Job No.: JKU0108
Route: Various
County: Clay/Platte

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

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

Olsson
1301 Burlington Street, Ste. 100
North Kansas City, MO 64116
Certificate of Authority:
Consultant Phone: 001592

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

JOB NUMBER: JKU0108
Clay and Platte Counties, MO
Date Prepared: 05/06/2025

ADDENDUM DATE:

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

Job No.: JKU0108
Route: Various
County: Clay/Platte

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.

Notice to Proceed: July 7, 2025
Contract Completion Date: June 1, 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
JKU0108	N/A	$1800

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

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

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

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

1.1 Maintaining Work Zones and Work Zone Reviews. The Work Zone Specialist (WZS) shall maintain work zones in accordance with Sec 616.3.3 and as further stated herein. The WZS shall coordinate and implement any changes approved by the engineer. The WZS shall ensure all traffic control devices are maintained in accordance with Sec 616, the work zone is operated within the hours specified by the engineer, and will not deviate from the specified hours without prior approval of the engineer. The WZS is responsible 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 20 minutes to prevent congestion from escalating beyond this delay threshold. If disruption of the traffic flow occurs and traffic is backed up in queues equal to or greater than the delay time threshold listed above, then the contractor shall immediately review the construction operations which contributed directly to disruption of the traffic flow and make adjustments to the operations to prevent the queues from reoccurring. Traffic delays may be monitored by physical presence on site or by utilizing real-time travel data through the work zone that generate text and/or email notifications where available. The engineer monitoring the work zone may also notify the contractor of delays that require prompt mitigation. The contractor may work with the engineer to determine what other alternative solutions or time periods would be acceptable. When a Work Zone Analysis Spreadsheet is provided, the contractor will find it in the electronic deliverables on MoDOT's Online Plans Room. The contractor may refer to the Work Zone Analysis Spreadsheet for detailed information on traffic delays.

2.5.1 Traffic Safety.

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

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

3.0 Work Hour Restrictions.

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

Memorial Day
Labor Day
Thanksgiving
Christmas
New Year's Day

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

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

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

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

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

4.0 Detours and Lane Closures.

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

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

5.0 Basis of Payment. No direct payment will be made to the contractor to recover the cost of equipment, labor, materials, or time required to fulfill the above provisions, unless specified elsewhere in the contract document. All authorized changes in the traffic control plan shall be provided for as specified in Sec 616.

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

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

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

Missouri Highway Patrol
816-622-0800

City of Kansas City, Missouri
Fire: 816-513-1700
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-96-05

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

Mark K Sommerhauser
Project Manager
600 NE Colbern Road
Lee's Summit, MO 64086

Telephone No. (816) 607-2243
Email: mark.sommerhauser@modot.mo.gov

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

F. Supplemental Revisions JSP-18-01FF

- 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.

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.

- Pavement Marking Paint Requirements for Standard Waterborne and Temporary

1.0 Description. High Build acrylic waterborne pavement marking paint shall be used in lieu of standard acrylic waterborne pavement marking paint for all Standard Waterborne Pavement Marking Paint items and all Temporary Pavement Marking Paint items. Paint thickness, bead type, bead application rate, retroreflectivity requirements, and all other specifications shall remain as stated in the Missouri Standard Specifications for Highway Construction, except as otherwise amended in the contract documents.

2.0 Material Requirements. Material requirements for Sec 620.20.2.5 Standard Waterborne Paint, and Sec 620.10.2 Temporary Pavement Marking Paint shall be per Sec 1048.20.1.2 High Build Acrylic Waterborne Pavement Marking Paint.

- 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 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, suppliers, manufacturers, and truckers 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. Utilities

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

Utility Name	**Known Required Adjustment**
Evergy J. Brent Gerling Email: brent.gerling@evergy.com Phone: (816) 652-1654	None

1.1 The Commission does not warrant that the above listing or the depiction of utility lines or facilities on other bidding documents are complete or accurately reflect either all utilities or their precise locations within or adjacent to the project limits or the status of any relocation work. It is, therefore, the responsibility of the contractor to verify the above listing information indicating existence, location and status of any facility. Such verification includes direct contact with the listed utilities.

1.2 The contractor agrees that any effects of the presence of the utilities, their relocation, contractor's coordination of work with the utilities and any delay in utility relocation shall not be compensable as a suspension of work, extra work, a change in the work, as a differing site condition or otherwise including but, without limitation, delay, impact, incidental or consequential damages. The contractor's sole remedy for the effects of the presence of utilities, delay in their relocation or any other effects shall be an excusable delay as provided in Section 105.7.3. The contractor waives, for itself, its subcontractors and suppliers the compensability of the presence of utilities, delay in their relocation and any cost to the contractor, its subcontractors and suppliers in any claim or action arising out of or in relation to the work under the contract.

1.3 The contractor shall be solely responsible and liable for incidental and consequential damage to any utility facilities or interruption of the service caused by it or its subcontractors operation. The contractor shall hold and save harmless the Commission from damages to any utility facilities interruption of service by it or its subcontractor's operation.

2.0 It shall be noted to the contractor that MoDOT is a member of Missouri One Call (800 Dig Rite). Some work on this project may be in the vicinity of MoDOT utility facilities, which includes but is not limited to traffic signal cables, highway lighting circuits, ITS cables, cathodic protection cables, etc. Therefore, prior to beginning work, the contractor shall verify that there are no conflicts with MHTC/MoDOT facilities by completing the Notice of Intent to Perform Work form located at the Missouri Department of Transportation website:

http://www.modot.mo.gov/asp/intentToWork.shtml

The contractor shall submit the form over the web (preferred method) or by fax to the numbers on the printed form. The notice must be submitted a minimum of 2 and a maximum of 10 working days prior to excavation just as Missouri One Call requires. If the contractor wants verification the locate is complete, they may inquire from the associated district office 2 working days after making the request.

H. 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:

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 watertight 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.

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 to1/2 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.

All tracer wire material and installation work shall be considered incidental to the conduit work, whether that conduit is trenched or pushed. The tracer wire will not be measured for separate payment, including any extra slack coils of tracer wire required at the pull box locations. See the Tracer Wire JSP for specific requirements.

