## **LP SolidStart**<sup>®</sup> **Roof Details**

# J1 **Rafter Connection**



LP® SolidStart® I-Joists, LP SolidStart LVL & LP SolidStart LSL

Note: For specific strength and span information, please consult specific product brochures. For applications with I-Joist depths over 16, please consult the Light-Frame Commercial and Multifamily Construction Tech Guide

Important Notes WARNING: Failure to follow proper procedures for handling, storage and installation could result in unsatisfactory performance, unsafe structures and possible collapse.

These instructions are offered as a guide to good practice in the handling, storage and installation of LP® SolidStart® I-Joists, LP SolidStart LVL & LP SolidStart LSL beams. They are, however, solely general recommendations and, in some instances, other or additional precautions may be desirable. In all cases, the procedures used should be as specified by the architect/engineer responsible for the entire building.

ENGINEERED WOOD

- This is not intended as a manual for selecting products and assumes that components and details have been specified correctly.
- Consult the LP SolidStart I-Joist. LP SolidStart LVL & LP SolidStart LSL brochures or contact your LP SolidStart products distributor for assistance.
- All rim joists, blocking, connections and temporary bracing must be installed before erectors are allowed on the structure.
- No loads other than the weight of the erectors are to be imposed on the structure before it is permanently sheathed.
- After sheathing, do not overload joists with construction materials exceeding design loads.
- LP SolidStart I-Joists, LP SolidStart LVL & LP SolidStart LSL beams must be used under dry, covered and well-ventilated interior conditions in which the equilibrated moisture content in lumber will not exceed 16% (US) or does not exceed a yearly average of 15% and does not exceed 19% at any time (CN).

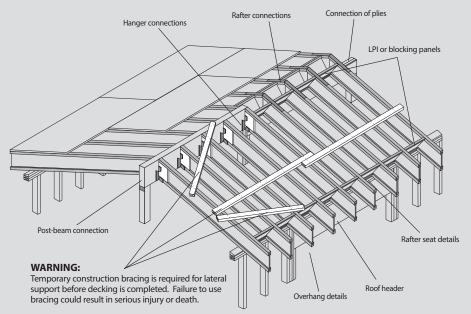
## Roof Layout (typical)

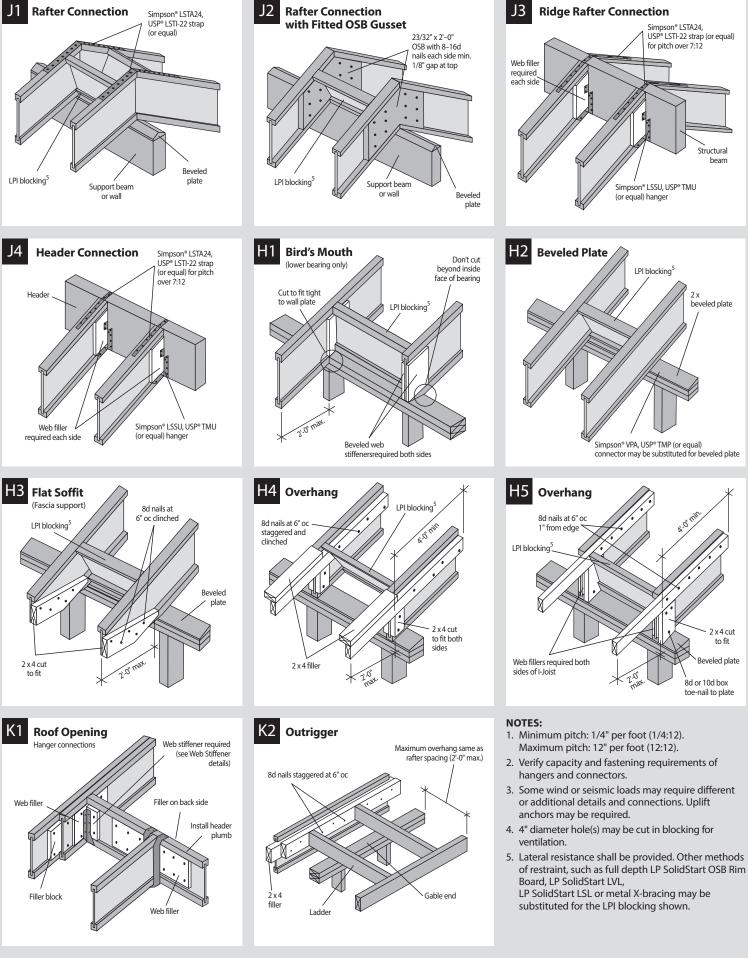
### **TEMPORARY BRACING**

- Use at least 1x4 temporary bracing members nailed to each I-Joist with two 8d nails.
- Keep the main runs parallel and no more than 8'-0" apart.
- Use long pieces, not short blocks; lap the ends to keep a continuous line of bracing.
- To prevent endwise movement of the continuous 1 x 4 lines of bracing, anchor them at the ends and at 25'-0" intervals into a stable end wall or an area braced by sheathing or diagonal bracing.
- Remember, the continuous 1 x 4 bracing is not effective unless attached to the braced area.
- Use particular care removing temporary bracing when applying sheathing. Remove the bracing as the sheathing is attached.

### **NOTES FOR ROOF LAYOUT:**

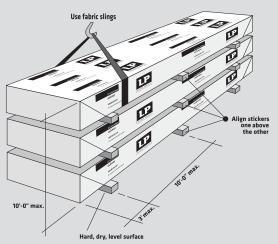
- I-Joists used as rafters must be supported laterally at all bearings and the ends of cantilevers.
- Any fastening of member not detailed, such as uplift or seismic anchor, is subject to local approval and may require additional details and connections.
- Minimum pitch: 1/4" per foot (1/4:12). Maximum pitch: 12" per foot (12:12).
- Verify capacity and fastening of hangers and connections.





# Handling & Storage

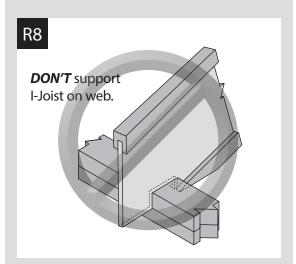
- Keep LP SolidStart I-Joists, LP SolidStart LVL & LP SolidStart LSL beams drv.
- Unload products carefully by lifting. Support the bundles to reduce excessive bowing. Individual products should be handled in a manner which prevents physical damage during measuring, cutting, erection, etc. I-Joists should be handled vertically and not flatwise
- Keep stored in wrapped and strapped bundles, stacked no more than 10' high. Support and separate bundles with 2 x 4 (or larger) stickers spaced no more than 10' apart. Keep stickers in line vertically.
- Product must not be stored in contact with the ground, or have prolonged exposure to the weather
- Use forklifts and cranes carefully to avoid damaging product.
- Do not use visually damaged product. Call your local LP SolidStart Engineered Wood Products distributor for assistance when damaged products are encountered.



