

Job No.: J5P3121


Route: 54

County: Cole

**JOB SPECIAL PROVISIONS TABLE OF CONTENTS (ROADWAY)**

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

A.	General - Federal JSP-09-02E	1
B.	Contract Liquidated Damages	1
C.	Work Zone Traffic Management	2
D.	Emergency Provisions and Incident Management	5
E.	Project Contact for Contractor/Bidder Questions	6
F.	Utilities	6
G.	Supplemental Revisions JSP-18-01H	8
H.	Guardrail Grading Requirements JSP-17-02B	10
I.	Contractor Quality Control NJSP-15-42	11
J.	Intelligent Compaction NJSP-18-08	13
K.	Paver-Mounted Thermal Profiles NJSP-18-09	17
L.	Surface Sealing Treatment NJSP-15-28	19
M.	Fertilizing, Seeding, and Mulching	23
N.	Contractor Retained Guardrail JSP-04-11	24
O.	8" White High Build Waterborne Pavement Marking Paint, Type L Beads	24
P.	Temporary Short-Term Rumble Strips JSP-13-05E	24
Q.	High Friction Surface Treatment NJSP-15-13B	25
R.	Route CC Culvert Repair	29
S.	Miscellaneous Backfill for Route CC Culvert Repair	29
T.	Permanent Concrete Traffic Barrier Pad	29

 <p>STATE OF MISSOURI</p> <p>MARIA K. PETERS</p> <p>NUMBER PE-2000162118</p> <p>PROFESSIONAL ENGINEER</p> <p>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</p>	<p><b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 W. CAPITOL AVE. JEFFERSON CITY, MO 65102 Phone 1-888-275-6636</p>
	<p>If a seal is present on this sheet, JSP's have been electronically sealed and dated.</p>
	<p>JOB NUMBER: J5P3121 COLE COUNTY, MO DATE PREPARED: 8/14/2019</p>
	<p>ADDENDUM DATE:</p>

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

JOB  
SPECIAL PROVISION

A. General - Federal JSP-09-02E

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

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

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

General Provisions & Supplemental Specifications

Supplemental Plans to July 2019 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

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

Notice to Proceed: January 6, 2020

Completion Date: November 1, 2020

**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
J5P3121	N/A	\$3,200
J5P3128	N/A	\$3,200
J5P3371	N/A	\$3,200

**3.0 Liquidated Damages for Contract Administrative Costs.** Should the contractor fail to complete the work on or before the 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 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 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

**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 **10 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:

12:00 noon July 2, 2020 – 10:00 p.m. July 5, 2020  
12:00 noon July 2, 2021 – 6:00 a.m. July 6, 2021  
12:00 noon July 1, 2022 – 6:00 a.m. July 5, 2022

**3.2** The contractor shall not perform any construction operation on the 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 be aware that traffic volume data indicates construction operations on the roadbed between the following hours will likely result in traffic queues greater than 15 minutes. Based on this, the contractors operations will be restricted accordingly unless it can be successfully demonstrated the operations can be performed without a 15 minute queue in traffic. It shall be the responsibility of the engineer to determine if the above work hours may be modified. Working hours for evenings, weekends and holidays will be determined by the engineer.

Route 54 Eastbound:

6:00 a.m. - 8:00 a.m.	Monday through Friday
9:00 a.m. – 6:00 p.m.	Sundays from May 17 <sup>th</sup> – September 13 <sup>th</sup>

Route 54 Westbound:

3:00 p.m. - 6:00 p.m.	Monday through Friday
12:00 p.m. - 8:00 p.m.	Fridays from May 15 <sup>th</sup> – September 11 <sup>th</sup>

**3.4** 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 **\$500 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.

**3.4.1** 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. The CMS shall be capable of communication with the Transportation Management Center (TMC), if applicable, 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

**1.0** The contractor shall have communication equipment on the construction site or immediate access to other communication systems to request assistance from the police or other emergency agencies for incident management. In case of traffic accidents or the need for police to direct or restore traffic flow through the job site, the contractor shall notify police 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 police services, the following agencies may also be notified for accident or emergency situation within the project limits.

Missouri Highway Patrol (573-751-1000)
--

<u>Cole County</u>	
Emergency Medical Services:	(573) 634-9205
Emergency:	911
Emergency Management Agency:	(573) 634-9146
Cell:	(573) 619-9914
Sheriff:	(573) 634-9160
Fax:	(573) 634-2336

**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 police agency.

**2.2** The contractor shall notify 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 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

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

Mia Peters, Project Contact  
Central District  
1511 Missouri Blvd., P.O. Box 718  
Jefferson City, MO 65102

Telephone Number: 573-751-7690  
Email: [Maria.Peters@modot.mo.gov](mailto:Maria.Peters@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:



<u>Utility Name</u>	<u>Known Required Adjustment</u>	<u>Type</u>
Ameren Missouri Electric Contact: Tammy Kolb 573-681-7515 <a href="mailto:tkolb@ameren.com">tkolb@ameren.com</a>	None	Electric
Ameren Missouri Gas Contact: Brian Robinson 573-931-7688 <a href="mailto:brobinson@ameren.com">brobinson@ameren.com</a>	None	Gas
AT&T Distribution Contact: Andy Erickson 314-223-2966 <a href="mailto:ae4137@att.com">ae4137@att.com</a>	None	Communications
Centurylink Contact: Tonjia Baldwin 573-415-6308 <a href="mailto:tonjia.baldwin@centurylink.com">tonjia.baldwin@centurylink.com</a>	None	Communications
City of Jefferson Wastewater Contact: Eric Seaman 573-634-6410 <a href="mailto:seaman@jeffcitymo.org">seaman@jeffcitymo.org</a>	None	Sewer
Cole County PWS 2 Contact: Randy Kay 573-635-7011 <a href="mailto:pwsd2@socket.net">pwsd2@socket.net</a>	None	Water
Level 3 Now Centurylink Contact: Robert LaFave 573-808-1551 <a href="mailto:robert.lafave@centurylink.com">robert.lafave@centurylink.com</a>	None	Communications
Mediacom Contact: Bob Boner 573-443-1536 <a href="mailto:bboner@mediacomcc.com">bboner@mediacomcc.com</a>	None	Communications
Missouri American Water Co. Contact: Scott Brewer 573-262-7062 <a href="mailto:scott.brewer@amwater.com">scott.brewer@amwater.com</a>	None	Water, Sewer



MoDOT Signals and Lighting Contact: Jason Morff 573-526-3207 <a href="mailto:jason.morff@modot.mo.gov">jason.morff@modot.mo.gov</a>	None	Electric
Phillips 66 Pipeline Contact: Mike Codd 314-210-6382 <a href="mailto:mike.p.codd@p66.com">mike.p.codd@p66.com</a>	None	Gas
Sho-Me Technologies Contact: Brad Baker 417-818-4778 <a href="mailto:bbaker@shometech.com">bbaker@shometech.com</a>	None	Communications
Socket Telecom Contact: Todd Pulis 573-818-4778 <a href="mailto:tpulis@socket.net">tpulis@socket.net</a>	None	Communications
Suddenlink Communications Contact: Tim Goerlitz 816-248-6671 <a href="mailto:timothy.goerlitz@suddenlink.com">timothy.goerlitz@suddenlink.com</a>	None	Communications

**1.1 Known Utility Facilities:** The Contractor shall be aware there are numerous utilities present along this corridor. The extents of the utility conflicts are unknown. However if conflicts are encountered the Contractor shall be required to move their operation to another location until the utility can be relocated or the Engineer determines another course of action. There shall be no delay claims until such time the Contractor has no place to work except in areas of utility conflict and as approved by the engineer. The contractor shall be proactive in the discovery of utility conflicts. The contractor is recommended, after award of the project, to have all utilities marked along the project to visually see where conflicts may occur. Any conflicts discovered and cleared before construction begins will help the contractor's progress on the project. MoDOT utilities staff will assist in relocation of utilities if necessary. There will be no direct pay for compliance to the above specification.

G. Supplemental Revisions JSP-18-01H

Stormwater Compliance Requirements

**1.0 Description.** This provision requires the contractor to provide a Water Pollution Control Manager (WPCM) for any project that includes areas of land disturbance that will total one (1) acre or greater on the project site at any point in time. 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.

**1.1 Applicability.** The project site consists of all areas designated on the plans, including temporary and permanent easements. This provision does not apply to Contractor staging,

plant, or borrow areas that are not located on MoDOT right of way (Off-site). The Contractor is responsible for obtaining its own separate land disturbance permit for Off-site areas. This provision is in addition to any other stormwater, environmental, and land disturbance requirements specified elsewhere in the contract.

**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 within 7 days of the stormwater inspection or any extended period of time granted by the Engineer.

**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.

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](http://www.modot.org/quality)).

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

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

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

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

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

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

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

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

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

**4.3 Pre-Activity Meeting.** A pre-activity meeting is required in advance of the start of each new activity, except when waived by the engineer. The purpose of this meeting is to review construction details of the new activity. At a minimum, the discussion topics shall include: safety precautions, QC testing, traffic impacts, and any required Hold Points. Attendees shall include 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. Intelligent Compaction NJSP-18-08

**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 PP81-17 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.



**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.MMMMMMMMM or decimal degrees (DD.DDDDDDDDD).
  - (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.** Shall be downloaded twice per day and forwarded to the Engineer before the start of the next day's production.

**9.3 Formatted Raw Data.** Formatted Raw 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 with the corresponding production date, direction, starting and ending log mile, and lane if applicable (e.g. 160623, NB, 283.21-281.82, PL).

**9.4 Veta Project File.** The 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. IC Data shall include at a minimum roller locations, temperatures, amplitudes, frequencies and speeds.

**9.5 Report.** A report shall be furnished to the engineer by the contractor two days prior to the 1<sup>st</sup> and 15<sup>th</sup> 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.

**10.0 Daily Verification.** The temperature and GPS on each IC Roller shall be verified and recorded at the start of each day. 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 last year. The temperatures shall compare to within 5°F. 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.** One training will be provided by the Engineer annually. The IC Technician and other IC quality control staff shall have completed a qualifying IC/IR training within the past 2 years. 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) A list of employees attending the provided training, along with the procedure for training operators or other individuals who may not be attending the training
- (f) Detailed daily verification procedure for checking the temperature sensor on IC Roller
- (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

**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 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 max length.

**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 Basis of Payment.** Payment for compliance with this provision will be made at the contract unit price for Item No. 401-99.01, 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.

$$\text{Incentive or Disincentive Payment} = ((\text{Length of Days Run}) / 1000) \times \$75$$

K. Paver-Mounted Thermal Profiles NJSP-18-09

**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 subplot. Data from the PMTPS shall be automatically uploaded and processed through a wireless data connection or exported to a 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;

<u>Parameter</u>	<u>Requirement</u>
Longitudinal and Lateral Surface Temperature Readings Footprints	≤ 12.0 inch intervals at all paving speeds
Surface Temperature Readings	Tolerance: ±1 inch 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 subplot: (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. subplot. The thermal segregation categories are based on the temperature differential as shown in the table below.

