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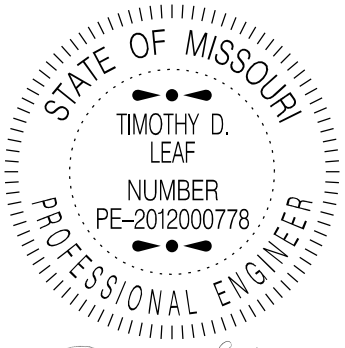

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TIMOTHY D. LEAF - CIVIL
MO-PE-2012000778

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 W. CAPITOL AVE.
JEFFERSON CITY, MO 65101
Phone (888) 275-6636

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

JOB NO. JKU0410
Jackson/Cass County, MO
Date Prepared: 8/26/2024

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

A. CONSTRUCTION REQUIREMENTS

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

2.0 Construction Requirements. The plans and the asbestos and lead inspection report for the existing structure(s) are included in the contract in the bridge electronic deliverables zip file for informational purposes only.

2.1 In order to assure the least traffic interference, the work shall be scheduled so that a lane closure is for the absolute minimum amount of time required to complete the work. A lane shall not be closed until material is available for continuous construction and the contractor is prepared to diligently pursue the work until the closed lane is opened to traffic.

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

2.3 Qualified special mortar shall be a qualified rapid set concrete patching material in accordance with Sec 704. A qualified rapid set concrete patching material will not be permitted for half-sole repair, deck repair with void tube replacement, full depth repair, modified deck repair and substructure repair (formed) unless a note on the bridge plans specifies that a qualified special mortar may be used.

2.4 Provisions shall be made to prevent any debris and material from falling onto the roadway. If determined necessary by the engineer, any debris and material that falls below the bridge outside the previously specified limits shall be removed as approved by the engineer at the contractor's expense. Traffic under the bridge shall be maintained in accordance with the contract documents.

2.5 Any damage sustained to the remaining structure as a result of the contractor's operations shall be repaired or the material replaced as approved by the engineer at the contractor's expense.

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

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

2.8 SSPC-SP2 and SSPC-SP3 surface preparation shall be in accordance with the environmental regulations in Sec 1081 and collection of residue shall be in accordance with Sec 1081 for collection of blast residue. SSPC-SP6, SSPC-SP10 and SSPC-SP11 surface preparation shall be in accordance with the approved blast media and environmental regulations in Sec 1081 and collection of blast residue shall be in accordance with Sec 1081.

3.0 Coating Information.

3.1 Slab Drains and Stay-In-Place Forms. The stay-in-place forms, slab drains and slab drain brackets shall not be recoated, overcoated or damaged during the painting operation. Any portion of the slab drain bracket that is blast cleaned shall be recoated with System G. Any damage sustained as a result of the contractor's operations shall be repaired or the material replaced as approved by the engineer at the contractor's expense.

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

MoDOT - Design Division - Environmental Section
P.O. Box 270
105 W. Capitol Ave., Jefferson City, MO 65102
Telephone: (573) 526-4778

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

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

4.0 Method of Measurement. No measurement will be made.

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

B. GRIND SURFACE DEFORMITIES

1.0 Description. This provision contains construction requirements for grinding surface deformities and repairing gouges as documented the contract plans.

2.0 Construction Requirements. Steel surface deformities in the region of the impact damage shall be ground smooth and repaired prior to application of heat straightening.

2.1 Gouges, nicks and similar surface deformities in the existing structural steel shall be repaired as shown on the contract plans; either a Gouge Repair Type 1 or Gouge Repair Type 2. Gouges, nicks, similar surface deformities and welds included as part of the repair in the existing structural steel shall be ground smooth and flush to the adjacent steel to remove potential points of stress risers where directed by, and to the satisfaction of, the engineer.

3.0 Method of Measurement. No measurement will be made.

4.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract lump sum price for Grind Surface Deformities.

C. HEAT STRAIGHTENING

1.0 Description. This work shall consist of performing heat straightening of the damaged steel members as shown on the contract plans and in accordance with this job special provision.

