



PACIFIC™  
WOODTECH

# FORMING GUIDE

Technical Data for  
Concrete Formwork

ENGINEERED WOOD PRODUCTS

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## Warranty

Pacific Woodtech Product Warranty .....	Back Cover
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## Product Reports

### I-joist

APA PR-L262 CCMC 13470-R

### Laminated Veneer Lumber

APA PR-L233 CCMC 13006-R

# CFI-Joist

## Build with confidence

Pacific Woodtech's Concrete Forming I-joists (CFI's) are made with a purpose—safety and quality first. Because the loads on concrete forming projects are often 3 to 4 times the magnitude of residential projects, there are important distinctions between a CFI and a “stock residential” I-joist. For example, the ‘pre-punched’ knockouts found in residential I-joists, which can cause weakness, have been eliminated to ensure a safe work place.

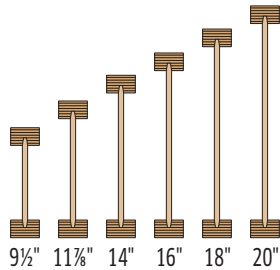
Exposure to the environment is also a very important factor to consider, and concrete forming products are subject to high moisture levels which must be accounted for in the design.

Pacific Woodtech understands these risks and stands behind all of its concrete forming products, with a full Manufacturer's Warranty, for this use. No other residential manufacturer can make that claim. Ask for yourself!

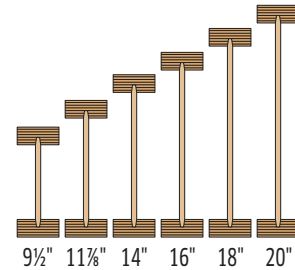


## Joist Dimensions

**CFI 77**  
 7/16" OSB Web  
 2 3/16" x 1 1/2" Flange



**CFI 90**  
 7/16" OSB Web  
 3 1/2" x 1 1/2" Flange



## Design Values

### REFERENCE DESIGN VALUES<sup>(1)</sup>

Joist Series	Joist Depth	EI <sup>(2)</sup> [x 10 <sup>6</sup> lb-in <sup>2</sup> ]	k <sup>(3)</sup> [x 10 <sup>6</sup> lb]	M <sup>(4)</sup> [ft-lb]	V <sup>(5)</sup> [lb]	ER <sup>(6)</sup> [lb]	IR <sup>(7)</sup> [lb]
CFI-77	9 1/2"	261	6.08	5155	1430	1430	2695
	11 1/2"	442	7.60	6675	1925	1760	2695
	14"	648	8.96	7960	2125	1760	2695
	16"	881	10.24	9120	2330	1760	2695
	18"	1152	11.52	10265	2535	1760	2695
	20"	1463	12.80	11395	2740	1760	2695
CFI-90	9 1/2"	392	6.08	7915	1430	1430	2860
	11 1/2"	661	7.60	10255	1925	1900	3355
	14"	965	8.96	12235	2125	1900	3355
	16"	1306	10.24	14020	2330	1900	3355
	18"	1703	11.52	15780	2535	1900	3355
	20"	2155	12.80	17520	2740	1900	3355

### FORMWORK DESIGN VALUES

Joist Series	Joist Depth	EI <sup>(2)</sup> [x 10 <sup>6</sup> lb-in <sup>2</sup> ]	k <sup>(3)</sup> [x 10 <sup>6</sup> lb]	M <sup>(4,9)</sup> [ft-lb]	V <sup>(5,9)</sup> [lb]	ER <sup>(6,9)</sup> [lb]	IR <sup>(7,9)</sup> [lb]
CFI-77	9 1/2"	235	6.08	5799	1609	1609	3032
	11 1/2"	398	7.60	7509	2166	1980	3032
	14"	583	8.96	8955	2391	1980	3032
	16"	793	10.24	10260	2621	1980	3032
	18"	1037	11.52	11548	2852	1980	3032
	20"	1317	12.80	12819	3083	1980	3032
CFI-90	9 1/2"	353	6.08	8904	1609	1609	3218
	11 1/2"	595	7.60	11537	2166	2138	3774
	14"	869	8.96	13764	2391	2138	3774
	16"	1175	10.24	15773	2621	2138	3774
	18"	1533	11.52	17753	2852	2138	3774
	20"	1940	12.80	19710	3083	2138	3774

- See PR-L262 for reference design values.
- Bending stiffness (EI).
- Coefficient of shear deflection (k). Calculate uniform load deflection in a simple-span application as follows:  
 Uniform Load:  $\delta = \frac{5wI^4}{384EI} + \frac{wl^2}{k}$  where:  
 $\delta$  = calculated deflection [in]  
 $w$  = uniform load [lb/in]  
 $l$  = design span [in]  
 $P$  = concentrated load [lb]  
 $EI$  = bending stiffness of the I-joist [lb-in<sup>2</sup>]  
 $k$  = coefficient of shear deflection [lb]
- Moment capacity (M).
- Shear capacity (V).
- End reaction capacity (ER) on bearing length of 3 1/2 inches.
- Intermediate reaction capacity (IR) on bearing length of 3 1/2 inches
- Adjusted by  $C_M = 0.90$  for unprotected use
- Adjusted by  $C_M = 0.90$  for unprotected use and by  $C_D = 1.25$  for construction load duration

