Job No. J3I3103
Various Routes
Various Counties

JOB SPECIAL PROVISIONS TABLE OF CONTENTS

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

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Job No. J3I3103
Various Routes
Various Counties

04/11/2023 8:18:31 AM
KARLEE A. COVINGTON - CIVIL
MO-PE-2020000009

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

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

JOB NUMBER: J3I3103
VARIOUS COUNTIES:

DATE PREPARED: 4/10/2023

ADDENDUM:

Only the following items of the Job Special Provisions are authenticated by this seal: ALL

Job No. J3I3103
Various Routes
Various Counties

JOB
SPECIAL PROVISIONS

A. General - Federal JSP-09-02H

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

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

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

General Provisions & Supplemental Specifications

Supplemental Plans to July 2022 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. Project Contact for Bidder / Contractor Questions

1.0 Any project specific questions shall be directed to the to the following contact:

Karlee Covington
Transportation Project Manager
MoDOT – Kansas City Design
Telephone Number – (816) 607-2217
Email – karlee.covington@modot.mo.gov

2.0 Upon award and execution of the contract, the successful bidder/contractor shall forward all questions and coordinate the work with the contract administrator. The contract will be administered and inspected by the Engineer/contract administrator listed below:

Russell Penner
Resident Engineer
MoDOT – Kansas City Construction
Telephone Number – (816) 889-3380
Email – russell.penner@modot.mo.gov

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

C. Scope of Work

1.0 The scope of work for this project is to provide guardrail and crashworthy end terminal repair and/or replacement on an as needed basis in response to vehicle damage and similar sudden occurrence, such as physical damage by the elements, but not solely as a result of wear and tear or changes in standards not in connection with a sudden occurrence. The contractor will be notified of the need for work by written notice on a location by location basis.

2.0 The work will be performed along Commission maintained roadways in: Johnson, Lafayette, Pettis, Ray and Saline Counties Missouri.

3.0 The contract includes pay items to repair various guardrail systems and crashworthy end terminals by removal and replacement of major components and assemblies that have been damaged.

4.0 The contract includes pay items for removal of existing guardrail systems and end terminals and installation of new guardrail, crashworthy end terminals, and related appurtenances complete in place. The Engineer may order a new guardrail system, crashworthy end terminal, or related appurtenance to be installed when the existing system and/or terminal is damaged to such a significant extent that it is in the best interest of the Commission and the traveling public to install new current standard material, complete in place, rather than repair the existing system. New guardrail systems and/or terminals may be used to replace an entire existing system and/or terminal, which is partially or wholly damaged, or selected portions of such damaged system and/or terminal. Installation of new guardrail systems and/or terminals may require conformance to location specific plans provided by the Engineer. The work may involve adjusting the location of new guardrail systems and/or crashworthy terminals to properly shield the roadside obstacle for which the existing damaged system and/or terminal was originally installed. The determination of when an existing guardrail system and/or crashworthy end terminal is significantly damaged such that it requires installation of a new system and/or terminal, rather than repair, or when an existing system and/or terminal requires adjusting the location will be made by the Engineer.

5.0 The Engineer reserves the right to have others perform some or all of the work at individual locations based on the needs of the Commission.

6.0 Work may be required during daytime, nighttime, and/or weekend hours. Some work may

be on a first priority basis with response required within the time specified in the job order.

D. Job Order Contract

1.0 A Job Order Contract is an indefinite quantity contract pursuant to which the contractor shall perform the work itemized in a Job Order at individual work locations throughout the project limits. The contractor shall perform all tasks itemized in the Job Order.

2.0 The Engineer may identify the required work at an individual work location in collaboration with the contractor at a Joint Scope Meeting, unless the Engineer approves other arrangements. The Engineer will provide the contractor with a draft Detailed Scope of Work which the contractor shall review. Once the detailed Scope of Work is agreed upon, the Engineer will issue a Job Order to the contractor. At any given time the contractor may be performing more than one Job Order.

3.0 The contract includes a list of fixed cost pay items with fixed unit prices. Payment for the work will be determined by multiplying the fixed unit prices by the Adjustment Factor. The contractor shall bid the Adjustment Factor to be applied to the fixed unit prices. The total cost of an individual Job Order will be determined by multiplying the fixed unit price of each fixed cost pay item by the Adjustment Factor.

4.0 Definitions.

4.1. Detailed Scope of Work. A written document that sets forth the work the contractor is obligated to perform in connection with a particular Job Order.

4.2 Job Order. A written order from the Engineer to the contractor directing the work required at an individual work location in accordance with the Detailed Scope of Work within the Job Order Completion Time.

4.3 Job Order Completion Time. The time within which the contractor must complete the Detailed Scope of Work for a particular Job Order.

4.4 Fixed Cost Pay Item. Work for which a description and fixed cost is set forth in the fixed cost pay item list.

4.5 Non-Fixed Cost Pay Item. Work for which a description and fixed cost is not set forth in the pay item list. Payment for non-fixed cost pay items will be determined in accordance with Sec 109.4.2, 109.4.3, or 109.4.4. Non-fixed cost pay items will be paid using an Adjustment Factor of 1.000.

E. Procedures for Developing a Job Order

1.0 Initiation of a Job Order. The Engineer will notify the contractor of a potential Job Order by issuing a Notice of Joint Scope Meeting. The notification will be issued by electronic mailing, unless the Engineer approves other arrangements. The contractor shall confirm receipt of all job

orders by the same means as issued. Notification for first priority repair work will be initiated by telephone and followed with the issuing of the job order.

1.1 The contractor shall attend the Joint Scope Meeting and be prepared to discuss, at a minimum:

a. The general scope of the work;
b. Existing conditions, presence of waterways, wetlands, or other natural resources,
c. Presence of hazardous materials
d. Methods and alternative for accomplishing the work;
e. Access to the site;
f. Staging area availability/location;
g. Requirements for catalog cuts, technical data, samples and shop drawings;
h. Requirements for professional services, including sketches, drawings, and specifications;
i. Hours of operation;
j. Anticipated working days and schedule;
k. Liquidated damages;
l. Specific quality requirements for equipment and material;
m. List of anticipated Subcontractors and Material Suppliers.

1.2 Upon completion of the joint scoping process, the Engineer will prepare a draft detailed Scope of Work referencing any sketches, drawings, photographs, and specifications required to document accurately the work to be accomplished. The contractor shall review the proposed detailed Scope of Work and request any desired changes or modifications thereto. When an acceptable detailed Scope of Work has been completed, the Engineer will issue a Draft Job Order.

1.3 The contractor does not have the right to refuse to perform any Job Order or any work identified in a Job Order. If the contractor refuses to perform any Job Order or any work identified in a Job Order, the contractor may be considered to be in default in accordance with Sec 108.

2.0 Preparation of The Job Order. The Engineer will prepare a Draft Job Order and submit the order to the contractor for final review. The contractor and the Engineer will jointly review the Draft Job Order and finalize the order. Establishment of pricing for any non-fixed cost pay items shall be in accordance with Sec 109.4.2 or 109.4.3. If no agreement to pricing can be made, then the work will proceed with payment for non-fixed cost items under Sec 109.4.4.

2.1 When the Engineer and contractor have agreed to the scope of work and Fixed Cost and Non-Fixed Cost tasks to be performed, the Engineer will finalize the official Job Order and submit a signed Job Order for the contractor to review and sign. The affixed signatures by the Engineer and the contractor shall bind the Job Order. If the contractor is not clear or in disagreement with the terms of the Job Order he shall NOT sign the Job Order, but shall work with the Engineer to clear up any discrepancies in the work to be done. If the contractor fails to execute the Job Order, the contractor may be considered to be in default in accordance with Sec 108.

3.0 The Commission reserves the right to cancel or reject a Job Order for any reason. The Commission also reserves the right not to issue a Job Order if that is determined to be in the best interests of the Commission. The contractor shall not recover costs arising out of or related to the development of the Job Order including but not limited to the costs to attend the Joint Scope

Meeting, review the Detailed Scope of Work, subcontractor costs, and the cost to review the Job Order Proposal with the Commission.

4.0 Job Order Issuance. The Job Order will be signed by the Engineer and delivered to the contractor. The Job Order will reference the Detailed Scope of Work and set forth the amount to be paid and the time to complete the work.

5.0 Notice to Proceed. Each Job Order will include a notice to proceed, which will stipulate the date the contractor is expected to begin work. The notice to proceed date will normally be within 3 calendar days after the job order is issued. For Job Orders that require a first priority response, contractors shall respond to the work location and begin the first priority repair work within 24 hours of execution of the Job Order.

6.0 Job Orders. A job order is a written notice from the Engineer to the contractor directing the work to be performed at each work location. A separate job order will be issued for each work location. A job order is considered a contract document as defined in Sec 101.2.

6.1 Job Order Information. The job order will provide the following information:

(a) Job order number and MoDOT Property Damage (PD) number
(b) County, route, and location
(c) Date and time of issuance
(d) Notice to proceed date and time
(e) Required completion date
(f) Designation of first priority repair (if needed)
(g) Designation of nighttime work (if needed)
(h) Traffic control plan type
(i) Additional traffic control devices (if needed)
(j) Speed limit reduction and normal speed limit (if needed)
(k) General description of repair
(l) Estimated repair quantities
(m) Name and signature of the Engineer

6.2 Multiple Job Orders. The Engineer may issue multiple job orders with the same or overlapping completion periods.

6.3 Completed Job Orders. The contractor shall provide the following information on the contractor's copy of the completed job order:

(a) Actual date and time that repairs are completed
(b) Actual repair materials used to complete the work
(c) Signature of the contractor's authorized representative certifying that the work is complete
(d) Missouri One Call (800 Dig Rite) "all clear" reference number indicating the contractor's notification of the Missouri One Call utility locate system
(e) MoDOT Signal & Lighting Locates "all clear" reference number indicating the contractor's notification of MoDOT’s utility locate system

6.4 One copy of all completed job orders shall be returned to the Engineer with the contractor's monthly request for payment unless otherwise directed by the Engineer.

F. Term of Contract

1.0 The term of this contract shall be for the period commencing July 1, 2023 and ending June 30, 2024.

2.0 Any work already ordered or in progress when the contract term ends shall be completed in accordance with the provisions, price proposals and timelines established in the issued Job Order(s), or liquidated damages will be assessed against the contractor in accordance with the provisions of this contract.

3.0 The contract may be extended under the original terms and contract prices for the period commencing July 1, 2024 and shall end June 30, 2025 for a maximum contract term of two (2) years. If, in the sole discretion of the Commission, the Commission desires to extend the contract, the contractor will be given written notification of the extension no later than December 1 of the current contract year. The contractor shall provide written notification of acceptance or rejection of the extension of this contract no later than January 1 of the current contract year. If the option for extending the contract is exercised by MoDOT, a time adjustment change order will be issued by the Commission to extend the contract to the new term limits. The contractor shall increase the performance contract bond to an amount equal to the original contract amount plus the extended contract amount (i.e., double the original bond amount).

G. Fixed Unit Price List – Guardrail and Guard Cable Repair

1.0 Description. A fixed unit price list containing unit prices associated with Guardrail and Guard Cable Repair is listed below. Fixed unit prices are for complete and in-place construction and include all labor, equipment and material required to complete the construction task. All labor, material, equipment and work required by a specification shall be considered part of the fixed unit price, unless otherwise stated elsewhere in this contract. Pay limits will be defined in the approved Job Order.

2.0 Fixed Unit Price List for Guardrail and Guard Cable Repair Job Orders.

MISC. TRAFFIC CONTROL ITEMS			
Item Number	**Description**	**Unit**	**Fixed Unit Price**
6169902	MISC. WORK BEYOND SHOULDER	EA	$250.00
6169902	MISC. SHOULDER WORK - UNDIVIDED ROADWAYS	EA	$250.00
6169902	MISC. RIGHT SHOULDER WORK - HIGH SPEED ROADWAY	EA	$350.00
6169902	MISC. LEFT SHOULDER WORK - HIGH SPEED ROADWAY	EA	$500.00
6169902	MISC. 1-LANE 2-WAY OPERATION W/ FLAGGERS	EA	$800.00
6169902	MISC. SINGLE LANE CLOSURE	EA	$900.00
6169902	MISC. PARTIAL RAMP CLOSURE	EA	$400.00
6169902	MISC. COMPLETE RAMP CLOSURE	EA	$600.00

6169902	MISC. ENTRANCE RAMP AREA, MAINLINE WORK	EA	$400.00
6169902	MISC. ENTRANCE RAMP AREA, ACCEL LANE WORK	EA	$400.00
6169902	MISC. EXIT RAMP AREA, MAINLINE/DECEL LANE WORK	EA	$400.00
6169902	MISC. ADDITIONAL TRUCK MOUNTED ATTENUATOR (TMA)	EA	$350.00
6169902	MISC. ADDITIONAL FLASHING ARROW PANEL	EA	$100.00
6169902	MISC. ADDITIONAL DIRECTIONAL INDICATOR BARRICADE	EA	$15.00
6169902	MISC. ADDITIONAL CHANNELIZER (TRIMLINE/)	EA	$11.00
6169902	MISC. ADDITIONAL CMS (CONTRACTOR FURNISHED/RETAINED)	EA	$1100.00
6169902	MISC. SEQUENTIAL FLASHING WARNING LIGHT	EA	$50.00
6169904	MISC. ADDITIONAL CONSTRUCTION SIGNS	SF	$4.00

NEW GUARDRAIL INSTALLATION ITEMS

Item Number	Description	Unit	Fixed Unit Price
2029902	MISC. TYPE A OR B TERMINAL REMOVAL	EA	$250.00
2029903	MISC. REMOVE GUARDRAIL	LF	$10.00
2149910	GRADING FOR CRASHWORTHY END TERMINAL	LS	$3,500.00
6060110	BULLNOSE GUARDRAIL SYSTEM	EA	$8843.00
6061010	GUARDRAIL TYPE A	LF	$28.00
6061011A	GUARDRAIL TYPE A, 7 FT. POST, 3 FT. - 1.5 IN. SPACING	LF	$44.00
6061050	GUARDRAIL TYPE E, 6 FT. POST, 3 FT. - 1.5 IN. SPACING	LF	50.00
6061051	GUARDRAIL TYPE E, 7 FT. POST	LF	$55.00
6061054	GUARDRAIL TYPE E, 6 FT. POST, 6 FT. - 3 IN. SPACING	LF	$37.00
6061060	MGS GUARDRAIL	LF	$28.00
6061061	MGS GUARDRAIL, 8 FT., 6 FT. – 3 IN. SPACING	LF	$32.00
6061063	MGS GUARDRAIL, 6 FT. POSTS, 3 FT. – 1.5 IN. SPACING	LF	$41.00
6061065	MGS GUARDRAIL, 6 FT. POSTS, 1 FT. – 6.75 IN. SPACING	LF	$64.00
6061067	MGS DOUBLE FACED GUARDRAIL	LF	$46.00
6061068	MGS BRIDGE APPROACH TRANSITION SECTION (MAJOR ROUTE)	EA	$3502.00
6061069	MGS BRIDGE APPROACH TRANSITION SECTION (MINOR ROUTE)	EA	$3375.00
6061070	MGS VERTICAL CONCRETE BARRIER TRANSITION	EA	$3375.00
6061074	MGS HEIGHT AND BLOCK TRANSITION SECTION	EA	$647.00
6061075	MGS LONG SPAN GUARDRAIL SECTION	EA	$3198.00
6061080	MGS END ANCHOR	EA	$1390.00
6061081	MGS BRIDGE ANCHOR SECTION (THRIE-BEAM BRIDGE)	EA	$2728.00
6062200A	BRIDGE ANCHOR SECTION, 6.5 FT. POSTS (SAFETY BARRIER CURB)(ROADWAY AND REHABILITATION WORK ONLY)	EA	$2787.00
6062202A	BRIDGE ANCHOR SECTION, 7.5 FT. POSTS (SAFETY BARRIER CURB)(ROADWAY AND REHABILITATION WORK ONLY)	EA	$2887.00
6062300A	TRANSITION SECTION, 6.5 FT. POSTS	EA	$592.00
6062301A	TRANSITION SECTION, 7.5 FT. POSTS	EA	$614.00
6062303	ASYMMETRICAL TRANSITION SECTION, 6.5 FT. POSTS	EA	$620.00
6062304	ASYMMETRICAL TRANSITION SECTION, 7.5 FT. POSTS	EA	$649.00

6062400	BRIDGE ANCHOR SECTION (THRIE BEAM)	EA	$2728.00
6063000	TERMINAL SECTION – GUARDRAIL	EA	$1484.00
6063014	TYPE A CRASHWORTHY END TERMINAL (MASH)	EA	$2958.00
6063016	TYPE B CRASHWORTHY END TERMINAL	EA	$5158.00
6066610	END ANCHOR	EA	$1262.00
6066620	GUARDRAIL ANCHOR, EMBEDDED	EA	$2217.00
6066630	GUARDRAIL ANCHOR, ROCK FACE	EA	$1650.00
6069902	MISC. INSTALL POST IN SOLID ROCK OR CONC, 6’ OR 7’ (TYPE A, E OR MGS)	EA	$350.00
6069902	MISC. FLARED TYPE A CRASHWORTHY END TERMINAL	EA	$2365.00

GUARDRAIL REPAIR ITEMS			
Item Number	**Description**	**Unit**	**Fixed Unit Price**
6069902	MISC. R&R 12.5’ BEAM, CONC/CONVEX RADIUS, TY A	EA	$350.00
6069902	MISC. R&R 12.5’ BEAM, CONC/CONVEX RADIUS, MGS	EA	$350.00
6069902	MISC. R&R 12.5’ W-BEAM PANEL (TYPE A GR)	EA	$162.00
6069902	MISC. R&R 12.5’ W-BEAM PANEL (MGS)	EA	$162.00
6069902	MISC. R&R 12.5' BEAM 10 GA. (TYPE E GR)	EA	$356.00
6069902	MISC. R&R 18.75’ THRIE BEAM PANEL (MGS)	EA	$485.00
6069902	MISC. R&R 25' THRIE BEAM PANEL (TYPE E GR)	EA	$460.00
6069902	MISC. R&R 25’ THRIE BEAM PANEL (MGS)	EA	$460.00
6069902	MISC. R&R 25' W-BEAM PANEL (TYPE A GR)	EA	$281.00
6069902	MISC. R&R 25’ W-BEAM PANEL (MGS)	EA	$281.00
6069902	MISC. R&R 6.25’ THRIE BEAM PANEL (MGS)	EA	$169.00
6069902	MISC. R&R 6.25' TYPE A TO TYPE E TRANSITION BEAM	EA	$159.00
6069902	MISC. R&R WOOD BLOCK 8X6X17 TRANSITION SECTION	EA	$35.00
6069902	MISC. R&R WOOD BLOCK 12X6X19 TRANSITION SECTION	EA	36.00
6069902	MISC. R&R MGS HEIGHT AND BLOCK TRANSITION SECTION	EA	$772.00
6069902	MISC. REALIGN & USE EXIST POST TYPE A, E OR MGS GR	EA	$25.00
6069902	MISC. RE-TENSION GUARDRAIL SYSTEM	EA	$75.00
6069902	MISC. R&R 12.5' END ANCHOR PANEL	EA	$154.00
6069902	MISC. R&R 12.5’ MGS END ANCHOR PANEL	EA	$154.00
6069902	MISC. R&R 12.5' THRIE BEAM RAIL TY E GR	EA	$234.00
6069902	MISC. R&R MGS END ANCHOR	EA	$1313.00
6069902	MISC. R&R 72” FOUNDATION TUBE W/O SOIL PLATE (MGS)	EA	$374.00
6069902	MISC. R&R 46” WOOD POST IN FOUNDATION TUBE (MGS)	EA	$78.00
6069902	MISC. R&R CABLE ASSY W/PIPE, PLATE & ANCHOR (MGS)	EA	$305.00
6069902	MISC. R&R END ANCHOR RAIL	EA	$164.00
6069902	MISC. R&R END ANCHOR CABLE ASSEMBLY	EA	$143.00
6069902	MISC. R&R END SEC (SHOE) TY A GR	EA	$72.00
6069902	MISC. R&R PARTS FOR END SECTION	EA	$105.00
6069902	MISC. R&R GR DELINEATOR 1 SIDE OR 2 SIDE	EA	$12.00
6069902	MISC. R&R STEEL POST 6', MGS	EA	$79.00
6069902	MISC. R&R STEEL POST 6', TY A OR MGS GR	EA	$79.00
6069902	MISC. R&R STEEL POST 6', TY E GR	EA	$89.00

6069902	MISC. R&R STEEL POST 7', TY A GR	EA	$89.00
6069902	MISC. R&R STEEL POST 7', TY E GR	EA	$90.00
6069902	MISC. R&R STEEL POST 8', MGS	EA	$98.00
6069902	MISC. R&R WOOD POST 6', TY A GR	EA	$74.00
6069902	MISC. R&R WOOD POST 7', TY A GR	EA	$84.00
6069902	MISC. R&R STEEL TUBE BLOCK 7X4 BR ANCH	EA	$107.00
6069902	MISC. R&R STEEL SPACER BLOCK (TYPE A GR)	EA	$40.00
6069902	MISC. R&R STEEL BLOCKOUT FOR RADIUS RAIL	EA	$40.00
6069902	MISC. R&R TERMINAL CONNECTOR, TY A OR MGS GR	EA	$115.00
6069902	MISC. R&R TERMINAL CONNECTOR, TY E OR MGS GR	EA	$150.00
6069902	MISC. R&R WOOD/PLASTIC BLOCK 8X6X14 MGS	EA	$21.00
6069902	MISC. R&R WOOD/PLASTIC BLOCK 8X6X14 TY A GR	EA	$21.00
6069902	MISC. R&R WOOD/PLASTIC BLOCK 8X6X21 TY E GR	EA	$25.00
6069902	MISC. R&R WOOD/PLASTIC BLOCK 12X6X14 MGS	EA	$25.00

BULLNOSE SYSTEM REPAIR ITEMS

Item Number	Description	Unit	Fixed Unit Price
6069902	MISC. R&R PARTS FOR BULLNOSE SYSTEM	EA	$1050.00
6069902	MISC. R&R 72 IN FOUNDATION TUBE BULLNOSE SYSTEM	EA	$350.00
6069902	MISC. R&R 96 1/16 IN FOUNDATION TUBE BULLNOSE SYSTEM	EA	$451.00
6069902	MISC. R&R POSTS #1-2 BULLNOSE SYSTEM	EA	$87.00
6069902	MISC. R&R POSTS #3-8 BULLNOSE SYSTEM	EA	$101.00
6069902	MISC. R&R POSTS #9-12 BULLNOSE SYSTEM	EA	$100.00
6069902	MISC. R&R 8X6X14 3/16 TAPERED WOOD BLOCK BULLNOSE SYSTEM	EA	$36.00
6069902	MISC. R&R RAIL SECTION #1 BULLNOSE SYSTEM	EA	$1257.00
6069902	MISC. R&R RAIL SECTION #2 BULLNOSE SYSTEM	EA	$768.00
6069902	MISC. R&R RAIL SECTION #3 BULLNOSE SYSTEM	EA	$426.00