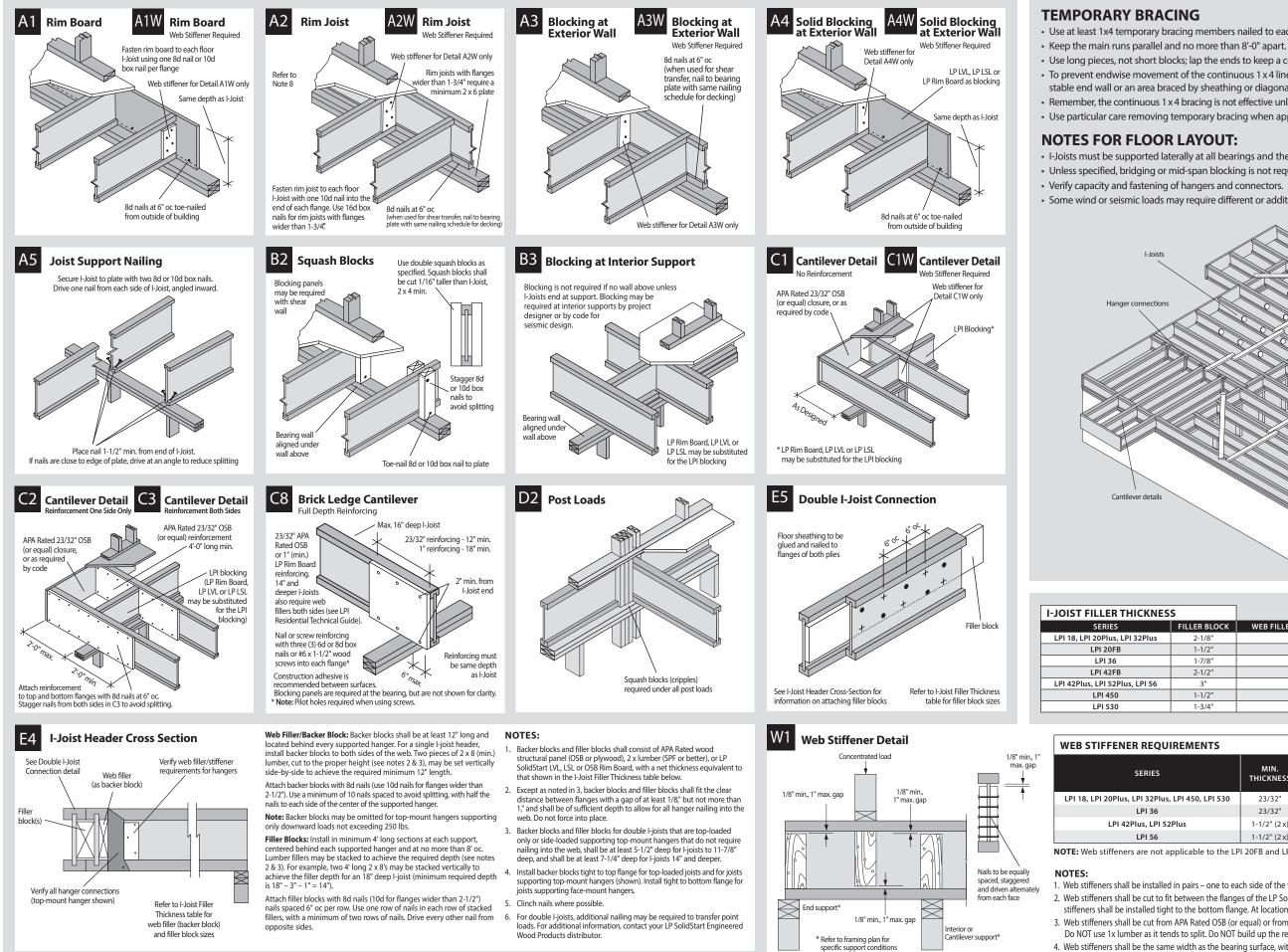
### WARNING

### The following conditions are NOT permitted!

Do not use visually damaged products without first checking with your local LP SolidStart Engineered Wood Products distributor or sales office.



### **Floor Details**

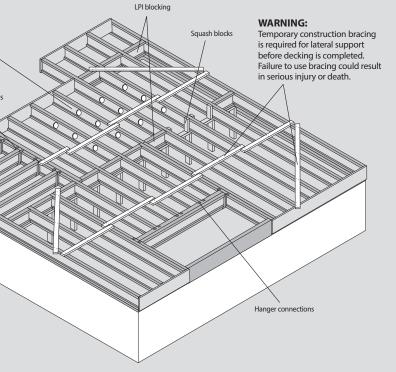


# Floor Layout (typical)

- Use at least 1x4 temporary bracing members nailed to each I-Joist with two 8d nails.
- Use long pieces, not short blocks; lap the ends to keep a continuous line of bracing.
- To prevent endwise movement of the continuous 1 x 4 lines of bracing, anchor them at the ends and at 25'-0" intervals into a stable end wall or an area braced by sheathing or diagonal bracing.
- Remember, the continuous 1 x 4 bracing is not effective unless attached to the braced area.
- Use particular care removing temporary bracing when applying sheathing. Remove the bracing as the sheathing is attached.

I-loist

- I-Joists must be supported laterally at all bearings and the ends of cantilevers.
- Unless specified, bridging or mid-span blocking is not required; however, it may enhance floor performance if used properly. • Verify capacity and fastening of hangers and connectors.
- Some wind or seismic loads may require different or additional details and connections.



WEB FILLER/BACKER BLOCK
1"
23/32"
7/8"
1-1/4″
1-1/2"
23/32"
7/8"

### NOTES:

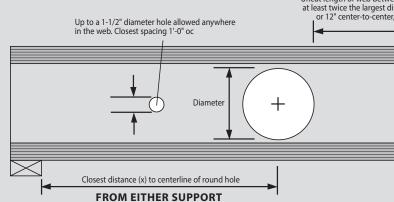
- 1. Backer blocks and filler blocks shall consist of APA Rated wood structural panel (OSB or plywood), or 2x lumber (SPF or better)
- 2. LP LVL, LSL or OSB Rim Board may also be used.
- 3 Refer to the Notes for the I-Joist Header Cross-Section to the left for details on the required height and length. and nailing of the backer blocks and filler blocks.

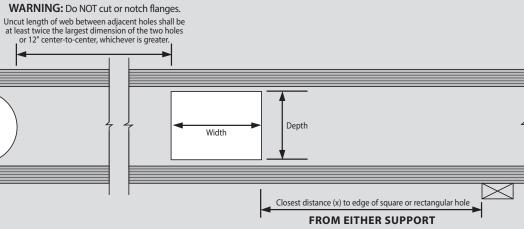
	MIN.	NAIL	NAIL QTY., MAX. STIFFENER HEIGHT FOR JOIST DEPTHS						
	THICKNESS	SIZE	9-1/2"	11-7/8"	14"	16"			
, LPI 450, LPI 530	23/32"	8d (2-1/2")	3, 6-3/8"	3, 8-3/4"	3, 10-7/8"	3, 12-7/8"			
	23/32"	8d (2-1/2")	-	4, 8-3/4"	5, 10-7/8"	6, 12-7/8"			
2Plus	1-1/2" (2 x)	10d (3")	3, 6-3/8"	3, 8-3/4"	3, 10-7/8"	3, 12-7/8"			
	1-1/2" (2 x)	10d (3")	-	4, 8-3/4"	5, 10-7/8"	6, 12-7/8"			

NOTE: Web stiffeners are not applicable to the LPI 20FB and LPI 42FB series.

- 1. Web stiffeners shall be installed in pairs one to each side of the web. Web stiffeners are always required for the "Bird's Mouth" roof joist bearing detail. 2. Web stiffeners shall be cut to fit between the flanges of the LP SolidStart I-Joist, leaving a minimum 1/8" gap (1" maximum). At bearing locations, the stiffeners shall be installed tight to the bottom flange. At locations of concentrated loads, the stiffeners shall be installed tight to the top flange. 3. Web stiffeners shall be cut from APA Rated OSB (or equal) or from LP SolidStart LVL, LSL or OSB Rim Board. 2x lumber is permissible.
- Do NOT use 1x lumber as it tends to split. Do NOT build up the required stiffener thickness from multiple pieces.
- 4. Web stiffeners shall be the same width as the bearing surface, with a minimum of 3-1/2".
- 5. See Web Stiffener Requirements for minimum stiffener thickness, maximum stiffener height and required nailing.

## Web Hole Details





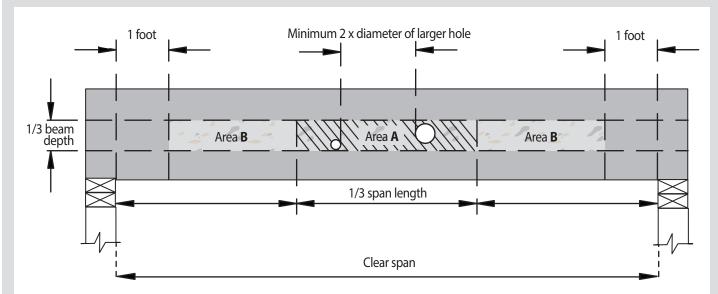
### CLOSEST DISTANCE (X) - (FT - IN)