<b>Temperature Differential (TD)</b>	<b>Thermal Segregation Category</b>
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 deliver to the engineer a summary of the daily Thermal Segregation Reports two days prior to the 1<sup>st</sup> and 15<sup>th</sup> of each month for verification.

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

<b>Thermal Segregation Category</b>	<b>Adjustment per 150 ft. Sublot</b>
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 401-99.01, Infrared Scanning. 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.

L. Surface Sealing Treatment NJSP-15-28

**1.0 Description.** This work shall consist of furnishing and applying a surface sealing treatment to the existing roadway as shown on the plans. The surface treatment shall contain a mixture of cationic asphalt emulsion, latex polymer, fine aggregate, water, and other additives as needed.

**2.0 Mix Design.**

**2.1** At least 30 days prior to placing the surface sealing treatment on the project, the contractor shall submit a mix design for approval to Construction and Materials. One gallon of the asphalt emulsion and 2500 grams of each aggregate material comprising the combined gradation shall be submitted with the mix design.

**2.2 Required Information.** At a minimum the Surface Sealing mix design shall contain the following information on the job mix formula:

- (a) Emulsified asphalt source and properties required.
- (b) Fine aggregate source, Acid Insoluble Residue (AIR) results, absorption, and deleterious requirements required.
- (c) Blended aggregate gradation required.
- (d) Mixture performance test results required.
- (e) Additives and their sources required.

**2.3 Mix Design Gradation Requirement.** The fine aggregate, mastic materials such as mineral filler, and/or other additives that comprise the combined gradation shall have 100 % of the material passing the No. 8 (2.36 mm) sieve. For spraying applications, the following mix

gradation shall be required:

Sieve	Percent Passing
No. 8 (2.36 mm)	100
No. 16 (1.18 mm)	95-100
No. 30 (600 µm)	85-100
No. 50 (300 µm)	40-70
No. 100 (150 µm)	30-65
No. 200 (75 µm)	25-60

**2.4 Mixture Performance Requirements.** The mixture shall meet the following requirements.

Testing Requirement	Min.	Max.	Test Method
Maximum Wet-Track Abrasion Loss, grams per square meter.	--	80 g/m <sup>2</sup>	TB 100 (ISSA) Modified <sup>a</sup>
Asphalt Content by Ignition Method, percent	30%	--	AASHTO T-308-08 <sup>b</sup>
Percent Solids, Asphalt Residue by Evaporation, percent	48%	--	AASHTO T59, Section 6

<sup>a</sup>This method is modified to a three day soak and samples prepared per MoDOT TM 86.

<sup>b</sup>To account for high percentage of binder, sample size should be adjusted based on laboratory oven capability.

**2.5 Required Additives.** A minimum of 3% latex polymer by weight of wet mixture is required in the surface sealant treatment and shall be listed in the job mix formula.

**2.6 Other Additives.** Any other material added to the mixture or to any of the component materials shall be listed in the job mix formula.

### 3.0 Material Certification.

**3.1** The materials used in the mix design shall be certified to meet the following specifications.

**3.2 Bituminous Material.** The bituminous material shall be an asphalt emulsion in accordance with the following table. The bituminous material shall show no separation after mixing. The emulsion shall be sampled in accordance with AASHTO T 40.



<b>Asphalt Emulsion (CSS)</b>			
	<b>Min.</b>	<b>Max.</b>	<b>Test Method</b>
Viscosity, Saybolt Furol at 25 C, s	15	100	AASHTO T 72
Particle charge test	Positive <sup>b</sup>		AASHTO T 59
Residue, %	60	--	AASHTO T 59
<b>Test on Residue from Distillation</b>	<b>Min.</b>	<b>Max.</b>	<b>Test Method</b>
Penetration, 25 C, 100 g, 5 s,	30	100	AASHTO T 49

<sup>b</sup>If the particle charge test is inconclusive, material having a maximum pH value of 6.7 will be acceptable.

**3.3 Noncarbonated Fine Aggregate Requirement.** The fine aggregate material (not including mastic material or additives) shall contain 100 percent non-carbonate aggregate. The fine aggregate material shall have an acid insoluble residue (AIR), MoDOT Test Method TM 76, of at least 75 percent insoluble residue.

**3.4 Absorption and Deleterious Requirement.** The absorption of the fine aggregate (not including mastic material or additives) shall have a maximum absorption limit of 2.0 percent tested in accordance with AASHTO T84. The percentage of deleterious substances shall not exceed the following values in accordance with AASHTO T113:

<b>Item</b>	<b>Percent by Weight</b>
Clay lumps	1.0
Total lightweight particles, including coal and lignite	0.5
Other deleterious substances	0.1

**3.5** Lightweight fine aggregate sources not meeting the absorption limits or deleterious requirements of Section 3.4 above shall be in accordance with the following requirements tested on the parent material:

<b>Property</b>	<b>Percent Maximum Limit</b>
Micro-Deval, ASTM D7428, percent, max	20
Los Angeles Abrasion for Lightweight Aggregate, MoDOT Test Method TM 78, percent, max	50

**3.6 Water.** Water shall be potable and free of harmful soluble salts.

#### **4.0 Construction Requirements.**

**4.1** The surface sealing mixture may be mixed and applied through mobile distribution equipment as described herein.

**4.2 Mixing Equipment.** All materials shall be thoroughly mixed as to produce a homogenous surface treatment. Individual volume or weight controls for proportioning each material in the



mix shall be provided. Materials shall be added by a calibrated controlled device capable of monitoring the amount of material used at the time.

**4.3 Distribution Equipment.** The Distributor shall be equipped with a full sweep agitation system, a pumping system designed to handle fine aggregate mixes, and sufficient power to operate the full spray system and the agitation system at the same time. The Distribution equipment shall be equipped with a monitoring system that ensures the even distribution of material and measures the application rate of the mix.

**4.4 Storage Tanks.** If the mix is being delivered from a central mixing plant, then a job site storage tank shall have the minimum capacity of the entire transport load. The storage tank shall have an internal full sweep mixing system having a mixing capability of providing a homogenous mix representing the mix design at any given location within the tank.

**4.5 Environmental Protection.** The contractor shall comply with all federal, state, and local laws and regulations controlling pollution of the environment.

**4.6 Weather Limitations.** Bituminous material shall not be placed on any wet surface or when the ambient temperature or the temperature of the pavement on which it is to be placed is below 60° F. Temperatures shall be obtained in accordance with MoDOT Test Method TM 20.

**4.7 Surface Preparation.** The surface shall be thoroughly cleaned immediately prior to placing the surface treatment.

**4.8 Protection of Other Surfaces.** All curbs, manhole covers, and ADA facilities shall be protected from the spray or laydown of the bituminous mixture during placement.

**4.9 Dilution.** The bituminous material shall not be diluted in the field with water or other additives except as approved by the manufacturer.

**4.10 Placement.** Placement of the mix shall be performed in two passes with a minimum coverage of 0.125 gal/yd<sup>2</sup> per pass and the minimum total coverage of 0.25 gal/yd<sup>2</sup>. Contractor shall provide a mat ensuring total coverage free of voids and pit holes.

**4.11 Opening to Traffic.** After the sealant application, the roadway shall remain closed until the surface is tack-free and capable of being open to traffic without tracking.

**4.12 Basis of Acceptance.**

**4.12.1 Quality Control.** Two samples shall be collected during production on a project. One sample shall be retained for the engineer. The contractor shall test the other sample and verify the mix design in accordance with Section 2.4 of this specification and submit the test results to the engineer.

**4.12.2 Field Performance.** The finished surface sealant treatment shall be evaluated by the engineer based on the following criteria. Any of the following shall be considered unacceptable material.

- (a) The presence of loose aggregate or synthetic materials that may cause damage to traveling vehicles.

(b) A final surface with insufficient coverage or delamination.

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

**6.0 Basis of Payment.** The accepted quantity of surface treatment, in place, will be paid for at the contract unit (square yard) price. No separate payment will be made for any additional construction methods or processes. Manufacturer shall report the unit weight (lbs/gallon) of the surface sealing material on the bill of lading.

M. Fertilizing, Seeding, and Mulching

**1.0** Fertilizing shall conform to Sec. 801 and more specifically as follows:

Pounds/Acre		Effective	
Nitrogen	Phos.	Potash	Neutralizing
<u>(N)</u>	<u>(P<sub>2</sub>O<sub>5</sub>)</u>	<u>(K<sub>2</sub>O)</u>	<u>Material</u>
80	120	40	800

Statewide – All settings – within the first 30 feet (mow area)

Species	Pounds per Acre
Tall fescue	80 lbs.
Annual ryegrass	10 lbs.
Perennial ryegrass	5 lbs.
White clover	5 lbs.
Oats	10 lbs.
<b>TOTAL</b>	<b>110 lbs.</b>

Seed bed preparation and seeding by hand will be allowed.

**3.0** All disturbed areas shall be mulched and conform to Section 802 and more specifically the contractor shall use vegetative mulch. Mulching by hand will be allowed.

**4.0 Basis of Payment.**

**4.1** No direct payment will be made for liming, fertilizing or mulching seeded areas.

**4.2** All cost incurred by the contractor for labor, equipment and materials in compliance with the above requirements including furnishing and placing fertilizer and mulch shall be considered as completely covered by the unit price bid for Item No. 805-10.00A, Seeding – Cool Season Mixtures, per acre.

N. Contractor Retained Guardrail JSP-04-11

**1.0 Description.** All guardrail removed from this project shall become the property of the Contractor and shall be disposed of in accordance with Sec 202.

**2.0 Basis of Payment.** All costs incurred for complying with this provision shall be considered completely covered by the contract unit price for Item No. 202-20.10, Removal of Improvements.

O. 8" White High Build Waterborne Pavement Marking Paint, Type L Beads

**1.0 Description.** This work shall consist of 8" white pavement marking paint with type L beads for painted islands and concrete median strip (islands) as shown in the plans.

**2.0 Basis of Payment.** Payment for all labor, equipment and material associated with pavement marking for painted islands and concrete median strip (islands) shall be completely covered by the contract unit price for Item No. 620-99.03, 8 IN. White High Build Waterborne Pavement Marking Paint, Type L Beads, per linear foot.

P. Temporary Short-Term Rumble Strips JSP-13-05E

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

**2.0 Material.**

**2.1** The short-term rumble strips shall be 10 to 12 feet in length, minimum of 8 inches wide,  $\frac{3}{4}$  to  $1\frac{1}{4}$  inch thick, fabricated from a polymer material, and orange in color.

**2.2** The short term-rumble strips shall not curl or deform across the width of the strip, maintaining its rigidity.

**3.0 Construction.**

**3.1** Each set shall consist of three individual strips spanning a single lane, spaced in accordance with the plans or as directed by the engineer. The short-term rumble strips shall be installed and removed in accordance with manufacturer's recommendation.

**3.2** The contractor shall monitor, maintain alignment, and repair if needed the short-term rumble strips during construction. Short-term rumble strips shall not be placed on roadways when there are no workers present.

