

NATURAL RESOURCES CONSERVATION SERVICE
CONSTRUCTION SPECIFICATION
North Dakota

TIMBER FABRICATION AND INSTALLATION
(Code 104)

1. SCOPE

The work shall consist of timber structures and the timber portions of composite structures, including the supply and treatment of all required materials as shown on the drawings and in accordance with this specification. Any materials or construction details contained within the design package supersede those of this construction specification.

2. LOCATION

Timber structures shall be installed at the locations, and in the configurations, as shown on the drawings and staked in the field. Any deviation from the drawings requires approval from NRCS prior to installation.

3. QUALITY CONTROL

Quality Control of all materials and construction procedures is the responsibility of the producer and installer. NRCS will make periodic review(s) of work for the benefit of the agency which will include final construction inspection.

4. MATERIALS

Timber and Lumber Grading – Structural timber and lumber shall be graded in accordance with the grading rules, applicable to the specified species, adopted by a lumber grading or inspection bureau or agency recognized as being competent and that conform to the basic principles of ASTM D245. The material supplied according to the commercial grading rules shall be of equal or greater stress value than the specified stress-grade.

Quality – All materials shall be sound wood, free from all rot and defects. No boxed heart pieces of Douglas fir or Redwood shall be used in stringers, floor beams, caps, posts, sills, or other principal structural members. Boxed heart pieces are defined as timber so sawed that at any section in the length of a sawed piece the pith lies entirely inside the four faces.

Heartwood – All timber and lumber specified for use without preservative treatment shall contain not less than 75 percent heartwood on any diameter or on any side or edge, measured at the point where the greatest amount of sapwood occurs. This requirement shall not apply to timber and lumber for which pressure treatment with wood preservative is specified.

Sizes – The sizes specified are nominal sizes (milled to full size dimensions). Unless otherwise specified, the material shall be furnished in American Standard dressed sizes.

Marking – Each piece of timber and lumber shall be legibly stamped or branded with an official grade identification. Plywood shall be legibly stamped with an official mark designating the grade, type, and surface finish as described in the cited Product Standard.

Preservative Treatment – The preservative in this specification applies only to structures for Agricultural Use and only to those specific materials identified on the drawings as requiring treatment. Allowable water-borne preservatives include Chromated Copper Arsenate (CCA), Ammoniacal Copper Arsenate (ACZA) (also known as Chemonite), and Copper Azole (CA). Treatment will be in accordance with the American Wood Protection Association, AWWA Use Category UC4B.

Hardware – All hardware, except for cast iron, shall be hot-dip galvanized or stainless steel. Unless otherwise specified, structural steel shapes, plates and rods shall not be galvanized. All fasteners, connectors, and any other metal contacting alkali copper quaternary (ACQ) or copper azole (CA) treated wood shall be stainless steel grade 304 or 316 or be manufactured with a coating intended for use with ACQ or CA. Galvanizing for fasteners shall conform to ASTM A153. Galvanizing for connectors made from steel sheet shall conform to ASTM A653, Class G185. Galvanizing for all other metal in contact with preservative treated wood shall conform to ASTM A123. Stainless steel shall be AISI Type 304 or 316.

For wood treatment approved by ICC Safe, fasteners must comply with the treatment report requirements and be verified prior to installation to meet those requirements.

Washers shall be ogee gray iron castings or malleable iron castings unless washers cut from medium steel or wrought iron plate are specified on the drawings. Cast washers shall have a thickness equal to the diameter of the bolt and a diameter equal to four times the thickness. For plate washers the thickness shall be equal to one-half the diameter of the bolt, and the sides of the square shall be equal to four times the diameter of the bolt. Holes in washers shall not be more than one-eighth inch greater in diameter than the bolt.

Split ring connectors, tooth ring connectors, and pressed steel shear plate connectors shall be manufactured from hot-rolled, low-carbon steel conforming to the requirements of ASTM A711, Grade 1015. Malleable iron shear plate connectors and spike grid connectors shall be manufactured in conformance with the requirements of ASTM A47, Grade 35018.

All connectors and fasteners shall be of approved design and of the type and size specified.

5. INSTALLATION

All framing shall be true and exact. Timber and lumber shall be accurately cut and assembled to a close fit and shall have even bearing over the entire contact surfaces. No open or shimmed joints will be accepted. Nails and spikes shall be driven with just sufficient force to set the heads flush with the surface of the wood. Deep hammer marks in wood surfaces shall be considered evidence of poor workmanship and sufficient cause for rejection of the work.

Holes for round drift-pins and dowels shall be bored with a bit 1/16-inch smaller in diameter than that of the drift-pin or dowel to be used. The diameter of holes for square drift-pins or dowels shall be equal to one side of the drift-pin or dowel. Holes for machine bolts and rods shall be bored with a bit not larger than the body of the screw at the base of the thread.

Washers shall be used in contact with all bolt heads and nuts that would otherwise be in contact with wood. Cast iron washers shall be used when the bolt will be in contact with earth. All nuts shall be checked or burred effectively with a pointed tool after the final tightening.

Unless otherwise specified, surfacing, cutting and boring of timber and lumber shall be done before treatment. All cuts and abrasions of treated timber or lumber shall be carefully trimmed and coated with a wood preservative. All recesses and holes cut or bored in treated timber and lumber shall be swabbed with a wood preservative or filled by pumping coal-tar roofing cement meeting ASTM D5643 into the holes using a caulking gun or similar device. The coating or swabbing of the lumber shall be not less than two coats of a copper naphthenate wood preservative containing a minimum of 2.0% copper metal. The treatment preservative shall be applied according to the product label. Any excess preservative not absorbed by the wood member shall be cleaned off prior to use.

After timber assembly, any unfilled holes shall be plugged with tightly fitting wooden plugs that have been treated with preservative as specified.

6. HANDLING AND STORING MATERIALS

All timber and lumber stored at the site of the work shall be neatly stacked on supports at least 12 inches above the ground surface and protected from the weather by suitable covering. Untreated material shall be so stacked and stripped as to permit free circulation of air between the tiers and courses. Treated timber shall be close-stacked. The ground underneath and in the vicinity of all stacks shall be cleared of weeds and rubbish. The use of cant hooks, peavies, or other pointed tools, shall not be permitted in the handling of structural timber or lumber. The exception to this are end hooks. Treated timber shall be handled with rope slings or other methods that will prevent the breaking or bruising of outer fibers, or penetration of the surface in any manner.

7. ITEMS OF CONSTRUCTION DETAIL

Items of work to be performed in accordance with this specification and construction details are:

a)