

PART 1 GENERAL

1.1 Section Includes

- A. Cross Laminated Timber (CLT) Panels as shown on drawings.

1.2 Related Sections

- A. Submittal Procedures.
- B. Wood and Steel Connector Details.
- C. Beam Construction Details.
- D. Glue Laminated Materials.
- E. General provisions of the Contract.

1.3 References

- A. CAN/CSA O122-06, ANSI D3737-07 Structural Glued Laminated Timber.
- B. CSA O86-14, Engineering Design in Wood, including Annex B.
- C. CSA O112 SERIES-M1977 (R2006), CSA Standards for Wood Adhesives.
- D. CSA O177-16, Qualification Code for Manufacturers of Structural Glued Laminated Timber.
- E. APA Standard for Performance Rated CLT ANSI/APA PRG 320/2012.

1.4 Design Requirements

- A. Structural design for all CLT panels and their connections as per CLT structural notes.
- B. Design to include fall restraint recommendations.
- C. Unsolicited alternative proposals, and unsolicited substitutions of materials, structure, connections or otherwise, must be submitted with sketches and calculations sealed by a Professional Engineer registered in the State of _____ and will require reviews by the consultants. Detailed reviews such as these, including changes to construction drawings and coordination, will be undertaken on an additional fee basis, at the Contractor's cost. This cost must be included in the proposal by the Contractor. Such review does not guarantee acceptance of the unsolicited alternative proposal(s).

1.5 Submittals

- A. CLT supplier to provide a fully accurate three-dimensional (3D) model of the interfaces (supports, abutments, etc.), CLT panels, secondary timber members, plus all connections prior to submission of shop drawings. Model to be generated using CADWorks (compatible with AutoCAD 2011), AutoCAD 2011, CATIA version 5 release 18 or approved alternate. 3D model to use as-built foundation X, Y, Z coordinates for CLT panel bases.
- B. Shop Drawings - Clearly indicate stress grade, service grade, appearance grade, connection details, shop applied finishes, shop and erection details, including cuts, holes, fastenings, camber and connection hardware.
- C. Submit PDF shop drawings showing all applicable details and material specifications to the Engineer for review prior to fabrication. Shop drawings shall be accompanied by a certificate of conformance to manufacturing standard.

- D. Drawings to be signed by a Registered Professional Structural Engineer, registered in the State of _____ for items designed by supplier.
- E. Do not fabricate until shop drawings are reviewed without further changes.

1.6 Manufacturer's Qualifications

- A. To be certified by the American Plywood Association - Engineered Wood Systems (APA EWS) and bonded with polyurethane resin (white) adhesive meeting the requirements of ANSI A190.1-1992, DIN 68 141 and EN 301 and 302.
- B. Cross Laminated Timber (CLT) manufacturer certified by CSA Administrative Board, Structure Glued Laminated Timber Division in accordance with CAN/CSA O177- to manufacture:
 - i. Class 1 interior softwood glued laminated members.
 - ii. Class X exterior softwood glued laminated members.
- C. Submit certificate in accordance with CAN/CSA O177.

1.7 Delivery and Handling

- A. Arrange delivery of panels in accordance with construction schedule to designated delivery location.
- B. Affix authorized label to all panels supplied. Also identify each panel with mark number.
- C. Protect corners with wood blocking.

1.8 Storage and Protection

- A. Slit underside of membrane covering during storage at site. Do not deface members.
- B. Store CLT panels, blocked off ground and separated with striping, so air may circulate around all faces of members.
- C. Cover top and sides with opaque moisture resistant membrane if outside.
- D. Maintain protection of CLT panels during construction.

PART 2 PRODUCTS

2.1 Materials

- A. Laminating Stock for Cross Laminated Timber (CLT) panels: Spruce Pine #1/2 to CSA-0122 - 06 or CSA 086 - 09.
- B. Adhesives: To CSA 0112.10, and Sections 2.1.3 and 3.3 (ASTM D7247 heat durability) of AITC 405.
- C. Acceptable Product: Purbond HB E452 (or approved equivalent).
- D. Finish of CLT panels: coating per section 9900, field applied.