CEDIEC	DEDTU		CIRCULAR HOLE DIAMETER									
SERIES	DEPTH	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"
LPI 18	9-1/2"	1'-2"	1'-10"	2'-7"	3'-3"	4'-3"	-	-	-	-	-	-
	11-7/8"	1'-0"	1'-5"	2'-1"	2'-9"	3'-6"	4'-3"	5'-5"	-	-	-	-
LPI 20Plus	9-1/2" 11-7/8"	1'-0" 1'-0"	1'-0" 1'-4"	1'-5" 1'-11"	2'-0" 2'-5"	2'-8" 2'-11"	- 3'-6"	- 4'-0"	-	-	-	-
LPI 20FB	11-7/8	1'-3"	1'-4	2'-2"	2-5	3'-1"	3'-6"	4-0	- 4'-6"	- 5'-1"	-	-
	16"	1'-8"	2'-1"	2'-6"	2'-11"	3'-4"	3'-9"	4'-3"	4'-8"	5'-1"	5'-7"	6'-3"
	9-1/2"	1'-0"	1'-2"	1'-11"	2'-9"	3'-6"	-	-	-	-	-	-
LPI 32Plus	11-7/8"	1'-1"	1'-9"	2'-5"	3'-0"	3'-8"	4'-4"	5'-0"	-	-	-	-
LFT SZFTUS	14"	1'-8"	2'-3"	2'-10"	3'-5"	4'-0"	4'-8"	5'-3"	5'-11"	6'-7"	-	-
	16"	2'-4"	2'-10"	3'-4"	3'-11"	4'-5"	4'-11"	5'-6"	6'-1"	6'-8"	7'-4"	8'-2"
	9-1/2"	1'-3" 3'-2"	2'-3" 3'-10"	3'-4" 4'-7"	4'-4" 5'-3"	5'-5" 6'-0"	- 6'-9"	- 7'-8"	-	-	-	-
LPI 42Plus LPI 42FB	11-7/8" 14"	4'-5"	5'-0"	4 -7 5'-7"	5-5 6'-1"	6'-8"	7'-3"	8'-0"	- 8'-10"	- 9'-11"	-	-
LF1421D	16"	5'-4"	5'-10"	6'-4"	6'-10"	7'-4"	7'-10"	8'-6"	9'-3"	10'-0"	11'-0"	12'-3"
	11-7/8"	5'-0"	5'-6"	6'-2"	6'-9"	7'-5"	8'-2"	8'-11"	-	-	-	-
LPI 52Plus	14"	6'-1"	6'-7"	7'-1"	7'-7"	8'-3"	8'-11"	9'-8"	10'-6"	11'-4"	-	-
	16"	7'-1"	7'-6"	7'-11"	8'-5"	9'-0"	9'-8"	10'-5"	11'-3"	12'-1"	12'-11"	13'-9"
	11-7/8"	1'-0"	2'-0"	3'-0"	4'-0"	5'-1"	6'-2"	7'-6"	-	-	-	-
LPI 36	14"	1'-10"	2'-8"	3'-7"	4'-5"	5'-4"	6'-3"	7'-3"	8'-6"	9'-11"	-	-
	16" 11-7/8"	2'-2" 3'-9"	3'-1" 4'-9"	3'-11" 5'-9"	4'-9" 6'-9"	5'-7" 7'-9"	6'-5" 8'-10"	7'-4" 9'-11"	8'-4"	9'-7"	- 10'-11"	12'-5"
LPI 56	14"	4'-10"	4-9 5'-9"	6'-8"	7'-7"	8'-7"	9'-7"	10'-7"	- 11'-7"	- 12'-10"	-	-
LIISU	16"	6'-0"	6'-11"	7'-9"	8'-8"	9'-7"	10'-5"	11'-4"	12'-2"	13'-3"	14'-4"	15'-11"
	11-7/8"	1'-0"	1'-5"	2'-5"	3'-6"	4'-6"	5'-7"	7'-2"	-	-	-	-
LPI 450	14"	1'-0"	1'-2"	1'-8"	2'-4"	3'-4"	4'-5"	5'-7"	6'-10"	8'-8"	-	-
	9-1/2"	1'-3"	2'-5"	3'-7"	4'-9"	6'-0"	-	-	-	-	-	-
LPI 530	11-7/8"	1'-0"	1'-7"	2'-6"	3'-8"	4'-11"	6'-2"	7'-9"	-	-	-	-
	14" 16"	1'-0"	1'-3"	1'-11" 1'-8"	2'-8" 2'-2"	3'-9" 2'-11"	4'-11" 4'-0"	6'-1" 5'-1"	7'-6" 6'-2"	9'-4" 7'-4"	- 8'-10"	- 11'-2"
	10	1'-0"	1'-2"	1	GULAR HO		1				8-10	11-Z
SERIES	DEPTH	2"	3"	4"	GULAR HO	6"		8"	9"	101H	11"	12"
	9-1/2"	2'-7"	3'-0"	3'-7"	4'-3"	5'-4"	5'-9"	6'-1"	6'-7"	7'-1"	7'-7"	8'-1"
LPI 18	11-7/8"	3'-5"	3'-10"	4'-4"	4'-11"	5'-10"	7'-0"	8'-11"	9'-6"	10'-2"	10'-10"	-
								6'-8"	7'-2"	7'-8"	8'-3"	8'-9"
	9-1/2"	2'-10"	3'-4"	3'-10"	4'-7"	5'-9"	6'-2"	0-8		/-8	0-3	
LPI 20Plus		2'-10" 3'-9"	3'-4" 4'-2"	3'-10" 4'-9"	4'-7" 5'-5"	5'-9" 6'-5"	6'-2" 7'-9"	9'-8"	10'-4"	11'-0"	11'-8"	12'-6"
LPI 20Plus LPI 20FB	9-1/2" 11-7/8" 14"	3'-9" 1'-2"	4'-2" 1'-10"	4'-9" 2'-6"	5'-5" 3'-2"	6'-5" 3'-11"	7'-9" 4'-8"	9'-8" 5'-7"	10'-4" 6'-10"	11'-0" 9'-0"	11'-8" 9'-11"	11'-1"
	9-1/2" 11-7/8" 14" 16"	3'-9" 1'-2" 1'-7"	4'-2" 1'-10" 2'-3"	4'-9" 2'-6" 2'-11"	5'-5" 3'-2" 3'-7"	6'-5" 3'-11" 4'-3"	7'-9" 4'-8" 4'-11"	9'-8" 5'-7" 5'-8"	10'-4" 6'-10" 6'-8"	11'-0" 9'-0" 8'-2"	11'-8" 9'-11" 10'-6"	11'-1" 14'-5"
	9-1/2" 11-7/8" 14" 16" 9-1/2"	3'-9" 1'-2" 1'-7" 3'-8"	4'-2" 1'-10" 2'-3" 4'-4"	4'-9" 2'-6" 2'-11" 5'-0"	5'-5" 3'-2" 3'-7" 6'-0"	6'-5" 3'-11" 4'-3" 7'-5"	7'-9" 4'-8" 4'-11" 7'-9"	9'-8" 5'-7" 5'-8" 8'-2"	10'-4" 6'-10" 6'-8" 8'-7"	11'-0" 9'-0" 8'-2" 9'-1"	11'-8" 9'-11" 10'-6" 9'-6"	11'-1" 14'-5" 10'-0"
	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0"	5'-5" 3'-2" 3'-7" 6'-0" 6'-11"	6'-5" 3'-11" 4'-3" 7'-5" 8'-1"	7'-9" 4'-8" 4'-11" 7'-9" 9'-8"	9'-8" 5'-7" 5'-8" 8'-2" 11'-5"	10'-4" 6'-10" 6'-8" 8'-7" 12'-0"	11'-0" 9'-0" 8'-2" 9'-1" 12'-6"	11'-8" 9'-11" 10'-6" 9'-6" 13'-3"	11'-1" 14'-5" 10'-0" 14'-0"
LPI 20FB	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8" 1'-7"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3" 2'-5"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0" 3'-4"	5'-5" 3'-2" 3'-7" 6'-0" 6'-11" 4'-2"	6'-5" 3'-11" 4'-3" 7'-5" 8'-1" 5'-1"	7'-9" 4'-8" 4'-11" 7'-9" 9'-8" 6'-0"	9'-8" 5'-7" 5'-8" 8'-2" 11'-5" 7'-2"	10'-4" 6'-10" 6'-8" 8'-7" 12'-0" 8'-11"	11'-0" 9'-0" 8'-2" 9'-1" 12'-6" 11'-8"	11'-8" 9'-11" 10'-6" 9'-6" 13'-3" 12'-7"	11'-1" 14'-5" 10'-0" 14'-0" 13'-7"
LPI 20FB	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0"	5'-5" 3'-2" 3'-7" 6'-0" 6'-11"	6'-5" 3'-11" 4'-3" 7'-5" 8'-1"	7'-9" 4'-8" 4'-11" 7'-9" 9'-8"	9'-8" 5'-7" 5'-8" 8'-2" 11'-5"	10'-4" 6'-10" 6'-8" 8'-7" 12'-0"	11'-0" 9'-0" 8'-2" 9'-1" 12'-6"	11'-8" 9'-11" 10'-6" 9'-6" 13'-3"	11'-1" 14'-5" 10'-0" 14'-0"
LPI 20FB	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8" 1'-7" 2'-2"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3" 2'-5" 3'-0"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0" 3'-4" 3'-10"	5'-5" 3'-2" 3'-7" 6'-0" 6'-11" 4'-2" 4'-8"	6'-5" 3'-11" 4'-3" 7'-5" 8'-1" 5'-1" 5'-6"	7'-9" 4'-8" 4'-11" 7'-9" 9'-8" 6'-0" 6'-5"	9'-8" 5'-7" 5'-8" 8'-2" 11'-5" 7'-2" 7'-5"	10'-4" 6'-10" 6'-8" 8'-7" 12'-0" 8'-11" 8'-9"	11'-0" 9'-0" 8'-2" 9'-1" 12'-6" 11'-8" 10'-8"	11'-8" 9'-11" 10'-6" 9'-6" 13'-3" 12'-7" 13'-9"	11'-1" 14'-5" 10'-0" 14'-0" 13'-7" 17'-2"
