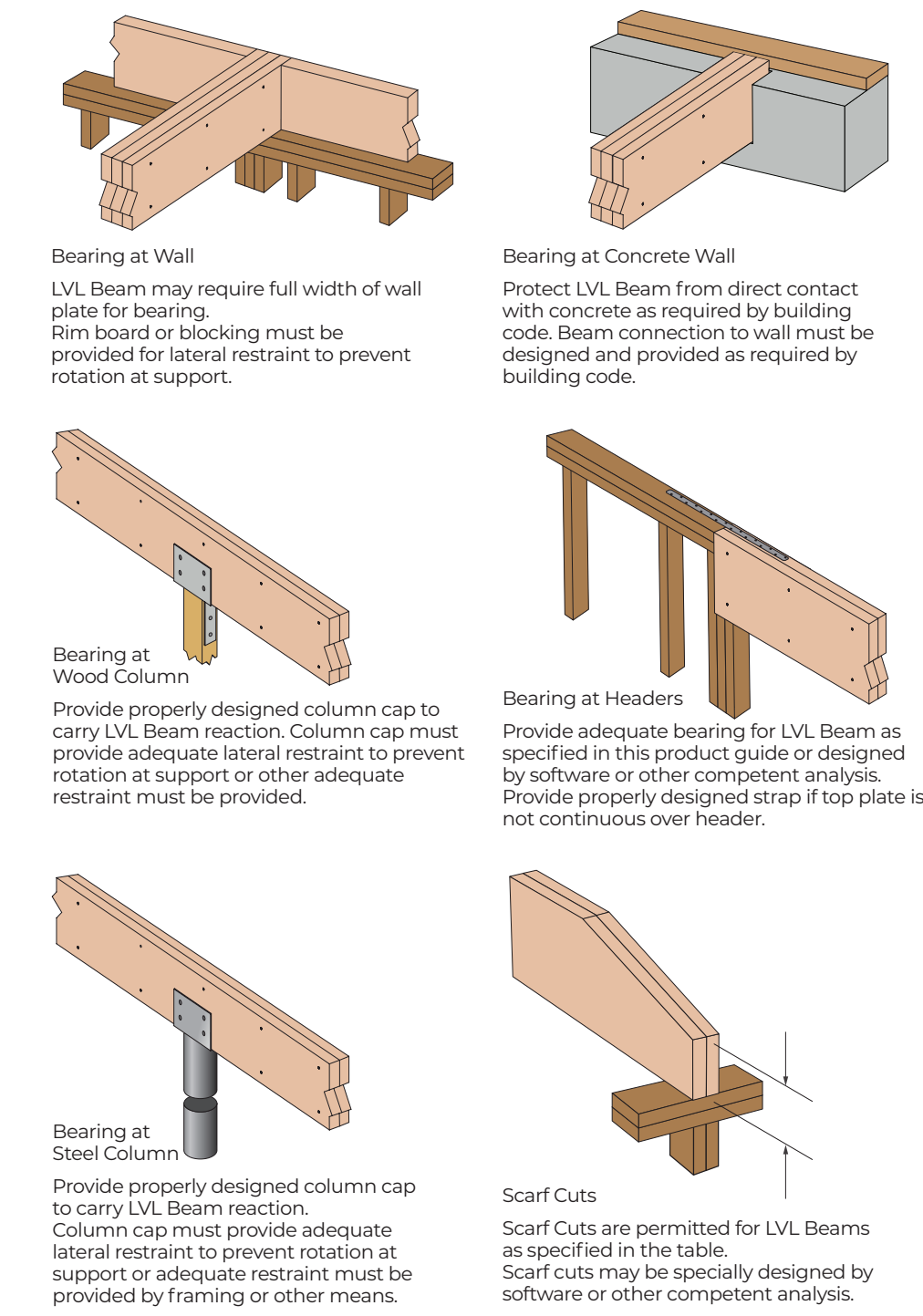




INSTALLATION DETAILS FOR FLOORS



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.
- Murphy LVL must be properly installed and braced before any loads are applied to the structure.
- Murphy LVL is to be used in a dry, well ventilated environment.
- Murphy LVL is not to be used for unintended purposes such as ramps or planks.
- Handle Murphy LVL 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
- Tables are for simple span beams (with a support at each end) and uniformly distributed loads.
 - Continuous lateral restraint must be provided at the top (compression) edge of the beam to prevent buckling.
 - For other span, load or restraint conditions, design the beam using iStruct® software or other competent analysis.
 - Lateral restraint is required at supports to prevent rotation of the beam.