2.0 Experience Requirements. The contractor shall meet the experience requirements of either Experience Option 1 or Experience Option 2.

2.1 Experience Option 1.

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

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

2.2 Experience Option 2.

2.2.1 The contractor shall have at least ten years of experience in conducting heat straightening repairs for damaged steel structures and shall have conducted an average of at least ten heat straightening projects per year during the preceding three-year period.

2.2.2 Technicians involved in the conduct of heat applications during heat straightening shall have at least three years of experience on a minimum of 15 projects.

2.2.3 Experience documentation for both contractor and technicians shall include: date of project, location, bridge owner, number and type of members straightened, and duration of project.

3.0 Equipment.

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

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

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

4.0 Construction Requirements.

4.1 Damage Assessment.

4.1.1 The contractor shall inspect areas to be straightened for cracking. Any cracking detected shall be brought to the attention of the engineer. Methods of crack detection shall be one or more of the following methods as applicable:

a) Visual inspection.

b) Liquid penetrant examination in accordance with ASTM E 165.

c) Magnetic particle examination in accordance with ASTM E 709.

d) Radiographic testing in accordance with the Bridge Welding Code as specified in Sec 1080.3.3.4 and 1080.3.3.5.

e) Ultrasonic testing in accordance with the Bridge Welding Code as specified in Sec 1080.3.3.4 and 1080.3.3.5.

4.1.2 If cracking exists, the contractor shall determine whether the cracks shall be repaired before or after straightening. All identified cracks in welds shall be repaired by a certified welder in accordance with Sec 712.6.

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

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

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

4.1.6 The contractor shall prepare and submit a work plan to the engineer for approval 14 days prior to initiating repairs. The engineer's acceptance of the plan shall not relieve the contractor of the responsibility for obtaining satisfactory results.

4.1.7 Upon completion of straightening, the steel surfaces shall be carefully inspected for the presence of cracks or other signs of distress. Any repair work and retesting of the repair work required as a result of this inspection will be paid for in accordance with Sec 109. This shall not relieve the contractor from responsibility to repair any damage caused by this work at the contractor's expense. Any delay or inconvenience caused by this inspection requirement will be non-compensable and effect on time of performance non-excusable.

4.2 Heat Application.

4.2.1 Prior to heat application, the determination of existing paint removal shall be made so as not to damage any of the surrounding existing paint that is to remain after the heating of the steel. See other contract documents to determine if existing paint is lead-based or non-lead based. The heating of the steel shall not damage any of the paint that is to be used in place and shall not create an environmental air quality issue.

4.2.2 The heat application shall be in accordance with Sec 1080.3.3.14.

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

(a) Temperature sensitive crayons.

(b) Pyrometer.

(c) Infrared non-contact thermometer.

4.2.4 The material shall be heated in a single pass following the specified pattern and allowed to cool to below 250°F prior to re-heating.

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

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

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

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

4.3 Application of Jacking Forces.

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

4.3.2 Magnitude of Jacking Forces.

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

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

4.3.3 The contractor shall determine and document the maximum jacking force for each damage location and the proposed sequence of jacking and heating. Copies of the documentation shall be submitted to the engineer for acceptance 14 days before initiating repairs. Modifications due to changing conditions shall be submitted to the engineer. The maximum jacking force may be controlled by measuring the deflection resulting from the jacking force.

