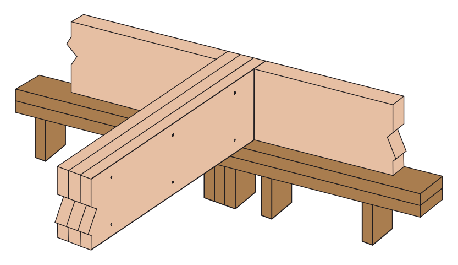
LVL
INSTALLATION GUIDE

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

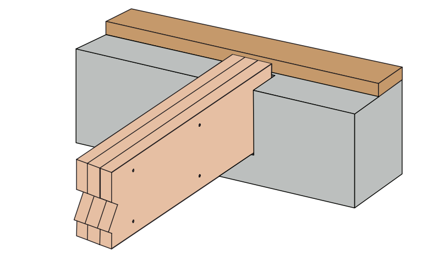
USA Version

INSTALLATION DETAILS FOR FLOORS



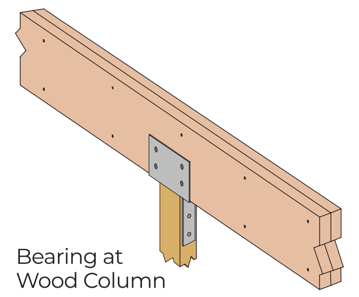
Bearing at Wall

PK-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.



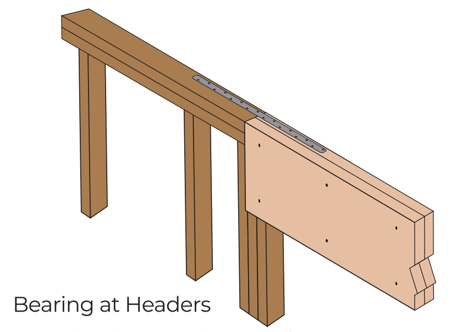
Bearing at Concrete Wall

Protect PK-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.



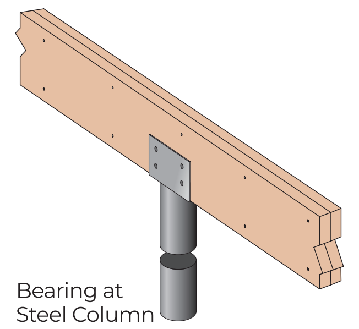
Bearing at Wood Column

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



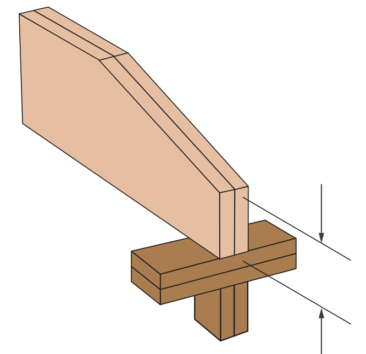
Bearing at Headers

Provide adequate bearing for PK-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 PK-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 PK-LAM Beams as specified in the table.
Scarf cuts may be specially designed by software or other competent analysis.

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.
- PK LAM must be properly installed and braced before any loads are applied to the structure.
- PK LAM is to be used in a dry, well ventilated environment.
- PK LAM is not to be used for unintended purposes such as ramps or planks.
- Handle PK LAM carefully to avoid damage. Store the product on stickers on a clean, level surface and keep it 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.

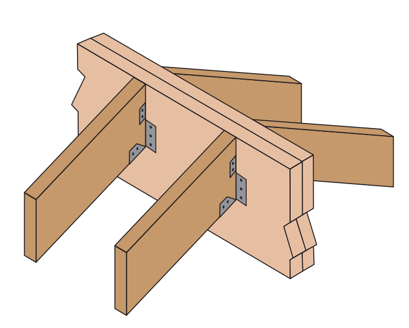
MULTIPLE PLIES:

10. 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
11. Beam plies (members) must be adequately connected by nails, screws or bolts as specified in this product guide or by competent analysis.
12. 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.
13. 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.
14. 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:

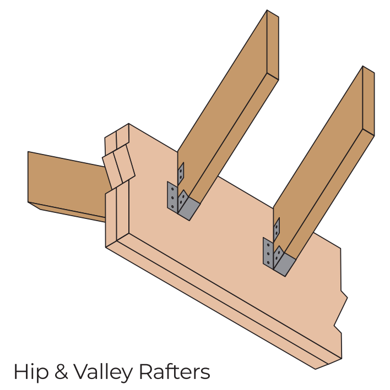
15. Make sure bearings are structurally adequate to carry the loads and are in compliance with building codes and regulations.
16. Bearing widths shown are required to support the maximum PLF loads shown. If less than maximum PLF load is applied to the beam, tabulated bearing widths may be reduced proportionally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

