

Job No.: J4S3490
Route: 71
County: Jackson

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

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 <p>STATE OF MISSOURI ★ JASON MICHAEL SHAFER ★ PROFESSIONAL ENGINEER NUMBER PE-2010019596</p> <p><small>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</small></p>	<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 W. CAPITOL AVE. JEFFERSON CITY, MO 65102 Phone 1-888-275-6636</p>
	<p>TREKK Design Group, LLC 1411 East 104th Street Kansas City, MO 64131</p>
	<p>Certificate of Authority: 2002010300 Consultant Phone: (816) 874-4672</p>
	<p>If a seal is present on this sheet, JSP's have been electronically sealed and dated.</p>
	<p>JOB NUMBER: J4S3490 JACKSON COUNTY, MO DATE PREPARED: October 03, 2025</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-09-02L

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

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

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

General Provisions & Supplemental Specifications

Supplemental Plans to July 2025 Missouri Standard Plans
For Highway Construction

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

B. Contract Liquidated Damages JSP- 13-01D

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

2.0 Period of Performance. Prosecution of work is expected to begin on the date specified below in accordance with Sec 108.2. Regardless of when the work is begun on this contract, all work on all projects shall be completed on or before the date specified below. Completion by this date shall be in accordance with the requirements of Sec 108.7.1.

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Notice to Proceed: February 23, 2026
Contract Completion Date: December 03, 2026

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

Project	Calendar Days	Daily Road User Cost
J4S3490	283	\$11,400

3.0 Liquidated Damages for Contract Administrative Costs. Should the contractor fail to complete the work on or before the contract completion date specified in Section 2.0, or within the number of calendar days specified in Section 2.1, whichever occurs first, the contractor will be charged contract administrative liquidated damages in accordance with Sec 108.8 in the amount of **\$3000** per calendar day for each calendar day, or partial day thereof, that the work is not fully completed. For projects in combination, these damages will be charged in full for failure to complete one or more projects within the specified contract completion date or calendar days.

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

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

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

1.1 Maintaining Work Zones and Work Zone Reviews. The Work Zone Specialist (WZS) shall maintain work zones in accordance with Sec 616.3.3 and as further stated herein. The WZS shall coordinate and implement any changes approved by the engineer. The WZS shall ensure all traffic control devices are maintained in accordance with Sec 616, the work zone is operated within the hours specified by the engineer and will not deviate from the specified hours without prior approval of the engineer. The WZS is responsible 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.

2.6 Traffic Management Center (TMC) Coordination. The Work Zone Specialist (WZS) or their designee shall contact by phone the MoDOT Traffic Management Center (KC Scout TMC at #816-347-2250 or Gateway Guide TMC at #314-275-1513) within five minutes of a lane or ramp closure

beginning and within five minutes of a lane or ramp closure being removed. The WZS shall make this phone call 24 hours a day, 365 days of the year since the MoDOT Traffic Management Centers are always staffed.

3.0 Work Hour Restrictions.

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

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

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

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

3.1.2 World Cup. Two lanes and all shoulders in each direction on Route 71 shall be scheduled to be open to traffic from 12:00 noon Tuesday June 9th, 2026 to 7:00 p.m. Tuesday, July 16th, 2026 for the World Cup. This traffic will utilize the ramps, and Bannister Road will be closed. No short-term closures or traffic shifts for US 71 traffic will be allowed during this period. All construction equipment shall remain clear of traffic and all traffic control related items, including signs, shall remain in place and shall not be moved or relocated during this period as directed by the engineer.

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

3.3 The contractor shall 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 contractor's 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.

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Two lanes and all shoulders in each direction on US 71 shall be open to traffic and no lane restrictions, short-term closures or traffic shifts for US 71 traffic will be allowed during the following listed hours:

Route 71 Mainline, Ramps, Northbound and Southbound:
6:00 a.m. - 9:00 p.m. Monday through Friday

3.4 Any work requiring a reduction in the number of through lanes of traffic shall be completed during nighttime hours. Nighttime hours shall be considered to be 9:00 p.m. to 6:00 a.m. for this project.

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 \$1000 per 15 minute increment for each 15 minutes that the temporary lane closures are in place and not open to traffic in excess of the limitation as specified elsewhere in this special provision. It shall be the responsibility of the engineer to determine the quantity of unapproved closure time.

3.5.1 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. If a CMS with Communication Interface is required, then the CMS shall be capable of communication prior to installation on right of way. All messages planned for use in the work zone shall be approved and authorized by the engineer or its designee prior to deployment. When permanent dynamic message signs (DMS) owned and operated by MoDOT are located near the project, they may also be used to provide warning and information for the work zone. Permanent DMS shall be operated by the TMC, and any messages planned for use on DMS shall be approved and authorized by the TMC at least 72 hours in advance of the work.

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

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

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

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

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

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

Missouri Highway Patrol 816-622-0800		
City of Kansas City		
Fire: 816-513-4000		
Police: 816-234-5000		

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

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

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

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

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

Thankam Mathew, Project Contact
Kansas City District
600 NE Colbern Rd.
Lee's Summit, MO 64086

Telephone Number: 816-607-2047
Email: thankam.mathew@modot.mo.gov

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

Steve Sandifer, Resident Engineer
Kansas City District
9400 E. 43 RD Street
Kansas City, MO 64133

Telephone Number: 816-353-8353
Email: Steveen.Sandifer@modot.mo.gov

F. Supplemental Revisions JSP-18-01JJ

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

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

- Stormwater Compliance Requirements

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

1.1 Definitions. The project site is defined as all areas designated on the plans, including temporary and permanent easements. The project site is equivalent to the “permitted site”, as defined in MoDOT’s State Operating Permit. An Off-site area is defined as any location off the project site the contractor utilizes for a dedicated project support function, such as, but not limited to, staging area, plant site, borrow area, or waste area.

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

disturbance. The Contractor is responsible for obtaining its own separate land disturbance permit for Off-site areas.

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

2.1 Duties of the WPCM:

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

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

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

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

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

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

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

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

106.9 Buy America Requirements.

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

106.9.1 Buy America Requirements for Iron and Steel.

On all federal-aid projects, the contractor's attention is directed to Title 23 CFR 635.410 *Buy America Requirements*. Where steel or iron products are to be permanently incorporated into the contract work, steel and iron material shall be manufactured, from the initial melting stage through the application of coatings, in the USA except for "minimal use" as described herein. Furthermore, any coating process of the steel or iron shall be performed in the USA. Under a general waiver from FHWA the use of pig iron and processed, pelletized, and reduced iron ore manufactured outside of the USA will be permitted in the domestic manufacturing process for steel or iron material.

106.9.1.1 Buy America Requirements for Iron and Steel for Manufactured items.

A manufactured item will be considered iron and steel if it is "predominantly" iron or steel. Predominantly iron or steel means that the cost of iron or steel content of a product is more than 50 percent of the total cost of all its components.

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

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

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

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

106.9.4.2 Items designated as Category 2 will include all other steel or iron products not in Category 1 and permanently incorporated in the project. Category 2 items shall consist of, but not be limited to items such as fencing, guardrail, signing, lighting and signal supports. The prime contractor is required to submit a material of origin form certification prior to incorporation into the project from the fabricator for each item that the product is domestic. The Certificate of Materials Origin form ([link to certificate form](#)) from the fabricator must show all steps of manufacturing, including coating, as being completed in the United States and in accordance with CFR Title 23 Section 635.410 Buy America Requirements and be signed by a fabricator representative. The engineer reserves the right to request additional information and documentation to verify that all Buy America requirements have been satisfied. These documents shall be submitted upon request by the engineer and retained for a period of 3 years after the last reimbursement of the material.

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

Requirements. Any foreign steel used was submitted and accepted under minor usage". The certification shall be signed by an authorized representative of the prime contractor.

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

106.9.6 Buy America Requirements for Construction Materials other than iron and steel materials. Construction materials means articles, materials, or supplies that consist of only one of the items listed. Minor additions of articles, materials, supplies, or binding agents to a construction material do not change the categorization of the construction material. Upon request by the engineer, the contractor shall submit a domestic certification for all construction materials listed that are incorporated into the project.

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

106.9.6.1 Minimal Use allowance for Construction Materials other than iron or steel.

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

106.9.7 Buy America Requirements for Manufactured Products.

Manufactured products means:

- (a) Articles, materials, or supplies that have been:
 - (i) Processed into a specific form and shape; or
 - (ii) Combined with other articles, materials, or supplies to create a product with different properties than the individual articles, materials, or supplies.
- (b) If an item is classified as an iron or steel product, a construction material, or a section 70917(c) material under § 184.4(e) and the definitions set forth in this section, then it is not a manufactured product. However, an article, material, or supply classified as a manufactured product under § 184.4(e) and paragraph (1) of this definition may include components that are construction materials, iron or steel products, or section 70917(c) materials.

