



## Evaluation Report CCMC 13261-R

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### **TJ<sup>®</sup> Rim Board**

#### **1. Opinion**

It is the opinion of the Canadian Construction Materials Centre (CCMC) that “TJ<sup>®</sup> Rim Board”, when used as a rim board around the perimeter of engineered wood joists in accordance with the conditions and limitations stated in Section 3 of this Report, complies with the National Building Code 2010:

- Clause 1.2.1.1.(1)(a), Division A, using the following acceptable solutions from Division B:
  - Sentence 4.3.1.1.(1) Design Basis for Wood (CAN/CSA-O86-09, “Engineering Design in Wood”)
- Clause 1.2.1.1.(1)(b), Division A, as an alternative solution that achieves at least the minimum level of performance required by Division B in the areas defined by the objectives and functional statements attributed to the following applicable acceptable solutions:
  - Sentence 9.23.3.4.(1) Nailing of Framing

This opinion is based on CCMC's evaluation of the technical evidence in Section 4.1 provided by the Report Holder.

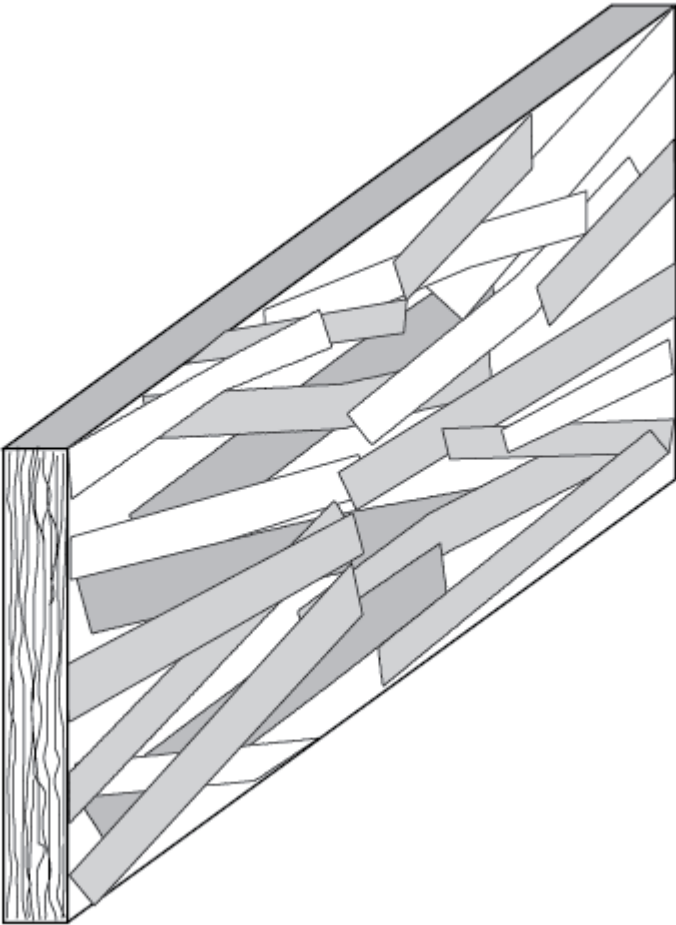
#### **2. Description**

The product is made from TimberStrand<sup>®</sup> LSL (see CCMC 12627-R for the general evaluation of TimberStrand<sup>®</sup> LSL) and is manufactured by blending strands of wood species or species combinations with an isocyanate-based adhesive. The wood species, species combinations and adhesive used are as specified in the Weyerhaeuser TimberStrand<sup>®</sup> LSL Manufacturing Standards. The strands are oriented in a parallel direction and formed into mats of various thicknesses that measure 2.44 m wide and either 10.67 m or 14.63 m long. The mats are pressed to the required thickness by using a steam injection press. The product members are available in thicknesses of 28 mm, depths up to 406 mm and lengths up to 7.3 m. Figure 1 illustrates the strand orientation of the product.

