NYC Department of Buildings
280 Broadway, New York, NY 10007
Patricia Lancaster, FAIA, Commissioner
(212) 566-5000, TTY: (212) 566-4769

Report of Materials and Equipment Acceptance Division

Pursuant to Administrative Code Section 27-131, the following equipment or material has been found acceptable for use subject to the terms and conditions contained herein.

MEA 156-04-E Vol.2

Manufacturer:	Weyerhaeuser, P.O. Box 8449, Boise, Idaho 83707
Trade Name(s):	TJI® Joists
Product:	Prefabricated Wood I-Joists
Pertinent Code Section(s):	27-617 through 27-624
Prescribed Test(s):	ASTM D 5055M Allowable moment capacity, allowable shear capacity, stiffness confirmation and reaction capacities.
Laboratory:	PFS Corporation and design tables were certified by Gary R. Schweizer, P.E., New York State License #062261-1.
Test Report(s):	Qualification Testing for the 2003 TJI Product Mix Joist Series issued July 31, 2003. Flange Qualification Testing for the 2003 TJI Product Mix Joist Series issued July 31, 2003. Bending Strength & Stiffness Testing for the 2003 TJI Product Mix Joist Series issued July 31, 2003. Establishment of the Vertical Shear Capacity of the 2003 TJI Product Mix Joist Series issued July 31, 2003. Evaluation of Hole Shear Capacity of the 2003 TJI Product Mix Joist Series issued July 31, 2003.

Bearing Capacity Qualification for the 2003 TJI Product Mix Joist Series issued July 31, 2003.

Miscellaneous Property Verification of the 1.6E Microllam LVL Flange Alternatives for the 2003 TJI Product Mix Joist Series issued July 31, 2003.

AC 124 Rim Board Testing of the 2003 TJI Product Mix Joist Series issued July 31, 2003.

Rationalization of Tapered Line of TJI Joists with Performance Plus OSB webs issued November 20, 2002.

Commercial TJI Joist Allowable Moment Capacities per ASTM Standard D 5055-02 issued July 31, 2003, revised September 24, 2003.

Follow-up Analysis of TJI HD90 and TJI HS90 Joists issued July 31, 2003, revised September 3, 2003.

Confirmation Testing of TJI HD90 and TJI HS90 Joists issued May 7, 2003.

Description – TJI Joists are Prefabricated Wood Joists, manufactured in accordance with ASTM D 5055-02. The flanges are either Microllam LVL or TimberStrand LSL as manufactured by Weyerhaeuser in accordance with the Weyerhaeuser manufacturing standards. The web material is Performance Plus® OSB manufactured in accordance with DOC Voluntary Product Standards PS 2-92, Exposure 1, with further requirements as specified in the Weyerhaeuser manufacturing standard. The web panels have the face grain oriented vertically and the web-to-web joints are either butt-jointed or serrated and glued to form a continuous web. The web-to-flange connection is a proprietary tongue-and-groove glued joint. The adhesive used is a phenol-resorcinol adhesive conforming to ASTM D 2559 and as specified in the Weyerhaeuser manufacturing standard. The top and bottom flanges are either parallel, forming a constant depth joist or the top flange has a single taper, forming a variable 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. Refer to Table 1 for TJI joist series and material description.

Design and Installation:

The design and installation of TJI joists must comply with the requirements of this MEA. Design of TJI joists is governed by the applicable code and ANDI/AF&PA NDS-97 (*National Design Specification for Wood Construction* (NDS).

Allowable Capacity:

Table 2 specifies allowable moments, reactions, shears, and joist stiffness (*EI*). Maximum allowable reactions are based on minimum and maximum bearing lengths of 1 ¾ inches and 3½ inches, for simple spans; and 3½ , 5¼ and 7 inches at intermediate reactions of continuous spans. When joists are used as multiple span members, the design shear is the calculated shear at the intermediate support, reduced by the following formula and limited to the depths shown in the table that appears after the formula:

$R = W \div K \leq 18\%$

where:

$K = V_{12} \div 100$

R = The percent reduction

V_{12} = The allowable shear for a 12-inch or 11⅞-inch deep joist (pounds)

W = The uniform loan (plf).

TJI Joist Series	TJI Joist Dept (inches)	V_{12}	K
TJI 110	**≤ 14**	**1,560**	**15.60**
TJI 210, TJI 230	**≤ 16**	**1,655**	**16.55**
TJI 360	**≤ 16**	**1,705**	**17.05**
TJI 560	**≤ 20**	**2,050**	**20.50**
TJI L45	**≤ 16**	**1,420**	**14.20**
TJI L65, TJI L90, TJI H90	**≤ 24**	**1,925**	**19.25**
TJI HD90, TJI HS90	**≤ 24**	**2,320**	**23.20**

For other joist depths, the design shear is the calculated shear at the interior face of support.

The allowable design shear at the interior supports of multiple-span-member TJI joists up to 12 inches deep, used in residential floor construction, is permitted to be increased an additional 10 percent. This increase of allowable design shear does not apply to the design shear at the ends of the joists.

Fasteners:

Allowable capacities and spacing of nails in Microllam LVL and TimberStrand LSL flanges must comply with this MEA and the applicable code. Lateral nail capacity and withdrawal values for nails installed on the wide face perpendicular to the glue lines of Microllam LVL or strands of TimberStrand LSL flanges shall be as provided in the applicable code for Douglas fir-larch (minimum specific gravity SG = 0.50). Nails installed perpendicular to the glue lines or

strands on the wide face shall be installed in accordance with the applicable code.

Web Stiffeners: Web stiffener requirements for reactions and concentrated loads are noted in Table 2 and Figure 1.

Lateral Support: TJI joist compression flanges with widths less than 2.30 inches require lateral support every 18 inches on center. TJI joist compression flanges with widths equal to or greater than 2.30 inches require lateral support every 24 inches on center. Each connection must be capable of transmitting a 75-pound horizontal load. All TJI joist ends require restraint to prevent rollover. Code-approved methods of lateral restraint specified for sawn lumber are acceptable. Bridging is not required for TJI joist floor and roof applications.

