

**CITY OF NEW YORK
DEPARTMENT OF BUILDINGS**

Pursuant to Administrative Code Section 27-131, the following equipment or material has been found acceptable for use in accordance with the Report of the Material and Equipment Acceptance (MEA) Division.

Ronny A. Livian, P.E., Acting Commissioner

**MEA 95-02-E
Report of Material and Equipment Acceptance Division**

Manufacturer - International Paper, 400 Atlantic Street, Stamford, CN 06921.

Trade Name - IPI™ Joists.

Product - Wooden I-Joists.

Pertinent Code Section(s) - 27-617 through 27-624.

Tests - ASTM D5055; flange tension and long span E, I-joist Moment, EI and Creep tests, I-joist shear tests, I-joist web knock-out tests, I-joist round and square hole web tests, I-joist end and intermediate reaction tests, I-joist duct chase tests and I-joist uniform vertical load capacity tests; web stock tests conducted in accordance with APA-Engineered Wood Association PRP-108 Performance Standards and Policies for Structural Use Panels.

Laboratory - APA-Engineered Wood Association P.O. Box 11700 Tacoma, WA 98411-0700. In plant qualification testing is conducted by International Paper and witnessed by APA-EWS. Design Properties and Allowable Floor Spans were certified by Scott Rutland, P.E., New York State License Number 078840-1.

Test Reports -

- a. International Paper IPI™-joist Installation Guide, dated February 2002.
- b. International Paper IPI™-joist User's Guide, dated February 2002.
- c. APA-The Engineered Wood Association (APA) Report No. T98Q-11, "I-Joist Qualification Tests," dated April 24, 1998.
- d. APA Report No. T99P-1, I-Joist Confirmation Tests," dated January 5, 1999.
- e. APA Report No. T99P-28, "14-inch UCI 1.5 I-Joist Tests, dated September 13, 1999.

- f. APA Report No. T2000P-3, "I-joist Qualification Tests PRI-40, 60 and 80," dated December 30, 2000.
 - g. APA Report No. T2001P-16, "Weldwood(LVL I-Joist Qualification Tests," dated March 20, 2001.
 - h. APA Report No. T2001P-19, Weldwood LVL Flange Proprietary Series I-Joist Qualification Tests," dated June 27, 2001.
 - i. APA Report T2001P-21, "I-Joist Qualification Tests PRI-90," dated August 17, 2001.
 - j. APA Report No. T2001P-61, "Weldwood LVL Flange I-Joist Qualification Tests 16-inch IPI-400," dated August 20, 2001.
 - k. APA Report No. T2001P-62, "IPI-550 I-Joist Qualification Tests," dated August 24, 2001.
 - l. APA Report No. T2001P-59, "IPI-Joist Series Analysis," dated August 29, 2001.
 - m. APA Report No. T2001P-84, "IPI-100, 200 and 540 Series Qualification," dated November 21, 2001.
- 4. Quality Control Manual for IPI(-joists and APA PRI(-400 Series I-Joists, dated January 2002.
 - 5. Manufacturing Standard for IPI(-joists and APA PRI(-400 Series I-Joists, dated January 2002.

Description - IPI™ Joists are Prefabricated Wood I-joists, manufactured in accordance with ASTM D5055. The flanges are Laminated Veneer Lumber (LVL) manufactured by International Paper in accordance with International Paper manufacturing standards. The web material is OSB manufactured in accordance with DOC Voluntary Product Standard PS2-92, exposure 1, with further requirements as specified in the International Paper manufacturing standard. The web-to-web joint is a proprietary tongue-and-groove joint. The web-to-flange joint is a proprietary tongue-and-groove glued joint. The adhesive used is a phenol-resorcinol adhesive conforming to ASTM-D2559. The top and bottom flanges are parallel forming a constant depth joist. This product has been tested and assigned design values for use in structural applications. Daily quality control checks and periodic third party inspections are conducted to assure product quality and performance.

