Job No.: J8I0445
Route: 44
County: Webster

JOB SPECIAL PROVISIONS TABLE OF CONTENTS (ROADWAY)

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

Job No.: J8I0445
Route: 44
County: Webster

"THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT."	**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION** 105 W. CAPITOL AVE. JEFFERSON CITY, MO 65102 Phone 1-888-275-6636
	CRAWFORD, MURPHY & TILLY, INC. *1631 W. Elfindale* *Springfield, MO 65807* Certificate of Authority: 000631 Consultant Phone: 417-869-6009
	If a seal is present on this sheet, JSP's have been electronically sealed and dated.
	JOB NUMBER: J8I0445 WEBSTER COUNTY, MO DATE PREPARED: Mar 11, 2019
	ADDENDUM DATE:
Only the following items of the Job Special Provisions (Roadway) are authenticated by this seal: All	

Job No.: J8I0445
Route: 44
County: Webster

JOB
SPECIAL PROVISION

A. General - Federal JSP-09-02D

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 "Bidding". 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 "Business"; "Standards and Specifications". The effective version shall be determined by the letting date of the project.

General Provisions & Supplemental Specifications

Supplemental Plans to July 2018 Missouri Standard Plans
For Highway Construction

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

B. Contract Liquidated Damages JSP-13-01B

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

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

Notice to Proceed: July 8, 2019
Completion Date: October 31, 2020

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

Job Number	Calendar Days	Daily Road User Cost
J8I0445	N/A	$7,600

3.0 Liquidated Damages for Contract Administrative Costs. Should the contractor fail to complete the work on or before the completion date specified in Section 2.0, or within the number of calendar days specified in Section 2.1, whichever occurs first, the contractor will be charged contract administrative liquidated damages in accordance with Sec 108.8 in the amount of **$2,000** 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 above specified completion date or calendar days.

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

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

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

1.1 Maintaining Work Zones and Work Zone Reviews. The Work Zone Specialist (WZS) shall maintain work zones in accordance with Sec 616.3.3 and as further stated herein. The WZS shall coordinate and implement any changes approved by the engineer. The WZS shall ensure all traffic control devices are maintained in accordance with Sec 616, the work zone is operated within the hours specified by the engineer, and will not deviate from the specified hours without prior approval of the engineer. The WZS is responsible to manage work zone delay in accordance with these project provisions. When requested by the engineer, the WZS shall submit a weekly report that includes a review of work zone operations for the week. The report shall identify any problems encountered and corrective actions taken. Work zones are subject to unannounced inspections by the engineer and other departmental staff to corroborate the validity of the WZS's review and may require immediate corrective measures and/or additional work zone monitoring.

1.2 Work Zone Deficiencies. Failure to make corrections on time may result in the engineer suspending work. The suspension will be non-excusable and non-compensable regardless if road user costs are being charged for closures.

2.0 Traffic Management Schedule.

2.1 Traffic management schedules shall be submitted to the engineer for review prior to the start of work and prior to any revisions to the traffic management schedule. The traffic management schedule shall include the proposed traffic control measures, the hours traffic control will be in place, and work hours.

2.2 The traffic management schedule shall conform to the limitations specified in Sec 616 regarding lane closures, traffic shifts, road closures and other width, height and weight restrictions.

2.3 The engineer shall be notified as soon as practical of any postponement due to weather, material or other circumstances.

2.4 In order to ensure minimal traffic interference, the contractor shall schedule lane closures for the absolute minimum amount of time required to complete the work. Lanes shall not be closed until material is available for continuous construction and the contractor is prepared to diligently pursue the work until the closed lane is opened to traffic.

2.5 Traffic Congestion. The contractor shall, upon approval of the engineer, take proactive measures to reduce traffic congestion in the work zone. The contractor shall immediately implement appropriate mitigation strategies whenever traffic congestion reaches an excess of **15 minutes** to prevent congestion from escalating beyond this delay threshold. If disruption of the traffic flow occurs and traffic is backed up in queues equal to or greater than the delay time threshold listed above then the contractor shall immediately review the construction operations which contributed directly to disruption of the traffic flow and make adjustments to the operations to prevent the queues from reoccurring. Traffic delays may be monitored by physical presence on site or by utilizing real-time travel data through the work zone that generate text and/or email notifications where available. The engineer monitoring the work zone may also notify the contractor of delays that require prompt mitigation. The contractor may work with the engineer to determine what other alternative solutions or time periods would be acceptable. When a Work Zone Analysis Spreadsheet is provided, the contractor will find it in the electronic deliverables on MoDOT's Online Plans Room. The contractor may refer to the Work Zone Analysis Spreadsheet for detailed information on traffic delays.

2.5.1 Traffic Safety.

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

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

3.0 Work Hour Restrictions.

3.1 There are six major holiday periods shown below. All lanes shall be scheduled to be open to traffic during these holiday periods, 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 approved by the Engineer.

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

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

3.3 Any work requiring a reduction in the number of through lanes of traffic shall be completed during nighttime hours. Nighttime hours shall be considered to be 7:00 p.m. to 6:00 a.m. for this project.

3.4 Traffic pacing for girder placement to be coordinated with the Engineer and Highway Patrol. Girder placement will only be allowed between the hours of 10pm and 6am. Provide two-week advance notice to the engineer prior to requested dates for girder placement.

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

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

4.0 Detours and Lane Closures.

4.1 When a changeable message sign (CMS) is provided, the contractor shall use the CMS to notify motorists of future traffic disruption and possible traffic delays one week before traffic is shifted to a detour or prior to lane closures. The CMS shall be installed at a location as approved or directed by the engineer. The CMS shall be capable of communication with the Transportation Management Center (TMC), if applicable, prior to installation on right of way. All messages planned for use in the work zone shall be approved and authorized by the engineer or its designee prior to deployment. When permanent dynamic message signs (DMS) owned

and operated by MoDOT are located near the project, they may also be used to provide warning and information for the work zone. Permanent DMS shall be operated by the TMC, and any messages planned for use on DMS shall be approved and authorized by the TMC at least 72 hours in advance of the work.

4.2 Per the environmental commitments, the public, emergency and school services will be notified of the road work 30 days prior to the start of construction, and one week before the establishment of a detour. A plan for how notifications will occur to be developed by the contractor as part of the Traffic Management Plan.

4.3 Maximum length of closure of Route CC in construction stage 3 will be 7 days. Liquidated damages will be applied. See Liquidated Damages Specified for Route CC Closure JSP-93-28.

4.4 Maximum length of closure of Rifle Range Road in construction stage 2 will be 30 days. Liquidated damages will be applied. See Liquidated Damages Specified for Rifle Range Road Closure JSP-93-28.

4.5 Maximum length of closure of Marshall Road in construction stage 2 will be 30 days. Liquidated damages will be applied. See Liquidated Damages Specified for Marshall Road Closure JSP-93-28.

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

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

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

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

Missouri Highway Patrol 417-895-6868		
Webster County, MO	City of Marshfield, MO	City of Niangua, MO
Sherriff: 417-859-2247	Fire: 417-859-0884	Fire: 417-473-6226
	Police: 417-859-5325	

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

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

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

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

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

John Sanders, P.E.
Transportation Project Manager - Southwest District
3025 East Kearney St.
Springfield, MO 65803

Telephone Number: (417) 829-8039
Email: John.Sanders@modot.mo.gov

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

F. Supplemental Revisions

(to be inserted by Central Office)

G. Contractor Quality Control NJSP-15-42

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

2.0 Quality Control Plan.

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

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

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

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

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

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

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

4.0 Work Planning and Scheduling.

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

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

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

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

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

4.4.2 Prior to all Hold Point inspections, the contractor shall verify the work has been completed in accordance with the contract and specifications. If the engineer identifies any corrective actions needed during a Hold Point inspection, the corrections shall be completed prior to continuing work. The engineer may require a new Hold Point to be scheduled if the corrections require a follow-up inspection. Re-scheduling of Hold Points require a minimum 24-hour advance notification from the contractor unless otherwise allowed by the engineer.

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

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

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

H. MoDOT's Construction Workforce Program NJSP-15-17A

1.0 Description.

1.1 Projects utilizing federal funds include contract provisions for minority and female workforce utilization in the various trade crafts used to complete construction contracts. These federal contract workforce goals are described in the section labeled "Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity". These goals are included in all MoDOT federal aid contracts and are under the authorization and enforcement of the U.S. Department of Labor (US DOL).

1.2 The Federal workforce requirement (Goals – TABLE 1) is authorized in 41 CFR Part 60-4 and Executive Order 11246 which set Equal Employment Opportunity goals with Affirmative Action requirements.

1.3 The required federal aid workforce provisions noted above, coupled with the following additional contract provisions, constitute MoDOT's Construction Workforce Program herein called Program.

1.4 This provision does not require pre-qualification nor is it a condition of award.

1.5 The Program does not eliminate or limit any actions the US DOL may take in relation to this contract's federal provisions.