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

4.4 Field Supervision of Repairs.

4.4.1 Jacking forces shall be monitored to ensure that limits are not exceeded.

4.4.2 Heating temperatures shall be monitored to ensure compliance with specified limits.

4.5 Tolerances.

4.5.1 The dimensions of heat straightened structural members shall be in accordance with the following tolerances:

Member Type	Recommended Minimum Tolerance [1,2]
Girders/beams, truss members, or columns: Within 10 feet or less Overall sweep excluding impact point At impact point	 1/4 inch 1/2 inch 3/4 inch
Local web deviations	d/100 but not less than 1/4 inch
Local flange deviations	b/100 but not less than 1/4 inch
[1] Units of member depth, d, and flange width, b, are inches [2] Tolerances for curved or cambered members should account for the original shape of the member	

4.5.2 The above tolerance limits may be relaxed with approval from the engineer based on one or more or the following considerations:

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

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

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

4.6 Damage Due to Contractor's Operations.

4.6.1 Care shall be exercised in the straightening operations to prevent additional damage to the members.

4.6.2 If, in the judgement of the engineer, the contractor's operations damage the members or the remaining structure, the contractor shall be required to modify the method of operations and make all necessary repairs or material replacement as approved by the engineer at the contractor's expense.

4.6.3 The work shall be performed by methods not likely to produce fracture or other injury to the steel members being straightened.

5.0 Method of Measurement. No measurement will be made.

6.0 Basis of Payment. Payment for the above described work including all material, labor, tools, equipment, and all incidentals necessary to complete this item of work will be considered completely covered by the contract lump sum price for Heat Straightening.

D. NON-DESTRUCTIVE TESTING

1.0 Description. This work shall consist of performing non-destructive testing on the diaphragm connection plates and welds to be re-used and any other welds/members as directed by the engineer. Steel surface preparation for recoating and straightening of the damaged beam shall be completed before this work is started.

2.0 Construction Requirements.

2.1 After the surface preparation, the steel that is to be tested will be inspected by the engineer. In addition to this inspection and if directed by the engineer, within the limits of heat straightening the adjacent base metal shall have non-destructive (magnetic particle) testing performed. Also, for length impacted by the heat straightening of the members, any appurtenances (stiffener/diaphragm connection plates) welded to the members shall be tested. The engineer will also determine if there is a need for any additional testing of the diaphragm welds to the adjacent members in this area. Non-destructive testing shall be performed by an acceptable testing agency. The contractor shall provide the Engineer with documentation of the testing agency and the qualifications of personnel performing the testing. The documentation and qualifications shall be submitted to the State Bridge Engineer for acceptance. Personnel performing the tests shall be qualified for SNT-TC-1A Level II.

2.2 With the approval of the engineer one of the following methods may be used in lieu of magnetic-particle testing:

(a) Liquid penetrant examination as described in ASTM E165 (1994 or latest edition).

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

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

2.3 The length of weld to be tested and the adjacent base metal shall be cleaned of all rust prior to the testing.

2.4 Any cracks discovered by testing, regardless of length, shall be marked and reported to the engineer. All repairs shall be made by a certified welder in accordance with Sec 712.6. Any repair work and retesting of the repair work required, as a result of this inspection, will be paid for in accordance with Heat Straightening. This shall not relieve the contractor from responsibility to repair any damage caused by this work at the contractor's expense. Any delay or inconvenience caused by this inspection requirement will be non-compensable and effect on time of performance non-excusable.

3.0 Method of Measurement. No measurement will be made.

4.0 Basis of Payment. Payment for the above described work, including all material, equipment, labor and any other incidental work necessary to complete this item, will be considered completely covered by the contract lump sum price for Non-Destructive Testing.

E. REMOVAL OF DIAPHRAGM

1.0 Description. This provision contains construction requirements for the removal of diaphragm(s) as shown on the contract plans.

2.0 Construction Requirements. The existing diaphragm(s) shall be removed to the limits as shown on the contract plans.

2.1 The removal shall include the diaphragm(s) and connection plate(s) to beams/girders as shown in the plans.

2.2 The Contractor shall carefully remove the diaphragm(s) to avoid damage to any other components of the bridge.

2.3 The connection plates as shown in the plans may be used in-place if the non-destructive test of the welded connection shows no defects and the member is not deformed. See Job Special Provision for Non-Destructive Testing.

2.4 At the location of the connection plate(s) removal, the steel shall be ground smooth.

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

3.0 Method of Measurement. Measurement will be made per each diaphragm removed.

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