Holes in Webs: Tables 3, 4, 5 and 6 with related figures, as applicable, set forth allowable sizes and location of round, square and rectangular holes in the webs of TJI joists.

Duration of Load: Adjustments for duration of load, as permitted by the applicable code, apply to the TJI joists and their fastenings.

In-Service Moisture Conditions: TJI joist properties and allowable loads in this MEA are limited to covered installations with dry conditions of use. Dry conditions of use are those environmental conditions represented by sawn lumber in which the moisture content is less than 16 percent.

Repetitive-Member Use: The repetitive member use factors applicable to the resistive moment capacities listed in Table 2 of this MEA are limited to 1.0.

Member Spans: The span of TJI joists shall be taken as distance from face to face of supports, plus one-half the required bearing length at each end, except that for cantilever and continuous spans, the span shall be taken as the distance between centers of bearings on supports over which the joist is continuous.

Deflection: Deflection of simple span TJI joists with either uniform load or a concentrated load at mid-span

is determined using the formulas in the footnotes to Table 2.

Blocking Panels: Bearing walls perpendicular to and supported by TJI joists at the end or intermediate supports, or both, require full-depth blocking. TJI joists up to 16 inches in depth, when used as blocking panels, have a maximum vertical load transfer capacity of 2,100 plf. TJI joists over 16 inches and up to 20 inches in depth, when used as blocking panels, have a maximum vertical load transfer capacity of 1,550 plf.

TJI Rim Joists: TJI joists used as rim joists, having depths of up to 16 inches, have a maximum vertical load transfer capacity of 2,100 plf. TJI joists used as rim joists, having depths of up to 16 inches, are permitted to be used as boundary members of horizontal wood structural diaphragms. The allowable shear values in pounds per foot, specified in the code for horizontal wood structural panel diaphragms with framing of nominal 2-inch thick Douglas fir-larch or southern pine are applicable to TJI joists used as rim joists in unblocked and blocked diaphragm applications. The TJI joists used as rim joist shall be laterally supported at the top and continuously supported at the bottom, and the gravity loads shall be uniformly applied along the top. Other loading and support conditions shall be investigated and approved by the design professional.

Cantilevered TJI Joists: TJI joists are permitted to be installed with cantilevers, provided the cantilevers have a maximum length equal to one-third of the adjacent span and support uniform loads only. Otherwise, cantilever applications require design by a design professional.

TABLE 1 - TJI® Joist Description

TJI Joist Series	Flange Size, Depth x Width (inches)	Web Thickness (inches)	Range of Joist Depths (inches)
TJI® 110	**1.375 x 1.75**	**3/8**	**9½ x 14**
TJI® 210	**1.375 x 2.08**	**3/8**	**9½ x 16**
TJI® 230	**1.375 x 2.3**	**3/8**	**9½ x 16**
TJI® 360	**1.375 x 2.3**	**3/8**	**9½ x 20**
TJI® 560	**1.375 x 3.5**	**7/16**	**9½ x 20**
TJI® L45	**1.5 x 1.75**	**3/8**	**8 – 20 taper only**

TJI® L65	**1.5 x 2.5**	**7/16**	**9½ - 30 (9½ - 30 taper)**
TJI® L90	**1.375 x 2.08**	**7/16**	**11⅞ - 30 (9½ - 30 taper)**
TJI® H90	**1.75 x 3.5**	**7/16**	**11⅞ - 30**
TJI® HD90	**2.125 x 3.5**	**1/2**	**11⅞ - 32**
TJI® HS90	**2.5 x 3.5**	**1/2**	**11⅞ - 32**

