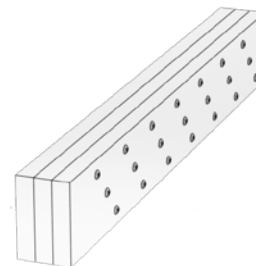


# Tech Bulletin

## Multi-Ply Beams

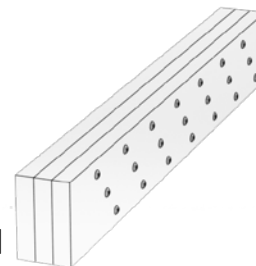


### Multiple Sawn Lumber and Engineered Wood Beams

Fastener	# Screw Rows	Fastener Spacing in inches	Allowable Face Mounted Loads Per Foot (PLF)					
			<i>MFR Lumber G=0.5</i>			<i>Sawn Lumber with Varying Specific Gravity values</i>		
			Assembly per Table 3			S.Pine G=0.55	D.Fir G=0.50	SPF G=0.42
			A	B	C			
CONSTRUCTION SCREW 1/4 x 3-3/8"	2	24	175			191	175	140
	2	16	263			287	263	210
	2	12	350			382	350	280
	3	24	263			287	263	210
	3	16	394			430	394	315
	3	12	525			573	525	420
CONSTRUCTION SCREW 5/16 x 3-1/8"	2	24	206			258	223	161
	2	16	309			387	335	242
	2	12	412			516	446	322
	3	24	309			387	335	242
	3	16	464			581	502	362
	3	12	618			774	669	483
CONSTRUCTION SCREW 5/16 x 5"	2	24		215	242	246	230	180
	2	16		323	363	369	345	270
	2	12		430	484	492	460	360
	3	24		323	363	369	345	270
	3	16		484	545	554	518	405
	3	12		645	726	738	690	540
CONSTRUCTION SCREW 3/8 x 3-1/8"	2	24				273	229	166
	2	16				410	344	249
	2	12				546	458	332
	3	24				410	344	249
	3	16				614	515	374
	3	12				819	687	498
CONSTRUCTION SCREW 3/8 x 3-3/8"	2	24				273	229	166
	2	16				410	344	249
	2	12				546	458	332
	3	24				410	344	249
	3	16				614	515	374
	3	12				819	687	498
CONSTRUCTION SCREW 3/8 x 5"	2	24		235	273	286	250	197
	2	16		353	410	429	375	296
	2	12		470	546	572	500	394
	3	24		353	410	429	375	296
	3	16		529	614	644	563	443
	3	12		705	819	858	750	591
CONSTRUCTION SCREW 3/8 x 6-3/4"	2	24		273	273	286	250	197
	2	16		410	410	429	375	296
	2	12		546	546	572	500	394
	3	24		410	410	429	375	296
	3	16		614	614	644	563	443
	3	12		819	819	858	750	591

Note: 1. Applied load from joist are assumed to be uniform  
2. Fastener capacity is based on fastener spacing, not joist spacing  
3. 1-1/2-inch min thread length

Table # 1



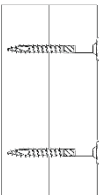
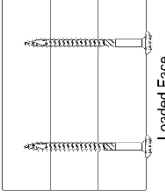
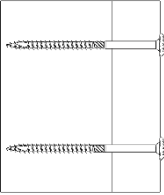
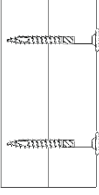
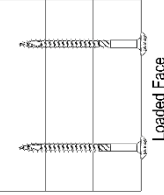
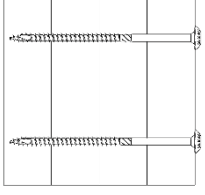
### Multi-Ply Beam Point Load

