

PERMANENT CHANGES TO PROJECT DATED SPECIAL PROVISIONS

REVISION OF SECTION 628 PEDESTRIAN BRIDGES

<u>DATE</u>	<u>AUTHOR</u>	<u>DESCRIPTION OF CHANGE</u>
1/6/95	DLD	CREATED
5/20/97	DLD	REVISED to address AWS/ANSI D1.1-96 code changes. Added BGR Manufacturing and Distribution, Inc. to potential supplier list.
7/8/99	MAL	Revised for adoption of AASHTO Guide Specification for the Design of Pedestrian Bridges. Removed requirement for WSD. Made allowance for concrete deck.
11/17/1999	M.Nord	Verified the specification references for conformance with the <i>1999 Colorado DOT Standard Specifications for Road and Bridge Construction</i> . No exceptions were found. Converted to Microsoft Word 97 SR-2 Changed all occurrences of "Staff Construction and Materials Branch" to "Design Construction Branch Inspection Unit" On page 4 added ",when required on the plans," after "Allowable stresses for timber decking" because concrete or timber decks are allowed on pedestrian bridges. On page 4 deleted "Bridge camber at the center of the structure shall be 2 1/2% of the bridge's span" because 2 1/2% camber results in end grades which exceed ADA requirements and camber was only defined for aesthetic reasons.
11/15/2002	M. Nord	Corrected mailing address and fax phone number for Steadfast Bridges. Corrected company name, mailing address and fax phone number for Continental Bridge. Corrected phone number for Excel Bridge Manufacturing Company. Corrected company name and Zip +4 Code for Big R Manufacturing LLC.

9/15/2003	DLD	Changed all occurrences of “Design Construction Branch Inspection Unit to “Staff Bridge Branch Fabrication Inspection Unit”. Required drilled holes at the low point of all members. Verified references to the latest edition (2002) of AWS/ANSI D1.1.
3/31/2004	DLD	Added Wheeler Lumber, LLC to the suppliers list.
11/3/2006	DEC	Revised longitudinal Charpy V-notch (CVN) required value from 15 ft. lbs. at 40 degrees Fahrenheit to 25 ft. lbs at 40 degrees Fahrenheit.

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Section 628 is hereby added to the Standard Specifications for this project as follows:

DESCRIPTION

628.01 This work consists of the design, fabrication, and erection of a simple span, welded self weathering steel, truss pedestrian bridge (with a timber or concrete deck) in accordance with the specifications and plan details.

Potential bridge suppliers are:

1. Continental Bridge
8301 State Highway 29 N
Alexandria, Minnesota 56308
1-800-328-2047, FAX 320-852-7067
2. Steadfast Bridges
4021 Gault Ave. South
Fort Payne, Alabama 35967
1-800-749-7515, FAX 256-845-9750
3. Excel Bridge Manufacturing Company
12001 Shoemaker Avenue
Santa Fe Springs, California 90670
562-944-0701, FAX 562-944-4025
4. Big R Manufacturing LLC
P.O. Box 1290
Greeley, Colorado 80632-1290
1-800-234-0734, FAX 1-970-356-9621
5. Wheeler Lumber, LLC
9330 James Avenue South
Bloomington, Minnesota 55431-2317
1-800-328-3986, FAX 952-929-2909

MATERIALS

628.02 Structural Steel. All structural steel shall be new (unused) material. The Contractor shall provide the Engineer and the Staff Bridge Branch Fabrication Inspection Unit with copies of all certified mill test reports for all structural steel and bolts. Floor beams, stringers, and members of each Half-through truss (upper and lower chords, diagonals, end posts and vertical

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posts) utilized in the bridges shall meet a longitudinal Charpy V-notch (CVN) value of 25 ft. lbs. at 40 degrees Fahrenheit. Testing shall be in accordance with AASHTO T 243 (ASTM A 673). The H frequency of heat testing shall be used. The Contractor shall provide the Engineer and the Staff Bridge Branch Fabrication Inspection Unit with certified copies of all CVN test reports.

All square and rectangular structural steel tubing shall conform to the requirements of ASTM A 847, Cold-Formed Welded and Seamless High Strength, Low Alloy Structural Tubing With Improved Atmospheric Corrosion Resistance.

