STATE OF MISSOURI HIGHWAYS and TRANSPORTATION COMMISSION

JEFFERSON CITY, MISSOURI

CONSTRUCTING OR IMPROVING Contract I.D. 181019-F01

THIS JOB SHALL BE CONSTRUCTED UNDER FEDERAL PROJECT NUMBER(S): N/A

J6M0268, J6M0269 - ROUTES 44/MARITZ, I-70 ST. LOUIS, ST. LOUIS CITY COUNTIES

BIDDER CHECKLIST FINAL CHECKLIST BEFORE SUBMITTING BID

1. Submit completed Contractor Questionnaire and/or Contractor Prequalification Questionnaire with attachments not later than seven (7) days prior to the date and hour of the bid opening. See Secs 101-103 of the Missouri Standard Specifications for Highway Construction, and Rule 7 CSR 10-15.010, "Prequalifications to Bid of Certain Contractors". Questionnaire and Contact information are provided on MoDOT's website.

2. All bids shall be submitted electronically using "Bid Express Secure Internet Bidding" at www.bidx.com. Any paper bid submitted will be considered irregular per section 102.8 of the Missouri Standard Specifications for Highway Construction.

3. Please read all items in the bidding document carefully. The EBSX files from MoDOT's website may be used for the itemized bid.

4. If submitted in the name of a firm or corporation, the legal name of the firm or corporation should appear in the space designated, and be signed for by one or more persons legally qualified to execute papers in the name of said firm or corporation.

5. The bidder shall submit a Bid Guaranty meeting the requirements of Sec 102 of the Missouri Standard Specifications for Highway Construction. If submitting a project specific or annual bid bond, bidders must use the MoDOT provided bid bond forms. The project specific bond form is included in the request for bid. The project specific and annual bid bond forms are also available on MoDOT's website. Annual bid bonds shall be executed by June 15th of each year.

6. Submit the Subcontractor Disclosure Form in accordance with the bidding documents. For bids of more than \$2,000,000, each bidder shall submit with each bid a disclosure of the subcontracts that have a subcontract value that is equal or greater than twenty percent of the total project bid or subcontracts that are greater than or equal to \$2,000,000. If that information is not available at the time of bid the bidder shall submit the "Subcontractor Disclosure Form" pages with MODOT on or before 4:00 p.m. of the third business day after the bid opening date.

7. Submit the DBE Identification Submittal in accordance with the bidding documents for Federal Projects Only.

8. Alternate Pavements; to exercise this option, separate pay items, descriptions and quantities are included in the itemized proposal for each of the two alternates. The bidder shall bid only one of the two alternates and leave the contract unit price column blank for any pay item listed for the other alternate.

9. When submitting a bid, your bid will still come through with "red" folders. You should make sure that it is not the Schedule of Items folder or the Signature and Identity of Bidder folder. Click on the yellow checkmark (Check Bid)at the top and it will list any errors in the bid. To view itemized folders, click the Tree View. This will show the status of the individual folders.

Below is a list of common mistakes made by bidders leading to nonresponsive bids. Please refer to the Standard Specifications for the appropriate procedures for completing and submitting a bid.

- a) Submitting a paper bid for a project
- b) Using a different bid bond form than the one provided
- c) Improper use of the Maximum Monetary Value Award Provision -only used if bidding more than one project and should be in only one bid proposal
- d) Not obtaining a digital ID in advance of the letting (obtaining a digital ID may take 5 business days)

All questions concerning the bid document preparation shall be directed to the Central Office - Design Division at (573) 751-2876. Project specific questions shall be directed to the project contact listed in the Job Special Provisions.

TABLE OF CONTENTS

Notice	to	Contractors

Proposed Work	item	(1)
Compliance With Contract Provisions	item	(2)
Period of Performance	item	(3)
Liquidated Damages	item	(4)
Itemized Bid	item	(5)
Trainees	item	(6)
DBE Certification*	item	(7)
Acceptance of Provision for Price Adjustment for Fuel	item	(8a)
Acceptance of Provision for Asphalt Cement Price Index	item	(8b)
Max. Monetary Value of Awards Accepted this Bid Opening	item	(9)
Combination Bids	item	(10)
Certification for Federal Jobs	item	(11a)
Certification for State Jobs	item	(11b)
Antidiscrimination	item	(12)
Preference to Missouri Firms in Awarding of Contracts	item	(13)
Subcontractor Disclosure Form*	.item	(14)
Signature and Identity of Bidder	item	(15)
Bid Guaranty*	item	(16)

*These forms are also available on MoDOT's Website, www.modot.org under Information on the Bid Opening Info page of the Contractor Resources site.

NOTICE TO CONTRACTORS

Electronic bids submitted through the Bid Express website for the proposed work will be received by the Missouri Highways and Transportation Commission until 11:00 o'clock a.m. (prevailing local time) on 10/19/2018.

Bid bonds will be received at the office of the Secretary to the Commission in the Missouri Department of Transportation Central Office Building, 105 West Capitol Avenue, Jefferson City, Missouri; delivered by US Mail should be mailed to: Missouri Highways and Transportation Commission, Attention: State Design Engineer/Bid Bond, P.O. Box 270, Jefferson City, MO 65102 or delivered by parcel delivery services, (such as UPS, Fed Ex, DHL, etc.) should be shipped to Missouri Highways and Transportation Commission, Attention: State Design Engineer/Bid Bond, 105 West Capitol Avenue, Jefferson City, MO 65102.

(1) PROPOSED WORK: The proposed work, hereinafter called the work, includes:

****(1): Job J6M0268 Route 44/Maritz ST LOUIS County. Bridge rehabilitation over I-44 in Fenton, the total length of improvement being 0.01 miles.****(2): Job J6M0269 Route I-70 ST LOUIS CITY County. Bridge rehabilitation Adelaide Avenue Bridge over I-70, the total length of improvement being 0.01 miles.

If more than one Job Number is listed for this call, then combination bids will be required on the Jobs listed above.

(2) COMPLIANCE WITH CONTRACT PROVISIONS: The bidder, having examined and being familiar with the local conditions affecting the work, and with the contract, contract documents, including the Missouri Highways and Transportation Commission's "Missouri Standard Specifications for Highway Construction, 2018," and "Missouri Standard Plans for Highway Construction, 2018", their revisions, and the request for bid, including appendices, the special provisions and plans, hereby proposes to furnish all labor, materials, equipment, services, etc., required for the performance and completion of the work. All references are to the Missouri Standard Specifications for Highway Construction, as revised, unless otherwise noted. All questions concerning the bid document preparation shall be directed to the Central Office - Design Division at (573) 751-2876.

(3) PERIOD OF PERFORMANCE: If the bid is accepted, the bidder shall continuously and diligently prosecute the work in such order and manner as will ensure the completion of the work within the time specified in the Job Special Provisions in accordance with Sec 108.

(4) LIQUIDATED DAMAGES: The bidder agrees that, should the bidder fail to complete the work in the time specified or such additional time as may be allowed by the engineer under the contract, the amount of liquidated damages as specified in the Job Special Provisions to be recovered in accordance with Sec 108.

(5) ITEMIZED BID: The bidder should complete the following section in accordance with Sec 102.7. The bidder proposes to furnish all labor,

materials, equipment, services, etc. required for the performance and completion of the work, as follows:

Line N	umber	Item Number		Quantity U	nit	Unit	Price	Extension	Price
Section Road	n 0001 dway It	ems - J6M0268							
0010		6169901		1 L	S				
	MISC.	TEMPORARY TRAFFI	C CONTROL						
0020		6169902		2.000 E	A				
	MISC.	NTCIP CHANGEABLE	MESSAGE SIGN	(CONTRACTOR	FURNISHED/RETAINED)				
0030		6181000		1 L	S				
	MOBILI	ZATION							
0040		6274000		1 L	S				
	CONTRA	ACTOR FURNISHED S	URVEYING AND S	STAKING					
Section	n 0001	Total							

Sectio Bri	on 0002 dge A39965 Items - J6M0268	
0050	2169901 MISC. TEMPORARY SUPPORT OF CONDUIT	1 LS
0060	2169903 60.00 MISC. PARTIAL REMOVAL AND STORAGE OF PEDEST	000 LF TRIAN FENCE
0070	2169904 396.00 MISC. PARTIAL REMOVAL OF SUPERSTRUCTURE	000 SQFT
0080	6079903 60.00 MISC. RE-INSTALLATION OF PEDESTRIAN FENCE	000 LF
0090	7034214 10.70 CLASS B-2 CONCRETE	700 CUYD
0100	7034215 60.00 SAFETY BARRIER CURB	000 LF
0110	7061070 240.00 MECHANICAL BAR SPLICE	000 EA
0120	7079901 MISC. RE-INSTALL CONDUIT SYSTEM ON STRUCTUR	1 LS RE
0130	7101000 2270.00 REINFORCING STEEL (EPOXY COATED)	000 LB
0140	7121100 7400.00 FABRICATED STRUCTURAL LOW ALLOY STEEL (MISC	000 LB C)
0150	7125100 SURFACE PREPARATION FOR RECOATING STRUCTURA	1 LS AL STEEL
0160	7125110 FIELD APPLICATION OF INORGANIC ZINC PRIMER	1 LS
0170	7125111 INTERMEDIATE FIELD COAT (SYSTEM G)	1 LS
0180	7125112 FINISH FIELD COAT (SYSTEM G)	1 LS
0190	7129901 MISC. HEAT STRAIGHTENING OF EXISTING PLATE	1 LS GIRDERS
0200	7129902 2.00 MISC. CRACK ARRESTING	000 EA
0210	7163000 1.00	DOO EA

TYPE N PTFE BEARING

Section 0002 Total

Sectio Roa	on 0003 ndway Items - J6M0269
0220	6169901 1 LS
	MISC. TEMPORARY TRAFFIC CONTROL
0230	6169902 4.000 EA
	MISC. NTCIP COMPLIANT CHANGEABLE MESSAGE SIGN (CONTRACTOR FURNISHED AND RETAINED)
0240	6181000 1 LS
	MOBILIZATION
0250	6274000 1 LS
	CONTRACTOR FURNISHED SURVEYING AND STAKING
Sectio	on 0003 Total
Soatic	
Section	gnal Items - J6M0269
0260	9029902 2.000 EA
	MISC. ETHERNET BRIDGE RADIO
	·····
Sectio	on 0004 Total
Sectio Sig	on 0005 ming Items - J6M0269
0270	9035069A 14.000 SQFT
	SHF-FLAT SHEET FLUORESCENT
Sectio	n 0005 Total
Sectio	on 0006
ITS	B Items - J6M0269
0280	9109902 6.000 EA
	MISC. FIBER OPTIC JUMPER, MM, FURNISH AND INSTALL
0290	9109902 6.000 EA
	MISC. FIBER OPTIC JUMPER, SM, FURNISH AND INSTALL
0300	9109902 8.000 EA
	MISC. FIBER OPTIC PIGTAIL, MM, FURNISH AND INSTALL
0310	9109902 8.000 EA
	MISC. FIBER OPTIC PIGTAIL, SM, FURNISH AND INSTALL
0320	9109902 8.000 EA
	MISC. FIBER OPTIC SPLICE
0330	9109903 460.000 LF
	MISC. FIBER OPTIC CABLE, 18 STRAND, SINGLE MODE
0340	9109903 460 000 T.F
0540	MISC. FIBER OPTIC CABLE, 6 STRAND, MULTI MODE
Sectio	on 0006 Total

0350	2169902	2.000	EA		
5550	MISC. PARTIAL REMOVAL AND STORAGE	OF ORNAMENT	AL LIGHT	POLES	
0360	2169903	73 000			
0300	MISC. PARTIAL REMOVAL AND STORAGE	OF PEDESTRI	AN FENCE		
0370	2169904	1210 000	SOFT		
0370	MISC. PARTIAL REMOVAL OF SUPERSTRU	CTURE	bgi i		
0380	6079903	73 000	LF		
0000	MISC. RE-INSTALLATION OF PEDESTRIA	N FENCE			
0390	7033009		LS		
0000	AESTHETIC CONCRETE STAIN	1			
0400	7034215	64.000			
0 1 0 0	SAFETY BARRIER CURB	01.000			
0410	7039903	118.000	 LF		
	MISC. FABRICATED BRIDGE UNIT	0	-		
0420	7071000	1	LS		
	CONDUIT SYSTEM ON STRUCTURE				
0430	7121060	1	LS		
	FABRICATED SIGN SUPPORT BRACKETS				
0440	7125100	1	LS		
	SURFACE PREPARATION FOR RECOATING	STRUCTURAL	STEEL		
0450	7125110	1	LS		
	FIELD APPLICATION OF INORGANIC ZIN	C PRIMER			
0460	7125111	1	LS		
	INTERMEDIATE FIELD COAT (SYSTEM G)				
0470	7125112	1	LS		
	FINISH FIELD COAT (SYSTEM G)				
0480	7162000	8.000	EA		
	LAMINATED NEOPRENE BEARING PAD ASS	EMBLY			
0490	9019902	2.000	EA		
			ПО		

Item Total

\$0.00

Contract ID: 181019-F01

DBE CERTIFICATION

(6) Trainees: (Applies to Federal Projects only) The number of trainee hours provided under this contract will be 0 slots at 1000 hours per slot or 0 hours.

(7) Bidder's Certificaton for DBE Program and Contract Goal

(Applies to Federal Projects only.)

(A) DBE Contract Goal: By submitting this bid, the bidder certifies that the bidder is familiar with the DBE Program Requirements in the General Provisions. The contract goal for the amount of work to be awarded is 0 % of the total federal project price. The bidder shall also complete the DBE Identification Submittal form in accordance with the General Provisions. This form is available on MoDOT's Website, www.modot.org on the Bid Opening Info page of the Contractor Resources site.