Fastener	# Screw Rows	Max Point Load to One Side of Member **						
		MFR Lumber G=0.5			Sawn Lumber with Varying Specific Gravity values			
		Assembly per Table 3			S.Pine G=0.55	D.Fir G=0.50	SPF G=0.42	Assembly per Table 3
		A	B	C				
CONSTRUCTION SCREW 1/4 x 3-3/8"	4	700			764	700	560	<b>D</b>
	6	1,050			1,146	1,050	840	
	8	1,400			1,528	1,400	1,120	
CONSTRUCTION SCREW 5/16 x 3-1/8"	4	824			1,032	892	644	<b>D</b>
	6	1,236			1,548	1,338	966	
	8	1,648			2,064	1,784	1,288	
CONSTRUCTION SCREW 5/16 x 5"	4		860	968	984	920	720	<b>E</b>
	6		1,290	1,452	1,476	1,380	1,080	
	8		1,720	1,936	1,968	1,840	1,440	
CONSTRUCTION SCREW 3/8 x 3-1/8"	4	900			1,092	916	664	<b>D</b>
	6	1,350			1,638	1,374	996	
	8	1,800			2,184	1,832	1,328	
CONSTRUCTION SCREW 3/8 x 3-3/8"	4	976			1,092	916	664	<b>D</b>
	6	1,464			1,638	1,374	996	
	8	1,952			2,184	1,832	1,328	
CONSTRUCTION SCREW 3/8 x 5"	4		940	1,092	1,144	1,000	788	<b>E</b>
	6		1,410	1,638	1,716	1,500	1,182	
	8		1,880	2,184	2,288	2,000	1,576	
CONSTRUCTION SCREW 3/8 x 6-3/4"	4		1,092	1,092	1,144	1,000	788	<b>F</b>
	6		1,638	1,638	1,716	1,500	1,182	
	8		2,184	2,184	2,288	2,000	1,576	

- 1-1/2-inch min thread length
- Screws shall be sized to penetrate laminations from both sides.
- See Tables 1&2 for load carrying capacity

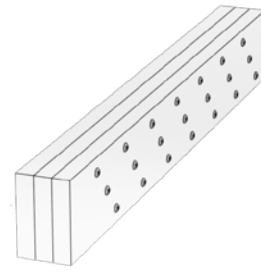
Table #2

\*\* Note when applying loads on both faces of built up beam, screws determined from table # 2 shall be installed on both sides 1" offset for rows on opposite face.

MFR Lumber			Sawn Lumber		
<b>A</b> 2 x 1-3/4"	<b>B</b> 3 X 1-3/4"	<b>C</b> 1-3/4" to 3-1/2"	<b>D</b> 2 X 1-1/2"	<b>E</b> 3 X 1-1/2"	<b>F</b> 4 X 1-1/2"
					

Note: Load applied to the face the screw head.

Table # 3



## Minimum Spacing Geometry

(Perpendicular to grain loading)