2.2 Accessories

- A. Steel Connectors: Hot dipped galvanized.
- B. Wrapping material: Weatherproof, lightproof, stain free material. Cut holes on site on underside of wrapping to avoid accumulation of condensation.

2.3 Fabrication

- A. Fabricate Cross Laminated Timber (CLT) panels in accordance with ANSI/APA PRG 320/2012 except where specified otherwise and to following classifications. Use multiple layers of 19mm (¾ in) minimum to 38mm (1½ in) maximum thick laminations. Exceptions only with written consent of the Consultant.
- B. CLT grade: as indicated on drawings and referenced by APA/PRG 320 and APA PR-L314C.
- C. Appearance Classification:
 - a. Non-Exposed – where panels are concealed.
 - Shake and checks allowed, shall not exceed 915mm or ¼ the length
 - Heart or Blue Stain allowed, not limited
 - Knots – firm and tight (NLGA #2)
 - Pitch streaks not limited
 - Minimal wane on face
 - Side pressure on exposed face not required
 - b. Exposed – where panels are in view in final construction. Exposed face to utilize “J” grade SPF lumber, or L3&Btr D. fir
 - Shake and checks allowed up to 610mm (24 in) long, none through
 - Up to a maximum of 5% Blue stain allowed, heart stain permitted.
 - Knots – firm and tight (NLGA #2)
 - Pitch streaks not limited
 - Wane on face not permitted
 - Side pressure on exposed faces required
- D. Visual grade Cross Laminated Timber (CLT) panels to be fabricated with chamfers, Non-Visual grade panels can be supplied without chamfers (90° corners).
- E. Cross Laminated Timber (CLT) panels to be joined at edges using a continuous spline. All required fastener and spline geometry by manufacturer. To be pre-approved by Engineer prior to fabrication.
- F. Mark panels for identification during erection, ensure that marks will be concealed in final assembly for appearance grade panels. Clearly mark top surface.
- G. All structural steel connecting CLT panels to each other and to supporting panels shall be detailed, supplied and test fitted in the shop by the CLT supplier.

Part 3 EXECUTION

3.1 Examination

- A. Prior to fabrication, check all dimensions relating to this section of work. Report any discrepancies to Engineer.
- B. Prior to site erection, examine all site conditions and ensure an acceptable condition.

3.2 Erection

- A. Erect CLT panels in accordance with final reviewed shop drawings.
- B. Make adequate provision for possible erection stresses. Set panels level and plumb to correct positions. Securely brace panels and anchor in place to maintain plumb until permanently secured by finished structure.

- C. Fit CLT panels closely and accurately, without trimming, cutting or other modifications, unless approved in writing by Engineer.
- D. Site cutting or boring of CLT panels, other than shown on shop drawings not permitted without written consent of Engineer.

Part 4 ALTERNATES AND/OR EQUALS

4.1 Base Bid

Due to the customized detailing and engineering characteristics of the wall and/or roof and/or floor framing assembly, it is a requirement that CrossLam® by Structurlam Products LP be used in the base bid.

4.2 Alternate Manufacturers

Other manufacturers' bids are to be listed in the alternate section of your proposal. All framing plans, detailing and calculations for the alternate bids will be reviewed by the owner, architect and engineer for structural performance, possible conflicts with related trades, and compatibility with the overall building requirements and building code.

4.3 Alternate Products

Alternate products will only be permitted if written approval and acceptance is obtained by both architect and owner at least 7 days prior to the bid date.

4.4 Acceptable Alternates

At the discretion of the specifier of record, accepted alternates will be listed on the final addendum prior to the bid date.

Part 5 AVAILABILITY

For availability of the fabricated CrossLam® System contact:

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END OF SECTION