(B) DBE Participation: The bidder certifies that it will utilize DBE's as follows:

% OF TOTAL FEDERAL CONTRACT

NOTE: Bidder must fill in the above blank. If no percentage is specified, the bidder certifies that it agrees to and will comply with the contract goal. If a percentage below the contract goal is specified, then the bidder must submit complete documentation of good faith efforts to meet the DBE contract goal, immediately below.

The DBE Identification Submittal form will be submitted via

(C) Certification of Good Faith Efforts to Obtain DBE Participation: By submitting its signed bid, the bidder certifies under penalty of perjury and other provisions of law, that the bidder took each of the following steps to try to obtain sufficient DBE participation to achieve the Commission's proposed DBE Contract Goal:

CONTRACT PROVISIONS

(8a) ACCEPTANCE OF PROVISION FOR PRICE ADJUSTMENT FOR FUEL: Bidders have the option to accept the provision for Price Adjustment for Fuel in accordance with Sec. 109.14. The bidder must select "Yes" for those items of work in which they choose to accept the provision. No price adjustments will be made, due to fuel price changes, for bidders who do not accept this provision. This provision does not apply to Seal Coat.

EXCAVATION PRODUCTION

ASPHALT PAVING PRODUCTION AND HAULING

CONCRETE PAVING PRODUCTION AND HAULING

AGGREGATE BASE HAULING

(8b) ACCEPTANCE FOR PROVISION FOR ASPHALT CEMENT PRICE INDEX, SEAL COAT PRICE INDEX, ASPHALT UNDERSEAL PRICE INDEX, OR POLYMER MODIFIED EMULSION MEMBRANE PRICE INDEX: Bidders have the option to accept the provision for Asphalt Cement Price Index, Seal Coat Price Index, Asphalt Underseal Price Index, and/ or Polymer Modified Emulsion Membrane Price Index (when used in conjunction with an Ultrathin Bonded Asphalt Wearing Surface treatment) in accordance with the General Provisions. The bidder must mark each box below if they choose to accept the provision. No price adjustments will be made, due to asphalt price changes, for bidders who do not accept this provision.

ASPHALT CEMENT

SEAL COAT

ASPHALT UNDERSEAL

POLYMER MODIFID EMULSION MEMBRANE (UBAWS)

(9) MAXIMUM MONETARY VALUE OF AWARDS ACCEPTED THIS BID OPENING: Bidders have the option to specify the maximum monetary value of awards that they will accept for the total of all bids they have submitted in the bid opening, Sec 102.7.2. If the bidder is submitting only one bid, or if the bidder does not want to specify a maximum monetary value for submitted bids, this section should not be completed. If a submitted bid upon correction exceeds the indicated maximum monetary amount, the bid may be declared non-responsive. If a bidder's submitted bids show different values for the maximum monetary value, the lowest value will govern.

MAXIMUM MONETARY VALUE OF AWARDS ACCEPTED THIS BID OPENING

(Note: this amount should be entered in only one of the bids for this bid opening)

(10) COMBINATION BIDS: (Applies only if combination bids are specified. See cover and/or notice to contractor(s).) Combination bids will be in accordance with Sec 102.12. By selecting "All or None" the bidder desires to combine all projects in accordance with Sec 102.12.2.1.

(11a) CERTIFICATIONS FOR FEDERAL JOBS: (Applies to Federal Projects only.) By signing and submitting this bid, the bidder makes the certifications appearing in Sec. 102.18.1 (regarding affirmative action and equal opportunity), Sec. 102.18.2 (regarding disbarment, eligibility, indictments, convictions, or civil judgments), Sec. 102.18.3 (regarding anti-collusion), and Sec. 102.18.4 (regarding lobbying activities). Any necessary documentation is to accompany the bid submission, as required by these sections. As provided in Sec. 108.13, the Commission may terminate the contract for acts of misconduct, which limited fraud, dishonesty includes but is not to and material misrepresentation or omission of fact within the bid submission.

(11b) CERTIFICATIONS FOR STATE JOBS: (Applies to State Projects only.) By signing and submitting this bid, the bidder makes the certifications appearing in Sec. 102.18.2 (regarding diseligibility, indictments, convictions, or civil judgments), Sec. 102.18.3 (regarding anti-collusion), and Sec. 102.18.5 (regarding Missouri Domestic Products Procurement Act).

Any necessary documentation is to accompany the bid submission, as required by these sections. As provided in Sec. 108.13, the Commission may terminate the contract for acts of misconduct, which includes but is not limited to fraud, dishonesty, and material misrepresentation or omission of fact within the bid submission.

Does the bidder make certification for the above items listed in 11(a) or 11 (b)? Yes \bigcirc No \bigcirc

By selecting "No" the bidder REFUSES to make one or more certifications for the above items 11a or 11b. The bidder shall provide a statement of explanation for the refusal in the space below or by fax to the Design Division @ Fax no. 573-522-2281.

(12) ANTIDISCRIMINATION: The Commission hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, businesses owned and controlled by socially and economically disadvantaged individuals will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, religion, creed, sex, age, ancestry, or national

origin in consideration for an award.

(13) PREFERENCE TO MISSOURI FIRMS IN AWARDING OF CONTRACTS: (Applies to State Projects only.) The bidder's attention is directed to Section 34.355 RSMo Supp 2000, et seq, which requires that preference be given in awarding contracts to firms, corporations, or individuals doing business as Missouri firms, corporations, or individuals doing business as Missouri firms, corporations, when the quality of performance promised is equal, or better, and the price quoted is the same, or less.

The law also requires that a contractor or bidder domiciled outside the State of Missouri shall be required, in order to be the successful bidder, to submit a bid which is the same percent less than the lowest bid submitted by a responsible contractor or bidder domiciled in Missouri as would be required for the Missouri domiciled contractor or bidder to succeed over the bidding contractor or bidder domiciled outside Missouri in a like contract or bid being let in his domiciliary state. A contractor or bidder domiciled outside Missouri shall also be required to submit an audited financial statement as would be required of a Missouri domiciled contractor or bidder on a like contract or bid being let in the domiciliary state of that contractor or bidder.

For firms, corporations or individuals domiciled outside the State of Missouri, it is requested they submit the following information:

List the state of domicile

List address of all Missouri offices or places of business

I acknowledge that I have read, understand and completed the above Contract Provisions.

SUBCONTRACTOR DISCLOSURE

(14) SUBCONTRACTOR DISCLOSURE The bidder shall submit with this bid any subcontracts that meet the requirements of Sec 102. List below the name of each subcontractor that will be furnishing labor, labor and materials, the category of work that the subcontractor will be performing (e.g. asphalt, concrete, earthwork, bridges...), and the dollar value of the subcontract. Select "NONE" if there are no subcontractors that need to be disclosed.

If the information is not available at the time of bid, the bidder shall submit the "Subcontractor Disclosure Form", located on MoDOT's website, on or before 4:00 p.m. of the third business day after the bid opening date, directly to the Design Division, Missouri Department of Transportation, 105 W. Capitol Avenue, P.O. Box 270, Jefferson City, Missouri 65102-0270. Telefax transmittal to MoDOT will be permitted at fax no. 573-522-2281 or emailed to subcontractor.disclosure@modot.mo.gov. The complete signed original documents do not need to be mailed to MoDOT, but the bidder shall have it available if requested by the Design Division or the engineer.

SUBCONTRACTOR NAME:

DOLLAR VALUE: \$

CATEGORY OF WORK:

Submitted:

SIGNATURE AND IDENTITY OF BIDDER

(15) SIGNATURE AND IDENTITY OF BIDDER

BY SUBMITTING THIS BID ELECTRONICALLY, I HEREBY ACKNOWLEDGE THAT ALL REQUIREMENTS INCLUDED IN THE HARD COPY REQUEST FOR BID, AND AMENDMENTS ARE A PART OF THIS BID AND CONTRACT.

*** AN ELECTRONIC PROPOSAL SUBMITTED AND SIGNED WITH A DIGITAL ID, UNDER THE PROVISION OF THE MISSOURI DEPARTMENT OF TRANSPORTATION, WILL BE CONSIDERED VALID AND BINDING. ***

THE BIDDER CERTIFIES THAT THE BIDDER AND ITS OFFICIALS, AGENTS, AND EMPLOYEES HAVE NEITHER DIRECTLY NOR INDIRECTLY ENTERED INTO ANY AGREEMENT, PARTICIPATED IN ANY COLLUSION, OR OTHERWISE TAKEN ANY ACTION IN RESTRAINT OF FREE COMPETITIVE BIDDING IN CONNECTION WITH THIS BID, AND THAT THE BIDDER INTENDS TO PERFORM THE WORK WITH ITS OWN BONAFIDE EMPLOYEES AND SUBCONTRACTORS, AND DID NOT BID FOR THE BENEFIT OF ANOTHER CONTRACTOR.

THE BIDDER CERTIFIES THAT THE BIDDER'S COMPANY KNOWINGLY EMPLOYS ONLY INDIVIDUALS WHO ARE AUTHORIZED TO WORK IN THE UNITED STATES IN ACCORDANCE WITH APPLICABLE FEDERAL AND STATE LAWS AND ALL PROVISIONS OF MISSOURI EXECUTIVE ORDER NO. 07-13 FOR CONTRACTS WITH THE MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION, ACTING THROUGH THE MISSOURI DEPARTMENT OF TRANSPORTATION.

THE BIDDER ACKNOWLEDGES THAT THIS IS AN UNSWORN DECLARATION, EXECUTED UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE UNITED STATES AND/OR FALSE DECLARATION UNDER THE LAWS OF MISSOURI, AND ANY OTHER APPLICABLE STATE OR FEDERAL LAWS. THE FAILURE TO PROVIDE THIS CERTIFICATION IN THIS BID MAY MAKE THIS BID NON-RESPONSIVE, AND CAUSE IT TO BE REJECTED.

🔵 Yes 🌔 No

Select "No" ONLY if the bidder REFUSES to make this certification. The bidder may provide an explanation for the refusal with this submittal in the space below or by fax to the Design Division @ fax no. 573-522-2281.

USE OF ANOTHER PERSON'S DIGITAL ID IN THIS BIDDING PROCESS VIOLATES THE LAWS OF MISSOURI.

I acknowledge that I have read, understood and completed the above Electronic Bid Submission Certification.

BID BOND

(16) BID GUARANTY: The bidder shall submit a Bid Guaranty meeting the requirements of Section 102 of the Missouri Standard Specifications for Highway Construction. MoDOT's bid bond forms are available on MoDOT's website.

Annual bid bonds shall be submitted to MoDOT by June 15th of each year. If utilizing a paper annual or project specific bid bond as a Bid Guaranty

for this project the bidder shall mark the box below.

**Pay by: Paper Annual or Project Specific Bid Bond.

If submitting a cashier's/certified check, the Bid Bond folder will not turn green.

ELECTRONIC BID BOND

The bidder shall complete the following bond verification process if utilizing an electronic project bid bond or electronic annual bid bond as a Bid Guaranty for this project.

**Bond ID: Verify Clear

**Surety Registry Agency:

**Bond Pct:

Surety State:

FIELDS WITH THE ** INDICATOR ARE REQUIRED FIELDS IF SUBMITTING YOUR BID VIA BID EXPRESS

JOB SPECIAL PROVISIONS TABLE OF CONTENTS (ROADWAY)

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

A.	General – State JSP-09-03D	1
В.	Contract Liquidated Damages	1
C.	Work Zone Traffic Management Plan	2
D.	NTCIP Compliant Changeable Message Sign (Contractor Furnished and Retained)	7
E.	Project Contact for Contractor/Bidder Questions	10
F.	Emergency Provisions And Incident Management	10
G.	Utilities	11
Н.	Liquidated Damages Specified for Bridge Repair Work	12
Ι.	Temporary Traffic Control (Lump Sum)	13
J.	DNR Notification for Bridge Rehabilitation Work	15
K.	Stormwater Compliance Requirements NJSP-15-38	15
L.	Coordination with ITS Staff and Utility Locates	20
М.	Fiber Optic Cable Relocation	21
N.	Install Ethernet Bridge Radio at Signalized Intersections	25
О.	Supplemental Revisions JSP-18-01D	26

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 W. CAPITOL AVE. MI JEFFERSON CITY, MO 65102 Phone 1-888-275-6636 Horner & Shifrin, Inc. 401 S. 18th St. Suite 400 St. Louis, MO 63103 314-531-4321 Certificate of Authority #000159 NUMBER Expiration Date: December 31, 2018 PE-2009030035 JOB NUMBER: J6M0268 & J6M0269 St. Louis County, MO DATE PREPARED: 9/06/2018 9/7/2018 Date: Only the following items of the Job Special Provisions (Roadway) are authenticated by this seal: A-O

JOB SPECIAL PROVISION

A. <u>General – State JSP-09-03D</u>

1.0 Description. The Federal Government is not participating in the cost of construction of this project.

1.1 This contract requires payment of the prevailing hourly rate of wages for each craft or type of worker required to execute the contract as determined by the Missouri Department of Labor and Industrial Relations. The current State Wage Rates can be found on the Missouri Department of Transportation web page at <u>www.modot.org</u> under "Bidding" for the applicable bid opening. This supplemental bidding document has 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.

State Wage Rates

1.2 The following documents are available on the Missouri Department of Transportation web page at <u>www.modot.org</u> 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. <u>Contract Liquidated Damages</u>

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:	December 3, 2018
Completion Date:	June 28, 2019

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
J6M0268	N/A	\$1,800
J6M0269	N/A	\$3,200

3.0 Liquidated Damages for Contract Administrative Costs. Should the contractor fail to complete the work on or before the completion date specified in Section 2.0, the contractor will be charged contract administrative liquidated damages in accordance with Sec 108.8 in the amount of <u>\$500</u> 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.