INSTALLATION DETAILS FOR ROOFS



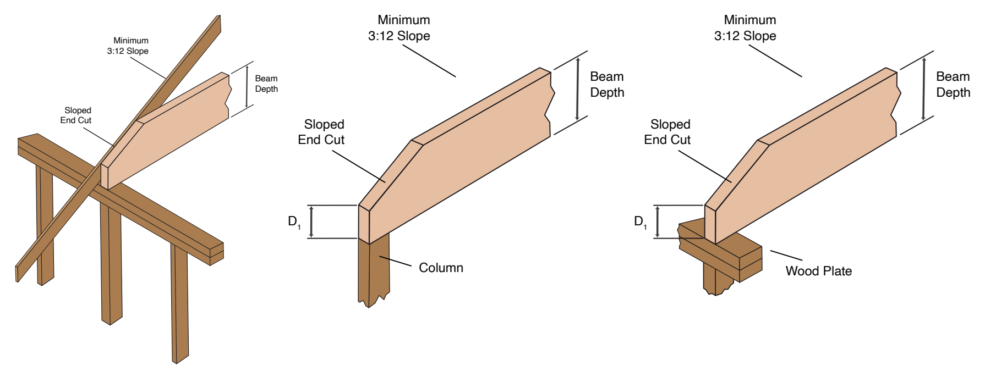
Ridge Beam

PK-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 ”	14”	16”	18”
1 ½” bearing	2284	2284	2284	2284	2284	2284	2284	2284
3” bearing	2707	3453	3547	4200	4200	4328	4568	4568
4 ½” bearing	2707	3453	3547	4200	4433	5227	5973	6720

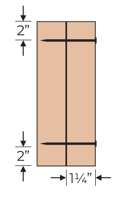
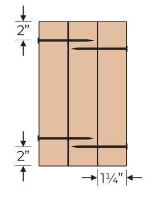
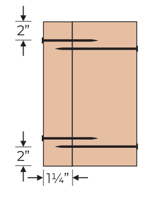
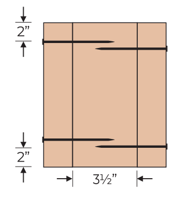
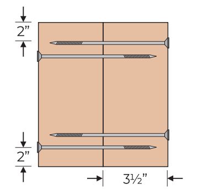
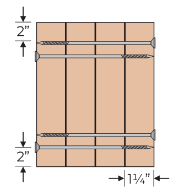
Reactions are for 1-ply 1 ¾” PK LAM. For 2-plies multiply by 2. For 3-plies multiply by 3

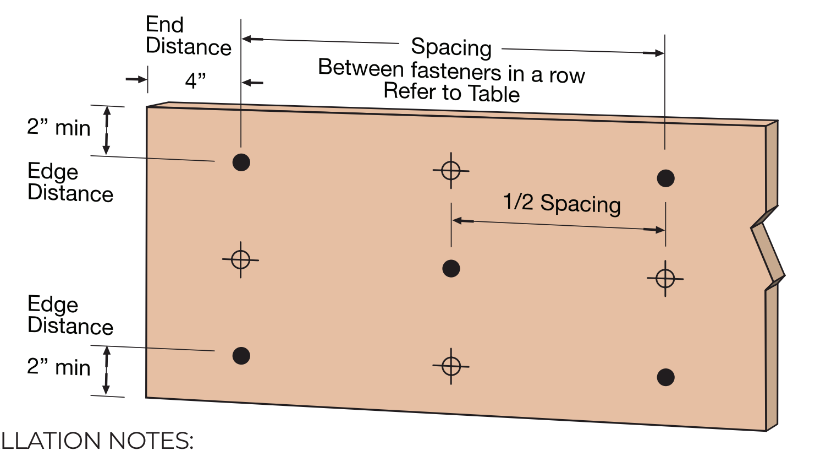
MINIMUM HEEL HEIGHT FOR SCARF CUTS (in)

1 ½” bearing	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
3” bearing	7.3	9.3	9.5	11.3	11.3	11.6	12.2	12.2
4 ½” bearing	7.3	7.3	9.5	11.3	11.9	14	16	18