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. Tracer wire shall be installed in all conduits and all tracer wire work shall be considered incidental to the conduit installation work, whether the conduit is trenched or pushed.

4.0 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.

Item No.	Type	Item Description
902-52.00	LF	Conduit, 2 in. Trench with Tracer Wire
902-72.00	LF	Conduit, 2 in. Pushed with Tracer Wire

I. 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 1 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 1 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 1 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 Class 1 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:

Item No.	Type	Item Description
910-99.02	EA	KC SCOUT Fiber Optic Splice Vault
910-88.11	EA	Pull Box, Preformed Class 2

J. Power Supply Assembly

1.0 Description. All electrical power supply and service equipment and work shall comply with the requirements of Section 901.8 except as modified herein. The contractor shall consult the local electric utilities regarding their service installation requirements and shall furnish the service equipment in compliance with codes and regulations, and their requirements.

All electrical equipment shall be sized assuming the available fault current from the electric utility is less than 10,000 Amps. The contractor shall coordinate equipment fault current ratings for the electrical equipment used with the available fault current as provided by the electric utility. Available fault current will vary with each installation. Inquiry for a particular location should be directed to the Evergy Business Center: Phone 816-221-2323.

The power service locations as indicated on the drawings are initial service points coordinated with the electric utilities. The contractor is responsible for all coordination of final point of service. Any relocation, adjustment, and/or modification of the service locations shall be a part of this contract at no additional costs. Increases and/or decreases of cable, pull boxes, or conduit quantities based on length as a result of these changes, will be made at the unit price bid for these items.

For those locations where only power cable exists, preformed Class 1 pull boxes may be used.

Power service equipment shall include meter boards, meter socket, meter test cabinets, disconnect means, grounding materials, and service fittings required by the utility. Contractor shall provide lightning arresters at each service drop and shall coordinate installation of the arrester with the utility.

The contractor shall be responsible for notifying the utilities for the need for service and shall coordinate the schedule for that service from the utility. Each constructed service drop shall be provided with a phenolic nameplate indicating the following:

- Project "KC Scout"
- Service address "_____"
- Service Voltage "_____"

2.0 Materials. Materials shall comply with the detail shown in the plans and with the National Electrical Code. Consult the appropriate utility company regarding its requirements and provide equipment complying with the utility company's requirements.

2.1 Service Pole. Where overhead power service points are shown on the plans, the contractor shall provide a new service pole unless an existing pole was left in place from a previous project. The service pole shall be 30 ft. minimum height made of class 4 or 5 wood. Conduit attached to

the pole shall be rigid galvanized steel and include a service entrance cap on the top of the conduit run. This cap shall be designed to prevent ingress of water into conduit. Poles shall include guy wires where requested by power service provider. Power supply assemblies shall be supplied and installed in accordance with the details shown on the plans. The service shall include meter socket and disconnect on an overhead service pole. Conductor and disconnect size shall be as indicated on the plans. All grounding shall be in accordance with the NEC.

2.2 Power Service Pedestal. Furnish and install a power supply pedestal for 120/240 volt service as shown in the special sheets. Available units are listed in the MoDOT approved products list. This product shall be installed in accordance with the plans and the manufacture specifications.

2.3 Fittings and Adapters. Where large conductor sizes are shown on the plans, the contractor shall provide shop drawings that show the type of fitting/adapter being proposed and the locations in which these fittings/adapters are being proposed to accommodate proper termination (lugs/splices) within panels, pull boxes, and cabinets for a complete system assembly that can be installed in a tidy, professional manner.

2.4 Conductors. Power conductors shall be continuous and not spliced in pull boxes or junction boxes. Power conductors shall be in accordance with the requirements of Section 1061.

2.4.1 Labeling for circuits as defined in Section 901.14 shall be used for all handholes, pull boxes and junction boxes.

2.4.2 Labeling for circuits as defined in Section 902.11.1 shall be used for all cabinet assemblies.

2.4.3 The contractor shall install two conductors and a ground for each circuit with the exception of DMS circuits. The two conductors shall include a white neutral and one positive. The three conductors shall include a white neutral and two positives. The ground shall be the size listed in the plans.

2.5 Electrical Service Application. Copies of the electrical service request forms will be available to the selected contractor.

3.0 Construction Requirements. The power service locations, as indicated on the drawings, are initial service points coordinated with the power service provider. Coordinate with the local power service provider to verify the final point of service.

The contractor shall be responsible for paying all power consumption costs during periods of construction and testing until the entire intelligent transportation system has been finally accepted by MoDOT.

The power service voltage shall be verified at the power service locations prior to installation of circuits at all locations indicated on the drawings.

Lightning arrestors shall be of the rated voltage as shown on the plans. Guy wires shall be installed per the utility company's requirements.

Notify the local power service provider of the need for service and coordinate the schedule for that service from the utility. A copy of the service request shall be submitted to the engineer for his records.

All 480 Volt Type 1 power supplies shall be installed with a non-fused disconnect according to the requirements of the utility company.

4.0 Measurement and Payment. Measurement all power supplies shall be made per each power supply location. All power supply locations will be paid under the pay item for Type 1 Pole Mounted Power Supply Assembly or Type 2 Service Pedestal Power Supply Assembly:

Item No.	Type	Item Description
910-86.21	EA	Power Supply Assembly, Type 2, 240/120 V, ITS

K. Modification of Existing Power Supply Assembly

1.0 Description. The existing power supply M435NBPS-70 that is located along northbound I-435 at 136th Street must be modified to a dual circuit power supply. The existing single 120/240 volt metered circuit runs to a step-up 480 volt transformer that is mounted on the same wood power supply pole. This existing circuit operates a critical Scout telecommunications cabinet that is located along southbound I-29 at the southwest corner of the I-29 and I-435 interchange. The contractor shall operate a generator at that Scout telecommunications cabinet as long as the power supply modifications last. The contractor shall remove the existing meter and disconnect and provide and install a new aluminum NEMA 3R single meter service pedestal that includes the meter housing, pull section, and breaker distribution section all in one pole mounted cabinet assembly. The new power supply cabinet shall provide two 120/240 volt circuits, one of which will operate the new camera being installed, and a second circuit will continue to connect to the step up transformer that is already in place. The contractor shall coordinate with the Platte/Clay Electrical Co-op in order to complete this power supply modification work within one business day.