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, the contractor will be charged road user costs in accordance with Sec 108.8 in the amount specified in Section 2.2 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. <u>Work Zone Traffic Management Plan</u>

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 Work Zone Specialist. The Traffic Management Plan shall name an individual, either employeed by the contractor or hired by the contractor, to act as the Work Zone Specialist (WZS) throughout the entirety of the project. The (WZS) will have no job duties other than traffic control. The WZS shall be in direct charge of the temporary traffic control pre-activity meeting and traffic control items such as; setup, communications, reviews, and reporting of all daily work zones on the project. Any change in personnel for the WZS shall be submitted in written form to the engineer. The WZS shall be trained and certified as a Traffic Control Supervisor from an organization such as ATSSA or equivalent and will be directly involved with daily traffic management and traffic management planning. It will be the responsibility of the WZS to coordinate daily traffic management with the contractor's traffic control crews, inspector or engineer and the ST. Louis Traffic Management Center (TMC). The WZS shall be required to be on the project daily and remain on the project until all work zones have been removed for the day. The WZS shall be on site before the first work zone sign is placed for the day and until the last traffic control device is taken down for the day. The WZS shall remain on site the entire time daily/nightly lane drops are in use. The WZS shall maintain daily contact with the engineer or inspector on the project.

1.2 Work Zone Set Up. The WZS shall direct the configuration and placement of each work zone daily and ensures work zones are set up and maintained in accordance with the EPG. The WZS shall conduct a daily meeting with the set up crew to determine which traffic control devices are required, their locations and set up and take down times.

1.3 Work Zone Communication. The WZS shall notify the TMC before the first work zone sign is set up and after the last traffic control item is taken down at the end of each work day or night. The WZS shall also to notify the inspector of any work zone cancellation for the day. Notification of cancellations shall be made prior to 3:00 pm for nighttime work zones, as well as for daytime work zones the following day. The WZS shall also notify the inspector or engineer 2 weeks before any new lane closures or detours are put into place.

1.4 Work Zone Reviews. Once the traffic control has been placed for the day, the WZS shall review the work zone to ensure all devices are legible and clean, installed in the correct location with the correct spacing and convey the correct message. The WZS shall approve the work zone before any work can begin. The WZS shall also review the job site hourly to determine if any traffic control devices need to be added, reconfigured or cleaned. If the engineer or inspector notifies the WZS of any safety or traffic related concerns in the work zone, the engineer or inspector will communicate the type of deficiency as per 616.4.2.5.2. This communication will be verbal and documented in writing via the DWR for that day. The DWR entry will include the time of verbal communication. The WZS will also document the deficiency in their daily report. For Category 1 deficiencies, the written documentation will include the time of correction. Any liquidated damages assessed shall be placed on the next Engineer's estimate as per 1.7 of this section.

1.5 Work Zone Reporting. After the WZS has conducted the daily initial review of the work zone, the WZS shall record the findings. Thereafter, the WZS shall conduct reviews on an hourly bases and subsequently record findings, required corrections and times the corrections were completed. Copies of the WZS review documentation shall be furnished to the Engineer within 24 hours.

1.6 Maintaining Work Zones and Work Zone Reviews. The WZS shall maintain work zones on a daily basis to ensure safety to the traveling public and the workers; this includes long term work zones that have devices and/or roadway conditions that need to be maintained. If the engineer or inspector notifies the WZS of any safety or traffic delay concerns in the work zone, the WZS shall promptly inspect and work to provide a solution to correct the situation in accordance with Sec. 616.4.2.5. Missing, damaged or over-turned traffic control devices shall typically be corrected without the need for direction by the engineer. The WZS is responsible to assure all traffic control devices are maintained in accordance with EPG standards. The WZS is responsible to ensure 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 project special provisions. The WZS and engineer shall submit one joint weekly technical review of work zone operations identifying any concerns present and the corrective actions taken. Reviews may be subjected to unannounced inspections by the engineer to corroborate the validity of the ratings. The engineer and WZS will be notified of the results.

1.6.1 Work zone signs and bases shall be removed from both inside and outside shoulders of the roadway when not in use and the end of each work shift. This includes signs and bases used for daily or nightly lane closures.

1.7 Work Zone Conflict Resolution. Any conflict resolution shall be in accordance with Standard Specification 616.4. 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, hours traffic control will be in place, and work hours.

2.2 The contractor shall request permission at least two working days prior to lane closures or shifting traffic onto detours, and 14 calendar days prior to the imposition of height, width or weight restrictions. This is to ensure closures do not conflict with other work within the zone of influence and the work zone information on the MoDOT's website can remain real-time. In accordance with Management of Traffic (MOT) procedures, the contractor shall submit lane closures for the following week to the engineer by 3:00pm on Monday.

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

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

2.5 Traffic Congestion. The contractor shall, upon approval of the engineer, take proactive measures to reduce traffic congestion in the work zone. The contractor shall immediately implement appropriate mitigation strategies whenever traffic congestion reaches an excess of **10 minutes** to prevent congestion from escalating beyond this delay threshold. If disruption of the traffic flow occurs and traffic is backed up in queues equal to or greater than the delay time threshold listed above then the contractor shall immediately review the construction operations which contributed directly to disruption of the traffic flow and make adjustments to the operations to prevent the queues from reoccurring. Traffic delays may be monitored by physical presence on site or by utilizing real-time travel data through the work zone that generate text and/or email notifications where available. The engineer monitoring the work zone may also notify the contractor of delays that require prompt mitigation. The contractor may work with the engineer to determine what other alternative solutions or time periods would be acceptable. The contractor may refer to the Work Zone Analysis Spreadsheet found in the electronic deliverables under the MoDOT Online Plans Room for detailed information on traffic delays.

2.5.1 Traffic Safety

2.5.1.1 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 When a traffic queue extends 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 due to non-recurring congestion, 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 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 proceeding the holiday until 9:00 a.m. on the first working day subsequent to the holiday:

Memorial Day Independence Day and July 5 Labor Day Thanksgiving Christmas New Year's Day

There may be other events of regional significance, such as specific sporting events (i.e. St. Louis Cardinals and St. Louis Blues home games), events at Forest Park, Tower Grove Park, or Grand Center, parades, marathons, concerts, and other major St. Louis events. The Engineer will advise the contractor of any such events and how they are to be handled. Restricted periods for special events shall be determined by the Engineer.

3.2 The contractor shall not perform any construction operation on the active lanes, including the hauling of material within the project limits, during restricted periods, holiday periods or other special events specified in the contract documents. Any work requiring a temporary reduction for the number of I-44 through lanes of traffic for the A39965 Bridge Closure shall be completed during the following hours:

WB I-44	Single (2 lanes open)	Double (1 lane open)
Monday-Friday	8:00pm-6:00am	8:00pm-5:00am
Saturday	24 hours	8:00pm-5:00am
Sunday	24 hours	8:00pm-5:00am

Westbound I-70 shall be closed for one weekend of work. Westbound I-70 Traffic shall be detoured through the Westbound Exit Ramp to the Westbound Entrance Ramp at the I-70/Adelaide Avenue Interchange. Any work requiring a temporary reduction of the number of I-70 through lanes of traffic for the A59602 Bridge Closure shall be completed during the following hours:

WB I-70	Weekend Closure	Single (2 lanes open)	Double (1 lane open)
Friday-Monday	8:00pm-5:00am	9:00am-3:00pm	8:00pm-6:00am

3.3 The contractor shall be aware that traffic volume data indicates construction operations on the roadbed between the following hours will likely result in traffic queues greater than 10 minutes.

Westbound I-44: Monday through Sunday 5:00 a.m. – 8:00 p.m. Westbound I-70: Monday through Sunday 5:00 a.m. – 8:00 p.m.

Based on this, the contractors operations will be restricted accordingly unless it can be successfully demonstrated the operations can be performed without a 10 minute queue in traffic. It shall be the responsibility of the engineer to determine if the above work hours may be modified. Working hours for evenings, weekends and holidays will be determined by the engineer.

3.4 The contractor shall not alter the start time, ending time, or a reduction in the number of through lanes of traffic or ramp closure 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 its 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 **\$1,000** per 15 minute increment for each 15 minutes that the temporary lane closures are in place and not open to traffic in excess of the limitation as specified elsewhere in this special provision. It shall be the responsibility of the engineer to determine the quantity of unapproved closure time.

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

4.0 Liquidated Damages Related to Bridge A39965 Closure and Bridge A596002 Closure.

Closing Bridge A39965 (Maritz Road over I-44) and Bridge A596002 (Adelaide Avenue over I-70) results in an impact to traffic flow. A liquidated damage amount of **\$2000 each day**, determined by the Commission, reflects the value that interference, inconvenience, delay, congestion, or potential danger to the traveling public will cost the road users for each calendar day.

The contractor will be allowed 30 full consecutive calendar days closure for Bridge A39965 (Maritz Road over I-44) to be in place free of a specific liquidated damage assessment. A liquidated damage amount of **\$2000 per day** will be charged for each calendar day (partial or full) over 30 full days in which the Bridge A39965 (Maritz Road over I-44) is closed.

The contractor will be allowed one weekend from Friday at 8 P.M. until 12:00 A.M. on Wednesday for the closure of Bridge A59602 (Adelaide Avenue over I-70) to be in place free of a specified liquidated damage assessment. A liquidated damage amount of **\$2000 per day** will be charged for each calendar day (partial or full) starting Wednesday at 12:00 A.M. in which Bridge A59602 (Adelaide Avenue over I-70) is closed.

4.0.1 This deduction(s) will be made as liquidated damages from any money due to or to become due to the contractor under the contract. The contractor and surety shall be liable for any liquidated damages assessed in excess of any amount due to the contractor.

4.0.2 This deduction will continue until such time as all closure work is completed and the roadway is unrestricted. Liquidated damages as described elsewhere in the contract will be assessed on any work, excluding closure work as described. There is no deduction cap to any or all liquidated damages.

4.0.3 Liquidated damages for Bridge A39965 Closure and Bridge A59602 Closure will be charged year round including from December 15 to March 15 including Saturdays, Sundays and legal holidays. See **JSP H** – Liquidated Damages Specified for Bridge Repair Work.

4.0.4 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.

5.0 Detours and Lane Closures.

5.1 The contractor shall provide changeable message signs (CMS) notifying 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. Permanent dynamic message signs (DMS) owned and operated by MoDOT 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.

5.2 At least one lane of traffic in each direction shall be maintained at all times except for the weekend closure of Westbound I-70 for the Bridge A59602 closure and the for brief intervals of time required when the movement of the contractor's equipment will seriously hinder the safe movement of traffic. Periods during which the contractor will be allowed to interrupt traffic will be designated by the engineer.

6.0 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 Standard Specifications Section 616.

D. NTCIP Compliant Changeable Message Sign (Contractor Furnished and Retained)

1.0 Description. All solar powered changeable message signs, hereinafter referred to as a CMS, shall be in accordance with these specifications.

2.0 Material. Each CMS shall consist of an all LED (light emitting diode) matrix message board, solar/battery power supply and a user-operated interface, as specified, all mounted on a heavy duty, towable trailer.

2.1 Each CMS shall be either Full Matrix or Character Matrix, and have the following minimum characteristics:

- (a) Full Matrix Each CMS shall be the Full Matrix type with the capability of providing one, two, and three lines of individual changeable characters with minimum heights of 52 (1300), 28 (700), and 18 (450) inches (mm), respectively. Full Matrix signs shall be capable of both static and dynamic graphics, and full display sized messages.
- (b) Character Matrix (Three Line) Each CMS shall consist of a minimum of three lines containing eight individual changeable characters per line. Each character shall be a minimum of 12 inches wide and 18 inches (450 mm) high.
- (c) Sign firmware shall comply with the current FHWA and DOT (Department of Transportation) NTCIP standards and support all NTCIP mandatory objects.
- (d) The sign controller shall be remotely accessible by the MoDOT St Louis District Transportation Management Center (TMC) through the Commission's ATMS (Advanced Traffic Management System) software, currently TransSuite provided by TransCore. The contractor will be responsible for ensuring the CMS is added to the ATMS software.
- (e) The CMS shall have a cellular data modem compatible with the district's current cellular IP (packet data) service provider and be capable of allowing the MoDOT St Louis District TMC ATMS software to have full control of the NTCIP compliant CMS controller remotely. Modem shall by capable of being programmed with a static IP.
- (f) The sign shall have a GPS unit that can assist in locating the sign's position when polled by the TMC. The GPS unit must be remotely accessible by the TMC and be part of or work with the provided communication modem.
- (g) Physical access to the onboard computer shall be protected by a padlock or other locking handle mechanism. Electronic access to the onboard computer shall be protected by a username and password.
- **2.2** Full matrix CMS and character matrix CMS shall meet the following:
 - (a) The overall sign dimensions shall not be less than 72 inches (1800 mm) high x 126 inches (3150 mm) wide.
 - (b) The CMS shall be legible up to a distance of 650 feet (200 m) for both day and night operations and shall be visible for ½-mile (800 m) with 18 inch (450 mm) characters.
 - (c) When fully raised in the display position, the bottom of the CMS board shall be at least a height of 7 feet (2100 mm) from the ground and shall be able to rotate a complete 360 degrees atop the lift mechanism. A sight tube, used to aim the CMS board to oncoming traffic, shall be installed on the CMS board or mast. The CMS shall have an electrical-hydraulic lifting mechanism that includes a manual lifting and lowering relief mechanism as a backup. It also must be able to be locked into various viewing angles as determined best for the motorists by the CMS operator.
 - (d) All LED displays and control circuitry shall be operational from -20 F (6 C) to 120 F (50 C). The LED's shall have a rated life of 100,000 hours. The LED's shall be ITE amber in color on a flat black background.

