



**National Research
Council Canada**

**Conseil national
de recherches Canada**

Institute for
Research in
Construction

Institut de
recherche en
construction

CCMC 12885-R



*EVALUATION
REPORT*

DIVISION	06094
Issued	1998-11-27
Re-evaluated	2003-09-18
Re-evaluation due	2004-11-27

Re-Evaluation
in process

Renown Hangers & Connectors

Renown Specialties Company Ltd.
226 Jardin Drive, Unit 1-2
Concord, Ontario
L4K 1Y1

Tel.: (905) 669-6955

Fax: (905) 669-1563

Plant: 226 Jardin Drive, Unit 1-2
Concord, Ontario

1. Purpose of Evaluation

The proponent sought confirmation from the Canadian Construction Materials Centre (CCMC) that "Renown Hangers & Connectors" model numbers (ST/HDST/DT/HDDT/HHDST, IU, THDS, SHDS, FA and HT/RT) can serve as joist hanger or other lumber connector in compliance with the intent of the National Building Code of Canada (NBC) 1995.

2. Opinion

Subject to the limitations and conditions stated in this report, test results and assessments provided by the proponent show that "Renown Hangers & Connectors" model numbers (ST/HDST/DT/HDDT/HHDST, IU, THDS, SHDS, FA and HT/RT), assigned with the model numbers specified in this report, complies with CCMC's Technical Guide for Joist Hangers, Masterformat number 06094, dated 1995-08-30, and provides a level of performance equivalent to that required in:

- NBC 1995, Section 4.3. and Article 9.4.1.1. when designed in accordance with CSA O86-01, "Engineering Design in Wood."

This Report is provided without representation, warranty, or guarantee of any kind, expressed or implied, and the National Research Council of Canada (NRC) provides no endorsement for any evaluated material, product, system or service described herein.

NRC has evaluated the material, product, system or service described herein only for those characteristics stated herein.

The information and opinions in this Report are directed to those who have the appropriate degree of experience to use and apply its contents.

NRC accepts no responsibility whatsoever arising in any way from any and all use or reliance on the information contained in this Report. NRC is not undertaking to render professional or other services for or on behalf of any person or entity nor to perform any duty owed by any person or entity to another person or entity.

Canada Mortgage and Housing Corporation permits the use of this product in construction financed or insured under the National Housing Act.

3. Description

“Renown Hangers & Connectors” model numbers (ST/HDST/DT/HDDT/HHDST, IU, THDS, SHDS, FA and HT/RT), assigned with the model numbers specified in this report, consists of a joist hanger, truss hanger, strap hanger, framing anchor, and a hurricane or rafter tie with fasteners used to transfer the loads from the supported member to the supporting member. Hanger and connector models that have been evaluated are shown in Figures 1 and 2.

The metal hangers and connectors are fabricated in cold-form with light gauge steel from structural grade B (16, 18 and 22 gauge) and with a galvanized finish. Testing has been performed with galvanized nails.

4. Usage and Limitations

“Renown Hangers & Connectors” model numbers (ST/HDST/DT/HDDT/HHDST, IU, THDS, SHDS, FA and HT/RT) are used to support joists consisting of: lumber, wood trusses, glued-laminated timber, prefabricated wood I-joists or structural composite lumber. Installation, specifically regarding web stiffeners, and maintenance shall conform to the manufacturer’s current specifications and instructions.

The design values provided in this report are valid for the wood species and hanger models shown in Tables 2 and 3. However, the design value (Factored Resistance) can be valid for other wood product provided that:

- the relative density (or compressive strength perpendicular to grain “ f_{cp} ”) of the wood product is equal or superior to the wood product tested with the hanger or connector.
- where proprietary structural composite lumber (SCL) products are intended for use, only TimberStrand® (LSL), Parallam® (PSL) and laminated veneer lumber (LVL) of vertical veneer are acceptable.