# I-Joist Allowable Formwork Spans

## Deflection Limited to L/360 or ¼" Max.

Slab Thickness	Cantilever Length	Joist Spacing	CFI-77						CFI-90					
			Joist Depth						Joist Depth					
			9½"	11½"	14"	16"	18"	20"	9½"	11½"	14"	16"	18"	20"
6"	Less Than Joist Depth	12" o.c.	12'-11"	14'-8"	16'-2"	17'-5"	18'-8"	19'-9"	14'-2"	16'-2"	17'-9"	19'-1"	20'-5"	21'-8"
		16" o.c.	11'-11"	13'-7"	15'-0"	16'-2"	17'-3"	18'-4"	13'-1"	14'-11"	16'-5"	17'-8"	18'-11"	20'-0"
		19.2" o.c.	11'-4"	13'-0"	14'-3"	15'-5"	15'-7"	15'-3"	12'-6"	14'-3"	15'-7"	16'-10"	17'-1"	16'-9"
	From Joist Depth to 24"	24" o.c.	10'-6"	12'-2"	12'-6"	12'-2"	11'-10"	11'-6"	10'-6"	13'-4"	13'-8"	13'-4"	13'-0"	12'-8"
		12" o.c.	12'-11"	14'-8"	16'-2"	17'-5"	18'-8"	19'-9"	14'-2"	16'-2"	17'-9"	19'-1"	20'-5"	21'-8"
		16" o.c.	11'-11"	13'-7"	15'-0"	16'-2"	17'-3"	18'-4"	13'-1"	14'-11"	16'-5"	17'-8"	18'-11"	20'-0"
6½"	Less Than Joist Depth	12" o.c.	11'-9"	13'-4"	14'-8"	15'-10"	16'-11"	17'-11"	12'-10"	14'-8"	16'-1"	17'-4"	18'-6"	19'-8"
		16" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
		19.2" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
	From Joist Depth to 24"	24" o.c.	9'-11"	12'-0"	11'-10"	11'-6"	11'-2"	10'-10"	9'-11"	13'-1"	13'-0"	12'-8"	12'-4"	12'-0"
		12" o.c.	12'-11"	14'-8"	16'-2"	17'-5"	18'-8"	19'-9"	14'-2"	16'-2"	17'-9"	19'-1"	20'-5"	21'-8"
		16" o.c.	11'-11"	13'-7"	15'-0"	16'-2"	17'-3"	18'-4"	13'-1"	14'-11"	16'-5"	17'-8"	18'-11"	20'-0"
7"	Less Than Joist Depth	12" o.c.	11'-9"	13'-4"	14'-8"	15'-10"	16'-11"	17'-11"	12'-10"	14'-8"	16'-1"	17'-4"	18'-6"	19'-8"
		16" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
		19.2" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
	From Joist Depth to 24"	24" o.c.	9'-5"	11'-7"	11'-3"	10'-11"	10'-7"	10'-3"	9'-5"	12'-8"	12'-4"	12'-0"	11'-8"	11'-4"
		12" o.c.	12'-11"	14'-8"	16'-2"	17'-5"	18'-8"	19'-9"	14'-2"	16'-2"	17'-9"	19'-1"	20'-5"	21'-8"
		16" o.c.	11'-11"	13'-7"	15'-0"	16'-2"	17'-3"	18'-4"	13'-1"	14'-11"	16'-5"	17'-8"	18'-11"	20'-0"
7½"	Less Than Joist Depth	12" o.c.	11'-9"	13'-4"	14'-8"	15'-10"	16'-11"	17'-11"	12'-10"	14'-8"	16'-1"	17'-4"	18'-6"	19'-8"
		16" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
		19.2" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
	From Joist Depth to 24"	24" o.c.	10'-4"	11'-9"	12'-11"	13'-11"	14'-11"	15'-9"	12'-10"	14'-1"	15'-3"	16'-3"	16'-3"	16'-3"
		12" o.c.	12'-11"	14'-8"	16'-2"	17'-5"	18'-8"	19'-9"	14'-2"	16'-2"	17'-9"	19'-1"	20'-5"	21'-8"
		16" o.c.	11'-11"	13'-7"	15'-0"	16'-2"	17'-3"	18'-4"	13'-1"	14'-11"	16'-5"	17'-8"	18'-11"	20'-0"
8"	Less Than Joist Depth	12" o.c.	11'-9"	13'-4"	14'-8"	15'-10"	16'-11"	17'-11"	12'-10"	14'-8"	16'-1"	17'-4"	18'-6"	19'-8"
		16" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
		19.2" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
	From Joist Depth to 24"	24" o.c.	10'-4"	11'-9"	12'-11"	13'-11"	14'-11"	15'-9"	12'-10"	14'-1"	15'-3"	16'-3"	16'-3"	16'-3"
		12" o.c.	12'-11"	14'-8"	16'-2"	17'-5"	18'-8"	19'-9"	14'-2"	16'-2"	17'-9"	19'-1"	20'-5"	21'-8"
		16" o.c.	11'-11"	13'-7"	15'-0"	16'-2"	17'-3"	18'-4"	13'-1"	14'-11"	16'-5"	17'-8"	18'-11"	20'-0"
8½"	Less Than Joist Depth	12" o.c.	11'-9"	13'-4"	14'-8"	15'-10"	16'-11"	17'-11"	12'-10"	14'-8"	16'-1"	17'-4"	18'-6"	19'-8"
		16" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
		19.2" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
	From Joist Depth to 24"	24" o.c.	10'-4"	11'-9"	12'-11"	13'-11"	14'-11"	15'-9"	12'-10"	14'-1"	15'-3"	16'-3"	16'-3"	16'-3"
		12" o.c.	12'-11"	14'-8"	16'-2"	17'-5"	18'-8"	19'-9"	14'-2"	16'-2"	17'-9"	19'-1"	20'-5"	21'-8"
		16" o.c.	11'-11"	13'-7"	15'-0"	16'-2"	17'-3"	18'-4"	13'-1"	14'-11"	16'-5"	17'-8"	18'-11"	20'-0"
9"	Less Than Joist Depth	12" o.c.	11'-9"	13'-4"	14'-8"	15'-10"	16'-11"	17'-11"	12'-10"	14'-8"	16'-1"	17'-4"	18'-6"	19'-8"
		16" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
		19.2" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
	From Joist Depth to 24"	24" o.c.	10'-4"	11'-9"	12'-11"	13'-11"	14'-11"	15'-9"	12'-10"	14'-1"	15'-3"	16'-3"	16'-3"	16'-3"
		12" o.c.	12'-11"	14'-8"	16'-2"	17'-5"	18'-8"	19'-9"	14'-2"	16'-2"	17'-9"	19'-1"	20'-5"	21'-8"
		16" o.c.	11'-11"	13'-7"	15'-0"	16'-2"	17'-3"	18'-4"	13'-1"	14'-11"	16'-5"	17'-8"	18'-11"	20'-0"
9½"	Less Than Joist Depth	12" o.c.	11'-9"	13'-4"	14'-8"	15'-10"	16'-11"	17'-11"	12'-10"	14'-8"	16'-1"	17'-4"	18'-6"	19'-8"
		16" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
		19.2" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
	From Joist Depth to 24"	24" o.c.	10'-4"	11'-9"	12'-11"	13'-11"	14'-11"	15'-9"	12'-10"	14'-1"	15'-3"	16'-3"	16'-3"	16'-3"
		12" o.c.	12'-11"	14'-8"	16'-2"	17'-5"	18'-8"	19'-9"	14'-2"	16'-2"	17'-9"	19'-1"	20'-5"	21'-8"
		16" o.c.	11'-11"	13'-7"	15'-0"	16'-2"	17'-3"	18'-4"	13'-1"	14'-11"	16'-5"	17'-8"	18'-11"	20'-0"
10"	Less Than Joist Depth	12" o.c.	11'-9"	13'-4"	14'-8"	15'-10"	16'-11"	17'-11"	12'-10"	14'-8"	16'-1"	17'-4"	18'-6"	19'-8"
		16" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
		19.2" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
	From Joist Depth to 24"	24" o.c.	10'-4"	11'-9"	12'-11"	13'-11"	14'-11"	15'-9"	12'-10"	14'-1"	15'-3"	16'-3"	16'-3"	16'-3"
		12" o.c.	12'-11"	14'-8"	16'-2"	17'-5"	18'-8"	19'-9"	14'-2"	16'-2"	17'-9"	19'-1"	20'-5"	21'-8"
		16" o.c.	11'-11"	13'-7"	15'-0"	16'-2"	17'-3"	18'-4"	13'-1"	14'-11"	16'-5"	17'-8"	18'-11"	20'-0"
10½"	Less Than Joist Depth	12" o.c.	11'-9"	13'-4"	14'-8"	15'-10"	16'-11"	17'-11"	12'-10"	14'-8"	16'-1"	17'-4"	18'-6"	19'-8"
		16" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
		19.2" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
	From Joist Depth to 24"	24" o.c.	10'-4"	11'-9"	12'-11"	13'-11"	14'-11"	15'-9"	12'-10"	14'-1"	15'-3"	16'-3"	16'-3"	16'-3"
		12" o.c.	12'-11"	14'-8"	16'-2"	17'-5"	18'-8"	19'-9"	14'-2"	16'-2"	17'-9"	19'-1"	20'-5"	21'-8"
		16" o.c.	11'-11"	13'-7"	15'-0"	16'-2"	17'-3"	18'-4"	13'-1"	14'-11"	16'-5"	17'-8"	18'-11"	20'-0"
11"	Less Than Joist Depth	12" o.c.	11'-9"	13'-4"	14'-8"	15'-10"	16'-11"	17'-11"	12'-10"	14'-8"	16'-1"	17'-4"	18'-6"	19'-8"
		16" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
		19.2" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
	From Joist Depth to 24"	24" o.c.	10'-4"	11'-9"	12'-11"	13'-11"	14'-11"	15'-9"	12'-10"	14'-1"	15'-3"	16'-3"	16'-3"	16'-3"
		12" o.c.	12'-11"	14'-8"	16'-2"	17'-5"	18'-8"	19'-9"	14'-2"	16'-2"	17'-9"	19'-1"	20'-5"	21'-8"
		16" o.c.	11'-11"	13'-7"	15'-0"	16'-2"	17'-3"	18'-4"	13'-1"	14'-11"	16'-5"	17'-8"	18'-11"	20'-0"
11½"	Less Than Joist Depth	12" o.c.	11'-9"	13'-4"	14'-8"	15'-10"	16'-11"	17'-11"	12'-10"	14'-8"	16'-1"	17'-4"	18'-6"	19'-8"
		16" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
		19.2" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
	From Joist Depth to 24"	24" o.c.	10'-4"	11'-9"	12'-11"	13'-11"	14'-11"	15'-9"	12'-10"	14'-1"	15'-3"	16'-3"	16'-3"	16'-3"
		12" o.c.	12'-11"	14'-8"	16'-2"	17'-5"	18'-8"	19'-9"	14'-2"	16'-2"	17'-9"	19'-1"	20'-5"	21'-8"
		16" o.c.	11'-11"	13'-7"	15'-0"	16'-2"	17'-3"	18'-4"	13'-1"	14'-11"	16'-5"	17'-8"	18'-11"	20'-0"
12"	Less Than Joist Depth	12" o.c.	11'-9"	13'-4"	14'-8"	15'-10"	16'-11"	17'-11"	12'-10"	14'-8"	16'-1"	17'-4"	18'-6"	19'-8"
		16" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
		19.2" o.c.	11'-2"	12'-8"	14'-0"	15'-1"	14'-9"	14'-5"	12'-3"	13'-11"	15'-4"	16'-6"	16'-2"	15'-10"
	From Joist Depth to 24"	24" o.c.	10'-4"	11'-9"	12'-11"	13'-11"	14'-11"	15'-9"	12'-10"	14'-1"	15'-3"	16'-3"	16'-3"	16'-3"
		12" o.c.	12'-11"	14'-8"	16'-2"	17'-5"	18'-8"	19'-9"	14'-2"	16'-2"	17'-9"	19'-1"	20'-5"	21'-8"
		16" o.c.	11'-11"	13'-7"	15'-0"	16'-2"	17'-3"	18'-4"	13'-1"	14'-11"	16'-5"	17'-8"	18'-11"	20'-0"

### Notes:

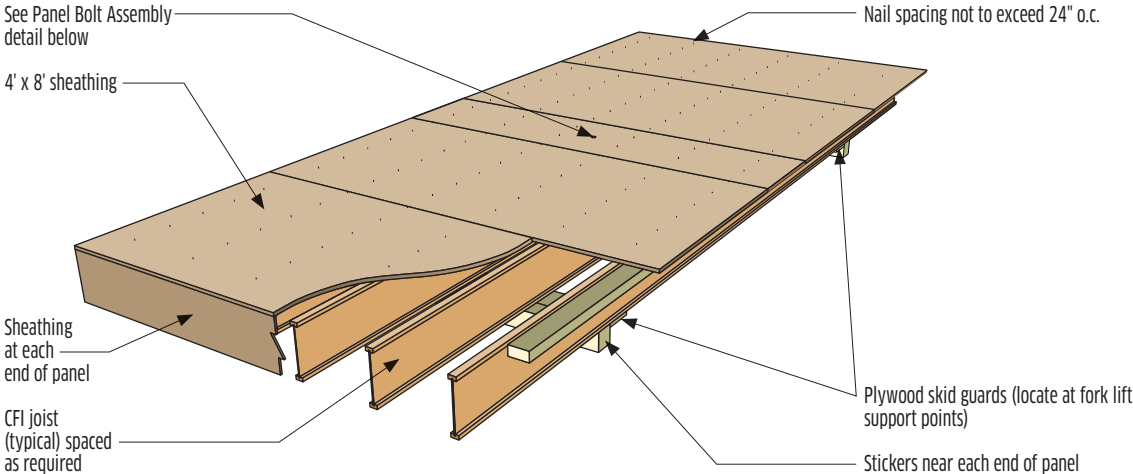
- This table applies to uniformly-loaded, simple-span joists with no cantilevers, or with equal cantilevers (24 inches maximum) at each end.
- Span is measured from center to center of supports. Cantilevers are measured from center of support to end of cantilever.
- This table is based on 150 pcf concrete slabs, 50 psf live load, and 8 psf formwork dead load.
- This table is based on joist design values adjusted by  $C_M = 0.90$  for unprotected use and by  $C_D = 1.25$  for construction load duration.
- Deflection under concrete plus dead load is limited to the lesser of ¼ inch or span/360.
- Provide at least 3½ inches of bearing length at both supports.
- Provide lateral restraint at supports (Examples: blocking panels, plywood rim) and along the compression flange of each joist (Example: plywood nailed at least every 24 inches along each joist). PANELIZED SYSTEMS ONLY. NO HAND-SETTING.

- Use sizing software or consult a professional engineer to analyze conditions outside the scope of this table (Example: continuous spans, longer cantilevers, non-uniform loads, different uniform loads).