MULTIPLE-MEMBER CONNECTIONS FOR SIDE-LOADED BEAMS

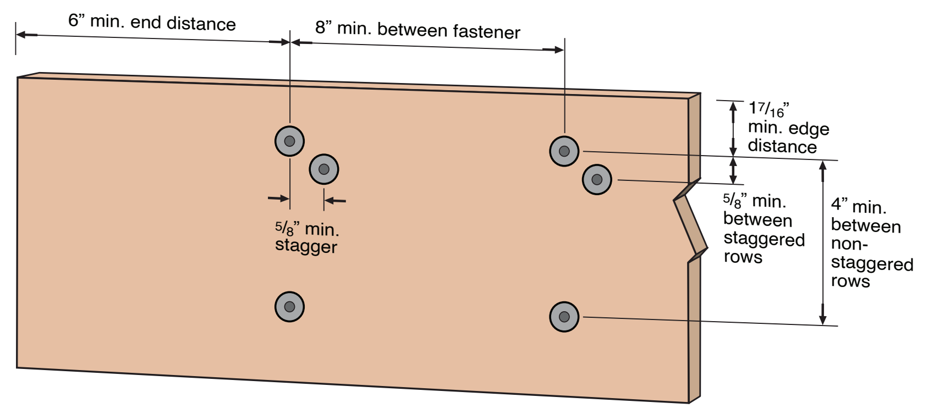
Maximum Uniform Load Applied To Either Outside Member (PLF).

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)	2-ply, 3 ½” (7” wide)	4-ply, 1 ¾” (7” wide)
Fastener Pattern (3)				**Assembly A** 	**Assembly B** 	**Assembly C** 	**Assembly D** 	**Assembly E** 	**Assembly F** 
16d Pneumatic Nail 0.131 x 3 ¼” (1)	As Shown	2	12	370	280	280	280	--	--
		3	12	560	420	420	420	--	--
				3 ½”	3 ½”	3 ½”	3 ½”	6”	6”
Simpson Strong-Tie SDS-Screw (2)	As Shown	2	24	680	510	510	455	1360	555
			19.2	850	640	640	565	1700	695
			16	1020	765	765	680	2040	835
			12	1360	1020	1020	910	2720	1110
MiTek WS Screw (2)	As Shown	2	24	640	480	480	425	--	475
			19.2	800	600	600	530	--	595
			16	955	720	720	640	--	715
			12	1280	960	960	850	--	950
MiTek WSWH Screw (2)	One Face	2	24	600	430	480	380	830	380
			19.2	750	535	600	475	1040	475
			16	905	645	720	575	1245	575
			12	1200	860	960	760	1660	760



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. SDW nails. End distance = 4”

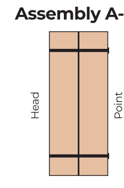
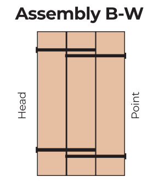
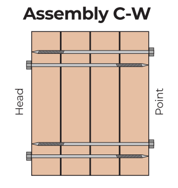
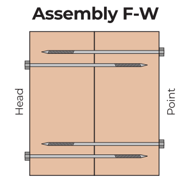


Spacing Requirements
Screwed Connection Assembly Types 1 & 2

1. Nailed connection values may be doubled for 6” on-center or tripled for 4” on-center nail spacing.
2. Where fasteners are installed on both faces, stagger fasteners on the second face so they fall between fasteners on the first face.
3. 7” wide beams should be side loaded only when loads are applied to both faces to minimize rotation.

MULTIPLE-MEMBER CONNECTIONS FOR SIDE-LOADED BEAMS

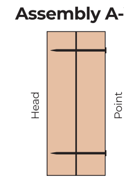
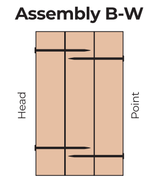
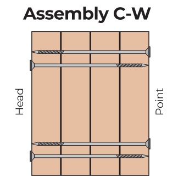
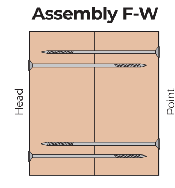
FastenMaster FlatLOK Fasteners Applied On One Face
Maximum Uniform Load Applied To Either Outside Member (PLF).