106.9.7.1 Manufactured products are exempt from Buy America requirements. To qualify as a manufactured product, items that consist of two or more of the listed construction materials that have been combined together through a manufacturing process, and items that include at least

one of the listed materials combined with a material that is not listed through a manufacturing process, should be treated as manufactured products, rather than as construction materials.

106.9.7.2 Manufactured items are covered under a general waiver to exclude them from Buy America Requirements. To qualify for the exemption the components must comprise of 55% of the value of materials in the item. The final assembly must also be performed domestically.

- Third-Party Test Waiver for Concrete Aggregate

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

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

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

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

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

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

3.1 The testing facility shall be AASHTO accredited.

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

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

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

3.3 Results, no more than five years old, from the third-party test facility shall compare within ± 2.0 percent of an independent test from another AASHTO accredited test facility or with MoDOT test records, in order to be approved for use (e.g. test facility results in a durability factor of 79, MoDOT's recent durability test factor is 81; this compared within +2 percent). The independent

testing facility shall be in accordance with this provision. The comparison test can be from a different sample of the same ledge combination.

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

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

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

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

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

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

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

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

G. Liquidated Damages Specified JSP-93-28A

1.0 Description. If long term closures on Route 71, Bannister Road, and surrounding local street network are not complete and open to traffic in a timely manner, the Commission, the traveling

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public, and state and local police and governmental authorities will be damaged in various ways, including but not limited to, increased construction administration cost, potential liability, traffic and traffic flow regulation cost, traffic congestion and motorist delay, with its resulting cost to the traveling public. These damages are not reasonably capable of being computed or quantified. Therefore, the contractor will be charged with liquidated damages specified in the amount of \$7,600 per day for each full day that the defined activity is not complete and 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 excess closure time.

Location	Calendar Days	Daily Road User Cost
Bannister Road Closure	104	\$ 1500
Route 71 Bridge Closure	104	\$ 3000

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

H. Alternates for Pavements JSP-96-04G

1.0 Description. This work shall consist of a pavement composed of either portland cement concrete or asphaltic concrete, constructed on a prepared subgrade in accordance with the standard specifications and in conformity with the lines, grades, thickness and typical cross sections shown on the plans or established by the engineer.

1.1 Separate pay items, descriptions and quantities are included in the itemized proposal for each of the alternates. The bidder shall only bid one of the alternates and leave the contract unit price column blank for any pay item listed for any other alternate. If the bidder leaves any value in the unit price column for another alternate other than the one they are bidding, the bid will be rejected.

2.0 Mainline Pavements

2.0.1 A sum of **\$559,600** will be added by the Commission to the total bid using an asphalt alternate for the Alternate A pavement for bid comparison purposes to factor in life cycle cost analysis of the roadway. The additional amount added will not represent any additional payment to be made to the successful bidder and is used only for determining the low bid.

2.0.2 A sum of **\$80,600** will be added by the Commission to the total bid using an asphalt alternate for the Alternate E pavement for bid comparison purposes to factor in life cycle cost analysis of the roadway. The additional amount added will not represent any additional payment to be made to the successful bidder and is used only for determining the low bid.

2.1 A2 Shoulders

2.1.1 A sum of **\$91,800** will be added by the Commission to the total bid using an asphalt A2 Shoulder alternate for the Alternate C pavement for bid comparison purposes to factor in life cycle cost analysis of the roadway. The additional amount added will not represent any additional payment to be made to the successful bidder and is used only for determining the low bid.

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2.1.2 A sum of **\$5,000** will be added by the Commission to the total bid using an asphalt A2 Shoulder alternate for the Alternate G pavement for bid comparison purposes to factor in life cycle cost analysis of the roadway. The additional amount added will not represent any additional payment to be made to the successful bidder and is used only for determining the low bid.

2.2 The quantities shown for each alternate reflect the total square yards of pavement surface designated for alternate pavement types as computed and shown on the plans. No additional payment will be made for asphaltic concrete mix quantities to construct the required 1:1 slope along the edge of the pavement, or for tack applied between lifts of asphalt.

2.3 The grading shown on the plans was designed for the (*thicker asphalt*) pavement alternate.

2.4 Pavement alternates composed of Portland cement concrete shall have contrast pavements for intermittent markings (skips), dotted lines, and solid intersection lane lines. The pavement markings shall comply with Sec 620. No additional payment will be for the contrast pavement markings.

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

4.0 Basis of Payment. The accepted quantity of the chosen alternate and other associated items will be paid for at the unit price for each of the appropriate pay items included in the contract.

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

4.2 For projects with grading in the contract, there will be no adjustment of the earthwork quantities due to adjusting the roadway subgrade for alternate pavements.

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

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

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

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

2.1 The ADA Checklist is not to be considered all-inclusive, nor does it supersede any other contract requirements. The ADA checklist is a required guide for the contractor to use during the construction of the pedestrian facilities and a basis for the commission's acceptance of work. Prior to work being performed, the contractor shall bring to the engineer's attention any planned work that is in conflict with the design or with the requirement shown in the checklist. This notification

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shall be made in writing. Situations may arise where the checklist may not fully address all requirements needed to construct a facility to the full requirements of current ADA law. In those situations, the contractor shall propose a solution to the engineer that is compliant with current ADA law using the following hierarchy of resources: 2010 ADA Standards for Accessible Design, Draft Public Rights of Way Accessibility Guidelines (PROWAG) dated November 23, 2005, MoDOT's Engineering Policy Guidelines (EPG), or a solution approved by the U.S. Access Board.

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

3.0 Coordination of Construction.

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

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

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

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

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

5.0 Basis of Payment. The contractor will receive full pay of the contract unit cost for all sidewalk, ramp, curb ramp, median, island, approach work, cross walk striping, APS buttons, pedestrian heads, detectible warning systems and temporary traffic control measures that are completed during the current estimate period as approved by the engineer. Based upon completion of the ADA Checklist, the contractor shall complete any necessary adjustments to items deemed non-compliant as directed by the engineer.

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

J. Utilities JSP-04-10

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>
<u>Google Fiber</u> Jordan Weibel 908 Broadway Blvd, 6 th floor Email: kc-google-uc@google.com	None	Communications
<u>AT&T Distribution</u> Shane Jarman 507 East Main Street Union, MO 63084 Phone: 816-944-9428 Email: sj3085@att.com Mark Manion Sr Specialist OSP design engineering 2121 E 63rd St Kansas City, MO 64130 Skype: 816-772-0267 Phone: 816-214-2322 Email: mm256t@att.com	None	Communications
<u>KCMO PW Street Lighting</u> Mahmoud Hadjian, PE, ENV SP, MBA Division Manager / Assistant City engineer Public Works Engineering Division City of Kansas City, Mo. 5310 Municipal Avenue, Kansas City, Missouri 64120 Phone: 816-438-6302 Email: mahmoud.hadjian@kcmo.org	None	Power
<u>KCMO WS Water</u> Melanie Jollett, P.E. Water Distribution Division Head Engineering City of Kansas City, Mo. 4800 E. 63rd St. Kansas City, MO 64130 Phone: 816-513-0154 Email: melanie.jollett@kcmo.org	None	Water

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<p><u>Evergy</u> Jasper Mirabile General Design/Planning Phone: 816-585-3479 Email: jasper.mirabile@evergy.com</p>	None	Power
<p><u>Spire Energy (MGE)</u> Chris Collins Area Manager - Construction Engineer 7500 E 35th Terrace Kansas City, MO 64129 Phone: 816-509-4400 Email: chris.collins@spireenergy.com</p>	None	Gas
<p><u>MoDOT Scout</u> York Morlan KC Scout Locator Email: york.morlan@modot.mo.gov Phone: 816-985-0884 Scout - 600 NE Colbern Road, Lee's Summit, MO 64086</p>	To be relocated as shown in plans	Communications
<p><u>UPN/SEGRA Fiber</u> Samuel Vohsen Phone: 816-814-9768 Email: upngis@upnfiber.com Email: fibermanagement@segrafiber.com</p> <p>Brandon Myer Construction Manager Phone: 816-206-4257 Email: brandon.myer@segrafiber.com</p>	None	Communications
<p><u>Verizon Communications Inc</u> Joe Bullimore Jr Sr Engr Spec-Outside Plant Network Engineering and Ops Phone: 913-609-1024 10740 Nall Ave Suite 400 Overland Park, Kansas 66211 Email: joseph.bullimore@verizon.com</p>	None	Communications

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

2.0 Project Specific Provisions:

AT&T Distribution – Do not disturb existing facilities that are buried under the existing culvert H00336 removal and extension near Ramp Q. Depths available upon request.

Google Fiber - Contractor must contact Google Fiber at least 2 weeks prior to construction of the storm sewer on the south side of Route W (Bannister Road). A representative from Google Fiber will be on site during construction to monitor and protect the utility in the area of the storm sewer. Depths available upon request.

KCMO PW Street Lighting / SEGRA – SEGRA fiber is inside KCMO owner conduit. Contractor must contact KCMO / SEGRA at least 2 weeks prior to construction of the storm sewer on the south side of Route W (Bannister Road). A representative from KCMO will be on site during construction to monitor and protect the utility in the area of the storm sewer. Depths available upon request.