2.0 Method of Measurement and Basis of Payment. Accepted modification of existing power supply work will be paid for as a lump sum pay item. 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.

Item No.	Type	Item Description
910-99.01	LS	Modification of Existing Power Supply

L. Pole Mounted 336 ITS Cabinet

1.0 Description. This work shall consist of furnishing equipment and material for installing pole mounted 336 ITS cabinets in conformity with the locations and details shown on the plans.

2.0 General. The contractor shall furnish all tools, labor, equipment, materials, supplies and manufactured articles and shall perform all operations necessary to install the pole mounted 336 cabinet as shown in the plans with a 19 inch rack.

2.1 Cabinet Components. The cabinet shall include a 19 inch rack in order to mount the various equipment. Additional components include the following: slide out drawer, power panel and breakers, ventilated flat shelf for excess telecom equipment, fan and thermostat, 250 watt cabinet heater with built in thermostat, AC outlet and main power surge protection, rack mounted power

strip with built in surge protection, 1U CCH fiber termination panel (unless the cabinet is only connected by a wireless radio), sealable, clear document holder that is mounted on one door using hooks, and two recessed DIN rail brackets (one to mount device controllers and device surge protection and the second to mount telecommunication equipment). The Electrical Service Panel must be installed on the side of the cabinet so it does not require using or filling up the limited 9 inch rack space.

2.2 336 Cabinet Mounting Requirements. The contractor shall provide pole mounting brackets and a conduit entry system that allows access to all camera pole handholes while still allowing both cabinet doors to be opened and all sections of the 19 inch rack reachable from the ground level. Each cabinet door shall utilize a No. 2 Corbin lock.

3.0 Method of Measurement. Measurement for each pole mounted 336 cabinet shall be made per each cabinet installed and operational.

4.0 Basis of Payment. The pay item for pole mounted 336 cabinet is:

Item No.	Type	Item Description
910-99.02	EA	336 Cabinet Control Assembly

M. ITS Camera Pole and Lowering Device

1.0 General. At the location specified in the plans, provide a steel camera pole mounted on a concrete foundation along with a camera lowering device and a pole mounted 336 ITS cabinet.

2.0 Materials.

(a) Steel CCTV Pole.

If the contractor's pole manufacturer deviates from the steel camera pole design shown in the plans, then the contractor must submit revised camera pole shop drawings with calculations for review and approval by the engineer before installation.

(b) Camera Lowering Device.

The camera lowering device arm shall be made of steel with a square cross-section. The lowering device shall be constructed with a two piece clamshell junction box with one hinge side and one latch side.

3.0 Construction Requirements.

(a) Pole and Foundation.

The location of closed circuit television cameras as specified on plans is approximate only, based on design location of foundation. CCTV camera locations may need to be field adjusted for final location, upon approval of the engineer. Adjust anchor bolt nuts to plumb the pole under load.

(b) Pole Grounding.

Connect the bottom of the pole to one or more ground rods using a bare, solid AWG #4 copper wire. Use exothermic welding for all ground wire connections, except the connection to the pole, which shall use the pole's grounding lug. Use a device that measures resistance to ground using the three-point fall-of-potential method to ensure that the resistance from the air terminal to ground does not exceed 5 ohms. Add more ground rods if necessary to achieve this requirement. All work related to the installation of the air terminal shall be performed in accordance with NFPA 780.

(c) Anchor Bolt Installation.

Anchor bolts, nuts, and washers shall be shipped pre-assembled and shall be protected from dirt and moisture. Threads must be protected from damage during installation. Anchor bolts shall not be subjected to erection or service loads until the concrete has reached 75 percent of the design strength or as approved by the engineer.

(1) Installation Torque. The torque wrench used for tightening the nuts for final torque verification shall have a torque indicator that is calibrated annually. A certification of such calibration shall be available to the engineer. The verification torque shall be 350 lb-ft for 1.5" diameter Grade 36 anchor bolts.

(2) Anchor Bolt Rotation Capacity Test. Prior to use, an Anchor Bolt Rotation Capacity test shall be run with at least one anchor bolt from each lot. The test consists of two parts:

(a) Using the base plate or plate of equivalent grade, thickness, and finish; install anchor bolt and nuts as specified below to verify its adequacy to achieve the verification torque. The plate must be restrained to resist the torque during the test. Following completion of tightening, the anchor bolt and nuts shall be removed and inspected for thread damage.

(b) The anchor bolt is restrained while the nuts are turned onto the bolts at least one bolt diameter past the location of the leveling nut, then backed off by one worker using an ordinary wrench (without a cheater bar). The threads are considered damaged if unusual effort is required to turn the nut.

If the threads are damaged or the verification torque is not attained, the lot of anchor bolts shall be rejected. If there is no damage to the anchor bolt or nuts during this test, they may be used in the joint.

(3) Templates. Two templates plans shall be used to maintain the spacing and alignment of anchor bolts during placing and curing of the concrete. Bottom template shall consist of clean steel and shall be located within the shaft as to ensure the plumbness and rigid orientation of the bolts during placing and curing of the concrete. Top template shall be located above top of concrete. The template hole pattern shall match the base plate hole pattern. Use of additional templates shall be approved prior to use by the engineer.

(4) Installation. Anchor bolts shall be installed using the following procedure:

a. Prior to and during concrete placement, anchor bolts shall be adequately secured with templates in place.
b. After concrete placement, the misalignment from vertical shall not exceed 1:40.
c. After concrete placement, the exposed part of the anchor bolts shall be cleaned with a wire brush and lubricated.

