be designed in accordance with AASHTO R 35 or R 46 and shall be tested in accordance with AASHTO T 312 except as noted herein. A detailed description of the mix design process shall be included with the job mix formula (JMF). Representative samples of each ingredient for the mixture shall be submitted with the mix design.

**403.4.1 Proficiency Sample Program.** Laboratories that participate in and achieve a score of three or greater in the AASHTO proficiency sample program for T 11, T 27, T 84, T 85, T 166, T 176, T 209, T 304 (ASTM C 1252), T 308 and T 312 will have the mixture verification process waived. The mix design shall be submitted to Construction and Materials for approval at least seven days prior to mixture production.

**403.4.2 Required Information.** The mix design shall include raw data from the design process and contain the following information:

- (a) All possible sources intended for use, and grade and specific gravity of asphalt binder.
- (b) Source, type (formation, etc.), ledge number if applicable, gradation, and deleterious content of each aggregate fraction.
- (c) Bulk and apparent specific gravities and absorption of each aggregate fraction in accordance with AASHTO T 85 for coarse aggregate and AASHTO T 84 for fine aggregate including all raw data.
- (d) Specific gravity of hydrated lime, mineral filler or baghouse fines, if used, in accordance with AASHTO T 100.
- (e) Percentage of each aggregate component.
- (f) Combined gradation of the job mix.
- (g) Percent asphalt binder, by weight, based on the total mixture and percent asphalt binder contributed by reclaimed asphalt materials.
- (h) Bulk specific gravity ( $G_{mb}$ ) by AASHTO T 166 Method A of a laboratory compacted mixture compacted at  $N_{design}$  gyrations.
- (i) Percent air voids ( $V_a$ ) of the laboratory compacted specimen compacted to  $N_{design}$  gyrations.
- (j) Voids in the mineral aggregate (VMA) and volume of Effective Asphalt ( $V_{be}$ ) at  $N_{design}$  gyrations.

(k) Theoretical maximum specific gravity ( $G_{mm}$ ) as determined by AASHTO T 209, in accordance with Sec 403.19.3, after the sample has been short term aged in accordance with AASHTO R 30.

(l) The tensile strength ratio as determined by AASHTO T 283 including all raw data.

(m) The gyratory sample weight to produce a 115 mm minimum height specimen.

(n) Mixing temperature and gyratory molding temperature.

(o) Number of gyrations at  $N_{design}$ .

(p) Dust proportion ratio ( $-200/P_{be}$ ).

(q) Bulk specific gravity ( $G_{sb}$ ) of the combined aggregate.

(r) Percent chert contained in each aggregate fraction.

(s) Percent of  $G_{mm}$  at  $N_{initial}$  and  $N_{maximum}$ .

(t) Voids in coarse aggregate (VCA) for both the mixture and dry-rodded condition for SMA mixtures.

(u) Draindown for SMA mixtures.

(v) Performance testing results for Cracking Tolerance Index ( $CT_{Index}$ ), Long-Term aged Cracking Tolerance Index ( $CT_{Index, Long-Term Aged}$ ), Hamburg Wheel Tracking Test (HWTT), and Rutting Tolerance Index ( $RT_{Index}$ ).

(w) Baghouse fines added for design.

(i) Batch and continuous mix plants – Indicate which aggregate fraction to add baghouse percentage during production.

(ii) Drum mix plants – Provide cold feed settings with and without baghouse percentage.

**403.4.3 Approval.** No mixture will be accepted for use until the JMF for the project is approved by Construction and Materials.

**403.4.4 Mix Formula Modification.** The JMF approved for each mixture shall be in effect until modified in writing by the engineer. When unsatisfactory results occur or should a source of material be changed, a new JMF may be required.

**403.4.4.1 Asphalt Binder Source Change.** When an asphalt binder source change includes a binder grading that differs from the original grade on the JMF, new performance testing values ( $CT_{Index}$  and  $RT_{Index}$ ) shall be provided prior to use.

**403.4.4.2 Additive Source Change.** When rejuvenators, warm mix additives, anti-strip additive, or other additives sources change; new performance testing values ( $CT_{Index}$  and  $RT_{Index}$ ) shall be provided.

**403.4.5 Design Gyration.** The minimum number (N) of gyrations required for gyratory compaction shall be as follows:

Design	$N_{design}$ <sup>a</sup>
F	35
E	50
C	60
B	65

<sup>a</sup> SMA mixtures shall have  $N_{design}$  equal to 100.

**403.4.6 Mixture Characteristics.** When compacted in accordance with AASHTO T 312, the mixture shall meet the following criteria.

**403.4.6.1 Air Voids ( $V_a$ ).** Design air voids for SuperPave mixtures at all traffic levels shall be between 3.0 and 5.0 percent. SMA mixtures shall have a design air void of 4.0 percent.

**403.4.6.2 Voids in the Mineral Aggregate (VMA).** SuperPave mixtures shall have a minimum volume of effective asphalt, equal to the VMA minus the air voids, as shown in the chart below, with design air voids between 3.0 to 5.0 percent for SuperPave and shall be 4.0 percent for SMA. The minimum VMA shall be equal to the minimum volume of effective binder ( $V_{be}$ ) plus design air voids.

Mixture	$V_{be}$ Minimum (percent)
SP250	9.0
SP190	10.0
SP125 (except for SMA)	11.0
SP095 (except for SMA)	12.0
SP048	13.0
SMA	13.0

**403.4.7 Dust to Binder Ratio.** For all mixtures except SMA and SP048, the ratio of minus No. 200 material to effective asphalt binder ( $P_{be}$ ) shall be between 0.8 and 1.6. For SP048, the ratio of minus No. 200 material to effective asphalt binder ( $P_{be}$ ) shall be between 0.9 and 2.0.

**403.4.8 Moisture Susceptibility.** For all mixtures except SMA, the mixture shall have a tensile strength ratio (TSR) greater than 85 percent (80 percent if an approved anti-strip agent is used) when compacted to 3.7 inches with  $7 \pm 0.5$  percent air voids and tested in accordance with AASHTO T 283. SMA mixtures shall have a TSR greater than 85 (80 percent if an approved anti-strip agent is used) percent when compacted to 3.7 inches with  $6 \pm 0.5$  percent air voids and tested in accordance with AASHTO T 283.

**403.4.8.1 Minimum Tensile Strength.** All mixtures shall have a minimum allowable conditioned tensile strength of 60 psi.

**403.4.8.2 Liquid Anti-Strip Dosage.** The liquid anti-strip dosage shall be in the range recommended by the manufacturer and provided on the JMF.

**403.4.9 Draindown.** AASHTO T 305, Draindown Test, shall be performed on all SMA mixtures prior to job mix approval. The mixture shall be stabilized in such a way that the draindown of the asphalt binder shall not exceed 0.3 percent by weight of mixture.

**403.4.10 Voids in Coarse Aggregate.** The percent  $VCA_{MIX}$  of SMA mixtures shall be less than or equal to the  $VCA_{DRC}$  as determined using AASHTO T 19. This may be calculated using the following equations:

$$VCA_{DRC} = 100 \times (G_{CA}\gamma_w - \gamma_s) / G_{CA}\gamma_w$$

$$VCA_{MIX} = 100 - (P_{bp} \times G_{mb} / G_{CA})$$

$$P_{bp} = P_s \times PA_{bp}$$

Where:  $G_{CA}$  = bulk specific gravity of the combined coarse aggregate (AASHTO T 85),  
 $\gamma_s$  = unit weight of coarse aggregate in the dry-rodded condition (DRC) (lb/ft<sup>3</sup>) (AASHTO T 19),  
 $\gamma_w$  = unit weight of water (62.34 lb/ft<sup>3</sup>),  
 $P_{bp}$  = percent aggregate by total mixture weight retained on No. 4 sieve and  
 $PA_{bp}$  = percent aggregate by total aggregate weight retained on No. 4 sieve\*.  
\*Use No. 8 sieve for SP095xSM

**403.4.11 Mix Design Performance Testing.** Acceptable test results meeting the criteria for the following performance tests shall be submitted with the mix design for approval. Test specimens shall be compacted to an air void content of 7.0 ± 0.5 percent or 6.0 ± 0.5 percent for SMA mixtures.

**403.4.11.1 Cracking Tolerance Index (CT<sub>Index</sub>) Testing.** The CT<sub>Index</sub> testing shall be completed in accordance with ASTM D8225 and at a test temperature of 25 ± 0.5 C.

Mix Type	Minimum CT <sub>Index</sub>	CT <sub>Index,(Long-Term Aged)*</sub>
Non-SMA	50	Informational Only
SMA	135	Informational Only

\*Long-Term Aged defined as loose mix aging for 20 hours at 115 C.

**403.4.11.2 Rutting Tolerance Index (RT<sub>Index</sub>) Testing.** The RT<sub>Index</sub> testing shall be completed in accordance with ASTM D8360 and at a test temperature of 50 ± 1 C.

PG Grade High Temperature*	Minimum RT <sub>Index</sub>
58-28H / 64-22	50
64-22H / 70-22	65
64-22V / 76-22	80

\*Determined by the binder grade specified in the contract.

**403.4.11.3 Hamburg Wheel Track (HWT).** HWT testing will be completed in accordance with AASHTO T324 at test temperature of 50 ± 1 C and 2.44 inch specimen height.

PG Grade High Temperature *	Minimum Wheel Passes	Maximum Rut Depth (in.)
58-28H / 64-22	7,500	0.38
64-22H / 70-22	15,000	0.38
64-22V / 76-22	20,000	0.38

\*Determined by the binder grade specified in the contract.

**403.5 Mixture Production Specification Limits.**

**403.5.1 Gradation and Deleterious Content Control.** The gradation of the aggregate shall be determined from samples taken from the hot bins on batch-type or continuous mixing plants or from the composite cold feed belt on drum mix plants. The gradation may also be obtained by sampling the mixture and testing the residual aggregate. The deleterious content of the aggregate shall be determined from samples taken from the composite cold feed belt. Aggregate samples shall be taken in accordance with AASHTO R 90. The RAP shall be sampled from the RAP feeding system on the asphalt plant. Gradation and deleterious shall be taken when directed by the engineer.

