Job No.: J1P3318
Route: 36
County: Livingston

JOB SPECIAL PROVISIONS TABLE OF CONTENTS (ROADWAY)

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

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 W. CAPITOL AVE.
JEFFERSON CITY, MO 65102
Phone 1-888-275-6636

If a seal is present on this sheet, JSP's have been electronically sealed and dated.

JOB NUMBER: J1P3318
LIVINGSTON COUNTY, MO
DATE PREPARED: 6/30/2023

ADDENDUM DATE:

Only the following items of the Job Special Provisions (Roadway) are authenticated by this seal: All

Job No.: J1P3318
Route: 36
County: Livingston

JOB
SPECIAL PROVISION

A. General - Federal JSP-09-02J

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 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 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 2023 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-13-01C

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

Notice to Proceed Date: October 10, 2023
Contract Completion Date: November 1, 2024

2.1 Calendar Days. The count of calendar days will begin on the date the contractor starts any construction operations on the project.

Job Number	Calendar Days	Daily Road User Cost
J1P3318	102	$2,300

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 **$2000** 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 above 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 to manage 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 **15 minutes** to prevent congestion from escalating beyond this delay threshold. If disruption of the traffic flow occurs and traffic is backed up in queues equal to or greater than the delay time threshold listed above, 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 generate 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. When a Work Zone Analysis Spreadsheet is provided, the contractor will find it in the electronic deliverables on MoDOT's Online Plans Room. The contractor may refer to the Work Zone Analysis Spreadsheet for detailed information on traffic delays.

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:

When Independence Day falls on:	The Holiday is Observed on:	Halt Lane Closures beginning at:	Allow Lane Closures to resume at:
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

3.2 The contractor shall not perform any construction operation on the roadway, roadbed, or active lanes, including the hauling of material within the project limits, during restricted periods, holiday periods or other special events specified in the contract documents.

3.3 The contractor shall not alter the start time, ending time, or a reduction in the number of through lanes of traffic or ramp closures without advance notification and approval by the engineer. The only work zone operation approved to begin 30 minutes prior to a reduction in through traffic lanes or ramp closures is the installation of traffic control signs. Should lane closures be placed or remain in place, prior to the approved starting time or after the approved ending time, 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 delays, with a resulting cost to the traveling public. These damages are not easily computed or quantified. Therefore, the contractor will be charged with liquidated damages specified in the amount of **$1000 per 15-minute increment** for each 15 minutes that the temporary lane closures are in place and not open to traffic in excess of the limitation as specified elsewhere in this special provision. It shall be the responsibility of the engineer to determine the quantity of unapproved closure time.

3.3.1 The said liquidated damages specified will be assessed regardless if it would otherwise be charged as liquidated damages under the Missouri Standard Specification for Highway Construction, as amended elsewhere in this contract.

4.0 Detours and Lane Closures.

4.1 When a changeable message sign (CMS) is provided, the contractor shall use the CMS to notify motorists of future traffic disruption and possible traffic delays one week before traffic is shifted to a detour or prior to lane closures. The CMS shall be installed at a location as approved or directed by the engineer. If a CMS with Communication Interface is required, then the CMS shall be capable of communication prior to installation on right of way. All messages planned for use in the work zone shall be approved and authorized by the engineer or its designee prior to deployment. When permanent dynamic message signs (DMS) owned and operated by MoDOT are located near the project, they may also be used to provide warning and information for the work zone. Permanent DMS shall be operated by the TMC, and any messages planned for use on DMS shall be approved and authorized by the TMC at least 72 hours in advance of the work.

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

D. 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 *55 Troop H: (816) 387-2345
City of Chillicothe
Fire: 660-646-2139
Police: 660-646-2121

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.

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

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

Richard Orr, Project Contact
Northwest District
3602 North Belt Hwy
Saint Joseph, MO 64506

Telephone Number: (816) 387-2483
Email: Richard.Orr@modot.mo.gov

All questions concerning the bid document preparation can be directed to the Central Office – Design at (573) 751-2876.

F. Utilities

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:

Utility Name	**Known Required Adjustment**	**Type**
Ameren Missouri Electric 2101 North Jesse James Road Excelsior Springs, MO 64024 Phone: (800) 778-9140	None	Electric
AT&T Distribution 320 North 10th Street Saint Joseph, MO 65401 Phone: (314) 275-0020	None	Communications
City of Chillicothe-Electric 920 Washington Street Chillicothe, MO 64601 Phone: (660) 646-0934	None	Electric
City of Chillicothe-Waste 920 Washington Street Chillicothe, MO 64601 Phone: (660) 646-0934	None	Sewer
City of Chillicothe-Water 920 Washington Street Chillicothe, MO 64601 Phone: (660) 646-0934	None	Water

Farmers' Electric Cooperative 201 West Business 36 Chillicothe, MO 64601 Phone: (800) 279-0496	None	Electric
Green Hills Companies 7926 Northeast State Route M Breckenridge, MO 64625 Phone: (660) 644-5411	None	Communications
Liberty Utilities 602 S Joplin Avenue Joplin, MO 64801 Phone: (660) 646-5851	None	Gas
Livingston County PWSD 1 7512 Highway C Dawn, MO 64638 Phone: (660) 745-3448	None	Water
Livingston County PWSD 3 P.O. Box 190 Wheeling, MO 64688 Phone: (660) 636-5257	None	Water
MNA-Bluebird 800 Northwest Chipman Road, Suite 5750 Lee's Summit, MO 64063 Phone: (800) 778-9140	None	Communications
MoDOT Northwest District 3602 North Belt Highway St. Joseph, MO 64506 Phone: (816) 387-2956	None	Electric & Communications
Zito Media 421 Locust Street Chillicothe, MO 64601 Phone: (660) 646-2061	None	Communications
Village of Utica P.O. Box 63 Utica, MO 64686 Phone: (660) 247-0083	None	Electric/ Sewer

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.

1.2 Some utilities may have manholes and valves in the driving lanes and shoulders of the proposed resurfacing. Some adjustments may need to be performed in conjunction with construction operations. The contractor shall contact the city or utility company two weeks in advance of operations to coordinate any necessary adjustments with the utility.

G. Permanent Aggregate Edge Treatment NJSP-15-40B

1.0 Description. This work shall consist of furnishing and installing a permanent aggregate edge treatment along the edge of shoulder or pavement as shown on the plans or as directed by the engineer.

2.0 Construction Requirements. Aggregate shall be simultaneously deposited and spread on the sub-grade and shall not be deposited on the pavement or shoulder and bladed into place. Aggregate material shall be shaped according to the typical section and compacted until there is no visible evidence of further consolidation.

3.0 Material Requirements. Material used for the aggregate edge treatment shall be Type 1, 5, or 7 Aggregate in accordance with Sec 1007 or an allowable substitute approved by the engineer. Bituminous cold millings meeting the gradation for Type 1, 5 or 7 Aggregate may be used in lieu of aggregate. Limestone screenings or other material with excessive fines will not be allowed. Material will be accepted based on certification in lieu of testing contingent upon satisfactory results being obtained in the field.

4.0 Measurement by Weight. Measurement of the aggregate edge treatment material shall be per ton and in accordance with Sec 310.5.3.

5.0 Basis of Payment. The accepted quantities of aggregate edge treatment will be paid for at the contract unit price for 304-99.10, Permanent Aggregate Edge Treatment, per ton and will be full compensation for all labor, equipment and material to complete the described work. No fuel adjustment will be made for Permanent Aggregate Edge Treatment.

H. 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.

I. 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).

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 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.

J. Optional Pavements

1.0 Description. This work shall consist of a pavement composed of either Portland cement concrete or asphaltic concrete constructed on a prepared subgrade. This work shall be performed in accordance with the standard specifications and as shown on the plans or established by the engineer.

2.0 The quantities shown reflect the total square yards of pavement surface designated for each pavement type as computed and shown on the plans.

2.1 No additional payment will be made for asphaltic concrete mix quantities to construct the required 1:1 slope along the edge of the pavement, or for tack applied between lifts of asphalt.

2.2 No additional payment will be made for aggregate base quantities outside the limits of the final surface area as computed and shown on the plans. When A2 shoulders are specified, payment for aggregate base will be as shown on the plans.

2.3 The grading shown on the plans was designed for the thinner pavement option. For projects with grading in the contract, there will be no adjustment of the earthwork quantities due to adjusting the roadway subgrade for optional pavements.

2.4 The contractor shall comply with Sections 401 through 403 for the asphalt option and Sections 501 and 502 for the concrete option.

2.5 Pavement options composed of Portland cement concrete shall have contrast pavement marking for intermittent markings (skips), dotted lines, and solid intersection lane lines. The pavement markings shall be in accordance with Section 620. No additional payment will be made for the contrast pavement markings.

3.0 Method of Measurement. The quantities of concrete pavement will be measured in accordance with Section 502.14. The quantities of asphaltic concrete pavement will be measured in accordance with Section 403.22.

4.0 Basis of Payment. The accepted quantity of the chosen option will be paid for at the contract unit bid price for Item 401-99.05, Optional Pavement, per square yard.

4.1 For projects with previously graded roadbeds, any additional quantities required to bring the roadway subgrade to the proper elevation will be considered completely covered by the pay item for Subgrading and Shouldering.

4.2 Price Adjustment for Fuel. If the contractor accepts the option for fuel adjustment in the bid proposal, a fuel adjustment will be applied in accordance with Sec 109.14 for the type of pavement constructed.

K. Optional Rumble Strips

1.0 Description. This work shall consist of constructing rumble strips as shown on the plans or as directed by the engineer. Rumble strips shall be milled into bituminous or concrete shoulders to produce a neat and uniform finish.

2.0 The contractor shall comply with Section 626 for the installation of either the Bituminous Rumble Strip or the Portland Cement Concrete Rumble Strip.

Basis of Payment. The accepted quantity of the chosen option will be paid for by the contract unit bid price for Item 626-99.09, Optional Rumble Strips, per station.

L. Class C Partial Depth Pavement Repair

Class C Partial Depth Repair shall be in accordance with Sec 613.35, CLASS C PARTIAL DEPTH PAVEMENT REPAIR, except as specified herein.

Delete Sec 613.35.2 and substitute with the following:

613.35.2 Material. The material used for Class C partial depth repairs shall be BITUMINOUS PAVEMENT MIXTURE PG 64-22 (BP-1), in accordance with Sec 401, except as otherwise specified throughout this provision.