END TERMINAL REPAIR ITEMS

Item Number	Description	Unit	Fixed Unit Price
6069902	MISC. NEW OR R&R REFLECTIVE SHEETING ON END TERMINAL (UNIVERSAL)	EA	$45.00
6069902	MISC. R&R 12.5 FT END SECTION 1ST W-BEAM RAIL (MSKT)	EA	$203.00
6069902	MISC. R&R 9.375 FT 2ND SECTION W-BEAM RAIL (MSKT)	EA	$135.00
6069902	MISC. R&R CABLE ASSY W/ PIPE, PLATE & ANCH (MSKT)	EA	$113.00
6069902	MISC. R&R GROUND STRUT (MSKT)	EA	$115.00
6069902	MISC. R&R NEW IMPACT HEAD (MSKT)	EA	$1075.00
6069902	MISC. REM EXT GR & REUSE EXIST IMPACT HD (MSKT)	EA	$250.00
6069902	MISC. R&R POST #1 HBA TOP (MSKT)	EA	$110.00
6069902	MISC. R&R POST #1 HBA BOTTOM (MSKT)	EA	$308.00
6069902	MISC. R&R POST #2 HBA TOP (MSKT)	EA	$100.00
6069902	MISC. R&R POST #2 HBA BOTTOM (MSKT)	EA	$165.00
6069902	MISC. R&R 12’6” GALV GR PANEL 3’1.5” O/C (SOFTSTOP)	EA	$166.00

6069902	MISC. R&R 12/25/3'1.5:3@6'3:3'1.5/S (SOFTSTOP)	EA	$274.00
6069902	MISC. R&R 6'0 SYT POST/8.5/31" GR HT (SOFTSTOP)	EA	$125.00
6069902	MISC. R&R ANCHOR GUARDRAIL 12'-6" (SOFTSTOP)	EA	$315.00
6069902	MISC. R&R ANGLE STRUT (SOFTSTOP)	EA	$88.00
6069902	MISC. R&R STYP#1 8.5# 4'9-1/2 (SOFTSTOP)	EA	$119.00
6069902	MISC. R&R ANCHOR POST W6X15#X6' (SOFTSTOP)	EA	$411.00
6069902	MISC. R&R IMPACT HEAD (SOFTSTOP)	EA	$1098.00
6069902	MISC. REM EXT GR & REUSE EXIST IMPACT HD (SOFTSTOP)	EA	$253.00
6069902	MISC. R&R CAN TL3 SS646 (SOFTSTOP)	EA	$322.00
6069902	MISC. R&R ANCHOR ANGLE (SOFTSTOP)	EA	$41.00
6069902	MISC. R&R PLATE WASHER (SOFTSTOP)	EA	$35.00
6069902	MISC. R&R KEEPER PLATE (SOFTSTOP)	EA	$30.00
6069902	MISC. R&R ANCHOR PADDLE (SOFTSTOP)	EA	$142.00
6069902	MISC. R&R SLED WELDMENT (TRACC)	EA	$2978.00
6069902	MISC. R&R SHREDDER (TRACC)	EA	$380.00
6069902	MISC. R&R STAGE 2 RIP PLATE 75 IN (TRACC)	EA	$225.00
6069902	MISC. R&R STAGE 3 RIP PLATE 93 IN (TRACC)	EA	$240.00
6069902	MISC. R&R STAGE 3 RIP PLATE (25965G) 87 IN (TRACC)	EA	$230.00
6069902	MISC. R&R STAGE 3 RIP PLATE (25966G) 87 IN (TRACC)	EA	$230.00
6069902	MISC. R&R 2 BAY FENDER PANEL (TRACC)	EA	$280.00
6069902	MISC. R&R NOSEPIECE YELLOW (TRACC)	EA	$355.00

THREE-STRAND LOW TENSION CABLE REPAIR AND REPLACEMENT

Item Number	Description	Unit	Fixed Unit Price
2029903	MISC. REMOVE GUARD CABLE 3-STRAND	LF	$7.00
6064110	ANCHOR ASSEMBLY, GUARD CABLE 3-STRAND	EA	$3350.00
6064111	ANCHOR ASSEMBLY, GUARD CABLE 3-STRAND TO GUARDRAIL TRANSITION	EA	$3013.00
6069902	MISC. ATTACH CABLES TO POST 3/S LT	EA	$19.00
6069902	MISC. GUARD CABLE LINE POST SET IN ROCK 3/S	EA	$199.00
6069902	MISC. R&R ANCHOR POST 3/S	EA	$153.00
6069902	MISC. R&R LINE POST 3/S	EA	$89.00
6069902	MISC. R&R LINE POST IN ROCK LT	EA	$171.00
6069902	MISC. R&R ANCH BRACKET - MED OR RDSIDE 3/S	EA	$503.00
6069902	MISC. R&R ANCH BRACKET - GUARD CABLE TO GR 3/S	EA	$403.00
6069902	MISC. R&R CABLE TRANSITION BRACKET 3/S	EA	$108.00
6069902	MISC. R&R CABLE END FITTING 3/S	EA	$138.00
6069902	MISC. R&R COMPENSATING CABLE END ASSY 3/S	EA	$358.00
6069902	MISC. R&R COMPENSATOR SPRING 3/S	EA	$275.00
6069902	MISC. R&R TURNBUCKLE END ASSY W/O COMPE'TOR 3/S	EA	$233.00
6069902	MISC. REALIGN LINE POST 3/S	EA	$20.00
6069902	MISC. REPLACE GUARD CABLE DELINEATOR	EA	$9.00
6069902	MISC. RETENSION LOW TENSION GUARD CABLES 3/S	EA	$83.00
6069902	MISC. RETROFIT SLIP BASE PLATE	EA	$275.00
6069902	MISC. SPLICE 3/4 INCH CABLE 1/S	EA	$179.00

6069903	MISC. 3/4 INCH CABLE 1/S - LT	LF	$9.00

HIGH TENSION CABLE BARRIER REPAIR AND REPLACEMENT - TRINITY

Item Number	Description	Unit	Fixed Unit Price
2029903	MISC. REMOVE GUARD CABLE 3-STRAND	LF	$7.00
6064110	ANCHOR ASSEMBLY, GUARD CABLE 3-STRAND	EA	$3808.00
6064111	ANCHOR ASSEMBLY, GUARD CABLE 3-STRAND TO GUARDRAIL TRANSITION	EA	$3250.00
6069902	MISC. ATTACH CABLES TO POST 3/S HT - TRINITY	EA	$41.00
6069902	MISC. ATTACH NEW CRP ANCH POST TO BASE HT	EA	$364.00
6069902	MISC. REATTACH EXIST CRP ANCH POST TO BASE - TRINITY	EA	$79.00
6069902	MISC. R&R CRP ANCH POST 1-3 CONC FOOT W/ STUB HT	EA	$621.00
6069902	MISC. FURN/INST TURNBUCKLE CABLE SPLICE ASSY HT	EA	$480.00
6069902	MISC. R&R TURNBUCKLE HT	EA	$316.00
6069902	MISC. R&R CCT TERMINAL POST 4-7 IN EX SLEEVE HT	EA	$263.00
6069902	MISC. R&R CCT TERMINAL POST 8-9 IN EX SLEEVE HT	EA	$276.00
6069902	MISC. R&R CCT TERM POST 4-9 CON FOOT W/ SLEEVE HT	EA	$334.00
6069902	MISC. R&R LINE POST CONC FOOTING W/ SLEEVE HT	EA	$252.00
6069902	MISC. R&R LINE POST IN EXIST SLEEVE HT	EA	$163.00
6069902	MISC. R&R LINE POST IN ROCK HT	EA	$210.00
6069902	MISC. R&R TOP/MID/OR BOTTOM CABLE END ASSY HT	EA	$286.00
6069902	MISC. RETENSION HIGH TENSION CABLES 3/S HT	EA	$188.00
6069902	MISC. REALIGN LINE POST HT	EA	$60.00
6069902	MISC. SPLICE 3/4 INCH CABLE 1/S - HT	EA	$271.00
6069903	MISC. 3/4 INCH CABLE 1/S - HT	LF	$8.00
6069903	MISC. HIGH TENSION SAFETY FENCE, TL-3	LF	$27.00
6069903	MISC. HIGH TENSION SAFETY FENCE, TL-4	LF	$33.00

HIGH TENSION CABLE BARRIER REPAIR & REPLACEMENT - GIBRALTAR

Item Number	Description	Unit	Fixed Unit Price
2029903	MISC. REMOVE GUARD CABLE 3-STRAND	LF	$7.00
6064110	ANCHOR ASSEMBLY, GUARD CABLE 3-STRAND	EA	$3950.00
6064111	ANCHOR ASSEMBLY, GUARD CABLE 3-STRAND TO GUARDRAIL TRANSITION	EA	$3150.00
6069902	MISC. ATTACH CABLES TO TL-3 POST 3/S HT - GIBRALTAR	EA	$56.00
6069902	MISC. ATTACH CABLES TO TL-4 POST 3/S HT - GIBRALTAR	EA	$79.00
6069902	MISC. ANCHOR POST	EA	$868.00
6069902	MISC. ANCHOR TERMINAL FITTING	EA	$188.00
6069902	MISC. ATTACH NEW CABLE RELEASE POST	EA	$560.00
6069902	MISC. REATTACH EXIST CRP ANCH POST TO BASE-GIBRALTAR	EA	$193.00
6069902	MISC. CABLE SPLICE TURNBUCKLE	EA	$314.00
6069902	MISC. R&R ANCHOR POST 3/S	EA	$151.00

6069902	MISC. R&R LINE POST CONC FTG W/ SLEEVE HT - GIBRALTAR	EA	$267.00
6069902	MISC. R&R LINE POST IN ROCK HT	EA	$356.00
6069902	MISC. R&R LINE POST 3/S	EA	$112.00
6069902	MISC. REALIGN LINE POST HT	EA	$18.00
6069902	MISC. REPLACE GUARD CABLE DELINEATOR	EA	$11.00
6069902	MISC. RETENSION HIGH TENSION CABLES 3/S HT	EA	$175.00
6069902	MISC. SPLICE 3/4 INCH CABLE 1/S - HT	EA	$219.00
6069902	MISC. TERMINAL POST #1/ WEAK	EA	$111.00
6069902	MISC. TERMINAL POST #2/ WEAK	EA	$111.00
6069902	MISC. TL-3 TERMINAL POST #3&4/ WEAK	EA	$118.00
6069902	MISC. TL-4 TERMINAL POST #3&4/ WEAK	EA	$118.00
6069902	MISC. TL-3 LINE POST DRIVEN	EA	$130.00
6069902	MISC. TL-3 LINE POST SOCKETED	EA	$95.00
6069902	MISC. TL-4 LINE POST DRIVEN	EA	$142.00
6069902	MISC. TL-4 LINE POST SOCKETED	EA	$113.00
6069903	MISC. 3/4 INCH CABLE 1/S - HT	LF	$8.00
6069903	MISC. HIGH TENSION SAFETY FENCE, TL-3	LF	$26.00
6069903	MISC. HIGH TENSION SAFETY FENCE, TL-4	LF	$33.00

H. Adjustment Factor

1.0 Description. The Adjustment Factor includes business and construction related costs as defined in this specification. It is the responsibility of the contractor to verify the unit prices provided in this contract and to modify their Adjustment Factor accordingly.

1.1 Business Costs. Business related costs consist of profit, overhead costs, subcontractor profit and overhead, taxes, finance costs, and other costs including but not limited to;

(a) insurance, bonds and indemnification
(b) project meetings, training, management and supervision
(c) project office staff and equipment
(d) employee or subcontractor wage rates that exceed prevailing wages
(e) fringe benefits, payroll taxes, worker's compensation, insurance costs and any other payment mandated by law in connection with labor that exceeds the labor rate allowances
(f) business risks such as the risk of low than expected volumes of work, smaller than anticipated Job Orders, poor subcontractor performance, and inflation or material cost fluctuations

1.2 Construction Costs. Construction related costs include but are not limited to;

(a) personnel safety equipment
(b) security requirements
(c) excess material waste
(d) daily and final clean-up
(e) costs resulting from inadequate supply of materials, fuel, electricity, or skilled labor
(f) costs resulting from productivity loss
(g) working in extreme and adverse weather conditions
(h) any other discreet items of work required to complete a particular Job Order

1.3 General Costs. The above lists are not exhaustive and are intended to provide general examples of cost items to be included in the contractor's Adjustment Factor as defined in the contract.

2.0 Adjustment Factor. The Adjustment Factor may include daytime, nighttime, and/or weekend hours as identified by the Engineer.

2.1 Daytime hours are defined as ½ hour after sunrise to ½ hour before sunset. If the contractor works outside of the defined daytime hours, the contractor shall provide lighting equipment at no additional cost to the Commission.

3.0 Nighttime Work. If the Engineer determines traffic volumes are such that work cannot be performed during the daytime, without significant traffic impacts, the Job Order will specify nighttime repair operations.

4.0 Weekend Work. If the Engineer determines traffic volumes are such that work cannot be performed Monday through Friday without significant traffic impacts, the Job Order will specify weekend repair operations.

I. Bidding the Adjustment Factor

1.0 The bidder shall complete the bid form by writing in the Adjustment Factor. The Adjustment Factor shall be specified to three decimal places. Note that this is a contract pay item for contractor payment, not work items.

EXAMPLE: The Adjustment Factor shall be entered as the following example illustrates.

1 . 1 9 8

OR

0 . 9 8 7

Note: The Adjustment Factors used are for example purposes only and is not an indication of factors being bid by the contractor.

J. Contract Award

1.0 The Commission will evaluate the bids with the intent of awarding the contract to the lowest responsible bidder. The budget for this project will have a minimum budget of $0 dollars and an anticipated maximum of $1,000,000. If the contract is extended in accordance with the TERM OF CONTRACT JSP, the anticipated budget will be two times the maximum amount.

2.0 The lowest bid will be determined by multiplying the Adjustment Factor by the anticipated budget for the adjustment factor. For purposes of bidding this contract, the estimated percentage

of work performed during Daytime hours is 90%, Nighttime hours is 5%, and Weekend hours is 5%. The dollar quantities provided in the bid form are anticipated budgets and are not intended to represent the actual value of work that will be assigned.

K. Bonds

1. 0 The amount of the Bid Bond shall be 5% of the anticipated budget for this project.

2.0 The amount of the Performance Bond shall be 100% of the anticipated budget for this project.

L. Notice to Proceed

Delete Sec 108.2 and substitute the following:

108.2 Notice to Proceed. For each Job Order, the Engineer will include a notice to proceed, which will stipulate the date the contractor is expected to begin work. The notice to proceed date will normally be 3 working days after the job order is issued.

108.2.1 For job orders that require a first priority response, the contractor shall respond to the work location and begin the first priority repair work within 24 hours of execution of the Job Order.

M. First Priority Repair

1.0 If the Engineer determines the safety of the public is unduly compromised by the damaged guardrail or guardrail end terminal, the work will be designated as a First Priority repair, and as such, will take precedent over any routine pending Job Orders, as specified herein. Commission forces or others will initially respond to the location and perform such work as necessary to reduce the immediate danger to the public.

2.0 The contractor shall provide a means for the Engineer to notify the contractor of emergencies 24 hours a day. The contractor will be given initial notification by phone of the location and type of work of the First Priority Repair. Written confirmation of the anticipated work will be provided by e-mail or text immediately after notification by phone. The Job Order will be issued by the Engineer within 48 hours of initial notification of the contractor.

3.0 The contractor shall respond to the work location and begin the First Priority Repair work within 24 hours of execution of the Job Order. After beginning the First Priority Repair work, the contractor shall continuously and diligently pursue the work according to the mutually agreed upon schedule in the Job Order until all of the repairs described in the Job Order are complete, unless otherwise approved by the Engineer.

3.1 Additional time to begin the work may be granted for shipment of repair items not included in the Fixed Unit Price List. The contractor shall notify the Engineer immediately of any delays due to shipment of non-Fixed Cost pay items.

4.0 If multiple First Priority Job Orders are active simultaneously, all First Priority Job Orders shall be completed prior to routine Job Order repairs and in the order issued unless otherwise re-prioritized by the Engineer.

4.1 If a First Priority Job Order is issued while a current First Priority Job Order is active, the Notice to Proceed for the subsequent First Priority Job Order will be no less than 12 hours following the planned completion of the active First Priority Job Order.

4.2 If issuance of one or more First Priority Job Orders causes delays to other pending routine Job Orders, additional time will be granted for completion of the other repairs if the contractor can provide sufficient evidence that issuance of the First Priority Job Order was cause for the delay.

4.3 Based on repair history, it is estimated that use of the First Priority Repair will occur fewer than 10 times per year. However, the Commission makes no guarantee of the actual number of First Priority Repairs that may be required.

5.0 No additional payment will be made for First Priority Repairs. Payment will be made for work as specified elsewhere in the contract.

N. Contract Time for Completion of Job Order

1.0 Contract Time for Completion of Job Order. The time for the completion of the job order will be specified by calendar days. Time is an essential element of the contract, and it is therefore important that the work be pursued vigorously to completion.

2.0 Completion by Calendar Days. The contractor shall complete all work described in each job order within seven (7) calendar days of the notice to proceed date.

3.0 Contract Time Extension for Change in the Work. If a change in the work on a job order is ordered by the Engineer, the contractor will be allowed an extension of contract time when it can be established that the additional work required more time. In such cases, the actual time required, as determined by the Engineer, will be allowed.

4.0 Contract Time Extension for Traffic Control Restrictions. If a traffic control time restriction ordered by the Engineer changes the contractor's work schedule on a job order, the contractor will be allowed an extension of contract time when it can be established that the restriction prevented the contractor from performing the work within the contract time. In such cases, the actual restriction time, as determined by the Engineer, will be allowed.

5.0 Contract Time Extension for Unsuitable Weather. The contractor will not be entitled to any extension of contract time because of unsuitable weather conditions unless authorized in writing by the Engineer as an excusable, non-compensable delay under Sec 108.14.1.

O. Completing the Work

1.0 The contractor shall perform any task in the fixed unit price list for the fixed unit price multiplied by the quantity, multiplied by the Adjustment Factor . The contractor shall perform the Detailed

Scope of Work for the Job Order Price as calculated in accordance with the procedure for developing Job Orders set forth herein.

2.0 When installed quantities differ from the estimated quantities in the issued Job Order, the as built quantities in the final Job Order will address the quantity variation(s) for final payment. When quantities are not specified in the Detailed Scope of Work, the Job Order Price will be deemed to be lump sum for such work.

3.0 The contractor shall employ and supply a sufficient force of workers, materials and equipment and shall progress the work with such diligence so as to ensure completion of the Detailed Scope of Work within the Job Order completion Time or within such extended time for completion as may be granted by the Engineer.

P. Final Inspection and Acceptance of the Work

Delete Secs 105.10.7 through 105.10.7.2 and substitute the following:

105.10.7 Final Inspection. Upon completion of the required work for each Job Order, the contractor shall notify the Engineer by phone or electronic mailing, and the Engineer will perform an inspection. If the Engineer determines all work required by the contract has been satisfactorily completed, the Engineer will make the acceptance for maintenance and notify the contractor in writing of the date of acceptance for maintenance.

105.10.7.1 Work determined to be unsatisfactory by the Engineer and not accepted shall be corrected to acceptable standards at the contractor's sole cost. All items that are unsatisfactory shall be corrected within the specified working days for each job order. If needed for correction of unsatisfactory work, the contractor will be given an extension of contract time in an amount equal to the number of working days remaining in the job order at the time the Engineer was notified for inspection. No contract time extension will be made for notification made prior to completion of the work. Any time extension given will be considered a non-compensable delay. Upon completion of the corrections, the contractor shall notify the Engineer for a re-inspection.

105.10.7.2 Following a Job Order final inspection, the contractor, subcontractors, and suppliers are relieved of any new or additional liability to third parties for personal injury, death, or property damages which may be alleged to result from the performance of the work required by that job order, unless additional work on the right of way is required by the Engineer.

105.10.7.3 Nothing in this section shall be deemed to excuse the contractor of liability or responsibility for any personal injury, death, or property damages which may arise from acts or the failure to act prior to the final inspection of the work required by the Job Order.

Q. Liquidated Damages for Failure or Delay in Starting or Completing Work on Time

1.0 Description. If the contractor, or in case of default, the surety fails to begin or complete the work required in a job order within the time specified, or within such extra time as may be allowed by the contract, the contractor shall be charged with liquidated damages in the amount of **$250 per day** for each day or partial day that the job order remains incomplete in excess of the specified

time. The amount specified is agreed upon, not as a penalty, but as liquidated damages for loss to the Commission and the public. This amount will be deducted from any amount due under the contract. These damages will apply to each individual job order for which the contractor fails to complete the work on time. The contractor and surety shall be liable for all liquidated damages. Permitting the contractor to continue the work after the expiration of the specified time or any extension of time will not constitute a waiver by the Commission of any contractual rights. It shall be the responsibility of the engineer to determine the quantity of excess time.

2.0 Sec 108.8.1 through 108.8.1.3 shall not apply to this contract.

3.0 These liquidated damages will not be charged for Saturdays, Sundays, national, and state holidays established by law.

R. Liquidated Damages Specified for First Priority Repair Response

1.0 Description. For those job orders that are designated as a first priority repair, if the contractor does not respond to the work site and begin the first priority repair work within 24 hours, 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, increased potential liability, increased traffic and traffic flow regulation cost and greater 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 **$250.00 per hour** that the first priority repairs are not started, in excess of the limitation as specified elsewhere in the contract documents. The Engineer will determine the quantity of excess time.

1.1 The said liquidated damages specified for first priority repair response will be assessed in addition to any other applicable liquidated damages specified elsewhere in the contract documents.

S. Liquidated Damages Specified for Lane Closures

1.0 Description. The contractor shall be required to have all lanes open to unrestricted traffic and free of any equipment by the time specified in Job Order for each closure location. Should the contractor fail to have the roadway completely open, and free of any equipment by the time specified in Job Order, the Commission, the traveling public, 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. These damages are not reasonably capable of being computed or quantified. Therefore, the contractor will be charged with liquidated damages specified in the amount of **$1,000 per 15 minutes** for each 15-minute increment that the roadway is not open and free of any equipment, in excess of the limitation as specified elsewhere in the special provision. It will be the responsibility of the Engineer to determine the quantity of excess closure time.

1.1 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.

1.2 This deduction will continue until such time as the necessary work is completed and all lanes are open to traffic.

2.0 A contingency plan mutually agreed upon by the contractor and the Engineer shall be established at the joint meeting and documented in each Job Order in the event of a delay of the scheduled traffic opening time due to weather or other unforeseen circumstances.

T. Contract Payments

1.0 The contractor shall request payment by submitting an invoice to the Engineer. The invoice shall be for the job orders completed and shall be itemized by job order number. A summary of all contract items used, contract unit prices, and total cost shall be included with the invoice.

1.1 The Engineer will make payment estimates for the Job Orders completed and final inspected and the value thereof at the price established in the Job Order, including any necessary adjustments. The payment estimates will include deductions from the contractor's invoice for any liquidated damages applicable to any of the Job Orders.