Nail specifications in Tables 2 and 3 must be used for the published values to be valid. The hangers and connectors must be fastened to both wood members and either all fastener holes must be filled, or there must be a minimum number of nails as per engineer’s specifications. The use of hot-dip galvanized nails is recommended in corrosive environments.

The hanger or connector shall display no fracturing in either the protective coating or the base metal.

Structural members (joist and header) assembled with the evaluated hangers or connectors must conform to NBC 1995, Section 9.23. or must be designed by a professional engineer licensed to practice under provincial or territorial legislation.

Where building construction conforms to Part 9 of NBC 1995, there are no requirements related to the use of hangers and other connectors. However, listed in the following Table 1 are hanger models that have a factored resistance capable of supporting SPF floor joists with the maximum span and spacing requirements shown in Table A-1 and A-2 of the NBC. The joists must be of grade 2 or better. Hangers can be used with any maximum span and spacing of the NBC that correspond to the joist dimensions specified in the following Table.

Table 1. Hangers conforming to Part 9 of NBC 1995

Hanger models	Applicable floor joist dimensions (mm)
ST 24	38 x 89
HHDST26	38 x 140 / 38 x 184
ST26	38 x 140
ST28	38 x 184 / 38 x 235
ST210	38 x 235
ST212	38 x 286
HDST24	38 x 89 / 38 x 140
HDST26	38 x 140 / 38 x 184
HDST28	38 x 184 / 38 x 235
HDST210	38 x 235 / 38 x 286

“Renown Hangers & Connectors” model numbers (ST/HDST/DT/HDDT/HHDST, IU, THDS, SHDS, FA and HT/RT) must be identified with the phrase “CCMC # 12885-R”.

5. Performance

Tests were conducted by a laboratory recognized by CCMC. Tests were conducted in accordance with CCMC’s Technical Guide for Joist Hangers, Masterformat number 06094.

The ultimate lateral resistance was obtained from vertical load tests performed on three pairs of hangers or connectors. The ultimate lateral

resistance was based on the “lowest” capacity as determined from the following criteria as per CSA O86-01, “Engineering Design in Wood”:

- the lowest corrected ultimate load per hanger or connector calculated in accordance with clause 10.10.3.3 multiplied by 0.91.; or
- the average load per hanger or connector at which the vertical movement between the joist and the header is 3 mm, multiplied by 2.42.

Factored resistances were calculated in accordance with article 10.10.3.1 of CSA O86-01, “Engineering Design in Wood.” Results are listed in Table 2.