**403.5.1.1 Stone Matrix Asphalt Tolerances.** In producing mixtures for the project, the plant shall be operated such that no intentional deviations from the job mix formula are made. The maximum deviation from the approved job mix formula shall be as follows for SMA mixtures:

Sieve	Max. Tolerance	
	SP095	SP125
3/4 in.	---	---
1/2 in.	---	±4
3/8 in.	±4	±4
No. 4	±3	±3
No. 8	±3	±3
No. 200	±2	±2

**403.5.1.2 Mixture Tolerance.** For all other SP mixtures, the percent passing the first sieve size smaller than the nominal maximum size shall not exceed 92.0 percent, a tolerance not to exceed 2.0 percent on the No. 8 sieve from the table in Sec 403.3.1, and within the range listed in Sec 403.3.1 for the No. 200 sieve The

deleterious content of the material retained on the No. 4 sieve shall not exceed the limits specified in Sec 1002.2.

**403.5.2 Density.** The final, in-place density of the mixture shall be 92.5 to 98.0 percent of the theoretical maximum specific gravity for all mixtures except SMA. SMA mixtures shall have a minimum density of 94.0 percent of the theoretical maximum specific gravity. The theoretical maximum specific gravity shall be determined from a sample representing the material being tested. Tests shall be taken not later than the day following placement of the mixture. The engineer will randomly determine test locations.

**403.5.2.1 Shoulder Density.** Density on non-integral shoulders shall be in accordance with Sec 403.15.3.

**403.5.2.2 Integral Shoulder.** When shoulders are placed integrally with the traveled way, tests shall be taken on the traveled way.

**403.5.2.3 Longitudinal Joint Density.** Density along longitudinal joints shall be in accordance with Sec 403.16.1. Pay shall be in accordance with Sec 403.23.4.1.

**403.5.3 Asphalt Content.** The asphalt content (AC) shall be within  $\pm 0.3$  percent of the approved mix design.

**403.5.4 Air Voids.** Air voids shall be within  $\pm 1.0$  percent of the approved mix design at  $N_{des}$  gyrations.

**403.5.5 Cracking Tolerance Index.** Minimum  $CT_{Index}$  shall be 50 for all mixtures except SMA. SMA mixtures shall have a minimum  $CT_{Index}$  of 135.

**403.5.6 Rutting Tolerance Index.** Minimum  $RT_{Index}$  shall be based upon the high temperature asphalt binder grade in the contract in accordance with the following:

<b>PG Grade High Temperature*</b>	<b>Minimum <math>RT_{Index}^{(a)}</math></b>
58-28H / 64-22	50
64-22H / 70-22	65
64-22V / 76-22	80

\*Determined by the binder grade specified in the contract.

<sup>(a)</sup>Mixtures not meeting the minimum  $RT_{Index}$  shall be tested by the Hamburg Wheel Track Test and meet a minimum of  $\frac{1}{2}$ " rutting at the number of wheel passes required by the contract grade of the mixture.

**403.5.7 Tensile Strength Ratio (TSR).** The TSR shall be greater than or equal to 75 percent as determined from loose mixture taken from the plant and tested in accordance with AASHTO T 283. The minimum allowable conditioned tensile strength of the mixture shall be 60 psi. The liquid anti-strip dosage during production shall match the dosage listed on the JMF.

**403.5.8 Fibers.** The fiber proportioning and delivery system for SMA mixtures shall have an accuracy of 10 percent by weight of the material actually being measured in any given period of time.

**403.5.9 Moisture Content.** The asphaltic concrete mixture, when sampled and tested in accordance with AASHTO T 329, shall not contain more than 0.5 percent moisture by weight of the mixture.

**403.5.10 Contamination.** The asphaltic concrete mixture shall not be contaminated with deleterious agents such as unburned fuel, objectionable fuel residue or any other material not inherent to the job mix formula.

**403.6 Field Laboratory.** The contractor shall provide a Type 3 field laboratory in accordance with Sec 601. The contractor shall furnish the bituminous mixture equipment to perform all required test methods for QC and QA work. The gyratory compactor shall be evaluated in accordance with AASHTO PP 35. An approved list will be maintained by Construction and Materials. All other equipment shall be capable of performing tests in accordance with the approved test methods.

**403.7 Bituminous Mixing Plants.** Bituminous mixing plants and preparation of material and mixtures shall be in accordance with Sec 404.

**403.8 Hauling Equipment.** Trucks used for hauling bituminous mixtures shall be in accordance with Sec 404.

**403.9 Pavers.** Bituminous pavers shall be self-contained units, provided with an activated screed or strike-off assembly, heated if necessary, and capable of spreading and finishing asphaltic concrete in lane widths applicable to the specified typical sections and thicknesses shown on the plans.

#### **403.10 Construction Requirements.**

**403.10.1 Weather Limitations.** No mixture shall be placed on any wet or frozen surface. No mixture shall be placed when either the air temperature or the temperature of the surface on which the mixture is to be placed is below 40 F. Temperatures shall be obtained in accordance with MoDOT Test Method TM 20.

**403.10.2 Substitutions.** With approval from the engineer, the contractor may substitute a smaller nominal maximum size mixture for a larger sized mixture. Specifications governing the substitute mixture shall apply. Except for a single surface layer, the total pavement thickness shall be maintained when the substitute mixture layer is reduced as allowed in Sec 403.13 by increasing the thickness of other layers or courses. The contract unit price for the original mixture shall be used.

**403.11 Field Adjustments of Job Mix Formulas.** When test results indicate the mixture produced does not meet the specification requirements, the contractor may field adjust the job mix formula as noted herein. Field adjustments may consist of changing the percent binder as listed on the original approved job mix by no more than 0.3 percent. Additional fractions of material or new material will

not be permitted as field adjustments. The engineer shall be notified immediately when any change is made in the cold feed settings, the hot bin settings or the binder content. A new  $G_{sb}$  shall be calculated using the new aggregate percentages. The gradation of the adjusted mixture shall meet the requirements of the mixture type specified in the contract. When the binder content is adjusted more than 0.3 percent, the mixture will be considered out of specification, and a new mix design shall be established.

**403.11.1 Field Mix Redesign.** When a new mix design will be required, the contractor will be permitted to establish the new mix design in the field. The mixture shall be designed in accordance with AASHTO R 35 or AASHTO R 46 and shall meet the mix design requirements, including performance testing and TSR requirements. A representative sample of the mixture shall be submitted with the new mix design to the Central Laboratory for mixture verification. The amount of mixture submitted for verification shall weigh at least 50 pounds.

**403.11.1.1 Approval.** New mix designs established in the field shall be submitted for approval to Construction and Materials. Upon approval, Construction and Materials will assign a new mix number to the mixture.

**403.11.1.2 Resume Production.** No mixture shall be placed on the project until the new field mix design is approved.

**403.12 Application of Prime or Tack.** The prime coat, if specified, shall be applied in accordance with Sec 408. A tack coat is required on all existing pavement and shoulder surfaces that will be overlaid with a bituminous mixture. A tack coat is also required between all lifts of bituminous pavements placed within the driving and turn lanes, unless otherwise specified in the contract. All construction requirements of a tacked surface shall be in accordance with Sec 407, and specified herein. The tack coat shall be applied uniformly and shall completely cover the surface upon which the bituminous mixture is to be placed. Placement of a bituminous mixture shall not be placed upon a tacked surface that is not uniformly covered or surfaces that have experienced excessive loss of tack due to tracking. Re-application of tack due to excess tracking or non-uniform coverage shall be at the contractor's expense.

**403.13 Spreading and Finishing.** The base course, primed or tacked surface, or preceding course or layer shall be cleaned of all dirt, packed soil or any other foreign material prior to spreading the asphaltic mixture. If lumps are present or a crust of mixture has formed, the entire load will be rejected. The thickness and width of each course shall conform to the typical section in the contract. The contractor may elect to construct each course in multiple layers. The minimum compacted thickness shall be 0.75 inches for SP048, 1.25 inches for SP095, 1.75 inches for SP125, 2 inches for SP190, and 3 inches for SP250.

**403.13.1 Paving Widths.** The following shall apply for roadways constructed under traffic. For pavements having a width of 16 to 24 feet, inclusive, the asphaltic concrete pavement shall be laid in lanes approximately one half the full width of the completed pavement, and the full width shall be completed as soon as practical. Unless otherwise permitted, a single lane of any course shall not be

constructed to a length that cannot be completed to full width of the pavement the succeeding operating day. For pavements greater than 24 feet wide, single lane width construction shall be limited to one day's production and completion to full width shall be accomplished as soon as practical. Uneven pavement shall be left in place for no more than seven days, unless approved by the engineer. Removal of pavement to be in accordance with this specification shall be at the contractor's expense.

**403.13.2 Segregation.** No thermal or physical mix segregation will be permitted in handling the mixture at the plant, from the truck or during spreading operations on the roadbed.

Paver Mounted Thermal Profiling (PMTP) shall be conducted in accordance with Sec 406.

All layers shall be feathered out, by hand raking, if necessary, in transitioning the depth of the surface to meet present grades at bridges or ends of projects, to provide a uniform, smooth riding surface free of irregularities. Where only the top layer of the surfacing continues across a bridge, the bottom layers shall be feathered out.

Any visual/physical segregation shall be tested in accordance with MoDOT Test Method TM 75. Mixture production shall immediately cease if either criteria of MoDOT Test Method TM 75 fail. Segregated mixture shall be removed and replaced to the limits determined by the engineer.

**403.13.3 Release to Traffic.** If the asphaltic concrete construction consists of more than a single layer, each layer shall be compacted as specified and allowed to cool to the ambient temperature before the next layer is placed. The contractor shall keep traffic off the asphaltic concrete until the surface of the asphaltic concrete is 140 F or below and the asphaltic concrete has cooled sufficiently to prevent flushing of the asphalt binder to the surface, marking or distorting the surface or breaking down the edges.