1.6 The Program goals included in the contract are separate from any Disadvantaged Business Enterprise (DBE) or On-The-Job (OJT) training provision that may be included as contract provisions. DBE and OJT goals may or may not be included in a contract based on the individual size of contracts, type of contract work, anticipated length of contract, available and willing resources or other reasons.

1.7 Contractor, for the purpose of this provision, means the prime contractor and any and all subcontractors.

1.8 It is expected that the contractor recognizes the construction workforce goals for both minority and female workers in the project's county and make efforts to attain those goals, if possible, through the existing workforce makeup of the prime (including subcontractors) that will be on the project and/or through hiring opportunities that may arise for the project. However, it is not the intent of this provision to compel any contractor to displace existing workforce or move workers around to just meet the workforce goals.

1.9 If the contractor's existing Missouri construction workforce meets or exceeds the federal workforce goals established in Table 1, then the OJT goal (Training Provision) if included in the contract, does not be apply.

1.10 Contractor's Workforce Plan. The Contractor shall submit its Workforce Plan a minimum of 1 week before construction starts. One plan shall be submitted for the project that shall include the cumulative planned workforce of the prime and subcontractor(s). The contractor shall prepare the plan, for total minority and female utilization, regardless of the craft. The Engineer will provide the Contractor with comments regarding their Workforce Plan prior to the start of construction. Once work starts, all monthly reporting shall include the craft of each worker reported. If the contractor's plan includes project manager, direct project support roles, project testers or other project professionals, these designations should also be included in addition to the workers designated by craft such as laborer, operator, carpenter, ironworker and others.

1.11 The plan accepted by the engineer before the start of construction will be the effort expected of the prime contractor to maintain during the life of the project.

1.12 If the contractors planned project workforce plan (including OJT hours if included in the contract) is short of the goals included in Table 1, there is opportunity for the contractor to receive a reimbursement of $10.00 / hour for any new project minority and female hires needed through the remainder of the project. The reimbursement is applicable to work that qualifies for prevailing wage under the federal Davis-Bacon Act, 40 U.S.C. §§ 3141–3148, in accordance with an approved workforce plan. Any reimbursement must be pre-approved by the Engineer. The reimbursement is provided as a remedy to the contractor and as an aid in the long-term growth of experienced persons in the building of roads and bridges in Missouri. The contractor shall manage the plan through the life of the project as described in the plan or as modified, in coordination with the Engineer. The total amount available per project is not capped.

1.13 The Contractor's workforce plan may include existing construction support and professional services staff.

2.0 Forms and Documentation. The bidder must submit the following documents if awarded the contract:

Cumulative Workforce Utilization Reports. This report is contract specific. One report shall be submitted to the Engineer by the 15th of each month. The report will be used to report the total workforce compliance data for the prime contractor and all subcontractors retained by the contractor on the Commission's construction contract. The reporting shall include the workforce hours per each craft broken down by gender and ethnicity. Construction Support, testing and other professional services hours shall be included as these hours are part of the overall plan. The report will include the previous month's hours worked for the project. For projects less than 60 days in length, only one report with total hours worked by classification is required at substantial completion of construction.

3.0 Methods for Securing Workforce Participation and Good Faith Efforts.

3.1 *By submitting a bid, the Bidder agrees, as a material term of the contract, to carry out MoDOT's Construction Workforce Program by making good-faith efforts to utilize minority and female workers on the contractor's job sites to the fullest extent consistent with submitting the lowest bid to MoDOT. The Bidder shall agree that the Program is incorporated into this document and agree to follow the Program. If a bidder is unable to meet the workforce goals at the time of bid, it shall be required to objectively demonstrate to MoDOT that the goals have been met or demonstrate a good faith effort has been made with the level of effort submitted prior to the start of construction.*

3.2 The Engineer, through consultation with MoDOT's External Civil Rights (ECR's) Division, may determine that the contractor has demonstrated that good-faith efforts to secure minority and female participation have been made.

3.3 In evaluating good-faith efforts, the ECR's Division will take into consideration the affirmative actions listed in the Federal Provisions (including provisions of Executive Order 11246).

3.4 MoDOT's Program allows the contractor flexibility to implement a project specific workforce and improve the diversity of their existing workforce that can be utilized across various areas of the state to meet future MoDOT Program goals and Federal Provisions.

3.5 If the contractor's approved plan changes during the project and/or the available workforce changes from what is approved at any time, it is the contractor's responsibility to remedy, in coordination with MoDOT's ECR Division, the conditions as outlined and made available through this provision.

4.0 Compliance Determination. (Required with project closeout) All documentation and on-site information will be reviewed by MoDOT's ECR Division in making a determination of whether the contractor made sufficient good faith efforts to meet the compliance with MoDOT's Construction Workforce Program.

5.0 Liquidated Damages. If the contractor elects to not submit a workforce plan prior to work starting or fails to fulfill their workforce plan committed to prior to the start of construction, the contractor will be required to establish a good-faith effort determination, as to why either of these events occurred. MoDOT may sustain damages, the exact extent of which would be difficult or impossible to ascertain, as this impacts the cost of future road and bridge construction. Therefore, in order to liquidate those damages, MoDOT shall be entitled, at its sole discretion, to deduct and withhold the following amounts: **The sum of one thousand five hundred ($1,500)**

6.0 Administrative Reconsideration. The contractor shall be offered the opportunity for administrative reconsideration upon written request related to findings and/or actions determined by MoDOT's ECR's Division. The Administrative Reconsideration Committee shall be composed of individuals not involved in the original MoDOT determination(s).

7.0 Available Pre-Apprentice Training Programs. The Commission has established a labor force recruiting program intended to assist contractors in identifying, interviewing and hiring qualified job applicants. MoDOT strongly encourages the hiring of individuals from the MoDOT funded pre-apprentice training programs.

8.0 Independent Third-Party Compliance Monitor (Monitor). MoDOT may utilize a monitor that will be responsible for tracking the project's workforce utilization for the information the contractor submits. The contractor and its subcontractors shall allow the monitor access to their reports, be available to answer the monitor's questions and allow the monitor to access to the site and to contractor and subcontractor employees. The monitor shall abide by the contractor's project site protocols.

9.0 Regional Diversity Council (Council). (Applicable to the Kansas City and St. Louis District regions only) The Council shall consist of local community leaders, leadership of local construction trades, MoDOT staff, Industry representation, and a representative(s) from the Federal Highway Administration. The Council will meet quarterly and evaluate the workforce activity per each project according to the following criteria:

a. Review monthly workforce reports.
b. Review progress toward the stated project workforce program.
c. Review findings of Administrative Reconsideration hearings.
d. Recommend *other* workforce actions to MoDOT.

10.0 Federal Workforce Goals.

Female Participation for Each Trade is 6.9% Statewide for Missouri.

Minority Participation for Each Trade is shown below in Table 1.

TABLE 1:

County	Goal (Percent)	County	Goal (Percent)
Adair	4	Linn	4
Andrew	3.2	Livingston	10
Atchison	10	McDonald	2.3
Audrain	4	Macon	4
Barry	2.3	Madison	11.4
Barton	2.3	Maries	11.4
Bates	10	Marion	3.1
Benton	10	Mercer	10
Bollinger	11.4	Miller	4
Boone	6.3	Mississippi	11.4

Buchanan	3.2	Moniteau	4
Butler	11.4	Monroe	4
Caldwell	10	Montgomery	11.4
Callaway	4	Morgan	4
Camden	4	New Madrid	26.5
Cape Girardeau	11.4	Newton	2.3
Carroll	10	Nodaway	10
Carter	11.4	Oregon	2.3
Cass	12.7	Osage	4
Cedar	2.3	Ozark	2.3
Chariton	4	Pemiscot	26.5
Christian	2	Perry	11.4
Clark	3.4	Pettis	10
Clay	12.7	Phelps	11.4
Clinton	10	Pike	3.1
Cole	4	Platte	12.7
Cooper	4	Polk	2.3
Crawford	11.4	Pulaski	2.3
Dade	2.3	Putnam	4
Dallas	2.3	Ralls	3.1
Daviess	10	Randolph	4
DeKalb	10	Ray	12.7
Dent	11.4	Reynolds	11.4
Douglas	2.3	Ripley	11.4
Dunklin	26.5	St. Charles	14.7
Franklin	14.7	St. Clair	2.3
Gasconade	11.4	St. Francois	11.4
Gentry	10	Ste. Genevieve	11.4
Greene	2	St. Louis City	14.7
Grundy	10	St. Louis County	14.7
Harrison	10	Saline	10
Henry	10	Schuyler	4
Hickory	2.3	Scotland	4
Holt	10	Scott	11.4
Howard	4	Shannon	2.3
Howell	2.3	Shelby	4
Iron	11.4	Stoddard	11.4
Jackson	12.7	Stone	2.3
Jasper	2.3	Sullivan	4

Jefferson	14.7	Taney	2.3
Johnson	10	Texas	2.3
Knox	4	Vernon	2.3
Laclede	2.3	Warren	11.4
Lafayette	10	Washington	11.4
Lawrence	2.3	Wayne	11.4
Lewis	3.1	Webster	2.3
Lincoln	11.4	Worth	10
		Wright	2.3

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)

This contractor and subcontractor shall abide by the requirements of 41 CFR 60-1.4(a), 60-300.5(a) and 60-741.5(a). These regulations prohibit discrimination against qualified individuals based on their status as protected veterans or individuals with disabilities, and prohibit discrimination against all individuals based on their race, color, religion, sex, sexual orientation, gender identity or national origin. Moreover, these regulations require that covered prime contractors and subcontractors take affirmative action to employ and advance in employment individuals without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability or veteran status.