K. Disposition of Existing Signal and Lighting Equipment JSP-15-05A

1.0 Description. All controllers, cabinets, cabinet equipment, network equipment, DMS equipment, antennas, radios, modems, and other equipment noted in the plans shall be removed by the contractor and delivered to the following location:

Mr. Christopher Divine
9101 E. 40th Terrace
Kansas City, MO 64086
816-564-3123

2.0 Signal Equipment. All equipment {or specific equipment listed here} other than network communication devices noted in 3.0 are to be transported to the address listed above. The contractor shall notify the Commission's representative 24 hours prior to each delivery by calling the phone number listed above and ask for the field traffic supervisor.

3.0 Network Communication Devices. Devices such as CCTV cameras and domes, video encoders, device servers, Ethernet switches, media converters, and radio assemblies are to be transported to the address listed below. The contractor shall notify the Commission's representative 24 hours prior to each delivery by calling phone number listed below and providing details for the delivery.

Mr. Christopher Divine
9101 E. 40th Terrace
Kansas City, MO 64086
Phone: 816-564-3123

4.0 The contractor shall exercise reasonable care in the handling of the equipment during the removal and transportation. Should any of the equipment be damaged by the contractor's negligence, it shall be replaced at the contractor's expense. The contractor shall dispose of any other equipment. Delivery shall be within 2 working days of removal. All items returned shall be tagged with the date removed, project number and location/intersection.

5.0 Basis of Payment. Payment for removal, handling and transportation of all equipment specified shall be considered completely covered by the contract unit price for 202-20.10, Removal of Improvements, per lump sum.

L. Removal and Disposal of Existing Signs JSP-12-01C

1.0 Description. All Commission-owned signs removed from the project shall be disassembled, stored, transported, and disposed of as specified herein. Sign supports, structures and hardware removed from the project shall become the property of the contractor.

2.0 Disassembly and Delivery.

2.1 All Commission-owned signs, (excluding abandoned billboard signs), designated for removal in the plans, or any other signs designated by the Engineer, shall be removed from the sign supports and structures, disassembled, stored, transported, and delivered by the contractor to the recycling center for destruction.

2.2 The contractor shall coordinate and make arrangements with the recycling center for delivery of the signs. Sign panels shall be disassembled and/or cut into sizes as required by the recycling center.

2.3 The contractor shall provide the Engineer with a "Sign Delivery Certification" attesting to completion of delivery of all existing sign material from the project to the recycler. In addition, the contractor shall provide to the Engineer a final "Sign Certification of Destruction" from the recycler that documents the total pounds of scrap sign material received from the project and attests that all such material will not be re-purposed and will be destroyed in a recycling process. The contractor can locate the required certification statements from the Missouri Department of Transportation website:

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

2.4 Funds received from the disposal of the signs from the recycling center shall be retained by the Contractor.

3.0 Basis of Payment. All costs associated with removing, disassembling and/or cutting, storing, transporting, and disposing of signs shall be considered as completely covered by the contract unit price for Item No. 202-20.10, "Removal of Improvements", per lump sum.

M. Fiber Optic Cable, Installation, and Hardware

1.0 General. All fiber optic (F/O) cable required for this project shall be all dielectric, gel filled, duct type, with loose buffer tubes and shall conform to these special provisions. The fiber optic cables shall connect the ITS field equipment such as Closed Circuit Television (CCTV) Cameras and Dynamic Message Signs (DMS) to the aggregators and bandwidth managers via the communications backbone cable. The Single Mode Fiber Optic (SMFO) fibers shall contain single mode (SM) dual-window (1310 nm and 1550 nm) fibers.

The optical fibers shall be contained within loose buffer tubes. The loose buffer tubes shall be stranded around an all dielectric central member. Aramid yarn and/or fiberglass shall be used as a primary strength member, and a polyethylene outside jacket shall provide for overall protection.

Fiber optic cables shall be provided and installed as shown in the plans and specifications. The fiber optic cable shall be installed with a minimum number of splices. No additional splice vault locations will be permitted. The contractor shall utilize the maximum cable lengths possible and avoid additional splices in the backbone 24 count cable.

All fiber optic cable on this project shall be from the same manufacturer, who is regularly engaged in the production of this material. If availability and delivery schedule does not allow fiber optic cable to be from the same manufacturer, multiple manufacturers may be used if approved by the engineer.

The fiber optic cable shall be qualified as compliant with Chapter XVII, Title 7, Part 1755.900 of the Code of Federal Regulations, "REA specification for filled fiber optic cables".

Each buffer tube shall be terminated in its own splice tray and each tray shall contain a maximum of 12 splices. Pictures must be taken of each fiber splice enclosure when all work has been completed and that documentation must be submitted to the engineer along with OTDR traces. The first splice location must be inspected and approved by the engineer and Scout technical staff before the contractor continues with fiber optic cable splicing.

1.1 Material. Each optical fiber shall be made of glass that is manufactured by Corning or licensed by Corning and consist of a doped silica core surrounded by concentric silica cladding. All fibers in the buffer tube shall be usable fibers and shall be sufficiently free of surface imperfections and inclusions to meet the optical, mechanical, and environmental requirements of these specifications.

The individual fiber coating shall be a dual layered, UV cured acrylate. The coating shall be mechanically or chemically strippable without damaging the fiber.

The cable shall comply with the optical and mechanical requirements over an operating temperature range of -40° F. to +158° F. The cable shall be tested in accordance with EIA-455-3A (FOTP-3), "Procedure to Measure Temperature Cycling Effects on Optical Fiber, Optical Cable, and Other Passive Fiber Optic Components." The attenuation shall be measured at 1310 nm and 1550 nm.

Fibers within the finished cable shall meet the requirements in the following table:

Fiber Characteristics Table

Parameters	Value
Mode	Single
Type	Step Index
Core diameter	8.3 μm (nominal)
Cladding diameter	125 μm ±1.0 μm
Core to Cladding Offset	≤ 0.6 μm
Coating Diameter	245 μm ±10 μm

Cladding Non-circularity defined as: $\frac{[1 - (\text{min. cladding dia} \div \text{max. cladding dia.})] \times 100}{1}$	$\leq 1.0\%$
Proof/Tensile Test	100 kpsi, min.
Attenuation @ 1,310 nm	≤ 0.40 dB/km
Attenuation @ 1,550 nm	≤ 0.35 dB/km
Attenuation at the Water Peak	≤ 2.1 dB/km @ 1383 \pm 3nm
Chromatic Dispersion:	
Zero Dispersion Wavelength	1301.5 to 1321.5 nm
Zero Dispersion Slope at zero dispersion wavelength	≤ 0.092 ps/(nm ² *km)
Maximum Dispersion:	3.3 ps/(nm*km) for 1285 - 1330 nm <18 ps/(nm*km) for 1550 nm
Cut-Off Wavelength	<1260 nm
Mode Field Diameter (Petermann II)	9.3 \pm 0.5 μ m at 1310 nm 10.5 \pm 1.0 μ m at 1550 nm

1.2 Color Coding. Optical fibers shall be distinguishable from others in the same buffer tube by means of color coding according to the following:

1. Blue (BL)	5. Slate (SL)	9. Yellow (YL)
2. Orange (OR)	6. White (WT)	10. Violet (VL)
3. Green (GR)	7. Red (RD)	11. Rose (RS)
4. Brown (BR)	8. Black (BK)	12. Aqua (AQ)

The colors shall be targeted in accordance with the Munsell color shades and shall meet EIA/TIA-598A "Color Coding of Fiber Optic Cables." The color formulation shall be compatible with the fiber coating and the buffer tube filling compound and be heat stable. It shall not fade or smear or be susceptible to migration and it shall not affect the transmission characteristics of the optical fibers and shall not cause fibers to stick together.

1.3 Cable Construction. The fiber optic cable shall consist of, but not be limited to, the following components:

- A. Buffer tubes
- B. Central member
- C. Filler rods if needed
- D. Stranding
- E. Core and cable flooding
- F. Tensile strength member
- G. Ripcord
- H. Outer jacket
- I. Glass fibers as described above

1.3.1 Buffer Tubes. Loose buffer tubes shall provide clearance between the fibers and the inside of the tube to allow for expansion without constraining the fiber. The fibers shall be loose or suspended within the tubes and shall not adhere to the inside of the tube.

The loose buffer tubes shall be extruded from a material having a coefficient of friction sufficiently low to allow free movement of the fibers. The material shall be tough and abrasion resistant to

provide mechanical and environmental protection of the fibers yet designed to permit safe intentional "scoring" and breakout, without damaging or degrading the internal fibers.

Buffer tube filling compound shall be a homogenous hydrocarbon-based gel with antioxidant additives. It shall prevent water intrusion and migration. The filling compound shall be non-toxic and dermatologically safe to exposed skin. It shall be chemically and mechanically compatible with all cable components, non-nutritive to fungus, non-hydroscopic and electrically non-conductive. The filling compound shall be free from dirt and foreign matter and shall be readily removable with conventional nontoxic solvents.