Delete Sec 613.35.3.2 and substitute with the following:

613.35.3.2 Placement of Repair Material. The repair area shall be filled using a Material Transfer Vehicle (MTV) to minimize temperature loss during placement. The asphalt mixture shall be compacted above 225 F or 200 F when warm mix technology is used. Areas greater than 3 inches in depth shall be filled and thoroughly compacted in two lifts. For pavements that will receive a final overlay, the final compacted surface of the repair shall be level with, or not more than one-fourth inch above, the surrounding pavement. If the repair will be the final driving surface, smoothness shall be in accordance with Sec 610.4.3 and Sec 610.4.4.

Add the following three sections:

613.35.3.3 Weather Limitations. Partial depth pavement repair shall not be placed when either the air temperature or the temperature of the subgrade is below 50 F, nor shall it be placed upon a wet subgrade. Temperatures shall be obtained in accordance with MoDOT Test Method TM 20.

Sec 613.35.3.4 Application of Tack Coat. Tack shall be in accordance with Sec 407 and shall be uniformly applied to the sides (vertical) and bottom of the repair locations at no less than the minimum application rate specified in Sec 407.4.2 for milled surfaces, prior to the placement of the asphalt mixture.

613.35.3.5 Quality Control. The contractor shall maintain equipment and qualified personnel to perform QC inspections during pavement repair operations. A QC plan will not be required. One QC density (MoDOT Test Method TM-41 or AASHTO T 166) shall be taken per day. Repairs with density test results less than 91.5 percent shall be considered unacceptable. At the engineer's discretion, testing may be waived when the total contract quantity for Type C repair is less than 200 ton.

M. Intelligent Compaction NJSP-18-08C

1.0 Description. This work shall consist of collecting location, temperature, speed, and intelligent compaction measurement values (ICMV) from properly instrumented rollers within the mainline paving limits and then submitting the Intelligent Compaction (IC) Data in the defined format. This provision shall apply for each lift of mainline pavement. This work shall be completed in accordance with the general principles set forth in AASHTO PP81-18 Standard Practice for Intelligent Compaction Technology for Embankment and Asphalt Pavement Applications, and specifically as stated in the following sections.

2.0 IC Asphalt Rollers. All asphalt rollers with the exception of the finish roller shall be properly instrumented. These instrumented rollers will be referred to as IC Rollers. Steel wheel rollers shall be self-propelled double-drum vibratory rollers equipped with accelerometers mounted to acquire signals from the vibratory response in the drum measuring the interactions between the rollers and compacted materials in order to evaluate the applied compaction effort known as the ICMV. Rubber tire rollers will not be required to collect the ICMV. IC Rollers shall be equipped with non-contact temperature sensors for measuring pavement surface temperatures as well as a Global Positioning System (GPS) to map the roller position history.

3.0 Equipment Accuracy. IC Roller accuracy shall be in accordance with the following.

Operating Parameter	Accuracy
Global Positioning System	±50 mm (±2 in.) in the X and Y Direction
Rolling Speed	±0.5 kph (±0.3 mph)
Frequency	±2 Hz
Amplitude	±0.2 mm (±0.008 in.)
Temperature	±1.5°C (±2.7°F)

4.0 Onboard Unit. The IC Rollers shall include an integrated on-board documentation system that is capable of displaying real-time color-coded maps of IC measurement values including the stiffness response values, roller location, number of roller passes, pavement surface temperatures and line work (alignment file) if applicable. The unit shall display the current value for roller speeds, vibration frequencies and vibration amplitude of the roller drums. The operator

shall have the ability to label or select each Layer ID. The display unit shall be capable of transferring the data by means of a USB port to a removable media device or wirelessly to the manufacturer's Cloud storage.

5.0 Software Requirements. The manufacturer's Intelligent Compaction software, or cloud computing, shall map and export gridded all-pass data and resemble PP81 section 4.3.5.2 as much as possible. At minimum, the exported data shall consist of the required fields in Table 5 of PP81 in order to allow adequate filtering in Veta.

6.0 Global Positioning System (GPS). Radio and receiver units shall be mounted on each IC roller to monitor the drum locations and track the number of passes of the rollers. The GPS system shall also meet the following requirements:

(a) Set all GPS devices to the Universal Transverse Mercator (UTM) coordinate system No.15 except for portions of the SE District which are No. 16, regardless of whether GPS or Grid data are originally recorded. If UTM coordinates are not available, use the State Plane coordinate system and designate the appropriate State Plane zone. The recorded coordinates shall be in US survey feet. If an alternate coordinate system is established for the construction of the project, it may be used for the IC.

(b) Provide a GPS system that can be a ground-based base station or Virtual Reference Station (VRS) to achieve Real Time Kinematic Global Positioning Systems (RTK-GPS) accuracy.

(c) Provide GPS receivers on IC Rollers and a hand-held GPS rover that reference to the same ground-based base station channel or have the same VRS subscription.

(d) Provide the recorded GPS data, whether from the IC Rollers or hand-held GPS rovers, in the following formats:

(i) The time stamp shall be in military format (HHMMSS.SS) in local time zone. Accuracy of 0.01 second is necessary to differentiate sequence of Intelligent Compaction data points during post processing.

(ii) Provide GPS latitudes and longitudes in DDMM.MMMMMMMM or decimal degrees (DD.DDDDDDDD).

(iii) Provide grid coordinates in feet to the nearest 0.1 foot.

7.0 Rover. The contractor shall provide one fully equipped survey grade hand-held GPS rover with RTK for the duration of the contract. The rover may remain in the possession of the contractor but shall be available to the engineer as needed.

7.1 Rover Specifications. The Rover shall read GPS signals L1 C/A, L1/L2 P-Code, and L2C and Glonass signals L1/L2 CA, L1/L2 P-Code. It shall achieve horizontal accuracies of 10mm + 1 ppm RMS and vertical accuracies of 15 mm + 1 ppm RMS in RTK surveys. It shall support Network RTK using NTRIP and have an internal modem with cellular service provided. Single Baseline RTK shall also be supported with an internal UHF Radio. Training shall be provided to ensure that MoDOT personnel shall have enough knowledge of software and hardware to operate the GPS rover.

8.0 Control Points. The contractor shall establish control points on the project at locations necessary to ensure compliance with the outlined provisions.

9.0 Data Management. All submitted files shall be adequately labeled prior to submission as defined in the MoDOT IC-PMTPS Project Protocol.

9.1 Trial Section Data. The results from the trial section shall be recorded on the appropriate spreadsheet and submitted to the engineer within 24 hours of completing the trial section.

9.2 Unfiltered Raw Data. The raw IC data shall be downloaded twice per day day and uploaded to the appropriate MODOT IC SharePoint site before the start of the next day's production.

9.3 Formatted Raw Data. The formatted raw IC data shall be submitted to the engineer before the start of the next day's production. The formatted raw IC data shall be compatible with the latest version of Veta. The data shall include IC data files, core locations/data, and coordinates of daily production boundaries. The GPS and temperature verification data shall be submitted as well in a separate file. Each file shall be labeled in accordance with the current IC-IR naming protocol posted on the IC SharePoint Site.

9.4 Veta Project File. The Veta project file shall include the day's production data and be submitted to the engineer within 36 hours after completion of the day's paving. The valid Veta project file shall contain the day's IC data, core locations and paving boundaries. The IC Data shall include at a minimum roller locations, temperatures, amplitudes, frequencies and speeds as well as ICMV if the accelerometer is used.

9.5 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 without jeopardizing a portion of the lump sum payment for that day. The engineer must be notified immediately of the issue and 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 deduction from the lump sum pay item based on the percentage of the data which is lost.

9.6 Summary Report. The Summary Report shall be furnished to the engineer by the contractor two days prior to the 1st and 15th of each month which includes the roller coverage results, classification for each segment, any qualifying GPS obstructions and the mean temperature at the optimum pass count. A copy of the specific version of the Summary Report used for the current construction season can be downloaded from the Construction Forms folder on the IC SharePoint page.

10.0 Daily Verification. The surface temperature sensor and GPS on each IC Roller shall be verified each day, although a record needs only be submitted for the measurements at the start of each week. IC Roller GPS verification shall include verifying a point established by the rover for both X and Y position to an accuracy of +/- 6 Inches. The rover shall be verified for both X and Y position with a control point at the start of each day. The IC roller temperature sensor verification shall be compared with a temperature gun which has been calibrated within the past year. The IC temperatures shall compare to be within 5°F of the temperature gun measurement. A record of each verification shall be submitted to the engineer electronically as soon as possible but no later than the start of the next day's production.

11.0 IC Segments. Each IC Segment shall consist of one day's production.

12.0 Technical Support. Technical Support from the IC roller manufacturer shall include availability on an as-needed basis for the duration of the project at no cost to the Commission. The manufacturer's representative shall provide assistance with setup, verification, data management, operation, and analysis.

13.0 Training. IC training materials are available online and located on the IC SharePoint Site. The IC Quality Control Technician shall review the training materials prior to the start of the project. Equipment operators shall be knowledgeable of the equipment that will be used and trained as needed by the contractor or equipment supplier.

14.0 IC Quality Control Plan. A pre-activity meeting shall be required prior to mainline paving. The IC 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-GPS of both the IC roller(s) and rover(s)
(c) Procedure for the construction of the trial section and establishment of the optimum compaction pass count and target IC-MV value
(d) Procedure for downloading IC data from the roller(s)
(e) The procedure for training operators or other project staff
(f) Detailed daily verification procedure for checking the temperature sensor on the IC Roller(s)
(g) The name of the designated IC Quality Control Technician
(h) Procedure for submitting data
(i) Contact information for technical support staff
(j) A list of the control points with either UTM or State Plane Coordinates established by the contactor
(k) The date range when the IC component of the project will be taking place.

15.0 Coring. Cores shall be taken as typically required by the Missouri Standard Specification for acceptance of the pavement. The GPS coordinates of each core shall be collected with an accuracy of +/- 2 inches and submitted to the engineer by the start of the next day's production.

16.0 Daily Production Boundaries. The paving limits of the freshly placed mat shall be collected with an accuracy of +/- 2 inch. The edge of the new paved mainline surface shall be collected at least every 100 feet for curves and every 200 feet for tangent sections. These points shall be used to define the boundaries of each segment.

