

METWOOD = INNOVATION

Doing more, better, faster, and safer, while giving customers a better value is what Metwood Innovation is all about. Metwood products are extremely adaptable to all types of building systems, and fit right in with wood, log, ICF, SIP, metal, or just about anything else. Start with a complete Metwood system or try several components to get comfortable with the working aspects of Cold Formed Steel, and try others when the time is right. Call or visit www.metwood.com for more information.



The Metwood **TUFF BEAM™** is a compact structural beam of incredible strength, capable of spanning greater distances with fewer vertical supports while allowing the passage of utilities right through the structural member. Hole sizes vary from 6", 8" and 10" depending on beam depth. Other sizes available on request. Beams can be manufactured without holes for certain applications.



Metwood **TUFF JOIST+™** combines the strength and consistency of standard C-Stud joists, the flexibility of pre-punched reinforced access holes, and Metwood's patented internal reinforcing technology. Hole sizes vary from 6", 8" and 10" depending on beam depth. Other sizes available on request. The joists can be manufactured without holes for certain applications.



TUFF BEAM™, **TUFF JOIST™**, and **TUFFJOIST+™** make up the **TUFF FLOOR™** system, offering the design flexibility to achieve conventional or radical floor designs. Pre-punched reinforced access holes allow plumbing, HVAC, electrical, and other technology services to be installed within the floor system to improve ease of installation while maintaining structural integrity.



Nothing compares to the solid feel and security of steel. **TUFF DECK™** accommodates any handrail, or ceiling finish, and is radiant ready. Metwood's ultimate deck system is pre-engineered and available with either **TUFF JOIST™**, **TUFF JOIST+™**, or **TUFF BEAM™**, providing a strong, light-weight support system that installs quickly. **TUFF JOIST™** and **TUFF BEAM™** can be trimmed on site and installed with screws, so no welding is required.



Eliminates Headers above Window and Door Openings. The **RIM BEAM™** increases the Energy Envelope's efficiency by replacing the CFS Header with Insulation, which has four times the resistance to heat flow. (LEED awards). Resolves framing challenges caused by specified headers such as different depths specified for various openings, and special order, multi-ply, heavier gauges typically needed to carry loads.



819 Naff Road. Boones Mill, VA. 24065
Ph: 540-334-4294

www.metwood.com



STEEL | North America's
#1 Recycled Material

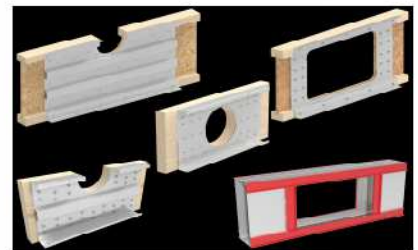
SQUAREcolumns™ by Metwood

Metwood **SQUARE COLUMNS™** are a perfect match for **TUFF BEAM™**, but they'll support just about anything. Used in both **TUFF DECK™** and **TUFF FLOOR™** Systems™, Metwood **SQUARE COLUMNS™** feature a higher strength to weight ratio than round columns, and offering more convenience in attaching finish materials at a price comparable to round columns. Cut to length on the job and assemble using self drilling screws.



REINFORCER™ technologies by Metwood

Metwood **Joist Reinforcers™** restore the strength of Floor Joists weakened by the placement of large holes or cut-outs. **Joist Reinforcers™** are engineered light gauge steel attachments for engineered I-Joists or conventional framing. By allowing larger openings in Floor joists, the **Joist Reinforcer™** simplifies the routing and installation of utilities.

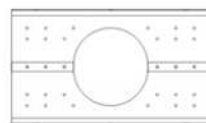


2810HR

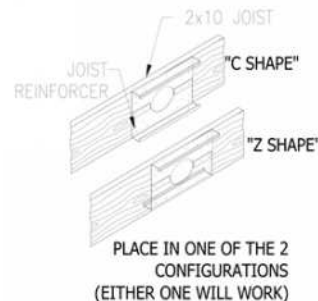


Use the 2810HR Joist Reinforcer to allow placement of up to 6" holes in 2x10 wood joists and 4" holes in 2x8's. The 2810HR Joist Reinforcer has 2 identical pieces which are simultaneously attached to a joist to accommodate a hole in the joist which may have pipes, conduit, wires, etc., already in place.

****CCRR-0279 covers use on 2x10 solid sawn described in Section 6.3. All other species and sizes will require an engineered letter.**



2x10 VIEW

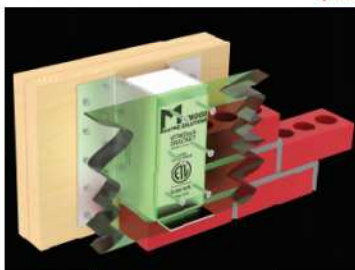


CODE
COMPLIANCE



Intertek
CCRR-0279

MTWDeck Bracket By Metwood



The Metwood **MTWDeck Bracket** can be utilized on structures with stone or masonry veneer as an alternate deck ledger connection. Section R507.2.2 of the 2012 IRC states, "Deck ledger connections not conforming to Table R507.2 shall be designed in accordance with accepted engineering practice."

MTWDeck Bracket Maximum Spacing

Band of Structure Species	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)						
	6	8	10	12	14	16	18
Douglas Fir-Larch and Southern Pine	8-0	8-0	6-0	5-0	5-0	4-0	3-0
Spruce Pine Fir and Hem Fir	8-0	6-0	5-0	4-0	3-0	3-0	3-0

CODE
COMPLIANCE



Intertek
CCRR-0261

819 Naff Road. Boones Mill, VA. 24065
Ph: 540-334-4294

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STEEL | North America's
#1 Recycled Material

TUFF BEAM™, The Original Internally Reinforced Structural Beam



TUFF BEAM™

**Internally Reinforced
Structural Beam**

by Metwood

The Metwood TUFF BEAM™ is a compact structural beam of incredible strength, capable of spanning greater distances with fewer vertical supports while allowing the passage of utilities right through the structural member. TUFF BEAM™ can be cut to length on the jobsite with typical power tools, easily positioned, and screwed in place with self-drilling screws. Generally no welding is required. TUFF BEAM™ adapts simply to any project, allowing a variety of finishing products, wood nailers, and joist hangers to be easily attached for even greater flexibility.

Hole sizes vary from 4", 6", 8" and 10" depending on beam depth. Other sizes available on request. Beams can be manufactured without holes for certain applications.

- Headers (Brick & Stone Loading, etc)
- Floor & Roof Girders
- Ridge Beams
- Deck Girders (Treated, Composite, etc)
- Concrete Floor & Deck Supports
- Floor Truss / Joist Strongbacks
- May be cambered to reduce deflection and increase load capacity.



Environmental Data - The Average Recycled Steel Content of Metwood Products (% of Total Weight) is 70% or greater and are 100% recyclable.

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TUFF BEAM™

**Internally Reinforced
Structural Beam**

by Metwood

TUFF BEAM™ - The Original Internally Reinforced Structural Beam



Environmental Data - The Average Recycled Steel Content of Metwood Products (% of Total Weight) is 70% or greater and are 100% recyclable.

**METWOOD
BUILDING SOLUTIONS**

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VS. Engineered Wood

HOLE SIZE

<u>Header or Beam Depth</u>	<u>Maximum Round Hole Size</u>
9 1/4"	6"
12"	8"
14"	10"

<u>Header or Beam Depth</u>	<u>Maximum Round Hole Size</u>
9 1/4" - 9 1/2"	3"
11 1/4" - 11 7/8"	3 5/8"
14" - 16"	4 5/8"

TUFF BEAM ARRIVES WITH PRE-PUNCHED HOLES

JOBSITE PREPARATION

- | | |
|---|--|
| <ul style="list-style-type: none"> • Trim to Length (Maximum 2' Drop) • Field Apply Wood Nailers (If Not Factory Applied) • Install • Bearing Length Maximum 3" | <ul style="list-style-type: none"> • Trim to Length • Field Assemble (Multiple Rows of Nails, Bolts, and / or Screws) • Install • Bearing Length Varies from 1 1/2" up to 7 3/4" |
|---|--|

Other Advantages of TUFF BEAM

- Achieve Longer Spans with Shallower Depth Beam
- Camber is Available to Reduce Deflection
- Fewer Vertical Supports
- Ability to Handle Multiple Point Loads
- Drywall can be attached directly to TUFF BEAM
- Higher Strength to Weight Ratio
- TUFF BEAM has a 70% or higher recycle content
- Trimmed pieces are 100% Recyclable
- Cost Competitive to Engineered Wood and Structural Steel
- Inventory Reduction – TUFF BEAM is readily available to eliminate the need to stock 40' Engineered Wood Beams
- Waist Reduction – TUFF BEAM is sold in 2' increments to eliminate excess waist, drops, and profit loss.
- TUFF BEAM will not Shrink, Swell, Twist, and / or Rot

Member Data**Description: B01**
ROOF GIRDERMember Type: Girder
Top Lateral Bracing: Continuous
Bottom Lateral Bracing: Continuous
Moisture Condition: Dry
Deflection Criteria: L/360 live, L/240 total
Deck Connection: Nailed
Filename: 51087 GIRDER

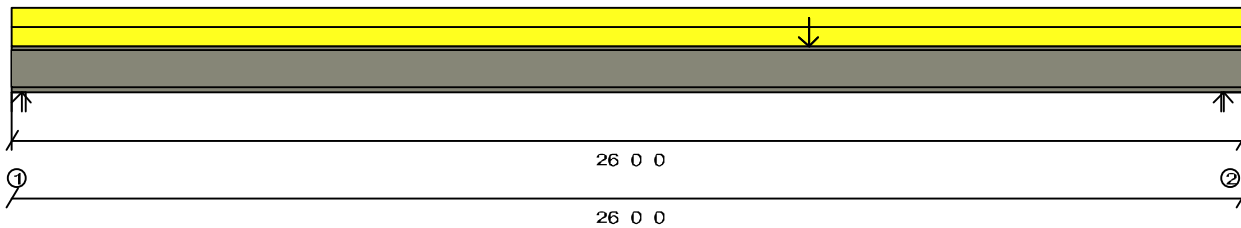
Application: Floor

Building Code: IBC/IRC

Member Weight: 30.9 PLF

Standard Load:
Live Load: 0 PLF
Dead Load: 0 PLF**Other Loads**

Type (Description)	Side	Begin	End	Trib. Width	Other Start	End	Dead Start	End	Category
Replacement Uniform (PLF)	Top	0' 0.00"	26' 0.00"		150		0		Snow
Replacement Uniform (PLF)	Top	0' 0.00"	26' 0.00"		0		75		Live
Point (LBS)	Top	16' 10.13"			2959		0		Snow
Point (LBS)	Top	16' 10.13"			290		1726		Live

**Bearings and Reactions**

	Location	Type	Material	Input Length	Min Required	Gravity Reaction	Gravity Uplift
1	0' 0.000"	Wall	Southern Pine (565psi)	3.500"	N/A	4867#	--
2	26' 0.000"	Wall	Southern Pine (565psi)	5.500"	N/A	6316#	--

Maximum Load Case Reactions

Used for applying point loads (or line loads) to carrying members

	Live	Snow	Dead
1	100#	2927#	1941#
2	190#	3842#	2475#

Design spans

25' 4.750"

Product: Metwood 14511 - 14" x 5" 1 ply**PASSES DESIGN CHECKS**

Design assumes continuous lateral bracing for both flanges.

