

BRIDGE & TRESTLE CONSTRUCTION SPECIFICATIONS

BRULE RIVER ATV & SNOWMOBILE BRIDGE

FLORENCE COUNTY FORESTRY AND PARKS DEPARTMENT

PART 1 – GENERAL

SCOPE

- A. Design, furnish and install a trestle with pilings and abutment in accordance with the requirements of the plans and specifications. These specifications shall be regarded as minimum standards for design and construction.
- B. Design, furnish and install a bridge rehabilitation in accordance with the requirements of the plans and specifications. These shall be regarded as minimum standards for design and construction.

RELATED REQUIRED WORK

- A. The contractor shall be responsible for the design, detailing, fabrication, delivery, construction and erection of the entire structure.
- B. The contractor shall be responsible for the removal and disposal of the current bridge wood decking.
 - a. A disposal site will be provided by the Florence County Forestry and Parks Department.
- C. All necessary permits have been secured by the Florence County Forestry and Parks Department.
- D. Bidder is responsible for the seeding and mulching of all areas disturbed by construction activity.
- E. Bidder is responsible for the removal and proper disposal of all construction debris and structure being replaced.

REFERENCES

- A. State of Wisconsin Department of Transportation “Standard Specifications for Construction”, current edition.
- B. AASHTO Standards Specifications for Highway Bridges, current edition.
- C. AWPA Standards, current edition.
- D. NFPA National Design Specifications for Wood Construction

PART 2 – DESIGN

BRIDGE

- A. Design shall be in accordance with AASHTO specifications, all current interims, the AASHTO Guide Specifications for Design of Pedestrian Bridges and the following criteria.
 - a. Bridge Rehabilitation

- i. Bridge 88' clear span
- ii. Existing steel super-structure has been inspected by an engineer and certified for the use as an ATV and snowmobile bridge.
- iii. 12' width inside of rails.
- iv. Total rail height shall measure at least 42" above deck surface and meet AASHTO requirements.
- v. Remove and dispose of existing structural decking.
 - 1. Disposal site will be provided by the Florence County Forestry and Parks Department.
- b. All dead loads, applied dead loads, live loads, and wind loads as specified in the AASHTO specification. The bridge shall be cambered to offset the calculated dead load deflection by 1% of the bridge length.
- c. Live loads: (worst case loading shall be used for design)
 - i. AASHTO pedestrian load
 - ii. Groomer load with a 12,000 lb. GVW positioned to produce the maximum load effect, combined with a 30 psf snow load. Groomer load for girder and/or truss design shall be considered to be evenly distributed over 8' wide x 10' long area. For structural plank and deck stringer design, a wheel load equal to 30% of the groomer GVW shall be used.
 - iii. Transverse structural timber deck shall be provided and shall be a minimum of 3" in thickness.
 - iv. A longitudinal wear course shall be installed on top of the structural decking.
 - v. Railing shall include a minimum 6" kick plate to assist grooming and retain snow on deck. Top of kick plate shall be a minimum of 8" above deck surface. Vertical pickets and/or timber railings are not allowed.

TRESTLE

- A. Design shall be in accordance with AASHTO specifications, all current interims, the AASHTO Guide Specifications for Design of Pedestrian Bridges and the following criteria.
 - a. Trestle Construction
 - i. Trestle approximately 275' in length
 - 1. Design length must be verified by contractor.
 - ii. 12' width inside of rails.
 - iii. Maintain a constant slope over entire length of structure between existing railroad grade and bridge.
 - iv. Total rail height shall measure at least 42" above deck surface and meet AASHTO requirements.
 - b. All dead loads, applied dead loads, live loads, and wind loads as specified in the AASHTO specification. The bridge shall be cambered to offset the calculated dead load deflection by 1% of the bridge length.
 - c. Live loads: (worst case loading shall be used for design)
 - i. AASHTO pedestrian load

- ii. Groomer load with a 12,000 lb. GVW positioned to produce the maximum load effect, combined with a 30 psf snow load. Groomer load for girder and/or truss design shall be considered to be evenly distributed over 8' wide x 10' long area. For structural plank and deck stringer design, a wheel load equal to 30% of the groomer GVW shall be used.
- iii. Transverse structural timber deck shall be provided and shall be a minimum of 3" in thickness.
- iv. A longitudinal wear course shall be installed on top of the structural decking.
- v. Railing shall include a minimum 6" kick plate to assist grooming and retain snow on deck. Top of kick plate shall be a minimum of 8" above deck surface. Vertical pickets and/or timber railings are not allowed.