As used in these specifications:

"Minority" includes;

(i) Black (all person having origins in any of the Black African racial groups not of Hispanic origin);
(ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
(iii) Asian and pacific islander (all persons having origins in any of the original peoples of the Far East, southeast Asia, the Indian Subcontinent, or the Pacific Islands; and
(iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North American and maintaining identifiable tribal affiliations through membership and participation or community identification).

I. Additional Mobilization for Seeding NJSP-16-03

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

2.0 Additional Mobilization for Seeding. Additional mobilization to perform temporary or permanent seeding, beyond the initial occurrence, may be necessary as specified in Sec

806.50.2 and as required per terms of the SWPPP. Mobilization of all equipment, workers and materials necessary to perform seeding and mulching shall be considered included in this work.

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

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

J. Add Alternate Sections JSP-12-03A

1.0 Description. This contract requires bidders to bid on additional contract work that will be considered for award. The award of this project does not guarantee work for all add alternate sections.

Routes	Proposal Section Description
Route CC, Interchange Ramps, Marshall Road, Rifle Range Road	Base
Interchange Landscaping and Irrigation	Add Alternate A
Elm Street	Add Alternate B

Note: See plans for a breakdown of all quantities for each add alternate section.

2.0 Consideration of Bids. The contractor shall submit a bid for each add alternate section. The Commission reserves the right to award, to the lowest responsible bidder, the combination of base plus add alternate sections that will allow the most work to be completed within the Commission's budget of $***(Insert Program Dollar Amount)***. If the Commission chooses to exercise this right, the award of add alternate sections will be selected in accordance with the following priorities:

1. Base + Add Alt A + Add Alt B
2. Base + Add Alt A
3. Base

2.1 The Commission reserves the right to award the combination of highest priority add alternate sections over the Commission's budget as long as the low bidder does not change and the award of the combination of highest priority alternate sections does not exceed more than ten percent or $250,000 of the Commission's budget, whichever is less.

2.2 The Commission's budget is the basis for award of add alternates but not the basis for award of the base section. The base section of the contract will be awarded or rejected in accordance with Sec 100.

2.3 The awarded bidder will be notified, on MoDOT's website, of the Commission's selection of the combination of add alternate sections to be awarded the day of the Commission meeting.

3.0 Bid Bond Requirements. The contractor shall be required to obtain a bid bond for 5% of the total bid amount for the base bid and all add alternates. This bid bond will be considered applicable to the proposed work for any option.

4.0 DBE Goal. The DBE contract goal percentage applies to all work awarded. The bidder shall meet the DBE Goal in the base section and any add alternates awarded. The award of any add alternates will be determined by the Commission budget as described in Section 2.0.

4.1 The contractor may elect to complete the electronic form to be submitted with their bid but should not rely on the color of the DBE Goal folder to determine if the goal is met.

5.0 Basis of Payment. The accepted quantities of the chosen combination of base plus add alternate sections will be paid for by the contract unit bid price for item numbers found within the schedule of items for each section.

K. 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**
AT&T Distribution Contact: Ashley Davis (417) 836-2652 ad6628@att.com	Yes See 2.0	Communications
Webster Electric Cooperative Contact: Tom Houston (417) 859-2216 x 135 tomh@websterec.com	Yes See 3.0	Power
Sho-Me Technologies Contact: Brad McGoon (417)830-6717 DMcGoon@shomepower.com	Yes See 4.0	Communications

CenturyLink-local Contact: Garland Jones (417) 926-0117 Garland.Jones @centurylink.com	Yes See 5.0	Communications
Lightcore, A Centurylink Company Contact: Bobby Kennedy (417) 860-4526 bobby.kennedy@centurylink.com	Yes See 6.0	Communications
Summit Gas Contact: James Trujillo (660) 473-1933 jtrujillo@Summitutilitiesinc.com	Yes See 7.0	Gas
Sho-Me Power Electric Coop. Contact: Ron Marlin (417) 859-2615 RMarlin@shomepower.com	Yes See 8.0	Electric

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 AT&T-d AT&T has an existing toll fiber in conflict with Proposed Ramps 3 and 4, as shown on plan sheets 4-7. AT&T plans to perform their relocation soon after the roadway contractor performs the tree clearing operation within AT&T's utility easement and within right of way, as shown on plan sheets 4-7. AT&T advised they anticipate taking 6-8 weeks to complete their relocation work after their contractor starts working. AT&T advised they need 3 weeks prior notice to advise their contractor to commence working on the project.

3.0 Webster Electric Coop. Webster Electric Coop has existing overhead facilities in the job limits:
(1) crossing I-44 (see plan sheet 6)
(2) along the Marshall Road (see plan sheet 9, 10 and 11)
(3) along Rifle Range (see plan sheet 15 and 16).

Webster Electric plans to replace the overhead facilities crossing I-44 and along Marshall Road with underground facilities (see plan sheets 6. 9.10). Webster Electric plans to install new overhead facilities along Rifle Range (sheet 15 and16). Webster Electric plans to start work soon after the tree clearing operation by the road contractor is complete between Marshall Road and I-44. Webster Electric advised they have 8-10 weeks of work to complete all their relocation work in the project.

4.0 Sho-Me Technologies Sho-Me Technologies fiber is located on Webster Electric poles. Webster Electric advised they plan to relocate the fiber in conjunction with their electric relocation work.

5.0 CenturyLink-local CenturyLink-local has buried copper facilities at the following locations:
1) North side of north outer road of I-44 (see plan sheets 4-8)- relocations shown on plan sheets 5-7)
2) East side of Marshall Road (see plan sheets 6, 10 and 11). Relocations are shown on plan sheets 6 and 11)
3) North side of Route CC (see plan sheets 15 and 16), Relocation is shown on plan sheets 15 and 16)

CenturyLink advised they plan to start the relocation work in early May 2018 and take 12 weeks to complete all the relocations.

6.0 LightCore LightCore has a fiber in the median of I-44 (see plan sheet 4-8). LightCore plans to shift their fiber away from the intermediate bridge piers and concrete encase 100 feet of fiber conduit, as shown on plan sheet 6. LightCore advised they anticipate starting the work soon after the preconstruction meeting and take two weeks to complete the work.

7.0 Summit Gas Summit Gas has an existing gas main located on the north side of Marshall Road (see plan sheets 6, 10 and 11). Summit Gas relocation is shown on plan sheets 6, 10 and 11. Summit Gas advised they plan to start soon after the preconstruction meeting and take 6-8 weeks to complete their relocation work.

8.0 Sho-Me Power Electric Coop. Sho-Me has overhead 69kv transmission lines that cross I-44 (see plan sheet 8), and along Rifle Range (see plan sheet 15 and 16). There are no conflicts with the I-44 crossing but along Rifle Range will need to relocate to span the new Route CC, as shown on plan sheet 15. Sho-Me Power plans to have their new facilities relocated by early May 2019.

L. Liquidated Damages Specified for Marshall Road Closure JSP-93-28

1.0 Description. If Marshall Road is not complete and open to traffic within **30** days of its closure, 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 **$1,000** per day for each full day that Marshall Road is not complete and open to traffic in excess of the limitation as specified elsewhere in this special provision. It shall be the responsibility of the engineer to determine the quantity of excess closure time.

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 for Route CC Closure JSP-93-28

1.0 Description. If Route CC is not complete and open to traffic within **7** days of its closure, 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 day for each full day that Route CC is not complete and open to traffic in excess of the limitation as specified elsewhere in this special provision. It shall be the responsibility of the engineer to determine the quantity of excess closure time.

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 for Rifle Range Road Closure JSP-93-28

1.0 Description. If Marshall Road is not complete and open to traffic within **30** days of its closure, 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 **$1,500** per day for each full day that Rifle Range Road is not complete and open to traffic in excess of the limitation as specified elsewhere in this special provision. It shall be the responsibility of the engineer to determine the quantity of excess closure time.

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. Special Drainage Structures

1.0 Description. This work covers the furnishing and installation of special drainage structures as shown in the plans and details.

2.0 Construction Requirements. Construction shall be in accordance with the Missouri Department of Transportation Standard Specifications and Plans, latest edition.

3.0 Method of Measurement.

3.1 Measurement of Special Inlet No. 1 shall be the depth for payment, as per the Special Sheets and as shown in the Culvert Section Plan Sheets.