1.2 Material Allowance. No material allowance will be made for this contract.

U. Work Zone Traffic Management Plan

1.0 Description. The contractor may be responsible for the work zone traffic management as mutually agreed upon by the contractor and engineer for each individual Job Order. 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:

2.0 Traffic Management Schedule.

2.1 The contractor shall notify the Engineer at least 48 hours prior to performing any work at each work site with the exception of first priority repairs. The notification shall include all information needed to identify traffic impacts such as work location, anticipated work hours, traffic control plan type, required lane or shoulder closures, anticipated duration of the work, etc. The Engineer will make appropriate notification to the public, MoDOT customer service, and MoDOT work crews of the contractor's operations. The contractor shall notify the Engineer at the actual time of closing any lane or shoulder and shall again notify the Engineer when the lane or shoulder is reopened to traffic. The contractor shall notify the Engineer as soon as practical any postponement due to weather, material, or other circumstances and shall renotify the Engineer when the work has been rescheduled.

2.2 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 work and the contractor is prepared to diligently pursue

the work until the closed lane is reopened to traffic.

3.0 Maintenance of Traffic.

3.1 Traffic flow shall be maintained through the work zone using the existing pavement in accordance with the traffic control plans. No detours or lane shifts onto shoulders will be allowed unless otherwise approved by the Engineer.

3.2 Provisions shall be made to allow the movement of emergency vehicles through the limits of the work at all times.

3.3 During non-working hours the contractor shall have all lanes of traffic open for all routes, ramps, and side roads. All channelizers and other traffic control devices shall be removed from the roadway during non-working hours unless otherwise approved by the Engineer.

4.0 Traffic Congestion and Delay. The contractor shall, upon approval of the Engineer, take proactive measures to reduce traffic congestion in the work zone. The contractor shall be responsible for maintaining the existing traffic flow through the job site during the work. If disruption of the traffic flow occurs and traffic is backed up in queues of 15 minute delays or longer, then the contractor shall review the construction operations which contributed directly to disruption of the traffic flow and make adjustments to the operations to prevent queues from occurring again.

5.0 Traffic Safety.

5.1 Where traffic queues routinely extend to within 1000 feet (300 m) of the ROAD WORK AHEAD, or similar, sign on a divided highway or to within 500 feet (150 m) 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.

5.2 When a traffic queue extends to within 1000 feet (300 m) of the ROAD WORK AHEAD, or similar, sign on a divided highway or to within 500 feet (150 m) 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 (300 m) and no more than 0.5 mile (0.8 km) in advance of the end of the traffic queue on divided highways and no less than 500 feet (150 m) and no more than 0.5 mile (0.8 km) in advance of the end of the traffic queue on undivided highways.

6.0 Work Hour Restrictions.

6.1 All work shall be scheduled to avoid major sporting events, conventions, concerts, and similar special events as specified by the engineer. During the term of this contract, there are six major holiday weekends: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, and Christmas. All lanes shall be scheduled to be open to traffic during these holiday periods, from 12:00 noon on the last working day preceding the holiday until 9:00 a.m. on the first working day subsequent to the holiday, unless otherwise designated by the engineer.

6.2 During non-working hours the contractor shall have all lanes of traffic open for all routes, ramps, and side roads. Working hours for holidays shall be determined by the engineer.

6.3 Due to the wide variance in traffic volumes throughout the contract area, it is not possible to give specific work hours for the term of the contract. No work will be allowed during the morning and afternoon rush periods (6:30 a.m. to 9:00 a.m. and 3:00 p.m. to 6:00 p.m.) within the rural Kansas City District (outside MARC Boundary) unless otherwise directed or approved by the Engineer. Each Job Order will specify work hours or work hour restrictions based on the repair location, this may include peak hour restrictions. The following table provides general guidance as to the most restrictive schedule for when work on or adjacent to the roadway may be allowed.

Traffic Control Plan Type	Work Hours (Monday thru Friday)
Single Lane Closure	7:30 p.m. to 4:30 a.m.
Ramp Closure	Hours and days as approved by the engineer
One Lane Two Way Operation with Flagger	Hours and days as approved by the engineer

Specific work hours for an individual work location shall be according to the mutually agreed upon schedule in the Job Order.

7.0 Work Within Another Work Zone. The Engineer may determine it is in the best interest of the Commission and the traveling public to have the work designated in the job order performed within another contractor's work zone or within a MoDOT work zone. If the work is designated to be performed within another work zone, the contractor shall coordinate and perform the work in accordance with Sec 105.6.

8.0 Ramp Closure. Ramp closures shall be minimized and shall be approved by the engineer a minimum of five days prior to the closure. Only one ramp closure will be permitted in a particular interchange or complex at one time. Work on acceleration / deceleration lanes will not require ramp closure unless approved by the engineer. Detour traffic handling details will be as specified by the engineer. Major ramp closures may require detour signing with other ramp closures only requiring use of changeable message signs (CMS) for detours. If the engineer determines detour signing is required, all necessary detour trailblazing placards will be furnished, installed, and covered by others. The contractor shall furnish all CMS required by the engineer. The contractor shall be responsible for uncovering and covering the trailblazing placards as work progresses.

9.0 Changeable Message Signs. The contractor shall provide changeable message signs notifying motorists of future traffic disruption and possible traffic slow down one week before traffic is shifted to a detour. The changeable message sign installation shall be placed at a location as approved or directed by the engineer.

10.0 Basis of Payment. All items necessary to complete the traffic control will be paid for at the fixed unit price multiplied by the Adjustment Factor, as mutually agreed upon in the Job Order.

V. Traffic Control Plan Types

1.0 Description. The engineer will designate in the job order the type of traffic control plan (TCP) necessary to perform the work. If the engineer determines more than one type of TCP is needed

to perform the work, the additional plan or plans will be specified in the job order. The various types of TCP's and the traffic control devices required for each TCP are shown on the plans. The contractor shall furnish adequate channelizing devices as shown on the plans. **The contractor's attention is directed to the fact that trim line channelizers are required for all TCP's regardless of daytime or nighttime operations. Cones will not be allowed for use on this contract.**

2.0 Plan Types.

2.1 Single Lane Closure. A single lane closure shall be performed by furnishing, installing, and removing the following set of traffic control devices:

2 each	Road Work Ahead
2 each	Right (Left) Lane Closed Ahead
2 each	Reduced Speed Limit Ahead (Symbol)
1 each	Right (Left) Lane Closed
1 each	Merge with Right (Left) Arrow
2 each	Speed Limit XX MPH
2 each	Work Zone (Plaque)
14 each	Directional Indicator Barricade
30 each	Channelizer (Trim Line)
2 each	Flashing Arrow Panel (One Truck Mount for TMA)
1 each	Truck Mounted Attenuator
1 each	Changeable Message Sign (Contractor Furnished / Retained)

2.2 Ramp Closure. The contractor shall obtain approval from the engineer a minimum of five days prior to any ramp closure. A ramp closure shall be performed by furnishing, installing, and removing the following set of traffic control devices:

2 each	Road Work Ahead
2 each	Ramp Closed Ahead
2 each	Reduced Speed Limit Ahead (Symbol)
2 each	Detour Ahead
2 each	Speed Limit XX MPH
2 each	Work Zone (Plaque)
1 each	Road Closed
2 each	Speed Limit XX (Normal Speed)
14 each	Directional Indicator Barricade
40 each	Channelizer (Trim Line)
2 each	Flashing Arrow Panel (One Truck Mount for TMA)
1 each	Truck Mounted Attenuator
2 each	Changeable Message Sign (Contractor Furnished / Retained)

2.3 Partial Ramp Closure. A partial ramp closure shall be performed by furnishing, installing, and removing the following set of traffic control devices:

1 each	Ramp Work Ahead
1 each	Ramp Narrows
1 each	Speed Limit XX MPH

2 each	Work Zone (Plaque)
14 each	Directional Indicator Barricade
40 each	Channelizer (Trim Line)
1 each	Flashing Arrow Panel (One Truck Mount for TMA)
1 each	Truck Mounted Attenuator
1 each	Changeable Message Sign (Contractor Furnished / Retained)

2.4 Entrance Ramp Area Mainline Work. Entrance Ramp Area Mainline Work shall be performed by furnishing, installing, and removing the following set of traffic control devices:

3 each	Road Work Ahead
2 each	Right (Left) Lane Closed Ahead
1 each	Right (Left) Lane Closed
1 each	Merge
1 each	Ramp Narrows
14 each	Directional Indicator Barricade
50 each	Channelizer (Trim Line)
2 each	Flashing Arrow Panel (One Truck Mount for TMA)
1 each	Truck Mounted Attenuator
1 each	Changeable Message Sign (Contractor Furnished / Retained)

2.5 Entrance Ramp Area Acceleration Lane Work. Entrance Ramp Area Acceleration Work shall be performed by furnishing, installing, and removing the following set of traffic control devices:

3 each	Road Work Ahead
2 each	Right (Left) Lane Closed Ahead
1 each	Right (Left) Lane Closed
1 each	Merge
1 each	Ramp Narrows
1 each	Yield
1 each	Yield Ahead (Symbol)
1 each	Merge Traffic (Symbol)
14 each	Directional Indicator Barricade
50 each	Channelizer (Trim Line)
2 each	Flashing Arrow Panel (One Truck Mount for TMA)
1 each	Truck Mounted Attenuator
1 each	Changeable Message Sign (Contractor Furnished / Retained)

2.6 Exit Ramp Area Deceleration/Mainline Lane Work. Exit Ramp Area Deceleration/Mainline Work shall be performed by furnishing, installing, and removing the following set of traffic control devices:

2 each	Road Work Ahead
2 each	Right (Left) Lane Closed Ahead
1 each	Right (Left) Lane Closed
1 each	Merge
1 each	Ramp Narrows
1 each	Exit

14 each	Directional Indicator Barricade
50 each	Channelizer (Trim Line)
2 each	Flashing Arrow Panel (One Truck Mount for TMA)
1 each	Truck Mounted Attenuator
1 each	Changeable Message Sign (Contractor Furnished / Retained)

3.0 Additional Traffic Control Devices. The engineer may determine that signs and channelizers, in addition to those devices shown in the plans are necessary to safely accommodate traffic. These additional devices may be needed for merging ramp traffic, detours, or other special cases to supplement the specified lane closure devices. The contract provides a fixed cost for any additional traffic control items.

5.0 Method of Measurement and Basis of Payment.

5.1 Measurement will be made per each set-up made within the term of the Job Order. A set-up is defined as each installation and removal of traffic control devices at a specific work site. The accepted quantity of each set-up will be paid for at the fixed unit price for:

Item 616-99.02	Single Lane Closure	Each
Item 616-99.02	Ramp Closure	Each
Item 616-99.02	Partial Ramp Closure	Each
Item 616-99.02	Entrance Ramp Area, Mainline Work	Each
Item 616-99.02	Entrance Ramp Area, Accel Lane Work	Each
Item 616-99.02	Exit Ramp Area, Mainline/Decel Lane Work	Each
Item 616-99.02	One-Lane Two-Way Operation with Flaggers	Each

multiplied by the Adjustment Factor, as mutually agreed upon in the Job Order.

5.2 Measurement of additional traffic control devices will be made per each set-up made within the term of the Job Order. Payment for the devices shall include furnishing, installing, and removing the additional devices at a specific work site. No payment will be made for additional devices used by the contractor without prior approval of the engineer. The accepted quantity of additional traffic control devices will be paid for in accordance with the fixed unit price list, multiplied by the Adjustment Factor, as mutually agreed upon in the Job Order.

W. Truck Mounted Attenuator (TMA)

1.0 Description. If a truck mounted attenuator (TMA) is shown for use in a traffic control plan or if an additional TMA is specified in the job order for use at a specific work location, the contractor shall furnish, operate, repair, replace, and maintain a TMA as indicated on the plans or as directed by the Engineer.

2.0 Basis of Payment. Payment will be made at the contract unit price for each of the pay items included in the contract and will be considered full compensation for all labor, material, and equipment necessary to furnish and maintain the TMA.

2.1 If a truck mounted attenuator (TMA) is shown for use in a traffic control plan then payment will be considered covered by the contract unit price of that plan.

2.2 If an additional TMA is specified in the job order for use at a specific work location, the TMA will be paid for once at the established fixed unit price for:

Item 616-99.02	Additional Truck Mounted Attenuator	Each

X. Work Plan and Schedule for Accomplishing Work

Delete Sec 108.4 through 108.4.4 and substitute the following:

108.4 Work Plan and Schedule. Prior to or at the preconstruction conference, the contractor shall provide a proposed work plan and typical schedule for accomplishing both normal and first priority work. The work plan shall include a written list of equipment and personnel that the contractor intends to use in executing the work.

108.4.1 The work plan will be reviewed by the Engineer to determine in general if adequate personnel and equipment appear to be available to complete the work within the required number of calendar days. If the Engineer determines the work plan is inadequate, the Engineer and contractor shall meet for a joint review of the plan to correct and adjust the plan and schedule as necessary. A revised work plan and schedule shall be provided by the contractor prior to commencing the work.

108.4.2 If multiple job orders are issued with overlapping completion periods, the priority of the work will be jointly determined by the Engineer and the contractor, with final approval of the work plan by the Engineer. The work schedule and work priorities will be determined by the needs of the Commission and not the contractor's convenience of work location.

108.4.3 No direct payment will be made for furnishing the work plan or revisions.

108.4.4 The contractor shall determine the most feasible work plan and schedule consistent with the requirements of the contract. The Engineer's approval of contractor's work plan is not intended to be acknowledgment or representation that it is reasonable or will accomplish the work within a particular time or at a particular cost.

Y. 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. MoDOT customer service shall also be notified when the contractor requests emergency assistance.

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

Missouri Highway Patrol	(314) 340-4000
MoDOT District KC Customer Service (24 hr.)	(816) 622-6500
MoDOT Incident Response (24 hr.)	(816) 241-2223
Ray County Sheriff	(816) 290-5323
Lafayette County Sheriff	(660) 259-3622
Saline County Sheriff	(660) 886-5511
Johnson County Sheriff	(660) 747-6469
Pettis County Sheriff	(660) 827-0052

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

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

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

Z. Utilities

1.0 It is the inherent risk of the work under this contract that the contractor may encounter utilities above and/or below the ground or in the vicinity of any given job order which may interfere with their operations. The contractor expressly acknowledges and assumes this risk even though the nature and extent is unknown to both the contractor and the Commission at the time of bidding and award of the contract. The effect in cost or time of the presence of utilities above, below or in the vicinity of the contractor's work under this contract shall not be compensable.

AA. Delay Provisions

1.0 If the contractor is delayed in the commencement, prosecution or completion of the work by any act of the Commission, or by any cause beyond the contractor's control, then the contractor will be entitled to an extension of time. If the contractor is delayed or prevented from working on a particular date as a result of a delay, error or omission of the Commission, and the contractor incurs unavoidable labor costs as a direct result thereof because the contractor did not have enough time to cancel or divert its labor force, then the contractor will be reimbursed for such costs. For each worker so paid, the contractor will be reimbursed the amount paid the worker. Also, the contractor will be reimbursed for construction tasks required as a direct result of such delay, error or omission, such as closing off areas of work. No other costs shall be paid as a result of a delay or late cancellation.

BB. Mobilization

Delete Sec 618.2 and substitute the following:

618.2 No direct payment will be made for mobilization. All costs for mobilization shall be considered included in the cost of the individual contract pay items included in the contract.

CC. Sample Job Orders

1.0 The following are example Job Orders intended to be illustrations that may be used as a guide for formulating the bid of the Adjustment Factor. For each example Job Order, the appropriate items that would be used and the quantities are computed based upon the sample work that would be completed in the Job Order. The contractor shall be reminded these are Job Order samples and the quantity totals in actual Job Orders, if issued, may be more or less than that depicted below or be totally different from the samples illustrated.

1.1 Job Order Sample 1: Damaged Guardrail repair location does not have significant daytime peak hour ADT and will only require shoulder closure.

Item Description	Fixed Unit Price	Quantity	Price
Misc. Shoulder Work – Undivided Roadways	$190.00	1	$190.00
Misc. R&R 12.5' W-Beam Panel (Type A GR)	$109.00	1	$109.00
Misc. Realign & Use Exist Post Type A, E, or MGS GR	$19.00	3	$57.00
Misc. R&R GR Delineator 1 Side or 2 Side	$8.00	1	$8.00
		Subtotal:	**$364.00**
Adjustment Factor	1.150		
		TOTAL:	**$418.60**

1.2 Job Order Sample 2: Damaged Guardrail repair location is a high ADT location requiring a 'Single Lane Closure" so off-peak nighttime hours are required with reopening to traffic before the next morning rush period.

Item Description	Fixed Unit Price	Quantity	Price
Misc. Single Lane Closure	$700.00	1	$700.00
Misc. R&R 12.5' W-Beam Panel (Type A GR)	$109.00	5	$545.00
Misc. Realign & Use Exist Post Type A, E, or MGS GR	$19.00	1	$19.00
Misc. R&R GR Delineator 1 Side or 2 Side	$8.00	6	$48.00
		Subtotal:	**$1,312.00**
Adjustment Factor	1.200		
		TOTAL:	**$1,574.40**

1.3 Job Order Sample 3: Damaged Guardrail repair location is a high ADT location, but due to the length of repair two continuous closure days will be required to complete the work. An "Entrance Ramp Area, Mainline Work" traffic control set-up will be required. A weekend closure

will be used so the entire section can be removed and replaced at one time without impacting peak hour traffic.

Item Description	Fixed Unit Price	Quantity	Price
Misc. Entrance Ramp Area, Mainline Work	$325.00	1	$325.00
Misc. R&R 12.5' W-Beam Panel (Type A GR)	$109.00	10	$1,090.00
Misc. Realign & Use Exist Post Type A, E, or MGS GR	$19.00	15	$285.00
Misc. R&R Steel Post 6', TY A or MGS GR	$68.00	20	$1,360.00
Misc. R&R GR Delineator 1 Side or 2 Side	$8.00	5	$40.00
Misc. R&R Wood/Plastic Block 8X6X14 TY A GR	$18.00	10	$180.00
		Subtotal:	**$3,280.00**
Adjustment Factor	1.250		
		TOTAL:	**$4,100.00**

DD. Supplemental Revisions JSP-18-01X

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

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

Stormwater Compliance Requirements

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

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

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

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

2.1 Duties of the WPCM:

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

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

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

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

(e) Review the project site for compliance with the Project SWPPP, as needed, from the start of any grading operations until final stabilization is achieved, and take necessary actions to correct any known deficiencies to prevent pollution of the waters of the state or adjacent property owners prior to the engineer's weekly inspections;

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

3.0 Pre-Activity Meeting for Grading/Land Disturbance and Required Hold Point. A Pre-Activity meeting for grading/land disturbance shall be held prior to the start of any land disturbance operations. No land disturbance operations shall commence prior to the Pre-Activity meeting except work necessary to install perimeter controls and entrances. Discussion items at the pre-activity meeting shall include a review of the Project SWPPP, the planned order of grading

operations, proposed areas of initial disturbance, identification of all necessary BMPs that shall be installed prior to commencement of grading operations, and any issues relating to compliance with the Stormwater requirements that could arise in the course of construction activity at the project.

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

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

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

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

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

Anti-Discrimination Against Israel Certification

By signing this contract, the Company certifies it is not currently engaged in and shall not, for the duration of the contract, engage in a boycott of goods or services from the State of Israel, companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel, or persons or entities doing business in the State of Israel as defined by Section 34.600 RSMo. This certification shall not apply to contracts with a total potential value of less than One Hundred Thousand Dollars ($100,000) or to contractors with fewer than ten (10) employees.

Ground Tire Rubber (GTR) Dry Process Modification of Bituminous Pavement Material

1.0 Description. This work shall consist of the dry process of adding ground tire rubber (GTR) to modify bituminous material to be used in highway construction. Existing GTR requirements in Section 1015 pertain to the wet process method of GTR modification that blends GTR with the asphalt binder (terminal blending or blending at HMA plant). The following requirements shall govern for dry process GTR modification. The dry process method adds GTR as a fine aggregate or mineral filler during mix production. All GTR modified asphalt mixtures shall be in accordance with Secs 401, 402, or 403 as specified in the contract; except as revised by this specification.

2.0 Materials. The contractor shall furnish a manufacturer's certification to the engineer for each shipment of GTR furnished stating the name of the manufacturer, the chemical composition, workability additives, and certifying that the GTR supplied is in accordance with this specification.

2.1 Product Approval. The GTR product shall contain a Trans-Polyoctenamer (TOR) added at 4.5 % of the weight of the crumb rubber or an engineered crumb rubber (ECR) workability additive that has proven performance in Missouri. Other GTR additives shall be demonstrated and proven prior to use such as a five-year field performance history in other states or performance on a federal or state-sanctioned accelerated loading facility.

2.2 General. GTR shall be produced from processing automobile or truck tires by ambient or cryogenic grinding methods. Heavy equipment tires, uncured or de-vulcanized rubber will not be permitted. GTR shall also meet the following material requirements:

Table 1 – GTR Material Properties

Property	Test Method	Criteria
Specific Gravity	ASTM D1817	1.02 to 1.20
Metal Contaminates	ASTM D5603	$\leq$ 0.01%
Fiber Content	ASTM D5603	$\leq$ 0.5%
Moisture Content	ASTM D1509	$\leq$ 1.0%*
Mineral Filler	AASHTO M17	$\leq$ 4.0%

*Moisture content of the GTR shall not cause foaming when combined with asphalt binder and aggregate during mix production

2.3 Gradation. The GTR material prior to TOR or ECR workability additives shall meet the following gradation and shall be tested in accordance with ASTM D5603 and ASTM D5644.

Table 2 – GTR Gradation	
Sieve	**Percent Passing by Weight**
No. 20	100
No. 30	98-100
No. 40	50-70
No. 100	5-15

3.0 Delivery, Storage, and Handling. The GTR shall be supplied in moisture-proof packaging or other appropriate bulk containers. GTR shall be stored in a dry location protected from rain before use. Each bag or container shall be properly labeled with the manufacturer's designation for the GTR and specific type, mesh size, weight and manufacturer's batch or Lot designation.

4.0 Feeder System. Dry Process GTR shall be controlled with a feeder system using a proportioning device that is accurate to within ± 3 percent of the amount required. The system shall automatically adjust the feed rate to always maintain the material within this tolerance and shall have a convenient and accurate means of calibration. The system shall provide in-process monitoring, consisting of either a digital display of output or a printout of feed rate, in pounds per minute, to verify feed rate. The supply system shall report the feed in 1-pound increments using load cells that will enable the user to monitor the depletion of the GTR. Monitoring the system volumetrically will not be allowed. The feeder shall interlock with the aggregate weight system and asphalt binder pump to maintain correct mixture proportions at all production rates.

Flow indicators or sensing devices for the system shall be interlocked with the plant controls to interrupt mixture production if GTR introduction rate is not within ± 3 percent. This interlock will immediately notify the operator if GTR introduction rate exceeds introduction tolerances. All plant production will cease if the introduction rate is not brought back within tolerance after 30 seconds. When the interlock system interrupts production and the plant has to be restarted, upon restarting operations; the modifier system shall run until a uniform feed can be observed on the output display. All mix produced prior to obtaining a uniform feed shall be rejected.

4.1 Batch Plants. GTR shall be added to aggregate in the weigh hopper. Mixing times shall be increased per GTR manufacturer recommendations

4.2 Drum Plants. The feeder system shall add GTR to aggregate and liquid binder during mixing and provide sufficient mixing time to produce a uniform mixture. The feeder system shall ensure GTR does not become entrained in the exhaust system of the drier or plant and is not exposed to the drier flame at any point after introduction.

