

## Horizontal Diaphragm Design with TJI® Joists

With the ever increasing optimization of I-joist flange dimensions and properties, more focus has been placed on the performance of these products in horizontal diaphragm applications. iLevel has performed a significant amount of full scale horizontal diaphragm testing with TJI® joists in accordance with ASTM E455 to validate diaphragm performance properties. Based on this testing, iLevel has developed the following guidelines when TJI® joists are used as horizontal diaphragm framing members.

### TJI® Joists as Prescriptive (2005 NBCC, Part 9) Diaphragm Framing Members

TJI® joists are permitted as framing members in prescriptive floor and roof diaphragm construction in accordance with the 2005 NBCC, Part 9. When TJI® 110, 210 and 230 joists are used in floor diaphragm construction, the thickness of the sheathing must be a minimum of 19/32" with 8d(0.131"X2½") nails.

### TJI® Joists as Engineered Diaphragm Framing Members

TJI® 110,210,230,360 and 560 joists may be used as framing members in blocked and unblocked engineered diaphragms designed using the specified shear strength values in table 9.5.2 and procedures given in section 9 of CSA O86-01, subject to the limitations in Table 1 below.

**Table 1: TJI® Joist Engineered Diaphragm Framing Design Information <sup>(1)</sup>**

TJI®	Closest Permitted Nail Spacing (in) <sup>(2)</sup>			Design Information		
	6d Common (0.113"X2")	8d Common (0.131X2½")	10d Common (0.148X3")	Equivalent Framing Member Width (in)	Equivalent Specific Gravity	Maximum Permitted Specified Shear Strength, $v_d$ (plf)
<b>110<sup>(3)</sup> and 210<sup>(3)</sup></b>	4	4	4	1½	0.50	790
<b>230<sup>(3)</sup></b>	4	4	4	2½	0.50	895
<b>360 and 560</b>	3	3	4	2½	0.50	1340

- (1) Specified shear strength for wood structural diaphragms with TJI® joist framing must be determined in accordance with Table 9.5.2 of CSA O86-01, using the equivalent framing member width and specific gravities specified in table 1 above and must not exceed the maximum permitted specified strength given.
- (2) One row of nails is permitted along each sheathing panel end and edge. When nail spacing is less than 6" on-center, adjacent nails within a row must be offset (staggered). The closest permitted nail spacing in table 1 must not be exceeded. Solid sawn framing members must be used in lieu of TJI® framing members where the fastener spacing required in table 9.5.2 of CSA O86-01 is closer than the permitted nail spacing in table 1 above.
- (3) The specified shear strength of an unblocked diaphragm framed with TJI® 110, 210 and 230 joists must be multiplied by a factor of 0.85 unless a non-polyurethane sub-floor adhesive is used in combination with mechanical fasteners for the sheathing attachment.

If you have any questions or require additional information, please contact your iLevel representative.

Some TJI® joist series may not be available in your region.

TJI® joists are intended for dry use applications.



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