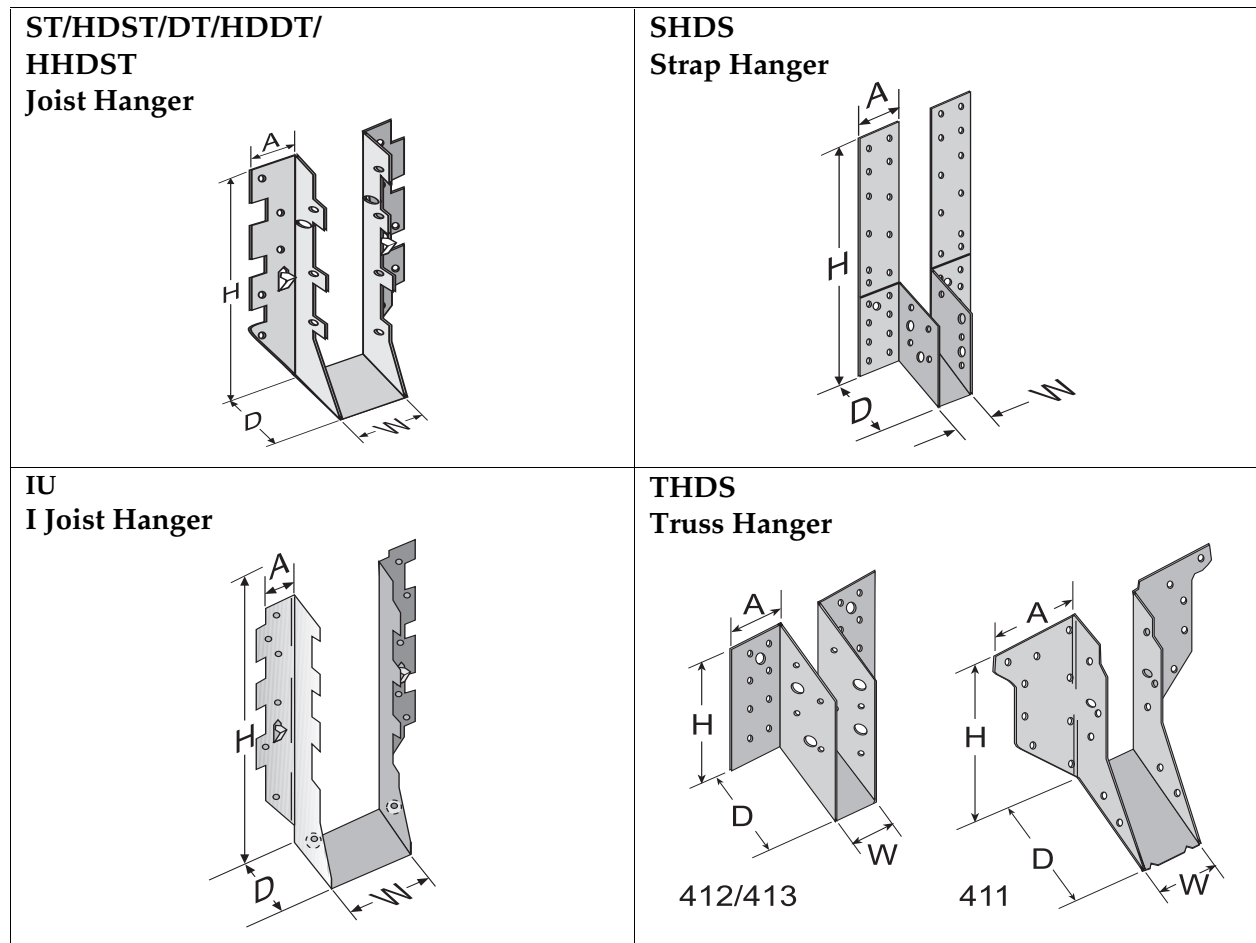
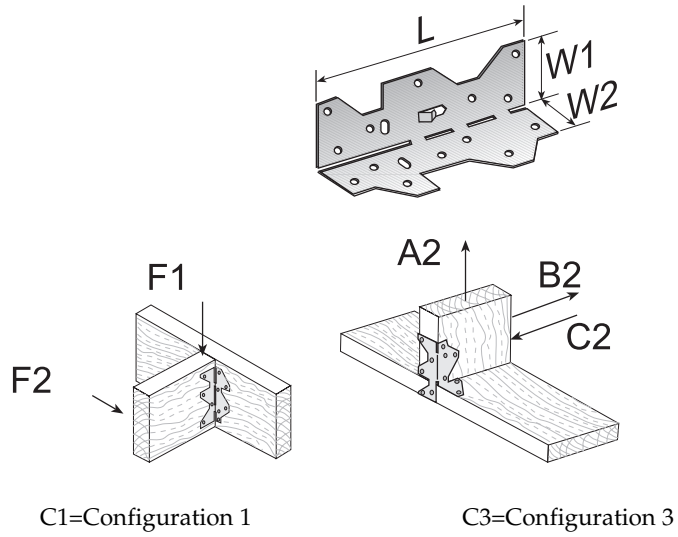


Figure 1. “Renown Hangers & Connectors” model numbers (ST/HDST/DT/HDDT/HHDST, IU, THDS, SHDS, FA and HT/RT)