ABUTMENTS AND PILINGS

- A. Abutment and piling design shall be the responsibility of the bidding contractor or bridge supplier.
- B. Bridge shall be founded on substructure comprised of driven pile sufficiently capped to provide foundation for the trestle. Approach fill shall be sufficiently retained so that fill does not bear on bridge superstructure. Erosion and scour protection shall be provided by the contractor.
- C. Number of piles and pile capacity shall be dictated by the supplier based on reactions resulting from all loading conditions. Driven length of pile to be determined by installing contractor.
- D. Bidder must furnish and install rip rap below and on the side slopes of the south trestle abutment.
 - a. Placement of additional rip-rap will be at the discretion of the Florence County Forestry Department and considered incidental to the abutment installation.
- E. The Florence County Forestry Department will not supply soil information from the site. If required, soil investigation will be the responsibility of the bidding contractor or bridge designer.

PART 3 – MATERIALS

STRUCTURAL TIMBER

- A. This section shall include only such lumber and timber, as is part of the completed work. It shall not include false work, forms, bracing, sheeting or other lumber and timber used for erection.
- B. All structural timber shall be in accordance with WisDOT Section 507.
- C. Only pieces consisting of sound wood free from any form of decay shall be accepted. No piece of exceptionally lightweight shall be accepted.

- D. Knotholes and holes from causes other than knots shall be measured and limited as provided for knots. All visible pieces of lumber and timber having knots that are unsightly in appearance shall be rejected. Cluster knots and knots in groups are not permitted.
- E. Lumber and timber meeting the requirements of Structural Timber only shall be permitted.
- F. All structural timber furnished shall conform to the dimensions specified for either rough or surface stock.
- G. All timber to be graded as per NFPA National Design Specifications for Wood Construction.

PRESERVATIVE TREATMENT

- A. This section covers the wood preservatives and the preservative treatment of lumber, timber, piling, and posts conforming to the Specifications as referenced or otherwise specified in the plans or special provisions.
- B. Preservative treatment of Structural Timber and lumber shall be by the pressure process, and unless otherwise provided in the contract special provisions, be in accordance to the requirements of the specifications for Preservatives and Pressure Treatment Process for the Timber, ASHTO Designation; M133.
- C. Preservatives and Preservative Treatments shall be in accordance with WisDOT Section 507.
- D. So far as practicable all adazing, boring, chamfering, framing, gaging, mortising, surfacing and general framing etc., shall be done prior to treatment. If cut after treatment, coat cut surfaces according to AWWA M4.

STRUCTURAL STEEL

- A. Square or rectangular tubing shall be produced from high strength, low alloy, atmospheric corrosion resistant ASTM A847, ASTM A588 or ASTM A242 steel.
- B. Plates and structural steel shapes shall be in accordance with ASTM A606 with a minimum corrosion index of 5.8 per ASTM G101.
- C. Steel beams shall be ASTM A709 W shapes.
- D. All structural steel shall be grade 50.
- E. All exposed surfaces of weathering steel shall be blast cleaned in accordance with Steel Structures Painting Council Surface Preparation Specifications No. 7 Brush-Off Blast Cleaning, SSPC-SP7 or latest edition. Exposed surfaces of weathering steel shall be defined as those surfaces seen from the deck and from outside the structure. Stringers, floor beams, lower brace diagonals and the inside face of the truss below the deck and bottom of the bottom chord need not be blasted.
- F. If painted steel is utilized both the paint and paint process must be approved by the Florence County Forestry Department prior to fabrication.

