Murphy LVL Installation Guide

MURPHY
Engineered Wood

Murphy Company

For over 100 years, Murphy Company has manufactured wood products for discerning customers who demand quality.

From green and dry softwood veneer (White City, OR and Elma, WA), to softwood plywood (Rogue River, OR), Hardwood Plywood (Eugene, OR), or Engineered Douglas-fir LVL (Sutherlin, OR), we understand our customers' needs and provide solutions for demanding market conditions.

Controlling the entire process, from "log to finished product," allows us to customize your product at a competitive price.

Douglas fir LVL

Providing the superior performance and durability of engineered wood, Murphy Company LVL is perfectly suited to spans bearing heavy loads and multi-span applications. Common problems associated with lumber sizes – like decreased dimensional stability and uniformity – do not apply to our LVL, which utilizes ultrasonically tested and graded Douglas fir veneer.

Engineered for Quality

Checking is minimized because Murphy Company LVL is cured in a controlled process in which water-proof adhesives boost stability and reduce warps and twists. All products are machine-ripped to generate uniform size and rigid, flat surfaces with inherently superior nail-holding characteristics.

We are confident that our products will provide our customers with consistent high performance when handled and installed in accordance with our installation instructions.

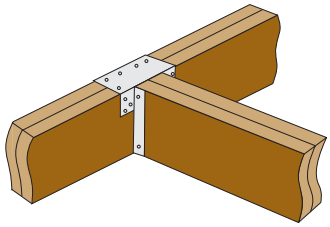
Tested for strength and engineered for quality, Murphy Company LVL represents our ongoing commitment to unsurpassed performance and service.

Murphy Company LVL is third-party tested by the APA (The Engineered Wood Association), a leading industry quality assurance organization.

General notes for this product guide:
1. All tables assume dry conditions. Calculations are based on NDS and IBC and ICC-ESR#2913.
2. Lateral support of the compression edge of all beams must be provided at 24" on center.
3. Application tables include live load reductions applied in accordance with 2012 IBC.
4. Tables apply to Dead, Floor Live, Roof Live and Snow loads. Lateral loads must be considered by the building designer.
5. This design manual is intended to be used for preliminary design purposes; a complete structural analysis should be performed by a design professional.
6. Beams that are 13/4" x 16" and deeper require multiple plies.

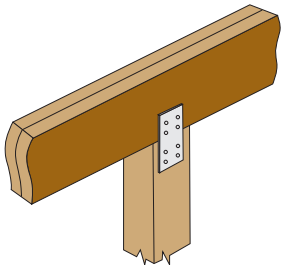
Connection Details

Beam-to-Beam Connection



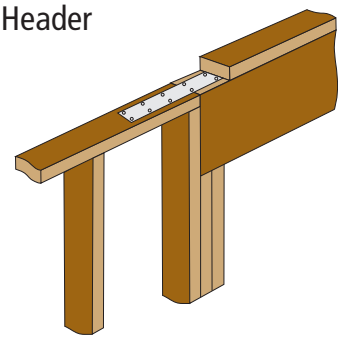
Install hanger per manufacturer's instructions. Hanger must distribute load to each ply of the assembly. Contact Murphy Company technical support with questions.

Bearing on Wood Column



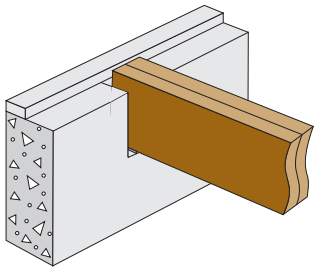
Install column cap per manufacturer's instructions; verify cap and column capacity.

Bearing for Door or Window Header



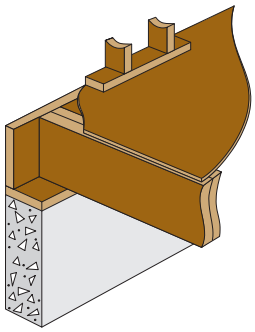
Strap per building code if top plate is not continuous over header.