FA
Framing Anchor



HT/RT
Hurricane and Rafter Ties

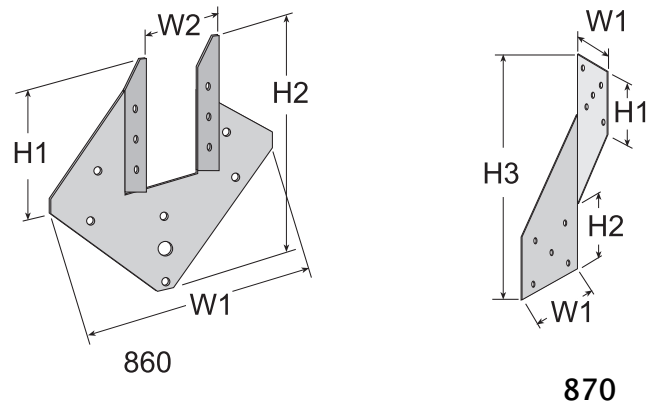


Figure 2. "Renown Hangers & Connectors" model numbers (ST/HDST/DT/HDDT/HHDST, IU, THDS, SHDS, FA and HT/RT)

Table 2. Factored Resistance of the hangers

Model No.	Mat. (ga.) H. & J.	Dimensions (mm)				Wood Members Tested			Fasteners			Factored Resistance (kN)
		W	H	D	A	Header	Joist	Header	Header	Joist		
5261-ST24	22	39.7	82.6	47.6	31.8	1 - 2x4 SPF	1 - 2x4 SPF	4-10dx1.5"	4-10dx1.5"	3-8dx1.5"	2.98 ²	
HHDT26	22	39.7	127.0	47.6	31.8	1 - 2x6 SPF	1 - 2x6 SPF	10-10dx1.5"	10-10dx1.5"	5-8dx1.5"	6.02	
526-ST26	22	39.7	127.0	47.6	31.8	1 - 2x6 SPF	1 - 2x6 SPF	6-10dx1.5"	6-10dx1.5"	5-8dx1.5"	4.47 ²	
328-ST28	22	39.7	171.5	47.6	31.8	1 - 2x8 SPF	1 - 2x8 SPF	8-10dx1.5"	8-10dx1.5"	7-8dx1.5"	5.96	
522-ST210	22	39.7	203.2	47.6	31.8	1 - 2x10 SPF	1 - 2x10 SPF	10-10dx1.5"	10-10dx1.5"	8-8dx1.5"	6.76 ¹	
524-ST212	22	39.7	254.0	47.6	31.8	1 - 2x12 SPF	1 - 2x12 SPF	12-10dx1.5"	12-10dx1.5"	10-8dx1.5"	7.55	
527-DT26	22	77.8	127.0	50.8	31.8	1 - 2x6 SPF	2 - 2x6 SPF	8-16dx2.5"	8-16dx2.5"	5-8dx1.5"	6.15	
348-DT28	22	77.8	171.5	50.8	31.8	1 - 2x8 SPF	2 - 2x8 SPF	10-16dx2.5"	10-16dx2.5"	7-8dx1.5"	6.72 ¹	
523-DT210	22	77.8	200.0	50.8	31.8	1 - 2x10 SPF	2 - 2x10 SPF	12-16dx2.5"	12-16dx2.5"	8-8dx1.5"	7.29	
523-DT210	22	77.8	200.0	50.8	31.8	2 - 2x10 SPF	2 - 2x10 SPF	12-16dx2.5"	12-16dx2.5"	8-8dx1.5"	8.00	
525-DT212	22	77.8	254.0	50.8	31.8	1 - 2x12 SPF	2 - 2x12 SPF	14-16dx2.5"	14-16dx2.5"	10-8dx1.5"	7.71 ¹	
525-DT212	22	77.8	254.0	50.8	31.8	2 - 2x12 SPF	2 - 2x12 SPF	14-16dx2.5"	14-16dx2.5"	10-8dx1.5"	8.46	
