Pollmeier

LVL
SPRUCE
INSTALLATION GUIDE

S-LAM Beams, Joists, Headers, Rafters and Columns for Floor and Roof Applications.

HANDLING, STORAGE AND INSTALLATION GUIDELINES:
- Warning: Failure to apply good building practices regarding application, handling, storage and installation of this product can result in poor performance and/or unsafe structures.
- S-LAM must be properly installed and braced before any loads are applied to the structure.
- S-LAM is to be used in a dry, well ventilated environment.
- S-LAM is not to be used for unintended purposes such as ramps or planks.
- Handle S-LAM carefully to avoid damage. Product must avoid ground contact and be stored on a clean, level surface and kept dry.
- Use appropriate personal protection equipment for handling and working with wood products; including but not limited to eye protection and gloves.

GENERAL NOTES

FOR USING THIS PRODUCT GUIDE AND UNIFORM LOAD (PLF) TABLES

1. Tables are for simple span beams (with a support at each end) and uniformly distributed loads.
2. Continuous lateral restraint must be provided at the top (compression) edge of the beam to prevent buckling.
3. For other span, load or restraint conditions, design the beam using iStruct® software or other competent analysis.
4. Lateral restraint is required at supports to prevent rotation of the beam.

MULTIPLE PLIES:

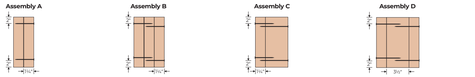
1. Loads are for one-ply (member) 1 ¾" thick.
   Multiply the loads: x 2 for 2 – ply beams, x 3 for 3–ply beams, x 4 for 4–ply beams
2. Beam plies (members) must be adequately connected by nails, screws or bolts as specified in this product guide or by competent analysis.
3. Two (2) or more 1 ¾" plies are recommended for depths greater than 14 inches. If a single 1 ¾" member deeper than 14" is used; pay particular attention to stability, lateral restraint and connections. Make sure these structural details are provided and properly installed.
4. 4-ply beams require bolts or long screws which are specifically manufactured to connect all the plies of a multiple ply beam. 4-ply beams must be top loaded or loaded equally from both faces unless required by a design professional.
5. Refer to the multiple ply connection information in this product guide for specific fastener information for connecting the plies. Note: Connection requirements depend on whether loads are applied equally to each ply (Typically when beam is top loaded). Or if loads are applied to one face of the multiple ply beam. For loads applied to one face, additional connections and lateral restraint may be required to avoid torsional loads/stresses in the beam.

BEARINGS:

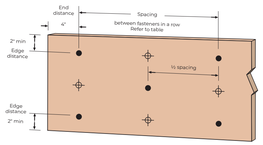
1. Make sure bearings are structurally adequate to carry the loads and are in compliance with building codes and regulations.
2. Bearing widths shown are required to support the maximum PLF loads shown. If less than maximum PLF load is applied to the beam, tabulated bearing widths may be reduced proportionally as follows: Total Load applied/Total Load from table. Refer to examples on PLF tables.
3. This value may be conservative, specific analysis may produce a better result.

MULTIPLE-MEMBER CONNECTIONS FOR SIDE-LOADED BEAMS
Maximum Uniform Load Applied To Either Outside Member (PLF).

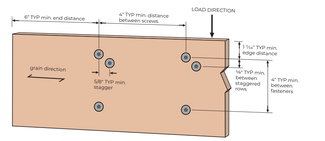
Fastener Type	Fastener Placement	Rows	Fastener On-Center Spacing (in)	2-ply, 1 ¾" (3 ½" wide)	3-ply, 1 ¾" (5 ¼" wide)	2-ply, 1 ¾"/3 ½" (5 ¼" wide)	3-ply, 1 ¾"/3 ½" (7" wide)
Nail Fastener Pattern [3]				Assembly A	Assembly B	Assembly C	Assembly D
16d Pneumatic Nail 0.131 x 3 ¼" [1]	As Shown	2	12	300	280	280	280
		3	12	560	420	420	420



Nails



Screws



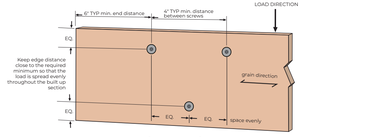
Spacing Requirements
Screwed Connection Assembly Types - All

INSTALLATION NOTES:

Nails: Offset nails at least 2" from nails in adjacent ply to avoid splitting.

