
Addendum # 1 -- 13-025.2-CIP -- E-Mail Coversheet Muirfield Drive / NFIR Pedestrian Bridges

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Please sign, date and return by e-mail to hgeorge@dublin.oh.us to verify receipt of this addendum. Attach signed copy of addendum to bid package when submitting a bid.

Received by: _____ Date: _____



Date of Addendum
Jun 16, 2014

City of Dublin -- Division of Engineering
5800 Shier-Rings Road Dublin OH 43016
Phone (614) 410-4640 Fax (614) 761-650

**ADDENDUM NO. 1
to the contract for**

**Muirfield Drive/North Fork Indian Run Pedestrian Bridges
13-025.2-CIP**

Bid Date: June 20, 2014

TO PROSPECTIVE BIDDERS: The following changes shall be made part of the contract documents for this project:

SUPPLEMENTAL SPECIFICATIONS

Add the following notes:

**ITEM SPECIAL - STRUCTURE MISC.: 67' PRE-ENGINEERED HALF THROUGH
TRUSS PEDESTRIAN BRIDGE, H TRUSS DESIGN**

1.0 General

1.1. The AASHTO LRFD Guide Specification for the Design of Pedestrian Bridges, December 2009 shall apply except as noted.

1.2. Design loads

1.2.1. Live Loads

1.2.1.1. Pedestrian Live Load

Main Members: Main-supporting members, including girders and trusses, shall be designed for a pedestrian live load of 85 pounds per square foot (psf) of bridge walkway area. The pedestrian live load shall be applied to those areas of the walkway so as to produce maximum stress in the member being designed.

Secondary Members: bridge decks and supporting floor systems, including secondary stringers, floor beams, and their connections to main supporting members, shall be designed for a live load of 85 psf, with no reduction allowed.

1.2.1.2. Vehicle Load

Pedestrian/bicycle bridge shall be designed for an occasional single maintenance vehicle load. This shall be an 8,000 pound vehicle load. The axle spacing shall be 9'- 0" and the wheel spacing 5'- 0" with 3,200 pounds on the front axle and 4,800 pounds on the back axle.

* * * Beginning of Sheet 2 * * *

The maintenance vehicle live load shall not be placed in combination with the pedestrian live load.

A vehicle impact allowance is not required.

1.2.2. Wind Loads

A wind load of the following intensity shall be applied horizontally at right angles to the longitudinal axis of the structure. The wind load shall be applied to the projected vertical area of all superstructure elements, including exposed truss members on the leeward truss.

For Trusses: 75 pounds per square foot

For open truss bridges, where wind can readily pass through the trusses, bridges may be designed for a minimum horizontal load of 35 pounds per square foot on the full vertical projected area of the bridge, as if enclosed.

1.3. Design details

1.3.1. Deflection

Members should be designed so that the deflection due to the service pedestrian live loads does not exceed 1/400 of the length of the span.

The horizontal deflection due to lateral wind load shall not exceed 1/500 of the length of the span.

1.3.2. Vibrations

The fundamental frequency of the pedestrian bridge without live load should be greater than 3.0 hertz (Hz) to avoid the first harmonic. If the fundamental frequency cannot satisfy this limitation, or if the second harmonic is a concern, a dynamic performance evaluation should be made.

In lieu of such evaluation the bridge may be proportioned so that the fundamental frequency shall be greater than

$$F \geq 2.86 \ln (180/W)$$

where \ln is the natural log and W is the weight (kips) of the supported structure, including dead load and an allowance for actual pedestrian

* * * End of Sheet 2 * * *

* * * Beginning of Sheet 3 * * *

live load. Alternatively, the minimum supported structure weight (W) shall be greater than

$$W \geq 180 e^{(-0.35f)}$$

Where f is the fundamental frequency (Hz)

1.3.3. Allowable Fatigue Stress

Allowable fatigue stress ranges for steel members shall be determined from Article 6.6 of the AASHTO LRFD Bridge Design Specifications, except that the allowable fatigue stress ranges for Redundant Load Path structures may be used, regardless of the actual degree of member redundancy. Fatigue provisions need not apply to pedestrian live load stresses for cases where heavy pedestrian loads are infrequent, but shall be considered for wind loads.