5.0 Testing During Mixture Production. Testing of asphalt mixes containing GTR shall not begin until at least 30 minutes after production or per additive supplier's recommendation.

6.0 Construction Requirements. Mixes containing GTR shall have a target mixing temperature of 325 F or as directed by the GTR additive supplier. The additive supplier's recommendations shall be followed to allow for GTR binder absorption/reaction. This may include holding mix in the silo to allow time for binder to absorb into the GTR. Rolling operations may need to be modified.

7.0 Mix Design Test Method Modification. A formal mixing procedure from the additive supplier shall be provided to the contractor and engineer that details the proper sample preparation, including blending GTR with the binder or other additives. Samples shall be prepared and fabricated in accordance with this procedure by the engineer and contractor throughout the duration of the project.

8.0 Mix design Volumetrics. Mix design volumetric equations shall be modified as follows:

8.1 Additional virgin binder added to offset GTR absorption of binder shall be counted as part of the mix virgin binder

8.2 GTR shall be included as part of the aggregate when calculating VMA of the mix.

8.2.1 GTR SPG shall be 1.15

8.3 VMA shall be calculated as follows:

$$VMA = 100 - G_{mb}\left(\frac{P_s}{G_{sb}} + \frac{P_{GTR}}{G_{GTR}}\right)$$

$where$:

$P_s = percent\ aggregate\ by\ total\ mixture\ weight$
$P_{GTR} = percent\ GTR\ by\ total\ mixture\ weight$
$G_{sb} = bulk\ specific\ gravity\ of\ the\ combined\ aggregate$
$G_{GTR} = GTR\ specific\ gravity$

8.4 G_{se} shall be calculated as follows:

$$G_{se} = \frac{(100 - P_b - P_{GTR})}{\left(\frac{100}{G_{mm}} - \frac{P_b}{G_b} - \frac{P_{GTR}}{G_{GTR}}\right)}$$

8.5 P_{be} shall be calculated as follows:

$$P_{be} = P_b - \frac{P_{ba}}{100} * (P_s + P_{GTR})$$

9.0 Minimum GTR Amount. The minimum dosage rate for GTR shall be 5 % by weight of total binder for an acceptable one bump grade or 10 % by weight of total binder for an acceptable two bump grade as detailed in the following table. Varying percentage blends of GTR and approved

additives may be used as approved by the engineer with proven performance and meeting the specified requirements of the contract grade.

Contract Binder Grade	Percent Effective Virgin Binder Replacement Limits	Required Virgin Binder Grade	Minimum GTR Dosage Rate
PG 76-22	0 - 20	PG 70-22	5 %
		PG 64-22	10 %
PG 70-22	0 - 30	PG 64-22	5 %
		PG 58-28	10 %
PG 64-22	0 – 40*	PG 58-28	5 %
		PG 52-34	10 %
PG 58-28	0 – 40*	PG 52-34	5 %
		PG 46-34	10 %

* Reclaimed Asphalt Shingles (RAS) may be used when the contract grade is PG 64-22 or PG 58-28. RAS replacement shall follow the 2 x RAS criteria when calculating percent effective binder replacement in accordance Sec 401.

Delete Sec 107 in its entirety and substitute the following:

107.1 Laws to be Observed The contractor shall know, observe and comply with all federal and state laws, local laws, codes, ordinances, orders, decrees and regulations existing at the time of or enacted subsequent to the execution of the contract that in any manner affect the prosecution of the work, except as specified in the contract or as directed by the engineer. The Contractor shall also ensure that any subcontractor know, observe and comply with all federal and state laws, local laws, codes, ordinances, orders, decrees and regulations as outlined above. The contractor and surety shall indemnify and save harmless the State, the Commission, the Commission's agents, employees and assigns from any claim or liability arising from or based on the violation of any such law, code, ordinance, regulation, order or decree, except any local regulations, decrees, orders, codes or ordinances directed by the contract.

107.1.1 Contract and Legal Inconsistency The engineer shall be notified immediately in writing if any discrepancy or inconsistency is discovered between the contract and any law, ordinance, regulation, order or decree.

107.1.2 Local Building and Zoning Codes or Ordinances The projects of the Commission are not typically subject to local building or zoning codes or ordinances. Therefore, the contractor usually need not obtain a local building or zoning permit or variance for work done exclusively as the Commission's contractor on the Commission's project and the Commission's right of way. Other local codes or ordinances may not apply to the Commission, and thus to the contractor as well. If any questions arise concerning whether the contractor shall comply with a local code, ordinance, decree or order of any type, the contractor shall advise the engineer of the problem immediately, for resolution by the engineer. This provision will not exempt the contractor from the requirement of thoroughly researching and determining, before submitting a bid on the contract and from complying with, all federal, state or local laws, regulations, codes, ordinances, decrees

or orders that may apply to the contract work. The Commission will not be responsible for the contractor's failure to be informed before bidding as to the federal, state and local laws, regulations, codes, ordinances, decrees or orders that may govern the contract work, or for the contractor's failure to determine before bidding which of these do not govern the contract work.

107.1.3 Authentication of Certain Documents If plans, plats, detailed drawings or specifications for falsework, cofferdams or any other work are required to be submitted to the engineer, the documents shall be signed, sealed and stamped in accordance with the laws relating to the practice of architecture and professional engineering in the State of Missouri (Chapter 327, RSMo).

107.2 Permits, Licenses and Taxes Except as otherwise provided in the contract, the contractor shall procure all permits and licenses, shall pay all charges, fees and taxes, and shall give all notices necessary and incidental to the due and lawful prosecution of the work. No direct payment will be made for the cost of complying with this requirement.

107.3 Patented or Copyrighted Devices, Material and Processes. If the contractor is required or desires to use any design, device, material or process covered by letters, patent, copyright, service or trademark, the contractor shall arrange and provide for such use by suitable agreement with the patentee or owner, and a copy of the agreement may be required by the Commission. The contractor and surety shall indemnify and save harmless the State, the Commission, the Commission's agents, employees and assigns from any suits, claims or damages arising from the infringement upon or use of any patented, copyrighted or registered design, device, material, process or mark.

107.4 Safety and Sanitary Provisions The contractor shall at all times take necessary precautions to protect the life and health of all persons employed on the project or, who at the direction of the contractor are present on the right of way. The contractor shall be familiar with the latest accepted accident prevention methods and shall provide necessary safety devices and safeguards accordingly. The Commission will refuse to provide inspection services at plants or work sites where adequate safety measures are not provided and maintained.

107.4.1 Apparel. All workers within highway right of way shall wear approved ANSI/ISEA 107 Performance Class 2 or 3 safety apparel and more specifically as follows:

107.4.1.1 During daytime activities, flaggers shall wear a high visibility hard hat, safety glasses, a Performance Class 3 top OR a Performance Class 2 top, and safety footwear. Hard hats other than high visibility orange or green shall be covered with a high visibility covering.

107.4.1.2 During daytime activities, workers shall wear a hard hat, safety glasses, a Performance Class 3 top OR a Performance Class 2 top, and safety footwear.

107.4.1.3 During nighttime activities, flaggers shall wear a high visibility/reflective hard hat, safety glasses, a Performance Class 3 top AND Class E bottoms, OR Performance Class 2 top AND Class E bottoms, and safety footwear. Hard hats shall be reflective or covered with a high visibility covering.

107.4.1.4 During nighttime activities, workers shall wear a hard hat, safety glasses, a Performance Class 3 top OR Performance Class 2 top AND Class E bottoms, and safety footwear.

107.4.2 The contractor shall provide and maintain in a neat and sanitary condition, such accommodations for the use of employees as may be necessary to comply with the requirements and regulations of any agency having jurisdiction over public health and sanitation. The contractor shall permit no public or private nuisance.

107.4.3 All sanitary facilities and safety devices shall be furnished free to employees and no direct payment will be made for such facilities or devices.

107.5 Public Convenience and Safety The contractor shall conduct the work in a manner that will ensure, as far as practical, the least obstruction to traffic and shall provide for the convenience and safety of the general public and residents along and adjacent to the highway in an adequate and satisfactory manner.

107.5.1 Obstructions Prohibited Fire hydrants on and adjacent to the highway shall be kept accessible to firefighting apparatus at all times, and no obstruction shall be placed within15 feet of any such hydrant. Footways, gutters, sewers, outlets, inlets and portions of highways adjoining the work under construction shall not be obstructed. Pavements over which hauling is performed shall be kept clean of spilled or tracked-on material at all times when in use by traffic.

107.5.2 Objects Potentially Affecting Navigable Airspace. The contractor shall comply with all federal regulations pertaining to constructing, erecting or installing any object, temporary or permanent, which could potentially affect navigable airspace.

107.5.3 Material and Equipment. During construction hours, equipment, material and vehicles utilized in construction of the project will only be permitted on shoulders, medians or pavements where the locations are closed to traffic, properly signed and occupied by ongoing construction operations, unless otherwise approved by the engineer. Except in cases of emergency, construction equipment, material and vehicles will not be permitted on pavements or shoulders being utilized by traffic. If the contract specifies time periods the contractor will not be permitted to perform work, construction equipment or vehicles shall not enter or leave the construction area via the pavements handling traffic nor be operated on the pavements handling traffic within the construction area during the restricted time periods. During non-construction hours, construction equipment, material and vehicles will not be permitted within 30 feet of the edge of the pavement or shoulders carrying traffic unless the equipment, material and vehicles are located in a properly protected area, an off-site storage area or as otherwise directed by the engineer.

107.5.4 Distractions to the Traveling Public in Work Zones. In order to avoid distracting operators of vehicles traveling on the roadway, the Contractor and its sub-contractors shall not bring or display any signs, flags, logos, emblems, advertising, or any other communicative device on construction equipment that is large enough to be legible from the main traveled way of the highway in the work zone or on highway right of way. This prohibition does not apply to any sign, logo or emblem placed on Contractor equipment identifying the owner or manufacturer of the equipment or to any official highway signs approved by the Commission pursuant to 227.220 RSMo.

107.6 Bridges over Navigable Waters. All work on navigable waters shall be conducted such that free navigation of the waterways will not be interfered with and that existing navigable depths will not be impaired except as allowed by permit issued by the USCG or the USACE.

107.7 Use of Explosives. All blasting operations shall be conducted under the direct supervision of a licensed blaster as required by the Missouri Blasting Safety Act. When explosives are used in the prosecution of the work, the contractor shall use the utmost care to prevent bodily injury and property damage. The contractor shall be responsible for damage resulting from the use of explosives. The engineer will have the authority to suspend any unsafe blasting operation. The contractor shall be familiar and comply with the rules and regulations of any city, county, state or federal agency or any other agency that may have jurisdiction in the handling, loading, transporting, storage and use of explosives. All places used for explosives storage shall be marked clearly "DANGEROUS EXPLOSIVES".

107.7.1 Before beginning work, the contractor shall furnish the engineer letters of approval for the proposed operation from the appropriate regulating agencies. The contractor shall notify in writing the appropriate fire protection jurisdiction of the intent to store, transport or use explosives and shall provide proof of notice to the engineer. The contractor shall provide the engineer with copies of all permits, blasting logs and seismic monitoring data.

107.7.2 The contractor shall notify in advance each property owner, tenant and public utility company having structures or facilities close to the work of any intention to use explosives.

107.7.3 Removal of any item or material of any nature by blasting shall be done in such a manner and at such time as to avoid damage affecting the integrity of the design and to avoid damage to any new or existing structure, whether on Commission right of way or private property, included in or adjacent to the work. Unless the contract documents or the engineer restricts such operation, the contractor shall be responsible for determining a method of operation to ensure the desired results and the integrity of the completed work.

107.7.4 The contractor and surety shall indemnify and save harmless the State, the Commission, the Commission’s agents, employees and assigns from any claim related to the possession, transportation, storage or use of explosives.

107.8 Preservation of Monuments and Artifacts.

107.8.1 Monuments. The contractor shall not disturb or damage any land monument or property landmark unless authorized by the engineer.

107.8.2 Human and Archaeological Remains. The contractor shall report to the engineer the discovery of human remains, artifacts, fossils and other items of historical, archaeological or geological significance discovered within the right of way during construction. Such items will remain in the Commission's custody and shall not be removed from the site unless directed by the engineer. The preservation and handling of such items shall be in accordance with Sec 203.4.8.

107.9 Forest and Park Protection. Environmental and sanitary laws and regulations regarding the performance of work within or adjacent to state or national forests or parks shall be obeyed. The contractor shall keep the project site in an orderly condition, dispose of all refuse, obtain permits for the construction and maintenance of all construction camps, stores, warehouses, residences, latrines, cesspools, septic tanks and other structures in accordance with the regulations and instructions issued by the forest or park supervisor. The contractor shall require

employees and subcontractors, independently, and at the request of forest officials, to prevent and suppress forest fires, and to notify a forest official of the location and extent of any fire.

107.10 Environmental Protection. The contractor shall comply with all federal, state and local laws and regulations controlling pollution of the environment. Pollution of streams, lakes, ponds and reservoirs with fuels, oils, bitumens, chemicals or other harmful material and pollution of the atmosphere from particulate and gaseous matter shall be avoided.

107.10.1 Fording of streams and fill for temporary work not specified on design plans will not be permitted unless the plan for such operation is authorized by the Corps of Engineers, meets the approval of the engineer, complies with the current MoDOT Pollution Plan and results in minimum siltation to the stream. Temporary stream crossings shall not be constructed unless specifically designated as a condition of the Corps of Engineers Section 404 permit or a permit is obtained, and the temporary stream crossing is in accordance with Sec 806.

107.10.2 When work areas or pits are located in or adjacent to streams, the areas shall be separated from the main stream by a dike or barrier to keep sediment from entering the stream. Care shall be taken during the construction and removal of such barriers to minimize siltation of the stream.

107.10.3 Disposal of Portland cement concrete residue and wash water, water from aggregate washing, or other operations producing sediment laden runoff shall be treated in accordance with Sec 806.

107.10.4 Oil distributors or tanker trucks used for the transport or application of any petroleum-based products, and that have a capacity greater than 1,320 gallons, shall not be left unattended on MoDOT right of way within the project limits during non-construction hours unless secondary containment is deployed as per the Spill Prevention Control and Countermeasure rule. Parking of these vehicles on MoDOT right of way outside of the project limits, or on any MoDOT owned property, shall not be allowed without the aforementioned secondary containment and prior authorization from the engineer.

107.11 Responsibility for Claims for Damage or Injury. The contractor and insurance company shall indemnify and save harmless the State, the Commission, the Commission's agents, employees and assigns from all claims or suits made or brought for bodily injury, death or property damage, arising from performance of the work to the extent of:

(a) The negligent acts or omissions of the contractor, subcontractors, suppliers or their respective officers, agents or employees.

(b) The creation or maintenance of a dangerous condition of or on the Commission's property or right of way, which condition occurred due to the acts or omissions of the contractor, subcontractors, suppliers or their respective officers, agents or employees or for which the contractor had knowledge of or could have had knowledge of the condition in time to warn of or repair said condition.

(c) The failure of the contractor, subcontractors, suppliers or their respective officers, agents or employees, to perform the work in accordance with the plans and specifications.

107.11.1 The contractor will not be required to defend, indemnify or hold harmless any other person, including the State, the Commission, or the Commission's agents, employees or assigns for any acts, omissions or negligence of other persons.

107.11.2 Neither the Commission nor the contractor, by execution of a contract, shall intend to or create a new or enlarge an existing cause of action in any third party. This provision shall not be interpreted to create any new liability that does not exist under the law, or to waive or extinguish any defense that either party to this contract or their respective agents and employees may have to an action or suit by a third party.

107.12 Contractor's Responsibility for Work From the earlier of the date of commencement of the work or the effective date of the notice to proceed, and until any work is accepted by the engineer, the work shall be in the custody and under the charge and care of the contractor. Issuance of a payment estimate on any part of the work done will not be considered as final acceptance of any work completed up to that time.

107.12.1 Damages to any portion of the work before the work is completed and accepted, caused by the action of the elements or from any other reason, shall be repaired or replaced at the contractor's expense. The contractor, at the contractor's option, may insure against any such damages. The Commission may, in its discretion, make such a payment, determined in accordance with Sec 109.4, for damage to the work due to unforeseeable causes beyond the control of, and without fault or negligence on the part of the contractor, unless the contractor has been reimbursed for such damages by the contractor's insurer. Prior to reimbursement, the contractor shall furnish documentary evidence of all efforts to recover such repair costs.

107.12.2 The contractor shall immediately give written notice to the engineer of any pedestrian, worker and/or vehicular accident. The contractor may be directed by the engineer to repair permanent Commission facilities that have been damaged by events that are beyond the control of the contractor. Reimbursement will be provided by the Commission, determined in accordance with Sec 109.4, for the actual direct cost of labor, equipment and material, exclusive of overhead, indirect or consequential costs of profit. The Commission may elect to make such repairs in lieu of the contractor.

107.13 General Insurance Requirements. The Contractor shall procure and maintain at the Contractor's expense until Final Acceptance of the project by the engineer, insurance for all damages and losses imposed by law and assumed under the contract,of the kinds and in the amounts specified in Secs 107.13.1 through 107.13.8.

107.13.1 Sovereign Immunity Limits for Missouri Public Entities. The Contractor shall procure and maintain at least minimum insurance coverages to meet the sovereign immunity limits for Missouri public entities as calculated by the Missouri Department of Insurance and published annually in the Missouri Register pursuant to Section 537.610 RSMo., for Secs 107.13.2 through 107.13.5, unless specified otherwise for each type of insurance coverage. Each policy shall provide additional insured status for the Missouri Highways and Transportation Commission (Commission), the Missouri Department of Transportation (MoDOT) and its employees up to Missouri's sovereign immunity limits.

107.13.2 Commercial General Liability Insurance. The Contractor shall procure, and maintain during the term of the project, commercial general liability insurance with coverage at least as broad as Insurance Services Office (ISO) policy form CG 00 01. The general aggregate limit shall, by endorsement or otherwise, provide a designated aggregate limit solely for this project using ISO form CG 25 03 05 09 or an equivalent form. General liability policies shall be endorsed to add the Commission, MoDOT, and its employees as additional insureds (the "Additional Insureds") using Insurance Services Office forms CG 20 10 or the equivalent under such policy. For construction contracts, an endorsement providing completed operations coverage to the Additional Insureds, ISO form CG 20 37 or the equivalent, is also required. This form, CG 20 37, shall be endorsed on each subsequent commercial general liability policy issued to the Contractor for three (3) years after final acceptance of the project. The contractor could provide extended completed operations for specific project needs. Discontinued operations coverage shall be provided for three (3) years when applicable. Coverage shall not be reduced by insured versus insured exclusions or by explosion, collapse and underground (XCU) exclusions.

107.13.3 Commercial Automobile Liability Insurance. The Contractor shall procure and maintain automobile liability coverage at least as broad as ISO policy form CA 00 01 covering owned, hired, and non-owned autos. The policy shall include as insureds anyone liable for the conduct of an insured as described by policy provision or by endorsement added to the policy.

107.13.4 Contractor's Pollution Liability (CPL) Insurance. The Contractor performing excavation, remediation, hazardous materials removal, or any other work involving potential pollution arising from construction operations shall procure and maintain contractor's pollution liability insurance for liability arising out of sudden, accidental, and gradual pollution and remediation. The policy shall have minimum limits of $1,000,000 and the Commission, MoDOT and its employees shall be endorsed as additional insureds under such policy. The policy shall provide coverage for the hauling of waste from the project site to the final disposal location, including non-owned disposal sites. Products/completed operations coverage for pollution liability insurance shall extend a minimum of three (3) years after final acceptance of the project. Coverage shall be included on behalf of the insured for covered claims arising out of the actions of independent contractors. If the insured is using subcontractors, the Policy must include work performed "by or on behalf" of the insured. Policy shall specifically provide for a duty to defend on the part of theinsurer.

107.13.5 Aircraft Liability Insurance. If aircraft, including unmanned aircraft, will be used on the project, Contractor shall provide, or cause to be provided, aircraft liability insurance protecting against claims for damages resulting from such use in all cases where any aircraft that is owned, leased or chartered by any Contractor-Related Entity used on the Project. The policy shall have minimum limits of $1,000,000 and the Commission, MoDOT and its employees shall be additional insureds on the policy by endorsement or policy provision. The use of any aircraft in performance of the Work, the aircraft crew, flight path and altitude, including landing of any aircraft on the Site or on any property owned by the Commission, MoDOT or other parties at interest, shall be subject to review and written acceptance by the Commission prior to any such usage. If any aircraft are leased or chartered with crew and/or pilot, evidence of non-owned aircraft liability insurance will be acceptable to meet these requirements but must be provided prior to use of the aircraft. For use of unmanned aircraft vehicles, the contractor may provide insurance either through an aircraft liability insurance policy, or by endorsement to the Contractor's commercial general liability insurance policy and excess liability policies. Use of unmanned aircraft must comply with all state and federal rules and regulations, including FAA requirements.

107.13.6 Excess or Umbrella Liability Insurance. The Contractor may satisfy the required limits for Secs 107.13.2 through 107.13.5 by use of excess or umbrella liability insurance policies in any combination that meets the contract limits requirements. Such policies shall include as insureds, the Missouri Highways and Transportation Commission (Commission), the Missouri Department of Transportation (MoDOT) and its employees.

107.13.7 Workers' Compensation Insurance. The Contractor shall provide evidence to the engineer that the Contractor has obtained workers' compensation insurance and employers liability insurance as required by the state or is exempt and provides proper documentation to the engineer. Coverage shall include all statutory workers' compensation benefits to Contractor employees who may sustain work-related injury, death or disease. If applicable, commensurate with the requirements of the U.S. Longshore and Harbor Workers' Compensation Act (USL&H) and the Jones Act, with a minimum limit of $2,000,000 per occurrence and in the aggregate, or as may be specified by law, for each. The required insurance must be endorsed to include a waiver of subrogation in favor of the Commission, MoDOT and its employees.

107.13.8 Railroad Protective Liability Insurance. In addition to other forms of required insurance, the Contractor shall provide railroad protective liability insurance when any of the Contractor's work is to be performed within any railroad right of way and in some cases may be required when the project improvements are near a railroad right of way. The name or names of the railroad companies known to be in the vicinity of the contract improvements will be specified in each contract, but the contractor shall confirm the railroad companies impacted and the final insurance needed with each railroad. The minimum limits of the insurance indicated by each railroad to the Commission will be included in the contract bid documents for informational purposes, but the contractor shall be bound by each individual railroad company requirements. Each railroad agency has final determination in the content and coverage limits of the policies required. No work will be permitted within any railroad's right of way until the railroad involved has reviewed and approved the insurance policy. Any day upon which the Contractor cannot perform work due to such a policy not being approved by the railroad will not be counted as a contract day under Sec 108.7.

107.13.9 Evidence of Insurance. Required evidence of insurance providing confirmation of compliance with these requirements shall consist of a certificate of insurance, an endorsement to any workers compensation policy waiving the subrogation by the insurer, and any endorsements adding the Commission, MoDOT and its employees as additional insureds where specified. "Blanket" or "automatic" additional insured endorsements providing additional insured coverage "where required by contract," may be used, provided that such forms provide coverage at least as broad as provided by the specified endorsement forms required. The contractor and any subcontract work shall not commence under the contract until the contractor obtains the applicable insurance coverage required and receives approval for such insurance from the engineer. All evidence of insurance for the prime contractor, including certificates of insurance and required endorsements, and notices shall be submitted electronically by the insurance agent to ContractorSupport@MoDOT.mo.gov. The Contractor shall promptly furnish the engineer with a complete copy of its policy upon request. Failure to furnish evidence of proper insurance, or complete insurance policies when requested, may result in the suspension of work as provided in

Sec 108, and may result in other claims or actions for breach of contract or otherwise, as may be recognized at law or in equity.