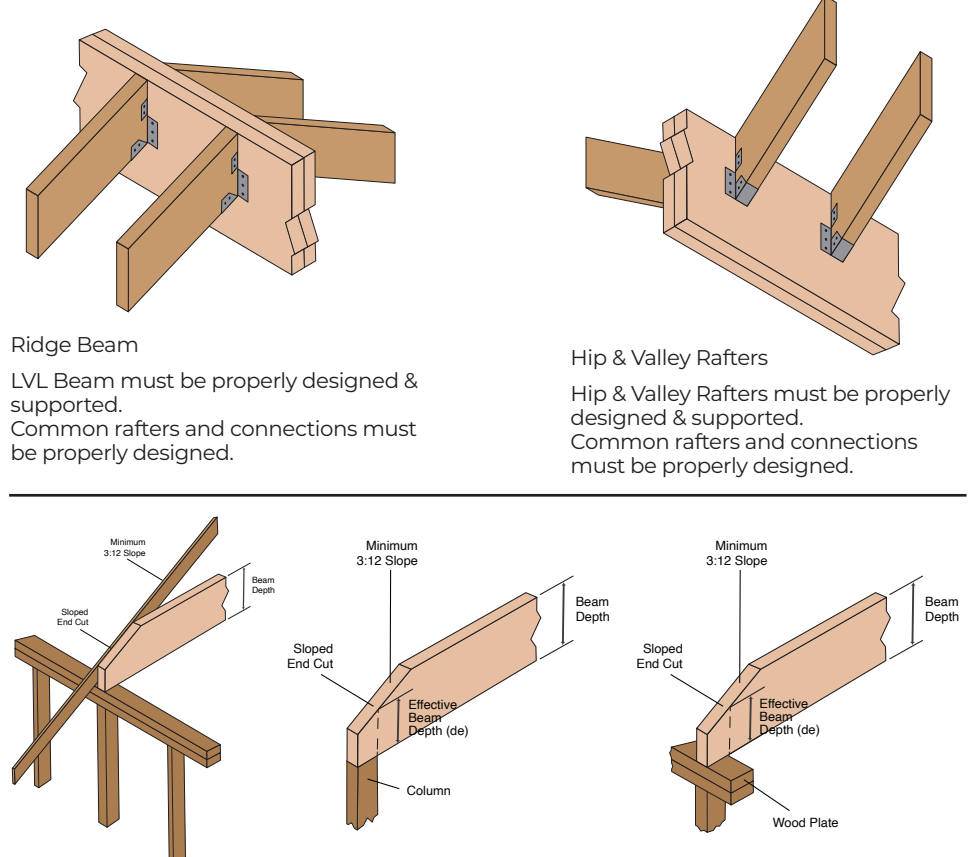
MULTIPLE PLIES:

- Loads are for one-ply (member) 1 3/4" thick. Multiply the loads: x 2 for 2-ply beams, x 3 for 3-ply beams, x 4 for 4-ply beams
- Beam plies (members) must be adequately connected by nails, screws or bolts as specified in this product guide or by competent analysis.
- Two (2) or more 1 3/4" plies are recommended for depths greater than 14 inches. If a single 1 3/4" 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-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.
- 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:

- Make sure bearings are structurally adequate to carry the loads and are in compliance with building codes and regulations.
- 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.
- This value may be conservative, specific analysis may produce a better result.

INSTALLATION DETAILS FOR ROOFS



MAXIMUM REACTION FOR SCARF CUTS (lbs)

Depth	7 1/4"	9 1/4"	9 1/2"	11 1/4"	11 1/2"	14"	16"	18"
1 1/2" bearing	1472	1878	1929	2284	2411	2842	3248	3654
3 1/2" bearing	1472	1878	1929	2284	2411	2842	3248	3654
5 1/4" bearing	1472	1878	1929	2284	2411	2842	3248	3654

Footnotes:

- Beam shear values in the table are for 1 1/2" wide beams. For a 3 1/2" wide beam, multiply the value by 2. For a 5 1/2" beam, multiply the value by 3. For a 7 1/2" beam, multiply the value by 4.
- Values are based on 312 slope cut and can be used for slopes from 312 to 712. For slopes greater than 712, consult a design professional.
- Values are based on minimum heel heights and are calculated using the effective depth (de) of the beam at the face of support.
- It is the designer's responsibility to calculate the compression bearing capacity of the supporting member.
- No increase for duration of load is permitted.
- Concentrated loads are not allowed in the tapered beam cut area.

