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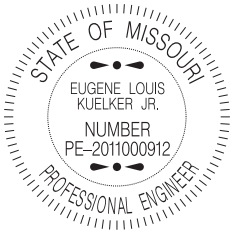 THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.	**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION** 105 W. CAPITOL AVE. JEFFERSON CITY, MO 65102 Phone 1-888-275-6636
	HDR Engineering Inc. *1001 Highlands Plaza Drive, Suite 200* *St. Louis, MO 63110-1390* Certificate of Authority: 000856 Consultant Phone: 314-425-8300
	If a seal is present on this sheet, JSP's have been electronically sealed and dated.
	JOB NUMBER:J6I3020D, JSL0021, J6I3580B ST. LOUIS COUNTY, MO DATE PREPARED:05/04/2026
	ADDENDUM DATE: ***6/9/2026 & 6/16/2026***
The following items of the Job Special Provisions (Roadway) are authenticated by this seal unless otherwise Noted: A-BBB & DDDDD	

 THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY	**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION** 105 W. CAPITOL AVE. JEFFERSON CITY, MO 65102 Phone 1-888-275-6636
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	If a seal is present on this sheet, JSP's have been electronically sealed and dated.
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	ADDENDUM DATE:
Only the following items of the Job Special Provisions (Roadway) are authenticated by this seal: CCC-VVV	

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

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

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Certificate of Authority: 000856
Consultant Phone: 314-425-8300

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JOB NUMBER:J6I3020D, JSL0021
ST. LOUIS COUNTY, MO
DATE PREPARED:05/04/2026

ADDENDUM DATE:

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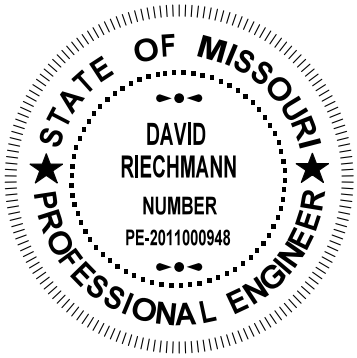

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105 W. CAPITOL AVE.
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Horner & Shifrin Inc.
401 south 18th Street, Suite 400
St. Louis, MO 63103
Certificate of Authority: 000159
Consultant Phone: 314-531-4321

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

JOB NUMBER:J6I3020D, JSL0021
ST. LOUIS COUNTY, MO
DATE PREPARED: 05/04/2026

ADDENDUM DATE:

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 W. CAPITOL AVE.
JEFFERSON CITY, MO 65102
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St. Louis, MO 63103
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Consultant Phone: 314-531-4321

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JOB NUMBER:J6I3020D, JSL0021
ST. LOUIS COUNTY, MO
DATE PREPARED:05/04/2026

ADDENDUM DATE:
6/9/2026

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

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:	August 17, 2026
Contract Completion Date:	September 1, 2029

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
J6I3020D	N/A	$11,400
JSL0021	N/A	$11,400
J6I3580B	N/A	$11,400

3.0 Liquidated Damages for Contract Administrative Costs. Should the contractor fail to complete the work on or before the contract completion date specified in Section 2.0, or within the number of calendar days specified in Section 2.1, whichever occurs first, the contractor will be charged contract administrative liquidated damages in accordance with Sec 108.8 in the amount of **$3,000** 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 **10 minutes** to prevent congestion from escalating beyond this delay threshold. If disruption of the traffic flow occurs and traffic is backed up in queues equal to or greater than the delay time threshold listed above, then the contractor shall immediately review the construction operations which contributed directly to disruption of the traffic flow and make adjustments to the operations to prevent the queues from reoccurring. Traffic delays may be monitored by physical presence on site or by utilizing real-time travel data through the work zone that generate text and/or email notifications where available. The engineer monitoring the work zone may also notify the contractor of delays that require prompt mitigation. The contractor may work with the engineer to determine what other alternative solutions or time periods would be acceptable.

2.5.1 Traffic Safety.

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

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

2.6 Transportation Management Plan. The contractor Work Zone Specialist (WZS) shall review the Transportation Management Plan (TMP), found as an electronic deliverable on MoDOT's Online Plans Room and discuss the TMP with the engineer during the preconstruction conference. Throughout the construction project, the WZS is responsible for updating any changes or modifications to the TMP and getting those changes approved by the engineer a minimum of two weeks in advance of implementation. The WZS shall participate in the post construction conference and provide recommendations on how future TMPs can be improved.

2.7 Traffic Management Center (TMC) Coordination. The Work Zone Specialist (WZS) or their designee shall contact by phone the MoDOT Traffic Management Center Gateway Guide TMC at #314-275-1513) within five minutes of a lane or ramp closure beginning and within five minutes of a lane or ramp closure being removed. The WZS shall make this phone call 24 hours a day, 365 days of the year since the MoDOT Traffic Management Centers are always staffed.

3.0 Work Hour Restrictions.

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

Memorial Day
Labor Day
Thanksgiving
Christmas
New Year's Day

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

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

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

No Bridge Demolitions Scheduled when St. Louis Zoo Wildlife Park off Riverview Drive north of I-270 has its opening weekend in Spring of 2027.

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 work the following hours as noted below. It shall be the responsibility of the engineer to determine if the work hours below may be modified. Working hours for weekends and holidays will be determined by the engineer.

Demolition of Bridges:
Minimum 2 Through Lanes open in each direction at all times on I-270 when demolishing the Rte. 367 and Bellefontaine Road Bridges.

All cross streets under I-270 will be closed to traffic during bridge demolition activities on JSL0021 as specified in the Liquidated Damages JSPs.

Lilac Avenue will be closed to traffic over I-270 during bridge demolition activities. The EB I-270 ramps at Lilac Avenue will remain open during demolition activities on J6I3020D, including for right turns to and from Lilac Avenue. The WB ramps at Lilac Avenue will be open during demolition activities but only for I-270 traffic. Lilac Avenue will have a hard closure at Dunn Road.

Setting of New Girders:
The Contractor will be allowed 15-minute closure windows between 12:00 a.m. and 4:00 a.m. to set new girders for the new I-270 mainline bridges over Bellefontaine Road and Route 367.

The Contractor will be allowed 15-minute closure windows between 12:00 a.m. and 4:00 a.m. to set new girders for the new Lilac Avenue Bridge over I-270.

Replace I-270 Mainline Bridges over Route 367 and Bellefontaine Road:

Minimum 2 Through Lanes open in each direction at all times on I-270.

Minimum 1 Through Lane open in each direction at all times under I-270 along Route 367 and Bellefontaine Road, excluding during bridge demolition or setting girders.

Loop off-ramp from WB I-270 to SB Route 367 – closed during work on JSL0021.

Off-ramp from WB I-270 to Bellefontaine Road – closed during work on JSL0021.

On-ramp from Bellefontaine Road to WB I-270 – closed during work on JSL0021.

On-ramp from Route 367 (SB & NB) to EB I-270 – closed during work on JSL0021.

Replace Lilac Avenue Bridge over I-270:
Lilac Avenue shall be closed during reconstruction of the bridge over I-270. See Liquidated Damages JSPs for additional information.

Minimum 2 Through Lanes open in each direction at all times on I-270, excluding during bridge demolition or setting girders.

All ramps to and from Lilac Avenue at the I-270 interchange shall remain open at all times.

Coldmilling, Resurfacing & Pavement Marking:

I-270 Eastbound (from west of Route 367 to the I-270 Mainline Bridge over the Railroad west of Lilac Avenue):

Single Lane Drop: 8:00 p.m. – 5:00 a.m.
Double Lane Drop: 10:00 p.m. – 5:00 a.m.

I-270 Eastbound (from west of Route 367 to the I-270 Mainline Bridge over the Railroad west of Lilac Avenue):

Single Lane Drop: 8:00 p.m. – 5:00 a.m.
Double Lane Drop: 10:00 p.m. – 5:00 a.m.

Route 367, Bellefontaine Road, Lilac Avenue:

1 Through Lane open in each direction at all times on the cross streets
If Lane restrictions are needed during Daytime hours work shall be performed during the following intervals.
Lilac Ave 9:00 a.m. – 2:00 p.m.
Bellefontaine Rd 10:00 a.m. – 2:00 p.m.

I-270 Ramps:
Ramp Closed from 8:00 p.m. to 5:00 a.m.

Ramps at Bellefontaine Road and Lilac Avenue shall not be closed at the same time to allow for detours.

Median Barrier Installation:

Minimum 2 Through Lanes open in each direction at all times on I-270 with full time inside lane closure for an extended closure window of 1 month, for each project.

Stage 0 Construction as Specified in the Plans:

J6I3020D – Resurfacing & Reconstruction of Outside Shoulders ~~east of Railroad Bridge west of Lilac~~
1 Through Lane Open in each direction of Mainline I-270 from 8:00 p.m. to 5:00 a.m.

JSL0021 – Outside Shoulder work
~~2 Through Lanes Open in each direction of Mainline I-270 from 8:00 p.m. to 5:00 a.m.~~ 2 Through Lanes Open in each direction of Mainline I-270 at all times will full time outside lane closure for an extended closure window of 1 month. All ramps to and from I-270 shall remain open during this work.

Guardrail, Signing & Other Miscellaneous Construction on I-270:
Single Lane Drop in each direction of I-270: 9:00 a.m. – 3:00 p.m.

3.4 The contractor shall not alter the start time, ending time, or a reduction in the number of through lanes of traffic or ramp closures without advance notification and approval by the engineer. The only work zone operation approved to begin 30 minutes prior to a reduction in through traffic lanes or ramp closures is the installation of traffic control signs. Should lane closures be placed or remain in place, prior to the approved starting time or after the approved ending time, the Commission, the traveling public, and state and local police and governmental authorities will be damaged in various ways, including but not limited to, increased construction administration cost, potential liability, traffic and traffic flow regulation cost, traffic congestion and motorist delays, with a resulting cost to the traveling public. These damages are not easily computed or quantified. Therefore, the contractor will be charged with liquidated damages specified in the amount of **$500 per 15 minute increment** for each 15 minutes that the temporary lane closures are in place and not open to traffic in excess of the limitation as specified elsewhere

in this special provision. It shall be the responsibility of the engineer to determine the quantity of unapproved closure time.

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

4.0 Detours and Lane Closures.

4.1 When a changeable message sign (CMS) is provided, the contractor shall use the CMS to notify motorists of future traffic disruption and possible traffic delays one week before traffic is shifted to a detour or prior to lane closures. The CMS shall be installed at a location as approved or directed by the engineer. 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. Coordination with Other Projects in the Vicinity

1.0 Description. The contractor shall coordinate traffic management between the following projects within the same project limits:

MoDOT Job JSL0117 – Safety Improvements on Route 367, south of I-270
MoDOT Job JSL0065 – Resurfacing of Rte. H/Riverview Drive in 2027

1.1 This list of projects is not all inclusive. The contractor shall be aware that there may be other projects including, but not limited to, utility, St. Louis County, City, private, MoDOT maintenance, permit, or other projects that may impact project construction or traffic control in the vicinity of this project. It shall be the responsibility of the contractor to determine what, if any projects other than the ones listed above may impact this project and work to coordinate construction and traffic management efforts between this project and any other project involved.

1.2 JSL0117 Safety Demonstration Project. Due to recent fatalities on Route 367 south of I-270, MoDOT will be implementing a safety demonstration project in July 2026 closing 1 southbound lane of Route 367 from north of I-270 south to Haviland Drive using Tramar Contracting for the installation of DIBs, trimline channelizers, new striping, temporary barrier and crash cushions. Any adjustment of these items shall be made by Tramar by contacting the Engineer 2 weeks prior

to any adjustment. Plans for this demonstration project will be provided at the pre-construction meeting once the project is awarded.

2.0 Basis of Payment. No direct payment or additional time 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.

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

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

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

Missouri State Highway Patrol
Troop C Headquarters
891 Technology Dr.
Weldon Spring, MO 63304
(636) 300-2800
North County Fire and Rescue
805 Chambers Rd
St. Louis, MO 63137
(314) 867-8005

St. Louis County Police Department – North County Precinct
2225 Dunn Rd
St. Louis, MO 63136
(314) 615-4297

Christian Hospital
11133 Dunn Rd
St. Louis, MO 63136
(314) 251-6000

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

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

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

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

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

Daniel Savageau, PE
Project Manager
St. Louis District
1590 Woodlake Drive
Chesterfield, MO 63017

Telephone Number: (314) 453-5089
Email: daniel.savageau@modot.mo.gov

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

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

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

David Bauer, PE
Resident Engineer
St. Louis District
2620 Adie Road
Maryland Heights, MO 63043

Telephone Number: (314)-877-2770
Email: David.Bauer@modot.mo.gov

G. Supplemental Revisions JSP-18-01KK

- Compliance with 2 CFR 200.216 – Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment.

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

- Stormwater Compliance Requirements

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

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

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

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

2.1 Duties of the WPCM:

(a) Be familiar with the stormwater requirements including the current MoDOT State Operating Permit for construction stormwater discharges/land disturbance activities; MoDOT's statewide Stormwater Pollution Prevention Plan (SWPPP); the Corps of Engineers Section 404 Permit, when applicable; the project specific SWPPP, the Project's Erosion & Sediment Control Plan; all applicable special provisions, specifications, and standard drawings; and this provision;

(b) Successfully complete the MoDOT Stormwater Training Course within the last 4 years. The MoDOT Stormwater Training is a free online course available at MoDOT.org;

(c) Attend the Pre-Activity Meeting for Grading and Land Disturbance and all subsequent Weekly Meetings in which grading activities are discussed;

(d) Oversee and ensure all work is performed in accordance with the Project-specific SWPPP and all updates thereto, or as designated by the engineer;

(e) Review the project site for compliance with the Project SWPPP, as needed, from the start

of any grading operations until final stabilization is achieved, and take necessary actions to correct any known deficiencies to prevent pollution of the waters of the state or adjacent property owners prior to the engineer's weekly inspections;

(f) Review and acknowledge receipt of each MoDOT Inspection Report (Land Disturbance Inspection Record) for the Project within forty eight (48) hours of receiving the report and ensure that all Stormwater Deficiencies noted on the report are corrected as soon as possible, but no later than stated in Section 5.0.

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

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

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

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

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

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

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

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

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

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

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

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

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

106.9.1.3.2 Items designated as Category 2 will include all other steel or iron products not in Category 1 and permanently incorporated in the project. Category 2 items shall consist of, but not be limited to items such as fencing, guardrail, signing, lighting and signal supports. The prime

contractor is required to submit a material of origin form certification prior to incorporation into the project from the fabricator for each item that the product is domestic. The Certificate of Materials Origin form (link to certificate form) from the fabricator must show all steps of manufacturing, including coating, as being completed in the United States and in accordance with CFR Title 23 Section 635.410 Buy America Requirements and be signed by a fabricator representative. The engineer reserves the right to request additional information and documentation to verify that all Buy America requirements have been satisfied. These documents shall be submitted upon request by the engineer and retained for a period of 3 years after the last reimbursement of the material.

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

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

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

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

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

106.9.3 Buy America Requirements for Manufactured Products.

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

excluded materials, or other product categories as specified by law or in 2 CFR part 184. Mixtures of excluded materials delivered to a work site without final form for incorporation into a project are not a manufactured product.

106.9.3.1 Produced in the United States, in the case of manufactured products, means:
(A) For projects obligated on or after October 1, 2025, the product was manufactured in the United States; and
(B) For projects obligated on or after October 1, 2026, the product was manufactured in the United States and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product.

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

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

- Third-Party Test Waiver for Concrete Aggregate

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

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

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

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

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

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

3.1 The testing facility shall be AASHTO accredited.

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

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

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

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

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

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

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

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

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

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

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

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

H. Order of Work

1.0 Description. The Contractor shall follow the order of work as noted below.

1.1 ITS. The contractor shall install the new ITS fiber under I-270 east of Lilac Avenue (J6I3020D) prior to beginning any other work on the project. In addition, the Contractor shall make the temporary connection for St. Louis County ITS fiber into the existing signal cabinet at the Lilac Avenue and I-270 interchange as shown in the plans. The new fiber shall be located as to not impact construction operations and to ensure it will not be disturbed again on this project. In addition, the Contractor shall relocate the existing CCTV camera pole in the northwest quadrant of the Bellefontaine Road interchange (JSL0021) to a new foundation and shall have the CCTV camera operational except for the time needed to remove and reinstall on the new foundation. See JSP – Fiber Optic Cable Construction Staging for additional details.

1.2 Existing Temporary Signals. The existing temporary signals for the I-270/Riverview interchange project (J6I3020C) at the intersection of Lilac Avenue shall remain in place as part of J6I3020D until the Lilac interchange improvements have been completed. The Contractor for J6I3020D shall remove the existing signals at this intersection as part of this new contract.

1.3 JSL0021. The Full and Partial depth pavement repairs proposed with the JSL0021 shall be completed prior to any traffic switches that are necessary to perform any other aspects of the proposed work.

1.4 JSL0021, J6I3020D and J6I3580B. All 3 projects listed will be let in combination. The Contractor shall work on the projects in the following order, unless specified in the JSPs or as approved by the Engineer.

1st JSL0021 – Reconstruct I-270 Mainline Bridges over both Route 367 & Bellefontaine Road
2nd J6I3020D – Reconstruct Lilac Avenue Bridge over I-270 and Construct 3rd Lane on I-270.
3rd J6I3580B – Resurface I-270.

1.5 Existing Overhead Sign and Striping from Riverview interchange project (J6I3020C) – WB I-270. Prior to opening the 3rd lane on WB I-270 between Riverview Drive and Lilac Avenue, the Contractor shall remove any striping that conflicts with the opening of the 3rd lane, then restripe WB I-270 as shown in the plans and then finally replace the overhead sign.

1.6 Last Order of Work – Final Striping. All 3 projects shall have a final striping completed by the Contractor as the last order of work on the project. Striping quantity has been included in the contract to stripe each project in their expected order of completion along with a final phase to touch up the striping before it is accepted by the Engineer. With resurfacing on J6I3580B expected to be the last project completed in combination, no additional striping is being included for that work.

I. Stockpiled Material

1.0 Description. The Contractor is advised that some stockpiled material may be available for use as fill on this combination project. This stockpiled material is located in the NW quad of the I-270 and Riverview interchange. The Contractor may survey this material with permission from the Engineer on the current project J6I3020C, but it should be noted that the availability of this excess fill may change between the letting and the Notice to Proceed. No additional payment shall be made to the Contractor if he or she chooses to use this stockpile as embankment in place on this combination project.

J. Utilities JSP-93-26F

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

Utility Name	**Known Required Adjustment**	**Type**
Zak Kaller **Ameren-Missouri (Distribution)** 6440 North Hanley Road Berkeley, MO 63134 Telephone: (636) 793-1487 Email: zkaller@ameren.com	Yes – J6I3020D Yes – JSL0021 No – J6I3580B	Power
Tonya Wells **ATT-Distribution** 402 North 3rd Street St Charles, MO 63301 Telephone: (636) 949-1323 Email: tw2745@att.com	Yes – J6I3020D Yes – JSL0021 No – J6I3580B	Communications
Chris Mead **Charter**		

101 Northwest Plaza St. Ann, MO 63074 Telephone: 314-386-1676 Email: chris.mead@charter.com	No – J6I3020D No – JSL0021 No – J6I3580B	Communications
Devin Johnson **i3** 230 Turner Blvd St Peters, MO 63376 Telephone: 314-619-1520 Email: devin.johnson@i3broadband.net	No – J6I3020D No – JSL0021 No – J6I3580B	Communications
Rich Obremski **Lumen** 11111 Dorsett Rd Maryland Heights, MO 63043 Telephone: 314-378-9931 Email: Richard.obremski@lumen.com	No – J6I3020D No – JSL0021 No – J6I3580B	Communications
Domenic Nicastro **MCI-Verizon** 500 Technology Dr Weldon Spring, MO 63304 Telephone: 636-459-1600 Email: Domenic.nicastro@verizon.com	No – J6I3020D No – JSL0021 No – J6I3580B	Communications
Dave Pruitt **Missouri American Water Company** 727 Craig Rd Creve Couer, MO 63131 Telephone: 314-574-3601 Email: dave.pruitt@amwater.com	Yes – J6I3020D Yes – JSL0021 No – J6I3580B	Water
Robert Sewell **Segra (Formerly Everstream)** 900 Walnut St Ste. 150 St. Louis, MO 63102 Telephone: 314-546-7927 Email: rsewell@segrafiber.commailto:mnankivil@stlwater.com	No – J6I3020D No – JSL0021 No – J6I3580B	Communications
Nick Eggert **Spire Energy** 6400 Graham Rd Berkeley, MO 63134 Telephone: (314) 330-5720 Email: mailto: Nicholas.eggert@spireenergy.com	Yes – J6I3020D Yes – JSL0021 No – J6I3580B	Gas

Robert LaFollette **St. Louis County Dept of Traffic and Public Works** 1050 N Lindbergh Blvd. Creve Couer, MO 63132 Telephone: 314-502-1094 Email: rlafollette@stlouiscountymo.gov	Yes – J6I3020D Yes – JSL0021 No – J6I3580B	Traffic Communications

SL0021

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

2.0 Ameren Electric

Ameren Electric has the following existing facilities within the project limits:

- Aerial facilities running east-west along the north side of Dunn Rd from western project limits to the NW quadrant of the 270/367 interchange.
    - No impact to these facilities is anticipated.
- Aerial facilities running north-south along the north side of Dunn Rd on the west side of the 270/367 interchange and continuing north through the northern project limits.
    - No impact to these facilities is anticipated.
- Aerial facilities running north-south along the north side of Dunn Rd on the east side of the 270/367 interchange and continuing north through the northern project limits.
    - No impact to these facilities is anticipated.
- Aerial facilities running east-west along the north side of Dunn Rd from the NE quadrant of the 270/367 interchange and continuing east throughout the eastern project limits.
    - No impact to these facilities is anticipated.
- Buried power running north-south on the east side of the 270/367 interchange and crossing Dunn Rd and the centerline of I-270 at Sta. 623+75.
    - No impact to these facilities is anticipated.
- Aerial facilities running north along the east side of Bellefontaine Rd from a power pole at Sta. 661+06, 191’ LT and continuing north through the northern project limits.
    - No impact to these facilities is anticipated.
- Aerial facilities running north-south along the east side of Bellefontaine Rd between a power pole at Sta. 661+06, 191’ LT and a power pole at Sta. 661+42, 296’ RT. The facilities cross over centerline of I-270 at Sta. 661+22.
    - The aerial facilities are in conflict with the project due to the grade increase at this location for the proposed bridge deck; the requisite aerial clearance is not met between top of deck and the power lines.
        - Ameren will convert this aerial facility to an underground facility and relocate the cables east of the proposed Bellefontaine bridge. The

relocated buried power crossing will be installed prior to construction, and the existing aerial crossing will be removed.

- Aerial facilities running south along the east side of Bellefontaine Rd from a power pole at Sta. 661+42, 296' RT and continuing south through the southern project limits.
    - No impact to these facilities is anticipated.
- Aerial facilities crossing the centerline of Bellefontaine at Sta. 17+09.
    - No impact to these facilities is anticipated.
- Aerial facilities crossing the centerline of Bellefontaine at Sta. 18+47 and continuing east through the eastern project limits.
    - No impact to these facilities is anticipated.

The contractor shall coordinate with Ameren Electric, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact Ameren Electric to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by Ameren Electric.
The contractor shall discuss the planned work as it relates to Ameren Missouri's energized power lines and coordinate with Ameren Missouri for the installation of any insulation covers over the lines and/or any other designated requirements. Please note Ameren Missouri has revised its policy regarding the charges for placement, length of use and relocation of covers. The contractor is advised to contact Ameren Missouri regarding the current policy so the anticipated cost to the contractor can be estimated and a tentative schedule for this payment can be established. The Contractor shall contact Ameren Missouri at least two weeks in advance of when construction work is scheduled to begin to request covers to be placed at a given location.

No direct payment will be made for this provision. The contractor is responsible for any charges from Ameren Missouri for this provision and payment will be directly to Ameren Missouri.

3.0 AT&T Distribution

AT&T Distribution has the following existing facilities within the project limits:

- Aerial facilities running east-west along the north side of Dunn Rd from western project limits to the NW quadrant of the 270/367 interchange.
    - No impact to these facilities is anticipated.
- Aerial facilities running north-south along the north side of Dunn Rd on the west side of the 270/367 interchange and continuing north through the northern project limits.
    - No impact to these facilities is anticipated.
- Aerial facilities running along the north side of Dunn Rd on the east side of the 270/367 interchange.
    - No impact to these facilities is anticipated.
- Aerial facilities running east-west along the north side of Dunn Rd from west of Bellefontaine to the eastern project limits.
    - No impact to these facilities is anticipated.
- Aerial facilities running north-south along the east side of Bellefontaine starting in the NE quadrant of Dunn Rd and Bellefontaine and continuing north from through the northern project limits.
    - No impact to these facilities is anticipated.
- Aerial facilities running east from a power pole in the southernmost project limits on Bellefontaine Rd. These facilities continue east through the eastern project limits.
    - No impact to these facilities is anticipated.

- Buried facilities running east-west along the north side of the north outer road west of the 367/270 interchange.
    - No impact to these facilities is anticipated.
- Buried facilities crossing the centerline of I-270 at Sta. 620+08 on the east side of the 367/270 interchange. The facilities run between a manhole at Sta. 620+15, 132' RT and another at Sta. 621+11, 151' LT.
    - No impact to these facilities is anticipated.
- Buried facilities running along the westbound ramp of the 367/270 interchange.
    - No impact to these facilities is anticipated.
- Buried facilities running along the southbound ramp of the 367/270 interchange.
    - No impact to these facilities is anticipated.
- Buried facilities running along the eastbound ramp of the 367/270 interchange.
    - No impact to these facilities is anticipated.
- Buried facilities running east from a manhole at Sta 621+11, 151' LT the travel lanes of Dunn Rd on the northeast side of the 367/270 interchange. These facilities continue east along the north side of Dunn Rd outside of the active project limits.
    - No impact to these facilities is anticipated.
- Buried facilities running east from a handhole at Sta. 661+39, 181' LT in the northeast quadrant of Dunn Rd and Bellefontaine Rd. The facilities run east along the north side of Dunn Rd through the eastern project limits.
    - No impact to these facilities is anticipated.
- Buried facilities running north from a handhole at Sta. 661+39, 181' LT in the northeast quadrant of Dunn Rd and Bellefontaine Rd. The facilities run north along the eastern side of Bellefontaine Rd through the northern project limits.
    - No impact to these facilities is anticipated.
- Buried facilities running north to south on the east side of Bellefontaine Rd between a handhole at Sta. 661+39, 181' LT and a handhole at Sta. 661+50, 305' RT. These facilities cross the centerline of I-270 at Sta. 661+70.
    - These facilities were potholed and determined to be in conflict with the proposed bridge pile.
        - ATT-D will relocate these facilities prior to construction, with an anticipated completion date of May 2026.
- Buried facilities running south from a handhole at Sta. 661+50, 305' RT in the southeast quadrant of Bellefontaine and I-270. These facilities run south along the east side of Bellefontaine though the southern project limits.
    - No impact to these facilities is anticipated.

The contractor shall contact AT&T-D a minimum of 4 weeks ahead of need for adjustment.
The contractor shall coordinate with AT&T (Distribution), as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact AT&T (Distribution) to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by AT&T (Distribution).

4.0 Charter/Spectrum

Charter has the following existing facilities within the project limits:

- Aerial facilities running east-west along the north side of Dunn Rd from western project limits to the NW quadrant of the 270/367 interchange.
    - No impact to these facilities is anticipated.
- Aerial facilities running north-south along the north side of Dunn Rd on the west side of the 270/367 interchange and continuing north through the northern project limits.

    - No impact to these facilities is anticipated.
- Aerial facilities running along the north side of Dunn Rd on the east side of the 270/367 interchange.
    - No impact to these facilities is anticipated.
- Aerial facilities running east-west along the north side of Dunn Rd from west of Bellefontaine to the eastern project limits.
    - No impact to these facilities is anticipated.
- Aerial facilities running north-south along the east side of Bellefontaine starting in the NE quadrant of Dunn Rd and Bellefontaine and continuing north from through the northern project limits.
    - No impact to these facilities is anticipated.
- Aerial facilities running east from a power pole in the southernmost project limits on Bellefontaine Rd. These facilities run east and exit the eastern project limits.
    - No impact to these facilities is anticipated.

The contractor shall contact Charter a minimum of 4 weeks ahead of need for adjustment.
The contractor shall coordinate with Charter, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact Charter to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by Charter.

5.0 Lumen

Lumen has the following existing facilities within the project limits:

- Buried facilities running east-west along the south side of Pershall Rd from the western project limits to approximately Sta. 595+90, where it turns north and crosses I-270.
    - No impact to these facilities is anticipated.
- Buried facilities crossing the centerline of I-270 just west of the MO367/I-270 interchange. This facility crosses the centerline of I-270 at Sta. 595+88.
    - No impact to these facilities is anticipated.
- Buried facilities running along the west edge of pavement on MO 367 in the NW quadrant of the 367/270 interchange. These facilities cross the centerline of Mo 367 at Sta. 512+27.
    - No impact to these facilities is anticipated.
- Buried facilities running in the space between the east edge of pavement on Mo 367 and the west edge of pavement of Dunn Rd in the NE quadrant of the 367/270 interchange. These facilities cross the centerline of MO 367 at Sta. 512+27.
    - No impact to these facilities is anticipated.
- Buried facilities running east-west along the south side of Dunn Rd from the NE quadrant of the 367/270 interchange and continuing east throughout the project limits east of Bellefontaine Rd.
    - No impact to these facilities is anticipated.

6.0 Missouri American Water Company

Missouri American Water has the following existing facilities within the project limits:

- 24” CI main running east-west along the north side of the north outer road in the northwest quadrant of the 367/270 interchange.
    - No impact to this main is anticipated.

- 24” DI main crossing the centerline of I-270 at Sta. 596+00 on the west side of the 367/270 interchange.
    - No impact to this main is anticipated.
- 12” DI running along the north side of Dunn Rd in the northwest quadrant of the 367/270 interchange.
    - No impact to this main is anticipated.
- 24” CI main running along the southbound ramp in the southwest quadrant of the 367/270 interchange.
    - No impact to this main is anticipated.
- 30” CI main running along the southeast edge of the eastbound ramp in the southeast quadrant of the 367/270 interchange.
    - No impact to this main is anticipated.
- 30” CI crossing the centerline of Rt. 367 just south of the active project limits.
    - No impact to this main is anticipated.
- 30” CI main crossing the centerline of I-270 on the east side of the 367/270 interchange at Sta. 621+16.
    - No impact to this main is anticipated.
- 16” CI water main running east-west along the south side Dunn Rd from the east side of the 367/270 interchange to the SW quadrant of Dunn Rd and Bellefontaine.
    - No impact to this main is anticipated.
- 12” CI water main running north-south along the west side of Bellefontaine from the southern project limits to the SW corner of Bellefontaine and Dunn, where it turns east and enters the roadway to a valve at Sta. 12+03, 22’ RT.
    - Two potholes were performed at this location and the data obtained from these efforts was shared with the Engineer and MAWC. MAWC confirmed that there is adequate separation between the proposed bridge pile and the east edge of the main and that the water line can be used in place.
- 6” CI main crossing the centerline of Bellefontaine near the southern project limits at Sta. 18+12.
    - No impact to this main is anticipated.
- 12” CI water main running east-west along the south side of Dunn Rd from the SW quadrant of Dunn Rd and Bellefontaine and continuing east through the active project limits.
    - Proposed guardrail falls within 1’ of the south edge of this main between Sta. 12+10, 124’ LT and Sta. 12+14, 176’ LT.
    - Two potholes were performed at this location and the data obtained from these efforts was shared with the Engineer and MAWC. Although the separation between replacement guardrail posts and the south edge of the main does not fall within current specifications, as the guardrail is replace-in-kind, the water line will be protected-in-place. Any damage to current MAWC facilities will be the responsibility of the contractor.
    - It is the responsibility of the contractor to locate and protect these facilities during guardrail installation.
    - Contractor shall contact MAWC two months prior to installation of the guardrail posts so MAWC can send a representative to monitor the installation.
- 12” PVC main running north-south under the southbound travel lanes of Bellefontaine starting the NW quadrant of Dunn Rd and Bellefontaine and continuing north through the northern project limits.
    - No impact to this facility is anticipated.

NOTE ON I-270 WATER MAIN CROSSINGS WITHIN THE PROJECT LIMITS:

MAWC voluntarily upgraded their facilities, and the following main was relocated and encased as part of this work. This existing main crosses I-270 at the location specified below and connects to mains running east-west along the north and south side of the Pershall Rd and Dunn Rd. Neither the abandoned nor the relocated mains are in conflict with the MODOT project.

- The 6" CI main crossing the centerline of I-270 at Sta. 681+38 has been abandoned in place. The relocated main is an 8" ST in a 12" steel casing and crosses the centerline of 270 approximately 15' west of the abandoned 8" main.
    - MAWC voluntarily upgraded their facilities and this main was relocated and encased as part of this work.
    - The location and proposed depths for the relocated main were reviewed by the project team and no impact to the project is anticipated.
    - MAWC abandoned their existing main in place.
    - All work for this relocation project has been completed.
    - As-built drawings and actual installation depths of the relocated main will be available prior to the start of construction.

MAWC contact for Construction Monitoring and to resolve issues in the field:

Valerie Bivens
Cell: 314-740-5166
Email: Valerie.bivens01@amwater.com

The following valves fall in the proposed improvements and may require adjustment to grade:

- Sta. 12+02, 22' RT
- Sta. 18+15, 28' RT
- Sta. 18+47, 27' RT

Please contact the following MAWC representative at least two months before the valves need to be adjusted. MAWC will submit a work order at that time. MAWC anticipates a two-month turnaround for completion of this work, and it will be done during construction in coordination with the contractor.
Operations Supervisor
Tiffany Huey at 314-239-4968
The contractor shall coordinate with Missouri American Water Company, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact MAWC to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by MAWC.

7.0 Segra (formerly Everstream)

Segra has the following existing facilities within the project limits:

- Buried facilities running north-south along the west side of Bellefontaine throughout the project limits. These facilities cross under the centerline of I-270 at Sta. 659+93.
    - No impact to this facility is anticipated due to the construction of the proposed bridge and related improvements.
- Handhole at Sta. 10+43, 50' RT falls at the west edge of proposed sidewalk in the proposed ditch slope.
    - No impact to this facility is anticipated, but Segra will adjust this handhole to grade during construction in coordination with the Contractor if required.

- Handhole at Sta. 16+54, 52’ RT falls just outside the proposed ditch on the west side of Bellefontaine Rd.
    - No impact to this facility is anticipated, but Segra will adjust this handhole to grade during construction in coordination with the Contractor if required.

The contractor shall coordinate with Segra, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact Segra to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by Segra.

8.0 Spire Energy

Spire Energy has the following existing facilities within the project limits:

- 12” steel supply feeder main running on the northwest side of Dunn Rd in the NW quadrant of MO 367 and I-270. These facilities turn east and cross the centerline of MO 367 just outside of the northern project limits.
    - No impact to these facilities is anticipated.
- 12” steel supply feeder main running on the north side of Dunn Rd in the NE quadrant of MO 367 and I-270. This main continues east to the northwest quadrant of Dunn Rt and Bellefontaine Rd.
    - No impact to these facilities is anticipated.
- 2” steel main supply feeder main running from the SW quadrant of MO 367 and I-270 and continuing east in the back of ROW until approximately Sta. 637+15, 139’ RT, where it turns north and crosses I-270.
    - No impact to these facilities is anticipated.
- 2” steel main in 12” steel casing crossing the centerline of I-270 at Sta. 637+16.
    - No impact to these facilities is anticipated.
- 20” steel supply feeder running north to south along the west side of Bellefontaine Rd from the southern project limits to NE quadrant of Dunn Rd and Bellefontaine Rd. This main crosses under the centerline of I-270 at Sta. 660+11.
    - Two potholes were performed at this location and the data obtained from these efforts was shared with the Engineer and Spire. Spire confirmed that there is adequate separation between the bridge pile and the east edge of the main and that the gas line can be protected in place.
        - The proposed bridge pile will fall approximately 12’ from the west edge of the main.
        - Spire will also require that monitoring take place during pre-boring/pre-drilling stages of the project. See below for contact information.
    - Proposed signal base falls in close proximity to existing main at Sta 12+22, 48’ RT.
        - Care should be taken by Contractor to locate these facilities prior to the installation of the signal base and take all precautions needed to protect this facility in place.
        - Spire will also require that monitoring take place during pre-boring/pre-drilling stages of the project. See below for contact information.
    - Proposed signal base falls within inches from existing main at Sta 15+50, 51’ RT.
        - Care should be taken by Contractor to locate these facilities prior to the installation of the signal base and take all precautions needed to protect this facility in place.
        - Spire will also require that monitoring take place during pre-boring/pre-drilling stages of the project. See below for contact information.

    - No impact to this main is anticipated due to construction of proposed bridge or associated improvements.
- 20” steel supply feeder main crossing the centerline of Bellefontaine Rd north of Dunn Rd at Sta. 10+68.
    - No impact to this main is anticipated.
- 4” steel IP main crossing Bellefontaine Rd on the north side of Dunn Rd between a valve at Sta. 11+15, 97’ RT and another at Sta. 11+31, 35’ LT. This main continues east along the north side of Dunn Rd through the eastern project limits.
    - No impact to this main is anticipated.
- 8” steel IP main running north to south along the east side Bellefontaine through the project limits.
    - Two potholes were performed at this location and the data obtained from these efforts was shared with the Engineer and Spire. Spire confirmed that there is adequate separation between the bridge pile and the east edge of the main and that the gas line can be protected in place.
    - The proposed bridge pile will fall approximately 12’ from the east edge of the main.
        - Spire requires that monitoring take place during pre-boring/pre-drilling stages of the project. See below for contact information.
    - The proposed drainage from Sta. 13+37, 44’ LT to Sta. 13+89, 44’ LT runs parallel to—and approximately 1’ from—the east side of this main.
        - Care should be taken by Contractor to locate these facilities prior to the installation of the proposed drainage. Contractor shall contact Spire two months prior to installation of the drainage so Spire can send a representative to monitor the installation.
    - The proposed signal base at Sta. 14+28, 50’ LT falls within 2’ of this main.
        - Care should be taken by Contractor to locate these facilities prior to the installation of the signal nase and take all precautions needed to protect this facility in place.

The following valves fall in the proposed improvements and may require adjustment to grade:

- Sta. 10+86, 38’ LT
- Sta. 10+87, 39’ LT
- Sta. 11+31, 35’ LT
- Sta. 11+33, 36’ LT
- Sta. 11+55, 49’ RT
- Sta. 12+04, 50’ RT
- Sta. 12+36, 47’ LT
- Sta. 12+37, 44’ RT
- Sta. 14+82, 50’ RT

The Contractor shall contact the following representative at Spire a minimum of three weeks ahead of need for adjustment of any valves.

- Nick Eggert – Area Manager Construction Engineering
    - Email: Nicholas.eggert@spireenergy.com
    - Cell: 314-330-5720
- Jason Love – Field Operations Supervisor
    - Email: Jason.Love@spireenergy.com
    - Cell: 314-713-6565

The Contractor shall contact the following representative at Spire a minimum of two months prior to the start of boring or pre-drilling for the proposed bridge at Bellefontaine.

- Nick Eggert – Area Manager Construction Engineering
    - Email: Nicholas.eggert@spireenergy.com

    - Cell: 314-330-5720
- Steve Ball – Field Operations Inspector
    - Email: Steve.Ball@spireenergy.com
    - Cell: 314-356-5466

Please see the attached file for additional requirements related to the adjustment to grade of Spire valves: "**Procedure to Ensure the Integrity of Spire Valve Boxes on Street Maintenance Projects**"
The contractor shall coordinate with Spire as necessary and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact Spire Energy to verify location of facilities.
MoDOT cannot warrant the information above which was provided by Spire Energy.

9.0 St. Louis County Traffic

St. Louis County Traffic has the following existing facilities within the project limits:

- Buried traffic fiber running north-south along the west side of Bellefontaine Rd from the southern project limits to a handhole at Sta. 10+27, 49' RT just north of Dunn Rd. This facility crosses under the centerline of I-270 at Sta. 660+19.
    - Proposed pedestrian signal base falls on or near existing traffic fiber at Sta. 11+51, 40' RT.
        - No impact to this facility is anticipated due to the construction of the proposed bridge and related improvements.
        - Contractor should take precautions to ensure this facility is protected in place during the installation of the pedestrian signal base.
- Traffic handhole at Sta. 10+26, 50' RT falls just outside of the proposed sidewalk and may require adjustment to grade.
    - St. Louis County Traffic will adjust this handhole to grade, if required, during construction in coordination with the contractor.
- Traffic handhole at Sta. 14+00, 43. RT falls just outside of the proposed sidewalk and may require adjustment to grade.
    - St. Louis County Traffic will adjust this handhole to grade, if required, during construction in coordination with the contractor.
- Traffic handhole at Sta. 18+04, 28' RT falls in the proposed green space between the proposed sidewalk and the proposed shoulder of Bellefontaine. Adjustment to grade may be required.
    - St. Louis County Traffic will adjust this handhole to grade, if required, during construction in coordination with the contractor.

10.0 Verizon-MCI

Verizon-MCI has the following existing facilities within the project limits:

- Buried facilities running east-west along the north side of Dunn Road throughout the project limits. These facilities cross the centerline of Bellefontaine at Sta. 11+17.
    - No impact to these facilities is anticipated.

The contractor shall coordinate with MCI, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact MCI to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by MCI.