17.0 Software Access. The contractor shall supply the engineer with the manufacturer's Intelligent Compaction 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.

18.0 GPS Obstructions. Isolated areas influenced by a GPS obstruction may be excluded from % roller coverage computation provided that the following conditions are satisfied:

1) The position data is present

2) The GPS Reception Mode as recorded by the onsite equipment indicates that a obstruction is present
3) The location is properly flagged in the Veta project file and the location is identified in the bi-weekly report
4) The total of these areas are no more than 5% of any single day's production.

19.0 Trial Section. Mainline paving shall begin with the construction of a trial section for each mix type. One trial section may be constructed for each mix design. The engineer shall be notified at least 48 hours prior to construction of the trial section. The trial section shall be constructed and compacted with the same equipment, progression and methods which will be used during production. The roller speed and frequency used on the trial section shall be maintained during the construction of the project. The trial section shall be constructed with sufficient passes to determine the optimum density. The trial section shall typically be 1000 feet in length, with the last 400 feet being utilized for testing, the width of one lane and shall be constructed as part of the project. Within the 400 feet long testing portion, one Evaluation Location shall be identified for each 100 feet. Flexibility will be allowed up a maximum combined length of 1500 feet in order to facilitate the construction of the trial section. Areas needed beyond the 1500 feet will be assessed as deficient. Each Evaluation Location shall be positioned away from the center of the lane due to potential overlap of roller passes during compaction. After each of the passes, the contractor shall collect a density measurement with a nuclear gauge or an approved alternate density gauge at each Evaluation Location. When approved by the engineer, initial pairs or pass groups may be completed between density measurements. The passes shall be continued until either the pavement density begins to decrease or the density measurement on two consecutive passes are within 0.2%. Following completion of the trial section, a compaction curve shall be constructed from the pass vs. density information. From this curve the optimum number of passes and optimum IC-MV shall be determined from either the peak density versus pass value or from the 0.2% increase pass versus density values. If the 0.2% increase is the determining factor, the pass prior to the 0.2% increase will be used. Cores shall be collected at each Evaluation Location after completion of the recorded passes. The density of each core shall be determined by the contractor and used to correlate with the final density collected from the nuclear gauge. If the density at the optimum pass count is determined to be outside the required acceptance range, then a new trial section shall be initiated. The trial section will not be considered for IC incentive or disincentive payment up to the 1500 feet maximum length. Acceptance of this area will be made in accordance with section 403.23.7.4 regarding density.

19.1 Optimum Pass Count Refinement. Once the project is underway, changes in operation or roadway characteristics may require refinement of the optimum pass count. With approval of the engineer, an optimum pass count refinement may be scheduled at a predetermined time when the inspector can be in attendance. The refinement shall follow the criteria established in section 19.0 and the results from this refinement will be effective starting the day that the optimum pass count refinement takes place.

20.0 Segment Classification. Passing Segments shall have a minimum of 90% coverage at or above the optimum number of passes. Segments with between 90% and 70% coverage will be called moderate segments. Any segment with less than 70% coverage at the optimum number of passes shall be a Deficient Segment, including areas where data is lost. If 70% 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.

21.0 Quality Assurance. Quality Assurance will be performed by means of a Commission-furnished, Commission-retained magnetic GPS system attached to the top of any IC roller. Thermal Sensors may also be installed by means of a magnetic mount. The units will be solar-powered. The contractor shall provide the engineer access to these systems and accommodate the presence of the device on the IC Roller. The engineer will conduct a QA analysis according to the NJSP1808-Form-01-DataQA-Instructions and provide the contractor pass or fail results to be recorded in the Summary Sheet. In the event that a favorable comparison is not obtained, the accuracy of each system shall be verified prior to conflict resolution being initiated. The contractor shall be responsible for not damaging the QA GPS System while on their equipment and in their possession. In the event that the unit is damaged, the contractor shall be responsible for repair or replacement up to $500.

22.0 Basis of Payment. Payment for compliance with this provision will be made at the contract unit price for Item No. 403-10.58, Intelligent Compaction, lump sum. In addition, an incentive payment of $75 per 1000 feet will be made on all Passing Segments and a disincentive deduct of $75 per 1000 feet will be made on all Deficient Segments. No additional payment will be made for the equipment, software, training, survey, analysis, trial section, trial section cores or any other incidentals necessary to complete the work.

Incentive or Disincentive Payment = ((Length of Days Run) / 1000) x $75

N. Paver-Mounted Thermal Profiles NJSP-18-09B

1.0 Description This work shall consist of collecting the paving location, surface temperature and paver stops with a Contractor supplied, Contractor retained Paver-Mounted Thermal Profile System (PMTPS) for each lift of mainline asphalt pavement. The PMTPS shall be used to continually monitor the surface temperature of the mat immediately behind the paver screed during paving operations in order to determine the thermal segregation levels for each sublot. Data from the PMTPS shall be automatically uploaded and processed through a wireless data connection or exported to an USB drive. This work shall be completed in accordance with the general principles set forth in AASHTO PP 80-17 “Standard Practice for Continuous Thermal Profile of Asphalt Mixture Construction”, and specifically as stated in the following sections.

2.0 PMTPS Equipment. The PMTPS shall consist of a temperature scanner/camera, wheel speed/distance sensor, GPS antenna, control panel and necessary cabling. The PMTPS shall measure the surface temperature over the complete paving width. The current position shall be recorded via the GPS antenna. The control panel shall feature the keys and screen displays necessary to control the system as well as the software for data recording and visualization during the paving process. The system shall provide a real-time map of the temperature readings, as well as the total number of sublots in each temperature segregation category. The system shall store the data locally on a memory stick and also upload the data directly to cloud-based software which shall be supplied by the contractor for use on this project. Logon information shall be provided to the engineer for direct access to the cloud storage. In addition, the equipment shall meet the following requirements;

Parameter	Requirement
Longitudinal and Lateral Surface	≤ 12.0 inch intervals at all paving speeds
Temperature Readings Footprints	Tolerance: ±1 inch
Surface Temperature Readings	Range: 32°F to 480°F
	Accuracy: ± 6° F
Location (x and y)	Accuracy: ± 4 feet
Ground Distance Sensor	Accuracy: ± 1/1000 feet

3.0 Verification. The system shall have a documented verification before beginning construction and a minimum of once per week for Travel Distance and Temperature.

4.0 PMTPS Training. The PMTPS Technician and individuals performing daily setup of the equipment shall be properly trained. If trained personnel are unavailable PMTPS scanning and mainline paving shall not be performed. The PMTPS Technician shall have completed a qualifying Veta training within the last 2 years.

5.0 Thermal Profile Sublots For each run, the thermal profiles shall be divided into sublots that are 150 ft. in length and of the width placed. Sublots shall not extend over multiple days, different lifts or directions.

6.0 Thermal Segregation Exclude the following surface temperature readings from each sublot: (1) Surface temperature readings less than 180°F; and (2) Surface temperature readings within 2 ft. prior to and 8 ft. after paver stops that are greater than 1 minute in length. The temperature differential is the difference between the surface temperature readings at the 98.5 and 1 percentile in each 150 ft. sublot. The thermal segregation categories are based on the temperature differential as shown in the table below.

Temperature Differential (TD)	Thermal Segregation Category
TD ≤25.0 F	Low
25.0 F < TD ≤ 50.0 F	Moderate
TD > 50.0 F	Severe

7.0 Data Management. All of the header inputs shall be correctly entered by the contractor at the start of each run. The Veta Thermal Segregation Report shall be generated and electronically submitted to the engineer for each day before the start of the next day's production, along with the Veta file. Each file shall be labeled with the corresponding production date, direction, starting and ending log mile, and lane according to the MoDOT IC-PMTPS Protocol. The contractor shall provide to the engineer a Summary Report of the daily Thermal Segregation Reports two days prior to the 1st and 15th of each month for verification. A blank copy of the Summary Report can be found in the construction forms folder on the IC SharePoint page.

8.0 Incentive/Disincentive. Incentive/disincentive adjustments shall be made for each sublot in accordance with the following:

Thermal Segregation Category	Adjustment per 150 ft. Sublot
Low	$7 Incentive
Moderate	No Pay Adjustment
Severe	$7 Disincentive

9.0 Quality Assurance (QA) Testing. The Engineer will record spot temperature readings with a calibrated infrared thermometer. 2 QA test sets each consisting of 3 spot readings at the lane quarter points will be taken for each full production day. The test sets will be taken at random locations. The contractor shall assist the engineer with determining the GPS location of each spot reading location. The recorded temperature shall be within 12°F of the temperature recorded by the thermal scanner for each location. If 4 readings from any 2 consecutive test sets fall outside of the 12°F range, then conflict resolution shall be initiated to determine corrective action.

10.0 Basis of Payment. Payment for compliance with this provision will be made at the Lump Sum Price for Item 403-10.59, Paver-Mounted Thermal Profiles. No additional compensation will be provided to the contractor for any direct or indirect cost, including scheduling delays, associated with the installation of the noted equipment, training or the affiliated data processing.

O. Balanced Mix Design Performance Testing NJSP-20-01C

1.0 Description. This work shall consist of providing asphalt mixture in accordance with Sec 403 and meet the Balanced Mix Design (BMD) performance requirements of cracking and rutting resistant properties at an increased density level. The BMD performance requirements will be applied to SuperPave mainline wearing surface mixtures. Bituminous binder and base, level course, shoulder, and pavement repair mixtures are excluded from the BMD requirements.

2.0 Performance Testing. Acceptable test results meeting the 100% pay criteria for both Cracking Tolerance Index (CT_{Index}) and Hamburg Wheel Track (HWT) tests shall be submitted with the mix design for approval. The contractor shall conduct Quality Control (QC) testing for CT_{Index} and HWT tests at a frequency of 1/10,000 tons for the mainline pavement. The random testing location will be determined by the engineer.

Incentive/disincentive payment will be calculated based upon the mixture cost for the tonnage represented by each sample, generally 10,000 tons. An incentive of 3% of the asphalt mixture item cost will be paid if the CT_{Index} results are within the incentive range and HWT results are below 12.5 mm. The engineer will conduct performance testing at a frequency of 1/20,000 tons for Quality Assurance (QA). A favorable comparison will be achieved if the results for QA and QC are within 20%.