9524-HDST24	18	39.7	82.6	47.6	31.8	1 - 2x4 SPF	1 - 2x4 SPF	4-10dx1.5"	4-10dx1.5"	3-8dx1.5"	4.10 ²	
9526-HDST26	18	39.7	127.0	47.6	31.8	1 - 2x6 SPF	1 - 2x6 SPF	6-10dx1.5"	6-10dx1.5"	5-8dx1.5"	6.15 ¹	
9328-HDST28	18	39.7	171.5	47.6	31.8	1 - 2x8 SPF	1 - 2x8 SPF	8-10dx1.5"	8-10dx1.5"	7-8dx1.5"	8.20	
9522-HDST210	18	39.7	203.2	47.6	31.8	1 - 2x10 SPF	1 - 2x10 SPF	10-10dx1.5"	10-10dx1.5"	8-8dx1.5"	8.44	
9527-HDDT26	18	77.8	127.0	50.8	31.8	1 - 2x6 SPF	2 - 2x6 SPF	8-16dx2.5"	8-16dx2.5"	5-8dx1.5"	7.69	
9348-HDDT28	18	77.8	171.5	50.8	31.8	1 - 2x8 SPF	2 - 2x8 SPF	10-16dx2.5"	10-16dx2.5"	7-8dx1.5"	8.30	
9348-HDDT28	18	77.8	171.5	50.8	31.8	2 - 2x8 SPF	2 - 2x8 SPF	10-16dx2.5"	10-16dx2.5"	7-8dx1.5"	9.01	
9523-HDDT210	18	77.8	200.0	50.8	31.8	1 - 2x10 SPF	2 - 2x10 SPF	12-16dx2.5"	12-16dx2.5"	8-8dx1.5"	9.16 ¹	
9523-HDDT210	18	77.8	200.0	50.8	31.8	2 - 2x10 SPF	2 - 2x10 SPF	12-16dx2.5"	12-16dx2.5"	8-8dx1.5"	9.94	
9623-IU310	18	65.1	228.6	50.8	31.8	1 - 2x10 SPF	2 - 1 1/4 x 9 1/2" LSL	12-10dx1.5"	12-10dx1.5"	2-10dx1.5"	8.08	
9623-IU310	18	65.1	228.6	50.8	31.8	1 - 2x10 SPF	2 - 1 1/4 x 9 1/2" LSL	12-10dx1.5"	12-10dx1.5"	6-10dx1.5"	8.08 ²	
9624-IU410	18	88.9	228.6	50.8	31.8	1 - 2x10 SPF	2 - 1 3/4 x 9 1/2" LVL	12-10dx1.5"	12-10dx1.5"	2-10dx1.5"	7.92	
9624-IU410	18	88.9	228.6	50.8	31.8	1 - 2x10 SPF	2 - 1 3/4 x 9 1/2" LVL	12-10dx1.5"	12-10dx1.5"	6-10dx1.5"	7.92 ²	
411-THDS26	18	41.3	130.2	88.9	61.9	1 - 2x6 SPF	1 - 2x6 SPF	18-16dx2.5"	18-16dx2.5"	10-10dx1.5"	9.39	
411-THDS26	18	41.3	130.2	88.9	61.9	2 - 2x6 SPF	1 - 2x6 SPF	18-16dx2.5"	18-16dx2.5"	10-10dx1.5"	10.4	

Table 2. Factored Resistance of the hangers (cont'd)