**3.3** Strips shall not extend onto the shoulder without the approval of the Engineer.

**4.0 Method of Measurement.** Measurement of short-term rumble strips will be based per each set.

**5.0 Basis of Payment.** The accepted quantity of Temporary Short-Term Rumble Strips sets will be paid for at the contract unit price for 616-20.04, Temporary Short-Term Rumble Strips, per each set. The short-term rumble strips unit bid price shall include the cost of all labor, equipment and materials to install, maintain, remove and relocate the rumble strips during the construction of the project.

Q. High Friction Surface Treatment NJSP-15-13B

**1.0 Description.** This work shall consist of furnishing and placing a High Friction Surface Treatment (HFST) on asphalt or concrete pavement.

**1.1** The HFST shall be comprised of surface preparation and a minimum of a single layer using a Binder Resin System which holds a surface applied aggregate firmly in place. The Binder Resin System shall include Polymeric or Methl Methacrylate (MMA) Resins.

**2.0 Material.**

**2.1.1 Resin Binder System.** Resin Binder Systems shall be recommended by the manufacturer as suitable for use on the intended pavement surface and for the potential range of atmospheric exposure.

**2.1.2** The contractor shall furnish and install a Resin Binder System that meets the criteria in (AASHTO PP 79-14 Table 1):

<b>Table 1 - Resin Binder System</b>			
<b>Property</b>	<b>Test Method</b>	<b>Requirements</b>	
		<b>Polymeric Resin</b>	<b>MMA</b>
Ultimate Tensile Strength	AASHTO M-235	2500-5000 psi	1500-5000 psi
Elongation at break point	AASHTO M-235	30-70%	30-70%
Compressive Strength	ASTM C 579	1000 psi min. at 3 hours 5000 psi min. at 7 days	1000 psi min. at 3 hours 2000 psi min. at 7 days
Water Absorption	AASHTO M-235	1% max.	1% max.
Durometer Hardness (Shore D)	ASTM D-2240	60-80	40-75
Viscosity	ASTM D-2556	Class C: 7-30 poises	Class C: 12-20 poises
Gel Time	AASHTO M-235	Class C: 10 minutes min.	Class C: 10 minutes min.
Cure Rate (Dry through time)	ASTM D-1640	3 hrs. max.	3 hrs. max.
Adhesive Strength at 24 hours	ASTM D 4541	250 psi min. or 100% substrate failure	250 psi min. or 100% substrate failure

**2.1.3** Independent laboratory reports per formulation shall be provided, documenting that the resin binder meets the requirements of this specification. A sample of the resin binder or components lot/batch shall be supplied upon request.

**2.1.4** At the request of the engineer, the manufacturer of the Resin Binder System shall certify that the Resin Binder System meets the requirements of this specification. Such certification shall consist of either a copy of the manufacturer's test report or a statement by the manufacturer, accompanied by a copy of the current test results, that the Resin Binder System has been sampled and tested. Such certification shall indicate the date of testing and shall be signed by the manufacturer.

**2.2.1 Aggregate.** The contractor shall furnish and install a high friction aggregate that is clean, dry and free from deleterious material. The high friction aggregate shall be Calcined Bauxite for this project.

**2.2.2** The calcined bauxite aggregate shall meet the criteria in Table 2:

<b>Property</b>	<b>Test Method</b>	<b>Requirement</b>
Resistance to Degradation	AASTHO T-96	20% max.
Aggregate Grading	AASHTO T-27	No. 4 Percent Passing 100% min. No. 6 Percent Passing 95% min. No. 16 Percent Passing 5% max.
Moisture Content	AASHTO T-255	0.2% max.
Aluminum Oxide	ASTM C-25	87% min.

**2.2.3** All aggregates shall be furnished in appropriate packaging that is clearly labeled and protects the aggregate from any contaminants on the jobsite and from exposure to rain or other moisture.

**2.2.4** At the request of the engineer, the manufacturer of the aggregate shall certify that the aggregate meets the requirements of this specification. Such certification shall consist of either a copy of the manufacturer's report or a statement by the manufacturer, accompanied by a copy of the current test results, that the aggregate has been sampled and tested. Such certification shall indicate the date of testing and shall be signed by the manufacturer.

**2.2.5** Test methods should be in accordance with AASHTO PP 79-14.

**3.0 Construction Requirements.** A manufacturer's representative of the Resin Binder System shall be present at the jobsite during all construction operations relating to the preparation and placement of the HFST. All construction operations relating to the HFST shall meet the recommendations of the manufacturer's representative. Final approval of all HFST placement operations will be given by the engineer.

**3.1 Weather Limitations.** Resin Binder system shall not be placed on any wet surface or when the ambient temperature or the temperature of the pavement is above or below the manufacturer's recommendations or when the anticipated weather conditions would prevent the proper application of the surface treatment as directed by the manufacturer's representative. Temperatures shall be obtained in accordance with MoDOT Test Method TM 20.

**3.2 Surface Preparations.** The surface shall be thoroughly cleaned immediately prior to installation of the HFST. The surface shall be clean, dry and free of all dust, oil, debris and any other material that might interfere with the bond between the resin binder material and the existing surface as recommended by the manufacturer's representative.

**3.2.1** The contractor shall pre-treat joints and cracks greater than ¼ inch in width and depth with the mixed Resin Binder System. Once the resin binder in the pre-treated areas has gelled, the installation of the HFST may proceed.

**3.2.2 Asphalt Pavement.** Clean asphalt pavement surfaces using mechanical sweepers and high pressure air wash with sufficient oil traps. Mechanically sweep all surfaces to remove dirt, loose aggregate, debris, and deleterious material. Vacuum sweep or air wash using a minimum of 180 cfm of clean and dry compressed air, all surfaces to remove all dust, debris, and deleterious material. HFST shall not be applied to newly placed asphalt pavement surfaces that are less than 30 days old.

**3.2.3 Concrete Pavement.** Clean concrete pavement surfaces by shot blasting and vacuum sweeping. Shot blast all surfaces to remove all curing compounds, loosely bonded mortar, surface carbonation, and deleterious material. The prepared surface shall comply with the International Concrete Repair Institute (ICRI) standard for surface roughness CSP 5. After shot blasting, vacuum sweep or air wash, with a minimum of 180 cfm of clean and dry compressed air, all surfaces to remove all dust, debris, and deleterious material.

**3.2.4** All existing edge line pavement markings that are adjacent to the HFST location shall be covered and protected as approved by the engineer prior to performing surface preparation. HFST shall not be placed over existing pavement markings or rumble strips. Lane line pavement markings that conflict with the HFST installation shall be removed by methods approved by the manufacturer's representative. Any existing edge line pavement markings that are damaged during the HFST application process shall be replaced at the contractor's expense.

**3.3** HFST shall be allowed to cure for the minimum duration as recommended by the binder component supplier's specifications and during that time the application area shall be closed to all vehicles and contractor's equipment traffic. After placement and cure of the HFST, the contractor shall test the finished surface in accordance with ASTM D7234 to detect unbonded areas.

**3.4** Excess and loose aggregate shall be removed from the traveled way and shoulders in such a way that the HFST is not damaged or disturbed. Excess aggregate that can be reused shall be reclaimed by a vacuum sweeper. The recovered aggregate shall be clean, uncontaminated and dry, if it is to be re-used in the HFST application. All reclaimed aggregate must be in conformance with the requirements in Section 2.0. Material.

**3.5** Utilities, drainage structures, curbs and any other structures within or adjacent to the treatment location shall be protected against the application of the HFST materials.

**3.6 Surface Friction Test.** The surface friction of the completed HFST shall meet a minimum requirement of 65 FN40R from the ASTM E274 test. MoDOT will perform this test, at the expense of the Commission, within 7 calendar days after completion of the HFST. In order to allow for adequate scheduling time for the surface friction test, the contractor shall provide an anticipated completion date of the HFST for each segment of roadway being treated in this

contract. The contractor shall provide this date(s) to the engineer a minimum of two weeks prior to any anticipated completion date of the HFST.

**3.6.1** Any surface that fails to conform to the above friction requirement must be removed and replaced at the contractor's expense within 24 hours after being notified by the engineer.

**3.7 Surface Quality Verification.** The engineer will check the HFST surface for areas of debonding or excessive loss of aggregate fourteen days after completion of the HFST. Any deficiencies found shall be corrected at the contractor's expense.

**4.0 Application Methods.** HFST shall be applied in accordance with the manufacturer's recommendations. The HFST can be applied by either mechanical or manual techniques.

**4.1** The Resin Binder System shall be blended and mixed in the ratio per the manufacturer's specification (+/- 2% by volume) and shall be continuously applied once blended.

**4.1.1** The Resin Binder System shall be applied at a uniform thickness of 50-65 mils (25-32 square feet per gallon). Coverage rate is based upon expected variances in the surface profile of the pavement.

**4.1.2** The operation shall proceed in such a manner that will not allow the mixed material to separate, cure, dry, be exposed or otherwise harden in such a way as to impair retention and bonding of the high friction aggregate.

**4.1.3** The high friction aggregate shall be immediately applied at a rate of 12-15 pounds per square yard (achieving saturation) in such a manner that there is no disruption to the leveled binder. It is the responsibility of the contractor to ensure full embedment of the high friction aggregate.

**4.1.4** Wet spots shall be covered with the high friction aggregate prior to the gelling of the Resin Binder System.

**4.1.5** Walking, standing on, or any form of contact or contamination with the wet uncured Resin Binder System without spiked shoes as approved by the engineer, prior to application of the aggregate, will result in that section of Resin Binder System being removed and replaced at the contractor's expense.

**4.1.6** Applications on high speed highways such as interstate, interstate ramps, and bridge decks will require additional sweeping three days after the initial installation is completed to remove excess and loose aggregate from the traveled way and shoulders.

**5.0 Method of Measurement.** Final measurement of the completed HFST will not be made except for authorized changes during construction, or where appreciable errors are found in the contract quantity. When required, measurement of HFST, complete in place, will be made to the nearest square yard. The revisions or correction will be computed and added to or deducted from the contract quantity.

**6.0 Basis of Payment.** The accepted quantity of HFST, in place, will be paid for at the contract unit price bid for Item Number 413-99.05, "High Friction Surface Treatment-Bauxite", per square yard. The contract price per square yard of HFST shall include full compensation for all labor, materials, tools, equipment, testing and incidental items necessary to complete the described work.



R. Route CC Culvert Repair

**1.0 Description.** A section of pavement in the northbound lane of Route CC is damaged due to a failed pipe collar. The repair work consists of removing a portion of existing concrete pavement, excavating to uncover the collar and 10' of existing culvert, removing a segment of the existing pipe culvert and installing replacement pipe and a Type B Pipe Collar in accordance with the plans.

**2.0 Installation.** Group B Pipe and Type B Pipe Collar shall be installed in accordance with the applicable sections of the MoDOT Standard Specifications.

**3.0 Basis of Payment.** Payment for culvert repair will be paid for at the contract unit price for each of the pay items included in the contract. Payment will be considered full compensation for all labor, equipment and material to complete the work.

S. Miscellaneous Backfill for Route CC Culvert Repair

**1.0 Description.** Class 3 material from the culvert repair area shall be stockpiled on MoDOT right of way. The material shall be backfilled over the culvert repair to the bottom grade of the 4" Type 5 aggregate base in accordance with the plans.