Gyratory compacted samples for the Asphalt Material Performance Tester (AMPT) shall be fabricated at a minimum of once per project or as directed by the engineer and submitted to the MoDOT Central Laboratory for informational purposes only.

3.0 Mix Sampling and Preparation. Laboratory mixed samples for mix design submittal shall be short term conditioned in accordance with AASHTO R30 prior to conducting performance testing. Loose mix samples from the plant shall be taken during production in accordance with AASHTO R 97 and split to the appropriate size in accordance with AASHTO R 47. No conditioning is required on plant mixed samples. Samples shall then be heated to the compaction temperature +/- 3° C prior to compacting necessary samples for QA/QC testing. QA personnel shall be present during the sampling, splitting, and molding process. QC shall fabricate all test specimens. QA will randomly select the specimens to submit to the MoDOT Central Laboratory for performance testing. The following table details the minimum number of specimens required:

Performance Test	Minimum Number of Specimens per Set	Molded Specimen Height (mm)
Cracking Tolerance Index (CT_{Index})	3	62
Hamburg Wheel Track (HWT)	4	62
AMPT Samples for Research Purposes	5	180

When QA testing is to be performed, three sets shall be fabricated for CT_{index} and HWT performance testing: QC, QA, and an additional set for QA retention.

AMPT samples for BMD research shall be fabricated in accordance with AASHTO PP 99-19, carefully following the exceptions noted herein:

1) Pour the mixture into the center of the mold to minimize air void variation between samples. Pouring material down the sides of the mold will result in lower air voids on that side of the mold.
2) Charge the mold in two equal lifts. After each lift, use the spatula to scrape the walls of the mold, inserting the spatula 8-10 times around the circumference of the mold. Insert the spatula into the center of the mixture 10-12 times in an evenly distributed pattern. Insert the spatula as far as possible into the mixture without damaging aggregates.
3) Target air void for AMPT samples should be 8.5 +/- 0.5% for non SMA specimens or 7.5 +/- 0.5 % for SMA specimens due to the lower internal air void structure with sample preparation.

3.1 Molding BMD Samples. The specimens shall be compacted to an air void content of 7.0 +/- 0.5% or 6.0 ± 0.5% for SMA mixtures. The gyratory specimen weight for each performance test shall be submitted with the mix design. The compacted test specimens shall be allowed to cool to 25 +/- 3° C prior to determining the air void content.

3.2 Determining Air Voids. The bulk specific gravity of the test specimen will be determined in accordance with AASHTO T166. Specimens shall be air dried for 24 +/- 3 hours before preconditioning the test specimens for CT_{Index} testing. Test specimens shall be preconditioned as specified in the test methods. If a water bath is utilized, it is critical that samples are kept dry.

3.3 Records. Compaction temperature, times in and out of the oven, gyratory specimen weight, and sample identification shall be recorded.

4.0 Cracking Tolerance Index (CT_{Index}) Testing. The CT_{Index} testing shall be completed in accordance with ASTM D8225 and at a test temperature of 25 C +/- 1° C. Incentive/disincentive payment will be calculated based upon the mixture cost for the tonnage represented by each sample, generally 10,000 tons. An incentive of 3% of the asphalt mixture item cost will be paid if the CT_{Index} results are within the incentive range and HWT results are below 12.5 mm.

Non SMA Mixtures	
Cracking Tolerance Index (CT_{Index})	**Percent of Contract Price**
< 45	97%
45 - 97	100%
> 97	103%

SMA Mixtures	
Cracking Tolerance Index (CT_{Index})	**Percent of Contract Price**
< 135	97%
135 - 240	100%
> 240	103%

5.0 Hamburg Wheel Track (HWT). HWT testing will be completed in accordance with AASHTO T324 at test temperature of 50 C and 62 mm specimen height.

PG Grade High Temperature *	Minimum Wheel Passes	Maximum Rut Depth (mm)
58S-xx	5,000	12.5
64S-22	7,500	12.5
64H-22	15,000	12.5
64V-22	20,000	12.5

*Determined by the binder grade specified in the contract.

6.0 Design Gyrations. The number (N) of gyrations required for gyratory compaction shall be in accordance with Sec 403.4.5. For Non-SMA mixtures, at the option of the contractor the number of gyrations and air voids may be lowered. Mixtures having lowered gyrations 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 4.0%. The minimum VMA shall be the design air voids plus the volume of effective asphalt.

Mixture	Volume of Effective Asphalt (percent)
SP125	11.0
SP095	12.0
SP048	13.0

The minimum gyration level shall be in accordance with the following:

Design	N_{design}
F	35
E	50
C	60
B	65

7.0 VFA Requirements. Section 403.4.6.3 Voids Filled with Asphalt shall be omitted provided that the HWT requirements described above are satisfied and the CT_{Index} is 45 or greater.

8.0 Sec 403 Revisions.

Delete Section 403.5.2 and replace with the following…

403.5.2 Density. The final, in-place density of the mixture shall be between 92.0 and 97.5 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.

Delete Section 403.23.7.3 and replace with the following…

403.23.7.3 Removal of Material. All lots of material with a PFT less than 50.0 shall be removed and replaced with acceptable material by the contractor. Any sublot of material with a percent of theoretical maximum density of less than 90.0 percent or greater than 98.0 percent shall be removed and replaced with acceptable material by the contractor. For SMA mixtures, any sublot 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 sublot of material with air voids in the compacted specimens less than 2.0 percent shall be evaluated with Hamburg testing and removed and replaced with acceptable material by the contractor if the rut depth is greater than 14.0 mm at the designated number of wheel passes above. 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.

Delete Section 403.23.7.4.1 and replace with the following…

403.23.7.4.1 Small Quantities. Small quantities are defined in Sec 403.19.3.2.1. 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 will not be required.

(b) Mixtures shall be within the specified limits for VMA, V_a, 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:

Field Density (Percent of Laboratory Max. Theoretical Density)			**Pay Factor (Percent of Contract Unit Price)**
For all SP mixtures other than SMA:			
		92.0 to 97.5 inclusive	100
97.6 to 98.0	or	91.5 to 91.9 inclusive	90
	or	91.0 to 91.4 inclusive	85
	or	90.5 to 90.9 inclusive	80
	or	90.0 to 90.4 inclusive	75
Above 98.0	or	Below 90.0	Remove and Replace

For SMA mixtures:			
		>94.0	100
		93.5 to 93.9 inclusive	90
		93.0 to 93.4 inclusive	85
		92.5 to 92.9 inclusive	80
		92.0 to 92.4 inclusive	75
		Below 92.0	Remove and Replace

9.0 Basis of Pavement. Payment for compliance with this provision will be made at the contract unit price for Item No. 403-10.56, Asphalt Performance Testing, lump sum.

P. Special Consideration of Change Orders and Value Engineering JSP-21-07

1.0 Description. Increased Federal Share has been approved by the FHWA for an innovative technology or practice. The Commission will receive an additional five percent Federal Share of the overall contract value due to innovations within the following pay item(s).

Pay Item Number	Pay Item Description	Innovation
403-10.56	Asphalt Performance Testing	Asphalt Performance Testing
403-10.58	Intelligent Compaction	Intelligent Compaction
403-10.59	Thermal Mounted Profiles	Thermal Mounted Profiles

Due to the increased Federal Share, the project components related to the innovation(s) described above must be constructed with the materials, quantities, methods, and innovations as shown on the project plans and specifications. If the contractor requests materials, quantities, methods, or innovations other than those included in the plans and specifications, the request must be reviewed and approved by the Commission and FHWA. Approved changes to the innovation items above shall be at no additional cost to the Commission and shall not increase the contract time.

2.0 Special Consideration of Change Orders and Value Engineering Change Proposals (VECP). Change ordering and/or value engineering the pay item(s) listed in section 1.0 jeopardize the ability for the Commission to receive an additional Federal Share for the overall contract value. Special consideration should be given to the change order value for removing or modifying such item(s) from the contract ensuring the benefit outweighs the cost.

3.0 Contacting Financial Services. If it is determined that the proposed change order and/or VECP outweighs the additional overall five percent Federal Share value, the Engineer shall notify the MoDOT project manager.

Q. Coordination Between Contractors

1.0 Description. This contract is one of two improvement projects in the Chillicothe area that may be under construction concurrently during the 2023 construction season, requiring the coordination of overlapping traffic control segments between the two contracts.

2.0 Job No. J1P3255 (Contract ID 211015-A01) consists of the construction of low-slump concrete driving surfaces to Bridge No. A1180 (twin structures) on Route 36 over Blackwell Creek. This contract was awarded to Capital Paving & Construction, LLC in November of 2021. The Blackwell Creek Bridge work is anticipated to be complete by August 1, 2023. However, until that date traffic will be narrowed to single lanes per details in the traffic control plans for the Blackwell Creek Bridge contract. This is expected to conflict with traffic control requirements in this contract for pavement reconstruction beneath the railroad bridge and Route 65 overpasses on Route 36.

2.1 At the engineer's discretion and with the agreement and cooperation of both contractors, the work zone for projects J1P3255 and J1P3318 may be combined into a single continuous work zone. This option will only be available under conditions where both projects are working on the same lane of traffic concurrently (i.e., only working in passing lanes or only working in driving lanes.) The contractor shall not alter the order of construction for the pavement reconstruction operation (i.e., stage 1 first, stage 2 second) to better coordinate with the Blackwell Creek bridge work without prior approval of the engineer.

2.1.1 If the contractor elects to coordinate one continuous work zone for both projects, they shall be responsible for submitting a revised traffic control plan to the engineer for approval prior to the start of pavement reconstruction work.

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 document. No separate or additional payment will be made for any additional cost associated with the installation, maintenance, or removal of the traffic control to coordinate with the other project's work including, without limitation, for equipment, labor, materials, time, or inefficiencies in work scheduling. All authorized changes in the traffic control plan shall be provided for as specified in Sec 616.

R. Temporary Long-Term Rumble Strips JSP-13-04C

1.0 Description. The work shall include furnishing, installing, maintaining, and removing long-term rumble strips, as shown in the plans, or as designated by the engineer.

2.0 Material.

2.1 The long-term rumble strips shall be 10 feet to 12 feet in length, fabricated from a polymer material, and be orange in color.

