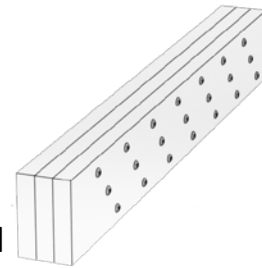


Multiple Sawn Lumber and Engineered Wood Beams

| 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 | Assembly per Table 3 |
| | | | A | B | C | | | | |
| CONSTRUCTION SCREW 1/4 x 3-3/8" | 2 | 24 | 175 | | | 191 | 175 | 140 | D |
| | 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 | D |
| | 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 | E |
| | 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 | 225 | | | 273 | 229 | 166 | D |
| | 2 | 16 | 338 | | | 410 | 344 | 249 | |
| | 2 | 12 | 450 | | | 546 | 458 | 332 | |
| | 3 | 24 | 338 | | | 410 | 344 | 249 | |
| | 3 | 16 | 506 | | | 614 | 515 | 374 | |
| | 3 | 12 | 675 | | | 819 | 687 | 498 | |
| CONSTRUCTION SCREW 3/8 x 3-3/8" | 2 | 24 | 244 | | | 273 | 229 | 166 | D |
| | 2 | 16 | 366 | | | 410 | 344 | 249 | |
| | 2 | 12 | 488 | | | 546 | 458 | 332 | |
| | 3 | 24 | 366 | | | 410 | 344 | 249 | |
| | 3 | 16 | 549 | | | 614 | 515 | 374 | |
| | 3 | 12 | 732 | | | 819 | 687 | 498 | |
| CONSTRUCTION SCREW 3/8 x 5" | 2 | 24 | | 235 | 273 | 286 | 250 | 197 | E |
| | 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 | F |
| | 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 | D |
| | 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 | D |
| | 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 | E |
| | 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 | D |
| | 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 | D |
| | 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 | E |
| | 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 | F |
| | 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

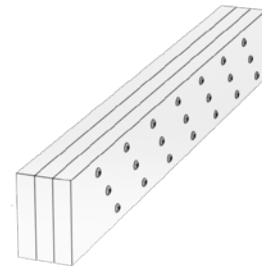
Table #2

** 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 | | |
|------------|------------|------------------|-------------|------------|------------|
| A | B | C | D | E | F |
| 2 x 1-3/4" | 3 X 1-3/4" | 1-3/4" to 3-1/2" | 2 X 1-1/2" | 3 X 1-1/2" | 4 X 1-1/2" |
| | | | | | |

Note: Load applied to the face the screw head.

Table # 3



Minimum Spacing Geometry (Perpendicular to grain loading)