LPI 20FB LPI 32Plus	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 9-1/2" 11-7/8" 14"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8" 1'-7" 2'-2" 5'-8" 7'-2" 4'-4"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3" 2'-5" 3'-0" 6'-6" 8'-0" 5'-2"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0" 3'-4" 3'-10" 7'-4" 9'-0" 6'-0"	5'-5" 3'-2" 3'-7" 6'-0" 6'-11" 4'-2" 4'-8" 8'-2" 10'-0" 6'-10"	6'-5" 3'-11" 4'-3" 7'-5" 8'-1" 5'-1" 5'-6" 9'-3" 10'-11" 7'-10"	7'-9" 4'-8" 4'-11" 7'-9" 9'-8" 6'-0" 6'-5" 9'-7" 12'-1" 9'-1"	9'-8" 5'-7" 5'-8" 8'-2" 11'-5" 7'-2" 7'-5" 9'-11" 13'-8" 10'-10"	10'-4" 6'-10" 6'-8" 8'-7" 12'-0" 8'-11" 8'-9" 10'-4" 14'-3" 12'-7"	11'-0" 9'-0" 8'-2" 9'-1" 12'-6" 11'-8" 10'-8" 10'-9" 14'-11" 14'-7"	11'-8" 9'-11" 10'-6" 9'-6" 13'-3" 12'-7" 13'-9" 11'-3" 15'-7" 15'-4"	11'-1" 14'-5" 10'-0" 14'-0" 13'-7" 17'-2" 11'-9" 16'-6" 16'-3"
LPI 20FB	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 9-1/2" 11-7/8" 14" 16"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8" 1'-7" 2'-2" 5'-8" 7'-2" 4'-4" 5'-3"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3" 2'-5" 3'-0" 6'-6" 8'-0" 5'-2" 6'-0"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0" 3'-4" 3'-10" 7'-4" 9'-0" 6'-0" 6'-9"	5'-5" 3'-2" 3'-7" 6'-0" 6'-11" 4'-2" 4'-8" 8'-2" 10'-0" 6'-10" 7'-7"	6'-5" 3'-11" 4'-3" 7'-5" 8'-1" 5'-1" 5'-6" 9'-3" 10'-11" 7'-10" 8'-6"	7'-9" 4'-8" 4'-11" 7'-9" 9'-8" 6'-0" 6'-5" 9'-7" 12'-1" 9'-1" 9'-8"	9'-8" 5'-7" 5'-8" 8'-2" 11'-5" 7'-2" 7'-5" 9'-11" 13'-8" 10'-10" 11'-2"	10'-4" 6'-10" 6'-8" 8'-7" 12'-0" 8'-11" 8'-9" 10'-4" 14'-3" 12'-7" 13'-1"	11'-0" 9'-0" 8'-2" 9'-1" 12'-6" 11'-8" 10'-8" 10'-9" 14'-11" 14'-7" 15'-1"	11'-8" 9'-11" 10'-6" 13'-3" 12'-7" 13'-9" 11'-3" 15'-7" 15'-4" 17'-4"	11'-1" 14'-5" 10'-0" 14'-0" 13'-7" 17'-2" 11'-9" 16'-6" 16'-3" 20'-7"
LPI 20FB LPI 32Plus LPI 42Plus LPI 42FB	9-1/2" 11-7/8" 14" 9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 11-7/8"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8" 1'-7" 2'-2" 5'-8" 7'-2" 4'-4" 5'-3" 8'-6"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3" 2'-5" 3'-0" 6'-6" 8'-0" 5'-2" 6'-0" 9'-2"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0" 3'-4" 3'-10" 7'-4" 9'-0" 6'-0" 6'-0" 6'-9" 9'-11"	5'-5" 3'-2" 3'-7" 6'-0" 6'-11" 4'-2" 4'-8" 8'-2" 10'-0" 6'-10" 7'-7" 10'-8"	6'-5" 3'-11" 4'-3" 7'-5" 8'-1" 5'-6" 9'-3" 10'-11" 7'-10" 8'-6" 11'-8"	7'-9" 4'-8" 4'-11" 7'-9" 9'-8" 6'-0" 6'-5" 9'-7" 12'-1" 9'-7" 12'-1" 9'-8" 12'-10"	9'-8" 5'-7" 5'-8" 8'-2" 7'-2" 7'-5" 9'-11" 13'-8" 10'-10" 11'-2" 14'-5"	10'-4" 6'-10" 6'-8" 8'-7" 12'-0" 8'-11" 8'-11" 10'-4" 14'-3" 12'-7" 13'-1" 15'-0"	11'-0" 9'-0" 8'-2" 9'-1" 12'-6" 11'-8" 10'-8" 10'-9" 14'-11" 14'-7" 15'-1"	11'-8" 9'-11" 10'-6" 9'-6" 13'-3" 12'-7" 13'-9" 11'-3" 15'-7" 15'-4" 15'-4" 17'-4"	11'-1" 14'-5" 10'-0" 14'-0" 13'-7" 17'-2" 11'-9" 16'-6" 16'-3" 20'-7" 17'-4"
LPI 20FB	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 11-7/8" 14"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8" 1'-7" 2'-2" 5'-8" 7'-2" 4'-4" 5'-3" 8'-6" 6'-0"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3" 2'-5" 3'-0" 6'-6" 8'-0" 5'-2" 6'-0" 9'-2" 6'-9"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0" 3'-4" 3'-10" 7'-4" 9'-0" 6'-0" 6'-9" 9'-11" 7'-6"	5'-5" 3'-2" 3'-7" 6'-0" 6'-11" 4'-2" 4'-8" 8'-2" 10'-0" 6'-10" 7'-7" 10'-8" 8'-5"	6'-5" 3'-11" 4'-3" 7'-5" 8'-1" 5'-6" 9'-3" 10'-11" 7'-10" 8'-6" 11'-8" 9'-6"	7'-9" 4'-8" 4'-11" 7'-9" 9'-8" 6'-0" 6'-5" 9'-7" 12'-1" 9'-8" 12'-10" 12'-10" 10'-8"	9'-8" 5'-7" 5'-8" 8'-2" 11'-5" 7'-2" 7'-5" 9'-11" 13'-8" 10'-10" 11'-2" 14'-5" 11'-11"	10'-4" 6'-10" 6'-8" 8'-7" 12'-0" 8'-11" 8'-9" 10'-4" 14'-3" 12'-7" 13'-1" 15'-0" 13'-5"	11'-0" 9'-0" 8'-2" 9'-1" 12'-6" 11'-8" 10'-9" 14'-11" 14'-7" 15'-1" 15'-8" 15'-5"	11'-8" 9'-11" 10'-6" 13'-3" 12'-7" 13'-9" 11'-3" 15'-4" 15'-4" 15'-4" 16'-6" 16'-3"	11'-1" 14'-5" 10'-0" 14'-0" 13'-7" 17'-2" 11'-9" 16'-6" 16'-3" 20'-7" 17'-4" 17'-1"
LPI 20FB LPI 32Plus LPI 42Plus LPI 42FB	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 14" 16"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8" 1'-7" 2'-2" 5'-8" 7'-2" 4'-4" 5'-3" 8'-6" 6'-0" 7'-0"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3" 2'-5" 3'-0" 6'-6" 8'-0" 5'-2" 6'-0" 9'-2" 6'-9" 7'-7"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0" 3'-4" 9'-0" 6'-0" 6'-0" 6'-9" 9'-11" 7'-6" 8'-5"	5'-5" 3'-2" 3'-7" 6'-0" 6'-11" 4'-2" 4'-8" 8'-2" 10'-0" 6'-10" 6'-10" 7'-7" 10'-8" 8'-5" 9'-4"	6'-5" 3'-11" 4'-3" 7'-5" 8'-1" 5'-1" 5'-6" 9'-3" 10'-11" 7'-10" 8'-6" 11'-8" 9'-6" 10'-5"	7'-9" 4'-8" 4'-11" 7'-9" 9'-8" 6'-0" 6'-5" 9'-7" 12'-1" 9'-7" 12'-1" 9'-8" 12'-10" 10'-8" 11'-8"	9'-8" 5'-7" 5'-8" 8'-2" 11'-5" 7'-2" 7'-5" 9'-11" 13'-8" 10'-10" 11'-2" 14'-5" 11'-11" 13'-0"	10'-4" 6'-10" 6'-8" 8'-7" 12'-0" 8'-11" 8'-9" 10'-4" 14'-3" 12'-7" 13'-1" 15'-0" 13'-5" 14'-4"	11'-0" 9'-0" 8'-2" 9'-1" 12'-6" 11'-8" 10'-9" 14'-11" 14'-7" 15'-1" 15'-1" 15'-5" 15'-5" 16'-0"	11'-8" 9'-11" 10'-6" 9'-6" 13'-3" 12'-7" 13'-9" 11'-3" 15'-7" 15'-4" 15'-4" 15'-4" 15'-6" 16'-3" 18'-2"	11'-1" 14'-5" 10'-0" 14'-0" 13'-7" 17'-2" 11'-9" 16'-6" 16'-3" 20'-7" 17'-4" 17'-1" 21'-5"
