

B907 – STRUCTURAL WOOD SYSTEMS – (OPSS 907)

B907.1 GENERAL

The work under these items consists of structural wood systems composed of modular bridge components, including all wood in the structure and cribs, associated decking, ramps, bank seats, sidewalks, and railings. Fabrication, preservative treatment, delivery, erection and assembly of mass timber elements is also included.

B907.2 REFERENCES

- Structural Manual;
- Canadian Highway Bridge Design Code (CHBDC), CSA-S6;
- OPSS.PROV 1601;
- American Wood Council – National Design Specification for Wood Construction;
- AASHTO – LRFD BDS-9, LRFD Bridge Design Specifications, 9th Edition.

B907.3 TENDER ITEMS

0907-0010	Wood in Structure	(Normal, Lump Sum/ m ³)
0907-0020	Wood in Cribs	(Normal, m ³ , PQP)
0907-0030	Fabrication of Mass Timber Elements	(Normal, Lump Sum)
0907-0040	Delivery of Mass Timber Elements	(Normal, Lump Sum)
0907-0050	Erection of Mass Timber Elements	(Normal, Lump Sum)

B907.4 SPECIFICATIONS

The requirements for the construction of structural wood systems are contained in OPSS 907. This includes design, erection, and assembly of mass timber elements, and stressing of structural wood systems.

The requirements for prefabrication of elements, treatment with preservatives, delivery, handling and storage of wood are contained in OPSS 1601.

B907.5 SPECIAL PROVISIONS

The designer should refer to Chapter “E” of this manual to review applicable special provisions.

A Special Provision should be included for the post-fabrication shop trial assembly of main structural elements. See B907.9.1 below.

A Special Provision may be included for the post-treatment shop trial assembly of main structural elements. See B907.9.1 below.

B907.6 STANDARD DRAWINGS

Drawings are contained in Ontario Provincial Standard Drawings (OPSD), Ministry of Transportation Ontario Drawings (MTOD), and Structural Standard Drawings (SSD).

B907.7 DESIGN

Design shall be according to the Structural Manual, CSA-S6 and CSA-O86.

B907.8 COMPUTATION**B907.8.1 Item Payment Basis**

Wood in Structure is a lump sum item for all sawn lumber in a structure, except for cribs.

Wood in Cribs is a PQP item for the volume of wood in cribs.

Fabrication of Mass Timber Elements is a lump sum item for the pre-fabrication and post-fabrication preservative treatment of mass timber elements such as girders and deck panels. Mass timber elements include Glulam (GLT), Dowel Laminated Timber (DLT) and Nailed Laminated Timber (NLT) according to OPSS 1601.

Delivery of Mass Timber Elements is a lump sum item for the delivery of pre-fabricated structural elements to site.

Erection of Mass Timber Elements is a lump sum item for the erection of pre-fabricated structural elements.

B907.8.2 Sources of Information

The main sources of information for the above tender items are the Structural Office, Foundation Design Section, and the Regional Geotechnical Section.

B907.8.3 Method of Calculation

The unit of measurement for the Wood in Structure item is lump sum per cubic metre of volume. The lump sum per cubic metre units are only used for cost estimating. In the tender, this shall be a LS item with a quantity of 100%.

The unit of measurement for the Wood in Cribs item is the volume in cubic metres. Each component (i.e., pier, abutment) shall be calculated separately and the total summed for each individual structure.

The volume of wood shall be calculated based on dimensions specified in the Contract Drawings (nominal or dressed as applicable) and shall be given to the nearest 0.1 of a cubic metre.

The unit of measurement for the Fabrication of Mass Timber Elements is lump sum and the unit of measure is each.

The unit of measurement for the Delivery of Mass Timber Elements is lump sum and the unit of measure is each.

The unit of measurement for the Erection of Mass Timber Elements is lump sum and the unit of measure is each.

B907.9 DOCUMENTATION

B907.9.1 Drawings

The designer shall include all the pertinent information in the contract drawings.

Field Fabrication

When field fabrication of wood components is required, the designer shall indicate this on the Contract Drawings under Construction Notes.

Field fabrication is strongly discouraged, exposure of bright wood significantly decreases the life of the component. Field fabrication should be limited to drilling of breakaway holes in timber sign structure and guide rail posts only.

Shop Fabrication

Pre-fabrication of elements in the shop and post-treatment with preservatives is the preferred approach to structural wood.

Where incising is required by the wood species being treated, incising shall be specified on the Contract Drawings. The designer should be familiar with CSA O80.

The OPSS requirement is for assembly of the major structural system after machining and prior to preservative treatment, when specified in the Contract Documents. The Contract Drawings shall specify pre-treatment shop assembly for prefabricated elements (GLT and DLT).

A post-treatment assembly should be considered by the designer for details such as complicated fixed-end moment connections, arch components, primary longitudinal girders where dimensional change is not allowed by the connections to the substructure, or components of bridges with large skews.

Fasteners

Installation torque of lag screws shall be identified on the Contract Drawings and be based on the specific fastener, diameter and depth, and wood species specific gravity.

Gauge lines for horizontal nailing shall be provided.

Geotextile – Wood in Cribs

The designer shall indicate on the Contract Drawings the Geotextile placement details.

Stress-Laminated Wood Decks

The designer shall indicate on the Contract Drawings the stressing forces as well as any stressing and restressing sequence requirements.

B907.9.2 Quantity Sheets

Each tender item is to be entered into a separate column in the Quantity Sheet-Quantities-Structure. The tender item name is the column heading.

For the Wood in Structure tender item, the structure name is labelled in one row. The total is entered as cubic metres for lump sum per cubic metre tender items where the appropriate row and column meet. Contract Preparation System will convert lump sum per cubic metre tender items to lump sum items and insert 100% as the tender quantity. For multiple structures on one contract, it is appropriate to use a separate Wood in Structure tender item for each applicable structure.

For fabrication, delivery and erection of element items, the structure name is labelled in one row. For multiple structures in one contract, it is appropriate to use a separate tender item for each applicable structure.

A separate row in the Quantity sheet is used for each bridge.