3.3 Excavation for Special Inlets is paid for separately as Class 3 Excavation. See plans for quantities.

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:

Pay Item No. 731-99.13, Special Inlet No. 1, per foot.

P. Rock Excavation Quantity

1.0 Description. The assumed rock excavations quantities are shown in the plans for information only. The cross sections and related quantities were based on best data for rock and they may not reflect field conditions. No additional compensation will be given for differing field conditions.

The State of Missouri and, in particular, the area that encompasses this project is known to have, at least in part, bedrock that exhibits karst conditions. One karst condition is sometimes referred to as pinnacle or pinnacled rock. The nature of this condition makes graphical representations of this pinnacled zone difficult to classify and excavate. It is incumbent upon the bidder to investigate above surface warnings of this rock formation (road cuts, quarry sites and any other exposed faces) and be aware that the same is a regularly occurring phenomenon and is not to be regarded as a differing site condition or result in changes in the work, regardless of what any actual boring or lines on the plans may or may not tend to indicate.

2.0 Material and Construction Requirements. The material and construction requirements shall conform to Sec 203.

3.0 Method of Measurement. The method of measurement shall conform to Sec 203.

4.0 Basis of Payment. Excavation will be paid for as Pay Item No. 203-50.00, Unclassified Excavation, per cubic yard.

Q. Special Curb, Curb and Gutter

1.0 Description. This work covers the furnishing and installation of special concrete curb, and curb and gutter as shown in the plans and details.

2.0 Construction Requirements and Method of Measurement. Construction Requirements and Method of Measurement shall conform to Missouri Standard Specifications in Section 609, except as modified in the plans.

3.0 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.

Pay Item No. 609-99.03, 24 In. Spill Curb and Gutter, per linear foot.
Pay Item No. 609-99.03, Integral Curb Type O, 4 In., per linear foot.
Pay Item No. 609-99.03, Concrete Curb (4 In. Height) Type O, per linear foot.

R. Concrete Traffic Barrier, Special

3.0 Description. This work covers the furnishing and installation of special concrete traffic barrier as shown in the plans and details.

4.0 Construction Requirements. The barrier will include Ashlar Stone form lining and stained to match the adjacent bridge safety barrier curb. All requirements for the bridge safety barrier curb apply.

5.0 Method of Measurement. No measurement of completed barrier will be made.

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.

Pay Item No. 617-99.03, Concrete Traffic Barrier, Special, per linear foot.
Pay Item No. 617-99.01, Concrete Traffic Barrier Form Lining and Staining, per lump sum.

S. Combination Pad Mounted Power Supply and Lighting Control Station

1.0 Description. This work shall consist of furnishing and installing combination power supply and control stations as shown in the plans. The pad mounted power supply shall be for 120V continuous service for either CCTV Camera or a future irrigation system, and 240V photoelectric controlled lighting service. Control stations shall be installed in accordance with the plans and by direction of the engineer.

2.0 Construction Requirements. Construction requirements shall conform to Missouri Standard Specifications in Section 901.

3.0 Basis of Payment. Payment for furnishing and installing pad mounted combination units shall include all excavation, materials, equipment, tools, labor, and work incidental thereto, and shall be considered to be completely covered by the following contract unit price for items as indicated in the plans:

Number 901-99.02, “Dual Meter, Combination Pad Mounted Power Supply / Lighting Control Station, 120/240V,” per each

No direct pay will be made for cable, rigid steel conduit, and installation thereof necessary for connection of the combination pad mounted power supply and controller to the power source.

T. Damage to Existing Pavement, Shoulders, Side Roads, and Entrances

1.0 Description. This work shall consist of repairing any damage to existing pavement, shoulders, side roads and entrances caused by contractor operations. This shall include, but is not limited to, damage caused by the traffic during contractor operations within the project limits including the work zone signing.

2.0 Construction Requirements. Any cracking gouging, or other damage to the existing pavement, shoulders, side roads, or entrances from general construction shall be repaired

within twenty-four (24) hours of the time of damage at the contractor's expense. Repair of the damaged pavement, shoulders, side roads, or entrances shall be as determined by the engineer.

3.0 Method of Measurement. No measurement of damaged pavement or shoulder areas or damaged side roads or entrances as described above shall be made.

4.0 Basis of Payment. No payment will be made for repairs to existing pavement, shoulders, side roads or entrances damaged by contractor expenses.

U. Winter Months Requirements JSP-15-07

1.0 Description. This project contains work which spans the winter months.

2.0 Work to be Completed. When the contractor ceases operations for the winter months, any paving operation performed by the contractor shall not result in a lane height differential between adjacent lanes.

3.0 Maintenance of Pavement Marking. Prior to ceasing operations for winter months, a permanent or temporary stripe shall be provided on any completed length to the point that the original stripe was obliterated or obscured by the contractors operation. Temporary striped areas shall be re-striped with the remaining route upon performance of the final striping.

4.0 Winter Related Maintenance Activities. The contractor shall have the project in a condition as not to interfere with the plowing of snow. The contractor shall also provide a taper at the end of his paving that will not be damaged by the plowing of snow.

5.0 Basis of Payment. There will be no direct pay for compliance with this provision.

V. Disposition of Existing Signing JSP-12-01A

1.0 Description. All signing indicated for removal in the plans, shall be covered by the contractor and delivered to the following location. The contractor shall call the phone number listed below 48 hours prior to delivery and make arrangements for the delivery.

Jeff Robertson
Marshfield Maintenance Lot
331 Pin Oak Loop
Marshfield, MO 65706
Phone 417-859-2219

2.0 The contractor shall exercise reasonable care in the handling of the signs during the removal and transportation. Should any of the signs be damaged by the contractor's negligence, it shall be replaced at the contractor's expense.

3.0 Basis of Payment. Payment for removal and transportation of these signs, as shown in the plans, shall be considered as and completely covered by the contract unit price for Item No. 202-20.10, "Removal of Improvements", per lump sum.

W. Alternates for Pavements JSP-96-04G

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

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

2.0 Mainline Pavements

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

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

2.1 A2 Shoulders

2.1.1 A sum of $_____ *(amount to be inserted by Central Office)* will be added by the Commission to the total bid using an asphalt A2 Shoulder **Alternate C** for the Ramp 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.

2.1.1 A sum of $_____ *(amount to be inserted by Central Office)* will be added by the Commission to the total bid using an asphalt A2 Shoulder **Alternate G** for the Route CC pavement for bid comparison purposes to factor in life cycle cost analysis of the roadway. The additional amount added will not represent any additional payment to be made to the successful bidder and is used only for determining the low bid.

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

2.3 The grading shown on the plans was designed for the concrete pavement alternate.

2.4 Pavement alternates composed of Portland cement concrete shall have contrast pavements for intermittent markings (skips), dotted lines, and solid intersection lane lines. The

pavement markings shall comply with Sec 620. No additional payment will be for the contrast pavement markings.

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

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

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

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

X. ADA Compliance and Final Acceptance of Constructed Facilities JSP-10-01A

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:

http://www.modot.mo.gov/business/contractor_resources/forms.htm

2.1 The ADA Checklist is intended to be a helpful tool 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. 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-complaint 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-complaint items that are allowed to remain at the end of the construction project. Specific details of the non-complaint 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.

Y. Contractor Furnished Surveying and Staking – SW

In addition to the requirements of Section 627 of the Missouri Standard Specifications for Highway Construction, the following shall apply:

1.0 Description. The contractor shall be responsible for all layout required on the project. This responsibility shall include, but not be limited to the following: Construction signing, transition milling, pavement marking, loop detectors, etc.

1.1 The above list is not all inclusive. The contractor shall have the primary responsibility for these operations. The contractor shall provide the Resident Engineer with a staking plan layout for approval prior to the installation of signs. The RE will also provide assistance during this layout provided a request is submitted to the RE or Construction Project Manager 48 hours in advance. This will ensure that all permanently mounted traffic control devices remain consistent with District policy and avoid re-staking. If the contractor installs any signs without engineer approval, all costs associated with re-staking and/or relocation will be at the contractor's expense.

1.2 The intent of this provision is to increase the quality of our work zones and minimize negative impacts to the contractor's schedule that can result from delays in staking.

1.3 Any adjustments to the plan quantities or line numbers established in the contract shall be approved by the Engineer.

2.0 Basis of Payment. No direct payment will be made to cover the costs associated with these additional requirements. All costs will be considered completely covered by the unit bid price submitted for Contractor Furnished Surveying and Staking.

Z. Temporary Pavement Marking Removal

1.0 Description. This work will include removing temporary pavement markings as shown on the traffic control plans.

2.0 Construction Requirements. This work shall conform to Section 620.50 of the Standard Specifications, latest edition. In addition, the contractor will not be allowed to diamond grind; waterblasting or shotblasting are the preferred removal methods.

3.0 Basis of Payment. Temporary pavement marking removal shall be incidental to the cost of each of the associated temporary pavement marking pay items shown on the contract plans.