LPI 20FB LPI 32Plus LPI 42Plus LPI 42FB	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8" 1'-7" 2'-2" 5'-8" 7'-2" 4'-4" 5'-3" 8'-6" 6'-0"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3" 2'-5" 3'-0" 6'-6" 8'-0" 5'-2" 6'-0" 9'-2" 6'-9"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0" 3'-4" 3'-10" 7'-4" 9'-0" 6'-0" 6'-9" 9'-11" 7'-6"	5'-5" 3'-2" 3'-7" 6'-0" 6'-11" 4'-2" 4'-8" 8'-2" 10'-0" 6'-10" 7'-7" 10'-8" 8'-5"	6'-5" 3'-11" 4'-3" 7'-5" 8'-1" 5'-6" 9'-3" 10'-11" 7'-10" 8'-6" 11'-8" 9'-6"	7'-9" 4'-8" 4'-11" 7'-9" 9'-8" 6'-0" 6'-5" 9'-7" 12'-1" 9'-8" 12'-10" 12'-10" 10'-8"	9'-8" 5'-7" 5'-8" 8'-2" 11'-5" 7'-2" 7'-5" 9'-11" 13'-8" 10'-10" 11'-2" 14'-5" 11'-11"	10'-4" 6'-10" 6'-8" 8'-7" 12'-0" 8'-11" 8'-9" 10'-4" 14'-3" 12'-7" 13'-1" 15'-0" 13'-5"	11'-0" 9'-0" 8'-2" 9'-1" 12'-6" 11'-8" 10'-9" 14'-11" 14'-7" 15'-1" 15'-8" 15'-5"	11'-8" 9'-11" 10'-6" 13'-3" 12'-7" 13'-9" 11'-3" 15'-4" 15'-4" 15'-4" 16'-6" 16'-3"	11'-1" 14'-5" 10'-0" 14'-0" 13'-7" 17'-2" 11'-9" 16'-6" 16'-3" 20'-7" 17'-4" 17'-1"
LPI 20FB LPI 32Plus LPI 42Plus LPI 42FB LPI 52Plus	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 14" 16"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8" 1'-7" 2'-2" 5'-8" 7'-2" 4'-4" 5'-3" 8'-6" 6'-0" 7'-0" 6'-7"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3" 2'-5" 3'-0" 6'-6" 8'-0" 6'-0" 9'-2" 6'-9" 7'-7" 7'-4"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0" 3'-4" 9'-0" 6'-0" 6'-0" 6'-9" 9'-11" 7'-6" 8'-5" 8'-1"	5'-5" 3'-2" 6'-0" 6'-11" 4'-2" 4'-8" 8'-2" 10'-0" 6'-10" 7'-7" 10'-8" 8'-5" 9'-4" 8'-10"	6'-5" 3'-11" 4'-3" 7'-5" 8'-1" 5'-6" 9'-3" 10'-11" 7'-10" 8'-6" 11'-8" 9'-6" 10'-5" 9'-8"	7'-9" 4'-8" 4'-11" 7'-9" 9'-8" 6'-0" 6'-5" 9'-7" 12'-1" 9'-1" 9'-8" 12'-10" 10'-8" 11'-8" 10'-9"	9'-8" 5'-7" 5'-8" 8'-2" 11'-5" 7'-2" 7'-5" 9'-11" 13'-8" 10'-10" 11'-2" 14'-5" 11'-11" 13'-0" 12'-1"	10'-4" 6'-10" 6'-8" 8'-7" 12'-0" 8'-11" 8'-9" 10'-4" 14'-3" 12'-7" 13'-1" 15'-0" 13'-5" 14'-4" 12'-7"	11'-0" 9'-0" 8'-2" 9'-1" 12'-6" 11'-8" 10'-9" 14'-11" 14'-7" 15'-7" 15'-7" 15'-5" 16'-0" 13'-2"	11'-8" 9'-11" 10'-6" 9'-6" 13'-3" 12'-7" 13'-9" 11'-3" 15'-7" 15'-4" 15'-4" 15'-4" 15'-4" 16'-3" 18'-2" 13'-10"	11'-1" 14'-5" 10'-0" 13'-7" 17'-2" 11'-9" 16'-6" 16'-3" 20'-7" 17'-4" 17'-4" 17'-4" 17'-1" 21'-5" 14'-7"
LPI 20FB LPI 32Plus LPI 42Plus LPI 42FB LPI 52Plus LPI 36	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8" 1'-7" 2'-2" 5'-8" 7'-2" 4'-4" 5'-3" 8'-6" 6'-0" 7'-0" 6'-7" 3'-8" 4'-4" 9'-2"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3" 2'-5" 3'-0" 6'-6" 8'-0" 5'-2" 6'-0" 9'-2" 6'-9" 7'-7" 7'-4" 4'-66" 5'-2" 9'-9"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0" 3'-4" 3'-10" 7'-4" 9'-0" 6'-9" 9'-11" 7'-6" 8'-5" 8'-1" 5'-5" 8'-1" 5'-5" 6'-0"	5'-5" 3'-2" 3'-7" 6'-0" 6'-11" 4'-2" 4'-8" 8'-2" 10'-0" 6'-10" 7'-7" 10'-8" 8'-5" 9'-4" 8'-10" 6'-3" 6'-3" 6'-3" 6'-11" 11'-3"	6'-5" 3'-11" 4'-3" 7'-5" 8'-1" 5'-6" 9'-3" 10'-11" 7'-10" 8'-6" 10'-5" 9'-8" 9'-6" 10'-5" 9'-8" 7'-2" 7'-10" 12'-3"	7'-9" 4'-8" 4'-11" 7'-9" 9'-8" 6'-0" 6'-5" 9'-7" 12'-1" 9'-7" 12'-1" 9'-8" 12'-10" 10'-8" 11'-8" 10'-9" 8'-51" 13'-6"	9'-8" 5'-7" 5'-8" 8'-2" 7'-2" 9'-11" 13'-8" 10'-10" 11'-2" 14'-5" 11'-11" 13'-0" 12'-1" 9'-9" 10'-3"	10'-4" 6'-10" 6'-8" 8'-7" 12'-0" 8'-11" 8'-9" 10'-4" 14'-3" 12'-7" 13'-1" 13'-1" 13'-5" 14'-4" 12'-7" 11'-8" 15'-10"	11'-0" 9'-0" 8'-2" 9'-1" 12'-6" 11'-8" 10'-9" 14'-11" 14'-7" 15'-1" 15'-1" 15'-5" 16'-0" 13'-2" 12'-11" 13'-3" 16'-7"	11'-8" 9'-11" 10'-6" 9'-6" 13'-3" 12'-7" 13'-9" 11'-3" 15'-7" 15'-7" 15'-7" 15'-4" 16'-6" 16'-3" 18'-2" 13'-10" 13'-7" 15'-1"	11'-1" 14'-5" 10'-0" 13'-7" 17'-2" 11'-9" 16'-6" 16'-3" 20'-7" 17'-4" 17'-4" 17'-4" 17'-1" 21'-5" 14'-7" 14'-7" 17'-10"
LPI 20FB LPI 32Plus LPI 42Plus LPI 42FB LPI 52Plus	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 14"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8" 1'-7" 2'-2" 5'-8" 7'-2" 4'-4" 5'-3" 8'-6" 6'-0" 7'-0" 6'-7" 3'-8" 4'-4" 9'-2" 6'-10"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3" 2'-5" 3'-0" 6'-6" 8'-0" 5'-2" 6'-9" 9'-2" 6'-9" 7'-7" 7'-4" 4'-6" 5'-2" 9'-9" 7'-8"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0" 3'-4" 9'-0" 6'-0" 6'-0" 6'-9" 9'-11" 7'-6" 8'-5" 8'-1" 5'-5" 6'-0" 10'-5" 8'-7"	5'-5" 3'-2" 3'-7" 6'-0" 6'-11" 4'-2" 4'-8" 8'-2" 10'-0" 6'-10" 7'-7" 10'-8" 8'-5" 9'-4" 8'-10" 6'-3" 6'-11" 11'-3" 9'-7"	6'-5" 3'-11" 4'-3" 5'-1" 5'-1" 5'-1" 9'-3" 10'-11" 7'-10" 8'-6" 11'-8" 9'-6" 10'-5" 9'-8" 7'-2" 7'-2" 7'-2" 12'-3" 10'-6"	7'-9" 4'-8" 4'-11" 7'-9" 9'-8" 6'-0" 6'-5" 9'-7" 12'-1" 9'-1" 9'-8" 12'-10" 10'-8" 12'-10" 10'-8" 11'-8" 10'-9" 8'-5" 8'-5" 8'-5"	9'-8" 5'-7" 5'-2" 11'-5" 9'-1" 13'-8" 10'-10" 11'-2" 14'-5" 11'-11" 13'-0" 12'-1" 9'-9" 10'-3" 15'-2" 12'-8"	10'-4" 6'-10" 6'-8" 8'-7" 12'-0" 8'-11" 8'-9" 10'-4" 14'-3" 12'-7" 13'-1" 15'-0" 13'-5" 14'-4" 12'-7" 14'-4" 12'-7" 11'-2" 15'-10"	11'-0" 9'-0" 8'-2" 9'-1" 12'-6" 11'-8" 10'-8" 10'-8" 10'-8" 14'-11" 14'-17" 15'-1" 15'-5" 15'-5" 16'-0" 13'-2" 12'-11" 13'-2" 16'-7" 16'-3"	11'-8" 9'-11" 10'-6" 13'-3" 12'-7" 13'-9" 15'-7" 15'-4" 15'-4" 15'-4" 15'-4" 15'-4" 15'-4" 16'-6" 16'-6" 18'-2" 13'-10" 13'-7" 13'-7" 13'-7"	11'-1" 14'-5" 10'-0" 14'-0" 13'-7" 17'-2" 11'-9" 16'-6" 16'-3" 20'-7" 17'-4" 17'-1" 21'-5" 14'-7" 14'-7" 14'-4" 17'-10" 18'-2" 18'-0"