DESIGN PROPERTIES

IPI-JOIST ⁽¹⁾ Series	Depth	EI ⁽²⁾ (10 ⁶ lbf-in. ²)	M ⁽³⁾ (lbf-ft)	V ⁽⁴⁾ (lbf)	IR ⁽⁵⁾ (lbf)	ER ⁽⁶⁾ (lbf)	K ⁽⁷⁾ (10 ⁶ lbf)
IPI-100	9½"	122	2415	1200	1715	1000	4.94
	11⅞"	220	3200	1420	1715	1000	6.18
	14"	326	3910	1600	1715	1000	7.28
IPI-200	9½"	149	2835	1200	2050	1080	4.94
	11⅞"	253	3760	1420	2050	1080	6.18
	14"	373	4600	1710	2050	1080	7.28
IPI-300	9½"	167	2820	1350	2100	1000	4.94
	11⅞"	286	3765	1420	2100	1000	6.18
	14"	435	4480	1600	2100	1000	7.28
IPI-500	9½"	195	3305	1350	2300	1050	4.94
	11⅞"	332	4410	1600	2300	1050	6.18
	14"	488	5410	1800	2300	1050	7.28
	16"	666	6355	1850	2300	1050	8.32
IPI-540	9½"	204	3785	1400	2500	1250	4.94
	11⅞"	346	5025	1625	2500	1250	6.18
	14"	505	6145	1750	2500	1250	7.28
	16"	694	7200	1750	2500	1250	8.32
IPI-700	11⅞"	435	5870	1600	3000	1220	6.18
	14"	638	7205	1800	3000	1220	7.28
	16"	868	8465	1850	3000	1220	8.32
IPI-900	11⅞"	663	9250	1950	3800	1500	6.18
	14"	968	11,335	2240	3800	1500	7.28
	16"	1317	13,340	2330	3950	1650	8.32

(1) The tabulated values are design values for normal duration of load. All values except for EI and K are permitted to be adjusted for other load durations as permitted by code.

(2) Bending stiffness (EI) of the I-joist.

(3) Moment capacity (M) of a single I-joist. For repetitive members, the tabulated values are permitted to be increased by a repetitive member factor of 1.04.

(4) Shear capacity (V) of the I-joist.

(5) Intermediate reaction (IR) of the I-joist with a minimum bearing length of 3½" without web stiffeners.

(6) End reaction (ER) of the I-joist with a minimum bearing length of 1¾" without web stiffeners. Higher end reactions are permitted. For a bearing length of 4" (5" for 14 IPI-300, 14 IPI-500, and 16 IPI-500), the end reaction may be set equal to the tabulated shear value. Interpolation of the end reaction between 1¾" and 4" (5" for 14 IPI-300, 14 IPI-500, and 16 IPI-500) bearing is permitted.

(7) Coefficient of shear deflection (K), used to calculate deflections for I-joist applications. Equations 1 and 2 below are provided for uniform load and center point load conditions for simple spans.

Uniform Load:

$$[1] \delta = \frac{5\omega\ell^4}{384EI} + \frac{\omega\ell}{K}$$

Center-Point Load:

$$[2] \delta = \frac{P\ell^3}{48EI} + \frac{2P\ell}{K}$$

where:

δ = calculated deflection (in.)

ω = uniform load (lbf/in.)

ℓ = design span (in.)

P = concentrated load (lbf)

EI = bending stiffness of the I-joist (lbf-in.)

K = coefficient of shear deflection (lbf)

