CCMC CANADIAN CONSTRUCTION MATERIALS CENTRE

May 28, 2020

CCMC Technical Bulletin – May 2020

FIRE PROTECTION OPTIONS FOR ALTERNATIVE FLOOR JOISTS IN HOUSES

Revisions to CCMC evaluation reports to present information about fire protection options to Authorities Having Jurisdiction

Revisions to CCMC evaluation reports

The table below lists the revised Canadian Construction Materials Centre (CCMC) evaluation reports for engineered wood joists to be reviewed by Authorities Having Jurisdiction (AHJ's) across Canada.

Sections 4.2 and 4.3 in the reports have been revised to include:

- the available fire test data from the manufacturer, and
- direction from the Canadian Commission on Construction Materials Evaluation (CCCME) to provide the fire test information to AHJs.

Appendix B in the reports has been revised to outline optional fire-protected assemblies.

Sections 4.2 and 4.3 in the reports are reserved for providing additional information to building officials across Canada. These sections are beyond the scope of the formal evaluation conducted by the CCMC covered in Section 4.1, which outlines the evidence related to the explicit requirements of the National Building Code of Canada (NBC), or which emanate from the attributed objectives and functional statements to the NBC provisions. The CCMC's role in Sections 4.2 and 4.3 is limited to reviewing the manufacturer's data to make sure it is reliable and accurate for publication and presentation to the AHJs.

The following CCMC evaluation reports of engineered wood joists have been revised:

CCMC report no.	Joist product	Manufacturer
12412-R	LP SolidStart® I-Joists	Lousiana-Pacific Corporation
12691-R	Posi-Strut® Metal Web Joists	MiTek Canada Inc.,
12787-R	AllJoist® Prefabricated I-Joists	Boise Cascade Company
13032-R	Nordic I-Joist Series	Nordic Structures
13053-R	P3 Joist® PJI-40, PJI-60, PJI-80 I-Joists	EACOM Timber Corporation
13132-R	TJI® Series Joists	Weyerhaeuser
13300-R	BCI® Joists	Boise Cascade Company
13323-R	RFPI® Joists	Roseburg Forest Products Co.
13474-R	TRIFORCE™	Barrette Structural Inc.
13487-R	Red-I™ Series Joists	RedBuilt, LLC
13535-R	Nascor Series I-Joists	Nascor Systems
14001-R	Pinkwood Series I-Joists	Pinkwood Ltd.
14146-R	IB MAX-CORE® Series I-Joists	IB EWP inc.

Fire test data and fire protection solutions

The majority of the fire test data presented to the CCMC was generated by the engineered wood joist manufacturers that conducted floor fire tests for approval in the United States (US). In the US, the International Code Council's (ICC) residential building code requires equivalency to exposed 2x10 lumber floors in lieu of other fire protection options (for example, sprinklers). A test protocol was developed by the national ICC Evaluation Service, LLC (ICC-ES) in collaboration with the Wood I-Joist Manufacturers Association (WIJMA), which includes Canadian I-joist manufacturers, the American Wood Council (AWC), Underwriters Laboratories (UL), and other fire protection agencies.

The fire testing is essentially conducted following the principles of the CAN/ULC-S101 (ASTM E119 in the US) floor assembly test. The fire test protocol follows the CAN/ULC-S101 severe fire conditions and the time-to-collapse of the engineered wood joist has to meet the time-to-collapse determined for an exposed 2x10 lumber joist. The latter has been determined in the US to be 15 minutes and 30 seconds, which is the time-to-collapse criteria to be met. With this fire test protocol and pass/fail criterion, the innovative/alternative floor joist is tested with or without protection (see Figures 1, 2 and 3 below). In the US, the alternative joist is deemed equivalent to exposed 2x10 joists when it passes this test/criterion.

You will note that CCMC reports use the objective-based code language for alternative solutions where it is stated that the protected alternative joist performs "as well as" the inherent fire performance of exposed lumber floors. Since the NBC is not explicit on the fire performance of floors in single-family houses, the CCMC cannot make an exact equivalency to a specific NBC acceptable solution at this time. As a result, the CCCME decided that the CCMC should make these fire protection solutions from Canadian and US manufacturers available to AHJs across Canada as additional information.

Example fire protection solutions of wood I-joist below floor sheathing
(see the CCMC reports in the table above for details)

Figure 1a: end view of the installation of 12.5 mm (1/2 in.) regular gypsum board to protect web of I-joist

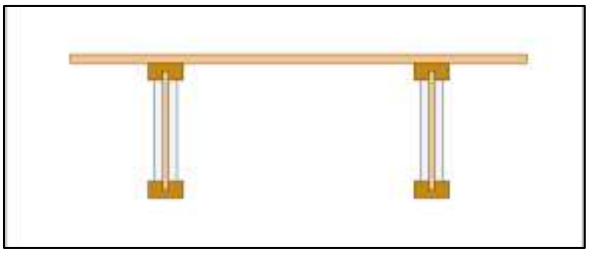


Figure 1b: side view of the installation of 12.5 mm (1/2 in.) regular gypsum board to protect web of I-joist

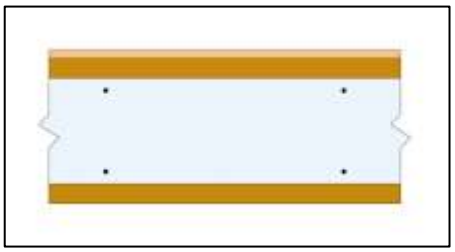


Figure 2a: end view of the installation of 12.5 mm (1/2 in.) regular gypsum board flange-to-flange of I-joist

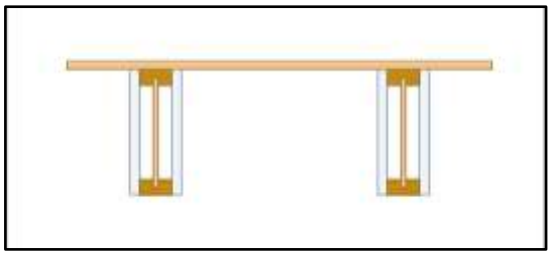
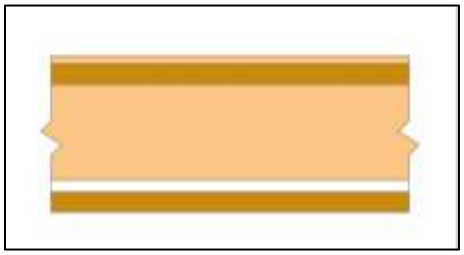


Figure 2b: side view of the installation of 12.5 mm (1/2 in.) regular gypsum board flange-to-flange of I-joist

Figure 3a: end view for wood I-joist at 600 mm spacing, placing 15.8 mm (5/8 in.) regular gypsum board on top of bottom flange of I-joist

Figure 3b: side view for wood I-joist at 600 mm spacing, placing 15.8 mm (5/8 in.) regular gypsum board on top of bottom flange of I-joist



For more details about the engineered wood joist fire protection solutions, please consult the individual CCMC reports. Some manufacturers have not conducted any fire testing and offer the default solution, which is a gypsum ceiling. Others have proprietary fire protection solutions for their specific alternative joist product.

If you have any questions, please contact:

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