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

2.0 Ameren Electric

Ameren Electric has the following existing facilities within the project limits:

- Buried facilities crossing the centerline of 270 at Sta. 732+73. This is a 750 MCM cable in a 5" conduit and runs from a manhole at Sta. 732+37, 193' LT and a manhole at Sta. 733+05, 205' RT.
    - Proposed 18" drainage pipe in Line 734-A crosses this buried cable at Sta. 732+73, approximately 67' west of proposed inlet 733B2, and 181' east of proposed inlet 730B3.
        - Contractor to pothole this facility at the start of construction to ensure no conflict exists. If facility is found to be in conflict with the proposed drainage, Contractor will contact Ameren to create a plan of adjustment.
    - Proposed guardrail crosses buried Ameren cable at Sta. 732+85, 54' RT.
        - Care should be taken by Contractor to locate this cable prior to guardrail installation and to space guardrail posts as needed to protect these facilities in place.
- Aerial facilities running east-west along the north side of Dunn Rd in the back of MoDOT ROW from the western limits to the eastern limits.
    - No impact to these facilities is anticipated.
- Aerial facilities crossing the centerline of Lilac Rd at Sta.10+09 on the north side of the Dunn/Lilac intersection.
    - No impact to these facilities is anticipated.
- Aerial facilities crossing the centerline of I-270 at the following locations west of Lilac:
    - Sta. 695+73. No impact to these facilities is anticipated.
    - Sta. 696+28. No impact to these facilities is anticipated.
    - Sta. 696+54. No impact to these facilities is anticipated.
    - Sta. 697+23. No impact to these facilities is anticipated.
- Aerial facilities running east-west along the south side of Pershall Rd in the back of MoDOT ROW between Sta. 695+72, 178' RT and Sta. 705+35, 220' RT.
    - No impact to these facilities is anticipated.
- Aerial facilities crossing the centerline of Lilac at Sta. 22+82.
    - No impact to these facilities is anticipated.
- Aerial facilities running north-south along the east side of Lilac from the southern project limits to a power pole at Sta. 22+55, 50' LT, just north of Fry Lane.
    - No impact to these facilities is anticipated.
- Aerial facilities running east-west along the south side of Fry Lane from a power pole at Sta. 22+94, 52' LT and continuing east through the eastern limits.
    - No impact to these facilities is anticipated.

- Aerial facilities running east-west along the south side of Pershall Rd from a power pole at Sta. 733+32, and continuing east through the eastern project limits.
    - No impact to these facilities is anticipated.

The contractor shall coordinate with Ameren Electric, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact Ameren Electric to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by Ameren Electric.
The contractor shall discuss the planned work as it relates to Ameren Missouri's energized power lines and coordinate with Ameren Missouri for the installation of any insulation covers over the lines and/or any other designated requirements. Please note Ameren Missouri has revised its policy regarding the charges for placement, length of use and relocation of covers. The contractor is advised to contact Ameren Missouri regarding the current policy so the anticipated cost to the contractor can be estimated and a tentative schedule for this payment can be established. The Contractor shall contact Ameren Missouri at least two weeks in advance of when construction work is scheduled to begin to request covers to be placed at a given location.

No direct payment will be made for this provision. The contractor is responsible for any charges from Ameren Missouri for this provision and payment will be directly to Ameren Missouri.

3.0 AT&T Distribution

AT&T Distribution has the following existing facilities within the project limits:

- Aerial facilities running east-west along the north side of Dunn Rd from the western limits to a power pole at Sta. 701+56, 211' LT.
    - No impact to these facilities is anticipated.
- Buried facilities running east-west along the north side of Dunn Rd in the back of MoDOT ROW from the western project limits through the eastern project limits. These facilities cross the centerline of Lilac at Sta. 10+23.
    - No impact to these facilities is anticipated.
- Buried facilities crossing the centerline of 270 at Sta. 702+30. These facilities run between Sta. 702+15, 200' RT on the south side of Pershall and a manhole at Sta. 702+42, 203' LT on the north side of Dunn Rd.
    - Proposed guardrail crosses buried ATT at Sta. 702+37, 62' RT.
        - Care should be taken by Contractor to locate this cable prior to guardrail installation and to space guardrail posts as needed to protect these facilities in place.
    - No impact to these facilities is anticipated.
- Buried facilities running east-west along the south side of Pershall Rd in the back of MoDOT ROW from the western project limits on the southeast side of the existing railroad bridge and continuing east to the southwest quadrant of Pershall and Lilac.
    - No impact to these facilities is anticipated.
- Buried fiber optic cable running north-south along the west side of Lilac between a cabinet at Sta. 22+61, 59' RT south of Pershall Rd and a handhole at Sta. 10+41, 86' RT on the north side of Dunn Rd. These facilities cross the centerline of I-270 at Sta. 711+75.
    - Proposed 18" drainage pipe crosses buried FO cable at Sta. 12+80, 81' RT.
        - ATT performed a pothole at this location and determined that no impact is anticipated at this location.
    - Based on pothole data at various locations, these facilities were determined be in conflict with the following improvements:

        - Proposed retaining wall crosses buried FO cable at Sta. 711+44, 64’ LT. Facility is in conflict due to excavation for proposed wall and reinforcement straps.
            - ATT-D’s relocation of this facility is in progress and is expected to be completed by April 2026.
        - Proposed centerline 18” drainage pipe crossed buried FO cable at Sta. 711+67, 4’ RT. Pothole data confirmed that there is minimal separation between cable and proposed pipe.
            - ATT-D’s relocation of this facility is in progress and is expected to be completed by April 2026.
        - Proposed retaining wall crosses buried FO cable at Sta. 711+82, 62’ RT. Facility is in conflict due to excavation for proposed wall and reinforcement straps.
            - ATT-D’s relocation of this facility is in progress and is expected to be completed by April 2026.
- Buried facilities running north-south along the west edge of pavement on Lilac from a handhole at Sta. 21+00, 36’ RT to a handhole at Sta. 22+70, 36’ RT.
    - Thes facilities cross the proposed 18” drainage pipe at Sta. 21+70, 35’ RT.
        - Potholes were performed by ATT at this location and ATT determined that no impact to these facilities is anticipated.
- Buried facilities running east out of a handhole at Sta. 21+00, 36’ RT, crossing the centerline of Lilac at Sta. 21+00, and continue east to a handhole at Sta. 20+77, 113’ LT. These facilities continue to run east in the back of MoDOT ROW along the south side of Pershall throughout the eastern project limits.
    - Potholes were performed by ATT on these facilities at various locations and ATT determined that no impact to these facilities is anticipated.
- Buried facilities existing a handhole on the west side of Lilac at the southern project limits and running to the northeast, crossing the centerline of Lilac at Sta. These facilities continue to the northeast in the back of the MoDOT ROW on the south side of Pershall Rd, until exiting the project limits at Sta. 734+29, 221’ RT.
    - No impact to these facilities is anticipated.

The following Handhole will need to be adjusted to grade:

- Handhole at Sta. 21+00, 36’ RT on the west side of Lilac south of Pershall falls in the proposed sidewalk.
    - ATT-D will adjust this handhole to grade during construction in coordination with the contractor.

The contractor shall contact AT&T-D a minimum of 4 weeks ahead of need for adjustment of handholes/manholes.
The contractor shall coordinate with AT&T (Distribution), as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact AT&T (Distribution) to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by AT&T (Distribution).

4.0 Charter-Spectrum

Charter has the following existing facilities within the project limits:

- Buried facilities running east-west in the back of MoDOT ROW on the north side of Dunn Rd from approximately Sta. 699+00 to 722+00.
    - No impact to these facilities is anticipated.

- Buried facilities running north-south along the east side of Lilac in the back of MoDOT ROW from the southern project limits and turning northeast and continuing in the back of MoDOT ROW along Pershall Road through the eastern project limits.
    - No impact to these facilities is anticipated.
- Buried facilities running east on the north side of Fry Lane from a pedestal at Sta. 22+43, 58' LT and continuing east through the eastern project limits.
    - No impact to these facilities is anticipated.
- Buried facilities crossing the centerline of Lilac near Sta. 24+63.
    - No impact to these facilities is anticipated.
- Aerial facilities running east-west along the north side of Dunn Rd in the back of MoDOT ROW from the northeast quadrant of Lilac and Dunn Rd and continuing east through the eastern limits.
    - No impact to these facilities is anticipated.

The contractor shall coordinate with Charter, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact Charter to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by Charter.

5.0 i3 Broadband

I3 Broadband has the following existing facilities within the project limits:

- Buried facilities on the north side of Dunn Road running east-west in the back of MoDOT ROW from east of Lilac to the eastern project limits.
    - No impact to these facilities is anticipated.

The contractor shall coordinate with I3, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact I3 to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by I3.

6.0 Lumen

Lumen has the following existing facilities within the project limits:

- Buried facilities running east-west along the south side of Dunn Rd from the western project limits to the southeast quadrant of Dunn and Lilac. These facilities cross the centerline of Lilac at Sta. 11+20 and enter a handhole at Sta. 11+30, 65' LT, where they terminate.
    - No impact to these facilities is anticipated.

The contractor shall coordinate with Lumen, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact Lumen to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by Lumen.

7.0 MCI-Verizon

MCI has the following existing facilities within the project limits:

- Buried facilities running east-west along the north side of Dunn Rd in the back of MoDOT ROW from the western project limits and continuing east to approximately Sta. 732+53, 220' LT. The facilities cross the centerline of Lilac at approximately Sta. 10+32.
    - No impact to these facilities is anticipated.
- Buried facilities running north-south from a handhole in the back of MoDOT ROW on the north side of Dunn Rd and a handhole on the south side of Pershall Rd. These facilities cross the centerline of I-270 at Sta. 732+89.
    - Proposed 18" drainage pipe in Line 734-A crosses these facilities at Sta. 732+90, approximately 50' west of proposed inlet 733B2, and 197' east of proposed inlet 730B3.
        - MCI potholed this facility at various locations and determined that no impact is anticipated.
    - Proposed guardrail crosses buried FO cable at Sta. 732+99, 59' RT.
        - Care should be taken by Contractor to locate these facilities prior to guardrail installation and to space guardrail posts as needed to protect these facilities in place.

The contractor shall coordinate with MCI, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact MCI to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by MCI.

8.0 Missouri American Water Company

Missouri American Water has the following existing facilities within the project limits:

- 12" CI main running east-west along the north side of Dunn Rd from the western limits to a valve at Sta. 703+53, 149' LT.
    - No impact to these facilities is anticipated.
- 12" HDPE main running east-west along the north side of Dunn Rd from valve at Sta. 703+53, 149' LT to a valve in the NW quadrant of Lilac and Dunn at Sta. 10+10, 13' RT.
    - No impact to this main is anticipated.
- 8" DI main running north from a valve at Sta. 10+10, 13' RT and continuing north along the west side of Lilac through the northern project limits.
    - No impact to these facilities is anticipated.
- 8" CI main running east-west along the north side of Dunn Rd from a valve at Sta. 10+10, 13' RT and continuing east through the eastern project limits.
    - No impact to these facilities is anticipated.
- 6" DI main running east-west along the south side of Pershall Rd from the western limits to a valve at Sta. 700+47, 207' RT.
    - No impact to these facilities is anticipated.
- 12" CI main running along the south side of Pershall Rd from a valve at Sta. 700+47, 207' RT to the west side of Lilac. This main runs in the back of the ROW and continues south along the west side of Lilac where it exits the southern project limits.
    - No impact to this main is anticipated.
- 8" DI main running along the east side of Lilac in the back of ROW from the southern project limits to approximately Sta. 22+01, 59' LT, where it turns to the northeast and follows the south ROW along Pershall Rd. The main runs in the back of ROW along the south side of Pershall to its termination point at Sta. 736+47, 239' RT.
    - No impact to these facilities is anticipated.
- 6" CI main running east from a main Sta. 22+53, 55' LT and continuing east along the north side of Fry Ln. This connection and main are just east of the active project limits.

- No impact to these facilities is anticipated.

NOTE ON I-270 WATER MAIN CROSSINGS WITHIN THE PROJECT LIMITS:
MAWC is voluntarily upgrading their facilities, and the following mains were relocated and encased as part of this work. These existing mains cross I-270 at the locations specified below and connect to mains running east-west along the north and south side of the Pershall Rd and Dunn Rd. The mains along Dunn Rd and Pershall Rd are not in conflict. Neither the abandoned nor the relocated mains are in conflict.

- The 12" DI main crossing the centerline of I-270 at Sta. 703+53 just west of the 270/Lilac interchange has been abandoned in place.
    - MAWC voluntarily upgraded their facilities and this main was relocated and encased as part of this work. The relocated main is a steel-encased 20" main running approximately 60' west of the abandoned 12" main.
    - The location and proposed depths for the relocated main were reviewed by the project team and no impact to the project is anticipated.
    - MAWC abandoned their existing main in place.
    - All work for this relocation project has been completed.
    - As-built drawings and actual installation depths of the relocated main will be available prior to the start of construction.
- The 6" CI main crossing the centerline of I-270 at Sta. 733+58 near the eastern limits of the project has been abandoned in place.
    - MAWC voluntarily upgraded their facilities and this main was relocated and encased as part of this work. The relocated main is a 12" ST main in a 20" steel casing running approximately 125' west of the abandoned 6" main.
    - The location and proposed depths for the relocated main were reviewed by the project team and no impact to the project is anticipated.
    - MAWC abandoned their existing main in place.
    - All work for this relocation project has been completed.
    - As-built drawings and actual installation depths of the relocated main will be available prior to the start of construction.

Vertical Valve Adjustments: The following valves fall in the proposed roadway and may require adjustment to grade.
Lilac Alignment:
    - Valve at Sta. 10+9, 16' RT
    - Valve at Sta. 10+10, 8' RT

Please contact the following MAWC representative at least two months before the valves need to be adjusted. MAWC will submit a work order at that time. MAWC anticipates a two-month turnaround for completion of this work and it will be done during construction in coordination with the contractor.

- Operations Supervisor
- Tiffany Huey at 314-239-4968.

MAWC contact for Construction Monitoring and to resolve issues in the field:

- Valerie Bivens
- Cell: 314-740-5166
- Email: Valerie.bivens01@amwater.com

The contractor shall coordinate with Missouri American Water Company, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact MAWC to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by MAWC.

9.0 Segra (formerly Everstream)

Segra has the following existing facilities within the project limits:

- Buried facilities running north-south along the east side of Lilac in the back of MoDOT ROW from the southern project limits and turning northeast and continuing in the back of MoDOT ROW along Pershall Road through the eastern project limits.
    - No impact to these facilities is anticipated.

The contractor shall coordinate with Segra, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact Segra to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by Segra.

10.0 Spire Energy

Spire Energy has the following existing facilities within the project limits:

- 2" ST SF main running east-west along the north side of Dunn Rd between Sta. 700+13, 179' LT and Sta. 703+44, 188' LT, where it terminates.
    - No impact to these facilities is anticipated.
- 6" ST SF main crossing the centerline of I-270 at Sta. 700+09. This main runs north-south from the back of ROW at Sta. 700+13, 202' LT and a valve at Sta. 700+04, 148' RT.
    - No impact to these facilities is anticipated.
- 2" PL IP main crossing the centerline of Lilac at Sta. 24+84, south of the proposed improvements.
    - No impact to these facilities is anticipated.
- 6" PL IP running east-west from its termination point at Sta. 696+35, 183' RT and on the south side of Pershall Rd and a valve at Sta. 700+32, 198' RT.
    - No impact to these facilities is anticipated.
- 2" ST SF main running east-west along the south side of Pershall Rd from a valve at Sta. 700+32, 198' RT and 706+00, 223' RT.
    - No impact to these facilities is anticipated.
- 4" ST IP main running north-south along the east side of Lilac from the southern project limits and turning northeast just north of Fry Ln. The main runs in the back of the MoDOT ROW and continues east along the south side of Pershall through the eastern limits.
    - No impact to these facilities is anticipated.
- 4" ST IP main running north-south along the east side of Lilac from the northern project limits and continuing south to the NE quadrant of Lilac and Dunn. This main turns southeast and continues east along the north side of Dunn Rd within the MoDOT to a valve at Sta. 726+84, 215' LT.
    - No impact to these facilities is anticipated.
- 4" ST IP main crossing the centerline of I-270 at Sta. 733+77. This main enters MoDOT ROW at Sta. 733+82, 227' LT on the north side of Dunn Rd and exits MoDOT ROW at Sta. 733+66, 220' RT on the south side of Pershall Rd.
    - This main crosses the proposed 18" centerline drainage pipe at Sta. 733+76, 3' RT.
        - Spire potholed this facility and determined that there is no conflict with the proposed improvements.

The contractor shall contact Spire a minimum of 3 weeks ahead of need for adjustment.
The contractor shall coordinate with Spire as necessary and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact Spire Energy to verify location of facilities.

MoDOT cannot warrant the information above which was provided by Spire Energy.

11.0 St. Louis County Traffic

St. Louis County has the following existing facilities within the project limits:

- Buried interconnect traffic fiber optic cable running north-south along the east side of Lilac from the southern project limits to a cabinet at Sta. 18+08, 55' LT, just south of the eastbound 270 entrance ramp.
    - The existing MoDOT cabinet at Sta. 18+08, 55' LT will be relocated just east of the existing location. The St Louis Co interconnect FO cable will be reconnected to the proposed cabinet by the Contractor. Please see signal and lighting JSP for details.
    - The proposed 18" drainage pipe crosses the buried FO cable at Sta. 19+74, 44' LT.
        - The St Louis Co interconnect FO cable will be relocated by the Contractor. Please see Signal and ITS JSPs for details.
    - The proposed 18" drainage pipe and structure fall on the buried FO cable at Sta. 21+89 42' RT to Sta, 21+96, 42' LT.
        - The St Louis Co interconnect FO cable will be relocated by the Contractor. Please see Signal and ITS JSPs for details.
- Buried traffic interconnect FO cable crossing the centerline of Lilac at Sta. 21+60.
    - No impact to the FO cable crossing Lilac is anticipated.
- The existing traffic handhole at Sta. 21+63, 36' LT falls in the proposed sidewalk and adjustment to grade will be required.
        - Contractor to relocate the interconnect FO cable referenced above and adjust this handhole to grade.
- The existing traffic handhole at Sta. 21+55, 36' RT falls in the proposed sidewalk and adjustment to grade will be required.
        - Contractor to relocate the interconnect FO cable referenced above and adjust this handhole to grade.

The contractor shall coordinate with St. Louis County Traffic, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact St. Louis County Traffic to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by St. Louis County Traffic.

J6I3580B

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

2.0 Ameren Electric

Ameren Electric has the following existing facilities within the project limits:

- Buried power running north-south on the east side of the 270/367 interchange and crossing Dunn Rd and the centerline of I-270 at Sta. 623+75.
    - No impact to these facilities is anticipated.
- Buried facilities crossing the centerline of 270 at Sta. 732+73. This is a 750 MCM cable in a 5" conduit and runs from a manhole at Sta. 732+37, 193' LT and a manhole at Sta. 733+05, 205' RT.
    - No impact to these facilities is anticipated due to work for the MoDOT resurfacing project.
- Aerial facilities crossing the centerline of I-270 at the following locations west of Lilac:
    - Sta. 696+54. No impact to these facilities is anticipated.
    - Sta. 697+23. No impact to these facilities is anticipated.

The contractor shall coordinate with Ameren Electric, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact Ameren Electric to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by Ameren Electric.
The contractor shall discuss the planned work as it relates to Ameren Missouri's energized power lines and coordinate with Ameren Missouri for the installation of any insulation covers over the lines and/or any other designated requirements. Please note Ameren Missouri has revised its policy regarding the charges for placement, length of use and relocation of covers. The contractor is advised to contact Ameren Missouri regarding the current policy so the anticipated cost to the contractor can be estimated and a tentative schedule for this payment can be established. The Contractor shall contact Ameren Missouri at least two weeks in advance of when construction work is scheduled to begin to request covers to be placed at a given location.

No direct payment will be made for this provision. The contractor is responsible for any charges from Ameren Missouri for this provision and payment will be directly to Ameren Missouri.

3.0 AT&T Distribution

AT&T Distribution has the following existing facilities within the project limits:

- Buried facilities crossing the centerline of I-270 at Sta. 620+08 on the east side of the 367/270 interchange. The facilities run between a manhole at Sta. 620+15, 132' RT and another at Sta. 621+11, 151' LT.
    - No impact to these facilities is anticipated.
- Buried facilities running north to south on the east side of Bellefontaine Rd between a handhole at Sta. 661+39, 181' LT and a handhole at Sta. 661+50, 305' RT. These facilities cross the centerline of I-270 at Sta. 661+70.
    - NOTE: These facilities were determined to be in conflict with the SL0021 Project and will be relocated prior to construction.
    - No impact to these facilities is anticipated due to the proposed resurfacing work.
- Buried facilities crossing the centerline of 270 at Sta. 702+30. These facilities run between Sta. 702+15, 200' RT on the south side of Pershall and a manhole at Sta. 702+42, 203' LT on the north side of Dunn Rd.
    - No impact to these facilities is anticipated due to work for the MoDOT resurfacing project.
- Buried fiber optic cable running north-south along the west side of Lilac between a cabinet at Sta. 22+61, 59' RT south of Pershall Rd and a handhole at Sta. 10+41, 86' RT on the north side of Dunn Rd. These facilities cross the centerline of I-270 at Sta. 711+75.

    - NOTE: These facilities were determined to be in conflict with the SL0021 Project and will be relocated prior to construction.
    - No impact to these facilities is anticipated due to work for the MoDOT resurfacing project.

The contractor shall contact AT&T-D a minimum of 4 weeks ahead of need for adjustment of handholes/manholes.
The contractor shall coordinate with AT&T (Distribution), as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact AT&T (Distribution) to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by AT&T (Distribution).

4.0 Lumen

Lumen has the following existing facilities within the project limits:

- Buried facilities running east-west along the south side of Dunn Rd from the western project limits to the southeast quadrant of Dunn and Lilac. These facilities cross the centerline of Lilac at Sta. 11+20 and enter a handhole at Sta. 11+30, 65' LT, where they terminate.
    - No impact to these facilities is anticipated due to work for the MoDOT resurfacing project.

The contractor shall coordinate with Lumen, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact Lumen to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by Lumen.

5.0 MCI-Verizon

MCI has the following existing facilities within the project limits:

- Buried facilities crossing the centerline of I-270 at Sta. 732+89. These facilities run north-south from a handhole in the back of MoDOT ROW on the north side of Dunn Rd to a handhole on the south side of Pershall Rd.
    - MCI potholed this facility at various locations and determined that no impact is anticipated with the MoDOT improvements.

The contractor shall coordinate with MCI, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact MCI to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by MCI.

6.0 Missouri American Water Company

Missouri American Water has the following existing facilities within the project limits:

- 30" CI main crossing the centerline of I-270 on the east side of the 367/270 interchange at Sta. 621+16.
    - No impact to this main is anticipated.
- 6" CI main crossing the centerline of I-270 at Sta. 681+38.
    - MAWC voluntarily upgraded their facilities and this main was relocated and encased as part of this work.

    - The location and proposed depths for the relocated main were reviewed by the project team and no impact to the project is anticipated.
    - MAWC abandoned their existing main in place.
    - All work for this relocation project has been completed.
    - As-built drawings and actual installation depths of the relocated main will be available prior to the start of construction.
- 12” DI main crossing the centerline of I-270 at Sta. 703+53 just west of the 270/Lilac interchange.
    - MAWC voluntarily upgraded their facilities and this main was relocated and encased as part of this work.
    - The location and proposed depths for the relocated main were reviewed by the project team and no impact to the project is anticipated.
    - MAWC abandoned their existing main in place.
    - All work for this relocation project has been completed.
    - As-built drawings and actual installation depths of the relocated main will be available prior to the start of construction.
- 6” CI main crossing the centerline of I-270 at Sta. 733+58 near the eastern limits of the project.
    - MAWC voluntarily upgraded their facilities and this main was relocated and encased as part of this work.
    - The location and proposed depths for the relocated main were reviewed by the project team and no impact to the project is anticipated.
    - MAWC will abandon their existing main in place.
    - All work for this relocation project is expected has been completed.
    - As-built drawings and actual installation depths of the relocated main will be available prior to the start of construction.

The contractor shall coordinate with Missouri American Water Company, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact MAWC to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by MAWC.

7.0 Segra (formerly Everstream)

Segra has the following existing facilities within the project limits:

- Buried facilities running north-south along the west side of Bellefontaine and crossing the off ramp from EB 270 at Sta. 17+28.
    - No impact to these facilities is anticipated.

The contractor shall coordinate with Segra, as necessary, and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact Segra to verify the locations of their facilities.
MoDOT cannot warrant the information above which was provided by Segra.

8.0 Spire Energy

Spire Energy has the following existing facilities within the project limits:

- 2” steel main in 12” steel casing crossing the centerline of I-270 at Sta. 637+16.
    - No impact to these facilities is anticipated.
- 6” ST SF main crossing the centerline of I-270 at Sta. 700+09. This main runs north-south from the back of ROW at Sta. 700+13, 202’ LT and a valve at Sta. 700+04, 148’ RT.
    - No impact to these facilities is anticipated.

- 4” ST IP main crossing the centerline of I-270 at Sta. 733+77. This main enters MoDOT ROW at Sta. 733+82, 227’ LT on the north side of Dunn Rd and exits MoDOT ROW at Sta. 733+66, 220’ RT on the south side of Pershall Rd.
    - No impact to these facilities is anticipated due to the resurfacing work.

The contractor shall contact Spire a minimum of 3 weeks ahead of need for adjustment.
The contractor shall coordinate with Spire as necessary and take measures to protect in place their existing facilities during construction.
The contractor shall directly contact Spire Energy to verify location of facilities.
MoDOT cannot warrant the information above which was provided by Spire Energy.

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

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

L. Liquidated Damages Specified – Demolition of Existing I-270 Mainline Bridges

1.0 Description. As specified in JSP C – Work Zone Traffic Management, the contractor will be allowed on separate weekends to close Bellefontaine Avenue and Route 367 under I-270 for an extended period of time beginning on a Friday at 8:00 p.m. and lasting until the following Monday at 5:00 a.m. to demolish and remove the existing bridge. Prior to demolishing the bridge, the contractor shall have all detour signs in place.

If all work noted above is not complete and Bellefontaine Ave or Route 367 open to through traffic within the extended weekend closure window allowed for the demolition, the Commission, the traveling public, and state and local police and governmental authorities will be damaged in various ways, including but not limited to, increased construction administration cost, potential liability, traffic and traffic flow regulation cost, traffic congestion and motorist delay, with its resulting cost to the traveling public. These damages are not reasonably capable of being computed or quantified. Therefore, the contractor will be charged with liquidated damages specified in the amount of **$5,000 per every 15 minutes** for **each full 15 minutes past 5:00 a.m**. that the work described above is not complete and lanes on Bellefontaine Avenue or Rte 367 are not open to traffic in excess of the limitation as specified elsewhere in this special provision. Multiple liquidated damages may be charged to the contractor as 4 demolition weekends, 2 for each structure, is expected to demolish half of the bridge. The contractor is not expected to demolish bridges over both Bellefontaine Road and Route 367 at the same time due to detour routes setup in the contract. It shall be the responsibility of the engineer to determine the quantity of excess closure time.

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

M. Liquidated Damages Specified – Demolition of Lilac Avenue Bridge over I-270

1.0 Description. As specified in JSP C – Work Zone Traffic Management, the contractor will be allowed to close I-270 under Lilac Avenue for an extended weekend beginning on a Friday at 8:00 p.m. and lasting until the following Monday at 5:00 a.m. to demolish and remove the existing

bridge. Prior to demolishing the bridge, the contractor shall have all detour signs in place to allow I-270 traffic to use the ramps at Lilac Avenue to exit and then re-enter the interstate.

If all work noted above is not complete and I-270 and the interchange ramps open to traffic within the extended weekend closure window allowed for the demolition, the Commission, the traveling public, and state and local police and governmental authorities will be damaged in various ways, including but not limited to, increased construction administration cost, potential liability, traffic and traffic flow regulation cost, traffic congestion and motorist delay, with its resulting cost to the traveling public. These damages are not reasonably capable of being computed or quantified. Therefore, the contractor will be charged with liquidated damages specified in the amount of **$5,000 per every 15 minutes** for **each full 15 minutes past 5:00 a.m**. that the work described above is not complete and all lanes on I-270 and the interchange ramps are open to traffic in excess of the limitation as specified elsewhere in this special provision. Multiple liquidated damages may be charged as each stage for each bridge has an extended weekend closure window to demolish half of the bridge. It shall be the responsibility of the engineer to determine the quantity of excess closure time.

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

N. Liquidated Damages Specified – Reconstruction of Lilac Avenue Bridge over I-270

1.0 Description. If reconstruction of the Lilac Avenue Bridge over I-270 is not complete and at least one lane open to traffic in each direction on Lilac Avenue within 180 Calendar Days starting the Friday of the demolition of the existing bridge as specified in JSP – Liquidated Damages Specified – Demolition of Lilac Avenue Bridge over I-270, the Commission, the traveling public, and state and local police and governmental authorities will be damaged in various ways, including but not limited to, increased construction administration cost, potential liability, traffic and traffic flow regulation cost, traffic congestion and motorist delay, with its resulting cost to the traveling public. These damages are not reasonably capable of being computed or quantified. Therefore, the contractor will be charged with liquidated damages specified in the amount of **$4,800 per day for each full day** that the Lilac Avenue Bridge over I-270 is not complete and open to at least 1 lane in each direction on Lilac Avenue north and south of I-270 in excess of the limitation as specified elsewhere in this special provision. It shall be the responsibility of the engineer to determine the quantity of excess closure time.

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

O. Liquidated Damages / Liquidated Savings Specified For Completion of JSL0021

1.0 Description. If construction of Job JSL0021, which includes the reconstruction of mainline I-270 Bridges over both Route 367 and Bellefontaine Road, with all lanes open to traffic in their final configuration on mainline I-270 and its ramps per the plans, is not completed by noon on November 24th, 2027, the Commission, the traveling public, and state and local police and governmental authorities will be damaged in various ways, including but not limited to potential liability, traffic and traffic flow regulation cost, traffic congestion and motorist delay, with its resulting cost to the traveling public.

2.0 Liquidated Damages Specified for Failure To Complete Work on Time. These costs are not reasonably capable of being computed or quantified. Therefore, the contractor will be charged with liquidated damages specified in the amount of **$20,000.00** per day for each full day, that all lanes on mainline I-270 and ramps are not open to traffic in their final configuration per the plans, in excess of the limitation as specified elsewhere in the special provision. It will be the responsibility of the engineer to determine the quantity of excess closure time.

2.1 The said liquidated damages specified will be assessed in addition to any other liquidated damages charged under the Missouri Standard Specifications for Highway Construction, as indicated elsewhere in this contract.

2.2 This deduction will continue until such time as the necessary work is completed and traffic is restored.

3.0 Liquidated Savings Specified for Early Completion. The contractor may receive an incentive payment from the Commission, in addition to all other sums earned under the contract, if the contractor completes Job JSL0021 with all lanes open to traffic in their final configuration on mainline I-270 and its ramps per the plans. To qualify for this incentive payment, the reconstruction of mainline I-270 Bridges over both Route 367 and Bellefontaine Road, with all lanes open to traffic in their final configuration on mainline I-270 and its ramps per the plans must be completed by November 1st, 2027, which equates to 441 calendar days between the notice to proceed and this completion date. An incentive payment of **$20,000.00** will be paid per day for each full *day* that the work described above is completed prior to November 1st. The maximum amount paid as liquidated savings will not exceed **$600,000.00**

3.1 In the event of an excusable delay, including differing site conditions, an extension of the contract completion time will not extend the time specified for determining any liquidated savings or incentive, except that, in its discretion, the Commission may extend the time specified should the delay be directly caused by the Commission. Further, in the event of an excusable delay, if the contractor completes the work providing for liquidated savings or incentive on or before the milestone or other date, that shall not constitute a basis to claim acceleration costs in addition to the liquidated savings or incentive that may be earned.

3.2 The incentive payment described above is made, not as a bonus or gift, but as stipulated compensation in full for reduced risks, delay and inconvenience experienced by the traveling public, and for other reduced costs to the Commission and public resulting from early completion.

3.3 As noted above, the dates for when Liquidated Damages are charged (after November 24th) and for when Liquidated Savings are paid (30 days prior to November 1st) differ.

3.4 If the Contractor, with approval from the Engineer, adjusts the order of projects so that J6I3020D is constructed prior to JSL0021, then this provision will be adjusted prior to the pre-construction meeting after the Contractor has requested this change and received written approval from the Engineer such that construction on JSL0021 ~~has an adjusted completion requiring work through~~ is completed through only 1 winter season between November and March, and within the same number of calendar days, 441, as allowed in Section 3.0 of this provision.

P. Inlaid Pavement Marker Removal

1.0 Description. Existing Inlaid raised pavement markers shall be removed within the limits of the temporary pavement marking shown in the temporary traffic control plans for I-270.

2.0 Removal of Existing Inlaid Pavement Markers (IPM). This work shall consist of the removal of existing IRPM's. Removal of IRPM's shall include removing the IPM reflector and housing, with minimal damage to the pavement. The hole shall be patched with a commercial mix.

3.0 Method of Measurement. No Measurement shall be made for the removal of IRPM's, and associated patching of grove.

4.0 Basis of Payment. The accepted quantity of inlaid pavement marker removal shall be considered incidental to the lump sum pay item for Temporary Traffic Control.

Q. Inlaid Pavement Marker Installation

1.0 Description. This work shall consist of furnishing and installing inlaid pavement markers as shown on the plans or as directed by the engineer. An inlaid pavement marker shall consist of a retro-reflective pavement marker installed below the pavement surface. The marker shall be installed with a cradle device which supports the reflector at the proper depth below the pavement and attached to the pavement with adhesive. In addition to cutting a location for the marker, a slot shall be grooved into the pavement both before and after the marker for visibility of the marker and drainage. Final product shall have two markers in place at each location.

2.0 Material. All material shall be in accordance with the following.

2.1 Marker. The marker shall have two retro-reflective lenses white facing traffic and red facing opposing / wrong way traffic to reflect incident light from opposite directions. The lens shall be hermetically sealed and permanently bonded to the marker base. The manufacturer's identification shall be molded in the face of the marker lens or on the marker body so as to be visible after installation. The reflector color shall be as shown on the plans.

2.1.1 The marker shall have nominal dimensions of 2.0 x 5.0 x 0.7 inches. The reflective surface of each lens shall be a nominal 1.93 square inches in area.

2.1.2 In addition to the requirements described, the marker/cradle system shall be National Transportation Product Evaluation Program (NTPEP) approved. The marker shall receive at a minimum an average rating of 3.0 for lens and visibility after one year of exposure on both concrete and asphalt test decks. A written request for qualification shall be sent by the manufacturer to Construction and Materials with the following information:

(a) Brand name of the product.

(b) A copy of the actual test results from NTPEP.

(c) Certification that the material meets this specification and is intended for use as described.

(d) Specific installation instructions.

2.2 Adhesive. The adhesive used to bond the marker to the pavement shall be an epoxy approved by the engineer or meet the manufacturers specifications..

3.0 Construction Requirements.

3.1 Reflector placement. A cradle shall be used to hold the marker at the correct nominal depth of 0.12 inch. The cradle shall be made of polycarbonate plastic and the net weight of the cradle and marker shall be less than 5 ounces. When installed, the marker shall be perpendicular to traffic.

3.2 Pavement groove. There shall be a groove cut both in advance and behind the marker using diamond tipped blades. The entire groove shall be cut in accordance with the manufacturers recommendations. The groove should be straight to within 1/2 inch in 10 feet. The width of the groove shall be 5 inches or per manufacturer's specifications.

The overall length of the groove cut in the pavement surface shall be 9 feet, with markers placed 3.5 feet from either end and spaced 2.0 feet apart.

3.3 Installation. The groove and the bottom surface of the marker shall be free of scale, dirt, rust, oil, grease or any other contaminant that might reduce bonding to the adhesive.

3.3.1 The adhesive used to install the marker shall be machine applied unless otherwise approved by the engineer. The machine mixer and applicator shall be capable of accurately and uniformly proportioning the components. The mixing chamber shall produce an epoxy adhesive of uniform color with no visible evidence of streaks on the surface or within the mixed epoxy adhesive.

3.3.2 No markers shall be installed when the ambient temperature is below 50 F (10 C), the relative humidity is above 80 percent, or the pavement surface is wet.

3.3.3 Newly placed bituminous pavement surfaces shall be allowed to cure for a minimum of seven days prior to installing reflectors.

3.3.4 A longitudinal adjustment to the location of a marker shall be made in order to avoid damage to deteriorated pavement or transverse joints. In locations where concrete and bituminous surfaces abut, markers shall be installed in the concrete surface.

3.3.5 The pavement shall be accurately cut to the marker manufacturer's specifications. The depth of the groove where the marker is to be placed shall be in accordance with manufacturer's specifications.

3.3.6 If necessary, installation grooves on crowned pavements, superelevated pavements, or ramps shall be cut as needed to provide proper marker fit.

3.3.7 The groove shall be clean and dry prior to application of the adhesive.

3.4.9 There shall be no adhesive on the lens or top of the marker.

3.4.10 When hand mixing of epoxy adhesive is permitted, no more than one quart (L) of epoxy adhesive shall be mixed at one time. The marker shall be installed within five minutes after mixing operations are started.

3.4.11 The installed marker shall be protected from traffic until the adhesive has cured according to manufacturer's recommendations. If, after the manufacturer's recommended cure time, epoxy adhesive can be penetrated by a screwdriver or other pointed instrument, the marker shall be removed, cleaned, and reinstalled.

4.0 Method of Measurement. Final measurement will not be made except for authorized changes during construction or where appreciable errors are found in the contract quantity. When required, measurement of inlaid pavement markers will be measured per each. The revision or correction will be computed and added to or deducted from the contract quantity.

5.0 Basis of Payment. The accepted quantity of inlaid pavement markers will be paid at the contract unit price for:

Item No.	Unit	Description
620-99.02	Each	Inlaid Pavement Marker Installation

5.1 Payment for the Inlaid Pavement Marker Installation per each includes all labor, equipment and materials necessary to fulfill the requirements of the above provision. The cost of grooving, adhesive, and installation of two pavement markers per groove will be included in the unit cost per marker each installation.

R. Alternates for Pavements JSP-96-04G

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

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

2.0 Mainline Pavements (J6I3020D)

2.0.1 A sum of $___143,400__ will be added by the Commission to the total bid using an asphalt alternate for the ***Alternate A (Mainline I-270)*** pavement for bid comparison purposes to factor in life cycle cost analysis of the roadway. The additional amount added will not represent any additional payment to be made to the successful bidder and is used only for determining the low bid.

2.0.2 A sum of $___9,300___ will be added by the Commission to the total bid using an asphalt alternate for **the *Alternate G (Lilac Ave)*** pavement for bid comparison purposes to factor in life cycle cost analysis of the roadway. The additional amount added will not represent any additional payment to be made to the successful bidder and is used only for determining the low bid.

2.1 Shoulder Pavement (J6I3020D)

2.1.1 A sum of $___24,000___ will be added by the Commission to the total bid using an asphalt alternate for **the *Alternate C (Shoulder I-270)*** pavement for bid comparison purposes to factor

in life cycle cost analysis of the roadway. The additional amount added will not represent any additional payment to be made to the successful bidder and is used only for determining the low bid.

2.1.2 A sum of $___3,800___ will be added by the Commission to the total bid using an A2 asphalt alternate for **the *Alternate E (A2 Shoulder I-270)*** pavement for bid comparison purposes to factor in life cycle cost analysis of the roadway. The additional amount added will not represent any additional payment to be made to the successful bidder and is used only for determining the low bid.

2.2 Mainline Pavements (JSL0021)

2.2.1 A sum of $___197,500___ will be added by the Commission to the total bid using an asphalt alternate for the ***Alternate I (Mainline I-270)*** pavement for bid comparison purposes to factor in life cycle cost analysis of the roadway. The additional amount added will not represent any additional payment to be made to the successful bidder and is used only for determining the low bid.

2.2.3 A sum of $___8,100___ will be added by the Commission to the total bid using an asphalt alternate for **the *Alternate M (Bellefontaine Rd)*** pavement for bid comparison purposes to factor in life cycle cost analysis of the roadway. The additional amount added will not represent any additional payment to be made to the successful bidder and is used only for determining the low bid.

2.4.5 A sum of $___41,100___ will be added by the Commission to the total bid using an asphalt alternate for **the *Alternate O (MO 367 and Ramp 8D)*** pavement for bid comparison purposes to factor in life cycle cost analysis of the roadway. The additional amount added will not represent any additional payment to be made to the successful bidder and is used only for determining the low bid.

2.5 Shoulder Pavement (JSL0021)

2.5.1 A sum of $___127,500___ will be added by the Commission to the total bid using an asphalt alternate for the ***Alternate K (Shoulder I-270)*** pavement for bid comparison purposes to factor in life cycle cost analysis of the roadway. The additional amount added will not represent any additional payment to be made to the successful bidder and is used only for determining the low bid.

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

2.7 The grading shown on the plans was designed for the thicker asphalt pavement alternate and used for the computation of earthwork. The alternates used include: J6I3020D - Alternate A, C, and E on I-270, and Alternate G on Lilac Ave. JSL0021 - Alternate I and K on I-270, Alternate M on Bellefontaine Rd, and Alternate O on MO 367 and Ramp 8D.

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

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

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

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

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

S. Special Asphaltic Concrete Pavement

1.0 Description. This work shall consist of constructing the asphaltic concrete pavement alternate to a thickness of 14.5 inches or 15.5 inches on I-270, a thickness of 11.5 inches on Lilac Avenue, 10.5 inches on MO 367, and 9.5 inches on Bellefontaine Road placed in lifts as shown on the plans or as directed by the Engineer.

2.0 Material. Materials shall be in accordance with Division 1000, "Materials Details." The type of asphaltic concrete mixture used shall be as specified in the plans.

3.0 Construction Requirements. Construction of asphaltic concrete mixture shall be in accordance with Sec 403 of the Missouri Standard Specifications for Highway Construction, except as herein modified. The pavement shall be placed in multiple lifts to achieve the specified total thickness described above for the in 1.0 of this provision. Lift thickness shall conform to the requirements of Section 403.