2.2 The long-term rumble strips shall have a minimum width of 4 inches, but no greater than 6 inches. The long-term rumble strips shall have a minimum thickness of 0.25 inch, but no greater than 0.50 inch.

2.3 The long-term rumble strips shall have a pre-applied adhesive backing for securing to the asphalt or concrete roadway surface.

3.0 Construction. Long-term rumble strips layout and spacing shall be in accordance with the plans or as approved by the engineer. The long-term rumble strips shall be installed and removed in accordance with manufacturer's recommendation. The contractor shall monitor and repair, and maintain if necessary the long-term rumble strips until removed.

3.1 Each set shall consist of five individual strips spaced ten to twelve feet on center.

3.2 The long-term rumble strips removal process shall not damage the roadway surface. If any damage occurs to the pavement during the removal of long-term rumble strips, the contractor shall replace or repair the damaged pavement at no cost to the Commission.

4.0 Method of Measurement. Measurement of long-term rumble strips will be per each complete set of five strips.

5.0 Basis of Payment. The accepted quantity of Temporary Long-Term Rumble Strips sets will be included in the contract unit price for 616-99.01, Lump Sum Temporary Traffic Control, per lump sum. The Lump Sum Temporary Traffic Control bid price shall include the cost of all labor, equipment, and materials to install, maintain, and remove the rumble strips.

S. Pavement Marking Log

1.0 Description. The contractor shall log the locations of existing pavement marking prior to any construction operations that may affect the existing pavement marking. The log shall contain all existing pavement marking and shall include center stripes, lane lines, and intersecting roadway markings (where applicable.) The contractor shall provide a copy of the existing pavement marking log to the engineer. The contractor shall place the new pavement marking at the same locations as the existing pavement marking, unless otherwise directed by the engineer or shown on the plans.

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

T. Airport Requirements JSP-15-09

1.0 Description. The project is located near a public use airport or heliport or is more than 200 feet above existing ground level, which requires adherence to Federal Aviation Regulation Part 77 (FAA Reg Part 77). "Near" to a public use airport or heliport is defined as follows:

20,000 feet (4 miles) from an airport with a runway length of at least 3,200 feet
10,000 feet (2 miles) from an airport with runway length less than 3,200 feet
5,000 feet (1 mile) from a public use heliport

2.0 The maximum height of the improvement and the equipment operating while performing the improvements was assumed to be 20.0 feet above the current travelway during the process of evaluating the project for compliance with FAA Reg Part 77.

2.1 If the contractor's height of equipment or if the improvement itself is beyond the assumed height as indicated in Sec 2.0, the contractor will work with the resident engineer to fill out the Form 7460-1, or revise the original Form 7460-1 based upon the proposed height and resubmit, if necessary, for a determination by FAA on compliance with FAA Reg Part 77. Further information can be found in MoDOT's Engineering Policy Guide 235.8 Airports. If the Form 7460-1 must be filed, the associated work shall not be performed prior to the FAA determination, which could take up to 45 days.

2.2 If the contractor's height of equipment and the improvement itself is below the assumed height as indicated in Sec 2.0, no further action is necessary to fulfill the requirements set forth in FAA Reg Part 77.

3.0 Basis of Payment. There will be no direct payment for any work associated with this provision. Contract time extension will be given for the time necessary to obtain or revise the FAA permit. Any delays or costs incurred in obtaining the revised permit will be noncompensable.

U. Special Provisions for Protection of Dakota, Minnesota & Eastern Railroad Corporation Interest dba Canadian Pacific

To Report an Emergency on the railroad call: (800) 716-9132.

The project is located over Canadian Pacific, Kansas City Subdivision at Milepost 426.95, (DOT# 375 511W), Livingston County Route 36 in Chillicothe, Missouri.

1.0 AUTHORITY OF RAILROAD ENGINEER AND STATE ENGINEER.

1.1 The authorized representative of the Canadian Pacific, herein called "Railroad Engineer" shall have final authority in all matters affecting the safe maintenance of railroad traffic of this company including the adequacy of the foundations and structures supporting the railroad tracks.

1.2 The authorized representative of the Commission ("Engineer") shall have authority over all other matters as prescribed herein and in the Project Specifications.

1.3 Contractor's indemnity Obligations to the Railroad. The term "contractor" as used in this special provision includes any and all subcontractors. The Commission's contractor shall indemnify, defend and hold harmless the Railroad, and Railroad affiliated companies, partners, successors, assigns, legal representatives, officers, directors, shareholders, employees and agents (collectively, "Indemnitees(s)") from and against any and all loss, damage, claims, demands, causes of action, costs and expenses of whatsoever nature arising out of injury to or death of persons whomsoever, or out of damage to or destruction of or environmental contamination of property whatsoever, (including, without limitation, damage to fiber optic, communication and other cable lines and systems), where such injury, death, damage, contamination, or destruction results from any cause arising out of, or in any way connected to, contractor's (or its agents' representatives" use of the Railroad's right-of-way, or work performed by the contractor (or its agents or representatives) pursuant to the agreement between Railroad and the Commission for the project. The Commission's contractor shall also release the Railroad from and shall waive any claims for injury or damage to equipment or other property, which may result from the construction, maintenance and operation of railroad tracks, wire lines, fiber optic cable, pipe lines and other facilities on said right of way of the Railroad by the contractor. **THE LIABILITY ASSUMED BY THE CONTRACTOR WILL NOT BE AFFECTED BY THE FACT, IF IT IS A FACT, THAT THE DAMAGE, DESTRUCTION, INJURY, DEATH, CAUSE OF ACTION OR CLAIM WAS OCCASIONED BY OR CONTRIBUTED TO BY THE NEGLIGENCE OF THE RAILROAD, THE RAILROAD'S AGENTS, SERVANTS, EMPLOYEES OR OTHERWISE, EXCEPT TO THE EXTENT THAT SUCH CLAIMS ARE PROVEN BY ANY CLAIMANT TO HAVE BEEN PROXIMATELY CAUSED BY THE INTENTIONAL MISCONDUCT OR SOLE OR GROSS NEGLIGENCE OF THE RAILROAD.** The contractor's indemnity shall include loss of profits or revenue arising from damage or destruction to fiber optic, communication and other cable lines and systems. To the fullest extent permitted by law, the Commission shall require its

contractors, upon written notice from Railroad, to assume the defense of any lawsuit or other proceeding brought against any indemnitee by any entity, relating to any matter covered by this easement agreement for which the contractor has an obligation to assume liability for an/or save and hold harmless any indemnitee.

1.4 In addition to the indemnity obligations contained in the preceding paragraph, the contractor shall indemnify, defend and hold harmless the Railroad from any claims, expenses, costs, actions, demands, losses, fines, penalties, and fees, of whatsoever nature arising from, related to or connected, in whole or in part, with the following:

a) The removal of the contractor's agents, servants, employees or invitees from the Railroad's property for safety reasons.

b) Contractor's compliance or failure to comply with the provision of applicable law in connection with the performance of contractor's work.

1.5 Additional Safety Requirements: In addition to all the provisions found in these Job Special Provisions, the Contractor must follow the Minimum Safety Requirements for Contractors Working on CP Property in the United States, which can be found in the Electronic Deliverables for this project. Other attachments included in the Electronic Deliverables are Flagging Request form and Right of Entry application.

2.0 Notice of Starting Work.

2.1 The Contractor shall not commence any work on Railroad's right of way until the contractor has complied with the following conditions:

a) Give the Railroad written notice to the address below with copy to the Engineer who has been designated to be in charge of the work, at least ten days in advance of the date contractor proposes to begin work on Railroad's right of way.

Matthew Miller
Manager Public Works
CP Plaza – 120 South 6th Street
Minneapolis, MN 55402
Telephone Number: 612.330.4556
Email: matthew_miller@cpr.ca

b) Obtain written authorization from the Railroad to begin work on Railroad's right of way, such authorization to include an outline of specific conditions with which contractor shall comply.

c) Obtain written approval from the Railroad of Railroad Protective coverage as required by paragraph (12).

2.2 The Railroad's written authorization to proceed with the work with a copy to the Engineer shall include the names, addresses, and telephone numbers of the Railroad's representatives who are to be notified as hereinafter required. Where more than one representative is designated, the area of responsibility of each representative shall be specified.

3.0 Interference with Railroad Operations.

3.1 The Contractor shall arrange and conduct all work so that there will be no interference with Railroad operations, including train, signal, telephone and telegraphic services; or damage to the property of the Railroad Company; or to poles, wires, and other facilities of tenants on the right of way of the Railroad Company. Whenever work is liable to affect the operations or safety of trains, the method of doing such work shall first be submitted to the Railroad Engineer for approval, but such approval shall not relieve the Contractor from liability. Any work to be performed by the Contractor which requires flagging service or inspection service (watchman) shall be deferred by the Contractor until the flagging protection required by the Railroad is available at the job site.

3.2 Whenever work within Railroad's right of way is of such a nature that impediment to Railroad operations is unavoidable, such as use of runaround tracks or necessity for reduced speed, the Contractor shall schedule and conduct his operations so that such impediment is reduced to the absolute minimum.

3.3 Should conditions arising from, or in connection with the work, require that immediate and unusual provisions be made to protect operations and property of the Railroad, the Contractor shall make such provisions. If in the judgment of the Railroad Engineer, or the Engineer, if Railroad Engineer is unavailable, such provision is insufficient, either may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or the Commission.

3.4 If in the opinion of the Railroad a dangerous situation exists because of the contractor's work, the work will immediately cease and the contractor will leave the premises, if ordered to do so, and the track made safe before the contractor is allowed to resume. No work delay or claim will be assessed the Railroad as a result of this stoppage.

4.0 Track Clearances.

4.1 The minimum track clearances to be maintained by the Contractor during construction are shown on the Project plans. However, before undertaking any work within Railroad's right of way, or before placing any obstruction over any track, the Contractor shall:

a) Notify the Railroad Engineer at least seventy-two (72) hours in advance of the work.

b) Receive assurance from the Railroad Engineer that arrangements have been made for flagging service as may be necessary.

c) Receive permission from the Railroad Engineer to proceed with the work.

d) Ascertain that the Engineer has received copies of notice to the Railroad and of the Railroad's response.