d. The nuts shall be turned onto the bolts well past the elevation of the leveling nut and backed off by one worker using an ordinary wrench without a cheater bar. Thread damage requiring unusual effort shall be reported to the engineer.
e. Lubricate the exposed threads of the anchor bolts immediately prior to placing leveling nuts.
f. Leveling nuts shall be cleaned and threads and bearing surfaces lubricated. Place on the anchor bolts.
g. Leveling washers shall be placed on the anchor bolts and brought to their proper elevation.
h. Place column or pole on foundation.
i. Top washers shall be placed.
j. Top nuts shall be cleaned and threads and bearing surfaces lubricated. Place and tighten nuts to between 20 and 30 percent of the verification torque using tightening sequence shown on plans. This is termed snug-tight.
k. Leveling nuts shall be tightened to between 20 and 30 percent of the verification torque using tightening sequence shown on plans. This is termed snug-tight.
l. The position of the snug-tight top nuts shall be appropriately marked on the base plate and nut at each bolt. Top nuts shall be turned 1/6 turn for 1.5” diameter Grade 36 anchor bolts beyond snug tight using tightening sequence shown on plans and using at least two full tightening cycles. Verify proper nut rotation. Tolerance is plus 20 degrees.
m. A torque wrench shall be used to verify that a torque at least equal to the verification torque is required to additionally tighten the leveling nuts and the top nuts. An inability to achieve this torque shall be reported to the engineer.
n. After at least 48 hours the torque wrench shall again be used to verify that a torque at least equal to 110 percent of the verification torque is required to additionally tighten the leveling nuts and the top nuts. This verification is required at least 48 hours after erection of the remainder of the structure and after any heavy attachments to the structure.
o. Jam nuts shall be placed and installed to snug tight.
p. Rodent screens are required around the base of each pole.

(d) Camera Lowering Device.

The bottom of the lowering device junction box shall be pre-tapped with an inch and a half NPT thread that accepts a standard dome CCTV camera housing. The lowering device shall include a mounting point for a static PVC conduit along the inside of the camera pole that separates the moving lowering device cable from any static device cables. The contractor shall provide a work history of, at a minimum, five successful camera lowering device installations from that manufacturer, otherwise the contractor shall have a representative from the lowering device company onsite to train and supervise the field installation of the first camera pole on the project.

4.0 Method of Measurement.

4.1 Measurement of CCTV camera poles will be made per each.

4.2 Measurement of CCTV pole foundations, including all specified materials will be made per each.

4.3 Measurement of CCTV camera lowering devices will be made per each.

5.0 Basis of Payment. Accepted camera poles, pole foundations, cabinets, and lowering devices 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.

Item No.	Type	Item Description
910-99.02	EA	70 FT. CCTV Pole
910-99.02	EA	70 FT. CCTV Pole Foundation
910-99.02	EA	Camera Lowering Device

N. Closed Circuit Television Assembly

1.0 General. At each camera location, provide and install an IP dome camera assembly, as directed on the plans, with cabling, controller, and power over Ethernet surge protection.

2.0 Materials.

(a) CCTV Camera Assembly.

(1) General. The closed circuit television (CCTV) camera assembly shall consist of a high performance digital color CCTV camera, zoom lens, pan and tilt drive unit, dome assembly, connectors and cabling all assembled together into one operational unit. The CCTV camera assembly shall weigh less than 100 lbs and have a center of gravity of less than 24" from the center of the pole. The camera assembly shall utilize a 60 W midspan for the power over Ethernet connection and shall operate between -55° C to 50° C.

The contractor shall provide an HDTV 1080p IP dome PTZ camera that is also capable of providing lower bandwidth video streams as needed.

All CCTV equipment shall meet the following electrical and environmental requirements:

(1.1) Power: 120VAC @ 60Hz;
(1.2) Environmental: Operating Temperature: -55° to 50° C; and
(1.3) Operating Humidity: Up to 100% relative humidity.

(2) Color CCTV Camera. The CCTV camera shall be solid-state having a 1/4-inch color progressive scan with interline transfer CCD image sensor. The camera shall operate with a motorized-iris lens and be designed for day and night functionality. The shutter speeds shall be remotely adjustable from 1/4 to 1/10,000 seconds. The camera shall incorporate Digital Signal Processing (DSP) circuitry to provide advanced features such as automatic electronic shutter control, backlight compensation, digital zoom and image stabilization. The camera shall support closing of the iris when pointed directly at the sun. The camera shall support on-screen title generation that will allow the user to define the camera with character specific information. The camera shall utilize an instant laser focus in order to maintain color imagery during low light and nighttime conditions.

(3) Zoom Lens. The camera shall be supplied with mechanical and digital zoom capabilities. The mechanical zoom lens shall be remotely controlled through the camera unit and have a magnification factor of at least 30x. The zoom lens shall have an automatic and manual iris and focus controls. In addition, the camera shall have at least a 12x digital zoom capabilities. The lens aperture range shall be F1.4 to F2.8 minimum.

(4) Camera Enclosure. The camera housing shall be a non-pressurized dome enclosure and shall contain the CCTV camera, lens and pan/tilt drive unit. The camera enclosure shall be water tight and constructed so that the enclosed equipment will not be affected by rainfall, blowing dust, salt, fungus, and other debris. The camera casing shall be IP66-rated and NEMA 4X-rated. The unit shall be supplied with a heater to keep the camera within the acceptable operating temperature range.

(5) Pan and Tilt Drive Unit. The pan and tilt drive unit shall allow the remote position of the CCTV camera to view freeway traffic conditions. The units shall be fitted to mount to the CCTV camera and enclosure and be supplied with all of the necessary mounting plates, connectors, brackets and wiring for operation. The unit shall allow 360° of continuous panning which is variable from 0.05 to 450°/second. The unit shall allow a minimum of 64 preset positions accurate to within 0.5°.

(6) Video Encoding. The encoded video shall be H.264 (MPEG-4 Part 10/AVC) compliant using the baseline profile. The video resolution shall be configurable from HDTV 1080p (1920 x 1080) to 320 x 180. The frame rate shall be adjustable up to 30/25 fps (60/50 Hz).

(7) Communications. A 100Base-TX network interface shall be provided that facilitates the transmission of camera control commands and video over an Ethernet based IP network. The network connector at the camera shall be IP66 rated.

(8) Lowering Devices. This work shall consist of securing Commission furnished camera lowering devices and equipment and installing the lowering devices to the Direct bury CCTV Poles and the CCTV Camera Assembly at the locations as shown on the plans.

3.0 Method of Measurement. Measurement of CCTV camera assemblies, including all specified cameras, cables and other equipment, will be made per each.