TABLE 2 – PROPERTIES FOR TJI JOISTS

BASIC PROPERTIES						REACTION PROPERTIES									
						END REACTION (lbs.)					INTERMEDIATE REACTION (lbs.)				
Joist Depth (in.)	Joist Weight (plf)	Resistive Moment (ft.-lbs.) (10)	Vert. Shear (lbs.)	EI x 10^6 lbs.-in.^{2}	K	1-3/4" *2-1/2" (9)* Bearing Length		3-1/2" Bearing Length		Nails Req'd.	3-1/2" *5-1/4" (7)* Bearing Length		5-1/4" *7" (7)* Bearing Length		Nails Req'd
						Web Stiffeners		Web Stiffeners			Web Stiffeners		Web Stiffeners		
						NO	YES	NO	YES		NO	YES	NO	YES	
TJI 110															
9-1/2	2.3	2380	1220	140	4.5	885	NA	1220	NA	NA	1935	NA	2350	NA	NA
11-7/8	2.5	3015	1560	238	4.5	885	1225	1350	1560	3-8d	1935	2295	2350	2705	3-8d
14	2.8	3565	1860	351	4.5	885	1225	1350	1705	3-8d	1935	2295	2350	2705	3-8d
TJI 210															
9-1/2	2.6	2860	1330	167	4.5	980	NA	1330	NA	NA	2145	NA	2565	NA	NA
11-7/8	2.8	3620	1655	283	4.5	980	1340	1435	1655	3-8d	2145	2505	2565	2925	3-8d
14	3.1	4280	1945	415	4.5	980	1340	1435	1790	3-8d	2145	2505	2565	2925	3-8d
16	3.3	4895	2190	566	4.5	980	1340	1435	1790	3-8d	2145	2505	2565	2925	3-8d
TJI 230															
9-1/2	2.7	3175	1330	183	4.5	1035	NA	1330	NA	NA	2410	NA	2790	NA	NA
11-7/8	3.0	4015	1655	310	4.5	1035	1395	1460	1655	3-8d	2410	2765	2790	3150	3-8d
14	3.3	4755	1945	454	4.5	1035	1395	1460	1815	3-8d	2410	2765	2790	3150	3-8d
16	3.5	5440	2190	618	4.5	1035	1395	1460	1815	3-8d	2410	2765	2790	3150	3-8d
TJI 360															
9-1/2	2.7	4790	1425	249	4.5	1080	NA	1425	NA	NA	2460	NA	3000	NA	NA
11-7/8	3.0	6180	1705	419	4.5	1080	1440	1505	1705	3-8d	2460	2815	3000	3360	3-8d
14	3.3	7335	1955	612	4.5	1080	1440	1505	1865	3-8d	2460	2815	3000	3360	3-8d
16	3.5	8405	2190	830	4.5	1080	1440	1505	1865	3-8d	2460	2815	3000	3360	3-8d
18	3.7	9465	2425	1085	4.5	1080	1440	1505	1865	3-8d	2460	2815	3000	3360	3-8d
20	4.0	10515	2660	1376	4.5	1080	1440	1505	1865	3-8d	2460	2815	3000	3360	3-8d
TJI 560															
9-1/2	3.6	7355	1670	378	5.3	1265	NA	1670	NA	NA	3000	NA	3455	NA	NA
11-7/8	4.0	9500	2050	636	5.3	1265	1740	1725	2050	3-16d	3000	3475	3455	3930	3-16d
14	4.2	11275	2390	926	5.3	1265	1740	1725	2200	3-16d	3000	3475	3455	3930	3-16d
16	4.5	12925	2710	1252	5.3	1265	1740	1725	2200	3-16d	3000	3475	3455	3930	3-16d
18	4.8	14550	3030	1631	5.3	1265	1740	1725	2200	3-16d	3000	3475	3455	3930	3-16d
20	5.1	16165	3345	2064	5.3	1265	1740	1725	2200	3-16d	3000	3475	3455	3930	3-16d
TJI L45															
7-1/2	2.0	2720	860	103	4.5	860	NA	860	NA	NA	2025	NA	2025	NA	NA
9-1/2	2.2	3620	1120	185	4.5	1015	NA	1120	NA	NA	2025	NA	2575	NA	NA
11-7/8	2.5	4685	1420	319	4.5	1015	1225	1420	1420	3-8d	2025	2385	2575	2930	3-8d
14	2.8	5570	1710	474	4.5	1015	1225	1560	1710	3-8d	2025	2385	2575	2930	3-8d
16	3.0	6385	1970	653	4.5	1015	1225	1560	1915	3-8d	2025	2385	2575	2930	3-8d
18	3.2	7200	2155	865	4.5	1015	1225	1560	1915	3-8d	2025	2385	2575	2930	3-8d
20	3.5	8000	2165	1113	4.5	1015	1225	1560	1915	3-8d	2025	2385	2575	2930	3-8d
TJI L65															
9-1/2	3.0	5215	1675	263	5.3	1375	NA	1675	NA	NA	2745	NA	3365	NA	NA
11-7/8	3.3	6750	1925	450	5.3	1375	1745	1885	1925	3-8d	2745	3120	3365	3735	3-8d
14	3.6	8030	2125	666	5.3	1375	1750	1885	2125	5-8d	2745	3365	3365	3985	5-8d
16	3.9	9210	2330	913	5.3	1375	1750	1885	2330	6-8d	2745	3490	3365	4105	6-8d
18	4.2	10380	2535	1205	5.3	1375	1750	1885	2535	7-8d	2745	3615	3365	4230	7-8d
20	4.4	11540	2740	1545	5.3	NA	1750	NA	2740	8-8d	NA	3740	NA	4355	8-8d
22	4.7	12690	2935	1934	5.3	NA	1750	NA	2935	9-8d	NA	3860	NA	4480	9-8d
24	5.0	13830	3060	2374	5.3	NA	1750	NA	3060	10-8d	NA	3875	NA	4605	10-8d
26	5.3	14960	2900	2868	5.3	NA	1750	NA	2900	11-8d	*NA (7)*	*4725(7)*	*NA (7)*	*5345(7)*	11-8d
28	5.5	16085	2900	3417	5.3	NA	1750	NA	2900	12-8d	*NA (7)*	*4850(7)*	*NA (7)*	*5470(7)*	12-8d
30	5.8	17205	2900	4025	5.3	NA	1750	NA	2900	13-8d	*NA (7)*	*4975(7)*	*NA (7)*	*5590(7)*	13-8d