5.0 Construction Procedures.

5.1 General. Construction work on Railroad property shall be:

a) Subject to the inspection and review of the Railroad.

b) In accord with the Railroad's written outline of specific conditions.

c) In accord with these Special Provisions and Minimum Safety Requirements for

Contractors Working on CP Property in the United States, which can be found in the electronic deliverables for this project.

5.2 Excavation.

5.2.1 The subgrade of an operated track shall be maintained with edge of berm at least ten feet (10') from centerline of track and not more than twenty-four inches (24") below top of rail. The Contractor will not be required to make existing section meet this specification if substandard, in which case existing section will be maintained.

5.2.2 Excavation for Structures. The Contractor will be required to take special precaution and care in connection with excavating and shoring pits, and in driving piles for footings adjacent to tracks to provide adequate lateral support for the tracks and the loads which they carry, without disturbance of track alignment and surface, and to avoid obstructing track clearances with working equipment, tools or other material. The procedure for doing such work, including need of and plans for shoring, shall first be approved by the Railroad Engineer, but such approval shall not relieve the Contractor from liability. Before submission of plans to the Railroad Engineer for approval, such plans shall first be reviewed by the Engineer in accordance with the Standard Specifications. Contact the Railroad Engineer for current shoring guidelines.

5.3 Construction Clearances. The contractor shall provide a minimum vertical clearance 22 feet above top of rail and a minimum lateral clearance of 12.5 feet from the centerline of track to nearest temporary construction falsework.

5.4 Blasting.

5.4.1 The Contractor shall obtain advance approval of the Railroad Engineer and the Engineer for use of explosive on or adjacent to Railroad property. If permission for use of explosives is granted, the Contractor shall be required to comply with the following:

a) Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of the Contractor.

b) Electric detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way train radios.

c) No blasting shall be done without the presence of the Railroad Engineer. At least seventy-two (72) hours advance notice to the person designated in the Railroad's notice of authorization to proceed (see paragraph (2)(B)) will be required to arrange for the presence of an authorized Railroad Engineer and such flagging as the Railroad may require.

d) Have at the job site adequate equipment, labor and materials and allow sufficient time to clean up debris resulting from the blasting without delay to trains, as well as correcting at contractor's expense any track misalignment or other damage to Railroad property resulting from the blasting as directed by the Railroad Engineer. If contractor's actions result in delay of trains, the Contractor shall bear the entire cost thereof.

5.4.2 The Railroad Engineer will:

a) Determine the approximate location of trains and advise the Contractor the

approximate amount of time available for the blasting operation and clean-up.

b) Have the authority to order discontinuance of blasting if blasting is too hazardous or is not in accordance with these special provisions.

5.5 Maintenance of Railroad Facilities. 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 right of way and to repair any other damage to the property of the Railroad or its tenants. All such maintenance and repair of damages due to the Contractor's operations shall be done at the Contractor's expense.

5.6 Storage of Materials and Equipment.

5.6.1 Materials and equipment shall not be stored where they will interfere with Railroad operations, nor on the right of way of the Railroad company without first having obtained permission from the Railroad Engineer, and such permission will be with the understanding that the Railroad Company will not be liable for damage to such material and equipment from any cause and that the Railroad Engineer may move or require the Contractor to move, at the Contractor's expense, such material and equipment.

5.6.2 All grading or construction machinery that is left parked near the track unattended by a watchman shall be effectively immobilized so that it cannot be moved by unauthorized persons. The Contractor shall protect, defend, indemnify and save Railroad, and any associated, controlled or affiliated corporation, harmless from and against all loss, costs, expenses, claim or liability for loss of or damage to property or the loss of life or personal injury, arising out of or incident to the Contractor's failure to immobilize grading or construction machinery.

5.7 Cleanup. Upon completion of the work, the Contractor shall remove from within the limits of the Railroad's right of way, all machinery, equipment, surplus materials, falsework, rubbish or temporary buildings of the Contractor, and leave said right of way in a neat condition satisfactory to the Railroad Engineer.

5.8 Falsework. The Contractor shall be required to take special precaution and care to prevent any material from falling on Railroad's right of way. The procedure for preventing material from falling, including need of and plans for temporary falsework and containment, shall first be approved by Railroad Engineer, but such approval shall not relieve the Contractor from liability. Before submission of plans to Railroad Engineer for approval, the Engineer will first review such plans.

6.0 Damages. The Railroad shall not assume liability for any damages to the Contractor, Contractor's work, employees, servants, equipment and materials caused by Railroad traffic. Any cost incurred by the Railroad for repairing damages to its property or to property of its tenants, caused by or resulting from the operations of the Contractor, shall be paid directly to the Railroad by the Contractor.

7.0 Flagging Services.

7.1 When Required. Whenever the Railroad determines that flagging services are needed to protect the Railroad's operations, the contractor shall be responsible for arranging these flagging services to accomplish the highway improvement. In general, the Railroad may require flagging services whenever the contractor's personnel or equipment are, or are likely to be, working on the

Railroad's Property within 25 feet of the centerline of any track, or working across, over, adjacent to, or under a railroad track, or whenever the contractor's work has disturbed or is likely to disturb a railroad structure or the railroad roadbed or surface and alignment of any track, to such an extent that the movement of trains must be controlled by flagging to prevent an unreasonable risk of accident or hazard to Railroad's operations or personnel. Normally, the Railroad will assign one flagger to a Project; but in some cases, more than one flagger may be necessary, such as yard limits where up to three flaggers may be required. However, if the contractor works within distances that violate instructions given by the Railroad Engineer or performs work that has not been scheduled with the Railroad's Representative, flaggers may be required full time until the contractor's work on the project has been completed. Whenever the Railroad requires flagging services for any of the contractor's work on this project, the contractor shall not perform that work until all required flaggers are present at the job site.

7.2 Scheduling and Notification. Not later than the time that approval is initially requested to begin work on the Railroad's right of way (30 days), contractor shall furnish to the Railroad and the Commission a schedule for all work required to complete the portion of the Project within Railroad's right of way and arrange for a job site meeting between the contractor, the Engineer, and the Railroad's Representative. Flaggers may not be provided until the job site meeting has been conducted and the contractor's work scheduled.

7.2.1 The contractor shall be required to give the Railroad's Representative at least 30 days of advance written notice of intent to begin work within Railroad's right of way in accordance with this special provision. Once begun, if such work is then suspended at any time, or for any reason, the contractor shall be required to give the Railroad's Representative at least 5 working days of advance notice before resuming work on Railroad's right of way. Such notices shall include sufficient details of the proposed work to enable the Railroad's Representative to determine if flagging will be required. If such notice is in writing, the contractor shall furnish the Engineer a copy; if notice is given verbally, the notice shall be confirmed in writing with copy to the Engineer.

7.2.2 Obtaining a flagger or flaggers may take up to 30 days to obtain initially from the Railroad. When flagging begins, the flagger is usually assigned by the Railroad to work at the Project site on a continual basis until no longer needed and cannot be called for on a spot basis. If flagging becomes unnecessary and is suspended, obtaining a flagger or flaggers may take an additional 30 days. Due to Railroad labor agreements, 10 working day notice may be necessary before flagging services may be discontinued and responsibility for payment stopped.

7.2.3 At least ten days before commencing work on Railroad's Property, the contractor shall arrange the necessary flagging services with Railroad's Supervisor Public Works identified below:

Kyle Spree
Public Works Supervisor
CP Plaza – 120 South 6th Street
Minneapolis, MN 55402
Telephone: (612)468-6486
Email: Kyle_Spree@cpr.ca

7.2.4 Every Railroad flagger assigned to this Project will be responsible for notifying the Engineer as soon as possible after arrival at the job site on the first day, that flagging services have begun, and shall give notice to the Engineer on the last day that the flagger performs flagging services at the job site, for each separate period when the Railroad provides flagging services for the Project. The Engineer will document such notification in the Project records.

7.2.5 If emergencies arise after the flagger is assigned to the Project site which require the flagger's presence elsewhere, then the contractor shall delay work on the Railroad's right of way until such time as the flagger is again available. Any additional costs resulting from such delay shall be borne by the contractor and not the Railroad.

7.2.6 The contractor shall provide a temporary structure to provide shelter from weather conditions for the person(s) providing flagging protection service on behalf of the Railroad as described herein. The structure shall be provided in an area immediately accessible to the Railroad's main track and the construction site, and be equipped with telephone service, lighting and desk.

7.3 Payment.

7.3.1 The Commission will pay the Railroad directly for the cost of flagging services associated with the Project by deducting the amount from the normal contractor payments. If the Contractor pays the Railroad directly for flagging services, the Contractor shall notify the MoDOT Resident Engineer of such payment.

7.3.2 The Railroad shall submit progress invoices to the Engineer during the time the Railroad requires flagging services. The Railroad shall submit its final invoice for flagging services to the Engineer within one hundred eighty days after the contractor has notified the Railroad and the Commission that all its work on the Railroad's Property is complete. If the Commission does not receive the Railroad's final flagging invoice within this period, then the Railroad shall obtain payment directly from the contractor.

7.3.3 If a dispute arises concerning the amount charged for flagging service, then the Commission may deduct the full or partial amount of the Railroad's invoice from the contractor's payment, until the dispute is resolved. The Commission will make a corrected payment after the Railroad, the Commission and the contractor have settled the dispute.

7.3.4 The estimated cost of flagging service is approximately $1,300 per day based on an 8-hour work day and a 40-hour work week. The Railroad shall charge not more than its actual cost of providing these flagging services, including the current base pay for the flaggers actually used on the Project, the Railroad's reasonable overhead costs (including the costs of preparing and handling the invoices for flagging services), and costs the Railroad reasonably and actually incurs for the flaggers' travel expenses, meals and lodging. The Railroad may bill for a flagger's services at a minimum of 8 hours worked for each day the flagger reports for duty at this job site, unless the Railroad assigns the flagger to other Railroad work during that workday. Work by a flagger in excess of 8 hours per day or 40 hours per week but not more than 12 hours a day will result in overtime pay at 1 1/2 times the flagger's regular pay rate. Work by a flagger in excess of 12 hours per day will result in overtime pay at 2 times the flagger's regular pay rate. If a flagger is required to perform flagging services on a holiday, the flagging rate is 2 1/2 times the flagger's regular pay rate. The Railroad may charge a maximum of one hour travel time each way per day per flagger, for travel to and from the job site. The Railroad's charges for flagging services shall comply with applicable provisions of the current Federal-Aid Policy Guide issued by the Federal Highway Administration.