ALLOWABLE FLOOR SPANS

LIVE LOAD=40 PSF, DEAD LOAD=10 PSF

IP[JOIST] Series	Depth	Simple-Span				Multiple-Span			
		12" o.c.	16" o.c.	19.2" o.c.	24" o.c.	12" o.c.	16" o.c.	19.2" o.c.	24" o.c.
IPI-100	9½"	15'-10"	14'-8"	13'-9"	12'-10"	17'-5"	15'-9"	14'-11"	13'-6"
	11⅞"	19'-1"	17'-6"	16'-6"	15'-6"	20'-10"	19'-1"	16'-11"	13'-6"
	14"	21'-9"	19'-11"	18'-10"	17'-7"	23'-8"	20'-4"	16'-11"	13'-6"
IPI-200	9½"	16'-9"	15'-3"	14'-5"	13'-6"	18'-3"	16'-8"	15'-8"	14'-8"
	11⅞"	19'-11"	18'-2"	17'-2"	16'-1"	21'-8"	19'-10"	18'-8"	16'-2"
	14"	22'-7"	20'-8"	19'-6"	18'-3"	24'-8"	22'-6"	20'-3"	16'-2"
IPI-300	9½"	17'-3"	15'-10"	14'-11"	14'-0"	18'-10"	17'-2"	16'-3"	15'-1"
	11⅞"	20'-7"	18'-10"	17'-10"	16'-8"	22'-5"	20'-6"	19'-4"	16'-7"
	14"	23'-7"	21'-7"	20'-5"	19'-1"	25'-9"	23'-5"	20'-9"	16'-7"
IPI-500	9½"	18'-1"	16'-6"	15'-7"	14'-7"	19'-8"	18'-0"	16'-11"	15'-10"
	11⅞"	21'-6"	19'-8"	18'-7"	17'-4"	23'-5"	21'-5"	20'-2"	18'-2"
	14"	24'-5"	22'-4"	21'-1"	19'-8"	26'-7"	24'-4"	22'-9"	18'-2"
IPI-540	16"	27'-1"	24'-9"	23'-4"	20'-10"	29'-6"	27'-0"	22'-9"	18'-2"
	9½"	18'-3"	16'-8"	15'-9"	14'-9"	19'-11"	18'-2"	17'-2"	16'-0"
	11⅞"	21'-9"	19'-10"	18'-9"	17'-6"	23'-8"	21'-8"	20'-5"	19'-1"
IPI-700	14"	24'-8"	22'-6"	21'-3"	19'-10"	26'-8"	24'-6"	23'-2"	19'-9"
	16"	27'-5"	25'-0"	23'-7"	22'-1"	29'-11"	27'-3"	24'-9"	19'-9"
	11⅞"	23'-3"	21'-3"	20'-0"	18'-8"	25'-4"	23'-1"	21'-9"	20'-4"
IPI-900	14"	26'-5"	24'-1"	22'-9"	21'-3"	28'-9"	26'-3"	24'-9"	23'-1"
	16"	29'-3"	26'-8"	25'-2"	23'-6"	31'-11"	29'-1"	27'-5"	23'-9"
	11⅞"	26'-4"	24'-0"	22'-7"	21'-0"	28'-9"	26'-1"	24'-7"	22'-10"
	14"	29'-11"	27'-3"	25'-8"	23'-10"	32'-7"	29'-8"	27'-11"	25'-11"
	16"	33'-2"	30'-2"	28'-5"	26'-5"	36'-2"	32'-10"	30'-11"	28'-9"