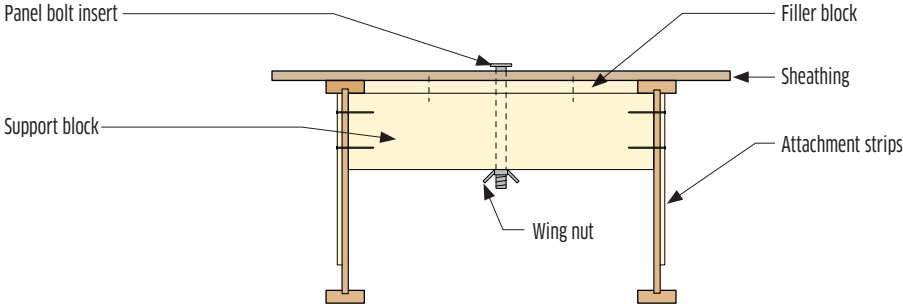
## How To Use These Tables:

- Determine span length (center to center of supports), cantile

# Panel Assembly

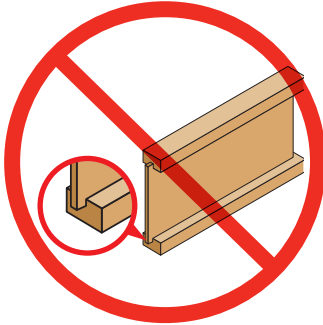


# Panel Bolt Assembly

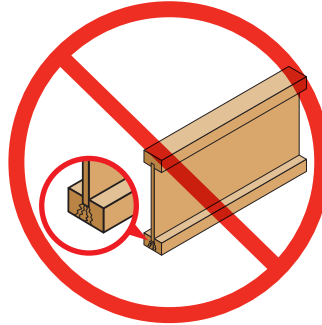


# Formwork Inspection

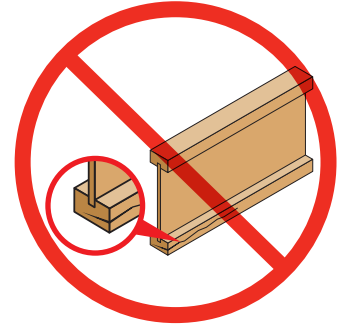
- Web-to-flange separation
- Web knifing
- Holes in webs
- Split flange
- Discoloration
- Soft spots in web or flange
- Mold/Fungus
- Bevel cuts extending beyond inside face of support
- Notched flange
- Saw kerf in flange
- Buckled web
- Gouged or splintered flange



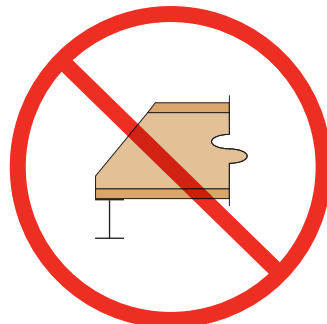
**Web-To-Flange Separation**  
Cut back or remove from service



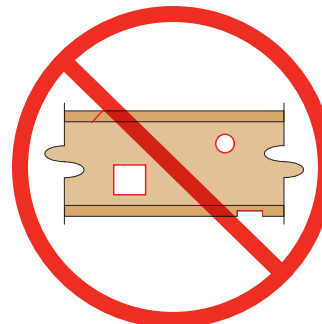
**Web Knifing**  
Cut back or remove from service



**Split Flanges**  
Cut back or remove from service



**Do Not Bevel**  
end of joist beyond inside  
face of support



**Do Not Cut, Notch, or Drill** Joists with holes  
in webs, with notches, or saw kerfs should  
be cut back or removed from service

# Storage & Handling Guidelines

## Storage

- Store bundles upright on a smooth, level, well drained supportive surface.
- Always stack and handle I-joists in the upright position only.
- Bundles should not be in contact with the ground.
- Place 2x or LVL spacers (at a maximum of 10' apart) between bundles and the ground and bundles stored on top of one another.
- Bundles should remain wrapped, strapped and protected from the weather until time of installation.

## Handling

- All handling of joists with a forklift or crane should be done carefully.
- Joists should remain vertical during handling.
- Avoid excessive bowing during all phases of handling and installation (i.e. measuring, sawing or placement).
- Damage may result if the joist or beam is twisted or a load is applied to it while it's lying flat.

Never use or field repair a damaged I-joist.

# 2.0E LVL

## STANDARD SIZES AVAILABLE (INCHES)

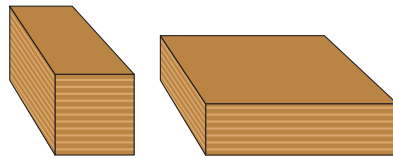
<b>Widths</b>	1½	1¾	2¼	2½	3½
<b>Depths</b>	3½	5½	7¼	9¼	11¼



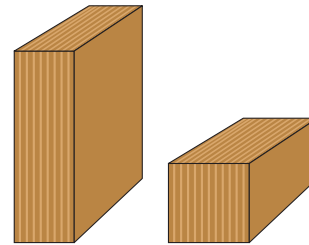
## 2.0E LVL DESIGN VALUES

	Formwork	Reference
Apparent Modulus of Elasticity, E	1800000 psi <sup>(2)</sup>	2000000 psi
Bending (beam), F <sub>b</sub>	3488 psi <sup>(2, 3, 4)</sup>	3100 psi
Bending (plank), F <sub>b</sub>	3488 psi <sup>(2, 3, 5)</sup>	3100 psi
Compression Perpendicular to Grain (beam), F <sub>cL</sub>	765 psi <sup>(2)</sup>	850 psi
Compression Perpendicular to Grain (plank), F <sub>cL</sub>	405 psi <sup>(2)</sup>	450 psi
Compression Parallel to Grain, F <sub>c</sub>	3094 psi <sup>(2, 3)</sup>	2750 psi
Horizontal Shear (beam), F <sub>v</sub>	321 psi <sup>(2, 3)</sup>	285 psi
Horizontal Shear (plank), F <sub>v</sub>	169 psi <sup>(2, 3)</sup>	150 psi
Equivalent specific gravity for lateral fastener design	0.50	0.50

1. See APA PR-L233
2. Adjusted by C<sub>M</sub> = 0.90 for unprotected use
3. Adjusted by C<sub>D</sub> = 1.25 for construction load duration
4. Adjust by (12/d)<sup>1/5</sup>, where d is the depth of the member [inches]
5. Adjust by (1.75/d)<sup>1/3</sup>, where d is the depth of the member [inches]



Plank



Beam

## 2.0E LVL FORMWORK DESIGN VALUES<sup>(1)(2)</sup>

Width	Design Property	Depth				
		3½"	5½"	7¼"	9¼"	11¼"
1½"	Moment [ft-lb]	1139	2569	4224	6549	9315
	Shear [lb]	1122	1763	2325	2966	3607
	EI [x 10 <sup>6</sup> lb-in <sup>2</sup> ]	10	37	86	178	320
	Weight [plf]	1.4	2.1	2.8	3.6	4.4
1¾"	Moment [ft-lb]	1329	2997	4928	7640	10868
	Shear [lb]	1309	2057	2712	3460	4208
	EI [x 10 <sup>6</sup> lb-in <sup>2</sup> ]	11	44	100	208	374
	Weight [plf]	1.6	2.5	3.3	4.2	5.1
2¼"	Moment [ft-lb]	1708	3853	6336	9823	13973
	Shear [lb]	1683	2645	3487	4449	5411
	EI [x 10 <sup>6</sup> lb-in <sup>2</sup> ]	14	56	129	267	481
	Weight [plf]	2.0	3.2	4.2	5.4	6.6
2½"	Moment [ft-lb]	1898	4282	7040	10915	15525
	Shear [lb]	1870	2939	3874	4943	6012
	EI [x 10 <sup>6</sup> lb-in <sup>2</sup> ]	16	62	143	297	534
	Weight [plf]	2.3	3.6	4.7	6.0	7.3
3½"	Moment [ft-lb]	1648	5994	9856	15281	21735
	Shear [lb]	1378	4115	5424	6920	8416
	EI [x 10 <sup>6</sup> lb-in <sup>2</sup> ]	23	87	200	416	748
	Weight [plf]	3.2	5.0	6.6	8.4	10.2

### Notes:

(1) Moment, shear and EI have been adjusted by C<sub>M</sub> = 0.90 for unprotected use. Moment and shear have also been adjusted by C<sub>D</sub> = 1.25 for construction load duration.

(2) Values are for beam orientation except in shaded cells.

■ Values in shaded cells are for either plank or beam orientation.

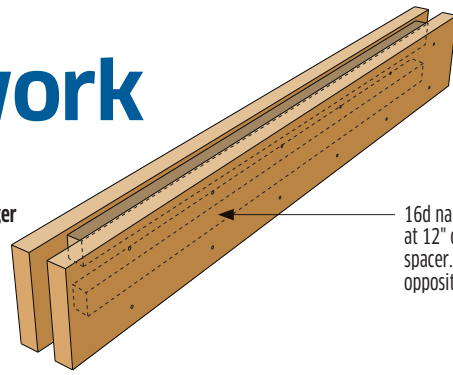
# Bridge Deck Formwork

## Systems and Definitions

### Wood spacers:

- Thickness per hanger manufacturer
- Width as required to avoid splitting
- Length equal to distance between coil bolts + 0", - 2"
- Locate at top and bottom of ledger

Double LVL Ledger

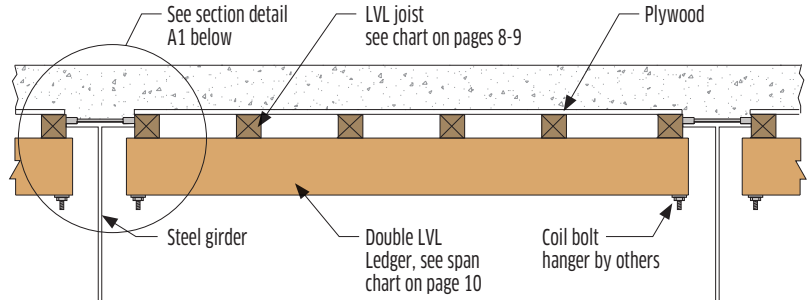


16d nails (0.162" x 3½") at 12" o.c. into each wood spacer. Stagger nailing from opposite side.