1.3.4. Minimum Thickness of metal

The provisions of Article 6 of the Standard Specifications for Highway Bridges shall apply, except that the minimum thickness of closed structural tubular members shall be ¼ inch.

1.3.5. Welded Tubular Connections

Welded tubular connections shall be designed in accordance with the Structural Welding Code-Steel ANSI/AWS D1.1.

2.0 GENERAL FEATURES OF DESIGN

2.1. Width

Bridge width shall be 8' and shall be as measured from the face/face of truss.

2.2. Member Components

All members of the vertical trusses (top and bottom chords, verticals, and diagonals) shall be fabricated from square and/or rectangular structural steel tubing. Other structural members and bracing shall be fabricated from structural steel shapes or square and rectangular structural steel tubing. To provide lateral support for the top flange of open shape stringers (w-shapes or channels), a minimum of one stiffener shall be provided in each stringer at every floor beam location.

* * * End of Sheet 3 * * *

2.3. Camber

The bridge shall have a vertical camber dimension at midspan equal to 100% of the full dead load.

2.4. Finish

All Blast Cleaning shall be done in a dedicated OSHA approved indoor facility owned and operated by the bridge fabricator. Blast operations shall use Best Management Practices and exercise environmentally friendly blast media recovery systems.

To aid in providing a uniformly "weathered" appearance, all exposed surfaces of steel shall be blast cleaned in accordance with Steel Structures Painting Council Surface Preparation Specifications No. 7 Brush-Off Blast Cleaning, SSPC SP7 latest edition.

Exposed surfaces of steel shall be defined as those surfaces seen from the deck and from outside of the structure. Stringers, floor beams, lower brace diagonals and the inside face of the truss below deck and bottom face of the bottom chord shall not be blasted.

3.0 Qualified Suppliers

Each bidder is required to identify their intended bridge supplier as part of the bid submittal. Qualified suppliers must have at least 5 years experience fabricating these type structures.

Pre-approved Manufacturers:

Continental Bridge
9025 Centre Pointe Drive, Suite 400
West Chester, Ohio 45069
513-645-7000
<http://www.conteches.com>

Big R Bridge
P.O. Box 1290
Greeley, CO 80632-1290
800-234-0734
<http://www.bigrbridge.com>

Wheeler Lumber LLC
9330 James Ave. S.
Bloomington, MN 55431
800-328-3986
<http://www.wheeler-con.com/>

Echo Bridge, Inc.
P.O. Box 89
Elmira, NY 14902
607-734-9456
<http://www.echobridgeinc.com>

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Steadfast Bridges Co.
9025 Centre Pointe Drive, Suite 400
West Chester, Ohio 45069
513-645-7000
<http://www.conteches.com>

Cameron Bridge Works
Elmira, NY
607-734-9456
<http://www.cameronbridgeworks.com>

Suppliers other than those listed above may be used provided the engineer or owner's agent evaluates the proposed supplier and approves the supplier 5 days prior to bid opening. The contractor must provide the following documentation, for any proposed supplier who is not pre-approved, at least 10 days prior to bid.

- Product Literature
- All documentation to insure the proposed substitution will be in compliance with these specifications.

This shall include:

- Representative design calculations
- Representative drawings
- Splicing and erection procedures
- Warranty information
- Inspection and Maintenance procedures
- AISC Shop Certification
- Welder Qualifications
- Proposed suppliers must have at least five (5) years experience designing and fabricating these type structures and a minimum of five (5) successful bridge projects, of similar construction, each of which has been in service at least three (3) years. List the location, bridge size, owner, and a contact for reference for each project.