Model No.	Mat. (ga.) H. & J.	Dimensions (mm)				Wood Members Tested			Fasteners			Factored Resistance (kN)
		W	H	D	A	Header	Joist	Header	Header	Joist		
411-THDS26	18	41.3	130.2	88.9	61.9	1 - 2x6 SPF	1 - SPF truss	18-16dx2.5"	18-16dx2.5"	10-10dx1.5"	15.2 ³	
411-THDS26	18	41.3	130.2	88.9	61.9	2 - 2x6 SPF	1 - SPF truss	18-16dx2.5"	18-16dx2.5"	10-10dx1.5"	16.2 ¹	
412-THDS46	16	79.4	127.0	95.3	50.8	1 - 2x6 SPF	2 - 2x6 SPF	20-16dx2.5"	20-16dx2.5"	8-10dx1.5"	11.2	
412-THDS46	16	79.4	127.0	95.3	50.8	2 - 2x6 SPF	2 - 2x6 SPF	20-16dx2.5"	20-16dx2.5"	8-10dx1.5"	12.2	
412-THDS46	16	79.4	127.0	95.3	50.8	1 - 2x6 SPF	2 - SPF truss	20-16dx2.5"	20-16dx2.5"	8-10dx1.5"	14.1 ^{1,3}	
412-THDS46	16	79.4	127.0	95.3	50.8	2 - 2x6 SPF	2 - SPF truss	20-16dx2.5"	20-16dx2.5"	8-10dx1.5"	15.4 ³	
413-THDS66	16	117.5	127.0	95.3	57.2	1 - 2x6 SPF	3 - 2x6 SPF	22-16dx2.5"	22-16dx2.5"	20-10dx1.5"	15.7	
413-THDS66	16	117.5	127.0	95.3	57.2	2 - 2x6 SPF	3 - 2x6 SPF	22-16dx2.5"	22-16dx2.5"	20-10dx1.5"	15.7	
413-THDS66	16	117.5	127.0	95.3	57.2	1 - 2x6 SPF	3 - SPF truss	22-16dx2.5"	22-16dx2.5"	20-10dx1.5"	15.7 ^{2,3}	
413-THDS66	16	117.5	127.0	95.3	57.2	2 - 2x6 SPF	3 - SPF truss	22-16dx2.5"	22-16dx2.5"	20-10dx1.5"	15.7 ³	
416-SHDS214	16	41.3	374.7	93.7	50.8	1 - 1 3/4 x 14" LVL	1 - 2x12 SPF	30-16dx2.5"	30-16dx2.5"	8-10dx1.5"	10.6	
416-SHDS214	16	41.3	374.7	93.7	50.8	2 - 1 3/4 x 14" LVL	1 - 2x12 SPF	30-16dx2.5"	30-16dx2.5"	8-10dx1.5"	14.1	
416-SHDS214	16	41.3	374.7	93.7	50.8	1 - 1 3/4 x 14" LVL	1 - SPF truss	30-16dx2.5"	30-16dx2.5"	8-10dx1.5"	13.5	
416-SHDS214	16	41.3	374.7	93.7	50.8	2 - 1 3/4 x 14" LVL	1 - SPF truss	30-16dx2.5"	30-16dx2.5"	8-10dx1.5"	18.0 ¹	
417-SHDS414	16	79.4	355.6	95.3	50.8	1 - 1 3/4 x 14" LVL	2 - 2x12 SPF	36-16dx2.5"	36-16dx2.5"	8-10dx1.5"	16.4	
417-SHDS414	16	79.4	355.6	95.3	50.8	2 - 1 3/4 x 14" LVL	2 - 2x12 SPF	36-16dx2.5"	36-16dx2.5"	8-10dx1.5"	16.4	
417-SHDS414	16	79.4	355.6	95.3	50.8	1 - 1 3/4 x 14" LVL	2 - SPF truss	36-16dx2.5"	36-16dx2.5"	8-10dx1.5"	22.3 ^{1,3}	
417-SHDS414	16	79.4	355.6	95.3	50.8	2 - 1 3/4 x 14" LVL	2 - SPF truss	36-16dx2.5"	36-16dx2.5"	8-10dx1.5"	22.3 ³	

