

Technical Bulletin # 12-10

# Master Plank<sup>®</sup> LVL for Manufactured Housing Applications



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**Master Plank® LVL Beams for Manufactured Housing Applications**

Beam Size		Master Plank LVL Section Properties					Master Plank LVL Design Values				
Beam Size b x d (in)	Dimensions b x d (in)	Maximum Moment (M) (ft-lbs)	Maximum Shear (V) (lbs)	Moment of Inertia (I) (in <sup>4</sup> )	Section Modulus (S) (in <sup>3</sup> )	Beam Weight (lbs/ft)	Static Bending F <sub>b</sub> * (PSI)	Modulus of Elasticity MOE (PSI)	Tension F <sub>t</sub> (PSI)	Compression F <sub>c</sub> & F <sub>c</sub> perp. (PSI)	Shear F <sub>v</sub> (PSI)
1.181 x 3 1/2	1.181" x 3-1/2"	701	882	4.2	2.4	0.9	2900		2300		320
1.181 x 4 1/2	1.181" x 4-1/2"	1116	1134	9.0	4.0	1.2	True	2.0 x 10 <sup>6</sup>	F <sub>c</sub>	2700	
1.181 x 4 7/8	1.181" x 4-7/8"	1294	1228	11.4	4.7	1.3	Apparent	1.9 x 10 <sup>6</sup>	F <sub>c</sub> perp.	870	
1.181 x 5 1/4	1.181" x 5-1/4"	1484	1323	14.2	5.4	1.4	Design values are for vertical (beam) orientation				
1.181 x 5 1/2	1.181" x 5-1/2"	1618	1386	16.4	6.0	1.4	* Allowable bending value F <sub>b</sub> to be modified by volume factor C <sub>V</sub> Where C <sub>V</sub> = (12/d) <sup>0.15</sup>				
1.181 x 5 3/4	1.181" x 5-3/4"	1756	1449	18.7	6.5	1.5	Specific Gravity (G) for Fasteners = 0.45				
1.181 x 7 1/4	1.181" x 7-1/4"	2697	1827	37.5	10.3	1.9	Refer to ICC-ES NER-555 for additional information				
1.181 x 9 1/2	1.181" x 9-1/2"	4446	2393	84.4	17.8	2.5					
1.181 x 11 7/8	1.181" x 11-7/8"	6718	2992	164.8	27.8	3.1					
1.181 x 14	1.181" x 14"	9110	3527	270.1	38.6	3.7					
1.181 x 16	1.181" x 16"	11663	4031	403.1	50.4	4.2					
1.181 x 18	1.181" x 18"	14503	4535	574.0	63.8	4.7					
		M=F <sub>b</sub> *S/12	V=F <sub>v</sub> A/1.5	I=bd <sup>3</sup> /12	S=bd <sup>2</sup> /6						

**Connections between Master Plank LVL Beam and Truss End Vertical:**

1.181 in beam - 2-1/2 in vertical	Master Plank LVL Beam	Load per Fastener			
		Driven through Master Plank LVL beam into truss end vertical			
		Floor (CD = 1.00)	Roof - Snow (CD = 1.15)	Roof - NO Snow (CD = 1.25)	Roof - Wind (CD = 1.6)
	<b>Fastened to:</b>	(lb)	(lb)	(lb)	(lb)
16d pneumatically driven "Gun" nails 0.131 in diameter 2-1/2 in long	SPF - Specific Gravity (G) = 0.42 So. Pine - Specific Gravity (G) = 0.55	85 96	98 110	106 120	136 153
15 gage pneumatically driven staples 7/16 in crown, 2-1/2 in leg	SPF - Specific Gravity (G) = 0.42 So. Pine - Specific Gravity (G) = 0.55	51 58	59 67	64 72	82 93
# 8 wood crews 0.164 in diameter 2-1/2 in long	SPF - Specific Gravity (G) = 0.42 So. Pine - Specific Gravity (G) = 0.55	127 142	146 164	158 178	203 228

Refer to NDS Section 11 for nail and screw values. Staple values calculated from *International Staple, Nail and Tool Association (ISANTA) ESR-1539*



**Master Plank LVL Ridge Beam Maximum Span Tables on Facing Page:**

11'-4"
1184 lb/2.36"