LIVE LOAD=40 PSF, DEAD LOAD=20 PSF

IP[JOIST] Series	Depth	Simple-Span				Multiple-Span			
		12" o.c.	16" o.c.	19.2" o.c.	24" o.c.	12" o.c.	16" o.c.	19.2" o.c.	24" o.c.
IPI-100	9½"	15'-10"	14'-6"	13'-9"	12'-9"	17'-3"	15'-7"	14'-1"	11'-3"
	11⅞"	19'-1"	17'-6"	16'-6"	14'-9"	20'-10"	16'-11"	14'-1"	11'-3"
	14"	21'-9"	19'-11"	18'-3"	16'-4"	22'-8"	16'-11"	14'-1"	11'-3"
IPI-200	9½"	16'-9"	15'-3"	14'-5"	13'-6"	18'-3"	16'-8"	15'-6"	13'-5"
	11⅞"	19'-11"	18'-2"	17'-2"	16'-0"	21'-8"	19'-7"	16'-10"	13'-5"
	14"	22'-7"	20'-8"	19'-6"	17'-9"	24'-8"	20'-3"	16'-10"	13'-5"
IPI-300	9½"	17'-3"	15'-10"	14'-11"	13'-10"	18'-10"	16'-11"	15'-5"	13'-9"
	11⅞"	20'-7"	18'-10"	17'-10"	16'-0"	22'-5"	19'-7"	17'-3"	13'-9"
	14"	23'-7"	21'-5"	19'-7"	16'-6"	24'-9"	20'-9"	17'-3"	13'-9"
IPI-500	9½"	18'-1"	16'-6"	15'-7"	14'-7"	19'-8"	18'-0"	16'-9"	14'-11"
	11⅞"	21'-6"	19'-8"	18'-7"	17'-4"	23'-5"	21'-2"	18'-11"	15'-1"
	14"	24'-5"	22'-4"	21'-1"	17'-4"	26'-7"	22'-9"	18'-11"	15'-1"
IPI-540	16"	27'-1"	24'-9"	21'-9"	17'-4"	29'-6"	22'-9"	18'-11"	15'-1"
	9½"	18'-3"	16'-8"	15'-9"	14'-9"	19'-11"	18'-2"	17'-2"	16'-0"
	11⅞"	21'-9"	19'-10"	18'-9"	17'-6"	23'-8"	21'-8"	20'-5"	16'-5"
IPI-700	14"	24'-8"	22'-6"	21'-3"	19'-10"	26'-11"	24'-6"	20'-7"	16'-5"
	16"	27'-5"	25'-0"	23'-7"	20'-8"	29'-11"	24'-9"	20'-7"	16'-5"
	11⅞"	23'-3"	21'-3"	20'-0"	18'-8"	25'-4"	23'-1"	21'-9"	19'-9"
IPI-900	14"	26'-5"	24'-1"	22'-9"	20'-2"	28'-9"	26'-3"	24'-9"	19'-9"
	16"	29'-3"	26'-8"	25'-2"	20'-2"	31'-11"	29'-1"	24'-9"	19'-9"
	11⅞"	26'-4"	24'-0"	22'-7"	21'-0"	28'-9"	26'-1"	24'-7"	22'-10"
	14"	29'-11"	27'-3"	25'-8"	23'-10"	32'-7"	29'-8"	27'-11"	25'-1"
	16"	33'-2"	30'-2"	28'-5"	26'-5"	36'-2"	32'-10"	30'-11"	26'-1"

(Clear Spans, L/480 Live Load, L/240 Total Load)

Notes

1. These span charts are based on uniform loads, as noted above; live load deflection is limited to L/480 for better performance. Floor performance is greatly influenced by the stiffness of the floor joist. Experience has shown that joists designed to the code minimum (L/360) live load deflection will result in a floor which may not meet the expectations of some end users. International Paper recommends that the floor spans for IP[JOIST] be limited to those given above.
2. Maximum spans shown above are clear distances between supports, and are based on composite action glued-nailed sheathing of 3/4" nominal AFA rated OSB or plywood. International Paper recommends glue-nailed sheathing. Reduce spans by 12" for nailed sheathing only.
3. Minimum end bearing length is 1/4". Minimum intermediate bearing length is 3/8".
4. End spans of multiple-span joists must be at least 40% of the adjacent span.
5. For loading other than that shown above, refer to Uniform Load Tables.

Recommendation - That the above IPI Joists be accepted on condition that all uses, locations and installations shall comply with the applicable requirements of the New York City Building Code and Technical Policy and Procedure Notice #8, 1992, dated August 19, 1992(attached), TPPN #2, 2000 dated July 24, 2000 (attached) and on further condition that:

1. All provisions of TPPN #8, 1992 and TPPN #2, 2000 for IPI Joists that are applicable shall be complied with.
2. Structure designs using the IPI Joists shall conform to the manufacturer's specifications except that appropriate design load(s), deflection limitation(s) and other performance standards of the New York City Building Code shall apply.
3. The glue used shall not delaminate during a fire.
4. IPI Joists shall be used indoors.
5. When stored out-of-doors, or exposed to wet weather conditions, during construction IPI Joists shall be inspected by the user for flange-web separation, swelling or warping and replaced if so damaged.
6. The size and location of any cutouts in the web of the joist shall not exceed the manufacturer's recommendations and shall be subject to controlled inspection.
7. IPI Joist flanges may not be cut, notched, or bored.
8. Firestopping shall be provided between the ceiling and the floor or roof above and shall be divided into approximately equal areas not greater than 500 square feet.
9. The building permit applicant shall notify the Fire Department of the proposed installation of IPI Joists prior to the Building Department issuance of a construction permit. Evidence of such notification shall be a certifying statement submitted on Form TR-1, Technical Report, reading as follows:

I hereby state that I have mailed a copy of this statement to the Fire Department, Bureau of Fire, Technology Management Unit, as notification of the proposed installation of Wood I Beams at this location.

This statement shall be placed on the reverse side of the form in the lower right-hand box.

The copy of the completed Form TR-1 shall be mailed to the new address at:

Chief-In-Charge of the Bureau of Fire Prevention
Fire Department
Bureau of Fire Prevention
Technology Management Unit
9 MetroTech Center
Brooklyn, New York 11201-3857

All shipments and deliveries of IPI Joists shall be provided with a permanent marking suitably placed, certifying that the materials shipped or delivered is equivalent to those tested and accepted for use, as provided for in Section 27-131 of the Building Code.

Final Acceptance April 10, 2002

Examined by Mark Jucy



The
City
of
New York

ISSUANCE # 367

DEPARTMENT OF BUILDINGS

EXECUTIVE OFFICES

60 HUDSON STREET, NEW YORK, N.Y. 10013

RUDOLPH J. RINALDI, Commissioner

312-8100

RICHARD C. VISCONTI, A.I.A.

Assistant Commissioner
Technical Affairs

TECHNICAL
POLICY AND PROCEDURE NOTICE # 8/92

TO: Distribution

FROM: Richard C. Visconti, A.I.A. *Richard Visconti*

DATE: August 19, 1992

SUBJECT: Laminated Wood "I" Beams

PURPOSE: To interpret the requirements of the Administrative Code, Sections 27-617 and 27-620, pertaining to firestopping requirements per RS 10-8 and Inspection of Methods of Construction per Table 10-2 for laminated wood "I" beams used in fire resistance rated floor/roof-ceiling assemblies.

To establish a new administrative procedure for applicant notification to the Fire Department of proposed use of laminated wood "I" beams.

SPECIFICS:

1. Firestopping

Reference Standard RS 10-8, Section 9.2.1 - General Requirements for Firestopping states that, "the space between the ceiling and the floor or roof above shall be divided by providing firestopping where ceilings are suspended below solid joists or suspended from or attached directly to the bottom of open wood floor trusses in buildings of combustible construction."

The Department now interprets the requirement to comply with the firestopping provisions of Section 9.2.1 et seq. to include laminated wood "I" beam assemblies. Therefore, the space between the ceiling and the floor or roof above shall be divided into approximately equal areas not greater than 500 square feet.

Firestopping is subject to controlled inspection pursuant to Section 27-345.

2. Inspection of Methods of Construction

Table 10-2 - Operations on Structural Elements that shall be Subject to Controlled Inspection, lists the "Fabrication of glue-laminated assemblies and of plywood components."

The Department now interprets the requirement to comply with the controlled inspection provision of Table 10-2 to include laminated wood "I" beams. Therefore, the cutting of openings for ducts, pipes, conduit, etc. in laminated wood "I" beams shall be considered fabrication and, therefore, subject to controlled inspection.

3. Notification

The applicant shall be required to notify the Fire Department of the proposed installation of laminated wood "I" beams prior to the Department issuing a construction permit. Evidence of such notification shall be a certifying statement submitted on Form TR-1, Technical Report, reading as follows:

I hereby state that I have mailed a copy of this statement to the Fire Department, Bureau of Fire Prevention, Technology Management Unit, as notification of the proposed installation of laminated wood "I" beams at this location.

This statement shall be placed on the reverse side of the form in the lower right-hand box.

