North Dakota Department of Transportation

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Director

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November 9, 2017

ADDENDUM 2 – JOB 9

TO: All prospective bidders on project BRC-CNOC-2416(069), Job No. 9 scheduled for the November 17, 2017 bid opening.

The following request for proposal revision shall be made:

Request for Proposal Revisions:

Remove and Replace the Special Provision PREFABRICATED VEHICLULAR BRIDGE dated 11/9/2017.

This addendum is to be incorporated into the bidder's proposal for this project.

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Enclosure

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION (SP)

PREFABRICATED VEHICULAR BRIDGE

PROJECT BRC-CNOC-2416(069)

1.0 GENERAL

1.1 Scope

These specifications are for fully engineered multi-piece modular bridge(s) of steel construction with and are minimum standards for design and construction. The work included under this item consists of design, fabricating, finishing and transporting the steel modular beam bridge superstructure(s) including bearings.

1.2 Definitions

Owner:	Entity who ultimately will own the bridge(s).
Engineer:	Entity who will be representing the Owner.
Contractor:	Entity who will be installing, and/or purchasing, the bridge(s).
Bridge Manufacturer:	Firm who will be supplying the bridge(s) in accordance with these Special Provisions.

1.3 Qualified of Bridge Manufacturer

Qualified Bridge Manufacturers must have at least 5 years experience fabricating these types of structures and must have an up to date certification by AISC as a Certified Bridge Fabrication - Intermediate (Major) with Fracture Critical Endorsement. All products are to be fabricated by the suppliers, no brokers are allowed.

1.4 Bridge Design Professional and Submittals

The Bridge Manufacturer must utilize an engineer who is experienced in bridge design to perform all engineering related task and design. The engineer is required to have a minimum of 10 years experience in bridge design and be a currently licensed civil or structural engineer in the State of North Dakota.

Prepare engineering drawings, 11x17 format, and submitted to the Contractor or Owner for their review after receipt of the order. Submit drawings that are unique drawings, prepared to illustrate the specific portion of the bridge being fabricated. Show all relative design information such as member size, ASTM/AASHTO material specification, dimension necessary to fabricate and required welding clearly on the drawings. Cross reference details and sheet numbers on all drawings. Stamp, sign and date all drawings by the Bridge Design Professional.

Prepare structural calculations for the design of the bridge superstructure and submit to the Owner for their review after receipt of the order. Calculations include complete design, analysis and code checks for the controlling member, connectivity and support conditions, deck design, deflection checks, bearings and all splices. Stamp, sign and date all structural calculations by the Bridge Design Professional.

2.0 APPLICABLE CODES AND STANDARDS

2.1 Governing Specifications

Design the bridge in compliance with the LRFD Bridge Design Specifications, latest edition, by AASHTO. Reference the appropriate sections for all formulas and calculations

2.2 Other Reference Codes, Specifications and Standards

AISC, Steel Construction Manual, Latest Edition

American Welding Society, Structural Welding Code, D1.5, Latest Edition

ASCE/SEI 7 Minimum Design Loads for Buildings and Other Structures, Latest Edition

National Design Specification for Wood Construction, ANSI NDS-Latest Edition

3.0 BRIDGE GEOMETRY

3.1 Span Length

The bridge span length is 25’-8” (straight line dimension) as measured from end to end of the bridge structure. See contract drawings for additional details.

3.2 Width

The bridge width is 28’-0” and as measured from the inside face to inside face of rail. The bridge outside width is 30’-0” as measured from the outside edge to edge of the bridge structure. See contract drawings for additional details

3.3 Lower Steel Clearance

Determine the distance from the top of the deck (measured from the highest point of the deck) to the bottom of any steel member. 2’-0 13/16” was assumed as the height of the beams with bearings.

3.4 Rail Height

Design and install top of rail a minimum 2'-3" above the top of the wearing surface for vehicular traffic only.

3.5 Camber

Design the bridge to have a vertical camber dimension at the mid-span equal to 100% of the anticipated full dead load deflection. If beam mill camber is adequate to accommodate full dead load deflection, then indicate so on drawings.