Nails:
● Head side ✢ Point side

1. Drive nails from opposite face between nails in row as shown.
2. Install nails according to manufacturer's instructions.
3. Nailed connection values may be doubled for 6" on-center or tripled for 4" on-center nail spacing.
4. Where fasteners are installed on both faces, stagger fasteners on the second face so they fall between fasteners on the first face.



Spacing Requirements
Two Fastener Staggered Uniform Load On Build-Up Assembly

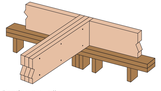
Fastener Type	Fastener Placement	Rows	Fastener On-Center Spacing (in)	2-ply, 1 ¾" (3 ½" wide)	3-ply, 1 ¾" (5 ¼" wide)	2-ply, 1 ¾"/3 ½" (5 ¼" wide)	3-ply, 1 ¾"/3 ½" (7" wide)	2-ply, 1 ¾"/3 ½" (7" wide)	3-ply, 1 ¾"/3 ½" (7" wide)
Screw Fastener Pattern [3]				Assembly A	Assembly B	Assembly C	Assembly D	Assembly E	Assembly F
Screw Length Brand				3 ½" SDWZ2338	5" SDWZ2500	5" SDWZ2500	6 ¾" SDWZ2634	6 ¾" SDWZ2634	6 ¾" SDWZ2634
Simpson Strong-Tie SDW EWP-Ply Screw [2]	As Shown	2	24	750	500 Head, 325 Point	750	750	750	500 Head, 325 Point
			19.2	1000	750 Head, 500 Point	1000	1000	1000	600 Head, 500 Point
			16	1300	1000 Head, 750 Point	1300	1300	1300	750 Head, 500 Point
			12	1500	1300 Head, 1100 Point	1500	1500	1500	1000 Head, 750 Point
Screw Length Brand				3 ½" WSWH338	5" WSWH5	5" WSWH5	6 ¾" WSWH634	6 ¾" WSWH634	6 ¾" WSWH634
MiTek WSWH Screw [2]	As Shown	2	24	635 Head, 600 Point	535 Head, 430 Point	535	535	715	475 Head, 380 Point
			19.2	800 Head, 755 Point	655 Head, 535 Point	670	670	895	590 Head, 475 Point
			16	950 Head, 905 Point	805 Head, 645 Point	805	805	1075	710 Head, 570 Point
			12	1270 Head, 1205 Point	1075 Head, 860 Point	1075	1075	1430	955 Head, 765 Point
Screw Length Brand				3 ½" FLS12	5" FLS55	5" FLS55	6 ¾" FLS34	6 ¾" FLS34	6 ¾" FLS34
FastenMaster FlatLOK-FLO2 Screw [2]	As Shown	2	24	660	490	660	660	660	750
			19.2	825	615	825	825	825	1000
			16	990	735	990	990	990	1300
			12	1320s	980	1320	1320	1320	1300

1. 7" wide beams should be side loaded only when loads are applied to both faces to minimize rotation.
2. Use 3" minimum hanger fasteners at hangers installed on Point Side of multi-ply assembly

ADDITIONAL NOTES

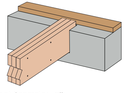
1. Each ply is assumed to carry same proportion of load. Loads may be applied to the head side and point side concurrently, provided the published allowable load is not exceeded for either side. (Example: a 3-ply assemble with a head side load of 735 plf and a point side load of 735 plf may be fastened together with 2 rows of screws at 16" o.c. between fasteners in a row.) To minimize rotation, 7" wide LVL may be side loaded only when loads are applied to both sides of the beam with the lesser loaded side bearing at least 25% of the overall design load.
2. **FlatLOK** load values are for LVL only. For LSL beams, the LVL load values should be reduced by a factor of 0.75.
3. When hangers are installed on point side, hanger face fasteners shall be a minimum of 3 ½" long.
4. Refer to the above chart for minimum spacing requirements for **FlatLOK** fasteners.
5. SCL refers to Structural Composite Lumber consisting of LVL, PSL, and LSL assemblies.
6. Each ply is assumed to carry same proportion of load. Loads may be applied to the head side and point side concurrently, provided neither published allowable load is exceeded. (Example: a 3-ply assembly with a head side load of 750 plf and a point side load of 500 plf may be fastened together with three rows of **SDW** at 16" o.c. between fasteners in a row.)
7. When hangers are installed on point side, hanger face fasteners shall be a minimum of 3" long.
8. Refer to the above chart for minimum spacing requirements for **SDW EWP-PLY** fasteners.