The copy of the completed Form TR-1 shall be mailed to:

Chief-in-Charge of the Bureau of Fire Prevention
Fire Department
Bureau of Fire Prevention
Technology Management Unit
250 Livingston Street
Brooklyn, NY 11201-5884

cc: Chief John Hodgens



ISSUANCE #586

DEPARTMENT OF BUILDINGS

EXECUTIVE OFFICES
60 HUDSON STREET, NEW YORK, N.Y. 10013-3394


RICHARD C. VISCONTI, R.A., Acting Commissioner
Website: nyclink.org/buildings

(212) 312-8000
TTY (212) 312-8188

SATISH K. BABBAR, R.A.
Acting Deputy Commissioner
Technical Affairs
(212) 312-8324
Fax (212) 312-8319

TECHNICAL
POLICY AND PROCEDURE NOTICE #2/00

TO: Distribution

FROM: Satish K. Babbar, R.A. 

DATE: July 24, 2000

SUBJECT: Semi-Controlled Inspection for Structural Light Gage Cold-Formed Steel,
Plate Connected Wood Floor Trusses and Laminated Wood "I" Beams

EFFECTIVE: Immediately

SUPERCEDES: Brooklyn Borough Memorandum by Borough Superintendent George E. Berger dated August 11, 1983.

BACKGROUND: There have been several structural failures involving lightweight floor construction. Professional inspection is needed during construction of buildings and other structures utilizing it in order to insure that the delivered members are not damaged or defective, the installation is proper and safeguards are taken to prevent failure.

PURPOSE: To set forth the requirements for the semi-controlled inspection of the construction, including size, quality, framing, erection and both temporary and permanent bracing of light gage cold-formed steel structural members, plate connected wood floor trusses and laminated wood "I" beams.

REFERENCE: Section 27-132(b) of the Administrative Code.

SPECIFICS:

REQUIREMENTS: The plans submitted for approval/ acceptance/professional certification showing these members shall be complete including member sizes, positions, locations, permanent and temporary bracing, fasteners (location, type and spacing), stiffeners, connections, etc., as needed for the proper erection of the structure.

The construction of all light gage cold-formed steel structural members, plate connected wood floor trusses and laminated wood "I" beams shall be subject to semi-controlled inspection for size, quality, framing, erection and both temporary and permanent bracing, as set forth below.

- Size** Profiles used structurally shall conform to the specified dimension. Care shall be taken not to stretch, bend, or otherwise distort parts of the sections unless such forming is in the integral part of the design.
- Quality** All materials shall be clean, straight, and undamaged. Damaged members shall be discarded. Only BSA/MEA approved laminated wood "I" beams shall be used. Glue shall completely bond all laminated wood "I" beam surfaces being joined. Quality Control for the erection of all members shall be under the supervision of the professional designated to perform the semi-controlled inspection.
- Framing** Components may be cut by slitting, shearing, sawing, or flame cutting, as appropriate, in accordance with manufacturers' instructions and the design drawings. All punched holes and sheared or flame cut edges of material in members subject to calculated stress shall be clean and free from notches and burred edges. The approved/ accepted/professionally certified drawings shall be adhered to regarding member dimensions, locations, positions, beam separators, bearing surfaces and fasteners, including shear connectors, plate connectors, screws, bolts and welds, as applicable.

Erection Care shall be taken to avoid damage to members when erecting, loading, unloading and otherwise handling them.

Bracing Temporary bracing, shoring, jacks, etc. shall not be removed until the registered architect or professional engineer determines that they are no longer needed. Permanent bracing, web stiffeners, bridging, wind bracing, etc. shall be installed according to the approved/accepted/professionally certified drawings.

INSPECTIONS AND REPORT TO BE SUBMITTED: These inspections are to be performed by, or under the direct supervision of, licensed professional engineers or registered architects, who shall submit form(s) TR-1 indicating the following: "Semi-controlled inspection of light gauge cold-formed steel structural members, plate connected wood floor trusses or laminated wood "I" beams (as applicable) per TPPN #2/00".

SKB:NJG:ng