**403.13.4 Draindown.** Evidence of asphalt binder separation or draindown at delivery will be cause for rejection.

**403.13.5 Shoulder Substitution.** When a Sec 403 mixture is specified for traffic lanes, the same mixture may be used for the adjacent shoulder, subject to the density requirements in Sec 403.5.2.

**403.14 Spot Wedging and Leveling Course.** The engineer will specify the locations and thickness of spot wedging and the thickness of leveling course to obtain the smoothest possible riding surface. This procedure may result in spot wedging operations over small areas with feather-edging at high points and ends of wedge areas. Rigid control of the placement thickness of the leveling course shall be required. Leveling course, consisting of a layer of asphaltic concrete of variable thickness used to superelevate curves and eliminate irregularities in the existing base, shall be spread uniformly to the specified profile grade and cross section. The mixture shall be uniformly spread and compacted, with only minor

segregation as accepted by the engineer. Type SP125 or finer mixtures, as applicable, shall be used for the spot wedging and for the leveling course. Mixtures used as spot wedging and leveling courses shall be accepted in accordance with Sec 403.23.8.3.

**403.15 Compaction.** After the asphaltic mixture has been spread, struck off and surface irregularities adjusted, the asphaltic mixture shall be compacted thoroughly and uniformly by rolling to obtain the required compaction while the mixture is in a workable condition. Excessive rolling, to the extent of aggregate degradation, will not be permitted. Rollers shall not be used in the vibratory mode when the mixture temperature is below 225 F. When warm mix technology is used, as approved by the engineer, rollers shall not be used in the vibratory mode when the mixture temperature is below 200 F.

**403.15.1 Rolling.** Any displacement occurring as a result of starting, stopping or changing direction of a roller, or from other causes, shall be avoided. Excess liquid, to prevent adhesion of the mixture to the rollers, will not be permitted. Diesel fuel, fuel oil or other detrimental products shall not be used as wetting agents. Along forms, curbs, headers, walls, and other places not accessible to the roller, the mixture shall be thoroughly compacted with hot hand tampers, smoothing irons or with mechanical tampers.

**403.15.2 Defective Mixture.** Any mixture that becomes loose and broken, mixed with dirt or is in any way defective shall be removed and replaced with fresh, hot mixture, which shall be compacted to conform with the surrounding area. Any area showing an excess or deficiency of asphalt binder shall be removed and replaced.

**403.15.3 Non-Traffic Areas.** Sec 403 mixtures used for surfacing medians and similar areas, shoulders adjacent to rigid or flexible pavement and shoulders adjacent to resurfaced pavement shall be compacted to the specified densities for the mixture. Once an established rolling pattern has been demonstrated to provide the required density for shoulders, at the engineer's discretion, the pattern may be used in lieu of density tests provided no changes in the material, typical location or temperatures are made. Regardless of the method, density will still be required and subject to testing as deemed necessary by the engineer. In lieu of roller and density requirements, temporary bypasses to be maintained at the expense of the contractor shall be thoroughly compacted. The rolling shall be performed at proper time intervals and shall be continued until there is no visible evidence of further consolidation.

**403.15.4 Density Measurement.** Measurements for determining the in-place density of the mixture shall be taken no later than the day following placement. Measurements not obtained within the prescribed time limits shall be subject to the requirements of Sec 403.22.

**403.15.4.1 Density Cores.** If a core is taken, material from underlying layers that remain adhered to the core shall be removed in a manner that does not harm the integrity of the specimen. If the contractor elects to place a lift of mixture greater

than six times the nominal maximum aggregate size, cores shall be cut in half and the density of each half determined separately.

**403.15.4.2 Nuclear/Alternative Methods.** In-place asphalt density may be obtained by nuclear or alternative methods in accordance with MoDOT TM-41. The nuclear/alternative calibration locations shall be conducted within a trial section in accordance with Sec 405.4.8.

**403.15.5 Intelligent Compaction.** Intelligent Compaction requirements in accordance with Section 405 shall not apply unless required by job special provision. Intelligent compaction shall be conducted on the traveled way to monitor the optimum roller passes at a mean temperature above 180 F in accordance with Sec 405. Passing Segments shall have a minimum of 85 percent coverage at or above the optimum number of passes. Segments with between 85 percent and 70 percent coverage will be called moderate segments. Any segment with less than 70 percent coverage at the optimum number of passes shall be a Deficient Segment. If 70 percent of the target IC-MV is not obtained, the segment shall be flagged accordingly in the Veta project file. All segments with a mean temperature of less than 180 F at the optimum pass shall be considered deficient.

**403.15.6 Surface Smoothness.** The finish of the pavement surface shall be substantially free from waves or irregularities and shall be true to the established crown and grade. The pavement surface shall be thoroughly tested for smoothness by profiling or straight edging in accordance with Sec 610.

**403.16 Joints.** Transverse joints shall be formed by any method that will produce a dense, vertical section for use when laying is resumed. When a transverse vertical edge is to be left and opened to traffic, a temporary depth transition shall be built as approved by the engineer. The joint formed when the fresh mixture is placed shall be dense, well sealed, and the grade, line and surface texture of the succeeding surface shall conform to that of the joined surface. If directed by the engineer, the transverse joint shall be painted with a light coating of liquid asphalt. Hand manipulation of the mixture shall be minimized to avoid unsightly surface texture.

**403.16.1 Joint Composition.** Longitudinal joints shall be formed by the use of an edging plate fixed on both sides of the finishing machine. Care shall be taken to obtain a well bonded and sealed longitudinal joint by placing the hot mixture in a manner ensuring maximum compaction at this point. If directed by the engineer for properly sealing the longitudinal joint, a light coating of bituminous material shall be applied to the exposed edge before the joint is made. Each side of the joint shall be flush and along true lines.

**403.16.2 Joint Offset.** The longitudinal joint in any layer shall offset that in the layer immediately below by a minimum of 6 inches; except, the joints in the completed surfacing shall be at the lane lines of the traveled way or other required placement width outside the travel lane. The placement width shall be adjusted such that pavement marking shall not fall on a longitudinal joint.

**403.17 Quality Control.**

**403.17.1 Quality Control Operations.** The contractor shall maintain equipment and qualified personnel to perform all QC field inspection, sampling and testing as required by this specification. All contractor personnel included in the QC operation shall be qualified by the MoDOT Technician Certification Program. Under no circumstances will unqualified personnel be allowed to perform QC sampling or testing. Personnel will be disqualified if acceptable methods and procedures are not followed.

**403.17.1.1 Asphalt Test Results.** The contractor shall record all test results and furnish a copy, including all raw data, to the engineer no later than the beginning of the day following the test. The contractor shall maintain all test results in an organized format and shall be available to the QA inspector at all times. Scale readings and other measurements not directly recorded by electronic media shall be recorded in an organized format. Printouts from gyratory compactors and asphalt content devices shall be retained as part of the testing records.

**403.17.2 Bituminous Quality Control Plan.** Prior to approval of the trial mix design by the engineer, the contractor shall submit a QC Plan to Construction and Materials for approval. The QC Plan shall include:

- (a) The contractor representative in charge of QC and the project level representative if different from the contractor representative. Contact information should be recorded for these individuals.
- (b) Lot and subplot sizes and how they will be designated.
- (c) Performance testing, volumetrics, and asphalt content sampling, fabrication, and testing plan.
- (d) The test method for determining asphalt content and density determination. If cores are to be cut, the number of cores shall be specified.
- (e) Intelligent Compaction (if included in contract) and Paver Mounted Thermal Profiler base station and cellular reception plan.
- (f) A proposed independent third party name, contact, address, and phone number for dispute resolution.

**403.17.2.1 Third Party.** The third party shall be independent of the contractor, MoDOT consultants and all project subcontractors or suppliers on each specific project. All testing of material for dispute resolution shall be performed by an approved laboratory. Approved laboratories shall be AASHTO Accreditation Program certified in the areas of the material being tested.

**403.17.2.2 Plant Calibration.** Plant calibration shall be performed by the contractor in accordance with Sec 404, and records shall be made available to the engineer.

**403.17.2.3 Retained Samples.** All samples taken by the contractor, including but not limited to tested aggregate, volumetric and density samples, shall be retained for the engineer until the contractor's and engineer's tests are complete and accepted unless otherwise instructed. This includes  $CT_{Index}$  and  $RT_{Index}$  results. These samples shall be maintained in clean covered containers, without contamination, readily accessible to the engineer. The retained sample's identification shall consist of, but is not limited to:

- (a) Time and date sampled.
- (b) Product specification number.
- (c) Type of sample, i.e. belt, bin, stockpile.
- (d) Lot and subplot designation.
- (e) Sampler/Tester.
- (f) Project Job Number.

**403.17.2.3.1 Retained Loose Mix Material.** All loose mix samples for determination of volumetrics, performance tests, asphalt binder content and TSR shall be taken from the plant at random as designated by the engineer. Loose mix material shall be taken, identified, and retained for the engineer.

**403.17.2.4 Performance Test Specimens and Loose Mix Sample.** All loose mix samples for determination of performance tests, volumetrics, asphalt binder content and TSR shall be taken at the plant at random intervals as designated by the engineer. All QC/QA loose mix samples shall be taken by the contractor. Non-TSR performance test specimens shall be fabricated by the contractor. The engineer shall be present when taking loose mix samples and fabricating specimens for QA testing. Companion samples shall be identified and retained for the engineer.