1. Tables on page 3 show: Maximum beam span, Maximum reaction/Minimum bearing
2. Tables are for simple spans and uniform loads only.
3. Tables assume beam is full-depth laterally braced at 24" O.C maximum by trusses or joists connected to one side.
4. Beam sizes are valid for wind zones I, II, and III as defined in the HUD Federal Registry.
5. All connection designs are the responsibility of others.
6. Spans are limited by L/180 maximum live load deflection and L/120 maximum total load deflection. Check governing codes for applicable deflection criteria.
7. Required bearing lengths, if shown, are for Spruce-Pine-Fir supporting members, F<sub>c</sub>p = 425 psi.
8. For combined wind zones, use the LOWEST SPAN and the HIGHEST UPLIFT values from both.
9. Refer to ICC Evaluation Service, Inc. Report No(s). ESR-555 for design values and additional information.

**Master Plank® LVL Beams for Manufactured Housing Applications**

Wind	Wind Zone I			Wind Zone II	Wind Zone III	Wind Zone I			Wind Zone II	Wind Zone III
	20 psf	30 psf	40 psf	30 psf	36 psf	20 psf	30 psf	40 psf	30 psf	36 psf
Live Load	20 psf	30 psf	40 psf	30 psf	36 psf	20 psf	30 psf	40 psf	30 psf	36 psf
Dead Load	12 psf	12 psf	12 psf	-6 psf	-6 psf	12 psf	12 psf	12 psf	-6 psf	-6 psf
Load Duration	NO Snow	Snow	Snow	Wind	Wind	NO Snow	Snow	Snow	Wind	Wind

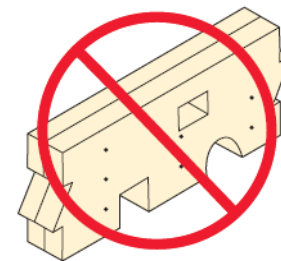
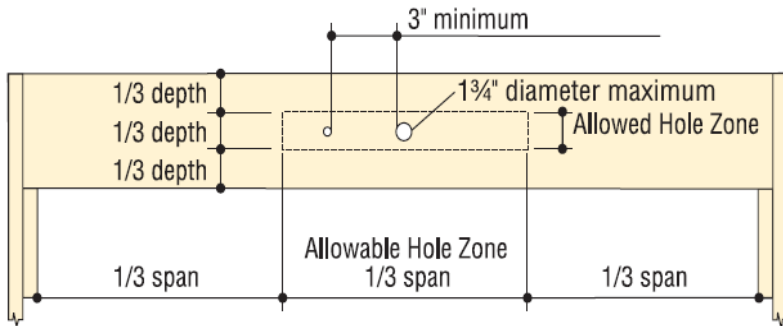
	Box Width 144" or 12'-0"					Box Width 156" or 13'-0"				
	5'-8"	5'-0"	4'-6"	5'-5"	5'-1"	5'-6"	4'-10"	4'-4"	5'-4"	4'-11"
1.181" x 3-1/2"	547 lb/1.09"	637 lb/1.27"	709 lb/1.41"	395 lb - UP	458 lb - UP	577 lb/1.15"	663 lb/1.32"	738 lb/1.47"	416 lb - UP	483 lb - UP
1.181" x 4-1/2"	704 lb/1.40"	804 lb/1.60"	895 lb/1.78"	507 lb - UP	589 lb - UP	742 lb/1.48"	837 lb/1.67"	931 lb/1.86"	535 lb - UP	621 lb - UP
1.181" x 4-7/8"	762 lb/1.52"	866 lb/1.73"	964 lb/1.92"	550 lb - UP	638 lb - UP	804 lb/1.60"	901 lb/1.80"	1003 lb/2.00"	580 lb - UP	673 lb - UP
1.181" x 5-1/4"	821 lb/1.64"	927 lb/1.85"	1032 lb/2.06"	592 lb - UP	687 lb - UP	866 lb/1.73"	965 lb/1.92"	1074 lb/2.14"	624 lb - UP	725 lb - UP
1.181" x 5-1/2"	860 lb/1.71"	968 lb/1.93"	1077 lb/2.15"	620 lb - UP	720 lb - UP	888 lb/1.81"	997 lb/2.01"	1106 lb/2.23"	654 lb - UP	759 lb - UP
1.181" x 5-3/4"	899 lb/1.79"	1009 lb/2.01"	1123 lb/2.24"	648 lb - UP	752 lb - UP	948 lb/1.89"	1050 lb/2.09"	1168 lb/2.33"	684 lb - UP	794 lb - UP
1.181" x 7-1/4"	1134 lb/2.26"	1250 lb/2.49"	1391 lb/2.77"	818 lb - UP	949 lb - UP	1184 lb/2.36"	1301 lb/2.59"	1448 lb/2.88"	862 lb - UP	1001 lb - UP
1.181" x 9-1/2"	1461 lb/2.91"	1605 lb/3.20"	1786 lb/3.56"	1071 lb - UP	1243 lb - UP	1521 lb/3.03"	1671 lb/3.33"	1859 lb/3.70"	1130 lb - UP	1311 lb - UP
1.181" x 11-7/8"	1796 lb/3.58"	1973 lb/3.93"	2196 lb/4.37"	1339 lb - UP	1554 lb - UP	1869 lb/3.72"	2054 lb/4.09"	2285 lb/4.55"	1412 lb - UP	1639 lb - UP
1.181" x 14"	2091 lb/4.17"	2298 lb/4.58"	2557 lb/5.09"	1579 lb - UP	1832 lb - UP	2177 lb/4.34"	2392 lb/4.77"	2661 lb/5.30"	1665 lb - UP	1932 lb - UP
1.181" x 16"	2366 lb/4.71"	2600 lb/5.18"	2893 lb/5.76"	1804 lb - UP	2094 lb - UP	2463 lb/4.91"	2706 lb/5.39"	3011 lb/6.00"	1903 lb - UP	2208 lb - UP
1.181" x 18"	2638 lb/5.26"	2899 lb/5.78"	3226 lb/6.43"	2030 lb - UP	2355 lb - UP	2746 lb/5.47"	3018 lb/6.01"	3358 lb/6.69"	2141 lb - UP	2484 lb - UP
Truss Load @ 16" O.C.	256 lb	336 lb	416 lb	384 lb	384 lb	277 lb	364 lb	451 lb	416 lb	416 lb
Truss Load @ 24" O.C.	384 lb	504 lb	624 lb	576 lb	576 lb	416 lb	546 lb	676 lb	624 lb	624 lb