**2.0 Placement.** The backfill over the culvert repair shall be placed in accordance with Section 203 of the MoDOT Standard Specifications.

**3.0 Basis of Payment.** The accepted quantity of backfill over the culvert repair will be paid for at the contract unit price bid for Item Number 203-99.07, "Miscellaneous Backfill", per cubic yard. The contract price per cubic yard of "Miscellaneous Backfill" shall include full compensation for all labor, materials, tools, equipment, testing and incidental items necessary to complete the described work.

T. Permanent Concrete Traffic Barrier Pad

**1.0 Description.** This work consists of constructing an 8 inch thick concrete pad using Concrete Pavement under Permanent Concrete Traffic Barrier (Type C) at variable widths as shown in the plans.

**2.0 Concrete Requirements.** The concrete pad will be constructed using Pavement Concrete. All material, proportioning, air-entraining, mixing, slump and transporting of Portland cement concrete shall be in accordance with MoDOT Standard Specifications, Section 501.

**3.0 Installation.** The pad shall be 8 inches thick and of variable width between the backside of the curb and gutter along the eastbound Route 54 Entrance Ramp/Acceleration Lane and the edge of pavement along Christy Drive, as shown in the plans. The cross sectional shape of the pad may vary as needed to accommodate the installation of a Permanent Concrete Traffic Barrier (Type C) for stepped pavement. Tie bars shall not be installed longitudinally along either side of the pad.

Job No.: J5P3121

Route: 54

County: Cole

**4.0 Basis of Payment.** Payment for concrete traffic barrier pad will be paid for at the contract unit price for Item Number 617-99.05, "Misc. Concrete Traffic Barrier Pad, 8 IN. Thick", per square yard. Payment will be considered full compensation for all labor, equipment and material to complete the work.

Job No.: J5P3128


Route: 54

County: Cole

**JOB SPECIAL PROVISIONS TABLE OF CONTENTS (ROADWAY)**

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

A.	General - Federal JSP-09-02E	1
B.	Contract Liquidated Damages	1
C.	Work Zone Traffic Management	2
D.	Emergency Provisions and Incident Management	5
E.	Project Contact for Contractor/Bidder Questions	6
F.	Utilities	6
G.	Supplemental Revisions JSP-18-01H	7
H.	Guardrail Grading Requirements JSP-17-02B	9
I.	Contractor Quality Control NJSP-15-42	10
J.	Intelligent Compaction NJSP-18-08	13
K.	Paver-Mounted Thermal Profiles NJSP-18-09	17
L.	Surface Sealing Treatment NJSP-15-28	19
M.	Fertilizing, Seeding, and Mulching	23
N.	Contractor Retained Guardrail JSP-04-11	24
O.	Chevron Protection	24
P.	High Friction Surface Treatment NJSP-15-13B	24
Q.	Modified Linear Grading Class 2	28
R.	8" White High Build Waterborne Pavement Marking Paint, Type L Beads	29

 <p>STATE OF MISSOURI MARIA K. PETERS NUMBER PE-2000162118 PROFESSIONAL ENGINEER</p> <p>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</p>	<p><b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 W. CAPITOL AVE. JEFFERSON CITY, MO 65102 Phone 1-888-275-6636</p>
	<p>If a seal is present on this sheet, JSP's have been electronically sealed and dated.</p>
	<p>JOB NUMBER: J5P3128 COLE COUNTY, MO DATE PREPARED: 8/14/2019</p>
	<p>ADDENDUM DATE:</p>
<p>Only the following items of the Job Special Provisions (Roadway) are authenticated by this seal: All</p>	

JOB  
SPECIAL PROVISION

A. General - Federal JSP-09-02E

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

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

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

General Provisions & Supplemental Specifications

Supplemental Plans to July 2019 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

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

Notice to Proceed: January 6, 2020  
Completion Date: November 1, 2020

**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
J5P3128	N/A	\$3,200
J5P3121	N/A	\$3,200
J5P3371	N/A	\$3,200

**3.0 Liquidated Damages for Contract Administrative Costs.** Should the contractor fail to complete the work on or before the 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 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 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

**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 **10 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:

12:00 noon July 2, 2020 – 10:00 p.m. July 5, 2020  
12:00 noon July 2, 2021 – 6:00 a.m. July 6, 2021  
12:00 noon July 1, 2022 – 6:00 a.m. July 5, 2022

**3.2** The contractor shall not perform any construction operation on the 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 be aware that traffic volume data indicates construction operations on the roadbed between the following hours will likely result in traffic queues greater than 15 minutes. Based on this, the contractors operations will be restricted accordingly unless it can be successfully demonstrated the operations can be performed without a 15 minute queue in traffic. It shall be the responsibility of the engineer to determine if the above work hours may be modified. Working hours for evenings, weekends and holidays will be determined by the engineer.

Route 54 Eastbound:

6:00 a.m. - 8:00 a.m.	Monday through Friday
9:00 a.m. – 6:00 p.m.	Sundays from May 17 <sup>th</sup> – September 13 <sup>th</sup>

Route 54 Westbound:

3:00 p.m. - 6:00 p.m.	Monday through Friday
12:00 p.m. - 8:00 p.m.	Fridays from May 15 <sup>th</sup> – September 11 <sup>th</sup>

**3.4** 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 **\$500 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.

**3.4.1** 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. The CMS shall be capable of communication with the Transportation Management Center (TMC), if applicable, 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

**1.0** The contractor shall have communication equipment on the construction site or immediate access to other communication systems to request assistance from the police or other emergency agencies for incident management. In case of traffic accidents or the need for police to direct or restore traffic flow through the job site, the contractor shall notify police 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 police services, the following agencies may also be notified for accident or emergency situation within the project limits.

Missouri Highway Patrol (573-751-1000)
--

<u>Cole County</u>	
Emergency Medical Services:	(573) 634-9205
Emergency:	911
Emergency Management Agency:	(573) 634-9146
Cell:	(573) 619-9914
Sheriff:	(573) 634-9160
Fax:	(573) 634-2336

**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 police agency.

**2.2** The contractor shall notify 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 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

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

Mia Peters, Project Contact  
Central District  
1511 Missouri Blvd., P.O. Box 718  
Jefferson City, MO 65102

Telephone Number: 573-751-7690  
Email: [Maria.Peters@modot.mo.gov](mailto:Maria.Peters@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:

<u>Utility Name</u>	<u>Known Required Adjustment</u>	<u>Type</u>
AT&T Distribution Contact: Andy Erickson 314-223-2966 <a href="mailto:ae4137@att.com">ae4137@att.com</a>	None	Communications
Centurylink Contact: Tonjia Baldwin 573-415-6308 <a href="mailto:tonjia.baldwin@centurylink.com">tonjia.baldwin@centurylink.com</a>	None	Communications
Level 3 Now Centurylink Contact: Robert LaFave 573-808-1551 <a href="mailto:robert.lafave@centurylink.com">robert.lafave@centurylink.com</a>	None	Communications
Sho-Me Technologies Contact: Brad Baker 417-818-4778 <a href="mailto:bbaker@shometech.com">bbaker@shometech.com</a>	None	Communications

**1.1 Known Utility Facilities:** The Contractor shall be aware there are numerous utilities present along this corridor. The extents of the utility conflicts are unknown. However if conflicts are encountered the Contractor shall be required to move their operation to another location until the utility can be relocated or the Engineer determines another course of action. There shall be no delay claims until such time the Contractor has no place to work except in areas of utility conflict and as approved by the engineer. The contractor shall be proactive in the discovery of utility conflicts. The contractor is recommended, after award of the project, to have all utilities marked along the project to visually see where conflicts may occur. Any conflicts discovered and cleared before construction begins will help the contractor's progress on the project. MoDOT utilities staff will assist in relocation of utilities if necessary. There will be no direct pay for compliance to the above specification.

G. Supplemental Revisions JSP-18-01H

Stormwater Compliance Requirements

**1.0 Description.** This provision requires the contractor to provide a Water Pollution Control Manager (WPCM) for any project that includes areas of land disturbance that will total one (1) acre or greater on the project site at any point in time. 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.

**1.1 Applicability.** The project site consists of all areas designated on the plans, including temporary and permanent easements. This provision does not apply to Contractor staging, plant, or borrow areas that are not located on MoDOT right of way (Off-site). The Contractor is

responsible for obtaining its own separate land disturbance permit for Off-site areas. This provision is in addition to any other stormwater, environmental, and land disturbance requirements specified elsewhere in the contract.

**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 within 7 days of the stormwater inspection or any extended period of time granted by the Engineer.

**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.

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](http://www.modot.org/quality)).

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

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



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

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

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

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

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

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

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

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

Job No.: J5P3128

Route: 54

County: Cole

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. Intelligent Compaction NJSP-18-08

**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 PP81-17 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.

**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.** Shall be downloaded twice per day and forwarded to the Engineer before the start of the next day's production.

**9.3 Formatted Raw Data.** Formatted Raw 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 with the corresponding production date,

direction, starting and ending log mile, and lane if applicable (e.g. 160623, NB, 283.21-281.82, PL).

**9.4 Veta Project File.** The 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. IC Data shall include at a minimum roller locations, temperatures, amplitudes, frequencies and speeds.

**9.5 Report.** A report shall be furnished to the engineer by the contractor two days prior to the 1<sup>st</sup> and 15<sup>th</sup> 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.

**10.0 Daily Verification.** The temperature and GPS on each IC Roller shall be verified and recorded at the start of each day. 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 last year. The temperatures shall compare to within 5°F. 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.** One training will be provided by the Engineer annually. The IC Technician and other IC quality control staff shall have completed a qualifying IC/IR training within the past 2 years. 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) A list of employees attending the provided training, along with the procedure for training operators or other individuals who may not be attending the training
- (f) Detailed daily verification procedure for checking the temperature sensor on IC Roller
- (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

**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 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 max length.

**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 Basis of Payment.** Payment for compliance with this provision will be made at the contract unit price for Item No. 401-99.01, 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.

$$\text{Incentive or Disincentive Payment} = ((\text{Length of Days Run}) / 1000) \times \$75$$

K. Paver-Mounted Thermal Profiles NJSP-18-09

**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 subplot. 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;



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

**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 subplot: (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. subplot. The thermal segregation categories are based on the temperature differential as shown in the table below.

<b>Temperature Differential (TD)</b>	<b>Thermal Segregation Category</b>
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 deliver to the engineer a summary of the daily Thermal Segregation Reports two days prior to the 1<sup>st</sup> and 15<sup>th</sup> of each month for verification.

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

<b>Thermal Segregation Category</b>	<b>Adjustment per 150 ft. Sublot</b>
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 401-99.01, Infrared Scanning. 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.

L. Surface Sealing Treatment NJSP-15-28

**1.0 Description.** This work shall consist of furnishing and applying a surface sealing treatment to the existing roadway as shown on the plans. The surface treatment shall contain a mixture of cationic asphalt emulsion, latex polymer, fine aggregate, water, and other additives as needed.

**2.0 Mix Design.**

**2.1** At least 30 days prior to placing the surface sealing treatment on the project, the contractor shall submit a mix design for approval to Construction and Materials. One gallon of the asphalt emulsion and 2500 grams of each aggregate material comprising the combined gradation shall be submitted with the mix design.