107.13.9.1 Work Performed by Subcontract. Prior to its commencement of the applicable work, the contractor shall cause each of its subcontractors to provide insurance that complies with the requirements for contractor-provided insurance. Contractor's determination of such insurance shall not be interpreted as relieving Contractor or its insurer of any liability otherwise imposed on Contractor or its insurers under these Contract Documents. The Contractor shall promptly furnish the engineer with a complete copy of its subcontractor policies upon request. Failure to furnish evidence of proper insurance, or complete insurance policies when requested, may result in the suspension of work as provided in Sec 108, and may result in other claims or actions for breach of contract or otherwise, as may be recognized at law or in equity.

107.13.10 Other Conditions and Requirements

107.13.10.1 Acceptability of Insurance Companies. All insurers must be authorized to transact business under the laws of the State of Missouri and hold an AM Best rating of no less than A-: VI.

107.13.10.2 Waiver of Right of Recovery. All insurance coverage maintained or procured pursuant to this agreement shall be endorsed to waive subrogation against the Commission, MoDOT and its employees or shall specifically allow the Contractor, or others providing insurance evidence in compliance with these specifications, to waive their right of recovery prior to a loss. Contractor hereby waives its own right of recovery against the Commission, MoDOT and its employees.

107.13.10.3 Enforcement of Contract Provisions (non estoppel). Contractor acknowledges and agrees that any actual or alleged failure on the part of the Commission, MoDOT or its employees to inform Contractor of non-compliance with any requirement imposes no additional obligations on the Commission, MoDOT or its employees, nor does it waive any rights hereunder.

107.13.10.4 Primary and Non-contributory. For any claims related to this contract, the Contractor's insurance coverage shall be primary insurance with respects to the Commission, MoDOT and its employees as the additional insureds. Any other insurance or self-insurance maintained by any of these parties shall be excess of the Contractor's insurance and shall not contribute with the Contractor's insurance.

107.13.10.5 Specifications not Limiting. Requirements of specific coverage features, or limits contained in this Section are not intended as a limitation on coverage, limits or other requirements, or a waiver of any coverage normally provided by any insurance. Specific reference to a given coverage feature is for purposes of clarification only as it pertains to a given issue and is not intended by any party or insured to be all inclusive, or to the exclusion of other coverage, or a waiver of any type.

107.13.10.6 Notice of Cancellation and Change in Insurance Carrier. Contractor agrees to oblige its insurance agent or broker, and insurers by endorsement to the policy, to provide to the engineer with thirty (30) days advance notice of cancellation, except for nonpayment for which ten (10) days' notice is required, or nonrenewal of coverage for each required coverage. If any policy is canceled or the insurance carrier is planned to change before the contract work is complete, a satisfactory replacement policy shall be obtained and in force, with notice and evidence of insurance submitted to the engineer, prior to the effective date of cancellation of the former policy.

107.13.10.7 Self-insured Contractors and Self-insured Retentions. A self-insured contractor will not be considered to comply with these specifications unless approved by the engineer prior to beginning work. A contractor with insurance policies arranged with self-insured retentions must be declared to and approved by the engineer prior to beginning work. The Commission reserves the right to require that self-insured retentions be eliminated, lowered, or replaced by a deductible or other policy type.

107.13.10.8 Timely Notice of Claims. Contractor shall give the engineer prompt and timely notice of claims made or suits instituted that arise out of or result from Contractor's performance under this Agreement, and that involve or may involve coverage under any of the required liability policies. The Commission and MoDOT will provide timely notice to the contractor of any claims or lawsuits that it receives. If the Commission demands that the contractor defend the suit and/or indemnify the Commission, the contractor or its insurance company shall acknowledge that demand within 20 days of receiving it and the contractor shall respond within a total of 45 days of the claim receipt the intent of the contractor to defend.

107.13.10.9 Exhaustion of Policy Limits. It shall be the contractor's responsibility to notify the engineer promptly when any provided insurance limits are not able to be maintained during the contract period or provide verification that additional coverage or excess coverage is also available.

107.14 Cooperation in Defense. The indemnified party shall cooperate with the indemnifying party in the defense of a third-party claim subject to the foregoing, (1) the indemnified party shall not have any obligation to participate in the defense of or to defend any third-party claim, and (2) the indemnified party's defense of or its participation in the defense of any third-party claim shall not in any way diminish or lessen its right to indemnification as provided in this section.

107.15 Third Party Liability. Neither the State of Missouri, including the Commission, nor the contractor, by execution of the contract including these specifications, intend to create a right of action in a third-party beneficiary, except as specifically set out in these specifications and the contract. It is not intended by any required contractual liability in the contract or in these specifications that any third-party beneficiary has a cause of action arising out of the condition of the project when completed in accordance with the plans and accepted by the Commission.

107.16 Personal Liability of Public Officials. There shall be no personal liability upon the Chief Engineer, or any member, employee, or agent of the Commission in carrying out any of the

provisions of the contract or in exercising any power or authority granted to the individual, it being understood that in such matters the individual acts as an agent and representative of the State, with official and public duty doctrine immunity. If any provision of the contract appears to impose a duty on such an individual, the duty will remain exclusively that of the Commission and will not be a personal duty or obligation of the individual.

107.17 Contractors That Are Not Resident In Missouri. Any contractor that is not a permanent resident of or domiciled in Missouri shall provide to the Commission proof of compliance with the Missouri "nonresident employers" financial assurance laws at Sections 285.230 to 285.234, RSMo, before the contractor performs any work on a project.

107.17.1 A nonresident contractor that is a "transient employer" as that term is defined in Section 285.230.1, RSMo, and 12 CSR 10-2.017(1)(A), shall file with the Commission a photocopy of the contractor's current transient employer's certificate of registration issued by the Missouri Department of Revenue before performing any work on a project. A nonresident contractor that is not classified by the Missouri Department of Revenue as a "transient employer" because the nonresident contractor has properly registered with the Missouri Department of Revenue and the Missouri Division of Employment Security, and has filed and paid Missouri state income taxes for more than 24 consecutive months, shall file with the Commission a photocopy of the contractor's certificate of registration, issued by the Missouri Department of Revenue, that it is not a "transient employer" before performing any work on a project.

107.17.2 The contractor shall require a nonresident subcontractor to file with the Commission a photocopy of the subcontractor's current transient employer's or alternate certificate of registration, as issued by the Missouri Department of Revenue, before that subcontractor performs any work on a project.

107.17.3 Any nonresident contractor or subcontractor that fails to file the financial assurance forms with the Missouri Department of Revenue as required by Missouri law will be prohibited from contracting for or performing labor on any project for a period of one year.

107.18 Basis of Payment. No direct payment will be made for compliance with Sec 107, except as provided by Sec 618.

Buy America

In addition to Section 106.9 of the Missouri Standard Specifications for Highway Construction, the following requirements will also be in effect for this project.

1.0 Description. The Bipartisan Infrastructure Law (BIL) was enacted on November 15, 2021. The BIL includes Build America, Buy America Act Publication L. No. 117-58. This provision expands the Buy America requirements beyond what is currently only required for steel and iron

products. The steel and iron provisions have not changed with the new bill. Cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives are excluded from this requirement. All other materials and manufactured products permanently incorporated into the project will be subject to Buy America requirements. There are three categories requiring Buy America Certification:

a) Iron and steel – no changes to the current specification requirements.

b) Manufactured products – these are currently exempted under the 1983 waiver from FHWA.

c) Construction materials consisting primarily of:

- Non-ferrous metals;
- Plastic and polymer-based products (including polyvinylchloride, composite build materials, and polymers used in fiber optic cables);
- Glass (including optic glass);
- Lumber; or
- Drywall

1.1 All products and or materials will only be classified under one of these categories and not under multiple categories. It is the prime contractor's responsibility to assure all submittals required for Buy America are submitted to the Engineer prior to the products and or materials being incorporated in the job. The implementation of this policy will be in effect for all projects awarded after November 10, 2022.

1.2 New items designated as construction materials under this requirement will require the prime contractor to submit a material of origin form certification prior to incorporation into the project. The Certificate of Material origin form (link to certificate form) from the supplier and/or fabricator must show all steps of the manufacturing being completed in the United States. The Certificate of Material form shall be filed with the contract documents.

1.3 Any minor miscellaneous construction material items that are not included in the materials specifications shall be certified by the prime contractor as being procured domestically The certification shall read "I certify all materials permanently incorporated in this project covered under this provision have been to the best of my knowledge procured and all manufactured domestically." The certification shall be signed by an authorized representative of the prime contractor.

1.4 The National Transportation Product Evaluation Program (NTPEP) compliance program verifies that some non-iron and steel products fabrication processes conform to 23 CFR 635.410 Buy America Requirements and an acceptable standard per 23 CFR 635.410(d). NTPEP compliant suppliers will not be required to submit step certification documentation with the shipment for some selected non-iron and steel materials. The NTPEP compliant supplier shall maintain the step certification documentation on file and shall provide this documentation to the engineer upon request.

2.0 Basis of Payment. Any costs incurred by the contractor by reason of compliance with the above requirements shall be considered as included in and completely covered by the unit price bid for the various items of work included in the contract.

Delete Sec 617.20.3 and substitute the following:

617.20.3 Certification. Prior to use the contractor shall submit to the engineer a manufacturer's certification of crashworthiness per NCHRP 350 or MASH 2016 for portable concrete barrier or other approved temporary barrier. Type F three-loop temporary concrete barrier is required to meet NCHRP 350 requirements regardless of manufacturing date and may be used until January 1, 2030. All other temporary barriers manufactured prior to January 1, 2023 may be used until January 1, 2030. All other temporary barriers manufactured after January 1, 2023 shall meet MASH 2016 crash test requirements.

Delete Sec 1063.2 and substitute the following:

1063.2 General Requirements. All temporary traffic control devices shall be manufactured as shown on the plans and as specified, in accordance with MUTCD requirements and shall be NCHRP 350 or MASH 2016 compliant. FHWA Category 1 temporary traffic control devices are not required to be crash tested unless modified. Non MASH 2016 FHWA Category 2 temporary traffic control devices and appurtenances manufactured prior to January 1, 2023 may be used until January 1, 2026. Non MASH 2016 FHWA Category 3 temporary traffic control devices and appurtenances manufactured prior to January 1, 2023 may be used until January 1, 2030. All other FHWA Category 2 and Category 3 temporary traffic control devices and appurtenances manufactured after January 1, 2023 shall meet MASH 2016 Test Level 3 crash test requirements. Type F three-loop temporary concrete barrier is required to meet NCHRP 350 requirements regardless of manufacturing date and may be used until January 1, 2030. MASH 2016 FHWA Category 4 temporary traffic control devices should be used when available. Nominal dimensions will be permitted for dimensional lumber where applicable. All temporary traffic control devices shall exhibit good workmanship and shall be free of objectionable marks or defects that affect appearance or serviceability. The brand name or model number shall be permanently identified on each traffic control device.

Alternate Weather Limitations for Plant Mix Bituminous Surface Leveling

1.0 Description. Weather limitations for Plant Mix Bituminous Surface Leveling mixtures shall be as specified in Sec 402.10.1 except as otherwise allowed herein.

1.1 When all remedial actions listed in Section 2.0 have been implemented by the contractor, at no additional cost to the Commission, the alternate weather limitations in Section 1.2 shall apply in lieu of Sec 402.10.1

1.2 Alternate Weather Limitations. Bituminous mixtures shall not be placed (1) when either the air temperature or the temperature of the surface on which the mixture is to be placed is below 40 F, or (2) on any wet surface or frozen pavement. Temperatures shall be obtained in accordance with MoDOT Test Method TM 20.

2.0 Remedial Actions.

a) Reclaimed Asphalt Pavement (RAP) content in the mix does not exceed 20% asphalt binder replacement.
b) No Reclaimed Asphalt Shingles (RAS) are added to the mix.
c) A material transverse vehicle is utilized to transfer the mix from the haul trucks to the paver.
d) Warm mix technology shall be incorporated into the mix (either by chemical additive or foaming), as approved by the engineer.

EE. Guardrail and End Terminal Repair and Replacement

1.0 Description. This work shall consist of all labor, equipment, and materials to remove, install, repair, and replace guardrail, crashworthy end terminals, and related appurtenances as specified in the job order or as directed by the Engineer. All work shall comply with Secs 202 and 606 except as herein modified.

2.0 Materials. All guardrail materials shall conform to Division 1000, Materials Details, and specifically Sec 1040. All materials shall be new unless otherwise approved by the Engineer or otherwise allowed by these specifications.

2.1 Replacement materials and components for proprietary crashworthy end terminals shall conform to the manufacturers latest approved design. All replacement components shall be from the original equipment manufacturer unless approved by the Engineer. The contractor shall provide manufacturer certification that the replacement components furnished, when properly installed by the contractor, will reestablish or exceed the original capabilities of the end terminal.

2.2 All materials intended for use in this contract shall be stored in a dedicated location on the contractor's property and shall be inspected and approved by the Engineer prior to use.

3.0 Construction Requirements.

3.1 Removal and Replacement of Individual Major Components. If the job order designates a contract pay item that includes the term "remove and replace", the contractor shall remove the described existing component, material, hardware, or other appurtenance, in whole or in part, as designated in the job order or as directed by the Engineer. The major components to be removed will be marked with paint or ribbon or other method convenient to the Engineer.

3.1.1 The contractor shall furnish and install the described major replacement component and any incidental items necessary to provide a fully functional system. Replacement components designated in the job order may not be of the same size or material as those removed. Some items designated for replacement may be damaged and not reusable. Other items designated for replacement may not meet current Commission standards and policies. The Engineer will determine the actual items to be replaced.

3.1.2 Unless otherwise directed by the Engineer, the contractor shall reuse any undamaged major components salvaged from the damaged guardrail system or appurtenance in order to provide a fully functional system. All end terminals on major routes and damaged end terminals

on minor routes, shall be replaced with approved MASH end terminals. Undamaged NCHRP 350 end terminals on minor routes may be used in place with the approval of the Engineer. Minor components, such as nuts and bolts, may only be reused after inspection and approval by the Engineer. Reused nuts and bolts shall only be used with salvaged major components. All new major components shall use new nuts, bolts, and other miscellaneous minor components.

3.2 Removal of Entire Guardrail System and/or Terminal. If the Engineer determines an existing guardrail, end anchor, bridge anchor section, turndown terminal, crashworthy terminal or other related appurtenance has been significantly damaged and/or the damaged guardrail system does not comply with current Commission standards or policies, the guardrail system and/or terminal shall be removed as designated in the job order or as directed by the Engineer.

3.2.1 Unless otherwise designated by the Engineer for salvage by the Commission, all materials removed shall become the property of the contractor and shall be removed from the right of way and properly disposed of.

3.2.2 If the system designated for removal includes a concrete pad, all hardware protruding above the surface of the pad shall be removed or otherwise cut off flush with the surface of the anchor. The concrete pad shall be abandoned in place unless otherwise directed by the Engineer.

3.3 Installation of New Guardrail System and/or Crashworthy Terminal. If the job order designates a contract pay item for new guard rail, bridge anchor, transition section, end anchor, crashworthy end terminal, or other appurtenance the contractor shall furnish and place the designated item complete in place. The new system and/or terminal shall be installed at the location designated by the Engineer.

3.4 Realigning Posts. Posts which are out of alignment but otherwise undamaged will be designated for realignment. The contractor shall realign and plumb the designated posts. After realignment, any voids around the post shall be securely backfilled with a cohesive soil, or a sand meeting the gradation requirements of Sec 1005.3.5, and thoroughly tamped.

3.5 Driving Replacement Posts and Foundation Tubes. When a replacement post or foundation tube is placed in the same hole as a removed damaged post or tube, the contractor shall first securely backfill the hole with a cohesive soil, or a sand meeting the requirements of Sec 1005.3.5, and thoroughly tamp the soil before driving the replacement post or tube.

3.6 Re-tensioning Guardrail System. After replacement of all necessary components, the anchor hardware (cable, bolts, bearing plates, etc.) for all end anchors and end terminals shall be re-tensioned such that the anchor is tightly connected to the guardrail beam and bearing plate is properly aligned to ensure the proper tension in the guardrail system and so that the finished installation presents an appearance satisfactory to the Engineer. Anchor systems for end terminals shall be tensioned in accordance with the manufacturer's recommendations. Following tensioning, all clamps, bolts and other required hardware shall be completely tightened.

3.7 Reflective Sheeting on End Terminals. On new or repaired/replaced crashworthy end terminals located 12 feet or less from the edge of the traveled way, the contractor shall furnish and install black/yellow reflective sheeting or other marking as directed by the Engineer. The reflective sheeting size, shape, method of attachment and placement shall be approved by the Engineer prior to installation. Reflective sheeting installed on new end terminals is included in

the cost of the end terminal.

3.8 Guardrail Block. Current Commission standards require the use of 8" x 6" x 14" or 21" wood or plastic guardrail blocks for new guardrail installations. Former standards allowed use of 6" x 6" x 14" or 21" blocks. For those locations requiring replacement of only the block and not the post, minor adjustments to the alignment of the existing guardrail posts or guardrail panels may be required to accommodate the 8" block.

3.9 Guardrail Delineators. Guardrail locations that require removal and replacement of existing damaged or missing delineators will be specified on the job order. The job order will designate the number of retro-reflective one-sided and two-sided delineators and will designate the color of the replacement delineators. Delineators installed on new rail or end terminals are included in the cost of the rail or end terminal.

3.10 Additional Work. If additional major components or pay items beyond those specified in the job order are needed to properly perform the work, the contractor shall contact the Engineer for authorization to proceed with the additional work. Any work performed without authorization of the Engineer will be at the contractor's expense.

4.0 Method of Measurement.

4.1 Measurement of existing guardrail, end anchor, bridge anchor, Type A crashworthy terminal, and turndown terminal removal will be made to the nearest foot from center of first post to center of last post.

4.2 Measurement of existing Type B crashworthy terminal removal will be made per each.

4.3 Measurement of removed and replaced guardrail and end terminal repair components will be made per each.

4.4 Measurement of realigned posts will be made per each.

4.5 Measurement of re-tensioning guardrail will be made per each complete section of guardrail re-tensioned between the two anchors.

4.6 Measurement of replacement reflective sheeting on end terminals will be made per each. No measurement or payment will be made for reflective sheeting installed on new end terminals.

4.7 Measurement of removal of extruded guardrail beam from an extruder and reuse of the extruder will be made per each.

4.8 Measurement of removed and replaced guardrail delineators will be made per each. Tabulation of delineators with one-sided retro-reflective sheeting and two-sided sheeting will be made combined for measurement and payment.

5.0 Basis of Payment.

5.1 The accepted quantity of removed guardrail, end anchor, bridge anchor, Type A crashworthy terminal, or turndown terminal will be paid for at the contract unit price for:

Item 202-99.03	Remove Guardrail Includes Turndown and Type A Crashworthy Terminals	Lineal Foot

5.1.1 Payment will be considered full compensation for all labor and equipment necessary to completely remove the guardrail system.

5.2 The accepted quantity of removed Type B crashworthy terminals will be paid for at the contract unit price for:

Item 202-99.02	Remove Complete Type B Crashworthy Terminal	Each

5.2.1 Payment will be considered full compensation for all labor and equipment necessary to completely remove the terminal system.

5.3 The accepted quantities of removed and replaced guardrail and terminal repair components will be paid for at the contract unit price for each of the pay items included in the contract. Payment will be considered full compensation for all labor, equipment, and material necessary to remove the existing component, furnish a new replacement component, and install the component. No direct payment will be made for removing or reinstalling any reused undamaged components necessary to provide a fully functional system.

5.4 The accepted quantity of realigned posts will be paid for at the contract unit price for:

Item 606-99.02	Realign and Use Existing Post, Type A, E, or MGS Guardrail	Each

5.4.1 Payment will be considered full compensation for all labor, equipment, and material, including any required backfill, necessary to realign and plumb an existing post.

5.5 The accepted quantity of re-tensioned guardrail system will be paid for at the contract unity price for:

Item 606-99.02	Re-tension Guardrail System	Each

5.5.1 Payment will be considered full compensation for all labor, equipment, and material necessary for re-tensioning an entire run of guardrail between two anchors.

5.6 The accepted quantity of reflective sheeting on end terminals will be paid for at the contract unit price for:

Item 606-99.02	New or R&R Reflective Sheeting on End Terminal (Universal)	Each

5.6.1 Payment will be considered full compensation for all labor, equipment, and material necessary to furnish and install the reflective sheeting on end terminals.

5.7 The accepted quantity of removal of extruded guardrail beam from an extruder and reuse of the extruder will be paid for at the contract unit price for:

Item 606-99.02	Remove Extruded Guardrail and Reuse Existing Extruder (ET)	Each

5.7.1 Payment will be considered full compensation for all labor, equipment, and material necessary to remove extruded guardrail beam from an existing extruder and reuse of the extruder on the repaired end terminal. No additional payment will be made if the contractor elects to furnish a new or used replacement extruder.

5.8 The accepted quantity of removed and replaced guardrail delineators will be paid for at the contract unit price for:

Item 606-99.02	R&R Guardrail Delineator Retro–reflective One-side or Two-side	Each

5.8.1 Payment will be considered full compensation for all labor, equipment, and material necessary to remove, furnish, and install a guardrail delineator.

FF. <u>One-Strand Access Restraint Cable Repair and Replacement</u>

1.0 Description. This work shall consist of all labor, equipment, and materials to remove, install, repair, and replace one-strand access restraint cable and appurtenances as specified in the job order or as directed by the engineer. All work shall comply with Secs 202 and 606 except as herein modified.

2.0 Materials. All materials shall conform to Division 1000, Materials Details, and specifically Sec 1040. All materials shall be new unless otherwise approved by the engineer or otherwise allowed by these specifications.

2.1 All materials intended for use in this contract shall be stored in a dedicated location on the contractor's property and shall be inspected and approved by the engineer prior to use.

3.0 Construction Requirements.

3.1 Removal and Replacement of Individual Major Components. If the job order designates a contract pay item that includes the term "remove and replace", the contractor shall remove the described existing component, material, hardware, or other appurtenance, in whole or in part, as designated in the job order or as directed by the engineer. The major components to be removed will be marked with paint or ribbon or other method convenient to the engineer.

3.1.1 The contractor shall furnish and install the described major replacement component and any incidental items necessary to provide a fully functional system. Replacement components designated in the job order may not be of the same size or material as those removed. Some items designated for replacement may be damaged and not reusable. Other items designated for replacement may not meet current Commission standards and policies. The engineer will determine the actual items to be replaced.

3.1.2 Unless otherwise directed by the engineer, the contractor shall reuse any undamaged major components salvaged from the damaged cable system or appurtenances in order to provide a fully functional system. Minor components, such as nuts and bolts, may only be reused after inspection and approval by the engineer. Reused nuts and bolts shall only be used with salvaged major components. All new major components shall use new nuts, bolts, and other miscellaneous minor components.