Web stiffeners are required at all bearing and point load locations unless reviewed by a design engineer.

Consult manufacturer's installation guide (if applicable) for details.

Allowable Stress Design

	Actual	Allowable	Capacity	Location	Loading
Moment	546682.##	1261920.##	43%	16.84'	Total Load D+S
Shear	6258.#	17290.#	36%	25.39'	Total Load D+S
V/M Interaction	0.24	1.00	24%	16.84'	Total Load D+S
TL Deflection	0.5158"	1.2698"	L/590	12.92'	Total Load D+S
LL Deflection	0.3141"	0.8465"	L/970	12.92'	Total Load S

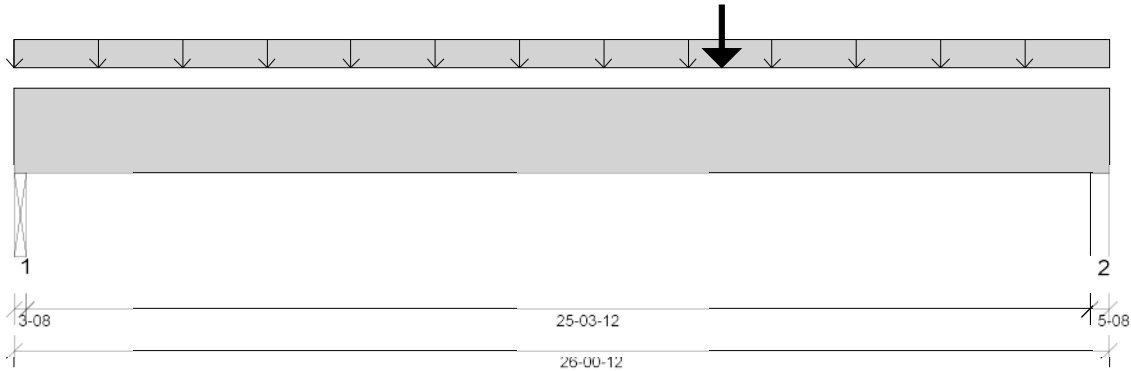
Control: Moment

Member Report

Label: BM1 | Design Tag: i6931

3 piece(s) of 1 3/4" x 24" 1.9E Microllam® LVL

Member Type: Beam | Level: 2nd Floor

Design Passed
Product is Sufficient for Application and Loads Described


Building Code: IBC 2009

Design Methodology: ASD

Member Cut Length: 26-00-12

Member Drawing Not to Scale

Design Results:	Design @ Location	Allowed	Result	LDF	Load Combination - (Load Group)
Critical Reaction	6464 lb @ 25-08-12	12272 lb (5.5")	Passed - 53%	-	1.0 D + 1.0 S - (0)
Shear	5825 lb @ 23-07-04	27531 lb	Passed - 21%	1.15	1.0 D + 1.0 S - (0)
Moment	46409 lb-ft @ 16-10-02	114283 lb-ft	Passed - 41%	1.15	1.0 D + 1.0 S - (0)
Live Load Deflection	0.29" @ 13-06-00	0.85" L/360	Passed - L/999	-	1.0 D + 1.0 S - (0)
Total Load Deflection	0.47" @ 13-05-12	1.28" L/240	Passed - L/647	-	1.0 D + 1.0 S - (0)

Design Notes:

* Bracing (Lu): All compression edges (top and bottom) must be braced at 10-06-06 o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.

Supports:

Support	Start : End	Req'd Br'g	Source	Maximum Loads to Supports			
				Dead	Floor Live	Roof Live	Snow
1	0 : 3-08	1.5"	BM2(i6932)	2021 lb	101 lb	-	2971 lb
2	25-07-04 : 26-00-12	2.9"	E5(i680)	2566 lb	189 lb	-	3898 lb

Loads:

Type	Start : End	Combine	Source	Maximum Loads on Member			
				Dead	Floor Live	Roof Live	Snow
Self Weight	0 : 26-00-12	-	Self Weight	35 lb/ft	-	-	-
Uniform	0 : 26-00-12	-	User Load	75 lb/ft	-	-	150 lb/ft
Point	16-10-02 : -	-	BM6(i6933)	1726 lb	290 lb	-	2959 lb

Errors, Warnings, & Notes:

* If sloping roof loads are applied to this member, the roof dead load has been adjusted for slope.

* The member graphic, dimensions, and locations shown on this report are based on the centerline of the member.

* Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.

* Load Duration Factors: Dead - 0.90, Floor Live - 1.00, Roof Live - 1.25, Snow - 1.15

Member Report

Label: BM1 | Design Tag: i6931

Design Passed
3 piece(s) of 1 3/4" x 24" 1.9E Microllam® LVL

Member Type: Beam | Level: 2nd Floor

Product is Sufficient for Application and Loads Described

Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Refer to current literature for installation details. (woodbywy.com) Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. The product application, input design loads, dimensions and support information have been provided by _____ of _____.

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SUSTAINABLE FORESTRY INITIATIVE

MULTIPLE-MEMBER CONNECTIONS

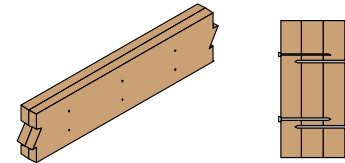
Fastener Installation Requirements

Piece Width	# of Plies	Fastener				
		Type ⁽¹⁾	Min. Length	# Rows	O.C. Spacing	Location
1 1/2" or 1 3/4"	2	10d nails	3"	3 ⁽²⁾	12"	One side
		12d-16d nails	3 3/4"	2 ⁽²⁾		
		Screws	3" for 1 1/2" members 3 3/4" for 1 3/4" members	2	24"	
	3	10d nails	3"	3 ⁽²⁾	12"	Both sides
		12d-16d nails	3 3/4"	2 ⁽²⁾		
		Screws	3 3/8" or 3 1/2"	2	24"	Both sides

(1) 10d nails are 0.128" diameter. 12d-16d nails are 0.148"-0.162" diameter; screws are SDS, SDW, USP WS, or TrussLOK EWP™.

(2) An additional row of nails is required with depths of 14" or greater.

- When fasteners are required on both sides, stagger fasteners on the second side so they fall halfway between fasteners on the first side.

L6


Multiple pieces can be nailed or bolted together to form a header or beam of the required size, up to a maximum width of 5 1/4". Load must be applied evenly across entire beam width.

For applications that require wider members and/or uneven/side loaded beams, refer to the Trus Joist® Beam, Header and Column Specifier's Guides TJ-9000 or TJ-9020, or contact your Weyerhaeuser representative.

3 piece(s) of 1 3/4" x 24" 1.9E Microllam® LVL

MSRP - \$1738.00* + Labor to Assemble Plies on Site.
Assembly requires Approx. 162 Nails
*** Price is for only 26'**

Comparable Metwood TUFF BEAM

1451126 - 14" x 5" x 26'
MSRP - \$1684.00 -
Product Ready to Install



Tuff Beam Load Charts



Allowable Uniform Load* (In Pounds Per Lineal Foot)

Span (Ft)	Condition	7 1/4" x 3 1/4"			9 1/4" x 3 1/4"			12" x 3 1/4"			14" x 3 1/4"		
		734	737	739	934	937	939	1234	1237	1239	1434	1437	1439
8'	Live Load L/480	1263	2216	3011	2204	3599							
	Live Load L/360	1660	2941	3337	2205	3599							
	Total Load	1660	2941	3337	2205	3599							
10'	Live Load L/480	647	1135	1542	1129	1992	2739	1890	3177				
	Live Load L/360	862	1513	2056	1411	2547	2880	1890	3177				
	Total Load	1062	1882	2567	1411	2547	2880	1890	3177				
11'	Live Load L/480	486	852	1158	848	1496	2058	1528	2696	2888	1848	3144	
	Live Load L/360	648	1137	1544	1131	1195	2618	1562	2861	2888	1848	3144	
	Total Load	878	1556	2121	1166	2105	2618	1562	2861	2888	1848	3144	
12'	Live Load L/480	374	657	892	653	1153	1585	1177	2077	2648	1553	2864	2882
	Live Load L/360	499	876	1190	871	1537	2113	1312	2404	2648	1553	2864	2882
	Total Load	738	1307	1783	980	1769	2400	1312	2404	2648	1553	2864	2882
13'	Live Load L/480	294	516	702	514	907	1247	925	1633	2263	1309	2306	2661
	Live Load L/360	392	689	936	685	1209	1662	1118	2048	2444	1323	2441	2661
	Total Load	589	1033	1403	835	1507	2090	1118	2048	2444	1323	2441	2661
14'	Live Load L/480	236	414	562	411	726	998	741	1308	1812	1048	1846	2471
	Live Load L/360	314	551	749	548	968	1331	964	1744	2269	1141	2104	2471
	Total Load	471	827	1124	720	1299	1802	964	1766	2269	1141	2104	2471
15'	Live Load L/480	192	336	457	334	590	811	602	1063	1473	852	1501	2085
	Live Load L/360	255	448	609	446	787	1082	803	1418	1965	994	1833	2306
	Total Load	383	672	914	627	1132	1570	840	1538	2118	994	1833	2306
16'	Live Load L/480	158	277	376	276	486	669	496	876	1214	702	1237	1718
	Live Load L/360	211	369	502	367	648	891	662	1168	1619	874	1611	2162
	Total Load	316	554	753	551	972	1337	738	1352	1901	874	1611	2162
17'	Live Load L/480			231	314	230	405	557	414	730	1012	585	1031
	Live Load L/360			308	418	306	541	743	552	974	1350	774	1375
	Total Load			462	628	459	881	1115	654	1198	1684	774	1427
18'	Live Load L/480			195	264	194	341	470	349	615	853	493	869
	Live Load L/360			259	352	258	455	626	465	820	1137	658	1158
	Total Load			389	529	387	683	939	583	1068	1502	690	1273
19'	Live Load L/480			165	225	165	290	399	296	523	725	419	739
	Live Load L/360			221	300	219	387	532	395	698	967	559	985
	Total Load			331	450	329	581	799	523	959	1348	620	1143
20'	Live Load L/480			193			249	342	254	449	622	359	633
	Live Load L/360			257			332	456	339	598	829	479	844
	Total Load			385			498	685	472	865	1217	559	1031
21'	Live Load L/480			166			215	296	220	388	537	311	547
	Live Load L/360			222			287	394	293	517	716	414	729
	Total Load			333			430	591	429	775	1074	507	935
22'	Live Load L/480					187	257	191	337	467	270	476	661
	Live Load L/360					249	343	255	449	623	360	634	881
	Total Load					374	514	382	674	934	462	852	1206
24'	Live Load L/480							198			260	360	509
	Live Load L/360							264			346	480	679
	Total Load							396			519	719	1013
26'	Live Load L/480							156			204	283	400
	Live Load L/360							208			272	377	534
	Total Load							312			408	566	801

*Can be applied to the beam in addition to its own weight.