Buffer tubes shall be stranded around a central member by a method, such as the reverse oscillation stranding process that will prevent stress on the fibers when the cable jacket is placed under strain.

Each buffer tube shall be distinguishable from other buffer tubes in the cable by using the same color coding as specified above for fibers.

1.3.2 Central Member. The central member, which functions as an anti-buckling element, shall be a glass reinforced plastic rod with similar expansion and contraction characteristics as the optical fibers and buffer tubes. To provide the proper spacing between buffer tubes during stranding, a symmetrical linear overcoat of polyethylene may be applied to the central member to achieve the optimum diameter.

1.3.3 Filler rods. Fillers may be included in the cable cross-section. Filler rods shall be solid medium or high-density polyethylene. The diameter of filler rods shall be the same as the outer diameter of the buffer tubes.

1.3.4 Stranding. Completed buffer tubes shall be stranded around the overcoated central member using stranding methods, lay lengths and positioning such that the cable shall meet mechanical, environmental and performance specifications. A polyester binding shall be applied over the stranded buffer tubes to hold them in place. Binders shall be applied with sufficient tension to secure the buffer tubes to the central member without crushing the buffer tubes. The binders shall be non-hydroscopic, non-wicking (or rendered so by the flooding compound), and dielectric with low shrinkage.

1.3.5 Core and Cable Flooding. The cable core interstices shall be filled with a polyolefin based compound to prevent water ingress and migration. The flooding compound shall be homogeneous, non-hydroscopic, electrically non-conductive, and non-nutritive to fungus. The compound shall also be nontoxic, dermatologically safe and compatible with all other cable components.

1.3.6 Tensile Strength Member. Tensile strength shall be provided by high tensile strength aramid yarns and/or fiberglass which shall be helically stranded evenly around the cable core and shall not adhere to other cable components.

1.3.7 Ripcord. The cable shall contain at least one ripcord under the jacket for easy sheath removal.

1.3.8 Outer jacket. The jacket shall be free of holes, splits, and blisters and shall be medium or high density polyethylene (PE), or medium density cross-linked polyethylene with minimum nominal jacket thickness of 37 mils. Jacketing material shall be applied directly over the tensile

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strength members and flooding compound and shall not adhere to the aramid yarn strength material. The polyethylene shall contain carbon black to provide ultraviolet light protection and shall not promote the growth of fungus. The jacket or sheath shall be marked with the manufacturer's name, the words "Optical Cable" or "Fiber Optic Cable", the number of fibers, "SM" or "Single Mode", year of manufacture, and sequential measurement markings every 3 feet. The actual length of the cable shall be within 1 percent of the length marking. The marking shall be in a contrasting color to the cable jacket (Yellow or White are preferred). The height of the marking shall be approximately 2.5 mm (.098 inch).

1.4 General Cable Performance Specifications. The fiber optic cable shall withstand water penetration when tested with a one-meter static head or equivalent continuous pressure applied at one end of a one-meter length of filled cable for one hour. No water shall leak through the open cable end. Testing shall be done in accordance with EIA-455-82A (FOTP-82), "Fluid Penetration Test for Fluid-Blocked Fiber Optic Cable."

A representative sample of cable shall be tested in accordance with EIA-455-81B (FOTP-81), "Compound Flow (Drip) Test for Filled Fiber Optic Cable". No preconditioning period shall be conducted. The cable shall exhibit no flow (drip or leak) at 176° F as defined in the test method.

Crush resistance of the finished fiber optic cables shall be 220 N/cm applied uniformly over the length of the cable without showing evidence of cracking or splitting when tested in accordance with EIA-455-41A (FOTP-41), "Compressive Loading Resistance of Fiber Optic Cables". The average increase in attenuation for the fibers shall be ≤ 0.10 dB/km at 1550 nm for a cable subjected to this load. The cable shall not exhibit any measurable increase in attenuation after removal of load. Testing shall be in accordance with EIA-455-41A (FOTP-41), except that the load shall be applied at the rate of 3 mm to 20 mm per minute and maintained for 10 minutes.

The cable shall withstand 25 cycles of mechanical flexing at a rate of 30 ± 1 cycles/minute. The average increase in attenuation for the fibers shall be ≤ 0.20 dB/km at 1550 nm at the completion of the test. Outer cable jacket cracking or splitting observed under 10x magnification shall constitute failure. The test shall be conducted in accordance with EIA-455-104A (FOTP-104), "Fiber Optic Cable Cyclic Flexing Test," with the sheave diameter a maximum of 20 times the outside diameter of the cable. The cable shall be tested in accordance with Test Conditions I and II of (FOTP-104). Impact testing shall be conducted in accordance with EIA-455-25B (FOTP-25) "Impact Testing of Fiber Optic Cables and Cable Assemblies." The cable shall withstand 20 impact cycles. The average increase in attenuation for the fibers shall be ≤ 0.20 dB/km at 1550 nm. The cable jacket shall not exhibit evidence of cracking or splitting.

The finished cable shall withstand a tensile load of 2669 N (600 lbs.) without exhibiting an average increase in attenuation of greater than 0.20 dB. The test shall be conducted in accordance with EIA-455-33A (FOTP-33), "Fiber Optic Cable Tensile Loading and Bending Test." The load shall be applied for one-half hour in Test Condition II of the EIA-455-33A (FOTP-33) procedure.

1.5 Packaging and Shipping Requirements. Documentation of compliance to the required specifications shall be provided to the engineer prior to ordering the material.

Attention is directed to "Fiber Optic Testing," in Section 3.5 of these special provisions.

The completed cable shall be packaged for shipment on reels. The cable shall be wrapped in weather and temperature resistant covering. Both ends of the cable shall be sealed to prevent the ingress of moisture.

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Each end of the cable shall be securely fastened to the reel to prevent the cable from coming loose during transit. Six feet of cable length on each end of the cable shall be accessible for testing. The complete outer jacket marking shall be visible on this six feet of cable length.

Each cable reel shall have a durable weatherproof label or tag showing the manufacturer's name, the cable type, the actual length of cable on the reel, the contractor's name, the contract number, and the reel number. A shipping record shall also be included in a weatherproof envelope showing the above information and also include the date of manufacture, cable characteristics (size, attenuation, bandwidth, etc.), factory test results, cable identification number and any other pertinent information.

The minimum hub diameter of the reel shall be at least thirty times the diameter of the cable. The F/O cable shall be in one continuous length per reel with no factory splices in the fiber. Each reel shall be marked to indicate the direction the reel should be rolled to prevent loosening of the cable.

Installation procedures and technical support information shall be furnished at the time of delivery.

2.0 Cable Installation. The contractor shall submit for review the planned procedures for pulling and or blowing the fiber optic cable to the engineer for review and approval at least 20 working days prior to installing cables. Mechanical aids may be used to assist cable installation.

If cable is pulled a tension measuring device or break away swivel shall be incorporated into the pulling line and attached to the cable, to ensure that the tension does not exceed 2669N (600lb). The cable grips for installing fiber optic cable shall have a ball bearing swivel attached to prevent the cable from twisting during installation. Pulling of fiber optic cable shall be with even tension. F/O cable ends shall be properly sealed during installation.

The breakaway tension limiting device shall be set to release at or below the manufacturer's maximum recommended pulling tension. One break away tension limiting device is required for each cable being pulled.

During cable installation, the bend radius shall be maintained at a minimum of twenty times the outside diameter of the cable. The cable shall not be stressed beyond the minimum bend radius at any time during installation and handling.

Fiber optic cable shall be installed using a cable pulling lubricant recommended by the fiber optic cable manufacturer and/or the inner duct or conduit manufacturer and a non-abrasive pull tape conforming to the provisions described under "Conduit" elsewhere in these special provisions. When lubricant is used, lubricant shall cover the fiber optic cable for entire pull.

Fiber optic cable shall be installed without splices except where specifically allowed on the plans or described in these special provisions. The fiber optic cables shall be spliced only at splice vault/handholes associated with bandwidth managers, aggregators, CCTV camera sites, DMS sites, radar detector sites or other VDS sites, unless shown otherwise in the plans. The engineer may allow additional splices between these specified locations. The slack shall be divided equally on each side of the splice enclosure.

Six feet of slack fiber optic cable shall be provided in all splice vaults/handholes that do not contain splices unless noted otherwise on the plans. At splice vaults/handholes that contain splices 50

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feet of slack fiber shall be provided on each side of the splice enclosure. At cabinet assemblies, 50 feet of slack fiber shall be stored in the adjacent splice vaults/handholes and 10 feet stored within the cabinet and fiber distribution unit.

The contractor shall record sequential markings at all splice vault/handholes. The contractor shall, after pulling, cut off and discard the first 10 feet of the fiber optic cable. This 10 feet has not been included in the conduit and cable routing tables on the plan sheets and shall be considered incidental to other items of work. The contractor shall account for this length. The remaining cable length in the splice vault/handhole must meet the slack cable length requirements.