3.2 Removal of Entire Cable System. If the engineer determines an existing one-strand access restraint cable system and related appurtenances have been significantly damaged and/or the damaged system does not comply with current Commission standards or policies, the cable system shall be removed as designated in the job order or as directed by the engineer.

3.2.1 Unless otherwise designated by the engineer for salvage by the Commission, all materials removed shall become the property of the contractor and shall be removed from the right of way and properly disposed of.

3.3 Installation of New Access Restraint Cable System. If the job order designates a contract pay item for new access restraint cable the contractor shall furnish and place the cable system complete in place. The new system shall be installed at the location designated by the engineer.

3.4 Replacing and Splicing Cable. Existing cable that has sustained damage that does not allow reuse will be designated for replacement. The existing damaged cable shall be cut and new replacement cable spliced at the locations designated by the engineer. Splices shall be as shown on the plans.

3.5 Realigning Posts. Posts which are out of alignment but otherwise undamaged will be designated for realignment. The contractor shall realign, plumb and correct the height on the designated posts. After realignment, any voids around the post shall be securely backfilled with a cohesive soil, or a sand meeting the requirements of Sec 1005.3.5, and thoroughly tamped.

3.6 Driving Replacement Posts. When a replacement post is placed in the same hole as a removed damaged post the contractor shall first securely backfill the hole with a cohesive soil, or a sand meeting the requirements of Sec 1005.3.5 and thoroughly tamp the soil before driving the replacement post.

3.7 Attaching Cable to Posts. Cable which is pulled loose from existing undamaged posts shall be reattached to any undamaged posts using new clamps and any other required hardware. Cable shall also be attached to any new replacement posts using new clamps. The clamps may need to be left slightly loose until final cable tensioning is complete.

3.8 Retensioning Cable. After replacement of all necessary components, the cable shall be retensioned such that no sag occurs between the posts and so that the finished installation presents an appearance satisfactory to the engineer. Following tensioning, all clamps shall be completely tightened. A tension log form shall be completed showing: the time, date, location, and ambient temperature, signed by the person performing the tensioning, and furnished to the engineer upon completion of the work.

3.9 Additional Work. If additional major components or pay items beyond those specified in the

job order are needed to properly perform the work, the contractor shall contact the engineer for authorization to proceed with the additional work. Any work performed without authorization of the engineer will be at the contractor's expense.

4.0 Method of Measurement.

4.1 Measurement of access restraint cable removal will be made to the nearest foot from center of end post to center of end post.

4.2 Measurement of removed and replaced access restraint cable repair components will be made per each.

4.3.1 Measurement of splice will be made per each.

4.4 Measurement of realigned posts will be made per each.

4.5 Measurement of cable attachment or reattachment to existing or new posts will be made per each post.

4.6 Measurement of retensioning cable will be made per each complete section of cable retensioned between two anchors.

5.0 Basis of Payment.

5.1 The accepted quantity of removed access restraint cable will be paid for at the contract unit price for:

Item 202-99.03	Remove Access Restraint Cable 1/S	Lineal Foot

5.1.1 Payment will be considered full compensation for all labor and equipment necessary to remove the cable system, including all cable, posts, and hardware.

5.2 The accepted quantities of removed and replaced repair components will be paid for at the contract unit price for each of the pay items included in the contract. Payment will be considered full compensation for all labor, equipment, and material necessary to remove the existing component, furnish a new replacement component, and install the component. No direct payment will be made for removing or reinstalling any reused undamaged components necessary to provide a fully functional system.

5.3 The accepted quantity of new 1/2 inch replacement cable will be paid for at the contract unit price for:

Item 606-99.03	1/2 Inch Cable 1/S	Lineal Foot
Item 606-99.03	Splice 1/2 Inch Cable 1/S	Each

5.3.1 Payment for cable and splices will be considered full compensation for all labor, equipment, and material necessary, including any clips, to cut the existing cable, furnish new 1/2 inch cable, and splice to the existing cable.

5.4 The accepted quantity of realigned posts will be paid for at the contract unit price for:

Item 606-99.02	Realign Line / End Post, Access Restraint Cable, 1/S	Each

5.4.1 Payment will be considered full compensation for all labor, equipment, and material, including any required backfill, necessary to realign and plumb an existing post.

5.5 The accepted quantity of attaching cable to new or existing posts will be paid for at the contract unit price for:

Item 606-99.02	Attach Cable to Post Access Restraint Cable, 1/S	Each

5.5.1 Payment will be considered full compensation for all labor, equipment, and material, including new clamps and other hardware, necessary for reattaching cable to existing and new posts.

5.6 The accepted quantity of retensioned cable will be paid for at the contract unit price for:

Item 606-99.02	Retension Access Restraint Cable, 1/S	Each

5.6.1 Payment will be considered full compensation for all labor, equipment, and material necessary for retensioning an entire run of cable between two anchors.

GG. 3-Strand Low Tension Guard Cable Repair and Replacement

1.0 Description. This work shall consist of all labor, equipment, and materials to remove, install, repair, and replace non-proprietary 3-strand low tension guard cable and appurtenances as specified in the job order or as directed by the engineer. All work shall comply with Secs 202 and 606 except as herein modified.

2.0 Materials. All materials shall conform to Division 1000, Materials Details, and specifically Sec 1040. All materials shall be new unless otherwise approved by the engineer or otherwise allowed by these specifications.

2.1 Replacement materials and components for proprietary crashworthy end terminals shall conform to the manufacturer's latest approved design. All replacement components shall be from the original equipment manufacturer unless approved by the engineer. The contractor shall provide manufacturer certification that the replacement components furnished, when properly installed by the contractor, will reestablish or exceed the original capabilities of the end terminal.

2.2 All materials intended for use in this contract shall be stored in a dedicated location on the contractor's property and shall be inspected and approved by the engineer prior to use.

3.0 Construction Requirements.

3.1 Removal and Replacement of Individual Major Components. If the job order designates

a contract pay item that includes the term "remove and replace", the contractor shall remove the described existing component, material, hardware, or other appurtenance, in whole or in part, as designated in the job order or as directed by the engineer. The major components to be removed will be marked with paint or ribbon or other method convenient to the engineer.

3.1.1 The contractor shall furnish and install the described major replacement component and any incidental items necessary to provide a fully functional system. Replacement components designated in the job order may not be of the same size or material as those removed. Some items designated for replacement may be damaged and not reusable. Other items designated for replacement may not meet current Commission standards and policies. The engineer will determine the actual items to be replaced.

3.1.2 Unless otherwise directed or approved by the engineer, the contractor shall reuse any undamaged major components salvaged from the damaged guard cable system or appurtenances in order to provide a fully functional system. Minor components, such as nuts and bolts, may only be reused after inspection and approval by the engineer. Reused nuts and bolts shall only be used with salvaged major components. All new major components shall use new nuts, bolts, and other miscellaneous minor components.

3.2 Removal of Entire Cable System. If the engineer determines an existing guard cable system and related appurtenances have been significantly damaged and/or the damaged system does not comply with current Commission standards or policies, the cable system shall be removed as designated in the job order or as directed by the engineer.

3.2.1 Unless otherwise designated by the engineer for salvage by the Commission, all materials removed shall become the property of the contractor and shall be removed from the right of way and properly disposed of.

3.3. If the portion of the system designated for removal includes concrete anchors, all hardware protruding above the surface of the anchor shall be removed or otherwise cut off flush with the surface of the anchor. The concrete anchor shall be abandoned in place unless otherwise directed by the engineer.

3.4 Installation of New Guard Cable System, Guardrail System, and/or Crashworthy Terminal. If the job order designates a contract pay item for new 3-strand guard cable, guardrail, or crashworthy terminal the contractor shall furnish and place the designated item complete in place. The new cable system, guardrail, or terminal shall be installed at the location designated by the engineer.

3.5 Replacing and Splicing Cable. Existing cable (wire rope) that has sustained damage that does not allow reuse will be designated for replacement. The existing damaged cable shall be cut and new replacement cable spliced at the locations designated by the engineer. Individual cables shall be spliced by use of an approved device as shown on the plans and shall be installed where no interference with the functions of any other part of the installation occurs. Splices shall develop the full breaking strength of the cable.

3.6 Realigning Posts. Posts which are out of alignment but otherwise undamaged will be designated for realignment. The contractor shall realign, plumb and correct the height on the designated posts. After realignment, any voids around the post shall be securely backfilled with

a cohesive soil, or a sand meeting the requirements of Sec 1005.3.5, and thoroughly tamped.

3.7 Driving Replacement Posts. When a replacement post is placed in the same hole as a removed damaged post, the contractor shall first securely backfill the hole with a cohesive soil, or a sand meeting the requirements of Sec 1005.3.5, and thoroughly tamp the soil before driving the replacement post. When a replacement post requires relocation or new cable installation is designated in the job order and the relocated or new post is in rock, the job order will designate the number of posts to be installed in rock.

3.8 Attaching Cables to Posts. Cables which are pulled loose from existing undamaged posts shall be reattached to any undamaged posts using new hooks and any other required hardware. Cables shall also be attached to any new replacement posts using new hooks. The hooks may need to be left slightly loose until final cable tensioning is complete.

3.9 Retensioning Cables. After replacement of all necessary components, all three cables shall be inspected at both ends of the cable run and any required adjustments to end fittings performed. The cables may require reattachment to the end anchors and fittings to properly complete the system. All compensator springs shall be inspected to ensure they are undamaged and capable of properly functioning. All compensating end assemblies on all three cable runs shall be fully loosened and the cables shall be stretched taut by mechanical means to eliminate sag between the posts. All cables shall be retensioned per the temperature and spring compression table shown on the plans. Following tensioning, all hooks shall be completely tightened. A tension log form shall be completed showing: the time, date, location, and ambient temperature, signed by the person performing the tensioning, and furnished to the engineer upon completion of the work.

3.10 Guard Cable to Guardrail Transition. A limited amount of guardrail may require repair at guard cable to guardrail transitions. The contract includes various guardrail pay items for repair and/or replacement at these locations. All post holes shall be properly backfilled in accordance with Section 3.6 of this provision prior to driving new posts. The repaired guard cable to guardrail transition shall be in accordance with the plans.

3.11 Guard Cable Delineators. Guard cable delineators shall be installed in accordance with the standard plans. The cost of delineators installed on new posts shall be included in the cost of the post. Payment will be made to replace damaged delineators on existing posts.

3.12 Additional Work. If additional major components or pay items beyond those specified in the job order are needed to properly perform the work, the contractor shall contact the engineer for authorization to proceed with the additional work. Any work performed without authorization of the engineer will be at the contractor's expense.

4.0 Method of Measurement.

4.1 Measurement of existing 3-strand guard cable removal will be made to the nearest foot from the center of the first line post to the center of the last line post.

4.2 Measurement of removed and replaced guard cable or guardrail repair components will be made per each.

4.3 Measurement of new 3/4 inch replacement cable (wire rope) will be made to the nearest foot

from center of splice to center of splice.

4.3.1 Measurement of splice will be made per each.

4.4 Measurement of realigned posts will be made per each.

4.5 Measurement of line posts set in rock will be made per each.

4.6 Measurement of cable attachment or reattachment to existing or new posts will be made per each post. One unit will include reattachment of up to 3 cables to one post.

4.7 Measurement of retensioning guard cable will be made per each complete section of guard cable retensioned between two anchors. One unit will include retensioning of all 3 cables.

4.8 Measurement of existing guardrail and Type A crashworthy terminal removal will be made to the nearest foot from center of first post to center of last post.

4.9 Measurement of replaced delineators will be made per each.

5.0 Basis of Payment.

5.1 The accepted quantities of removed cable will be paid for at the contract unit price for:

Item 202-99.03	Remove Guard Cable, 3-Strand	Lineal Foot

5.1.1 Payment will be considered full compensation for all labor and equipment necessary to remove the guard cable system, including all cable, posts, and hardware.

5.2 The accepted quantities of removed and replaced repair components will be paid for at the contract unit price for each of the pay items included in the contract. Payment will be considered full compensation for all labor, equipment, and material necessary to remove the existing component, furnish a new replacement component, and install the component. No direct payment will be made for removing or reinstalling any reused undamaged components necessary to provide a fully functional system.

5.3 The accepted quantity of new 3/4 inch replacement cable will be paid for at the contract unit price for:

Item 606-99.03	3/4 Inch Cable 1/S	Lineal Foot
Item 606-99.03	Splice 3/4 Inch Cable 1/S	Each

5.3.1 Payment for cable and splices will be considered full compensation for all labor, equipment, and material, including any wedges, fittings, and other hardware, necessary to cut the existing cable, furnish new 3/4 inch cable, and splice to the existing cable.

5.4 The accepted quantity of realigned posts will be paid for at the contract unit price for:

Item 606-99.02	Realign Line Post 3/S	Each

5.4.1 Payment will be considered full compensation for all labor, equipment, and material, including any required backfill, necessary to realign and plumb an existing post.

5.5 The accepted quantity of line posts set in rock will be paid for at the contract unit price for:

Item 606-99.02	Guard Cable Line Post Set in Rock 3/S	Each

5.5.1 Payment will be in addition to the amount paid for 3-strand guard cable complete in place or replacement posts and will be considered full compensation for all labor, equipment, and material necessary to drill or bore a hole and to set the line post in rock. No direct payment will be made for the required backfill material. Payment for the post will be considered included in the cost of the 3-strand guard cable or replacement post.

5.6 The accepted quantity of attaching up to 3 cables to new or existing posts will be paid for at the contract unit price for:

Item 606-99.02	Attach Cables to Post 3/S LT	Each

5.6.1 Payment will be considered full compensation for all labor, equipment, and material, including new hooks and other hardware, necessary for attaching/reattaching up to 3 cables to existing and new posts.

5.7 The accepted quantity of retensioned cable will be paid for at the contract unit price for:

Item 606-99.02	Retension Low Tension Guard Cables 3/S	Each

5.7.1 Payment will be considered full compensation for all labor, equipment, and material necessary for retensioning an entire run of 3 cables between two anchors.

5.8 The accepted quantity of removed guardrail or Type A crashworthy terminal removal will be paid for at the contract unit price for:

Item 202-99.03	Remove Guardrail, Including Type A Crashworthy Terminal	Lineal Foot

5.8.1 Payment will be considered full compensation for all labor and equipment necessary to completely remove the guardrail system.

5.9 The accepted quantity of replaced delineators will be paid for at the contract unit price for:

Item 606-99.02	Replace Guard Cable Delineator	Each

HH. 3-Strand High Tension Guard Cable Repair and Replacement

1.0 Description. This work shall consist of all labor, equipment, and materials to remove, install, repair, and replace 3-strand high tension guard cable systems. The work shall be as specified in the job order or as directed by the engineer. All work shall comply with Secs 202 and 606 except as herein modified.

2.0 Materials. All materials shall conform to Section II. of these Job Special Provisions, 3-Strand High Tension Cable Barrier, which follows this special provision. All materials shall be new unless otherwise approved by the engineer or otherwise allowed by these specifications.

2.1 Replacement materials and components for proprietary systems shall conform to the manufacturers latest approved design. All replacement components shall be from the original equipment manufacturer unless approved by the engineer. The contractor shall provide manufacturer certification that the replacement components furnished, when properly installed by the contractor, will reestablish or exceed the original capabilities of the system.

2.2 All materials intended for use in this contract shall be stored in a dedicated location on the contractor's property and shall be inspected and approved by the engineer prior to use.

3.0 Construction Requirements.

3.1 Removal and Replacement of Individual Major Components. If the job order designates a contract pay item that includes the term "remove and replace", the contractor shall remove the described existing component, material, hardware, or other appurtenance, in whole or in part, as designated in the job order or as directed by the engineer. The major components to be removed will be marked with paint or ribbon or other method convenient to the engineer.

3.1.1 The contractor shall furnish and install the described major replacement component and any incidental items necessary to provide a fully functional system. Replacement components designated in the job order may not be of the same size or material as those removed. Some items designated for replacement may be damaged and not reusable. Other items designated for replacement may not meet current Commission standards and policies. The engineer will determine the actual items to be replaced.

3.1.2 Unless otherwise directed or approved by the engineer, the contractor shall reuse any undamaged major components salvaged from the damaged guard cable system or appurtenances in order to provide a fully functional system. Minor components, such as nuts and bolts, may only be reused after inspection and approval by the engineer. Reused nuts and bolts shall only be used with salvaged major components. All new major components shall use new nuts, bolts, and other miscellaneous minor components.

3.2 Removal of Entire Cable System. If the engineer determines an existing guard cable system and related appurtenances have been significantly damaged and/or the damaged system does not comply with current Commission standards or policies, the cable system shall be removed as designated in the job order or as directed by the engineer.

3.2.1 Unless otherwise designated by the engineer for salvage by the Commission, all materials removed shall become the property of the contractor and shall be removed from the right of way and properly disposed of.

3.2.2 If the portion of the system designated for removal includes concrete anchors, all hardware protruding above the surface of the anchor shall be removed or otherwise cut off flush with the surface of the anchor. The concrete anchor shall be abandoned in place unless otherwise directed by the engineer.

3.3 Replacing and Splicing Cable. Existing cable (wire rope) that has sustained damage that does not allow reuse will be designated for replacement. The existing damaged cable shall be cut and new replacement cable spliced at the locations designated by the engineer. Individual cables shall be spliced by use of an approved device as shown on the manufacturer's plans and shall be installed where no interference with the functions of any other part of the installation occurs. Splices shall develop the full breaking strength of the cable.

3.4 Realigning Posts. Posts which are out of alignment but otherwise undamaged will be designated for realignment. The contractor shall realign, plumb and correct the height on the designated posts. After realignment, any voids around the post shall be securely backfilled with a cohesive soil, or a sand meeting the requirements of Sec 1005.3.5, and thoroughly tamped.

3.5 Attaching Cables to Posts. Cables which are pulled loose from existing undamaged posts shall be reattached to any undamaged posts using new hooks and any other required hardware. Cables shall also be attached to any new replacement posts using new hooks and spacers.

3.6 Retensioning Cables. After replacement of all necessary components, all three cables shall be inspected at both ends of the cable run and any required adjustments to end fittings performed. The cables may require reattachment to the anchor posts to properly complete the system. All cables shall be retensioned per the temperature table shown on the manufacturer's plans. A tension log form shall be completed showing: the time, date, location, ambient temperature and final tension reading, signed by the person performing the tensioning, and furnished to the engineer upon completion of the work. This form shall also include the system manufacturer's recommended tension chart.

3.7 Guard Cable Delineators. Guard cable delineators shall be installed in accordance with the standard plans. The cost of delineators installed on new posts shall be included in the cost of the post. Payment will be made to replace damaged delineators on existing posts.

3.8 Additional Work. If additional major components or pay items beyond those specified in the job order are needed to properly perform the work, the contractor shall contact the engineer for authorization to proceed with the additional work. Any work performed without authorization of the engineer will be at the contractor's expense.

4.0 Method of Measurement.

4.1 Measurement of removed and replaced guard cable repair components will be made per each.

4.2 Measurement of new 3/4 inch prestreched replacement cable will be made to the nearest foot from center of splice to center of splice.

4.2.1 Measurement of splices will be made per each.

4.3 Measurement of cable attachment or reattachment to existing or new posts will be made per each post. One unit will include reattachment of up to 3 cables to one post.

4.4 Measurement of retensioning guard cable will be made per each complete section of guard cable retensioned between two anchors. One unit will include retensioning of all 3 cables.

5.0 Basis of Payment.

5.1 The accepted quantities of removed and replaced repair components will be paid for at the contract unit price for each of the pay items included in the contract. Payment will be considered full compensation for all labor, equipment, and material necessary to remove the existing component, furnish a new replacement component, and install the component. No direct payment will be made for removing or reinstalling any reused undamaged components necessary to provide a fully functional system.

5.2 The accepted quantity of new 3/4 inch prestretched high tension replacement cable will be paid for at the contract unit price for:

Item 606-99.03	3/4 Inch Cable 1/S	Lineal Foot
Item 606-99.03	Splice 3/4 Inch Cable 1/S	Each

5.2.1 Payment for cable and splices will be considered full compensation for all labor, equipment, and material, including any wedges, fittings, and other hardware, necessary to cut the existing cable, furnish new 3/4 inch cable, and splice to the existing cable.

5.3 The accepted quantity of attaching up to 3 cables to new or existing posts will be paid for at the contract unit price for:

Item 606-99.02	Attach Cables to Post HT	Each

5.3.1 Payment will be considered full compensation for all labor, equipment, and material, including new hooks and other hardware, necessary for attaching/reattaching up to 3 cables to existing and new posts.

5.4 The accepted quantity of retensioned cable will be paid for at the contract unit price for:

Item 606-99.02	Retension High Tension Cables HT	Each

5.4.1 Payment will be considered full compensation for all labor, equipment, and material necessary for retensioning an entire run of 3 cables between two anchors and furnishing a tension log form to the engineer.

5.5 The accepted quantity of replaced delineators will be paid for at the contract unit price for:

Item 606-99.02	Replace Guard Cable Delineator	Each

II. 3- Strand High Tension Cable Barrier

1.0 Description. This work shall consist of all labor, equipment, and materials to remove, install, repair, and replace a 3-strand cable barrier system including all hardware and appurtenances as shown on the plans or as directed by the engineer. The cable barrier system shall function in accordance with the requirements of NCRHP 350, Test Level 3, and be approved by the Federal Highway Administration. Test Level 3 acceptable products, for use as a cable barrier system, are

included in the list of pre-qualified products displayed on MoDOT's website. Acceptable products shall include a concrete socketed line post system with galvanized high-tension wire ropes and anchorages. The cable barrier system shall be constructed as shown on the plans, with a maximum deflection of 9 feet.

2.0 Construction Requirements. Line posts shall be provided in accordance with the manufacturer's shop drawings and shall be placed plumb. Spacing of the posts shall not exceed 20 feet.

2.1 Anchor Assemblies. An anchor assembly, as specified in the manufacturer's shop drawings, shall be constructed at each end of a cable barrier run. The anchor assembly shall function in accordance with the requirements of NCRHP 350, Test Level 3, and be approved by the Federal Highway Administration. Anchors shall be constructed on firm, stable, undisturbed soil to the minimum dimension shown on the shop drawings. Anchor bolts and anchor post slip bases shall be firmly held in position at the top by templates during concrete replacement. Backfill shall be thoroughly compacted with mechanical tampers with care taken to prevent damage to the finished concrete. Backfill shall be brought up level with the finished grade line.

2.2 Cable. The galvanized wire rope shall be ¾" pre-stretched 3 x 7 construction as approved by the Federal Highway Administration during the system's acceptance testing. Threaded terminals (wedge or swaged type) shall be furnished. Swaged terminals may be shop- or field-swaged. Threaded terminals shall be right hand (RH) or left hand (LH) threaded M 24 x 3 pitch to ANSI B 1.13 M. The body of the threaded terminal shall provide a minimum of 5.9" of wire rope penetration depth. Threaded terminals shall be galvanized after threading to ASTM A 151. Turnbuckle or rigging screws shall be of the size and shape shown in the manufacturer's shop drawings. Rigging screws shall be of a solid or closed body type with two inspection holes to determine threaded rope terminal penetration. Rigging screws shall be galvanized to ASTM A 153 after threading.