- (e) The CMS face shall be constructed that if an individual panel or pixel fails the rest of the face shall continue to display the message.
- (f) All costs and coordination needed for testing to verify modem communication, sign NTCIP compliance, remote GPS status polling, ability to control the sign via the St Louis District's ATMS software provided by TransCore shall be the sole responsibility of the Contractor. Full integration into TransCore's ATMS shall be completed at least 5 business days prior to use of the CMS in the project. TransCore contact information will be provided to the contractor by contacting MoDOT's Gateway Guide staff at 314-275-1526 or via email at ggtech@modot.mo.gov with details of the request. No other support shall be provided by MoDOT other than TransCore contact information. Information provided shall include, at a minimum, CMS make and model, IP address, and proposed locations and messages.
- (g) The Contractor shall be responsible for all monthly cellular service fees for the duration of the project.
- (h) The unit shall be able to withstand a 65-mph (105-kmph) maximum road wind speed. The trailer shall be able to support the fully extended CMS board in an 80-mph (130-kmph) wind load.
- (i) Solar charging system shall allow for total autonomy of 24/7/365 continuous operation.
- (j) All exterior surfaces except the sign face shall be cleaned, primed, and finished with two coats of Highway Safety Orange and the sign interior itself shall be cleaned and finished with one coat of corrosion inhibiting primer and two coats of flat black. The sign face shall be covered with a rigid translucent material to prevent damage to the sign face caused by the environment.

3.0 Construction Requirements. Prior to placing a CMS on a project, the engineer shall verify proposed CMS location is void of conflict with another DMS or CMS locations presently established. If a conflict is present, the engineer shall contact the Traffic Management Center (TMC) at 314-275-1526 to mitigate. If no conflict is present, engineer shall provide Traffic Management Center (TMC) with the Job Number, Route, County, specific CMS location, and a CMS identification number that is permanently affixed to the CMS. The engineer and contractor shall verify the message displayed on board is compliant with CMS messaging policies. The contractor shall place the CMS 6 feet [2 meters] off of the right edge of shoulder at the location shown on the plans or as directed by the engineer. The CMS shall be placed so that the right side of the unit is advanced approximately 3 degrees ahead with the direction of traffic. CMS shall not be located in medians. CMS shall be delineated with a minimum of five non-metallic channelizing devices. Installation, including location and placement, shall be approved by the engineer. If needed, the contractor shall relocate the CMS as directed by the engineer.

3.1 When not in use, the CMS shall be stored no closer than 30 feet [10 meters] to the edge of pavement carrying traffic, unless it is in a properly protected area or an off-site storage area or as otherwise directed by the engineer.

4.0 Basis of Payment. All expenses incurred by the contractor in integrating, maintaining, relocating, operating and protecting the changeable message signs as outlined above shall be paid for at the contract unit price for Item 616-99.02 Changeable Message Sign, Contractor Furnished and Retained, per Each.

4.1 Cost for channelizers shall be included in the contract unit price for CMS.

4.2 Cost for cellular phone hookup and monthly usage fee for the duration of the project shall be included in the contract unit price for CMS.

Item No.	Туре	Description
616-99.02	Each	NTCIP COMPLIANT CHANGEABLE MESSAGE SIGN (CONTRACTOR FURNISHED AND RETAINED)

E. <u>Project Contact for Contractor/Bidder Questions</u>

All questions concerning both the J6M0268 and J6M0269 projects during the bidding process shall be forwarded to the project contact listed below.

Christopher Kelly, P.E., Project Manager MoDOT – St. Louis District 1590 Woodlake Drive Chesterfield, MO 63017 Telephone Number 314-453-5034 e-mail <u>Christopher.kelly@modot.mo.gov</u>

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

F. Emergency Provisions And Incident Management

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

2.0 In addition to the 911 emergency telephone number for ambulance, fire or police services, the following agencies may also be notified for accident or emergency situation within the J6M0268 project limits.

Missouri Highway Patrol (573-751-3313)		
City of Fenton	City of Valley Park	
Fire: 636-343-4188	Fire: 636-225-4288	
Police: 636-349-8120	Police: 636-225-5252	
St. Louis County Chief of Police (314-615-4260)		

2.1 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 J6M0269 project limits.

Missouri Highway Patrol (573-751-3313)			
City of St. Louis			
Fire: 314-533-3406			
Police: 314-444-5309			
St. Louis Chief of Police (314-444-5309)			

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

MoDOT Transportation Management Center 14301 South Outer Road Chesterfield, MO 63017 314-275-1500

2.3 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.

2.3 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.

2.4 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.

G. <u>Utilities</u>

1.0 For informational purposes only, the following is a list of names, addresses, email addresses, and phone and fax numbers of the <u>known</u> utility companies in the area of the construction work for this improvement:

<u>Utility Name</u>	<u>Known</u> <u>Required</u> <u>Adjustment</u>	<u>Түре</u>
N/A	None	N/A

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 utilities.

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

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

2.0 It shall be noted by the contractor that MoDOT is a member of Missouri One Call (800 Dig Rite). Some work on this project may be in the vicinity of MoDOT utility facilities, which includes but is not limited to traffic signal cables, highway lighting circuits, ITS cables, cathodic protection cables, etc. Prior to beginning excavation work, the contractor shall request locates from Missouri One Call.

H. Liquidated Damages Specified for Bridge Repair Work

1.0 Description. For Bridge A59602 (Adelaide Avenue over I-70), if all lanes on I-70 are not fully open to traffic prior per the table below the Commission, the traveling public, and state and local police and governmental authorities will be damaged in various ways, including but not limited to potential liability, traffic and traffic flow regulation cost, traffic congestion and motorist delay, with its resulting cost to the traveling public. Revise Sec 108.8.1.2 (a) and (b) and substitute the following for the project based upon information given in Sections 1.1 and 1.2 below:

- (a) Liquidated damages will be assessed from December 15 to March 15
- (b) Liquidated damages will be assessed for Saturdays, Sundays and Holidays.

1.1 If Bridge A39965 (Maritz Road over I-44) and Bridge A59602 (Adelaide Avenue over I-70) are not open to traffic prior to **May 24, 2019**, the Commission, the traveling public, and the state and local polices and the 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 **\$2,000** per day for each bridge each full day that Bridge A39965 and Bridge A59602 are 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 excess closure time.

2.0 Liquidated Damages Specified for Failure To Complete Work on Time. These costs are not reasonably capable of being computed or quantified. Therefore, the contractor will be charged with liquidated damages specified in the amount shown in the table below per each 15 minute interval that all traffic lanes are not fully open on I-70 as specified elsewhere in this special provision. It will be the responsibility of the engineer to determine the quantity of excess closure time.

WORK	COMPLETION DATE OR CLOSURE TIME ALLOWED	LIQUIDATED DAMAGES
I-70 WB Full Weekend Closure	8:00 p.m. Friday – 5:00 a.m. Monday	\$850/15 minutes

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

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

I. <u>Temporary Traffic Control (Lump Sum)</u>

1.0 Description. All work necessary to maintain safe and efficient traffic flow through the work areas shall be provided by the contractor. This will include furnishing, relocating, and removing temporary traffic control devices, truck mounted attenuators and equipment, and the removal and relocation or covering and uncovering of existing signs and other traffic control devices in accordance with the contract documents or as directed by the engineer.

2.0 Work requirements. Work shall be in accordance with Sec 616, Sec 612 and the contract plans.

3.0 Method of Measurement. The quantities shown on the plans shall be considered an estimate and may be subject to change based on field conditions. This work will not be measured for payment, but will be considered a lump sum unit. Any Value Engineering proposals to the temporary traffic control will not be paid for through value engineering but will be covered under Temporary Traffic Control, lump sum.

4.0 Basis of Payment.

4.1 Partial payments will be made as follows:

- (a) The first partial payment will be made when five percent of the original contract amount is earned. This payment will be the lesser of 50 percent of the contract price for the item of temporary traffic control or 5 percent of the original contract price.
- (b) The second partial payment will be made when 50 percent of the original contract amount is earned. This payment will be the lesser of 25 percent of the original contract price for the item of temporary traffic control or 2.5 percent of the original contract price.

- (c) The third partial payment will be made when 75 percent of the original contract amount is earned. This payment will be the lesser of 20 percent of the original contract price for the item of temporary traffic control or 2 percent of the original contract price.
- (d) When the engineer has accepted the contract for maintenance in accordance with Sec 105, the remaining contract price for the item of temporary traffic control will be paid.
- (e) The above partial payment schedule may be adjusted by the engineer if proof of invoices submitted by the contractor demonstrate additional temporary traffic control costs were incurred earlier than the above proposed schedule. The total payment for temporary traffic control will not exceed the bid amount for Temporary Traffic Control, lump sum, unless covered by a cost change order as referenced in the following Section 5.3.

4.1.1 For the purposes of this provision, the term "original contract price" will be construed as the total dollar value of the construction items (excluding temporary traffic control) of the original contract.

4.2 Temporary traffic control will be paid for at the contract lump sum price for Item 616-99.01, Temporary Traffic Control. No direct payment will be made for the following:

- (a) Incidental items necessary to complete the work, unless specifically provided as a pay item in the contract.
- (b) Installing, operating, maintaining, cleaning, repairing, removing or replacing traffic control devices.
- (c) Covering and uncovering existing signs and other traffic control devices.
- (d) Relocating temporary traffic control devices, including permanent traffic control devices temporarily relocated, unless specifically included as a pay item in the contract.
- (e) Providing channelizers, directional indicator barricades, moveable barricades, drums, etc.
- (f) Worker apparel.
- (g) Flaggers, pilot vehicles, and appurtenances at flagging stations.
- (h) Furnishing, installing, operating, maintaining, and removing construction-related vehicle and equipment lighting.
- (i) Providing work zone lighting.
- (j) Construction and removal of temporary equipment crossovers, including restoring preexisting crossovers.
- (k) Removing existing pavement markings, installing temporary pavement markings, and removing and relocating temporary pavement markings as necessary for staging operations.

(I) Installing "Drive Smart" and "Point of Presence" signs.

4.3 Any additional work deemed necessary by the engineer that requires temporary traffic control and is not covered by the contract plans will be included in the cost change order for the additional work. However, if the added work is required in a stage where temporary traffic control is already in place, no additional traffic control pay will be allowed in this case.

J. <u>DNR Notification for Bridge Rehabilitation Work</u>

1.0 Description. The contractor shall notify DNR, the Missouri Department of Natural Resources, at least 10 days in advance of any rehabilitation work on the following Bridges noted in the plans:

Bridge A39965 (Maritz Road over I-44) Bridge A59602 (Adelaide Avenue over I-70)

The rehabilitation work that requires the contractor to notify DNR includes, but is not limited to, rehabilitating the deck in which existing material from the bridge may be lost due to the rehab work. No concrete or water slurry from any of the bridges listed above will be allowed to enter the water systems of the State of Missouri.

1.1 The contractor may contact Missouri's Department of Natural Resources' Air Pollution Control Program at 1-800-361-4827. Notification is necessary in advance of the start date for bridge rehabilitation work with or without quantities of asbestos present. The contractor shall provide copies of all completed information and forms requested by DNR to the engineer prior to any bridge rehabilitation work for the above structures.

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.

K. <u>Stormwater Compliance Requirements NJSP-15-38</u>

1.0 The land disturbance necessary to complete this project is not anticipated to exceed one (1) acre. Should the contractor disturb more than one (1) acre to complete the work, or for any other reason, all terms of this Job Special Provision will apply.

1.1 Description. The Contractor shall comply with the terms of the United States of America v. Missouri Highways and Transportation Commission Consent Decree (Consent Decree) that are identified as the responsibility of the Contractor or subcontractor, and with the terms of this provision. Viewing of the Consent Decree is available on the MoDOT Land Disturbance webpage under Contractor Resources, or by going to the web address <u>www.modot.org/LD</u>.

1.2 Applicability. The Consent Decree and this provision apply to any project that includes land disturbance of areas totaling greater than one (1) acre on the project site. The project site consists of all areas designated on the plans, including temporary and permanent easements. The Consent Decree and this provision do not apply to Contractor staging, plant, or borrow areas that are not located on MoDOT right of way (Off-site). The Contractor is responsible for

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

2.0 Stormwater Training for Contractor Employees. The Contractor's on-site project manager, designated Water Pollution Control Manager (WPCM), as defined in Section 3.0, and WPCM delegate, shall complete MoDOT Stormwater Training prior to serving in those roles. If someone other than the Contractor's project manager is given the authority to manage the grading or erosion control operations, the project manager(s) for those operations shall also complete MoDOT Stormwater Training. MoDOT Stormwater Training is also required for any other person who the Contractor gives authority to take measures to prevent or minimize the consequences of non-compliance with the Stormwater requirements, as defined in Section 3.1(a) of this provision.

2.1 The Commission will provide MoDOT Stormwater Training to the Contractor employees specified in Section 2.0 at a location and time determined by MoDOT. There will be no fee for attending the training; however, the Contractor shall be responsible for all other cost related to the training, such as travel expenses, if necessary, and wages for its employees. The time to complete the training is anticipated to be no more than 6 hours. As long as the Consent Decree is in effect, MoDOT will provide periodic trainings at various locations around the state, as needed, to ensure contractors and bidders have the opportunity to maintain the number of WPCMs they need to comply with this provision.

2.2 Those who require MoDOT Stormwater Training per Section 2.0 shall complete the training prior to beginning any land disturbance work. Thereafter, training shall occur at least once every two (2) years. The training is not project-specific. Any Contractor employee who receives the training will be qualified to perform the WPCM duties on any MoDOT project for a period of two (2) years.

2.3 MoDOT will document the names and dates that contractor employees attend MoDOT Stormwater Training and will retain those records for the period of time specified in the Consent Decree. Duplicate record keeping by the contractor is not required.

3.0 Water Pollution Control Manager (WPCM). Prior to the Pre-Activity meeting for Grading/ Land Disturbance, the Contractor shall designate a Water Pollution Control Manager (WPCM) to fulfill the duties and responsibilities listed in Section 3.1 until final stabilization occurs. The Contractor's on-site project manager may also serve as the WPCM or that role may be assigned to another manager employed by the contractor or a subcontractor. The Contractor shall also maintain a WPCM delegate to temporarily fulfill the WPCM duties in the absence of the primary WPCM (e.g. illness, vacation, other leave).