4.0 Method of Measurement. The quantities of asphalt concrete pavement will be measured in accordance with Section 403. The quantities will be measured to nearest $1/10^{th}$ square yard.

5.0 Basis of Payment. Payment for the installation of the specified thickness of asphaltic concrete pavement, including all materials, equipment, labor and all necessary work shall be completely covered by the contract unit price paid for by the line items listed below:

Item No.	Unit	Description
403.99-05	SY	14.5 Inches, Asphaltic Concrete Pavement SP125BSM
403.99-05	SY	11.5 Inches, Asphaltic Concrete Pavement SP125CLP
403.99-05	SY	15.5 Inches, Asphaltic Concrete Pavement SP125BSM
403.99-05	SY	10.5 Inches, Asphaltic Concrete Pavement SP125CLP
403.99-05	SY	9.5 Inches, Asphaltic Concrete Pavement SP125CLP

T. Adjust To Grade Items – Version 12/10/2025

1.0 Description. This work shall consist of adjusting utility manholes, valves, and pull boxes located within areas designated for new sidewalks, curb ramps, approaches, or pavements, as shown on the plans. The Contractor shall verify the type of frame and cover in the field prior to performing any work.

2.0 Coordination. The Contractor is advised that the following utility owners may have facilities affected by this work: Metropolitan St. Louis Sewer District (MSD), Missouri Department of Transportation (MoDOT), Missouri American Water Company, and AT&T Telecommunications. Refer to the "Utilities" Job Special Provision for more details on project specific utilities. For information regarding MoDOT Intelligent Transportation Systems (ITS), refer to "ITS Pull Box Adjustment" Job Special Provision.

2.1 The Contractor shall notify the respective MoDOT Utility Coordinator at least three (3) weeks prior to any adjustment work to verify the location of the facilities.

3.0 Construction Requirements. The Contractor shall verify the type of frame and cover in the field prior to performing any adjustments. All adjustments shall match the final proposed grade. Utilities located within proposed sidewalks or sidewalk landings shall be adjusted to ensure a maximum slope of two percent (2%) in all directions, in compliance with current ADA standards. Utilities located within the ramp portion of a proposed ADA curb ramp shall be relocated outside the limits of the ramp.

3.1 Adjustments to manholes or inlets shall be performed in accordance with Section 604 of the Missouri Standard Specifications for Highway Construction, except as modified herein. All adjustments, extensions, lowering, excavation, and backfill shall be completed as approved by the Engineer. For MoDOT-owned facilities, adjustments shall conform to the Missouri Standard Specifications for Highway Construction. For MSD-owned structures, adjustments shall conform to the 2023 MSD Construction Specifications for Sewer and Drainage Facilities and the 2009 MSD Standard Detail Sheets.

3.2 Damaged concrete aprons on manholes shall be replaced as directed by the Engineer. Replacement aprons shall be four (4) inches deep and eighteen (18) inches wide around the manhole. Refer to "Concrete Manhole Apron" JSP for details on concrete manhole aprons.

4.0 Basis of Payment. No direct payment will be made for hauling, cutting, joining, backfilling, adjusting rings, or any other requirements necessary to fulfill this provision. No direct payment will be made to recover the cost of equipment, labor, materials, or time required to fulfill the above provision. All costs associated with fulfilling this provision will be considered fully compensated for by the pay items shown below.

Item Number	Unit	Description
604-20.10	Each	Adjusting Manholes
604-20.20	Each	Adjusting Basin or Inlet
604-99.02	Each	Adjusting Valves
604-99.02	Each	Adjusting Pull Boxes
604-99.02	Each	Concrete Manhole Apron

U. Concrete Manhole Apron

1.0 Description. The Contractor shall install a reinforced concrete apron around a manhole frame and cover or utility valve as indicated in the plans and as approved by the Engineer.

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

Item	Section
Reinforcing Steel for Concrete	1036

2.1 Concrete used for manhole apron shall be the same used for full depth pavement repairs as specified in Section 613.10 of the Standard Specifications.

3.0 Construction Requirements. Manhole aprons shall be provided in locations within the plans or as directed by the Engineer but generally shall be located where a manhole is adjusted to grade due to the cold-milling and overlaying of an existing roadway. The use of an apron can also be considered for new installations within new full depth asphalt pavement.

3.1 Steel Plate. If approved by the Engineer, a steel plate may be installed over the void created by the removal of pavement next to a manhole or utility valve prior to the installation of the manhole apron concrete. Asphalt wedging surrounding the steel plate shall be included when using a steel plate. No direct payment shall be made to provide this steel plate and asphalt wedging.

3.2 Joint Sealing. Per MoDOT Standard Specification 613.3.3, the contractor shall seal the joint between the asphalt surface and the new concrete apron along with seal any overcut created from the sawcutting operation when removing the portion of pavement to be replaced with manhole apron concrete. This joint shall be filled with either an expansive mortar, epoxy, polyester or joint material as approved by the Engineer. In addition, the contractor shall install tar paper between the new concrete and the existing manhole frame and cover as directed by the Engineer.

4.0 Method of Measurement. Measurement for installation of a reinforced concrete manhole apron will be made per each.

5.0 Basis of Payment. Payment for the installation of a reinforced concrete manhole apron, including all materials, equipment, labor, saw cuts before and/or after installation and all necessary work shall be completely covered by the contract unit price paid for the item listed below. Adjusting to grade the actual frame and cover shall be paid for separately. Please see JSP – Adjusting Manholes, Valves and Pullboxes for additional details regarding the adjustment to grade for those items.

Item No.	Type	Description
604-99.02	Each	Concrete Manhole Apron

V. Concrete Washout

1.0 Description. Concrete washout BMPs shall be established in designated areas for this project if concrete production or delivery is occurring. Washout BMPs can be non-leaking plastic or clay/bentonite lined pits, a straw bale enclosure lined with plastic, a storage tank or prefabricated BMP or other structure approved by the engineer or inspector. Designated washout areas should be located at least 50 feet away from storm drains, ditches, streams, or other water bodies. Washouts should be monitored like other BMPs to ensure there are no leaks and that they are operating effectively. They should be cleaned out when they reach 75% of their design capacity. Care should be taken to ensure these structures do not overflow during storm events. Upon completion of concrete washout on the project, the engineer or inspector should ensure proper disposal of washout materials. Washout liquids can be allowed to evaporate or be pumped out and properly disposed of. They cannot be discharged into storm drains, ditches, streams or other bodies of water. Dried concrete can be broken up and used as clean fill on the project, recycled or properly disposed of by other means.

2.0 Basis of Payment. No direct payment will be made to the contractor for installing, maintaining, and removing concrete washout facilities or for properly disposing of materials. The cost of complying with this requirement shall be completely covered in the contract unit price of the concrete pay items included in the contract.

W. Quality Management NJSP-15-22

1.0 Quality Management. The contractor shall provide Quality Management as specified herein to ensure the project work and materials meets or exceeds all contract requirements.

1.1 The contractor shall provide Quality Control (QC) of the work and material, as specified herein, to ensure all work and material is in compliance with contract requirements. QC staff shall perform and document all inspection and testing. The QC inspectors and testers may be employed by the contractor, sub-contractor, or a qualified professional service provided by the contractor.

1.2 The engineer will provide Quality Assurance (QA) inspection. The role of QA is to verify the performance of QC and provide confidence that the product will satisfy given requirements for quality.

1.3 The contractor shall designate a person to serve as the project Quality Manager (QM). The QM shall be knowledgeable of standard testing and inspection procedures for highway and bridge construction, including a thorough understanding of the Missouri Standard Specifications. The QM shall be responsible for the implementation and execution of the Quality Management Plan and shall oversee all QC responsibilities, including all sub-contract work. The QM shall be the primary point of contact for all quality related issues and responsibilities and shall ensure qualified QC technicians and inspectors are assigned to all work activities. The QM should be separate from the manager of the work activities to effectively manage a QC program.

1.4 Any QC personnel determined in sole discretion of the engineer to be incompetent, derelict in their duties, or dishonest, shall at a minimum be removed from the project. Further investigation will follow with a stop work notification to be issued until the contractor submits a corrective action report that meets the approval of the engineer.

2.0 Quality Management Plan. The contractor shall develop, implement and maintain a Quality Management Plan (QMP) that will ensure the project quality meets or exceeds all contract requirements, and provides a record for acceptance of the work and material. A sample QMP,

which shows minimum requirements, is provided on the MoDOT website at: www.modot.org/quality.

2.1 The QMP shall address all QC inspection and testing requirements of the work as described herein. A draft QMP shall be submitted to the Resident Engineer for review at least two weeks prior to the pre-construction conference. An approved QMP is required at least two weeks prior to the start of work, unless otherwise allowed by the engineer. Physical work on the project shall not begin prior to approval of the QMP by the engineer.

2.2 The approved QMP shall be considered a contract document and any revisions to the QMP will require approval from the engineer.

2.3 The following items shall be included in the Quality Management Plan:

a) Organizational structure of the contractor's project management, production staff, and QC staff, specific to this project.

b) Name, qualifications and job duties of the Quality Manager.

c) A list of all certified QC testers who will perform QC duties on the project, including sub-contract work, and the tests in which they are certified.

d) A list of all QC inspectors who will perform QC inspection duties on the project, including sub-contract work, and the areas of inspection that they will be assigned.

e) A procedure for verifying documentation is accurate and complete as outlined in Section 3.

f) A procedure describing QC Inspections as outlined in Section 4.

g) A procedure describing QC Testing, as outlined in Section 5, including a job specific Inspection and Test Plan (ITP).

h) A procedure describing Material Receiving as outlined in Section 6.

i) A list of Hold Points that are not included in the checklist forms, as outlined in Section 8.

j) A procedure for documenting and resolving Non-Conforming work as outlined in Section 9.

k) A procedure for tracking and documenting revisions to the QMP.

l) A list of any approved changes to the Standard Specifications or ITP, including a reference to the corresponding change order.

m) Format for the Weekly Schedule and Work Plans as outlined in Section 10, including a list of activities that will require pre-activity meetings.

3.0 Project Documentation. The contractor shall establish a Document Control Procedure for producing and uploading the required Quality Management documents to a MoDOT-provided server. The document management software used by MoDOT is Microsoft SharePoint®. Contractors do not need to purchase Microsoft SharePoint®, however, it is recommended that

new users acquire some basic training to better understand how to use this software. MoDOT does not provide the software training, but there are several online vendors who do. Contractors are required to use Microsoft Excel® and Microsoft Word® with some documents.

3.1 The contractor shall utilize the file structure and file naming convention provided by MoDOT. A sample file structure is available on the MoDOT website.

3.2 Documents (standard forms, reports, and checklists) referenced throughout this provision are considered the minimum documentation required. They shall be obtained from MoDOT at the following web address: www.modot.org/quality. The documents provided by MoDOT are required to be used in the original format, unless otherwise approved by the engineer. Any alteration to these forms shall be approved by the engineer.

3.3 Timely submittal of the required documents to the MoDOT document storage location is essential to ensure payment can be processed for the completed work. Submittal of the documents is required within 12 hours of the work shift that the work was performed, or on a document-specific schedule approved by the engineer and included in the QMP.

3.4 The contractor shall establish a verification procedure that ensures all required documents are submitted to the engineer within the specified time, and prior to the end of each pay period for the work that was completed during that period. Payment will not be made for work that does not include all required documents. Minimum documents that might be required prior to payment include: Test Reports, Inspection Checklists, Materials Receiving Reports, and Daily Inspection Reports.

3.5 The contractor shall perform an audit at project closeout to ensure the final collection of documents is accurate and complete.

4.0 Quality Control Inspections. The QMP shall identify a procedure for performing QC inspections. QC inspections shall be performed for all project activities to ensure the work is in compliance with the contract, plans and specifications.

4.1 The QM shall identify the QC inspectors assigned to each work activity. The QC inspectors shall inspect the work to ensure the work is completed in accordance with the plans and specifications and shall document the inspection by completing the required inspection checklists, forms, and reports provided by MoDOT. Depending on the type of work, the checklists may be necessary daily, or they may follow a progressive work process. The frequency of each checklist shall be stated in the QMP. The contractor may propose alternate versions of checklists that are more specific to the work.

4.2 A Daily Inspection Report (DIR) is required to document pertinent activity on the project each day. This report shall include a detailed diary that describes the work performed as well as observations made by the inspection staff regarding quality control. The report shall include other items such as weather conditions, location of work, installed quantities, tests performed, and a list of all subcontractors that performed work on that date. The report shall include the full name of the responsible person who filled out the report and shall be digitally signed by an authorized contractor representative.

4.3 External fabrication of materials does not require further QC inspection if the product is currently under MoDOT inspection or an approved QC/QA program. QC inspection and testing required in the production of concrete for the project shall be the responsibility of the contractor.

4.4 The contractor shall measure, and document on the DIR, the quantity for all items of work that require measurement. Any calculations necessary to support the measurement shall be included with the documentation. The engineer will verify the measurements prior to final payment.

5.0 Quality Control Testing. The QMP shall identify a procedure for QC testing. The contractor shall perform testing of the work at the frequency specified in the Inspection and Test Plan (ITP).

5.1 MoDOT will provide a standard ITP and the contractor shall modify it to include only the items of work in the contract, including adding any Job Special Provision items. The standard ITP is available on the MoDOT website at www.modot.org/quality. The contractor shall not change the specifications, testing procedures, or the testing frequencies, from the standard ITP without approval by the engineer and issuance of a change order.

5.2 Test results shall be recorded on the standard test reports provided by the engineer, or in a format approved by the engineer. Any test data shall be immediately provided to the engineer upon request at any time, including prior to the submission of the test report.

5.3 The contractor shall ensure that all personnel who perform sampling and/or testing are certified by the MoDOT Technician Certification Program or a certification program that has been approved by MoDOT for the sampling and testing they perform.

5.4 If necessary, an independent third party will be used to resolve any significant discrepancies between QC and QA test results. All dispute resolution testing shall be performed by a laboratory that is accredited in the AASHTO Accreditation Program in the area of the test performed. The contractor shall be responsible for the cost to employ the third party laboratory if the third party test verifies that the QA test was accurate. The Commission shall be responsible for the cost if the third party test verifies that the QC test was accurate.

6.0 Material Receiving. The QMP shall identify a procedure for performing material receiving. Standard material receiving forms will be provided by the engineer.

6.1 The procedure shall address inspections for all material delivered to the site (excluding testable material such as concrete, asphalt, aggregate, etc.) for general condition of the material at the time it is delivered. The material receiving procedure shall record markings and accompanying documentation indicating the material is MoDOT accepted material (MoDOT-OK Stamp, PAL tags, material certifications, etc.).

6.2 All required material documentation must be present at the time of delivery. If the material is not MoDOT accepted, the contractor shall notify the engineer immediately and shall not incorporate the material into the work.

7.0 Quality Assurance. The engineer will perform Quality Assurance inspection and testing (QA) to verify the performance of QC inspection and testing. The frequency of the QA testing will be as shown in the ITP, but may be more frequent at the discretion of the engineer. The engineer will record the results of the QA testing and inspection and will inform the contractor of any known discrepancies.

7.1 QA is responsible for verifying the accuracy of the final quantity of all pay items in the contract. This includes taking measurements on items that require measurement and other items that are found to have appreciable errors.

7.2 QA inspection and test results shall not be used as a substitute for QC inspection and testing.

7.3 QA will be available for Hold Point inspections at the times planned in the Weekly Schedule. The inspections may be re-scheduled as needed, but a minimum 24-hour advance notification from the contractor is required unless otherwise approved by the engineer.

8.0 Hold Points. Hold Points are events that require approval by the engineer prior to continuation of work. Hold Points occur at definable stages of work when the succeeding work depends on a QA review of the preceding work before work can continue.

8.1 A list of minimum Hold Points will be provided by the engineer and shall be included in the QMP. The engineer may make changes to the Hold Point list at any time.

8.2 Prior to all Hold Point inspections, QC shall provide the engineer with the Daily Inspection Reports, Inspection Checklists, Test Reports, and Material Receiving Reports for the work performed leading up to the Hold Point. If the engineer identifies any corrective actions needed during a Hold Point inspection, the corrections shall be completed prior to continuing work. The engineer may require a new Hold Point to be scheduled if the corrections require a follow-up inspection.

9.0 Non-Conformance Reporting. Non-conformance reports shall be issued by the contractor for work that does not meet the contract requirements. Non-conforming work includes work, testing, materials and processes that do not meet contract requirements. The contractor shall establish a procedure for identifying and resolving non-conforming work as well as tracking the status of the reports.

9.1 Contractor QC staff or production staff should identify non-conforming work and document the details on the Non-Conformance Report form provided by MoDOT. QA staff may also initiate a non-conformance report.

9.2 In-progress work that does not meet the contract requirements may not require a non-conformance report if production staff is aware of the issue and corrects the problem during production. QC or QA may issue a non-conformance report for in-progress work when documentation of the deficiency is considered beneficial to the project record.
9.3 The contractor shall propose a resolution to the non-conforming work. Acceptance of a resolution by the engineer is required before closure of the non-conformance report.

9.4 For recurring non-conformance work of the same or similar nature, a written Corrective Action Request will be issued by QC or QA. The contractor shall then establish a procedure for tracking the corrective action from issuance of the request to implementation of the solution. Approval from the engineer is required prior to implementation of the proposed corrective action. The contractor shall notify the engineer after the approved corrective action has been implemented.

10.0 Work Planning and Scheduling. The contractor shall include Quality Management in all aspects of the work planning and scheduling. This shall include providing a Weekly Schedule, a Work Plan for each work activity, and holding pre-activity meetings for each new activity.

10.1 A Weekly Schedule shall be provided to the engineer each week that outlines the planned project activities for the following two-week period. This schedule shall include all planned work, identification of all new activities, traffic control events, and requested Hold Point inspections for the period. Planned quantity of materials, along with delivery dates should also be included in the schedule.

10.2 A Work Plan shall be submitted to the engineer at least one week prior to the pre-activity meeting. The Work Plan shall include the following: a safety plan, list of materials to be used, work sequence, defined responsibilities for QC testing and inspection personnel, and stages of work that will require Hold Point inspections.

10.3 A pre-activity meeting is required prior to the start of each new activity. The purpose of this meeting is to discuss details of the Work Plan and schedule, including all safety precautions. Those present at the meeting shall include: the production supervisor for the activity, the Quality Manager, QC inspection and testing staff, and QA. The Quality Manager will review the defined responsibilities for QC testing and inspection personnel and will address any quality issues with the production staff. Attendees may join the meeting in person or by phone or video conference.

11.0 Basis of Payment. Payment for all costs associated with developing, implementing and maintaining the Quality Management Plan, providing Quality Control inspection and testing, and all other costs associated with this provision, will be considered included in the unit price of each contract item. No direct pay will be made for this provision.

X. Drainage Maintenance During Construction

1.0 Description. The contractor's attention is called to the drainage construction. The Contractor shall maintain drainage during construction and to ensure that the existing drainage system continues to convey all storm water until the new structures and pipes are in place.

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

Y. Concrete Traffic Barrier, Type C (Modified)

1.0 Description. This work covers the furnishing and installation of the modified concrete barrier, type C in the I-270 median and the MO 367 median when the vertical difference exceeds the value shown in the MoDOT Standard Plans for "Permanent Concrete Traffic Barrier, Type C".

2.0 Material. Concrete Traffic Barrier, Type C (Modified) shall meet the requirements of the plans. All material shall be in accordance with Division 1000.

3.0 Construction Requirements. Concrete Traffic Barrier, Type C (Modified) shall be installed as shown on the plans and in accordance with the Standard Specification 617.10.

4.0 Basis of Payment. The contract unit price shall be considered as full compensation for all labor, equipment, materials or other construction involved to complete the work. The following is the Pay Item No. for each type of structure listed above.

Item No.	Unit	Description
617.99-03	LF	Concrete Traffic Barrier, Type C (Modified)

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

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

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

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

2.1 The ADA Checklist is not to be considered all-inclusive, nor does it supersede any other contract requirements. The ADA checklist is a required guide for the contractor to use during the construction of the pedestrian facilities and a basis for the commission's acceptance of work. Prior to work being performed, the contractor shall bring to the engineer's attention any planned work that is in conflict with the design or with the requirement shown in the checklist. This notification shall be made in writing. Situations may arise where the checklist may not fully address all requirements needed to construct a facility to the full requirements of current ADA law. In those situations, the contractor shall propose a solution to the engineer that is compliant with current ADA law using the following hierarchy of resources: 2010 ADA Standards for Accessible Design, Draft Public Rights of Way Accessibility Guidelines (PROWAG) dated November 23, 2005, MoDOT's Engineering Policy Guidelines (EPG), or a solution approved by the U.S. Access Board.

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

3.0 Coordination of Construction.

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

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

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

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

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

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

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

AA. ADA Curb Ramp – St. Louis District Version 01-17-24

1.0 Description. This work shall consist of constructing new concrete curb ramps that are compliant with current Americans with Disabilities Act (ADA) and MoDOT guidelines at locations shown on the plans and as directed by the engineer.

1.1 The contractor shall ensure that the persons establishing the grades of the ADA facilities have a copy of ADA related provisions at hand for reference. If it is found that written provisions for ADA facilities are not at hand, the engineer may cause ADA work to be ceased until a copy arrives.

2.0 Construction Requirements. Except as noted herein, all applicable provisions in Sec 608 of the Standard Specifications shall apply to the construction of the curb ramps.

2.1 The following shall be included in the cost of a new ADA ramp:

- Excavation and preparing of the subgrade prior to placement of the aggregate base
- 4" Type 5 Aggregate Base underneath the new ramp
- Everything shown in the various figures of ADA ramp curb types on Standard Plan 608.50 shall be poured as 7" concrete. This includes all area of ramp, level landing pads and any flares included in the per each ADA Ramp.
- Variable height curb along the roadway within the limits of the new ADA ramp
- Variable height curb along the backside of the new ADA ramp
- Concrete median used to separate direction of travel within a dual perpendicular ramp

- Furnishing and installing any reinforcement needed as shown in the plans for curbs taller than 8”
- Tinting of concrete surface as required in the plans
- Saw Cuts needed for the removal of the existing concrete area where the new ADA ramp is being constructed

2.1.1 Regardless of the number of ramp areas or surfaces having a maximum ramp slope of 1V:12H (8.33%) that are constructed for a particular type of ADA Curb Ramp, the contractor **will not** be paid for additional number of ramps at that location. See special sheet for curb ramp pay limits. Exception: **Dual Perpendicular Ramps and Blended Transitions** will be paid as 2 each.

2.2 The following shall be paid for separately in the cost of a new ADA ramp:

- Truncated Domes

2.2.1 Detectable warning surfaces shall be provided, where a curb ramp, landing, or blended transition connects to a street. Where commercial or private driveways are provided with traffic control devices or otherwise are permitted to operate like public streets, detectable warnings should be provided at the junction between the pedestrian route and the street. See plans for additional details.

2.2.2 The truncated domes shall come from Materials’ Pre-Qualified List FS-1067 Table 1 from the following link:

https://www.modot.org/materials

2.3 Gutter Correction. The contractor shall establish the grade of the flow line of the gutter before establishing the grades of ADA facilities. The gutter line shall be free flowing with no ponding next to the curb. Under-performing gutters shall be replaced with a concrete curb and gutter or a minimum 1.75-inch thick asphalt mill and fill. Running or standing storm water shall not be pushed out into the roadway where it may be splashed on pedestrians by passing vehicles or cause a hydroplaning hazard. An asphalt mill and fill shall be a minimum of 1.75 inches thick and the edges shall be at a smooth milled butt joint. The contractor shall use an approved BP-1 mix for all corner asphalt mill and fill work unless another surface asphalt mix is specified elsewhere in the contract. Asphalt mill and fill is included in the work of ADA Curb Ramps. If asphalt mill and fill is needed at a corner without any other ADA work, it will be found as a separate line item in this contract.

2.4 Design Plans

2.4.1 Recommendations for the design type of each curb ramp to be built on this project are shown on the plans. Curb ramps constructed by the contractor may vary from the original design, with approval from the engineer, in size, shape, and location as necessary to comply with ADA laws. It is the contractor’s responsibility to inspect locations in the field before bidding to verify quantities needed to satisfy this provision. No additional pay will be made to the contractor if the original design is adjusted, and a different ramp type is constructed instead of the recommended/suggested in the plans.

2.4.2 ADA provides some exceptions to ramp slope where space limitations exist. The apparent construction limits shown on the plans are not considered a space limitation. The contractor shall not place any ADA exceptions without consulting the Engineer on a case-by-case basis.

2.4.3 Special Drawing. A special drawing (see Typical Section Sheet) shows the pay limits for each the small radii ADA ramp type used by MoDOT. This special drawing is not intended to replace the Standard Plans, Standard specifications or MoDOT's ADA checklist but is intended only to provide consistency regarding pay lengths/limits within the St. Louis District.

As shown on this special drawing, **15** feet beyond the landing is considered part of the ADA ramp. Payment for the ramp will be **15** feet beyond the landing and no adjustment in sidewalk length/quantity will be made if this **15**-foot ramp length is adjusted by the contractor in the field.

2.4.4 When a project **is only** replacing ADA Curb Ramps at intersections, a warping panel shall be included and considered incidental to the cost of the new ADA Curb Ramp. When a project is also constructing new sidewalk tied into the new ADA Curb Ramp, this warping panel shall be paid for within the sidewalk pay item. A warping panel consists of tying in an ADA compliant cross slope to an existing cross slope.

2.5 Median or Median Island Cut-throughs. If there is an actual ramp with a slope not exceeding 8.33% (1V:12H) that provides access to the **raised portion** of the island or median instead of cutting through a portion of the island or median, then that area of concrete will be paid for separately as an ADA Curb Ramp, per each, as noted below. If the pedestrian path cuts through an island or median, then this area is not considered a ramp and will be paid for with individual items necessary to construct this pedestrian path.

2.6 Prosecution of Work. The contractor shall have all necessary personnel, equipment, and materials at hand for all work at each location before the work begins so that work may proceed without delay.

3.0 Method of Measurement. Final measurement will not be made for each ramp except for authorized changes during construction or where appreciable errors are found in the contract quantity. The revision or correction will be computed and added to or deducted from the contract quantity.

4.0 Basis of Payment. The accepted quantity of ADA compliant curb ramps will be paid at the contract unit price for the following items:

Pay Item Number	Type / Description	Unit
608-10.12	Truncated Domes	SF
608-99.02	ADA Curb Ramp	Each

BB. Median Island Cut-Throughs – St. Louis District Version 10-18-23

1.0 Description. This work shall consist of providing a median or median island cut-through that is compliant with current Americans with Disabilities Act (ADA) and MoDOT guidelines at locations shown on the plans and as directed by the Engineer.

2.0 Construction Requirements. The contractor shall be responsible for removing the existing median and if necessary, the existing pavement and base prior to installing the new cut-through as shown in the plans and as per Section 608 in both the Standard Plans and Standard Specifications. If new pavement/sidewalk is to be installed, it shall be minimum 7" Concrete Sidewalk on a 4" Type 5 Aggregate Base with new median island doweled into this new sidewalk.

Truncated domes installed within the island or median cut-throughs shall be placed flush with the face of the curb/island.

2.1 ADA Ramps. If there is an actual ramp that provides access to the raised portion of the island or median instead of cutting through a portion of the island or median, then that area of concrete will be paid for separately as an ADA Curb Ramp, per each, and not per quantities noted below.

2.2 Cross Slope through Cut-Throughs. The contractor shall meet ADA requirements regarding cross slope through the cut-through.

3.0 Method of Measurement. Final measurement will not be made except for authorized changes during construction or where appreciable errors are found in the contract quantity. The revision or correction will be computed and added to or deducted from the contract quantity for each item listed in the Basis of Payment.

4.0 Basis of Payment. Payment for furnishing and installing a new median or median island cut-through shall include all excavation, base compaction, saw cuts, removal of existing pavement and median island, new sidewalk and base, new median island, new truncated domes, and all materials, equipment, tools, labor, and work incidental thereto, and shall be considered to be completely covered by the contract unit price for items listed below as indicated in the plans.

Pay Item Number	Type / Description	Unit
202-20.10	Removal of Improvements	Lump Sum
304-05.04	Type 5 Aggregate for Base (4 In. Thick)	S.Y.
608-60.07	Concrete Sidewalk, 7 In.	S.Y.
608-30.06	6 In. Concrete Median Strip	S.Y.
608-10.12	Truncated Domes	S.F.

CC. No Open Burning NJSP 21-05

Delete Sec 201.2.5.1 and substitute with the following:

201.2.5.1 No Open Burning. The contractor is encouraged to harvest marketable timber, utilize mulched timber for erosion control and utilize excess mulch for composting. Open burning of trees and other brushy material shall not be allowed on the project site or on a tract immediately adjacent to the project site. No additional payment will be made for compliance with this provision.

DD. Restrictions for Migratory Birds NJSP-16-06A

1.0 Description. Swallows or other bird species protected by the Migratory Bird Treaty Act may be nesting under the bridge or bridges that will be repaired under this contract.

2.0 Restrictions. To comply with the Migratory Bird Treaty Act, nests of protected species cannot be disturbed when active (eggs or young are present). Generally, nests are active between April 1 and July 31, but active nests can be present outside of these dates.

3.0 Avoidance Measures. The contractor shall not disturb active nests or destroy adults, eggs or young birds. In an effort to comply with the Migratory Bird Treaty Act, the contractor operations will be limited to the options established in the following sections.

3.1 Inactive or Partially Constructed Nests. If nests are present and MoDOT determines that the nests are inactive or partially constructed, the contractor may remove the nests provided that the colony's inactive or partially constructed nests are completely removed by March 15 and the contractor maintains a nest free condition until the bridge work is complete. Dry removal methods shall be used when practicable. If dry removal is not practicable, hydro cleaning may be used if approved by the Engineer and only if water is free of blasting grit, chemicals, or detergents, and applied using pressure less than 5,000 PSI. Clean water such as that from municipal water treatment plants or wells shall be used. Use of source water from Waters of the State (i.e., streams or lakes), is allowable, if the appropriate methods to prevent the possible spread of invasive aquatic species are implemented.

3.2 Water and Equipment Used for Hydro cleaning. Aquatic invasives such as zebra mussels and some algae species have infested several bodies of water in the United States and can be transported by vessels (barges, boats, tugs, tankers, etc.) and equipment (tanks, tubing, pumps, etc.) that have been used in areas that contain these invasive species. If equipment is not properly inspected and treated to prevent the spread of invasives, these species can be introduced into areas not currently known to have a population. These invasive species are detrimental to existing ecosystems and can outcompete native species. To assist in preventing the introduction and spread of aquatic invasive species through MoDOT projects in Missouri streams and lakes, the following precautions shall be followed.

3.2.1 Use of Water from Streams, Lakes or Ponds. Contractors shall not use water for nest removal from streams, lakes or ponds, unless they have implemented appropriate methods to prevent the possible spread of invasive aquatic species. Water sources from municipal water treatment plants or wells may be used without following these measures provided the equipment to be used has not previously contained waters from streams, lakes or ponds. If the equipment has previously contained waters from other streams or lakes, the following measures must be implemented prior to use.

3.2.1.1 Equipment Washing. Prior to the use or re-use of equipment following any use with water from streams, lakes or ponds, all equipment shall be washed and rinsed thoroughly with hard spray (power wash) and hot (minimum 120º F) water, for at least one minute.

3.2.1.2 Equipment Treating or Drying. Equipment shall be treated or dried in one of the following manners.

3.2.1.2.1 Equipment interior and/or other surfaces shall be treated with a 10% bleach solution to kill any aquatic nuisance species. This solution must also be run through all intake lines and hoses, to sterilize interior components. When chlorine treatment is used, all chlorine runoff from equipment washing must be collected and properly treated and/or disposed of in accordance with Sec 806.

3.2.1.2.2 Equipment interior and/or other surfaces shall be treated with 140º F water for a minimum of 10 seconds contact on all surfaces. 140 º F water must also be run through all intake lines and hoses, to purge any standing water.

3.2.1.2.3 Equipment shall be flushed of all non-municipal water, and dried thoroughly, in the sun before using in or transporting between streams and lakes. Dry times will depend on the season

the equipment is being used. Equipment must dry a minimum of 7 days for June-September, 18 days for March-May; 18 days for October-November, and 30 days for December-February. The drying method should be reserved as a last resort option.

3.2.2 Prior to use of equipment, contractors shall provide the MoDOT inspector written documentation of the equipment's geographic origin (including the water body it was last used in), as well as defining the specified treatment method used to adequately ensure protection against invasive species. The written documentation will include a statement indicating the contractor is aware of these provisions and will also treat the equipment appropriately after completion of the project.

3.3 Active Nests. The contractor may work on the bridge if active nests are present, as long as the work does not impact or disturb the birds and/or nests. At a minimum, work shall not be performed within 10 feet of an active nest; however, the contractor is responsible for ensuring their activities do not impact the nests, eggs, or young.

4.0 Additional Responsibilities. If active bird nests remain after all reasonable avoidance measures have been taken, or if bird nests are observed during project construction, the contractor shall notify the Resident Engineer and contact the MoDOT Environmental Section (573-526-4778) to determine if there are other allowable options.

EE. Slurry and Residue Produced During Surface Treatment of PCCP and Bridge Decks JSP-06-05A

1.0 Description. This work covers the requirements for controlling residue or slurry produced by milling, grinding, planing, grooving or other methods of surface treatments on new or existing PCCP and bridge decks in addition to Section 622.

2.0 Construction Requirements. The following shall be considered the minimum requirements for performing this work within the project limits.

2.1 The contractor shall submit to the Engineer for approval in writing prior to the pre-construction meeting, the best management practices (BMP's) to be used to protect the environment, including the method of disposal of the residue whether on right of way or off-site.

2.2 When slurry is dispersed on the right of way, BMP's shall be installed to keep slurry or residue from entering paved ditches or structures discharging within the areas restricted by Section 622.303.8.6, from entering any waterways or from leaving the right of way.

2.3 Upon approval of the contractor's BMP and residue disposal plan and prior to the contractor beginning surface treatment operations, the Engineer will identify slurry or residue "no discharge zones".

2.4 Operations may be suspended by the Engineer during periods of rainfall or during freezing temperatures.

3.0 Basis of Payment. No direct payment for slurry or residue control requirements for BMP's will be made. Compliance with this specification along with the cost of all materials, labor, and equipment necessary for the surface treatment work shall be included in and completely covered by the unit price bid for each of the items of work for surface treatment included in contract.

FF. Access to Commercial and Private Entrances

1.0 Description. While working on entrances or adjacent properties, the contractor shall make every reasonable effort to minimize any interference to the properties and to complete the work diligently. Under no circumstances shall the contractor block ingress/egress to and from businesses during the normal business hours of each business unless as approved by the property owner and engineer.

2.0 Construction Requirements. On all entrances the contractor shall keep one-half of the entrance open at all times. On narrow entrances it may be necessary for the contractor to provide temporary aggregate to provide access to the property. The contractor shall remove and dispose of the temporary aggregate following completion of the entrance. For properties with more than one entrance the contractor may construct one entire entrance at a time with the approval of the property owner and the engineer.

3.0 Basis of Payment. No direct payment will be made to the contractor for any expenses incurred for compliance with this provision.

GG. Removal and Delivery of Existing Signs JSP-12-01C

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

2.0 Disassembly and Delivery.

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

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

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

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

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

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

Item Number	Unit	Description
202-20.10	Lump Sum	Removal of Improvements

HH. Removal and Replacement of Traffic Signs

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

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

II. Overhead Sign Installation

1.0 Description. Installation of tubular steel overhead sign installation shall be in accordance with Section 903 and specifically as follows.

2.0 Construction Requirements. This work shall consist of erecting all post, tubular steel and incidental hardware associated with the overhead signs as shown on the plans.

3.0 Basis of Payment. The accepted quantity of overhead sign Installation, including all labor, equipment, and material necessary to install all sign posts, tubular steel, anchor bolts, and associated hardware necessary to erect the trusses and attach the sign panels, complete-in-place, will be paid for at the contract unit price under the following pay items:

J6I3020D:

Item Number	Unit	Description
903-99.02	EA	MISC. (Cantilever Sign Truss No. 7)
903-99.02	EA	MISC. (Cantilever Sign Truss No. 22)

JSL0021:

Item Number	Unit	Description
903-99.02	EA	MISC. (Cantilever Sign Truss No. 5)
903-99.02	EA	MISC. (Cantilever Sign Truss No. 30)

3.1 Foundations will be paid separately and will include the cost of all reinforcing steel and all incidentals necessary for the complete-in-place construction.

JJ. Sign Installation on Type D Barrier

1.0 Description. This work shall consist of fabricating and installing sign mounting brackets for signs mounted to the Type 'C' or 'D' Permanent Concrete Traffic Barrier. This work shall be in accordance with applicable portions of Section 617, 903 and Division 1000 of the Standard Specifications and specifically as follows.

2.0 Construction Requirements. The mounting bracket plate, flanges and anchor sleeve shall be fabricated from 3/8" steel and then galvanized after fabrication. The mounting bracket shall be installed to the top of the Type 'C' Permanent Concrete Traffic Barrier by anchor bolts per the manufacturer's recommendations and as approved by the engineer. The signs shall be mounted to either PSST or pipe posts as shown in the signing plans and then installed into the anchor sleeve portion of the sign mounting bracket. See special sheets for bracket details.

3.0 Basis of Payment. All expenses incurred by the contractor for fabricating and installing the sign mounting brackets shall be considered completely covered by the contract unit price for the following bid item:

Item No.	Type	Description
903-99.02	Each	Sign Mounting Bracket for Barrier Wall

KK. Missouri LOGOS

1.0 Description. Generic service signs (Gas / Food / Lodging), specific information logo signs, and/or Tourist-Oriented Directional signs (TODS), which show the motorist services available on a crossroad at or near an interchange, are within the limits of the project.

1.1 These signs shall remain visible to and effective for the traveling public during all stages of construction.

1.2 Any work involving the relocation (permanent or temporary), repair, replacement, or legend modification required for these signs is the responsibility of Missouri Logos. The contractor shall be responsible for coordinating this work with them using the contact information below and providing full cooperation during this work.

Missouri Logos – Ron Young
4742-A Country Club Dr.
Jefferson City MO 65109
Office: 800-666-3514 or (573) 893-6662 (Mon-Fri 8 am-5 pm)
(573) 291-6788 (24 hours a day, 7 days per week)
Email: missourilogos@interstatelogos.com
Web: missouri.interstatelogos.com

2.0 Replacement costs of any business specific logo panels damaged by vandalism or natural forces are the responsibility of the specified business. Any logo signs damaged as a result of the contractor's action shall be replaced at the contractor's expense.

3.0 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 this provision.

LL. Removal of Adopt-A-Highway Signs

1.0 Description. The contractor shall remove Adopt-A-Highway signs as indicated in the plans and transport them to the following location.

Missouri Department of Transportation
Bellefontaine Maintenance Facility
10601 Lewis & Clark Boulevard
Saint Louis MO, 63136

1.1 The contractor shall notify the Maintenance Supervisor at least 48 hours in advance of delivering the signs to the maintenance facility. The contractor shall exercise care when removing and transporting the signs to the maintenance facility. The contractor shall make arrangements for delivery during normal business hours. Contact information is:

Amir Ghaidi, Maintenance Superintendent
Office: (314) 954-6879 Cell: (314)624-5348

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

MM. Survey

1.0 Description. The topographic data collected to create the existing survey CAD file used in the contract documents for SL0021, J6I3020D, and J6I3580B occurred prior to the beginning of construction of J6I3020C. Existing topographic information east of the J6I3020D project limits was created using a combination of the existing survey prior to the commencement of J6I3020C and the electronic design files for that project.

Therefore the existing features represented east of the J6I3020D project limits may or may not be an actual representation of the existing topography at the time of the notice to proceed for this project. Before constructing improvements east of the matchline between J6I3020C and J6I3020D contractor shall be field verify existing topographic features to ensure constructability of proposed design.

Within the electronic files the file named J6I3020B_Topo_Merged_ORD.dgn is the most accurate representation of the topographic features at the time the design was completed.

2.0 Construction Requirements. The contractor shall field verify existing elements affected by proposed design east of the matchline between J6I3020C and J6I3020D to verify constructability and determine any changes that would require redesign of the proposed improvements or change in quantities that would necessitate a change order.

3.0 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 this provision.

NN. Value Engineering Study

1.0 Description. The contractor shall be advised that MoDOT conducted a value engineering study during the preliminary plans phase of the projects listed above. The final report of the study

includes recommendations and other design ideas along with whether each recommendation/idea was accepted to move forward into Final Design. The Contractor is encouraged to review this document prior to submitting their own value engineering ideas to the Engineer. The final report of the study is included within the Electronic Deliverables. No additional pay shall be made to the contractor if he or she chooses to use this information provided within the Electronic Deliverables.

OO. Lightweight Cellular Concrete

1.0 Description. This work shall consist of furnishing and placing Lightweight Cellular Concrete, hereafter referred to as LCC, as backfill at locations designated on the plans and as specified in these special provisions.

2.0 Materials.

2.1 Materials. The materials used for the LCC shall meet the following requirements:

(a) Portland cement meeting the requirements of Sec 1019.

(b) Air Entraining, water reducing, set retarding admixtures meeting the requirement of Sec 1054.

(c) Pozzolans and admixtures (for accelerating, water reducing, retaining, improving the bond, etc.) may only be used if specifically designated and approved by the LCC Manufacturer.

(d) During placement of the initial batches, the density shall be checked and the mix adjusted as required to obtain the specified cast density at the point of placement. Take four test specimens at the start of each pour and for each 300 cubic yards of LCC placed or every 4 hours of placing.

(e) Testing shall be performed by the LCC manufacturer in accordance with ASTM C796 (except do not oven dry load test specimens). The specimens shall be 3 inch diameter by 6 inch high cylinders covered after casting to prevent damage and loss of moisture. Moist cure the specimens at for at least 7 days prior to a 28 day compressive strength test. Specimens may be tested at any age to monitor the compressive strength. The manufacturer shall report test results to its certified applicator for distribution.