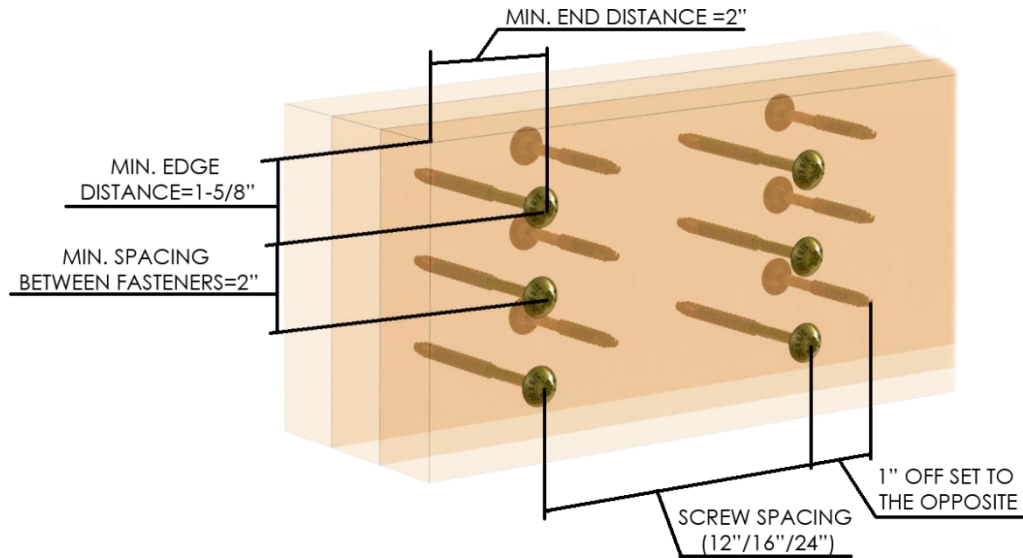


Figure 1

## Multi-Ply Beam with One Face Loaded

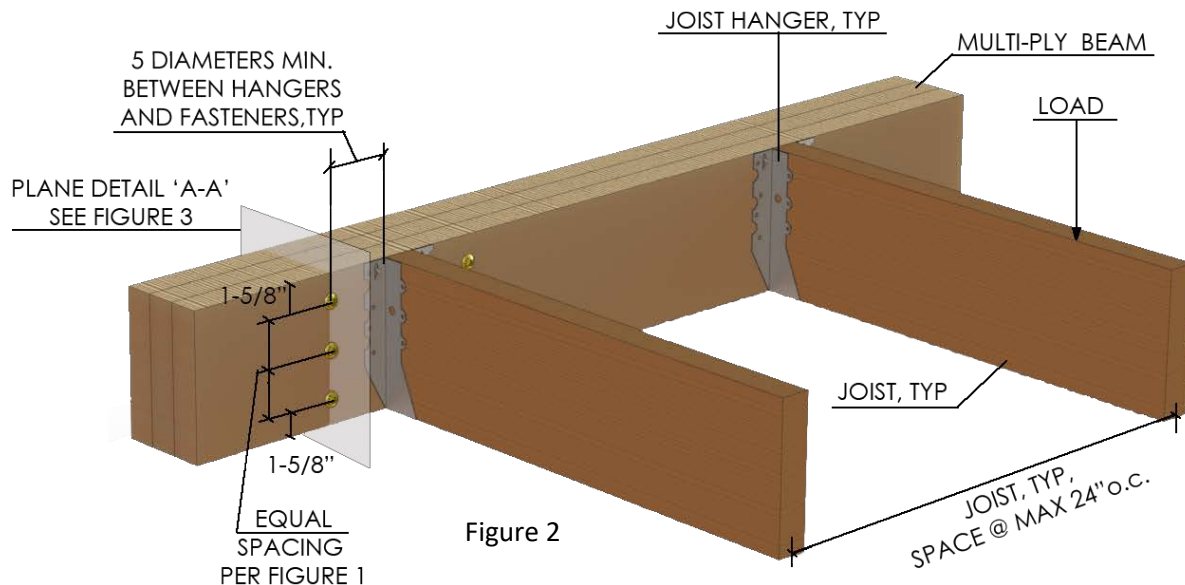
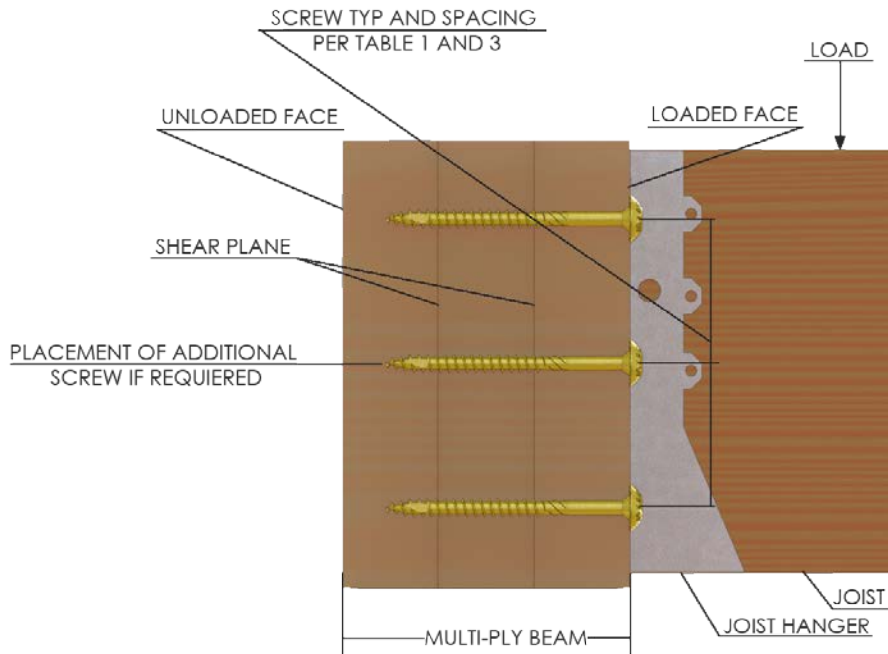
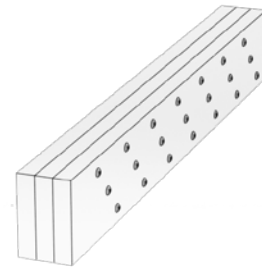


Figure 2

# Tech Bulletin Multi-Ply Beams

## Plane Detail 'A-A'



Scan this QR Code  
for IAPMO ER-454.