4.0 Basis of Payment. Accepted CCTV Camera System Elements 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.

Item No.	**Type**	**Item Description**
910-37.00	EA	CCTV Camera Assembly Installed

O. Dynamic Message Sign System

1.0 General. The purpose of this section is to provide general information for the replacement of existing walk-in Dynamic Message Signs (DMS) boards as shown on the plans and specified herein. The DMS system shall consist of a walk-in message board mounted on an existing butterfly truss.

The contractor shall furnish all tools, equipment, materials, supplies, and manufactured articles and shall perform all operations necessary to install the DMS hardware as shown on the plans and as specified herein. The hardware, construction services, and support services specified are intended to describe the minimum configuration that would be acceptable for this DMS system.

The contractor shall dispose of the existing dynamic message sign board and unused mounting hardware.

The DMS system shall provide the Traffic Management Center (TMC) operators with the ability to display travel related information to motorists via alphanumeric messages on LED signs. The Advanced Traffic Management Software developed for the TMC will control the DMS. The DMS hardware shall include the DMS sign, controller, mounting hardware and all other incidental hardware required for a fully functional and operational DMS system. The contractor shall be required to provide any device drivers that are necessary to obtain a fully functional DMS assembly that is integrated with the KC Scout ATMS software.

2.0 Description.

Electrical - The LED display matrix shall be powered by regulated DC power supplies that operate from 120 VAC ±10%.

Environmental -
- Operating Temperature: -40oC to 70o C
- Operating Humidity: 5 to 100% RH condensing

Mechanical –
- Housing Height: Approximately 8'-0"
- Housing Length: Approximately 25'
- Housing Depth: Approximately 4'

2.1 DMS Display.

The DMS shall be based on Light Emitting Diode (LED) technology. The DMS shall be a full matrix, full color (RGB) sign capable of displaying 3 lines of 18" characters with 17 characters per line. The DMS board shall have a 20 mm pixel spacing.

The signs shall be capable of displaying ASCII characters 32 through 126 decimal (including all upper and lower case letters from A-Z and digits from 0-9) at any location in the message line. The individual LED's that make up the DMS shall emit amber light, having a peak wavelength of 590 nanometers. The LED's shall also have minimum half-power viewing angle of 30°. The LED's shall be of a uniform color and intensity where the luminosity of the brightest LED is not greater than half the luminosity of the dimmest LED.

All LED pixels shall emit a minimum on-axis luminous intensity of 40 Candelas. In addition, the DMS shall be constructed so that the failure of one LED string or LED pixel shall not affect any other LED. The LED MTBF shall be a minimum of 100,000 hours.

All serviceable components shall be modular, interchangeable and removable from within the DMS enclosure. The DMS display shall be composed of identical and readily interchangeable display modules. Display modules shall be removable from the DMS with either simple hand tools or without any hand tools. All wiring and interconnecting for the individual display modules shall be modular harness assemblies with latching push-on/pull-off or twist on/off connectors.

The removal of any combination of one or more display modules shall not alter the structural integrity of the DMS assembly. Nor shall the removal of any combination of display modules affect the operation of the remaining operational modules in any way.

2.1.1 Brightness Control. Automatic adjustment of the LED brightness shall occur in small enough increments so that the brightness of the sign changes smoothly, with no perceivable brightness change between adjacent levels. Provision shall be made to prevent perceivable brightening of the sign due to stray headlights shining upon the photo sensors at night.

- Current - easily adjustable between 15 mA and 30 mA in 1% increments to allow for dimming of LEDs caused by aging.
- Maximum brightness - night brightness set to 2% of maximum daytime intensity.
- Pulse Width Modulation - (No multiplexing).
- Photocells - detect when sunlight directly in front of sign or directly behind.
- Detect Night and Day.

Brightness shall be also manually adjustable from the front panel of the controller and remotely from the central computer in 1% increments. Brightness control shall be able to be returned to automatic from the sign controller front panel and the central computer.

2.1.2 Enclosure.

The DMS shall have a weatherproof walk-in type enclosure that houses all electrical, communication and electronic control devices necessary for operation of the DMS. The DMS enclosure shall be attached to the support structure as herein specified. A shelf or workbench shall be provided inside the enclosure as a working surface.

The structural design of the DMS enclosure shall conform to current AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals. The enclosure shall be designed to withstand 90 mi/hr winds with a gust factor of 1.14.

An access door shall be provided at the end of the enclosure. This shall make it possible for a single maintenance person to easily access the display modules. The access door shall be 6'-8" X 2'-0" minimum. The door will be fitted with a handle operated locking mechanism, closed cell neoprene gasket and a stainless-steel hinge. The locking mechanism shall be a heavy duty, industrial-strength, three-point, dead bolt, center-case lock with a zinc finish. The lock shall accept a #2 Corbin key capable of opening the lock on the existing KC Scout DMS enclosures. There shall be a handle on both the inside and the outside of the door. Included in the door assembly shall be a device to hold the door open at 90 degrees.

2.1.3 Walk-In DMS Walkway. The walk-in DMS enclosure shall have an interior, nonskid walkway that extends the entire length of the sign enclosure. The walkway shall be free of obstructions and shall be at least 30" wide and provide minimum headroom of 75" throughout the length of the enclosure. The interior walkway shall have removable panels for access to the space below the walkway.

The walk-in DMS enclosure shall be equipped with a non-conductive ladder, which is suitable for safely servicing the upper lines of the sign, and shall automatically lock in place when in use. A latching system shall be provided which will allow the ladder to be securely stored within the sign enclosure when it is not in use.

2.1.4 Ventilation System. The ventilation system shall be a positive-pressure, filtered, defogger forced-air system, which cools both the display modules and the sign-housing interior. The sign housing shall have exhaust ports. Each exhaust port shall be filtered and protected by an

aluminum screened hood assembly. The ventilation system shall have a minimum of two electric fans. Air shall be drawn into the sign housing through hoods near the top of the housing, then filtered before reaching the fan units. There shall be one aluminum hood assembly and one inlet filter for each fan. The inlet and exhaust filters shall be electrostatic filters. The filters shall be sized to properly accommodate the airflow and pressure drop requirement of the ventilation system. These filters shall be easily removable from within the sign housing without the use of tools.