MINIMUM HEEL HEIGHT FOR SCARF CUTS (in)

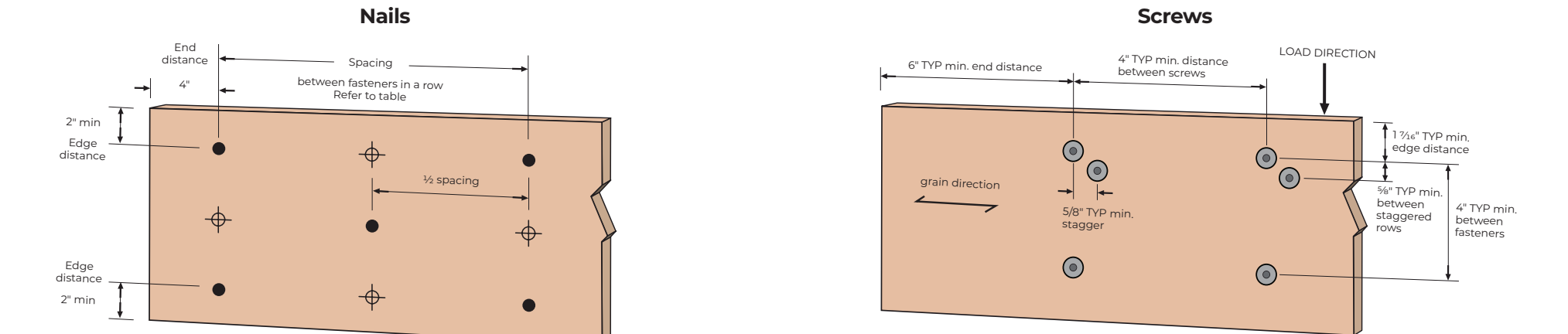
1 1/2" bearing	4.0	5.2	5.3	6.4	6.8	8.0	9.2	10.4
3 1/2" bearing	3.5	4.7	4.8	5.9	6.3	7.5	8.7	9.9
5 1/4" bearing	3.0	4.2	4.4	5.4	5.8	7.1	8.3	9.5

Footnotes:

- Beam heel height is measured at the outside face of the supporting member.
- Values are based on 312 slope cut. For other slopes, heel height must be calculated.
- Values are based on the beam's minimum effective depth (de) (d-dc), measured at the inside face of the supporting member, where d=uncut beam depth.

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 1/4" (3 1/2" wide)	3-ply, 1 1/4" (5 1/4" wide)	2-ply, 1 1/4"/3 1/2" (5 1/4" wide)	3-ply, 1 1/4"/3 1/2" (7" wide)
Nail Fastener Pattern ^(A)							
Assembly A							
Assembly B							
Assembly C							
Assembly D							



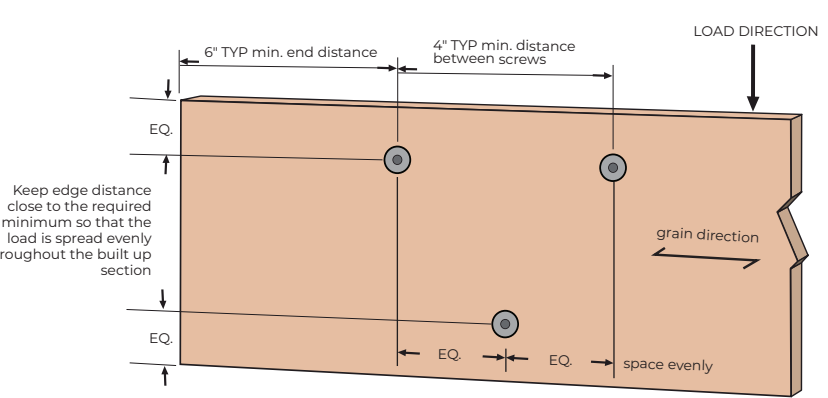
INSTALLATION NOTES:

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

Nails: ● Head side ⊕ Point side

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

Spacing Requirements Screwed Connection Assembly Types - All



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

Fastener Type	Fastener Placement	Rows	Fastener On-Center Spacing (in)	2-ply, 1 1/4" (3 1/2" wide)	3-ply, 1 1/4" (5 1/4" wide)	2-ply, 1 1/4"/3 1/2" (5 1/4" wide)	3-ply, 1 1/4"/3 1/2" (7" wide)	3-ply, 1 1/4"/3 1/2" (7" wide)	3-ply, 1 1/4"/3 1/2" (7" wide)
Screw Fastener Pattern ^(A)									
Assembly A									
Assembly B									
Assembly C									
Assembly D									
Assembly E									
Assembly F									