KEY TO TABLES

Live Load L.480 = Maximum Live Load - Limits Deflection to L/480

Live Load L.360 = Maximum Live Load - Limits Deflection to L/360

Total Load = Maximum Total Load - Limits Deflection to L/240

Allowable Uniform Load* (In Pounds Per Lineal Foot)

Span (Ft)	Condition	7 1/4" x 5"			9 1/4" x 5"				11 7/8" x 5"				14' X 5"			
		754	757	759	954	957	959	9511	1254	1257	1259	12511	1454	1457	1459	14511
10'	Live Load L/480	733	1261	1688	1352	2215	2880		2103	3177			2484	3459		
	Live Load L/360	1031	1681	2224	1681	2814	2880		2103	3177			2484	3459		
	Total Load	1222	2042	2670	1681	2814	2880		2103	3177			2484	3459		
12'	Live Load L/480	447	730	965	783	1282	1714	2276	1385	2285	2648		1725	2882		
	Live Load L/360	597	973	1287	1043	1709	2285	2400	1461	2553	2648		1725	2882		
	Total Load	849	1418	1893	1167	1954	2400	2400	1461	2553	2648		1725	2882		
14'	Live Load L/480	282	460	608	493	807	1079	1433	872	1439	1943	2269	1229	2026	2471	
	Live Load L/360	376	613	811	657	1076	1439	1911	1073	1876	2269	2269	1267	2232	2471	
	Total Load	563	919	1216	857	1436	1937	2057	1073	1876	2269	2269	1267	2232	2471	
16'	Live Load L/480	189	308	407	330	541	723	960	584	964	1302	1753	823	1357	1838	2162
	Live Load L/360	252	411	543	440	721	964	1280	779	1285	1736	1986	970	1709	2162	2162
	Total Load	377	616	815	656	1081	1446	1800	822	1436	1986	1986	970	1709	2162	2162
17'	Live Load L/480	157	257	340	275	451	603	800	487	804	1085	1462	686	1131	1533	2035
	Live Load L/360	210	342	453	367	601	804	1067	649	1071	1447	1869	860	1509	2035	2035
	Total Load	315	513	679	550	901	1206	1601	728	1272	1759	1869	860	1514	2035	2035
18'	Live Load L/480		216	286	232	380	508	674	410	677	914	1231	578	953	1291	1748
	Live Load L/360		288	381	309	505	667	899	547	903	1219	1642	767	1271	1722	1922
	Total Load		432	572	464	759	1016	1349	649	1135	1569	1765	767	1350	1879	1922
19'	Live Load L/480		184	243	197	323	432	573	349	576	777	1047	492	810	1098	1487
	Live Load L/360		245	324	263	430	576	765	465	767	1036	1396	655	1081	1464	1820
	Total Load		368	486	394	646	863	1147	583	1018	1408	1672	688	1212	1687	1820
20'	Live Load L/480		158	209	169	277	370	492	299	493	666	898	421	695	941	1275
	Live Load L/360		210	278	225	369	494	655	399	658	889	1197	562	926	1255	1699
	Total Load		315	417	338	554	740	983	526	919	1271	1589	621	1094	1522	1729
21'	Live Load L/480			180		239	320	425	258	426	576	775	364	600	813	1101
	Live Load L/360			240		319	426	566	345	568	768	1034	485	800	1084	1468
	Total Load			360		478	640	849	477	834	1151	1513	563	992	1381	1647
22'	Live Load L/480			157		208	278	369	225	371	501	674	317	522	707	958
	Live Load L/360			209		277	371	492	300	494	668	899	422	696	943	1277
	Total Load			313		416	556	739	435	741	1001	1349	513	904	1258	1572
23'	Live Load L/480					182	243	323	197	324	438	590	277	457	619	838
	Live Load L/360					243	325	431	262	433	584	787	369	609	825	1117
	Total Load					364	487	646	393	649	876	1180	470	827	1151	1504
24'	Live Load L/480					160	214	284	173	286	386	519	244	402	545	738
	Live Load L/360					214	286	379	231	381	514	693	325	536	726	983
	Total Load					320	428	569	346	571	771	1039	431	759	1057	1441
25'	Live Load L/480						190	252	153	253	341	460	216	356	482	653
	Live Load L/360						253	336	204	337	455	613	288	474	643	870
	Total Load						379	503	306	505	682	919	397	700	964	1305
26'	Live Load L/480						168	224		225	303	409	192	316	428	580
	Live Load L/360						225	298		299	404	545	256	422	571	774
	Total Load						337	448		449	607	817	367	633	857	1160
28'	Live Load L/480							179		180	243	327	154	253	343	464
	Live Load L/360							239		240	324	436	205	338	457	619
	Total Load							358		360	486	654	307	506	686	929
30'	Live Load L/480										197	266		206	279	378
	Live Load L/360										263	355		275	372	504
	Total Load										395	532		412	558	755

*Can be applied to the beam in addition to its own weight.

Using Allowable Uniform Load Tables

1. Tables are based on uniform loads, the more restrictive or simple or continuous spans, and dry-use conditions. For other loads or span configurations, contact a Metwood representative.
2. The Beam Depth is designated by the first group of numbers in the beam nomenclature:
7 → 7 ¼", 9 → 9 ¼", 12 → 11 7/8", 14 → 14".
3. The Beam Width is designated by the second group of numbers in the beam nomenclature:
3 → 3 ¼", 5 → 5", 7 → 7 ½", 10 → 10".
4. To size a beam it is necessary to check both live and total load. Selected beam must work in both rows.
5. For 7 ½" Width Beam Capacity, multiply the 5" Width Beam Capacity by 1.5. For 10" Width Beam Capacity, multiply the 5" Width Beam Capacity by 2.
6. To size a member for a span not shown, use capacities for the next larger span shown (example: for 7' span, use values shown for 8' span).
7. Verify deflection limit with local building code requirements.
8. Bearing across full width of beam is assumed. Minimum beam bearing length is 2". Adequate bearing condition and material are the responsibility of the contractor or end user of the beam.
9. Provide lateral support at bearing points, and continuous lateral support along the top edge of beam.

Example:

Select a Metwood beam to carry 400 PLF live load + 400 PLF dead load floor loading, spanning 20', with a Live Load Deflection of L/360.

Adding 400 PLF Live Load and 400 PLF Dead Load gives a total load of 800 PLF. Determine if width or depth is a factor. For this example, we can utilize a 5" width beam. Find 20' in the left most columns. To the right are three rows showing Live Load L/480, Live Load Load L/360, and Total Load. In the row marked Total Load, move to the right to locate a total load of at least 800 PLF. The 1257 beam can carry 919 PLF Total Load. Next, check Live Load capacity. The 1257 beam can carry 658 PLF Live Load. Therefore, 1257 is adequate to carry the required loading and meets the deflection criteria.



Metwood, Inc.

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TUFF JOIST+™

Floor Joist System



Metwood TUFF JOIST+™ combines the strength and consistency of standard C-Stub joists, the flexibility of pre-punched reinforced access holes, and Metwood's patented internal reinforcing technology.

Access holes greatly improve installation and architectural flexibility. Plumbing, HVAC, electrical, and other technology services can be installed within the floor system improving ease of installation while maintaining structural integrity.

Hole sizes vary from 6", 8" and 10" depending on Joist depth. Other sizes available on request. Joists can be manufactured without holes for certain applications.

- Design Flexibility
- Non-combustible
- Commercial and Residential
- Utilized for Shoring Alternative
- Green Building Products
- Hangers and Ledger System
- Support Plywood, Concrete, or Other
- May be cambered to reduce deflection and increase load capacity.



Environmental Data - The Average Recycled Steel Content of Metwood Products (% of Total Weight) is 70% or greater and are 100% recyclable.

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Floor Joist System

by Metwood

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TUFF JOIST+™
Floor Joist System

by Metwood

TUFF JOIST+™
Floor Joist System



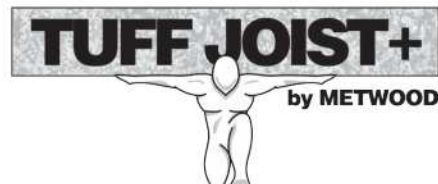
- 12" x 2.5" TUFF JOIST+™
- 34' Span
- 19.2" O.C. 3/4"
- T&G Plywood
- 1" Camber
- Total Load Deflection
Greater than L/900



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TUFF FLOOR™ - The Complete Floor System



TUFF BEAM™, TUFF JOIST™, and TUFF JOIST+™ make up the TUFF Floor™ Systems, offering the design flexibility to achieve conventional or radical floor designs. Pre-punched reinforced access holes allow plumbing, HVAC, electrical, and other technology services to be installed within the floor system to improve ease of installation while maintaining structural integrity.

Joists can free span or utilize TUFF BEAM™ to eliminate vertical supports. Use TUFF FLOOR™ Ledger and Hanger System on ICF projects to reduce project cycle time.

- Design Flexibility
- Non-combustible
- Commercial and Residential
- Green Building Products
- Hangers and Ledger System
- Support Plywood, Concrete, or Other



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TUFF FLOOR™

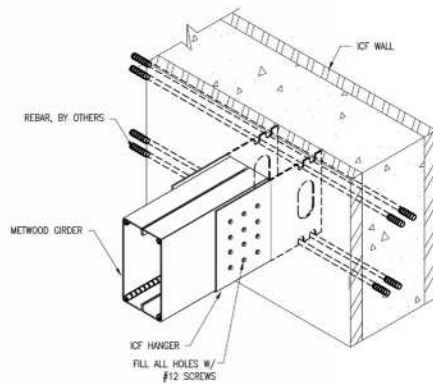
The Complete Floor System

by Metwood

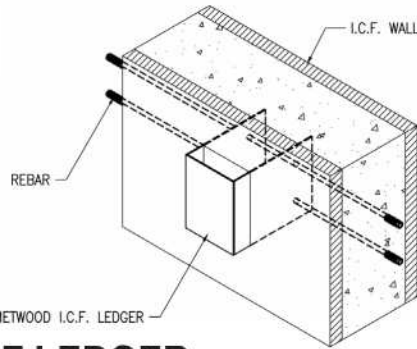
TUFF FLOOR™ - The Complete Floor System

Flooring Deck Options

- Metal
- Particle Board
- Plywood
- CBPB (Concrete Bonded Particle Board)
- EPS Panels
- SIPS (Structurally Insulated Panels) and more



ICF HANGER



ICF LEDGER

Applications

Complete Garages Solutions
Messanines
Living Space
Roof Systems

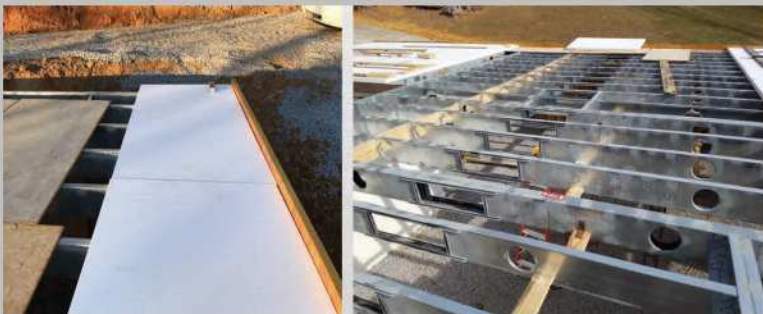
Simple Four Step Installation Process

1. Prepare Beam Pockets and Supports based on design
2. Install TUFF BEAM™, TUFF JOIST™, TUFF JOIST+™
3. Install Decking, Rebar, and In-floor Heating tube (as necessary)
4. Install Concrete Forms, Pour Concrete