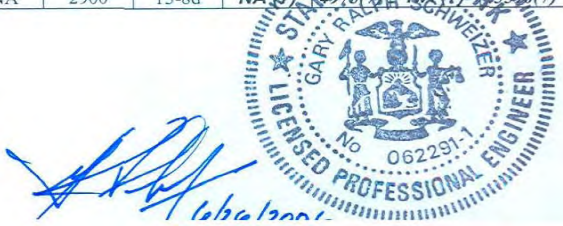


TABLE 2 – CONTINUED Page 2

BASIC PROPERTIES						REACTION PROPERTIES									
						END REACTION (lbs.)					INTERMEDIATE REACTION (lbs.)				
Joist Depth (in.)	Joist Weigh t (plf)	Resistive Moment (ft.-lbs.) (10)	Vert. Shear (lbs.)	EI x 10^6 lbs.-in.^{2}	K	1-3/4" *2-1/2" (9)* Bearing Length		3-1/2" Bearing Length		Nails Req'd.	3-1/2" *5-1/4" (7)* Bearing Length		5-1/4" *7" (7)* Bearing Length		Nails Req'd
						Web Stiffeners		Web Stiffeners			Web Stiffeners		Web Stiffeners		
						NO	YES	NO	YES		NO	YES	NO	YES	
TJI L90															
9 1/2	3.8	7415	1675	365	5.3	1400	NA	1675	NA	NA	3350	NA	3965	NA	NA
11-7/8	4.2	9605	1925	621	5.3	1400	1715	1885	1925	2-16d	3350	3665	3965	4285	2-16d
14	4.5	11430	2125	913	5.3	1400	1875	1885	2125	3-16d	3350	3825	3965	4440	3-16d
16	4.7	13115	2330	1246	5.3	1400	2030	1885	2330	4-16d	3350	3980	3965	4600	4-16d
18	5.0	14785	2535	1635	5.3	1400	2030	1885	2515	4-16d	3350	3980	3965	4600	4-16d
20	5.3	16435	2740	2085	5.3	NA	2190	NA	2675	5-16d	NA	4140	NA	4755	5-16d
22	5.6	18075	2935	2597	5.3	NA	2345	NA	2830	6-16d	NA	5090	NA	5705	11-16d
24	5.8	19700	3060	3172	5.3	NA	2345	NA	2830	6-16d	NA	5405	NA	6020	13-16d
26	6.1	21315	2900	3814	5.3	NA	2450	NA	2900	7-16d	***NA (7)***	***5800(7)***	***NA (7)***	***5800(7)***	14-16d
28	6.4	22915	2900	4525	5.3	NA	2450	NA	2900	8-16d	***NA (7)***	***5800(7)***	***NA (7)***	***5800(7)***	15-16d
30	6.6	24510	2900	5306	5.3	NA	2450	NA	2900	8-16d	***NA (7)***	***5800(7)***	***NA (7)***	***5800(7)***	17-16d
TJI H90															
11-7/8	4.6	10960	1925	687	5.3	1400	1715	1885	1925	2-16d	3495	3810	4100	4420	2-16d
14	4.9	13090	2125	1015	5.3	1400	1875	1885	2125	3-16d	3495	3970	4100	4575	3-16d
16	5.2	15065	2330	1389	5.3	1400	2030	1885	2330	4-16d	3495	4130	4100	4735	4-16d
18	5.4	17010	2535	1827	5.3	1400	2030	1885	2515	4-16d	3495	4130	4100	4735	4-16d
20	5.7	18945	2740	2331	5.3	NA	2190	NA	2675	5-16d	NA	4285	NA	4890	5-16d
22	6.0	20855	2935	2904	5.3	NA	2345	NA	2830	6-16d	NA	5235	NA	5840	11-16d
24	6.3	22755	3060	3549	5.3	NA	2345	NA	2830	6-16d	NA	5425	NA	6155	13-16d
26	6.5	24645	2900	4266	5.3	NA	2450	NA	2900	7-16d	***NA (7)***	***5800(7)***	***NA (7)***	***5800(7)***	14-16d
28	6.8	26520	2900	5059	5.3	NA	2450	NA	2900	8-16d	***NA (7)***	***5800(7)***	***NA (7)***	***5800(7)***	15-16d
30	7.1	28380	2900	5930	5.3	NA	2450	NA	2900	8-16d	***NA (7)***	***5800(7)***	***NA (7)***	***5800(7)***	17-16d
TJI HD90															
11-7/8	5.4	14075	2320	826	6.0	***1835(9)***	***2320(9)***	2150	2320	4-16d	3995	4650	4690	5345	4-16d
14	5.7	16920	2565	1232	6.0	***1835(9)***	***2565(9)***	2150	2565	6-16d	3995	4980	4690	5670	6-16d
16	6.0	19550	2790	1695	6.0	***1835(9)***	***2790(9)***	2150	2790	6-16d	3995	4980	4690	5670	6-16d
18	6.3	22150	3020	2239	6.0	***1835(9)***	***3020(9)***	2150	3020	8-16d	3995	5310	4690	6000	8-16d
20	6.7	24725	3250	2866	6.0	***NA(9)***	***3250(9)***	NA	3250	10-16d	NA	5425	NA	6330	10-16d
22	7.0	27280	3480	3579	6.0	***NA(9)***	***3475(9)***	NA	3480	10-16d	NA	5425	NA	6330	10-16d
24	7.3	29815	3710	4380	6.0	***NA(9)***	***3500(9)(11)***	NA	3710	12-16d	NA	5425	NA	6655	12-16d
26	7.6	32330	3940	5272	6.0	***NA(9)***	***3500(9)(11)***	NA	3940	14-16d	***NA (7)***	***6985(7)***	***NA (7)***	***7675(7)***	14-16d
28	7.9	34830	4165	6258	6.0	***NA(9)***	***3500(9)(11)***	NA	4165	14-16d	***NA (7)***	***6985(7)***	***NA (7)***	***7675(7)***	14-16d
30	8.2	37310	4375	7339	6.0	***NA(9)***	***3500(9)(11)***	NA	4375	16-16d	***NA (7)***	***7310(7)***	***NA (7)***	***8005(7)***	16-16d
32	8.5	39785	4375	8519	6.0	***NA(9)***	***3500(9)(11)***	NA	4375	18-16d	***NA (7)***	***7640(7)***	***NA (7)***	***8335(7)***	18-16d
TJI HS90															
11-7/8	6.0	16050	2320	900	6.0	***1835(9)***	***2320(9)***	2150	2320	4-16d	3995	4650	4690	5345	4-16d
14	6.3	19425	2565	1355	6.0	***1835(9)***	***2565(9)***	2150	2565	6-16d	3995	4980	4690	5670	6-16d
16	6.6	22550	2790	1876	6.0	***1835(9)***	***2790(9)***	2150	2790	6-16d	3995	4980	4690	5670	6-16d
18	7.0	25640	3020	2488	6.0	***1835(9)***	***3020(9)***	2150	3020	8-16d	3995	5310	4690	6000	8-16d
20	7.3	28695	3250	3195	6.0	***NA(9)***	***3250(9)***	NA	3250	10-16d	NA	5425	NA	6330	10-16d
22	7.6	31725	3480	3998	6.0	***NA(9)***	***3475(9)***	NA	3480	10-16d	NA	5425	NA	6330	10-16d
24	7.9	34730	3710	4901	6.0	***NA(9)***	***3500(9)(11)***	NA	3710	12-16d	NA	5425	NA	6655	12-16d
26	8.2	37715	3940	5905	6.0	***NA(9)***	***3500(9)(11)***	NA	3940	14-16d	***NA (7)***	***6985(7)***	***NA (7)***	***7675(7)***	14-16d
28	8.5	40680	4165	7014	6.0	***NA(9)***	***3500(9)(11)***	NA	4165	14-16d	***NA (7)***	***6985(7)***	***NA (7)***	***7675(7)***	14-16d
30	8.8	43630	4375	8230	6.0	***NA(9)***	***3500(9)(11)***	NA	4375	16-16d	***NA (7)***	***7310(7)***	***NA (7)***	***8005(7)***	16-16d
32	9.1	46560	4375	9555	6.0	***NA(9)***	***3500(9)(11)***	NA	4375	18-16d	***NA (7)***	***7640(7)***	***NA (7)***	***8335(7)***	18-16d