**403.17.3 Quality Control Laboratory.** All QC mixture testing shall be performed in an approved laboratory.

**403.17.3.1 Calibration Schedule.** The contractor shall calibrate or verify all significant test equipment associated with tests covered in this specification. Intervals as set by the contractor shall not exceed the following limits:

Equipment - Test Method (AASHTO)	Requirement	Interval (Month)
Performance Testing Load Frames – R 18	Calibrate	12
Hamburg Wheel Track Test - R 18	Calibrate	12
Gyratory Compactor - T 312	Calibrate – $1.16 \pm .02^\circ$ internal angle	12 <sup>a</sup>
Gyratory Compactor - T 312	Verify	1 <sup>c</sup>

Gyratory Molds - T 312	Check Critical Dimensions	12
Thermometers - T 209, T 166, T 312	Calibrate	12
Vacuum System - T 209	Check Pressure	12
Pycnometer (Flask) - T 209	Calibrate	Daily
Binder Ignition Oven - T 308	Verify	12 <sup>b</sup>
Nuclear Content Gauge – T 287 or MoDOT TM 54	Drift & Stability – Manuf. Recommendation	1
Mechanical Shakers - T 27	Check Sieving Thoroughness	12
Sieves	Check Physical Condition	6
Weighted Foot Assembly - T 176	Check Weight	12
Mechanical Shaker - T 176	Check Rate & Length of Throw	12
Liquid Limit Device - T 89	Check Wear & Critical Dimensions	12
Grooving Tool - T 89	Check Critical Dimensions	12
Ovens	Verify Temp. Settings	12
Balances	Verify	12 <sup>b</sup>
Timers	Check Accuracy	12

<sup>a</sup>Calibrate and/or verify after each move.

<sup>b</sup>Verify after each move.

<sup>c</sup>Includes ram pressure, LVDT, frequency of gyration, and external angle.

**403.17.3.1.1 Inventory.** An inventory of all major sampling, testing, calibration, and verification equipment, including the serial number or other identifying number shall be maintained.

**403.17.3.1.2 Calibration Records.** Calibration and verification records shall include but are not limited to:

- (a) Detailed results of the work performed (dimensions, mass, force, temperature, etc.)
- (b) Description of the equipment calibrated including identifying number.
- (c) Date the work was performed.
- (d) Identification of the individual performing the work.
- (e) Identification of the calibration or verification procedure used.
- (f) The previous calibration or verification date and next due date.
- (g) Identification of any in-house calibration or verification device used (including identification to establish traceability of items such as standard masses, proving rings, standard thermometers, balances, etc.).

**403.17.3.2 Record Retention.** Test records shall be maintained to permit verification of any test report. Records pertaining to testing, equipment calibration and verification, test reports, internal quality systems review, proficiency sample

testing, test technician training and evaluation and personnel shall be retained in a secure location for a minimum of three years.

**403.17.3.3 Test Method Availability.** A current copy of all test methods and procedures shall be maintained in the QC laboratory at all times for reference by the technicians. Examples of report formats and procedures may be found in AASHTO R 18.

**403.18 Quality Assurance.** All QA field inspection, sampling and testing will be performed by a qualified MoDOT technician. The QA inspector shall have free access to any and all testing equipment used by the mixture producer and any workbooks, records or control charts maintained by the mixture producer for the QC process. The QA inspector shall also have sufficient access to the plant grounds to assure compliance with the approved QC Plan.

**403.18.1 Assurance Testing.** The engineer will independently test the specimens and/or mixture from the roadway or plant at the frequency listed in Sec 403.19.3. The independent samples shall be of sufficient size to retain half for possible disputes. Further testing of this sample will be under the direction of the engineer. The retained portion of the QC samples for mixture properties, gradation, and deleterious content will be tested as directed by the engineer. The engineer's test results, including all raw data, will be made available to the contractor when completed and no later than the next working day.

**403.18.2 Chain of Custody.** QA density cores shall be sealed in approved tamper-evident containers immediately after extraction in the presence of the engineer. At the plant, the contractor shall provide loose mix material and test specimens at the frequency listed in Sec 403.19.3 for all QA testing at the provided random tonnage in the presence of the engineer.

**403.18.3 Aggregate Comparison.** Comparison for aggregate will be considered favorable when the contractor's QC results and engineer's QA test results of a retained sample compare within the following limits.

**403.18.3.1 Gradation.**

Sieve Size	Percentage Points
¾ inch and larger	5.0
½ inch	5.0
3/8 inch	4.0
No. 4	4.0
No. 8	3.0
No. 10	3.0
No. 16	3.0
No. 20	3.0
No. 30	3.0
No. 40	2.0

Job No.: J2P3396  
 Route: Various  
 County: Audrain

No. 50	2.0
No. 100	2.0
No. 200	1.0

**403.18.3.2 Deleterious.** The total and individual deleterious content shall not exceed the specification limits.

**403.18.4 Federal Highway Administration Requirements.** Performance and acceptance of QC/QA testing under these specifications shall not eliminate any FHWA requirements for acceptance of the material.

**403.19 Acceptance of Material.** Acceptance of bituminous mixture will be based on lots. With the exception of density, asphalt material will be sampled at the asphalt plant in lots or sublots on a random basis through the use of a random number system and evaluated using a Quality Level Analysis (QLA). A QLA will determine payment based on a combination of the total PWL (PWL<sub>t</sub>) determined for each pay factor item for each lot of material produced.

**403.19.1 Random Numbers.** The engineer will generate random numbers. Random numbers will be based upon tonnage.

**403.19.2** A lot shall consist of a maximum of 6,000 tons. The maximum subplot size shall be 1500 tons and each lot shall contain no less than 4 sublots. Sublots from incomplete lots shall be combined with the previous complete lot for determination of pay factors. When no previous lot exists, the mixture shall be treated in accordance with Sec 403.23.8.1. A new lot shall begin when the asphalt content of a mixture is adjusted in accordance with Sec 403.11 or if there is an asphalt binder grade change or an additive source change.

**403.19.3 Test and Pay Factor Items.** As a minimum, the contractor and engineer shall test in accordance with the following table. The number of random tests per subplot may be increased per the contractor's QC plan. The QC plan shall state the test and testing frequency. All random tests shall be used in the pay factor determination. Where multiple test methods are allowed, the contractor shall designate the test method to be used in the QC Plan. Final payment will be based on the indicated pay factor items.

Tested Property	Test Method	Contractor Frequency	Engineer Frequency
<b>Pay Factors</b>			
Mat Density (% of theoretical maximum density) <sup>(a)</sup>	MoDOT TM 41, AASHTO T 166 or AASHTO T 331	1 Sample / Sublot	1 Sample / Lot
Asphalt content	AASHTO T 164, or MoDOT Test Method TM-54, or AASHTO T 287, or AASHTO T 308	1 / Sublot	1 / Lot

V <sub>a</sub> , N <sub>des</sub>	AASHTO T 312 and R 35	1 / Sublot	1 / Lot
CT <sub>Index</sub>	ASTM D 8225	1 / 3000 tons	1 / 12000 tons
<b>Pay Factor Adjustments</b>			
Unconfined Longitudinal Joint Density <sup>(a)</sup>	MoDOT TM 41, AASHTO T 166 or AASHTO T 331	1 Sample / Sublot	1 Sample / Lot
Intelligent Compaction	Sec 405	Continuous	10% of travelway of one roller
RT <sub>Index</sub>	ASTM D 8360	1 / 3000 tons	1 / 12000 tons
Tensile Strength and TSR	AASHTO T 283	1 / 12000 tons (maximum)	1 / Project
<b>Other Testing</b>			
Cold feed or hot bin gradation and deleterious content	AASHTO T 27 and AASHTO T 11	As Needed	As Needed
Mix Temperature at Plant	----	1 / Sublot	1 / Day
Temperature of Base and Air	----	As Needed	As Needed

(a) Core samples shall consist of one core. Up to two additional cores, as stated in the QC Plan, may be obtained at the same offset within one foot of the randomly selected location. If more than one core is obtained, all cores shall be combined into one sample.

**403.19.3.1 Test Method Modification.**

**403.19.3.1.1 Binder Ignition Modification.** Asphalt content determination in accordance with AASHTO T 308, Section 6.9.1 shall be modified by adding the following: If the calibration factor exceeds 1.0 percent, lower the test temperature to 800 ± 8 F and repeat test. Use the calibration factor obtained at 800 F even if it exceeds 1.0 percent. If RAP is used, the binder ignition oven shall be calibrated in accordance with MoDOT Test Method TM 77. At the engineer’s discretion, testing may be waived when production does not exceed 200 tons per day. The contractor shall certify the proper proportions of a previously proven mixture were used.

**403.19.3.1.2 Rice Test.** When the water absorption of any aggregate fraction is greater than 2.0 percent, the test method for determining theoretical maximum specific gravity, AASHTO T 209, shall be modified as follows: After completing the procedure in accordance with Section 9.5.1 or 9.5.2, drain water from the sample. To prevent loss of fine particles, decant the water through a paper towel held over the top of the container. Spread the sample before an electric fan to remove surface moisture. Weigh at 15-minute intervals, and when the loss in mass is less than 0.05 percent for this interval, the sample may be considered to be surface dry. This procedure requires about 2 hours and shall be accompanied by

intermittent stirring of the sample. Break conglomerations of mixture by hand. Take care to prevent loss of particles of mixture. Calculate the specific gravity of the sample by substituting the final surface-dry mass for A in denominator of Equations 2 or 3.

**403.19.3.1.3 Mixture Bulk Specific Gravity.** Determining bulk specific gravity using paraffin-coated specimens, AASHTO T 275, shall not be used when required by AASHTO T 166. Alternate methods are AASHTO T 331 and ASTM D1188. The surface of specimens prepared for testing by these methods may have the surface texture removed by sawing a minimal amount. Specimens shall be securely held in a jig or other clamping device to eliminate distortion and retain a face parallel to the original surface. Measurements for lift thickness shall be made prior to sawing.