The engineer will evaluate and verify the accuracy of the submittal prior to bid. If the engineer determines that the qualifying criteria have not been met, the contractor's proposed supplier shall be rejected. The engineer's ruling shall be final.

4.0 Welded Tubular Connections

American National Standards Institute / American Welding Society (ANSI/AWS. All welded tubular connections shall be checked, when within applicable limits, for the limiting failure modes outlined in the ANSI/AWS D1.1 Structural Welding Code.

All tubular joints shall be plain unstiffened joints (made without the use of reinforcing plates) except as follows:

* * * End of Sheet 5 * * *

- Where chords, end floor beams and in high profiles the top end struts weld to the end verticals, the end verticals (or connections) may require stiffening to transfer the forces from these members into the end vertical.
- Truss vertical to chord connections.

NOTE: The effects of fabrication tolerances shall be accounted for in the design of the structure. Special attention shall be given to the actual fit-up gap at welded truss joints.

5.0 MATERIALS

5.1. Steel – Bridge members are fabricated from high strength, low alloy, enhanced atmospheric corrosion resistant ASTM A847 cold-formed welded square and rectangular tubing, and ASTM A588, ASTM A606, or ASTM A242 plate and structural shapes (Fy= 50,000psi). The minimum corrosion index of atmospheric corrosion resistant steel, as determined in accordance with ASTM G101, shall be 6.0.

5.2. Decking –

5.2.1. Ironwood IPE Planks

6.0 WELDING

6.1. Welding

Welding and weld procedure qualification tests shall conform to the provisions of ANSI/AWS D1.1 "Structural Welding Code", latest edition. Filler metal shall be in accordance with the applicable AWS Filler Metal Specification (i.e. AWS A 5.28 for the GMAW Process). For exposed, bare, unpainted applications of corrosion resistant steels (i.e. ASTM A588 and A847), the filler metal shall be in accordance with AWS D1.1, Section 3.7.3.

6.2. Welders

Welders shall be properly accredited operators, each of whom shall submit certification of satisfactorily passing AWS standard qualification tests for all positions with unlimited thickness of base metal, have a minimum of 6 months experience in welding tubular structures and have demonstrated the ability to make uniform sound welds of the type required.

7.0 SUBMITTALS

7.1. Submittal Drawings

Schematic drawings and diagrams shall be submitted to the City of Dublin for their review after receipt of order. Submittal drawings shall be unique drawings, prepared to illustrate the specific portion of the work to be done. All relative design information such as member sizes, bridge reactions, and general notes shall be clearly specified on the drawings. Drawings shall have cross referenced details and sheet numbers. All drawings shall be signed and sealed by a Professional Engineer who is licensed in the state of Ohio..

7.2. Structural Calculations

Structural calculations for the bridge superstructure shall be submitted by the bridge manufacturer and Reviewed by the approving engineer. All calculations shall be signed and sealed by a Professional Engineer who is licensed in the state of Ohio. The calculations shall include all design information necessary to determine the structural adequacy of the bridge. The calculations shall include the following:

- All AISC allowable stress checks for axial, bending and shear forces in the critical member of each truss member type (i.e. top chord, bottom chord, floor beam, vertical, etc.).
- Checks for the critical connection failure modes for each truss member type (i.e. vertical, diagonal, floor beam, etc.). Special attention shall be given to all welded tube on tube connections
- All bolted splice connections.
- Main truss deflection checks.
- Deck design.

NOTE: The analysis and design of triangulated truss bridges shall account for moments induced in members due to joint fixity where applicable. Moments due to both truss deflection and joint eccentricity must be considered.

7.3. Welder certifications in compliance with AWS standard qualification tests.

8.0 FABRICATION

8.1. General Requirements

8.1.1. Drain Holes

Provide 1" diameter drain holes at all low points.