INSTALLATION DETAILS FOR FLOORS



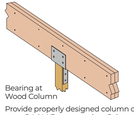
Bearing at Wall

S-LAM Beam may require full width of wall plate for bearing.
Rim board or blocking must be provided for lateral restraint to prevent rotation at support.



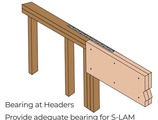
Bearing at Concrete Wall

Protect S-LAM Beam from direct contact with concrete as required by building code. Beam connection to wall must be designed and provided as required by building code.



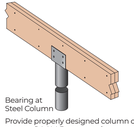
Bearing at Wood Column

Provide properly designed column cap to carry S-LAM Beam reaction. Column cap must provide adequate lateral restraint to prevent rotation at support or other adequate restraint must be provided.



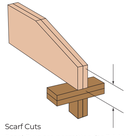
Bearing at Headers

Provide adequate bearing for S-LAM Beam as specified in this product guide or designed by software or other competent analysis. Provide properly designed strap if top plate is not continuous over header.



Bearing at Steel Column

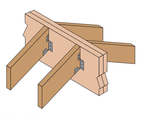
Provide properly designed column cap to carry S-LAM Beam reaction. Column cap must provide adequate lateral restraint to prevent rotation at support or adequate restraint must be provided by framing or other means.



Scarf Cuts

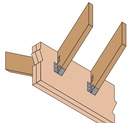
Scarf Cuts are permitted for S-LAM Beams as specified in the table. Scarf cuts may be specially designed by software or other competent analysis.

INSTALLATION DETAILS FOR ROOFS



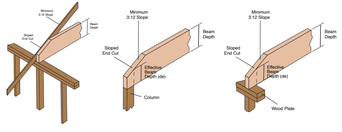
Ridge Beam

S-LAM Beam must be properly designed & supported.
Common rafters and connections must be properly designed.



Hip & Valley Rafters

Hip & Valley Rafters must be properly designed & supported.
Common rafters and connections must be properly designed.



MAXIMUM REACTION FOR SCARF CUTS (lbs)

Depth	7 ¼"	9 ¼"	9 ½"	11 ¼"	11 ¾"	14"	16"	18"
1 ½" bearing	1624	2072	2128	2520	2660	3136	3584	4032
3 ½" bearing	1624	2072	2128	2520	2660	3136	3584	4032
5 ¼" bearing	1624	2072	2128	2520	2660	3136	3584	4032

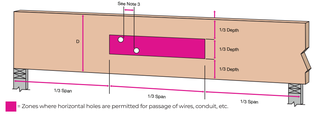
Footnotes:
1. Beam shear values in the table are for 1 ¾" wide beams. For a 3 ½" wide beam, multiply the value by 2. For a 5 ¼" beam, multiply the value by 3. For a 7" wide beam, multiply the value by 4.
2. Values are based on 3:12 slope cut and can be used for slopes from 3:12 to 7:12. For slopes greater than 7:12, consult a design professional.
3. Values are based on minimum heel heights and are calculated using the effective depth (de), of the beam at the face of support.
4. It is the designer's responsibility to calculate the compression bearing capacity of the supporting member.
5. No increase for duration of load is permitted.
6. Concentrated loads are not allowed in the tapered beam cut area.

MINIMUM HEEL HEIGHT FOR SCARF CUTS (in)

1 ½" bearing	4.0	5.2	5.3	6.4	6.8	8.0	9.2	10.4
3 ½" bearing	3.5	4.7	4.8	5.9	6.3	7.5	8.7	9.9
5 ¼" bearing	3.0	4.2	4.4	5.4	5.8	7.1	8.3	9.5

Footnotes:
1. Beam heel height is measured at the outside face of the supporting member.
2. Values are based on 3:12 slope cut. For other slopes, heel height must be calculated.
3. Values are based on the beam's minimum effective depth (de=0.66d), measured at the inside face of the supporting member, where d=uncut beam depth.

PERMISSIBLE HOLE LOCATIONS FOR LVL BEAMS UNDER UNIFORM LOADS



■ = Zones where horizontal holes are permitted for passage of wires, conduit, etc.