AA. Powder Coating JSP-04-06

1.0 Scope. This specification covers a powder coating finish for metallic components.

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. Powder coating each light pole and associated base, bracket arm and luminaire, noted in the plans shall be included in the contract unit price and shall be considered as full compensation for all labor, equipment, materials, or other construction involved to complete the work.

Pay Item No. 901-99.02, Black Powder Coating, per each.

BB. Central Island Grading

1.0 Description. This specification will only apply if Add Alternate B is not selected. If Add Alternate B is selected, follow the landscaping plans and specifications for central island grading.

This work shall consist of final grading of the central island of the roundabouts. The earth shall be broken up and loosened through mechanical means to the satisfaction of the engineer. The grading shall be brought to the final grade shown in the plans, smoothed, loosely tamped, and without irregularities over 6 inches tall, but not compacted in such a manner as to make re-excavation difficult.

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 provision.

CC. Grounded Power Receptacle

1.0 Description. This specification will only apply if Add Alternate B is selected.

This work shall consist of providing a post-mounted grounded GFCI weather resistant power duplex receptacle with weather-proof while in use cover near the flag poles in each roundabout. The location of the receptacle to be determined by the engineer in consultation with the City of Marshfield. The distance from the pull box to the receptacle shall not be more than 80 feet. The final height of the receptacle shall be a minimum of 18 inches above the finished grade. A

weed barrier consisting of a geotextile and rock blanket shall be provided within a radius of 3 feet from the finished receptacle. A subsurface drainage geotextile conforming to Section 624 shall be installed underneath a rock blanket with a minimum depth of 2 inches around the completed post. The rock blanket shall conform to the material specifications for Type 5 Aggregate Base or as approved by the engineer.

2.0 Materials. The receptacle shall have two grounded GFCI outlets and be rated for outdoor use. All conduit and wire required from the pull box located inside the roundabout to the final location shall be incidental to the cost of the receptacle. Conduit to be one-inch minimum diameter schedule 40 PVC or approved equal. Wire to be 8 AWG minimum.

Contractor to apply sticker inside of weather-proof cover listing maximum loading of receptacle of 500 Watts.

3.0 Construction Requirements. All electrical work described in this provision shall adhere to the latest adopted version of the National Electrical Code.

4.0 Basis of Payment. All conduit, wire, support posts, weed barrier, and other materials required to ensure the safe operations shall be included in the contract unit price and shall be considered as full compensation for all labor, equipment, materials, or other construction involved to complete the work.

Pay Item No. 901-99.02, Grounded Power Receptacle, per each.

DD. Route 66 Pavement Preservation

1.0 Description. This work shall consist of the Contractor leaving the existing Route 66 roadbed in place, as shown in the plans. The transverse ends are to be sawcut and backfilled with compacted earth. The contractor is to preserve the surface of the pavement and protect it from damage during construction. Tracked equipment will not be allowed on the section to persevered without adequate protection to ensure the protection of the pavement.

Any pavement removed outside of the existing pavement along the existing MO-CC (Route 66) to remain shall be preserved in large chunks (No smaller than 1 foot x 1 foot) and hauled to the XXXXXX.

The contractor is to notify Jill Phillips (417-860-3379) and John Benson (417-630-9014) 1 week prior to removal activities in this location. All activities associated with the removal of the existing pavement along the existing Route 66 alignment will be documented as part of the preservation efforts.

2.0 Basis of Payment. No direct compensation will be made to the Contractor for compliance with this provision. All costs associated with the equipment, labor, materials, and time necessary to fulfill the requirements of this provision shall be considered completely covered by the removal of improvements (Sec 202) line items in the contract.

EE. Field Verification of Existing Drainage Structures

1.0 Description. Contractor is responsible for field verifying the location and elevations of existing structures and pipes prior to beginning construction on each proposed structure. There is no direct payment for field measurements of existing structures.

FF. Fertilizing And Seeding

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

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

West of Interstate 44:

Pounds per Acre				
Offset	Calcium (Ca)	Nitrogen (N)	Phosphorus (P_2O_5)	Potassium (K_2O)
Beyond 30'	800	40	120	40
Within 30'	1200	80	240	80

East of Interstate 44:

Pounds per Acre				
Offset	Calcium (Ca)	Nitrogen (N)	Phosphorus (P_2O_5)	Potassium (K_2O)
Beyond 30'	1400	40	140	60
Within 30'	2100	80	280	120

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

Cool Season Mixtures Within the First 30 Feet Pounds Pure Live Seed (PLS) per Acre	
Tall Fescue	80 lbs.
Teff Grass	3 lbs.
Perennial ryegrass	6 lbs.
Annual ryegrass	5 lbs.
White clover	6 lbs.
Oats	5 lbs.
TOTAL	**105 PLS lbs./acre**

Warm Season Mixture Beyond the First 30 Feet and Steeper Than 3:1 Slopes Pounds Pure Live Seed (PLS) per Acre	
Indiangrass	6 lbs.
Big bluestem	4 lbs.
Little bluestem	5 lbs.
Sideoats grama	4 lbs.
Switchgrass	2 lbs.
Virginia or Canada rye	2 lbs.
Tall dropseed	0.5 lbs.

Purple prairie clover	0.5 lbs.
Teff Grass	3 lbs.
Perennial ryegrass	5 lbs.
Tall fescue	5 lbs.
Red fescue	5 lbs.
Redtop	1.5 lbs.
Partridge pea	3 lbs.
White clover	5 lbs.
Gray headed coneflower	0.25 lbs.
Black-eyed Susan	0.25 lbs.
Oats	5 lbs.
TOTAL	**57 PLS lbs./acre**

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

5.0 Basis of Payment.

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

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

GG. Environmental Commitments

1.0 Description. MoDOT and the City of Marshfield have made environmental commitments that apply to the contractor's work. The contractor must comply with the following provisions during the prosecution of the work.

1. If regulated solid or hazardous wastes are found during construction activities, the construction inspector shall direct the contractor to cease work at the suspect site. The construction inspector shall contact the appropriate environmental specialist to discuss options for remediation. The environmental specialist, the construction office, and the contractor shall develop a plan for sampling, remediation, and continuation of project construction. Independent consulting, analytical, and remediation services shall be contracted, if necessary. The MDNR and USEPA shall be contacted for coordination and approval of required activities.

2. The contractor, will dispose of all solid waste encountered including, but not limited to, domestic trash, furniture appliances, empty containers, tires, etc., in accordance with Missouri's solid waste disposal regulations.

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 provision.

HH. Parcel Provisions

Parcel 9 – Jenkins, Delbert Earl - A "Do not Disturb" area has been identified on the design plans in relation to Parcel 9. The contractor shall not under any circumstances extend the work outside of the easement or right-of-way limits, including staging or storage of materials.

II. Noise Impacts

1.0 Description. A temporary increase in noise levels due to equipment and construction operations is anticipated. The increased noise might impact residences near and adjacent to the project limits. All construction equipment shall be in good working order such that it will not create noise levels greater than is typically encountered by such equipment with properly functioning mufflers. There will be no direct pay for adherence to this specification.

JJ. Rumble Strip

1.0 Description. This work shall consist of constructing rumble strips as shown on the plans or as approved by the engineer.

2.0 Construction Requirements. Rumble strips shall be placed in accordance with Section 626. In addition, on roadways open to traffic, rumble strips shall be in place no later than five days after the final paving operations. This requirement applies per individual route if multiple routes are included in a contract or if a 15 mile section of an individual route is open to traffic within a contract. To fulfill this requirement, the contractor may have to mobilize in more than once for the installation of rumble strips.

2.1 On divided highways, the edge line rumble strip shall be installed as shown in the plans or per the Standard Plans.

2.2 On two-way roads, the edge line rumble strip shall be installed to maintain 21' preferred/20' absolute minimum between each edge line rumble. If the contract includes a centerline rumble in addition to the edge line rumble, the contractor shall only install the centerline rumble if 10.5' lane can be maintained between the edge of the centerline rumble and edge line rumble or as approved by the engineer. If this minimum distance cannot be achieved, the centerline rumbles may be underrun as approved by the engineer.

2.3 On two-way roads with existing 2' shoulders or include construction of new 2' shoulders, the edgeline rumble strip shall stop and start 25' to each side of the intersecting road or entrance unless otherwise approved by the engineer.

3.0 Basis of Payment. The accepted quantity of rumble strips will be paid at the contract unit price. Payment will be considered full compensation for all labor, equipment, and material necessary to complete the described work, including mobilizing, loading, hauling, stockpiling and disposal of milled material; and any other incidental items.

KK. Pigmenting and Texturing Concrete

1.0 Description. This work shall consist of pigmenting and texturing the concrete with an Ashlar Stone pattern for the truck apron and median strips surrounding the roundabout and bridge.

2.0 Materials. The Manufacturer shall submit to the Engineer, setting forth the brand name, designation (if any), composition and general description of the material to be used in the process of pigmenting. The manufacturer shall submit typical amounts of material to be used in the mixing of the concrete.