2.1.4.1 Temperature Control. Each sign includes heating, cooling, and ventilating equipment as required to provide an internal temperature and humidity range that is within the electronic or mechanical equipment's specifications. The followings are temperature controls to protect each sign:

- Back side of sign never exceeds 140°F.
- Thermostat to shut sign down if temperature gets above 140°F.
- Thermostat to display temperature readings.
- Exhaust system.

2.1.5 Walk-In DMS Interior Lighting. Each sign housing shall be furnished with four (4) 40 watt fluorescent lights. The lamps shall be spaced evenly above the walkway and shall be fitted with protective guards. The light switch shall be located near the door. LED lights that provide equivalent lighting are acceptable.

2.1.6 Mounting. The housing shall be designed to accommodate mounting on the rear vertical plane. Horizontal z-bars shall be mounted to the back of the walk-in DMS board structure and those z-bars shall be attached to the vertical galvanized steel supports that already exist on each butterfly truss structure. The contractor shall provide and install new bolts, nuts, and washers when attaching the new walk-in structure to the existing vertical truss bars.

2.2 New Sign Controller and the Replacement of Power Cables and Multi-mode Fiber. The sign controller shall be a programmable microprocessor-based system with resident software stored in non-volatile memory, the sign controller shall be programmed to receive sign control commands from the central controller or laptop computer. The sign controller shall be IP addressable and use a loose tube, outdoor rated, multi-mode fiber optic cable in order to communicate from the controller in the field cabinet to the controller in the walk-in DMS board.

The contractor shall provide and install new multi-mode fiber and four electrical conductors between the new color DMS board and the existing ground mounted cabinet. The new multi-mode fiber must be an outdoor-rated 50 micron fiber that is terminated inside the DMS board using a new wall mounted single panel housing that holds one CCH connector panel. The new power cable shall consist of four #6 conductors that are all insulated. Providing, installing and terminating the multi-mode fiber and electrical conductors is considered incidental to DMS replacement work and will not be measured for payment. At the ground cabinet end, the existing fiber distribution unit can be used to terminate the new 50 micron multi-mode fiber. The multi-mode fiber must utilize SC connectors and both ends.

The sign controller shall be rack mountable in a 19" rack and operate from 110VAC power. The operating temperate range shall be 0-122°F with a 5-95% relative humidity range, non-condensing.

New DMS controllers are located in existing cabinets and DMS cables at the cabinet end shall remain connected to the appropriate existing network devices as shown on the plans or as directed by the engineer. Existing DMS controllers shall be salvaged and turned over to the engineer. Salvaging work is included in the DMS replacement work and will not be measured for payment.

The controller shall comply with the NTCIP protocol and all related documents published by November 1, 2007, and as referenced herein. The software shall comply with NTCIP 1101:1996, the Simple Transportation Management Framework (STMF) and shall conform to Compliance Level 1.

The software shall conform with NTCIP 2101. All serial ports on the device shall support communications according to the standards.

DMS software shall implement all mandatory objects of all mandatory conformance groups as defined in NTCIP 1201 Global Object Definitions, and the NTCIP 1203 Object Definitions for Dynamic Message Signs. Software shall also implement all mandatory objects of the following optional conformance groups as defined in those standards.

NTCIP 1201, NTCIP – Global Object Definitions:

Time Management
Timebase Event Schedule/Report
STMP
PMPP

NTCIP 1203, NTCIP – DMS Object Definitions:

DMS Sign Configuration
Font Configuration
MULTI Configuration
Default Message Control
Pixel Service Control
MULTI Error
Illumination/Brightness Control
Scheduling
Auxiliary I/O
Sign Status
Pixel Error Status
Fan Error Status

Software shall also implement the following optional objects as defined in NTCIP 1201 and NTCIP 1203:

dmsSWReset
dmsMessage-Time-Remaining
dmsMemoryMgmt
dmsShortPowerRecoveryMessage
dmsLongPowerRecoveryMessage
dmsShortPowerLossTime
dmsResetMessage

dmsCommunicationsLossMessage
dmsTimeCommLoss
dmsPowerLossMessage
dmsEndDurationMessage
dmsMulti-Other-Error-Description
dmsIllimLightOutputStatus
watchdog-Failure-Count
dmsStat-Door-Open
fanFailures
fanTest-Activation
lineVolts
tempMaxSignHousing

The DMS software shall supply status diagnostic information related to the DMS operation health. These shall include:

- Field Traffic Controller Communications status
- DMS site power
- DMS display status
- LED intensity level
- LED intensity control
- LED pixel status
- DC power supply status
- Internal DMS temperature
- Ambient DMS temperature
- Ventilation fan status

2.3 Main Power Supply and Surge Protection. The sign and ITS controller shall be designed for use on the following:

- Power Line Voltage - 120/240 VAC Nominal, single-phase power, protected by one – 40 amperes circuit breaker per leg
- The system shall operate within a voltage range of 95 VAC to 135 VAC
- Frequency - 60 Hz +/- 3 Hz
- Since two DMS boards will be fed off of one cabinet, the contractor shall provide a separate breaker for each DMS board.

Under normal operation, the drop in voltage between no load and full load of the sign and its controller shall not exceed 10% of the nominal voltage.

A GFCI device shall protect all service outlets.

The primary electrical service panel shall be rated for 120/240 VAC, single phase, 3 wire and 100 amperes maximum with a 2-pole main circuit breaker and a single pole circuit breaker for each branch circuit and a copper ground bus. The panel shall have an interrupt rating of not less than 10 KA. Separate circuits shall be provided for the utility outlets, 120 VAC load shall be balanced.

2.4 Testing. The Dynamic Message Sign (DMS) vendor shall conduct an approved stand-alone test of the equipment installation at the field site. The test shall, as a minimum, exercise all stand-alone functional operations of the field equipment with all of the equipment installed as per the plans, or as directed by the engineer.

Approved data forms shall be completed and turned over to the engineer as the basis for review and rejection or acceptance. At least thirty (30) working day notice shall be given prior to all tests to permit the engineer to observe each test.

3.0 Method of Measurement.

3.1 Individual Dynamic Message Signs (DMS) components will not be measured for payment. Each walk-in DMS system at each individual location will be measured as one system and incidental items such as disconnecting and reconnecting cables will not be measured for separate payment.

3.2 Salvaging existing DMS controllers will not be measured for payment and all salvaging work is considered incidental to the pay item for each location.