Following installation of the cable in conduit, all conduit entrances in cabinet assemblies, pull boxes and splice vault/handholes shall be sealed with duct plugs and sealing compound to prevent the ingress of moisture, foreign materials and rodents. No residual tension should remain on the cable after installation, except the weight of the cable.

2.1 Splicing. The contractor shall submit a splicing plan for the engineer's review and approval. Approval of the splicing plan shall occur prior to any installation of fiber optic cable. The contractor's splicing plan shall include all information shown in the splicing diagrams, included in the plans, and be in a similar format.

The contractor shall cut only the fibers to be terminated/spliced at a location according to the design plans. Unused fibers or fibers that are continuous through a splice location are to be coiled, labeled and left loose in the tray.

Optical fibers shall be spliced using the fusion type method. Alignment shall be via fiber cores and not via fiber diameters. Mechanical splices shall not be permitted.

Splice losses shall average less than or equal to 0.05 dB/splice between any two optical ports and shall not exceed 0.10 dB for any splice.

The completed splices shall be placed in a splice tray. The splice tray shall then be placed in the splice enclosure.

Termination splices shall join the fibers in the fiber optic cable span to the fibers in pigtails. The termination splices shall be placed in a splice tray and the splice tray(s) shall then be placed in the fiber distribution unit (FDU). The individual fibers shall be looped a minimum of one full turn within the splice tray to avoid micro bending. A 51 mm (2 inches) minimum bend radius shall be maintained during installation and after placing in the optical fiber splice tray. Each fiber shall be individually restrained in a splice tray. The optical fibers in buffer tubes and the placement of the optical fibers in the splice tray shall be such that there is no discernable tensile force on the optical fiber.

All splices shall be protected with a thermal shrink sleeve.

All fiber cables shall be labeled in the cabinet assemblies and splice vault/handholes with permanent vinyl markers. Labels shall identify the destination cabinet assembly number or splice vault/handhole number of the fiber. Pigtail ends shall also be labeled to identify the destination cabinet assembly number or splice vault/handhole number of the fiber.

3.0 Passive Cable Assemblies and Components. The fiber optic cable assemblies and components shall be compatible components, designed for the purpose intended, and

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manufactured by a company regularly engaged in the production of material for the fiber optic industry. All components or assemblies shall be best quality, non-corroding, with a design life of at least 20 years. All components or assemblies of the same type shall be from the same manufacturer.

3.1 General. Fiber optic cable terminations shall include pigtails and jumpers. Breakout cables shall comply with the specifications for pigtails.

All components shall be the size and type required for the specified fiber.

All fiber optic cable on this project shall be from the same manufacturer, who is regularly engaged in the production of this material.

3.2 Fiber Optic Splice Enclosures. The fiber optic splice enclosure (also referred to as simply "closures") shall consist of an outer enclosure, an inner enclosure and splice trays, and shall conform to the following special provisions.

The fiber optic splice enclosure shall be designed for a temperature range of -40° F. to +158° F. The fiber optic splice enclosure shall be designed for splice vault/handhole applications. The splice enclosure shall and have enough room for up to 144 splices and shall have a minimum length of 28 inches and a minimum diameter of 6.6 inches. The enclosures shall be designed for cable entrance into the end of the enclosure.

All materials in the enclosures shall be non-reactive and shall not support galvanic cell action. The outer enclosure shall be compatible with the other enclosure components, the inner enclosure, splice trays, and cables.

The outer enclosure shall protect the splices from mechanical damage, shall provide strain relief for the cable, and shall be resistant to salt corrosion. The outer enclosure shall be waterproof, and re-enterable, corrosion resistant, rodent proof, and air tight. The outer enclosure shall be flash-tested at 103 kPa. (15 psi.). The inner enclosure shall be of metallic construction.

The inner enclosure shall be compatible with the outer enclosure and the splice trays and shall allow access to and removal of individual splice trays.

The splice trays shall be constructed of rigid plastic or metal.

Adequate splice trays shall be provided to splice all fibers entering the enclosure, plus 12 additional fibers.

The contractor shall install the fiber optic splice enclosure in the splice vault/handholes where splicing is required. The fiber optic splice enclosures shall be securely fastened to the splice vault/handhole using standard hardware. The contractor shall provide all mounting hardware required to securely mount the enclosures to the splice vault/handhole.

The fiber optic splice enclosure shall be mounted in a manner that allows the cables to enter at the end of the enclosure without exceeding the minimum bending radius specification for any of the cables contained within the splice vault/handhole. A vertical mounting bracket made for the splice enclosure shall be installed and the splice enclosure shall be securely strapped to that mounting bracket.

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Upon completion of the splices, the splice trays shall be secured to the inner enclosure. The enclosure shall be sealed using a procedure recommended by the manufacturer that will provide a waterproof environment for the splices.

Care shall be taken at the cable entry points to ensure a tight waterproof seal is made which will not leak upon aging. It is acceptable to have multiple pigtail-fibers enter the fiber optic splice enclosure through one hole as long as all spaces between the cables are adequately sealed.

3.3 Fiber Optic Cable Assemblies. Cable assemblies (jumpers and pigtails) shall be products of the same manufacturer. The cable used for cable assemblies shall be made of fiber meeting the performance requirements of these special provisions for the fiber optic cable being connected, except that the operating temperature shall be modified to -4° F. to +158° F. Manufacturer's attenuation test results shall be provided for all cable assemblies.

3.3.1 Pigtails. Pigtails shall be of simplex (one fiber) construction, in 900 micrometer tight buffer form, surrounded by aramid yarn for strength, with a connector on one end. The outer jacket shall be yellow PVC with a nominal diameter of 3 mm (.118 inch), marked with the manufacturer's identification information. All pigtails shall be at least one meter in length. Pigtails installed in conduit shall follow the installation procedures outlined for fiber optic cables, except that the pulling tension shall not exceed 890 N (200 lb.). Pigtail connectors shall be factory terminated. Field terminations shall not be permitted.

3.3.2 Jumpers. Jumpers may be of simplex or duplex design. Duplex jumpers shall be of duplex round cable construction and shall not have zip cord (Siamese) construction. All jumpers shall be at least 2 meters (6.5 feet) in length, sufficient to avoid stress and allow orderly routing. Jumpers shall have connectors on both ends.

The outer jacket of duplex jumpers shall be yellow. The two inner simplex jackets shall be contrasting colors to provide easy visual identification for polarity. Jumper connectors shall be factory terminated. Field terminations shall not be permitted.

3.3.3 Connectors. Connectors shall be of the type shown on the plans. No index-matching fluids, gels or anti-reflection coating shall be applied to the end of the fiber. The connector operating temperature range shall be -4°F to +158°F. Insertion loss shall not exceed 0.4 dB and the return reflection loss shall be at least 35 dB. Connection durability shall be less than a 0.2 dB change per 500 mating cycles per EIA-455-21A (FOTP-21). All terminations shall provide a minimum 222 N (50 lb.) pull out strength. The installed connector loss shall be less than 0.9 dB. Connectors shall have a yellow color body or boot.

All connectors installed on pigtails and jumpers shall be factory-installed and tested. Factory test results shall be documented and submitted to the engineer prior to installing any connectors. There shall be no installation of connectors in the field. All unmated connectors shall have protective caps installed.

3.4 Fiber Distribution Unit (FDU). The fiber distribution unit (FDU), also referred to as patch panels, shall be used to terminate fibers in the field termination cabinet assemblies including the CCTV camera and DMS cabinets. The terminations shall be SC-bulkhead connectors which match the fiber optic jumper cables used for connection to the optical termination equipment in the cabinet assembly. The units shall be rack mountable in an EIA 19-inch (482.6mm) rack and utilize 3U of rack space. The 3U fiber distribution units shall consist of a closet connector housing (CCH) and shall include two CCH panels at each FDU location. The FDU shall meet the

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requirements of ANSI/TIA/EIA-568-B and ANSI/TIA/EIA-606-A. The contractor shall leave enough fiber slack so the FDU can be removed and placed on a work table if needed. At all FDU locations, the contractor shall terminate all 12 fibers inside the fiber distribution unit located inside each ITS cabinet.

3.5 Fiber Optic Testing. The contractor shall test and document any fibers that are spliced and terminated at both ends. The contractor shall complete power meter and OTDR traces in both directions and document that those results meet the loss requirements listed above. The contractor shall complete a summary worksheet for each test and also provide the actual fiber trace for each test. The fiber trace shall be formatted and scaled so losses can be recognized when visually reviewing the fiber trace report. The contractor shall submit a proposed testing summary worksheet to the Engineer for review before any fiber splicing work begins on the project.

4.0 Method of Measurement. Measurement of fiber optic cable will be made to the nearest linear foot as shown on the plans. Contract quantities will be verified using the documented fiber sheath readings in and out of every fiber pull box and splice enclosure. Fiber optic splicing, testing and documentation will be measured as a lump sum pay item.