- **3.1** Duties of the WPCM:
 - (a) Be familiar with Stormwater Requirements including the National Pollutant Discharge Elimination System (NPDES), the current MoDOT State Operating Permit for construction stormwater discharges/ land disturbance activities, the Project-specific Stormwater Pollution Prevention Plan (Project SWPPP), the Corps of Engineers Section 404 Permit, when applicable, the Consent Decree, and this provision. The Project SWPPP includes: a title page with project-specific information, the general SWPPP

posted on the MoDOT land disturbance website, the Project Erosion & Sediment Control Plan, all applicable special provisions, and all applicable specifications and standard drawings;

- (b) Complete the stormwater training set forth in Section 2.0;
- (c) Attend the Pre-Activity for Grading/ Land Disturbance Meeting or, if hired after the meeting has occurred, be familiar with the conference decisions;
- (d) Review and sign the Project-specific SWPPP and all updates thereto within time periods set out in the Consent Decree;
- (e) Visit and review the project site for compliance with Stormwater Requirements at least once per week from the start of any grading operations until final stabilization is achieved and permit is closed;
- (f) Be authorized by the Contractor to supervise all work performed by the Contractor and subcontractors that involves compliance with Stormwater Requirements, including the authority to order work be stopped on a Project, implement MoDOT-directed changes in work related to Stormwater Requirements, and order the taking of, measures to cease, correct, prevent, or minimize the consequences of non-compliance with Stormwater Requirements;
- (g) Review and certify electronically each MoDOT inspection report for the Project within three (3) days of receiving each report to ensure it conforms with report requirements in the National Pollution Discharge Elimination System Stormwater (NPDES SW) Permit, Project SWPPP and the Consent Decree and ensure that all Stormwater Deficiencies noted on the report are corrected within the time required;
- (h) Recommend in writing within three (3) days of discovering any changes in site conditions and Best Management Practices (BMPs) that require an update to the Project-specific SWPPP; and
- (i) Be the point of contact relating to Stormwater Requirements and the Consent Decree between the Contractor, Subcontractors and MoDOT.

4.0 Pre-Activity Meeting for Grading/Land Disturbance and Required Hold Point. At each Project, a Pre-Activity Meeting for Grading/Land Disturbance shall be held prior to the start of any land disturbance and shall include a physical visit and review of the project site. Discussion items at the pre-activity meeting shall include a review of the project SWPPP, the planned order of grading operations, proposed areas of initial disturbance, identification of all necessary BMPs that shall be installed prior to commencement of grading operations, and any issues relating to compliance with the Stormwater requirements that could arise in the course of construction activity at the project.

4.1 Contractor employees who shall attend the Pre-Activity Meeting for Grading/Land Disturbance include the WPCM for the Project and the person(s) designated the authority to manage the grading and erosion control operations.

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

5.0 Compliance with the NPDES SW Permit and Project SWPPP. On all projects, the Contractor shall comply with all applicable Stormwater Requirements which are defined as, but are not limited to:

- (a) Consulting with the engineer on recommended design revisions to the Project SWPPP to accommodate the Contractor's staging plan, implementation, managing, and maintaining BMPs or other control measures to prevent or minimize sediment and other pollutants in stormwater runoff in accordance with contract specifications or any relevant manufacturer specifications and good engineering practices, including but not limited to the manuals (*Note: two manuals cited in the MoDOT permit are "Developing your stormwater pollution prevention plan: A guide for construction activities" and "Protecting Water Quality: A Field Guide to erosion, sediment and stormwater best management practices for development sites in Missouri"*) and any other applicable standards for sedimentation basins, stabilization, rock dams, brush checks, construction entrances, and other BMPs;
- (b) Installing all BMPs at the locations and relative times specified in the Project SWPPP; and
- (c) Complying with the Missouri Water Quality Standards and with effluent limitations in Section E.1 of the NPDES SW Permit. Measurement of effluent is not required except as specified in E.2.

5.1 Stormwater Deficiency Corrections. Per terms of the Consent Decree, Stormwater Deficiencies identified on the MoDOT Land Disturbance Inspection Report shall be corrected within 7 days of the inspection date to avoid stipulated penalties, except that more time might be granted by the engineer when weather or field conditions prohibit the corrective work. If the Contractor does not initiate corrective measures within 5 calendar days of the inspection date or any extended period granted by the engineer, all work shall cease on the project except for work to correct these deficiencies, unless otherwise allowed by the engineer. All impact costs related to this halting of work, including, but not limited to stand-by time for equipment, shall be borne by the Contractor. Work shall not resume until the engineer approves the corrective work.

6.0 Inspection Protocol. The Contractor and all subcontractors shall review and adhere to MoDOT's written Stormwater Inspection Protocol, found on the MoDOT Land Disturbance webpage (<u>www.modot.org/LD</u>). The Inspection Protocol is applicable to all Projects under the consent decree. The MoDOT Resident Engineer will serve the role of Stormwater Resident Engineer, or a delegate will be named in their absence.

6.1 Inspection Reports. MoDOT will provide one or more Environmental Construction Inspectors (ECI) to perform the weekly and post run-off inspections and other duties described in paragraph 17 of the Consent Decree. The ECI will enter the inspection reports into a webbased Stormwater Compliance database. The WPCM will have access to this database to view all report information, including any noted deficiencies, and to certify the report as required in Section 3.1 (g.). Automated email reminders of pending reports that need to be certified and for

deficiencies that need to be corrected will be sent to the WPCM. The Contractor may designate other employees or subcontractor employees to have viewing access to this database and to receive the email reminders. Completion of MoDOT Stormwater Training is necessary in order to receive the email reminders. The WPCM and other users shall be equipped with an electronic device (desktop computer, laptop, tablet, smartphone, etc.) with a browser and internet access to connect to the database. The contractor shall be responsible for providing the electronic devices.

7.0 Stipulated Penalties. If the Contractor fails to comply fully and timely with the requirements of the Consent Decree, stipulated penalties will be assessed to the Commission. For matters under the Contractor's responsibility and control the following stipulated penalties will be assessed to the Contractor and MoDOT will withhold payment pursuant to the following:

Violation	Stipulated Penalty Amount
Failure to Designate or Maintain WPCM at	\$750 for the initial violation (each person not
each Project in Accordance with Section 3.0.	designated) and then \$750 for each fourteen
	(14) day period that person is not designated.
Failure to complete MoDOT Stormwater	\$750 per person for each missed training.
Training by an Individual Required to be	This \$750.00 per person violation shall
Trained in Accordance with Section 2.0, such	continue to accrue for each fourteen (14) day
as the WPCM or Project Manager.	period that the person fails to timely receive
	the applicable training
Failure of WPCM to Review and Certify an	\$250 per inspection report not reviewed or
Inspection Report in Accordance with	signed.
Inspection Protocol as set forth in Section 6.	
Failure to Comply with Any NPDES SW	\$1000 per violation for the first ten (10) days
Permit or SWPPP Requirement.	of the violation; \$2500 per violation for days
	11-20; \$3500 per violation for days 21 and
	beyond.
Failure to Correct a Stormwater Deficiency	\$1000 per deficiency for the first ten (10)
Identified in a MoDOT Inspection Report, or	days after correction was required; \$2500 per
Otherwise Discovered by the WPCM, within	deficiency for days 11-20 after correction was
the Time Required by the NPDES SW Permit	required; \$3500 per deficiency for days 21
or SWPPP.	and beyond after correction was required.

8.0 Information Collection and Retention. The EPA, its representatives and its agents shall have the right of entry into any facility covered by this Consent Decree, at all reasonable times, upon presentation of credential, to:

- (a) monitor the progress of activities required under the Consent Decree;
- (b) verify any data or information submitted to the United States in accordance with the terms of the Consent Decree;
- (c) obtain samples and, upon request, splits of any samples taken by MoDOT or its representatives, contractors, or consultants;
- (d) obtain documentary evidence, including photographs and similar data; and
- (e) assess MoDOT's compliance with the Consent Decree.

8.1 Until three (3) years after the termination of the Consent Decree, Contractors and the agents of the Contractors shall preserve all non-identical copies of all documents, records, or other information (including documents, records, or other information in electronic form) in its or its Contractors' or agents' possession or control, or that come into the Contractor's or agent's possession or control, and that relate to MoDOT's performance of its obligations under the Consent Decree or to the Contractor's performance of its obligations under the Consent Decree. This information-retention requirement shall apply regardless of any contrary corporate or institutional policies or procedures.

9.0 Basis of Payment. Should the contractor disturb more than one (1) acre due to its method of operations, or for any other reason, no direct payment will be made for compliance with this provision, including the cost to provide a WPCM. Should the engineer direct the contractor to exceed one (1) acre of land disturbance, payment will be made only for the actual cost of the weekly duties of the WPCM. Separate payment will be made for erosion and sediment control devices, and for permanent and temporary seeding and mulching, when payment for those items are provided elsewhere in the contract.

L. <u>Coordination with ITS Staff and Utility Locates</u>

1.0 Description. Any work that will impact the existing communications network must be coordinated with the Commission's St. Louis District ITS staff. This includes but not limited to removal and replacement of any existing communications equipment, adding new devices and changes to power sources or disconnects. Minor modifications to the existing communications network can have significant impacts on the system and operation of other ITS and traffic signal systems.

1.1 MoDOT is a member of MO-One-Call System. Prior to any excavation or work within MoDOT Right-Of-way, the contractor must contact MO-One Call at 1-800-DIG-RITE and request for Utility Locates within noted project limits. If the scope of work contains modification, addition and/or expansion of existing underground MoDOT ITS, lighting, or signal facilities, the contractor must notify the MoDOT Utilities Locate staff prior to any work, in order for MoDOT to update MoDOT utility location records with Missouri One Call.

2.0 Contact. Initial contact must be made at least seven calendar days before work that may impact the existing communications network commences. Contact the ITS staff via an email at SLITS@modot.mo.gov. The engineer shall be notified prior to making contact with ITS staff. For MoDOT Utility location updates, the contractor must contact MoDOT TMC at 314-275-1500 and ask for Utility Locate Section at least seven calendar days before performing any work.

3.0 The ITS and network devices located within the project limits are a crucial part of the traffic operation system for this area. It is imperative that the downtime be kept to a minimum when adding, removing, or modifying any existing ITS and network devices. This may require the contractor to perform work that will affect existing network devices during nighttime and/or weekend hours, at the discretion of the Engineer. Allowable timeframes for this work will be subject to the need for ITS devices in the area to be used to manage other traffic impacting workzones.

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

M. Fiber Optic Cable Relocation

1.0 Description. This work shall consist of removal of the existing fiber cable, 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 -40° C to 70° 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 twelve 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 (1³/₄ 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 (1³/₄ 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 (1³/₄ 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.

2.10 Wall-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 be designed for wall or panel mounting and occupy no more than 350 square inches of wall space. It shall be made of powder coated aluminum and have a gasketted, hinged door. It shall have provisions for cable strain relief and for connector labeling. It shall have a patch panel with at least 24 positions compatible with the connectors specified in Section 2.3 of this provision. It shall accommodate at least six splice trays as specified in Section 2.2 of this provision and shall be equipped with enough trays for all the splices made in the interconnect center.

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 <u>before</u> 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:

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.

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)
(2.2)	+ (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.

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.

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.

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 Guarantee. All items covered by this specification shall carry a two-year guarantee from the date of acceptance against any defects in workmanship or materials.

8.0 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.	Туре	Description
910-99.03	Linear Foot	Fiber Optic Cable, 6 Strand, Multi Mode
910-99.03	Linear Foot	Fiber Optic Cable, 18 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	Fiber Optic Jumper, MM, Furnish and Install
910-99.02	Each	Fiber Optic Splice

N. Install Ethernet Bridge Radio at Signalized Intersections

1.0 Description. To provide and Ethernet network signal connection to other intersections, Ethernet bridge radios shall be furnished by the Commission and installed by the Contractor at the following intersections:

- a. Adelaide Avenue at Concrete Median Island at Northeast Intersection of Westbound I-70 Ramps and Adelaide Avenue
- b. Adelaide Avenue at Southwest corner of Northeast Intersection of Westbound I-70 Ramps and Adelaide Avenue

2.0 Requirements. An Ethernet bridge radio shall be installed on existing signal mast arms at the intersections as shown in the plans. Hardware to mount the integrated radios on the mast arms shall be provided by the contractor for each mounting location. Outdoor rated Category 5E cables shall be provided to connect the power injector to the Ethernet switch in the signal cabinet, and the power injector to the radio. The radio must be tested in combination with other radios prior to acceptance.

3.0 Construction Requirements. Construction requirements shall conform to Sec 902 and 1092. The integrated Ethernet bridge radios shall be mounted directly to the signal mast arm using an approved bracket.

4.0 Testing. The items of work described in this provision are not complete until network communications testing has been completed to the satisfaction of the Engineer.

5.0 Method of Measurement. Method of measurement shall conform to Sec 902.

6.0 Basis of Payment. Payment for the installing of Ethernet bridge radios at signalized intersections will be made by Item No. 902-99.02, "Ethernet Bridge Radio," per each and shall be considered full compensation for all contractor-provided equipment, connection cables, installation of non-contractual items, labor, and material to complete the described work.

O. <u>Supplemental Revisions</u> JSP-18-01D

Delete Sec 106.9 and substitute the following:

106.9 Buy America Requirement On all federal-aid projects, the contractor's attention is directed to Title 23 CFR 635.410 Buy America Requirements. Where steel or iron products are to be permanently incorporated into the contract work, steel and iron material shall be manufactured in the USA except for "minor usage" as described herein. Furthermore, any coating process of the steel or iron shall be performed in the USA. The use of pig iron and processed, pelletized and reduced iron ore manufactured outside of the USA will be permitted in the domestic manufacturing process for steel or iron material.

Delete Sec 106.9.3 and substitute the following:

106.9.3 Buy America requirements include a step certification for all fabrication processes of all steel or iron materials that are accepted per Sec 1000.