8.1.2. Welds

Special attention shall be given to developing sufficient weld throats on tubular members. Fillet weld details shall be in accordance with AWS D1.1, Section 3.9 (See AWS Figure 3.2). Unless determined otherwise by testing, the loss factor "Z" for heel welds shall be in accordance with AWS Table 2.8. Fillet welds which run onto the radius of a tube shall be built up to obtain the fullthroat thickness (See Figure 7.1). The maximum root openings of fillet welds shall not exceed 3/16" in conformance with AWS D1.1, Section 5.22. Weld size or effective throat dimensions shall be increased in accordance with this same section when applicable (i.e. fit-up gaps > 1/16").

The fabricator shall have verified that the throat thickness of partial joint penetration groove welds (primarily matched edge welds or the flare-bevel-groove welds on underhung floor beams) shall be obtainable with their fit-up and weld procedures. Matched edge welds shall be "flushed" out when required to obtain the full throat or branch member wall thickness.

For full penetration butt welds of tubular members, the backing material shall be fabricated prior to installation in the tube so as to be continuous around the full tube perimeter, including corners.

Backing may be of four types:

- A "box" welded up from four (4) plates.
- Two "channel" sections, bent to fit the inside radius of the tube, welded together with full penetration welds.
- A smaller tube section which slides inside the spliced tube.
- A solid plate cut to fit the inside radius of the tube.

Corners of the "box" backing, made from four plates, shall be welded and ground to match the inside corner radii of the chords. The solid plate option shall require a weep hole either in the chord wall above the "high side" of the plate or in the plate itself. In all types of backing, the minimum fit-up tolerances for backing must be maintained at the corners of the tubes as well as across the "flats".

8.2. Quality Certification

Bridge(s) shall be fabricated by a fabricator who is currently certified by the American Institute of Steel Construction to have the personnel, organization, experience, capability, and commitment to produce fabricated structural steel for the category "Simple Steel Bridges" as set forth in the AISC Certification Program. Quality control shall be in accordance with procedures outlined for AISC

certification.

9.0 DELIVERY AND ERECTION

Delivery is made to a location nearest the site which is easily accessible to normal over-the-road tractor/trailer equipment. All trucks delivering bridge materials will need to be unloaded at the time of arrival. The manufacturer will provide detailed, written instruction in the proper lifting procedures and splicing procedures (if required). The method and sequence of erection shall be the responsibility of others. The bridge manufacturer shall provide written inspection and maintenance procedures to be followed by the bridge owner.

10.0 BEARINGS

10.1. Bearing Devices

Bridge bearings shall consist of a steel setting or slide plate placed on the abutment or grout pad. The bridge bearing plate which is welded to the bridge structure shall bear on this setting plate. One end of the bridge will be fixed by fully tightening the nuts on the anchor bolts at that end. The opposite end will have finger tight only nuts to allow movement under thermal expansion or contraction. The bridge bearings shall sit in a recessed pocket on the concrete abutment. Minimum 28-day strength for the abutment concrete shall be 4,000 PSI. The bearing seat shall be a minimum of 16" wide. The step height (from bottom of bearing to top-of-deck) shall be determined by the bridge manufacturer.

11.0 FOUNDATIONS

The bridge manufacturer shall determine the number, diameter, minimum grade and finish of all anchor bolts. The anchor bolts shall be designed to resist all horizontal and uplift forces to be transferred by the superstructure to the supporting foundations. Engineering design of the bridge supporting foundations (abutment, pier, bracket and/or footings), including design of anchor bolt embodiments, shall be the responsibility of the foundation engineer. The contractor shall provide all materials for (including anchor bolts) and construction of the bridge supporting foundations. The contractor shall install the anchor bolts in accordance with the manufacturer's anchor bolt spacing dimensions. Information as to bridge support reactions and anchor bolt locations will be furnished by the bridge manufacturer after receipt of order and after the bridge design is complete.