Beam Pocket in Masonry Wall



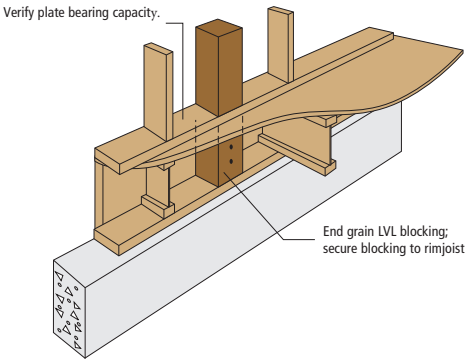
Protect LVL from moisture with a vapor barrier and airspace. LVL should not directly contact concrete.

Bearing on Exterior Wall



LVL should not directly contact concrete. Verify plate bearing capacity.

Solid Blocking at Post



Provide a continuous load path to concrete.

Minimum Nail Spacing

for nails installed parallel to the glueline

Nail Size	Single Row	Multiple Rows[1]
8d Common (2 1/2")	3"	4"
10d Common (3")	4"	5"
12d Common (3 1/4")	4"	5"
16d Common (3 1/2")	5"	6"[2]

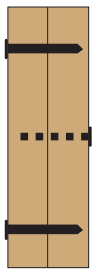
1. Offset multiple rows 1/2" and stagger nails on equal-equal layout
2. Minimum nail spacing may be reduced to 5" for 1 3/4" wide members
3. Nail penetration shall not exceed 2 1/2" for 10d and 12d nor 2" for 16d

Multiple Piece Assembly & Side Load Capacity

When assembling more than one LVL ply into a single load-bearing beam, follow the appropriate guidelines:

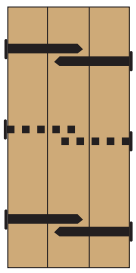
Detail A

Maximum
3 1/2" wide
2-ply beams



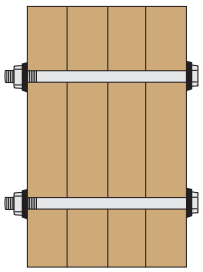
Detail B

Maximum
5 1/4" wide
3-ply beams



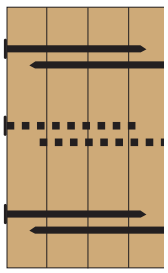
Detail C

Maximum
7" wide
4-ply beam



Detail D

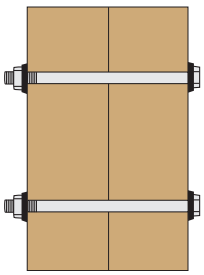
Maximum
7" wide
4-ply beam



Simpson SDS
1/4" x 6" screws
(or equal)

Detail E

Maximum
7" wide
2-ply beam



3 1/2" 3 1/2"

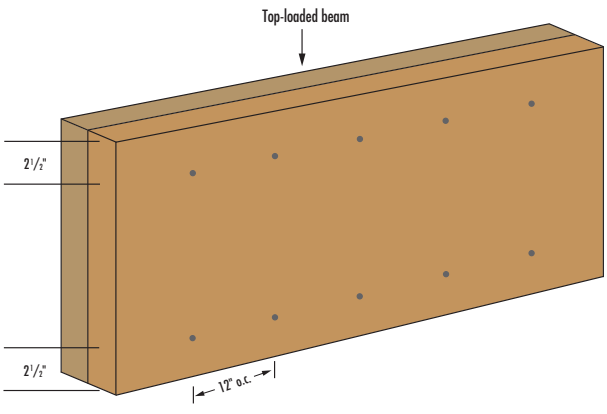
Uniform Side-load Capacity (plf)

Connection Detail	2 Rows of 10d Box Nails at 12" oc	3 Rows of Nails 10d Box Nails at 12" oc	2 Rows of 1/2" dia. Bolts at 24" oc	2 Rows of 1/2" dia. Bolts at 12"oc
A	365	545	500	1000
B	270	410	375	750
C	-	-	335	670
D	Refer to Simpson Strong-Tie catalog for SDS capacities			
E	-	-	855	1715