5.0 Basis of Payment. Accepted fiber optic cable will be paid for at the unit price for each of the pay items included in the contract. No direct payment will be made for pigtails, jumpers, or connectors, fiber optic splice closure, fiber optic distribution units, fiber distribution frames or any other incidental items necessary to complete the fiber splicing work unless specifically provided as a pay item in the contract. The contractor shall include all incidental items, fiber enclosures, mounting brackets, fiber installation, fiber splicing, fiber testing and documentation in the lump sum price for fiber splicing, testing, and documentation.

<u>Item No.</u>	<u>Type</u>	<u>Item Description</u>
910-83.54	LF	Fiber Optic Cable, 48-Strand, Single Mode
910-99.01	LS	Fiber Optic Splicing, Testing and Documentation

Scout ITS Conduits

1.0 General. These plans depict conduit routing in schematic form only. The contractor shall determine final routing based on actual field conditions prior to construction at each site, including utility locator service markings, to assure no conflicts with existing utilities, including State owned underground lighting, ITS, traffic signal, or cathodic protection facilities. The contractor shall field review necessary routing of conduit and location of pull boxes and splice vaults prior to submittal of bid to determine the types and extent of incidental removal, relocation and replacement items to include in the price of conduit, pull boxes, and splice vaults. Section 902.16 shall apply except as modified herein.

Before preparing a bid, the contractor shall visit the site of the work and make his own determination of the amount of rock, unclassified, or other materials that might be encountered in his trenching or pushing operations. No additional pay will be made for differences in material encountered.

1.1 Material. All material shall conform specifically as follows:

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Item	Section
Electrical Conduit	1060
Junction Boxes	1062

All non-metallic conduits shall be color-coded yellow for electrical cables, and powder blue for fiber optic cable. Any conduit on structure shall be galvanized rigid metallic conduit.

All HDPE conduit and materials shall have a minimum SDR of 11 and be compliant with ASTM D3035.

All conduit splices shall be made with conduit couplers in accordance with conduit manufacturer recommendations. Coupler materials to be used for conduit splices shall be submitted to the engineer for review and approval along with the manufacturer's recommendations and installation procedures. All conduit couplers are incidental to the linear feet of conduit being installed.

HDPE SDR11 conduit shall be required for all trenched or bored conduits.

Trenching and Pushing depths and installation shall be constructed with the following minimum covers:

Conduit under Paved areas including Roadway, Shoulders, Paved Medians and Sidewalks:

Pushed Conduit - minimum 42 inches below top of paved areas.

Conduit under Non-Paved Areas:

Conduit in Trench - minimum 30 inches of cover

Conduit shall slope to a pull box at a minimum rate of 0.5 percent, unless otherwise shown on plans. A change in direction of conduit shall be accomplished by bending the conduit uniformly to a radius that will fit the location or by the use of standard bends. The minimum bending radius of all conduits shall be the greater of the following: 20 times the diameter of the fiber optic cable or six times the internal diameter of the conduit.

Open ends of conduit placed for future use shall be capped or plugged with water tight mechanical terminations. Pull ropes shall be placed in all empty conduits. Pull ropes shall be polypropylene with a minimum tensile strength of 1,250 lbs.

All conduit ends shall be deburred before installing any cabling, including fiber optic cable and power cable.

If approved by the engineer, conduit may be installed by trenching, plowing, pushing or directional boring; however, payment will be made by the method specified in the contract for that conduit.

1.2 Conduit in Trench. Trenches shall be excavated to the width and depth necessary for conduit installation. Material which might cause mechanical damage to the conduit shall not be used for backfilling below an elevation 6 inches above the conduit. The bottom of the trench shall be free of such material before the conduit is placed. No conduit shall be placed without approval of the trench by the engineer. All trenches shall be backfilled as soon as practicable after installation of conduit. Backfill material shall be deposited in the trench in layers not exceeding 6 inches deep.

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1.2.1 In lieu of trenching, conduits may be installed by plowing. When installation is accomplished by plowing, it shall be done with a vibratory type plow which will place conduits at the minimum depths shown above and recompact the soil over the installation approximately to original in-place density. The contractor shall not plow conduit in areas of rock.

1.2.2 Orange burial tape imprinted with "CAUTION-BURIED FIBER OPTIC CABLE BELOW" shall be installed at approximately 1/3 to 1/2 of the depth of cover over any trenched conduits. The orange burial tape shall be color durable, and chemically resistant. Where excavation is made across parkways or driveways, sod, topsoil and crushed stone or gravel shall be replaced as soon as practicable to its former condition. Concrete or bituminous surfaces and stabilized bases shall be restored to their former condition. The entire area involved shall be left in a neat, presentable condition.

1.3 Pushed Conduit. If pushed conduit is specified or shown on the plans, the conduit shall be installed without disturbing the existing surface. Pushed conduit may be placed by jacking, pushing, boring or other approved means.

1.4 Power Service Conduit. Conduit between the contractor installed power supply pedestal and the utility service point shall meet the requirements of the specific electric utility company. This utility conduit must be installed by the contractor according to the utility company's requirements and the cost of this conduit is incidental to the cost of the Type 2 power supply.

2.0 Method of Measurement. Measurement of conduit in trench and pushed conduit will be made to the nearest linear foot as shown on the plans. Contract quantities will be adjusted using the documented fiber cable sheath readings along all conduit runs. If the contractor decides to bore conduit runs instead of trenching, then those additional boring lengths will only be measured and paid as trenched conduit.

No additional pay will be made for trenching or pushing operations in rock, unclassified, or other materials.

No additional pay will be made for conduit couplers or conduit splicing. Couplers used for conduit splicing are incidental to the linear feet of conduit installed.

Contractor shall not damage paved drainage ditches or unmarked pavement underdrains. Contractor has the option to bore under or trench around concrete drainage ditches or underdrains. No additional pay will be made for routing around paved drainage ditches or underdrains. Any damage to paved drainage ditches or underdrains due to contractor's operations shall be replaced at contractor's expense.

3.0 Basis of Payment. The accepted conduit system will be paid for at the unit price for each of the pay items included in the contract. No direct payment will be made for any incidental items necessary to complete the work unless specifically provided as a pay item in the contract.

Conduit shall only be paid as Pushed Conduit for only the length that is specified in the plans. Conduit couplers that are utilized to connect pushed conduit to trenched conduit shall be incidental to the linear feet of conduit installed.

<u>Item No.</u>	<u>Type</u>	<u>Item Description</u>
910-99.03	LF	Conduit, Two 2 in. Rigid, in Same Trench
910-99.03	LF	Conduit, Two 2 in. Pushed

N. Scout ITS Pull Boxes

1.0 Description. All ITS pull boxes that contain fiber optic cable (splice vaults) in this contract shall be circular and constructed and installed as detailed on the plans or as directed by the engineer. These circular pull boxes shall be constructed of one piece polymer concrete and shall be referred to as splice vaults. The splice vault shall have a minimum depth of 48" and come with a minimum of four stainless steel hooks to be used for hanging the fiber optic cable. The installation of all pull boxes shall conform to the locations, lines, grades, and details shown on the plans. All pull boxes shall be surrounded by a concrete pad and shall withstand a wheel load of 9,000 kg. Each pull box shall be equipped with a bolt down cover of the same material. All fiber and power pull boxes shall include a protective concrete pad around each pull box according to the details provided in the plans. Concrete for the pad shall be Class B, or a commercial mixture meeting the requirements of Sec 501. The concrete pad for the Class 2 Pull Box should extend for 10" around the entire outside of the box perimeter with a 6-inch minimum concrete depth. The top surface edges of all pull boxes and splice vaults shall be flush with surfaced areas and earth or sodded areas. For those locations where only power cable has been installed, the preformed Class 2 Pull Box shall be used.

Covers on pull boxes shown on the plans that contain 480-volt circuits shall be embossed with "CAUTION-HIGH VOLTAGE". Covers on all other pull boxes or splice vaults shall be embossed with "KC SCOUT ITS" unless otherwise directed by the engineer.

1.1 Conduit Openings. Conduit shall enter the splice vault through the side of the box. If it is necessary to increase the excavation depth and extend the pull box or splice vault, no direct payment will be made. The holes shall be round and no more than 1/2 inch larger than the conduit and shall be made as recommended by the manufacturer. All conduit entrances into pull boxes shall be sealed with an expandable foam sealer around the conduits to prevent the entering of foreign material into the pull boxes. Since Class 2 power pull boxes are too shallow for conduit openings, the conduit shall enter the pull box from underneath through the rock drain area. The top of the conduit must be installed a minimum of 6" below the bottom edge of the pull box in order to avoid future crushing of the conduit.

1.2 Excavation and Backfilling. The excavated opening outside pull boxes or splice vaults shall be wide enough to allow compaction of the backfill material. Cinders, broken concrete, broken rock or other hard or undesirable material shall not be used for backfilling. The backfill material shall be placed in layers not to exceed 6 inches deep and each layer shall be thoroughly compacted before the next layer is placed. All disturbed areas shall be seeded and mulched in accordance with Sec 802 and 805. No direct pay will be made for seeding and mulching disturbed areas.