All structural steel shapes and plates shall conform to the requirements of ASTM A 588, High-Strength Low-Alloy Structural Steel.

All anchor bolts and nuts shall conform to the requirements of ASTM A 307, Grade A, Carbon Steel Bolts and Studs, and shall be galvanized in accordance with the requirements of ASTM A 153. Each anchor bolt shall be provided with two nuts for jamming.

All structural steel field connections shall be bolted with high strength bolts. High strength bolts, including suitable nuts and plain hardened washers, shall conform to the requirements of ASTM A 325. Bolts shall be Type 3.

628.03 Timber. All timber shall be new (unused) material and conform to either of the following:

- (1) Southern Pine, No. 1 or better quality, Graded in accordance with Southern Pine Inspection Bureau (SPIB) rules.
- (2) Douglas Fir-Larch, No. 1 or better quality, Graded in accordance with West Coast Lumber Inspection Bureau (WCLIB) rules.

All lumber shall be manufactured and inspected in accordance with the latest edition of Product Standard 20-70 as published by the Department of Commerce, and shall be grade marked or have an accompanying certificate from a certified grading agency. The grading agency shall be certified by the Board of Review of the American Lumber Standards Committee.

All timber shall be pressure treated, conforming to the requirements of the American Wood Preserver's Association (AWPA) Standards, Section C1 and C2 (Soil Contact). Either Ammoniacal Copper Arsenate (ACA) or Chromated Copper Arsenate (CCA) preservatives conforming to the requirements of Section P5 (Standards For Waterborne Preservatives) of the AWPA Standards shall be utilized and treatment shall be to a total absorption of 0.40 pounds per

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cubic foot of timber. A certified treatment report shall be provided to the Engineer and the Staff Bridge Branch Fabrication Inspection Unit.

CONSTRUCTION REQUIREMENTS

628.04 Design. The *AASHTO Guide Specifications for Design of Pedestrian Bridges* and Division I (design) of the *AASHTO Standard Specifications for Bridges* shall govern the design.

The superstructure of the pedestrian bridge shall consist of two parallel Half-through trusses, or Pony trusses, with at least one diagonal per panel. The trusses shall be the main load-carrying members of the bridge.

The members of each Half-through truss, or Pony truss, (upper and lower chords, diagonals, end posts, and vertical posts) shall be fabricated from square and rectangular structural steel tubing.

Floor beams and stringers shall be fabricated from structural steel shapes or square and rectangular structural steel tubing.

The structure shall conform to the clear span, clear width, and railing requirements shown on the plans.

Each pedestrian bridge shall be designed for the following loads and loading conditions:

1. Dead load shall be as defined in Section 3.3 of the AASHTO Standard Specifications.
2. Live load shall be as defined in the AASHTO Guide Specifications. Distribution to the stringer and floor beams shall be in accordance with Section 3 of the AASHTO Standard Specifications. Deflection and vibration limits as per the AASHTO Guide Specifications shall apply.

Pedestrian live load shall be as defined by the AASHTO Guide Specifications, and used in load group I of the AASHTO Standard Specifications, Section 3.

Vehicle live load shall be as defined by the AASHTO Guide Specifications, and used in load group IB of the AASHTO Standard Specifications, Section 3. When required by the plans, the vehicle live load shall be the Colorado Legal Load Type 3 Vehicle. This is a 27 ton, three axle, vehicle with 13.5' front axle spacing and 4' rear spacing. The axle loads are 7 tons on the front axle and 10 tons on each of the rear axles.

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3. Wind load shall be as defined by the AASHTO Guide Specifications, and used in load group V of the Standard Specifications, Section 3.
4. Distribution of wheel loads on timber flooring shall be in accordance with Section 3 of the AASHTO Standard Specifications.

Allowable loads in the structural steel members and weld metal shall be in accordance with Section 10 of the AASHTO Standard Specifications.

Minimum thickness of structural steel shall be 3/16 of an inch.

½ inch diameter weep holes shall be drilled (flame cut holes will not be allowed) at all low points of all steel tubing members as oriented in the in-place, completed structure. In members that are level, or flat, a total of two weep holes shall be drilled, one at each end. Weep holes and their locations shall be shown on the Shop Drawings.