Table 3. Factored Resistance of the connectors

Model No.	Mat. (ga.) H. & J.	Dimensions (mm)				Wood Members Tested		Fasteners		Factored Resistance (kN)		
		W1	W2	H1	H2	H3	Header	Joist	Plate	Joist or Truss	Std. Term Load	Short Term Load
860-HT100	18	133.4	39.7	76.2	133.4	---	2 - 2x4 SPF	1 - 2x4 SPF	4-8dx1.5"	6-8dx1.5"	1.81	2.08
870-RT100	18	38.1	38.1	41.3	41.3	136.5	2 - 2x4 SPF	1 - 2x4 SPF	5-8dx1.5"	5-8dx1.5"	2.35	2.70
528-FA100	18	114.3	34.9	34.9	34.9	34.9	#1 (2x6 SPF)	F1 (2x6 SPF)	7-8dx1.5"	7-8dx1.5"	3.81	3.81
528-FA100	18	114.3	34.9	34.9	34.9	34.9	#1 (2x6 SPF)	F2 (2x6 SPF)	7-8dx1.5"	7-8dx1.5"	3.05	3.05
528-FA100	18	114.3	34.9	34.9	34.9	34.9	#3 (2x4 SPF)	A2 (2x4 SPF)	6-8dx1.5"	8-8dx1.5"	1.02	1.17
528-FA100	18	114.3	34.9	34.9	34.9	34.9	#3 (2x4 SPF)	B2 (2x4 SPF)	6-8dx1.5"	8-8dx1.5"	1.20	1.38
528-FA100	18	114.3	34.9	34.9	34.9	34.9	#3 (2x4 SPF)	C2 (2x4 SPF)	6-8dx1.5"	8-8dx1.5"	1.49	1.71
529-FA50	18	63.5	34.9	34.9	34.9	34.9	#1 (2x4 SPF)	F1 (2x4 SPF)	4-8dx1.5"	4-8dx1.5"	2.04	2.35

Footnotes to Tables 2 and 3:

- (1) Interpolated value. Interpolation is performed linearly between higher and lower value.
- (2) Conservative value has been assigned.
- (3) See the manufacturer's catalogue for truss plate requirements.

General Notes:

- * Factored Resistance is calculated in accordance with CSA O86-01, "Engineering Design in Wood." with standard load duration, dry service and no treatment.
- ** SPF = Spruce-Pine-Fir, SCL = Structural Composite Lumber, LVL (Microllam™) = Laminated Veneer Lumber, LSL (TimberStrand®) = Laminated Strand Lumber
- *** SPF (Spruce-Pine-Fir) specimens were tested and the density was in the specified range of article 10.10.1.5 of CSA O86-01, "Engineering Design in Wood."
- **** A specified steel tensile strength of 360 MPa (52000 ksi) was used for the calculation of the correction factor.
- ***** Where wood I-joists are supported by the hanger or the connector, the designer must ensure that the vertical load does not exceed the bearing and shear design values for the I-joist.
- ***** Fastener specifications:
 - 8dx1.5" = 3.33 mm of diameter and 38 mm of length
 - 10dx1.5" = 3.76 mm of diameter and 38 mm of length
 - 16dx2.5" = 4.11 mm of diameter and 64 mm of length
- ***** C = Configuration type, F = Force direction (see model connector 528/529-FA and Figure 2, Framing Anchor)

*Issued by the Institute for Research in Construction
under the authority of the National Research Council*

Note: Readers are asked to refer to limitations imposed by NRC on the interpretation and use of this report. These limitations are included in the introduction to CCMC's Registry of Product Evaluations, of which this report is part.

Readers are advised to confirm that this report has not been withdrawn or superseded by a later issue by referring to <http://irc.nrc.gc.ca/ccmc>, or contacting the Canadian Construction Materials Centre, Institute for Research in Construction, National Research Council of Canada, Montreal Road, Ottawa, Ontario, K1A 0R6; Telephone (613) 993-6189, Fax (613) 952-0268.