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

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

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

Delete Sec 106.9.4 and Renumber subsequent sections accordingly:

Delete Sec 616.5.1 and substitute the following:

616.5.1 Amber or Amber and White Warning Lights. All on-road construction-related vehicles and equipment shall operate with amber or amber and white warning lights having 360 degrees of total coverage and as follows:

(1) For daytime operations, SAE Class 1 or 2 lights shall be used.

(2) For dusk to dawn operations, SAE Class 2 lights shall be used, or SAE Class 1 lights with dimming capabilities to minimize glare experienced by travelers.

616.5.1.1 Red or Red and Blue Warning Lights. The contractor may elect to use red or red and blue warning lights in accordance with Missouri law and the following requirements:

(1) Use of red or red and blue lights shall be limited to use on a total of two vehicles per work zone and/or project.

(2) Use of red or red and blue warning lights shall be limited to areas in advance of tapers or lane shifts and at the active work location.

(3) Lights shall be SAE Class 2 or SAE Class 1 with dimming capabilities to minimize glare experienced by travelers.

The awarded contract will serve as a permit by the Commission, granting the prime contractor and approved sub-contractors to utilize red or red and blue lights as required by Missouri law.

TABLE OF CONTENTS

- A. Construction Requirements
- B. Partial Removal and Storage of Ornamental Light Poles
- C. Partial Removal and Storage of Pedestrian Fence
- D. Temporary Support of Conduit
- E. Partial Removal of Superstructure
- F. Re-installation of Pedestrian Fence
- G. Fabricated Bridge Unit
- H. Re-install Conduit System on Structure
- I. High Performance Concrete for Slab
- J. Grout for Shear Keys
- K. Aesthetic Concrete Stain
- L. Heat Straightening of Existing Plate Girders
- M. Crack Arresting
- N. Grind Weld Toes
- O. Structural Steel Requirements
- P. Re-Installation of Ornamental Light Poles



JOB SPECIAL PROVISIONS (BRIDGE)

A. <u>CONSTRUCTION REQUIREMENTS</u>

1.0 Description. This provision contains general construction requirements for this project.

2.0 Construction Requirements. Plans and shop drawings for the existing structure are included in the contract in the bridge electronic deliverables zip file for informational purposes only. Note, for Bridge A59602, the shop drawings differ from observations of the actual structure, particularly at the diaphragm connections, bearing stiffeners and fence details.

2.1 The Contractor shall complete field measurements prior to ordering material.

2.1.1 The Contractor shall be responsible for developing all required dimensional adjustments and coordinating the implementation of the dimensional adjustments with all involved fabricators and subcontractors. The Contractor assumes all risks it may encounter in basing its bid prices, time or schedule of performance on the dimensions and elevations provided on the plans.

2.2 In order to assure the least traffic interference, the work shall be scheduled so that a lane closure is for the absolute minimum amount of time required to complete the work. A lane 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.

2.2.1 Traffic under the bridge shall be maintained in accordance with the contract documents.

2.3 Bridge work by contractor forces, including erection, rehabilitation, or demolition, shall not be allowed over traffic unless a bridge platform protection system is installed below the work area except for work performed above a deck that is intact. The protection system shall be capable of catching all falling objects such as tools, overhang brackets or materials. Lifting of objects that are heavier than the capacity of the bridge protection system shall not be allowed.

2.4 Provisions shall be made to prevent any debris and materials from falling onto the roadway. Any debris and materials that falls below the bridge outside the limits mentioned previously and if determined necessary by the Engineer, the debris shall be removed as approved by the Engineer at the contractor's expense.

2.5 Any damage sustained to the remaining structures, conduit, traffic signals or ITS system as a result of the Contractor's operations shall be repaired or the material replaced as approved by the Engineer at the Contractor's expense.

2.6 Provisions shall be made to prevent damage to any existing utilities. Any damage sustained to the utilities as a result of the Contractor's operations shall be the responsibility of the contractor to repair. All costs of repair and disruption of service shall be as determined by the utility owners and as approved by the Engineer.

2.7 A washer shall be required under head and nut when any reaming is performed for bolt installation.

2.8 SSPC-SP2 and SSPC-SP-3 surface preparation shall be in accordance with the environmental regulations in Sec 1081 and collection of residue shall be in accordance with Sec 1081 for collection of blast residue. SSPC-SP6, SSPC-SP10 and SSPC-SP-11 surface preparation shall be in accordance with the approved blast media and environmental regulations in Sec 1081 and collection of blast residue shall be in accordance with Sec 1081 and collection of blast residue shall be in accordance with Sec 1081 and collection of blast residue shall be in accordance with Sec 1081 and collection of blast residue shall be in accordance with Sec 1081.

2.9 For Bridge No. A39965, the new girder segment shall be firmly seated on the new PTFE bearing prior to pouring the concrete slab. In order to achieve this, a load may need to be placed as shown on the contract plans. The Contractor shall coordinate placement of this load with the Engineer.

3.0 Coating Information. The new steel, heat straightened portion of steel and existing steel that requires surface preparation for connection of new steel shall be coated in accordance with the contract plans.

3.1 Straps Removal. Exposed portions of straps for stay-in-place forms shall be removed prior to surface preparation. Straps need not be removed in areas that are not being painted. Flame cutting will not be permitted. The Contractor shall exercise care not to damage the existing structure during removal. Any damage sustained to the remaining structure as a result of the Contractor's operations shall be repaired or the material replaced as approved by the Engineer at the Contractor's expense.

3.2 Existing Bridge Information. The informational plans may be used by bidders in determining the amount of steel to be cleaned and painted/coated with the full understanding that the State accepts no responsibility for accuracy of the estimated tons of existing steel shown in the table below. The bidder's acceptance and use of the estimate shown below shall be no cause for claim for any final adjustment in the contract unit price for the work involved in repainting. Each bidder is expected to carefully examine the structure(s), investigate the condition of existing paint and to prepare their own estimate of quantities involved before submitting a bid. Surface preparation and applying field coatings to the structural steel will be based on the contract plan quantities. No final measurements will be made.

	Estimated Tons				
Pridao	Coating System			Evicting Doint	Lood
No.	System G	Calcium Sulfonate	Total	System	Based
A39965	4	0	4	G	No
A59602	1	0	1	G	No

3.3 Environmental Contact. Environmental Section may be contacted at the below address or phone number. The Missouri Department of Health may be contacted at 573-751-6102.

 (a) MoDOT - Design Division - Environmental Section PO Box 270
105 W Capitol Ave, Jefferson City, MO 65102
Telephone (573) 526-4778

3.4 Approved Smelter and Hazardous Waste Treatment, Storage and Disposal Facility. The following is the approved smelter and hazardous waste treatment, storage and disposal facility:

> Doe Run Company-Resource Recycling Division-Buick Facility Highway KK Boss, MO 65440 Telephone 573-626-4813

JOB SPECIAL PROVISIONS (BRIDGE)

3.5 The Contractor shall take care to not paint or otherwise damage the stainless steel plate component of the PTFE bearing for Bridge No. A39965.

4.0 Method of Measurement. No measurement will be made.

5.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract unit price for other items included in the contract.

B. PARTIAL REMOVAL AND STORAGE OF ORNAMENTAL LIGHT POLES

1.0 Description. This provision contains construction requirements for the partial removal and storage of the existing ornamental light poles.

2.0 Construction Requirements. The existing ornamental light poles shall be removed to the limits as shown on the contract plans.

2.1 The removal shall include the ornamental light pole and fixture.

2.2 The Contractor shall carefully remove the ornamental light poles to avoid damage to any of the components.

2.3 All removed components of the ornamental light poles shall be stored in a secure manner at a location aproved by the Engineer until the ornamental light poles are ready for reinstallation.

2.4 Any damage sustained to the structure that is to remain in place, as a result of the Contractor's operations, shall be repaired or the material replaced as approved by the Engineer at the Contractor's expense.

3.0 Method of Measurement. Measurement will be made per each ornamental light pole.

4.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract unit price for Partial Removal and Storage of Ornamental Light Poles.

C. PARTIAL REMOVAL AND STORAGE OF PEDESTRIAN FENCE

1.0 Description. This provision contains construction requirements for the partial removal and storage of the existing pedestrian fence.

2.0 Construction Requirements. The existing fence shall be removed to the limits as shown on the contract plans.

2.1 The removal shall include the fence mesh, panels, posts, rails and base plates.

2.2 The Contractor shall carefully remove the fence to avoid damage to any of the components.

2.3 All removed components of the fence shall be stored in a secure manner at a location approved by the Engineer until the fence is ready for re-installation.

JOB SPECIAL PROVISIONS (BRIDGE)

2.4 Any damage sustained to the structure that is to remain in place, as a result of the Contractor's operations, shall be repaired or the material replaced as approved by the Engineer at the Contractor's expense.

3.0 Method of Measurement. Measurement will be made to the nearest linear foot.

4.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract unit price for Partial Removal and Storage of Pedestrian Fence.

D. <u>TEMPORARY SUPPORT OF CONDUIT</u>

1.0 Description. This provision contains construction requirements for the temporary support of conduit attached to the bridge for Bridge No. A39965.

2.0 Construction Requirements. There are two lines of conduit attached to the existing barrier curb to be replaced. The conduit contains MoDOT signal and ITS which must remain functional during construction.

2.1 The existing conduit attached to the segment of the barrier to be removed shall be removed prior to removal of the barrier and temporarily supported during construction.

2.2 The conduit shall not extend below 3" above the bottom of girders that remain in place.

2.3 The Contractor shall carefully remove the conduit clamps from the existing bridge to avoid damage to the conduit.

2.4 The temporary support shall remain in place until the conduit can be attached to the new barrier.

2.5 The method of supporting the conduit shall be approved by the Engineer prior to removal of the conduit.

2.6 Any damage sustained to the structure, conduit, signal or ITS system that is to remain in place, as a result of the Contractor's operations, shall be repaired or the material replaced as approved by the Engineer at the Contractor's expense.

3.0 Method of Measurement. No measurement will be made.

4.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract lump sum price for Temporary Support of Conduit.

E. <u>PARTIAL REMOVAL OF SUPERSTRUCTURE</u>

1.0 Description. The existing superstructure shall be removed to the limits shown on the contract plans. For Bridge No. A39965 this includes parts of Span (1-2) barrier curb, slab, Girder No. 1 and its bearing at End Bent No. 1, sign support structure, diaphragms and diaphragm connection plate at middle diaphragm at Girder No. 2. For Bridge No. A59602 this includes parts of Span (2-3) barrier curb, conduit, wires in conduit, Unit (2-3) A, Unit (2-3) E, bearings, tie plates, grout and diaphragms.

2.0 Removal Requirements.

2.1 Removal of concrete shall be in accordance with Sec 216.60.

2.2 Removal shall be by methods such that the structure that is to remain in place is not damaged.

2.2.1 The methods used to remove the superstructure shall prevent any debris being dropped onto the roadway.

2.3 Disposal of materials shall be in accordance with Sec 202.

2.4 Any damage sustained to the structure that is to remain in place, as a result of the Contractor's operations, shall be repaired or the material replaced as approved by the Engineer at the Contractor's expense.

2.5 For Bridge No. A39965, existing slab and safety barrier curb reinforcement shall be removed except as necessary for installation of mechanical bar splices where shown on the contract plans.

2.6 For Bridge No. A59602, existing safety barrier curb reinforcement embedded in concrete to remain shall be left in place.

2.7 For Bridge No. A59602, prior to concrete removal the wires in the conduit (external and embedded in barrier) shall be removed.

3.0 Method of Measurement. Measurement will be made per square foot of concrete slab to the limits of removal shown on the contract plans.

4.0 Basis of Payment. Payment for the above described work, including all material, equipment, labor, and any other incidental work necessary to complete this item, will be considered completely covered by the contract unit price for Partial Removal of Superstructure.

F. <u>RE-INSTALLATION OF PEDESTRIAN FENCE</u>

1.0 Description. This provision contains construction requirements for re-installation of pedestrian fence.

2.0 Construction Requirements. The existing pedestrian fence that was removed and stored shall be re-installed to the new barrier curb (Bridge No. A39965) or new slab (Bridge No. A59602).

2.1 All existing components of the fence shall be reinstalled except new U-bolt anchors, nuts and washers shall be installed in accordance with the contract plans.

2.2 Existing base plates shall be used as templates to determine dimensions of the U-bolt anchors.

2.2.1 The use of post-installed anchors will not be allowed.

JOB SPECIAL PROVISIONS (BRIDGE)

2.2.2 The contractor shall be solely responsible for making any necessary adjustments to the anchor bolt dimensions to facilitate re-use of the existing base plates.

2.2.3 U-bolt anchors shall be shown on the shop drawings for the Fabricated Bridge Units for Bridge No. A59602. Shop drawings will otherwise not be required for the fence.

3.0 Method of Measurement. Measurement will be made to the nearest linear foot.

4.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract unit price for Re-installation of Pedestrian Fence.

G. FABRICATED BRIDGE UNIT

1.0 Description. This provision contains construction requirements for Fabricated Bridge Units for Bridge No. A59602.

2.0 Materials. All materials shall be in accordance with the Missouri Standard Specifications for Highway Construction except as noted below.

2.1 Concrete and shear key materials shall be in accordance with these Job Special Provisions.

3.0 Construction Requirements.

3.1 Shop Drawings. Shop drawings shall be in accordance with Section 712 and shall include structural steel, slab rebar, embedded safety barrier curb rebar, fence anchors, ornamental light pole anchors, slab concrete and lifting anchors.

3.2 Fabrication Requirements. Fabrication shall be in accordance with Sec 705 and Sec 712 except as noted below.

3.2.1 Steel girders shall be cambered as specified on the plans prior to pouring the concrete slab.

3.2.2 Girders shall be supported every 8 feet (maximum) during concrete placement and curing.

3.2.3 Concrete shall reach a minimum compressive strength of 3000 psi before removing forms.

3.2.4 Concrete shall reach a minimum compressive strength of 5000 psi before lifting, or as required by the lifting plan.

