

COOLING TECHNOLOGY INSTITUTE

CTI CODE TOWER Standard Specifications

Timber Connection Specification



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This guideline document summarizes the best current state of knowledge regarding the specific subject. This document represents a consensus of those individual members who have reviewed this document, its scope and provisions. It is intended to aid all users or potential users of cooling towers.

Approved by the CTI Executive Board.



This document has been reviewed and approved as part of CTI's Five Year Review Cycle. This document is again subject to review in 2027.

Approved by the
CTI Executive Board

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Timber Connection Specification

Part I

Scope, Abbreviations, Other Standards, and Definitions

1.0 Scope

- 1.1 This standard sets forth in detail the recommended material and manufacturing limitations, design requirements and design loads for commonly used timber fasteners employed in the construction of industrial cooling towers.
- 1.2 Application of design loads is limited to member sizes, bolt diameter, shear plate and split ring sizes tabulated herein.
 - 1.2.1 Standard dressed sizes of wood members for species included from 25.4 mm (1") thru and including 203.2 mm (8"), nominal.
 - 1.2.2 Machine bolts in diameters from 9.5 mm (3/8") to 25.4 mm (1.0")
 - 1.2.3 63.5 mm (2-1/2") diameter split-ring connectors with 12.7 mm (1/2") diameter bolt.
- 1.3 Data included herein have been established and calculated in accordance with values and methods per the National Design Specification, latest edition, as published by the American Wood Council.
- 1.4 This specification is based on the best engineering and information available. It is not intended to prevent the use of assemblies, designs or materials not meeting the criteria herein, where it can be demonstrated that by proven analysis and testing an alternate assembly, design or material can perform satisfactorily in its intended end use.

2.0 Abbreviations

AWC American Wood Council, (www.awc.org)
ICC International Code Council, (www.iccsafe.org)
NDS National Design Specification for Wood Construction, (www.awc.org)
WCLIB West Coast Lumber Inspection Bureau, (www.wclib.org)
WWPA Western Wood Products Association, (www.wwpa.org)
RIS Redwood Inspection Service www.redwoodinspection.com)
IBC International Building Code, by ICC (www.-iccsafe.org)

3.0 Purpose

- 3.1 Connection capacities evaluated per the requirements of Part III, used in conjunction with lumber design stresses published in STD-103 and STD-114, provide the basis for complete structural analysis of the framework used in a tower.
- 3.2 All bolted, shear-plate and/or split-ring connector joints, when analyzed in accordance with acceptable engineering practices, shall have applied loads of magnitude that will produce stresses below evaluated values.

4.0 Definitions

- 4.1 Elements of a timber joint are as follows:
 - 4.1.1 Timber members. Columns, horizontal ties, braces, joists, beams and similar wood members.
 - 4.1.2 Bolts. Common commercial bolt which must be full-bodied diameter with nut and washer.
 - 4.1.3 Split-ring connector. Metal ring formed to closed, true, circle. The ring is cut through to form a tongue and corresponding slot in one place in its circumference. One split ring joins 2 wood members together and the bolt passing through the center of the ring holds the faces of the joint members in contact. See NDS chapter 12 for more information on split ring connectors.