**403.19.3.1.4 QC and QA Mix Sampling and Preparation.** All loose mix shall be sampled at the plant by the contractor during production in accordance with AASHTO R 97 and split to the appropriate size in accordance with AASHTO R 47. After QC has been notified of the random sample, the first truck shall be sampled as directed by the engineer. If the random number for multiple tests overlap, the contractor shall complete the first testing requirements and then immediately proceed with the second testing requirements. The contractor shall wait 30 minutes after sampling loose mix before fabricating specimens for  $CT_{Index}$  and  $RT_{Index}$  testing. Loose mix temperatures shall not drop below the molding temperature. The 30 minutes shall start when all the material for the loose mix sample has been obtained and the time this occurs shall be recorded. All specimens shall be fabricated as soon as possible after the 30-minute delay. QC and QA samples shall be taken and fabricated by the contractor at separate random times.

The following table details the minimum number of specimens required for QC or QA testing:

Test Method	Minimum Number of Specimens	Molded Specimen Height (mm)
<b>Required Fabrication for <math>CT_{Index}</math> and <math>RT_{Index}</math></b> <b>QC Frequency: 1 Set per 3000 tons</b> <b>QA Frequency 1 Set per 12000 tons</b>		
Cracking Tolerance Index ( $CT_{Index}$ )	5 Compacted Specimens	62 ( $\pm 1$ mm) <sup>(b)</sup>
Rutting Tolerance Index ( $RT_{Index}$ )	3 Compacted Specimens	62 ( $\pm 1$ mm) <sup>(b)</sup>
Retained Loose Mix <sup>(a)</sup> (QA sample only)	125 lbs	N/A

<b>Required Fabrication for Volumetrics and % Asphalt Content</b> <b>QC Frequency: 1 Set per subplot</b> <b>QA Frequency 1 Set per Lot</b>		
% Asphalt Content	1 Sample	N/A
Theo. Max SG of mixture, Gmm	1 Sample	N/A
% Air Voids	2 Compacted Specimens	N <sub>Design</sub>
Retained Loose Mix <sup>(c)</sup>	30 lbs	N/A
<b>Required Sampling for TSR</b> <b>QC Frequency: 1 Sample per 12,000 tons</b> <b>QA Frequency: 1 Sample per Project</b>		
Tensile Strength Ratio (TSR)	250 lbs	N/A

- (a) Retained loose mix for Hamburg verification of mixture not meeting minimum RT<sub>index</sub> thresholds
- (b) 95 mm specimen height for SP250 mixes
- (c) Retain at least 30 pounds of loose mix material for dispute resolution.

The CT<sub>index</sub> test shall be based upon five compacted specimens tested, discard the single highest and lowest values, and average the three remaining values.

The RT<sub>index</sub> test shall be based upon the average of three compacted specimens.

Volumetric testing shall be based upon the average of two compacted specimens.

**403.19.3.1.5 Molding Performance Samples.** The specimens shall be compacted to an air void content of 7.0 ± 0.5 percent or 6.0 ± 0.5 percent for SMA mixtures. The compacted test specimens shall be allowed to cool to 77 ± 5 F prior to determining the air void content.

**403.19.3.1.6 Records.** Compaction temperature, times in and out of the oven, gyratory specimen weights and times, and sample identification shall be recorded.

**403.20 Miscellaneous Applications.**

**403.20.1 Small Quantities.** Small quantities are less than 6000 tons for the pay item quantities of each separate mixture and the following shall apply:

- (a) A field laboratory will not be required for monitoring mixtures. All required QC and QA testing shall be performed in an approved laboratory.
- (b) No Performance Testing is required and acceptance shall be in accordance with Sec 403.23.8.1. Density, % AC, and % Air Voids shall be performed at a frequency of no less than one per day if production does not exceed 1000 tons

and at a frequency of no less than two per day if production exceeds 1000 tons. Independent or retained sample QA tests shall be performed at least once per project, as indicated.

**403.20.2 Base Widening and Entrances.** For base widening mixture and entrance work, the following will apply:

(a) All base widening shall be constructed in accordance with Sec 401.7 and subsections.

(b) The minimum density of these mixtures shall be attained as specified herein, except, compaction may be performed in accordance with Sec 403.15.3.

**403.20.3 Dispute Resolution.** When there are significant discrepancies between the engineer's and the contractor's test results, dispute resolution procedures will be used.

**403.20.3.1 Cease Work.** The contractor's operations may be required to cease until the dispute is resolved if the test results indicate the mixture is subject to failure.

**403.20.3.2 Third Party Resolution.** The first step in dispute resolution will be to identify differences in procedures and correcting inappropriate procedures before moving to third party resolution. If that does not resolve the dispute, either the contractor or the engineer may request the approved QC Plan third party involvement. The recommendations of the approved third party shall be binding on both the engineer and contractor.

**403.20.3.3 Third Party Payment.** The contractor shall be responsible for the cost associated with the third party testing and resolution if the final result indicates the engineer's test results were correct. Likewise the Commission will be responsible for the cost associated with the third party testing and resolution when the final result indicates the contractor's results were correct.

**403.20.3.4 Other Adjustments.** The contractor shall not be entitled to any additional payment for costs incurred due to use of the dispute resolution procedures such as, but not limited to, those for delay, cessation of operations, costs to subcontractors, etc. The engineer may give consideration to adjustment of working days if warranted.

**403.20.3.5 Dispute with  $CT_{Index}$  and  $RT_{Index}$  Results.** If QA and QC results for  $CT_{Index}$  or  $RT_{Index}$  do not compare favorably, the first step will be to identify differences in procedures, including specimen aging. If that does not resolve the dispute, the QA  $CT_{Index}$  result shall be averaged with the QC  $CT_{Index}$  result to determine pay. If  $RT_{Index}$  results are in dispute, QC shall fabricate specimens for Hamburg testing in the presence of the Engineer using the retained loose mix material. Retained loose mix material from the QC sample shall be used to fabricate specimens unless otherwise directed by the Engineer. Specimens shall be sent to the Engineer for Hamburg testing to determine specification compliance.

### **403.21 General Requirements.**

**403.21.1 Sequence of Operations.** To reduce inconvenience to the traveling public during widening or surfacing, the contractor will not be permitted to place any final surface course until the base widening, the leveling course and the binder course have been completed throughout the entire combination of sections, unless otherwise authorized by the engineer. The proper condition of the base widening, the leveling course, and the binder course, at the time of placing the surface course, shall be the contractor's responsibility.

**403.21.2 Pavement Marking.** If the contractor's work has obliterated the existing pavement marking on resurfacing projects open to through traffic, the pavement marking shall be replaced in accordance with Sec 620.

**403.21.3 Surfaced Approaches.** At locations designated in the contract or as specified by the engineer, approaches shall be primed in accordance with Sec 408 and surfaced with Type SP125 asphaltic concrete. The asphaltic concrete surface shall be placed in accordance with the details shown on the plans or as specified by the engineer. Approaches shall not be surfaced until after the surface course adjacent to the entrance is completed. Any work required to condition and prepare the subgrade on the approaches will be at the contractor's expense.

**403.21.4 Filling Drain Basins.** If shown on the plans, existing drain basins shall be filled to the top of the lip with plant mix bituminous base course or asphaltic concrete from the pavement edge to the edge of the shoulder. Any difficulty or delay created by this requirement will be at the contractor's expense.

**403.21.5 Pavement Repairs (Blow-Ups).** A blow-up will be considered that area where excessive expansion has resulted in distress to the existing pavement. Blow-ups occurring prior to the application of the tack coat on the existing surface will normally be repaired by the Commission. Blow-ups occurring after the application of the tack coat shall be repaired by the contractor by removing the distressed concrete and replacing the pavement in accordance with Sec 613.

### **403.22 Method of Measurement.**

**403.22.1 Weight Determination.** The weight of the mixture will be determined from the batch weights if a batch-type plant is used, and will be determined by weighing each truck load on scales in accordance with Sec 310 if other types of plants are used. Measurement will be made to the nearest 0.1 ton for the total tonnage of material accepted.

#### **403.22.2 Full Depth.**

**403.22.2.1** The final driving surface area, for the full depth of the pavement, will be used as the area for all underlying bituminous lifts and will not include the additional quantity needed to construct the 1:1 slope.

**403.22.2.2** Final measurement of the completed pavement will not be made except for authorized changes during construction, or where appreciable errors are found in the contract quantity. Where required, measurement of the pavement complete in place will be made to the nearest 0.1 square yard. The revision or correction will be computed and added to or deducted from the contract quantity.

**403.22.3 Alternate Overlay.**

**403.22.3.1 Field Established Quantity.** When bid as an alternate to a Portland cement concrete overlay, the contractor shall establish the existing roadway profile and set the final overlay profile. The engineer may adjust the final profile as needed. The tons of hot mix asphalt required will be determined by the engineer from the set or adjusted profile. This quantity will be the field established plan quantity.

**403.22.3.2 Overlay Measurement.** Final measurement of the completed pavement will be based on the field established plan quantity except for authorized changes during construction. The revision or correction will be computed and added to or deducted from the contract quantity. Measurement of the pavement complete in place will be made to the nearest 0.1 ton.

**403.22.4 Pavement Testing.** The finished courses shall have the nominal thickness shown on the plans. Tests will be conducted to ensure that each course is being constructed to proper thickness, composition, and density. The contractor shall cut samples from any layer of the compacted mixture at locations designated by the engineer. QA samples shall be cut and delivered to the engineer no later than the end of the next day following the laydown operation. If the samples are not cut and delivered as stated, the asphaltic laydown operation may be suspended and a deduction of 5 percent per day of the contract unit price of the representative material may be applied, until samples are cut and delivered to the engineer. Samples may be obtained by either sawing or drilling 4-inch minimum diameter cores. Each sawed sample shall consist of a single piece of the pavement of the size designated by the engineer, but no larger than 12 inches square.

**403.22.4.1 Pavement Thickness.** Lift thickness may be determined by the average thickness of cores taken for density measurements for each lot. Total thickness samples for new full depth asphalt pavements shall be obtained after all bituminous construction is completed on the project and shall be taken at locations specified by the engineer. For the purpose of determining the constructed thickness of full depth pavement, cores shall be taken at random intervals in each traffic lane at the rate of one core per 1000 feet or increment thereof, or at any other locations as may be determined by the engineer and measured in accordance with AASHTO T 148. Sections of any asphaltic concrete determined to be 0.5 inches or more, less than the thickness shown on the plans, shall be corrected by the contractor. No payment will be made for any costs incurred by the contractor in correcting pavement deficient in thickness. Each core is representative of the pavement thickness for a distance extending one-half the distance to the next core, measured along centerline, or in the case of a beginning or ending core, the distance will extend to the end of the pavement.