3.2.5 The top concrete surface shall be finished in accordance with Sec 703 for the requirements of finishing riding surface for concrete bridge decks.

3.2.6 The sides of the shear keys shall be sealed with a silane concrete sealer in accordance with Sec 1053.

3.3 Erection Procedure. The following steps shall be taken while setting the Fabricated Bridge Units in their final position:

- 1. Concrete slab shall have achieved 7000 psi compressive strength prior to installation of the girder units.
- 2. Set units and shim to proper elevation.
- 3. When unit has been properly set, place 10 kips load at centerline Span (1-2) and Span (3-4) and place 15 kip load at centerline Span (2-3). Loads shall be placed along centerline unit. More than one unit line can be done at the same time.
- 4. Fill transverse joint with high strength non-shrink grout to the top of the slab.
- 5. Install Tie Plates.
- 6. After grout reaches 2500 psi remove loads.
- 7. Differential camber between adjacent units in the field shall not exceed ¼" at the center of span. Units shall be loaded to reduce differential below ¼" prior to diaphragm installation.
- 8. Install diaphragms between units.
- 9. Fill longitudinal joints with high strength non-shrink grout to the top of the slab.
- 10. Bridge may be re-opened to traffic after grout achieves 5000 psi.

4.0 Method of Measurement. Measurement will be made to the nearest linear foot.

5.0 Basis of Payment. Payment of all material, labor and equipment necessary to fabricate, furnish and install the above described work including structural steel girders, concrete slab, shear keys, field splices, diaphragms, and shear connectors will be considered completely covered by the contract unit price for Fabricated Bridge Unit.

H. <u>RE-INSTALL CONDUIT SYSTEM ON STRUCTURE</u>

1.0 Description. This provision contains construction requirements for re-installation of conduit on the new barrier curb for Bridge No. A39965.

2.0 Construction Requirements. The existing conduit that was removed and temporarily supported shall be re-installed to the new barrier curb.

2.1 The conduit shall be reinstalled with clamps as recommended by the conduit manufacturer.

3.0 Method of Measurement. No measurement will be made.

4.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract lump sum price for Re-install Conduit System on Structure.

I. HIGH PERFORMANCE CONCRETE FOR SLAB

1.0 Description. This specification covers materials and construction requirements for producing and placing a high performance concrete mixture for precast bridge units for Bridge No. A59602.

1.1 All materials and construction procedures shall meet applicable requirements listed in Sec 705 except as noted herein.

1.2 Final design strength shall be 7000 psi.

2.0 Concrete Mixture Requirements.

2.1 The maximum water cement ratio by weight, including all cementitious materials (cement, fly ash, silica fume, ground granulated blast furnace slag) and water components, is not limited for the submitted design.

2.2 The minimum cement factor, including all cementitious materials, shall be 6.4 sacks per cubic yard with no specified maximum.

2.3 The minimum design air content of the mortar portion (all non-coarse aggregate components) of the mixture shall not be less than 8.0 percent. Based on the mortar content, the 8.0 percent figure shall be converted to a percentage total air content for the total mixture which shall be shown in the submitted design and used as the minimum allowable air content for the plastic concrete.

2.4 Slump shall not exceed 8 inches.

2.5 The mix shall attain final design strength by 56 days. Strengths may be obtained earlier.

2.6 Chloride permeability at design strength (irregardless of age) shall not be greater than 1000 coulombs when tested in accordance with AASHTO T 277. This test shall be performed on each mixture submitted for approval and at least once during production as designated by the engineer. The test is to be performed by a qualified commercial laboratory and results furnished to the engineer by the precaster.

3.0 Materials. Precaster selected and engineer approved combinations of coarse aggregate, fine aggregate, water reducer (high or low range), other approved additives, cement. fly ash, ground granulated blast furnace slag (GGBFS), or silica fume may be used. No proprietary mixtures will be allowed. All materials shall be compatible and approved. A statement from each supplier of silica fume or GGBFS and all other admixtures (not fly ash) including air entrainment shall be provided, listing and identifying all materials to be used, with indicated supplier concurrence that their material is compatible and recommended for use with those listed.

3.1 Coarse aggregates shall be porphyry aggregate meeting the requirements of Sec 1005 for pavement aggregate quality.

3.2 Silica fume material and usage shall meet applicable portions of Sec 505.30 concerning material and mixing and shall be added in accordance with manufacturer's recommendations, except that silica fume shall be limited to 6.0-8.0 percent of the cement weight.

3.3 Cementitous material, other than cement, may be bagged into the mixer unit provided it is done uniformly and expeditiously. Repulpable sacks shall not be used.

3.4 Cementitious material content shall be limited as noted in Sec 501 and 505.30, including maximum 15 percent fly ash and 25 percent GGBFS, except as noted herein. Silica fume and GPBFS may be intermixed, with a statement of compatibility and recommendation from the supplier. Type III cement may be used. Replacement of cement with other cementitious material shall not exceed 25 percent total by weight.

3.5 High range water reducers may be used and shall be previously approved for use in accordance with Sec 1054.

JOB SPECIAL PROVISIONS (BRIDGE)

3.6 With approval of the engineer, other gradations of coarse or fine aggregate may be used, however all quality requirements, including a maximum of 2.0 percent passing the No. 200 for fine and coarse aggregate, shall apply and the maximum aggregate size shall not exceed that of 1005, Grade E aggregate.

3.7 Admixtures containing calcium chloride shall not be used.

4.0 Mix Design. The precaster shall submit and specify the specific materials, mix design, designated slump, air content, and water/cement ratio within the limits of this provision. Actual test results on concrete made and cured in accordance with the submitted design and intended procedures shall be included, including air, slump, and strengths of cylinders at 24 hour intervals up to 7 days minimum and final design strength. Results of chloride permeability tests on concrete from those batches shall also be furnished. The above information will be required for each variation of water/cement ratio desired, as well as any major changes in material proportioning.

4.1 The precaster shall also designate the mixing sequence and mixing times.

All concrete shall be placed within a maximum of 60 minutes from the beginning of mixing operations and no greater than 15 minutes later than the time designated by the contractor and used for the trial batch.

4.2 If other aggregate gradations than standard specifications are utilized, the precaster shall designate the intended gradation range, which will be used for inspection and quality control of the aggregates.

5.0 Equipment. The precaster shall be responsible for furnishing calibrated equipment for cylinder breaks either in the plant or by using an approved commercial laboratory. The equipment capacity should exceed the anticipated loading by 50 percent. Approved high strength sulfur compound designed for use in the actual strength range shall be used for capping.

6.0 Construction Requirements.

6.1 In addition to any preliminary mix design work, after the concrete mixture is approved and prior to starting project unit casting, the precaster shall make a minimum of a 3 cubic yard trial batch in the same manner as intended for the final units to demonstrate proper batching, placement, finishing and curing of the concrete. The trial batch shall replicate all actual casting conditions including materials, times, equipment, and personnel. All required tests shall be performed and the concrete shall meet all specifications prior to start of initial casting. More than one trial batch may be required in the event that mix or process changes are necessary or specifications are not met. New trial batches will not be required for changes in water content for previously approved mix designs.

6.2 Mixture tests, sequencing, and times during production shall not exceed those limits specified by the precaster in the approved mix design or those listed herein.

6.3 Total mix air content shall not be less than that designated in the approved mix design, nor exceed that value by more than 3.5 percentage points.

6.4 Slump shall not exceed 8 inches and shall be within 2 inches of that specified in the approved mix design.

JOB SPECIAL PROVISIONS (BRIDGE)

6.5 The water/cement ratio shall be within 0.020 of that specified in the approved mix design. If adjustments for water content beyond that are necessary, a previously tested and approved mixture shall be used.

6.6 Compressive tests for release and final design strengths shall be performed on 6 inch x 12 inch cylinders cured in the same manner as the precast, prestressed units as the final indicator of strength compliance. As an alternate, the precaster may use 4 inch x 8 inch cylinders for determining strength to release and final design strength to cease cure, provided companion made and cured 6 inch x 12 inch cylinders shipped to the MoDOT central laboratory for ASAP testing after the same curing time are of equal or greater value.

6.7 No redosage of high range water reducer or other additives shall be done. Additional mixing water may be added only once after the initial mixing process and prior to any consequential discharge, in which case an additional 30 revolutions at mixing speed is required. All subsequent concrete in that load not meeting the air, slump, or other requirements shall be discarded and the remainder of the load rejected. No retempering, waiting, or other measures shall be used to obtain specification compliance. These requirements shall not be used to modify the required maximum of 30 minutes between lifts.

6.8 Continuous wet curing is required until final design strength is attained, per Sec 705.

6.9 The precaster shall provide the engineer with a cylinder representing a unit of production, immediately after final design strength is attained, for chloride permeability testing.

6.9.1 If the chloride permeability result is greater than specified herein, all units for that day's production shall be cored by the precaster and will be tested by the engineer. A minimum of three cores shall be obtained. If the average is less than specified, no further testing is required.

6.9.2 If the average of the three cores is greater than that specified, any unit with a test result greater than that specified is rejected without further testing and all other non-tested units shall be cored and tested by the precaster for chloride permeability at a qualified commercial laboratory, and shall meet the specifications prior to acceptance of each unit. Additional companion samples will be required by the engineer for MoDOT testing.

6.9.3 Testing of a subsequent improved mixture design may be used to eliminate testing of future individual units cast with the improved design.

6.10 No units shall have any cracks greater than 2 inches in depth, prior to shipment to the project site. If any cracks are visible to the naked eye under any conditions, the engineer may require coring by the precaster at any crack location as necessary to establish a crack depth. Those units with any cracking greater than 2 inches in depth are automatically rejected without recourse.

6.11 No splatter of concrete is allowed on any steel or other exposed portions of the precast units. All exposures shall be protected completely during casting by plastic or other suitable wrapping material. Coating with any liquid material is not allowed. In the event that splatter does occur and is not completely and totally removed by wiping, it shall be completely removed by sandblasting or other vigorous methods and the exposed surface returned to its original condition, with positively no residue.

J. <u>GROUT FOR SHEAR KEYS</u>

1.0 Description. This work consists of filling shear key joints between fabricated bridge units with non-shrink grout.

2.0 Materials.

2.1 Shear Key Grout. The Contractor shall use a flowable rapid set, low shrinkage mix in the shear key joints that meets the following minimum performance criteria:

Shear Key Grout		
Property	Requirement	Test Method
Compressive Strength	2.5 ksi @ 3 hours 5 ksi @ 1 day	ASTM C109
Bond Strength	> 300 psi	ASTM C882 ^a
Chloride Penetration ^b	< 1.5 in	ASTM C1543 ^a
Freeze-Thaw Durability (Grade 3) °	≥ 90%	ASTM C666 (Procedure A) ^a

Notes:

b. Depth for percent chloride of 0.2% by mass of cement after 90-day ponding

c. Relative dynamic modulus after 300 cycles

2.1.1 The grout shall conform to ASTM C928 and to the properties described in the specification.

2.1.2 Grouts having metallic formulations or chlorides will not be allowed.

2.1.3 No additives shall be added to prepackaged grout.

2.1.4 Extension of a grout mix with pea gravel will not be allowed.

2.1.5 Commercial grouts known to conform include W. R. Meadows Futura 45, SpecChem RepCon 928, Rapid Set Cement All, and Rapid Set DOT Repair Mix. The Contractor may utilize any of these products or an approved equivalent.

2.1.6 The contractor shall submit documentation for the proposed mix from an approved independent testing laboratory showing compliance with this specification for approval by the Engineer.

3.0 Mock-ups. Pretest the placement of the shear key joint mix in a mock-up to validate and refine placement, consolidation, and finishing procedures.

3.1 The narrower of the two shear keys as shown on the contract plans shall be used in the mock-up.

3.2 The trial placement shall use the same delivery and placing equipment as will be used in the actual work.

a. Modified per NCHRP 173

3.3 A representative from the manufacturer of the grout shall be present for the trial placement.

3.4 The closure joint mockup shall be conducted at least 30 days prior to pouring the closure joints.

3.5 Submittals. The contractor shall submit a plan for the mockups to the Engineer for approval.

3.6 Approval. Grout shall not be placed in the bridge shear keys until the Engineer approves the Contractor's plan, including the results of the trial placement.

4.0 Construction.

4.1 Surface Preparation, Mixing, and Placement of Shear Key Grout.

4.1.1 Preparation for Placement. All shear key surfaces shall be thoroughly cleaned using a high-pressure wash.

4.1.1.1 The ends and bottoms of the keyway shall be tightly sealed prior to placing shear key material to prevent grout loss during shear key placement.

4.1.1.2 Shear keys shall be sealed with a silane penetrating sealer in accordance with the Job Special Provision for Fabricated Bridge Unit at least 7 days prior to placement of grout.

4.1.2 Mixing.

4.1.2.1 All necessary equipment for mixing and placing shall be present at the work site prior to the start of mixing.

4.1.2.2 Mixing shall be performed as close as possible to the keyway to be filled. All equipment shall be in good working order as determined by the Engineer.

4.1.2.3 Mixed grout which, in the Engineer's opinion is not flowable and exhibits signs of initial setting or hardening prior to placement, shall not be incorporated in the work and be disposed of by the Contractor.

4.1.2.4 The procedures for mixing shall be in accordance with the grout manufacturer's recommendations.

4.1.3 Placement. Placement, and curing of shear key grout shall be in accordance with the manufacturer's recommendations and the contract documents. The Contractor is responsible for protecting the bridge unit edges from damage due to construction activities. No placement interruptions will be permitted. Grout shall be thoroughly consolidated as it is placed in the keyway.

4.1.4 Placement Sequence. The shear key joints shall be filled in accordance with the sequence shown in the Job Special Provision for Fabricated Bridge Unit.

