

PRE-FABRICATED BRIDGE SPECIFICATIONS

1.0 GENERAL

1.1 These specifications are for a fully engineered clear span bridge of welded steel construction and shall be regarded as minimum standards for design and construction as manufactured by Steadfast Bridge Company; 4021 Gault Avenue South; Fort Payne, Alabama 35967; telephone 800-749-7515; fax 256-845-9750.

1.2 Manufacturers other than Steadfast Bridge Company may be used provided they are pre-approved by the Project Engineer five (5) days prior to bid and they meet or exceed all the following specifications.

1.3 The bridge manufacturer shall have been in the business of design and fabrication of bridges for a minimum of five years and provide a list of ten successful bridge projects, of similar construction, each of which has been in service at least three years.

1.4 The bridge supplier shall be the designer and fabricator of the bridge and shall not assign, sublet, or subcontract any part of the bridge fabrication.

1.5 The specific type bridge required will be a "KEYSTONE" style bridge as manufactured by Steadfast Bridge Company.

2.0 DIMENSIONS

2.1 Width: Inside clear width of bridge shall be _____ feet _____ inches.

2.2 Span: Center to center of bearing of bridge shall be _____ feet _____ inches.

2.3 Camber: _____ Bridge shall be cambered 2% of the total span length. or _____ Bridge shall be cambered _____% of the total span length. or _____ Bridge shall be cambered to offset dead load and appear flat. All vertical truss members shall be perpendicular to the ground (horizon) after the bridge is erected and dead loads applied.

3.0 DESIGN

3.1 Open truss bridges shall be designed by a professional engineer experienced in pony truss bridge design and top chord stability criteria utilizing elastic lateral restraints.

In addition to normal dead loads, the bridge shall be designed for the following:

3.2 Uniform Live Load: Pedestrian bridges shall be designed for an evenly distributed live load of 85 pounds per square foot of deck area. For primary truss

members, when the deck area exceeds 400 square feet, the load may be reduced to in accordance with the following formula:

$$w = 85(0.25 + 15 / (A^{.5}))$$

where w is the pedestrian load (psf) and A is the deck influence area. The reduced design load shall not be less than 65 psf.

3.3 Vehicle Load: Bridges will also be designed to withstand a moving concentrated load of a vehicle weighing 1000 pounds per foot of bridge width (up to 10,000 pounds). For bridges used where snow removal is a concern, the vehicle load shall be in addition to a 20 pounds per square foot evenly distributed live load. The vehicle load shall be distributed such that 80% of the load is on the rear axle (per AASHTO).

3.4 Wind Load: All bridges shall be designed for a minimum wind load of 30 pounds per square foot (approximately 100 mph). The wind is calculated on the entire vertical surface of the bridge as if fully enclosed. The wind load shall change proportional to the square of the change in design velocity for local requirements.

3.5 Design Criteria: The design of the bridge shall be in accordance with the "American Institute of Steel Construction"; "Allowable Stress Design", June 1, 1989 or latest edition. Tubular members and their connections shall be designed per the AISC "Hollow Structural Sections Connections Manual" latest edition.

3.6 Seismic: All bridges shall be designed for seismic loads of the intensity required by local codes.

3.7 Temperature: Bridge shall be designed to accommodate a temperature differential of 120 degrees Fahrenheit. Slip pads of UHMW polyethylene shall be placed between the smooth surface of this setting plate and the smooth bearing plate of the bridge. At least 1" clearance shall be provided between the bridge and concrete abutments.

3.8 Deflection: The vertical deflection of the bridge due to pedestrian live load shall not exceed 1/400 of the span length. The maximum deflection due to vehicular loads shall not exceed 1/800 of the span length. For pedestrian comfort, the minimum live load used for the deflection check shall be a minimum of 600 pounds per lineal foot of bridge. The horizontal deflection due to lateral wind load shall not exceed 1/500 of the span length.

4.0 MATERIALS

4.1 All structural members shall have a minimum thickness of material of at least 3/16".

4.2 _____ Unpainted Weathering Steel bridges shall be fabricated from ASTM A242 or ASTM A588 steel for plates and structural shapes and ASTM A606 or ASTM A847 for tubular sections. Minimum yield (Fy) shall be greater than 50,000 psi.

or

_____ Painted Steel bridges shall be fabricated from ASTM A572, (Fy) greater than 50,000 psi and tubular sections from ASTM A500, (Fy) greater than 50,000 psi.

4.3 _____ Wood Decking shall be No. 1 grade Southern Yellow Pine. Wood decking shall be treated to a minimum of .40 pounds of preservative per cubic foot of wood. The wood deck shall be designed for a minimum 100 psf local loading condition in addition to the wheel loadings produced by the vehicle in section 3.3. Floor planks shall be attached with at least two plated fasteners where planks cross supporting members.

or

_____ Concrete Floors shall be completely formed by the bridge manufacturer with a minimum of 22 gauge galvanized floor deck. The floor deck shall be manufactured by a member of the Steel Deck Institute or have their deck properties certified by the Steel Deck Institute. The slab shall carry a 200 pounds per square foot superimposed live load. The pouring and finishing of 4000 psi lightweight concrete (no additives allowed) and the furnishing of the reinforcement shall be the responsibility of the contractor or owner. After the concrete has cured, an appropriate sealer should be applied by the contractor or owner.