4.0 Basis of Payment. Accepted Dynamic Message Sign boards replacements will be paid for per each location replaced. 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, including the installation of new multi-mode fiber and four new electrical conductors between the ground mounted cabinet and the interior of the walk-in DMS board.

Dynamic Message Signs will be paid for using the bid item listed below:

Item No.	Type	Item Description
910.92.30	EA	Dynamic Message Sign Assembly, Installed

P. Tree Clearing Restriction

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.

Q. Fiber Optic Cable, Installation, and Hardware

1.0 Description. All fiber optic 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. 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 and 48 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.

All fiber optic cable shall be installed with a tracer wire in the same conduit occupied by the fiber cable. Install a blue jacketed No. 14 AWG (2.5 mm^2) stranded copper wire for locating purposes in the conduit. The tracer wire shall be pulled into all cabinets and device bases. Inside cabinets or device bases the tracer wire shall be terminated on a protected terminal that is isolated from the cabinet or base ground and labeled "TRACER". Tracer wire shall be continuously connected along the fiber so the tracer wire only has to be toned and energized at the cabinet or equipment location. When continuous runs of tracer wire cannot be installed, connectors approved by the engineer shall be used in a splice vault to electrically bond the tracer wires. These connectors shall be insulated. Tracer wires ending in a splice vault shall be capped and labeled "TRACER". One loop of slack tracer wire shall be installed in each pull box, but additional slack is not required inside cabinets or equipment bases.

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: [1-(min. cladding dia ÷max. cladding dia.)]x100	≤ 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 ±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 ±0.5 µm at 1310 nm 10.5 ±1.0 µm 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 anti-oxidant 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 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," elsewhere in 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.

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 break away 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 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 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 length of 28 inches and a 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.

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 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 is considered subsidiary to the fiber optic cable line 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.

Item No.	Type	Item Description
910-99.03	LF	Fiber Optic Cable, 12-Strand, Single Mode
910-99.03	LF	Fiber Optic Cable, 48-Strand, Single Mode
910-99.01	LS	Fiber Optic Splicing, Testing and Documentation

R. Order of Work

1.0 The work shall be scheduled in the most efficient manner.

2.0 The contractor shall provide a construction schedule within 14 calendar days of notice to proceed outlining the proposed order of ITS work which shows a timely progression of construction.

3.0 No direct pay shall be allowed for following the above order of work or other requirements of this special provision except under items otherwise provided for in the contract.

S. Concrete Maintenance Pad

1.0 General. The construction of concrete maintenance pads shall be performed in order to provide Scout maintenance staff better access to pole mounted cabinets and lowering device handholes. Due to the varying terrain around each of the ITS devices, different types of concrete

maintenance pads have been listed in the plans. A dimensioned drawing has been included along with an approximated cross section of the sloping ground elevation. All concrete pads will be paid per each and that includes all work including removing any excavated material.

2.0 Method of Measurement and Basis of Payment. Accepted concrete maintenance pads will be paid for per each location constructed. No direct payment will be made for any incidental items, including forming, installing bond breaker material around the existing ITS device foundation, and removal of excavated material, necessary to complete the work unless specifically provided as a pay item in the contract.

Item No.	Type	Item Description
902-99.02	EA	Concrete Maintenance Pad

T. Lump Sum Temporary Traffic Control JSP-22-01A

1.0 Delete Sec 616.11 and insert the following:

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

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

2.0 Delete Sec 616.12 and insert the following:

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

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

(b) Installing, operating, maintaining, cleaning, repairing, removing, or replacing traffic control devices.

(c) Covering and uncovering existing signs and other traffic control devices.

(d) Relocating temporary traffic control devices, including permanent traffic control devices temporarily relocated, unless specifically included as a pay item in the contract.

(e) Worker apparel.

(f) Flaggers, AFADs, PFDs, pilot vehicles, and appurtenances at flagging stations.

(g) Furnishing, installing, operating, maintaining, and removing construction-related vehicle and equipment lighting.

(h) Construction and removal of temporary equipment crossovers, including restoring pre-existing crossovers.

(i) Provide and maintaining work zone lighting and work area lighting.

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

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

(a) The first payment will be made when five percent of the original contract amount is earned. The payment will be 50 percent of the price for LSTTC, or five percent of the original contract amount, whichever is less.

(b) The second payment will be made when 50 percent of the original contract amount is earned. The payment will be 25 percent of the price for LSTTC, or 2.5 percent of the original contract amount, whichever is less.

(c) The third payment will be made when 75 percent of the original contract amount is earned. The payment will be 20 percent of the price for LSTTC, or two percent of the original contract amount, whichever is less.

(d) Payment for the remaining balance due for LSTTC will be made when the contract has been accepted for maintenance or earlier as approved by the engineer.

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

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

U. Removal of Ditch Liner

1.0 Description. Removal of existing concrete ditch liner as depicted in the plans shall be removed accordingly and space made for intended improvements. Existing concrete ditch liner intended for removal shall be saw cut, and its remnants disposed of.

2.0 Construction Requirements. Contractor shall remove portion of ditch liner that has been depicted by the Engineer. Contractor shall not remove any additional portion of the concrete ditch liner without specific consent of the Engineer. Any portion of the existing concrete ditch liner that is compromised during construction shall be at the expense of the contractor for replacing in like-kind.

3.0 Basis of Payment. Payment for removal of existing ditch liner specified shall be considered completely covered by the contract unit price for 202-20.10, Removal of Improvements, per lump sum.

V. Tracer Wire

1.0 Description. All new or relocated cables, including fiber optic cable, communication cable, and power wire, shall be installed with a tracer wire in the conduit. Install a blue jacketed No. 14 AWG (2.5 mm^2) stranded copper wire for locating purposes in the conduit. The tracer wire shall be pulled into all cabinets and device bases. Inside cabinets, the tracer shall be coiled up and labeled with the destination point of that specific tracer wire. For instance, a tracer wire running from the cabinet to a CCTV camera pole would be labeled "TRACER - CCTV" while a tracer wire running to the power supply would be labeled “TRACER - POWER”. At the device end such as at the camera pole or the power supply, the tracer wire shall be attached to the ground lug. Branch fiber optic cables that run from the backbone splice vault to the cabinet shall be coiled up in the splice vault and labeled “TRACER – BRANCH FIBER” and at the cabinet end this tracer wire shall be terminated into the cabinet ground bar. Along the backbone fiber optic cable route, the tracer wire shall be continuously connected and labeled at each box as “TRACER – BACKBONE FIBER”. In all locations, the tracer wire shall have a 20’ loop of slack added and that tracer wire shall be free and accessible and not tied to any other cables inside the pull box or splice vault. Tracer wire shall be installed at the longest distance possible, but if splices are required, then the Contractor must use self-stripping, moisture resistant, electrical pigtail connectors in order to complete a waterproof splice of the tracer wire.