**403.22.4.2 Surface Restoration.** The surface from which samples have been taken, including those for density measurements, shall be restored by the contractor with the mixture then being produced no later than the next day of plant operation, if construction is still active. If bituminous construction has been completed, the surface from which samples have been taken shall be restored within 48 hours with an approved commercial mixture or with cold patch mixtures acceptable to the engineer.

**403.23 Basis of Payment.**

**403.23.1 Percent Within Limits.** PWL will be based on the mean, standard deviation and quality index of each lot's test results. The upper PWL (PWL<sub>u</sub>) and lower PWL (PWL<sub>l</sub>) is determined from the table in Sec 502.15.8. For Upper or Lower Quality Index values less than zero, the value in the Table shall be subtracted from 100. Total percent within limits, PWL<sub>t</sub>, is: PWL<sub>t</sub> = (PWL<sub>u</sub> + PWL<sub>l</sub>) - 100. For Density of SMA mixes the PWL<sub>u</sub> shall be 100.

The mean is:  $x_a = (\sum xi)/n$   
Where:  $x_a$  = Average of the individual values being considered  
 $\sum xi$  = The summation of all the individual values being considered  
 $n$  = The number of individual values under consideration

The Standard Deviation is:  $s = (\sum(x_i - x_a)^2/(n - 1))^{1/2}$   
The Upper Quality Index is:  $Q_u = (USL - x_a)/s$   
The Lower Quality Index is:  $Q_l = (x_a - LSL)/s$

Where:  $Q_u$  = Upper Quality Index  
 $Q_l$  = Lower Quality Index  
USL = Pay Factor Item Upper Spec Limit  
LSL = Pay Factor Item Lower Spec Limit

**403.23.1.1 Quality Level Analysis.** The engineer will make the QLA no more than 24 hours after receipt of the contractor's test results, by determining the PWL<sub>t</sub> for each designated pay factor item.

**403.23.1.1.1 Acceptance.** The contractor's test results will be used when applicable to determine the PWL, provided the contractor's QC tests and the engineer's QA tests compare favorably, and provided the engineer's inspection and monitoring activities indicate the contractor is following the approved QC Plan.

**403.23.1.1.2 Comparison.** Favorable comparison will be obtained when the engineer's QA test results on a production sample are within two standard deviations or the comparison limit, whichever is greater, of the mean of the contractor's test results for that particular lot. Comparison limits for QC average results are as follows: air voids within  $\pm 0.5$  percent, asphalt content within  $\pm 0.2$  percent, and density within  $\pm 1.3$  percent. QA CT<sub>Index</sub> results shall be within  $\pm 30$  of the QC testing that falls nearest result for SuperPave and  $\pm 60$  for SMA. For the CT<sub>Index</sub> test, if all QC and QA are greater than 80 for SuperPave mixes and greater than 190 for SMA mixes, then results are considered comparable. QA RT<sub>Index</sub>

results shall be within  $\pm 15$  percent of the QC testing that falls nearest. Further comparisons may be made by using F & t testing at a significance level of 1 percent as directed by the engineer.

**403.23.1.1.3 Outliers.** No test result shall be discarded, except individual test results on a lot basis may be checked for an outlier in accordance with the statistic T in ASTM E 178, at a significance level of 5 percent. If an outlier is found, material from the retained QA sample may be tested, in the presence of the engineer, to determine a replacement test value. The replacement test value shall be used in the PWL determination.

**403.23.1.1.4 Roadway/Shoulder Lots.** For the purpose of QLA, mixture placed on the traveled way and placed on the traveled way and shoulders integrally, shall be accounted for in a regular lot/sublot routine. Mixture placed on shoulders only shall be accounted for in a shoulder lot/sublot routine.

**403.23.1.1.5 Random Sampling.** For the purpose of QLA, all mixture produced at the plant and placed on the roadway shall be subject to random testing. Mainline density measurements at the roadway shall not be taken within 6 inches of an unconfined longitudinal joint. Random samples taken in the same day may be separated by 200 tons.

**403.23.2 Pay Factors.** The total pay factor ( $PF_T$ ) for each lot will be equal to the weighted sum of the pay factors (PF) for each pay factor item for each lot, and is determined as follows:

$$PF_T = + (0.5) PF_{Density} + (0.25) PF_{Va} + (0.25) PF_{AC}$$

The  $PF_T$  for each lot, on the shoulder or otherwise when the density pay factor is not directly included, will be equal to the weighted sum of the PF for each pay factor item for each lot, and will be determined as follows:

$$PF_T = (0.5) PF_{Va} + (0.5) PF_{AC}$$

The PF for each pay factor item for each lot will be based on the  $PWL_t$  of each pay factor item of each lot and will be determined as follows:

When  $PWL_t$  is greater than or equal to 90:  $PF = 0.3 PWL_t + 73$ ;

When  $PWL_t$  is greater than or equal to 70 and  $PWL_t$  is less than 90:  $PF = 0.5 PWL_t + 55$ ;

When  $PWL_t$  is less than 70:  $PF = 2 PWL_t - 50$ ;

**403.23.2.1 Density Pay Factor.** The theoretical maximum specific gravity of the mixture, as determined for each subplot and the bulk specific gravity of no less than one core from each subplot, will be used to perform the QLA for the percent of theoretical maximum density. Thick cores required to be cut in half in accordance with Sec 403.15.4 shall effectively double the number of sublots for cores. When

density is not used as a pay factor, additional adjustment of the contract unit price will be based on the table in Sec 403.23.8.1.

**403.23.2.2 Asphalt Content Pay Factor.** The QLA will be performed using the asphalt content test results from each lot.

**403.23.2.3 Air Voids Pay Factor.** Two gyratory specimens shall be compacted for each subplot and the average of the two specimens will be used to calculate the volumetrics of the subplot. The air voids shall be determined from the gyratory compacted specimens. The air voids for the QLA shall be those calculated using the average bulk specific gravity of the gyratory compacted specimens and the theoretical maximum specific gravity of the mixture determined for the subplot of material.

**403.23.2.4 CT<sub>Index</sub> and TSR Pay Factor.** The contract unit price for each 3,000 tons or fraction thereof for all mixtures shall be adjusted based on the average CT<sub>Index</sub> results for the tonnage according to the following table provided that acceptable RT<sub>Index</sub> or Hamburg and TSR results are obtained. The lower adjusted contract unit price from the CT<sub>Index</sub> and TSR results shall apply.

<b>SuperPave Mixtures</b>		
<b>Cracking Tolerance Index (CT<sub>Index</sub>)</b>	<b>Tensile Strength Ratio (TSR)<sup>(a)</sup></b>	<b>Percent of Contract Price</b>
40 – 49	70 – 74 %	97%
50 – 99	75 – 84 %	100%
100 or Greater	85 % or Greater	103%
<b>SMA Mixtures</b>		
<b>Cracking Tolerance Index (CT<sub>Index</sub>)</b>	<b>Tensile Strength Ratio (TSR)<sup>(a)</sup></b>	<b>Percent of Contract Price</b>
80 – 134	70 – 74 %	97%
135 – 239	75 – 84 %	100%
240 or Greater	85 % or Greater	103%

(a) If an approved liquid anti-strip is used, the TSR limit to receive full incentive is 80 percent.

The QLA shall be performed using each Density, % Air Void, and % Asphalt Content result within the lot.

**403.23.3 Removal of Material.** All lots of material with a PF<sub>T</sub> less than 50.0 shall be removed and replaced with acceptable material by the contractor.

Any subplot of material with a percent of theoretical maximum density of less than 90.5 percent or greater than 98.5 percent shall be removed and replaced with acceptable material by the contractor. For SMA mixtures, any subplot of material with a percent of theoretical maximum density of less than 92.0 percent shall be removed and replaced with acceptable material by the contractor.

Any material with a  $CT_{Index}$  less than 40 shall be considered unacceptable material. For SMA mixtures, any material with a  $CT_{Index}$  less than 80 shall be considered unacceptable material.

Any subplot of material with air voids in the compacted specimens less than 1.5 percent or tonnage of material not meeting the minimum  $RT_{Index}$  shall be evaluated with Hamburg testing and removed and replaced with acceptable material by the contractor if the rut depth is greater than 1/2 inch at the designated number of wheel passes.

Any material with TSR results below 70 percent or minimum conditioned tensile strength below 60 psi are considered unacceptable and will be subject to removal, production shall cease, the mixture reverified, and other payfactors incentives shall not be applied.

No additional payment will be made for such removal and replacement. The replaced material will be tested at the frequencies listed in Sec 403.19. Pay for the material will be determined in accordance with the applicable portions of Sec 403.23 based on the replacement material.

**403.23.4 Pay Factor Adjustments.** Pay factor adjustments are as follows:

**403.23.4.1 Unconfined Longitudinal Joint Density Adjustment.** The minimum density of all traveled way pavement within 6 inches of a longitudinal joint, including the pavement on the traveled way side of the shoulder joint, shall not be less than 90.5 percent of the theoretical maximum specific gravity for SuperPave mixtures and above 92.0 percent of the theoretical maximum specific gravity for SMA mixtures. The density of the longitudinal joint when confined will be included in the evaluation of the remainder of the mat. Pay adjustments will be in accordance with the following table and will be applied to the corresponding tonnage represented by the core(s).

Pay adjustments due to longitudinal joint density will apply to the full width of the lane paved. The average of joint cores from each subplot will determine specification compliance. If payment reductions are necessary, the lowest  $PF_{Total}$  shall apply. Adjustments due to joint density will apply to the subplot from which the cores are obtained.