TNT™
FLOOR SYSTEMS

Insulated Framing System for
Concrete Floors, Roofs, and Decks



Building Solution – “MAN CAVE / HER SPACE”

Utilize **METWOOD TUFF FLOOR** to Add Cost Effective Usable Square Footage Below the Main Level Garage

TYPICAL HOUSE WITH 8' BACKFILLED FOUNDATION

THE BELOW ITEMS CAN BE ELIMINATED, REPLACED OR ARE EXPENSES THAT CAN BE OFFSET

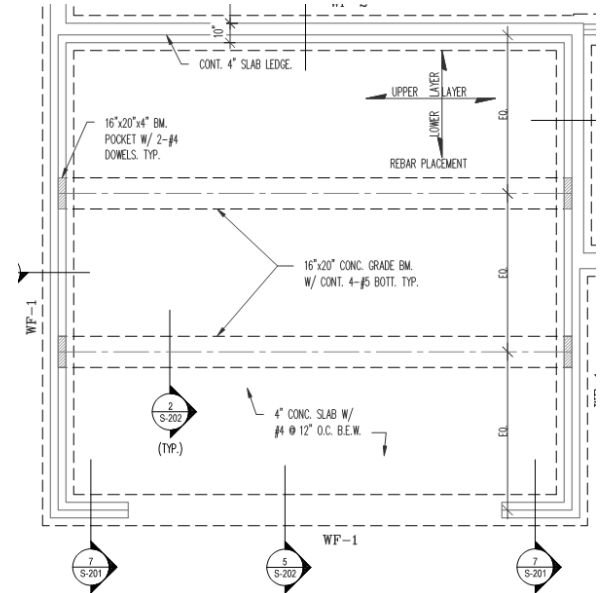
Prices may vary based on location, market conditions, and site conditions

DESCRIPTION	QTY	RATE	TOTAL
INT. AND REAR CONCRETE FOUNDATION	48 LINEAL FT.	\$125 / LF	\$6,000
BACKFILL MATERIAL - #57 GRAVELS	15 LOADS	\$400 / LOAD	\$6,000
MACHINE + LABOR TO BACKFILL			\$1,000
GRADING LABOR + REBAR INSTALLATION			\$500
GRADE BEAMS (16" X 20" W/ 4 - #5)	2	\$500	\$1,000
LABOR TO FORM & POUR MAIN FLOOR CONCRETE FOR SLAB	9 YARDS	\$160 / YRD	\$1,440

2 CAR GARAGE ON BACKFILL **TOTAL: \$16,590**

Construction Loan Borrowing Value (80%): \$16,128

**Construction Loan Appraised Value (\$35 / sq. ft) = \$20,160



HOUSE WITH METWOOD TUFF FLOOR SYSTEM

THE BELOW ITEMS ARE UTILIZED TO CREATE AN ADDITIONAL GARAGE BELOW THE MAIN LEVEL

Prices may vary based on location, market conditions, and site conditions

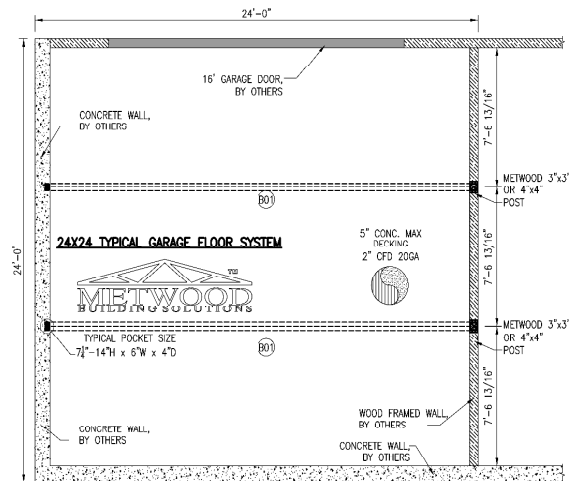
DESCRIPTION	QTY	RATE	TOTAL
INTERIOR AND REAR WALLS 2X6 WALLS	48 LINEAL FT.	\$25 / LF	\$1,200
MTWD TUFF FLOOR SYSTEM			\$7,000
MTWD TUFF BEAM GARAGE HEADER			\$500
LABOR / INSTALLATION OF TUFF FLOOR			\$2,200
CONCRETE FLOOR ON BASEMENT LEVEL	9 YARDS	\$160 / YRD	\$1,440
LABOR - FORM/POUR BASEMENT FLOOR			\$600
GRAVEL UNDER BASEMENT FLOOR	2 LOADS	\$400 / LOAD	\$800
DRYWALL FOR 48 LINEAL FT. OF WALLS	8 SHEETS	\$40 / SHEET	\$320
EXTRA INTERIOR DOOR			\$150
16 FT. GARAGE DOOR (INSTALLED)			\$1,500
CONCRETE FOR MAIN FLOOR SLAB	7 YARDS	\$160 / YRD	\$1,120
LABOR TO FORM & POUR MAIN FLOOR			\$650

2 CAR GARAGES WITH 2 CAR GARAGE BELOW **TOTAL: \$17,480**

Construction Loan Borrowing Value (80%): \$32,256

**Construction Loan Appraised Value (\$35 / sq. ft) = \$40,320

\$SMART MONEY!



Building Solution – “MAN CAVE / HER SPACE”

Utilize **METWOOD TUFF FLOOR** to Add Cost Effective Usable Square Footage Below the Main Level Garage

TYPICAL HOUSE WITH 8' BACKFILLED FOUNDATION

THE BELOW ITEMS CAN BE ELIMINATED, REPLACED OR ARE EXPENSES THAT CAN BE OFFSET

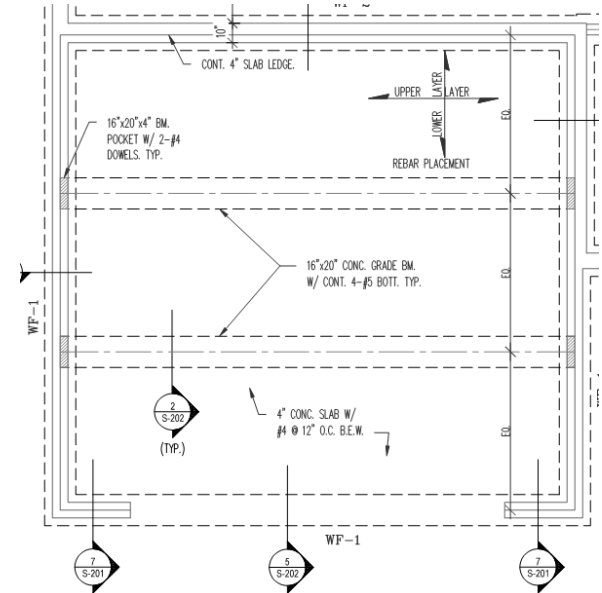
Prices may vary based on location, market conditions, and site conditions

DESCRIPTION	QTY	RATE	TOTAL
INT. AND REAR CONCRETE FOUNDATION	48 LINEAL FT.	\$125 / LF	\$6,000
BACKFILL MATERIAL - #57 GRAVELS	15 LOADS	\$400 / LOAD	\$6,000
MACHINE + LABOR TO BACKFILL			\$1,000
GRADING LABOR + REBAR INSTALLATION			\$500
GRADE BEAMS (16" X 20" W/ 4 - #5)	2	\$500	\$1,000
LABOR TO FORM & POUR MAIN FLOOR			\$650
CONCRETE FOR SLAB	9 YARDS	\$160 / YRD	\$1,440

2 CAR GARAGE ON BACKFILL TOTAL: **\$16,590**

Construction Loan Borrowing Value (80%): **\$16,128**

**Construction Loan Appraised Value (\$35 / sq. ft) = \$20,160



HOUSE WITH METWOOD TUFF FLOOR SYSTEM

THE BELOW ITEMS ARE UTILIZED TO CREATE AN ADDITIONAL GARAGE BELOW THE MAIN LEVEL

Prices may vary based on location, market conditions, and site conditions

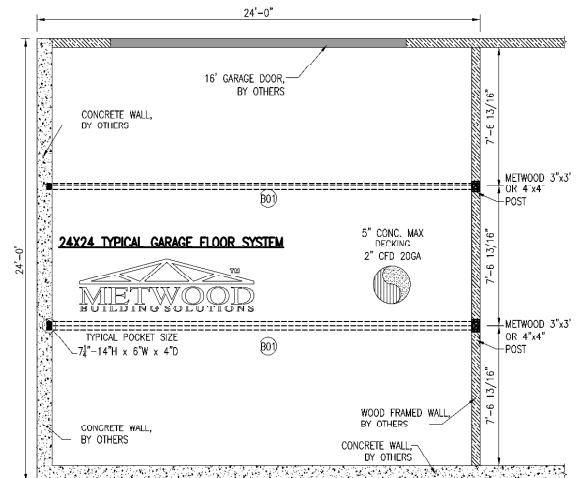
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CONCRETE FOR MAIN FLOOR SLAB	7 YARDS	\$160 / YRD	\$1,120
LABOR TO FORM & POUR MAIN FLOOR			\$650

2 CAR GARAGES WITH 2 CAR GARAGE BELOW TOTAL: **\$15,160**

Construction Loan Borrowing Value (80%): **\$32,256**

**Construction Loan Appraised Value (\$35 / sq. ft) = \$40,320

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TUFF DECK™

The Complete Deck System



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**The Complete Deck
System**

by Metwood

Nothing compares to the solid feel and security of concrete. TUFFDECK™ accommodates any handrail, or ceiling finish, and is radiant ready. Metwood's ultimate deck system is pre-engineered and available with either TUFFJOIST™, TUFFJOIST+™, or TUFFBEAM™, providing a strong, lightweight support system that installs quickly, used in conjunction with metal decking for concrete support. TUFFJOIST™, TUFFJOIST+™, and TUFFBEAM™ can be trimmed on site and installed with screws, so no welding is required.

TUFFDECK™ creates new possibilities for concrete decks and can accommodate any hand railing or aesthetic floor treatment, including wood, ceramic tile, decorative concrete or wood flooring materials. The choice is yours and the possibilities are endless.

- Design Flexibility
- Non-combustible
- Commercial and Residential
- Green Building Products
- Hangers and Ledger System



Unlimited Finish Options
Tile, Brick, Stamped, Stained

Unlimited Handrail Options
Wrought Iron, Steel, Wood, Vinyl



Environmental Data - The Average Recycled Steel Content of Metwood Products (% of Total Weight) is 70% or greater and are 100% recyclable.

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System**

by Metwood

TUFF DECK™

The Complete Deck System

Deck floor and
lower patio roof
in one pour



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Specialized Application Solutions



Eliminate Headers above Window and Door Openings

Increases the Energy Envelope's efficiency by replacing the CFS Header with Insulation, which has four times the resistance to heat flow (LEED awards credits for framing efficiencies such as this).

Resolves framing challenges caused by specified headers such as:

- Different Depths Specified for Various Openings
- Special Order, Multi- Ply, Heavier Gauges Typically Needed to Carry Loads

Eliminates the Requirement for In-Line Framing

Typical steel framing requires studs, joists, and trusses to be in-line for the height of the building resulting in added additional time and materials.