Fastener Type	Fastener Placement	Rows	Fastener On-Center Spacing (in)	Assembly Type 1			
				Assembly A-W 	**Assembly B-W** 	**Assembly C-W** 	**Assembly F-W** 
			Screw Length =	3 ³⁄₈”	5”	6 ¾”	6 ¾”
			Assembly Type (1) =	A-W	B-W	C-W	F-W
			Components (2) =	2-Ply LVL	3-Ply LVL	4-Ply LVL	2-Ply LVL
			Loaded Side (3) =	Either	Either	Either	Either
FastenMaster FlatLOK Screw (1)	As Shown	2	24	660	490	490	660
			19.2	830	620	620	830
			16	990	740	740	990
			12	1320	980	980	1320
FastenMaster FlatLOK Screw (1)	As Shown	2	24	990	740	740	990
			19.2	1240	920	920	1240
			16	1490	1110	1110	1490
			12	1980	1800	1800	990

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 1,100 plf and a point side load of 1,100 plf may be fastened together with 3 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” long.
4. Refer to the above chart for minimum spacing requirements for **FlatLOK** fasteners.

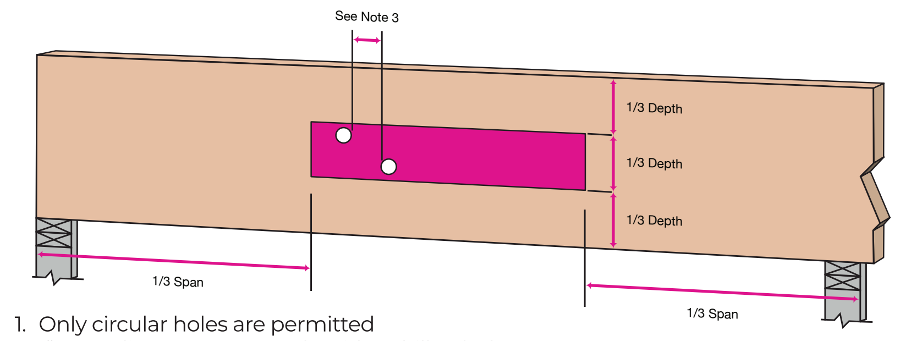
MULTIPLE-MEMBER CONNECTIONS FOR SIDE-LOADED BEAMS

Simpson Strong-Tie SDW EWP-PLY Fasteners Applied On One Face
Maximum Uniform Load Applied To Either Outside Member (PLF).

Fastener Type	Fastener Placement	Rows	Fastener On-Center Spacing (in)	Assembly Type 2					
				Assembly A-W 	**Assembly B-W** 		**Assembly C-W** 		**Assembly F-W** 
			Screw Length =	3 ³⁄₈”	5”	5”	6 ¾”	6 ¾”	6 ¾”
			Assembly Type (2) =	A-W	B-W	B-W	C-W	C-W	F-W
			Components (1) =	2-Ply SCL	3-Ply SCL	3-Ply SCL	4-Ply SCL	4-Ply SCL	2-Ply SCL
			Loaded Side (3) =	Either	Head	Point	Head	Point	Either
Simpson Strong-Tie® SDW EWP-PLY Screws (2)	As Shown	2	24	800	600	450	535	400	800
			19.2	1040	780	585	694	520	1040
			16	1200	900	675	800	600	1200
			12	1600	1200	900	1065	800	1600
Simpson Strong-Tie® SDW EWP-PLY Screws (2)	As Shown	2	24	1200	900	675	800	600	1200
			19.2	1560	1170	879	1040	780	1560
			16	1800	1350	1015	1200	900	1800
			12	2400	1800	1350	1600	1200	2400

1. SCL refers to Structural Composite Lumber consisting of LVL, PSL, and LSL assemblies.
2. 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 1,300 plf and a point side load of 1,000 plf may be fastened together with three rows of **SDW** at 16” o.c. between fasteners in a row.)
3. When hangers are installed on point side, hanger face fasteners shall be a minimum of 3” long.
4. Refer to the above chart for minimum spacing requirements for **SDW EWP-PLY** fasteners.