4.1.5 Finishing. The surface of the shear key shall be finished flush with the top of the keyway and in accordance with the manufacturer's recommendations. Surface texturing is not required.

5.0 Method of Measurement. Measurement will not be made.

6.0 Basis of Payment. Payment of all material, labor and equipment necessary to furnish and install the grout for the shear keys as described above will be considered completely covered by the contract unit price for Fabricated Bridge Unit.

K. <u>AESTHETIC CONCRETE STAIN</u>

1.0 Description. This work item shall consist of providing a field concrete stain to aesthetically color concrete sidewalk as shown on the plans for Bridge No. A59602.

2.0 Material Requirements

2.1 The material shall be two-coat, pigmented acrylic resin system which penetrates into the concrete surface to provide water repellency, semi-opaque aesthetic color and salt resistance and shall form a breathable film allowing trapped moisture vapor to safely migrate through the coating without blistering or peeling.

2.1.1 The color of the stain shall be as shown on the contract plans.

2.2 The contractor shall supply the engineer with a manufacturer's certification indicating that the material supplied is in accordance with this specification.

3.0 Construction Requirements

3.1 The concrete surface shall be fully cured a minimum of 28 days prior to application of the aesthetic concrete stain.

3.2 The absence of moisture in the concrete surface shall be verified with standard test ASTM D4263.

3.3 Pressure washing with a minimum of 3,000 psi shall be used to remove all foreign matter, form oils, waxes, curing compounds, laitance, efflorescence and dirt. Sand blasting will not be permitted for cleaning. The cleaned surface shall be free of blemishes, discolorations, surface voids and conspicuous form marks to the satisfaction of the engineer.

3.4 The concrete stain shall be adequately mixed within its container until homogenous in color. Application of the stain shall be in accordance with the manufacturer's recommendations including allowable ambient conditions.

3.5 Application of the stain will not be allowed during rain. All manufacturers' safety precautions shall be submitted to the engineer prior to work and followed during staining.

3.6 Sawcutting to a depth of 1/8" maximum shall be completed in the sidewalk area as shown on the contract plans.

4.0 Method of Measurement. No measurement will be made.

5.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract lump sum price for Aesthetic Concrete Stain.

JOB SPECIAL PROVISIONS (BRIDGE)

L. <u>HEAT STRAIGHTENING OF EXISTING PLATE GIRDERS</u>

1.0 Description. This work shall consist of furnishing the necessary materials, labor, and equipment for heat straightening the damaged portion of Girder No. 1 for Bridge No. A39965 that will not be replaced with new steel, generally about 13'-0" long from the splice plate in Span No. 1 towards the intermediate bent and shall include stiffeners and diaphragms as shown on the contract plans. This work shall be in accordance with this job special provision and the contract plans.

2.0 Experience Requirements.

2.1 The contractor's organization shall have at least 5 years of experience in conducting heatstraightening repairs for damaged steel structures. During the preceding three year period, the contractor shall have conducted an average of at least 2 heat-straightening projects per year. Experience documentation shall include: date of project, location, bridge owner, number and type of members straightened, and duration of project.

2.2 The contractor's field supervisor shall be a registered professional engineer qualified to practice in one of the following disciplines: structural, metallurgical, or welding engineering.

3.0 Equipment

3.1 Heating shall be with an oxygen-fuel combination. The fuel may be propane, acetylene or other similar fuel as may be selected by the contractor, subjected to the engineer's approval.

3.2 Heat application shall be by single or multiple orifice tips only. The size of the tip shall be proportional to the thickness of the heated material. No cutting torch heads are permitted.

3.3 Jacks, come-alongs or other force application devices shall be gauged and calibrated so that the force exerted by the device may be controlled and measured. No external force shall be applied to the structure by the contractor unless it is measured.

4.0 Damage Assessment

4.1 The contractor shall identify and document all yield zones, yield lines and associated damage and provide this information to the engineer prior to initiation of heat straightening by either visual inspection or measurements.

4.2 Steel with strains up to 100 times the yield strain may be repaired by heat straightening. For strains greater than this limit, the engineer shall determine if heat straightening may be used.

4.3 Cracks and/or strains exceeding 100 times the yield strain, or other serious defects shall be called to the attention of the engineer.

4.4 The contractor shall prepare and submit a work plan to the engineer for approval prior to beginning repairs.

5.0 Heat Application. The Contractor shall be fully responsible for identifying areas where paint would be damaged by the heat straightening process. Prior to application of heat to these areas, the paint shall be removed.

- **5.1** The temperature of the steel during heat straightening shall not exceed the following:
 - (a) 650°C (1,200°F) for Carbon Steels.
 - (b) 620°C (1,100°F) for A514 and A709 (grades 100 and 100W) steels.
 - (c) 565°C (1,050°F) for A709 grade 70W steel.

5.2 The Contractor shall use one or more of the following methods for routine, ongoing, documented temperature verification during heat straightening:

- (a) Temperature sensitive crayons.
- (b) Pyrometer.
- (c) Infrared non-contact thermometer.

5.3 The material should be heated in a single pass following the specified pattern and allowed to cool to below 120°C (250°F) prior to re-heating.

5.4 Heating patterns and sequences shall be selected to match the type of damage and cross section shape.

5.5 Vee heats shall be shifted over the yield zone on successive heating cycles.

5.6 Simultaneous vee heats may be used provided that the clear spacing between vees is greater than the width of the plate element.

5.7 Repair of previously heat-straightened members in the same region of damage may be conducted once. Further repairs shall not be performed without the approval of the engineer.

6.0 Application of Jacking Forces

6.1 Jacks shall be placed so that forces are relieved as straightening occurs during cooling.

6.2 Magnitude of Jacking Forces

(a) Jacking shall be limited so that the maximum bending moment in the heated zone shall be less than 50 percent of the plastic moment capacity of the member or major bending element. For local damage, the jacking force shall be limited to 50 percent of initial yield of the element.

(b) The jacking force shall be adjusted so that the sum of jacking-induced moments and estimated residual moments shall be less than 50 percent of the plastic moment capacity of the member. As an alternative to considering residual moments, the moment due to jacking forces can be limited to 25 percent of the plastic moment capacity of the member during the first two heating cycles. For additional heating cycles, the limit of 50 percent may again be used.

6.3 The contractor shall determine and document the maximum jacking force for each damage location, and the proposed sequence of jacking and heating. Copies of the documentation shall be submitted to the engineer for acceptance before beginning repairs. Modifications due to

changing condition shall be submitted to the engineer. The maximum jacking force may be controlled by measuring the deflection resulting from the jacking force.

6.4 The calibration of jacks and electronic temperature monitoring equipment shall be performed and documented monthly, and load cells used for calibration must be certified within a two year period.

7.0 Field Supervision of Repairs

7.1 Jacking forces shall be monitored to insure that limits are not exceeded.

7.2 Heating patterns shall be approved by the engineer.

7.3 Heating temperatures shall be routinely monitored to insure compliance with specified limits.

8.0 Field Supervision of Repairs

8.1 The dimensions of heat-straightened structural members shall conform to the tolerances specified in Table A1, except as noted below.

Member Type	Recommended Minimum Tolerance ^{1,2}
Beam/Girder overall Beam/Girder at impact point	1∕₂ in over 20 ft 3⁄₄ in over 20 ft
Local Web Deviations	d/100 but not less than ¼ in
Local Flange Deviations	b/100 but not less than ¼ in
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Table A1 - Recommended Tolerances for Heat Straightening Repair.

¹ Units of member depth, d, and flange width, b, are inches

² Tolerances for curved or cambered members should account for the original shape of the member

8.2 The above tolerance limits may be relaxed at the discretion of the engineer, based on one or more or the following considerations:

(a) Type and location of damage in the member.

(b) Time considerations resulting from the nature of traffic congestion during the repair operation.

(c) Degree of restoration required to restore structural integrity.

8.3 All areas of girder, diaphragm, stiffeners and connection plates that were heat straightened shall be inspected by one or more of the following non-destructive testing methods as applicable:

- (a) Liquid penetrant examination as described in ASTM E165 (1994 or latest edition).
- (b) Magnetic-Particle testing as described in ASTM E709 (1994 or latest edition).

(c) Ultrasonic examination as described in section 6, part C of the ANSI/AASHTO/AWS Bridge Welding Code D1.5, American Welding Society (1996 or latest edition).

(d) Radiographic examination as described in section 6, part B of the ANSI/AASHTO/AWS Bridge Welding Code D1.5, American Welding Society (1996 or latest edition).

9.0 Method of Measurement. No measurement will be made.

10.0 Basis of Payment. Payment for the above described work including all material, labor, tools, equipment, temporary jacks and all incidentals necessary to complete this item of work will be considered completely covered by the contract lump sum price for Heat Straightening of Existing Plate Girders except that paint removal will be considered completely covered by the contract lump sum price for Surface Preparation for Recoating Structural Steel.

M. <u>CRACK ARRESTING</u>

1.0 Description. The crack in Girder No. 2 for Bridge No. A39965 shall be repaired in accordance with the contract plans and this special provision.

2.0 Construction Requirements.

2.1 After partial superstructure removal and before installation of new diaphragms, each end of the crack shall have a 5/8 inch diameter hole drilled through them.

2.1.1 Identification of the ends of the cracks shall be with dye penetrant or other method as approved by the Engineer.

3.0 Method of Measurement. Measurement will be made per each hole drilled.

4.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract unit price for Crack Arresting.

N. <u>GRIND WELD TOES</u>

1.0 Description. This provision contains construction requirements for grinding weld toes for Bridge No. A39665.

2.0 Construction Requirements. Where there is any visual change in appearance to the weld profile or transition from the weld toe to the flange or web after heat straightening or if non-destructive testing as required by the Heat Straightening of Existing Plate Girders Job Special Provision indicates a potential discontinuity in the weld, then the Engineer shall be notified for consideration of remedies, to include grinding of the weld toes as described herein to reduce the likelihood of future crack initiation due to undetected damage and to reduce local stress concentrations.

2.1 The toes of the weld shall be ground in accordance with the detail shown on the plans.

2.1.1 The radius of the groove shall be no less than 0.25t, where t is the thickness of the main plate.

2.1.2 Grinding shall extend to a minimum of 0.5mm (1/64 inch) below any visible undercut and a maximum of 7% of the plate thickness.

2.1.3 The axis of the grinding tool shall be 45 to 60 degrees to the main plate and 45 degrees to the direction of travel.

2.2 The finished ground surface shall be as smooth as possible, with no visible evidence of the original weld toe nor any grinding marks at right angles to the weld toe line.

2.2.1 The existing weld throat thickness shall be maintained.

3.0 Method of Measurement. No measurement will be made.

4.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract lump sum price for Heat Straightening of Existing Plate Girders.

0. <u>STRUCTURAL STEEL REQUIREMENTS</u>

1.0 Description. This provision contains general structural steel requirements for this project.

2.0 Material. All material shall be in accordance with Division 1000, Material Details, and specifically as shown below. The gray epoxy-mastic primer (non-aluminum) shall be compatible with concrete and produce a dry film thickness of no less than 3 mils (75 μ m).

Item	Section
Structural Steel Construction	712
Gray Epoxy-Mastic Primer (non-aluminum)	1045
Structural Steel Fabrication	1080
Coating of Structural Steel	1081

3.0 Construction Requirements.

3.1 Before fabrication of new metalwork, the contractor shall make the necessary measurements in the field to verify dimensions of the existing structure where new members are affected. Any deviation of the dimensions shown on the plans shall be called to the engineer's attention. The contractor shall be responsible for developing all required dimensional adjustments and coordinating the implementation of the dimensional adjustments with all involved fabricators and subcontractors.

3.2 Prior to erection of the new structural steel, the steel that is to remain shall be carefully inspected for irregularities. If such irregularities are found, the irregularities shall be brought to the attention of the engineer.

3.3 Holes in the new diaphragm connection plates and angles may be used as a template for drilling the holes in the existing material.

3.4 A minimum edge distance shall be maintained for all field drilled holes. The minimum edge distance for bolts shall be as shown in table below measured from the centerline of holes.

Bolt Diameter	Minimum Edge Distance
inch (mm)	inch (mm)
3/4 (19.0)	1-1/4 (32)
7/8 (22.2)	1-1/2 (38)
1 (25.4)	1-3/4 (45)

3.5 Diaphragm Contact Surfaces. The surfaces of existing steel that will become faying surfaces for new diaphragm connections shall be cleaned according to the manufacturer's recommendation and with a minimum of SSPC-SP-3 surface preparation and coated with one prime coat of Gray Epoxy-Mastic Primer (non-aluminum) in accordance with Sec 1081.

4.0 Method of Measurement. No measurement will be made.

5.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract unit price for the structural steel items included in the contract. No payments or adjustments will be made where new members are affected due to any deviation of the dimensions shown on plans or shop drawings.

P. <u>RE-INSTALLATION OF ORNAMENTAL LIGHT POLES</u>

1.0 Description. This provision contains construction requirements for re-installation of ornamental light poles.

2.0 Construction Requirements. The existing ornamental light poles that were removed and stored shall be re-installed to the slab at the same location as prior to removal. Existing locations shall be verified by the Contractor prior to removal.

2.1 All existing components of the ornamental light poles shall be reinstalled except new U-bolt anchors, nuts and washers shall be installed in accordance with the contract plans.

2.2 Existing base plates shall be used as templates to determine dimensions of the U-bolt anchors.

2.2.1 The use of post-installed anchors will not be allowed.

2.2.2 The contractor shall be solely responsible for making any necessary adjustments to the anchor bolt dimensions to facilitate re-use of the existing base plates.

2.3 The existing electrical wires that were removed as part of the Partial Removal of Superstructure shall be re-installed in new conduit and connected to the re-installed light poles and overhead lighting that was not removed.

2.3.1 No splicing of electrical wires will be allowed.

3.0 Method of Measurement. Measurement will be made per each ornamental light pole.

4.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract unit price for Re-installation of Ornamental Light Poles.