Speeds Framing of Walls

- All cripples are the same length
- Eliminates the need for multiple jack studs
- Eliminates the material and the need to build and install the specified headers
- Eliminates two pieces of track the width of each opening

Speeds Framing of the Floors

- Use a clip or hanger for attachment versus track and stiffeners
- Easier Fastening
- Rim Beams can be Fabricated up to 30' in length requiring few splices.
- Eliminates the need for rim track
- Joists are not required to sit over studs



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Specialized Application
Solutions

by Metwood

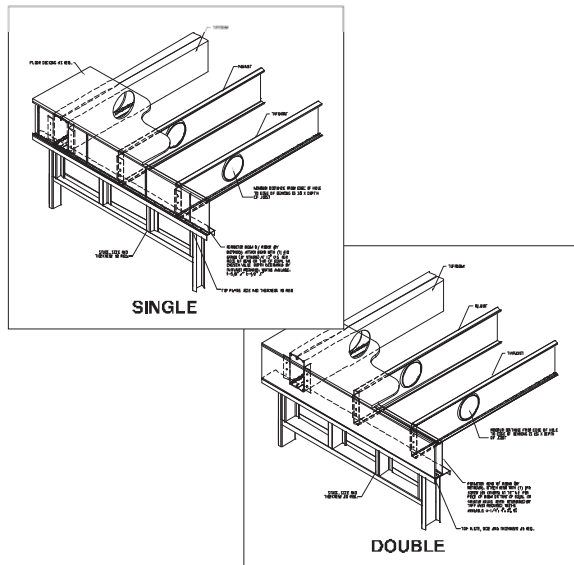
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Specialized Application Solutions

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Specialized Application Solutions



Remodel Beam



Concrete Columns and Bond Beam



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Trimvable Cold Formed Steel Square Columns



Metwood SQUARE COLUMNS™ are a perfect match for TUFF BEAM™, but the fact is they'll support just about anything. SQUARE COLUMNS™ have many advantages over round columns.

Metwood SQUARE COLUMNS™ are used in both TUFF FLOOR™ and TUFF DECK™ products. SQUARE COLUMNS™ feature a higher strength to weight ratio, and offer a more convenient means of attaching finish materials at a price comparable to round columns. They can be cut to length on the job site and easily assembled using self drilling screws.

- Design Flexibility
- Can be cut on the job site
- No welding required
- Non-combustible
- Commercial and Residential
- Utilized for Shoring Alternative
- Green Building Product

Available Loads (lbs.)

3" - 13 Ga.	9' - 16,906 lbs.
3" - 13 Ga.	10' - 14,702 lbs.
4" - 11 Ga.	10' - 34,261 lbs.
4" - 11 Ga.	12' - 28,578 lbs.



Environmental Data - The Average Recycled Steel Content of Metwood Products (% of Total Weight) is 70% or greater and are 100% recyclable.

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SQUARE COLUMNS™

Field Trimvable

by METWOOD

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Square Columns™
The Complete Deck
System
by Metwood

Trimable Cold Formed Steel Square Columns

Simple Four Step Installation Process



Fabrication of Structural Columns, Plates, and Other Steel Products Available



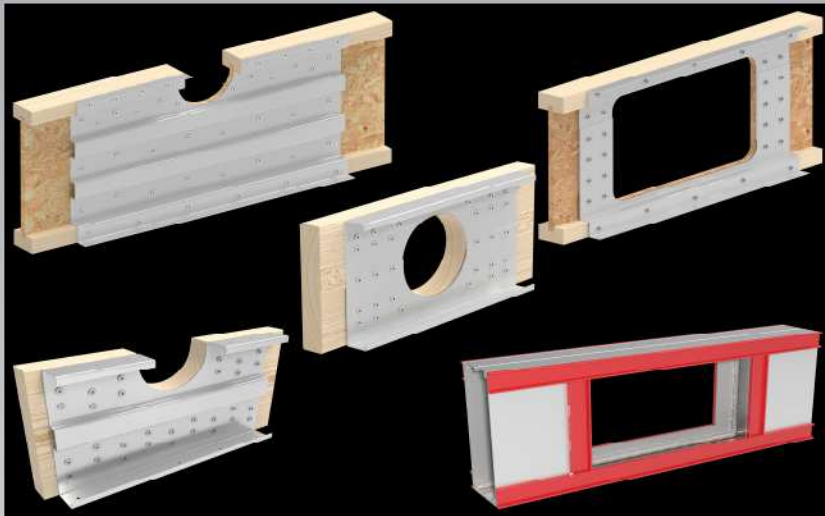
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Reinforcer Technologies



Run Utilities Right Through Conventional Floor Joists

Metwood Joist Reinforcers are engineered light gauge steel attachments for engineered I-Joists or conventional framing. By allowing larger openings in Floor Joists, the Joist Reinforcer simplifies the routing and installation of utilities.

Strength

Metwood Joist Reinforcers restore the strength of Floor Joists weakened by the placement of large holes or cut-outs.

Simplifies Construction

Allows utilities to be placed through the floor system rather than routing them below and decreasing ceiling height. Eliminates the need for bulkheads, chases and special engineering.

Easy Installation

Metwood Joist Reinforcers are simply glued and screwed to the side of the Floor Joist (screws included).



Environmental Data - The Average Recycled Steel Content of Metwood Products (% of Total Weight) is 70% or greater and are 100% recyclable.

METWOOD BUILDING SOLUTIONS

Reinforcer™
Technologies

by Metwood

**BEST OF IBS™
AWARDS 2020**

**WINNER
MOST INNOVATIVE
BUILDING MATERIAL**

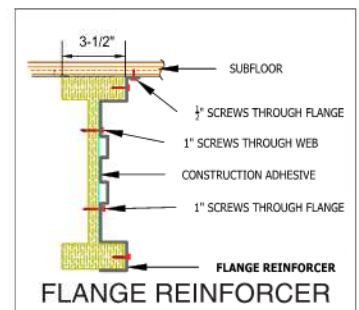
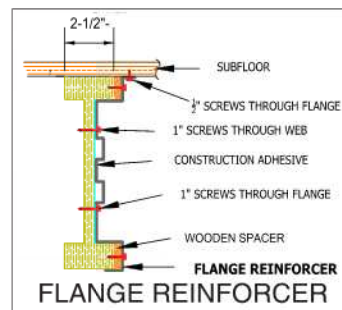
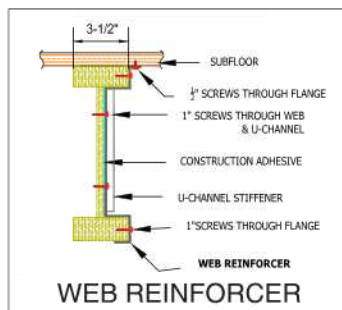
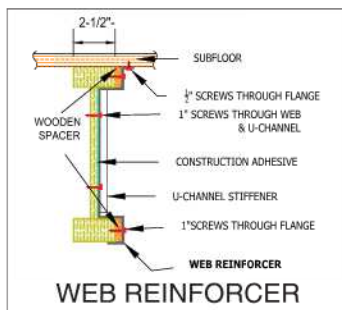


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I-Joist Flange Reinforcer		I-Joist Web Reinforcer		Hole Reinforcer		Notch Reinforcer		Beam Reinforcer	
Joist Depth	Notch Size	Joist Depth	Hole Size	Size	Hole Size	Size	Notch Size	Size	Opening Size
9-1/2"	3-1/4"H x 5"W	9-1/2"	5-1/2"H x 12"W	2" x 8"	4"	2" x 10"	3-1/2"H x 5"W	Opening sizes and locations are determined by load and span on a per project basis	
11-7/8"	4"H x 5"W	11-7/8"	7-7/8"H x 12"W	2" x 10"	6"				
14"	4"H x 5"W	14"	10"H x 16"W	2" x 12"	6"				
16"	4"H x 5"W	16"	12"H x 16"W						



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2810HR Joist Reinforcer

**CODE
COMPLIANCE**



Intertek
CCRR-0279

Issue Date: 10-11-2018
Revision Date: 10-06-2022
Renewal Date: 10-31-2023

DIVISION: 06 00 00 – WOOD, PLASTICS, AND COMPOSITES
Section: 06 05 23 – Wood, Plastic, and Composite Fastenings

REPORT HOLDER:
METWOOD, INC.
819 Naff Road
Boones Mill, VA 24065
540-334-4294
www.metwood.com

REPORT SUBJECT:
2810HR Joist Reinforcer

1.0 SCOPE OF EVALUATION

1.1 This Research Report addresses compliance with the following Codes:

- 2018, 2015 *International Building Code*® (IBC)
- 2018, 2015 *International Residential Code*® (IRC)

NOTE: This report references 2018 Code sections with [2015] Code sections shown in brackets where they differ.

1.2 Metwood Joist Reinforcers have been evaluated for the following properties:

- Structural Properties
- Corrosion Protection

1.3 Metwood Joist Reinforcers have been evaluated for the construction in accordance with the IRC and Type VB of the IBC.

2.0 STATEMENT OF COMPLIANCE

Metwood Joist Reinforcers comply with the Codes listed in Section 1.1, for the properties stated in Section 1.2 and uses stated in Section 1.3, when installed as described in this report, including the Conditions of Use stated in Section 6.

3.0 DESCRIPTION

3.1 2810HR Conventional Wood Joist Reinforcers consist of 2 cold-formed steel components fabricated from 14 gauge, galvanized (G90) sheet steel with yield strength of 50 ksi.

3.2 Subject to the conditions specified within this report, use of the Metwood Joist Reinforcer allows a maximum 6 inch diameter hole to be placed in any location along the length of a nominal 2x10 wood joist except within 12 inches of a support.

4.0 PERFORMANCE CHARACTERISTICS

4.1 Conventional 2x10 solid sawn lumber installed with a 6 inch diameter hole reinforced with a 2810HR joist reinforcer has equivalent design strength and stiffness to the same framing member with a code permitted hole size of 3 inches, unreinforced. See Section 5.0 for Installation and Section 6.0 for Conditions of Use.

5.0 INSTALLATION

Metwood Joist Reinforcers must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this Research Report. A copy of the manufacturer's instructions must be available on the jobsite during installation.

5.1 Metwood 2810HR Joist Reinforcer is installed with 30 SFS Intec #12-8 XG (0.133" shank dia.), 1-1/2" long, pancake head, carbon steel wood screws in the designated pre-drilled holes. See Figure 2 for fastening pattern.

5.2 Metwood Joist Reinforcers may be installed at any location along the span of the wood joist, with the holes located no less than 12" of the closest support or edge.



6.2 Holes in the joists, where the Metwood 2810HR Joist Reinforcer is installed, shall be limited to a maximum size of 6" in diameter located at the center of the joist height. Holes shall not be located within 12 inches from supports to the center of the hole.

6.3 The Metwood Joist Reinforcers shall be limited to use with nominal 2x10 solid sawn Southern Pine (G=0.50), Spruce-Pine-Fir (G=0.42) or, other graded wood species with a specific gravity (G) no less than 0.42.

6.4 A maximum of one Metwood Joist Reinforcer shall be used in a single joist.

6.5 Installation of the Metwood Joist Reinforcer is limited to dry conditions, where the moisture content of the lumber is 19% or less.

6.6 Use with preservative treated lumber is outside the scope of this report.

6.7 The Metwood Joist Reinforcers are manufactured under a quality control program with inspections by Intertek Testing Services NA, Inc.