2.3 Cable Tensioning. The cable height above ground shall be in accordance with the manufacturer's shop drawings. The cable shall be tensioned immediately after initial installation. Tension shall be rechecked and adjusted, if necessary, three to five days after initial tensioning on cable system sections with lengths greater than 2500 feet. A tension log form shall be completed showing: the time, date, location, ambient temperature and final tension reading, signed by the person performing the tensioning, and furnished to the engineer upon completion of the work. This form shall also include the system manufacturer's recommended tension chart.

2.4 Delineators. Delineator spacing and reflector colors shall be in accordance with Sec 606.10.

JJ. Definition of Special "99 Number" Pay Items

1.0 The contract contains a large number of special "99-number" pay items. The Commission's automated bidding system is limited by the number of characters allowed for each special item description. The following table defines the abbreviated item descriptions. This table also further defines the work required for each of the pay items.

ITEM NO.	ITEM DESCRIPTION

Traffic Control Items

616-99.02 ADDITIONAL TRUCK MOUNTED ATTENUATOR
Provide additional truck mounted attenuator for use in addition to other

616-99.04 ADDITIONAL CONSTRUCTION SIGNS
Provide additional construction signs for use in addition to other devices specified in the traffic control plan.

616-99.02 ADDITIONAL FLASHING ARROW PANEL
Provide additional flashing arrow panel for use in addition to other devices specified in the traffic control plan.

616-99.02 ADDITIONAL CHANNELIZER (TRIMLINE)
Provide additional channelizers for use in addition to other devices specified in the traffic control plan.

616-99.02 ADDITIONAL CHANGEABLE MESSAGE SIGN (CMS CONTRACTOR FURNISHED/RETAINED)
Provide additional changeable message sign for use in addition to other devices specified in the traffic control plan.

616-99.02 ADDITIONAL DIRECTIONAL INDICATOR BARRICADE
Provide additional directional indicator barricades (DIBS) for use in addition to other devices specified in the traffic control plan.

616-99.02 WORK BEYOND SHOULDER
Provide traffic control for work off roadway shoulder, but within clear zone. Not to be used when vehicles are parked on shoulder.

616-99.02 SHOULDER WORK – UNDIVIDED ROADWAYS
Provide traffic control for work on shoulder or vehicles parked on shoulder.

616-99.02 LEFT SHOULDER WORK – HIGH SPEED ROADWAY
Provide traffic control for work on left shoulder or vehicles parked on left shoulder of a high speed roadway as designated by the Engineer.

616-99.02 RIGHT SHOULDER WORK – HIGH SPEED ROADWAY
Provide traffic control for work on right shoulder or vehicles parked on right shoulder of a high speed roadway as designated by the engineer.

616-99.02 1-LANE 2-WAY OPERATION W/FLAGGERS
Provide traffic control for one lane, two way operations on non-divided two lane pavement, using two flaggers.

616-99.02 SINGLE LANE CLOSURE

Provide traffic control closing one lane, left or right, on a divided highway.

616-99.02 PARTIAL RAMP CLOSURE
Provide traffic control for partial ramp closure.

616-99.02 COMPLETE RAMP CLOSURE
Provide traffic control for complete ramp closure.

616-99.02 ENTRANCE RAMP AREA, MAINLINE WORK
Provide traffic control within an entrance ramp area closing one lane on a divided highway; work is along mainline.

616-99.02 ENTRANCE RAMP AREA, ACCEL LANE WORK
Provide traffic control within an entrance ramp area closing one lane on a divided highway. Work is along acceleration lane.

616-99.02 EXIT RAMP AREA, MAINLINE/DECEL LANE WORK
Provide traffic control within an exit ramp area closing one lane on a divided highway. Work is along mainline or deceleration lane.

616-99.02 SEQUENTIAL FLASHING WARNING LIGHT
Provide traffic control with sequential flashing warning light.

<u>New Guardrail Installation Items</u>

202-99.02 TYPE A OR B TERMINAL REMOVAL
Remove existing complete Type A or B crashworthy end terminal.

202-99.03 REMOVED GUARDRAIL
Remove existing complete guardrail. Item also includes existing turndown end treatments.

214-99.10 GRADING FOR CRASHWORTHY END TERMINAL
Furnish and place rocky fill material for end terminal installation.

606-01.10 BULLNOSE GUARDRAIL SYSTEM
Furnish and install Bullnose Guardrail System.

606-10.10 GUARDRAIL TYPE A
Furnish and install Type A Guardrail.

606-10.11A GUARDRAIL TYPE A, 7 FT. POST, 3 FT. – 1.5 IN. SPACING
Furnish and install Type A Guardrail with 7’ post, 3’-1 1/2” spacing.

606-99.02 INSTALL POST IN SOLID ROCK OR CONC, 6 OR 7’ (TYPE A, E OR MGS)
Install 6’ or 7’ guardrail post in solid rock or through concrete for Type A, E or MGS guardrail. Pay item is in addition to normal pay item for new guardrail or for normal pay item to remove and replace a 6’ or 7’ type A or

E guardrail post.

606-99.02 FLARED TYPE A CRASHWORTHY END TERMINAL
Furnish and install flared Type A crashworthy end terminal.

606-10.50 GUARDRAIL TYPE E, 6FT. POSTS, 3 FT. – 1.5 IN. SPACING
Furnish and install Type E Guardrail with 6’ post having 3’-1.5” spacing.

606-10.51 GUARDRAIL TYPE E, 7FT. POSTS
Furnish and install Type E Guardrail with 7’ post.

606-10.54 GUARDRAIL TYPE E, 6FT. POSTS, 6 FT. – 3 IN. SPACING
Furnish and install Type E Guardrail with 6’ post having 6’-3” spacing.

606-10.60 GUARDRAIL, MGS
Furnish and install Midwest Guardrail System guardrail.

606-10.61 GUARDRAIL, MGS, 8FT., 6 FT. – 3 IN. SPACING
Furnish and install Midwest Guardrail System guardrail with 8’ post with 6’-3” spacing.

606-10.63 MGS GUARDRAIL, 6FT. POSTS, 3 FT. – 1.5 IN. SPACING
Furnish and install Midwest Guardrail System guardrail with 6’ post having 3’-1 ½” spacing.

606-10.65 MGS GUARDRAIL, 6FT. POSTS, 1 FT. – 6.75 IN. SPACING
Furnish and install Midwest Guardrail System guardrail with 6’ post having 1’-6.75” spacing.

606-10.67 MGS DOUBLE FACED GUARDRAIL
Furnish and install Midwest Guardrail System double-faced guardrail.

606-10.68 MGS BRIDGE APPROACH TRANSITION SECTION (MAJOR ROUTE)
Furnish and install Midwest Guardrail System bridge approach transition section on a Major Route.

606-10.69 MGS BRIDGE APPROACH TRANSITION SECTION (MINOR ROUTE)
Furnish and install Midwest Guardrail System bridge approach transition section on a Minor Route.

606-10.70 MGS VERTICAL CONCRETE BARRIER TRANSITION
Furnish and install Midwest Guardrail System vertical concrete barrier transition.

606-10.74 MGS HEIGHT AND BLOCK TRANSITION SECTION
Furnish and install Midwest Guardrail System height and block transition section.

606-10.75 MGS LONG SPAN GUARDRAIL SECTION

Furnish and install Midwest Guardrail System long span guardrail section.

606-10.80 MGS END ANCHOR
Furnish and install Midwest Guardrail System end anchor.

606-10.81 MGS BRIDGE ANCHOR SECTION (THRIE-BEAM BRIDGE)
Furnish and install Midwest Guardrail System Thrie Beam bridge anchor section.

606-22.00A BRIDGE ANCHOR SECTION, 6.5 FT. POSTS (SAFETY BARRIER CURB)(ROADWAY AND REHABILITATION WORK ONLY)
Furnish and install bridge anchor section with 6’ 6” ft. posts for only roadway and rehabilitation work.

606-22.00A BRIDGE ANCHOR SECTION, 7.5 FT. POSTS (SAFETY BARRIER CURB)(ROADWAY AND REHABILITATION WORK ONLY)
Furnish and install bridge anchor section with 7’ 6” ft. posts for only roadway and rehabilitation work.

606-99.02 MGS TRANSITION SECTION, 6 FT. POSTS
Furnish and install Midwest Guardrail System transition section with 6’ posts.

606-23.00A TRANSITION SECTION, 6.5 FT. POSTS
Furnish and install guardrail transition section with 6’ 6” posts.

606-23.01A TRANSITION SECTION, 7.5 FT. POSTS
Furnish and install guardrail transition section with 7’ 6” posts.

606-23.03 ASYMMETRICAL TRANSITION SECTION, 6.5 FT. POSTS
Furnish and install asymmetrical guardrail transition section with 6’ 6” posts.

606-23.04 ASYMMETRICAL TRANSITION SECTION, 7.5 FT. POSTS
Furnish and install asymmetrical guardrail transition section with 7’ 6” posts.

606-24.00 BRIDGE ANCHOR SECTION (THRIE BEAM)
Furnish and install Thrie Beam bridge anchor section.

606-30.00 TERMINAL SECTION – GUARDRAIL
Furnish and install terminal section for guardrail.

606-30.14 TYPE A CRASHWORTHY END TERMINAL (MASH)
Furnish and install MASH Type A crashworthy end terminal.

606-30.16 TYPE B CRASHWORTHY END TERMINAL
Furnish and install Type B crashworthy end terminal.

606-66.10 END ANCHOR
Furnish and install end anchor.

606-66.20 GUARDRAIL ANCHOR, EMBEDDED
Furnish and install embedded guardrail anchor.

606-66.30 GUARDRAIL ANCHOR, ROCK FACE
Furnish and install Guardrail Anchor, Rock Face.

Guardrail Repair Items

606-99.02 R&R 12.5’ W-BEAM PANEL (TYPE A GR)
Remove and replace 12’-6” Type A guardrail beam.

606-99.02 R&R 12.5’ W-BEAM PANEL (MGS)
Remove and replace 12’-6” Midwest Guardrail System guardrail beam.

606-99.02 R&R 12.5' THRIE BEAM RAIL TY E GR
Remove and replace 12’-6” thrie beam rail for Type E guardrail.

606-99.02 R&R END ANCHOR RAIL
Remove and replace end anchor rail section.

606-99.02 R&R MGS END ANCHOR
Remove and replace Midwest Guardrail System end anchor.

606-99.02 R&R 72” FOUNDATION TUBE W/O SOIL PLATE (MGS)
Remove and replace Midwest Guardrail System end anchor system foundation tube with or without soil plate.

606-99.02 R&R 46” WOOD POST IN FOUNDATION TUBE (MGS)
Remove and replace Midwest Guardrail System end anchor system wood post in foundation tube.

606-99.02 R&R CABLE ASSY W/PIPE, PLATE & ANCHOR (MGS)
Remove and replace Midwest Guardrail System end anchor cable assembly with pipe, plate and anchor.

606-99.02 R&R MGS END ANCHOR CABLE ASSEMBLY
Remove and replace Midwest Guardrail System end anchor cable assembly.

606-99.02 R&R PARTS FOR END SECTION
Remove and replace parts for end section.

606-99.02 R&R 25’ W-BEAM PANEL (TYPE A GR)
Remove and replace 25’ W-beam guardrail panel for Type A guardrail. Existing panels may be 12.5’ long.

606-99.02 R&R 25’ W-BEAM PANEL (MGS)
Remove and replace 25’ W-beam guardrail panel for Midwest Guardrail System guardrail. Existing panels may be 12.5’ long.

606-99.02 R&R 6.25’ THRIE BEAM PANEL (MGS)
Remove and replace 6.25’ Thrie beam guardrail panel for Midwest Guardrail System guardrail.

606-99.02 R&R 18.75’ THRIE BEAM PANEL (MGS)
Remove and replace 18.75’ Thrie beam guardrail panel for Midwest Guardrail System guardrail.

606-99.02 R&R 25’ THRIE BEAM PANEL (TYPE E GR)
Remove and replace 25’ Thrie beam guardrail panel for Type E guardrail. Existing panels may be 12’-6” long.

606-99.02 R&R 25’ THRIE BEAM PANEL (MGS)
Remove and replace 25’ Thrie beam guardrail panel for Midwest Guardrail System guardrail. Existing panels may be 12’-6” long.

606-99.02 R&R 6.25’ TYPE A TO TYPE E TRANSITION BEAM
Remove and replace 6.25’ transition section beam for Type A to Type E transition.

606-99.02 R&R 12.5’ END ANCHOR PANEL
Remove and replace 12.5’ end anchor W-beam panel. Existing beam may be shorter.

606-99.02 R&R 12.5’ MGS END ANCHOR PANEL
Remove and replace Midwest Guardrail System 12.5’ end anchor panel.

606-99.02 R&R 12.5’ BEAM, CONC/CONVEX RADIUS, TY A
Remove and replace 12’-6” Type A guardrail beam with a concave or convex radius beam.

606-99.02 R&R 12.5’ BEAM, CONC/CONVEX RADIUS, MGS
Remove and replace 12’-6” Midwest Guardrail System guardrail beam with a concave or convex radius beam.

606-99.02 R&R 12.5’ BEAM 10 GA. (TYPE E GR)
Remove and replace 12’-6”, 10 gage, Type E guardrail beam.

606-99.02 R&R STEEL POST, 6' MGS
Remove and replace 6’ steel guardrail post for MGS guardrail.

606-99.02 R&R STEEL POST, 6' TYPE A OR MGS GR
Remove and replace 6’ steel guardrail post for Type A or MGS guardrail.

606-99.02 R&R STEEL POST 6', TY E GR

Remove and replace 6’ steel guardrail post for Type E guardrail.

606-99.02 R&R STEEL POST 7' (TY A GR)
Remove and replace 7’ steel post for Type A guardrail.

606-99.02 R&R STEEL POST 7' (TY E GR)
Remove and replace 7’ steel post for Type E guardrail.

606-99.02 R&R WOOD POST 6' (TY A GR)
Remove and replace 6’ wood post for Type A guardrail.

606-99.02 R&R WOOD POST 7' (TY A GR)
Remove and replace 7’ wood post for Type A guardrail.

606-99.02 R&R STEEL POST 8' MGS
Remove and replace 8’ steel guardrail post for MGS guardrail.

606-99.02 REALIGN & USE EXIST POST TY A OR E OR MGS GR
Realign and reuse existing guardrail post for Type A or E or MGS guardrail.

606-99.02 R&R WOOD/PLASTIC BLOCK 8X6X14 TY A GR
Remove and replace wood or plastic post block, 8" x 6" x 14" for Type A guardrail.

606-99.02 R&R WOOD/PLASTIC BLOCK 8X6X14 MGS
Remove and replace wood or plastic post block, 8" x 6" x 14" for Midwest Guardrail System guardrail.

606-99.02 R&R WOOD/PLASTIC BLOCK 12X6X14 MGS
Remove and replace wood or plastic post block, 12" x 6" x 14" for Midwest Guardrail System guardrail.

606-99.02 R&R WOOD BLOCK 8X6X17 TRANSITION SECTION
Remove and replace wood or plastic post block, 8" x 6" x 17" for Type A to Type E transition section.

606-99.02 R&R WOOD BLOCK 12X6X19 TRANSITION SECTION
Remove and replace wood or plastic post block, 12" x 6" x 19".

606-99.02 R&R MGS HEIGHT AND BLOCK TRANSITION SECTION
Remove and replace Midwest Guardrail System height and block transition section.

606-99.02 RE-TENSION GUARDRAIL SYSTEM
Re-tension anchor hardware for all end anchors and end terminals.

606-99.02 R&R STEEL SPACER BLOCK (TYPE A GR)
Remove and replace steel spacer block for Type A guardrail.

606-99.02 R&R STEEL BLOCKOUT FOR RADIUS RAIL
Remove and replace steel blockout for radius rail.

606-99.02 R&R WOOD/PLASTIC BLOCK 8X6X21 TY E GR
Remove and replace wood or plastic post block, 8" x 6" x 21" for Type E guardrail.

606-99.02 R&R STEEL TUBE BLOCK 7X4 BR ANCH
Remove and replace structural steel tubing block, 7" x 4" x 3/16" for bridge anchor section.

606-99.02 R&R END SEC (SHOE) TY A GR
Remove and replace guardrail end section (also called a shoe) for Type A guardrail.

606-99.02 R&R TERMINAL CONNECTOR TY A OR MGS GR
Remove and replace terminal connector for Type A or MGS guardrail.

606-99.02 R&R TERMINAL CONNECTOR, TYPE E OR MGS GR
Remove and replace thrie beam terminal connector for Type E or MGS guardrail.

606-99.02 R&R GR DELINEATOR 1 SIDE OR 2 SIDE
Remove and replace existing reflective guardrail delineator (includes both 1 and 2 sided). Color will be as specified in Sec 606.10.

End Terminal Repair Items

606-99.02 NEW OR R&R REFLECTIVE SHEETING ON END TERMINAL
Install black/yellow reflective sheeting on new crashworthy end terminal Head or remove and replace on existing head.

606-99.02 R&R NEW IMPACT HEAD (MSKT)
Remove and replace impact head with a new impact head for MSKT crashworthy end terminal.

606-99.02 REM EXT GR & REUSE EXIST IMPACT HEAD (MSKT)
Remove extruded guardrail beam from an existing impact head and reuse the undamaged, serviceable impact head on the repaired MSKT crashworthy end terminal. A new or used replacement head in an undamaged, serviceable condition may be furnished to allow removal of the extruded guardrail beam from the original head at the contractor's shop facilities.

606-99.02 R&R 12.5 FT END SECTION 1ST W-BEAM RAIL (MSKT) Remove and replace 1st 12.5' w-beam rail. Rail must be original manufacturer replacement part.

606-99.02 R&R 9.375 FT 2ND SECTION W-BEAM RAIL (MSKT)
Remove and replace 2nd 9.375' w-beam rail. Rail must be original manufacturer replacement part.

606-99.02 R&R CABLE ASSY W/PIPE, PLATE & ANCH (MSKT)
Remove and replace cable assembly including pipe sleeve, bearing plate, and anchor bracket for MSKT crashworthy end terminal.

606-99.02 R&R GROUND STRUT (MSKT)
Remove and replace a MSKT ground strut.

606-99.02 R&R POST #1 HBA TOP (MSKT)
Remove and replace #1 HBA top post on MSKT crashworthy end terminal.

606-99.02 R&R POST #1 HBA BOTTOM (MSKT))
Remove and replace #1 HBA bottom post on MSKT crashworthy end terminal.

606-99.02 R&R POST #2 HBA TOP (MSKT)
Remove and replace #2 HBA top post on MSKT crashworthy end terminal.

606-99.02 R&R POST #2 HBA BOTTOM (MSKT)
Remove and replace #2 HBA bottom post on MSKT crashworthy end terminal.

606-99.02 R&R 12/25/3'1.5:3@6'3:3'1.5/S (SOFTSTOP)
Remove and replace 12/25/3'1.5:3@6'3:3'1.5/S on SoftStop crashworthy end terminal.

606-99.02 R&R 6'0 SYT POST/8.5/31" GR HT (SOFTSTOP)
Remove and replace 6'0 SYT post/8.5/31" GR HT on SoftStop crashworthy end terminal.

606-99.02 R&R ANCHOR GUARDRAIL 12'-6" (SOFTSTOP)
Remove and replace anchor guardrail 12'-6" on SoftStop crashworthy end terminal.

606-99.02 R&R ANGLE STRUT (SOFTSTOP)
Remove and replace angle strut on SoftStop crashworthy end terminal.

606-99.02 R&R STYP#1 8.5# 4'9-1/2 (SOFTSTOP)
Remove and replace STYP#1 8.5# 4'9-1/2 on SoftStop crashworthy end terminal.

606-99.02 R&R ANCHOR POST W6X15#X6' (SOFTSTOP)
Remove and replace anchor post W6X15#X6' on SoftStop crashworthy end terminal.

606-99.02 R&R IMPACT HEAD (SOFTSTOP)
Remove and replace impact head on SoftStop crashworthy end terminal.

606-99.02 REM EXT GR & REUSE EXIST IMPACT HEAD (SOFTSTOP)
Remove extruded guardrail beam from an existing impact head and reuse the undamaged, serviceable impact head on the repaired SoftStop crashworthy end terminal. A new or used replacement head in an undamaged, serviceable condition may be furnished to allow removal of the extruded guardrail beam from the original head at the contractor's shop facilities.

606-99.02 R&R CAN TL3 SS646 (SOFTSTOP)
Remove and replace # CAN TL3 SS646 on SoftStop crashworthy end terminal.

606-99.02 R&R SLED WELDMENT (TRACC)
Remove and replace sled weldment on TRACC crashworthy end terminal.

606-99.02 R&R SHREDDER (TRACC)
Remove and replace shredder on TRACC crashworthy end terminal.

606-99.02 R&R STAGE 2 RIP PLATE 75 IN (TRACC)
Remove and replace stage 2 RIP plate 75" on TRACC crashworthy end terminal.

606-99.02 R&R STAGE 3 RIP PLATE 93 IN (TRACC)
Remove and replace stage 3 RIP plate 93" on TRACC crashworthy end terminal.

606-99.02 R&R STAGE 3 RIP PLATE (25965G) 87 IN (TRACC)
Remove and replace stage 3 RIP plate (25965G) 87" on TRACC crashworthy end terminal.

606-99.02 R&R STAGE 3 RIP PLATE (25966G) 87 IN (TRACC)
Remove and replace stage 3 RIP plate (25966G) 87" on TRACC crashworthy end terminal.

606-99.02 R&R 2 BAY FENDER PANEL (TRACC)
Remove and replace 2 bay fender panel on TRACC crashworthy end terminal.

606-99.02 R&R NOSEPIECE YELLOW (TRACC)
Remove and replace nosepiece yellow on TRACC crashworthy end terminal.

Bullnose System Repair Items

606-99.02 R&R PARTS FOR BULLNOSE SYSTEM
Remove and Replace various parts for Bullnose System

606-99.02 R&R 72 IN FOUNDATION TUBE BULLNOSE SYSTEM
Remove and Replace 72 in Foundation Tube for Bullnose System

606-99.02 R&R 96 1/16 IN FOUNDATION TUBE BULLNOSE SYSTEM
Remove and Replace 96 1/16 in Foundation Tube for Bullnose System

606-99.02 R&R POST #1-2 BULLNOSE SYSTEM
Remove and Replace post #1-2 for Bullnose System

606-99.02 R&R POST #3-8 BULLNOSE SYSTEM
Remove and Replace post #3-8 for Bullnose System

606-99.02 R&R POST #9-12 BULLNOSE SYSTEM
Remove and Replace post #9-12 for Bullnose System

606-99.02 R&R 8X16X14 3/16 TAPERED WOOD BLOCK BULLNOSE SYSTEM
Remove and Replace 8x16x14 3/16 Tapered Wood Block for Bullnose System

606-99.02 R&R RAIL SECTION #1 BULLNOSE SYSTEM
Remove and Replace Rail Section #1 for Bullnose System

606-99.02 R&R RAIL SECTION #2 BULLNOSE SYSTEM
Remove and Replace Rail Section #2 for Bullnose System

606-99.02 R&R RAIL SECTION #3 BULLNOSE SYSTEM
Remove and Replace Rail Section #3 for Bullnose System

GUARD CABLE ITEMS

ONE-STRAND ACCESS RESTRAINT CABLE REPAIR AND REPLACEMENT

202-99.03 REMOVE ACCESS RESTRAINT CABLE 1/S
Remove existing complete single strand access restraint cable system

606-40.00 ONE-STRAND CABLE – ACCESS RESTRAINT
Furnish and install new One-Strand Access Restraint Cable

606-99.02 ATTACH CABLE TO POST ACC REST CABLE 1/S
Includes all hardware necessary to attach cable to new or existing post, single strand access restraint cable

606-99.02 R&R ANCHOR ROD ASSY 1/S
Remove and replace anchor rod assembly, single strand access restraint cable

606-99.02 R&R STEEL LINE OR END POST 1/S
Remove and replace steel line or end post, single strand access restraint

cable

606-99.02 R&R TURNBUCKLE CABLE END ASSY 1/S
Remove and replace turnbuckle cable end assembly, single strand access restraint cable

606-99.02 REALIGN LINE/END POST ACC REST CABLE 1/S
Realign line or end post, single strand access restraint cable

606-99.02 REPLACE GUARD CABLE DELINEATOR
Replace delineator on one side of a guard cable post. (Note: Guard cable placed in the median shall have delineators facing both directions of traffic.)