LPI 20FB LPI 32Plus LPI 42Plus LPI 42FB LPI 52Plus LPI 36	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 14" 16" 14" 16" 14" 16" 14" 16" 14" 16" 16" 14" 16" 14" 16" 14" 16" 14" 14" 16" 14" 14" 16" 14" 16" 14" 14" 16" 14" 16" 14" 14" 16" 14" 14" 16" 14" 16" 14" 16" 14" 14" 16" 14" 16" 14" 14" 16" 14" 16" 11-7/8" 14" 16" 14" 16" 14" 16"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8" 1'-7" 2'-2" 5'-8" 7'-2" 4'-4" 5'-3" 8'-6" 6'-0" 7'-0" 6'-7" 3'-8" 4'-4" 9'-2" 6'-10" 8'-3"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3" 2'-5" 3'-0" 6'-6" 8'-0" 9'-2" 6'-0" 9'-2" 6'-9" 7'-7" 7'-4" 4'-6" 5'-2" 9'-9" 7'-8" 9'-2"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0" 3'-4" 9'-0" 6'-0" 6'-0" 6'-9" 9'-11" 7'-6" 8'-5" 8'-1" 5'-5" 6'-0" 10'-5" 8'7" 10'-0"	5'-5" 3'-2" 3'-7" 6'-0" 6'-11" 4'-2" 4'-8" 8'-2" 10'-0" 6'-10" 7'-7" 10'-8" 8'-5" 9'-4" 8'-10" 6'-3" 6'-11" 11'-3" 9'-7" 10'-11"	6'-5" 3'-11" 4'-3" 8'-1" 5'-1" 5'-6" 9'-3" 10'-11" 7'-10" 8'-6" 11'-8" 9'-6" 10'-5" 9'-8" 7'-2" 7'-10" 12'-3" 7'-0" 12'-5"	7'-9" 4'-8" 4'-11" 7'-9" 9'-8" 6'-0" 6'-5" 9'-7" 12'-17" 9'-1" 9'-8" 12'-10" 10'-8" 11'-8" 11'-8" 11'-5" 8'-51" 8'-51" 8'-51" 11'-5" 12'-9"	9'-8" 5'-7" 5'-8" 8'-2" 11'-5" 9'-11" 13'-8" 10'-10" 11'-2" 14'-5" 11'-11" 14'-5" 11'-11" 13'-0" 12'-1" 9'-9" 10'-3" 15'-2" 12'-8" 13'-9"	10'-4" 6'-10" 6'-8" 12'-0" 8'-11" 8'-9" 10'-4" 14'-3" 12'-7" 13'-1" 15'-0" 13'-5" 13'-1" 15'-0" 13'-5" 14'-4" 12'-7" 11'-2" 11'-2" 11'-2" 11'-2" 15'-1"	11'-0" 9'-0" 8'-2" 12'-6" 11'-8" 10'-8" 10'-9" 14'-1" 14'-7" 15'-1" 15'-8" 15'-8" 15'-8" 15'-2" 16'-0" 13'-2" 16'-9"	11'-8" 9'-11" 10'-6" 9'-6" 13'-3" 12'-7" 13'-9" 11'-3" 15'-7" 15'-4" 15'-4" 16'-6" 16'-6" 16'-6" 16'-6" 18'-2" 13'-10" 13'-7" 13'-7" 13'-7" 13'-7" 13'-7" 13'-7" 13'-7" 13'-7" 13'-7" 13'-7" 13'-7" 13'-7" 13'-7" 13'-7" 13'-7" 13'-7" 13'-7" 13'-7" 13'-7" 15'-7"	11'-1" 14'-5" 10'-0" 14'-0" 13'-7" 17'-2" 11'-9" 16'-6" 16'-3" 20'-7" 17'-4" 17'-1" 21'-5" 14'-7" 14'-4" 17'-10" 18'-2"
LPI 20FB LPI 32Plus LPI 42Plus LPI 42FB LPI 52Plus LPI 36	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 9-1/2" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8" 1'-7" 2'-2" 5'-8" 7'-2" 4'-4" 5'-3" 8'-6" 6'-0" 7'-0" 6'-7" 3'-8" 4'-4" 9'-2" 6'-10" 8'-3" 4'-10"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3" 2'-5" 3'-0" 6'-6" 8'-0" 9'-2" 6'-9" 7'-7" 7'-4" 4'-6" 5'-2" 9'-9" 7'-8" 9'-2" 5'-5"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0" 3'-4" 3'-10" 7'-4" 9'-0" 6'-0" 6'-0" 6'-9" 9'-11" 7'-6" 8'-5" 8'-5" 8'-5" 6'-0" 10'-5" 8'-7" 10'-0" 6'-2"	5'-5" 3'-2" 3'-7" 6'-11" 4'-2" 4'-8" 8'-2" 10'-0" 6'-10" 7'-7" 10'-8" 8'-5" 9'-4" 8'-5" 9'-4" 8'-10" 6'-3" 6'-11" 11'-3" 9'-7" 10'-11"	6'-5" 3'-11" 4'-3" 7'-5" 8'-1" 5'-6" 9'-3" 10'-11" 7'-10" 8'-6" 11'-8" 9'-6" 11'-8" 9'-6" 10'-5" 9'-8" 7'-2" 7'-10" 12'-3" 10'-6" 12'-3" 12'-3" 10'-5"	7'-9" 4'-8" 4'-11" 7'-9" 9'-8" 6'-0" 6'-5" 9'-7" 12'-10" 10'-8" 12'-10" 10'-8" 11'-8" 10'-9" 8'-5" 8'-5" 8'-5" 8'-5" 11'-6" 11'-6" 12'-9" 9'-2"	9'-8" 5'-7" 5'-8" 11'-5" 7'-2" 7'-5" 9'-11" 13'-8" 10'-10" 11'-2" 14'-5" 11'-11" 13'-0" 12'-1" 9'-9" 10'-3" 15'-2" 12'-8" 13'-9" 10'-4"	10'-4" 6'-10" 6'-8" 8'-71" 8'-9" 10'-4" 14'-3" 12'-7" 13'-1" 15'-0" 13'-5" 14'-4" 12'-7" 11'-2" 11'-8" 15'-10" 14'-10"	11'-0" 9'-0" 8'-2" 12'-6" 11'-8" 10'-8" 10'-9" 14'-1" 14'-7" 15'-1" 15'-5" 16'-0" 13'-2" 12'-11" 13'-3" 16'-7" 16'-7" 16'-9" 11'-4"	11'-8" 9'-11" 10'-6" 9'-6" 13'-3" 12'-7" 13'-9" 11'-3" 15'-7" 15'-4" 15'-4" 16'-6" 16'-3" 18'-2" 13'-10" 13'-7" 15'-1" 17'-3" 17'-3" 17'-0" 19'-0"	11'-1" 14'-5" 10'-0" 14'-0" 13'-7" 17'-2" 11'-9" 16'-6" 16'-6" 16'-6" 16'-7" 17'-4" 17'-1" 21'-5" 14'-7" 14'-4" 17'-10" 18'-2" 18'-2" 18'-2" -
LPI 20FB LPI 32Plus LPI 42Plus LPI 52Plus LPI 52Plus LPI 56	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 14" 16" 11-7/8" 14" 14" 16"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8" 1'-7" 2'-2" 5'-8" 7'-2" 4'-4" 5'-3" 8'-6" 6'-0" 7'-0" 6'-7" 3'-8" 4'-4" 9'-2" 6'-10" 8'-3"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3" 2'-5" 3'-0" 6'-6" 8'-0" 5'-2" 6'-0" 9'-2" 6'-9" 7'-7" 7'-7" 7'-4" 4'-6" 5'-2" 9'-9" 7'-8" 9'-2" 5'-5" 3'-9"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0" 3'-4" 9'-0" 6'-0" 6'-9" 9'-11" 7'-6" 8'-5" 8'-5" 8'-5" 8'-5" 8'-5" 6'-0" 10'-5" 8'7" 10'-0" 6'2" 4'-7"	5'-5" 3'-2" 3'-7" 6'-0" 6'-11" 4'-2" 4'-8" 8'-2" 10'-0" 6'-10" 7'-7" 10'-8" 8'-5" 9'-4" 8'-5" 9'-4" 8'-10" 6'-3" 6'-11" 11'-3" 9'-7" 10'-11" 7'-1" 5'-5"	6'-5" 3'-11" 4'-3" 7'-5" 8'-1" 5'-6" 9'-3" 10'-11" 7'-10" 8'-6" 11'-8" 9'-6" 10'-5" 9'-6" 10'-5" 9'-8" 7'-2" 7'-2" 7'-10" 12'-3" 10'-6" 11'-9" 12'-3"	7'-9" 4'-8" 9'-8" 6'-0" 6'-5" 9'-7" 12'-1" 9'-7" 12'-1" 9'-8" 12'-10" 10'-8" 11'-8" 10'-8" 11'-8" 10'-8" 11'-5" 13'-6" 11'-5" 12'-9" 