(f) The foaming agent from the selected manufacturer should produce a lightweight cellular concrete material that complies with the specifications in table below.

Lightweight Cellular Concrete Requirements

PROPERTY	REQUIREMENTS	TEST METHOD
Class II: Maximum/ Minimum Dry Density Minimum Unconfined Compressive Strength @ 28 days curing (if fly ash is used, 56 day test)	36.0 pcf (Max.) 80 psi	ASTM C 796 ASTM C 495 (No oven drying)
Internal Friction Angle	45 degrees (min.)	AASHTO T236 (ASTM D3080-72)

Frost Heave Sample @ 250 hr exposure, 4.5 inches high x 4 inch dia.	< 0.5 in	British Road Research Laboratory, Lab Report LR 90, 1967, by Croney, Jacobs.
Freeze-Thaw Resistance - minimum cycles @ relative E = N/N ≥ 70% per ASTM C666 modified per Bidwell Report dated April, 1975	Relative Young's Modulus, E ≥ 80% at 300 cycles.	ASTM C 666 Procedure B (Rapid freezing in air and Thawing in water) As modified
Coefficient of permeability @ 2.0 psi	1x10-5 cm/sec	

2.2 Submittals. Submit a LCC Quality Control (QC) and Placement Plan. Placement of the LCC shall be in accordance with this special provision and the information provided in the QC plan. Submit the plan to the Engineer for review and comment per the timeframes noted herein for each element prior to LCC placement. LCC production shall not begin before the plan has been reviewed and accepted by the Engineer. The submitted plan shall provide, as a minimum, the following elements:

(a) An organizational chart including names, telephone numbers, current certifications / titles, roles, and responsibilities of those involved with the quality control program.

(b) The process of communication by which the quality control information will be disseminated to the appropriate persons, including materials suppliers. This shall include a list of recipients, the communication means that will be used, action time frames, and report formats.

(c) Materials list of items proposed to be provided under this section.

(d) Manufacturer's specifications, catalog cuts, and other engineering data needed to demonstrate compliance with the specified requirements

(e) Mix designs for the LCC, prepared by the manufacturer, showing compliance with the specified properties.

(f) Certification of batch, mixing and placing equipment by the LCC manufacturer meeting the requirements specified herein.

(g) Written evidence of acceptance of the certified producer/supplier by the foam agent manufacturer.

(h) Written evidence that LCC Installer is certified by and approved by the foam agent manufacturer.

(i) LCC curing procedures.

2.3 At least two weeks prior to placement, a trial batch will be prepared and trial batch testing results submitted showing that the proposed LCC material properties comply with the requirements of this specification. The accepted trial batch mix design and tested properties will become the standard of the material furnished under this contract.

2.4 At least four weeks prior to placing, the contractor shall submit ten 3-inch diameter by 6-inch high cylinder samples of the designed and tested LCC to the Engineer. Specimens shall be covered after casting to prevent loss of moisture and shall not be oven dried. At the Engineer's option, the samples may be tested for strength and density in accordance with the requirements

of ASTM C495 and ASTM C796, respectively, to verify the submitted test results and validate the contractor's testing procedures and quality of the furnished product.

2.5 At least six weeks prior to placement, the contractor shall submit to the Engineer for approval a Placement Plan in accordance with this special provision and manufacturer's recommendations.

3.0 Construction Requirements.

3.1 Construction Supervision. LCC suppliers shall provide a qualified and experienced representative on site at the beginning of the LCC construction for up to 3 days at no additional cost.

3.2 Personnel Requirements

(a) The LCC installer shall be certified by the manufacturer of the foaming agent and regularly engaged in the production and placement of the LCC. This shall include the completion of lightweight cellular concrete having a minimum of 1000 total cubic yards in the past 4 years. Furthermore, the material shall have been successfully applied on at least three LCC projects, which have performed satisfactorily for at least 3 years.

(b) The LCC installer shall be certified and approved in writing by the foam agent manufacturer of the LCC material. The Installer's foreman shall have a minimum of 2 years of experience in this type of work and shall have worked on at least one of the three successful LCC projects presented.

(c) The LCC Installer shall use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are familiar with the specified requirements and the methods needed to assure proper performance of the work noted in this Section.

(d) The manufacturer's representative shall be experienced in the placement of LCC and shall be on site full time during placement.

3.3 Placement of LCC

(a) The placement of the LCC shall be coordinated with the construction of any elements that will be placed within the LCC.

(b) LCC shall be a homogeneous mixture and all materials shall be approved prior to use.

(c) During construction, the surface of the fill should be kept relatively horizontal.

(d) The areas to be filled shall not have any standing water prior to placement of the LCC. The contractor shall ensure the LCC remains above the water table at all times during construction.

(e) Subgrade for LCC fill will be prepared in accordance with Sec 209.

(f) Any items to be fully or partially encased in the LCC (including drainage pipes) shall be properly set and stable prior to the installation of the LCC.

(g) Material shall be protected before, during, and after installation and the LCC installer shall protect the work and materials of other trades. In the event of damage, immediately make replacements and repairs to the acceptance of the Engineer at no additional cost.

(h) LCC shall not be placed at a temperature below 32°F, nor when freezing conditions are expected in less than 24 hours unless precautions are taken to maintain temperatures above freezing. Do not place LCC on frozen ground.

(i) Cure LCC in accordance with the accepted placement plan.

(j) LCC shall only be proportioned, mixed, and placed using equipment approved by the manufacturer as indicated in the accepted LCC placement plan. Once mixed, the LCC concrete shall be pumped promptly to the location of placement without excessive handling.

(k) LCC shall be placed in lifts not exceeding 4.0 feet in depth.

(l) The final surface of the completed LCC portion of the embankment shall also be scarified.

(m) Allow a minimum of 24 hours between subsequent lifts. Prior to verification of the minimum specified compressive strength by testing, additional lifts may be placed after the one day minimum at the Contractor's risk. Any material that does not meet the minimum specified strength within 28 days shall be removed and replaced by the Contractor at no additional cost.

(n) Move the discharge hose(s) sufficiently to ensure leveled filling through the specified fill area. Uneven filling is not permitted.

(o) Limit the area of placement to the volume that can be placed within 1 hour, up to the maximum lift height of 4.0 feet. Stagger placements such that the vertical joints are at least 10 feet apart.

(p) The discharge hose length shall not exceed the maximum values presented in the Placement Plan.

(q) The final surface finish of LCC shall be above the minimum elevations shown on the plans and shall be generally sloped to promote drainage as indicated on the plans.

(r) Paving machines, heavy construction equipment or other unusual loading of the LCC shall not be permitted until it has attained the specified 28-day compressive strength.

(s) Sawing or ripping of the LCC for utilities, drains, or other conflicts will be by methods approved by the Engineer.

(t) Any material that does not comply with the minimum specified criteria shall be removed and replaced at no additional cost.

(u) The LCC will be applied at locations designated on the plans and in accordance with the manufacturer's recommendation.

(v) Placement of lightweight fill adjacent to temporary shoring shall incorporate a bond breaker between the temporary shoring and the lightweight fill.

4.0 Method of Measurement. ~~Measurement for Lightweight Cellular Concrete, in cubic yards, will be the quantity shown in the plans.~~ The final measurement will not be made for quantities of MISC. Lightweight Cellular Concrete for MSE Wall A9491 and MISC. Lightweight Cellular Concrete for MSE Wall A9492 except when:

a) Appreciable errors are found in the original computations.

b) An original cross section is found to have an average deviation from the true elevation in excess of one foot.

c) An authorized change in grade, slope or typical section is made.

d) Unauthorized deviations decrease the quantities on the plans.

e) Quantities are determined by measurement as specified in Sec 203.8.2.

If the plans have been altered or when disagreement exists between the contractor and the engineer as to the accuracy of the plan quantities of Lightweight Cellular Concrete for MSE Walls A9491 & A9492 either party has the right to request a recomputation of contract quantities within the limits shown on the plans by written notice to the other party. The written notice will contain evidence that an error exists in the original groudline elevation or in the original computations that will materially affect the final payment quantity. If such final measurements will be required, measurements will be made from the latest available ground surface and the design section.

5.0 Basis of Payment. Payment for above described work including furnishing and placing LCC as shown in the plans, preparation of submittals, material testing, specialized equipment to mix, transport and placing LCC, groundwater and surface water control, temporary shoring, and forming will be considered completely covered by the contract unit price per cubic yard for Lightweight Cellular Concrete.

Item Number	Unit	Description
703-99.07	CY	MISC. (Lightweight Cellular Concrete for MSE Wall A9491)
703-99.07	CY	MISC. (Lightweight Cellular Concrete for MSE Wall A9492)

PP. Removal of Unhoused Encampment under Bridges

1.0 Description. This work pertains to the removal and the maintenance thereof of encampment of the unhoused currently located under Bridge A0241 along Bellefontaine Road.

2.0 Coordination. Three (3) weeks prior to the planned start date for work on Bridge A0241, the Contractor shall contact the Resident Engineer and coordinate the efforts of removing the various items under the bridge. An initial, onsite meeting to discuss the extent and process for removals will be held with MoDOT Area Team members, members from MoDOT Environmental, the

Resident Engineer and their assigned personnel, and the Contractor and its assigned personnel. The City of Bellefontaine Neighbors will also be invited to the meeting.

2.1 The removals shall be coordinated to be in close proximity to the Contractor's start date so that construction fencing can be installed (by Contractor) and when construction activity and contractor presence will be regular.

2.2 The initial removal of the items shall be completed by MoDOT forces. The Contractor shall be present for a pre-final walkthrough of the area after removals have occurred to confirm / accept that the extent of the removals allows them the access and working room necessary for them to safety complete their construction activities.

2.3 Upon Contractor acceptance of the removal, the responsibility of maintaining the jobsite from similar encampments will be the Contractors.

3.0 Basis of Payment. No direct payment will be made to the Contractor to recover costs of the equipment, labor, materials, or time required for this coordination or maintenance of the above removals.

QQ. Measurement of Bridge Clearances

1.0 Description. The contractor shall measure the vertical clearance over all lanes of traffic on all existing or new bridges impacted by this project or as noted within this provision. Impacted bridges shall include bridges rehabbed or reconstructed over state routes, county roads, city streets and railroads. Impacted bridges also include those with vertical clearances potentially modified through resurfacing activities. The contractor shall fill out the Bridge Clearance Report and give the report to the Engineer for processing. The Bridge Clearance Report is available within EPG 760.4.

1.1 If the new or rehabbed bridge is over a railroad, the contractor shall refer to those provisions provided within this contract regarding coordination with the railroads prior to performing the survey measurement.

2.0 Construction Requirements. Per EPG 760.4.3, the contractor shall provide the following:

A. All measurements shall be taken on the roadway surfaces only and not on the shoulders. Every lane of travel shall be checked and the measurement shall be from the high point within that lane to the lowest point of the structure as determined in the field. Temporary Traffic Control shall be used to take these measurements. LiDAR may be used to take measurements but is not required.

B. On a bridge over multiple routes, including ramps, the vertical clearance measurement for each route in each direction of travel shall be required.

C. Measurement shall be made from the bottom of the lowest obstruction (beam, concrete, light fixture, rivet/bolt head, through truss member, etc.) The clearance shall be measured and rounded down to the nearest inch and reported to the Engineer.

D. The vertical clearance measurements shall be taken and provided to the Engineer within two weeks after all major construction activities have been completed which could impact the measurements. The major construction activities would include any rehab or reconstruction work or pavement improvements including coldmilling and resurfacing under structures.

3.0 Structures Measured within Job JSL0021 & J6I3020D. The following measurements will be needed for this project:

Bridge A9398 (Lilac Avenue) over all 3 Lanes of EB I-270 & over all 3 Lanes of WB I-270

Bridge A9489 (EB I-270) over all lanes of Route 367

Bridge A9490 (WB I-270) over all lanes of Route 367

Bridge A9493 (EB I-270) over all lanes of Bellefontaine Road

Bridge A9494 (WB I-270) over all lanes of Bellefontaine Road

4.0 Basis of Payment. The vertical clearance measurements filled out within the Bridge Clearance Report for each structure will be paid at the contract unit price for the pay item included in the contract. All labor, equipment and material cost required to fulfill this requirement shall be included in the unit price for the following pay item:

Item No.	Type	Description
627-40.00	Lump Sum	Contractor Furnished Surveying & Staking

RR. Bridge Layout and MoDOT Survey Check

1.0 Description. The contractor shall carefully review the layout of the new bridge and wall alignments shown in the plans for J6I3020D and JSL0021 including:

Bridge A9398: Lilac Avenue over I-270

Wall A9498: MSE Wall along EB I-270

Wall A9501: MSE Wall along WB I-270

Bridge A9489: EB I-270 over Route 367

Bridge A9490: WB I-270 over Route 367

Wall A9491: MSE Wall along SB Route 367

Wall A9492: MSE Wall along NB Route 367

Bridge A9493: EB I-270 over Bellefontaine Road

Bridge A9494: WB I-270 over Bellefontaine Road

2.0 MoDOT Survey Check and Notification. Prior to laying out new bridge abutments, the contractor shall contact the following MoDOT surveyor 3 weeks prior so that a time can be scheduled for MoDOT Survey to check the layout of the new bridge. Any temporary traffic control needed for these checks shall be provided by the Contractor. No direct payment shall be made to the contractor to comply with this provision.

John Wurm, PLS
MoDOT Land Survey Supervisor
Email: John.Wurm@modot.mo.gov

Andy Markiewicz
District Land Surveyor Manager
Email: Andrew.Markiewicz@modot.mo.gov
Note: Copy in Andy when sending email to John

SS. Powder Coating JSP-04-06

1.0 Scope. This specification covers a powder coating finish for metallic components. All fence, gate, and components as called out on the plans for the fence surrounding and adjacent to the detention pond, provided for in this contract shall be powder coated.

2.0 Basis of Acceptance. Basis of acceptance of the powder coated components will be based on a manufacturer's certification, including certified test results for all performance requirements, submitted by the contractor and upon results of any tests performed by the engineer. The contractor shall repair any areas damaged during the testing process by a written method of repair recommended by the powder coating manufacturer. All repairs shall be subject to the engineer's approval.

3.0 Material.

3.1 Color. The finished powder coating shall be in the color specified in the contract.

3.2 Powder Coating Type. The powder coating shall be a urethane or triglycidyl isocyanate (TGIC) polyester resin type.

3.3 Galvanizing. When galvanizing is specified, all surfaces of the component shall be galvanized prior to powder coating in accordance with ASTM A 123. Components shall not be water or chromate quenched prior to powder coating.

3.3.1 Testing of Galvanizing. The procedure for determining the mass of coating shall be in accordance with ASTM A 90. This method shall be used in cases where the area of the test specimen can be accurately tested. On specimens shaped so that the area cannot be calculated, the mass of coating shall be determined with a magnetic gauge in accordance with ASTM E 376. The powder coating shall be removed by solvent removal or other any other method that does not affect the zinc coating.

4.0 Workmanship.

4.1 Fabrication. After fabrication of the component, all welds, bolted connections, holes, cut ends, etc. shall be free of slag, burrs or other imperfections that would affect the overall appearance or performance of the finished product.

4.2 Finish of Galvanized Components. When galvanizing is required prior to powder coating, all galvanized surfaces shall be in accordance with the Finish and Appearance requirements of ASTM A 123 prior to application of the powder coating. Prior to powder coating, all surfaces shall be free of uncoated areas, blisters, flux deposits, gross dross inclusions, lumps, globules, runs, drips and sags. Zinc high spots, such as metal drip line, and other rough areas shall be removed by cleaning with hand or power tools as described in SSPC Surface Preparation Specification 2 or 3. The zinc shall be removed until the zinc is level with the surrounding area, taking care that the base coating is not removed by the cleaning methods. The final galvanized surface shall be an applicable substrate to ensure proper adhesion of the powder coating. After removal of high spots and other rough areas, the coated surface shall be inspected to verify the required zinc coating thickness is in accordance with ASTM A 123 utilizing a magnetic field type thickness instrument in accordance with ASTM E 376. Any component that does not comply with the zinc coating thickness requirement before or after removal of high spots or rough areas shall be repaired in accordance with ASTM A 780.

4.3 Finish of Powder Coating. The powder coated surface shall be smooth, free of thin spots, pinholes, blemishes, and other coating imperfections.

5.0 Powder Coating Application. The powder coating shall be applied in accordance with all requirements of the supplier of the powder coating material. When powder coating is to be applied over galvanized surfaces, the powder coating application shall also be in accordance with the requirements supplied by the galvanizer. This shall include storage and pre-treatment of the component prior to application of the powder coating. If there is a conflict in application method between the powder coating supplier and the galvanizer, the powder coater shall resolve the conflict prior to application of any powder coating.

6.0 Performance Requirements. The finished components shall be delivered to the project site with no damage to the powder coating. The contractor shall repair any damaged areas in accordance with the requirements of the powder coating manufacturer at the engineer's discretion. Damage to the powder coating may be cause for rejection. The powder coating of the finished components shall be in accordance with the following requirements:

Item	Test Method	Requirement
Salt Spray Corrosion, 500 hrs, single scribe	ASTM B 117	Creepage shall not exceed ¼" in either direction from scribe
Cross Hatch Adhesion, min	ASTM D 3359	5A and 5B
Pencil Hardness, Gouge, min	ASTM D 3363	F
Pencil Hardness, Scratch, min	ASTM D 3363	F
Coating Thickness, mils, min [a]	ASTM E 376	3.0
Gloss, 60°, min	ASTM D 523	20
Chemical Resistance [b]	ASTM D 1308	Coating shall show only a slight circular mark

[a] For components with an underlying non-magnetic coating over steel, the powder coating thickness will be the difference in thickness measurements with and without the powder coating.

[b] The open spot test shall be performed with 5 drops 95% toluene/5% MEK for 30 s.

7.0 Basis of Payment. Payment to provide powder coating of all fencing, gates, and components as called for in the plans shall be considered incidental to and completely covered at the contract unit price under the following pay items:

Item Number	Unit	Description
607-99.03	LF	BLACK POWDER COATED CHAIN-LINK FENCE (60 IN.)

TT. Ground Improvements

1.0 Description. This Work shall consist of furnishing all supervision, materials, equipment, labor and related services for ground improvement by the removal and replacement of selected soils at the locations shown on the Contract Plans (Plans). The Work shall be carried out in accordance with the requirements of the Plans, this special provision, the Standard Specifications and as directed by the Engineer. The Work shall include access, excavation and placement of select granular backfill.

1.1 Over-excavation. Based on subsurface exploration data, the soil depth beneath Mechanically Stabilized Earth (MSE) Wall A9501 from bottom of leveling pad will need to be over-excavated to achieve the required bearing capacity. Section 5.5 of the geotechnical report states it is anticipated that this over-excavation and rock fill should extend to a depth of 3 feet below the bottom of the levelling pad where wall heights exceed 15 feet.

1.2 General Requirements. A subsurface exploration and testing program has been conducted in the project area. The Contractor is responsible for the design of any changes in the ground improvements or over-excavation. The Contractor is responsible for obtaining any additional information to assist in their analysis at no additional cost to the Commission.

1.2.1 The purpose of the ground improvements is to strengthen the underlying soils and to provide additional bearing capacity for support of the bridge approaches and portions of MSE Wall A9501. The ground improvements have been designed to provide minimum factor of safety of 1.5 (φ=0.65) against bearing capacity failure. The above factor of safety is based on a MSE Wall reinforcement length of 1.0 times the height of the wall. Reinforcement lengths greater than this will likely result in increased factors of safety.

1.2.2 Ground improvements are limited to the areas indicated on the Plans. The actual limits of ground improvement may vary from those shown on the Plans, either decreased or increased, dependent on the Contractor's changes in design or subsurface conditions encountered during the work. All variations shall be approved by the Engineer.

1.2.3 The installation of the ground improvements shall also include the removal and disposal of excavation spoils as a result of the over-excavation process. The cost of installation of the ground improvements shall include the cost of hauling, stockpiling and off-site disposal, of the excess excavated material.

1.3 Submittals. The source and gradation of the aggregate proposed for the rock fill.

1.3.1 The proposed verification program methods to monitor and verify the trench installation is satisfying the design and performance requirements.

2.0 Materials

2.1 Backfill Materials

2.1.2 Granular Fill. The granular material used to construct the removal and replacement shall generally conform to the requirements of MoDOT Select Granular Backfill for Structural Systems (Section 1010).

2.1.2.1 The material should be compacted to a minimum 95% of standard maximum density per the Standard Compaction Test (AASHTO T99, Method C) and otherwise in accordance with Standard Specification 203.5.

2.3 Documentation. Provide documentation for all imported materials including pertinent laboratory test results prior to delivery on site.

3.0 Construction. The following are the minimum requirements that the contactor shall be expected to follow unless otherwise approved.

3.1 The site shall be graded as needed for proper installation of the trench system. Any grading and excavation below the improvement limits shown on the plans shall be incidental to the trench installation.

3.2 Any granular base drainage layer shall be considered incidental to the improvement. Contractor requesting drainage layers will only be allowed if approved.

3.3 The aggregate material shall be placed in a manner that allows measurement of the tonnage or quantity of aggregate placed down the trench.

3.4 Trenches shall be installed in a sequence that will minimize ground heave. Any heaving shall be re-compacted or excavated as directed by the Engineer prior to wall or embankment construction and shall be considered incidental to trench improvement.

3.5 Excavation. The final excavation for the over-excavation shall be made using an excavator equipped with a smooth-edged bucket to minimize disturbance to the in-situ soils. The prepared subgrade shall consist of in-situ soils compacted to moisture content within ± 2% of optimum moisture content. If compaction is not practical due to natural moisture water contents far above optimum and/or wet weather conditions, the in-situ soils shall be over excavated to a depth of 12 inches and replaced with compacted granular fill as specified herein. Any organic-rich or otherwise unsuitable soils shall be removed and replaced with compacted granular fill.

3.5.1 Operations on earthwork shall be suspended at any time when satisfactory results cannot be obtained because of rain, freezing, or other unsatisfactory conditions of the field. Drag, blade, or slope the embankment to provide proper surface drainage. In wet weather conditions, dewater as required to prevent the accumulation of ponded water in excavations for embankment construction, and the earthwork should be done in sections to minimize the need for such dewatering.

3.5.2 Disposal of Excavation Spoils. Stockpile all spoil material, including any topsoil and spoils generated by the over-excavation, at the locations designated on the soil erosion plan. Handling and disposal of spoils shall be in accordance with Sec 203 and performed at no additional cost to the project.

3.6 Granular Fill Construction.

3.6.1 Prior to construction the existing ground shall be excavated and stripped of topsoil and other unsuitable material as determined by the engineer.

3.6.2 The placement of select granular backfill in areas of removal and replacement below the MSE walls shall be compacted to not less than 95 percent of the maximum dry density as determined by laboratory tests using AASHTO T-99.

4.0 Method of Measurement. No measurement will be made.

5.0 Basis for Payment. Payment for ground improvements described above including all materials, labor, tools and equipment, testing and all incidentals necessary to complete this work shall be made and completely covered by the following:

Item No.	Type	Description
720-99.01	LS	Ground Improvements

UU. METRO Coordination

1.0 Description. The contractor shall contact Metro Transit 2 weeks prior to closing any ramps, demolishing any bridges, or any other work that significantly impacts Bus Routes #60 (Route 367 & Lilac Avenue) & #78 (Bellefontaine Road) from their current routes as shown within the Electronic Deliverables. It is requested that the coordination begin prior to the project Preconstruction Conference to ensure minimal disruption in service on Metro's system. Metro Transit is planning to reroute their buses due to detours shown within the plans. Any variations to these plans shall be approved by Metro.

2.0 Construction Requirements. All Metro Transit stops within the project limits shall remain open and operational throughout the duration of the project. In locations where the contractor's operations will involve work in proximity to a transit stop location, the contractor shall notify Metro Transit through the contacts listed below, not later than 72 hours prior to beginning work at that location. The contractor shall also take care to minimize exposure of transit users to construction hazards in proximity to all transit stops that are in service during work operations.

2.1 Project Contacts. The contractor shall notify the following contacts at Metro Transit coordinate scheduling throughout the project with them or their designated representative(s).

Mr. Roderick Thomas, Senior Planner
Office: (314) 923-3000
Email: rhthomas@metrostlouis.org

Ms. Natalie Siebert, Senior Planner Transit Operations
Office: (314) 982-1400 x1816
Cell: (314) 497-4916
Email: nmsiebert@MetroStLouis.org

Mr. Lance Peterson, Director of Service Planning
Office: (314) 982-1520
Cell: (314) 220-6756
Email: llpeterson@MetroStLouis.org

VV. Truck Mounted Attenuator (TMA) for Stationary Activities JSP-23-04

1.0 Description. Provide and maintain Truck Mounted Attenuators (TMA) in accordance with Sec 612 and as specified herein.

2.0 Construction Requirements. Truck Mounted Attenuators (TMA) shall be used for the work activities indicated in the plans or specified herein.

2.1 Installing Performed Thermoplastic Pavement Markings –
(a) Installing Preformed Arrows at Ramp 8-F
(b) Bellefontaine Rd Ramp 2
(c) Bellefontaine Rd Ramp 4
(d) Lilac Ave Ramp 2
(e) Lilac Ave Ramp 3
(f) Lilac Ave Ramp 4
(g) Dunn Rd Ramp to I-270 WB

2.2 Installing Overhead Signs –
(a) J6I3020D, Sign 4, STA 680+02
(b) J6I3020D, Sign 7, STA 702+57.00
(c) J6I3020D, Sign 10, Attached to Bridge
(d) J6I3020D, Sign 18, Attached to Bridge
(e) J6I3020D, Sign 21, STA 722+83.00
(f) JSL0021, Sign 5, STA 607+54.00 WB
(g) JSL0021, Sign 11, Attached to Bridge
(h) JSL0021, Sign 30, STA 661+80.00 WB

3.0 Method of Measurement. No measurement will be made for Truck Mounted Attenuators (TMA).

4.0 Basis of Payment. Delete Sec 612.5.1 and substitute with the following:

612.5.1 No payment will be made for truck mounted attenuators (TMAs) used in mobile operations or for any TMAs designated as optional.

612.5.1.1 Payment for TMAs required for stationary work activities will be paid for at the contract unit bid price for Item 612-30.01, Truck Mounted Attenuator (TMA), per lump sum. The lump sum payment includes all work activities that require a TMA, regardless of the number of deployments, relocations, or length of time utilized. No payment will be made for repair or replacement of damaged TMAs.

Item No.	Type	Description
612-30.01	LS	Truck Mounted Attenuator (TMA)

WW. Coordination with Outside Entities

1.0 Description. The contractor shall keep the following entities informed of ongoing work and minimize the impact to their operations.

2.0 Coordination. The Contractor shall coordinate with the following individuals at least 2 weeks in advance of any construction that could impact motorists coming from Illinois or getting to Christian Hospital Northeast or the St. Louis Zoo Wildlife Park:

Illinois Department of Transportation:
Joe Monroe
Email: Joseph.Monroe@illinois.gov
Telephone: 618-346-3250

Christian Hospital Northeast:

Rick Stevens (President) rick.stevens@bjc.org

Rebecca Sesler (Marketing/Communications) rebecca.sesler@bjc.org
Hilary Harris (COO) hilary.harris@bjc.org

St. Louis Zoo Wildlife Park:

Billy Brennan (Director, Public Relations: brennan@stlzoo.org
Emily Romines (Director, Governmental Affairs): eromines@stlzoo.org

St. Louis County Transportation Department

St. Louis County has a job (AR/CR-1939) on Bellefontaine north of Dunn Road that the contractor will need to coordinate with while working on the Bellefontaine Road and I-270 interchange.

Adam Spector, North/West Area Engineer ASpector@stlouiscountymo.gov

3.0 Basis of Payment. No direct payment will be made to the contractor for meeting the requirements set in this provision.

XX. Optional Temporary Pavement Marking Paint

1.0 Description. This provision provides the contractor with the option to either complete all Permanent Pavement Marking Paint (PPMP) prior to the time limits specified herein or to apply Temporary Pavement Marking Paint (TPMP) in accordance with Sec 620.10.2 (4 in. width) in all locations shown on the plans as PPMP and delay application of the PPMP until the spring of 2030, as allowed herein. PPMP is defined as Class 1 Pavement Marking Paint and Class 2 Pavement Marking Paint and does not include Sec 620.20.3 Durable Pavement Markings.

1.1 No application of PPMP shall occur between October 1, 2029 and March 1, 2029, both dates inclusive, except as stated herein. When the contractor has begun application of PPMP prior to October 1, 2026, and weather limitations stated in Sec 620.20.2.4 can be met, the contractor may complete the PPMP within the first seven (7) calendar days of October. If all (100%) of the PPMP is not completed on or before October 7, 2029, all previously applied PPMP, including any painted markings applied prior to October 1, shall be considered TPMP, and the contractor shall complete the remaining marking with TPMP, and then re-apply PPMP in all planned locations after March 1, 2030. All PPMP shall be completed prior to June 1, 2030. No additional payment will be made for PPMP that is later determined to be TPMP due to the contractor's failure to complete the PPMP within the time specified.

1.2 Use of TPMP Prior to October 1. The contractor has the option to apply TPMP in lieu of PPMP prior to October 1, 2029, even when there is sufficient time to complete the PPMP prior to October 1, 2029. For example, the contractor may choose to use TPMP as a base coat for the PPMP on open-graded surfaces in order to achieve higher retroreflectivity readings on the surface coat as compared to a single application.

1.2.1 The contractor has the option of using TPMP in lieu of Temporary Raised Pavement Markers if applied each day that existing markings are obliterated.

2.0 Construction Requirements. TPMP shall be accurately placed in the final planned location and shall be completely covered by the final application of PPMP. Any failure to comply with this requirement shall be corrected by removal of the misplaced pavement markings at the contractor's expense and without marring of the pavement surface.

2.1 Prior to application of the PPMP on TPMP, TPMP shall be fully cured in accordance with the manufacturer's recommendation, or for a period of 12 hours, whichever is greater.

3.0 Weather Limitations. All weather limitations specified in Sec 620 for PPMP and TPMP shall apply. Cold Weather Pavement Marking Paint, in accordance with Sec 620.10.6, shall be used for TPMP when specified weather limitations do not allow the use of waterborne paint. No additional payment will be made for the use of Cold Weather Pavement Marking Paint as TPMP. Cold Weather Pavement Marking Paint is not an allowable substitute for PPMP and shall subsequently be covered with PPMP.

4.0 Time Exception. If application of PPMP is to be delayed to the spring of 2030, the contractor shall submit a request to the engineer for a time exception and shall provide a revised work schedule that shows the planned completion of the PPMP.

4.1 Upon receipt of the time exception request in Section 4.0, the engineer will list "Application of Permanent Pavement Marking Paint" as an exception on the Semi-Final Inspection form, thus granting an exception to the count of contract time thru June 1, 2030, solely for the purpose of delaying application of PPMP. This time exception shall not apply to any time needed to complete any other work items. Liquidated Damages, as specified elsewhere in this contract, shall remain in effect for all other work items not completed by the contract time limits, as specified elsewhere in this contract, and for PPMP not completed by June 1, 2030.

5.0 Method of Measurement. No final measurement will be made for TPMP.

6.0 Basis of Payment. Full payment for TPMP will be made at the contract lump sum price even when PPMP is completed prior to the time limitation and TPMP is not used or only partially used.

6.2 If a $0 bid is entered for TPMP, no payment will be made should TPMP become necessary.

Item Number	Description	Unit
620-99.01	TEMPORARY PAVEMENT MARKING PAINT	LS

YY. Existing Overhead Sign Removal, Storage, and Reinstallation

1.0 Description. The following provision covers the removal of existing overhead signs mounted to A0221, storage of removed sign, and reinstallation on Bridge A9398. The signs covered in this provision are depicted in the plans as Sign 10 and Sign 18.

2.0 Construction Requirements.

2.1 Removal of Existing of Overhead Signs. Removal of Signs 10 and 18 as shown on the plans or as approved by the engineer. Existing overhead signs shall be completely removed to the satisfaction of the engineer without damage. Any damage shall be repaired at the contractor's expense. I determined by the engineer excess damage renders the sign to be unusable, sign will be replaced at the contractor's expense.

2.2 Storage of Existing Overhead Signs. Existing overhead signs 10 and 18 shall be stored at a location provided by the contractor. Further coordination with the resident engineer will be needed if the contractor wishes to use MoDOT right of way for storage.

2.3 Reinstallation of Existing Overhead Signs. Existing overhead signs 10 and 18 shall be stored at a location provided by the contractor.

3.0 Materials. All materials shall be in accordance with Division 600, 900, & 1000 Material Details.

4.0 Method of Measurement and Basis of Payment

4.1 Removal, Storage and Reinstallation. No measurement will be made for this item**.** All labor, equipment, and material costs to complete the described work shall be covered under the following Item Number:

Item No.	Unit	Description
902.99-02	EACH	Misc. Removal and Relocation of Overhead Signs

ZZ. Traffic Signal Maintenance and Programming

1.0 Description. Traffic signal maintenance and programming for this project shall be in accordance with Section 902 of the Standard Specifications, and specifically as follows.

2.0 Contractor Maintenance Responsibilities.

2.1 Traffic Signal Maintenance. Once any part of an existing traffic signal within the limits of this project has otherwise been modified and/or adjusted by the contractor or the contractor begins work at an intersection with traffic signals already in operation, then the contractor shall be solely responsible for that traffic signal's maintenance. All traffic signal maintenance shall be the responsibility of the contractor as specified in 902.2.and 902.3, until the Commission accepts the traffic signal for maintenance or as directed by the Engineer. Traffic signals to be accepted for maintenance by the contractor are listed in the below schedule:

Commission Traffic Signals to be Maintained by the Contractor:

Bellefontaine Road and Dunn Road

Bellefontaine Road and EB I-270 Ramps

Temporary Signal at Dunn Road and Lilac Avenue

Lilac Avenue and WB I-270 Ramps

Lilac Avenue and EB I-270 Ramps

Old Halls Ferry and I-270 Interchange Ramps (during Bridge demolition)

Dunn Road and Route 367 Interchange north of I-270

2.2 Traffic Signal Controller Programming. If the contractor modifies and/or adjusts an existing traffic signal controller's programming or makes any roadway changes to reduce the traffic capacity through a signalized intersection within the limits of a project or utilizes a project defined detour that utilizes the traffic signals within the below schedule, the contractor shall be solely responsible for those traffic signal controller programs. All controller programming shall be the responsibility of the contractor as specified in 902.2 or until final acceptance of the project or until released from the responsibility by the Engineer. Traffic signal controller programs to be administered by the contractor are listed in the below schedule:

MoDOT Traffic Signal Controller Programs to be Administered by the Contractor:

Bellefontaine Road and Dunn Road

Bellefontaine Road and EB I-270 Ramps

Temporary Signal at Dunn Road and Lilac Avenue

Lilac Avenue and WB I-270 Ramps

Lilac Avenue and EB I-270 Ramps

Old Halls Ferry and I-270 Interchange Ramps (during Bridge demolition)

Dunn Road and Route 367 Interchange north of I-270

2.3 Contractor's Traffic Engineer. If traffic signals are listed in the schedule outlined in section 2.2, the contractor shall have an experienced traffic Engineer with a Professional

Engineer's (PE) license in Missouri as well as a Professional Traffic Operations Engineer (PTOE) certification (hereafter referred to as "contractor's traffic Engineer") with the noted experience outlined to section 3.0. MoDOT shall approve the traffic Engineer prior to them being hired.

2.4 Traffic Signal Complaints The contractor shall respond to malfunction complaints or traffic signal timing complaints for those locations detailed in section 2.1 and/or section 2.2 of this provision and as specified in Section 902.21.1. Response time shall be 1 hour for complaints received by the contractor between 6 AM and 6 PM on non-holiday weekdays, and 2 hours for all other times. For cases due to travel times or other extenuating circumstances additional time may be acceptable within reason but must be approved by a Commission Traffic Operations Engineers. These timeframes will replace the '24 hour' response time in Section 105.14 for any traffic signal-related incidents, where the entire cost of the work, if performed by MoDOT personnel or a third party, will be computed as described in Section 108.9 and deducted from the payments due the contractor.

2.5 Traffic Signal Contacts. The contractor must supply to the Engineer and to the Commission's Transportation Management Center (TMC) a contact name and phone number who will be responsible for receiving traffic signal timing complaints for the Engineer. These complaints may be forwarded directly to the contractor by someone other than the Engineer's representative and will not relieve the contractor from properly responding based on the response times of this provision. The contractor shall respond to the Engineer and its representative within 12 hours of the complaint and its remedy. The contractor shall submit to the Engineer's representative a weekly report of complaints received and remedies performed throughout the duration of the project.

2.6 Existing Traffic Signal Controller Programming. The contractor shall request an electronic report from the Engineer on the existing phasing and timing of each traffic signal, which may be the contractor's responsibility to program. The contractor shall give the Engineer 2 weeks' notice to supply the electronic report. The Engineer's representative shall be available to the contractor before any changes are made to a traffic signal or controller to answer any questions about the report. In lieu of the report, the contractor's traffic Engineer may obtain this information from the appropriate agency's central traffic signal control system.

2.7 Traffic Mitigation Plan. The contractor shall notify the Engineer 2 weeks prior to the date of any work impacting the Commission's traffic signals as described in Section 2.1 and/or 2.2. The contractor shall meet with the Engineer's representatives to discuss their traffic mitigation plan at least 1 week before the date of the first impacts and as needed between construction stages. The traffic mitigation plan should at a minimum include:

(a) Proposed Timing Plan changes and any models
(b) Anticipated locations of concern
(c) A map in electronic format displaying the locations and names of the traffic signals and owning agency as detailed in sections 2.1 and/or section 2.2.
(d) Other traffic mitigation efforts

2.8 Notification of Changes to Traffic Signal System. The contractor shall notify the Engineer or representative of the changes no later than 1 working day after changes are programmed if unable to provide advance notice as specified in 902.2.

3.0 Contractor's Traffic Engineer Qualifications.

3.1 Credentials. The contractor shall have an experienced traffic Engineer with a Professional Engineer's (PE) license in Missouri as well as a Professional Traffic Operations Engineer (PTOE) certification.

3.2 Experience. Any proposed contractor traffic Engineer shall be able to demonstrate personal successful previous experience in the following tasks:

3.2.1 Response. The contractor's traffic Engineer shall have the ability to be on site within 1 hour of being requested.

3.2.2 Corridor Management. Time/space diagram manipulation to successfully adjust offsets and splits for rapidly changing traffic demands.

3.2.3 Controller Programming. Ability to program by hand and by software NTCIP-compatible controllers.

3.2.4 Intersection Programming. Implementation of adjusted and/or new timing plans because of changing traffic demand.

3.2.5 Traffic Signal Software. Use and understanding of all traffic signal controllers and central traffic signal control systems utilized by the Commission.

3.3 Proposed Traffic Engineers. The contractor shall submit the names(s) of proposed traffic engineer(s) and the name(s) of all other personnel on their proposed staff along with detailed experience in all tasks outlined in Paragraph 3.2 above. The Engineer reserves the right to reject any contractor traffic engineer, before the start of work, who does not have sufficient experience or, at any point during the project, which does not satisfy the requirements set forth within this Job Special Provision. A list of potential traffic engineers shall be submitted for review to the Project Manager and the Commission's Traffic Engineers prior to beginning work.

4.0 Contractor's Traffic Engineer Responsibilities.

4.1 VPN Access. The approved contractor's traffic Engineer and any staff assigned to manage the traffic signals during the project are encouraged to apply for VPN (Virtual Private Network) access with the Engineer once the project is awarded. If approved, the Engineer will assign a unique IP address to the contractor's traffic Engineer, which will allow for remote access to the Commission's central traffic signal control systems as appropriate and the ability to interface with the noted traffic signals on this project.

4.2 Traffic Signal Timing Complaints. The contractor's traffic Engineer shall respond to any traffic signal timing complaints regarding signals outlined in section 2.2 of this provision.

4.3 Traffic Signal Coordination. The contractor's traffic Engineer shall be solely responsible for maintaining the coordination at any affected traffic signal to the satisfaction of the Commission's Traffic Operations Engineers or representative until completion of work as set forth in section 2.2 of this provision. Maintenance of coordination may include the synchronization of the affected controller's internal time clocks to the second using an atomic clock, or other means approved by the Commissions Traffic Operations Engineers. If time clock synchronization is used, the contractor shall verify all affected controllers are synchronized at least 1 time per week with a report to the Engineer or representative. This report will be in the form of a documentation record as spelled out in the Work Zone Traffic Management Plan.

4.4 Traffic Signal Controller Programming. The contractor's traffic Engineer shall be responsible for implementing traffic signal controller programming at each intersection listed in section 2.2 for any of the following scenarios:

- **a.** Intersection Impact
- **b.** Construction Stage Traffic Switch
- **c.** Response to Customer Concern
- **d.** New Intersection Turn-On (along with any subsequent revisions)
- **e.** Final completion of improvements
- **f.** As otherwise directed by the Engineer or the Commission's Traffic Operations Engineers

Proposed timing plans should be submitted to the Commission's Traffic Operations Engineers for review prior to field implementation.

4.5 Central Traffic Signal Control System Setup. If a traffic signal cabinet is reconfigured, the contractor's traffic Engineer shall archive the existing controller programming in the Commission's central traffic signal control system. If the signal controller type is changed, the contractor's traffic Engineer shall archive the existing controller programming and convert any new controllers to the proper controller interface type in the Commission's central traffic signal control system. If only signal timing adjustments are made, all database versions shall be clearly labeled and saved separately from the default version, and the final timing program shall be uploaded into the Commission's central traffic signal control system and set as the default database. In addition, the contractor's traffic Engineer shall update any intersection diagrams (i.e., XPL) whose intersection controls were modified during construction.