7.4 Flagging Complaints. The contractor and the Railroad shall attempt to resolve any complaints concerning flagging services in a timely manner. If the contractor disputes the need for a flagger, the contractor shall notify the Railroad Engineer and the Engineer. The contractor

shall confirm any verbal complaints in writing within five working days, by sending a copy to the Railroad Representative and to the Engineer.

8.0 Haul Across Railroads.

8.1 Where the plans show or imply that materials of any nature must be hauled across a Railroad, unless the plans clearly show that the Commission has included arrangements for such haul in its Agreement with the Railroad, the Contractor shall be required to make all necessary arrangements with the Railroad regarding means of transporting such materials across the Railroad. The Contractor shall be required to bear all costs incidental, including flagging, to such crossings whether services are performed by contractor's own forces or by Railroad personnel.

8.2 No temporary contractor crossing may be established for use of the Contractor for transporting materials or equipment across the tracks of the Railroad Company unless specific authority for its installation, maintenance, necessary watching and flagging thereof and removal, all at the expense of the Contractor, is first obtained from the Railroad Engineer.

9.0 Work for the Benefit of the Contractor.

9.1 All temporary or permanent changes in wire lines or other facilities which reconsidered necessary to the project are shown on the plans; included in the force account Agreement between the Commission and the Railroad or will be covered by appropriate revisions to same which will be initiated and approved by the Commission and/or the Railroad.

9.2 Should the Contractor desire any changes in addition to the above, then contractor shall make separate arrangements with the Railroad for same to be accomplished at the Contractor's expense.

10.0 Cooperation and Delays.

10.1 It shall be the Contractor's responsibility to arrange a schedule with the Railroad for accomplishing construction involving work by the Railroad or tenants of the Railroad. In arranging the Contractor's schedule, the Contractor shall ascertain, from the Railroad, the lead time required for assembling crews and materials and shall make due allowance.

10.2 No charge of claims of the contractor against the Railroad Company will be allowed for hindrance or delay on account of railway traffic; any work done by the Railroad Company or other delay incident to or necessary for safe maintenance of railway traffic or for any delays due to compliance with these special provisions.

11.0 Trainman's Walkways. Along the outer side of each exterior track of multiple operated track, and on each side of single operated track, an unobstructed continuous space suitable for trainman's use in walking along trains, extending to a line not less than ten feet (10') from centerline of track, shall be maintained. Any temporary impediments to walkways and track drainage encroachments or obstructions allowed during work hours while Railway's protective service is provided shall be removed before the close of each work day. If there is any excavation near the walkway, a handrail with a ten feet (10') minimum clearance from centerline of track, shall be placed.

12.0 Insurance. The contractor shall, at its own expense, procure and continuously maintain in force during this Project all the insurance coverage required in this section (including all

subsections) until the contractor has completed all project work on the Railroad's Property, has removed all equipment and materials from the Railroad's Property, and has cleaned and restored the Railroad's Property to the satisfaction of the Engineer and the Railroad Representative. The amount of work to be performed upon, over or under Railroad's right of way is estimated to be 1 percent (1%) of the contractor's total bid for the Project.

12.1 Commercial General Liability Insurance. Commercial general liability (CGL) (occurrence based) with a combined single limit of not less than $10,000,000.00 per occurrence for bodily injury, death and damage to or destruction of property (including the loss of use thereof). CGL insurance shall be written on ISO occurrence form CG 00 01 12 04 (or a substitute form providing equivalent coverage). The policy shall also contain the following endorsement, which shall be stated on the certificate of insurance:

a. Contractual Liability Railroads ISO form CG 24 17 10 01 (or a substitute form providing equivalent coverage) showing "Dakota, Minnesota & Eastern Railroad Corporation Property" as the Designated Job Site.
b. Designated Construction Project(s) General Aggregate Limit ISO Form CG 25 03 03 97 (or a substitute form providing equivalent coverage) showing the project on the form schedule.

12.1.1 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.

12.1.2 Any exclusions related to the explosion, collapse and underground hazards shall be removed.

12.1.3 No other endorsements limiting coverage as respects obligations under this special provision shall be included on the policy with regard to the work being performed under the contract between the contractor and the Commission.

12.2 Business Automobile Policy Insurance. Business auto coverage written on ISO form CA 00 01 (or a substitute form providing equivalent liability coverage) with a combined single limit of not less $2,000,000.00 for each accident; covering owned, non-owned, and hired vehicles engaged in or about the work. The policy shall contain the following endorsements, which shall be stated on the certificate of insurance:

a. Coverage For Certain Operations In Connection With Railroads ISO form CA 20 70 10 01 (or a substitute form providing equivalent coverage) showing "Dakota, Minnesota & Eastern Railroad Corporation" as the Designated Job Site.
b. Motor Carrier Act Endorsement - Hazardous materials clean up (MCS-90), if required by law.

12.3 Workers Compensation Insurance. The contractor shall maintain 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.

12.4 Railroad Protective Liability Insurance. Railroad protective liability insurance (occurrence form), in the name of the Dakota, Minnesota, & Eastern Railroad Company d/b/a Canadian Pacific, with limits of $5,000,000.00 per occurrence and $10,000,000.00 aggregate for bodily injury (including death) and property damage. Contractor shall use the website listed below to acquire Railroad train movement information for the purpose of obtaining Railroad Protective Liability Insurance:

http://safetydata.fra.dot.gov/OfficeofSafety/PublicSite/Crossing/Crossing.aspx

12.4.1 The US DOT Crossing Inventory Number will be located in the project plans. Zero trains per day will be displayed on the crossing inventory report for locations with grade separated crossings or at-grade crossings when there is less than one train per day. In these situations generating a map to find alternative crossing locations may be used to provide the number of trains per day and speed nearest the project location.

12.5 Umbrella or Excess Policies. If the contractor utilizes umbrella or excess policies, these policies shall "follow form" and afford no less coverage than the primary policy. The contractor shall not use umbrella policies for the Railroad Protective Liability coverage.

12.6 Additional Insurance Requirements.

12.6.1 It is understood and agreed that these insurance policies are primary and not contributory and shall release the Railroad as to payments of any earned premium. All insurance certificates provided by the contractor shall be satisfactory to the Railroad as to insurance carriers covering the risk. The fact that insurance, including, without limitation, self-insurance, is obtained by the contractor shall not be deemed to release or diminish the liability of the contractor including, without limitation, liability under the indemnity provisions of these Railroad Requirements. Damages recoverable by the Railroad shall not be limited by the amount of the required insurance coverage.

12.6.2 With the exception of Workers Compensation and Railroad Protective Liability, the Railroad shall be named an additional insured under the above mentioned policies.

12.6.3 The policies described above shall contain a "Waiver of Transfer Rights" endorsement to waive any right of recovery that the insurance company may have against Railroad because of payments made for bodily injuries or property damage.

12.6.4 Railroad will not accept binders as evidence of insurance. Before entering upon the Railroad's Property, the contractor shall furnish the original certificate of insurance, the original insurance policy, or other acceptable evidence that the contractor is maintaining all the insurance required under the foregoing provisions, for approval by the Railroad, and shall furnish copies thereof for review by the Commission, at the following addresses:

Railroad:	Commission:
Mr. Matthew Miller	Ms. Brandi Baldwin
Manager Public Works	State Construction and Materials Engineer
CP Plaza – 120 S. 6th St.	MoDOT
Minneapolis, MN 55402	PO Box 270
	Jefferson City, MO 65102

12.6.5 Railroad will not accept binders as evidence of insurance; the original policy shall be provided. The named insured, description of the work and designation of the job site to be shown on the Policy are as follows:

Named Insured:
Dakota, Minnesota and Eastern Railroad Company d/b/a Canadian Pacific

Description and Designation:
Route 36, Livingston County in Chillicothe, MO
Project Description: Pavement replacement under Canadian Pacific bridge.
Job No. J1P3318
DOT# 375 511W Milepost 426.95, Kansas City Subdivision, Chillicothe, MO.

12.6.6 If any part of the work is sublet, similar insurance and evidence thereof in the same amounts as required of the Prime Contractor, shall be provided by or in behalf of the subcontractor to cover subcontractor's operations. Endorsements to the Prime Contractor's policies specifically naming subcontractors and describing their operations will be acceptable for this purpose.

12.6.7 All Insurance herein before specified shall be carried until all work required to be performed under the terms of the contract has been satisfactorily completed within the limits of the Railroad's right of way as evidenced by the formal acceptance by the Commission. Insuring Companies may cancel insurance by permission of the Commission and Railroad or on thirty (30) days written notice to the Commission and Railroad.

13.0 Failure to Comply. In the event the Contractor violates or fails to comply with any of the requirements of these Special Provisions:

a) The Railroad Engineer may require that the Contractor vacate Railroad property.

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

c) Any such orders shall remain in effect until the Contractor has remedied the situation to the satisfaction of the Railroad Engineer and the Engineer.

14.0 Payment for Cost of Compliance. No separate payment will be made for any extra cost incurred on account of compliance with these special provisions. All such cost shall be included in contract unit prices for other items of the work as specified in the payment items.

15.0 Attachments included in the Electronic Deliverables include:

a) Flagging Request Form US – ???

b) Minimum Safety Requirements for Contractors – US

c) Right of Entry USA DME

V. Supplemental Revisions JSP-18-01Z

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.

Anti-Discrimination Against Israel Certification

By signing this contract, the Company certifies it is not currently engaged in and shall not, for the duration of the contract, engage in a boycott of goods or services from the State of Israel, companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel, or persons or entities doing business in the State of Israel as defined by Section 34.600 RSMo. This certification shall not apply to contracts with a total potential value of less than One Hundred Thousand Dollars ($100,000) or to contractors with fewer than ten (10) employees.

Ground Tire Rubber (GTR) Dry Process Modification of Bituminous Pavement Material

1.0 Description. This work shall consist of the dry process of adding ground tire rubber (GTR) to modify bituminous material to be used in highway construction. Existing GTR requirements in Section 1015 pertain to the wet process method of GTR modification that blends GTR with the asphalt binder (terminal blending or blending at HMA plant). The following requirements shall govern for dry process GTR modification. The dry process method adds GTR as a fine aggregate or mineral filler during mix production. All GTR modified asphalt mixtures shall be in accordance with Secs 401, 402, or 403 as specified in the contract; except as revised by this specification.