12'-9" 9'-2" 7'-3"	9'-8" 5'-7" 5'-8" 8'-2" 7'-2" 9'-11" 13'-8" 10'-10" 11'-2" 14'-5" 11'-11" 13'-0" 12'-1" 9'-9" 10'-3" 15'-2" 12'-8" 13'-9" 10'-4" 8'-8"	10'-4" 6'-10" 6'-8" 8'-71" 12'-0" 8'-11" 8'-9" 10'-4" 14'-3" 12'-7" 13'-7" 13'-5" 14'-4" 13'-5" 14'-4" 12'-7" 11'-2" 11'-2" 11'-2" 11'-2" 11'-2" 11'-2" 11'-2" 11'-2" 11'-2" 11'-2" 11'-2" 11'-2"	11'-0" 9'-0" 8'-2" 9'-1" 12'-6" 11'-8" 10'-9" 14'-1" 15'-8" 15'-7" 15'-7" 15'-8" 15'-5" 16'-7" 13'-2" 12'-11" 13'-3" 16'-7" 16'-3" 16'-3"	11'-8" 9'-11" 10'-6" 9'-6" 13'-3" 12'-7" 13'-9" 11'-3" 15'-4" 17'-4" 16'-6" 16'-3" 18'-2" 13'-10" 13'-7" 13'-1" 13'-7" 13'-1"	11'-1" 14'-5" 10'-0" 14'-0" 13'-7" 17'-2" 11'-9" 16'-6" 16'-3" 20'-7" 17'-4" 17'-1" 21'-5" 14'-7" 14'-4" 17'-10" 18'-2" 18'-2" 18'-0" 22'-5" - 13'-8"
LPI 20FB LPI 32Plus LPI 42Plus LPI 52Plus LPI 36 LPI 56 LPI 450	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 9-1/2" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 14" 16" 11-7/8" 14" 14" 16" 11-7/8" 14" 14" 16" 11-7/8" 14" 14" 16" 11-7/8" 14" 14" 16" 11-7/8" 14" 14" 16" 11-7/8" 14" 14" 16" 11-7/8" 14" 14" 16" 11-7/8" 14" 14" 12" 14" 14" 14" 14" 14" 14" 14" 14	3'-9" 1'-2" 1'-7" 3'-8" 4'-8" 1'-7" 2'-2" 4'-4" 5'-3" 8'-6" 6'-0" 7'-0" 6'-7" 3'-8" 4'-4" 9'-2" 6'-10" 8'-3" 4'-10" 3'-0" 4'-1"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3" 2'-5" 3'-0" 6'-6" 8'-0" 5'-2" 6'-0" 9'-2" 6'-9" 7'-7" 7'-4" 4'-6" 5'-2" 9'-9" 7'-8" 9'-2" 5'-5" 3'-9" 4'-10"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0" 3'-4" 9'-0" 6'-0" 6'-9" 9'-11" 7'-6" 8'-5" 8'-1" 5'-5" 8'-1" 5'-5" 6'-0" 10'-5" 8'-7" 10'-0"	5'-5" 3'-2" 3'-7" 6'-0" 6'-11" 4'-2" 4'-8" 8'-2" 10'-0" 6'-10" 7'-7" 10'-8" 8'-5" 9'-4" 8'-5" 6'-3" 6'-3" 6'-3" 6'-11" 11'-3" 9'-7" 10'-11" 7'-1" 5'-5" 6'-4"	6'-5" 3'-11" 4'-3" 5'-1" 5'-1" 5'-6" 10'-11" 7'-10" 8'-6" 10'-5" 9'-6" 10'-5" 9'-8" 7'-2" 9'-8" 7'-2" 10'-6" 11'-9" 8'-1" 10'-6" 11'-9" 8'-1" 10'-6" 11'-9"	7'-9" 4'-8" 4'-11" 7'-9" 9'-8" 6'-0" 6'-5" 9'-7" 12'-1" 9'-1" 9'-1" 9'-8" 12'-1" 9'-8" 12'-6" 11'-8" 10'-9" 8'-51" 13'-6" 11'-5" 12'-9" 9'-2" 13'-6"	9'-8" 5'-7" 5'-2" 11'-5" 7'-2" 7'-5" 9'-1" 13'-8" 10'-10" 11'-2" 14'-5" 11'-11" 13'-0" 12'-1" 9'-9" 10'-3" 15'-2" 12'-8" 13'-9" 10'-4" 13'-9"	10'-4" 6'-10" 6'-8" 8'-7" 12'-0" 8'-11" 8'-9" 10'-4" 14'-3" 12'-7" 13'-1" 13'-5" 14'-4" 12'-7" 11'-2" 11'-2" 11'-2" 15'-10" 14'-2" 15'-10" 14'-2" 15'-10" 14'-2" 15'-10" 14'-2" 15'-10" 14'-2" 15'-10" 14'-2" 15'-10" 14'-2" 15'-10" 14'-2" 15'-10" 14'-2" 15'-10" 14'-2" 15'-10" 14'-2" 15'-10" 10'-2" 15'-10" 10'-2" 15'-10" 10'-2" 15'-10" 10'-2" 15'-10" 10'-2" 15'-10" 10'-2	11'-0" 9'-0" 8'-2" 9'-1" 12'-6" 11'-8" 10'-8" 10'-8" 14'-11" 14'-17" 15'-7" 14'-7" 15'-7" 15'-7" 16'-0" 13'-2" 12'-11" 13'-2" 16'-7" 16'-3" 16'-9" 11'-4" 12'-3" 8'-6"	11'-8" 9'-11" 10'-6" 13'-3" 12'-7" 13'-9" 15'-7" 15'-4" 15'-4" 15'-4" 15'-4" 15'-4" 15'-4" 15'-10" 13'-10" 13'-10" 13'-10" 13'-10" 17'-3" 17'-0" 19'-0" 11'-11"	11'-1" 14'-5" 10'-0" 14'-0" 13'-7" 17'-2" 11'-9" 16'-6" 16'-6" 16'-3" 17'-4" 17'-1" 21'-5" 14'-7" 14'-7" 14'-7" 14'-7" 14'-7" 14'-7" 14'-7" 14'-7" 14'-7" 14'-8" 17'-10" 18'-2" 13'-8" 9'-4"
LPI 20FB LPI 32Plus LPI 42Plus LPI 42FB LPI 52Plus LPI 36 LPI 56	9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 9-1/2" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 16" 11-7/8" 14" 14" 16" 11-7/8" 14" 14" 16"	3'-9" 1'-2" 1'-7" 3'-8" 4'-8" 1'-7" 2'-2" 5'-8" 7'-2" 4'-4" 5'-3" 8'-6" 6'-0" 7'-0" 6'-7" 3'-8" 4'-4" 9'-2" 6'-10" 8'-3"	4'-2" 1'-10" 2'-3" 4'-4" 5'-3" 2'-5" 3'-0" 6'-6" 8'-0" 5'-2" 6'-0" 9'-2" 6'-9" 7'-7" 7'-7" 7'-4" 4'-6" 5'-2" 9'-9" 7'-8" 9'-2" 5'-5" 3'-9"	4'-9" 2'-6" 2'-11" 5'-0" 6'-0" 3'-4" 9'-0" 6'-0" 6'-9" 9'-11" 7'-6" 8'-5" 8'-5" 8'-5" 8'-5" 8'-5" 6'-0" 10'-5" 8'7" 10'-0" 6'2" 4'-7"	5'-5" 3'-2" 3'-7" 6'-0" 6'-11" 4'-2" 4'-8" 8'-2" 10'-0" 6'-10" 7'-7" 10'-8" 8'-5" 9'-4" 8'-5" 9'-4" 8'-10" 6'-3" 6'-11" 11'-3" 9'-7" 10'-11" 7'-1" 5'-5"	6'-5" 3'-11" 4'-3" 7'-5" 8'-1" 5'-6" 9'-3" 10'-11" 7'-10" 8'-6" 11'-8" 9'-6" 10'-5" 9'-6" 10'-5" 9'-8" 7'-2" 7'-2" 7'-10" 12'-3" 10'-6" 11'-9" 12'-3"	7'-9" 4'-8" 9'-8" 6'-0" 6'-5" 9'-7" 12'-1" 9'-7" 12'-1" 9'-8" 12'-10" 10'-8" 11'-8" 10'-8" 11'-8" 10'-8" 11'-5" 13'-6" 11'-5" 12'-9" 12'-9" 9'-2" 7'-3"	9'-8" 5'-7" 5'-8" 8'-2" 7'-2" 9'-11" 13'-8" 10'-10" 11'-2" 14'-5" 11'-11" 13'-0" 12'-1" 9'-9" 10'-3" 15'-2" 12'-8" 13'-9" 10'-4" 8'-8"	10'-4" 6'-10" 6'-8" 8'-71" 12'-0" 8'-11" 8'-9" 10'-4" 14'-3" 12'-7" 13'-7" 13'-5" 14'-4" 13'-5" 14'-4" 12'-7" 11'-2" 11'-2" 11'-2" 11'-2" 11'-2" 11'-2" 11'-2" 11'-2" 11'-2" 11'-2" 11'-2" 11'-2"	11'-0" 9'-0" 8'-2" 9'-1" 12'-6" 11'-8" 10'-9" 14'-1" 15'-8" 15'-7" 15'-7" 15'-8" 15'-5" 16'-7" 13'-2" 12'-11" 13'-3" 16'-7" 16'-3" 16'-3"	11'-8" 9'-11" 10'-6" 9'-6" 13'-3" 12'-7" 13'-9" 11'-3" 15'-4" 17'-4" 16'-6" 16'-3" 18'-2" 13'-10" 13'-7" 13'-10" 13'-7" 13'-10" 13'-7" 13'-10" 13'-7" 13'-10" 13'-7" 13'-10" 13'-7" 13'-10"	11'-1" 14'-5" 10'-0" 14'-0" 13'-7" 17'-2" 11'-9" 16'-6" 16'-6" 16'-6" 10'-7" 17'-4" 17'-1" 20'-7" 17'-4" 17'-1" 14'-4" 17'-10" 18'-2" 18'-2" 18'-2" 18'-2" 18'-2" 18'-2" 13'-8"