FOOTNOTES FOR TABLE 2

1. Refer to Figure 1 for web stiffener details.
2. Deflection is calculated as follows:

$$\text{Uniform load}: \Delta = \frac{22.5WL^4}{EI} + \frac{12WL^2}{Kdx10^5} \qquad \text{Concentrated load at midspan}: \Delta = \frac{36PL^3}{EI} + \frac{24PL}{Kdx10^5}$$

Where:

P = Concentrated load, pounds.
W = Uniform load in pounds per lineal foot.
d = Out-to-out depth of joist, inches.
EI = From table.
L = Clear span in feet
K = From table.

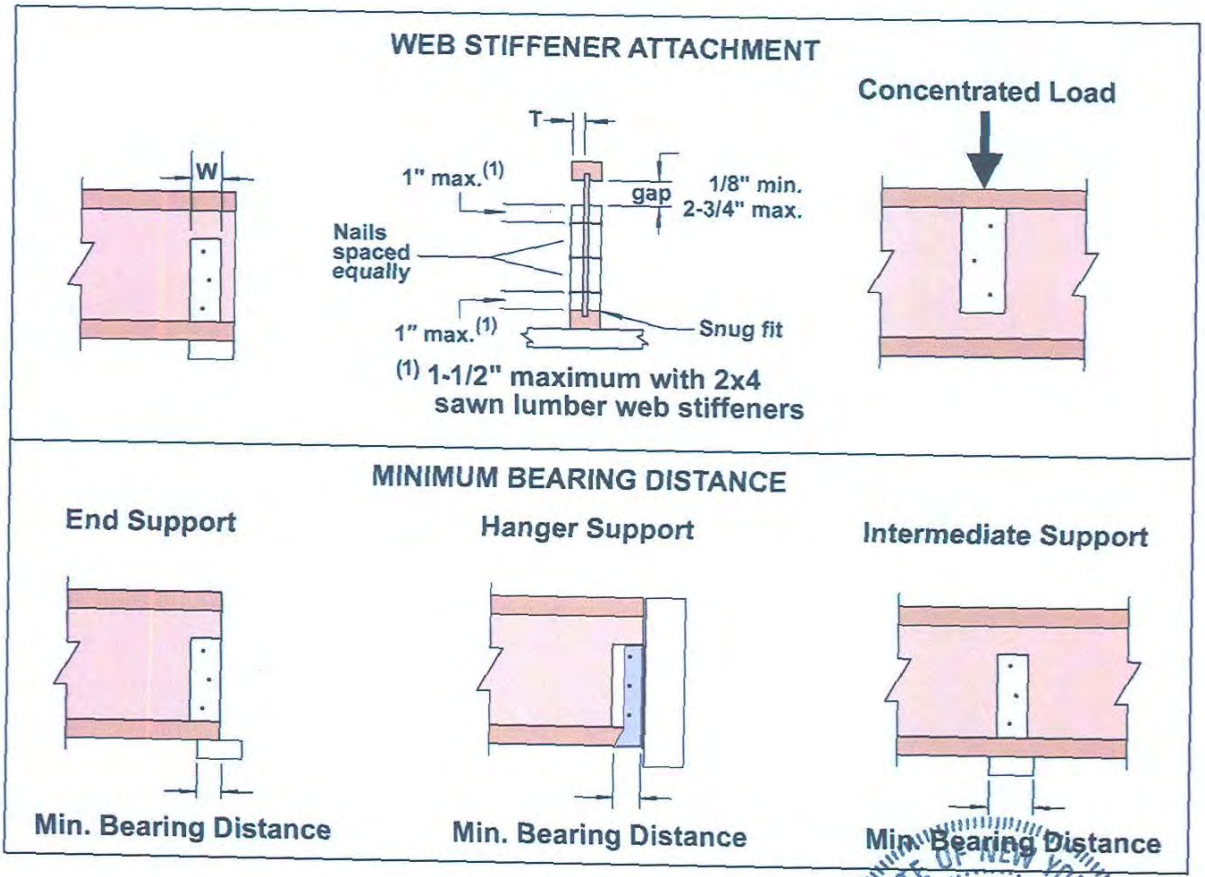
3. The stated allowable design properties are for loads of normal duration. Adjustments to the allowable design values shall be in accordance with the applicable code, with the exception noted in footnote 10 below.
4. Interpolation between bearing lengths and joist depths is permitted for allowable design reactions.
5. The minimum bearing length is permitted to be reduced for joists supported by hangers if supplemental nail attachment is provided to the web stiffener.
6. Allowable bearing lengths have been determined based on Trus Joist products. Allowable bearing on supporting members shall be checked.
7. Allowable bearing reactions for 5-1/4-inch and 7-inch bearing lengths at intermediate supports.
8. Joist weights shown are calculated on a rational basis, are based on the heavier of eastern or western species products and are suitable for dead load calculation. Contact the producing plant for shipping weight information if needed.
9. Applicable to TJI HD90 and TJI HS90 joists only. Areas indicate allowable bearing reactions for a 2-1/2 inch bearing length at end supports. 1-3/4 inch end bearing lengths are also permitted; with allowable reactions of 1600 lbs. without web stiffeners for depths up to and including 18 inches; with web stiffeners the allowable reaction is 2255 lbs. for the 11-7/8 inch depth and 2450 lbs. for all other depths.
10. The resistive moment capacities listed in Table 2 may not be increased by any code allowed repetitive-member use factor. Applicable to TJI HD90 and TJI HS90 joists only. Reaction capacities at a 3 inch bearing length (interpolated as per note 4 above) may be increased 510 lbs. when supported by Simpson Strong-Tie Co. HWI or WPU joist hangers with a minimum of 4 10d common nails installed through the joist hanger stirrups and into the joist web stiffener and web.