7.0 SUPPORTING EVIDENCE

7.1 Reports of tests in accordance with ASTM D198-15, Standard Test Methods of Static Tests of Lumber in Structural Sizes.

7.2 Engineering Analysis of the fastening in accordance with the National Design Specification for Wood Construction and Supplement, American Forest & Paper Association (ANSI/AF&PA NDS-2015), signed and sealed by a professional engineer.

7.3 Documentation of an Intertek approved quality control system for the manufacturing of products recognized in this report.

8.0 IDENTIFICATION

The Metwood Joist Reinforcers produced in accordance with this report shall be identified by the following information:

8.1 An imprint on the bracket identifying the name and/or trademark of manufacturer on the product, and text "Intertek CCRR-0279".

8.2 Packaging with a label with the Intertek Compliance Research Report mark and number (CCRR-0279).



9.0 OTHER CODES

This section is not applicable.

10.0 CODE COMPLIANCE RESEARCH REPORT USE

10.1 Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

10.2 Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

10.3 Reference to the <https://bpdirectory.intertek.com> is recommended to ascertain the current version and status of this report.

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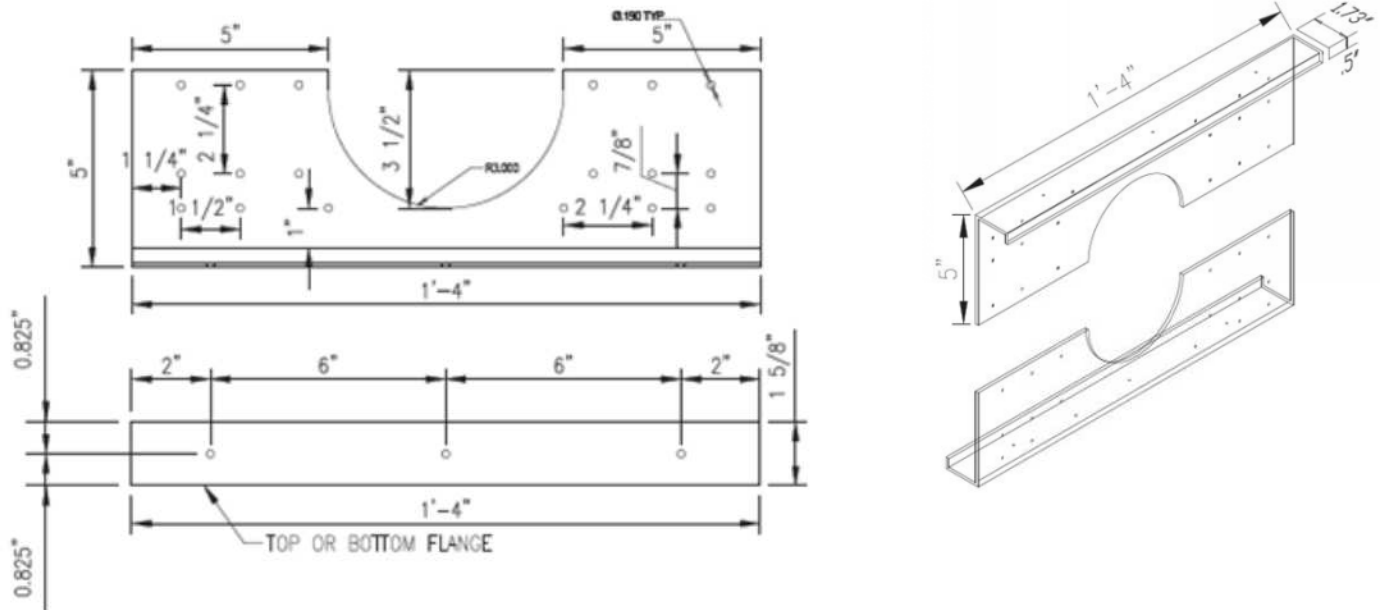


FIGURE 1 – 2810HR JOIST REINFORCER

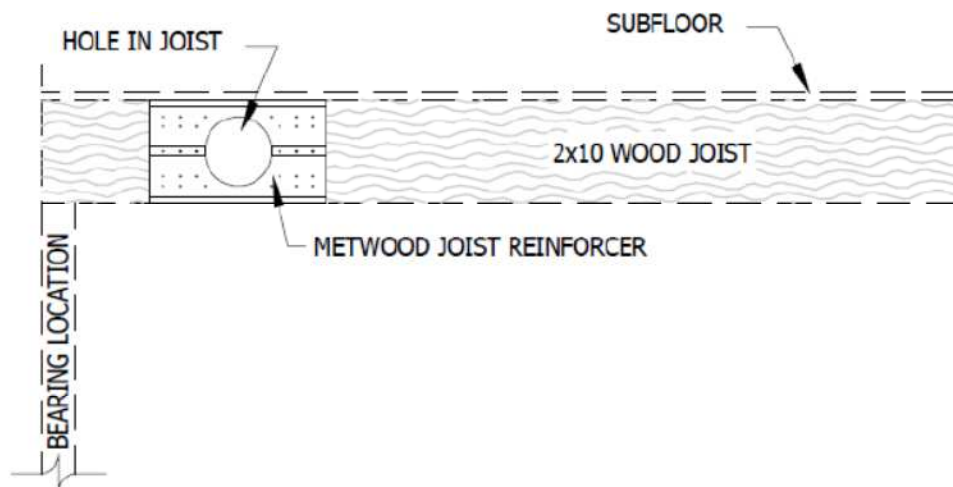


FIGURE 2 – INSTALLATION DIAGRAM OF 2810HR JOIST REINFORCER

Installation Instructions for 2810HR Joist Reinforcer

CODE
COMPLIANCE



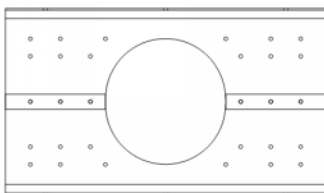
Intertek
CCRR-0279

Use the 2810HR Joist Reinforcer to allow placement of up to 6" holes in 2x10 wood joists and 4" holes in 2x8's. The 2810HR Joist Reinforcer has 2 identical pieces which are simultaneously attached to a joist to accommodate a hole in the joist which may have pipes, conduit, wires, etc., already in place.

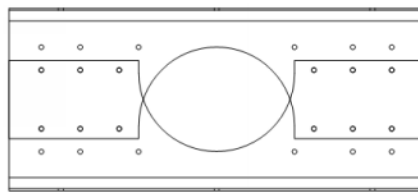
****CCRR-0279 covers use on 2x10 solid sawn described in Section 6.3. All other species and sizes will require an engineered letter.**

Installation Instructions

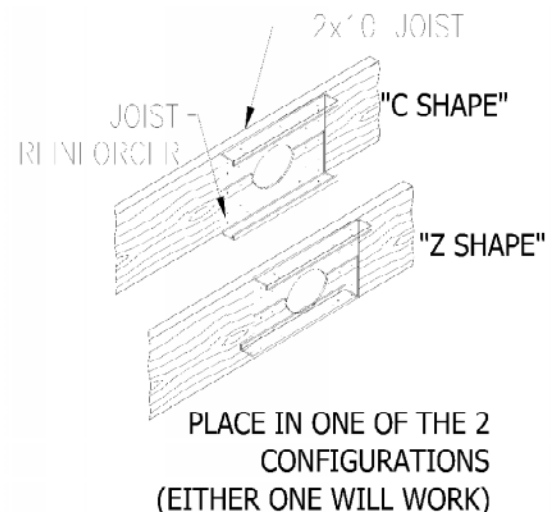
1. Locate position of desired hole in joist, place the 2810HR halves in the orientation shown in the sketch below on the joist, and, using the hole in the 2810HR as a template, mark the opening onto the joist. Keep the bottom half flush with the bottom of the joist and the upper half positioned with the alignment holes (see sketch) aligned. There are 4 alignment holes used on a 2x10 and 8 on a 2x8. Take away the 2810HR halves and cut the hole in the joist as marked.
2. Place the lower piece onto the bottom of the joist and attach it to the joist below the alignment holes with screws supplied with the 2810HR, leaving the alignment holes open. Drive the screws tight against the metal.
3. Place the upper half onto the joist, lapping over the lower half with the alignment holes aligned. Drive screws through alignment holes, through both halves, into the joist, 6 screws in the 2x10, 12 screws in the 2x8. Then drive screws through the remaining holes, into the joist. Total number of screws in a 2x10 is 30 and 24 in a 2x8. The finished installation **must have a screw in every hole**.



2x10 VIEW



2x8 VIEW



Installation Limitations

- **Hole Size:** Hole sizes may not exceed 6" diameter in 2x10's and 4" in 2x8's
- **Number of 2810HR's:** One 2810HR may be applied per joist.
- **Non-Compliant Installations:** It is often possible to use a 2810HR in conditions not complying with these Limitations. Contact Metwood for additional product and engineering support.

Issue Date: October 3, 2018

Letter Report No: H6968.01-117-14

Shawn Callahan
Metwood Inc.
819 Naff Road
Boones Mill, VA 24065

Subject: Summary Review Letter for Metwood 2810HR CCRR-0279

Dear Mr. Callahan,

Intertek has received supporting documentation from Metwood to address requirements of the 2015 International Building and Residential Codes. The documentation reviewed to-date is listed below.

I. Intertek Evaluation Plan for 2810HR Joist Reinforcer, H0997.01-117-38, dated 6/30/2017

Method of evaluation involves comparison of 2x10 framing strength with and without holes. Framing members with holes are reinforced with the Metwood 2810HR joist reinforce.

II. Intertek Test Report No. H9231.02-106-31, dated 10/3/2018 (ASTM D198 Testing)

The structural performance of the 2810HR joist reinforcer installed on 2x10 No.2 grade dimensional lumber (SYP and SPF) with a 6 inch hole was evaluated for comparison to 2x10 No.2 grade dimensional lumber (SYP and SPF) without holes or with code permitted holes. Fifteen foot and six foot test spans were selected to evaluate bending strength and stiffness and, shear strength, respectively.

Consistent with wood framing design values, evaluation of strength properties uses lower 5% exclusion values. Stiffness evaluation is based on average values with load at L/360 deflection data.

- i. For evaluating bending strength and stiffness, 2x10 dimensional lumber was tested at a 15 foot span for both with and without the 2810HR joist reinforcer for each wood species. Summary of the bending test data analysis is below.

Product	Specimen Quantity	Strength (ultimate, lbf)			Stiffness (L/360, lbf)		
		min	max	Lowest 5%	min	max	Average
2x10 SYP	28	2020	- 4820	1890	320	- 1,180	705
2x10 SYP with 2810HR	23	1950	- 4830	2226	482	- 1,190	801
2x10 SPF	28	1920	- 4060	1696	497	- 876	649
2x10 SPF with 2810HR	12	2110	- 3230	2155	629	- 786	690



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The data was reviewed and concludes the bending strength and stiffness performance for the 2x10 dimensional lumber with a 6 inch hole, reinforced with the 2810HR joist reinforcer, is comparable to 2x10 dimensional lumber.

- ii. For evaluating shear strength, 2x10 dimensional lumber was tested at a 6 foot span for both with and without the 2810HR joist reinforcer for each wood species. Summary of the shear test data analysis is below.