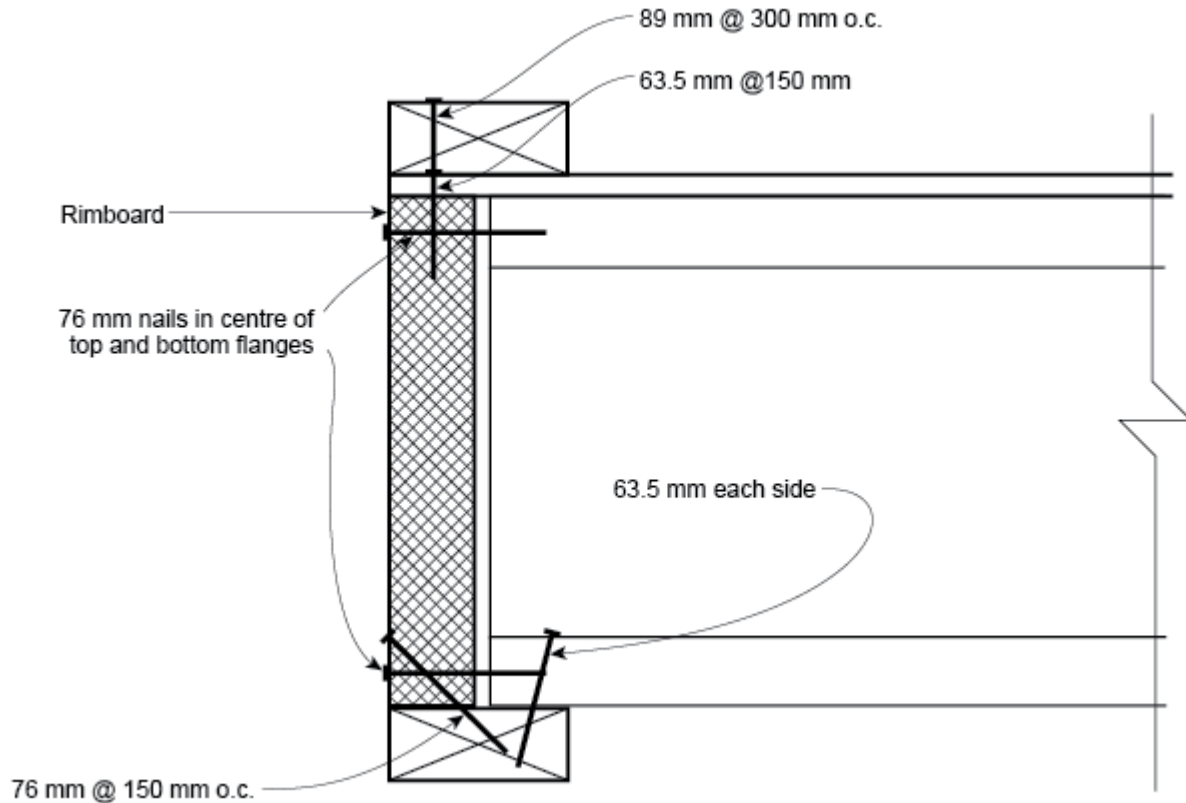
The product is intended to be installed in order to:

- transfer, from above to below, all vertical loads at the rim board location;
- provide diaphragm attachment (subfloor to the top edge of the rim board);
- transfer in-plane lateral loads from the diaphragm to the shear wall below;

- provide lateral support to the joist or rafter;
- provide closure at the ends of the joists or rafters; and
- provide an attachment base for siding and/or exterior deck ledger.



**Figure 1. Strand orientation**



**Figure 2. Installation details (see manufacturer's instructions)**

### **3. Conditions and Limitations**

CCMC's compliance opinion in Section 1 is bound by the "TJ<sup>®</sup> Rim Board" being used in accordance with the conditions and limitations set out below.

- The product is intended for use in structural applications as a rim board for engineered wood floor joists, and is intended for dry service use<sup>(1)</sup> applications only.