2.1 Pigment shall be brown in color matching the decorative elements of the bridge in color and texture, as approved by the engineer and shall be free from oil, grease, dirt and nonferrous particles and shall cause no deleterious effects to the concrete mix. The manufacturer shall guarantee that all materials used in the pigmenting process will have no deleterious effects on the strength and overall integrity of the concrete.

3.0 Sample. A minimum of two working days prior to the placement of the pigmented textured concrete, the Contractor shall submit a sample pavement section to the Engineer. The sample shall be constructed using the identical process for pigmenting and texturing the permanent pavement. If, in the opinion of the Engineer, changes need to be made to the texturing or color, a new sample shall be submitted before final approval can be given. The minimum size sample shall be 4 feet by 4 feet.

4.0 Texturing. After surface irregularities have been removed, the concrete shall be given a uniform surface finish resembling the Ashlar Stone pattern used on the bridge. The method by which the surface is textured is left to the discretion of the Contractor. A stamp or roller device is preferred to maintain consistency. Hand texturing will be permitted in irregular areas where, in the opinion of the Engineer, a stamp or roller device would no longer be beneficial or would not give a satisfactory appearance to the surface of the concrete. Prior to placing the concrete, the Contractor and Engineer shall review all perceived areas where hand texturing may be necessary. The Engineer shall make all efforts to minimize the amount of area to be hand textured.

5.0 Construction Requirements. This work shall be done in accordance with the requirements of Section 502 and 608.

6.0 Method of Measurement. Concrete areas shall be computed to the nearest 1/10 square yard.

7.0 Basis of Payment. Payment for the above described work including all materials, equipment, labor and any other incidental work necessary to complete the item shall be considered as completely covered in pay items:

502-99.05, 8 IN. Truck Apron, per Square Yard
608-30.06, 6 IN. Concrete Median Strip, per Square Yard
608-99.05, Pigmenting and Texturing Concrete, per Square Yard

LL. Stamped & Stained Concrete Sidewalk

1.0 Description. The sidewalk ribbon adjacent to the bridge, as shown on the construction plans, shall be stamped with an Ashlar Stone pattern and stained brown, matching the decorative elements of the bridge in color and texture, as approved by the engineer.

2.0 Construction Requirements. This work shall be done in accordance with the requirements of Section 608.

3.0 Basis of Payment. The accepted quantity of stamped and stained sidewalk shall include all materials, equipment, tools and labor necessary to complete this work, and shall be considered completely covered by the following unit bid price for item numbers:

608-60.04, Concrete Sidewalk, 4 IN., per Square Yard
608-99.01, Stamping and Staining Concrete Sidewalk, per lump sum

MM. Rock Base Material

1.0 Description. The contractor may choose, at no additional cost to MoDOT, to provide a rock base material, 12 inches deep, in lieu of the aggregate base shown in the plans. Should the contractor elect to obtain the material from the right of way, no corresponding increase in earthwork embankment quantities will be allowed.

A contractor option pavement design is provided in the plans if the contractor elects to provide 12-inch rock base. No change in asphalt or concrete quantities will be made if the rock base is selected. No change in payment or additional compensation will be given for rock base.

2.0 Material and Construction Requirements. The material and construction requirements shall conform to Sec 303.

3.0 Method of Measurement. The method of measurement shall conform to Sec 304.

4.0 Basis of Payment. Payment will be considered full compensation for all labor, equipment, materials, and incidentals required to complete the described work. All costs incurred for complying with this provision including all costs for using Rock Base Material shall be considered completely covered by the contract unit price for Pay Item No. 304-05.06, Type 5 Aggregate Base (6 In. Thick), per square yard. No additional compensation will be given to the contractor to fulfill the above provisions.

NN. Fiber Optic Cable

1.0 Description. This work shall consist of installing, splicing, and terminating fiber optic cables.

2.0 Materials.

2.1 Cable. Fiber optic cable shall be loose tube, single mode dielectric cable. The cable shall be listed in the latest edition of the Rural Utilities Service (RUS) *List of Materials Acceptable for Use on Telecommunications Systems of RUS Borrowers*, category oc-d-F, and shall have a short-term tensile rating of at least 600 lbs. The cable sheath shall have length markings in feet, and shall indicate that the unit of measure is feet. The cable shall have an operating temperature range of -40º C to 70º C.

2.1.1 All fibers shall be suitable for transmission using both 1310 nm and 1550 nm wavelengths. Attenuation shall not exceed 0.35 dB/km and 0.25 dB/km for 1310 nm and 1550 nm signals, respectively.

2.1.2 The cables shall be constructed with six fibers per tube.

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. Connectors shall be ST compatible, with ceramic ferrules. They shall be suitable for use in traffic cabinets and shall be designed for single mode fibers.

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. They must use the type of connector specified in Sec 2.3 of this provision. 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. The second connector shall be as specified in Sec 2.3 of this provision except where a different connector is required for compatibility with the equipment to which the jumper connects. Length shall suffice to provide approximately five feet of slack after installation.

2.6 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.

2.6.1 The enclosure shall have provisions for cable strain-relief. It shall have hinged front and rear doors.

2.6.2 The enclosure shall include splice trays as specified in Sec 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.

2.7 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 three rack units (1¾ inch each) in the cabinet. It shall be made of powder-coated aluminum.

2.7.1 The enclosure shall include routing guides for jumpers, strain relief for pigtails coming from a splice enclosure, and labels for every connector.

2.7.2 The enclosure shall include patch panel modules designed for the connectors specified in Sec 2.3 of this provision. The enclosure shall be designed to hold modules totaling at least 72

connectors. Provide enough modules for every fiber that terminates in the enclosure. Provide blank panels for panel positions that are not equipped with patch panel modules.

2.8 Patch Panel Module. Other contractors have equipped some cabinets with rack-mounted patch panel enclosures. Provide patch panel modules to increase the capacity of the enclosure, as needed. The modules shall be from the same manufacturer as the enclosure, and shall be compatible with the connectors specified in Sec 2.3 of this provision.

2.9 Rack-Mounted 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, unterminated.

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 be made of powder-coated aluminum.

The enclosure shall hold at least four splice trays meeting the requirements of Sec 2.2 of this provision. Provide enough trays for all splices made in the interconnect center. The enclosure's patch panel shall have at least 24 positions, compatible with the connectors specified in Sec 2.3 of this provision. It shall have provisions for cable strain relief and for connector labeling.

3.0 Construction Requirements.

3.1 Cable Installation. Prior to installation, perform such tests as indicated in Sec 4.0 of this provision to confirm that the cable is in good condition and complies with the specifications. Any defects found after installation will be deemed the fault of the contractor.

3.1.1 Install the 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.

3.1.2 Before any cable installation is performed, provide the engineer with four copies 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.

3.1.3 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.

3.1.4 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.

3.1.5 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.

3.1.6 In every intermediate pull box, store 30 feet of slack fiber optic cable for every cable that passes through the pull box. 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. 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. Store slack cable neatly on the walls of the pull box using racking hardware acceptable to the engineer.

3.1.7 Seal the fiber optic cable ends to prevent the escape of the filling compound and the entry of water.

3.2 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.

3.2.1 Make all splices using a fusion splicer that automatically positions the fibers using either the Light Injection and Detection (LID) system or the High-resolution Direct Core Mounting (HDCM) system. Provide all equipment and consumable supplies.

3.2.2 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.

3.2.3 Prior to splicing to a fiber installed by others, measure and record the optical loss over that fiber. See Sec 4.0 of this provision.

3.2.4 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.

3.3 Termination. Terminate fibers by splicing them to factory-made pigtails. Cap all connectors that are not connected to a mating connector.

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 diagram 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 5 copies of this diagram to the engineer, along with the calculations for the maximum allowable loss. Submit the diagrams and 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. The 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 the documentation and acceptance testing, in addition to all materials and equipment necessary for a fully operational system. Payment will be made as follows:

Item No.	Type	Description
910-99.03	Linear Foot	Fiber Optic Cable, 72 Strand, Single Mode
910-99.03	Linear Foot	Fiber Optic Cable, 24 Strand, Single Mode
910-99.02	Each	Fiber Optic Pigtail, SM, Furnish and Install
910-99.02	Each	Fiber Optic Pigtail, MM, Furnish and Install
910-99.02	Each	Fiber Optic Jumper, SM, Furnish and Install
910-99.02	Each	Rack-Mounted Splice Enclosure, Furnish and Install

910-99.02	Each	Rack-Mounted Patch Panel Enclosure, Furnish and Install
910-99.02	Each	Rack-Mounted Interconnect Center, Furnish and Install
910-99.02	Each	Fiber Optic Splice

OO. Furnish and Install CCTV Assembly

1.0 General.

1.1 Description. Install a Contractor furnished IP (Internet Protocol) closed circuit television (CCTV) assembly on a metal pole, and install a Contractor furnished power supply and surge protection in a nearby cabinet (usually on the same pole). An Axis HD IP camera and POE injector power supply shall be supplied. The pole and cabinet will be paid for separately. Provide cables connecting the camera to the equipment in the cabinet and to ground, provide an air terminal, set up the camera assembly, and test for proper operation.