## Typical Bridge Deck Formwork Systems

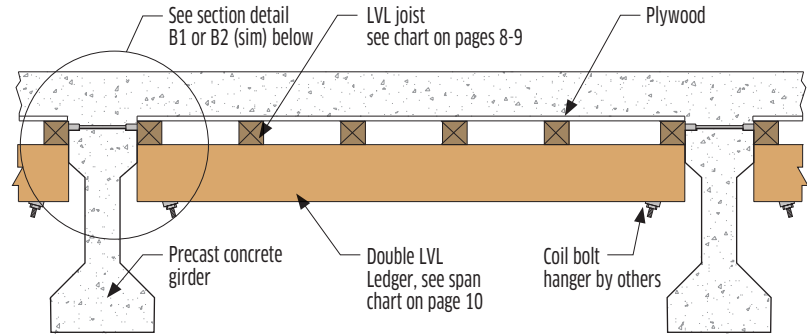
### SYSTEM A

LVL joists and double LVL ledger suspended from steel bridge girders by coil bolt hangers



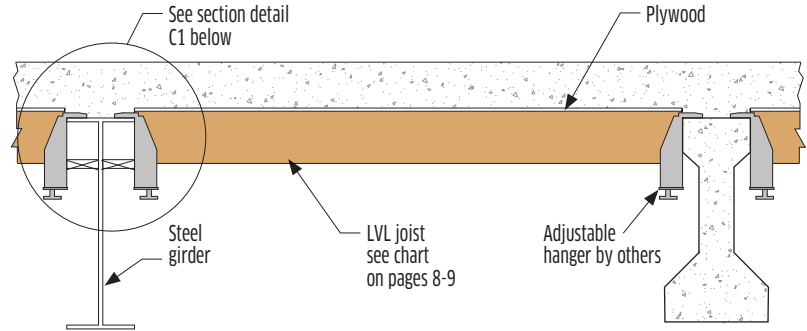
### SYSTEM B

LVL joists and double LVL ledger suspended from pre-cast concrete bridge girders by coil bolt hangers

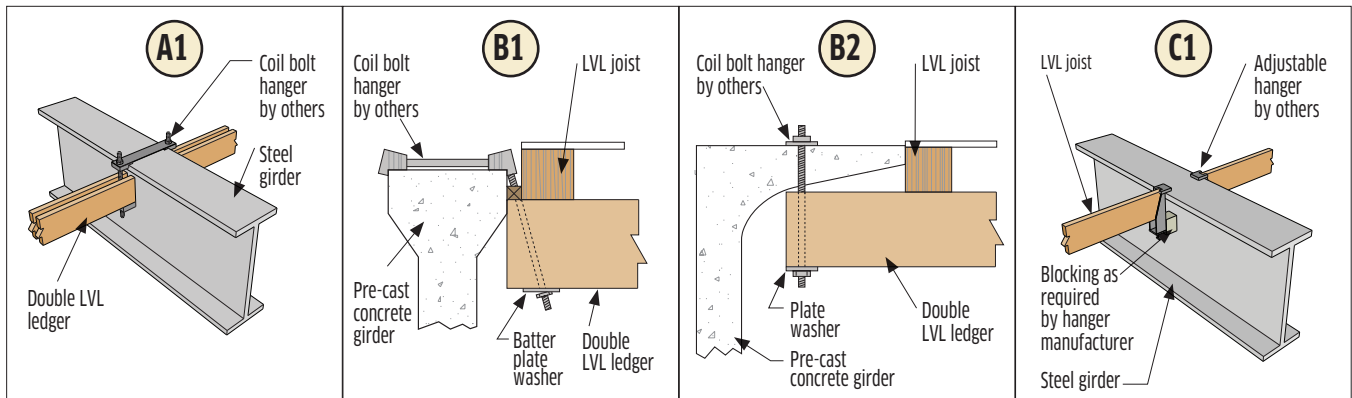


### SYSTEM C

LVL joists suspended from steel or pre-cast concrete bridge girders by adjustable hangers



# Bridge Deck Formwork Details





# 2.0E LVL Joist

Allowable Loads & Minimum Bearing Lengths. Deflection limited to L/360 or 1/4" Max.

## 2.0E LVL JOIST ALLOWABLE LOADS AND MINIMUM BEARING LENGTHS

Span (ft)	Thickness (in)		1½" JOIST						1¾" JOIST						2¼" JOIST									
	Depth (in)		3½	4½	5½	6½	7½	9½	11½	3½	4½	5½	6½	7½	9½	11½	3½	4½	5½	6½	7½	9½	11½	
4	Simple Span	Conc + DL [plf]	222	473	864	1428	1856	2115	2114	259	552	1008	1666	2165	2467	2466	333	709	1297	2142	2783	3172	3171	
		Total Load [plf]	591	928	1215	1555	1856	2115	2114	689	1082	1417	1814	2165	2467	2466	886	1392	1822	2332	2783	3172	3171	
	Continuous Spans	Conc + DL [plf]	420	727	933	1186	1418	2105	2905	490	848	1088	1384	1654	2456	3390	630	1091	1399	1779	2126	3158	4358	
		Total Load [plf]	543	727	933	1186	1418	2105	2905	633	848	1088	1384	1654	2456	3390	814	1091	1399	1779	2126	3158	4358	
Minimum End Bearing (in)		1½	1½	2½	3	3½	4	4	1½	1½	2½	3	3½	4	4	1½	1½	2½	3	3½	4	4		
Minimum Intermediate Bearing (in)		3½	3½	3½	5	6¼	7½	7½	3½	3½	3½	5	6¼	7½	7½	3½	3½	3½	5	6¼	7½	7½		
5	Simple Span	Conc + DL [plf]	113	241	442	730	1013	1718	1717	132	281	515	851	1182	2004	2003	169	362	662	1095	1520	2576	2575	
		Total Load [plf]	378	594	853	1123	1310	1718	1717	441	693	995	1310	1528	2004	2003	566	891	1279	1684	1965	2576	2575	
	Continuous Spans	Conc + DL [plf]	214	457	697	866	1006	1456	1930	250	533	814	1010	1174	1699	2252	322	685	1046	1298	1509	2185	2895	
		Total Load [plf]	378	552	697	866	1006	1456	1930	441	644	814	1010	1174	1699	2252	566	828	1046	1298	1509	2185	2895	
Minimum End Bearing (in)		1½	1½	2	2½	3¼	4	4	1½	1½	2	2½	3¼	4	4	1½	1½	2	2½	3¼	4	4		
Minimum Intermediate Bearing (in)		3½	3½	3½	4½	5¼	7¼	7¼	3½	3½	3½	4½	5¼	7¼	7¼	3½	3½	3½	4½	5¼	7¼	7¼		
6	Simple Span	Conc + DL [plf]	65	139	255	421	585	1218	1445	76	162	297	491	683	1421	1686	97	208	382	632	878	1827	2168	
		Total Load [plf]	262	412	592	799	973	1433	1445	305	481	690	933	1136	1672	1686	393	618	887	1199	1460	2150	2168	
	Continuous Spans	Conc + DL [plf]	123	264	482	684	787	1104	1444	144	308	563	798	918	1288	1685	185	395	724	1026	1180	1656	2167	
		Total Load [plf]	262	412	558	684	787	1104	1444	305	481	651	798	918	1288	1685	393	618	838	1026	1180	1656	2167	
Minimum End Bearing (in)		1½	1½	1½	2½	2½	4	4	1½	1½	1½	2½	2½	4	4	1½	1½	1½	2½	2½	4	4		
Minimum Intermediate Bearing (in)		3½	3½	3½	4½	5	7¼	7¼	3½	3½	3½	4½	5	7¼	7¼	3½	3½	3½	4½	5	7¼	7¼		
7	Simple Span	Conc + DL [plf]	87	160	264	368	766	1247		101	186	308	429	893	1455	60	130	239	397	551	1148	1871		
		Total Load [plf]	302	434	587	714	1108	1247		353	506	684	833	1293	1455	288	453	651	880	1072	1663	1871		
	Continuous Spans	Conc + DL [plf]	77	165	303	501	647	890	1154	90	193	353	585	754	1038	1346	116	248	454	752	970	1335	1731	
		Total Load [plf]	192	302	434	566	647	890	1154	224	353	506	660	754	1038	1346	288	453	651	848	970	1335	1731	
Minimum End Bearing (in)		1½	1½	1½	2	2½	3¼	4	1½	1½	1½	2	2½	3¼	4	1½	1½	1½	2	2½	3¼	4		
Minimum Intermediate Bearing (in)		3½	3½	3½	4	4½	7	7¼	3½	3½	3½	4	4½	7	7¼	3½	3½	3½	4	4½	7	7¼		
8	Simple Span	Conc + DL [plf]	54	99	165	230	479	865		63	116	193	268	559	1009		81	149	248	345	719	1297		
		Total Load [plf]	231	332	449	546	848	1097		269	387	523	637	989	1280		346	498	673	819	1272	1646		
	Continuous Spans	Conc + DL [plf]	103	189	314	436	746	960		56	120	221	366	509	870	1120	72	155	284	471	654	1119	1440	
		Total Load [plf]	231	332	449	546	746	960		171	269	387	523	637	870	1120	220	346	498	673	819	1119	1440	
Minimum End Bearing (in)		1½	1½	1½	2	3¼	4		1½	1½	1½	1½	2	3¼	4	1½	1½	1½	1½	2	3¼	4		
Minimum Intermediate Bearing (in)		3½	3½	3½	4½	6¼	7¼		3½	3½	3½	3½	4½	6¼	7¼	3½	3½	3½	3½	4½	6¼	7¼		
9	Simple Span	Conc + DL [plf]			61	102	142	298	538		71	119	166	348	628				92	153	214	447	807	
		Total Load [plf]			262	354	431	669	952		305	413	503	781	1111				393	531	647	1004	1429	
	Continuous Spans	Conc + DL [plf]			64	117	195	271	565	822		74	137	227	316	660	959		96	176	292	407	848	1233
		Total Load [plf]			182	262	354	431	642	822		212	305	413	503	750	959		273	393	531	647	964	1233
Minimum End Bearing (in)				1½	1½	1½	1½	2½	4		1½	1½	1½	2½	4			1½	1½	1½	2½	4		
Minimum Intermediate Bearing (in)				3½	3½	3½	4	6¼	7¼		3½	3½	3½	4	6¼	7¼		3½	3½	3½	4	6¼	7¼	
10	Simple Span	Conc + DL [plf]				66	92	194	352			77	108	227	410				59	99	139	291	527	
		Total Load [plf]				286	349	541	771			334	407	631	899				317	429	523	812	1156	
	Continuous Spans	Conc + DL [plf]			76	127	177	370	667			89	148	206	431	779		62	115	191	265	555	1001	
		Total Load [plf]			212	286	349	541	719			247	334	407	631	838		221	317	429	523	812	1078	
Minimum End Bearing (in)				1½	1½	1½	2½	3½			1½	1½	1½	2½	3½		1½	1½	1½	1½	2½	3½		
Minimum Intermediate Bearing (in)				3½	3½	3½	5¼	7¼			3½	3½	3½	5¼	7¼		3½	3½	3½	3½	5¼	7¼		
11	Simple Span	Conc + DL [plf]				62	132	239				52	73	153	279				67	93	197	358		
		Total Load [plf]				288	447	636				275	336	521	742				354	431	670	954		
	Continuous Spans	Conc + DL [plf]			51	86	120	251	454			60	100	140	293	530			77	129	180	377	682	
		Total Load [plf]			174	236	288	447	636			204	275	336	521	742		262	354	431	670	954		
Minimum End Bearing (in)				1½	1½	1½	2½	3¼			1½	1½	1½	2½	3¼			1½	1½	1½	2½	3¼		
Minimum Intermediate Bearing (in)				3½	3½	3½	5¼	7¼			3½	3½	3½	5¼	7¼		3½	3½	3½	3½	5¼	7¼		
12	Simple Span	Conc + DL [plf]					92	167					50	107	195						65	138	251	
		Total Load [plf]					375	534					281	437	623						362	562	801	
	Continuous Spans	Conc + DL [plf]			60	84	176	320					70	98	206	373			54	90	126	265	479	
		Total Load [plf]			198	241	375	534					231	281	437	623			219	297	362	562	801	
Minimum End Bearing (in)					1½	1½	2½	3				1½	1½	2½	3			1½	1½	1½	2½	3		
Minimum Intermediate Bearing (in)					3½	3½	4½	6¼				3½	3½	4½	6¼			3½	3½	3½	4½	6¼		
13	Simple Span	Conc + DL [plf]					66	120						77	140							99	180	
		Total Load [plf]					319	454						372	530							478	681	
	Continuous Spans	Conc + DL [plf]				60	127	231					50	70	148	269					64	90	191	346
		Total Load [plf]				205	319	454					196	239	372	530					252	308	478	681
Minimum End Bearing (in)						1½	2	2½				1½	1½	2	2½					1½	1½	2	2½	
Minimum Intermediate Bearing (in)						3½	4½	6¼				3½	3½	4½	6¼					3½	3½	4½	6¼	
14	Simple Span	Conc + DL [plf]						88						56	103							72	132	
		Total Load [plf]						391						320	456							412	587	
	Continuous Spans	Conc + DL [plf]																						