<b>Longitudinal Joint Density</b>	
Field Density (Percent of Laboratory Theoretical Gravity) Max. Specific Gravity	Percent of Contract Unit Price
<b>SuperPave Mixtures</b>	
$\geq 90.5$	$PF_{Total}$ not changed by longitudinal joint density
89.5 – 90.4	Maximum $PF_{Total} = 100\%$ ; Correction Required <sup>(a)</sup>
$< 89.5$	Remove and Replace

SMA Mixtures	
≥ 92.0	PF <sub>Total</sub> not changed by longitudinal joint density
90.0 – 91.9	Maximum PF <sub>Total</sub> = 100%; Correction Required <sup>(a)</sup>
< 90.0	Remove and Replace

(a) Correction requires spraying rapid penetrating emulsion on deficient density areas in accordance with JSP2303. All costs associated with correction shall be at the contractor’s expense with no additional payment.

**403.23.4.2 Smoothness Adjustment.** The contract unit price for all mixes, except wedge or level course, will be adjusted in accordance with Sec 610.5. The contract unit prices for asphaltic concrete pavement will be considered full compensation for all materials entering into the construction of the pavement and for the cost of the smoothness testing and correction.

**403.23.4.3 Paver Mounted Thermal Profiler.** The contract unit price for all mixes, except wedge or level course, will be adjusted in accordance with Sec 406. The contract unit prices for asphaltic concrete pavement will be considered full compensation for all materials entering into the construction of the pavement and for the cost of the PMTP testing and correction.

**403.23.4.4 Intelligent Compaction.** If Intelligent compaction is not included as a pay item in the contract, then all specification requirements and pay adjustments pertaining to Intelligent Compaction will not apply. If pay items for Intelligent Compaction are included in the contract, then all specification requirements and pay adjustments pertaining to Intelligent Compaction shall apply.

**403.23.5 Aggregate Variation.** Due to possible variations in the specific gravity of the aggregates, the tonnage of mixture used may vary from the proposal quantities. No adjustment in contract unit price will be made because of such variation.

**403.23.6 Compacted Samples.** Payment for obtaining and delivering samples of compacted mixture from the pavement and replacing the surface will be made per sample at the fixed price specified in Sec 109. No direct payment will be made for samples taken for QC and QA testing.

**403.23.7 Payment for Pavement Repairs (Blow-ups).** Payment for repairing blow-ups will be made in accordance with Sec 104.

**403.23.8 Miscellaneous Applications.**

**403.23.8.1 Small Quantities.** Small quantities are defined in Sec 403.20.1. Unless the contractor has elected to use the normal evaluation in the Bituminous QC Plan for small quantities, the following shall apply for each separate mixture qualifying as a small quantity

(a) QLA and PWL shall not apply.

(b) Mixtures shall be within the specified limits for % Air Voids, % AC, and density. In addition to any adjustments in pay due to profile, the contract unit price for the mixture represented by each set of cores will be adjusted based on actual field density above or below the specified density using the following schedule:

<b>Field Density (Percent of Laboratory Max. Theoretical Density)</b>	<b>Pay Factor (Percent of Contract Unit Price)</b>
<b>For all SP mixtures other than SMA:</b>	
92.5 to 98.0 inclusive	100
90.5 to 92.4 inclusive	Correction <sup>(a)</sup>
Above 98.0 or Below 90.5	Remove and Replace
<b>For SMA mixtures:</b>	
>94.0	100
92.0 to 93.9 inclusive	Correction <sup>(a)</sup>
Above 98.0 or Below 92.0	Remove and Replace

(a) Correction requires spraying rapid penetrating emulsion on deficient density areas in accordance with JSP2303. All costs associated with correction shall be at the contractor's expense with no additional payment.

**403.23.8.2 Base Widening and Entrances.** For base widening mixtures and entrance work, QLA and PWL will not be required. Payment for these mixtures will be made at 100 percent of contract unit price for material that otherwise meets the specifications.

**403.23.8.3 Single Lift on Unmilled Surface or Leveling Course Work.** For resurfacing projects specifying a single lift on an unmilled surface, surface mixture of 3,000 tons or more, or for leveling course work, the following shall apply to the traveled way mixture. All bituminous mixture QC/QA requirements shall apply, except the density pay factor designated in Sec 403.23.2 will not be directly included in the total pay factor. In lieu of that, one density sample shall be taken per subplot and the pay adjustment for density will be made using the table in Sec 403.23.8.1.

**3.0 Insert Sec 406 Paver-Mounted Thermal Profiles:**

**406 Paver-Mounted Thermal Profiles**

**406.1 Description.** This work shall consist of continuous thermal profiling of the asphalt mat temperature behind the trailing edge of the paver screed plate during placement operations using a Paver-Mounted Thermal Profile System (PMTPS). This work shall be completed in accordance with the general principles set forth in AASHTO R 110 "Standard Practice for Continuous Thermal Profile of Asphalt Mixture Construction", and specifically as stated in the following sections.

**406.2 Required Measurements.** PMTPS measurements are required on the full width of paving of each asphalt lift. Collection of data shall include shoulder

pavement when placed simultaneously with the mainline. The shoulder paving data will be filtered out using Veta during data processing. PMTPS data collection is not required in the following exceptions:

- (1) PMTPS measurements are not required on auxiliary lane tapers, ramps, shoulders (not paved simultaneously with mainline), cross-overs, non-continuous turn lanes, loops, bypass lanes, acceleration/deceleration lanes, intersecting streets, roundabouts, and partial lane width widenings.
- (2) PMTPS measurements are not required for a total net paving length less than 2 lane miles.
- (3) PMTPS measurements are not required on asphalt lift thicknesses less than 1 inch.

**406.3 Equipment Requirements.** The PMTPS shall consist of the following components listed.

- (1) Temperature sensor to continuously monitor surface temperature of mat.
  - a. Longitudinal and lateral surface temperature readings shall be collected at 12-inch or less intervals at all paving speeds with an X-Y accuracy of plus or minus 1 inch.
  - b. Surface temperatures shall be collected for the full width paved in one pass (including any shoulders paved simultaneously with mainline).
  - c. Surface temperature sensors(s) shall have a temperature range of at least 140 F to 480 F. Sensory accuracy shall be plus or minus 3.6 F, or plus or minus 2.0 percent of sensor reading, whichever is greater.
- (2) Global Navigation Satellite System (GNSS) receiver to capture coordinates of the surface temperature readings. GNSS accuracy shall be plus or minus 2 inches or less in X and Y directions when intelligent compaction is being used. A base station shall be required at any locations having poor cellular reception to obtain required accuracy. When intelligent compaction is not being used GNSS accuracy shall be plus or minus 4 feet or less in the X and Y directions and ground distance sensor shall be within plus or minus 1/1000 feet.
- (3) Onboard data acquisition with a minimum of the following capabilities:
  - a. Displays (in real-time) map of the surface temperature readings.
  - b. Displays total distance, paver speed and location.
  - c. Reports surface temperature readings and GNSS status.

- d. Provides real-time statistical summaries of surface temperature readings.
- e. Allows operator to define data lot currently being placed per AASHTO PP 114.
- f. Stores data internally until data transfer.
- g. Automatically transfers data to cloud storage or other approved methods.

**406.3.1 System Setup on Pavers.** Pavers shall be instrumented with the PMTP system for the full paving width and shall collect measurements no less than 3 feet and no greater than 12 feet from the trailing edge of the screed plate. Other objects shall not obstruct surface temperature measurements and GNSS accuracy.

#### **406.4 Construction Requirements.**

**406.4.1 Temperature Verification.** Temperature verification shall follow AASHTO R110-22, Section 6 Calibration. A record of each verification shall be submitted to the SharePoint prior to the start of the project.

**406.4.2 Data Management.** PMTP data files shall be compatible with the Veta software. The contractor shall supply the engineer with the manufacturer's PMTPS Computer Software 14 days prior to beginning work and until ninety days after completion of all work. If Cloud Storage or Cloud Computing is used, the engineer shall be supplied one user ID with full access for the same time-period specified. If cloud storage is not used Raw PMTP data files shall be downloaded once per day and uploaded to the appropriate MoDOT IC-PMTP SharePoint site before the start of the next day's production. The following data management requirements shall apply:

- (1) The PMTP data files should be directly transferred from cloud storage to Veta. Other methods shall be approved by the engineer.
- (2) The PMTP Veta files shall be appropriately formatted and filtered in accordance with MoDOT IC-PMTP protocol.
- (3) Date and time stamp of PMTP shall be checked and verified to reflect the local time zone for both mapped and exported data.

**406.4.3 Quality Control.** The following shall apply to the Contractor's Quality Control for PMTP.

- (1) The contractor shall have a properly trained person listed in the QC Plan that has completed a Veta training course within the last 2 years to perform the PMTP data collection and file management for the project.
- (2) The PMTP system shall have a documented annual calibration before beginning construction.

- (3) For each run, the thermal profile shall be divided into 150-foot sublots at the full paving width and partial data sublots as follows:
- (a) Combine partial data sublots less than 75 feet with the previous data subplot.
  - (b) Treat partial sublots greater than 75 feet as one data subplot.
  - (c) Sublots shall not extend over multiple days, different lifts, or paving directions.
- (4) Veta files shall be completed and uploaded with the appropriate naming convention in accordance with MoDOT IC-PMTPS Protocol. Appropriate naming convention can be found in the IC-PMTP Document Helper. The completed Veta files shall have the appropriate filters applied with the summary data transferred to the Summary Report. An up-to-date Summary Report shall be provided to the engineer two days prior to the 1<sup>st</sup> and 15<sup>th</sup> of each month.
- (5) **PMTP Quality Control Plan.** A pre-activity meeting shall be required prior to mainline paving. The PMTP Quality Control Plan shall be submitted to the engineer at least 2 weeks prior to the mainline paving pre-activity meeting. The plan at minimum shall include the following:
- (a) A list of personnel previously trained
  - (b) Detailed daily verification procedure for checking the RTK-GNSS of PMTP
  - (c) Procedure for downloading PMTP data from the instrument
  - (c) The procedure for training operators or other project staff
  - (e) Detailed daily verification procedure for checking the temperature sensor on the PMTP
  - (f) The name of the designated PMTP Quality Control Technician
  - (g) Procedure for submitting data
  - (h) Contact information for technical support staff
  - (i) Anticipated cellular service and GNSS coverage throughout entire project
  - (j) A list of the control points with either UTM or State Plane Coordinates established by the contractor if a base station is required.