1.2 Qualified Personnel. The Commission's agreement with the camera assembly manufacturer obligates the manufacturer to train the Commission's installation contractors in the unpacking, assembling, mounting, positioning, connecting to the communication network, set up, and testing of the camera assemblies. The training is free to the contractor, and is conducted at the jobsite. Do not perform any work until the manufacturer has certified the contractor as qualified. Only personnel who have been trained by the manufacturer shall participate in the camera assembly installation, setup, and testing. A Commission representative will be present to observe the training.

1.2.1 Contractors certified under a previous Commission contract need not be trained a second time, but only personnel who received the training shall participate in the camera assembly installation and testing.

1.3 Support During Installation. The Commission's agreement with the camera assembly manufacturer obligates the manufacturer to provide both on-site and remote factory support.

2.0 Materials.

2.1 Camera assembly, mounting bracket, power supply, and surge suppressors will be provided by the Contractor.

2.2 The contractor shall acquire cables for power, video, and camera control from MoDOT's current camera supplies manufacturer on this project.

2.3 Provide stainless steel bands to affix the mounting bracket to the pole. The banding shall be 1-inch wide, 0.044-inch thick, stainless steel.

2.4 The air terminal shall be solid copper at least 5/8 inch in diameter. The top of the rod shall be tapered to a point. The bottom of the rod shall be flattened and bolted to the pole using at least three stainless steel bolts as indicated on the plans.

3.0 Construction Requirements.

3.1 Install the dome so that the pole does not block the camera's view of traffic.

3.2 Install the air terminal on the opposite side of the pole from the dome. Position the rod to project a minimum of five feet above the highest point of the pole, and attach it to the pole with bolts passing through the wall of the pole and bond the air terminal to the top of the pole. Apply a copper-based conductive sealant between the rod and the pole before tightening the bolts. The pole itself shall be the ground conductor.

3.3 Connect the bottom of the pole to one or more ground rods using a bare, solid AWG # 6 copper wire. Use exothermic welding for all ground wire connections, except the connection to the pole, which shall use the pole's grounding lug. Use a device that measures resistance to ground using the three-point fall-of-potential method to ensure that the resistance from the air terminal to ground does not exceed 8 ohms. Add more ground rods if necessary to achieve this requirement. The contractor shall perform all work related to the installation of the air terminal in accordance with NFPA 780.

3.4 Terminate all the cables on surge protectors, install the Contractor furnished power supply in the cabinet, and connect the camera power circuit to the power supply.

4.0 Acceptance Testing.

4.1 After installing the camera assembly, 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 return it to the manufacturer for replacement. Except for costs borne by the manufacturer under his warranty agreement, the cost of replacement shall be borne entirely by the contractor.

5.0 Basis of Payment. Measurement and payment for camera assembly installation includes cables, testing, grounding, and all miscellaneous hardware required for a safe, fully operational camera assembly. Payment will be made as follows:

Item No.	Type	Description
910-37.00	Each	CCTV Camera Assembly, Installed

PP. Tracer Wire for ITS Conduit

1.0 Description. This work will include the furnishing, installation, and testing of tracer wire to be placed above and in the same trench with rigid ITS conduit.

2.0 Material and Construction Requirements. Tracer wire shall be 6 AWG solid copper polyethylene jacketed for 12 AWG Copperhead brand wire. Waterproof direct bury connectors shall be used for all connections. End tracer wire shall be terminated with 18-inch magnesium ground rods.

3.0 Basis of Payment. No direct payment will be made for the work in this provision. The cost of the wire, installation, and testing will be considered incidental the cost of the conduit.

QQ. ITS Equipment Cabinets

1.0 Description. This work shall consist of furnishing and installing new cabinets.

2.0 Materials.

2.0.1 All cabinets shall include a grounding system. Connection to ground must be bare, solid AWG # 6 copper wire or equivalent bonding strap.

2.0.2 All powered cabinets shall be wired for three-wire 240/120 volt AC service. Provide a lightning arrestor designed to protect 120/240 VAC split phase breaker panels. The protector shall use metal oxide varistors as the protective elements. The response time shall be under five nanoseconds and the maximum surge current shall be at least 40,000 amps. The clamping voltage shall not exceed 400 volts. The device shall protect line-to-line and line-to-neutral.

2.0.3 For cabinets with circuits that do not serve communication and traffic management equipment, provide a lightning arrestor connected to the load side of the main breaker. The arrestor shall be designed to protect 120/240 VAC split phase breaker panels and shall use metal oxide varistors as the protective elements. The response time shall be under five nanoseconds and the maximum surge current shall be at least 40,000 amps. The clamping voltage shall not exceed 400 volts. The device shall protect line-to-line and line-to-neutral.

2.0.4 Provide an additional surge protector just for the circuits powering the communication and traffic management equipment (excluding the dynamic message sign, which has its own surge protectors). This shall be a filtering, two-stage surge protector. Install it on the load side of the appropriate breaker. The protector shall provide radio frequency noise filtering and be capable of protecting equipment drawing a total of at least 10 amps. If the maximum load on the circuit exceeds 10 amps, the contractor shall split the load among multiple circuits, each with a surge protector. The protector shall clamp both the main line and the main neutral at 250 volts, both relative to each other and relative to the cabinet ground. The response time shall be such that the voltage never exceeds 250 volts. The surge protector shall suppress surges of up to 20,000 amps.

2.0.5 All doors shall have cabinet identification labels displaying the cabinet identifier. The engineer will provide a list of the identifiers for each location, as well as the format for the labels.

2.0.6 All seams shall be continuously welded and ground smooth.

2.0.7 All fasteners must be stainless steel.

2.0.8 All cabinets shall have a natural aluminum finish, free from blemishes.

2.0.9 All circuit breakers shall be molded case units with quick-make, quick-break, trip-free mechanism, and with a minimum interrupting capacity of 10,000A (RMS Symmetrical). The circuit breakers shall be of fixed trip type and UL listed. Circuit breakers shall be listed on the latest Qualified Products List QPL-W-C-375 maintained by the Defense Supply Center.

2.1 Type 7 Cabinet.

2.1.1 Provide a single door, NEMA 3R, aluminum cabinet. The aluminum shall be at least 0.188 inches thick, except that the door and top need be only 0.125 inches thick. The cabinet shall be approximately 36 inches high, 20 inches wide, and 17 inches deep. The cabinets shall be designed for pole mounting (with the back against the pole) and base mounting on a concrete

foundation. The cabinet shall have a three-point door latch and a lock that is keyed to match MoDOT's other traffic equipment cabinets. It shall also have provision for padlocking. The door hinge shall be continuous and shall be affixed by nuts and bolts that are concealed when the door is closed.

2.1.2 The cabinet shall be equipped with the following:

- Rack: For mounting 19-inch equipment. The mounting rails must have holes of the EIA standard size and spacing for the entire height of the cabinet.
- Mounting panels: For terminal blocks, breakers, surge protectors, and other small items on the back and side walls.
- Terminal blocks: For all conductors entering the cabinet. Except for blocks used for coaxial cable, the blocks shall be the barrier type with nickel-plated brass screw terminals and solid backs. Each terminal shall be clearly and permanently labeled on a contiguous surface using silk screening or other approved method. Terminal blocks for conductors carrying more than 60 volts must be covered by a clear acrylic shield.
- Fluorescent light: Controlled by a door switch.
- Duplex ground fault interrupt outlet: For use by technicians.
- Thermostatically controlled fan and heater: The fan shall move 100 CFM through vents at the top of the cabinet. The air intake shall be through louvers in the door, and the air shall pass through a replaceable filter as it enters the cabinet. The heater shall use at least 250 watts and shall be designed to prevent accidental contact with dangerous heat or voltage.
- Electrical distribution system: Consisting of two 15 amp main circuit breakers, one for each side of the split phase service. One of the main breakers shall serve the communication and traffic management equipment in the cabinet. Provide at least four outlets on this circuit. The second main breaker shall power auxiliary devices in the cabinet, such as the fan, heater, light, and GFI outlet.

  If the cabinet feeds power to other cabinets, the contractor shall provide two separate branch circuits for each of the other cabinets (one circuit for communication and traffic management equipment and the other circuit for the remaining devices). The contractor shall equip those branch circuits with 15 amp breakers.
- Sunshield: On the top.
- Mounting brackets: Stainless steel U-bolts and any other mounting hardware needed.