*(1) All lumber, wood-based panels and proprietary engineered wood products are intended for dry service conditions. "Dry service" is defined as the in-service environment under which the equilibrium moisture content (MC) of lumber is 15% or less over a year and does not exceed 19% at any time. Wood contained within the interior of dry, heated or unheated buildings has generally been found to have a MC between 6% and 14% according to season and location. During construction, all wood-based products should be protected from the weather to ensure that the 19% MC is not exceeded in accordance with Article 9.3.2.5., Moisture Content, of Division B of the NBC 2010.*

- The following literature has been provided to CCMC by the manufacturer to demonstrate compliance to Part 9 buildings for acceptance by the local authority having jurisdiction (AHJ):

i) Weyerhaeuser Installation Details

The installation of the product must be in accordance with the manufacturer's instructions provided in the following documents:

1. Framing Details for Floor and Roof, TJ-9001, dated June 2011; [Page 4]
2. iLevel Trus Joist, TJI 110, 210, 230, 360 and 560 Series Joist Specifier's Guide, TJ-4500, dated July 2010; [Page 10] and
3. iLevel Trus Joist, TJI s31, s33, s47 Series Joist Specifier's Guide, TJ-4510, dated July 2011 [Page 10].

The product must be installed in accordance with the manufacturer's installation guidelines noted in these documents for those applications falling within the scope of the documents. Applications outside the scope of these installation guidelines shall require engineering on a case-by-case basis.

#### ii) Engineering Required

For structural applications beyond the scope/limitations of the above referenced Weyerhaeuser publications or when required by the AHJ, the drawings or related documents shall bear the authorized seal of a professional engineer skilled in wood design and licensed to practice under the appropriate provincial or territorial legislation.

Installations beyond the scope/limitations of 3(i) imply, but are not limited to, the following:

- higher loads;
- concentrated column loads;
- areas of high wind and seismicity;
- concrete topping; and
- concrete roof tiles.

The engineer must design in accordance with CAN/CSA-O86-09, and may use as a guide, the “Engineering Guide for Wood Frame Construction,” published by the Canadian Wood Council.

- The product is intended to be installed in conjunction with engineered wood floor systems. The total factored loads on the product must not exceed the factored resistances listed in Table 4.1.1.1. Fastener details and nail spacing are presented in Tables 4.1.1.2 and 4.1.1.3 respectively.
- The rim boards must be stored and protected at all times from moisture and weather to prevent excessive weathering or deterioration of the wood components, as is the case for all wood-based composite wood products.
- The product must be identified with the phrase “CCMC 13261-R” along the face of the member. This CCMC number is only valid when it appears in conjunction with the PFS certification mark.
- Damaged or defective products must not be used unless repaired in accordance with written instructions from the manufacturer.

## **4. Technical Evidence**

CCMC's Technical Guide for “TJ<sup>®</sup> Rim Board” sets out the nature of the technical evidence required by CCMC to enable it to evaluate a product as an acceptable or alternative solution in compliance with the NBC 2010. The Report Holder has submitted test results and engineering analysis for CCMC's evaluation. Testing was conducted at independent laboratories recognized by CCMC. The corresponding test results for “TJ<sup>®</sup> Rim Board” are summarized below.

## 4.1 NBC 2010 Compliance Data for “TJ<sup>®</sup> Rim Board” on which CCMC Based its Opinion in Section 1

### 4.1.1 Design Requirements

**Table 4.1.1.1 Factored Resistances<sup>(1)(2)</sup> of the Product**

Thickness (mm)	Depth Range (mm)	Factored Horizontal Shear Transfer Capacity (kN/m)	Factored Vertical Load Resistance <sup>(3)</sup>	
			Distributed Load, $\Phi V$ (kN/m)	Concentrated Load, $\Phi C$ (kN)
28	≤ 406	3.8	95.7	Not Required <sup>(4)</sup>

**Notes to Table 4.1.1.1:**

1. All tabulated values are applicable to standard-term duration, therefore, adjustment is permitted for other load durations in accordance with CAN/CSA-O86. Use appropriate  $K_d$  (load duration factor) for a live-to-dead load ratio of less than four (4) (i.e. in the case of concrete toppings and concrete roof tiles).
2. Fastener resistances for the product are detailed in Table 4.1.1.2.
3. Compression perpendicular-to-grain resistances of the sill plate and floor sheathing shall be checked.
4. For rim boards 406-mm deep or less, no testing is required as the rim board’s compressive strength would be adequate to support individual studs or jack studs supporting lintels. For concentrated loads from columns supporting beams or girder trusses, squash blocks are required.