**406.4.4 Quality Assurance (QA) Testing.** The Engineer will use a Forward Looking InfraRed (FLIR) camera to verify the contractor's PMTP system. QA tests shall be taken at random locations twice per day. The contractor shall assist the engineer with the placement of the event marker.

The QA tests using the FLIR data QA tool shall compare favorably, according to the instructions found in the IC-PMTP Document Helper. If results do not compare favorably, the contractor's PMTPS shall be verified by the manufacturer. In the case that the PMTPS is required to be sent off to the manufacturer and the contractor is not able to provide a replacement, the contractor will be allowed to continue paving with the verification by the engineer using a FLIR camera for acceptance only.

**406.4.5 Thermal Segregation.** Thermal segregation will be calculated by using the Differential Range Statistics (DRS) under the parameters of AASHTO R110 in each 150-foot subplot.

The Veta analysis with the appropriate filters applied shall exclude the following surface temperature readings from each subplot:

- (1) Surface temperature readings less than 180 F.
- (2) Surface temperature readings within 2 feet. prior to and 8 feet. after paver stops that are greater than 1 minute in length.

The thermal segregation categories are based on the Differential Range Statistics (DRS), as shown in the table below.

Differential Statistics (DRS)	Range	Thermal Segregation Category
$DRS \leq 25.0^{\circ}F$		Low
$25^{\circ}F < DRS \leq 35^{\circ}F$		Moderate
$35^{\circ}F < DRS \leq 50^{\circ}F$		Moderate-High
$DRS \geq 50^{\circ}F$		Severe

**406.4.6.1 Incentive/Disincentive.** Incentive/disincentive adjustments shall be made for each subplot in accordance with the following:

Thermal Segregation Category	Adjustment per 150 ft. Sublot
Low	\$40 Incentive
Moderate	\$40 to \$0 Incentive (Linear)
Moderate-High	\$0 to -\$40 Disincentive (Linear)
Severe	-\$40 Disincentive and Reviewed by Engineer

**406.5 Loss of Data.** If data collection ceases as a result of circumstances reasonably beyond the control of the contractor, the contractor will be allowed to continue the days paving, but the paved sublots will not be eligible for 406 PMTP Incentive. The engineer must be notified immediately of the issue and shall determine if the contractor has made a reasonable effort to resolve the issue. A meeting with the engineer shall be held to determine how to proceed if the issue is expected to extend into the next day’s paving. Failure to notify the engineer of the issue at hand will result in the paved sublots to receive a minus \$40 deduct.

**406.5.1 GNSS Obstructions.** Isolated areas of GNSS obstruction may be filtered out of Veta at the contractor’s choice. These areas shall be identified in Veta and brought to the attention of the Engineer. Areas excluded from GPS obstruction shall not exceed approximately 5 percent of the total day’s production. It is at the discretion of the engineer to determine if the area exceeds an approximate 5 percent.

**406.6 Basis of Payment.** No direct payment will be made for compliance with this provision.

PP. Non-Tracking Tack JSP-24-02A

**1.0 Description.** This work requires application of tack in accordance with Sec 407 and prevention of tack loss from the surface as specified herein. Tack loss prevention shall be accomplished with successful usage of a MoDOT-approved non-tracking tack, or other acceptable non-tracking means, as approved by the engineer.

**2.0 MoDOT-Approved Non-Tracking Tack.** A list of MoDOT-approved non-tracking tack products is available at MoDOT.org under the Materials Qualified List. Upon request from the contractor, the MoDOT Division of Construction & Materials will consider allowance of other non-tracking products. To be approved, the contractor must successfully demonstrate that the proposed product meets the non-tracking requirements specified in section 3.0. The location of a contractor demonstration will only be allowed in areas approved by the engineer. The engineer will make final determination of product acceptance based on observation of the results of the contractor's demonstration.

**2.1** Products on the Qualified List have demonstrated successful non-tracking performance on previous projects; however, the Commission does not endorse nor guarantee success of any of the listed products. Success is dependent on the contractor choosing a product that can achieve the desired results while also taking into consideration all factors, including, but not limited to, cure time, weather conditions, surface prep, surface type, material properties, and adherence to manufacturer's instructions. The contractor is responsible for monitoring adherence of the tack to the pavement surface and shall cease operations when tack first begins to show signs of not meeting the requirements of Section 3.0. Corrective action shall be made prior to resuming tacking operations.

**3.0 Non-Tracking Requirements.** Non-tracking tack shall remain adhered to the pavement surface when exposed to any wheeled or tracked vehicles. The tack shall not track off the surface within 30 minutes of being applied, and shall not stick to the tires, tracks or other parts of paving equipment or vehicles such that the underlying surface becomes visible or void of tack prior to the placement of the hot mix asphalt. The tack shall not track onto any adjacent lanes, pavement markings, driveways, sideroads, etc.

**3.1** The contractor shall be responsible for cleaning all tracked tack from adjacent lanes, driveways, sideroads, etc., and shall replace all pavement markings that become coated with tracked tack. This cleaning and replacement requirement applies to both approved and proposed non-tracking products.

**4.0 Basis of Payment.** Measurement and payment shall be in accordance with Sec 407. The accepted quantity of non-tracking tack coat will be paid for per gallon at the contract unit price for 407-10.07 Tack Coat – Non-Tracking, per gallon. No additional payment will be made for the cost to demonstrate proposed products, for cleaning surfaces due to tracking of tack, or for replacement of pavement marking damaged by tracked tack.

QQ. Delayed Access to Parcels Pending Acquisition

**1.0 Description.** Acquisition is pending for the parcels listed below on the project. The contractor shall not be permitted to begin work within any designated Temporary Construction Easement or Permanent Easement on any of these parcels until the Right of Way acquisition has been completed. An anticipated date of possession has been provided for each parcel to assist with scheduling purposes.

**2.0 Construction Requirements.** The contractor shall verify with the engineer prior to beginning work on any of the parcels listed in this provision. The contractor will not be permitted access to work on any of these parcels until notification has been given by the engineer that the parcel has been cleared from this list.

**3.0 Parcels.** The following is the list of the parcels where acquisition is pending.

- Parcel 01 - Baker, John W & Suzanne M Trustees - Anticipated Acquisition Date 06/22/26
- Parcel 04 - Super Wash NET95 Investments, LLC - Anticipated Acquisition Date 06/22/26
- Parcel 08 - US Cellular - Family Video Movie Club, Inc - Anticipated Acquisition Date 06/22/26
- Parcel 09 - Break Time - MFA Petroleum Company - Anticipated Acquisition Date 06/22/26
- Parcel 13 - Robinett Construction Holdings, LLC - Anticipated Acquisition Date 06/22/26
- Parcel 15 - Cedar Grove, LLC - Anticipated Acquisition Date 06/22/26
- Parcel 18 - Myers, Zachary - Anticipated Acquisition Date 06/22/26
- Parcel 19 - Hatfield, Loren Jr, ETAL - Anticipated Acquisition Date 06/22/26
- Parcel 20 - Cedar Grove, LLC - Anticipated Acquisition Date 06/22/26
- Parcel 23 - Alexander, Thomas Dean & Elizabeth Ann - Anticipated Acquisition Date 06/22/26
- Parcel 27 - Cedar Grove, LLC - Anticipated Acquisition Date 06/22/26
- Parcel 28 - Cedar Grove, LLC - Anticipated Acquisition Date 06/22/26
- Parcel 29 - Cedar Grove, LLC - Anticipated Acquisition Date 06/22/26
- Parcel 30 - TM Hanson Properties, LLC - Anticipated Acquisition Date 06/22/26
- Parcel 32 - Pneiro, Reinaldo & Harrison, Jane E - Anticipated Acquisition Date 06/22/26
- Parcel 33 - Chitwood, Susan Trustee - Anticipated Acquisition Date 06/22/26
- Parcel 34 - Cornelison, Eric & Rebecca - Anticipated Acquisition Date 06/22/26
- Parcel 35 - Mendez, Ruth - Anticipated Acquisition Date 06/22/26
- Parcel 36 - Oblea, Alex and Jamie - Anticipated Acquisition Date 06/22/26
- Parcel 37 - Usnick, Thomas E & Debbie J - Anticipated Acquisition Date 06/22/26
- Parcel 38 - McDaniel, Katherine E - Anticipated Acquisition Date 06/22/26
- Parcel 40 - Galbreath Investments, LLC - Anticipated Acquisition Date 06/22/26
- Parcel 41 - Housing Authority of City of Mexico - Anticipated Acquisition Date 06/22/26
- Parcel 42 - King, Mark A - Anticipated Acquisition Date 06/22/26

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Parcel 43 - Housing Authority of City of Mexico - Anticipated Acquisition Date 06/22/26

Parcel 46 - J.A.D. Properties, LLC - Anticipated Acquisition Date 06/22/26

Parcel 48 - United Credit Union - Anticipated Acquisition Date 06/22/26

Parcel 49 - MReese & DLynn LLC - Anticipated Acquisition Date 06/22/26

The following is a list of parcels that are being voided, due to plan changes.

Parcel 03 – Pizza Hut - Store Master Funding XVI, LLC – Parcel is being voided

Parcel 45 - Gold, Richard Paul & Ruth Crame – Parcel is being voided

Parcel 47 - Gold, Ruth – Parcel is being voided

**4.0 Basis of Payment.** No direct payment will be made to the contractor for the labor, equipment, material, or time required to comply with this provision.