# 2.0E LVL Joist

Allowable Loads & Minimum Bearing Lengths. Deflection limited to L/360 or 1/4" Max.

## 2.0E LVL JOIST ALLOWABLE LOADS AND MINIMUM BEARING LENGTHS

Span (ft)	Thickness (in)		2½" JOIST							3½" JOIST						
	Depth (in)		3½	4½	5½	6½	7½	9½	11½	3½	4½	5½	6½	7½	9½	11½
4	Simple Span	Conc + DL [plf]	370	788	1441	2380	3093	3525	3523	518	1103	2017	3332	4330	4935	4933
		Total Load [plf]	985	1546	2025	2591	3093	3525	3523	839	2165	2834	3628	4330	4935	4933
	Continuous Spans	Conc + DL [plf]	700	1212	1555	1977	2363	3509	4842	665	1697	2177	2768	3308	4913	6779
		Total Load [plf]	905	1212	1555	1977	2363	3509	4842	665	1697	2177	2768	3308	4913	6779
Minimum End Bearing (in)		1½	1½	2¼	3	3½	4	4	1½	1½	2¼	3	3½	4	4	
Minimum Intermediate Bearing (in)		3½	3½	3½	5	6¼	7¼	7¼	3½	3½	3½	5	6¼	7¼	7¼	
5	Simple Span	Conc + DL [plf]	188	402	736	1216	1689	2863	2861	264	563	1030	1703	2365	4008	4006
		Total Load [plf]	629	990	1421	1871	2183	2863	2861	546	1386	1990	2620	3057	4008	4006
	Continuous Spans	Conc + DL [plf]	357	761	1162	1443	1677	2427	3217	500	1066	1627	2020	2348	3398	4504
		Total Load [plf]	629	920	1162	1443	1677	2427	3217	510	1289	1627	2020	2348	3398	4504
Minimum End Bearing (in)		1½	1½	2	2¾	3¼	4	4	1½	1½	2	2¾	3¼	4	4	
Minimum Intermediate Bearing (in)		3½	3½	3½	4½	5¼	7¼	7¼	3½	3½	3½	4½	5¼	7¼	7¼	
6	Simple Span	Conc + DL [plf]	108	231	424	702	975	2030	2408	151	324	594	983	1366	2841	3372
		Total Load [plf]	436	687	986	1332	1622	2389	2408	378	961	1380	1865	2271	3344	3372
	Continuous Spans	Conc + DL [plf]	206	439	804	1140	1311	1840	2407	288	615	1126	1596	1836	2576	3370
		Total Load [plf]	436	687	931	1140	1311	1840	2407	378	961	1303	1596	1836	2576	3370
Minimum End Bearing (in)		1½	1½	1½	2¼	2¼	4	4	1½	1½	1½	2¼	2¼	4	4	
Minimum Intermediate Bearing (in)		3½	3½	3½	4¼	5	7¼	7¼	3½	3½	3½	4¼	5	7¼	7¼	
7	Simple Span	Conc + DL [plf]	67	145	266	441	613	1276	2079	94	203	372	617	858	1786	2911
		Total Load [plf]	320	504	723	978	1191	1847	2079	277	705	1013	1369	1667	2586	2911
	Continuous Spans	Conc + DL [plf]	129	276	505	835	1078	1483	1923	180	386	707	1169	1509	2076	2692
		Total Load [plf]	320	504	723	943	1078	1483	1923	277	705	1013	1320	1509	2076	2692
Minimum End Bearing (in)		1½	1½	1½	2	2¼	3¾	4	1½	1½	1½	2	2¼	3¾	4	
Minimum Intermediate Bearing (in)		3½	3½	3½	4	4¼	7	7	3½	3½	3½	4	4¼	7	7¼	
8	Simple Span	Conc + DL [plf]	90	166	275	383	799	1441	58	126	232	385	536	1119	2018	
		Total Load [plf]	385	553	748	910	1413	1829	211	539	774	1047	1275	1978	2560	
	Continuous Spans	Conc + DL [plf]	80	172	316	523	727	1243	1600	112	241	442	732	1018	1740	2240
		Total Load [plf]	244	385	553	748	910	1243	1600	211	539	774	1047	1275	1740	2240
Minimum End Bearing (in)		1½	1½	1½	1½	2	3¼	4	1½	1½	1½	1½	2	3¼	4	
Minimum Intermediate Bearing (in)		3½	3½	3½	3¾	4¼	6¾	7¾	3½	3½	3½	3¾	4¼	6¾	7¾	
9	Simple Span	Conc + DL [plf]	55	102	170	237	497	897	77	143	238	332	695	1256		
		Total Load [plf]	304	436	590	718	1115	1587	166	425	611	826	1006	1561	2222	
	Continuous Spans	Conc + DL [plf]	106	196	325	452	942	1370	69	149	274	455	633	1319	1918	
		Total Load [plf]	304	436	590	718	1071	1370	166	425	611	826	1006	1499	1918	
Minimum End Bearing (in)		1½	1½	1½	1½	2¾	4	4	1½	1½	1½	1½	2¾	4		
Minimum Intermediate Bearing (in)		3½	3½	3½	3¾	4	6¾	7¾	3½	3½	3½	3¾	4	6¾	7¾	
10	Simple Span	Conc + DL [plf]	66	110	154	324	586	92	154	216	453	820				
		Total Load [plf]	353	477	581	902	1284	494	668	813	1263	1798				
	Continuous Spans	Conc + DL [plf]	69	127	212	295	616	1112	96	178	296	413	863	1557		
		Total Load [plf]	245	353	477	581	902	1198	343	494	668	813	1263	1677		
Minimum End Bearing (in)		1½	1½	1½	1½	2½	3½	1½	1½	1½	1½	2½	3½			
Minimum Intermediate Bearing (in)		3½	3½	3½	3¾	5¾	7¾	3½	3½	3½	3¾	5¾	7¾			
11	Simple Span	Conc + DL [plf]	74	104	219	398	61	104	145	307	557					
		Total Load [plf]	393	479	744	1060	407	551	671	1042	1484					
	Continuous Spans	Conc + DL [plf]	86	143	200	419	757	64	120	201	280	587	1060			
		Total Load [plf]	291	393	479	744	1060	283	407	551	671	1042	1484			
Minimum End Bearing (in)		1½	1½	1½	2¼	3¼	1½	1½	1½	1½	2¼	3¼				
Minimum Intermediate Bearing (in)		3½	3½	3½	5¼	7¼	3½	3½	3½	3½	5¼	7¼				
12	Simple Span	Conc + DL [plf]	51	72	153	279	71	101	214	390						
		Total Load [plf]	330	402	625	890	462	563	874	1246						
	Continuous Spans	Conc + DL [plf]	60	100	140	294	533	83	140	196	412	746				
		Total Load [plf]	244	330	402	625	890	341	462	563	874	1246				
Minimum End Bearing (in)		1½	1½	1½	2¼	3	1½	1½	1½	2¼	3					
Minimum Intermediate Bearing (in)		3½	3½	3½	4¾	6¾	3½	3½	3½	4¾	6¾					
13	Simple Span	Conc + DL [plf]	51	109	200	342	531	757	393	479	744	1060				
		Total Load [plf]	71	100	212	385	59	100	140	297	539					
	Continuous Spans	Conc + DL [plf]	281	342	531	757	290	393	479	744	1060					
		Total Load [plf]	1½	1½	2	2¼	1½	1½	1½	2	2¼					
Minimum End Bearing (in)		3½	3½	4¼	6¼	3½	3½	3½	4¼	6¼						
14	Simple Span	Conc + DL [plf]	80	147	457	652	51	71	153	281						
		Total Load [plf]	52	73	156	284	73	103	218	398						
	Continuous Spans	Conc + DL [plf]	241	294	457	652	338	412	640	912						
		Total Load [plf]	1½	1½	1½	2½	1½	1½	1½	2½						
Minimum End Bearing (in)		3½	3½	4	5¼	3½	3½	4	5¼							

Notes:

- Table values are for beam orientation except for shaded cells. Values in shaded cells are for either plank or beam orientation.
- Span is measured from center to center of supports.
- Table values for Conc + DL (concrete plus dead load) are limited by deflection equal to the lesser of ¼ inch or span/360.
- Table values have been adjusted by C<sub>M</sub> = 0.90 for unprotected use. Total Load has also been adjusted by C<sub>D</sub> = 1.25 for construction load duration.
- Table values are for joist spacings of 24 inches on center or less.
- Continuous Spans values are based on the worst case of 2 or 3 equal, continuous spans. Use sizing software or consult a professional engineer when a continuous span is less than half the length of an adjacent span, when loading is not uniform, or when design conditions are otherwise outside the scope of this table.