**2.2 Required Information.** At a minimum the Surface Sealing mix design shall contain the following information on the job mix formula:

- (a) Emulsified asphalt source and properties required.
- (b) Fine aggregate source, Acid Insoluble Residue (AIR) results, absorption, and deleterious requirements required.
- (c) Blended aggregate gradation required.
- (d) Mixture performance test results required.
- (e) Additives and their sources required.

**2.3 Mix Design Gradation Requirement.** The fine aggregate, mastic materials such as mineral filler, and/or other additives that comprise the combined gradation shall have 100 % of the material passing the No. 8 (2.36 mm) sieve. For spraying applications, the following mix gradation shall be required:

Sieve	Percent Passing
No. 8 (2.36 mm)	100
No. 16 (1.18 mm)	95-100
No. 30 (600 µm)	85-100
No. 50 (300 µm)	40-70
No. 100 (150 µm)	30-65
No. 200 (75 µm)	25-60

**2.4 Mixture Performance Requirements.** The mixture shall meet the following requirements.

Testing Requirement	Min.	Max.	Test Method
Maximum Wet-Track Abrasion Loss, grams per square meter.	--	80 g/m <sup>2</sup>	TB 100 (ISSA) Modified <sup>a</sup>
Asphalt Content by Ignition Method, percent	30%	--	AASHTO T-308-08 <sup>b</sup>
Percent Solids, Asphalt Residue by Evaporation, percent	48%	--	AASHTO T59, Section 6

<sup>a</sup>This method is modified to a three day soak and samples prepared per MoDOT TM 86.

<sup>b</sup>To account for high percentage of binder, sample size should be adjusted based on laboratory oven capability.

**2.5 Required Additives.** A minimum of 3% latex polymer by weight of wet mixture is required in the surface sealant treatment and shall be listed in the job mix formula.

**2.6 Other Additives.** Any other material added to the mixture or to any of the component materials shall be listed in the job mix formula.

### 3.0 Material Certification.

**3.1** The materials used in the mix design shall be certified to meet the following specifications.

**3.2 Bituminous Material.** The bituminous material shall be an asphalt emulsion in accordance with the following table. The bituminous material shall show no separation after mixing. The emulsion shall be sampled in accordance with AASHTO T 40.

<b>Asphalt Emulsion (CSS)</b>			
	<b>Min.</b>	<b>Max.</b>	<b>Test Method</b>
Viscosity, Saybolt Furol at 25 C, s	15	100	AASHTO T 72
Particle charge test	Positive <sup>b</sup>		AASHTO T 59
Residue, %	60	--	AASHTO T 59
<b>Test on Residue from Distillation</b>	<b>Min.</b>	<b>Max.</b>	<b>Test Method</b>
Penetration, 25 C, 100 g, 5 s,	30	100	AASHTO T 49

<sup>b</sup>If the particle charge test is inconclusive, material having a maximum pH value of 6.7 will be acceptable.

**3.3 Noncarbonated Fine Aggregate Requirement.** The fine aggregate material (not including mastic material or additives) shall contain 100 percent non-carbonate aggregate. The fine aggregate material shall have an acid insoluble residue (AIR), MoDOT Test Method TM 76, of at least 75 percent insoluble residue.

**3.4 Absorption and Deleterious Requirement.** The absorption of the fine aggregate (not including mastic material or additives) shall have a maximum absorption limit of 2.0 percent tested in accordance with AASHTO T84. The percentage of deleterious substances shall not exceed the following values in accordance with AASHTO T113:

<b>Item</b>	<b>Percent by Weight</b>
Clay lumps	1.0
Total lightweight particles, including coal and lignite	0.5
Other deleterious substances	0.1

**3.5** Lightweight fine aggregate sources not meeting the absorption limits or deleterious requirements of Section 3.4 above shall be in accordance with the following requirements tested on the parent material:

<b>Property</b>	<b>Percent Maximum Limit</b>
Micro-Deval, ASTM D7428, percent, max	20
Los Angeles Abrasion for Lightweight Aggregate, MoDOT Test Method TM 78, percent, max	50

**3.6 Water.** Water shall be potable and free of harmful soluble salts.

#### **4.0 Construction Requirements.**

**4.1** The surface sealing mixture may be mixed and applied through mobile distribution equipment as described herein.

**4.2 Mixing Equipment.** All materials shall be thoroughly mixed as to produce a homogenous surface treatment. Individual volume or weight controls for proportioning each material in the

mix shall be provided. Materials shall be added by a calibrated controlled device capable of monitoring the amount of material used at the time.

**4.3 Distribution Equipment.** The Distributor shall be equipped with a full sweep agitation system, a pumping system designed to handle fine aggregate mixes, and sufficient power to operate the full spray system and the agitation system at the same time. The Distribution equipment shall be equipped with a monitoring system that ensures the even distribution of material and measures the application rate of the mix.

**4.4 Storage Tanks.** If the mix is being delivered from a central mixing plant, then a job site storage tank shall have the minimum capacity of the entire transport load. The storage tank shall have an internal full sweep mixing system having a mixing capability of providing a homogenous mix representing the mix design at any given location within the tank.

**4.5 Environmental Protection.** The contractor shall comply with all federal, state, and local laws and regulations controlling pollution of the environment.

**4.6 Weather Limitations.** Bituminous material shall not be placed on any wet surface or when the ambient temperature or the temperature of the pavement on which it is to be placed is below 60° F. Temperatures shall be obtained in accordance with MoDOT Test Method TM 20.

**4.7 Surface Preparation.** The surface shall be thoroughly cleaned immediately prior to placing the surface treatment.

**4.8 Protection of Other Surfaces.** All curbs, manhole covers, and ADA facilities shall be protected from the spray or laydown of the bituminous mixture during placement.

**4.9 Dilution.** The bituminous material shall not be diluted in the field with water or other additives except as approved by the manufacturer.

**4.10 Placement.** Placement of the mix shall be performed in two passes with a minimum coverage of 0.125 gal/yd<sup>2</sup> per pass and the minimum total coverage of 0.25 gal/yd<sup>2</sup>. Contractor shall provide a mat ensuring total coverage free of voids and pit holes.

**4.11 Opening to Traffic.** After the sealant application, the roadway shall remain closed until the surface is tack-free and capable of being open to traffic without tracking.

**4.12 Basis of Acceptance.**

**4.12.1 Quality Control.** Two samples shall be collected during production on a project. One sample shall be retained for the engineer. The contractor shall test the other sample and verify the mix design in accordance with Section 2.4 of this specification and submit the test results to the engineer.

**4.12.2 Field Performance.** The finished surface sealant treatment shall be evaluated by the engineer based on the following criteria. Any of the following shall be considered unacceptable material.

- (a) The presence of loose aggregate or synthetic materials that may cause damage to traveling vehicles.

(b) A final surface with insufficient coverage or delamination.

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

**6.0 Basis of Payment.** The accepted quantity of surface treatment, in place, will be paid for at the contract unit (square yard) price. No separate payment will be made for any additional construction methods or processes. Manufacturer shall report the unit weight (lbs/gallon) of the surface sealing material on the bill of lading.

M. Fertilizing, Seeding, and Mulching

**1.0** Fertilizing shall conform to Sec. 801 and more specifically as follows:

Pounds/Acre		Effective	
Nitrogen	Phos.	Potash	Neutralizing
<u>(N)</u>	<u>(P<sub>2</sub>O<sub>5</sub>)</u>	<u>(K<sub>2</sub>O)</u>	<u>Material</u>
80	120	40	800

Statewide – All settings – within the first 30 feet (mow area)

Species	Pounds per Acre
Tall fescue	80 lbs.
Annual ryegrass	10 lbs.
Perennial ryegrass	5 lbs.
White clover	5 lbs.
Oats	10 lbs.
<b>TOTAL</b>	<b>110 lbs.</b>

Seed bed preparation and seeding by hand will be allowed.

**3.0** All disturbed areas shall be mulched and conform to Section 802 and more specifically the contractor shall use vegetative mulch. Mulching by hand will be allowed.

**4.0 Basis of Payment.**

**4.1** No direct payment will be made for liming, fertilizing or mulching seeded areas.

**4.2** All cost incurred by the contractor for labor, equipment and materials in compliance with the above requirements including furnishing and placing fertilizer and mulch shall be considered as completely covered by the unit price bid for Item No. 805-10.00A, Seeding – Cool Season Mixtures, per acre.

N. Contractor Retained Guardrail JSP-04-11

**1.0 Description.** All guardrail removed from this project shall become the property of the Contractor and shall be disposed of in accordance with Sec 202.

**2.0 Basis of Payment.** All costs incurred for complying with this provision shall be considered completely covered by the contract unit price for Item No. 202-20.10, Removal of Improvements.

O. Chevron Protection

**1.0 Description.** This work shall consist of protecting existing preformed thermoplastic pavement marking chevrons at offset left median crossover locations as shown on the plans.

**2.0 Damaged Chevrons.** Any chevrons damaged or covered by the mill and fill operation shall be repaired or replaced with the same or approved product at the contractor's expense to the satisfaction of the engineer.

**3.0 Basis of Payment.** No direct payment will be made for protecting existing preformed thermoplastic pavement marking.

P. High Friction Surface Treatment NJSP-15-13B

**1.0 Description.** This work shall consist of furnishing and placing a High Friction Surface Treatment (HFST) on asphalt or concrete pavement.

**1.1** The HFST shall be comprised of surface preparation and a minimum of a single layer using a Binder Resin System which holds a surface applied aggregate firmly in place. The Binder Resin System shall include Polymeric or Methyl Methacrylate (MMA) Resins.

**2.0 Material.**

**2.1.1 Resin Binder System.** Resin Binder Systems shall be recommended by the manufacturer as suitable for use on the intended pavement surface and for the potential range of atmospheric exposure.

**2.1.2** The contractor shall furnish and install a Resin Binder System that meets the criteria in (AASHTO PP 79-14 Table 1):

<b>Table 1 - Resin Binder System</b>			
<b>Property</b>	<b>Test Method</b>	<b>Requirements</b>	
		<b>Polymeric Resin</b>	<b>MMA</b>
Ultimate Tensile Strength	AASHTO M-235	2500-5000 psi	1500-5000 psi
Elongation at break point	AASHTO M-235	30-70%	30-70%



Compressive Strength	ASTM C 579	1000 psi min. at 3 hours 5000 psi min. at 7 days	1000 psi min. at 3 hours 2000 psi min. at 7 days
Water Absorption	AASHTO M-235	1% max.	1% max.
Durometer Hardness (Shore D)	ASTM D-2240	60-80	40-75
Viscosity	ASTM D-2556	Class C: 7-30 poises	Class C: 12-20 poises
Gel Time	AASHTO M-235	Class C: 10 minutes min.	Class C: 10 minutes min.
Cure Rate (Dry through time)	ASTM D-1640	3 hrs. max.	3 hrs. max.
Adhesive Strength at 24 hours	ASTM D 4541	250 psi min. or 100% substrate failure	250 psi min. or 100% substrate failure

**2.1.3** Independent laboratory reports per formulation shall be provided, documenting that the resin binder meets the requirements of this specification. A sample of the resin binder or components lot/batch shall be supplied upon request.