4.0 STRUCTURAL DESIGN LOADS

4.1 Dead Load

Design the bridge structure for the total bridge weight plus the initial 4” of gravel wearing

surface.

4.2 Vehicle Load (VL)

Design the bridge for 2 lanes of traffic, supporting HL-93 vehicle plus Dynamic Load Allowance.

The design ADTT (Average Daily Truck Traffic) is < 100.

4.3 Wind Load (WS)

Design the bridge for a 50 pounds per square foot wind load applied horizontally against the height of the stringer plus the side dam.

4.4 Fatigue Load (FL)

Use fatigue loading as specified in AASHTO LRFD Bridge Design Specifications, current edition.

4.5 Railing Loads (RL)

Design the traffic rail in accordance with AASHTO LRFD Bridge Design Specifications, current edition, Appendix A13.2. Use a TL-3 rating meeting NCHRP Report 350 standards.

4.6 Combination of Loads

Follow all load combinations and load factors as specified in AASHTO LRFD Table 3.4.1-1.

5.0 STRUCTURAL DESIGN CRITERIA

5.1 Deflections

Limit the vehicle load deflection limit to 1/800 of the span length, calculated in accordance with AASHTO LRFD Section 3.6.1.3.2.

5.2 Fracture

Provide main beams meeting CVN values of 20 ft-lbs @ 40-degrees Fahrenheit.

5.3 Wheel Load Distribution

Design the bridge deck to support the maximum wheel load from the design vehicle.

6.0 MATERIALS OF CONSTRUCTION

6.1 Structural Steel

Use ASTM A588 (weathering) for all structural steel.

6.2 Deck Material

Use a 9-gage minimum decking material, placed transverse across the width of the bridge. The height of the deck was assumed to be 4.25”. Adjust the elevation of the

abutment accordingly for other deck thicknesses. Use planks that are 12-13/16" with one 13/16" overlapping leg. Manufacture decking from pre-galvanized steel, ASTM A653 Grade 50 Class with a minimum 2 oz galvanized coating, Fy=50 ksi. Decking is to be welded to top flange of stringers and to adjoining sheets. Welds to be treated with organic zinc-rich coating meeting the material and performance requirements of ASTM A 780 (Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings).

6.3 Wearing Surface

Detail the top of the side dam to be able to retain 4" of gravel wearing surface above the top of the steel bridge deck.

6.4 Fasteners

Use ASTM A325 structural bolts and ASTM A563 nuts to field splice, or connect all main members in accordance with the *Specification for Structural Joints using ASTM A325 or A490 Bolts.* Supply one flat hardened washer meeting ASTM F436 with all bolts. Galvanize all bolts, nuts and washers and furnish an amount of 5% in excess of the number required for each size and length.

Any bolts that are non-structural bolts are required to be ASTM A307, ¼" diameter carriage bolts, zinc plated or galvanized.

Use #14 x 1" Zinc Plated Hex Washer Screws self-drilling fasteners.

Use power actuated sheet metal fasteners or approved equal.

6.5 Traffic Rail

Rail to be galvanized steel Thrie-Beam Rail, 10-gage thickness, with flared ends at each end of bridge. Provide a 2-sided crystal reflector tab placed 6'-3" on center.

7.0 FINISH

7.1 Blast Cleaning

Blast clean all exposed surfaces of structural steel seen from the deck or from the outside and bottom of the structure in accordance with the Steel Structures Painting Council (SSPC), Surface Preparation Specification No. 7, latest edition, (SSPC-SP7), Brush-Off Blast.

8.0 BEARINGS

8.1 Bearing Plates

Use bearing plates under the stringers at both ends of the bridge and design the bearing plates to support the anticipated reactions and thermal movement. Provide bearing plate material that meets ASTM A588. The Bridge Manufacturer should design the bearing plates such that one end of the bridge is fixed and the other end allows for expansion. All bearing plates should have a minimum of two holes to receive anchor rods (one on each side of the stringer). Use a minimum 3" slotted hole for the expansion base plates to allow for expansion and contraction. Ship all bearing plates loose for field installation by others and field welded to the stringers by an AWS D1.5 certified welder.