### How To Use These Tables:

- Determine the Conc + DL (concrete plus dead load) and Total Load in pounds per lineal foot (plf) that must be supported by the formwork. Neglect joist weight.
- Select a table that matches the width of the joist under consideration.
- Select a span from the first column.
- Select Simple Span or Continuous Spans from the second column.
- Scan across the table for a pair of Conc + DL and Total Load values that exceed the design requirements identified in Step 1.
- Support across the full width of each joist is required. Verify that the required Minimum End/Intermediate Bearing length can be provided. If not, consider wider joists and return to Step 2.
- Select the joist depth at the top of the column that satisfies the criteria provided by Steps 5 and 6.

# 2.0E LVL Double Ledger

Allowable Loads and Minimum Bearing Lengths. Deflection limited to L/360 or 1/4" Max.

## 2.0E LVL ALLOWABLE LOADS AND MINIMUM BEARING LENGTHS—DOUBLE LEDGER

Span [ft]	Condition	DOUBLE 1½" LEDGER					DOUBLE 1¾" LEDGER					DOUBLE 2¼" LEDGER					DOUBLE 2½" LEDGER				
		Depth [in]					Depth [in]					Depth [in]					Depth [in]				
		5½	6½	7¼	9¼	11¼	5½	6½	7¼	9¼	11¼	5½	6½	7¼	9¼	11¼	5½	6½	7¼	9¼	11¼
6	Conc + DL [plf]	509	843	1171	2436	3568	594	983	1366	2841	4162	764	1264	1756	3653	5352	849	1404	1951	4059	5946
	Total Load [plf]	1137	1537	1872	2867	3568	1327	1793	2184	3344	4162	1706	2306	2807	4300	5352	1896	2562	3119	4778	5946
	Min. Bearing [in]	3	3	3	4	5	3	3	3	4	5	3	3	3	4	5	3	3	3	4	5
7	Conc + DL [plf]	319	529	735	1531	2759	372	617	858	1786	3218	479	793	1103	2297	4138	532	881	1225	2552	4598
	Total Load [plf]	835	1128	1374	2131	3033	974	1316	1603	2486	3538	1252	1692	2060	3197	4549	1391	1880	2289	3552	5055
	Min. Bearing [in]	3	3	3	3½	5	3	3	3	3½	5	3	3	3	3½	5	3	3	3	3½	5
8	Conc + DL [plf]	330	460	959	1729	232	385	536	1119	2018	298	495	689	1438	2594	331	550	766	1598	2882	
	Total Load [plf]	862	1050	1630	2320	744	1006	1225	1902	2707	957	1294	1575	2445	3480	1063	1437	1751	2717	3867	
	Min. Bearing [in]	3	3	3	4-1/4	3	3	3	3	4-1/4	3	3	3	3	4-1/4	3	3	3	3	4-1/4	
9	Conc + DL [plf]	204	285	596	1076	238	332	695	1256	306	427	894	1614	204	340	475	993	1794			
	Total Load [plf]	680	829	1286	1831	794	967	1501	2136	1021	1243	1930	2747	839	1134	1381	2144	3052			
	Min. Bearing [in]	3	3	3	3-3/4	3	3	3	3-3/4	3	3	3	3-3/4	3	3	3	3	3-3/4			
10	Conc + DL [plf]			389	703		216	453	820		277	583	1055		220	308	648	1172			
	Total Load [plf]			1041	1482		782	1214	1729		1005	1561	2222		917	1117	1734	2469			
	Min. Bearing [in]			3	3-1/2		3	3	3-1/2		3	3	3-1/2		3	3	3	3-1/2			
11	Conc + DL [plf]			263	477		307	557			395	716			207	438	796				
	Total Load [plf]			859	1223		1002	1427			1288	1834			921	1431	2038				
	Min. Bearing [in]			3	3-1/4		3	3-1/4			3	3-1/4			3	3	3-1/4				
12	Conc + DL [plf]			335			214	390			275	502				306	558				
	Total Load [plf]			1026			841	1197			1081	1539				1201	1710				
	Min. Bearing [in]			3			3	3			3	3				3	3				

### Notes:

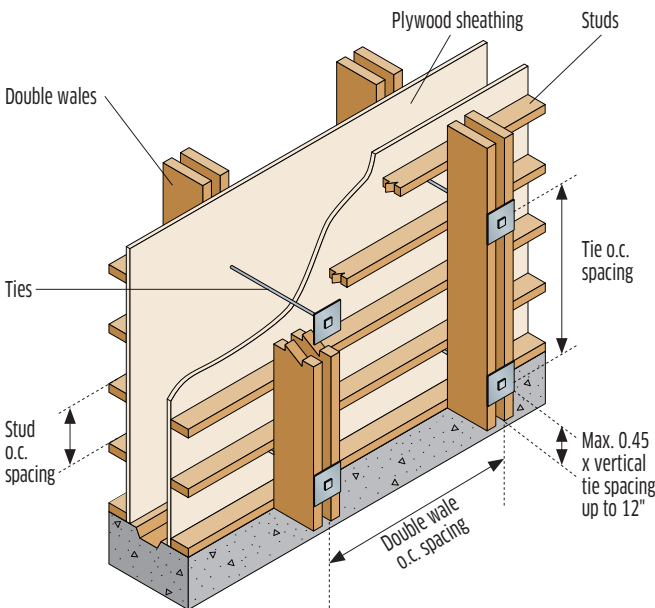
- Table values are for beam orientation.
- Span is measured from center to center of supports.
- Table values for Conc + DL (concrete plus dead load) are limited by deflection equal to the lesser of 1/4 inch or span/360.
- Table values have been adjusted by  $C_M = 0.90$  for unprotected use. Total Load has also been adjusted by  $C_D = 1.25$  for construction load duration.
- Use sizing software or consult a professional engineer when loading is not uniform or when design conditions are otherwise outside the scope of this table.

### How To Use These Tables:

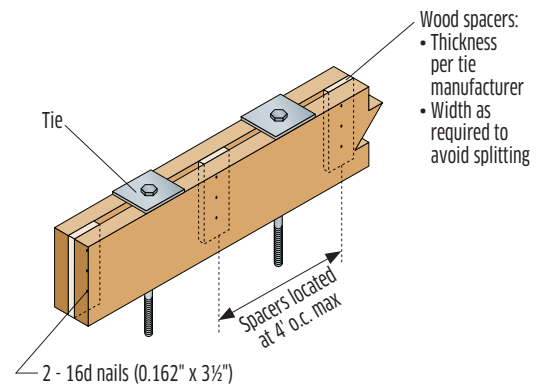
- Determine the Conc + DL (concrete plus dead load) and Total Load in pounds per lineal foot (plf) that must be supported by the formwork. Neglect ledger weight.
- Select a table that matches the ledger under consideration.
- Select a span from the first column.
- Scan across the table for a pair of Conc + DL and Total Load values that exceed the design requirements identified in Step 1. If none are found, choose a wider ledger and return to Step 2.
- Support across the full width of the ledger is required. Verify that the required Min. Bearing length can be provided. If not, consider a wider ledger and return to Step 2.
- Select the ledger depth at the top of the column that satisfies the criteria provided by Steps 4 and 5.

# Wall and Column Forms

## TYPICAL WALL FORM ASSEMBLY



## DOUBLE WALE ASSEMBLY FOR WALL APPLICATIONS



# 2.0E LVL Stud

Allowable Pressure [PSF]. Deflection limited to L/360 or ¼" Max.

2.0E LVL ALLOWABLE PRESSURE [PSF]

Stud Size	Stud Spacing	Wale Spacing								Minimum Bearing Length
		18"	24"	30"	36"	42"	48"	54"	60"	
1½" x 3½"	6"	3000	2865	2072	1622	1258	843			3"
	8"	3000	2149	1554	1217	944	632			3"
	12"	2322	1433	1036	811	629				3"
	16"	1741	1074	777	608					3"
1¾" x 3½"	6"	3000	3000	2417	1893	1468	983	691		3"
	8"	3000	2507	1813	1420	1101	737			3"
	12"	2709	1671	1209	946	734				3"
	16"	2032	1254	906	710					3"
2¼" x 3½"	6"	3000	3000	3000	2434	1887	1264	888	647	3"
	8"	3000	3000	2331	1825	1415	948	666		3"
	12"	3000	2149	1554	1217	944	632			3"
	16"	2612	1612	1165	913	708				3"
2½" x 3½"	6"	3000	3000	3000	2704	2097	1405	987	719	3"
	8"	3000	3000	2590	2028	1573	1053	740		3"
	12"	3000	2388	1726	1352	1048	702			3"
	16"	2902	1791	1295	1014	786				3"
3½" x 3½"	6"	3000	3000	2544	1992	1637	1390	1207	1007	3"
	8"	3000	2639	1908	1494	1228	1042	905	755	3"
	12"	2851	1759	1272	996	819	695	604		3"
	16"	2138	1319	954	747	614				3"
1½" x 4½"	6"	3000	3000	2947	2256	1827	1536	1258	917	3½"
	8"	3000	3000	2210	1692	1370	1152	944	688	3½"
	12"	2695	2021	1474	1128	914	768	629		3½"
	16"	2021	1516	1105	846	685				3½"
1¾" x 4½"	6"	3000	3000	3000	2632	2132	1792	1468	1070	3½"
	8"	3000	3000	2579	1974	1599	1344	1101	802	3½"
	12"	3000	2358	1719	1316	1066	896	734		3½"
	16"	2358	1769	1289	987	799	672			3½"
2¼" x 4½"	6"	3000	3000	3000	3000	2741	2303	1887	1376	3½"
	8"	3000	3000	3000	2538	2056	1728	1415	1032	3½"
	12"	3000	3000	2210	1692	1370	1152	944	688	3½"
	16"	3000	2274	1658	1269	1028	864	708		3½"
2½" x 4½"	6"	3000	3000	3000	3000	3000	2559	2097	1529	3½"
	8"	3000	3000	3000	2820	2284	1919	1573	1146	3½"
	12"	3000	3000	2456	1880	1523	1280	1048	764	3½"
	16"	3000	2526	1842	1410	1142	960	786		3½"
3½" x 4½"	6"	3000	3000	3000	3000	3000	3000	2935	2140	3½"
	8"	3000	3000	3000	3000	3000	2687	2202	1605	3½"
	12"	3000	3000	3000	2632	2132	1792	1468	1070	3½"
	16"	3000	3000	2579	1974	1599	1344	1101	802	3½"
1½" x 5½"	6"	3000	3000	3000	2695	2310	1964	1683	1472	3½"
	8"	3000	3000	2425	2021	1732	1473	1262	1104	3½"
	12"	2695	2021	1617	1347	1155	982	841	736	3½"
	16"	2021	1516	1213	1011	866	736	631		3½"
1¾" x 5½"	6"	3000	3000	3000	3000	2695	2291	1963	1717	3½"
	8"	3000	3000	2830	2358	2021	1718	1472	1288	3½"
	12"	3000	2358	1886	1572	1347	1146	982	859	3½"
	16"	2358	1769	1415	1179	1011	859	736	644	3½"