4.4 Field splices shall be bolted with High Strength ASTM A325 bolts; type 3 bolts are required for weathering steel bridges.

4.5 Welding materials shall be in strict accordance with the American Welding Society (AWS). Structural welding code, D1.1. Filler metal as specified in 4.1 shall be used for the particular welding process required. Welders will be certified in accordance with AWS D1.1.

5.0 FABRICATION AND QUALITY CONTROL

5.1 Bridge fabricator shall be certified by the American Institute of Steel Construction to have the personnel, organization, experience, capability, and commitment to produce fabricated structural steel for Conventional Steel Structures and Major Steel Bridge Structures with Sophisticated Paint Endorsement as set forth in the AISC Certification Program.

5.2 To ensure quality control during bridge fabrication, the bridge supplier shall be the designer and fabricator of the bridge and shall not assign, sublet, or subcontract any part of the bridge fabrication.

5.3 Workmanship, fabrication, and shop connections shall be in accordance with American Association of State Highway and Transportation Officials Specifications (AASHTO).

5.4 Each bridge shall be inspected by a Certified Weld Inspector that is qualified under the AWS QC-1 program. This inspection shall include as a minimum requirement the following: review of shop drawings, weld procedures, welder qualifications and weld testing reports, visual inspection of welds and verification of overall dimensions and geometry of the bridge. A report shall be produced indicating the above items were reviewed. The report shall be signed by the CWI, signifying compliance with AWS D1.1 codes.

5.5 All structural elements used in the bridge shall be identified by heat number of the steel member used. Specific mill test reports and individual welder certificates shall be tracked and kept on file to be provided at the request of the owner or engineer.

5.6 Welding operators shall be properly accredited experienced operators, each of whom shall submit satisfactory evidence of experience and skill in welding structural steel with the kind of welding to be used in the work, and who have demonstrated the ability to make uniform good welds meeting the size and type of weld required.

5.7 All welding shall utilize E70 or E80 series electrodes. The weld process used shall be Flux Core Arc Welding (FCAW) or Gas Metal Arc Welding (GMAW) or Shielded Manual Arc Welding (SMAW per ANSI/AASHTO/AWS D1.5) "Bridge Welding Code."

5.8 The connection of bridge end post to top chord should be a mitered joint with the exposed welds ground smooth.

5.9 The connection of the floor beam to a pony truss system shall not be solely into the side of a tubular bottom chord without the use of additional stiffeners.

6.0 RAILINGS & ACCESSORIES

6.1 All railings shall have a smooth inside surface with no protrusions or depressions. All ends of angles and tubes shall be closed and ground smooth. In accordance with AASHTO, railings for _____ pedestrian use should be a minimum of 42" above the floor deck. or _____ bicycle use should be a minimum height of 54" above the floor deck.

6.2 _____ Safety Rails: Continuous rails shall be located on the inside of the trusses. The rails will be _____ horizontal safety rails with a maximum opening of _____ inches. or _____ vertical picket rails with a maximum opening of _____ inches.

(optional) 6.3 _____ Toe Plate: A 5" steel channel shall be located 2" above the floor deck.

(optional) 6.4 _____ Fencing: Chain link fencing shall be factory installed on to meet AASHTO requirements for highway overpasses. The fence shall be located on _____ both sides of the bridge up to a height of _____ feet. or _____ both sides and the top of the bridge. The chain link fencing shall be _____ galvanized with a maximum opening of _____ inches. or _____ vinyl coated with a maximum opening of _____ inches.

7.0 FINISHES

7.1 All boldly exposed surfaces of bridges shall be sand blasted in accordance with the Steel Structures Painting Council (SSPC) Surface Preparation Specification No. 6 "Commercial Blast Cleaning".

(for painted bridges)

7.2 _____ Bridge shall be painted by the bridge manufacturer. The manufacturer shall have an AISC certified shop with Sophisticated Paint Endorsement. The bridge shall be painted with an epoxy primer ("Devran 4170" by Devoe Coatings) followed by an Aliphatic Urethane Gloss Enamel topcoat ("Devthane 4708" by Devoe Coatings) or approved equal. Bridges shall be provided with paint for touch up after erection.

8.0 DELIVERY AND ERECTION

8.1 Bridges will be delivered by truck to a location nearest to the site accessible by roads. Hauling permits and freight charges are the responsibility of the manufacturer.

8.2 The manufacturer will notify the customer in advance of the expected arrival time. Information regarding delays after the trucks depart the plant such as inclement weather, delays in permits, re-routing by public agencies or other circumstances will be passed on to the customer as soon as possible but the expense of such unavoidable delays will not be accepted by the manufacturer.

8.3 The manufacturer will advise the customer of the actual lifting weights, attachment points and all necessary information to install the bridge. Unloading, splicing, bolting, and proper lifting equipment is the responsibility of others.

8.4 The owner shall procure all necessary information about the site and soil conditions. The engineering design and construction of the bridge abutments, piers and/or footing shall be by the owner. The owner shall install the anchor bolts in accordance with the manufacturer's anchor bolt spacing dimensions. All grounding and lightning protection shall be the responsibility of the owner.

9.0 WARRANTY

9.1 The manufacturer shall provide a warranty against defects in material and workmanship for a period of ten years.

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