1. For beam depth of 3 ½", 5 ½", and 7 ¼", the maximum hole diameter is ¾", 1 ⅛", and 1 ½", respectively. For deeper beams, the maximum diameter is 2".
2. For beam depth of 3-1/2", 5-1/2" and 7-1/4", the maximum hole diameter is 3/4", 1-1/8" and 1-1/2" respectively. For deeper beams, the maximum diameter is 2".
3. For other hole configurations, use Simpson EWP Design Studio™ or MiTek® design software.

The following chart may be used to calculate circular holes for other span and loading conditions. Contact a design professional for analysis.

ALLOWABLE SHEAR AND MOMENT CAPACITY FOR 1 ¾" S-LAM BEAMS

Beam Depth	Max Hole	Design Property	Circular Hole Diameter 0"	2"	3"	4"	5"	6"	7"
9 ¼"	6.2"	Moment (ft. lbs.)	6765	6339	5984	5027	3010	0	0
		Shear (lbs.)	5180	3182	2365	1649	1094	639	0
9 ½"	6.3"	Moment (ft. lbs.)	7096	6656	6302	5386	3433	0	0
		Shear (lbs.)	5320	3316	2491	1783	1194	722	0
11 ¼"	7.5"	Moment (ft. lbs.)	9604	9055	8774	8019	6428	3533	0
		Shear (lbs.)	6300	4259	3388	2616	1944	1372	899
11 ½"	7.9"	Moment (ft. lbs.)	10560	9996	9724	9016	7525	4814	349
		Shear (lbs.)	6650	4399	3174	2925	2229	1628	1121
14"	9.3"	Moment (ft. lbs.)	14205	13442	13227	12648	11426	9204	5546
		Shear (lbs.)	7840	5760	4840	4000	3240	2560	1960
16"	10.7"	Moment (ft. lbs.)	18041	17094	16911	16418	15378	13488	10376
		Shear (lbs.)	8960	6860	5915	5040	4235	3500	2835
18"	12.0"	Moment (ft. lbs.)	22275	21122	20964	20536	19635	17996	15297
		Shear (lbs.)	10080	7964	7000	6098	5258	4480	3764
20"	13.3"	Moment (ft. lbs.)	26898	25519	25379	25003	24210	22767	20391
		Shear (lbs.)	11200	9072	8092	7168	6300	5488	4732
22"	14.7"	Moment (ft. lbs.)	31902	30276	30152	29817	29110	27824	25707
		Shear (lbs.)	12320	10182	9189	8247	7356	6516	5727
24"	16.0"	Moment (ft. lbs.)	37279	35387	35275	34973	34337	33180	31274
		Shear (lbs.)	13440	11293	10290	9333	8423	7560	6743

NOTES for Allowable Shear and Moment Capacity Table

1. If the demand shear at the hole location exceeds 1/3 of the published allowable shear of the member, the maximum hole diameter shall be less than or equal to 1/3 the depth of the beam.
2. Hole shall be centered in the depth of the beam.
3. Minimum hole spacing shall be 2x maximum hole diameter.
4. Tabulated moment capacities have been adjusted by a volume factor Cv=(12/d)
5. CD=1.0 load duration was used for tabulated values.
6. Refer to details in this installation guide for hole placement requirements.
7. Reference document: APA Technical Note V900, equations (1) and (3) were used to calculate table values.

MULTIPLE MEMBER CONNECTIONS

GENERAL NOTES

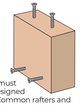
1. Maximum loads for fasteners are shown in the table on the facing page.
2. Connections are for uniform loads listed in this product guide. Concentrated or other load conditions require special design.
3. Make sure the load capacity of the beam meets or exceeds the load capacity of the fasteners.
4. 4-ply beams must be top loaded or loaded equally from both faces. For other load conditions, special design is required to avoid torsional stresses in the beam.
5. Do not use more than 4–plies for multiple member beams.

MULTIPLE MEMBER CONNECTIONS FOR TOP LOADED BEAMS

1. Load must be equally distributed to each ply of the multiple member beam.
2. Use the minimum connections; nails, bolts or screws from the SIDE LOADED table.

MULTIPLE MEMBER CONNECTIONS FOR SIDE LOADED BEAMS

1. Loads may be applied to either or both faces of the beam. Make sure load applied to either face does not exceed the value in the table.
2. Maximum Uniform Loads (PLF) shown in the table are for normal load duration. Appropriate Load Duration Factors may be applied to the values as permitted by the building code.