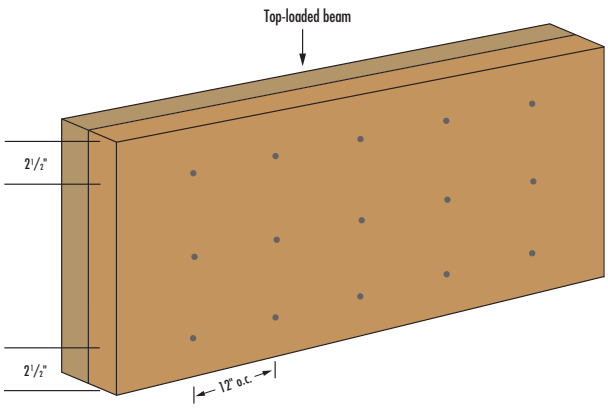
Notes:

1. Design values based on 2005 NDS and PR-L283 APA and ICC-ES ESR-2913 Product Report.
2. Dry conditions of use.
3. Design values may be increased for load duration; see 2006 NDS.
4. Verify load capacity of framing member in addition to connection design.
5. Use minimum two rows of fasteners for up to 11 7/8" LVL beam depth and minimum three rows of fasteners for 14" to 18" LVL beam depths. For 20" to 24" LVL beam depths, contact Murphy Company.

Connection of Multiple Pieces for Top-loaded Beams



Minimum of 2 rows of 16d (3 1/2") nails at 12" o.c. for 9 1/2" through 11 7/8" beams.

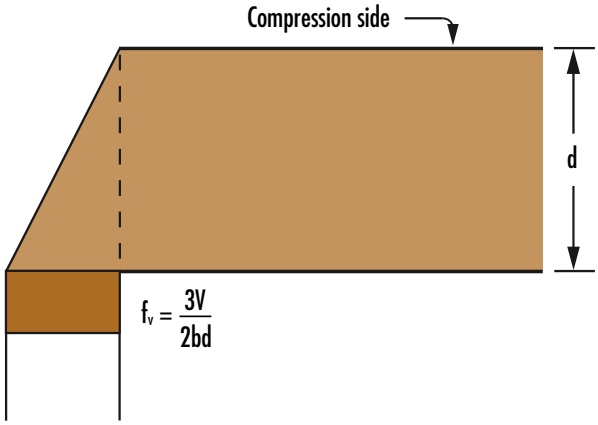


Minimum of 3 rows of 16d (3 1/2") nails at 12" o.c. for 14" through 24" beams.