12.0 WARRANTY

The bridge manufacturer shall warrant their steel truss structure(s) to be free of design, material and workmanship defects for a period of fifteen years from the date

of delivery. This warranty does not include decking, railing attachments, on any other items not part of the steel truss structure. This warranty shall 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 shall be void unless owner's records, which will indicate compliance with the minimum guidelines specified in the Inspection and Maintenance Procedures, can be supplied. Repair or replacements shall be the exclusive remedy for defects under this warranty. The bridge manufacturer shall not be liable for any consequential or incidental damages for breach of any express or implied warranty on their structures.

13.0 APPROVAL CHECKLIST

The following checklist will be used in the evaluation of all submittals to assure compliance with the Special Specifications for Prefabricated Bridge. This checklist is considered the minimum acceptable requirements for compliance with these specifications. Any deviations from this checklist shall be considered grounds for rejection of the submittal. Any costs associated with delays caused by the rejection of the submittal, due to non-compliance with this checklist, shall be fully borne by the contractor and bridge supplier.

SUBMITTAL DRAWINGS

Data required to be shown:

- Bridge Elevation
- Bridge Cross Section
- All Member Sizes
- All Vertical Truss Members are Square or Rectangular Tubing
- Bridge Reactions
- General Notes Indicating
- AISC Stress Conformance
- Material Specifications to be Followed
- Design Live Load
- Design Vehicle Load (If Applicable)
- Design Wind Load
- Other Specified Design Loads
- Welding Process
- Blast Cleaning
- Paint System to be Used (If Applicable)
- Paint Color Chart (If Applicable)
- Detailed Bolted Splices (If Applicable)
- Bolted Splice Location (If applicable)
- Signature and Seal of Professional Engineer, licensed in Accordance with Section 3.0

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DESIGN CALCULATIONS

Data required to be shown:

- Joint Coordinates & Member Incidences
- Joint and Member Loads
- Member Properties
- Load Combinations
- AISC Member Stress Checks for Each Member Type
- Critical Connection Failure Mode Checks For Each Member Type
- Chord Face Plastification Checks
- Punching Shear Checks
- Material Failure Checks (Truss Webs)
- Weld Failure Checks (Effective Length)
- Weld Failure Checks (Ultimate)
- Local Buckling of the Main Member Face Checks
- Main Member Yielding Failure Checks
- Main Member Crippling Failure Checks
- Main Member Buckling Failure Checks
- Main Member Shear Failure Checks
- All Bolted Splice Checks (if applicable)
- Main Truss Deflection Checks
- Decking Material Checks
- Consideration of Individual Member Moments Due to Truss Deflection, Joint Fixity and Joint Eccentricity

FABRICATION SUBMITTALS

Data required to be shown:

- Written Installation Instructions **
- Written Splicing Instructions **
- Written Maintenance & Inspection Instructions **
- Welder Certifications **
- Welding Procedures **
- Material Certifications (if applicable)
- Structural Steel (if applicable)
- Decking (if applicable)
- Structural Bolts (if applicable)
- Quality Control Section of AISC Certification Manual (if applicable) **
- Painter Certifications (if applicable) **
- Weld Testing Reports (if applicable)

** NOTE: These items are required to be submitted along with Submittal Drawings and Design Calculations.

Those Fabrication Submittal Items not marked are to be submitted prior to shipment of the

* * * End of Sheet 11 * * *

bridge.

RAILINGS

All railings shall be mounted with 1/2" x 4" studs and bolts (wedge anchors), stainless steel hardware.

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Addendum Approved By:

Paul A. Hammersmith, PE 06-16-14
Director of Engineering/City Engineer Date

* * * * *

**Terminus for Addendum No. 1
Certification by Bidder**

Bidder shall sign and date one copy of this Addendum No. 1 and submit with his proposal as evidence of receipt and evaluation of same in his bid analysis.

Signed: _____ **Date:** _____

Company: _____