4.6 Controller Program Test Period. The intersection program shall operate properly with no faults or malfunctions for a period of 15 consecutive days as a condition of being accepted for maintenance by the Commission. Any programming faults shall be corrected by the contractor's traffic Engineer per the response protocols of this provision and the 15 days will start over.

4.7 Cabinet Photos. The contractor's traffic Engineer shall obtain cabinet photos of any new or modified traffic signal cabinet affected by the project. The photos shall be captured of the following perspectives and delivered in the .jpg format electronically and via thumb drive to the Commission's Traffic Operations Engineers.

(a) Power Meter 1 – Away from power meter with meter centered

(b) Power Meter 2 – Close up with power meter number

(c) Cabinet 1 – Away with cabinet centered and door closed

(d) Cabinet 2 – Close up of entire cabinet with door opened

(e) Cabinet 3 – Close up of center cabinet interior

(f) Cabinet 4 – Close up of left cabinet interior

(g) Cabinet 5 – Close up of right cabinet interior

(h) Cabinet 6 – Close up of back panel

(i) Cabinet 7 – Close up of switch

(j) Cabinet 8 - Close up of wall interconnect center

4.8 RRFB/PHB Timing. The contractor's traffic Engineer shall calculate the duration of flash time for any new or modified RRFB's (rectangular rapid flashing beacons) affected by the project. The contactor's traffic engineer shall be responsible for calculating phase intervals and programming traffic signal controllers for new/modified PHB's (pedestrian hybrid beacons) affected by the project.

4.9 Detection. The contractor's traffic Engineer shall assist the contractor in setting up detection as per plan and/or SL District Traffic Signal Detection System JSP. The contractor's traffic Engineer shall verify that all detectors work properly and that each detector input into the traffic signal controller is programmed regarding its intended use. The contractor's traffic Engineer is responsible for optimizing the detector operation by utilizing various detector settings in the traffic signal controller.

4.10 Signal Performance Measures. The contractor's traffic Engineer shall setup traffic signal controllers on the Commission's advanced traffic signal performance measures module unless directed otherwise by the Commission's Traffic Operations Engineers. This includes any work on the Commission's advanced traffic signal performance measures module, traffic signal controller(s), and video detection processor(s). The contractor's traffic Engineer shall provide proof of each traffic signal setup in the module to the Commission's Traffic Operations Engineers. The contractor's traffic Engineer shall setup any traffic signal detectors as system detectors in the Commission's central traffic signal control system.

4.11 Preemption Controller Programming. If preemption is to be provided at a traffic signal, the contractor's traffic Engineer shall program the preemption settings in the traffic signal controller per MoDOT EPG guidelines and at the direction of the Commission's Traffic Operations Engineers. The contractor's traffic Engineer shall test the preempt settings at the traffic signal cabinet to verify proper operation.

4.12 Leading Pedestrian Interval (LPI) for Pedestrians at Signals. The Contractor shall program the signal controller at the following intersections to allow for additional time, typically 3 to 7 seconds, for a pedestrian to cross an approach of the intersection. LPI will be used at locations that do not have an island separating the right turn from mainline traffic.

Job JSL0021

Intersection	Approach	Roadway Pedestrian is Crossing
Dunn/Bellefontaine	WB Dunn Road	Bellefontaine Road

Job J6I3020D

Intersection	Approach	Roadway Pedestrian is Crossing
WB I-270 off-ramp/Lilac	WB I-270 off-ramp	Lilac Avenue
WB I-270 off-ram//Lilac	SB Lilac Avenue	WB I-270 on-ramp
EB I-270 off-ramp/Lilac	EB I-270 off-ramp	Lilac Avenue
EB I-270 on-ramp/Lilac	NB Lilac Avenue	EB I-270 on-ramp

4.12.1 LPI Notification. The Engineer and the District Traffic Engineer or his/her designee must approve the site for using LPI at each signalized intersection. The Engineer, Contractor and the District Traffic Engineer or designee shall field check the location together at least 7 days in advance before the planned date when the signal's controller has been programmed (reprogrammed) to allow for LPI. The contractor should coordinate with them in advance and follow their instructions and recommendations. Contact Information is below:

Lisa Kuntz
(314)-453-1879

4.12.2 LPI Testing. The Contractor shall test the additional time to cross each approach noted above by programming 3 additional seconds of time for a pedestrian to cross. MoDOT personnel shall be made aware 48 hours prior to this test. If additional timing is needed as determined by the Engineer and the Contractor, the contractor shall increase the additional time by 1 second until both the Engineer and the Contractor are satisfied with the results. Any modifications needed after testing shall be completed by the Contractor at no additional pay. Once modifications are made, the Contractor shall retest per requirements within this section. The Engineer shall give approval to the Contractor once each location has been successfully tested.

4.13 Left-Turn Protection for Pedestrians at Signals. The Contractor shall program the signal controller at the following intersections with Flashing Yellow Arrow (FYA) left turns to <u>not provide</u> for the flashing yellow phase and instead keep the red left arrow phase when the push-button is activated until the pedestrian has crossed that leg of the intersection.

Job JSL0021

Intersection	Approach	Roadway Pedestrian is Crossing*
Dunn/Bellefontaine	NB Bellefontaine	Dunn Road (Signal Head 11)

Job J6I3020D

Intersection	Approach	Roadway Pedestrian is Crossing*
WB I-270 Ramps/Lilac	NB Lilac Avenue	WB I-270 on-ramp (Signal Head 11)
EB I-270 Ramps/Lilac	SB Lilac Avenue	EB I-270 on-ramp (Signal Head 51)

Note: * Indicates Signal Head Associated with Left Turn Movement that will be Left-Turn Protect

4.13.1 Left-Protect Notification. The Engineer and the District Traffic Engineer or his/her designee must approve the site for using Left-Protect at each signalized intersection as noted in the plans. The Engineer, Contractor and the District Traffic Engineer or designee shall field check the location together at least 7 days in advance before the planned date when the signal's controller has been programmed (reprogrammed) to allow for Left-Protect. The contractor should coordinate with them in advance and follow their instructions and recommendations. Contact Information is below:

Lisa Kuntz
(314)-453-1879

4.13.2 Left-Protect Testing. The Contractor shall test that the Left-Protect setup for each approach noted above is functioning as designed. MoDOT personnel shall be made aware 48 hours prior to this test. The actual test will require the Contractor to activate the push button for a particular crossing and to monitor that the left turn signal that turns into that particular crossing being tested does not allow for the FYA to function until after the pedestrian has crossed. All Left-Protect crossings shall be tested by the Contractor. Any modifications needed after testing shall be completed by the Contractor at no additional pay. Once modifications are made, the Contractor shall retest per requirements within this section. The Engineer shall give approval to the Contractor once each location has been successfully tested.

5.0 Post Project Report. The contractor shall submit to the Engineer a post project report, four to six weeks after the final traffic signal adjustments have been completed. The report shall include at a minimum an observation report, summary of timing changes and locations, summary of complaints, and any other pertinent information regarding the contractor's efforts for managing these traffic signal corridors in one electronic document.

6.0 Deliverables. All deliverables mentioned in this provision shall be submitted to the Engineer in a timely manner to the satisfaction of the Engineer prior to receiving full compensation for this work. All deliverables must be submitted to the Engineer via USB.

- Experience submittal
- Preliminary Traffic Mitigation Plan
- Notification of Detour Implementation
- Time Base Reports, As Needed
- Complaint Resolutions
- Audible pedestrian signal voice message files
- Traffic Signal Database versions (in PDF format)
- Traffic signal photos
- Notification of Restoration to Normal Operations
- Post Project Report

7.0 Construction Requirements. Construction requirements shall conform to Sections 902, 1061 and 1092.

8.0 Method of Measurement. Method of measurement shall conform to Section 902.

9.0 Basis of Payment. Payment will be considered full compensation for all contractor services, installation, and labor to complete the described work:

Item No.	Type	Description
902-99.01	Lump Sum	Traffic Signal Maintenance & Programming

AAA. 18 Inch Island Tubular Markers

1.0 Description. Tubular markers shall be mounted on raised islands at the locations indicated in the plans.

2.0 Requirements. Island tubular markers shall have a height 18-inches as noted on plans, 2 reflective bands with super high intensity prismatic sheeting in accordance to Sec 1042 and be constructed from thermoplastic polyurethane. Color of the island tubular marker and reflective bands shall match the pavement marking in which it is placed. Post shall be in the shape of a "T" with a width of 3 inches and depth of 2 inches. Post shall be capable of recovering from repeated vehicle impacts. Post shall insert and be secured into the plastic base with horizontal locking pins. When the post is no longer serviceable, it shall be able to be removed and a new post can be manually inserted and locked into the existing base.

3.0 Construction Requirements. Shall be surface mounted on the radius points of the island noses. The roadway shall be cleaned of dirt and gravel before installation. Island tubular markers shall be mounted using proper sized anchor bolts according to manufacturer's instructions.

4.0 Method of Measurement. Measurement for installation of tubular marker with base will be made per each.

5.0 Basis of Payment. All labor, equipment and materials necessary to install these markers will be paid for under:

Item Number	Type	Description
620-99.02	Each	18 IN. White Island Tubular Marker
620-99.02	Each	18 IN. Yellow Island Tubular Marker

BBB. Delayed Access to Parcels Pending Acquisition

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

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

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

Parcel 1: Anticipated possession by December 31, 2026

CCC. Disposition of Existing Signal/Lighting and Network Equipment

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

2.0 Signal Equipment. All equipment other than network communication devices noted in 3.0 are to be transported to the Commission's maintenance lot located at 2309a Barrett Station Road, Ballwin, Missouri 63021. The contractor shall notify the Commission's representative 24 hours prior to each delivery by calling:

Mr. Brian Ducote, Traffic Supervisor, Preventive Maintenance Signals
Cell: (314) 681-8395

Mr. Sherwin Caldwell, Traffic Signal Supervisor, Emergency Signal Maintenance
Cell: (314) 404-7256

Mr. Dusty Henson, Urban Traffic Supervisor
Temporarily Handling Lighting and Locates
Cell: (636) 591-8749

Mr. Tony Rogers, Lighting Supervisor
Cell: (314) 348-9481

3.0 Network Communication Devices. Devices such as CCTV cameras and domes, video encoders, device servers, Ethernet switches, media converters, and radio assemblies are to be transported to the Commission's TMC in Chesterfield. The contractor shall notify the Commission's representative 24 hours prior to each delivery by calling 314-275-1526 and providing details for the delivery.

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

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

DDD. Temporary Generator

1.0 Description. The contractor shall maintain signal operations at all times at the I-270 interchange with Bellefontaine Avenue intersection when the power is switched over from the existing power supply to the new power supply for each intersection as noted in the plans.

1.1 Construction Requirements. The contractor will be responsible for providing a temporary generator to operate the existing signal cabinet at the intersection(s) noted above while Ameren connects the power from its transformer to the new power supply. The contractor shall discuss with the Engineer and Ameren any issues pertaining to the installation of the power supply and transformer prior to the switch over to the new power.

2.1 All construction items listed in this provision shall conform to the Ameren Electrical Service Manual.

3.0 Method of Measurement. Method of measurement shall be made per each installed temporary generator regardless of the time needed to operate the generator at each location.

4.0 Payment. Payment for a temporary generator, including all equipment, fuel, time and labor shall be made at the contract unit price for the following:

Item No.	Type	Description
902-99.02	Each	Temporary Generator for Signal Power

EEE. Temporary Traffic Signals

1.0 Description. This work shall consist of maintaining the operation of existing traffic signals during the construction of the new traffic signals at each intersection. This includes any necessary temporary traffic signal devices, removing/relocating signal equipment to keep the intersection signalized, staging traffic signal construction/equipment, any necessary temporary signage, and any other equipment/devices and work to keep the operation of the existing signalized intersections during construction.

2.0 Construction Requirements. Work shall be in accordance with Sec 902 and the manufacturer's recommendations regarding any temporary signals if needed.

2.1 Prior to removal of the existing temporary traffic signal at the Lilac Avenue and Dunn Road intersection, the Contractor shall contact MoDOT so that the Engineer can allow the Contractor on the current project, J6I3020C – Riverview Interchange Reconstruction, to pickup any existing signal equipment that Contractor would like to reuse on future projects.

3.0 Basis of Payment. Payment for temporary traffic signals shall be considered to be completely covered by the contract unit price for Item Number 902-94.00, "Temporary Traffic Signals," per lump sum as indicated in the plans. This pay item pertains to every signalized intersection along the project limits. There will be no additional payment for any temporary removals and relocations that may be necessary.

FFF. Audible Pedestrian Pushbuttons and Signing

1.0 Description. Audible pedestrian pushbuttons and signing will be required for all pedestrian indications at all the intersections. Each audible pedestrian signaling system shall include all electronic control equipment, mounting hardware and pushbuttons necessary to provide audible tone and speech indications as well as a vibrating tactile indication for specific

pedestrian signal functions. Each audible pedestrian system will also include the hardware and software needed for programming the system operational parameters.

2.0 Installation, Programming and Functionality. The contractor shall install the audible pedestrian system following manufacturer's recommendations and Sec 902, and program each component for operation to provide the following functionality. Prior to activating each audible pedestrian system the contractor shall submit a listing of the values programmed for all variable system parameters to the engineer for review and approval. Use also Section 4E.09 – 4E.13 of the 2009 MUTCD for additional guidance of initial values for each programmable parameter.

2.0.1 Connectivity. All audible push system buttons shall have Blu-tooth interface or other hands-free capability and be password protected. Programming of the APS buttons shall be accessible through a field service application available on both iOS and Android platforms

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

- 2009 MUTCD, Section 4E.09 – 4E.13
- NEMA 250 – 4X
- NEMA TS1, TS2, TS4, Type 170, Type 2070

3.1 Walk Indications. Accessible pedestrian signals shall have both audible and vibrotactile walk indications.

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

3.3 Audible. Accessible pedestrian signals shall have an audible walk indication during the walk interval only. The audible walk indication shall be audible from the beginning of the associated crosswalk.

3.4 Pushbutton signage/Tactile Arrow. In addition to standard pedestrian sign requirements, all pushbuttons for the locations mentioned in 1.0 shall have additional signage to indicate crosswalk direction by use of a tactile arrow and the name of the street containing the crosswalk served by the audible pedestrian signal. The sign shall be located immediately above the push button mechanism and parallel to the crosswalk controlled by the button. The street name shall be the name of the street or reasonable abbreviation whose crosswalk is controlled by the push button. Signage shall comply with ADA Accessibility Guidelines (ADAAG) 703.2 specifications for Braille and raised print.

3.4.1 Arrow. Signs shall include a tactile arrow aligned parallel to the crosswalk direction. The arrow shall be raised 0.8 mm (.03 inch) minimum and shall be 4 mm (1.5 in) minimum in length. The arrowhead shall be open at 45 degrees to the shaft and shall be 33 percent of the length of the shaft. Stroke width shall be 10 percent minimum and 15 percent maximum of arrow length. The arrow shall contrast with the background.

3.4.2 Street Name. Accessible pedestrian signals (APS) shall include street name information aligned parallel to the crosswalk direction and shall comply with Revised Draft

Guidelines for Accessible Public Rights-of-Way R409.3 or shall provide street name information in audible format.

4.0 Performance.

4.1 Audible Locator Tone. All APS buttons shall have a Locator tone. The Locator tone tells the pedestrian that the intersection is equipped with an APS system and guides them to the pushbutton location. The locator tone shall operate during the DON'T WALK and flashing DON'T WALK intervals only and shall be deactivated when the pedestrian signal is not operative. Locator tones shall have a duration of 0.15 seconds or less and repeat at 1-second intervals. Push button locator tones shall be intensity responsive to ambient sound and be audible 6 to 12 feet from the pushbutton, or the building line, whichever is less.

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

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

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

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

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

5.0 Documentation and Support.

5.1 Operation and Maintenance Manuals. Two copies of the operation and maintenance manuals for each station shall be included.

5.2 USB with Audible Messages. The Contractor shall provide two copies of USB data card to the Engineer that contains files for the manufacturer’s audible messages for complete operation of all APS signals at all stations.

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

7.0 Method of Measurement. Method of measurement shall conform to Sec 902.

8.0 Basis of Payment. Payment for the audible signals will be for each unit per bid item, 902-99.02, “Audible Pedestrian Pushbutton and Signing with Verbal Walk Message”, per each. This will include all wiring, power adaptors, pusbuttons and installation hardware needed. Payment for signing and mounting hardware will be included in the pay item for audible pedestrian pushbutton. All costs incurred for complying with this provision including labor shall be considered completely covered by the contract unit price for:

Item Number	Type	Description
902-99.02	EA	Audible Pedestrian Pushbutton and Signing

GGG. Advanced Traffic Controller

1.0 Description. The Commission’s St. Louis District is utilizing TransCore’s TransSuite software (TSC) as their Advanced Traffic Management System (ATMS), therefore all signal controllers must be able to interface with their TCS program.

2.0 Material. All traffic signal controllers purchased and installed on this project shall be selected from the list below and match the cabinet type and connections indicated on the D-37C sheet for each intersection. The controllers on the list below are the only controllers that are tested, fully functional, and approved with the version of TransSuite that the St. Louis District is currently operating (TransSuite version 19.4):

Controller/Firmware Type	Firmware Supported	Cabinet Type (Match in field)
Econolite Cobalt	32.65.10 or newer	NEMA TS2 Type 1 or 2
Econolite ASC/3	2.66	NEMA TS2 Type 1 or 2
McCain Omni EX	1.11	NEMA TS2 Type 1 or 2
Intelight X3	MaxTime 2.1.1	NEMA TS2 Type 1 or 2

3.0 Construction Requirements. Contractor shall ensure that the signal controller as noted above is programmed to be compatible with the previously mentioned version of TransSuite TCS system.

4.0 Acceptance Testing. All controllers shall be tested per the Commission’s specifications. Programming and testing should be done prior to any installation and approved by the Commission’s engineer or representative. The contractor shall provide a copy of the signal programming to the engineer via an USB Flash drive.

5.0 Documentation. Contractor shall provide the engineer with an electronic copy of the manufacturer’s signal controller manual or link to the website where the manual can be downloaded in .pdf format.

6.0 Basis of Payment. Measurement and paywork for work covered by this specification shall include all equipment, tools, and materials necessary and shall be paid for at the contract unit price as follows:

Item No.	Type	Description
902-99.02	Each	ATC Traffic Signal Controller

HHH. MoDOT TS2 Type 1 Cabinet Assembly

1.0 Description. The cabinet assembly shall meet, as a minimum, all applicable sections of the latest revisions as found in the NEMA TS2 Standard Publication and sections 902 and 1092 of the Missouri Standard Specifications for Highway Construction Manual. Where differences occur, this specification shall govern.

2.0 Materials.

2.1 Cabinet. The cabinet shall be constructed from aluminum with a minimum thickness of 0.125 inches. The cabinet shall be designed and manufactured with materials that will allow rigid mounting, whether intended for pole, base or pedestal mounting. All mounting points where the cabinet is bolted to the foundation shall be reinforced at the factory by welding in an additional layer of material equal to the thickness of the material that the cabinet is constructed from. Triangular gussets are also required when the base plate and cabinet walls are welded together vs. continuous rolled material. A rain channel shall be incorporated into the design of the main door opening to prevent liquids from entering the enclosure. All external hardware shall be stainless steel. Unless otherwise specified, the cabinet exterior shall be supplied with a natural aluminum finish. Sufficient care shall be taken in handling to ensure that scratches are minimized. All surfaces shall be free from weld flash. Welds shall be smooth, neatly formed, free from cracks, blowholes and other irregularities. All sharp edges shall be ground smooth. The cabinet shall be equipped with (2) lifting brackets for installation and removal purposes.ing. All mounting points where the cabinet is bolted to the foundation shall be reinforced at the factory by welding in an additional layer of material equal to the thickness of the material that the cabinet is constructed from. Triangular gussets are also required when the base plate and cabinet walls are welded together vs. continuous rolled material. A rain channel shall be incorporated into the design of the main door opening to prevent liquids from entering the enclosure. All external hardware shall be stainless steel. Unless otherwise specified, the cabinet exterior shall be supplied with a natural aluminum finish. Sufficient care shall be taken in handling to ensure that scratches are minimized. All surfaces shall be free from weld flash. Welds shall be smooth, neatly formed, free from cracks, blowholes and other irregularities. All sharp edges shall be ground smooth. The cabinet shall be equipped with (2) lifting brackets for installation and removal purposes.

2.2 Cabinet Doors. The cabinet shall include front and rear doors of NEMA type 3R construction with rain tight gaskets. A stiffener plate shall be welded across the inside of the main door to prevent flexing. Doors shall include a mechanism capable of holding the door open at approximately 90 and 165 degrees under windy conditions. Manual placement of the mechanism shall not be required by field personnel. Only the main door shall have ventilation louvers. A plaque designation “Traffic Control” shall be affix to each main cabinet door.

2.3 Door Alarm. The front and rear doors shall be equipped with switches wired to the traffic signal controller alarm **with** 1 input for logging and reporting of a door open condition. This should indicate a Special Status 1 alarm in the signal controller alarm screen.

2.4 Shelves. No less than (2) shelves shall be provided and each shall have the ability to be independently removed, relocated, and adjusted. The front edge of each shelf shall have holes predrilled at a spacing of no greater than 8 inches to accommodate tie-wrapping to secure cables/harnesses.

2.5 Mounting Rails. A minimum of one set of vertical "C" channels shall be mounted on each interior wall of the cabinet for the purpose of mounting the cabinet components. The channels

shall accommodate spring mounted nuts or studs. All mounting rails shall extend to within 7 inches of the top and bottom of the cabinet.

2.6 Pull-out Drawer. The cabinet shall be equipped with a pull-out drawer/shelf assembly. A 1½ inch deep drawer shall be provided in the cabinet, mounted directly beneath the controller support shelf. The drawer shall have a hinged top cover and shall be capable of accommodating one complete set of cabinet prints and manuals. This drawer shall support 50 pounds in weight when fully extended. The drawer shall open and close smoothly. The drawer dimensions shall make maximum use of available depth offered by the controller shelf and be a minimum of 18 inches wide.

2.7 Police Door. The police door shall contain only (1) switch used for flash/auto operations. The ability to turn field indications off from the police panel will not be permitted.

2.8 Lighting. The cabinet shall include no less than (3) field replaceable LED light assemblies along the top and sides of the cabinet. The LED panels shall be controlled by a manually activated toggle switch on the tech panel.

2.9 Fans/Ventilation. The components of the system as well as the CFM requirements shall be in compliance with the MoDOT 902 & 1092 specifications.

2.10 Heater. The cabinet shall be supplied with a 200-Watt fan heater with thermostat control that is designed to protect electronics from the effects of low temperatures such as corrosion, freezing or condensation, which can damage critical components within a control enclosure. Housing shall be constructed of aluminum. Overall dimensions including mounting areas shall be approximately: 4inch depth, 4inch width, 5.50inch height.

2.11 Switch Guards. All switches shall include switch guards. All switches shall be clearly labeled.

2.12 Receptacles and power strip(s). One 8-outlet IP-addressable power strip shall be provided and Commission-furnished. The installation of the power strip shall be included in the cost of the cabinet assembly. The main door tech panel shall contain a 15 amp duplex GFI receptacle. A separate grounded service outlet shall be provided in the controller cabinet for supplying power to the video detection monitor. The monitor shall be installed to automatically power on when the cabinet door is opened and automatically power off when the cabinet door is closed. The use of the grounded service outlet located on the cabinet door will not be permitted for this function. A manual on/off switch shall also be provided and mounted to the main door tech panel.

2.13 16-Position Back Panel Wiring. All new signal cabinets shall have a 16-position load switch back panel and conform to the following specifications. Regardless of the number of phases specified on the plans, all load switch positions shall be completely wired for use. The load switch back panel shall be configured for NEMA Configuration “A” or “G” as designated on the signal plans. Vehicle phases, overlaps (including FYA configurations), and pedestrian phases shall be wired such that it must work with a Type 16 MMU. The cabinet shall include both a DT panel and a CTB (SDLC) panel with 6 harnesses.

2.14 Detection Configuration.

2.14.1 For all Detector Types. Detection configuration shall be in accordance with the configuration prescribed in the SL District Detection JSP.

2.14.*2* Intersections with Video Detection. For intersections with video detection, the cabinet shall be wired to automatically power on the video monitor when the cabinet door is open.

2.15 Load Switch. The front of the load switch shall be provided with (3) indicators to show the input signal from the controller to the load switch and (3) indicators to show the output to the field devices. The full complement of load switches shall be supplied with each cabinet to allow for maximum phase utilization for which the cabinet is designed.

2.16 SDLC. All connection points shall be protected by a BIU 15 pin surge suppressor used for the protection of any devices on Port 1 Synchronous Data Link Control (SDLC). Each cabinet shall be provided with a SDLC hub assembly and (6) SDLC cables unless otherwise noted on the order form. All mechanical connections shall be soldered.

2.17 Surge Protection. Surge protection shall be a modular plug in type product as listed in the MoDOT Traffic APL.

2.18 AC line filter. The AC line filter shall protect equipment from malfunctions due to conducted interference coming into the equipment from line, especially line to ground (common mode) noise and transients. Overall dimensions including mounting areas shall be approximately: 4.17inch width and 3.53inch height.

2.19 Signal Buss Relay. The relay shall be a direct "drop-in" replacement for existing mercury displacement relays. The relay shall be a single pole solid state or hybrid relay. Overall dimensions including mounting areas shall be approximately: 2.5inch depth, 2inch width, 5 inch height.

2.20 Field Wiring termination. All field wires shall be attached to the back panel terminal strips via a mechanical copper lug, which can accommodate wire sizes from 14AWG - 6AWG. Lugs shall be provided for all field outputs to maximize the cabinet design.

2.21 Flash Transfer Relays. The full complement of relays shall be supplied with each cabinet to allow for maximum phase utilization for which the cabinet is designed.

2.22 Cabinet Wiring Prints. Paper cabinet prints as well as electronic media shall be provided with each cabinet. (4) paper copies shall be provided (22" X 34") and (1) electronic copy in pdf and dgn format. All flash program wiring configurations shall be represented on the cabinet print (Red, Amber, No Flash, FYA, Ped, FYA & Ped).

2.23 Generator Attachment. A generator plug shall be installed on each cabinet unless otherwise noted. The access door shall be hinged, lockable and watertight. The plug shall conform to the (NEMA L5-30 configuration). An automatic transfer switch shall be provided which will switch power to/from "line", "UPS" or "generator" when power from one of the sources has been lost or gained. The unit shall be rated for 30 amps and shall contain either a LCD display or indicator lights that validate the following: Line in, Line out, UPS in, UPS out and "from" generator. The unit shall contain a main breaker (on/off switch), a UPS bypass breaker (switch) and a Generator breaker (switch). To minimize the impact of the presence of the auto transfer switch, the dimensions shall be no greater than 12" wide X 6" deep X 4" high. The unit shall be constructed of either aluminum or stainless steel.

3.0 Testing.

3.1 Each controller and cabinet assembly shall be tested as a complete entity under signal load

in accordance with Missouri Standard Specifications Section 902 for a minimum of 30 days after installation.

3.2 Each assembly shall be delivered with a signed document detailing the cabinet final tests performed.
The cabinet shall be assembled and tested by the controller manufacturer or authorized local distributor to ensure proper component integration and operation.troller manufacturer or authorized local distributor to ensure proper component integration and operation.

4.0 Warranty and Training.

4.1 If a Controller and/or Malfunction Management Unit are ordered with a cabinet assembly, the Controller and Malfunction Management Unit shall be warranted by the manufacturer against mechanical and electrical defects for a period of 2 years from date of shipment. The manufacturer's warranty shall be supplied in writing with each cabinet and controller. Second party extended warranties are not acceptable.facturer's warranty shall be supplied in writing with each cabinet and controller. Second party extended warranties are not acceptable.

4.2 The cabinet assembly and all other components shall be warranted for a period of one year from date of shipment. Any defects shall be corrected by the manufacturer or supplier at no cost to the owner.

4.3 MoDOT may require training on the maintenance and operation of NEMA TS2 cabinet assemblies. Maintenance and operation personnel shall be trained on troubleshooting, maintenance and repair of cabinets and all serviceable equipment. Training shall include field level troubleshooting and bench repair. This training shall be for a minimum of sixteen hours over two days. Training shall be conducted at a time and location mutually agreeable by the contractor and the signal shop traffic supervisor or as directed by MoDOT.

5.0 Method of Measurement. Method of measurement shall conform to Sections 902 and 1092 of the Standard Specifications.

6.0 Basis of Payment. Payment included with cost of item number 902-42.83, “Controller Assembly Housing, NEMA TS2 Controller”, per each. Payment will be considered full compensation for all labor, equipment, and material to complete the described work as shown on the plans. No additional payment will be made to provide conformance. Payment also includes connection of NEMA TS2 Controller to existing power source. **Modifications required for connection to the existing power source shall be at no direct pay.**

Item Number	Type	Description
902-42.83	Each	Controller Assembly Housing, NEMA TS2 Controller

III. Countdown Pedestrian Signal Heads

1.0 Description. This work shall consist of furnishing, installing and placing into operation any countdown, pedestrian signal heads.

2.0 System Requirements. Delete Sec. 1092.1.9 in its entirety and substitute the following:

1092.1.9 Pedestrian Signal Heads. Pedestrian signal heads shall be in accordance with ITE specifications and standards for pedestrian traffic control signal indications and the following:

(a) Pedestrian signal head housings shall be constructed of a one-piece, 0.250-inch (6 mm) thick, polycarbonate material as shown on the plans. The housing shall include an integral mounting bracket designed for side-of-pole mounting on all makes of signal poles with a terminal compartment and minimum 5-position, double-row terminal block.

(b) The door, lens and any openings in the housing shall have gaskets or seals to exclude dust and moisture from the inside of the compartment.

(c) Lenses shall be constructed of polycarbonate material.

(d) Pedestrian signal head units shall be provided with a manufactured preformed rectangular visor or screen-type louver.

(e) All plastic material shall be ultraviolet stabilized.

(f) Indications shall be ITE Class 3 symbol messages. The "UPRAISED HAND" symbol shall be illuminated with a filled, Portland orange LED module. The "WALKING PERSON" symbol shall be illuminated with a filled, white LED module. The “Countdown” display numbers shall be illuminated with a Portland orange LED module. The LED modules shall be in accordance with applicable portions of Sec 1092.1.

(g) Pedestrian traffic control signal faces shall be constructed such that all messages are displayed from the same message-bearing surface having a black opaque background. The "Countdown" display shall be located to the right of the "UPRAISED HAND" and “WALKING PERSON” symbols, which will be overlaid.

(h) Pedestrian signal heads require “Countdown” displays and shall have the following features:

(1) Display numbers must be two digits at least 9 inches in height.

(2) Shall only display the “Countdown” time during the pedestrian change interval. Time displayed shall be in seconds and begin only at the beginning of the pedestrian change interval. The flashing “UPRAISED HAND” symbol shall be concurrently displayed during the pedestrian change interval. The total time displayed at the start of the pedestrian change interval shall be automatically adjusted by the pedestrian signal head and not require any manual settings or additional wiring to the signal cabinet.

(3) Once the “Countdown” display reaches “0”, the “Countdown” display shall blank-out until the next pedestrian change interval begins.

(4) If the pedestrian change interval is interrupted or shortened as part of a transition into a preemption sequence, the “Countdown” display shall go dark immediately upon activation of the preemption transition.

(5) A test switch shall be provided in order to test the “Countdown” display.

3.0 Construction Requirements. Construction requirements shall conform to Sec 902.

4.0 Method of Measurement. Method of measurement shall conform to Sec 902.

5.0 Basis of Payment. Payment for pedestrian signal heads, including all materials, equipment, labor and tools shall be made and considered completely covered by the contract unit price bid for:

Item Number	Type	Description
902-99.02	Each	Countdown Pedestrian Signal Head, Type 1S

JJJ. Network Connected Signal Monitor

1.0 Description. The Commission’s signal cabinet shall have a flashing yellow arrow compatible monitor installed with an internal RJ-45 plug for 10/100 Ethernet communication that is connected to the Commission’s computer network through Commission furnished Ethernet switch and allow a remote user running the monitor’s software to interface with any specific monitor.

2.0 Performance.

2.1 ***Inputs. If video detection is used, inputs into controller shall be via SDLC port. Signal cabinet to be TS2 Type 2 setup with 3 ea. SDLC connectors and the monitor to be a Malfunction Management Unit (MMU).***

2.2 ***Status and Event Logging. Monitor shall be able to remotely communicate, at a minimum, active status, current faults, and event logs for at least the previous 7 days.***

2.3 ***Flashing Yellow Arrow. Monitor shall be capable of operating a flashing yellow arrow for left turns by utilizing unused yellow channels on the pedestrian load switches.***

2.4 ***Software and Configuration. Software needed to communicate to any network-enabled monitor shall be provided to the Commission for an unlimited number of users.***

3.0 Construction Requirements.

3.1 Requirements. Construction requirements shall conform to Sections 902 and 1092.

3.2 Setup and Training. A minimum of one day of training shall be provided in the operation, setup communication and maintenance of the monitors.

3.3 Acceptance Testing. Contractor shall demonstrate that all network-connected monitors are remotely communicating and individually addressable via supplied software and Commission furnished devices from the Commission’s St. Louis Traffic Management Center in order to satisfy the requirements of this provision. No direct payment will be made for this testing.

4.0 Method of Measurement. Method of measurement shall conform to Sec 902.

5.0 Basis of Payment. No direct payment will be made for the software. Payment will be considered full compensation for all labor, equipment, and material to complete the described work other than Commission furnished devices needed to complete the network connections. Payment will be made as follows:

Item No.	Type	Description
902-99.02	Each	Network Connected Signal Monitor

KKK. Coordination with MoDOT Signal Shop for Cabinet Entry

1.0 Description. Commission-furnished color-coded pad locks have been placed on all of MoDOT's signal cabinets in addition to the key used to unlock the door handle. To gain access to the appropriate cabinets during the project all contractors shall coordinate with MoDOT's signal shop to obtain the proper keys and locks.

1.1 Keys & Locks. Red locks and keys are provided when a contractor has modified the signal cabinet and MoDOT staff shall not have access to the cabinet until it is accepted for maintenance. The blue keys are provided for entry into the cabinet where MoDOT's Signal Shop group deems the access to be minor in nature (entry to the cabinet to make a simple network switch connection, for example).

1.2 Completion of Project. At the completion of the project all keys and pad locks distributed to contractor during the project shall be returned to the Signal Shop supervisor or their representative and keys shall not be reproduced.

2.0 Contact. Initial contact must be made at least seven calendar days before work begins, preferably when the project has the notice to proceed or during the pre-construction meeting, if applicable. MoDOT's Signal Shop supervisors shall be notified prior to work beginning. Contact the signal shop via email at **sltrs@modot.mo.gov** to coordinate which padlocks are to be used.

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

LLL. Partial Acceptance of Signalized Intersections

1.0 Description. This work shall consist of maintaining operational signals and detection (both stopbar and advanced) throughout the construction staging, in accordance with Sec 902 and except as approved by the engineer. At the engineer's option, MoDOT may accept intersections for maintenance prior to final acceptance.

1.1 Once an intersection is complete, including but not limited to completion of construction, acceptance of all ADA facilities, and successful testing and operation of signal equipment, the engineer may partially accept that intersection for MoDOT's maintenance prior to Final Acceptance of the entire project.

2.0 Basis of Payment. No direct payment will be made for the cost of equipment, labor, materials or time required to fulfill this provision.

MMM. Pad Mounted 120V/240V Signal Power Supply & Lighting Controller with Uninterruptible Power Supply

1.0 Description. This work shall consist of furnishing and installing combination 120/240 volt signal and lighting power supply with uninterruptible power supply (UPS).

2.0 UPS Requirements. See the plans for which signalized intersections include an "Uninterruptible Power Supply" to be specifically constructed and it shall be NEMA approved for traffic signal operations.

2.1 UPS Location and Cabling. The UPS shall be installed separately from the signal cabinet and shall be installed in the same cabinet as the power supply and lighting controller station. In addition to the power cables from the UPS to the signal cabinet, the contractor will route but not connect an outdoor rated CAT-5 cable between the UPS RJ-45 port and the Ethernet switch in the signal cabinet. The contractor shall also install a 7-conductor serial cable and make connections from the UPS to the D-plug panel in the signal cabinet. The **On battery** contact (C-1) on the inverter should be programmed to energize when the UPS provides battery backup. The normally open contact should be wired to provide logic ground to the appropriate pin on the D-Panel (normally 17) when the UPS is in battery backup mode. This should indicate a Special Status 2 alarm in the signal controller alarm screen. The **Low Battery** contact (C-2) on the inverter should be programmed to energize when the UPS drops below a preset voltage level. (Set at 40%) The normally open contact should be wired to provide logic ground to the appropriate pin on the D Panel (normally pin 18) when the UPS is in Low Battery mode. This should indicate a Special Status 3 alarm in the signal controller alarm screen. The **Timer #1** contact (C-4) on the inverter should be programmed to energize after the UPS is inverter mode for **3** hours. The normally closed contact should be wired in series with Controller Voltage Monitor (CVM) to allow for the circuit to open after **3** hours and bring the signal to flash. The CAT-5 cable and serial cable will be run in a separate conduit from the power cables into the cabinet. All conduits will be internal and not visible from the exterior of either the UPS or signal cabinet. The contractor shall verify all control wiring with the manufacture of the traffic signal cabinet assembly for accuracy and compatibility and perform test to ensure proper operation.

2.2 UPS Input Specifications. Each UPS system shall have the following input requirements:

(a) A nominal input voltage of 120 VAC.
(b) An input voltage range of 85 to 175 VAC.
(c) Two (2) input voltage boost modes.
(d) Boost-1 shall increase the input voltage from 94 to 115 VAC.
(e) Boost-2 shall increase the input voltage from 85 to 101 VAC.
(f) Two (2) input voltages buck modes.
(g) Buck-1 shall decrease the input voltage from 154 to 124 VAC.
(h) Buck-2 shall decrease the input voltage from 175 to 142 VAC.

A user configurable power quality (PQ) option with default values of:

(a) High line disqualify shall be 130 VAC.
(b) High line qualify shall be 128 VAC.
(c) Low line qualify shall be 105 VAC.
(d) Low line disqualify shall be 100 VAC.
(e) Input current shall be less than 16A with nominal voltage, full load on the output and charger set at 10A.
(f) 50/60Hz automatic frequency detection with built-in class A EMI filter and transient suppression.

2.3 UPS Output Specifications. Each UPS system shall have the following output requirements:

(a) The output voltage of the UPS shall be 120 VAC ±10% in line mode.
(b) The output voltage of the UPS shall be 120 VAC ±6% in backup mode.
(c) The output frequency of the UPS shall be 60Hz ±5% in line mode.
(d) The output frequency of the UPS shall be 60Hz ±5% in backup mode.
(e) The output waveform of the UPS shall be sinusoidal.
(f) The output voltage total harmonic distortion (THD) shall be less than 3% with a resistive load.
(g) The efficiency of the UPS at nominal line voltage shall be greater than 98%.
(h) The efficiency of the UPS in backup mode shall be greater than 84%.
(i) The step-load response of the UPS shall be full recovery in ½-cycle @ 50% change with a resistive load.
(j) The transfer time of the UPS line to back up and backup to line shall be 5ms typical.
(k) The line qualification time of the UPS shall be user selectable at 3, 10, 20, 30, 40 and 50 seconds.
(l) The line qualification time of the UPS default shall be three (3) seconds.

2.4 UPS Battery and Charger Specifications. Each UPS system shall have the following specifications for the battery and charger:

(a) The nominal battery voltage of the UPS shall be 48 VDC.
(b) The battery charger current of the UPS shall be user programmable for 3, 6, and 10 A.
(c) The battery charger current default setting for the UPS shall be 6A.
(d) The battery charger in the UPS shall turn OFF when the battery temperature is 50°C.
(e) The UPS shall have a user programmable temperature compensated battery charger with setting for -2.5, -4, -5 and -6 mV/°C/Cell.
(f) The UPS shall have a temperature compensated battery charger with a default setting of -5 mV/°C/Cell.
(g) The UPS shall have a battery charge with a float voltage of 56VDC maximum.
(h) The UPS shall have a user configurable low battery warning.
(i) The UPS shall have a default low battery warning set at 47VDC to indication 40% remaining battery capacity.
(j) The UPS shall have a low battery shutdown set for 42VDC (10.5VDC per battery).

2.5 UPS Protection Specifications. Each UPS system shall have the following specifications for protection:

(a) The UPS shall have a 250VAC @ 20A input circuit breaker.
(b) The UPS shall have a 50A battery circuit breaker.
(c) The UPS shall have electronic short circuit protection when operating in backup mode.
(d) The UPS shall indicate an overload warning with a flashing alarm LED when the load is between 95% and 105% of the rated output for the UPS.
(e) The UPS shall shutdown in two (2) minutes when operating in backup mode when the load is between 106% and 115% of the rated output for the UPS, and the fault LED shall turn ON. The fault LED shall clear when the overload is removed and the utility line power returns.
(f) The UPS shall shutdown in one (1) minute when operating in backup mode when the load is greater than 115% and the fault LED shall turn ON. The fault LED shall clear when the overload is removed and the utility line power returns.
(g) The UPS shall disable the backup mode function when operating in line mode if the load exceeds 115% of the rated output for the UPS. The alarm shall be reset when the overload condition is removed.