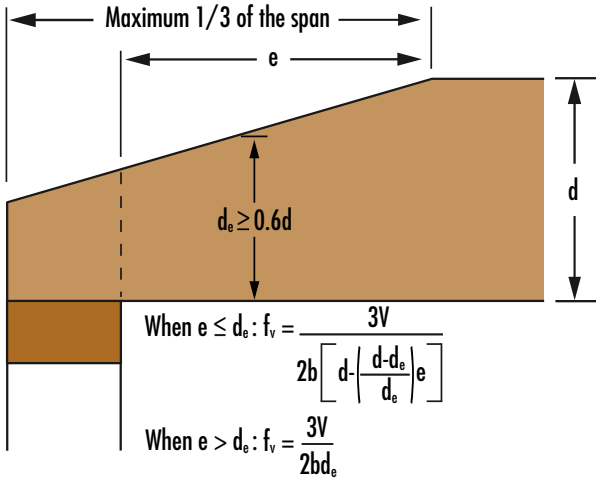
Notching Details

Shear Design Equations for Notched and Tapered LVL Beams

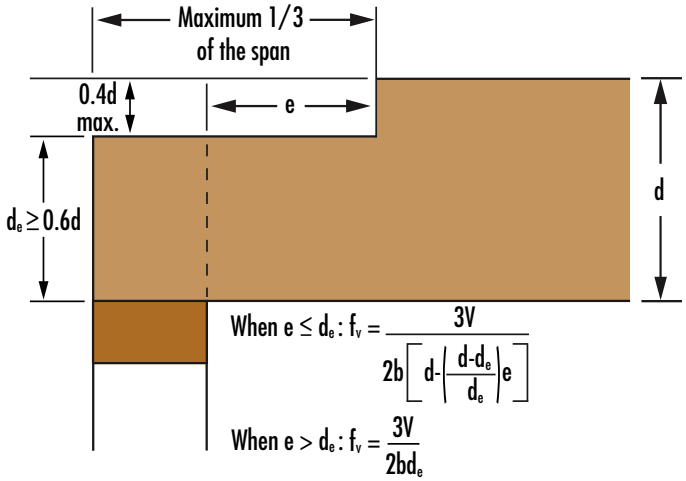
Slope Bearing End



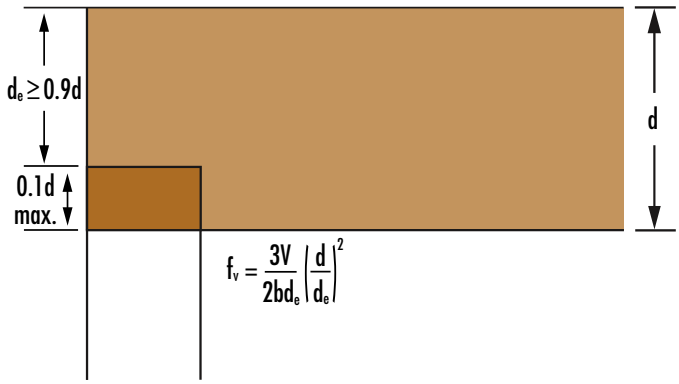
Sloped End Cut for Roof Drainage



Compression-side Notch

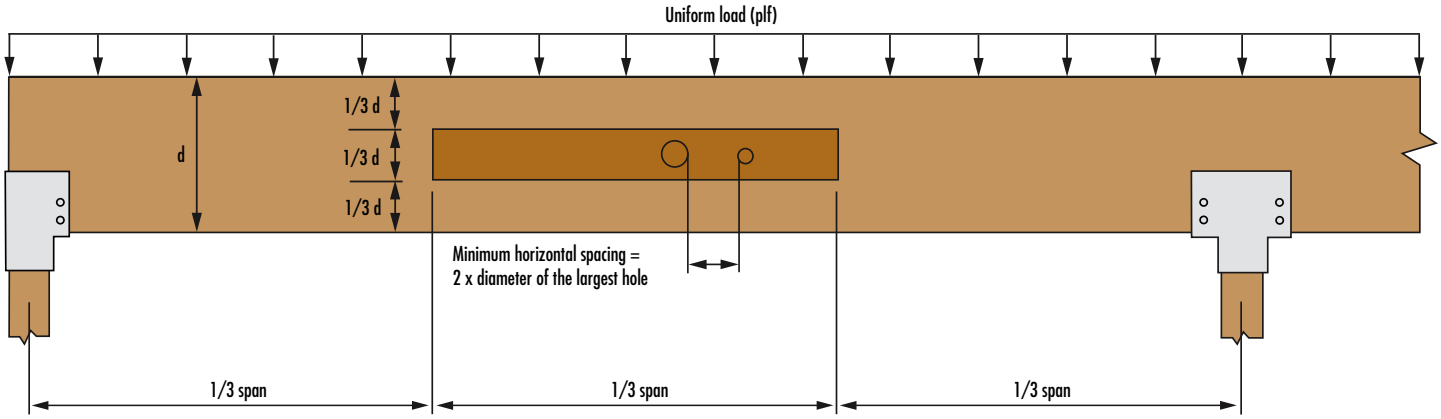


Tension-side Notch



f_v = shear stress (psi)
d = depth of beam (in.)
V = shear force at notch (lbf)
d_e = effective depth as shown (in.)
b = width of beam (in.)
e = length of notch as shown (in.)

Permissible Hole Locations for LVL Beams Under Uniform Loads



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

1. 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".
2. The maximum number of holes for each span is limited to 3.
3. Holes should not be cut in cantilevers.

