

COLORADO PROJECT NO.

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**REVISION OF SECTION 628
BRIDGE GIRDER AND DECK UNIT**

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 (ASTM A 709 Grade 50W), pedestrian truss bridge with deck per the specifications and plan details. Alternate construction materials, such as fiberglass or timber, may be submitted for approval. ■

Potential bridge suppliers are:

1. Continental Pedestrian Truss (Contech)
9025 Centre Pointe Drive
West Chester, Ohio 45069
1-800-338-1122
2. Steadfast Bridges (Contech)
4021 Gault Ave. South
Fort Payne, Alabama 35967
256-845-0154
3. Excel Bridge Manufacturing Company
12001 Shoemaker Avenue
Santa Fe Springs, California 90670
562-944-0701
4. Big R Manufacturing LLC (Contech)
19060 County Road 66
Greeley, Colorado 80631
1-888-339-1684
5. Wheeler Lumber, LLC
9330 James Avenue South
Minneapolis, Minnesota 55431
952-929-7854

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6. TrueNorth Steel
702 13th Ave E
West Fargo, ND 58078
1-866-982-9511

MATERIALS

628.02 Structural Steel. All structural steel shall be new (unused) material and shall conform to the requirements in Section 509. Floor beams, stringers, and members of each truss (upper and lower chords, diagonals, end posts and vertical posts) utilized in the bridges shall meet a longitudinal Charpy V notch (CVN) values per Table C6.6.2.1-1 of the AASHTO LRFD Bridge Design Specifications for Temperature Zone 2 (typically 25 ft. lbs. at 40 degrees Fahrenheit). Testing shall be per 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 copies of all certified mill test reports and CVN test reports, heat numbers and Buy America documentation for all structural steel and bolts . Minimum thickness of closed structural tubular members shall be 1/4 of an inch.

CONSTRUCTION REQUIREMENTS

628.03 Concrete. When concrete deck is used, concrete shall be Class D (Bridge) ♣ unless specified otherwise in the plans. The concrete and reinforcement shall conform to the requirements in Sections 601 and 602 respectively.

628.04 Timber. When timber deck is used, the timber shall conform to the requirements in Section 508. It shall be placed transverse to the trusses and have a minimum nominal thickness of 3 inches. Decking shall be fastened securely to each stringer and at each end to prevent warping. All timber shall be new (unused) material and conform to either of the following:

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

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All lumber shall be manufactured and inspected per 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 Quaternary (ACQ), Ammoniacal Copper Zinc Arsenate (ACZA) 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 cubic foot of timber. A certified treatment report shall be provided to the Engineer and the Staff Bridge Branch Fabrication Inspection Unit.

628.05 Design. The current editions of the AASHTO LRFD Bridge Design Specifications, LRFD Guide Specifications for the Design of Pedestrian Bridges, AASHTO Guide Specifications for Design of FRP Pedestrian Bridges and CDOT Bridge Design Manual Section 31, shall govern the design.

All welded tubular connections shall be designed per Section 2, Part A and Section 9, Part A of the Structural Welding Code-Steel ANSI/AWS/D1.1 (Latest Edition).

Openings between horizontal or vertical members on pedestrian railings shall be small enough that a 4 in. sphere cannot pass through them for the lower 34" of the pedestrian rail.

Half-inch diameter drain 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 drain holes shall be drilled, one at each end. Drain holes and their locations shall be shown on the Shop Drawings.

628.06 Submittals. The Contractor shall submit certified copies of all the required submittals per Section 105 and this specification to the Engineer and the Staff Bridge

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Branch Fabrication Inspection Unit. The submittals to the Staff Bridge Fabrication Inspection Unit can also be electronic. All PDFs with text or numerical data shall be 300 dpi, page aligned, text searchable, and in conformance with ISO PDF/A-1b archival specification. It shall be provided to:

The Engineer
Staff Bridge Branch
Fabrication Inspection Unit
2829 W Howard Pl 3rd Floor
Denver, CO 80204