**2.1.4** At the request of the engineer, the manufacturer of the Resin Binder System shall certify that the Resin Binder System meets the requirements of this specification. Such certification shall consist of either a copy of the manufacturer's test report or a statement by the manufacturer, accompanied by a copy of the current test results, that the Resin Binder System has been sampled and tested. Such certification shall indicate the date of testing and shall be signed by the manufacturer.

**2.2.1 Aggregate.** The contractor shall furnish and install a high friction aggregate that is clean, dry and free from deleterious material. The high friction aggregate shall be Calcined Bauxite for this project.

**2.2.2** The calcined bauxite aggregate shall meet the criteria in Table 2:

Property	Test Method	Requirement
Resistance to Degradation	AASHTO T-96	20% max.
Aggregate Grading	AASHTO T-27	No. 4 Percent Passing 100% min. No. 6 Percent Passing 95% min. No. 16 Percent Passing 5% max.
Moisture Content	AASHTO T-255	0.2% max.
Aluminum Oxide	ASTM C-25	87% min.

**2.2.3** All aggregates shall be furnished in appropriate packaging that is clearly labeled and protects the aggregate from any contaminants on the jobsite and from exposure to rain or other moisture.

**2.2.4** At the request of the engineer, the manufacturer of the aggregate shall certify that the aggregate meets the requirements of this specification. Such certification shall consist of either

a copy of the manufacturer's report or a statement by the manufacturer, accompanied by a copy of the current test results, that the aggregate has been sampled and tested. Such certification shall indicate the date of testing and shall be signed by the manufacturer.

**2.2.5** Test methods should be in accordance with AASHTO PP 79-14.

**3.0 Construction Requirements.** A manufacturer's representative of the Resin Binder System shall be present at the jobsite during all construction operations relating to the preparation and placement of the HFST. All construction operations relating to the HFST shall meet the recommendations of the manufacturer's representative. Final approval of all HFST placement operations will be given by the engineer.

**3.1 Weather Limitations.** Resin Binder system shall not be placed on any wet surface or when the ambient temperature or the temperature of the pavement is above or below the manufacturer's recommendations or when the anticipated weather conditions would prevent the proper application of the surface treatment as directed by the manufacturer's representative. Temperatures shall be obtained in accordance with MoDOT Test Method TM 20.

**3.2 Surface Preparations.** The surface shall be thoroughly cleaned immediately prior to installation of the HFST. The surface shall be clean, dry and free of all dust, oil, debris and any other material that might interfere with the bond between the resin binder material and the existing surface as recommended by the manufacturer's representative.

**3.2.1** The contractor shall pre-treat joints and cracks greater than ¼ inch in width and depth with the mixed Resin Binder System. Once the resin binder in the pre-treated areas has gelled, the installation of the HFST may proceed.

**3.2.2 Asphalt Pavement.** Clean asphalt pavement surfaces using mechanical sweepers and high pressure air wash with sufficient oil traps. Mechanically sweep all surfaces to remove dirt, loose aggregate, debris, and deleterious material. Vacuum sweep or air wash using a minimum of 180 cfm of clean and dry compressed air, all surfaces to remove all dust, debris, and deleterious material. HFST shall not be applied to newly placed asphalt pavement surfaces that are less than 30 days old.

**3.2.3 Concrete Pavement.** Clean concrete pavement surfaces by shot blasting and vacuum sweeping. Shot blast all surfaces to remove all curing compounds, loosely bonded mortar, surface carbonation, and deleterious material. The prepared surface shall comply with the International Concrete Repair Institute (ICRI) standard for surface roughness CSP 5. After shot blasting, vacuum sweep or air wash, with a minimum of 180 cfm of clean and dry compressed air, all surfaces to remove all dust, debris, and deleterious material.

**3.2.4** All existing edge line pavement markings that are adjacent to the HFST location shall be covered and protected as approved by the engineer prior to performing surface preparation. HFST shall not be placed over existing pavement markings or rumble strips. Lane line pavement markings that conflict with the HFST installation shall be removed by methods approved by the manufacturer's representative. Any existing edge line pavement markings that are damaged during the HFST application process shall be replaced at the contractor's expense.

**3.3** HFST shall be allowed to cure for the minimum duration as recommended by the binder component supplier's specifications and during that time the application area shall be closed to

all vehicles and contractor's equipment traffic. After placement and cure of the HFST, the contractor shall test the finished surface in accordance with ASTM D7234 to detect unbonded areas.

**3.4** Excess and loose aggregate shall be removed from the traveled way and shoulders in such a way that the HFST is not damaged or disturbed. Excess aggregate that can be reused shall be reclaimed by a vacuum sweeper. The recovered aggregate shall be clean, uncontaminated and dry, if it is to be re-used in the HFST application. All reclaimed aggregate must be in conformance with the requirements in Section 2.0. Material.

**3.5** Utilities, drainage structures, curbs and any other structures within or adjacent to the treatment location shall be protected against the application of the HFST materials.

**3.6 Surface Friction Test.** The surface friction of the completed HFST shall meet a minimum requirement of 65 FN40R from the ASTM E274 test. MoDOT will perform this test, at the expense of the Commission, within 7 calendar days after completion of the HFST. In order to allow for adequate scheduling time for the surface friction test, the contractor shall provide an anticipated completion date of the HFST for each segment of roadway being treated in this contract. The contractor shall provide this date(s) to the engineer a minimum of two weeks prior to any anticipated completion date of the HFST.

**3.6.1** Any surface that fails to conform to the above friction requirement must be removed and replaced at the contractor's expense within 24 hours after being notified by the engineer.

**3.7 Surface Quality Verification.** The engineer will check the HFST surface for areas of debonding or excessive loss of aggregate fourteen days after completion of the HFST. Any deficiencies found shall be corrected at the contractor's expense.

**4.0 Application Methods.** HFST shall be applied in accordance with the manufacturer's recommendations. The HFST can be applied by either mechanical or manual techniques.

**4.1** The Resin Binder System shall be blended and mixed in the ratio per the manufacturer's specification (+/- 2% by volume) and shall be continuously applied once blended.

**4.1.1** The Resin Binder System shall be applied at a uniform thickness of 50-65 mils (25-32 square feet per gallon). Coverage rate is based upon expected variances in the surface profile of the pavement.

**4.1.2** The operation shall proceed in such a manner that will not allow the mixed material to separate, cure, dry, be exposed or otherwise harden in such a way as to impair retention and bonding of the high friction aggregate.

**4.1.3** The high friction aggregate shall be immediately applied at a rate of 12-15 pounds per square yard (achieving saturation) in such a manner that there is no disruption to the leveled binder. It is the responsibility of the contractor to ensure full embedment of the high friction aggregate.

**4.1.4** Wet spots shall be covered with the high friction aggregate prior to the gelling of the Resin Binder System.

**4.1.5** Walking, standing on, or any form of contact or contamination with the wet uncured Resin Binder System without spiked shoes as approved by the engineer, prior to application of the

aggregate, will result in that section of Resin Binder System being removed and replaced at the contractor's expense.

**4.1.6** Applications on high speed highways such as interstate, interstate ramps, and bridge decks will require additional sweeping three days after the initial installation is completed to remove excess and loose aggregate from the traveled way and shoulders.

**5.0 Method of Measurement.** Final measurement of the completed HFST will not be made except for authorized changes during construction, or where appreciable errors are found in the contract quantity. When required, measurement of HFST, complete in place, will be made to the nearest square yard. The revisions or correction will be computed and added to or deducted from the contract quantity.

**6.0 Basis of Payment.** The accepted quantity of HFST, in place, will be paid for at the contract unit price bid for Item Number 413-99.05, "High Friction Surface Treatment-Bauxite", per square yard. The contract price per square yard of HFST shall include full compensation for all labor, materials, tools, equipment, testing and incidental items necessary to complete the described work.

Q. Modified Linear Grading Class 2

**1.0 Description.** Modified Linear Grading, Class 2 shall consist of preparing the shoulder subgrade by excavating, compacting, fine-grading, and shaping existing shoulder and ditch fore-slope, conforming to the typical section shown on the plans. It may also be necessary to haul material and involve work on high banks, side hills, and rock outcroppings. Modified Linear Grading Class 2 shall also consist of hauling embankment material to the project or obtaining embankment material from the right of way as approved by the engineer to accommodate the 2 and 4 foot shoulder widening and inslope as shown in the plans.

**2.0 Construction Requirements.** Embankment construction shall be in accordance with applicable requirements of Section 203 or similar methods approved by the engineer in order to produce a stabilized roadway embankment. The shoulder shall be excavated and graded as shown on the typical section with minimal disturbance of the existing sub-grade and fore-slope, except where new embankment or rock fill is required. Embankment and subgrade density shall be obtained from reasonable compactive efforts consisting of no less than three passes with a roller until no further visible compaction can be achieved, or by other methods approved by the engineer. Subgrade preparation and compaction shall also be in accordance with Sections 209 and 210.

**2.1** Following placement of the shoulder pavement, the shaping of the fore-slope shall be done as shown on the typical section.

**2.2** The contractor shall provide a vertical face to the existing pavement. This requirement is included in the modified linear grading class 2 pay item.

**2.3** All ditches shall maintain existing flow direction and provide adequate capacity for drainage, as approved by the engineer. All ditches shall use existing drainage structures unless shown otherwise in the project documents. Slopes can be steepened if necessary to use existing drainage structures as approved by the engineer.

**2.4** It may be necessary to go outside the limits of the right of way to obtain additional material or to dispose of excess material. All costs for providing additional material or disposing of excess material shall be included in Mod. Linear Grading, Class 2.

**2.5** For areas where it is required to haul embankment material to the project to accommodate the 2 foot shoulder widening and inslope, the top 6 inches of embankment material shall be Class A material in areas where the adjacent property owners mow and/or maintain the right of way. The Class A material shall be free of rocks and other materials undesirable for growing grass.

**2.6** Included in this work is any pavement edge treatment that might be necessary in order to stay in compliance with the Standard Plans. The need for edge treatment is determined by the contractor's method of operations.

**3.0 Method of Measurement.** Final measurement will not be made except where appreciable errors are found in the contract quantity.

**3.1** Where required, measurement will be made to the nearest 1/10 Station for the length of the shoulder along each side of the roadway, measured along centerline of the traveled way and totaled to the nearest Station for the sum of all segments.

**3.2** If material is encountered that may be classified as other than Class A Excavation as described in Sec 203.2.1, the limits of linear grading will not be underrun. Material classified as other than Class A Excavation will be measured and paid for per cubic yard in accordance with Sec 203.8. Where undergrading is necessary, backfilling of the undergraded area will be considered as part of the linear grading operation.

**4.0 Basis of Payment.** Payment for Modified Linear Grading, Class 2 as described in this provision will be made at the contract unit price for pay item 207-99.09, Modified Linear Grading, Class 2, per station.

R. 8" White High Build Waterborne Pavement Marking Paint, Type L Beads


**1.0 Description.** This work shall consist of 8" white pavement marking paint with type L beads for painted islands as shown in the plans.