8.2 Elastomeric Pads

Use elastomeric pads that are made of 60-Durometer Neoprene and are to be used only as leveling pads. Elastomeric pads do not meet AASHTO LRFD design criteria. Place the bearing plates on top of elastomeric pads.

9.0 FABRICATION

9.1 Welding

Ensure all welding procedures and weld qualification test procedures to the provisions of AWS D1.5, Bridge Welding Code, latest edition. Use filler metal in accordance with the applicable AWS Filler Metal Specification, and that matches the corrosion properties of the base metal.

9.2 Welders

All welders are required to be qualified for each process and position used while fabricating the bridge. Complete qualification tests in accordance with AWS D1.1. Keep all weld qualifications and records in accordance with the Fabricator's Quality Assurance Manual which has been approved by AISC.

9.3 Bolted Splices

For shipping purposes, the bridge may be fabricated in sections. Field assemble sections using bolted connections and or field welding as indicated on the drawings. Tighten all structural bolts by the Turn-of-the-Nut Method.

10.0 QUALITY CONTROL

10.1 AISC Certification

Fabricate the bridge in a shop owned by the Bridge Manufacturer. This facility is required to maintain up to date certification by AISC as a Certified Bridge Fabrication - Intermediate (Major) with Fracture Critical Endorsement.

10.2 Certified Weld Inspector

The bridge manufacturer must employ a Certified Weld Inspector (CWI), with endorsement by AWS QC1. A CWI is required to be present during the complete fabrication of the bridge. Provide written documentation from the CWI that the bridge has been fabricated in accordance with these specifications and the approved design drawings.

10.3 Documentation

Make Material Certifications available for review for all materials within the bridge. Traceability of heat numbers is required for all steel.

Make documentation showing the performance of all critical quality checks available for review by the Engineer or Owner.

10.4 Non-Destructive Testing

Visually inspect all welds within the structure for conformance to size, under cut, profile and finish.

10.5 Owner's Quality Assurance

The Owner may employ a 3rd party quality assurance representative to randomly observe fabrication activities during production of the bridge. The Owner's QA representative must be granted access to the production facility to review material testing, inspection of welds, installation of decking/railings and other related activities.

11.0 DELIVERY AND ERECTION

11.1 Delivery

Deliver via truck to a location nearest the site which is accessible to normal over-the-road equipment. All trucks delivering bridge materials will need to be unloaded at the time of arrival. If the erection Contractor needs special delivery or delivery is restricted, notify the Bridge Manufacturer prior to bid date. This includes site issues which may prevent over-the-road equipment from accessing the site. Determining the length of bridge section which can be delivered is the responsibility of the Contractor. Communicate this information to the Bridge Manufacturer prior to the bid date.

11.2 Installation & Lifting Procedures

The Bridge Manufacturer will provide a standard typical written procedure for lifting and splicing the bridge. All actual methods, equipment and sequence of erection used are the responsibility of the Contractor. Lift each section from the four lifting lugs provided. Attach rigging to lifting lugs with adequately sized rigging hardware. Rigging materials and methods are the responsibility of the Installer. Capacity of the lifting lug is 24,000 pounds at a 45-degree lift angle.

11.3 Loose Items

Post and Rails will be shipped loose for field installation.

Bearing Plate will be shipped loose for filed welding to the bottom flange of the stringers.

Perform field welding using an AWS Certified Welder.

12.0 WARRANTY

The Bridge Manufacture is required to submit a warranty that their steel structure(s) to be free of design, material, and workmanship defects for a period of ten years from the earlier of the date of delivery or from 60 days after final fabrication. Wood is excluded under this warranty. This warranty does not cover defects in the bridge caused by abuse, misuse, overloading, accident, improper maintenance, alteration, or any other cause not the result of defective materials or workmanship. This warranty is void unless Owner's records can be supplied which indicate compliance with the minimum guidelines specified in the inspection and maintenance procedures. A warranty for the paint, galvanizing and other special coatings is required from the coating manufacturer and is not covered by the Bridge Manufacturer. The exclusive remedy for defects under this warranty is repair or replacement. The Bridge Manufacturer is not liable for any consequential or incidental damages for breach of any express or implied warranty on their structures. Use of de-icing or dust prohibitive chemicals or salts to any part of the bridge structure will void this warranty.