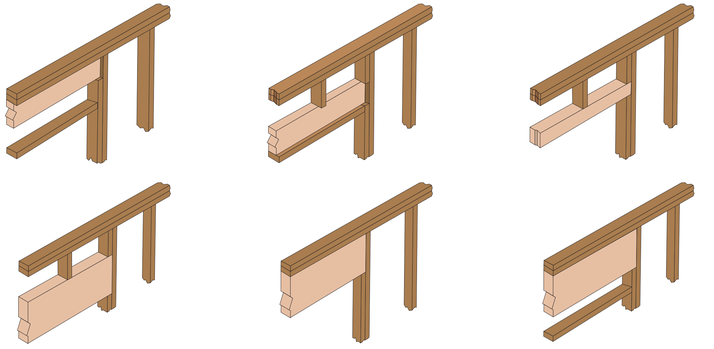
Ridge Beam

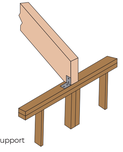
S-LAM Beam must be properly designed & supported. Common rafters and connections must be properly designed.

Connector	Nailing Parallel to Glue Line	Multiple Rows of Nails
8d Box	3"	4"
8d Common	3"	4"
10d and 12d Box	4"	5"
10d and 12d Common	4"	5"
16d Common	5"'	6"[3]

1. Move several rows 1/2" and step in an equal arrangement.
2. Minimum nail spacing may be reduced to 3" for 16c" wide members.
3. Nail penetration shall not exceed 2½" for 10d and 12d not 2" for 16d.

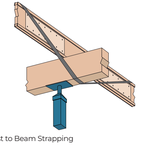
LVL HEADER ASSEMBLY EXAMPLES





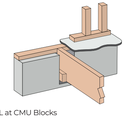
Lateral Support

S-LAM Beam LVL must be secured to plates with fasteners of approved connectors to prevent lateral movement.



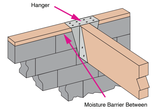
Joist to Beam Strapping

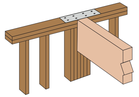
S-LAM Beam LVL can be used with approved strap connectors when properly fastened to post of column. See strap manufacturers details for approved fastening requirements.



LVL at CMU Blocks

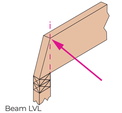
Use appropriate hangers for CMU Block Walls and treated top plate. Protect S-LAM Beam from direct contact with CMU as required by building code. For Beam Pocket conditions in concrete, S-LAM Beam must be protected from direct contact with concrete as required by building code. Use treated 2x spacer block-material when Beam Pocket is wider than LVL Beam.





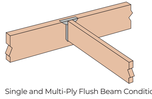
Drop Beam

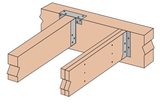
For dropped beam conditions which are flush to the wall plates, ensure proper bearing and plate splice is utilized per design professional.



Beam LVL

S-LAM Beam may be tapered cut from the bottom to the top of beam without reinforcement provided that the taper cut remains within the inside face of bearing.





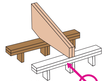
Single and Multi-Ply Flush Beam Conditions

For Single and Multi-Ply beam to beam connection, ensure the appropriate face mount or top flange hanger is used. Consult hanger manufacturer for capacities and connection requirements.

WARNING! DON'T DO

Tapered Bottom Cuts

Bird-Mouth Cuts are not permitted in S-LAM LVL without review by a licensed design professional.



Hip & Valley Cuts

Hip & Valley Rafter is required to be full depth (uncut) at inside edge of bearing.

Notches and Holes

Only circular holes are permitted.

DON'T:
Cut rectangular or any other holes. Drill larger holes than permitted. Drill holes except in permitted zones. Notch S-LAM beams.

Cope or notch beams over support.

CERTIFIED RAW MATERIAL

Upgrading the renewable raw material to PEFC products.

Currently, S-LAM wood use comes from PEFC certified forests. It secures future growth of forests, and indicates the sustainability of wood. Our chain of custody management systems enables us to monitor the origin and logistics chain of the wood we purchase throughout the entire value chain. Our network allows for efficient, reliable logistics.

SOFTWARE

S-LAM may be designed using Simpson EWP Design Studio™ and MiTek® design software. (Contact your S-LAM distributor).

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S-LAM provides competitive and environmentally friendly wood products for the construction industry and distribution partners. The products are manufactured from German Spruce, a sustainable raw material of premium quality. S-LAM is manufactured by Pollmeier Massivholz GmbH & Co. KG.

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