ALLOWABLE HOLES FOR UNIFORMLY LOADED BEAMS



1. Only circular holes are permitted
2. 1” max. diameter, cut neatly with a drill or hole saw.
3. For other hole configurations, use Simpson Strong Tie 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” PK-LAM BEAMS

Beam Depth	Max Hole	Design Property	Circular Hole Diameter					
			2”	3”	4”	5”	6”	7”
9 ¼”	3.7”	Moment (ft. lbs.)	3948	2934	2070			
		Shear (lbs.)	2121	1577	1112			
9 ½”	3.8”	Moment (ft. lbs.)	4202	3156	2259			
		Shear (lbs.)	2211	1660	1189			
11 ¼”	4.5”	Moment (ft. lbs.)	6168	4907	3789	2816		
		Shear (lbs.)	2839	2259	1744	1296		
11 ⁷⁄₈”	4.75”	Moment (ft. lbs.)	6950	5614	4420	3369		
		Shear (lbs.)	3066	2476	1950	1486		
14”	5.6”	Moment (ft. lbs.)	9915	8331	6885	5577	4407	
		Shear (lbs.)	3840	3227	2667	2160	1707	
16”	6.4”	Moment (ft. lbs.)	13122	11314	9641	8101	6695	
		Shear (lbs.)	4573	3943	3360	2823	2333	
18”	7.2”	Moment (ft. lbs.)	16720	14695	12801	11038	9405	7903
		Shear (lbs.)	5310	4667	4065	3505	2987	2510
20”	7.2”	Moment (ft. lbs.)	20698	18462	16354	14374	12521	10796
		Shear (lbs.)	6048	5395	4779	4200	3659	3155
22”	7.2”	Moment (ft. lbs.)	25047	22605	20288	18097	16030	14089
		Shear (lbs.)	6788	6126	5498	4904	4344	3818
24”	7.2”	Moment (ft. lbs.)	29758	27115	24594	22196	19921	17769
		Shear (lbs.)	7529	6860	6222	5616	5040	4496

NOTES for Allowable Shear and Moment Capacity Table

1. Reference document: APA Technical Note V900D, equations (1) and (3) were used to calculate the table values.
2. Values are limited to horizontal round holes.
3. Hole diameter shall not exceed ²⁄₃ the LVL depth.
4. Refer to details in this installation guide for hole placement requirements.
5. Tabulated moment capacities have been adjusted by a volume factor, Cv = (12/d)0.21
6. Normal load duration CD = 1.0 was used for tabulated values.

MULTIPLE MEMBER CONNECTIONS

GENERAL NOTES

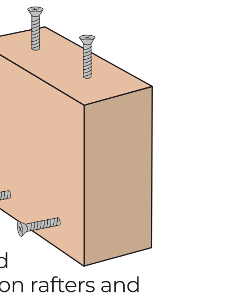
1. Maximum loads for fasteners are shown in the table on the facing page.
2. Connections are for uniform loads listed in this product guide. Concentrated or other load conditions require special design.
3. Make sure the load capacity of the beam meets or exceeds the load capacity of the fasteners.
4. 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.