Allowable stresses for timber decking, when required on the plans, shall be in accordance with Section 13 of the AASHTO Standard Specifications.

All metallic fasteners utilized in attaching timber to structural steel shall be galvanized.

All welded tubular connections shall be designed in accordance with Section 2, Parts A and D (Delete Subsection 2.36.6), of the Structural Welding Code-Steel ANSI/AWS/D1.1 (Latest Edition).

When timber decking is used it shall be placed transverse to the trusses and have a minimum nominal thickness of 3 inches. Decking shall be securely fastened to each stringer and at each end to prevent warping.

Concrete and reinforcing steel, when used for the deck, shall conform to Sections 601 and 602, respectively.

The Contractor shall submit seven sets of Design Calculations and Shop Fabrication Details (Shop Drawings) to the Engineer for each pedestrian bridge separately. This submittal shall be in accordance with Subsection 105.02. The Design Calculations and Shop Drawings shall contain the endorsement seal of the Professional Engineer registered in the State of Colorado responsible for the design.

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628.05 Shop Fabrication. Welding and fabrication of weathering steel pedestrian bridges shall conform to the requirements of the Structural Welding Code-Steel ANSI/AWS D1.1 (Latest Edition) as amended by the following:

1. As required in Subsection 4.7.3, a welding procedure shall be established by qualification in accordance with the requirements of Subsection 3.3 for the ASTM A 847 material used on the bridge. The results of the Procedure Qualification shall be recorded on Form E-1 in Annex E of AWS D 1.1.
2. The Contractor shall submit a Quality Control Plan. The Plan shall include personnel qualifications, certifications, and a Written Practice in accordance with ASNT SNT-TC-1A.
3. The quality of all welds shall be in accordance with Section 6, Table 6.1. In Table 6.1, Undercut 7(B), the criteria for primary members shall apply to the bottom chord members.
4. All Complete Joint Penetration Groove Welds in butt joints in the bottom chord members shall be 100% Magnetic Particle tested in accordance with ASTM E 709. Acceptance shall be determined in accordance with Section 6.10 and Table 6.1, using Alternating Current. In addition, complete joint penetration groove butt welds welded from one side without backing of bottom chord members shall be examined by ultrasonic testing in accordance with Section 6.11.1.
5. Magnetic Particle Testing shall be performed on 100% of all attachment welds to the bottom chord, using Alternating Current, in accordance with Section 6.10 and Table 6.1.
6. All Procedure Qualification Records and Welder Qualification Test Records shall be current within three years of the date of beginning fabrication.
7. A copy of all Procedure Qualification Records, Welder Qualification Test Records, Quality Control Plan and all visual and nondestructive test reports shall be provided to:
 - a. The Engineer.
 - b. Staff Bridge Branch
Fabrication Inspection Unit
4201 E. Arkansas Ave., Room 330
Denver, Colorado 80222.

All weathering steel shall be blast cleaned, Steel Structures Painting Council Surface Preparation No. 6 (SSPC-SP6, Commercial Blast Cleaning), to remove mill scale and foreign material which would prohibit rusting to a uniform color.

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628.06 Field Construction. The substructure shall be constructed in accordance with the details shown in the plans and the pedestrian bridge shop drawings. Before construction begins on the substructure, the Contractor shall determine the anchor bolt requirements and substructure dimensions needed to properly erect the structure which will be provided. The Engineer shall be provided with two copies of detail sheets delineating these requirements before work begins.

METHOD OF MEASUREMENT

628.07 Pedestrian bridge will be measured by the complete Bridge Girder and Deck Unit installed and accepted.

BASIS OF PAYMENT

628.08 The accepted quantity shall be paid for at the contract unit price for the pay unit listed below. Payment will be made under:

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Bridge Girder and Deck Unit()	EACH

Payment shall be full compensation for all work necessary to complete the item, which shall include design, fabrication, transportation to the bridge site, and erection. The substructure shall be measured and paid for separately, anchor bolts shall be included in Item 628. Payment will not be made for this item until all required reports, certifications, and forms have been submitted to the Engineer.