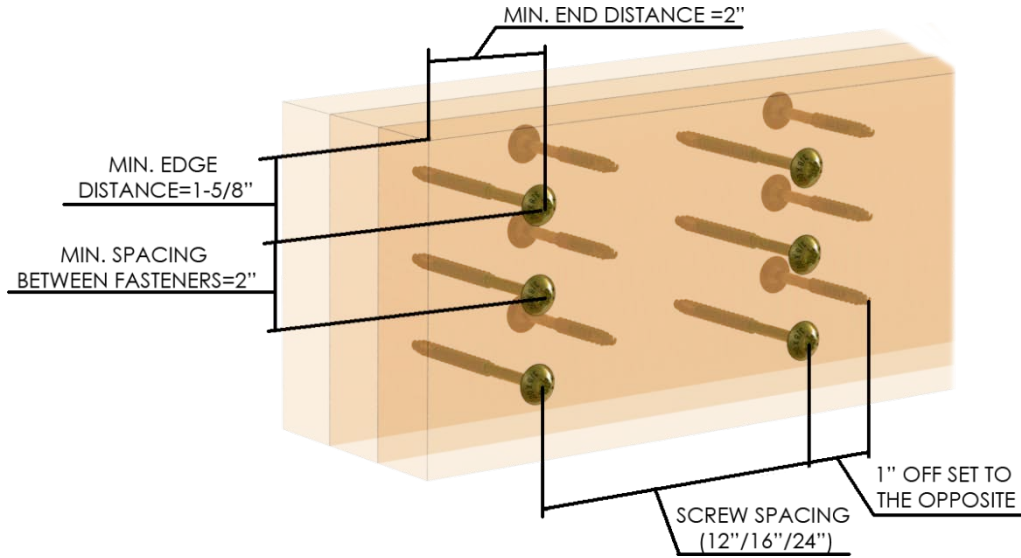


Figure 1

Multi-Ply Beam with One Face Loaded

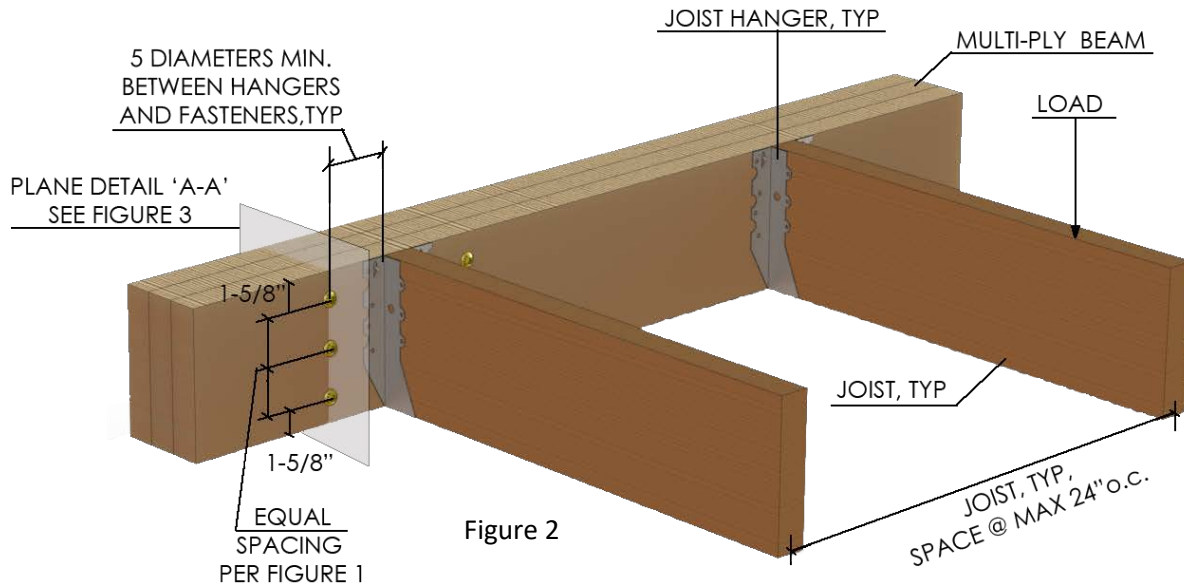
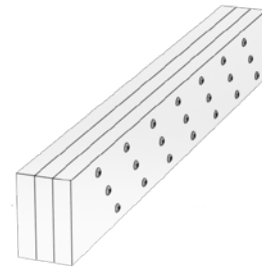
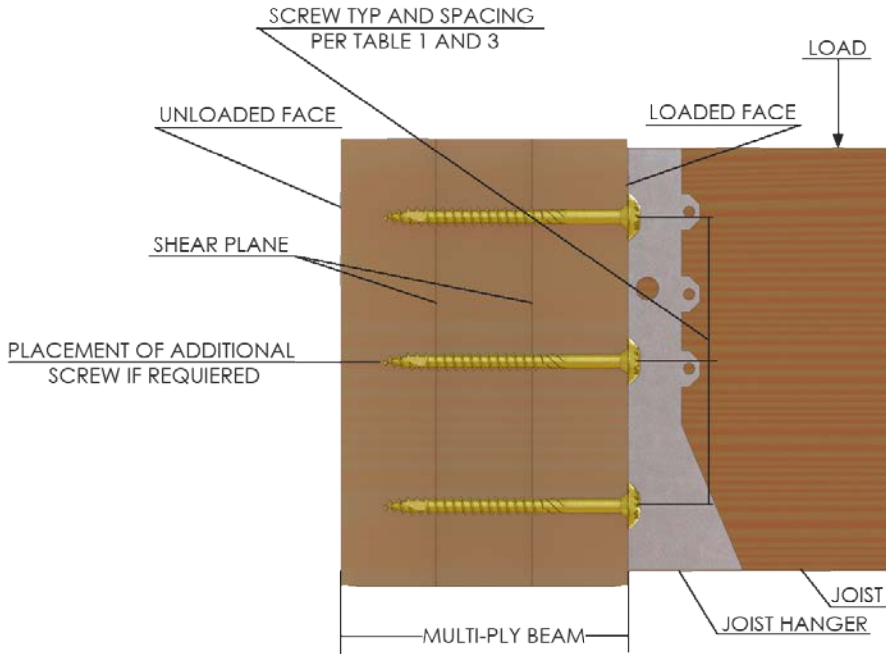


Figure 2



Plane Detail 'A-A'



Scan this QR Code for IAPMO ER-454.

Figure 3 (Detail 'A-A')

Multi-Ply Beam Top Loaded

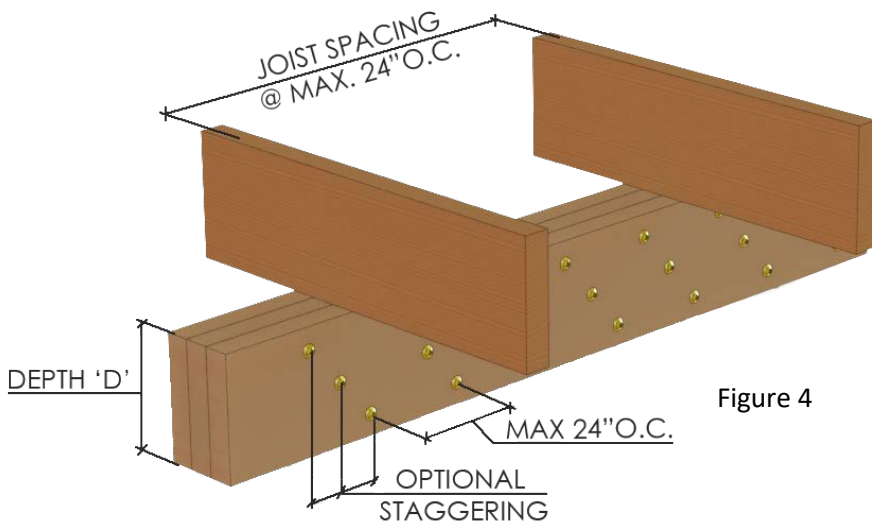
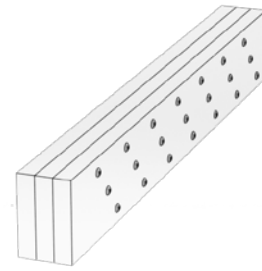


Figure 4

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



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