	Box Width 168" or 14'-0"					Box Width 180" or 15'-0"				
	5'-4"	4'-8"	4'-2"	5'-2"	4'-10"	5'-3"	4'-6"	4'-0"	5'-1"	4'-8"
1.181" x 3-1/2"	607 lb/1.21"	688 lb/1.37"	766 lb/1.53"	437 lb - UP	508 lb - UP	635 lb/1.27"	713 lb/1.42"	793 lb/1.58"	458 lb - UP	531 lb - UP
1.181" x 4-1/2"	780 lb/1.55"	869 lb/1.73"	967 lb/1.93"	562 lb - UP	653 lb - UP	817 lb/1.63"	899 lb/1.79"	1000 lb/1.99"	589 lb - UP	683 lb - UP
1.181" x 4-7/8"	845 lb/1.68"	935 lb/1.86"	1041 lb/2.07"	609 lb - UP	707 lb - UP	881 lb/1.76"	968 lb/1.93"	1077 lb/2.15"	638 lb - UP	740 lb - UP
1.181" x 5-1/4"	910 lb/1.81"	1002 lb/2.00"	1115 lb/2.22"	656 lb - UP	761 lb - UP	944 lb/1.88"	1037 lb/2.07"	1154 lb/2.30"	687 lb - UP	797 lb - UP
1.181" x 5-1/2"	952 lb/1.90"	1046 lb/2.08"	1164 lb/2.32"	687 lb - UP	798 lb - UP	985 lb/1.96"	1083 lb/2.16"	1205 lb/2.40"	720 lb - UP	835 lb - UP
1.181" x 5-3/4"	992 lb/1.98"	1090 lb/2.17"	1213 lb/2.42"	719 lb - UP	834 lb - UP	1027 lb/2.05"	1128 lb/2.25"	1255 lb/2.50"	752 lb - UP	873 lb - UP
1.181" x 7-1/4"	1229 lb/2.45"	1350 lb/2.69"	1503 lb/2.99"	906 lb - UP	1051 lb - UP	1272 lb/2.53"	1398 lb/2.78"	1555 lb/3.10"	949 lb - UP	1101 lb - UP
1.181" x 9-1/2"	1578 lb/3.14"	1734 lb/3.45"	1929 lb/3.84"	1187 lb - UP	1378 lb - UP	1633 lb/3.25"	1795 lb/3.58"	1997 lb/3.98"	1243 lb - UP	1442 lb - UP
1.181" x 11-7/8"	1940 lb/3.86"	2131 lb/4.25"	2372 lb/4.73"	1484 lb - UP	1722 lb - UP	2008 lb/4.00"	2206 lb/4.40"	2455 lb/4.89"	1554 lb - UP	1803 lb - UP
1.181" x 14"	2259 lb/4.50"	2482 lb/4.94"	2762 lb/5.50"	1749 lb - UP	2030 lb - UP	2338 lb/4.66"	2569 lb/5.12"	2859 lb/5.70"	1832 lb - UP	2126 lb - UP
1.181" x 16"	2556 lb/5.09"	2808 lb/5.60"	3125 lb/6.23"	1999 lb - UP	2320 lb - UP	2645 lb/5.27"	2907 lb/5.79"	3234 lb/6.44"	2094 lb - UP	2429 lb - UP
1.181" x 18"	2850 lb/5.68"	3132 lb/6.24"	3484 lb/6.94"	2249 lb - UP	2610 lb - UP	2950 lb/5.88"	3241 lb/6.46"	3607 lb/7.19"	2355 lb - UP	2733 lb - UP
Truss Load @ 16" O.C.	299 lb	392 lb	485 lb	448 lb	448 lb	320 lb	420 lb	520 lb	480 lb	480 lb
Truss Load @ 24" O.C.	448 lb	588 lb	728 lb	672 lb	672 lb	480 lb	630 lb	780 lb	720 lb	720 lb