2.0 Materials. The contractor shall furnish a manufacturer's certification to the engineer for each shipment of GTR furnished stating the name of the manufacturer, the chemical composition, workability additives, and certifying that the GTR supplied is in accordance with this specification.

2.1 Product Approval. The GTR product shall contain a Trans-Polyoctenamer (TOR) added at 4.5 % of the weight of the crumb rubber or an engineered crumb rubber (ECR) workability additive that has proven performance in Missouri. Other GTR additives shall be demonstrated and proven prior to use such as a five-year field performance history in other states or performance on a federal or state-sanctioned accelerated loading facility.

2.2 General. GTR shall be produced from processing automobile or truck tires by ambient or cryogenic grinding methods. Heavy equipment tires, uncured or de-vulcanized rubber will not be permitted. GTR shall also meet the following material requirements:

Table 1 – GTR Material Properties		
Property	**Test Method**	**Criteria**
Specific Gravity	ASTM D1817	1.02 to 1.20
Metal Contaminates	ASTM D5603	≤ 0.01%
Fiber Content	ASTM D5603	≤ 0.5%
Moisture Content	ASTM D1509	≤ 1.0%*
Mineral Filler	AASHTO M17	≤ 4.0%

*Moisture content of the GTR shall not cause foaming when combined with asphalt binder and aggregate during mix production

2.3 Gradation. The GTR material prior to TOR or ECR workability additives shall meet the following gradation and shall be tested in accordance with ASTM D5603 and ASTM D5644.

Table 2 – GTR Gradation	
Sieve	**Percent Passing by Weight**
No. 20	100
No. 30	98-100
No. 40	50-70
No. 100	5-15

3.0 Delivery, Storage, and Handling. The GTR shall be supplied in moisture-proof packaging or other appropriate bulk containers. GTR shall be stored in a dry location protected from rain before use. Each bag or container shall be properly labeled with the manufacturer's designation for the GTR and specific type, mesh size, weight and manufacturer's batch or Lot designation.

4.0 Feeder System. Dry Process GTR shall be controlled with a feeder system using a proportioning device that is accurate to within ± 3 percent of the amount required. The system shall automatically adjust the feed rate to always maintain the material within this tolerance and shall have a convenient and accurate means of calibration. The system shall provide in-process monitoring, consisting of either a digital display of output or a printout of feed rate, in pounds per minute, to verify feed rate. The supply system shall report the feed in 1-pound increments using load cells that will enable the user to monitor the depletion of the GTR. Monitoring the system volumetrically will not be allowed. The feeder shall interlock with the aggregate weight system and asphalt binder pump to maintain correct mixture proportions at all production rates.

Flow indicators or sensing devices for the system shall be interlocked with the plant controls to interrupt mixture production if GTR introduction rate is not within ± 3 percent. This interlock will immediately notify the operator if GTR introduction rate exceeds introduction tolerances. All plant production will cease if the introduction rate is not brought back within tolerance after 30 seconds. When the interlock system interrupts production and the plant has to be restarted, upon restarting operations; the modifier system shall run until a uniform feed can be observed on the output display. All mix produced prior to obtaining a uniform feed shall be rejected.

4.1 Batch Plants. GTR shall be added to aggregate in the weigh hopper. Mixing times shall be increased per GTR manufacturer recommendations.

4.2 Drum Plants. The feeder system shall add GTR to aggregate and liquid binder during mixing and provide sufficient mixing time to produce a uniform mixture. The feeder system shall ensure GTR does not become entrained in the exhaust system of the drier or plant and is not exposed to the drier flame at any point after introduction.

5.0 Testing During Mixture Production. Testing of asphalt mixes containing GTR shall not begin until at least 30 minutes after production or per additive supplier's recommendation.

6.0 Construction Requirements. Mixes containing GTR shall have a target mixing temperature of 325 F or as directed by the GTR additive supplier. The additive supplier's recommendations shall be followed to allow for GTR binder absorption/reaction. This may include holding mix in the silo to allow time for binder to absorb into the GTR. Rolling operations may need to be modified.

7.0 Mix Design Test Method Modification. A formal mixing procedure from the additive supplier shall be provided to the contractor and engineer that details the proper sample preparation, including blending GTR with the binder or other additives. Samples shall be prepared and fabricated in accordance with this procedure by the engineer and contractor throughout the duration of the project.

8.0 Mix design Volumetrics. Mix design volumetric equations shall be modified as follows:

8.1 Additional virgin binder added to offset GTR absorption of binder shall be counted as part of the mix virgin binder

8.2 GTR shall be included as part of the aggregate when calculating VMA of the mix.

8.2.1 GTR SPG shall be 1.15

8.3 Mix G_{sb} used to determine VMA shall be calculated as follows:

$$G_{sb\ (JMF)} = \frac{(100 - P_{bmv})}{\left(\frac{P_s}{G_{sb}} + \frac{P_{GTR}}{G_{GTR}}\right)}$$

$$where:$$

$G_{sb\ (JMF)} = bulk\ specific\ gravity\ of\ the\ combined\ aggregate\ including\ GTR$
$P_{bmv} = percent\ virgin\ binder\ by\ total\ mixture\ weight$
$P_s = percent\ aggregate\ by\ total\ mixture\ weight\ (not\ including\ GTR)$
$P_{GTR} = percent\ GTR\ by\ total\ mixture\ weight$
$G_{sb} = bulk\ specific\ gravity\ of\ the\ combined\ aggregate\ (not\ including\ GTR)$
$G_{GTR} = GTR\ specific\ gravity$

8.4 G_{se} shall be calculated as follows:

$$G_{se} = \frac{(100 - P_b - P_{GTR})}{\left(\frac{100}{G_{mm}} - \frac{P_b}{G_b} - \frac{P_{GTR}}{G_{GTR}}\right)}$$

8.5 P_{be} shall be calculated as follows:

$$P_{be} = P_b - \frac{P_{ba}}{100} * (P_s + P_{GTR})$$

9.0 Minimum GTR Amount. The minimum dosage rate for GTR shall be 5 % by weight of total binder for an acceptable one bump grade or 10 % by weight of total binder for an acceptable two bump grade as detailed in the following table. Varying percentage blends of GTR and approved additives may be used as approved by the engineer with proven performance and meeting the specified requirements of the contract grade.

Contract Binder Grade	Percent Effective Virgin Binder Replacement Limits	Required Virgin Binder Grade	Minimum GTR Dosage Rate
PG 76-22	0 - 20	PG 70-22	5 %
		PG 64-22	10 %
PG 70-22	0 - 30	PG 64-22	5 %
		PG 58-28	10 %
PG 64-22	0 – 40*	PG 58-28	5 %
		PG 52-34	10 %
PG 58-28	0 – 40*	PG 52-34	5 %
		PG 46-34	10 %

* Reclaimed Asphalt Shingles (RAS) may be used when the contract grade is PG 64-22 or PG 58-28. RAS replacement shall follow the 2 x RAS criteria when calculating percent effective binder replacement in accordance Sec 401.

Buy America

In addition to Section 106.9 of the Missouri Standard Specifications for Highway Construction, the following requirements will also be in effect for this project.

1.0 Description. The Bipartisan Infrastructure Law (BIL) was enacted on November 15, 2021. The BIL includes Build America, Buy America Act Publication L. No. 117-58. This provision expands the Buy America requirements beyond what is currently only required for steel and iron products. The steel and iron provisions have not changed with the new bill. Cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives are excluded from this requirement. All other materials and manufactured products permanently incorporated into the project will be subject to Buy America requirements. There are three categories requiring Buy America Certification:

a) Iron and steel – no changes to the current specification requirements.

b) Manufactured products – these are currently exempted under the 1983 waiver from FHWA.

c) Construction materials consisting primarily of:

- Non-ferrous metals;
- Plastic and polymer-based products (including polyvinylchloride, composite build materials, and polymers used in fiber optic cables);
- Glass (including optic glass);
- Lumber; or
- Drywall

1.1 All products and or materials will only be classified under one of these categories and not under multiple categories. It is the prime contractor's responsibility to assure all submittals required for Buy America are submitted to the Engineer prior to the products and or materials being incorporated in the job. The implementation of this policy will be in effect for all projects awarded after November 10, 2022.

1.2 New items designated as construction materials under this requirement will require the prime contractor to submit a material of origin form certification prior to incorporation into the project. The Certificate of Material origin form (link to certificate form) from the supplier and/or fabricator must show all steps of the manufacturing being completed in the United States. The Certificate of Material form shall be filed with the contract documents.

1.3 Any minor miscellaneous construction material items that are not included in the materials specifications shall be certified by the prime contractor as being procured domestically The certification shall read "I certify all materials permanently incorporated in this project covered under this provision have been to the best of my knowledge procured and all manufactured domestically." The certification shall be signed by an authorized representative of the prime contractor.

1.4 The National Transportation Product Evaluation Program (NTPEP) compliance program verifies that some non-iron and steel products fabrication processes conform to 23 CFR 635.410 Buy America Requirements and an acceptable standard per 23 CFR 635.410(d). NTPEP compliant suppliers will not be required to submit step certification documentation with the shipment for some selected non-iron and steel materials. The NTPEP compliant supplier shall maintain the step certification documentation on file and shall provide this documentation to the engineer upon request.

2.0 Basis of Payment. Any costs incurred by the contractor by reason of compliance with the above requirements shall be considered as included in and completely covered by the unit price bid for the various items of work included in the contract.

Delete Sec 403.19.2 and substitute the following:

403.19.2 Lots. The lot size shall be designated in the contractor's QC Plan. Each lot shall contain no less than four sublots and the maximum sublot size shall be 1,000 tons. The maximum lot size shall be 4,000 tons for determination of pay factors. 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 403.23.7.4.1. A new lot shall begin when the asphalt content of a mixture is adjusted in accordance with Sec 403.11.

W. Section 401 - Weather Limitations

Delete Sec 401.7.1 and substitute with the following:

401.7.1 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.

X. Section 403 - Weather Limitations

Delete Sec 403.10.1 and substitute with the following:

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.

Y. Lump Sum Temporary Traffic Control JSP-22-01

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