Product	Specimen Quantity	Shear (lbf)		
		min	max	Lowest 5%
2x10 SYP	22	3,820	- 10,900	5,110
2x10 SYP with 2810HR	22	6,080	- 11,200	5,519
2x10 SPF	17	4,350	- 8,030	4,202
2x10 SPF with 2810HR	17	3,620	- 7,330	4,063 ¹

- (1) The 2x10 SPF with the 2810HR joist reinforcer yielded results less than the 2x10 SPF without the joist reinforcer, however the difference (3%) is insignificant and deemed comparable.
- (2) The 2810HR joist reinforcers are installed no less than 12 inches from the edge of the joist reinforcer to the closest support.

The data was reviewed and concludes the shear strength performance for the 2x10 dimensional lumber with a 6 inch hole, reinforced with the 2810HR joist reinforcer, is comparable to 2x10 dimensional lumber.

III. Structural Analysis – 14 Gauge Galvanized Metwood Joist Reinforcer, prepared by Lakdas/Yohalem Engineering, Inc. Consulting Engineers, 7/27/2016

IV. Factory Audit Manual No. H6973.01-117-38, dated 5/10/2018

The intent of this letter is to provide you with a current summary of our review. Our evaluation has been completed and the data satisfies the evaluation requirements for recognition of the 2810HR Joist Reinforcer in an Intertek CCRR. If you have any questions regarding this letter report, please do not hesitate to contact the undersigned.

Sincerely,

INTERTEK TESTING SERVICES NA, INC.

Reported by:

Digitally Signed by: Kendall A. Leaman

Kendall A Leaman
Project Engineer

Digitally Signed by: Craig H. Wagner

Craig H Wagner, PE
Chief Engineer



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CUSTOMER MEMO: MTWDeck Ledger Bracket

The Metwood MTWDeck Bracket can be utilized on structures with stone or masonry veneer as an alternate deck ledger connection. Section R507.2.2 of the 2015 IRC states, "Deck ledger connections not conforming to Table R507.2 shall be designed in accordance with accepted engineering practice." The MTWDeck Bracket has been designed in accordance with accepted engineering practice and has been evaluated and achieved a Code Compliance Research Report.



CODE
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CCRR-0261

MTWDeck Bracket Maximum Spacing

Band of Structure Species	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)						
	6	8	10	12	14	16	18
<i>Douglas Fir-Larch and Southern Pine</i>	8-0	8-0	6-0	5-0	5-0	4-0	3-0
<i>Spruce Pine Fir and Hem Fir</i>	8-0	6-0	5-0	4-0	3-0	3-0	3-0

- **Band of Structure:** The MTWDeck Bracket must be attached to a 2-inch (51 mm) nominal lumber band joist plus an additional 2" nominal lumber blocking that bear on a sill plate or wall plate. If the MTWDeck Bracket is attached to a 1-inch-thick engineered wood product, the 2" nominal lumber blocking is still required.
- **Flashing:** All MTWDeck Brackets and Ledgers shall be flashed to prevent water from contacting the house band joist.
- **Section R507:** All other connections and design of a wood-framed deck shall be in accordance with Section R507 of the 2015 and 2018 IRC.

Building Solution – DECK LEDGER

Utilize **METWOOD DECK LEDGER BRACKET** to Install a Deck Ledger
on a Project With Masonry Veneer

***All Fasteners for Wood Application Included*

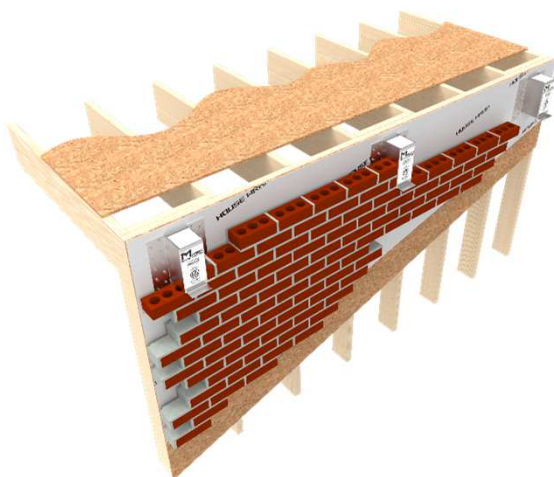
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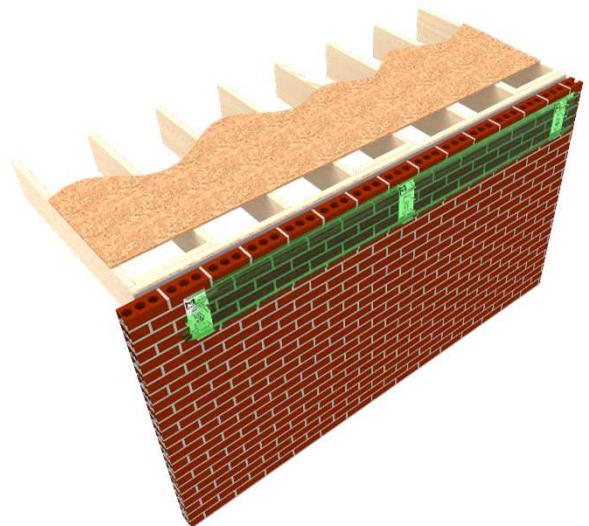
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**Step 1 – Mount Deck Bracket
To Double Blocking**



**Step 2 – Install brick, stone or other veneer
Around MTWDeck Brackets**



**Step 3 – Attach Deck Ledger
To Face of Brackets**

Installation Instruction



The Metwood MTWDeck Bracket can be utilized on structures with brick, stone, or other veneers as an alternate deck ledger connection. The following steps demonstrate proper application of the MTWDeck Bracket.

Fastening					Allowable Design Loads ⁽⁴⁾			
Bracket to Wood Rim Joists ⁽¹⁾		Wood Deck Ledger to Bracket ⁽²⁾		Wood Members Specific Gravity ⁽³⁾	Wind Uplift C _D = 1.6	Vertical (Downward)		
Qty.	Type	Qty.	Type			Live Load C _D = 1.0	Snow Load C _D = 1.15	Construction Load C _D = 1.25
20	Simpson Strong-Tie, 1/4" x 3" Strong-Drive SDS screw (ICC-ES ESR-2236)	6	Type 7, 1/4-20 x 2-1/2" Dril-Flex Self-Drilling Structural Fastener (ICC-ES ESR-3332)	0.55	2,133 lbs	2,600 lbs	2,990 lbs	3,250 lbs

⁽¹⁾ Wood rim joists must consist of double blocked 2x members, with sufficient width to mount the MTWDeck Brackets.

⁽²⁾ Self-drilling screws must penetrate through the steel bracket, at the designated pre-drilled holes in the MTWDeck Bracket, with a minimum of three threads protruding past the wall thickness of the bracket.

⁽³⁾ Installation using wood members of lesser specific gravity may result in lower allowable design loads.

⁽⁴⁾ Allowable loads apply to connection of wood members with an installed or in-service moisture content of 19% or less, and wood members that will experience sustained exposure to elevated temperatures up to 100°F.

Step 1: Attach Bracket to Structure utilizing the (20) Fasteners in BAG #1. Space Brackets according to TABLE 1.

TABLE 1: MTWDeck Bracket Maximum Spacing

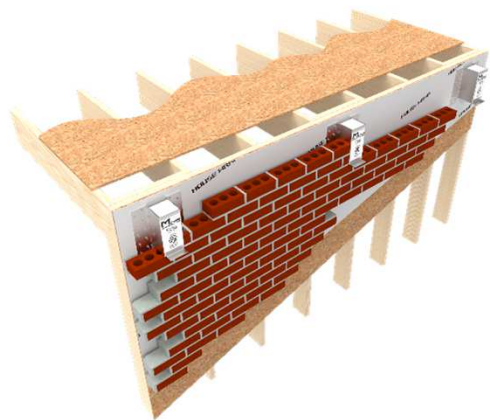
Band of Structure Species	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)						
	6	8	10	12	14	16	18
Douglas Fir-Larch and Southern Pine	8-0	8-0	6-0	5-0	5-0	4-0	3-0
Spruce Pine Fir and Hem Fir	8-0	6-0	5-0	4-0	3-0	3-0	3-0



****Please note:** The MTWDeck Bracket must be attached to a 2-inch nominal lumber band joist plus an additional 2" nominal lumber blocking that bear on a sill plate or wall plate. If the MTWDeck Bracket is attached to a 1-inch-thick engineered wood product, the 2" nominal blocking is still required.

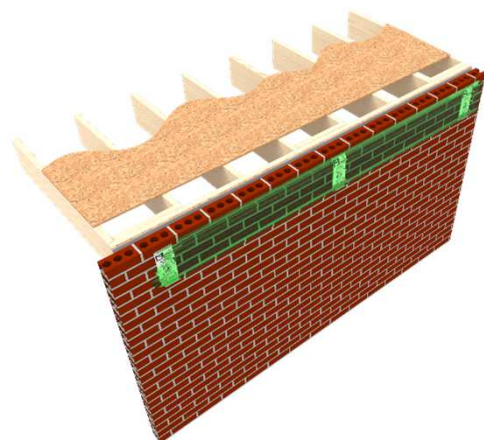
Step 2: Install brick, stone or other veneer around the MTWDeck Bracket.

****Please note that all MTWDeck Brackets and Ledgers shall be flashed according to code to prevent water from contacting the house band joist.**

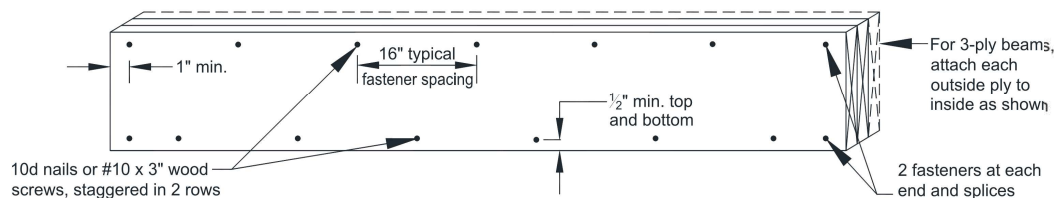
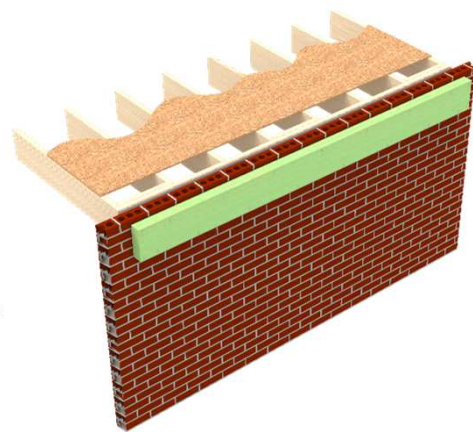


Step 3: Attach Deck Ledger to MTWDeck Bracket with the (6) Self Drilling Fasteners in BAG #2

****Please note that all other connections and design of a wood-framed deck shall be in accordance with Section R507 of the 2012 and 2015 IRC.**



Step 4: Attach additional plies in accordance with Section 507.6 Deck Beams of the 2012 and 2015 IRC.