Master Plank® LVL Beams

for Manufactured Housing Applications

Allowable Holes for Uniformly Loaded Beams:



Cutting, notching or drilling holes are NOT allowed, except as noted.

1. This hole chart is for typical beam applications only, and covers uniform loads and span conditions provided in this brochure.
2. **NO** square holes are allowed.
3. For other hole configurations, contact your design professional or supplier for assistance.



Master Plank LVL Features:

**Weather Guard® Coating:** Master Plank LVL is intended for dry applications and should not be exposed to the weather; however, it is protected by a special moisture resistant coating which is applied at the mill using an in-line coating process. If the product gets wet during construction, this patented technology helps reduce moisture absorption and consequent dimensional changes.

**Flexibility:** We make it your way. Finnforest manufacturing is flexible, custom depths are not a problem. If there is a particular product that you need, one that would suit your span, load and production requirements then let us know and we will see what we can put together for you to make your designs more efficient and save you time and money.

**Sustainability:** Finnforest Master Plank LVL is manufactured with low energy and emissions, using the best available technology. This renewable and recyclable raw material that absorbs carbon dioxide from the atmosphere is sourced from sustainably managed forests. By-products generated during manufacturing are utilized by production units and power production. At the end of its life cycle, wood can be burned and used as heating energy. Finnforest has also been awarded ISO 14001: 2004 environmental certification by Bureau Veritas, an international group specializing in the inspection, analysis, audit, and certification of products.

**Reliability:** Scandinavian manufacturers are well known for carefully crafted, reliable products and our Master Plank LVL is no exception. Unchanged for over 25 years in residential and commercial markets in the USA.

**Quality:** Finnforest Master Plank LVL is manufactured to the latest version of international quality standard; ISO 9001: 2008. Rigorous testing and third party auditing are required as part of our quality assurance program to make sure you receive the highest quality products.

Master Plank® is a registered trademark of Finnforest USA  
Weather Guard® is a registered trademark of Finnforest USA

**MASTER PLANK** PRODUCT WARRANTY

Finnforest USA warrants **MASTER PLANK**® Laminated Veneer Lumber to be free from any defects or errors due to faulty materials or workmanship in the manufacturing process in accordance with our specification.

We further guarantee that **MASTER PLANK**®, when correctly installed, will meet or exceed their design specifications for the normal life of the structure.

**finnforest**  
Finnforest USA, Engineered Wood Division

*James Gillen*  
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