FIGURE 1. - WEB STIFFENER NOTES AND DETAILS

1. Web stiffeners shall be installed at bearing points as required in Table 2 of this MEA.
2. Web stiffeners shall be installed at points of concentrated loads greater than 1500 pounds and are to be nailed in accordance with the intermediate reaction schedule in Table 2 of this MEA.
3. Web stiffeners are to be installed on each side of the web as shown, with nails equally spaced vertically.
4. A gap shall be left at the top of web stiffeners as shown at all bearing conditions. In the case of concentrated loads, web stiffeners are required as shown and the gap shall be at the bottom.
5. Web stiffener material shall be sheathing meeting the requirements of PS-1 or PS-2 with the face grain parallel to the long axis.
6. Some hangers require web stiffeners to comply with nailing requirements through side plates.
7. If web stiffeners are not used in hanger support, the side of the hanger shall extend up to laterally support the top flange.

Web stiffener specifications are as follows:

es	Minimum Dimensions		Grade
	"W" (Inches)	"T" (Inches)	
TJI 110, TJI L45	2 5/16	5/8	See Note 5
TJI 210	2 5/16	23/32	See Note 5
TJI 230, TJI 360, TJI L65	2 5/16	7/8	See Note 5
TJI 560, TJI L90, TJI H90	3 1/2	1 1/2	Construction Grade 2x4
TJI HD90, TJI HS90	3 1/2	1 1/2	1.3E minimum grade TimberStrand LSL



STATE OF NEW YORK
GARY RALPH SCHWEIZER
No. 062291-1
LICENSED PROFESSIONAL ENGINEER
6/26/2006

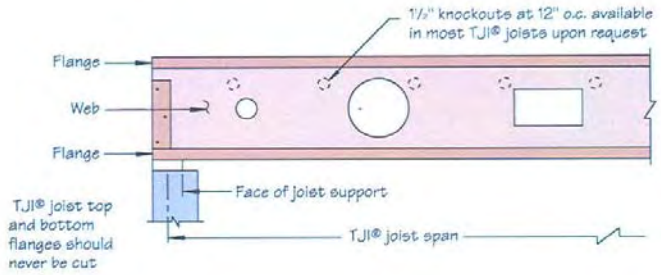


FIGURE 2. Allowable Hole Size and Location for the TJI L45, TJI L65, TJI L90, TJI H90, TJI HD90 and TJI HS90 Joists ONLY.

Hole Factors and Locations Chart

Round Hole Size (inches)		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Rectangular Hole Size (inches)		1¼	1¾	2¼	3	3½	4	4¾	5¼	6	6½	7	7¾	8¼	9	9½	10	10¾	11¼	12
Joist depth (inches)	11⅞	A	A	B	C	E														
	14	A	A	B	C	C	D	E												
	16	A	A	A	B	C	C	D	E	E										
	18	4"	1'-3"	A	A	B	C	C	D	E	E									
	20	4"	1'-3"	A	A	B	B	C	C	D	D	E	E							
	22	4"	1'-3"	1'-3"	A	A	B	B	C	C	D	D	E	E						
	24	4"	4"	1'-3"	A	A	A	B	B	C	C	D	D	E	E	E				
	26	4"	4"	1'-3"	A	A	A	B	B	B	C	C	D	D	D	E	E			
	28	4"	4"	1'-3"	1'-3"	A	A	A	B	B	B	C	C	D	D	D	E	E	E	
	30	4"	4"	4"	1'-3"	1'-3"	A	A	A	B	B	B	C	C	C	D	D	E	E	E

Hole Locations Chart

Joist Span (center to center of support, feet)	Hole Factor A	B	C	D	E
14	1'-3"	2'-0"	2'-6"	3'-9"	5'-0"
15	1'-3"	2'-0"	3'-0"	4'-0"	5'-3"
16	1'-3"	2'-3"	3'-3"	4'-6"	5'-9"
17	1'-6"	2'-9"	3'-9"	5'-0"	6'-3"
18	1'-6"	3'-0"	4'-3"	5'-6"	6'-9"
19	1'-9"	3'-0"	4'-3"	5'-6"	7'-0"
20	1'-9"	3'-0"	4'-3"	5'-6"	7'-0"
21	2'-0"	3'-0"	4'-3"	5'-9"	7'-3"
22	2'-0"	3'-0"	4'-3"	5'-9"	7'-3"
23	2'-0"	3'-3"	4'-3"	5'-9"	7'-6"
24	2'-3"	3'-3"	4'-6"	5'-9"	7'-6"
25	2'-3"	3'-6"	4'-9"	5'-9"	7'-9"
26	2'-3"	3'-9"	4'-9"	6'-0"	7'-9"
27	2'-6"	3'-9"	5'-0"	6'-3"	7'-9"
28	2'-6"	4'-0"	5'-3"	6'-6"	8'-0"
29	2'-6"	4'-0"	5'-6"	6'-9"	8'-3"
30	2'-9"	4'-3"	5'-9"	7'-0"	8'-6"
31	3'-0"	4'-3"	5'-9"	7'-3"	8'-9"
32	3'-0"	4'-6"	6'-0"	7'-6"	9'-3"
33	3'-0"	4'-9"	6'-3"	7'-9"	9'-6"
34	3'-0"	5'-0"	6'-6"	8'-0"	9'-9"
35	3'-3"	5'-0"	6'-6"	8'-3"	10'-0"
36	3'-3"	5'-0"	6'-9"	8'-6"	10'-3"

Notes to Figure 2:

1. Charts are based on simple spans and uniform load applications or applicable building code provisions for concentrated loads (2000 lbs. Over 2.5 square feet) with 25 psf dead load and 20 psf partition load.
2. For uniformly loaded multiple span applications holes must be located 1.0 inch farther from the support for each foot of joist span, than the values indicated in the Charts.
3. Holes are not allowed in cantilever areas unless specifically designed by a qualified design professional.
4. Where more than one hole is to be cut in the web, the clear distance between holes must be twice the length of the longest dimension of the largest adjacent hole.
5. Hole sizes shown are hole sizes, not duct sizes.
6. Rectangular hole sizes are based on measurement of the longest side.