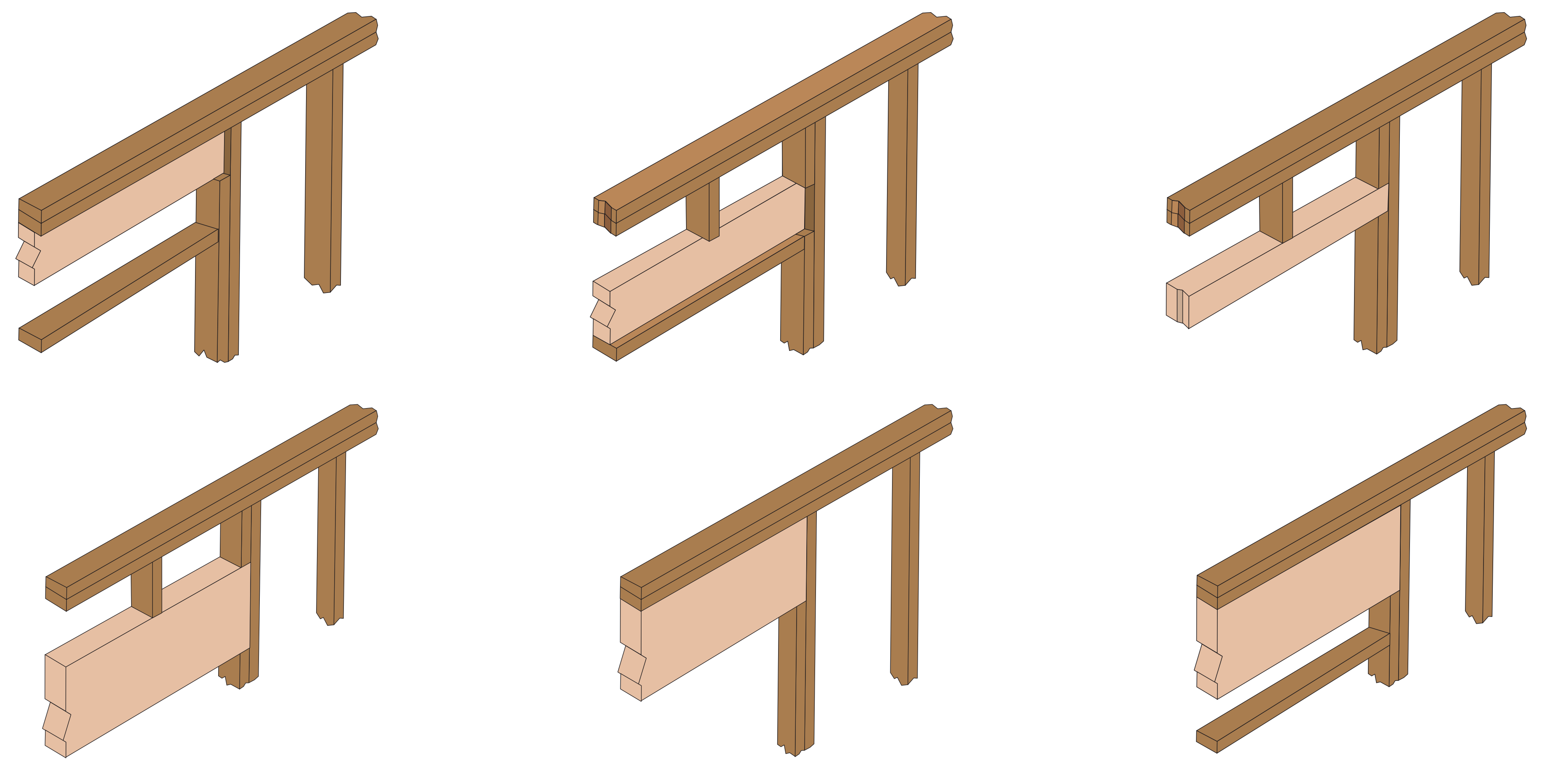
Ridge Beam

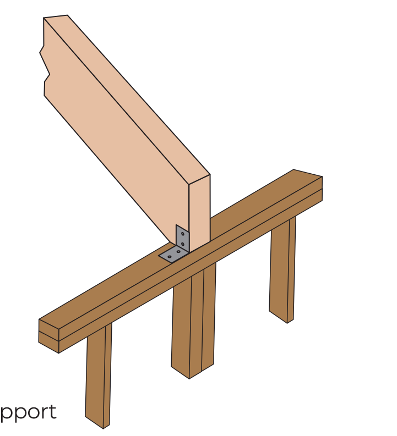
PK-LAM Beam must be properly designed & supported. Common rafters and connections must be properly designed.

Connector	Nailing Parallel to Glue Line	Nailing Perpendicular to Glue Line
8d Box	3”	2”
8d Common	3”	2”
10d and 12d Box	4”	2”
10d and 12d Common	4”	3”
16d Common	8”*	3”

*Not allowed on product thickness less than 1 ½”