**2.0 Basis of Payment.** Payment for all labor, equipment and material associated with pavement marking for painted islands shall be completely covered by the contract unit price for Item No. 620-99.03, 8 IN. White High Build Waterborne Pavement Marking Paint, Type L Beads, per linear foot.

**JOB SPECIAL PROVISIONS TABLE OF CONTENTS (ROADWAY)**

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

A.	General - Federal JSP-09-02E	2
B.	Contract Liquidated Damages JSP-13-01B	2
C.	Work Zone Traffic Management	3
D.	Emergency Provisions and Incident Management JSP-90-11	6
E.	Project Contact for Contractor/Bidder Questions JSP-96-05	7
F.	Supplemental Revisions JSP-18-01H	7
G.	3- or 4- Strand High Tension Cable Barrier JSP 06-07C	9
H.	Utilities	11
I.	Guard Cable Posts in Existing Pavement	13
J.	Vegetation Barrier Pavement	13
K.	Additional Mobilization for Seeding NJSP-16-03	14
L.	Mowing and Vegetation Control	14
M.	Fertilizing and Seeding	14
N.	Contractor Quality Control NJSP-15-42	16
O.	Removal and Relocation of Existing Signing	18

 <p>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</p>	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 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: J5P3371 COLE COUNTY, MO DATE PREPARED: 8/8/19
	ADDENDUM DATE:
Only the following items of the Job Special Provisions (Roadway) are authenticated by this seal: All	



JOB  
SPECIAL PROVISION

A. General - Federal JSP-09-02E

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

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

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

General Provisions & Supplemental Specifications

Supplemental Plans to July 2019 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-13-01B

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

Notice to Proceed: January 6, 2020  
Completion Date: November 1, 2020

**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
J5P3371	N/A	\$3200
J5P3121	N/A	\$3200
J5P3128	N/A	\$3200

**3.0 Liquidated Damages for Contract Administrative Costs.** Should the contractor fail to complete the work on or before the 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 **\$500** 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 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 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

**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:

12:00 noon July 2, 2020 – 10:00 p.m. July 5, 2020  
12:00 noon July 2, 2021 – 6:00 a.m. July 6, 2021  
12:00 noon July 1, 2022 – 6:00 a.m. July 5, 2022

3.2 The contractor shall not perform any construction operation on the roadway, during restricted periods, holiday periods or other special events specified in the contract documents.

3.3 The contractor shall be aware that traffic volume data indicates construction operations on the roadbed between the following hours will likely result in traffic queues greater than 15 minutes. Based on this, the contractors operations will be restricted accordingly unless it can be successfully demonstrated the operations can be performed without a 15 minute queue in traffic. It shall be the responsibility of the engineer to determine if the above work hours may be modified. Working hours for evenings, weekends and holidays will be determined by the engineer.

Route 54 Eastbound:

6:00 a.m. - 8:00 a.m. Monday through Friday  
9:00 a.m. – 6:00 p.m. Sundays from May 17<sup>th</sup> – September 13<sup>th</sup>

Route 54 Westbound:

3:00 p.m. - 6:00 p.m. Monday through Friday  
12:00 p.m. - 8:00 p.m. Fridays from May 15<sup>th</sup> – September 11<sup>th</sup>

3.5 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 **\$500 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.

**3.5.1** 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. The CMS shall be capable of communication with the Transportation Management Center (TMC), if applicable, 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-90-11**

**1.0** The contractor shall have communication equipment on the construction site or immediate access to other communication systems to request assistance from the police or other emergency agencies for incident management. In case of traffic accidents or the need for police to direct or restore traffic flow through the job site, the contractor shall notify police 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 police services, the following agencies may also be notified for accident or emergency situation within the project limits.

Missouri Highway Patrol Troop F 573-751-1000 (*55 Cell)		
City of Jefferson City	County of Cole	County of Miller
Fire: 573-634-6401	Cole County Fire Protection District: 573-634-9011	Moreau Fire District Station One: 573-392-5511
Police: 573-634-6400	Cole County Sheriff: 573-634-9160	Miller County Sheriff: 573-369-2341

**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 police agency.

**2.2** The contractor shall notify 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 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.

Mia Peters, Project Contact  
 Central District  
 1511 Missouri Blvd.  
 Jefferson City, MO 65101

Telephone Number: 573-751-7690  
 Email: [maria.peters@modot.mo.gov](mailto:maria.peters@modot.mo.gov)

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

F. Supplemental Revisions JSP-18-01H

Stormwater Compliance Requirements

**1.0 Description.** This provision requires the contractor to provide a Water Pollution Control Manager (WPCM) for any project that includes areas of land disturbance that will total one (1) acre or greater on the project site at any point in time. 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.

**1.1 Applicability.** The project site consists of all areas designated on the plans, including temporary and permanent easements. This provision does not apply to Contractor staging, plant, or borrow areas that are not located on MoDOT right of way (Off-site). The Contractor is responsible for obtaining its own separate land disturbance permit for Off-site areas. This provision is in addition to any other stormwater, environmental, and land disturbance requirements specified elsewhere in the contract.

**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 within 7 days of the stormwater inspection or any extended period of time granted by the Engineer.

**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.

G. 3- or 4- Strand High Tension Cable Barrier JSP 06-07C

**1.0 Description.** This work shall consist of all labor, equipment, and materials to remove, install, repair, and replace a 3-strand cable barrier system including all hardware and appurtenances as shown on the plans or as directed by the engineer. The cable barrier system shall function in accordance with the requirements of NCRHP 350, Test Level 3, and be approved by the Federal Highway Administration. Test Level 3 acceptable products, for use as a cable barrier system, are included in the list of pre-qualified products displayed on MoDOT's website. Acceptable products shall include a concrete socketed line post system with galvanized high-tension wire ropes and anchorages. The cable barrier system shall be constructed as shown on the plans, with a maximum deflection of 8 feet.

**2.0 Construction Requirements.** Line posts shall be provided in accordance with the manufacture's shop drawings and shall be placed plumb. Spacing of the posts shall not exceed 20 feet.



**2.1 Anchor Assemblies.** An anchor assembly, as specified in the manufacturer's shop drawings, shall be constructed at each end of a cable barrier run. The anchor assembly shall function in accordance with the requirements of NCRHP 350, Test Level 3, and be approved by the Federal Highway Administration. Anchors shall be constructed on firm, stable, undisturbed soil to the minimum dimension shown on the shop drawings. Anchor bolts and anchor post slip bases shall be firmly held in position at the top by templates during concrete replacement. Backfill shall be thoroughly compacted with mechanical tampers with care taken to prevent damage to the finished concrete. Backfill shall be brought up level with the finished grade line.

**2.2 Cable.** The galvanized wire rope shall be  $\frac{3}{4}$ " pre-stretched 3 x 7 construction as approved by the Federal Highway Administration during the system's acceptance testing. Threaded terminals (wedge or swaged type) shall be furnished. Swaged terminals may be shop- or field-swaged. Threaded terminals shall be right hand (RH) or left hand (LH) threaded M 24 x 3 pitch to ANSI B 1.13 M. The body of the threaded terminal shall provide a minimum of 5.9" of wire rope penetration depth. Threaded terminals shall be galvanized after threading to ASTM A 151. Turnbuckle or rigging screws shall be of the size and shape shown in the manufacturer's shop drawings. Rigging screws shall be of a solid or closed body type with two inspection holes to determine threaded rope terminal penetration. Rigging screws shall be galvanized to ASTM A 153 after threading.

**2.3 Cable Tensioning.** The cable height above ground shall be in accordance with the manufacturer's shop drawings. The cable shall be tensioned immediately after initial installation. Tension shall be rechecked and adjusted, if necessary, three to five days after initial tensioning on cable system sections with lengths greater than 2500 feet. A tension log form shall be completed showing: the time, date, location, ambient temperature and final tension reading, signed by the person performing the tensioning, and furnished to the engineer upon completion of the work. This form shall also include the system manufacturer's recommended tension chart.

**2.4 Delineators.** Delineator spacing and reflector colors shall be in accordance with Sec 606.10.

**2.5 Vegetation Barrier.** A vegetation barrier, 3 inches thick, extended from the existing paved shoulder to 2.5 feet beyond the guard cable line in the median shall be constructed of an accepted commercial mix. The contractor should be aware of the varying shoulder widths throughout the project. A typical inside shoulder width for four-lane divided expressways is 4 ft., however there are shoulders a min. of 1 ft. wide and up to 10 ft. wide in several locations. Pay width for the vegetation barrier, regardless of width constructed, will be 6.5 ft.

**3.0 Method of Measurement.** Measurement of the cable barrier will be made from center of line posts, totaled to the nearest linear foot.

**3.1 Anchor Assemblies.** Measurement of anchor assemblies will be made per each. For runs over 2000' long an intermediate anchor assembly has been added to the quantity for every 2000' of run. Intermediate anchor assemblies shall be added as per manufacturer's recommendation.

**4.0 Basis of Payment.** The accepted quantities of cable barrier, anchor assemblies, cable barrier to guardrail interfaces will be paid for at the contract unit price with Item No. 606-99.03 High Tension Guard Cable (per linear foot), Item No. 606-99.02 HTGC Anchor Assembly (per each), and Item No. 606-99.02 Cable to Guardrail Transition (per each). Any anchor assembly

required for cable to guardrail transition shall be considered included in the contract unit price for cable to guardrail transition. No direct payment will be made for delineators or setting post in rock.

H. 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:

<u>Utility Name</u>	<u>Known Required Adjustment</u>	<u>Type</u>
Ameren Missouri Electric Contact: Tammy Kolb 573-681-7515 <a href="mailto:tkolb@ameren.com">tkolb@ameren.com</a>	None	Electric
Ameren Missouri Gas Contact: Brian Robinson 573-931-7688 <a href="mailto:brobenson@ameren.com">brobenson@ameren.com</a>	None	Gas
AT&T Distribution Contact: Andy Erickson 314-223-2966 <a href="mailto:ae4137@att.com">ae4137@att.com</a>	None	Communications
Centurylink Contact: Tonjia Baldwin 573-415-6308 <a href="mailto:tonjia.baldwin@centurylink.com">tonjia.baldwin@centurylink.com</a>	None	Communications
City of Jefferson Wastewater Contact: Eric Seaman 573-634-6410 <a href="mailto:seaman@jeffcitymo.org">seaman@jeffcitymo.org</a>	None	Sewer
Cole County PWSD 2 Contact: Randy Kay 573-635-7011 <a href="mailto:pwsd2@socket.net">pwsd2@socket.net</a>	None	Water
Level 3 Now Centurylink Contact: Jason Johns 916-296-8520 <a href="mailto:jason.johns@centurylink.com">jason.johns@centurylink.com</a>	None	Communications