(h) The UPS shall display an alarm LED if the battery ambient temperature is greater than 75°C and disable the backup mode function. The alarm shall clear when the battery ambient temperature is less than 70°C.
(i) The UPS shall display a fault LED when operating in backup mode and shutdown the inverter if the internal temperature is greater than 110°C. The fault shall clear when the utility power returns, and the internal temperature is less than 90°C.
(j) The UPS shall have output over-voltage protection to electronically shutdown the UPS if the output voltage exceeds 132VAC.
(k) The UPS shall disable the battery charger in two (2) seconds and display an alarm LED if the battery voltage exceeds 59VDC. The alarm shall be cleared, and charge enabled when the battery voltage drops to less than 57VDC.
(l) The UPS shall limit the charger voltage to 52VDC in the event the battery probe is not installed.
(m) The UPS shall have a battery circuit breaker with reverse polarity protection. The battery circuit breaker shall trip in the event the battery polarity is wired incorrectly.
(n) The UPS shall have protection for electrical backfeed to the utility that meets UL 1778 and CSA C22.2 No. 107.1.3 requirements.
(o) The UPS shall have user-selectable settings that are password protected.
(p) The UPS shall be cooled by a variable speed fan that is microprocessor and PWM controlled.
(q) The fan shall be OFF when the ambient temperature is less than 40°C.
(r) The UPS shall display an alarm LED to indicate the fan is enabled but not turning.
(s) The UPS shall have a fan that is field replaceable.

2.6 UPS Displays, Controls and Diagnostics Specifications. Each UPS system shall have the following specifications for the noted features:
(a) The UPS shall have a two (2) line/20-character LCD display and control panel that can be rotated for easy user interface.
(b) The UPS shall have event and alarm logging with time/date stamping for up to 100 historical events.
(c) The UPS shall have six (6) independently programmable control relays for control and report functions.
(d) The UPS shall have two (2) independently programmable timers 0 to 8hr with two (2) time-of-day restrictions on each timer.
(e) The UPS shall be equipped with a RS-232 port, which can be connected to a laptop.
(f) The UPS shall be equipped with a SNMP Ethernet card.

2.7 Programmable Dry Contacts. Each UPS system shall have the following requirements for the noted features relating to dry contacts:
(a) The UPS shall have six (6) sets of normally open (NO) and normally closed (NC) single pole double-throw (SPDT) dry contact relays rated for 250VAC @1A.
(b) The UPS shall have five (5) sets of dry contact relays that are user programmable, C1 through C5, and one relay contact that is factory configured, C6.
(c) The UPS shall have dry contact relays that are user programmable via either the RS-232 or (optional) Ethernet communication ports to activate under the following conditions:
(i) ON BATTERY. The relay is energized whenever the UPS switches to battery power.
(ii) LOW BATTERY. The relay is energized when the battery has reached a user defined low battery level of remaining useful capacity. This alarm is latched when a qualified line returns or the inverter shuts down. The default setting is 47VDC (~40%) of remaining useful battery capacity.
(iii) TIMER 1. The relay is energized after being in backup mode for a given amount of time. This timer is adjustable from 0 to 8hr. The default setting is two (2) hours.

(iv) ALARM. The relay is activated after a specific or general alarm is detected. The alarm conditions include: line frequency, low output voltage, no temperature probe, overload, unconnected batteries, high temperature (>55°C) and low temperature (<-20°C).
(v) FAULT. The relay is activated after a specific or general fault is detected. These faults include: short circuit, low battery voltage (<41VDC), high battery voltage (> 59VDC), overload and over temperature (>75°C).
(vi) OFF. The relay is disabled and will not activate under any condition.
(viii) TIMER 2. Same as TIMER 1.
(ix) TIMER 3. Same as TIMER 1.
(x) AC/DC FAN CONTROL. The relay is activated when the battery ambient temperature is greater than 35°C or at a user programmable threshold from 25 to 55°C @ 5°C increments.
(xi) The UPS shall have a default dry contact relay configuration of:

C1	ON BATT
C2	LOW BATT
C3	LOW BATT
C4	TIMER
C5	ALARM
C6	48VDC

2.8 Mechanical. Each UPS system shall have the following mechanical requirements:
(a) The UPS shall have AC input and AC output terminal blocks mounted on the front panel. The terminal blocks shall be approved by the Engineer.
(b) The UPS shall have six (6) user programmable dry contact relay terminal blocks on the front panel. The terminal blocks shall be approved by the Engineer.
(c) The UPS shall have one (1) user input and one (1) Automatic Transfer Switch (ATS) terminal block on the front panel. The terminal blocks shall be approved by the Engineer.
(d) The UPS shall have a DE-9 RS-232 connector on the front panel.
(e) The UPS shall have an RJ45 Ethernet connector on the front panel.
(f) The UPS shall have a battery connector on the front panel. The battery connector shall be approved by the Engineer.
(g) The UPS shall have a RJ14 battery temperature probe connector on the front panel.

2.9 Environmental. Each UPS system shall have the following environmental requirements:
(a) The operating temperature range of the UPS shall be -40° to 55°C with the capability of operating @ 800W for up to 2hr at 74°C ambient.
(b) The storage temperature range of the UPS shall be -40° to 75°C.
(c) The operating and storage humidity (non-condensing) range of the UPS is up to 95% RH.
(d) The altitude operating range of the UPS is up to 12,000ft with a de-rating of 2°C per 1000ft above 4500ft.
(e) The UPS shall be shipped in materials designed to meet requirements for ISTA program.
(f) The UPS shall pass electrical safety standards UL1778, CSA 22.2 No. 107.3, EN50091-1-1-2 and EN60950.
(g) The UPS shall pass emission standards FCC Subpart J Level A for conducted and radiated EMI CISPR22, EN55022 Level A for conducted and radiated EMI.
(h) The UPS shall pass Immunity standards:
EN61000-4-2: ESD (Electrostatic discharge).
EN61000-4-3: Radiated immunity.
EN61000-4-4: EFT (Electrical fast transient).
EN61000-4-5: Surge.
EN61000-4-6: Conducted (Power and signal lines).
EN61000-4-8: Power frequency magnetic.
EN61000-3-2: Harmonic distortion.

(i) The UPS shall display agency approval mark “cCSAus” on the manufacturer’s nameplate label.

2.10 Manual Bypass Switch. Each UPS system shall include a manual bypass switch (MPS). UATS assemblies that include items referenced individually need not be duplicated. The MPS shall have the following specifications:

(a) The MPS shall be a self-contained module separate from the UPS
(b) The MPS shall be shelf or rack mountable.
(c) The MPS shall have terminal blocks labeled “AC Input”, AC Output”, “To UPS” and “From UPS”.
(d) The MPS shall be a Break-Before-Make rotary switch.
(e) The MPS shall be rated at 120VAC @ 20A.
(f) The MPS shall have a 5-15R duplex receptacle connected to utility line.
(g) The MPS shall have a 5-15R receptacle labeled “Optional LA-P” to facilitate a plug-in surge suppressor.
(h) The MPS shall have a 5-15R receptacle labeled “Optional Battery Heater Mat” to provide non-standby power to a battery heater mat.
(i) The MPS shall have two (2) positions: one labeled “UPS” to connect the utility line to the UPS, and one labeled “Bypass” to connect the utility line to the load.
(j) The MPS shall have a 15A circuit breaker labeled “AC Input”.
(k) The MPS shall have a 15A circuit breaker labeled “AC Output”.

2.11 Automatic Transfer Switch. Each UPS system shall include an automatic transfer switch (ATS) with the following requirements:

(a) The ATS shall be rated for 120VAC @ 40A.
(b) The ATS shall be shelf or rack mountable.
(c) The ATS shall transfer the load to UPS when the utility line fails or is unqualified.
(d) The ATS shall transfer the load to utility line when the utility line is available and qualified.
(e) The ATS shall be activated by a 48VDC input from the UPS.
(f) The ATS shall have a terminal block labeled “L IN”, “NEUT”, “GRD” and “L OUT”.
(g) The ATS shall have a six (6) foot line cord labeled “UPS IN”.
(h) The ATS shall have a six (6) foot line cord labeled “UPS OUT”.
(i) The ATS shall have a 5-15R duplex receptacle connected to utility line.
(j) The ATS shall have a 5-15R receptacle labeled “Optional LA-P” to facilitate a plug-in surge suppressor.
(k) The ATS shall have a 5-15R receptacle labeled “Optional Battery Heater Mat” to provide non-standby power to a battery heater mat.

2.12 Automatic Bypass Switch. Each UPS system shall include an automatic bypass switch (ABS) with the following requirements:

(a) The ABS shall be rated for 120VAC @ 20 amps.
(b) The ABS shall be shelf or rack mountable.
(c) The ABS shall connect the UPS to the load to allow the UPS to continuously power the load.
(d) The ABS shall transfer the load to utility line when there is no UPS output voltage.
(e) The ABS shall be activated by the 120VAC from the UPS.
(f) The ABS shall have a terminal block labeled “L IN”, “NEUT”, “GRD” and “L OUT”.
(g) The ABS shall have a six (6) foot line cord labeled “UPS IN”.
(h) The ABS shall have a six (6) foot line cord labeled “UPS OUT”.
(i) The ABS shall have a 5-15R duplex receptacle connected to utility line.
(j) The ABS shall have a 5-15R receptacle labeled “Optional LA-P” to facilitate a plug-in surge suppressor.

(k) The ABS shall have a 5-15R receptacle labeled “Optional Battery Heater Mat” to provide non-standby power to a battery heater mat.
(l) The ABS dimensions shall be 4.6"H x 4.75"W x 6.5"D.
(m) The ABS weight shall be 4lbs.

2.13 Generator Transfer Switch. Each UPS system shall include a generator transfer switch (GTS) with the following requirements:
(a) The GTS shall sense when a portable generator is connected and transfer the load to the generator after a 30s delay.
(b) The GTS shall be rated for 120VAC @ 20A.
(c) The GTS shall be shelf or rack mountable.
(d) The GTS shall have a terminal block labeled “AC INPUT”, “AC OUTPUT” and “GENERATOR INPUT”.

2.14 UPS Batteries. The batteries for the UPS system shall meet the following requirements:
(a) The batteries shall be Gel Cell Valve Regulated Lead Acid (VRLA) type specifically designed for outdoor use.
(b) The batteries shall be designed for “Float Service” to provide 100% out-of-box runtime capacity.
(c) The batteries shall have Silver Alloy positive plates.
(d) The batteries shall have a five (5) year full replacement, non-prorated warranty.
(e) The battery capacity rating at 20hr shall be 94Ah.
(f) The battery shall be 12VDC.
(g) The number of batteries in the system shall be four (4) or eight (8).
(h) The batteries shall be connected to provide 48VDC.
(i) Batteries for each location shall provide full power for all devices shown on the plans that are powered through the signal cabinet for three (3) hours and then send the signal into all red flash and power that state for an additional three (3) hours.

2.15 Battery Heater Mat.
(a) The battery heater mats shall be available in four (4) battery and single (1) battery sizes.
(b) The single battery heater mat shall allow for a Master-Slave configuration so two (2) or more mats can be ganged together.
(c) The battery heater mats shall plug into a 120VAC/5-15 receptacle.
(d) The battery mats shall be thermally controlled, turning ON at 5°C and turning OFF at 15°C.
(e) The battery mats shall be thermally fused for 82°C to prevent thermal runaway.

2.16 Battery Charge Management System. Each UPS system shall have a battery charge management system with the following requirements:
(a) The battery charge management system shall spread the charge voltage equally across all batteries.
(b) The battery charge management system shall compensate for batteries with different internal resistances.
(c) The battery charge management system shall have a quality of final balance of ±100mV maximum between any two (2) batteries in the string.
(d) The battery charge management system shall have reversed polarity protection.
(e) The battery charge management system shall be designed to CSA C22.2 No. 107.1 and UL 1778 Standards for safe unattended operation.

2.17 Surge Suppression. Each UPS system shall have the following requirements for surge suppression:

(a) The surge suppression shall provide protection from voltage transients appearing on the utility line.
(b) The surge suppression shall be a plug-in module that is field replaceable.
(c) The surge suppression shall have a LED indicator that turns OFF when the module is no longer providing protection.
(d) The surge suppression shall have a clamping voltage of 150VAC.
(e) The surge suppression shall have a response time of less than one (1) nanosecond.

2.18 Construction Requirements. Construction requirements shall conform to Sec 902. Any exceptions to these requirements shall be approved by the engineer before system installation.

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

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

Item No.	Type	Description
902-99.02	Each	Pad Mounted 120V/240V Signal PS & Lighting Controller w/ UPS

NNN. SL District Traffic Signal Detection System (Modified)

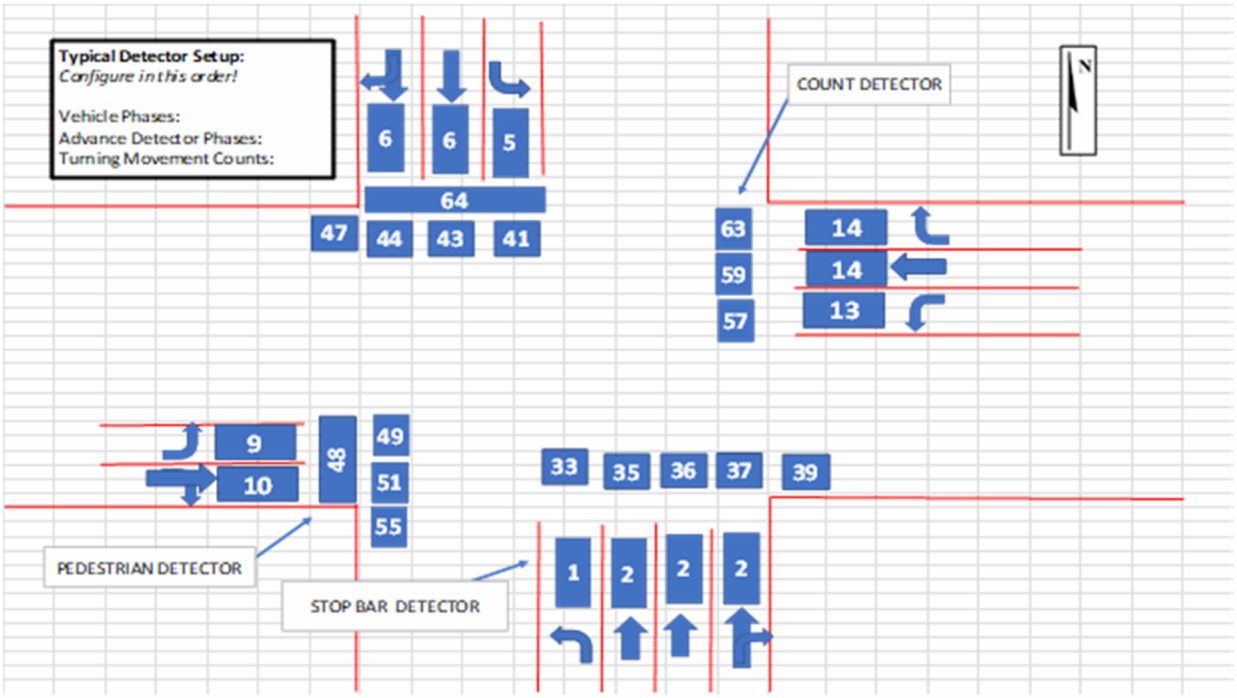
1.0 Description. This work shall consist of providing detectors for signalized installations that will support advance traffic signal performance measures (ATSPM) on the Commission's St. Louis District roadways. Detectors shall be in accordance with the Missouri Standard Specifications for Highway Construction (latest version) and installed to provide detection at locations as shown on the plans or as directed by the Engineer in accordance with Section 902. If any information conflicts between Section 902 and this JSP, the JSP shall supersede.

2.0 Detector Zones. The following detector zones shall be placed as shown in the graphic below:

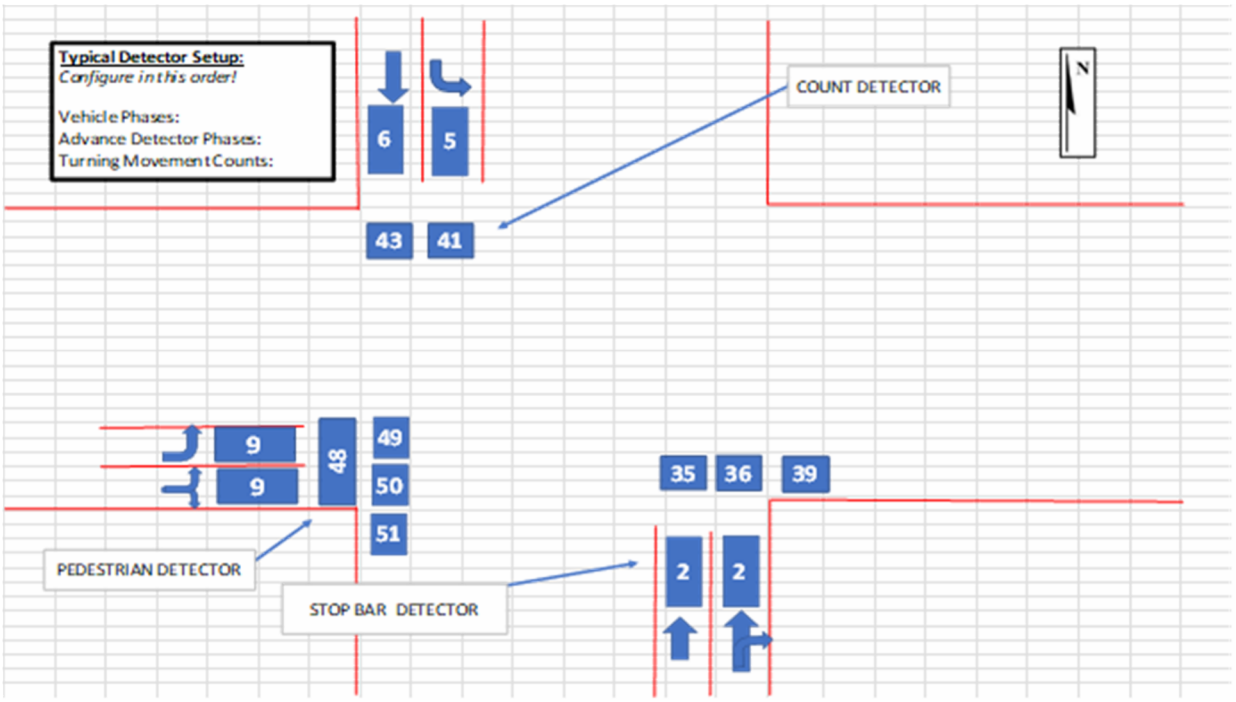
- Stop Bar Detection
- Advance Upstream (Performance Measures)
- Dilemma Zone
- Turn Counts

2.1 Dilemma Zones. Dilemma zone detection shall be required for the following approaches for high speed dilemma zone detection:

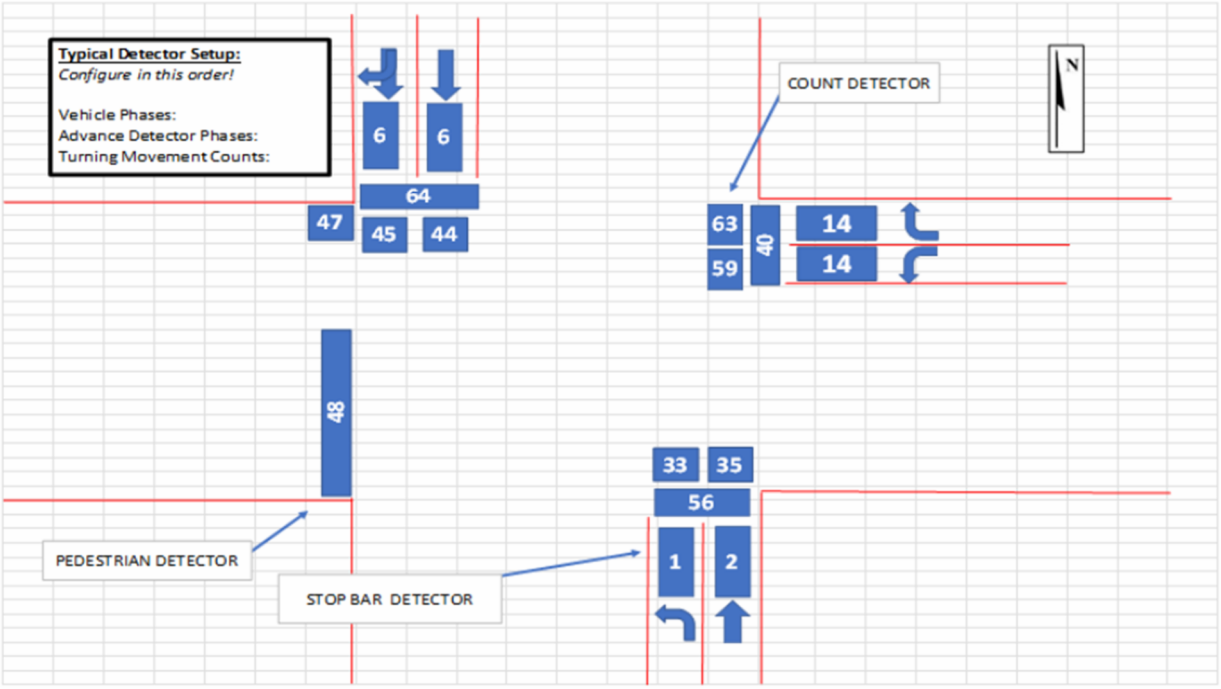
Bellefontaine at Dunn



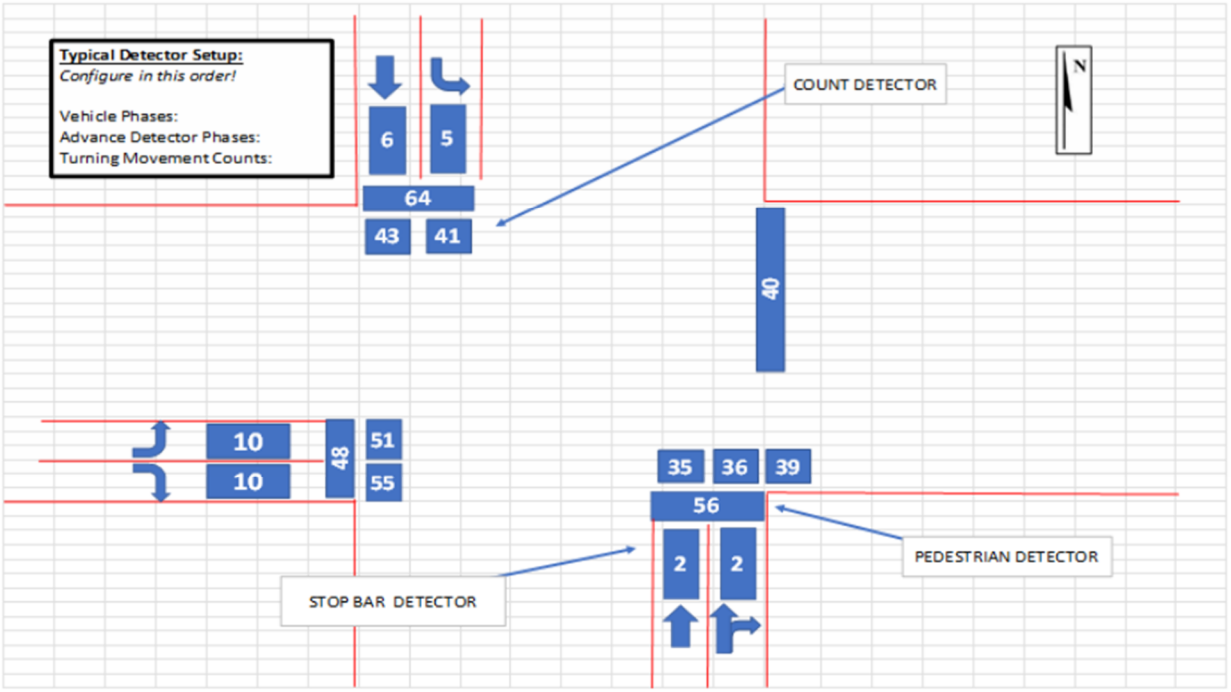
Bellefontaine at 270



270 at Lilac North Intersection



270 at Lilac South Intersection



Dilemma zone detectors shall be placed at 5 secs and 8 seconds travel time before stop bar per below Table unless directed otherwise in the plans or by the Engineer.

Approach Speed (MPH)	Advance Detector Placement 5 secs Travel time	Advance Detector Placement 8 seconds travel time
35 mph	260	415
40 mph	295	470
45 mph	330	530
50 mph	370	590
55 mph	405	645
60 mph	440	705

3.0 Performance Measures. In addition to presence detection, the detection system shall be capable of providing data to an advanced traffic signal controller that can perform at a minimum the following calculations in real time for each detection zone without the addition of another device:

- Speed
- Volume
- Lane Occupancy
- Vehicle Classification
- Other available performance measures

For speed calculations thru movements are required for all detection installations. Turning movement measurements are required for all detection installations. For volume measurements/calculations both mainline thru and all turning movements are required. All values are to be assigned to detector channels within the controller. Other performance measures must be clearly defined. In all cases all performances measures must be ultimately available in an easily usable, exportable format. Turning movement counts shall be installed per the detector setup diagram(s) above to include all lanes. The Contractor shall provide documentation to the Engineer to confirm the volumes are configured and operational through the detection system. The Contractor shall also provide a final schedule of detector assignments in the .pdf format to the Engineer and the Commission's signal maintenance supervisor. Performance measurement data must be configured and fed into the Commission's ATSPM platform with data storage confirmed, see Section 5.0. If utilized on the project, the Contractor's Traffic Engineer shall assist in this task.

4.0 Material. The Contractor can choose from the following list of detector types according to the exceptions noted below:

- Video Image
- Radar

Reference each detection type's subsection for specific allowable models. Unless otherwise specified on the plans, the Contractor may supply more than one type of detector and customize the installation based on field conditions, as approved by the Engineer.

4.1 Video Detection. If video detection is selected, the following provisions shall also apply.

4.1.1 Description. The Contractor shall furnish and install all equipment, materials, software and other miscellaneous items that are required to provide a fully functional Video Detection System for the control of vehicular and pedestrian traffic signals.

4.1.2 Material. The video detection system shall consist of power supply, hard-wired video cameras, all necessary video and power cabling with end connectors, mounting brackets, surge protection as recommended by the manufacturer, video detection processors/extension modules capable of processing the number of camera and phase combination video sources shown on the project plans. The video detection system will be defined as the complete assembly of all required equipment and components for detection of vehicles. Each video detection system shall consist of the video camera(s), lightning arrester for video cabling, processor unit(s), control device (track ball or keypad; no mouse allowed), software and license for system control via a computer (if applicable), communication components, and a color monitor. The video detection system shall have the most current available firmware installed. All camera views shall be obtainable without requiring the disconnection and reconnection of cables within the system. The video detection systems in the list below are the only systems that are tested, fully functional, and approved for use in the St. Louis District.

- Autoscope Vision
- Iteris Vantage Next
- Aldis Gridsmart Smart mount Camera (Performance Module to be included)

4.1.3 Installation Requirements. The video detection system shall be installed per the manufacturer's recommendations. The installer shall be certified by the video detection

system's manufacturer to install the system. All CAT5 cable runs (if used) shall be continuous without splice from the cabinet to the camera. If requested by the engineer, a factory certified representative from the supplier shall be available for on-site assistance for a minimum of one day during installation. The bottom of the video camera shall be mounted per the manufacturer's recommendations, unless otherwise indicated on the plans or approved by the Engineer. The video detection system shall not be installed on pedestal signal unless otherwise directed by the Engineer. The video detection system shall not be installed on a 15' luminaire arm unless otherwise directed by the Engineer.

A separate grounded 120 VAC service outlet shall be provided in the controller cabinet for supplying power to the parts of the video detection system requiring AC power. Use of the grounded service outlet located on the cabinet door will not be permitted. The video detection system must integrate/be compatible with an Advanced Transportation Signal Controller (ATC).

4.1.4 Detection Zones. The detection zones shall be created by drawing the detection zones on the video image. A graphical user interface shall be built into the video detection system and displayed on a video monitor or computer. It shall be possible to edit previously defined detector configurations to fine-tune detection zone placement. When a vehicle is detected by crossing a detection zone, there shall be a visual change on the video display, such as a flashing symbol or a change in color or intensity to verify proper operation of the video detection system.

4.1.5 Performance. Overall performance of the video detection system shall be comparable to inductive loops. Using camera optics and in the absence of occlusion, the video detection system shall be able to detect vehicle presence with 98% accuracy under normal day and night conditions with only slight deterioration in performance under adverse weather conditions, including fog, snow and rain. When visibility exceeds the capabilities of the camera, the video detection system shall default to placing a call on all detectors. Supportive documentation is required to meet this specification and shall be provided to the Engineer before installation.

4.1.6 Monitor. The monitor shall be an LCD active matrix with a minimum 7" diagonal screen color monitor, an NTSC-M system and BNC video in-out connections built into the housing. The unit shall be compact and lightweight, securely mounted to the cabinet shelving, have low power consumption, constructed to operate under extreme temperature conditions, and run on AC power. AC adaptor shall be included. The monitor shall be installed to automatically power on when the cabinet door is opened and automatically power off when the cabinet door is closed. A manual on/off switch shall be provided.

4.1.7 Video Camera and Housing. The camera shall produce a color video image of vehicles during daylight hours, with an optional production of black and white images during nighttime hours. The video shall produce a clear image for scenes with a luminance from a minimum range of 0.18 to 929 foot-candles (2.0 to 10,000 lux). The camera shall provide a minimum resolution of 430 lines horizontal (TVL) and 350 lines vertical under NTSC operation. The camera shall include an electronic shutter or auto iris control based on average scene luminance and shall be equipped with an auto iris lens. sun shield that prevents sunlight from directly entering the lens. The sun shield shall include a provision for water diversion to prevent water from flowing in the camera field of view and shall be able to slide forward and back.

4.1.8 Video Detection System Connections. All bus connections in the video detection system shall be corrosion resistant. Serial communications to a computer shall be through an RS-232/RS-422 serial port through a subminiature “D” connector with a computer running supplied system software. The port shall have the capability to access detection system data as well as the real-time imagery needed to show detector actuations. The processor shall have a RJ-45 plug using Ethernet 10/100 protocols. The equipment shall be provided with either a NEMA TS1 or NEMA TS2 interface as shown on the plans.

For TS1 systems, the video detection system shall be equipped with a TS1 detector interface for a minimum of 32 detector outputs. Logic output levels shall be compatible with the TS1. A subminiature "D" connector on the video detection system shall be used for interfacing to these outputs.

For TS2 systems, the video detection system shall be equipped with a TS2 Type 1 detector interface, where detector information is transmitted serially via an RS-485 data path. A 15-pin subminiature "D" connector, meeting the requirements of the TS2 standard, shall be used for the serial detector output. A minimum of 32 detector outputs is required, with the capability of expansion to 64 outputs if required based on the design plans.

The contractor shall be responsible for any changes or additions to either an existing or new cabinet in order to provide a properly functional video detection system and monitor display. This may include, but is not limited to, additional SDLC connectors, an MMU (malfunction management unit), shelf relocation and component reorganization. No direct pay for any changes or additions. All required connections will be considered part of the video detection system installation.

4.1.9 Documentation. The contractor shall provide one bound copy and one electronic version (.pdf format) of the user’s manual.

4.2 Radar Detection. If radar detection is selected, the following provisions shall also apply.

4.2.1 Description. Provide, install and test continuous tracking advance detector (CTAD) units and cabinet interface to detect range, speed, and vehicle estimated time of arrival (ETA) to the stop bar for vehicles or clusters of vehicles moving in the user selected direction of travel. The CTAD shall also detect instantaneous roadway efficiency. This specification sets forth the provisions for a radar detection system that detects vehicles, pedestrians, bicycles, and motorcycles on roadways and provides vehicle presence and full-motion tracking.

4.2.2 Material

4.2.2.1 Stop Bar Detector. The radar detection systems in the list below are the only systems approved for use in the St. Louis District. Installation of radar detection systems shall follow both the below specifications and the manufacturer’s instructions.

- WAVETRONIX SmartSensor
  - Matrix

Provide a radar detection system with the following features.

- Shall be able to track/detect a minimum of 64 objects
- Shall be able to operate in a temperature range between -30 degrees and 165 degrees F
- The detection zones shall be configurable based off several factors' such as classification, ETA, speed, presence, and delay.
- The radar sensor shall be forward fire
- The sensor shall operate in the 25 GHz band
- The sensor shall be housed in a sealed IP-67 enclosure

4.2.2.2 Advance Detector. The radar detection systems in the list below are the only systems approved for use in the St. Louis District. Installation of radar detection systems shall follow both the below specifications and the manufacturer's instructions.

- WAVETRONIX SmartSensor
  - Advance
  - Advance Extended
- Iteris Vector
- In addition to the specifications listed in Section 4.3.2.1, the detection range shall also cover the dilemma zone distances prescribed in section 2.1.

4.2.2.3 Power and Communications.

- Power and communications cabling shall be installed per manufacturer specifications
- The radar sensor shall operate at 24 VDC
- Power consumption shall be no more than 38 watts
- If required, the advance detection System shall include all equipment to communicate wirelessly.

4.2.2.4 Contact Closure Card. Any contact closure card shall be compatible with a NEMA detector rack and shall be installed per manufacturer specifications.

4.2.2.5 Lightning Surge Protection. The CTAD shall include surge protection hardware installed per manufacturer specifications. The hardware shall be accepted by the engineer before installation in the cabinet.

4.2.3 Construction Requirements.

4.3.3.1 Mounting Location. All mounting hardware shall be installed per manufacturers specifications. The CTAD shall be mounted as follows:

- at a height that is within the manufacturer's recommended mounting heights.
- The radar shall be positioned so that all detection zones needed for an approach can be captured.
- in a forward-fire position, looking towards either approaching or departing traffic.

4.2.3.2 Induction Card Rack Interface. {Install the contact closure card in the existing induction card rack} ***or*** {Install a 4-position induction card rack with power supply} and configure based on manufacturer's instructions to provide all needed

detection outputs. Any power supply cards for the induction card rack needed for proper operation of the CTAD shall be provided and installed by the contractor.

4.2.3.3 Support. A factory-certified representative from the supplier shall be available for on-site assistance for a minimum of one day during installation and shall provide two (2) days of local training after the CTAD has been installed and are operational.

4.2.3.4 Acceptance Testing. The contractor shall develop a proposed test procedure for the CTAD and submit it to the Engineer for approval. It must include visual verification of vehicle detections being received. Each detector shall be tested separately. Revise the proposed test procedure until it is acceptable to the Engineer. Provide all equipment and personnel needed to safely conduct the tests. Arrange for the Engineer's representative to witness the tests. Give the Engineer a report documenting the result of the tests.

4.2.4 Documentation and Software.

4.2.4.1 Prior to purchasing the CTAD system, the contractor shall submit five copies of catalog cut sheets and the environmental testing results to the Engineer for approval.

4.2.4.2 The contractor shall provide five copies of the operation and maintenance manuals for the CTAD system.

4.2.4.3 Contractor shall provide one copy of the software and any cables needed to interface with the system.

4.2.4.4 Contractor shall provide the CTAD installation kit, if applicable, to the Commission upon completion and acceptance of the project.

5.0 Communication with Advanced Transportation Management System (ATMS). The detection systems and all performance measure data should be fed directly into the Commission's current ATSPM platform (currently through TransSuite). All data must be online and verified by contractor to be fully operational and available for data output reporting via the Commission's ATSPM platform. In addition, the data storage for long-term storage use should be configured properly on the Commission's ATSPM platform. The Contractor shall be responsible for ensuring the firmware of all detection works with the Commission's ATSPM platform. If utilized on the project, the Contractor's Traffic Engineer shall assist in this task.

6.0 Technical Support for Detection System. The detection system(s) chosen for installation shall be free of defects in material and workmanship. For five (5) years, technical support from factory certified personnel or factory certified installers shall be available from the supplier. Ongoing software support by the supplier shall include updates for the processor unit and computer software and shall be provided at no cost during this two-year period. The update of the processor unit software to be NTCIP compliant shall be included. Detection system(s) must not be within 5 years of end of support or sale by manufacturer.

7.0 Construction Requirements. Construction requirements shall conform to Sec 902.

8.0 Method of Measurement. Method of measurement shall conform to Sec 902.

9.0 Basis of Payment. Measurement and payment for work covered by this specification shall include all equipment, materials, tools, labor, programming, testing, and documentation necessary to provide a detection system **per intersection** and shall be paid at the contract unit price as follows:

Item No.	Type	Description
902-99.02	Each	SL District Traffic Signal Detection System

OOO. Maintenance of Roadway Lighting

1.0 Description. This work shall consist of maintaining the operation of the existing roadway lighting during the construction of the project.

2.0 Construction Requirements. Contractor shall schedule/stage work such as to minimize the duration that any roadway lighting will not be operational. Contractor shall provide a schedule of when the roadway lighting will not be operational to the Engineer for review and approval.

2.1 Temporary Lighting. The contractor shall provide temporary lighting to ensure all existing locations that are currently lit stay that way during construction and that all islands (existing and new) and signalized intersections have lighting when open to traffic.

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

PPP. Lighting Demolition

1.0 Description. Lighting including all associated structures, circuits, conductors and all appurtenances shall be demolished at the locations and in the manner shown on the plans.

2.0 Work requirements. Work shall be in accordance with Project Plan and Details. All other aspects of the construction shall comply with Sec 901. Coordinate work with MoDOT and Ameren.

3.0 Method of Measurement. This work will not be measured for payment.

4.0 Basis of Payment. No direct payment will be made to the contractor to recover the cost of equipment, labor, materials or time required to fulfill the above provisions. Cost associated with complying with this provision shall be considered incidental to Item 202-20.10 Removal of Improvements.

QQQ. Top Mount Luminaire

1.0 Description. This work shall consist of furnishing and installing LED Top Mounted Luminaires as indicated in the plans.

2.0 Construction Requirements. Luminaires shall be vertical top mount type (pole top mount) with a slip-fitter that accommodates a standard 2” top mount. Available types are listed on the MoDOT approved products list and must meet all MoDOT Specifications along with additional requirements noted in the additional sections below. The contractor shall coordinate the pole top mount size with the luminaire mount to ensure compatibility. All luminaires for this project shall allow for a tilt angle to be adjusted in the field dependent upon the placement of the pole. All necessary mounting brackets and hardware shall be included in the payment for the luminaire.

2.1 LED luminaires shall not be equipped with a Photo Control Receptacle.

2.2 LED Luminaires shall have a terminal block for easy installation of a two wire Line/neutral circuit (no wire nuts for termination of field/luminaire circuit).

2.3 LED luminaires shall have an easy access point for future repairs to the driver.

2.4 LED luminaires shall have pole adaptors which are capable of feeding wires through without disassembling the knuckle.

3.0 Basis of Payment. Payment for furnishing and installing top mounted luminaries shall include all materials, equipment, tools, labor, and work incidental thereto, and shall be considered completely covered by the contract unit price for:

Item Number	Item Name	Units
901-99.02	170W Top Mounted LED-B Luminaire	Each

RRR. Top Mount Light Pole

1.0 Description. This work shall consist of furnishing and installing top mount poles as indicated in the plans.

2.0 Construction Requirements. Top mount poles shall conform to the Type AT lighting poles and shall be fabricated with a circumferentially welded top mount and top plate to accept top mounted luminaries. The top mount shall extend 4" above the top of the pole and meet AASHTO loading requirements for the luminaires provided. The top mount shall be made of the same material as the pole shaft, be constructed as a one-piece pole and top mount unit by the manufacturer and have an outside diameter that accepts the appropriate luminaire slip-fitter. Pole and top mount shall conform to all MoDOT specifications and material requirements. Bridge mounted poles shall be constructed to match the existing bolt pattern.

3.0 Basis of Payment. Payment for furnishing and installing top mount poles shall include all excavation, materials, equipment, tools, labor, and work incidental thereto, and shall be considered completely covered by the contract unit price for:

Item Number	Item Name	Units
901-99.02	45 Ft. Top Mount Light Pole	Each

SSS. Ornamental Luminaire

1.0 Description. This work shall consist of furnishing materials, labor, and equipment required to install ornamental luminaires in conjunction with ornamental pedestrian fencing. Installation details shall be in accordance with the plans and manufacturer's recommendations. This work shall conform with applicable portion of Sec 901 of the Standard Specifications, as herein modified.

2.0 Material Requirements.

2.1 Luminaire: The ornamental luminaire shall be a “Solitaire 2.0” SRSP2-72L-260-3K7-2-UNV-BLS-BC as manufactured by KIM Lighting or an approved equal. The housing shall be powder coated to match the ornamental pedestrian fence.

2.2 Mounting Adapter. Luminaires shall be provided with an adapter housing, if required, to ensure proper mating of luminaires with light poles. The adapter housing shall be attached to the poles and fit inside the luminaire to ensure a proper and tight installation. Adapter materials and coatings shall meet the requirements of section 2.1 above, except that only exposed adapter surfaces shall be coated.

2.3 Photometrics. The luminaire shall be constructed to reduce the amount of veiling luminance. Prior to ordering luminaires, the contractor shall submit computer lighting calculations demonstrating a neutral effect on the veiling luminance conditions existing with the roadway luminaires already in place. These calculations shall indicate that the installation of the ornamental luminaires does not increase the maximum veiling luminance to average pavement luminance above existing conditions. The calculations shall indicate a graphical representation of each bridge and roadway configuration with all input values at the pavement elevation on a grid no larger than 10 feet along the roadway and 6 feet across the roadway in accordance with IES recommendations. The calculations shall indicate the overall statistics showing average, maximum, minimum, average to minimum ratio, veiling luminance ratio and any other pertinent information as may be required by the engineer.

3.0 Construction Requirements. Luminaires shall be installed in accordance with the manufacturer’s recommendations. The contractor shall verify all materials with the engineer prior to ordering.

4.0 Basis of Payment. Payment for furnishing and installing pedestrian luminaires shall include all excavation, materials, equipment, tools, labor, and work incidental thereto, and shall be considered completely covered by the contract unit price for:

Item Number	Item Name	Units
901-99.02	Ornamental Luminaire (Bridge Mounted)	Each

TTT. Replacing Existing Luminaire

1.0 Description. There are four existing luminaire poles adjacent to MO-367 and one adjacent to I-270 called out for removal and replace with a new luminaire on the existing screw-in bases, all of which are shown on plan. Contractor shall utilize the existing screw-in bases, conduits, and wire in conduit in-place.