2.0E LVL ALLOWABLE PRESSURE [PSF]

Stud Size	Stud Spacing	Wale Spacing								Minimum Bearing Length
		18"	24"	30"	36"	42"	48"	54"	60"	
2¼" x 5½"	6"	3000	3000	3000	3000	3000	2946	2524	2208	3½"
	8"	3000	3000	3000	3000	2599	2209	1893	1656	3½"
	12"	3000	3000	2425	2021	1732	1473	1262	1104	3½"
	16"	3000	2274	1819	1516	1299	1105	947	828	3½"
2½" x 5½"	6"	3000	3000	3000	3000	3000	3000	2805	2453	3½"
	8"	3000	3000	3000	3000	2887	2455	2104	1840	3½"
	12"	3000	3000	2695	2246	1925	1637	1402	1227	3½"
	16"	3000	2526	2021	1684	1444	1227	1052	920	3½"
3½" x 5½"	6"	3000	3000	3000	3000	3000	3000	3000	3000	3½"
	8"	3000	3000	3000	3000	3000	3000	2945	2576	3½"
	12"	3000	3000	3000	3000	2695	2291	1963	1717	3½"
	16"	3000	3000	2830	2358	2021	1718	1472	1288	3½"
1¾" x 6½"	8"	3000	3000	3000	2967	2543	2183	1851	1606	4½"
	12"	3000	2967	2373	1978	1695	1455	1234	1071	4½"
	16"	2967	2225	1780	1483	1271	1091	925	803	4½"
	19.2"	2472	1854	1483	1236	1059	910	771	669	4½"
2¼" x 6½"	8"	3000	3000	3000	3000	3000	2806	2379	2065	4½"
	12"	3000	3000	3000	2543	2180	1871	1586	1377	4½"
	16"	3000	2861	2288	1907	1635	1403	1190	1032	4½"
	19.2"	3000	2384	1907	1589	1362	1169	991	860	4½"
2½" x 6½"	8"	3000	3000	3000	3000	3000	3000	2644	2294	4½"
	12"	3000	3000	3000	2825	2422	2079	1762	1530	4½"
	16"	3000	3000	2543	2119	1816	1559	1322	1147	4½"
	19.2"	3000	2649	2119	1766	1514	1299	1102	956	4½"
3½" x 6½"	8"	3000	3000	3000	3000	3000	3000	3000	3000	4½"
	12"	3000	3000	3000	3000	3000	2910	2467	2141	4½"
	16"	3000	3000	3000	2967	2543	2183	1851	1606	4½"
	19.2"	3000	3000	2967	2472	2119	1819	1542	1338	4½"

**Notes:**

- Table values are for beam orientation except for shaded cells. Values in shaded cells are for either plank or beam orientation.
- Span is measured from center to center of supports.
- Table values are limited by deflection equal to the lesser of ¼-inch or span/360.
- Table values have been adjusted by C<sub>M</sub> = 0.90 for unprotected use and by C<sub>D</sub> = 1.25 for construction load duration.
- Table values are based on 3 or more equal, continuous spans. Use sizing software or consult a professional engineer when a continuous span is less than half the length of an adjacent span or when design conditions are otherwise outside the scope of this table.

## How To Use These Tables:

- Determine the design wall pressure in pounds per square foot (psf).
- Select a combination of stud size, stud spacing, and wale spacing that will resist the design wall pressure.
- Verify that the required Minimum Bearing Length can be provided. If not, use sizing software or consult a professional engineer.

# 2.0E LVL Double Wale

Allowable Pressure [PSF]. Deflection limited to L/360 or ¼" Max.

2.0E LVL ALLOWABLE PRESSURE [PSF]

Wale Size	Wale Spacing	Tie Spacing								Minimum Bearing Length
		16"	19.2"	24"	26"	28"	30"	32"	34"	
Double 1½" x 3½"	12"	3000	3000	2915	2550	2267	2040	1855	1700	5"
	24"	3000	2218	1457	1275	1134	1020	927	850	5"
	36"	2267	1479	972	850	756	680	618		5"
	48"	1700	1109	729	638					5"
Double 1¾" x 3½"	12"	3000	3000	3000	2975	2645	2380	2164	1984	5"
	24"	3000	2587	1700	1488	1322	1190	1082	992	5"
	36"	2645	1725	1134	992	882	793	721	661	5"
	48"	1984	1294	850	744	661				5"
Double 2¼" x 3½"	24"	3000	3000	2481	2135	1874	1669	1505	1370	7"
	36"	3000	2708	1654	1423	1249	1113	1003	914	7"
	48"	3000	2031	1241	1068	937	835	753	685	7"
	60"	2825	1625	993	854	750	668	602		7"
Double 2½" x 3½"	24"	3000	3000	2757	2372	2082	1855	1672	1523	7"
	36"	3000	3000	1838	1582	1388	1237	1115	1015	7"
	48"	3000	2257	1379	1186	1041	927	836	761	7"
	60"	3000	1806	1103	949	833	742	669	609	7"
Double 1½" x 4½"	12"	3000	3000	3000	3000	2862	2580	2349		5"
	24"	3000	3000	2127	1830	1606	1431	1290	1175	5"
	36"	2549	2124	1418	1220	1071	954	860	783	5"
	48"	1912	1593	1063	915	803	715	645		5"
Double 1¾" x 4½"	24"	3000	3000	2481	2135	1874	1669	1505	1370	5"
	36"	2973	2478	1654	1423	1249	1113	1003	914	5"
	48"	2230	1858	1241	1068	937	835	753	685	5"
	60"	1784	1487	993	854	750	668	602		5"
Double 2¼" x 4½"	24"	3000	3000	3000	3000	2683	2361	2108	1904	7"
	36"	3000	3000	2459	2071	1789	1574	1405	1269	7"
	48"	3000	3000	1845	1553	1341	1180	1054	952	7"
	60"	2987	2489	1476	1243	1073	944	843	762	7"
Double 2½" x 4½"	24"	3000	3000	3000	3000	2981	2623	2342	2116	7"
	36"	3000	3000	2733	2301	1987	1749	1561	1410	7"
	48"	3000	3000	2049	1726	1491	1312	1171	1058	7"
	60"	3000	2766	1640	1381	1192	1049	937	846	7"
Double 1½" x 5½"	24"	3000	3000	2549	2353	2185	1924	1718	1551	5"
	36"	2549	2124	1699	1568	1456	1283	1145	1034	5"
	48"	1912	1593	1274	1176	1092	962	859	776	5"
	60"	1529	1274	1019	941	874	770	687	621	5"
Double 1¾" x 5½"	24"	3000	3000	2973	2745	2549	2244	2004	1810	5"
	36"	2973	2478	1982	1830	1699	1496	1336	1207	5"
	48"	2230	1858	1487	1372	1274	1122	1002	905	5"
	60"	1784	1487	1189	1098	1019	898	802	724	5"
Double 2¼" x 5½"	24"	3000	3000	3000	3000	3000	3000	2829	2531	7"
	36"	3000	3000	3000	2915	2466	2138	1886	1688	7"
	48"	3000	3000	2489	2186	1850	1603	1415	1266	7"
	60"	2987	2489	1992	1749	1480	1283	1132	1013	7"
Double 2½" x 5½"	24"	3000	3000	3000	3000	3000	3000	3000	2813	7"
	36"	3000	3000	3000	3000	2740	2375	2096	1875	7"
	48"	3000	3000	2766	2429	2055	1781	1572	1406	7"
	60"	3000	2766	2213	1943	1644	1425	1257	1125	7"

2.0E LVL ALLOWABLE PRESSURE [PSF]

Wale Size	Wale Spacing	Tie Spacing								Minimum Bearing Length
		16"	19.2"	24"	26"	28"	30"	32"	34"	
Double 1¾" x 6½"	24"	3000	3000	2973	2745	2549	2379	2230	2099	5"
	36"	2973	2478	1982	1830	1699	1586	1487	1399	5"
	48"	2230	1858	1487	1372	1274	1189	1115	1049	5"
	60"	1784	1487	1189	1098	1019	952	892	840	5"
Double 2¼" x 6½"	36"	3000	3000	3000	3000	2845	2655	2471	2186	7"
	48"	3000	3000	2489	2298	2134	1992	1853	1640	7"
	60"	2987	2489	1992	1838	1707	1593	1483	1312	7"
	72"	2489	2075	1660	1532	1423	1328	1236	1093	7"
Double 2½" x 6½"	36"	3000	3000	3000	3000	3000	2950	2746	2429	7"
	48"	3000	3000	2766	2553	2371	2213	2059	1822	7"
	60"	3000	2766	2213	2043	1897	1770	1647	1457	7"
	72"	2766	2305	1844	1702	1581	1475	1373	1214	7"
Double 2¾" x 7¼"	36"	3000	3000	3000	3000	2845	2655	2489	2343	7"
	48"	3000	3000	2489	2298	2134	1992	1867	1757	7"
	60"	2987	2489	1992	1838	1707	1593	1494	1406	7"
	72"	2489	2075	1660	1532	1423	1328	1245	1171	7"
Double 2½" x 7¼"	36"	3000	3000	3000	3000	3000	2950	2766	2603	7"
	48"	3000	3000	2766	2553	2371	2213	2075	1952	7"
	60"	3000	2766	2213	2043	1897	1770	1660	1562	7"
	72"	2766	2305	1844	1702	1581	1475	1383	1302	7"

**Notes:**

1. Table values are for beam orientation.
2. Span is measured from center to center of supports.
3. Table values are limited by deflection equal to the lesser of ¼-inch or span/360.
4. Table values have been adjusted by C<sub>M</sub> = 0.90 for unprotected use and by C<sub>D</sub> = 1.25 for construction load duration.
5. Table values are based on 3 or more equal, continuous spans. Use sizing software or consult a professional engineer when a continuous span is less than half the length of an adjacent span or when design conditions are otherwise outside the scope of this table.