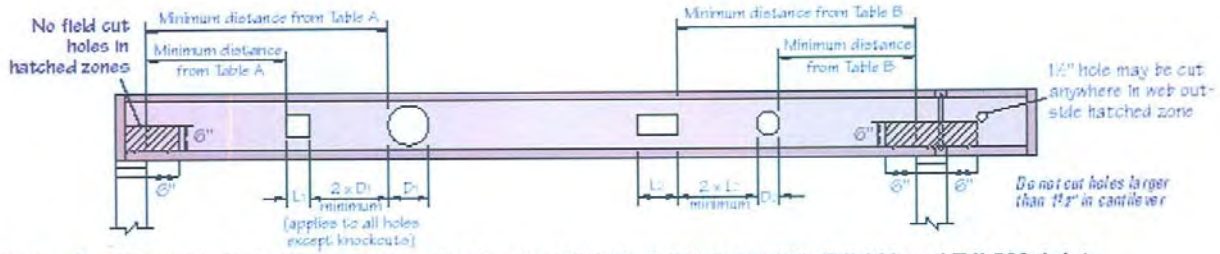


Figure 3. - Allowable Hole Size and Location for the TJI 110, TJI 210, TJI 230, TJI 360 and TJI 560 Joists

Table A – END SUPPORT
Minimum Distance From Edge of Hole to Inside Face of Nearest End Support

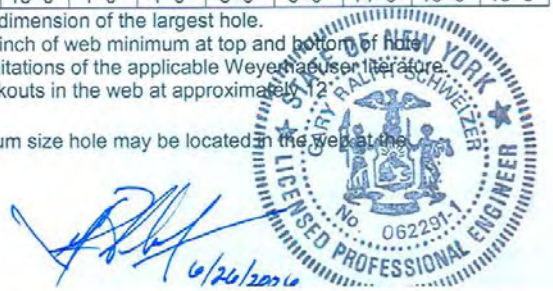
Joist Depth (inches)	TJI Joist Series	Round Hole Size (inches)							Square or Rectangular Hole Size (inches)						
		2	3	4	6½	8⅞	11	13	2	3	4	6½	8⅞	11	13
9½	TJI 110	1'-0"	1'-6"	2'-0"	5'-0"				1'-0"	1'-6"	2'-6"	4'-6"			
	TJI 210	1'-0"	1'-6"	2'-0"	5'-0"				1'-0"	2'-0"	2'-6"	5'-0"			
	TJI 230	1'-0"	2'-0"	2'-6"	5'-6"				1'-0"	2'-0"	3'-0"	5'-0"			
11⅞	TJI 110	1'-0"	1'-0"	1'-0"	2'-6"	5'-0"			1'-0"	1'-0"	1'-6"	4'-6"	6'-0"		
	TJI 210	1'-0"	1'-0"	1'-0"	2'-6"	5'-6"			1'-0"	1'-0"	2'-0"	5'-0"	6'-6"		
	TJI 230	1'-0"	1'-0"	1'-0"	3'-0"	6'-0"			1'-0"	1'-0"	2'-0"	5'-6"	7'-0"		
	TJI 360	1'-0"	1'-0"	1'-6"	4'-6"	7'-0"			1'-0"	1'-0"	2'-6"	6'-6"	7'-6"		
	TJI 560	1'-0"	1'-0"	1'-6"	5'-0"	8'-0"			1'-0"	2'-0"	3'-6"	7'-0"	8'-0"		
14	TJI 110	1'-0"	1'-0"	1'-0"	1'-0"	2'-6"	5'-0"		1'-0"	1'-0"	1'-0"	3'-6"	6'-0"	8'-0"	
	TJI 210	1'-0"	1'-0"	1'-0"	1'-0"	3'-0"	6'-0"		1'-0"	1'-0"	1'-0"	4'-0"	6'-6"	8'-6"	
	TJI 230	1'-0"	1'-0"	1'-0"	1'-6"	3'-6"	6'-6"		1'-0"	1'-0"	1'-0"	4'-0"	7'-0"	9'-0"	
	TJI 360	1'-0"	1'-0"	1'-0"	2'-6"	5'-6"	8'-0"		1'-0"	1'-0"	1'-0"	5'-6"	8'-0"	9'-6"	
	TJI 560	1'-0"	1'-0"	1'-0"	2'-6"	6'-0"	9'-0"		1'-0"	1'-0"	1'-6"	6'-6"	9'-0"	10'-0"	
16	TJI 210	1'-0"	1'-0"	1'-0"	1'-0"	1'-6"	3'-6"	6'-0"	1'-0"	1'-0"	1'-0"	2'-6"	6'-6"	8'-0"	10'-6"
	TJI 230	1'-0"	1'-0"	1'-0"	1'-0"	2'-0"	4'-0"	6'-6"	1'-0"	1'-0"	1'-0"	3'-0"	7'-0"	9'-0"	11'-0"
	TJI 360	1'-0"	1'-0"	1'-0"	1'-0"	3'-0"	6'-0"	9'-0"	1'-0"	1'-0"	1'-0"	4'-0"	9'-0"	10'-0"	11'-6"
	TJI 560	1'-0"	1'-0"	1'-0"	1'-0"	3'-0"	6'-6"	10'-0"	1'-0"	1'-0"	1'-0"	5'-0"	10'-0"	11'-0"	12'-0"

See notes below Table B.