Mediacom Contact: Bob Boner 573-443-1536 <a href="mailto:bboner@mediacomcc.com">bboner@mediacomcc.com</a>	None	Communications
Missouri American Water Co. Contact: Scott Brewer 573-262-7062 <a href="mailto:scott.brewer@amwater.com">scott.brewer@amwater.com</a>	None	Water, Sewer
MoDOT Signals and Lighting Contact: Jason Morff 573-526-3207 <a href="mailto:jason.morff@modot.mo.gov">jason.morff@modot.mo.gov</a>	None	Electric
Phillips 66 Pipeline Contact: Mike Codd 314-210-6382 <a href="mailto:mike.p.codd@p66.com">mike.p.codd@p66.com</a>	None	Gas
Sho-Me Technologies Contact: Brad Baker 417-818-4778 <a href="mailto:bbaker@shometech.com">bbaker@shometech.com</a>	None	Communications
Socket Telecom Contact: Todd Pulis 573-818-4778 <a href="mailto:tpulis@socket.net">tpulis@socket.net</a>	None	Communications
Suddenlink Communications Contact: Tim Goerlitz 816-248-6671 <a href="mailto:timothy.goerlitz@suddenlink.com">timothy.goerlitz@suddenlink.com</a>	None	Communications
Three Rivers Electric Coop Contact: Ted Neuner 573-644-9022 <a href="mailto:tneuner@threeriverselectric.com">tneuner@threeriverselectric.com</a>	None	Electric

**1.1 Known Utility Facilities:** The Contractor shall be aware there are numerous utilities present along this corridor. The extents of the utility conflicts are unknown. However if conflicts are encountered the Contractor shall be required to move their operation to another location until the utility can be relocated or the Engineer determines another course of action. There shall be no delay claims until such time the Contractor has no place to work except in areas of utility conflict and as approved by the engineer. The contractor shall be proactive in the discovery of utility conflicts. The contractor is recommended, after award of the project, to have all utilities marked along the project to visually see where conflicts may occur. Any conflicts discovered and cleared before construction begins will help the contractor's progress on the

project. MoDOT utilities staff will assist in relocation of utilities if necessary. There will be no direct pay for compliance to the above specification.

I. Guard Cable Posts in Existing Pavement

**1.0 Description.** This work shall consist of cutting or coring through existing pavement to allow for the installation of guard cable posts in existing pavement. The size of the opening shall be at the discretion of the contractor to ensure adequate clearances and that the installation conforms to the manufacturer's guidelines. No more pavement shall be removed than is necessary for installation of the posts.

**2.0 Construction Requirements.** Holes shall extend through the pavement and through the aggregate as necessary for proper post installation. After post installation, the hole shall be back filled as necessary to ensure the completed guard cable system operates as intended.

**3.0 Method of Measurement.** No measurement will be made.

**4.0 Basis of Payment.** There will be no direct pay for installing posts in existing pavement as specified in this contract. There are minimal areas where existing widened shoulders may exist within the installation area, therefore the work to install posts through existing pavement will be considered completely covered under the pay item for 3-Strand High Tension Cable Barrier.

J. Vegetation Barrier Pavement

**1.0 Description.** This work shall consist of constructing an asphalt pavement strip at a compacted thickness of 3 inches and a pay width of 6.5 feet. Placement shall be in accordance with Sec 400 of the Standard Specifications.

**1.1** Material may need to be added in some locations to provide a stable and uniform subgrade prior to paving at the thickness specified. Prior to paving, the area shall be prepared and compacted with three passes of a 10 ton roller or by another method as approved by the Engineer.

**1.2** Soil sterilant shall be applied to the compacted surface as specified by the manufacturer's requirements and as approved by the Engineer.

**1.3** A commercial mix for the vegetation barrier will be allowed, as approved by the Engineer.

**1.4** Slopes shall be blended into the existing slope beyond the limits of the vegetation barrier.

**2.0 Method of Measurement.** Vegetation barrier pavement shall be measured in square yards, Modified Linear Grading per Station, and Shaping Slopes, Class II per 100 Ft.

**3.0 Basis of Payment.** Equipment, labor, material, compaction, and soil sterilant for preparation of the vegetation barrier subgrade will be considered completely covered under the unit price for "Modified Linear Grading", item number 2079909, per Sta. Vegetation barrier pavement and compaction, including equipment, labor and materials to construct the asphalt barrier will be paid for under the unit bid item "Vegetation Barrier, 3 In. Depth", item number 401-99.05, per square yard. Grading work following the construction of the vegetation barrier, needed to repair and smooth out slopes disturbed during construction, will be considered

completely covered under the bid item "Shaping Slopes, Class II", item number 2152000A, per 100 Ft.

K. Additional Mobilization for Seeding NJSP-16-03

**1.0 Description.** This provision provides compensation for additional mobilization for seeding, as specified herein.

**2.0 Additional Mobilization for Seeding.** Additional mobilization to perform temporary or permanent seeding, beyond the initial occurrence, may be necessary as specified in Sec 806.50.2 and as required per terms of the SWPPP. Mobilization of all equipment, workers and materials necessary to perform seeding and mulching shall be considered included in this work.

**2.1 Measurement of the number of occurrences authorized by the engineer to mobilize equipment onto the project to perform temporary or permanent seeding will be made per each occurrence, except for the initial occurrence and as specified herein. No measurement will be made for mobilization necessary to perform repair work to previously seeded areas or for mobilization necessary due to removal of equipment prior to completion of seeding all areas available for seeding, as determined by the engineer.**

**3.0 Basis of Payment.** The accepted occurrences of Additional Mobilization for Seeding will be paid for under 618-99.02, ADDITIONAL MOBILIZATION FOR SEEDING, at a fixed unit price of \$600 per each occurrence. Payment for the initial occurrence to mobilize for seeding, and any additional mobilization costs in excess of the fixed price, shall be considered completely covered under other items.

L. Mowing and Vegetation Control

**1.0 Description.** This work shall consist of allowing MoDOT maintenance forces access to the Route 54 median to perform routine mowing and spraying operations during construction of the project. The Engineer will coordinate with MoDOT Maintenance Supervisor and the Contractor to determine areas to be mowed and/or sprayed to minimize work zone traffic compacts to the contractor's work schedule.

**2.0 Basis of Payment.** No direct payment will be made to the contractor for compliance with the requirements of this provision.

M. Fertilizing and Seeding

1.0 Any revisions or deviations from contract seed mixtures and applications must be approved by the Roadside section of MODOT's Maintenance Division.

2.0 Fertilizing shall conform to Sec 801, and more specifically, as follows:

<b>Pounds per Acre</b>				
Offset	Nitrogen (N)	Phosphorus (P205)	Potash (K20)	Effective Neutralizing Material
Beyond 30'	40	40	80	800
Within 30'	80	80	160	800

3.0 Seeding shall conform to Sec 805. The following seed mixture shall be applied at the rate specified:

<b>Cool Season Mixtures Within the First 30 Feet Pounds Pure Live Seed (PLS) per Acre</b>	
Blue Grama	12 lbs
Buffalo Grass	12 lbs
Tall Fescue	10 lbs
Annual Ryegrass	5 lbs
Teff Grass	5 lbs
Perennial ryegrass	6 lbs
White Clover	6 lbs
Oats	5 lbs
<b>Total</b>	<b>61 PLS lbs./acre</b>

<b>Warm Season Mixtures Beyond the First 30 Feet and Steeper Than 3:1 Slopes Pounds Pure Live Seed (PLS) per Acre</b>	
Indian Grass	6 lbs
Big Bluestem	4 lbs
Little Bluestem	5 lbs
Sideoats Grama	4 lbs
Switchgrass	2 lbs
Virginia or Canada Rye	2 lbs
Tall Dropseed	0.5 lbs
Purple Prairie Clover	0.5 lbs
Annual Ryegrass	5 lbs
Teff Grass	5 lbs
Perennial Ryegrass	5 lbs
Red Fescue	10 lbs
Redtop	1.5 lbs
Partridge Pea	3 lbs

White Clover	5 lbs
Gray Headed Coneflower or Lance-Leaf Coreopsis	0.25 lbs
Black-Eyed Susan	0.25 lbs
Oats	5 lbs
<b>Total</b>	<b>64 PLS lbs./acre</b>

4.0 All disturbed areas shall be mulched and conform to Sec 802 and more specifically the contractor shall use vegetative mulch.

5.0 Basis of Payment.

5.1 No direct payment will be made for fertilizing or mulching seeded areas.

5.2 All cost incurred by the contractor for labor, equipment and materials in compliance with the above requirements including furnishing and placing fertilizer and mulch shall be considered as completely covered by the unit bid price for Item 8051000A, Seeding – Cool Season Mixtures, per acre, and/or for Item 8052000A, Seeding – Warm Season Mixtures, per acre.

N. Contractor Quality Control NJSP-15-42

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

**2.0 Quality Control Plan.**

- (a) The name and contact information of the person in responsible charge of the QC testing.
- (b) A list of the QC technicians who will perform testing on the project, including the fields in which they are certified to perform testing.
- (c) A proposed independent third party testing firm for dispute resolution, including all contact information.
- (d) A list of Hold Points, when specified by the engineer.
- (e) The MoDOT Standard Inspection and Testing Plan (ITP). This shall be the version that is posted at the time of bid on the MoDOT website ([www.modot.org/quality](http://www.modot.org/quality)).

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

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

**3.1.1** Test results shall be reported on electronic forms provided by MoDOT. Forms and Contractor Reporting Excel2Oracle Reports (CRE2O) can be found on the MoDOT website. All



required forms, reports and material certifications shall be uploaded to a Microsoft SharePoint® site provided by MoDOT, and organized in the file structure established by MoDOT.

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

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

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

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

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

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

**4.3 Pre-Activity Meeting.** A pre-activity meeting is required in advance of the start of each new activity, except when waived by the engineer. The purpose of this meeting is to review construction details of the new activity. At a minimum, the discussion topics shall include: safety precautions, QC testing, traffic impacts, and any required Hold Points. Attendees shall include the engineer, the contractor superintendent and the foreman who will be leading the new activity. Pre-activity meetings may be held in conjunction with the weekly project meeting.

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

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

**4.4.2** Prior to all Hold Point inspections, the contractor shall verify the work has been completed in accordance with the contract and specifications. If the engineer identifies any corrective actions needed during a Hold Point inspection, the corrections shall be completed prior to continuing work. The engineer may require a new Hold Point to be scheduled if the corrections

require a follow-up inspection. Re-scheduling of Hold Points require a minimum 24-hour advance notification from the contractor unless otherwise allowed by the engineer.

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

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

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

O. Removal and Relocation of Existing Signing

**1.0 Description.** On Route 54 at each median opening and along the shoulder of Route 54 there are signs that may conflict with the placement of the guard cable and vegetative barrier. The contractor shall remove the signs, if necessary, to perform the work, and reinstall the signs, in accordance with the Std. Plans, in locations approved by the Central District Traffic Department if the signs cannot be placed in the original location.

**2.0** The contractor shall exercise reasonable care in handling the signs, backing bars, and attachment hardware during the removal and transportation to and from a storage site, approved by the Engineer. Should any of the signs, backing bars or hardware be damaged by the contractor's negligence, it shall be replaced at the contractor's expense.

**3.0 Basis of Payment.** Payment for removal, transportation of signs for storage and for re-installation, and labor and equipment needed for re-installation of the signs, generally shown in the plans, shall be considered completely covered by the unit bid item No. 202-20.10, "Removal of Improvements", per lump sum. Payment for replacement footings, breakaway assemblies, and posts will be covered under other bid items in the contract.