2.0 Work Requirements. Work shall be in accordance with Project Plan and Details. All other aspects of the construction shall comply with Sec 901. Coordinate work with MoDOT.

3.0 Method of Measurement. Measurement for removal of existing luminaires shall be provided in JSP T – Lighting Demolition. Measurement for installing a replacement luminaire pole, luminaire head, and pole & bracket cable will be made per each. No measurement will be made for wiring/splicing or other incidental items needed to accomplish a complete and operational luminaire.

4.0 Basis of Payment. Payment for removing and reinstalling new light poles and luminaires shall include all excavation, materials, equipment, tools, labor, and work incidental thereto, and shall be considered completely covered by the contract unit price for:

Item Number	Item Name	Units
901-99.02	Replace Ex. Luminaire	Each

UUU. Relocate Existing Luminaire

1.0 Description. There is an existing luminaire pole on the west side of MO-367 immediately south of the I-270 EB bridge that shall be removed from the existing screw-in base and reinstalled on a new screw-in base at Station 526+65, 62' RT of the centerline of MO-367.

2.0 Work Requirements. Work shall be in accordance with Project Plan and Details. All other aspects of the construction shall comply with Sec 901. Coordinate work with the MoDOT and Ameren.

3.0 Method of Measurement. Measurement for removing and reinstalling the existing luminaire pole will be made per each. The luminaire base for this relocated luminaire is quantified separately. No measurement will be made for wiring/splicing or other incidental items needed to accomplish a complete and operational luminaire

4.0 Basis of Payment. Payment for removing and reinstalling the luminaire shall include all excavation, materials, equipment, tools, labor, and work incidental thereto, and shall be considered completely covered by the contract unit price for:

Item Number	Item Name	Units
901-99.02	Relocate Ex. Luminaire	Each

VVV. Underpass LED Luminaire (Wallpack)

1.0 Description. This work shall consist of furnishing and installing LED Underpass (Wallpack) Luminaires as indicated in the plans.

2.0 Material Specifications. Underpass luminaires are 59-watt Light Emitting Diode (LED) units with integral ballasts for wall mounting outdoors. Product shall be Holophane WCNP-P2-40K-T4M-MVOLT-BKSDP-NTR or approved equivalent. The luminaires (black in color) shall consist of a pre-wired unit for wall mounting, with raintight cast aluminum housing, cast aluminum door with integral cast guard, polycarbonate refractor, and asymmetric light fitting. The door shall have

a stainless-steel hinge along the bottom, stainless steel latches at the top and non-ferrous metal or stainless-steel safety chains.

2.1 Underpass LED luminaires shall not be equipped with a Photo Control Receptacle or Adjustable Output.

2.2 Underpass LED luminaires shall have a terminal block for easy installation of a two wire Line/neutral circuit.

3.0 Construction Requirements. Provisions shall be made to attach the unit directly to a wall with non-ferrous metal or stainless-steel hardware.

4.0 Basis of Payment. Payment for furnishing and installing underpass luminaries shall include all materials, equipment, tools, labor, and work incidental thereto, and shall be considered completely covered by the contract unit price for:

Item Number	Item Name	Units
901-99.02	Underpass LED Luminaire (Wallpack)	Each

WWW. CCTV Extension Pole Installation

1.0 Description. Furnish and install a 20' x 4" extension pole to the existing signal upright pole as shown on the plans. CCTV Camera assembly installation is paid seperatly.

2.0 Material. See details in the plans. A metalic finish means a natural aluminum finish. Free from blemishes.
The contractor shall demonstrate to the Engineer that the brackets are installed properly and bandings are tight to the signal and extension poles.

3.0 Basis of Payment. Measurement and payment for CCTV extension pole includes materials, installation and all miscellenious hardware required for a fully operational system. The cost of the CCTV extension pole is incidental to the cost of "Relocate Existing CCTV Camera Assembly".

XXX. CAT-5e/CAT-6 Ethernet Cable

1.0 Description. There is a new CCTV camera to be installed on a signal post upright. This item is to supply and install either a CAT-5e or CAT-6 Ethernet Cable from the POE Injector in the signal cabinet through the conduit system and up to the CCTV camera as a continuous cable with no splices along the run. Cable shall have RJ-45 connectors installed on both ends.

2.0 Material Specifications. The cable shall be outside plant rated (OSP), consisting of four (4) balanced twisted pairs of solid copper conductors, surrounded by a water blocking gel and designed for use in 10BASE-T through 1000BASE-T Ethernet networks. It shall be jacketed with a sunlight and abrasion resistant black, polyethylene outer jacket. The following performance compliance standards apply:

- ANSI/TIA-568-C.2
- ANSI/ICEA S-107-704-2012

- RoHS-compliant/RoHS 2-compliant
- REACH-compliant

3.0 Work Requirements. Work shall be in accordance with Project Plan and Details. All other aspects of the construction shall comply with Sec 901.

4.0 Method of Measurement. Measurement includes total linear feet of cable installed from POE Injector to CCTV camera, including slack in pullboxes per MoDOT standards. CCTV camera, POE Injector, and any and all other network devices are quantified separately from the traffic signal. No measurement will be made for RJ-45 connectors.

5.0 Basis of Payment. All labor, equipment, and materials necessary to install new CAT-5e or CAT-6 cables will be included in the following:

Item No.	Type	Description
902-99.03	LF	CAT-5e/CAT-6 Ethernet Cable

YYY. Fiber Optic Cable Construction Staging

1.0 Description. The contractor **shall** install a new 2" conduit and 24 SM fiber optic cable between eastbound and westbound I-270 Off Ramp signal cabinets at Bellefontaine and Lilac as shown on the plans and **before roadway and bridge construction begin.**

2.0 Construction Requirements. The contractor shall:

1. Notify MoDOT ITS group via an email at SLITS@modot.mo.gov prior to any work on existing signal cabinets or fiber cable.
2. Install a 2" conduit and one 24 SM fiber optic cable fiber cable and terminate and splice the noted fiber cable strands as shown in the plans at both existing signal cabinets at WB and EB I-270 Off Ramps at Bellefontaine. The contractor shall provide a minimum of 60 feet of fiber cable slacks inside the existing pull boxes for the relocation onto new signal cabinets as noted below. The contractor shall ensure there is a tracer-wire in all conduits per Fiber Optic Cable Job Special Provisions and for future utility locating process. The new conduit and fiber optic cables shall not be disturb during the entire roadway and bridge construction.
3. The contractor then shall remove and dispose of the existing fiber cables.
4. After new signal facilities are constructed, the contractor shall relocate the newly installed 24 SM fiber cable into the new signal cabinets and terminate and splice it as shown on the plans.
5. Verify with the SL ITS group that all network devices are online and operating properly at all time.
6. Be responsible for maintaining and the operation of the signal network and communications during the entire construction stages.

3.0 Basis of Payment. No direct payment shall be made for compliance with this provision. All fiber optic cable related works shall be paid under separate pay items.

ZZZ. Relocate Existing Stand-Alone CCTV Camera Assembly

1.0 Description. The contractor shall relocate the existing stand-alone CCTV camera assembly on NWQ of I-270 and Bellefontaine further west onto new foundation as shown on the plans and per below noted instructions.

2.0 Construction Requirements.

2.1 Before removing the existing CCTV camera assembly, the contractor shall inspect all related CCTV camera parts and report to the SLITS Group via an email to SLITS@modot.mo.gov of any damage or concern items. Also verify with the SLITS Group that the camera has a quality images and the pan-tilt-zoom works properly.

2.2 The contractor shall disconnect the existing CCTV Cat-5 cable (Removal the existing CCTV camera should not impact the existing ITS downstream networks since this camera is connected to the WB I-270 at Bellefontaine signal network switch via this Cat-5 cable) from WB I-270 at Bellefontaine signal cabinet network switch and remove the existing stand-alone CCTV pole, camera unit and pole-mounted cabinet from existing foundation and store those devices at a safe place till it is ready to be relocated onto the new foundation. Prior to CCTV pole removal, the contractor shall take note of the existing CCTV pole bolt-pattern.

2.3 The contractor shall construct a new foundation as shown on the plans and per above noted CCTV pole bolt-pattern. The new concrete foundation shall be paid on a separate pay item. The contractor shall ensure the existing CCTV pole will fit onto the new foundation.

2.4 The contractor shall construct a new power supply and power cable for the relocated CCTV camera assembly as shown on the plans. This work shall be paid on a separate pay item.

2.6 The contractor then shall install the existing CCTV pole, camera unit, new Cat-5 cable on newly constructed concrete foundation. They shall also furnished a new Type 7 ITS Cabinet and mount it to the pole per ITS plans and specifications. This new pole-mounted Type 7 ITS Cabinet shall be paid on a sperate pay item.

2.6 The contractor shall install a new 2” conduit and 24 SM fiber optic cable between this relocated CCTV camera assembly and the nearest ITS or signal cabinet as shown on the plans. This work shall be paid on a separate pay item.

2.7 The contractor shall splice and terminate the above noted 24 SM fiber optic cable inside the relocated CCTV pole-mounted ITS cabinet as shown on the plans. This work shall be paid on a separate pay item.

2.8 The contractor shall then connect the new 24 SM fiber optic cable, new Cat-5 cable and noted power supply cable as shown on the plans and verify with the ITS group when this CCTV camera goes online.

4.0 Acceptance Testing.

4.1 After installing the camera assembly, test it using manufacturer recommended procedures to demonstrate that high quality video is be transmitted and that the pan, tilt and zoom functions are operating properly. Also, use a device that measures resistance to ground using the three-point fall-of-potential method to demonstrate that the resistance from the air terminal to ground does not exceed 8 ohms. If the installed camera assembly fails to operate properly, and the problem

cannot be fixed by changing the wiring or setup parameters, the camera assembly will be deemed defective and the contractor shall install a new MoDOT furnished camera.

5.0 Basis of Payment. Measurement and payment to Relocate Existing CCTV Camera Assembly includes the removal, temporary storage, relocation onto new foundation includes cables, testing, grounding, and all miscellaneous hardware required for a safe, fully operational relocated camera assembly. Payment will be made as follows:

Item No.	Type	Description
910-99.02	Each	Relocate Existing CCTV Camera Assembly

AAAA. Drilled Shaft for CCTV Pole

1.0 Drilled Shafts for CCTV Structures.

1.1 Description. Follow the requirements of Sec 701 of the Standard Specifications except for the following:

Delete Secs 701.4.10.3 through 701.4.11.2
Delete Secs 701.6.4 and 701.6.5
Replace Secs 701.7.1 and 701.7.2 with sections 1.2.1 and 1.2.2 respectively, below.
Delete Secs 701.7.5 thru 701.7.9

1.2 Basis of Payment. Follow the requirements of Sec 701.7 of the Standard Specifications, except for the following:

1.2.1 Drilled Shaft. Replaces Sec 701.7.1 of the Standard Specifications. Payment will be considered full compensation for all reinforcing steel, anchor bolts and templates, washers, nuts, disposal of excavated soil, restoration of site around the drilled shaft, costs of drilling (including temporary casing), excavation, slurry, cleaning, an acceptable method of inspection as required, furnishing and placing concrete, grouting and incidental work and material required by the contract documents. Payment for any drilled shaft installed and accepted will be at the contract unit price per linear foot for the diameter of the drilled shafts specified, irrespective of the character of the material actually encountered during excavation. No additional compensation will be made for concrete required to fill an oversized casing or for oversized excavation. If the method of construction requires that drilled shaft casing be seated into the sound rock such that the bottom of the casing is below the determined top of sound rock elevation, payment for excavation below the top of the sound rock layer (top of the rock socket) will be included in the payment for the rock socket. If sound rock is encountered within the excavation at which point a rock auger, core barrel, or other rock-removing specialty tool must be used by the contractor before the top of the sound rock elevation to be used as “top of the rock socket” is confirmed by the engineer, that work will be paid for as rock socket excavation. Payment will be made as follows:

Item No.	Type	Description
910-99.02	Each	Drilled Shaft (3 Ft. 0 In. Dia.)

BBBB. Conduit and Pull Box System Adjustment, Interception or Repair

1.0 Description. At locations noted on the plans, the contractor shall adjust the conduit system routing or repair the existing conduit system. Conduit system routing adjustment may involve

lowering the conduit in place or minor horizontal adjustments to avoid other construction. Adjustment may require installing new conduit and splicing it to existing conduit. When existing cabling cannot be removed, split duct conduit shall be used. Adjustments to the existing conduit system may also involve removal of existing pull boxes or adjusting existing pull boxes to the new grade. Removal of existing pull boxes, when applicable, will be paid for by the removal of improvement bid item. Existing pull box adjustment to new grade, as shown in plans, is a separate pay item (see below). If applicable, relocating the existing cabling into the adjusted conduit system will be paid for by the fiber installation and relocation pay item.

2.0 Materials. The materials used shall be per MoDOT Approved Product List (APL) and meet all MoDOT Specifications. If the materials are not in the APL, the contractor shall submit the material specification documents to the Engineer and the ITS group (via an email to SLITS@modot.mo.gov) for review and approval before construction.

2.1 Couplings. Coupler used to join new conduits to existing conduits shall be designed by the manufacturer to join conduits of the type and size to be joined.

2.2 Use PVC conduit meeting the requirements of Sec 1060.

2.3 Use HDPE conduit meeting the requirements of Sec 1060. Use orange conduit for communication cable and black for power cable.

2.4 Split Duct Conduit. Split duct conduit shall be designed by the manufacturer for repairing damaged conduits in a manner that will protect the cabling. The split duct material shall be approved by the Engineer.

3.0 Construction Requirements.

3.1 Construction requirements shall conform to Sec 902.16

3.2 The Contractor shall submit in writing his anticipated method of splicing the conduit to the Engineer for approval prior to performing the work.

3.3 Adjust Existing Pull Box to New Grade. As shown on the plans, the contractor shall adjust the existing pull box elevation to match new sidewalk or surrounding surface. This work shall be coordinated with the new sidewalk elevation or surface for a safe condition.

3.4 If the existing conduit system contains fiber optic cable, before and after fiber testing, using the OTDR (Optical Time-Domain Reflectometer) is required to ensure the existing fiber cable is not degraded. The fiber testing reports shall be submitted to the ITS group via an email to SLITS@modot.mo.gov. If the fiber cable is degraded, the fiber optic cable shall be replaced between splice points approved by the Engineer.

3.5 At locations where connection of a new trenched conduit to an existing conduit is shown, or require, a watertight connection shall be made using a mechanical coupler.

3.6 Pull Box Removal. If an existing pull box must be removed, the existing pull box shall be carefully broken up and removed without damaging existing conduits or cabling. Once the new conduit is installed and connected to the existing conduit, the void around the conduit shall be backfilled with Grade A crushed stone or gravel to 6 inches above the conduit. Above the stone or gravel complete backfilling with clean fill free of large stones or rubble.

3.7 If the existing conduit and cabling are shallow to the surface and within new sidewalk construction segment, the contractor shall hand dig or break up the existing sidewalk by hand and carefully without damaging the existing conduit and cable, lower the existing conduit at least 10 inches from bottom of proposed sidewalk, backfilled with Grade A crushed stone or gravel to 6 inches above the conduit and then construct the new sidewalk.

3.8 Before backfilling around the adjusted or repaired conduit, the St. Louis District ITS Group must be contacted and given time to inspect the conduit. Notify the ITS group that the location is ready for inspection via email to SLITS@modot.mo.gov. Send pictures of the adjusted or repaired conduit. Based on the pictures, the ITS Group may approve backfilling or may make a site visit. Do not backfill until email approval is provided.

3.9 The contractor shall backfill excavated areas with clean fill free of large stones or rubble. The finished grade shall match the surrounding grade to maintain existing drainage patterns and the work area will be restored to match the surrounding area.

3.10 The contractor shall exercise reasonable care relocating MoDOT ITS Assets. Damage to any MoDOT facilities within the area of work caused by the contractor will be deemed by the Engineer as either "non-emergency" or "emergency" upon notification of the damages. Repair to damages will be performed as follows:

a) Non-Emergency: Contractor will have 4 hours to propose a repair plan to the Engineer for a complete repair within 3 business days.

b) Emergency: Upon notification of the damage, Contractor must immediately submit a repair plan to the Engineer which will take no more than 4 hours to respond on-site and complete repairs within 48 hours of notification of damage.

c) In either case, if the proposed plan is unacceptable for any reason to MoDOT, repairs will be made by MoDOT with all costs billed to the Contractor.

3.11 The ITS conduit systems located within the project limits are a crucial part of the traffic operation system for this area. It is imperative that the downtime be kept to a minimum when replacing, removing, or modifying any existing ITS facilities.

4.0 Basis of Payment. Measurement and payment for work covered by this specification includes equipment, tools, materials, necessary to install and splice existing conduit sufficient for pulling new cable. Payment will be made as follows:

Item No.	Type	Description
910-99.02	Each	Conduit System Adjustment or Repair

CCCC. Conduit

1.0 Description.

1.1 Furnish and install conduits as shown on the plans and as described within this section. The plans depict conduit routing in schematic form only. Determine final routing based on actual field conditions at each site, including utility locator service markings, to assure no conflicts with existing utilities.

2.0 Materials.

1.1 Use PVC conduit meeting the requirements of Sec 1060.

1.2 Use HDPE conduit meeting the requirements of Sec 1060. Use orange conduit for communication cable and black for power cable.

1.3 Use rigid metallic conduit meeting the requirements of Sec 1060.

1.4 Pull ropes or tapes shall be polypropylene with a minimum tensile strength of 600 pounds.

1.5 Conduit coupling used for splicing conduit shall be designed for splicing together the type of conduits being joined together.

1.6 Split duct conduit shall be designed by the manufacturer for repairing damaged conduits in a manner that will protect the cabling. The split duct material shall be approved by the Engineer.

2.1 LB Conduit Bodies

Provide 3-inch LB-style conduit bodies as required for access, pulling, splicing, and direction changes.

LB bodies shall meet the following requirements:

1. Compliance
    a. Conform to Sec 1060 for conduit fittings, including meeting required ANSI/UL standards and being visually free of defects.
2. Material Types Allowed
    a. Die-cast aluminum LB bodies, UL 514A listed, suitable for rigid or IMC conduit.
    b. PVC LB bodies, suitable for Schedule 40/80 conduit, UL-listed.
3. Covers & Gaskets
    a. Each LB body shall include a manufacturer-supplied cover and gasket suitable for wet locations.
4. Size & Capacity
    a. Trade size: 3 inches
    LB bodies shall provide internal volume as defined by manufacturer specifications for standard 3" LB fittings.

3.0 Construction Requirements.

3.1 General. The contractor shall comply with Sec 902.16, except as noted in this special provision.

3.1.2 Pull ropes shall be furnished and installed in all empty conduit cells.

3.1.3 HDPE duct shall not be spliced. All runs shall be continuous.

3.1.4 Use an impact mole to install conduit under existing sidewalk unless otherwise indicated or unless the crossing is part of a longer bore or unless otherwise indicated in the plans. The portion installed using a mole will be paid for at the same price per foot as trenched conduit.

3.1.5 Trenching and pushing conduit installation shall be with the following minimum depth**:**

- Conduit under paved areas including roadway, shoulders, paved medians and sidewalks for pushed method shall be 42 inches below top of the paved areas.
- Conduit under non-paved areas for trench method shall be 30 inches of cover.

3.1.6 Installation of LB Conduit Bodies

- Install 3" LB conduit bodies as follows:
- **Orientation**
  Install LB bodies in the orientation shown on the plans, ensuring the cover is accessible for future maintenance.
- **Compatibility**
  Match LB body material with conduit type (e.g., aluminum LB with RMC/IMC, PVC LB with PVC conduit).
- **Sealing**

  Ensure proper installation of gaskets and covers to maintain watertight integrity.

- **Integration**
  - LB conduit bodies shall be considered incidental to conduit installation unless shown as a separate pay item.

3.2 Directional Drilling.

3.2.1 Preliminary Site Work. Determine all utility locations near the path of the proposed bore, including depth. Use this information to avoid damage to utilities and/or facilities within the work area. Provide this information, including the sources, to the engineer a minimum of five working days prior to boring. Do not bore until the engineer approves that submittal. Prior to boring, expose all utilities for which it is customary and safe to do so.

3.2.2 Boring. The diameter of the drilled hole shall conform to the outside diameter of the conduit as closely as practical. Pressure grout as directed by the engineer, to fill any voids, which develop during the installation operation. Remove and replace any conduit damaged in directional drilling operations at no expense to the project.

3.2.3 Drilling Fluid ("Slurry"). The use of water and other fluids in connection with the drilling operation will be permitted only to the extent necessary to lubricate cuttings. Jetting will not be permitted, and the use of water alone as a drilling fluid will not be permitted. Use a drilling fluid consisting of at least 10% high grade, processed Bentonite to consolidate excavated material, seal the walls of the hole, and furnish lubrication for subsequent removal of material and immediate installation of the pipe.

Provide a means of collecting and containing drilling fluid that returns to the surface, such as slurry pit, or a method approved by the engineer. Provide measures to prevent drilling fluids from entering storm sewer systems. Prevent drilling fluid from accumulating on or flowing onto sidewalks, other pedestrian walkways, driveways, or streets. Immediately remove any slurry that is inadvertently deposited on pedestrian walkways. Transport waste drilling slurry from the site and dispose of it. Do not allow slurry to enter wetlands. Protect wetlands using appropriate soil erosion control measures approved by the engineer. This requirement also applies to slurry resulting from vacuum excavation to locate underground utilities.

3.2.4 Drilling Control. Use a digital walkover locating system to track the drill head during the bore. At minimum, the locating system shall be capable of determining the pitch, roll, heading, depth, and horizontal position of the drill head at any point along the bore. During each drilling operation, locate the drill head every 10 feet along the bore and prior to crossing any underground utility or structure. Upon completion of the drilling operation and conduit installation, furnish the engineer with an as-built profile drawing and plan drawing for the drilled conduit showing the horizontal and vertical locations of the installed conduit.

3.3 Intercept Existing Conduit with Proposed Pull Box.

3.3.1 Determine whether the conduit is occupied. If so, disconnect the cables at one end of the cables and pull them back so that they are not damaged when the conduit is cut. Alternatively, they can be removed entirely and replaced with new, identical cables. Notify the engineer if any of the cables appear to be in poor condition.

3.3.2 Excavate a pit big enough for the pull box and drain material, with at least an additional foot on each side with conduit.

3.3.3 Install the drain material. From the top of the drain material, measure the vertical distance to the bottom the conduit at the points corresponding to the walls of the box.

3.3.4 If the conduit is PVC or metal, cut it in two places such that the distance between the cuts is longer than the box. Be sure the ends are cut squarely. If the conduit is HDPE, cut it in the center of the pit. Ensure that the pit is long enough that the conduit can be bent out of the way when the box is installed, and can be bent enough to insert the conduit through the wall of the box.

3.3.5 Make a hole in the wall of the box at each point that the conduit will enter. Use the distances measured earlier to determine how far from the box's bottom to make the holes.

3.3.6 Set the pull box in the pit with the holes aligned with the conduits.

3.3.7 Pass the conduits through the wall of the box so that they end about one inch inside the wall. For PVC conduit, extend the existing conduit using a short length of new PVC conduit that includes a socket end. For metal conduit, thread the existing conduit, apply a threaded coupling, and add a short length of new conduit. For HDPE, bend the existing conduit to pass through the box wall, then cut it to length inside the box.

3.3.8 Use non-shrink grout to completely fill the space between the conduit and box wall.

3.3.9 Backfill the pit and restore the area as with any pull box installation.

3.3.10 Reinstall, reconnect, and test the cables that were pulled back at the beginning of the procedure. Alternatively, replace them in kind and test them.

3.4 Install Conduit into Existing Pull Box.

3.4.1 Carefully expose the outside of the existing pull box without disturbing any existing conduits or cabling.

3.4.2 Make the appropriately sized hole for the entering conduit at a location within the pull box that will not disturb the existing cabling and that will not hinder the installation of new cabling within the installed conduit.

3.4.3 Install the conduit.

3.4.4 Fill any void area between the drilled hole and the conduit with an engineer-approved filling material to protect against conduit movement and the entry of fill material.

3.4.5 Backfill shall be carefully tamped in place. All disturbed areas shall be restored.

3.5 Conduit Splicing

3.5.1 Where shown in the plans splice a new conduit to an existing conduit using a mechanical coupling. Expose the existing conduit where it is to be spliced.

3.5.2 Cut the conduits so the ends are clean and perpendicular to the axis of the conduit.

3.5.3 The outside edges of the conduits being joined shall be beveled or chamfered to facilitate insertion into the coupler and prevent damage to the gasket. The inside edges of the conduits shall also be beveled or chamfered to provide a smooth transition and internal alignment so no sharp edge might catch or damage the cable during installation.

3.5.4 Align the axes of the two conduits being joined to facilitate good splice.

3.5.5 Backfill shall be carefully tamped in place. All disturbed areas shall be restored.

3.6 Pull Box Removal.

3.6.1 If an existing pull box must be removed, the existing pull box shall be carefully broken up and removed without damaging existing conduits or cabling. Use a split duct conduit system to join the conduits together. Follow manufacturer's installation requirements. Once the conduits are connected, the void around the conduit shall be backfilled with Grade A crushed stone or gravel to 6 inches above the conduit. Above the stone or gravel complete backfilling with clean fill free of large stones or rubble.

3.6.2 Before backfilling around the connected conduit, the St. Louis District ITS Group must be contacted and given time to inspect the conduit. Notify the ITS group that the location is ready for inspection via email to SLITS@modot.mo.gov. Send pictures of the connected conduit. Based on the pictures, the ITS Group may approve backfilling or may make a site visit. Do not backfill until email approval is provided.

4.0 Basis of Payment.

4.1 All surface-mounted junction boxes, fittings, liquid-tight flexible conduits, hangers, supports, resin anchor systems, and all hardware are incidental to the cost of conduit.

4.2 Conduit may be installed by directional boring at locations shown as trenched on the plans. Such conduit will be paid for as if it had been installed by trenching.

4.3 Payment for Intercept Conduit with Pull Box includes only that work that would not be incurred in a normal pull box installation. The cost of the box and its installation will be paid for separately.

4.4 Payment for Pull Box Removal is incidental to the Remove of Improvements bid items.

4.4 Measurement and payment for work covered by this specification includes equipment, tools, materials, necessary to install conduit. It includes excavation and site restoration. Payment will be made as follows:

Item No.	Type	Description
910-99.02	LF	Conduit, 2 in., Rigid, Pushed

DDDD. Coordination With ITS Staff and Utility Locates

1.0 Description. Any work that will impact the existing communications network must be coordinated with the Commission's St. Louis District ITS staff. This includes but not limited to removal and replacement of any existing communications equipment, adding new devices and changes to power sources or disconnects. Minor modifications to the existing communications network can have significant impacts on the system and operation of other ITS and traffic signal systems.

1.1 MoDOT is a member of MO-One-Call System. Prior to any excavation or work within MoDOT Right-Of-way, the contractor must contact MO-One Call at 1-800-DIG-RITE and request for Utility Locates within noted project limits. If the scope of work contains modification, addition and/or expansion of existing underground MoDOT ITS, lighting, or signal facilities, the contractor must notify the MoDOT Utilities Locate staff prior to any work, in order for MoDOT to update MoDOT utility location records with Missouri One Call.

2.0 Contact. The contractor shall notify the ITS group via an email to SLITS@modot.mo.gov at least 2 days before any work that may impact the existing network communications. The contractor shall include the Job#, location and brief scope of work in the email's subject line. The engineer shall be notified prior to making contact with ITS staff. For MoDOT Utility location updates, the contractor must contact MoDOT TMC at 314-275-1500 and ask for Utility Locate Section at least seven calendar days before performing any work.

3.0 The ITS and network devices located within the project limits are a crucial part of the traffic operation system for this area. It is imperative that the downtime be kept to a minimum when adding, removing, or modifying any existing ITS and network devices. This may require the contractor to perform work that will affect existing network devices during nighttime and/or weekend hours, at the discretion of the Engineer. Allowable timeframes for this work will be subject to the need for ITS devices in the area to be used to manage other traffic impacting work zones.

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

EEEE. Fiber Optic Cable

1.0 Description. This work shall consist of installing, splicing, and terminating fiber optic cables. The fiber optic cable may be new or existing cable relocated as shown on the plans. Fiber optic cable relocation requires existing cable to be removed from an existing conduit system and installed in a new or existing conduit system per plans. Relocated cable must be carefully removed from the existing conduit system without being damaged. No direct pay shall be paid for relocating the existing fiber optic cable into new ITS or signal cabinet. If the existing fiber cable is removed, that length shall be paid separately per plans.

2.0 Materials. Some of the below noted materials may not be applicable on this project. See the plans and below quantities for applicable materials.

2.1 Cable. Fiber optic cable shall be of loose tube construction. Provide certification by an independent testing laboratory that the cable meets all requirements of Rural Utilities Service Bulletin 1753F-601a *Minimum Performance Specification for Fiber Optic Cables* (https://www.rd.usda.gov/files/UTP_Bulletins_1753F-601a.pdf). The cable shall be gel free, all dielectric, and have 12 fibers per tube. The cable sheath shall have length markings in feet, and shall indicate that the unit of measure is feet. The cable shall have single mode fibers whose attenuation does not exceed 0.35 dB/km and 0.25 dB/km for 1310 nm and 1550 nm signals, respectively. The optical fibers used in the cable shall meet or exceed the International Telecommunication Union ITU-T G.652.D requirements.

2.2 Splice Tray. Splice trays shall be 11.7” long, 3.9” wide, and 0.2” tall. They shall be aluminum with clear plastic covers, designed for outdoor use. Each shall accommodate 24 fusion splices. The trays shall have a black powder coat finish. The trays shall have both perforations for cable ties and crimpable metal tabs for buffer tube strain relief.

2.3 Connector. LC connectors shall be used for all cabinet terminations and patch panel connections unless the plans indicate otherwise. Connectors shall have ceramic ferrules and be suitable for ITS field cabinets.

If any equipment requires a different connector type, a hybrid jumper may be used (LC-to-ST or LC-to-SC) to match that device.

2.4 Pigtail. Pigtails shall be factory-made, buffered, and strengthened with aramid yarn to reduce the possibility that accidental mishandling will damage the fiber or connection. Pigtails shall be yellow. Each must contain one fiber. Length shall suffice to provide two feet of slack after installation.

2.5 Jumper. Jumpers shall meet the requirements for pigtails, but shall have a connector on each end. Length shall suffice to provide approximately five feet of slack after installation.

2.6 Interconnect Center. An interconnect center is a splice enclosure that has a patch panel built into one of its walls. Within the interconnect center, fibers in cables are spliced to pigtails and the pigtails are plugged into the patch panel from the inside. This allows jumper cables (not part of the interconnect center) to plug into the patch panel from the outside, connecting the fibers to equipment in the cabinet or to other fibers on the patch panel. Within an interconnect center,

some fibers may be spliced to the corresponding fiber in a mating cable, rather than to a pigtail. Still other fibers may be coiled, un-terminated.

The enclosure shall be made of powder-coated metal. It shall have provisions for cable strain relief and for connector labeling. The enclosure's patch panel shall have at least 24 positions. Provide enough splice trays for all splices made in the interconnect center. Provide patch panel modules that are compatible with the connectors specified in section 2.3 of this provision.

2.6.1 Wall-Mounted Interconnect Center. The enclosure shall be designed for wall or panel mounting and occupy no more than 350 square inches of wall space. It shall have a gasketed, hinged door. It shall hold at least six splice trays. These enclosures are typically used in signal cabinets.

2.6.2 Rack-Mounted Interconnect Center. The enclosure shall have brackets and all other hardware required for rack mounting in an EIA standard 19-in. equipment rack. It shall take up no more than three rack units (1¾ inch each) in the cabinet. It shall have front and rear doors. It shall hold at least four splice trays. These enclosures are typically used in ITS device cabinets.

2.7 Rack-Mounted Splice Enclosure. The enclosure shall have brackets and all other hardware required for rack mounting in an EIA standard 19-in. equipment rack. However, alternate forms of mounting will be permitted if more practical at a particular location. The enclosure shall take up no more than five rack units (1¾ inch each) in the cabinet. It shall be made of powder-coated aluminum. These enclosures are typically used in network node cabinets.

2.7.1 The enclosure shall have provisions for cable strain-relief. It shall have hinged front and rear doors.

2.7.2 The enclosure shall include splice trays as specified in section 2.2 of this provision. The contractor shall provide enough splice trays for all the splices made in the enclosure. The enclosure shall include a splice tray holder with capacity for 22 trays. It shall be mounted on a sliding shelf inside the enclosure so that individual trays can be removed from the enclosure without disturbing the other trays or removing the enclosure itself from the cabinet.

2.8 Rack-Mounted Patch Panel Enclosure. The enclosure shall have brackets and all other hardware required for rack mounting in an EIA standard 19-in. equipment rack. However, alternate forms of mounting will be permitted if more practical at a particular location. The enclosure shall take up no more than five rack units (1¾ inch each) in the cabinet. It shall be made of powder-coated aluminum. Provide patch panel modules that are compatible with the connectors specified in section 2.3 of this provision, as needed. These enclosures are typically used in network node cabinets.

2.9 Underground Splice Closure. Closures for underground fiber splices include all materials necessary to make, organize, and protect the splices.

2.9.1 The closure shall supply environmental protection of cable and splices from water and dirt. It shall be designed for splicing fiber-optic cables underground in pull boxes and to be submersed in water.

2.9.2 Provide certification by an independent testing laboratory that the closure meets all requirements of Telcordia GR-771 for environmentally sealed closures for buried installation.

2.9.2 The closure shall be re-enterable without any special tools.

2.9.3 The closure shall be able to accommodate at least four fiber optic cables.

2.9.4 The closure shall accommodate 144 single mode fiber splices.

2.9.5 It shall be possible to remove any splice tray without disturbing the others.

2.9.6 Splice trays in the closure need not be of the type specified in 2.2, above.

2.9.7 Designed for butt splicing.

2.9.8 No encapsulated materials shall be allowed.

2.10 Tracer Wire. A jacketed #14 AWG XHHW-2 standard blue tracer wire (also known as the locator wire) shall be provided in the conduit within the project limits unless it exists.

3.0 Construction Requirements.

3.1 Pre-Installation Cable Inspection and Testing. Prior to installation, confirm that the cable is in good condition and complies with the specifications. The contractor shall perform fiber testing (see below requirements) of new fiber on the reel and existing fiber before it is removed. Notify the SLITS Group about any fiber anomalies and submit fiber testing reports to the SLITS Group for review and approval. Any defects found after installation will be deemed the fault of the contractor.

3.2 Cable Installation.

3.2.1 The ITS and network devices located within the project limits are a crucial part of the traffic operation system for this area. It is imperative that the network downtime be kept to a minimum when adding, removing, or modifying any existing ITS and network devices. This may require the contractor to perform work that will affect existing network devices during nighttime and/or weekend hours, at the discretion of the Engineer. Allowable timeframes for this work will be subject to the need for ITS devices in the area to be used to manage other traffic impacting work zones.

2.2.2 In case of fiber optic cable replacement, all new fiber cable must be installed, spliced, terminated and go online before removing the old cable.

3.2.3 Remove existing cable to be relocated and install cable such that the optical and mechanical characteristics of the fiber are not degraded. Do not violate the minimum bend radius or the maximum tension, both during and after installation.

3.2.4 Before any cable installation is performed, provide the engineer with four copies or an electronic copy, as required by the engineer, of the cable manufacturer's recommended maximum pulling tensions for each cable size. These pulling tensions shall be specified for pulling from the cable's outer jacket. Also, provide a list of the minimum allowable cable bending radius and the cable manufacturer's approved pulling lubricants. Only those lubricants approved by the cable manufacturer will be permitted.

3.2.5 If the cable is pulled by mechanical means, use a clutch device to ensure the allowable pulling tension is not exceeded. Also, attach a strain gauge to the pulling line at the cable exit location, and at a sufficient distance from the take-up device, such that the strain gauge can be read throughout the entire cable pulling operation.

3.2.6 Do not leave the let-off reel unattended during a pull, in order to minimize the chance of applying excess force, center pull, or back feeding.

3.2.7 Use an approved lubricant, in the amount recommended by the cable manufacturer, to facilitate pulling the cable. After the cable has been installed, wipe the exposed cable in a pull box, junction box, or cabinet clean of cable lubricant with a cloth before leaving the pull box, junction box, or cabinet.

3.2.8 When installing new fiber optic cable store 30 feet of slack fiber in every intermediate pull box, unless otherwise noted on plans. Additional slack storage, as indicated on the plans, is required in designated pull boxes. At cabinet locations, where cable runs from the pull box directly to an equipment cabinet, store 60 feet of slack fiber optic cable in the pull box, unless otherwise noted on plans. Additionally, treat the cable returning from the cabinet to the pull box as a separate cable, and store 60 feet of slack for these links, unless otherwise noted on plans. Store slack cable neatly on the walls of the pull box using racking hardware acceptable to the engineer. If the length of fiber optic cable being relocated does not allow for fully meeting these slack requirements, maximize fiber slack at cabinets before providing slack in pull boxes.

3.2.9 While pulling and until splicing seal the fiber optic cable ends to prevent the escape of filling compound and the entry of water.

3.3 Splicing. Splice all optical fibers, including spares, to provide continuous runs. Splices shall be allowed only in equipment cabinets except where shown on the plans.

3.3.1 Make all splices using a fusion splicer that automatically positions the fibers using the Light Injection and Detection (LID) system or the High-resolution Direct Core Mounting (HDCM) system. Provide all equipment and consumable supplies.

3.3.2 Secure each spliced fiber in a protective groove. Completely re-coat bare fibers with a protective room temperature vulcanizing (RTV) coating, gel or similar substance, prior to insertion in the groove, so as to protect the fiber from scoring, dirt, or microbending.

3.3.3 Prior to splicing to a fiber installed by others, measure and record the optical loss over that fiber. See section 4.0 of this provision.

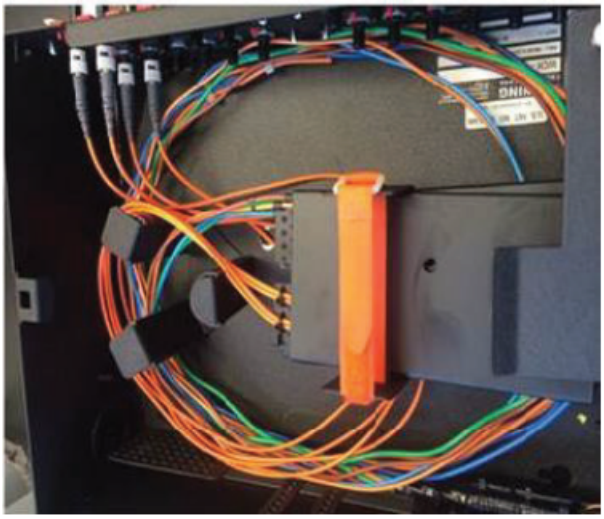
3.3.4 Use a different splice tray for each buffer tube color. If an enclosure contains multiple buffer tubes of the same color, but none of the fibers in one of the tubes are spliced to fibers in other tubes of the same color, use a separate splice tray for that tube.

3.4 Termination. Terminate fibers by splicing them to factory-made pigtails. Cap all connectors that are not connected to a mating connector.

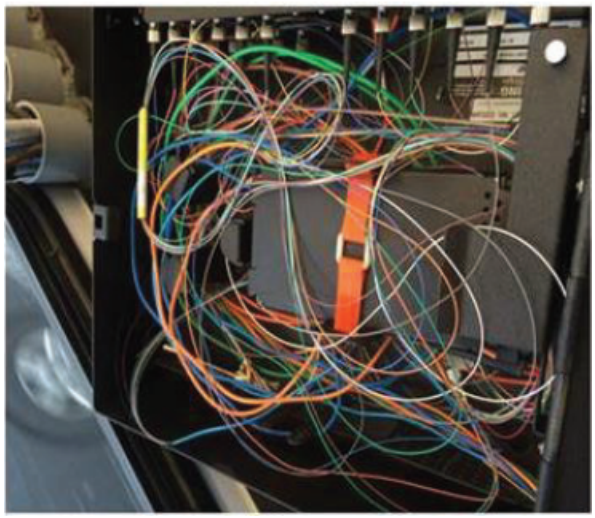
3.5 Tracer Wire. The contractor shall install a jacketed #14 AWG XHHW-2 standard blue tracer wire (also known as the locator wire) in conduit with new or replaced fiber optic cable(s). In the pull box nearest to the ITS or signal cabinet connect the tracer wire to a ground rod with a ground rod clamp and provide five feet of slack, as shown on the ITS pull box detail. In other fiber pull boxes provide five feet of slack, but a ground rod shall not be installed. Secure the tracer wire slack in individual coils to the inside wall of each pull box. If the tracer wire already exists, the contractor shall ensure it is connected to the ground rod properly in the pull box nearest to the ITS or signal cabinet and demonstrate a locate signal will transmit along the tracer wire. When fiber optic cable is relocated, existing tracer wire may be reused.

Prior to final acceptance and transition of ownership, the contractor shall meet with the Engineer to demonstrate the tracer-wire and locate system is working properly throughout the entire fiber, tracer wire and locate system.

3.6 Fiber Management. Fiber in splice trays along with pigtails and buffer tubes in the interconnect center or splice closures shall be neatly looped and restrained following telecom industry standard fiber and cable management practice and enclosure manufacturer's recommendations. Shown below are examples of acceptable and unacceptable fiber and cable management. Work will not be accepted unless good fiber management practices are followed.



Acceptable



Unacceptable

3.7 Required Fiber Splicing, Installation and Testing Experience. Submit resumes, certificates and references detailing fiber installation, splicing and testing for on-site personnel to the engineer for approval. Subcontractors used on the project are considered part of the contractor's team and are also required to submit resumes, certificates and references. Submit to the engineer references including client project manager, phone number and project experience. Demonstrate successful completion of fiber optic cable installation and splice training courses by providing certificates of completion. Failure to comply may result in a declaration of noncompliance.