628.07 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, a welding procedure shall be established by qualification per 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 M1 in Annex M 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 per ASNT SNT-TC-1A.
3. The quality of all welds shall be per Section 6, Table 6.1 for non-tubular and Section 9 and 9.16 for tubular. 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 per ASTM E709. Acceptance shall be determined per Section 6.10 and Table 6.1 for non-tubular using alternating Current. Section 9 and Table 9.16 for tubular, UT per 9.27.1. In addition, complete joint penetration groove butt welds welded from one side without backing of bottom chord members shall be examined by ultrasonic testing per Section 6.11.
5. Magnetic Particle Testing shall be performed on 100% of all attachment welds to the bottom chord, using Alternating Current, per Section 6.10 and Table 6.1 for non-tubular, Section 9 and 9.16 for tubular.
6. Welder Qualification Test Records shall follow 4.2.3 Period of Effectiveness.

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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
2829 W. Howard Place 3rd floor,
Denver, Colorado 80204

628.07 The structure shall conform to the clear span, clear width, structure depth, railing and any other requirements as shown on the plans. Metal handrails shall be installed at a height of ▲ from top of deck. For bridges seven feet and wider, post with an R12-1 weight limit signs in conformance with MUTCD.

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.

628.08 Field Construction. The substructure shall be constructed per 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. The Engineer shall be provided with two copies of detail sheets delineating these requirements before work begins.

The Contractor shall comply with CDOT Standard Specification Subsection 509.26 through 509.31 for Field Construction Requirements paying particular attention to Section 509.28 for Connections Using High-Strength Bolts. Fastener assemblies shall be tested using a Calibrated Tension Measuring Device. DTI washers shall be subject to tension verification by use of a separate direct tension measuring device.

A Pre-Erection Conference will be held at least one week before the beginning of erection. At least one week before the Pre-Erection Conference, the Contractor shall submit an Erection Plan (as specified in Section 509) to the Engineer for review. The Erection Plan will be reviewed by the Engineer. Written comments submitted by the Engineer shall be discussed at the Pre-Erection Conference and incorporated into the Final Erection Plan. The Final Erection Plan shall be signed and sealed by the

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Contractor's Engineer and Marked "Approved for Construction". If false work drawings are required, they shall conform to and be submitted per subsection 601.11.

When a bridge spans traffic of any kind, including those where vehicles, railroad, watercraft or pedestrians have access onto, underneath or adjacent to, the Contractor's Professional Engineer shall inspect and provide stamped written approval of the stability of the erected bridge components before opening the area beneath the bridge to traffic. The Contractor is responsible for coordination of any inspection and submittal of construction documents with the local agencies, railroad etc. as required.

METHOD OF MEASUREMENT

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

BASIS OF PAYMENT

628.10 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, erection, inspection and construction including deck, railing, ♥ and other items as shown on the plans. The substructure shall be measured and paid for separately. Payment will not be made for this item until all required reports, certifications, and forms have been submitted to the Engineer.

INSTRUCTIONS TO DESIGNERS (delete instructions and symbols from final draft):

Use this project special provision when manufactured pedestrian bridge is used.

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♣ Provide any additional or alternate aesthetic or required treatments, e.g., galvanization, painting.

♦ Enter deck type, concrete or timber

▲ Insert height of railing as required. See CDOT Bridge Design Manual Section 2.4.1 for minimum requirements.

♥ Include items such as fencing, lighting, bearings, anchor bolts, expansion plates etc. as required.

♣ Concrete Class G may be substituted for Class D (Bridge) in high corrosion environments.

■ New materials such as fiberglass are in the marketplace and may be cost competitive.

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 1999 Colorado DOT Standard Specifications for Road and Bridge Construction. No exceptions were found.

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**REVISION OF SECTION 628
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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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1/10/2019	JJ/SA	Updated to 2017 specification references and AASHTO LRFD
5/24/2019	JJ/SA	Re-added steel & timber requirements for easier reference.
7/6/2021	AJP	Added FRP requirements and updated suppliers list.
04.11.2023	M. Kayen	Revisions to make spec online ADA-compliant. 5.22.23 Additional ADA.