HARDWARE

- A. All hardware (machine bolts, carriage bolts, drift pins, lag screws, dowels, rods, nails, spikes, washers, connectors, etc.) shall conform to WisDOT Section 507.
- B. Unless a dome Head Bolt or approved equal is used, all bolt heads or tightening nuts in contact with Structural Timber and lumber shall have a washer of sufficient thickness and

bearing area to ensure a minimum deformation of the contacted surface when tightening to develop not more than the maximum allowable tensile stress of that bolt.

- C. Bolt heads of tightening nuts in contact with metal surfaces shall have a cut washer or approved equal placed between the bolt head or nut and the metal surface.

PART 4 – SUBMITTALS

SEALED PLAN

- A. A detailed representative bridge, trestle and abutment plan shall be included with the proposal. Bidder shall supply any additional details the Florence County Forestry Department deems necessary prior to award of contract. The bridge supplier will provide estimated weight of the bridge in their proposal to the contractor.
- B. A bridge, trestle and abutment plan, specific to the site and in compliance with these specifications, sealed by a professional engineer registered in the State of Wisconsin and experienced in bridge design, shall be submitted to Florence County Forestry Department within 4 weeks after award of contract. The plan shall include all details necessary for the construction of both the trestle and bridge rehabilitation.
- C. This Submittal shall include, but not limited to, the following:
 - a. Basic design criteria shall be shown on the design plans.
 - b. Complete detailed drawings of all structural steel connections, sizes of members, spans lengths between bearing points, skews, walkway widths, height of handrails and safety rails, bearing assembly details, anchor bolt location, concrete deck reinforcement, design data, materials data, and dead and live load bearing reactions.
 - c. Engineer's certification. The plans shall be sealed, signed and dated by a Professional Engineer registered in the State of Wisconsin.
 - d. One set of design calculations with independent checks.
 - e. One set of prints from this submittal, and any subsequent submittals, will be returned to the Contractor, either indicating acceptance or marked with revisions and/or corrections as necessary. Contractor shall provide Project Engineer with copies of final plans to be used in fabrication and construction.

PART 5 – QUALITY ASSURANCE

MANUFACTURE

- A. All materials shall be well manufactured. All steel is to be new and of domestic origin. All lumber and timber shall be straight, well sawed, sawed square at ends and have opposite surfaces parallel unless otherwise required by the plans and specifications.
- B. All welds are to be visually inspected. Nondestructive weld testing shall be performed by the manufacturer.

WORKMANSHIP

- A. Workmanship shall be first class throughout. Nails and spikes shall be driven with sufficient force to set the heads flush with the surface of the wood, thus ensuring the surface shall be free from deep or frequent hammer and tool marks.

HANDLING

- A. Lumber and timber shall be handled with sufficient care to avoid breaking through portions penetrated by treatment, and thereby exposing untreated wood. Chains, peavies, cant hooks, timber dogs, pike poles and other pointed tools that would burr, blemish, penetrate or permanently deform the contacted member shall not be used. Rope, rubber or fabric slings are to be used.

DELIVERY AND ERECTION

- A. Delivery and Erection: The bridges shall be delivered by truck to a location nearest to the site accessible by roadways. The Contractor shall be responsible for unloading the bridges from the trucks at the time of arrival.
- B. The manufacturer shall notify the Contractor in advance of the expected arrival time. Information regarding delays after the trucks depart the plant such as inclement weather, delays in permits, rerouting by public agencies, or other circumstances shall be passed on to the Contractor as soon as possible.
- C. The manufacturer shall inform the Contractor of the actual lifting weights, attachment points, and all other pertinent information needed to install the bridge. Unloading, splicing, bolting, and proper lifting equipment is the responsibility of the Contractor. The procedure for bolting the field splices shall be given to the Contractor by the manufacturer. Contractor shall provide all tools, equipment, labor, and miscellaneous items required to complete the work. Installation of the bridge sections will be accomplished with cranes or other adequate heavy equipment.

PILE DRIVING

- A. Pile shall be driven in accordance with WisDOT specifications to insure proper capacity is attained.

Construction may not begin prior to October 1st, 2013 and construction must be completed by December 1st, 2014. Construction activity may occur earlier than October 1st, 2013 with prior approval by the Florence County Forestry and Parks Department.