606-99.02 RETENSION ACCESS RESTRAINT CABLE 1/S
Retension single strand access restraint cable

606-99.02 SPLICE 1/2 INCH CABLE 1/S
Splice one 1/2 inch cable. Cut existing cable, and splice new cable to replace existing damaged cable; a splice includes clamps or torpedo cable splices to fully develop the strength of the cable.

606-99.03 1/2 INCH CABLE RESTRAINT 1/S
Furnish new ½ inch cable for access restraint.

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<u>THREE-STRAND LOW TENSION CABLE REPAIR AND REPLACEMENT</u>

202-99.03 REMOVE GUARD CABLE 3-STRAND
Remove 3-strand guard cable system

606-41.10 ANCHOR ASSEMBLY, GUARD CABLE 3-STRAND
Furnish and install anchor assembly, 3-strand guard cable system

606-41.11 ANCHOR ASSEMBLY, GUARD CABLE 3-STRAND TO GUARDRAIL TRANSITION
Furnish and install anchor assembly to guardrail transition, 3-strand guard cable system

606-99.02 ATTACH CABLES TO POST 3/S LT
Includes all hardware necessary to attach or reattach up to 3 cables to one line post or anchor post, 3-strand guard cable system

606-99.02 GUARD CABLE LINE POST SET IN ROCK 3/S
Install line post in solid rock or existing concrete for 3-strand guard cable system, pay item is in addition to normal pay item for 3-strand guard cable

606-99.02 R&R ANCHOR POST 3/S
Remove and replace anchor post, 3-strand guard cable system

606-99.02 R&R LINE POST 3/S

Remove and replace line post, 3-strand guard cable system

606-99.02 R&R LINE POST IN ROCK LT
Remove and replace line post in rock, low tension guard cable system

606-99.02 R&R ANCH BRACKET - MED OR RDSIDE 3/S
Remove and replace median or roadside anchor bracket, 3-strand guard cable system

606-99.02 R&R ANCH BRACKET - GUARD CABLE TO GR 3/S
Remove and replace guard cable to guardrail transition anchor bracket, 3-strand guard cable system

606-99.02 R&R CABLE TRANSITION BRACKET 3/S
Remove and replace cable transition bracket, 3-strand guard cable to guardrail transition

606-99.02 R&R CABLE END FITTING 3/S
Remove and replace cable end fitting, 3-strand guard cable system

606-99.02 R&R COMPENSATING CABLE END ASSY 3/S
Remove and replace compensating cable end assembly, 3-strand guard cable system

606-99.02 R&R COMPENSATOR SPRING 3/S
Remove and replace compensator spring only, 3-strand guard cable system

606-99.02 R&R TURNBUCKLE END ASSY W/O COMPE'TOR 3/S
Remove and replace turnbuckle cable end assembly without compensator, 3-strand guard cable system

606-99.02 REALIGN LINE POST 3/S
Realign line post, 3-strand guard cable system

606-99.02 REPLACE GUARD CABLE DELINEATOR
Replace delineator on one side of a guard cable post. (Note: Guard cable placed in the median shall have delineators facing both directions of traffic.)

606-99.02 RETENSION LOW TENSION GUARD CABLES 3/S
Re-tension all 3 strands of 3-strand low tension guard cable system, item includes check and adjustment of all end assemblies on both ends of a cable run

606-99.02 RETROFIT SLIP BASE PLATE
Furnish and Install retrofit slip base plate in accordance with standard drawing included in this proposal.

606-99.02 SPLICE 3/4 INCH CABLE 1/S

Splice one 3/4 inch cable. Cut existing cable, and splice new cable to replace existing damaged low tension cable; a splice includes clamps or torpedo cable splices to fully develop the strength of the cable.

606-99.03 3/4 INCH CABLE 1/S LOW TENSION
Furnish 3/4 inch cable 1/s Low Tension

HIGH TENSION GUARD BARRIER REPAIR AND REPLACEMENT - TRINITY

202-99.03 REMOVE GUARD CABLE 3-STRAND
Remove 3-strand guard cable system

606-41.10 ANCHOR ASSEMBLY, GUARD CABLE 3-STRAND
Furnish and install anchor assembly, 3-strand guard cable system

606-41.11 ANCHOR ASSEMBLY, GUARD CABLE 3-STRAND TO GUARDRAIL TRANSITION
Furnish and install anchor assembly to guardrail transition, 3-strand guard cable system

606-99.02 ATTACH CABLES TO POST 3/S HT - TRINITY
Includes delineator and all hardware necessary to attach or reattach up to 3 cables to one line post or anchor post; high tension cable system

606-99.02 ATTACH NEW CRP ANCH POST TO BASE HT
Furnish and attach a new CRP upper anchor post to an existing undamaged CRP stub post mounted in a concrete footing; includes new reflector for post; high tension cable system

606-99.02 REATTACH EXIST CRP ANCH POST TO BASE - TRINITY
Reattach an existing undamaged cable release post (CRP) upper anchor post to an existing undamaged CRP stub post mounted in a concrete footing; high tension cable system

606-99.02 R&R CRP ANCH POST 1-3 CONC FOOT W/STUB HT
Remove and replace CRP post footing # 1-3 with a new reinforced concrete footing with a new CRP stub; high tension cable system

606-99.02 FURN/INST TURNBUCKLE CABLE SPLICE ASSY HT
Furnish and install a turnbuckle cable splice assembly to tie two cut ends of high tension cable together; includes all castings, wedges, threaded rods, nuts, and turnbuckles needed to fully develop the strength of the cable, high tension cable system

606-99.02 R&R TURNBUCKLE HT
Remove and replace a turnbuckle to tie two existing cable ends with existing left hand and right hand stud assemblies. New turnbuckle will typically be used when an existing turnbuckle has been cut by emergency

personnel to free a vehicle from the cable system, high tension cable system

606-99.02 R&R CCT TERMINAL POST 4-7 IN EXSLEEVE HT
Remove and replace CCT post # 4-7 in an existing ground sleeve mounted in a concrete footing; high tension cable system

606-99.02 R&R CCT TERMINAL POST 8-9 IN EXSLEEVE HT
Remove and replace CCT post # 8-9 in an existing ground sleeve mounted in a concrete footing; high tension cable system

606-99.02 R&R CCT TERM POST 4-9 CONC FOOT W/SLEEVE HT
Remove and replace Cable Terminal (CCT) post footing # 4-9 with a new reinforced concrete footing with a new sleeve; high tension cable system

606-99.02 R&R LINE POST CONC FOOTING W/SLEEVE HT
Remove and replace steel yielding cable line post reinforced concrete footing with a new sleeve; engineer may allow abandoning of old concrete base and installation of new base immediately adjacent to damaged base; high tension cable system

606-99.02 R&R LINE POST IN EXIST SLEEVE HT
Remove and replace steel yielding cable line post in an existing ground sleeve mounted in a concrete footing; includes new delineator for top of post; high tension cable system

606-99.02 R&R LINE POST IN ROCK HT
Remove and replace line post in rock, low tension guard cable system

606-99.02 R&R TOP/MID/OR BOTTOM CABLE END ASSY HT
Remove and replace the top, middle, or bottom cable end assembly at a CCT terminal; bottom assembly is 41’-9” long; middle assembly is 48’-0” long; top assembly is 54’-3” long; includes all hardware to fully replace the cable end assembly; high tension cable system

606-99.02 REALIGN LINE POST 3/S
Realign line post, 3-strand guard cable system

606-99.02 RETENSION HIGH TENSION CABLES 3/S HT
Retension all 3 strands of 3-strand high tension guard cable system; item includes written documentation on a tension log form provided to the engineer; includes check and adjustment of all end assemblies on both ends of a cable run; high tension cable system

606-99.02 SPLICE 3/4 INCH CABLE 1/S
Splice one 3/4 inch cable. Cut existing cable, and splice new cable to replace existing damaged high tension cable; a splice includes clamps or torpedo cable splices to fully develop the strength of the cable.

606-99.03 3/4 INCH CABLE 1/S HT
Furnish 3/4 inch cable 1/s HT

606-99.03 HIGH TENSION SAFETY FENCE, TL-3
Furnish and install new TL-3 High Tension Safety Fence

606-99.03 HIGH TENSION SAFETY FENCE, TL-4
Furnish and install new TL-4 High Tension Safety Fence

HIGH TENSION GUARD BARRIER REPAIR AND REPLACEMENT - GIBRALTAR

202-99.03 REMOVE GUARD CABLE 3-STRAND
Remove 3-strand guard cable system

606-41.10 ANCHOR ASSEMBLY, GUARD CABLE 3-STRAND
Furnish and install anchor assembly, 3-strand guard cable system

606-41.11 ANCHOR ASSEMBLY, GUARD CABLE 3-STRAND TO GUARDRAIL TRANSITION
Furnish and install anchor assembly to guardrail transition, 3-strand guard cable system

606-99.02 ATTACH CABLES TO TL-3 POST 3/S HT - GIBRALTAR
Includes all hardware necessary to attach or reattach up to 3 cables to one TL-3 line post or anchor post; high tension cable system

606-99.02 ATTACH CABLES TO TL-4 POST 3/S HT - GIBRALTAR
Includes all hardware necessary to attach or reattach up to 3 cables to one TL-4 line post or anchor post; high tension cable system

606-99.02 ANCHOR POST
Furnish and Install Anchor Post

606-99.02 ANCHOR TERMINAL FITTING
Furnish and Install Anchor Terminal Fitting

606-99.02 ATTACH NEW CABLE RELEASE POST
Furnish and Install Cable Release Post and attach cables

606-99.02 REATTACH EXIST CRP ANCH POST TO BASE - GIBRALTAR
Reattach an existing undamaged cable release post (CRP) to base

606-99.02 CABLE SPLICE TURNBUCKLE
Furnish and Install Cable Splice Turnbuckle

606-99.02 R&R ANCHOR POST 3/S
Remove and replace anchor post, 3-strand guard cable system

606-99.02 R&R LINE POST IN ROCK HT

Remove and replace line post in rock, high tension guard cable system

606-99.02 R&R LINE POST 3/S
Remove and replace line post, 3-strand guard cable system

606-99.02 R&R LINE POST CONC FOOTING W/SLEEVE HT - GIBRALTAR
Remove and replace steel yielding cable line post reinforced concrete footing with a new sleeve; engineer may allow abandoning of old concrete base and installation of new base immediately adjacent to damaged base; high tension cable system

606-99.02 REALIGN LINE POST HT
Realign line post, high tension guard cable system

606-99.02 REPLACE GUARD CABLE DELINEATOR
Replace delineator on one side of a guard cable post. (Note: Guard cable placed in the median shall have delineators facing both directions of traffic.)

606-99.02 RETENSION HIGH TENSION CABLES 3/S HT
Retension all 3 strands of 3-strand high tension guard cable system; item includes written documentation on a tension log form provided to the engineer; includes check and adjustment of all end assemblies on both ends of a cable run; high tension cable system

606-99.02 SPLICE 3/4 INCH CABLE 1/S
Splice one 3/4 inch cable. Cut existing cable, and splice new cable to replace existing damaged high tension cable; a splice includes clamps or torpedo cable splices to fully develop the strength of the cable.

606-99.02 TERMINAL POST #1/WEAK
Furnish and Install Terminal Post #1/WEAK

606-99.02 TERMINAL POST #2/WEAK
Furnish and Install Terminal Post #2/WEAK

606-99.02 TL-3 TERMINAL POST #3&4/WEAK
Furnish and Install TL-3 Terminal Post #3&4/WEAK

606-99.02 TL-4 TERMINAL POST #3&4/WEAK
Furnish and Install TL-4 Terminal Post #3&4/WEAK

606-99.02 TL-3 LINE POST DRIVEN
Furnish and Install TL-3 line post driven, high tension guard cable system

606-99.02 TL-3 LINE POST SOCKETED
Furnish and Install TL-3 line post socketed, high tension guard cable system

606-99.02 TL-4 LINE POST DRIVEN

Furnish and Install TL-4 line post driven, high tension guard cable system

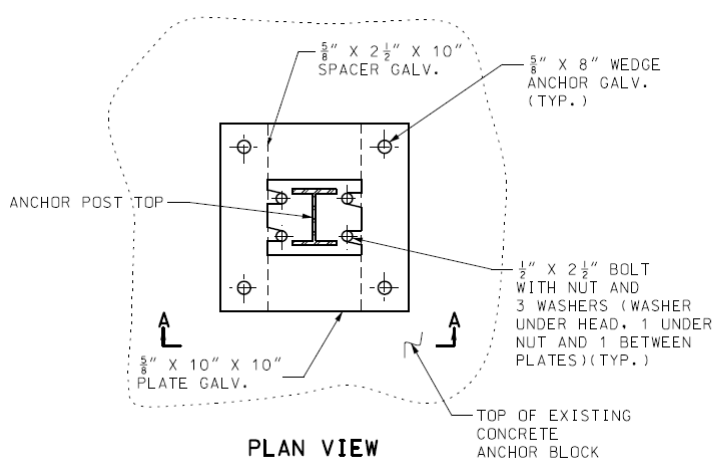
606-99.02 TL-4 LINE POST SOCKETED
Furnish and Install TL-4 line post socketed, high tension guard cable system

606-99.03 3/4 INCH CABLE 1/S HT
Furnish 3/4 inch cable 1/s HT

606-99.03 HIGH TENSION SAFETY FENCE, TL-3
Furnish and install new TL-3 High Tension Safety Fence

606-99.03 HIGH TENSION SAFETY FENCE, TL-4
Furnish and install new TL-4 High Tension Safety Fence

KK. Retrofit Slip Base Plate Detail



PLAN VIEW

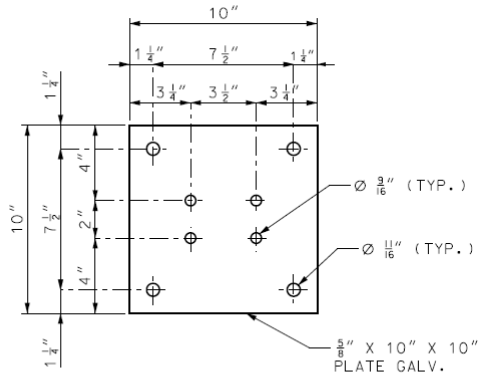
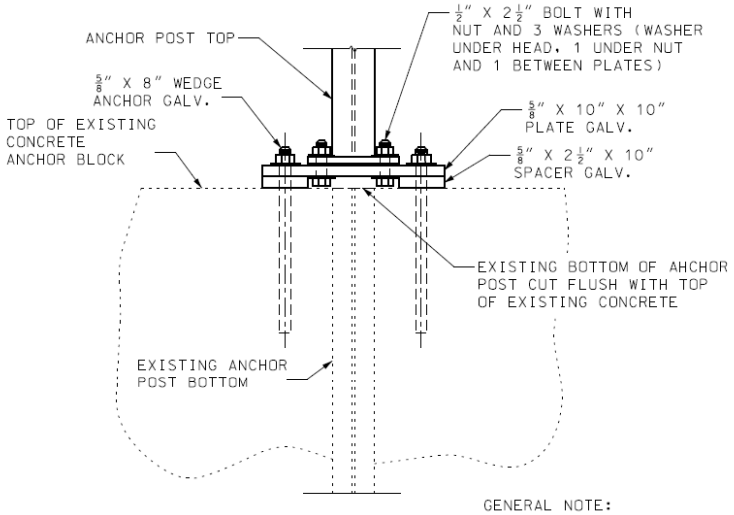
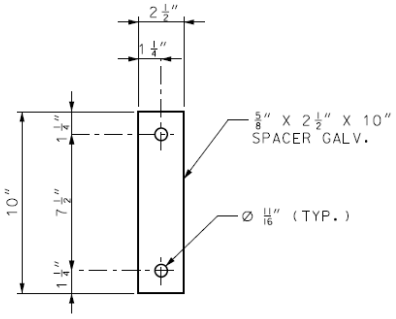


PLATE
ONE PER ANCHOR



SECTION A-A



SPACER
TWO PER ANCHOR

GENERAL NOTE:

PAYMENT WILL BE CONSIDERED FULL COMPENSATION FOR ALL LABOR, EQUIPMENT, AND MATERIAL INCLUDING PLATES, SPACERS, POSTS, AND OHER HARDWARE NECESSARY FOR REPAIRING THE GUARD CABLE ANCHOR POST. PAYMENT FOR THE CUTTING AND REMOVAL OF THE EXISTING POST WILL BE CONSIDERED INCLUDED IN THE COST OF THE ANCHOR POST REPAIR.

RETROFIT SLIP BASE PLATE DETAIL FOR GUARD CABLE ANCHOR POST REPAIR

LL. Guardrail Compliance Requirements

1.0 Effective July 1, 2016 all new end terminals and end terminal repairs on routes shall be MASH Crashworthy End Terminals.

All new guardrail installations shall use Midwest Guardrail System (MGS) in lieu of Type A Guardrail. For guardrail repairs, Type A or MGS guardrail may be used as determined by the Engineer.

MM. Grading for Crashworthy End Terminal

1.0 Description. This work shall consist of all grading necessary to meet or exceed the Alternate Grading limits for MASH crashworthy End Terminals as shown on Standard Drawing 606.81, including furnishing and placing the fill material and mobilization of equipment. The graded area for the end terminal shall be sloped no greater than 10:1 away from the edge of pavement or shoulder. Grading shall include constructing a 2:1 or flatter slope from the grading limits shown on the standard drawing to the existing slope.

1.1 Grading for Crashworthy End Terminal (GCET) will not be used for locations where the Engineer estimates more than 15 cubic yards of material per end terminal will be required or where constructing a 2:1 or flatter slope from the grading area to the existing slope is deemed to be infeasible. When either of the aforementioned conditions applies, the work is considered beyond the scope of this contract unless both parties agree to a negotiated settlement to proceed with performing the work. The Engineer may also decline to utilize GCET for any other reasons.

1.2 Completion of the GCET work may be done concurrently with the repair of the end terminal or may be postponed by the contractor for a maximum of 30 calendar days from the notice to proceed date specified on the job order. Failure to complete the grading work within the limit specified herein will result in liquidated damages as specified elsewhere in this contract.

2.0 Materials. The fill material used by the contractor shall be rocky in nature, such as crushed stone, base rock, or other granular type material approved by the Engineer. Limestone screenings, sand and other fine materials that are highly erodible shall not be used for fill material. Large rock, not to exceed a maximum nominal size of 8”, may be used, but shall be gap-graded to minimize voids. When the size of the rock used exceeds 3” in diameter, all voids in the rock fill shall be filled with granular material of 1” size or less.

2.1 Material shall not be obtained from Commission right of way. Material obtained from a contractor-furnished borrow shall be in accordance with 203.3.

3.0 Construction. The rocky fill material shall be placed in accordance with this provision and as stated herein. Existing vegetative material shall be removed prior to adding fill material. Compactive effort and construction methods shall be performed to the extent that the final 10:1 platform has sufficient stability to support a standard unloaded dump truck without sliding of the material or rutting of the platform in excess of 1” in depth. Proof rolling by the contractor with an unloaded dump truck may be required upon request by the Engineer at no additional cost to the Commission. Benching of the existing slope may be required to ensure the material has a stable

foundation to comply with this provision. The final surface of the graded area shall be uniform and true to grade.

4.0 Method of measurement. No final measurement will be made for the volume of material used for GCET. A preliminary estimate of the amount of fill will be made by the Engineer for the purpose of determining if GCET shall be specified. The job order issued by the Engineer will indicate the need for GCET when, in the opinion of the Engineer, the existing terrain at the end terminal does not meet or exceed the alternate grading limits for MASH crashworthy end terminals as shown on Standard Drawing 606.81 and the Engineer estimates the grading work needed to meet the standard will not exceed 15 CY of material.

5.0 Basis of Payment. A lump sum payment will be made for each end terminal that requires GCET, as determined by the Engineer. Payment for this work shall be completely covered by the fixed unit price for GRADING FOR CRASHWORTHY END TERMINAL multiplied by the Adjustment Factor.

5.1 Payment for traffic control will not be duplicated when the contractor performs the GCET work separate from the repair of the end terminal.

NN. Weekly Reconnaissance

1.0 The contractor shall perform inspections for damage to the guardrail and guard cable of the routes below on a weekly or bi-weekly schedule based on the route. If damage has occurred to the guardrail or guard cable the contractor shall perform the following activities:

1. Document the damage discovered utilizing the Guardrail and Guard Cable Itemized Repair worksheet. The damage location, direction and detail shall be recorded on the work sheet.
2. Itemize the repairs to be made using bid items and descriptions consistent with the contract. These bid items shall be the initial estimate for repair, adjustments to this estimate may be made during work order generation or upon discovery of additional damage in the field.
3. Provide a minimum of two (2), high resolution color digital photographs, documenting the discovered damage, for each itemized repair worksheet.
4. Damaged area or item shall be prominently painted at the limits of the repair utilizing Fluorescent Pink marking paint. This will provide recognition that the damage has been identified and a work order is in progress.
5. A No Damage Report shall be filled out and submitted when a route is inspected and no damage is discovered.

1.1 All documentation generated during each day of inspection shall be submitted to the Project Office by 9:00 a.m. the next business day. This information shall be submitted electronically via email to the Project Office for timely generation of work orders for repair.

The Project Office shall reserve the right to make adjustments on work orders, based on information provided from the inspection, and determine the priority of repair (Emergency or Non-Emergency), timing of the repair (Day, Night, Weekend) and any additional work required consistent with the contract.

The contractor will be notified of the need for work by written notice on a location by location basis.

1.2 The following routes shall be inspected **weekly** for damaged guardrail and guard cable:

Ray County
- MO 210 From the Clay County line to the Saline County line
- MO 13 From MO 10 to the Lafayette County

Lafayette County
- I-70 From the Lafayette County line to the Saline County line
- US 24 From the Jackson County Line to the Carrol County line
- MO 13 From the Ray County line to the Johnson County line

Johnson County
- US 50 From the Jackson County line to the Pettis County line
- MO 13 From the Ray County line to the Johnson County line

Saline County
- I-70 From the Lafayette County line to Cooper County line
- US 65 From the Lafayette County line to the Pettis County line

Pettis County
- US 50 From the Johnson County line to the Moniteau County line
- US 65 From the Saline County line to the Benton County line

1.2 Basis of Payment. Weekly Reconnaissance will be incidental to the contract and "No Direct Pay".