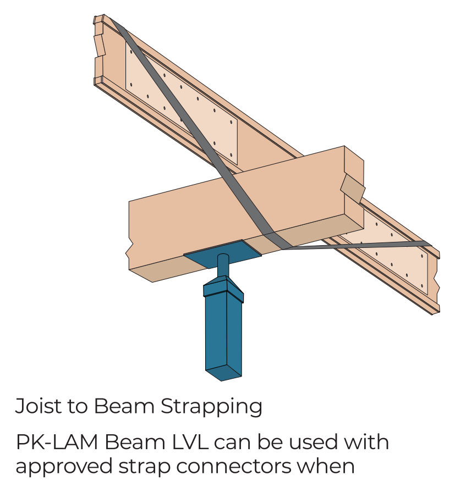
LVL HEADER ASSEMBLY EXAMPLES





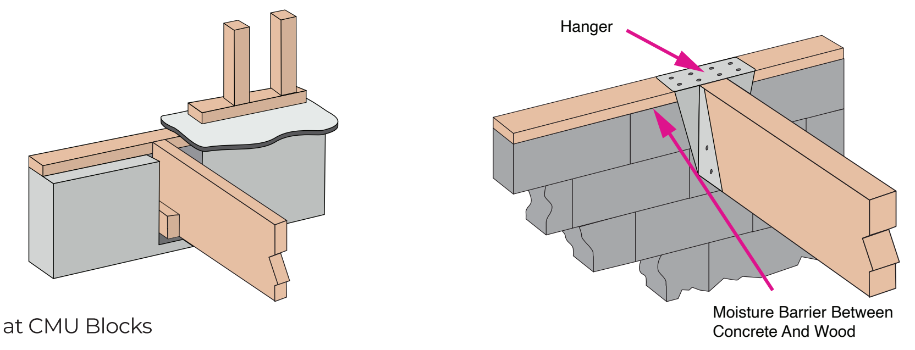
Lateral Support

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



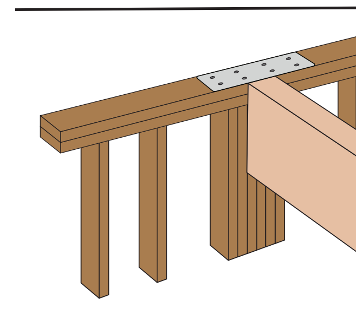
Joist to Beam Strapping

PK-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.



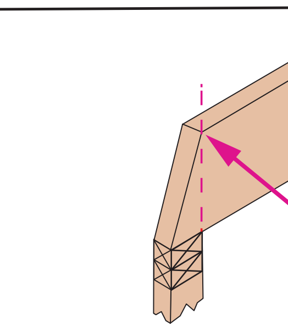
LVL at CMU Blocks

Use appropriate hangers for CMU Block Walls and treated top plate. Protect PK-LAM Beam from direct contact with CMU as required by building code. For Beam Pocket conditions in concrete, PK-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.



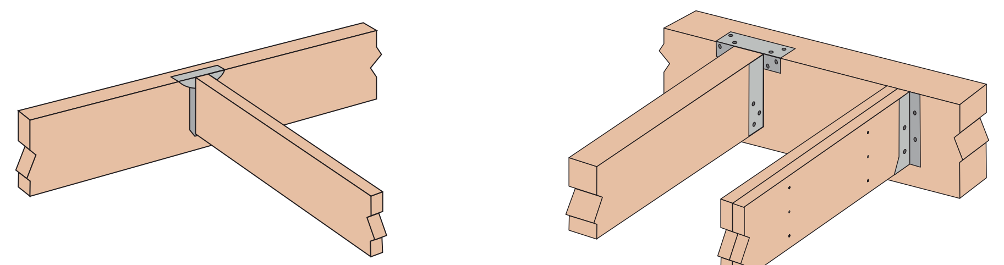
Drop Beam

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



Beam LVL

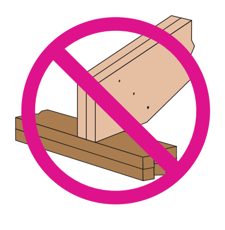
PK-LAM Beam may be tapered cut from the bottom to the top of beam without reinforcement provided that the taper cut remains within the inside face of bearing.



Single and Multi-Ply Flush Beam Conditions

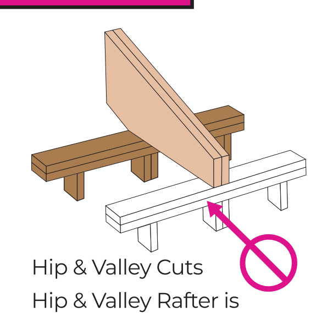
For Single and Multi-Ply beam to beam connection, ensure the appropriate face mount or top flange hanger is used. Consult hanger manufacturer for capacities and connection requirements.

WARNING! DON’T DO



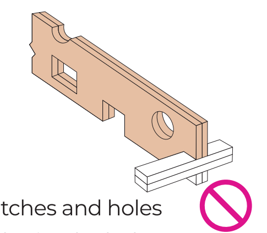
Tapered Bottom Cuts

Bird-Mouth Cuts are not permitted in PK-LAM S 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 PK-LAM beams.

Cope or notch beams over support.

CERTIFIED RAW MATERIAL

Upgrading the renewable raw material to high-quality products.

Currently, PK-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
PK-LAM may be designed using CSD® iStruct® design software. (Contact your PK-LAM distributor).

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PK-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. PK-LAM is manufactured by Pollmeier Massivholz GmbH & Co. KG.

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