Removed concrete and soil shall become the property of the contractor and shall be disposed of off the right of way. No direct pay will be made for removal of paved surfaces or the disposition of excess material off of the right of way.

1.3 Drains. All ITS pull boxes will be constructed with a stone drain that is 2' deeper than the bottom of the pull box. No direct pay will be made for stone drains.

2.0 Method of Measurement. Measurement all pull boxes shall be made per each structure. All concrete pads, special covers, and grounding requirements for splice locations shall be included in the unit price for Fiber Splice Vault or Preformed Class 2 Pull Box.

No additional pay will be made for installation of pull box or splice vault in rock.

3.0 Basis of Payment. The pay items for Pull Boxes and Splice Vaults are:

<u>Item No.</u>	<u>Type</u>	<u>Item Description</u>
910-99.02	EA	Scout Fiber Optic Pull Box
910-88.16	EA	Pull Box, Preformed Class 5

O. New Truss Sign on Existing Truss

1.0 Description. This work shall consist of removing and replacing the existing signs on an existing truss with new signs.

2.0 Construction Requirements. Truss signs shall be installed in accordance with specification called out in Section 903, Highway Signing of the Missouri Standard Specification for Highway Construction and with Standard Plan 903.60 of the Missouri Standard Plans for Highway Construction.

2.1 New signs placed on existing trusses shall be mounted per standards. Existing vertical sign supports that exceed the vertical dimensions of the new sign shall be modified, when practical, so as not to exceed the vertical dimensions of the new signs. The contractor shall provide any additional vertical stiffeners required to properly mount the new signs.

3.0 Method of Measurement. Measurement of all work related to placing new signs on existing truss will be made as lump sum.

4.0 Basis of Payment.

4.1 Payment for removal of the signs will be paid for by contract unit bid price for Item 202-20.10 Removal of Improvements, per lump sum, and will include all labor, equipment, and material necessary to remove signs and any materials associated with the signs.

4.2 Payment for any required truss modification and new signs will be paid for by contract unit bid price for Item 903-99.01 New Truss Signs on Existing Truss, per lump sum, and includes all labor, equipment, and material necessary to furnish and place the new signs.

P. Highway Sign Truss

1.0 Description. This work consists of furnishing and installing highway sign truss as designed in the plans shown.

2.0 Construction Requirements. Truss signs shall be installed in accordance with specification called out in Section 903, Highway Signing of the Missouri Standard Specification for Highway Construction and with Standard Plan 903.60 of the Missouri Standard Plans for Highway Construction.

2.0 Method of Measurement. Measurement of highway cantilever signing will be made per lump sum.

3.0 Basis of Payment. All expenses incurred by the contractor by reason of their compliance with this provision shall be considered completely covered by the unit price bid as follows:

- Item No. 903-99.01 SB at Sta. 421+72 Truss #12
- Item No. 903-99.01 NB at Sta. 432+83 Truss #13
- Item No. 903-99.01 SB at Sta. 445+72 Truss #15

Q. Maintenance on Existing Truss Signs

1.0 Description. This work shall consist of repairs to existing truss structures and truss signs based on a maintenance report document, all maintenance items are as seen below.

2.0 Maintenance Items.

<u>Truss Number</u>	<u>Truss Description</u>	<u>Truss Maintenance Items</u>
Truss MP 129.6	This 79' long box truss is located on the US71 Southbound off ramp where the roadway splits to either go East on 470 or West on 435.	-Tighten loose anchor rod nut on the right base plate - Clean and repaint anchor rods
Truss #1	This 80' long box truss is located at Sta. 382+87 where existing truss signs are getting replaced. (MP 187.8)	-Tighten loose anchor rod but on the right base plate -Tighten loose or replace missing sign panel clip -Monitor section loss in support columns above the base plate -Clean and repaint support column interior where possible
Truss MP 129.4	This 88' long box truss and cantilever is located at Sta. 386+12.	-Monitor section loss in support columns above the base plate -Clear brush around right support -clean and repaint support column interior where possible near base plate -Repair bullet hole and minor damage to signs -Sign legend beginning to peel -Clear brush around Aux sign
Truss #2	This 76' long box truss is located at Sta. 400+22 where existing truss signs are getting replaced. (MP 188.2)	-Tighten loose sign panel frame to chord connection bolts, and replace missing bolts -Remove walkway and lights -Remove tree from median -Monitor section loss from support columns above the base plate -Clean and repaint the base plates and support column interior where possible near base plate -Sign legend and edges are peeling

Truss MP 129.0	This 88.5' long box truss is located at Sta. 402+11	-Clear brush around right support -Minor impact damage to one sign
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3.0 Basis of Payment. Payment for any required truss or sign modification be paid for by contract unit bid price for Item 903-99.01. No additional payment will be made for any incidental items necessary to complete the work unless specified in the contract.

R. 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.

S. 4-Inch Square Steel Sign Post JSP-23-02

1.0 Description. The 4-inch square steel post and breakaway system shall be MASH 2016 approved and on [MoDOT's Approved Products List](#).

2.0 Material. All material shall be in accordance with Division 1000 and as further specified per this provision. The 4-inch square steel posts are to be multi-directional. The posts shall be 4 inches square, 8 gauge, and galvanized. The 4-inch square steel posts shall be hot-dip galvanized after fabrication. Galvanizing of sign posts, bolts, nuts, washers, other appurtenances, and repair of galvanizing shall be in accordance with Sec. 1081.

3.0 Construction Requirements. Concrete footing construction shall be in accordance with Sec. 903.3.1.2. Post installation shall follow the manufacturer's recommendations.

4.0 Method of Measurement. Measurement of 4-inch square steel posts will be made to the nearest linear foot for each post, as shown on the plans. Measurement for 4-inch square steel post base will be made per each.

5.0 Basis of Payment. Payment for 4-inch square steel post will be paid for at the contract unit price for: **903-12.30 4-Inch Square Steel Post**. Post cap, post clamp, hardware (nuts and bolts), and backing bars are incidental to the post. Payment for **903-10.05 Square Steel Sign Post (4-In.) Base** shall include, complete and in place, the concrete footing, ground anchor, breakaway assembly, and hardware (nuts and bolts).

T. Contractor Quality Control NJSP-15-42

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

2.0 Quality Control Plan.

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

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

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

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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.

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

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

2.0 Material.

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

2.2 The long-term rumble strips shall have a minimum width of 4 inches, but no greater than 6 inches. The long-term rumble strips shall have a minimum thickness of 0.25 inches, but no greater than 0.5inchesch.

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

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

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

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

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

5.0 Basis of Payment. The accepted quantity of Temporary Long-Term Rumble Strips sets will be paid for at the contract unit price for 616-20.02, Temporary Long-Term Rumble Strips, per each set. The long-term rumble strips unit bid price shall include the cost of all labor, equipment and materials to install, maintain, and remove the rumble strips.

V. Clean Water Act Requirements

1.0 Description. The Contractor shall be aware that any work within streams, wetlands, or special aquatic sites requires a Section 404 permit from the Corps of Engineers.

2.0 The project meets the conditions of the following listed permits with no pre-construction notification to the Corps of Engineers:

Section 404 Nationwide Permit 14 (Linear Transportation Projects)
Section 404 Nationwide Permit 3 (Maintenance)

3.0 The Contractor shall abide by all general conditions of Section 404 and 401 Permits, and specific conditions of the following listed Nationwide Permit found in the General Provisions and Supplemental Specifications to the current Missouri Standard Specifications for Highway Construction referenced in this contract.

Section 404 Nationwide Permit 14 (Linear Transportation Projects)
Section 404 Nationwide Permit 3 (Maintenance)

3.1 If there are any changes to the scope or limits to the project, the Contractor must notify the Engineer who will then notify the MoDOT Environmental Section to verify that the project still meets permit conditions.

3.2 No additional time will be added to the contract for the contractor to obtain any permits.

4.0 Basis of Payment. There will be no direct payment for compliance with this provision.

W. Guardrail Maintenance

1.0 Description. All guardrail and associated materials installed by the contractor shall be maintained throughout the life of the project as directed by the engineer. No additional payment will be made for repairs or reinstallation if damaged by the contractor or the traveling public prior to project's acceptance.

2.0 Basis of Payment. All Expenses incurred by the contractor by reason of their compliance with this provision shall be considered as completely covered by the contract unit price for item No. 606-10.61, "MGS Guardrail".

X. Rigid Geogrid to Enhance Aggregate Base or to Enhance Rock Base NJSP-18-11B

1.0 Description. This work shall consist of furnishing and installing rigid geogrid base reinforcement, over a separation geotextile, on a prepared subgrade prior to the placement of the aggregate base or rock base as shown in the plans or as directed by the engineer.