Table B – INTERMEDIATE OR CANTILEVER SUPPORT
Minimum Distance from Edge of Hole to Inside Face of Nearest Intermediate or Cantilever Support

Joist Depth (inches)	TJI Joist Series	Round Hole Size (inches)							Square or Rectangular Hole Size (inches)						
		2	3	4	6½	8⅞	11	13	2	3	4	6½	8⅞	11	13
9½	TJI 110	1'-6"	2'-6"	3'-0"	7'-6"				1'-6"	2'-6"	3'-6"	6'-6"			
	TJI 210	2'-0"	2'-6"	3'-6"	7'-6"				2'-0"	3'-0"	4'-0"	7'-0"			
	TJI 230	2'-6"	3'-0"	4'-0"	8'-0"				2'-6"	3'-0"	4'-6"	7'-6"			
11⅞	TJI 110	1'-0"	1'-0"	1'-6"	4'-0"	8'-0"			1'-0"	1'-6"	2'-6"	6'-6"	9'-0"		
	TJI 210	1'-0"	1'-0"	2'-0"	4'-6"	9'-0"			1'-0"	2'-0"	3'-0"	7'-6"	10'-0"		
	TJI 230	1'-0"	2'-0"	2'-6"	5'-0"	9'-6"			1'-0"	2'-6"	3'-6"	8'-0"	10'-0"		
	TJI 360	2'-0"	3'-0"	4'-0"	7'-0"	11'-0"			2'-0"	3'-6"	5'-0"	9'-6"	11'-0"		
	TJI 560	1'-6"	3'-0"	4'-6"	8'-0"	12'-0"			3'-0"	4'-6"	6'-0"	10'-6"	12'-0"		
14	TJI 110	1'-0"	1'-0"	1'-0"	2'-0"	4'-6"	8'-0"		1'-0"	1'-0"	1'-0"	5'-0"	9'-0"	12'-0"	
	TJI 210	1'-0"	1'-0"	1'-0"	2'-6"	5'-0"	9'-0"		1'-0"	1'-0"	2'-0"	6'-0"	10'-0"	12'-6"	
	TJI 230	1'-0"	1'-0"	1'-0"	3'-0"	5'-6"	10'-0"		1'-0"	1'-0"	2'-6"	6'-0"	10'-6"	13'-0"	
	TJI 360	1'-0"	1'-0"	2'-0"	5'-6"	8'-6"	12'-6"		1'-0"	2'-0"	4'-0"	9'-0"	12'-0"	14'-0"	
	TJI 560	1'-0"	1'-0"	1'-6"	5'-6"	9'-6"	13'-6"		1'-0"	3'-0"	5'-0"	10'-0"	13'-6"	15'-0"	
16	TJI 210	1'-0"	1'-0"	1'-0"	1'-0"	3'-0"	5'-6"	9'-6"	1'-0"	1'-0"	1'-0"	4'-6"	9'-6"	12'-6"	15'-6"
	TJI 230	1'-0"	1'-0"	1'-0"	1'-6"	4'-0"	6'-6"	10'-6"	1'-0"	1'-0"	1'-0"	5'-0"	10'-6"	13'-0"	16'-0"
	TJI 360	1'-0"	1'-0"	1'-0"	3'-0"	6'-6"	10'-0"	13'-6"	1'-0"	1'-0"	2'-0"	7'-6"	13'-0"	14'-6"	17'-0"
	TJI 560	1'-0"	1'-0"	1'-0"	2'-6"	7'-0"	11'-0"	15'-0"	1'-0"	1'-0"	3'-6"	9'-0"	14'-6"	16'-0"	18'-0"

1. The clear distance between multiple holes must be twice the longest dimension of the largest hole.
2. Holes may be located vertically anywhere within the web. Leave 1/8 inch of web minimum at top and bottom of hole.
3. Tables A and B are based on uniform load applications, within the limitations of the applicable Weyerhaeuser literature.
4. TJI Joists are manufactured with 1 1/2 inch diameter perforated knockouts in the web at approximately 12 inches on center along the length of the joist.
5. For simple span (5 foot minimum) uniformly loaded joists one maximum size hole may be located in the web at the center of the joist span provided no other holes occur in the joist.



Pursuant to "Promulgation of the Rules relating to Material and Equipment Application Procedures" dated November 5, 1992, the Bureau of Fire Prevention has no objections Letter dated

Terms and Conditions: The above TJI® Joists are accepted on the condition that::

1. 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) and TPPN #2, 2000 dated July 24, 2000 (attached).

2. Structure designs using the TJI® 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. TJI® Joists shall be used indoors.

5. When stored out-of-doors, or exposed to wet weather conditions during construction, TJI® 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. The flanges of TJI® Joists shall not be cut, notched or bored.

8. Firestopping shall be provided between the ceiling and 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 installment of TJI® 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 "Prefabricated
   > Wood I-Joists" 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, N.Y. 11201-3857

10. All shipments and deliveries of such equipment shall be provided with a metal tag, suitably placed, certifying that the equipment shipped or delivered is equivalent to that tested and acceptable for use, as provided in Section 27-131 of the Building Code.

Note: In accordance with Section 27-131(d), all materials tested and accepted for use shall be subject to periodic retesting as determined by the Commissioner; and any material which upon retesting is found not to comply with code requirements or the requirements set forth in the approval of the Commissioner, shall cease to be acceptable for the use intended. During the period for such retesting, the Commissioner may require the use of such material to be restricted or discontinued, if necessary, to secure safety.

Final Acceptance August 3, 2006

Examined By

The City of New York

ISSUANCE # 367

DEPARTMENT OF BUILDINGS

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

RUDOLPH F. RINALDI, Commissioner

112-8100

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.

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 firestopping provisions of Section 9.2.1 et seg. 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 pursuit 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 that 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
9 MetroTech Center
Brooklyn, N.Y. 11201-3857

The City of New York

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 Affair
(212) 312-8324
Fax (212) 312-8319

ISSUANCE #586

TECHNICAL
POLICY AND PROCEDURE NOTICE #2/00

TO: Distribution

FROM: Satish K. Babbar, R.A.

DATE: July 24, 2000

Semi-Controlled Inspection for Structural Light Gauge 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 gauge cold-formed steel structural members, place 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, place 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 forming is in the integral part of the design,

Quality All materials shall be clean, straight, and undamaged. Damaged member 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 manufacturer's 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 approval/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.

INSPECTONS 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 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”.