In addition, ensure a number of the contractor's team approved by the engineer that has at least two years of experience in the installation, splicing and testing of the fiber optic cable is on site at all times during the fiber optic cable installation and fiber optic splicing work until successful completion of the work. Receive approval from the engineer for any substitution of this individual. The engineer may stop the work activity on this project as a result of the absence of these on-site personnel from the project and may continue to charge time to the contractor and will not grant a time extension.

3.8 Existing Fiber Replacement. When plans show new fiber being installed to replace existing fiber, the existing fiber should remain in service until the new fiber is installed and is ready for splicing to minimize network downtime.

3.9 Fiber Relocation. The fiber optic cable is a crucial part of the traffic operation system. It is imperative that the downtime be kept to a minimum when relocating fiber optic cable. When existing fiber is disconnected for relocation, the relocation and fiber splicing of the relocated fiber shall progress continuously to minimized downtime.

3.10 If grading will result in an existing fiber pull box not being flush with the final grading, the pull box elevation should be adjusted to match the final ground surface. If the existing pull box is in a condition that can be adjusted without damage, it can be reused. If a pull box is raised, a split duck system shall be used to protect the cable into the adjusted pull box and the void below the box shall be backfilled and the stone drain installed. If the pull box is lowered, the stone drain shall be provided as shown on the pull box detail. Installing a new pull box or concrete sonotube over the existing ITS pull box is NOT allowed. A concrete pad shall also be installed around the adjusted box. If site conditions do not allow these construction requirements to be met, the contractor shall suspend such a work and notify MoDOT ITS group via an email to SLITS@modot.mo.gov and carbon copy MoDOT construction inspector immediately for approval of any alternative fiber adjustment option.

4.0 Acceptance Testing.

4.1 General. Test the fiber after installation, including all splicing and termination, is complete. Note, however, that this test procedure involves measuring the loss of fiber installed by others before splicing to it. For each fiber optic link, including spare fibers, determine whether the optical loss is within the limits permitted by these specifications. A link is a continuous segment of fiber between one connector (or unterminated end) and another connector (or unterminated end). When testing links that do not have connectors on both ends, use a mechanical splice to attach a pigtail to the unterminated fiber for the duration of the test.

4.2 Test Procedure. For each fiber link, follow this procedure:

(a) If the link includes fiber installed by others, use an optical loss test set to measure and record the optical loss over that portion of the link before it is spliced to new fiber.

(b) Calculate the maximum allowable loss for the completed link, both at 1310 nm and at 1550 nm. Use the following formula:

Maximum link loss = Measured loss over portion installed by others
+ (Fiber length in km) x (0.35 for 1310 nm and 0.25 for 1550 nm)
+ (Number of fusion splices) x (0.05)
+ (Number of mechanical splices [for temp. connection]) x (0.3)
+ (Number of connections) x (0.5)

Provide this calculation to the engineer along with the test results.

(c) Calibrate an optical loss test set and provide evidence satisfactory to the engineer that the set produces accurate results at both wavelengths. This can be a demonstration that the set correctly measures the loss of a test fiber whose loss is known.

(d) Use the test set to measure the loss of the link under test. Record the result at both 1310 nm and 1550 nm. Arrange for the engineer or his representative to witness these tests.

(e) If the measured loss exceeds the calculated maximum, use an optical time domain reflectometer and other test equipment to troubleshoot the link. Take whatever corrective

action is required, including cable replacement, to achieve a loss less than the calculated maximum.

4.3 Test Result Documentation. Prepare a report showing all of the links tested in this project. For the portions installed in this project, show the equipment cabinets, splices, and pigtails. On each line representing a link, show the maximum allowable loss and the actual loss. The actual loss shall be the one measured after all corrective actions have been taken. Submit an electronic copy of the report to the engineer, along with the calculations for the maximum allowable loss. Submit the report including calculations in an electronic format acceptable to the engineer.

5.0 Documentation. Provide the engineer mark-ups of the plans, neat and legible, illustrating as-built versions of the splice and connection diagrams that are contained in the plans.

6.0 Certifications. New fiber optic cable shall be factory certified to meet the requirements in this specification. In addition, the manufacturer shall certify that the fiber optic cable has a life expectancy of 20 years.

7.0 Basis of Payment. Measurement and payment for items covered by this specification include all items listed below, acceptance testing and tracer wire within new, existing or relocated conduit used for the fiber optic cable in addition to all materials, labor and equipment necessary for a fully operational system. Payment will be made as follows:

Item No.	Type	Description
910-99.02	Each	Fiber Optic Fusion Splice
910-99.02	Each	Fiber Optic Pigtail
910-99.02	Each	Fiber Optic Jumper
910-99.02	Each	Wall-Mounted Interconnect Center

FFFF. Installing a Commission Furnished and Programmed IP Addressable Power Strip

1.0 Description. The contractor shall install a Commission Furnished and Programmed IP-Addressable Power Strip(s) in the ITS and/or Signal Cabinets as shown on the plans. The IP-Addressable Power Strip(s) shall be approved by the ITS group prior to installation.

2.0 Installation Requirements. The contractor:

- Shall email the SL ITS Group at SLITS @modot.mo.gov two business days in advance of installation and include MoDOT Job # and the location of the ITS or Signal Cabinets.
- Shall mount the power strip on the back side of the ITS Type 7 ITS cabinet (or any open space of other ITS cabinets away from the door) and on any open space of the signal cabinet with the power cable facing away from the door or other devices.
- Should remove and dispose the old power strip as well as any other inactive devices, if present, to make room.
- Should contact MoDOT Signal Shop Supervisor and/or SL ITS group if they have questions regarding the inactive devices.

- Should hard-wired the power source to the cabinet auxiliary breaker. No plug in to any cabinet outlet allowed to the Power Strip.

4.0 Acceptance Testing. The Contractor shall contact MoDOT St. Louis ITS staff to verify remote communication to the power strip upon installation and while still on-site. They also shall provide a list of devices and designated port assignments to the ITS group so they can update that port description in the Power Strip software.

5.0 Basis of Payment. Measurement and payment for Power Strip Installation includes the removal of the old and inactive power strip or other devices to make space for new power strip, installation of new power strip, grounding, testing and all miscellaneous hardware required for a safe, fully operational Power Strip. Payment will be made as follows:

Item Number	Unit	Description
910.99-02	Each	Installing a Commission Furnished and Programmed IP Addressable Power Strip

GGGG. ITS Asset Management Tool

1.0 Description. For all locations where any MoDOT and other agency's ITS (Intelligent Transportation System) components are modified or added, the contractor shall be responsible for populating and updating Commission's ITS and Signal Network Asset Management Tool (currently NexusWorx) to reflect the final condition of the entire ITS system within the project limits as shown on the plans. Updating shall be performed by the Commission approved staff (currently the Byers Engineering; Doug Stanford at Doug.Stanford@BYERS.COM)

2.0 Construction Requirements.

1.7 The Contractor shall provide the final construction as-built plans and any relevant notes to the Commission approved contractor (currently the Byers Engineering) via an email and carbon copy the SL Construction staff and ITS group at SLITS@modot.mo.gov for input into the ITS Asset Management Tool. The relevant notes for each modified or new location shall aid in the understanding of the device configuration and location details. At a minimum, this will include providing the required latitude and longitude coordinates of each pull box, DMS, CCTV, node cabinet, conduit, cable, and fiber, along with any serial numbers and/or identification information for any new, relocated or otherwise changed by this project. The Contractor shall locate the conduit every 100 feet using a GPS locating device that is accurate to the nearest foot. The Contractor shall provide a GIS based map of the conduit route and a complete listing of all of map coordinates in an electronic format. Population of the ITS Asset Management Tool will be required for all new, relocated and modified devices improved under this contract.

1.8 Other agency's ITS assets such as conduit, fiber cable, Cat-E cable, cabinet, pull box, etc. within MoDOT Right-Of-Way shall be highlighted including in a polygon in the ITS Asset Management Tool so it can be clearly identified for future references.

1.9 The contractor shall furnish to Commission approved staff a copy of the final plans relevant to all of the ITS components in Visio and/or Microstation formats, if relevant.

1.10 The contractor shall be provided one licensed read-only access login by Commission before work begins.

1.11 A PDF and Visio format of all relevant fiber splicing drawings shall be provided to the Commission approved contractor for posting into the ITS Asset Management Tool's perspective ITS and Signal cabinets.

3.0 Acceptance.

3.1 All entries and updates shall be completely entered and available for use within 30 days from substantial completion of construction of the project.

3.2 Commission staff shall verify population of the ITS Asset Management Tool within 10 working days, including accuracy and completeness of details for each component prior to acceptance and payment.

4.0 Measurement and Payment. Measurement and Payment for items covered by this specification include the population and correction of inaccuracies, in addition to all materials and equipment necessary complete the updates to the ITS Asset Management Tool which shall be coordinated and paid to the Commission approved staff (currently the Byers Engineering).

Item No.	Type	Description
910-99.01	Lump Sum	ITS Asset Management Tool

HHHH. ITS Pull Box

1.0 Description. Furnish and install ITS Pull Boxes with concrete pads as shown on the plans.

2.0 Materials.

2.1 Pull Box. ITS pull boxes shall meet the requirements in Section 1062 of the Missouri Standard Specifications for Highway Construction.

2.2 Ground Rod. Ground rods shall be listed according to UL requirements as detailed in the standard UL 467, Grounding and Bonding Equipment, and meet the requirements of NEC 250. Use electrodes that are solid copper or copper-bonded steel.

2.3 Concrete Pad. The contractor shall install a non-reinforced concrete pad around the ITS pull box as shown in the plans. The concrete used shall be a Class 'B' concrete as described within Sec 501 of the Standard Specifications.

3.0 Construction. Install ITS pull boxes as shown in the plans. Provide a concrete pad around the pull boxes as shown in the plans. Install a ground rod in the Class 5 pull boxes nearest ITS or signal cabinets.

3.1 If grading will result in an existing fiber pull box not being flush with the final grading, the pull box elevation should be adjusted to match the final ground surface. If the existing pull box is in a

condition that can be adjusted without damage, it can be reused. If a pull box is raised, a split duck system shall be used to protect the cable into the adjusted pull box and the void below the box shall be backfilled and the stone drain installed. If the pull box is lowered, the stone drain shall be provided as shown on the pull box detail. Installing a new pull box or concrete sonotube over the existing ITS pull box is NOT allowed. A concrete pad shall also be installed around the adjusted box. If site conditions do not allow these construction requirements to be met, the contractor shall suspend such a work and notify MoDOT ITS group via an email to SLITS@modot.mo.gov and carbon copy MoDOT construction inspector immediately for approval of any alternative fiber adjustment option.

4.0 Basis of Payment. Measurement and payment for ITS Pull Boxes with a concrete pad includes excavation, materials, construction, backfill and all miscellaneous hardware required for a fully operational system. Payment will be made as follows:

Item No.	Type	Description
910-99.02	Each	ITS Pull Box with Concrete Pad, Preformed Class 5

IIII. MoDOT Buried Cable Drivable Delineator Post

1.0 Description. The contractor shall install a MoDOT 'Buried Cable' deliberator next to each ITS pull box and additional locations approved by the Engineer (typically within grass areas using 500' spacing on interstates/freeways and 200' spacing on arterials) within the project limits as indicated on the plans.

2.0 Materials. See detail in the plans. The post shall be supplied in orange color and incorporate a premium UV inhibitor package to resist harmful effects to the sun. The post shall withstand multiple directional impacts and provide a long lasting and extremely durable product requiring little field maintenance. The post shall have a minimum 0.20" wall thickness and shall stand up straight in all weather conditions and self-right to straight upon impact. Top of post shall be permanently sealed and partially flattened and transition to round to afford 360 degree visibility. The post materials shall include an anchor, a non-mechanical flexible joint, and a round delineator post.

The post assembly should allow for easy change-out of any one part if necessary.

3.0 Construction Requirements. Construction requirements shall conform to the delineator post manufacturer's recommendations and engineer's approval. If the plans show the post near a pull box, put it next to the box as an aid to finding the box. Do not drive it through the conduit.

4.0 Basis for Payment. Payment for the 'Buried Cable' delineator post shall be considered full compensation for all contractor-provided equipment items, labor, and material to complete the described work. Payment will be made as follows:

Item No.	Type	Description
910-99.02	Each	MoDOT Buried Cable Drivable Delineator Post

JJJJ. MoDOT ITS Assets Within Project Limits

1.0 Description. . MoDOT owned fiber optic cable and conduit, critical MoDOT power supplies and power cables, and pull boxes for fiber and power cabling and other above and underground ITS (Intelligent Transportation System) facilities are present within the limits of this project. Damage or interruption of these items can cause extensive outages to the MoDOT network.

2.0 Construction Requirements. The contractor shall exercise reasonable care while completing work near these facilities, and shall take steps necessary to protect these facilities from damage for all items that are not specifically identified as being removed and/or relocated in the plans. Should any of the existing wiring or conduit be damaged by the contractor, it shall be replaced at the contractor's expense and the system in full operation within **4** hours of when the damage occurred. If it is mutually agreed upon between the Commission and the Contractor that the repairs will require more than **4** hours to complete, a mutually agreed upon time for repairs to be complete will be determined.

2.1 The contactor shall not modify any existing network or electrical connections within equipment cabinets, unless coordinated with MoDOT ITS staff. Existing connections include, but are not limited to, fiber jumpers, CAT5(e) cables, power supplies, and power strips. The connection to specific fiber and copper ports on network equipment shall also not be modified, unless coordinated with MoDOT ITS staff, as the network equipment has been configured specifically for each equipment cabinet. Significant network outages and unnecessary troubleshooting to investigate outages can occur, even with minor changes to existing connections within the cabinet.

3.0 Liquidated Damages. In the event of damage, if the system is not repaired and in full operation within **4** hours of the damage occurring, or within the timeframe agreed upon, the contractor will be charged with a liquidated damage specified in the amount of $100.00 per hour for each full hour that the system is not fully operational. This damage will be assessed independently of the liquidated damages specified elsewhere in the contract.

3.1 The MoDOT Engineer will also have the option of issuing a work order for MoDOT's on-call ITS Maintenance contractor to make repairs, if it is the Engineer's opinion that the contractor creating the damage will not be able to make repairs in a timely manner. Contractor's reimbursement for MoDOT expense for this option shall be in addition to the liquidated damages.

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

KKKK. Removal of Existing Fiber Optic Cable

1.0 Description. This work shall consist of removal of the existing fiber cable and the tracer wire, if applicable, from existing conduit as shown on the plans. Installation of the new fiber optic cable shall be paid under separate pay item.

2.0 Construction Requirements. The removal of existing fiber optic cables be completed as approved by the Engineer and shall conform to current Missouri Standard Specifications for Highway Construction.

2.1.1 Signal conduit, pull box, or other signal cable damage by construction activity shall be replaced by the contractor at the contractor's expense.

2.1.2 Existing, unused fiber optic cable and tracer wire shall be removed between Page Industrial and Ashby on Route D as shown on the plans.

2.1.3 MoDOT's ITS Asset Management Tool (currently the Nexus system) shall be updated to indicate the removal and replacement of the fiber optic cable as shown on the plans.

2.1.4 See separate Job Special Provision for specific guidance regarding update to the MoDOT ITS Asset Management Tool.

2.1.5 The existing conduit containing the existing, unused fiber optic cable may be abandoned.

2.1.6 Any unused pull box, owned by MoDOT, within this project limits shall be removed and filled properly.

2.1.7 No direct pay shall be made for the removal of pull boxes to satisfy the requirement of this provisions.

2.1.8 The Contractor shall not disturb any pull box owned and maintained by other agencies within this project limits.

3.0 Acceptance Testing. Contractor shall demonstrate that all existing fiber has been removed and all original connection points at the upstream intersection are clean and free of obstruction. No direct payment will be made for this testing.

4.0 Measurement and Payment. All costs associated with this work shall be considered completely covered by the following pay item. Please see the above noted segments and the plans for details.

Item No.	Type	Description
910-99.03	Linear Foot	Removal of Existing Fiber Optic Cable

LLLL. St. Louis County Roadway Permits – Permit ID 26SUP-00497

1.0 Description. The contractor shall obtain a Special Use Permit from St. Louis County, MO before beginning construction operations or before closing lanes on a roadway maintained by St. Louis County. Information regarding obtaining this special use permit can be found here:

St. Louis County Department of Transportation
Attention: Special Use Permit Section
41 South Central Avenue, 6th Floor
Clayton, Missouri 63105

Phone Number: 314-615-8515
Fax Number: 314-615-7084

Addition Information from St. Louis County's website can be found here regarding Special Use Permits:

https://www.stlouisco.com/YourGovernment/CountyDepartments/HighwaysandTraffic/HighwayPublicationsManuals

1.1 The contractor shall provide a copy of the permit obtained from St. Louis County, MO and shall submit to the engineer an electronic copy of the obtained permit before beginning construction.

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

MMMM. St. Louis County Fiber Optic Cable Relocation

1.0 Description. The contractor shall relocate St Louis County's (STL Co) existing fiber optic cable on Lilac Ave. South of I-270 as noted in the plans.

2.0 St Louis County Point of Contact

Below noted St Louis County Representative shall be invited to the pre-construction meeting and all fiber optic cable related work shall be coordinated with him:

Michael Feldhaus

314-502-1083 (Mobile)

314-615-0204 (Office)

MFeldhaus@stlouiscountymo.gov

3.0 Construction Requirements.

After MoDOT's new signal facilities on eastbound I-270 off-ramp at Lilac Avenue have been constructed, the contractor shall:

- Notify STL Co Rep., MoDOT ITS group (SLITS@modot.mo.gov) and MoDOT Construction Rep. via email at least 24 hours prior to any work on STL Co fiber cable ,
- Disconnect STL Co fiber from existing MoDOT signal cabinet,
- Carefully pull it out to new constructed pull box south of that cabinet,
- Then pull it back into new conduit, into the new signal cabinet and terminate it as shown in the plans,
- Notify St Louis County Rep., MoDOT ITS group and MoDOT Construction Rep. via email for the network verification.

If STL Co's fiber cable is damaged during this work, the contractor shall replace it with a new fiber cable at no charge to MoDOT.

4.0 Basis of Payment.

Measurement and payment for work covered by this specification includes equipment, tools, materials, necessary to install conduit. It includes excavation and site restoration. Payment will be made as follows:

Item No.	Type	Description
910-99.01	Lump Sum	St Louis County Fiber Optic Cable Relocation

NNNN. Install CCTV Camera Assembly

1.0 Description

1.1 This work shall consist of furnishing and installing a complete closed-circuit television (CCTV) camera assembly at the location shown on the plans, including all labor, equipment, materials, mounting hardware, cabling, grounding, testing, and incidentals necessary to provide a safe and fully operational installation.

1.2 This work shall include installation of the CCTV camera, pole, extension pole if required, pole-mounted appurtenances, cabling from the cabinet to the camera, grounding and bonding, and all miscellaneous hardware required for a complete operating system.

1.3 The effective versions of all Missouri Standard Specifications, Missouri Standard Plans, and applicable MoDOT ITS requirements shall be those in effect for the project letting.

2.0 Materials

2.1 The CCTV camera assembly shall be new and shall be compatible with MoDOT St. Louis District ITS operations and software requirements.

2.2 If shown on the plans or noted elsewhere in the contract documents, certain network communication devices may be furnished by the Commission. In such case, the contractor shall furnish all remaining items necessary for a complete installation, including patch cords, camera cable, mounting hardware, connectors, and miscellaneous accessories required for proper operation. Similar language is used in St. Louis District ITS JSPs where some communications equipment is Commission-furnished while the contractor provides the remaining installation materials.

2.3 The contractor shall furnish the camera cable between the cabinet and the camera mounting location. Where required by the camera manufacturer, the cable shall be either outdoor-rated Category cable or manufacturer-provided composite cable. No substitution of cable types shall be allowed without approval of the engineer.

2.4 All mounting hardware exposed to the weather shall be corrosion resistant.

2.5 Grounding materials shall comply with the contract requirements and manufacturer recommendations.

3.0 Construction Requirements

3.1 Prior to beginning work, the contractor shall coordinate with MoDOT St. Louis District ITS staff by email at **SLITS@modot.mo.gov**. Recent St. Louis District JSPs require advance coordination through that email address for work affecting CCTV or ITS communications.

3.2 The contractor shall notify the engineer and MoDOT St. Louis District ITS staff at least **2 working days** before any work that may impact existing ITS communications or camera operations. St. Louis District JSPs use this coordination requirement for ITS-impacting work.

3.3 Before installation, the contractor shall verify all equipment locations, mounting details, and field conditions shown on the plans. Any discrepancy shall be brought to the attention of the engineer before proceeding.

3.4 The contractor shall install the CCTV camera assembly in accordance with the plans, manufacturer recommendations, and MoDOT requirements.

3.5 The contractor shall make all necessary electrical, communication, and grounding connections for a complete and operational installation.

3.6 The contractor shall program and configure the camera in accordance with manufacturer recommendations and MoDOT St. Louis District requirements.

3.7 Camera orientation shall be coordinated with the engineer and MoDOT ITS staff to provide the intended field of view.

3.8 The contractor shall protect all existing MoDOT ITS equipment during construction. Any damage caused by the contractor shall be repaired or replaced at the contractor's expense. Similar St. Louis District CCTV JSP language places responsibility on the contractor for damage during handling, removal, storage, or installation.

3.9 Where the installation ties into existing MoDOT ITS infrastructure, the contractor shall keep the existing network operational except for short durations approved by the engineer and coordinated with MoDOT ITS staff. St. Louis District ITS JSPs emphasize maintaining the network online except for brief approved outages.

3.10 The contractor shall submit product data and any proposed installation details requested by the engineer or MoDOT ITS staff before installation.

4.0 Acceptance Testing

4.1 After installation, the contractor shall test the CCTV camera assembly using manufacturer-recommended procedures and demonstrate that:

- high-quality video is transmitted,
- pan, tilt, and zoom functions operate properly, where applicable,
- communications with the field cabinet and network are functioning properly, and
- the grounding system is operational.

4.2 The contractor shall use a device that measures resistance to ground using the three-point fall-of-potential method, or an approved equivalent method, to demonstrate that the resistance to ground does not exceed **8 ohms**. This testing threshold appears in recent MoDOT CCTV JSP language.

4.3 If the installed camera assembly fails to operate properly, the contractor shall correct the issue at no additional cost to the Commission.

4.4 MoDOT ITS staff shall inspect the CCTV assembly installation and related network devices for proper operation prior to acceptance. This is consistent with other recent MoDOT CCTV JSP language.

5.0 Basis of Payment

5.1 Measurement and payment for this work shall include furnishing and installing the camera assembly, testing, grounding testing, mounting hardware, cabling, connectors, and all miscellaneous hardware and incidentals required for a safe and fully operational camera assembly. This follows the general payment structure used in recent MoDOT CCTV JSPs.

5.2 Payment will be made at the contract unit price for the following item:

Item No.	Type	Description
910-99.02	Each	Misc. Install CCTV Camera Assembly

5.3 If the plans include separate payment for the pole, foundation, camera cable, power supply, or related equipment, those items will be paid for separately under their respective contract line items and shall not be included in this item. Recent MoDOT CCTV JSP examples separate items such as the camera assembly, pole foundation, pole, and camera cable.

OOOO. Shallow Grate Inlet

1.0 Description: This work shall provide a product which meets or exceeds material, performance, and design characteristics of the following product: Neenah R-3165-Combonation Inlet, with Curb Box.

2.0 Method of Measurement: The quantity of Shallow Grate Inlet shall be measured per Each.

3.0 Basis of Payment: The accepted quantity of Shallow Grate Inlet will be paid for at the contract unit price per Each, which shall include all work associated with construction of the shallow grate structure including connections to pipes, excavation, backfilling, material, and labor shall be included in the following pay item:

Item No.	Type	Description
614-99.02	Each	Shallow Grate Inlet

PPPP. Gutter Scupper

1.0 Description: This work shall provide all material required to construct Gutter Scupper as shown in the Gutter Scupper Detail in construction plans. All material shall meet or exceeds material, performance, and design characteristics as shown on Gutter Scupper Detail.

2.0 Method of Measurement: The quantity of Gutter Scupper shall be measured per Each.

3.0 Basis of Payment: The accepted quantity of Gutter Scupper will be paid for at the contract unit price per Each, which shall include all work as shown in the Gutter Scupper Detail in the construction plans including all work associated with construction of the Gutter Scupper including connections to structure, excavation, backfilling, material, and labor shall be included in the following pay item:

Item No.	Type	Description
614-99.02	Each	Gutter Scupper

QQQQ. Box Culvert Extension, (5'x4')

1.0 Description: This work shall provide all material required to construct Box Culvert Extension, (5'x4') as shown in the construction plans. All material shall meet or exceeds material, performance, and design characteristics included in MoDOT Standard Specifications and MoDOT Standard Plans 703.14, 703.16, 703.17, 703.37, and 703.38.

2.0 Method of Measurement: The quantity of Box Culvert Extension, (5'x4') shall be measured as Lump Sum.

3.0 Basis of Payment: The Box Culvert Extension, (5'x4') contract pay item will be paid for as Lump Sum, which shall include all work required to construct Box Culvert Extension, (5'x4') as shown in the construction plans with materials meeting MoDOT Standard Specifications and MoDOT Standard Plans 703.14, 703.16, 703.17, 703.37, and 703.38. All work associated with construction of the Box Culvert Extension, (5'x4') including connection to existing structure, excavation, backfilling, material, and labor shall be included in the Box Culvert Extension, (5'x4') shall be included in the following pay item:

Item No.	Type	Description
703-99.01	Lump Sum	Box Culvert Extension (5'X4')

RRRR. Connection to Existing Sewers

1.0 Description: This work shall consist of furnishing all labor, equipment, and materials required to construct Connection to Existing Sewers as shown in construction plans. The opening in the existing sewer shall be kept to the minimum size necessary to accommodate the proposed connection. Proper care shall be taken to avoid damage to the existing sewer and the connection shall be constructed watertight. All materials and workmanship shall meet or exceed the requirements of the MoDOT Standard Specifications and Standard Plans.

2.0 Method of Measurement: The quantity of Connection to Existing Sewers shall be measured per Each.

3.0 Basis of Payment: The accepted quantity of Connection to Existing Sewers will be paid for at the contract unit price per Each. Payment shall include all work required to complete work as shown in the construction plans including all work associated with removal of structure material as necessary, reconstruction around the opening, sealing to ensure watertight connection, and all incidental work required to complete the connection as shown on the plans, included in the following pay item:

Item No.	Type	Description
604-99.02	Each	Connection to Existing Sewers

SSSS. Coordination with Detention Basin Construction

1.0 Description. Prior to removing any existing improvements or beginning grading work on the new detention basin near Station 738+00 on the south side of I-270, the Contractor along with the Engineer shall contact Faith Miracle Temple Church at 870 Pershall Road to inform them of the

upcoming work and the general schedule. The Contractor and the Engineer shall inform the Church at least 2 weeks prior to beginning any work. The contact number for the church is the following:

Faith Miracle Temple Church 314-653-9346

2.0 No direct payment shall be made for compliance with this provision.

TTTT. Metropolitan Sewer District of St. Louis Permit No. 25MSD-00035

1.0 Description. Metropolitan St. Louis Sewer District (MSD) has issued permit 25MSD-00035 for improvements associated with project J6I3020D and JSL0021. Copy of the approved plans and permit requirements are available for download at https://aca3.accela.com/STLMSD/.

2.0 The Contractor shall comply with all General Construction Permitting Requirements indicated in the approved permit to include payment of all permit fees.

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

UUUU. Metropolitan Sewer District of St. Louis As-Built Submittals (Permit No. 25MSD-00035)

1.0 Description. Metropolitan St. Louis Sewer District (MSD) requires as-built drawings of the constructed drainage facilities to be submitted for their records. The contractor shall perform all work necessary to produce and submit the final as-built drainage plans to MSD, per MSD's as-built submittal requirements. The contractor shall submit the MSD as-built drawings for MSD P No. 25MSD-00035 and subsequent revisions after all drainage structures related to the project have been constructed or adjusted.

1.1 MSD Electronic Plans Submittal Process. MSD requires that permits be submitted electronically using their new online paperless system Accela. The contractor will be required to login on to this system and upload as-builts and/or shop drawings as necessary. Additional information can be found here:

https://msdprojectclear.org/doing-business/development-review/

A direct link to the new online system can be found here:

https://aca3.accela.com/STLMSD/Login.aspx

In order to access the permit, the contractor will first need to call MSD in order to obtain access for the particular job mentioned above.

1.2 The contractor shall provide a copy of the as-built drainage plans to the MoDOT engineer at the time of the MSD submittal.

2.0 The Contractor shall comply with all General Construction Permitting Requirements indicated in the approved permit, which includes payment of all permit fees.

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

VVVV. Trench Drain

1.0 Description.

1.1 This work shall consist of furnishing and installing a new trench drain, grates, and connection to drop inlets. Trench drain assembly can be one of the following:

POLYCAST Series 900 Pre-Sloped Trench Drain System with POLYCAST Heavy Duty Ductile Iron Grate & Frame (Non-Removable);

ACO Highway Drain HD200;

or approved equal.

1.2 Trench drain shall have a nominal width of 8 inches.

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

2.1 Trench Drain. All materials shall meet or exceed AASHTO H-20 loading criteria.

2.1.1 Grates. Grates shall be ductile iron or other durable material that meets or exceeds AASHTO H-20 loading criteria. Grates shall have a minimum open area of 60%.

3.0 Construction Requirements.

3.0.1 All work shall be performed in accordance with the Trench Drain manufacturer's recommendations and as approved by the engineer.

3.1.2 The layout of the Trench drains shall be submitted to the engineer for approval.

3.1.3 Contractor is required to install non-removable grates within the limits shown on the plans. Grates shall be affixed in a manner that reduces the chance of being dislodged by traffic. Bolting or other locking devices are not acceptable.

3.1.4 Contractor is required to modify the drop inlets and provide a drainage connection from the trench drain to facilitate drainage into the existing or proposed drainage system as shown on the plans. Contractor shall also clean out all debris from the existing inlet and flush the inlet and pipe run to ensure proper drainage.

3.1.5 The trench drain shall be encased in concrete at a minimum of 8" wide and a minimum of 8" deep around the trench drain.

4.0 Method of Measurement. Trench Drains shall be measured complete in place and will be made to the nearest foot along the geometrical center of the trench. The revision or correction will be computed and added to or deducted from the contract quantity.

5.0 Basis of Payment. Payment will be made for compliance with this provision including all sawcuts, pavement removal, pavement replacement, labor, excavation, equipment, and material

necessary with installation of the trench drain assembly at the contract unit price for the following pay item:

Item No.	Unit	Description
713-99.03A	LF	Trench Drain

WWWW. Welding of Grates on Drop Inlets

1.0 Description. This work shall consist of modifying the existing drop inlet grate along the inside shoulder of Interstate 270 at the following locations:

608+27 RT	631+12 LT	654+96 RT
608+27 LT	637+54 RT	654+96 LT
618+65 RT	637+54 LT	657+95 RT
618+65 LT	641+56 RT	657+95 LT
625+06 RT	643+87 LT	658+94 RT
625+06 LT	647+95 LT	658+94 LT
631+12 RT	651+96 LT	663+43 RT

2.0 Construction Requirements. All work including method and materials required to attach the grate to the frame shall be approved by the engineer prior to work being performed.

2.1 The grate shall be fixed to the frame of the inlet in a manner that allows traffic to traverse the inlet without the probability of the grate separating from the frame during traffic.

2.2 Weld shall be removed prior to completion of project. In the event a grate or frame is damaged during removal of the weld, the grate and/or frame shall be replaced in kind at no direct pay.

3.0 Method of Measurement. Final measurement will not be made.

4.0 Basis of Payment. Payment will be made for compliance with this provision including all labor, equipment, and material necessary at the contract unit price for the following pay item:

Item No.	Unit	Description
613-99.01	LS	Welding of Grates on Drop Inlets

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

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

2.0 Material.

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

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

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

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

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

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

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

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

YYYY. Temporary Asphalt Transition Patch

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

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

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

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

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

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

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

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

4.0 Basis of Payment. The accepted quantity of the chosen option will be paid for at the contract unit bid price for the following Item:

Item No.	Unit	Description
401-99.05	SY	Temporary Asphalt Transition Patch

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

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

ZZZZ. Covering and Uncovering Existing Overhead Signs for Construction Phasing

1.0 Description. This work shall consist of temporarily covering 'Exit Only' panels on existing sign trusses and any additional signs listed in the contract along with installing 'Closed' sign plaques on the existing signs as well. Uncovering of the signs and the removing of the 'Closed' plaques shall be included within the cost of this pay item. The contractor shall uncover signs and remove 'Closed' plaques once the traffic control stage is completed for each roadway/bridge which has signs to be covered and plaques to be installed.

2.0 Basis of Payment. The accepted quantity of covering/uncovering existing signs and installing/removing 'Closed' plaques on existing signs will be paid at the contract unit price for the pay item included in the contract. All labor, equipment and material cost required to fulfill this requirement shall be included in the unit price for the following pay item:

Item No.	Type	Description
903-99.02	Each	Cover Existing Overhead Signs

AAAAA. Pavement Marking Removals

1.0 Description. Pavement Marking Removal shall be in accordance with Section 620.50 and specifically as follows.

2.0 Construction Requirements. Removal of all pavement marking within the project limits shall be as shown on the plans or as approved by the engineer. Pavement marking shall be completely removed to the satisfaction of the engineer with minimal damage to the pavement. The contractor shall use an approved **water blasting method** to remove the pavement marking on concrete surfaces. No more than five percent of the existing marking shall remain. The pavement surface shall not be left scarred with an image that might mislead traffic. Any excess damage or scarring of the pavement shall be repaired at the contractor's expense. It shall be the contractor's responsibility to determine what type of material needs to be removed.

3.0 Method of Measurement. Final measurement will not be made except for authorized changes during construction or where appreciable errors are found in the contract quantity. The revision or correction will be computed and added to or deducted from the contract quantity.

4.0 Basis of Payment. The accepted quantity of pavement marking removal including all labor, equipment, and material necessary to remove the existing marking will be included in the following pay item:

Item No.	Unit	Description
6207001	LF	Pavement Marking Removal

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

1.0 Delete Sec 616.11 and insert the following:

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

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

2.0 Delete Sec 616.12 and insert the following:

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

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

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

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

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

(e) Worker apparel.

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

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

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

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

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

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

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

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

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

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

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

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

CCCCC. Temporary Traffic Signals - Special

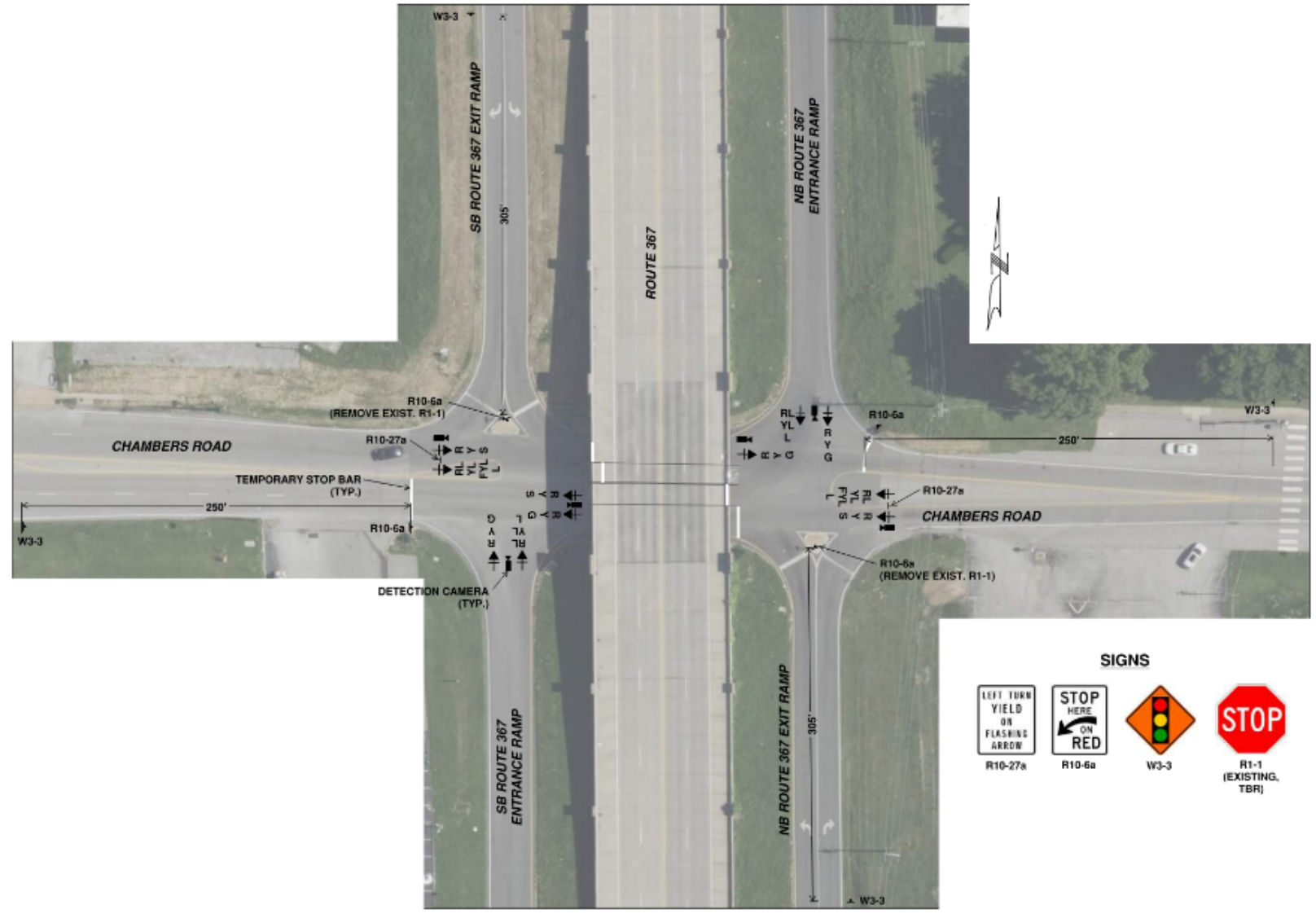
1.0 Description. This work shall consist of installing, maintaining, and removing temporary traffic signals at both intersections of the Highway 367 ramps and Chambers Road interchange during the closure of Highway 367 to accommodate the demolition of I-270 bridges over Highway 367.The work shall be in accordance with Section 902.3 “Temporary Traffic Signals” of the Standard Specifications, except as noted herein.

1.1 The temporary traffic signals between the two intersections shall be coordinated and operational for the two weekends that Highway 367 is closed. Span wire traffic signals or portable signals with adjustable mast arms are both permissible, given that signal heads extend into each lane of control. If span wire signals are used, the contractor shall submit a proposed configuration design for review and approval by the District. Portable traffic signal layouts that result in the reduction of the number of travel lanes or with of the traveled way shall be submitted for review and approval by the District. Temporary traffic signals shall be removed following the completion of the second closure.

1.2 Traffic signal maintenance and timing for this project shall be in accordance with Section 902 of the Standard Specifications, and specifically, the contractor shall have an experienced traffic Engineer with a Professional Engineer’s (PE) license in Missouri as well as a Professional Traffic Operations Engineer (PTOE) certification (hereafter referred to as “contractor’s traffic Engineer”). The contractor’s traffic Engineer shall have the ability to be on site within 1 hour of being requested, as well as experience with time/space diagram manipulation in order to successfully adjust offsets and splits for rapidly changing traffic demands. The traffic Engineer shall exhibit experience in implementation of adjusted and/or new timing plans as a result of changing traffic demand. MoDOT shall approve the traffic Engineer prior to them being hired.

2.0 Construction Requirements. All work and materials required for installation and proper function of the temporary traffic signals, including temporary pavement markings, signage, detection cameras, and other necessary traffic control devices shall be considered incidental to this work. All materials or methods not in accordance with Section 902.3 “Temporary Traffic Signals” of the Standard Specifications or otherwise specified with this JSP shall be approved by the engineer prior to work being performed.

2.1 The signal head indications, detection cameras, and temporary traffic control at the interchange shall be configured as shown below:



3.0 Method of Measurement. Final measurement will not be made.

4.0 Basis of Payment. Payment will be made for compliance with this provision including all labor, equipment, and material necessary at the contract unit price for the following pay item:

Item No.	Unit	Description
902-99.01	LS	Temporary Traffic Signals – Special

DDDDD. PAVEMENT SMOOTHNESS

1.0 Description. This work shall consist of profiling the new pavement on I-270 and other pavements included in the contract for smoothness in accordance with Sec 610 of the Standard Specifications.

2.0 Construction Requirements. If the new pavement surface does meet the acceptable index, corrective action shall be taken by the contractor to correct the pavement surface. Additional requirements are as follows.

Delete Sec 610.4.2.2 in its entirety and substitute the following:

610.4.2.2 Profiling will not be required for the following exceptions: MODIFY PER LIST ABOVE FROM STD. SPECS

(a) Bridge decks, bridge approach slabs and concrete approach pavements.

(b) Pavement on horizontal curves with centerline radius of curve less than 1000 feet and pavement within the superelevation transition of such curves.

(c) Pavement on vertical curves having a "K" value less than 90 and a length less than 500 feet.

(d) Pavement width transitions.

(e) Fifty feet in direction of travel on each side of utility appurtenances such as manholes and valve boxes.

(f) Fifty feet in direction of travel on each side of intersecting routes.

(g) Shoulders.

(h) Interruptions designated by the engineer which provide independently placed sections shorter than 50 feet.

(i) The last 15 feet of any section where the prime contractor is not responsible for the adjoining surface.

Delete Sec 610.4.2.3 in its entirety and substitute the following:

610.4.2.3 Profiling will be required on this project for any area not included in the exceptions as noted in Sec 610.4.2.2 above.

2.0 Basis of Payment. No direct payment will be made to the contractor to recover the costs of equipment, labor, materials or time required to fulfill the above provision.