2.0 Materials. The rigid geogrid shall be manufactured from a punched and drawn polypropylene sheet integrally formed into a biaxial or triaxial grid structure designed to provide significant mechanical interlock with the aggregate material being reinforced. The rigid geogrid structure

shall be dimensionally stable to retain its reinforcement and interlock capabilities under repeated dynamic loads while in service and shall have high resistance to damage during construction, ultraviolet degradation, and all naturally encountered forms of chemicals, alkalis, acids, and biological degradation encountered in the materials being reinforced. Woven or flexible geogrids will not be allowed. A separation geotextile meeting the requirements of Sec 1011.3.4 shall be used in conjunction with the rigid geogrid. All aggregate base shall comply with Sec 304 and all rock base shall comply with Sec 303.

2.1 Physical Properties. The rigid geogrid shall meet the following properties:

Property	Test Method	Units	Geogrid Requirements ¹	
			MD	XMD
Rigid Geogrid Type	Observed	Punched & Drawn Polypropylene		
Aperture Shape	Observed	Equilateral Triangular, Rectangle, or Square		
Minimum Roll Width	Observed	feet	9	
Minimum Index Properties (Unless indicated otherwise)				
Rib Thickness	Observed	inch	0.05	0.05
Maximum Aperture Dimensions ^{6,7}	Calipered	inch	1.3	1.3
Tensile Strength @ 2 % Strain	ASTM D6637	lbs/ft	410	620
Tensile Streingth @ 5 % Strain	ASTM D6637	lbs/ft	810	1340
Ultimate Tensile Strength	ASTM D6637	lbs/ft	1310	1970
Structural Integrity				
Junction Efficiency ²	ASTM D7737 Method A	Percent	93	
Flexural Stiffness ³	ASTM D7748	mg-cm	750,000	
Aperture Stability ⁴	GRI GG9	m-N/deg	0.65	
Durability				
Resistance to Installation Damage ⁵	ASTM D 6637	%SC / %SW / %GP	95 / 93 / 90	
UV Resistance @ 500 hours	ASTM D 4355	Percent	100	
Resistance to Chemical Degradation	EPA 9090 Emersion Testing	Percent	100	

Notes:

1. Minimum Average Roll Values (MARVs) determined in accordance with ASTM 4759, unless indicated otherwise. MD = Machine Direction; XMD = Cross-Machine Direction
2. Load transfer capability expressed as a percentage of ultimate tensile strength.
3. Resistance to bending force determined in accordance with ASTM D7748, using specimens of width two ribs wide, with transverse ribs cut flush with exterior edges of longitudinal ribs (as a "ladder"), and of length sufficiently long to enable measurement of the overhang dimension.
4. Resistance to in-plane rotational movement measured by applying a 20 kg-cm (2 m-N) moment to the central junction of a 9 inch x 9 inch specimen restrained at its perimeter in accordance with GRI GG9.
5. Resistance to loss of load capacity or structural integrity when subjected to mechanical installation stress in clayey sand (SC), well-graded sand (SW), and crushed stone classified as poorly graded gravel (GP). The rigid geogrid shall be sampled shall be in accordance with ASTM D5818 and load capacity shall be determined in accordance with ASTM D6637.
6. Nominal dimensions rounded to the nearest one tenth of an inch.
7. Maximum MD or XMD shall be no greater than or equal to 2*D85 of the aggregate base. Minimum MD or XD shall be no less than 1.0 inches.

2.2 Acceptance. The contractor shall furnish a manufacturer's certification to the engineer for each lot of material furnished stating the name of the manufacturer, the chemical composition and certifying that the material supplied is in accordance with this specification. The certification shall include or have attached typical results of tests from specific lots for all specified requirements. A rigid geogrid will be rejected at installation if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transport, handling or storage.

2.3 Handling. Each roll shall be clearly marked with manufacturer's name, brand name, lot number. During all periods of shipping and storage, the separation geotextile and rigid geogrid shall be protected from temperatures greater than 140 deg. F and all deleterious materials that might otherwise become affixed to the rigid geogrid and affect its performance. The manufacturer's recommendations shall be followed regarding protection from direct sunlight. The separation geotextile and rigid geogrid shall be stored off the ground in a clean, dry environment.

3.0 Construction. The separation geotextile and rigid geogrid shall be installed in accordance with the manufacturer's recommendations and with this job special provision.

3.1 Site Preparation. The surface shall be smooth and free of stumps, large stones, sharp objects, and debris that may puncture the separation geotextile or damage the rigid geogrid.

3.2 Separation Geotextile.

3.2.1 The separation geotextile fabric shall be used on all subgrades that require the rigid geogrid to prevent the infiltration of fines.

3.2.2 Separation Geotextile Installation. The separation geotextile shall be laid out smooth and applied with tension to minimize wrinkles or folds on the prepared subgrade. The separation geotextile shall be oriented such that the roll length runs parallel to the construction centerline.

3.2.3 Exposure. The separation geotextile shall be covered with rigid geogrid material the same day of placement to protect against unnecessary exposure.

3.2.4 Overlaps. The end of separation geotextile rolls and adjacent separation geotextile rolls shall be overlapped a minimum of 3 feet. The overlap shall be in the direction of anticipated aggregate placement and shall be held in place by U-staples, washer pins or aggregate piles.

3.3 Rigid Geogrid Installation. The rigid geogrid shall be laid out smooth and applied with tension to minimize wrinkles or folds on the separation geotextile. The rigid geogrid shall be oriented such that the roll length runs parallel to the construction centerline.

3.3.1 Exposure. The rigid geogrid shall be covered with aggregate base material the same day of placement to protect against unnecessary exposure.

3.3.2 Overlaps. The end of rigid geogrid rolls and adjacent rigid geogrid rolls shall be overlapped a minimum of 3 feet. The overlap shall be in the direction of anticipated aggregate placement and shall be held in place by U-staples, washer pins or aggregate piles.

3.3.3 Intermediate Splicing. The rigid geogrid may require intermediate splices to provide for a smooth layout minimizing wrinkles or folds around curves. Each splice shall be overlapped a minimum of 3 feet and kept taut with fasteners.

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3.4 Aggregate Placement. Materials shall be placed onto the rigid geogrid from the edge or over previously placed aggregate. A minimum of 6 inches of crushed aggregate shall be placed over the rigid geogrid before construction equipment is allowed on the material. Construction equipment will not be allowed directly on the rigid geogrid. Rollers shall not use vibratory compaction. Avoid sudden stops or sharp turns when operation construction equipment over the rigid geogrid.

3.5 Damaged Areas. If any separation geotextile or rigid geogrid is damaged during installation, the contractor shall repair or replace the separation geotextile and rigid geogrid in accordance with manufacturer's recommendations. The contractor shall replace any separation geotextile and rigid geogrid damaged prior to or during installation at no expense to the commission.

4.0 Method of Measurement. Measurement of the separation geotextile and rigid geogrid will be made to the nearest square yard. Incidental overlaps for connections and splices are not included in the pay item.

5.0 Basis of Payment. Payment for the rigid geogrid will be paid for at the contract unit price for 304-99.05, Rigid Geogrid to Enhance Aggregate or Rock Base, per square yard. Payment for the separation geotextile will be paid for at the contract unit price for 624-01.04A, Separation Geotextile, per square yard.

Y. Order of Work

1.0 The proposed order of work is as follows:

1.1 KC Scout. The contractor shall relocate the KC Scout 48 count fiber as shown in the plans before removing the northbound bridge. The fiber shall be fully spliced and operational within 24 hours of the line being cut for relocation.

1.2 Lighting system. The contractor shall construct the intersection and gore lighting system on both intersections to bring them to "lit conditions" (refer to section 901.1 of the MoDOT EPG) before detouring US-71 traffic on the ramps and beginning construction on the bridges.

1.3 Signal mast arm. The contractor shall remove the signal mast arms over Ramp O and Ramp Q prior to detouring US-71 traffic to the ramps. The contractor must replace all signal mast arms removed when US-71 traffic is moved back to its original alignment and before Bannister Road (Route W) is reopened.

2.0 Basis of Payment

2.1 KC Scout. No direct payment will be made for compliance with this provision.

2.2 Lighting. No direct payment will be made for compliance with this provision.

2.3 Signal Mast Arm. No direct payment will be made for compliance with this provision.

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Z. Trash Rack Headwall

1.0 Description. This work consists of furnishing and installing trash rack headwalls as designed in the plans shown.

2.0 Construction Requirements. The low flow orifice pipe shall be protected by a trash rack headwall upon placement of the pipe drain. The trash rack shall have the configuration shown on the plans, or equivalent.

2.0 Method of Measurement. Measurement of trash rack headwalls will be made per each.

3.0 Basis of Payment. All expenses incurred by the contractor by reason of their compliance with this provision shall be considered as completely covered by the unit price bid as follows:

Item No. 732-99.02 Trash Rack Headwall

AA. Tree Clearing Restriction JSP-07-05C

1.0 Description. The project is within the known range of the federally endangered Indiana bat, northern long-eared bat, and proposed endangered tricolored bat. These bats are known to roost in trees with suitable habitat characteristics during summer months.

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

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

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