

Basis of Design

This section applies to the design and installation of timber framing.

Design Criteria

- Use most recent version of the International Building Code (IBC) with local municipality amendments. Referenced standards include the National Design Specification (NDS) for Wood Construction, the Allowable Stress Design (ASD) Manual for Engineered Wood Construction, and the Load and Resistance Factor Design (LRFD) Manual for Engineered Wood Construction.
- Design timber structures not only to be structurally adequate but also to be durable with a minimum of maintenance required.
- Use only new wood products. An exception to this would be when considering reuse of materials for LEED.
- Specify preservative-treated wood where members are exposed to weather or in contact with concrete or masonry. Specify all fasteners and connection hardware in contact with preservative-treated wood to be stainless steel. Option is to separate the fastener by other means.
- Account for wood shrinkage in design. Use prefabricated wood "I" or open web joists or trusses where necessary to avoid shrinkage problems.
- Check for availability of long members such as studs. Utilize structural composite lumber where necessary.
- Specify camber of floor and roof framing to provide level floors and flat roof planes.
- Engineer of record shall design and document all permanent bridging and bracing necessary for stability of metal plate connected wood trusses.
- Clearly detail shear wall nailing, stud sizes, plate sizes, sheathing orientation, anchor bolts, plate washers, and hold-downs. Provide hold-downs anchors at each end of all shear walls.
- Provide adequate ventilation for all crawl and attic spaces.
- All exposed wood surfaces should be pitched to assure runoff of water. Avoid construction details that trap moisture in end grain.

Design Evaluation

The following information is required to evaluate the design:

- Schematic Design Phase: Provide schematic plan indicating typical framing. Outline specifications.
- Design Development Phase: Provide framing plans, typical details. Draft specifications.
- Construction Document Phase: Complete design and specifications.

Construction Submittals

- Shop drawings and calculations for prefabricated wood joists and trusses.

- Shop drawings for Glulam members.

Quality Assurance

- Inspection of all wall, floor and roof sheathing nailing is required in addition to current code required inspection. Verify sheathing, nailing and nominal size of framing members at adjoining panel edges.

Related Sections

- Facilities Services Design Guide - General Requirements - Structural
- Facilities Services Design Guide - Foundations (for timber piles)
- Facilities Services Design Guide - Structured Floors
- Facilities Services Design Guide - Roofs

Products, Material and Equipment

- Sawn timber to be Douglas Fir-Larch or better.
- Plywood shall be exterior grade. OSB (oriented strandboard) is not allowed for floors and roof.
- Glulam members shall be 2400 psi minimum. Use architectural grade where exposed to view.
- Gage metal framing connectors shall be Simpson Strong-Tie or equal with ICBO certification.
- Metal plate connected wood trusses shall be designed per TPI (Truss Plate Institute) specifications.

Installation, Fabrication and Construction

- Overdriven nails into sheathing are not allowed. Replace sheathing if nails are overdriven.
- Notching of members not allowed at any time.
- Members shall not be cut, drilled, or altered in any way without written approval by the engineer of record.
- Install all members full length. Splicing of members between supports not allowed.
- Use common nails, staples are not an allowable substitution.
- Glue all floor sheathing with minimum 3/16" diameter continuous bead of construction adhesive. Use two continuous beads at abutting panels.
- Erect and protect timber framing from moisture as quickly as possible to reduce possibility of swelling or distortion.

END OF DESIGN GUIDE SECTION