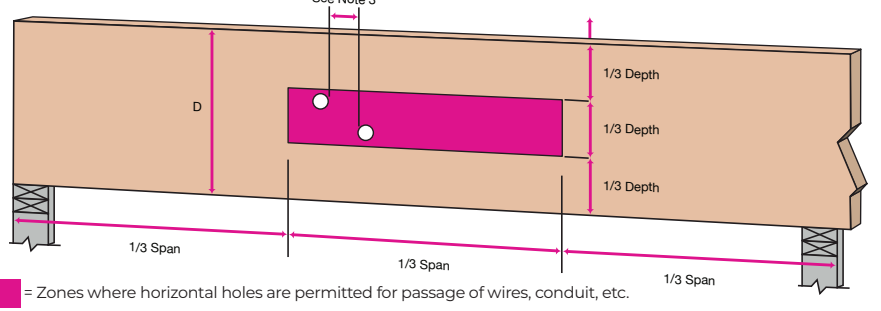
Screw Length Brand		3 3/8" SDW22338	5" SDW22500	5" SDW22500	6 3/4" SDW22634	6 3/4" SDW22634	6 3/4" SDW22634
Simpson Strong-Tie SDW EWP-Ply Screw ^(A)	As Shown	2	24	750	500 Head, 325 Point	750	500 Head, 325 Point
			9.2	1000	750 Head, 500 Point	1000	600 Head, 500 Point
			16	1300	1000 Head, 750 Point	1300	750 Head, 500 Point
			12	1500	1300 Head, 1100 Point	1500	1000 Head, 750 Point
Screw Length Brand		3 3/8" VSWH338	5" VSWH5	5" VSWH5	6 3/4" VSWH634	6 3/4" VSWH634	6 3/4" VSWH634
Mitek WSWH Screw ^(A)	As Shown	2	24	635 Head, 600 Point	535 Head, 430 Point	535	715
			19.2	800 Head, 755 Point	655 Head, 535 Point	670	895
			16	950 Head, 905 Point	805 Head, 645 Point	805	1075
			12	1270 Head, 1205 Point	1075 Head, 860 Point	1075	1430
Screw Length Brand		3 1/4" FL32	5" FL05	5" FL05	6 3/4" FL634	6 3/4" FL634	6 3/4" FL634
FastenMaster FlatLOK-FL02 Screw ^(A)	As Shown	2	24	660	490	660	750
			19.2	825	615	825	1000
			16	990	735	990	1300
			12	1320s	980	1320	1300

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

ADDITIONAL NOTES

- 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 assembly with a head side load of 755 plf and a point side load of 755 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.
- When hangers are installed on point side, hanger face fasteners shall be a minimum of 3" long, a factor of 0.75.
- When hangers are installed on point side, hanger face fasteners shall be a minimum of 3 3/8" long.

PERMISSIBLE HOLE LOCATIONS FOR LVL BEAMS UNDER UNIFORM LOADS



- For beam depth of 3 1/4", 5 1/2", and 7 1/4", the maximum hole diameter is 3/4", 1 1/4", and 1 1/2", respectively. For deeper beams, the maximum diameter is 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".
- 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 3/4" LVL BEAMS

Beam Depth	Max Hole	Design Property	Circular Hole Diameter	2"	3"	4"	5"	6"	7"
9 1/4"	6.2"	Moment (ft. lbs.)	6809	6381	6023	5060	3030	0	0
		Shear (lbs.)	4694	2884	2143	1512	991	580	0
9 1/2"	6.3"	Moment (ft. lbs.)	7142	6700	6363	5421	3455	0	0
		Shear (lbs.)	4821	3005	2257	1616	1082	654	0
11 1/4"	7.5"	Moment (ft. lbs.)	9666	9113	8831	8071	6469	3556	0
		Shear (lbs.)	5709	3860	3070	2371	1762	1343	815
11 1/2"	7.9"	Moment (ft. lbs.)	10649	10061	9787	9075	7574	4845	352
		Shear (lbs.)	6227	4168	3366	2650	2020	1475	1016
14"	9.3"	Moment (ft. lbs.)	14298	13529	13313	12730	11500	9264	5582
		Shear (lbs.)	7105	5220	4396	3625	2936	2320	1776
16"	10.7"	Moment (ft. lbs.)	18158	17205	17021	16524	15478	13576	10443
		Shear (lbs.)	8120						