Figure 3 (Detail 'A-A')

## Multi-Ply Beam Top Loaded

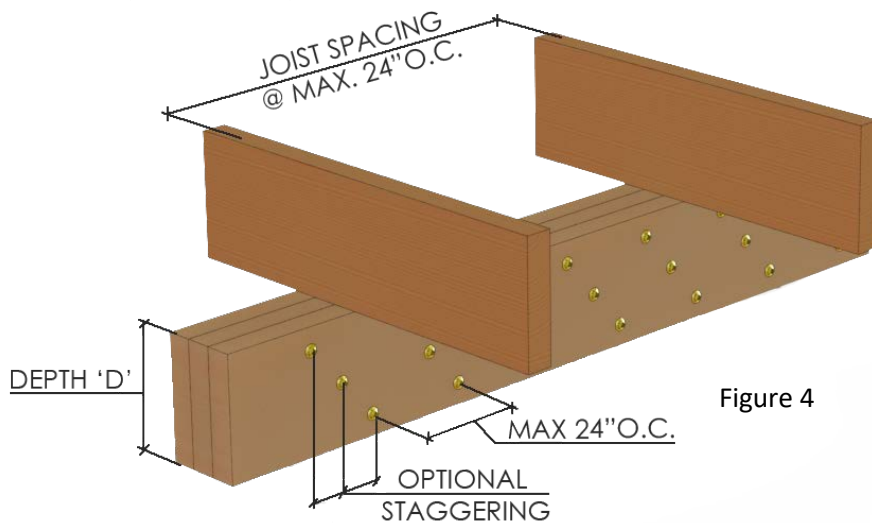


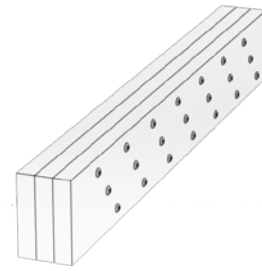
Figure 4

1. Load must be applied evenly across the entire beam width. Otherwise, use connections listed for side loaded beams.
2. U2 Construction screws shall be sized to penetrate through all plies.
3. For beams with 4 or more plies, install screws on both sides 1" offset between rows on the opposite.
4. For 'D' < 12" use 2- rows, for 'D' > 12" use 3- rows of U2 Construction Screws

## Tech Bulletin

# Multi-Ply Beams

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### Notes:

1. Connection capacities for multi-ply beams are based on the National Design Specification (NDS) for wood construction, 2018 edition or U2 Fasteners IAPMO 454 report or third-party independent testing.
2. Multi beam connections for manufactured structural composite lumber (MFR) are based on a specific gravity (G) of 0.50 as listed in the tables.
3. Capacities are designed at 100% stress level. Adjustments in stress level for duration of load may apply where permissible by code.
4. A design professional should be consulted when designing multi-ply beams or connections not shown in this bulletin.
5. Nominal design values are for connections in seasoned wood to a moisture content of 19% or less and used under continuously dry conditions (refer NDS 10.3.3).
6. Multi-ply beams are assumed to bear fully on supports of the same width or wider than the total width of the beam.
7. Single side-loaded beams and beams with unequal side loads applied on opposite faces may undergo torsion when loaded. A design professional should be consulted to consider the effects of torsion on multi-ply beams.
8. In addition to the fasteners specified in tables # 1 and # 2 a row of fasteners should be provided at the ends, of beams and each side of any splice location.
9. The design loads in the tables do not consider any effects of splicing in the plies. Consult a design professional to design splices and to confirm the required connectors and connection geometry.
10. Do not use multi -ply beams as diaphragm chords or drag-ties unless specifically designed to do so by a design professional.
11. Always consult a design professional for the sizing and specification of the multi-ply beam and for the design of the joist hangers or brackets.
12. Fastener installations to comply with NDS 12.1.5.6 embedment requirements.
13. All installations to comply with current NDS requirements