**Table 4.1.1.2 Product Fastener Details**

Fastener Property <sup>(1)</sup>	Nail Orientation	Load Direction	Specific Gravity of Equivalent Species for Design Purposes
Factored lateral nail resistance	Edge	Parallel and perpendicular to grain	(2)
	Face	Parallel and perpendicular to grain	D.Fir-L, SG=0.5
Factored lateral bolt resistance	Face	Perpendicular to grain	D.Fir-L, SG=0.5
Factored lateral lag screw resistance	Face	Perpendicular to grain	12.7-mm dia.: 2560 N <sup>(3)</sup>

**Notes to Table 4.1.1.2:**

1. When loading at an angle to the grain, the lateral capacity is calculated using the Hankinson Formula.
2. The product may be used as rim board material in structures complying with Part 9 of the NBC 2010.
3. 2560 N is the lateral load capacity allowed for 12.7-mm lag bolts in the product main members with 38-mm-thick side members fully penetrated into the main member, with a maximum 9.5-mm gap between main and side members.

**Table 4.1.1.3 Closest On-centre In-edge Nail Spacing<sup>(1)</sup> for the Product**

<b>Connector Size</b>	<b>Box (mm)</b>	<b>Common (mm)</b>
63.5 mm (8d)	152	152
76 mm (10d)	152	152
83 mm (12d)	152	152
89 mm (16d)	406 <sup>(2)</sup>	406 <sup>(2)</sup>

**Notes to Table 4.1.1.3:**

1. The closest on-centre spacing for nails installed perpendicular to the wide face is the same as permitted by the NBC 2010 for sawn lumber.
2. When nailing through the wall sill plate and floor sheathing, the closest on-centre nail spacing is 127 mm with 35-mm maximum penetration.

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# Appendix A

Tests on the product were conducted at a laboratory recognized by CCMC. The following is a summary of tests conducted in accordance with the CCMC Technical Guide.

**Table A1. Test Information for the Product**

Thickness swell	Specimens were subjected to a 24-h soak test in accordance with CAN/CSA-O325.0-92, “Construction Sheathing,” and some specimens failed the criteria by a narrow margin (1-2%). Manufacturing in-plant quality control adjustments will address thickness swell specification.
Bond durability	Bond durability testing in accordance with a modified version of CAN/CSA-O325.0-92, Section 6.3 was conducted and the product passed the standard’s criteria. The modified bond durability test is an improved method adopted by Industry and is part of revisions to CAN/CSA-O325.0-92 and PS2.
Control values	Control values have been established as part of the on-going quality control.
Vertical uniform load capacity	Eleven specimens of 406-mm-deep rim board were tested in order to determine the uniform compressive strength and factored resistance.
Vertical concentrated load capacity	Ten specimens of 406-mm-deep rim board were tested in order to determine the concentrated load strength and factored resistance.
Lateral load capacity	Twenty specimens of 406-mm-deep rim board were tested in order to determine the lateral load capacity and factored lateral load transfer.
Edge nailing durability	Three lateral load capacity specimens, each 406 mm deep, were soaked and tested and passed the criteria.
Lag screw capacity	Ten specimens were tested to determine the lag screw capacity and factored resistance.
Adhesives	The adhesives used were polymeric methylene diphenyl diisocyanate (PMDI) with a valid CCMC evaluation.
Manufacturing quality assurance	The manufacturing quality assurance program includes audits by PFS Corporation as part of the product certification.