Notes:

Clear Sealer

All Murphy Company LVL is fully sealed with a factory applied industry-leading premium grade sealer. The sealer repels water absorption and improves durability during typical distribution yard and jobsite storage conditions.

FSC® Certification

Murphy Company has achieved Forestry Stewardship Council® Chain of Custody Certification (FSC® C011299). This certification ensures that Murphy's customers have a verifiable connection between their companies and certified manufacturers who adhere to the requirements of the FSC® certification program. Murphy Company LVL products are available with this chain of custody certification. Builders who utilize products manufactured from forests certified by FSC®, with an intact chain of custody, can qualify for points in the US Green Building Council's LEED system, a third-party certification program and benchmark for the design, construction, and operation of high-performance green buildings. (FSC® certified panels available upon request: FSC® C011299).

Sizing Software

To better assist engineers, designers, and specifiers, we've partnered with Calculated Structured Designs, an industry leader in software development. iStruct™ is a state of the art layout, design, and structural analysis enterprise solution that combines layout/drafting, single member design, reporting, and an incredible real time 3D experience while supporting a selection of products, including I-joists, LVL, lumber, walls, rimboard, hangers, etc.

Handling and Storage Guidelines

- LVL should be protected from the weather and stored lying flat.
- Product must not be stored in contact with the ground.
- Store LVL in wrapped bundles, provide air circulation and support bundles with 2x4 stickers.
- Protect from the weather on the job site both before and after installation. LVL is intended for use in covered, dry conditions only.
- Except as described in this product guide, LVL should not be cut, drilled or notched.
- Do not install wet or visually damaged product.
- Once a factory sealed LVL product is cut, a coat of water repellent sealer should be applied to the freshly cut end to prevent moisture from entering the cut end.

Murphy

Limited Lifetime Warranty
Murphy Laminated Veneer Lumber

We warrant to each Qualified Owner (as defined below) that Murphy laminated veneer lumber (Murphy LVL) is manufactured in accordance with the exacting standards (as prescribed in the APA-EWS Quality Control Manual) and is free from defects in materials and workmanship for the expected life of the structure in which it is installed. "Qualified Owner" is any person who purchases a residential structure in which any Murphy LVL has been selected, purchased, handled and installed in accordance with our installation instructions by a person who has been trained in the installation of Engineered Wood Products.

Conditions:
We must be given reasonable prior notice and opportunity to inspect any Murphy LVL before we will honor any claim under this warranty. If inspection confirms that a defect exists and has caused a structural problem, we may repair or replace (at our option) the product at our expense. Any defect or damage resulting in whole or part from exposure to the elements, fire or natural disaster, improper handling, improper use or improper installation techniques is NOT our responsibility and is NOT covered by this warranty.

DISCLAIMER:
THE LIMITED LIFETIME WARRANTY STATED ABOVE IS EXCLUSIVE AND IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. CORRECTION OF THE DEFECTS IN THE MANNER AND UNDER THE CONDITIONS STATED ABOVE SHALL CONSTITUTE FULFILLMENT OF ALL OUR OBLIGATIONS AND LIABILITIES TO ANY PERSON WITH RESPECT TO THE COVERED PRODUCTS, WHETHER BASED ON CONTRACT, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE. NO PERSON OR ENTITY IS AUTHORIZED TO CREATE FOR US ANY OTHER OBLIGATION OR LIABILITY TO ANY PERSON RELATING TO THE COVERED PRODUCTS. IN NO EVENT WILL WE BE LIABLE FOR INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND SUSTAINED FROM ANY CAUSE.

Murphy Engineered Wood Division • 412 West Central • Sutherlin, OR 97479 • (541) 459-4545

Technical Support

While supplying a superior product, Murphy Company is dedicated to providing an unprecedented level of support for our customers. Phone support, bulletins, a broad library of technical materials, and other relevant information are available.

Our highly trained technical services staff, led by industry veterans, combined with extensive knowledge and state-of-the-art tools, assist with design or construction questions and provide full support for our design software.

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