2.0 Basis of Payment. Tracer wire will not be measured for payment and all material and installation work is considered incidental to conduit work, whether that conduit is trenched or pushed.

W. Salvaging Existing ITS Equipment

1.0 Description. The following equipment shall be salvaged by the contractor and delivered to the following location:

MoDOT KC District Office
600 NE Colbern Road
Lee’s Summit, MO 64086
Phone Number: 816-607-2243

2.0 Dynamic Message Sign Board Equipment. DMS board controllers inside the sign and inside the cabinet shall all be salvaged along with all surge protection equipment and all LED modules.

3.0 Wireless Radios. Wireless radios and their associated mounting brackets shall be salvaged at both locations along I-29 (removed from camera poles M029SBC-40 and M029SBC-21). All radio cable access holes into the camera pole shall be plugged and all radio cable shall be salvaged. All wireless radio equipment inside the cabinet shall be salvaged and boxed up before being turned over to the Commission.

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 Method of Measurement and Basis of Payment. Salvaging work, including the delivery of salvaged materials, will not be measured for separate payment. Salvaging the DMS board parts is considered incidental for each of the two replaced Dynamic Message Sign (DMS) board systems and salvaging the two wireless radios is considered incidental to the Removal of Improvements.

X. DBE Prompt Payment Reporting JSP-24-05B

1.0 Description.

1.1 This provision will only apply to contracts that have a Disadvantaged Business Enterprise (DBE) goal greater than 0% and have at least one DBE subcontractor.

1.2 MoDOT monitors the payments made by prime contractors and subcontractors to DBEs for compliance with DBE payment monitoring rules as outlined in 49 CFR 26.37. To facilitate this monitoring, MoDOT requires prime contractors to report their remitted payments to DBEs and subcontractors to report their remitted payments to lower-tier DBEs.

1.3 Tracking of DBE payments are made through the Signet™ application (Signet). Signet is a third-party service, supported by the vendor, for usage by the prime contractor and all subcontractors. Signet is only a reporting tool; it does not process financial transactions. MoDOT does not provide direct technical support for Signet. Information about Signet may be found at https://signet-help.zendesk.com/hc/en-us.

1.4 Upon completion of the first pay estimate on the contract, Signet will automatically send an email to the prime contractor prompting registration. The prime will be required to pay a one-time, fixed fee of $1,000 for this contract directly to the Signet vendor. Use of Signet to track DBE payments will be available for the life of the contract, regardless of the contract value, contract duration, number of subcontractors, or payments reported. No additional fee will be charged to subcontractors that are required to report payments or DBEs that are required to verify payments through Signet. The contractor may also, at no additional cost, report payments through Signet to subcontractors that are not DBEs.

1.5 After each estimate, when contractor reporting of payments is complete, the subcontractor will receive an email notifying them of the payment and requesting verification of the reported payment. A subcontractor that has not completed registration with Signet will be prompted to do so at this time.

1.6 Users will be set up automatically based on information in MoDOT's vendor list. Additional users under each contractor may be added once registration has been completed within Signet. The current vendor list can be found at https://www.modot.org/bid-opening-info.

1.7 For purposes of this requirement, payer is defined as the prime contractor or subcontractor that reports a payment in Signet to a vendor that is either a subcontractor, trucker, manufacturer, regular dealer, or broker. Payee is defined as the vendor that receives notification of payment through Signet from the prime contractor or a higher-tier subcontractor. Payment is defined as issuing an Electronic Funds Transfer (EFT) or mailing a check to a payee.

2.0 Requirements. Payers must report remitted payment to DBEs within Signet, for work performed by the DBE subcontractor, DBE trucking, materials supplied from a DBE manufacturer, dealer, or broker, as well as a return of retainage (and/or other amounts withheld), within 15 calendar days.

2.1 Prime contractors must report remitted payments to DBEs within 15 calendar days of each payment it receives from MoDOT. Prime contractors must also report payments to non-DBE subcontractors if that subcontractor is making payment to a lower tier DBE subcontractor, trucker, manufacturer, regular dealer, or broker.

2.2 The payer must report the following information within Signet:

a. The name of the payee.
b. The dollar amount of the payment to the payee.
c. The date the payment was made.
d. Any retainage or other amount withheld (if any) and the reason for the withholding (if other than retainage).
e. The DBE function performed for this payment (e.g., contracting, trucking, or supplying as a manufacturer, dealer, or broker).
f. Other information required by Signet.

The payer must report its return of retainage (and/or other amounts withheld) in separate, standalone payment entries (i.e., without being comingled with a payment for work performed or materials supplied).

2.3 In the event that no work has been completed by a DBE during the estimate period, such that no payment is due to a DBE subcontractor, trucker, manufacturer, regular dealer, or broker, then the prime contractor will mark payment complete within Signet, and no other payments are required to be reported.

2.4 Each subcontractor making a payment to a lower-tier DBE must report remitted payments within Signet, as detailed in Section 2.2, within 15 days of receipt of each payment from the prime contractor.

2.5 DBE payees must verify in Signet each payment reported by a payer within 15 calendar days of the payment being reported by the payer. This verification includes whether the payment was received, and if so, whether it was as expected.

3.0 Basis of Payment. A fixed cost of $1,000 will be paid on this contract for the required software to report payments to DBEs through Signet. Regardless of the number of projects in a contract, a single payment will be made under item 108-10.00, SIGNET DBE REPORTING, per lump sum. The engineer reserves the right to underrun this item for any reason. Any additional costs for registration, software, usage, time, labor, or other costs will be considered incidental and no direct payment will be made.