3.0 Construction Requirements.

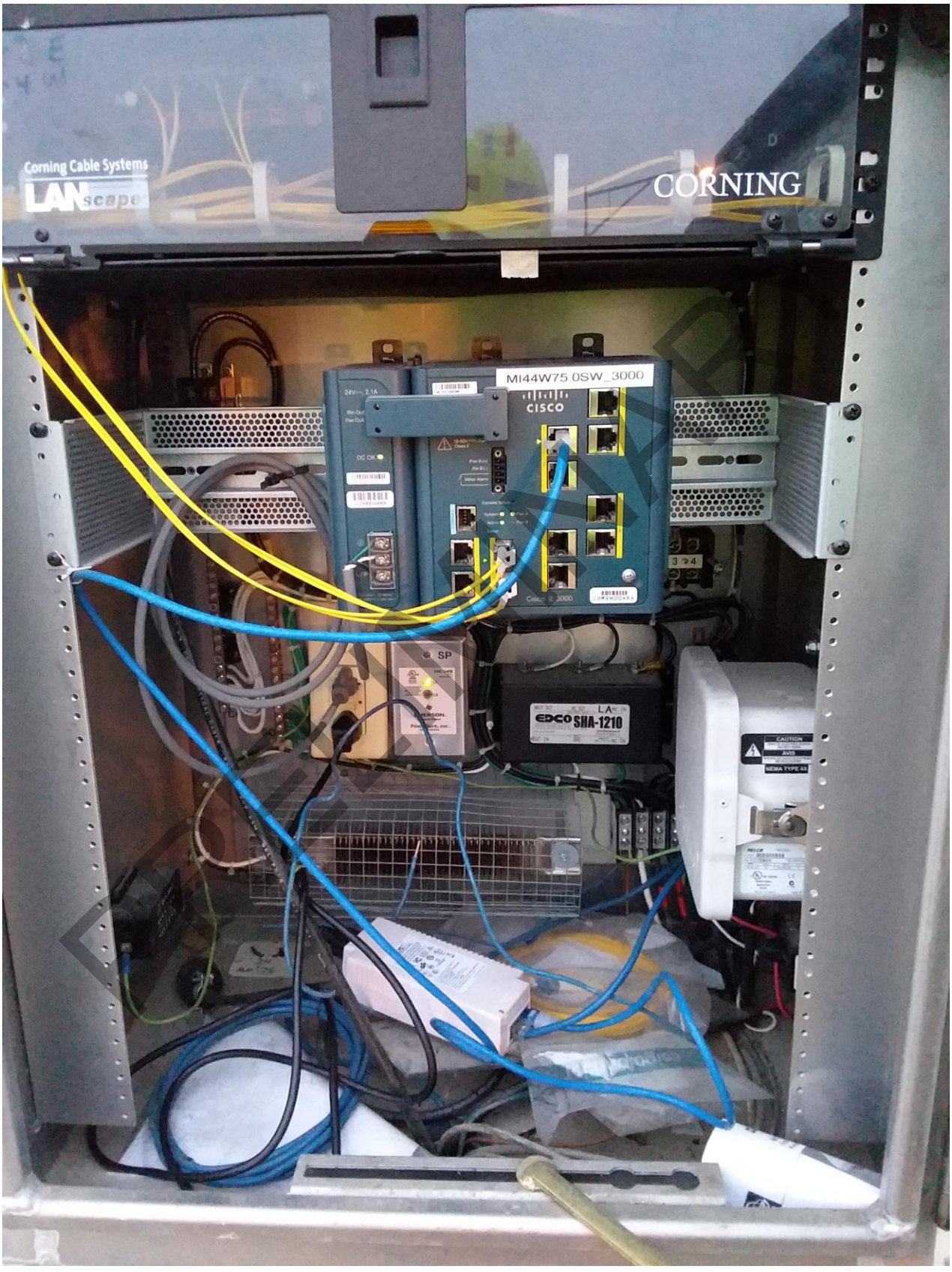
3.1 Pole Mounted Cabinets. Securely fasten pole-mounted cabinets to their poles using mounting brackets as indicated in the plans.

3.2 Bonding and Grounding. Bond pole-mounted cabinets to the pole and ensure that the pole is connected to a ground rod. Connect base-mounted cabinets directly to a ground rod.

3.3 Wire Management. Use spiral wrap to guide and protect bundles of wires and cables. Affix the spiral wrap to the wall of the cabinet or vertical member of the rack, and keep power and signal cables separated.

3.4 Cabinet Layout. The cabinet layout shall generally conform to the image below and the layout shall be approved by the engineer as provided for elsewhere in this provision.

Job No.: J8I0445
Route: 44
County: Webster



4.0 Acceptance Testing.

4.1 Develop a proposed test procedure for the cabinets and submit it to the engineer for approval. It shall include visual inspection, testing of lights, fan, heater, power outlets and alarm sensors. It shall also include a test in which each branch circuit is shorted to the cabinet wall to confirm that the breaker trips. Revise the proposed test procedure until it is acceptable to the engineer.

4.2 Provide all equipment and personnel needed to safely conduct the tests, arrange for the engineer's representative to witness the tests, and give the engineer a report documenting the result of every visual inspection and test. Include a summary indicating whether the cabinet passed every test. The cabinet must pass every test to be accepted.

4.3 If the cabinet fails, correct the problems and arrange for a new test. If the test of the breakers reveals breakers that do not trip, the resistance to ground is too high; lower the resistance by adding more ground rods and improving the connections in the ground system.

5.0 Documentation.

5.1 Prior to purchasing the cabinets, provide five sets of complete shop drawings, layout drawings, catalog cuts, and schematics. The layout drawings shall be dimensioned drawings showing the proposed location of all equipment for each cabinet. The drawings shall demonstrate that all the equipment will fit, and that all controls, connections, and other service points are readily accessible. It should also demonstrate that incoming conductors reach surge suppressors as soon as they enter the cabinet. Lay out all cabinets that have the same equipment in the same way and submit a single drawing for all like cabinets. Revise the layout as instructed by the engineer and resubmit the drawings until they are accepted.

5.2 After installation, provide one reproducible 24 inch X 36 inch and two prints of the cabinet wiring diagram for each cabinet. The diagrams shall be nonproprietary. They shall reflect as-built conditions and shall identify all circuits in such a manner as to be readily interpreted. The diagrams shall be placed in a heavy duty, side-opening clear plastic pouch, and attached to the front cabinet door. The pouch shall be of such design and material that it provides adequate storage and access to the wiring diagram.

6.0 Basis of Payment. Measurement and payment for items covered by this specification include the documentation and acceptance testing, in addition to all materials, including base adapters, liquid tight flexible metal conduit, and equipment. Payment will be made as follows:

Item No.	Type	Description
910-99.02	Each	Pole Mount Type 7 Cabinet

RR. Furnish and Install Communication Equipment

1.0 Description. Furnish and install communication equipment in new and existing roadside cabinets, including existing traffic signal cabinets. Connect it to power, communication, and ground. Test the completed installation and report any problems to the engineer. Trouble shoot to the point of identifying the particular device that is causing the communication problem.

2.0 Material.

2.1 Cisco IE 3000 Switch. Furnish and Install Cisco IE 3000 switch at each field cabinet location as shown on plans. Provide a model that has a minimum of (8) Ethernet 10/100 ports and (2) fiber SFP ports and has layer 2 LAN base image, as shown in the plans. Provide power supplies, transformers, and mounting kit for a fully functional switch.

2.3 SFP Transceivers. Furnish and Install transceivers capable of transmission distances between switches as required by the plans. Ensure that the launch power of the optical ports is great enough such that when coupled with the receiver sensitivity of the connecting device, the optical budget of the link is not exceeded.

3.0 Construction Requirements.

3.1 Provide to the Engineer a detailed schedule of installation of communications equipment, at least thirty (30) days before commencing this type of work. Additionally, coordinate such work with the Engineer.

3.2 For equipment installed in cabinets, mount the equipment in the existing/proposed rack and power from existing/proposed outlets. If there are insufficient outlets or rack space, provide power strips and mounting racks as required.

3.3 In proposed MoDOT cabinets connect the Cisco switches provided by this contract to proposed single-mode fiber or multi-mode fiber as required by the plans. Contractor shall terminate four strands of the existing single-mode fiber and mount in a new rack interconnect center. In each cabinet, the Contractor shall provide fiber termination and patch panel in accordance with the requirements of Fiber Optic Cable of this specification.

3.4 Contractor shall supply the equipment to MoDOT's network integrator to pre-configure the proposed equipment as required for a complete and functional system. Contractor shall verify that the communications equipment installed by this contract is operating and communicating properly from the head-end. Replace any malfunctioning equipment.

4.0 Acceptance Testing.

4.1 Verify physical connections are performed as specified in contract documents.

4.2 Verify all LED indicators for link, activity, and power are functioning.

4.3 Verify these configuration settings: system name, location, IP address, subnet mask, and default gateway.

4.4 Verify all active ports have been configured as required. Check the speed, duplex, and Virtual Local Area Network (VLAN) settings.

5.0 Documentation. Provide testing results for all communications equipment.

6.0 Measurement and Payment. Measurement and Payment for items covered by this specification include the population and acceptance testing, in addition to all materials and equipment necessary for a fully operational system including power supply.

Item No.	Type	Description

910-99.02	Each	Cisco IE 3000-8TC Switch, Furnish and Install
910-99.02	Each	GLC-LH-SMD, Furnish and Install
910-99.02	Each	PWR-IE50W-AC-IEC, Furnish and Install