## How To Use These Tables:

1. Determine the design wall pressure in pounds per square foot (psf).
2. Select a combination of wale size, wale spacing, and tie spacing that will resist the design wall pressure.
3. Support across the full width of each wale is required. Verify that the Minimum Bearing Length can be provided. If not, consider wider wales and return to Step 2.

# LVL Shoring

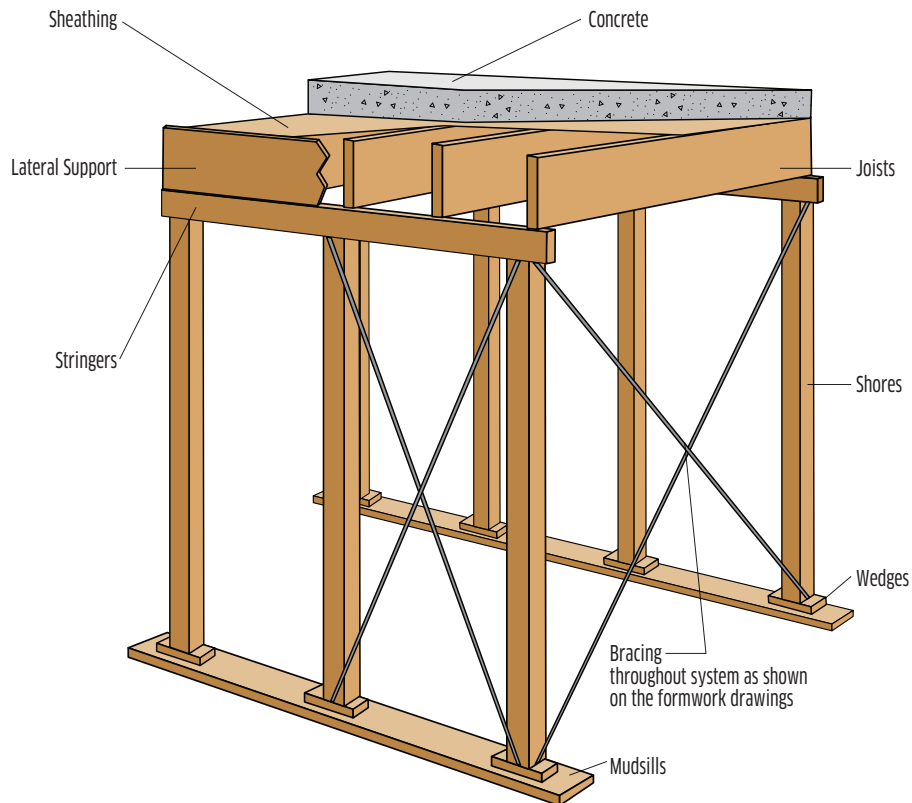
## 2.0E LVL ALLOWABLE LOADS [LB]

Shore Length [ft]	Shore Size					
	3½" x 3½"	3½" x 5½"	3½" x 7¼"	5¼" x 5½"	5¼" x 7¼"	7" x 7¼"
4	10885	17105	22545	35500	46800	68225
5	8935	14040	18515	31620	41680	64045
6	7415	11650	15355	27840	36700	59495
7	6235	9800	12910	24445	32220	54770
8	5300	8330	10980	21510	28355	50040
9	4555	7160	9440	18990	25035	45575
10	3955	6215	8195	16855	22215	41450
11	3465	5445	7175	15035	19815	37735
12	3055	4800	6335	13475	17765	34405

**Notes:**

1. Table values have been adjusted by  $C_M = 0.90$  for unprotected use and by  $C_D = 1.25$  for construction load duration.
2. Tables values apply to solid, one-piece shores that are installed plumb and braced in both directions at the top and bottom.
3. Table values apply to shores that bear only axial loads with maximum load eccentricity of either 1/6 of the shore width or thickness.
4. Use sizing software or consult a professional engineer when design conditions are outside the scope of this table.
5. Shore capacity might be limited by the capacity of the stringer or other supported member, wood wedges, hardware, mudsills, soil, etc.

## Typical Slab Form Assembly

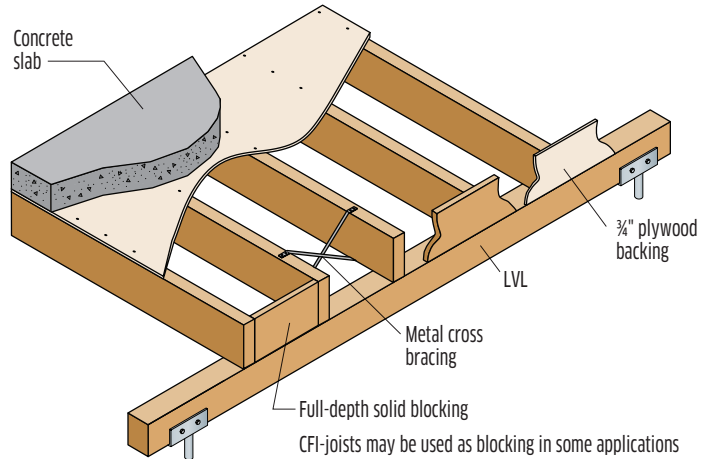


# Bearing and Lateral Support Detail

## MINIMUM LATERAL SUPPORT REQUIREMENTS

- Depth to width  $\leq 2$  to 1, no lateral support required.
- Depth to width  $\leq 4$  to 1, lateral support required at supports to prevent rotation (Example: solid blocking).
- Depth to width  $> 4$  to 1, no hand-setting. Formwork must be panelized. Lateral support required at supports to prevent rotation (Example: solid blocking) and at 24 inches on center maximum along the loaded edge to prevent buckling (Example: sheathing attached with minimum 2½" x 0.131" nails at 24" o.c.).
- Project conditions might call for more than minimum lateral support. See the formwork drawings.

**DANGER! Formwork is unstable until required lateral support is installed.**



## Storage

- LVL should be stored lying flat and protected from the weather.
- Keep the material above ground to minimize the absorption of ground moisture and allow circulation of air.
- Protect from the weather on the job site both before and after installation.

# Formwork Inspection

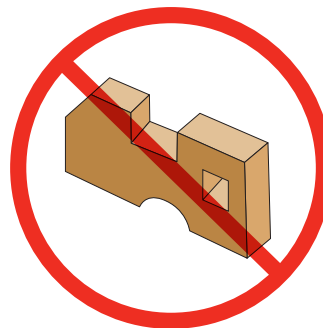
## Laminated Veneer Lumber

Do not cut, notch, or drill form beams except as shown on the formwork drawings. Proper inspection of all form beams for damage before using them is mandatory. Remove damaged form beams and replace them immediately. Failure to remove and replace damaged form beams may result in collapse of the formwork, serious injury, or death. Look for these common types of occurrences (as well as other signs of damage):

- Damage due to overloading (e.g., crushed bearing areas, stress cracks)
  - Damage due to dropping, forklift damage, or other improper handling
  - Improper saw cuts, drill holes, or notches
  - Signs of decay or insect damage

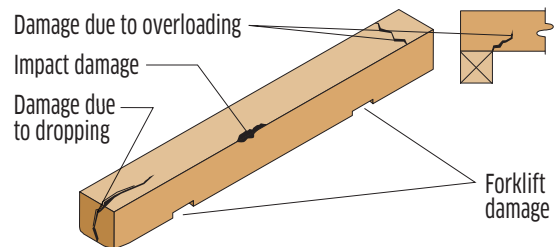
### INSPECT FOR DAMAGE

due to overloading, impact, dropping, and forklift damage

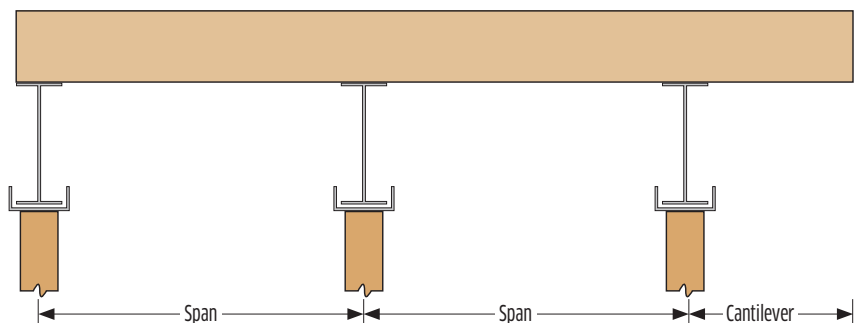


### Do Not Cut, Notch, or Drill

Form beams with cuts, notches, or drill holes should be removed from service



## Span Definition



## Product Warranty

Pacific Woodtech Corporation warrants that its products, as manufactured, will be free from manufacturing errors or defects in workmanship and material.

In addition, provided the product, as manufactured, is stored, handled, installed and used correctly, Pacific Woodtech Corporation warrants the adequacy of its design.

This warranty is backed by the full resources of Pacific Woodtech Corporation and by underwritten product liability insurance.

**PACIFIC**  
**WOODTECH**  
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