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CCRR-0261

For additional information visit
www.metwood.com or call (540) 334-4294

Issue Date: 11-02-2017

Revision Date: 11-21-2022

Renewal Date: 11-30-2023

DIVISION: 06 00 00 – WOOD, PLASTICS AND COMPOSITES
Section: 06 05 23 – Wood, Plastic, and Composite Fastenings

REPORT HOLDER:
METWOOD, INC.
819 Naff Road
Boones Mill, VA 24065
540-334-4294
www.metwood.com

REPORT SUBJECT:
MTWDeck Bracket

1.0 SCOPE OF EVALUATION

1.1 This Research Report addresses compliance with the following Codes:

- 2018, 2015, 2012 *International Building Code*® (IBC)
- 2018, 2015, 2012 *International Residential Code*® (IRC)

NOTE: This product references 2018 Code section with [2015, 2012] Code sections shown in brackets where they differ.

1.2 MTWDeck Bracket has been evaluated for the following properties (see Table 1):

- Structural Performance

1.3 MTWDeck Bracket has been evaluated for the following uses (see Table 1):

- Supporting wood framing members for exterior deck construction in accordance with 2018 IBC Section 2304.10.3 [2012 IBC Section 2304.9.3], where the veneer of the building structure is masonry. See Figure 2.

2.0 STATEMENT OF COMPLIANCE

MTWDeck Bracket complies with the Codes listed in Section 1.1, for the properties stated in Section 1.2 and uses stated in Section 1.3, when installed as described in this report, including the Conditions of Use stated in Section 6.

3.0 DESCRIPTION

3.1 The MTWDeck Bracket is cold-formed from 10 gage (0.013") steel with a protective coating conforming to Specification ASTM A653-G90 and is prefabricated with twenty 1/4" dia. holes for fastening through and into the rim joist, and six 5/32" dia. holes for receiving self-drilling screws where the deck ledger is fastened to the bracket. See Figure 1 for overall dimensions.

4.0 PERFORMANCE CHARACTERISTICS

4.1 Tabulated allowable loads determined in accordance with 2018 IBC 2303.5 [2012 IBC Section 1711.1] are presented in Table 2. Values are based on allowable stress design (ASD) and include adjustment factors in accordance with the National Design Specification (NDS).

4.1.1 Wood members in the supporting structure for anchorage of the MTWDeck Bracket shall be a minimum two boards of 2-inch nominal thickness each.

4.1.2 Wood members in the deck structure for the anchorage of the deck ledger shall be a minimum of 2-inch nominal thickness.

5.0 INSTALLATION

5.1 General:

MTWDeck Bracket must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this Research Report. A copy of the manufacturer's instructions must be available on the jobsite during installation.

5.2 The MTWDeck Bracket fastens the deck ledger to the adjacent building's rim joists. See Table 2 for fastening schedule and Figure 2 for installation diagram. Masonry veneer is installed around the MTWDeck Bracket.



5.3 Deck framing anchorage to the primary structure is not within the scope of this report and shall comply with IRC Sections R507.1 and R507.9.2 [2015, 2012 IRC Section R507.2.4], and IBC Section 1604.8.3 for lateral load. See paragraph 6.2.

6.0 CONDITIONS OF USE

6.1 Installation must comply with this Research Report, the manufacturer's published installation instructions, and the applicable Code. In the event of a conflict, this report governs.

6.2 Additional design and construction are required for anchorage of lateral loads to the primary building structure in accordance with Sections R507.1 and R507.9.2 [2015, 2012 IRC Section R507.2.4] of the IRC and Section 1604.8.3 of the IBC.

6.3 The MTWDeck Bracket is manufactured under a quality control program with inspections by Intertek Testing Services NA, Inc.

7.0 SUPPORTING EVIDENCE

7.1 Manufacturer's drawings and installation instructions.

7.2 Reports of vertical (downward) and uplift testing demonstrating compliance with ASTM D 7147-11 [-05], Standard Specification for Testing and Establishing Allowable Loads of Joist Hangers.

7.3 Reports of testing demonstrating compliance with ICC-ES AC13, Acceptance Criteria for Joist Hangers and Similar Devices, approved October 2018.

7.4 Engineering analysis of the fastening in accordance with the National Design Specification for Wood Construction and Supplement, American Forest & Paper Association, ANSI/AF&PA NDS-2018 [2015, 2012], signed and sealed by a professional engineer.

7.5 ICC-ES Evaluation Report, ESR-2236 for Simpson Strong-Tie Company, Inc., Simpson Strong-Drive SDS Wood Screws.

7.6 ICC-ES Evaluation Report, ESR-3332 for Elco Construction Products, Dril-Flex® Self-Drilling Structural Fasteners.

7.7 Documentation of an Intertek approved quality control system for the manufacturing of products recognized in this report.

8.0 IDENTIFICATION

The MTWDeck Bracket produced in accordance with this report shall be identified by the following information:

8.1 An imprint on the bracket identifying the name and/or trademark of manufacturer on the product, and text "Intertek CCRR-0261".

8.2 Packaging with a label with the Intertek Compliance Research Report mark and number (CCRR-0261).



9.0 OTHER CODES

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10.0 CODE COMPLIANCE RESEARCH REPORT USE

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TABLE 1 - PROPERTIES EVALUATED

Property	2018 IBC	2018 IRC	2015 IBC	2015 IRC	2012 IBC	2012 IRC
Structural	Section 2303.5	n/a	Section 2303.5	n/a	Section 1711.1	n/a

TABLE 2 – ALLOWABLE LOADS FOR MTWDECK BRACKET

Fastening					Allowable Design Loads ⁽⁴⁾			
Bracket to Wood Rim Joists ⁽¹⁾		Wood Deck Ledger to Bracket ⁽²⁾		Wood Members Specific Gravity ⁽³⁾	Wind Uplift C _D = 1.6	Vertical (Downward)		
Qty.	Type	Qty.	Type			Live Load C _D = 1.0	Snow Load C _D = 1.15	Construction Load C _D = 1.25
20	Simpson Strong-Tie, 1/4" x 3" Strong-Drive SDS screw (ICC-ES ESR-2236)	6	Type 7, 1/4-20 x 2-1/2" Drill-Flex Self-Drilling Structural Fastener (ICC-ES ESR-3332)	0.55	2,133 lbs	2,600 lbs	2,990 lbs	3,250 lbs

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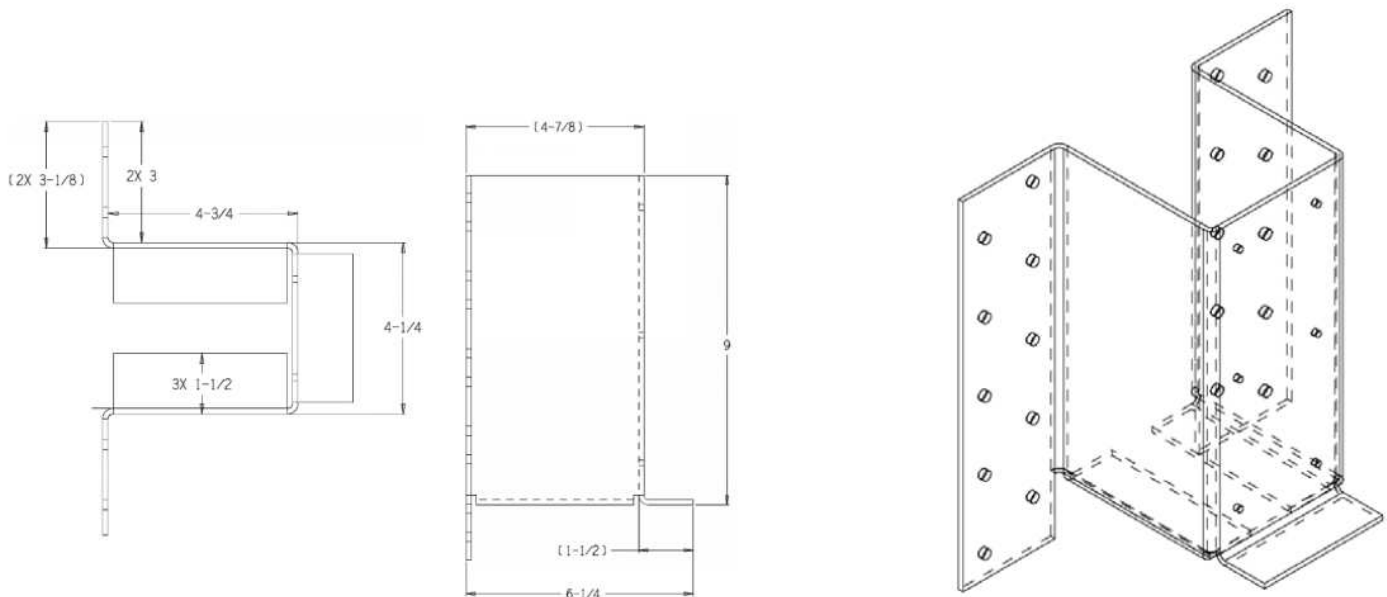


FIGURE 1 – MTWDeck Bracket

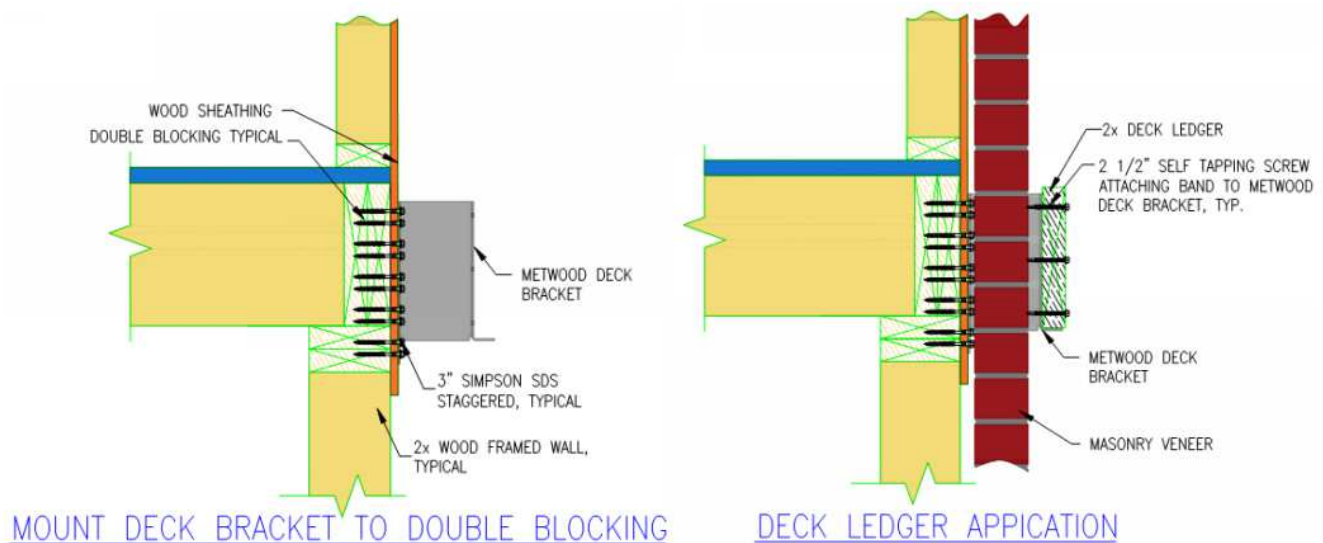


FIGURE 2 – Installation Diagram