### NOTES:

- 1. CUT HOLES CAREFULLY! DO NOT OVERCUT HOLES! DO NOT CUT JOIST FLANGES!
- 2. Holes may be placed anywhere within the depth of the web. A minimum 1/4" clear distance from the flanges is recommended so as not to cut a flange.
- 3. Round holes up to 1-1/2" diameter may be placed anywhere in the web.
- 4. Perforated "knockouts" may be neglected when locating web holes.
- 5. Holes larger than 1-1/2" are not permitted in cantilevers without special engineering.
- 6. Multiple holes shall have a clear separation along the length of the joist of at least twice the larger dimension of the larger adjacent hole, or a minimum of 12" centerto-center, whichever is greater.
- 7. Multiple holes may be spaced closer provided they fit within the boundary of an acceptable larger hole. Example: two 3" round holes aligned parallel to the joist length may be spaced 2" apart (clear distance) provided that a 3" high by 8" long rectangle or an 8" diameter round hole are acceptable for the joist depth at that location and completely encompass the holes.
- 8. These web hole tables are valid for simple and continuous span I-Joists with uniform loads only, as sized from the tables contained in LP's current I-Joist product guides. Larger holes, non-uniform loading conditions and/or closer proximity to supports may be possible, but require further analysis using LP's design software. Please contact your local LP SolidStart Engineered Wood Products distributor for more details.
- 9. The maximum hole depth is the I-Joist Depth less 4," except the maximum hole depth is 6" for 9-1/2" LP I-Joists, and 8" for 11-7/8" LP I-Joists. Where the Maximum Hole Dimension exceeds the hole depth, the dimension refers to hole width and the depth of the hole is assumed to be the maximum for that joist depth. The maximum hole width is 18," regardless of I-Joist Depth.

### **Beam Hole Details**



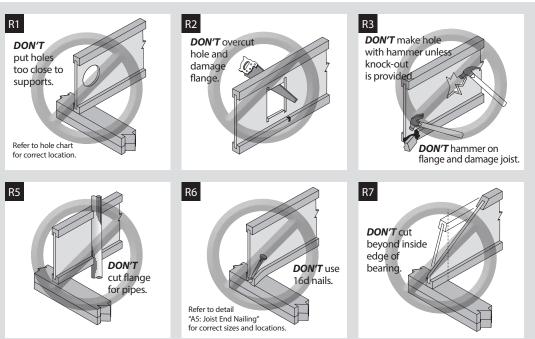
### NOTES

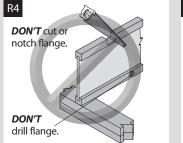
- all other applications, such as beams with concentrated loads, please contact your LP SolidStart Engineered Wood Products distributor for assistance.
- 2. Round holes can be drilled anywhere in "Area A" provided that: no more than four holes are cut, with the minimum spacing described in the diagram. The maximum hole size is 1-1/2" for depths up to 9-1/4," and 2" for depths greater than 9-1/4."
- 3. Rectangular holes are NOT allowed
- 4. DO NOT drill holes in cantilevers without prior approval from the project engineer/architect.
- 5. Other hole sizes and configurations MAY be possible with further engineering analysis. For more information, contact your LP SolidStart Engineered Wood Products distributor.
- the depth, or a minimum of 3" from the bottom and top of the beam. For beams shallower than 9-1/4," locate holes at mid-depth.
- 7. Protect plumbing holes from moisture

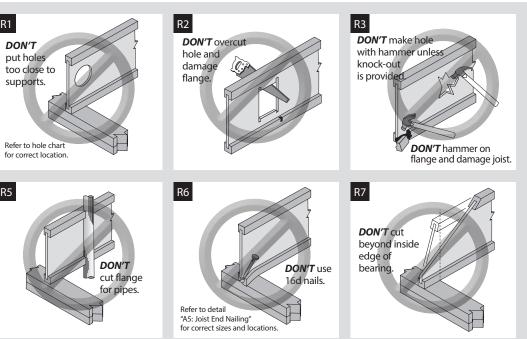
## WARNINGS

The following conditions are NOT permitted!

Do not use visually damaged products without first checking with your local LP SolidStart **Engineered Wood Products** distributor or sales office.







FLANGE	FACE NAILING SCHEDULE							
SERIES	NAIL SIZE AND TYPE	MINIMUM NAIL DISTANCE		SERIES	NAIL SIZE AND TYPE	MINIMUM NAIL DISTANCE		
SERIES	NAIL SIZE AND TTPE	OC SPACING	END	SERIES	NAIL SIZE AND TTPE	OC SPACING	END	
LPI 18	8d (2-1/2") Box or Common	2"	1"		8d (2-1/2") Box or Common	3″	1-1/2″	
LPI 20Plus LPI 32Plus	10d (3") or 12d (3-1/4") Box	2"	1"	LPI 36 LPI 56	10d (3") or 12d (3-1/4") Box	3″	1-1/2″	
LPI 42Plus	10d (3") or 12d (3-1/4") Common	3"	1-1/2"	LPI 450	10d (3") or 12d (3-1/4") Common	3″	1-1/2″	
LPI 52Plus LPI 20FB LPI 42FB	16d Sinker (3-1/4")	3"	1-1/2"	& LPI 530	16d Sinker (3-1/4")	3″	1-1/2″	
	16d (3-1/2") Box or Common	4"	1-1/2"		16d (3-1/2") Box or Common	5″	1-1/2″	

1. These quidelines apply to uniformly loaded beams selected from the Quick Reference Tables or the Uniform Load Tables or designed with LP's design/specification software only. For

6. Up to three 3/4" holes may be drilled in "Area B" to accommodate wiring and/or water lines. These holes must be at least 12" apart. The holes should be located in the middle third of

### NOTES:

- 1. Some wind or seismic loads may require different or additional details and connections.
- 2. Verify building code requirements for suitability of details shown.
- 3. Refer to LPI Product Guides for bearing length requirements.
- 4. Refer to Flange Nailing Schedule for rim joist and blocking panel nailing.
- 5. Lateral support shall be considered for bottom flange when there is no sheathing on underside.
- 6. Verify capacity and fastening requirements of hangers and connectors.
- 7. Squash block capacity designed by others.
- 8. Do not use rim joists with flanges wider than 2-1/2."

## Stair Stringer Details

### G1 P1 Stair Stringer - Top Support - Ledger G2 Stair Stringer - Top Support -Connector Provide restraint to ensure stringer lateral stability Bevel cut the Simpson<sup>®</sup> LSC Adjustable ledger to provide Stair-Stringer Connector full support for "or Equal" stair stringer Design professional to verify capacity and Ledger Size and all Connections by Others ning requirements for all connections. P6 G3 G4 Stair Stringer - Bottom Support -Stair Stringer - Bottom Support -Concrete Beam Min. 2x4 let-in block Min. 2x4 let-in block nailed to sheathing connected to the Clinch nails plate below Concrete Slab Freated 2x plates connected to concrete Alian support with supporting both front and back of the stringer back of stringer G5 Stair Stringer - Bottom Support -**Customer Service and Product** Ledger Technical Support: 1.888.820.0325 **DETAIL A** MAXIMUM 4" WIDE Design professional to verify E-mail: customer.support@lpcorp.com. 2-PLY BEAMS capacity and fastening requirements for all Visit our web site at: www.lpcorp.com. -1/2" connections LP SolidStart Material Safety Data Sheets (MSDS) may be found on our website, www.lpcorp.com. LP SolidStart Engineered Wood Products are manufactured at different locations in the United States and Canada. Please verify 1-1/2" availability with the LP SolidStart Engineered Wood Products distributor in your area before 2" max. ply specifying these products. 94 thickness Ledger (min. 2x) or connector Cal. Prop 65 Warning: to support stringer; Stringer PEFC seat cut to match ledger WARNING: Drilling, sawing, sanding or machining wood width or hanger seat length. PEFC/29-31-102 products can expose you to wood dust, a substance known to the State SUSTAINABLE FORESTRY of California to cause cancer. Avoid R9 Warnings INITIATIVE inhaling wood dust or use a dust Good for you. Good for our h mask or other safeguards for personal www.sfiprogram.org protection. For more information go DON'T to www.P65Warnings.ca.gov.wood. BV-SFICOC-US09000262 The following conditions bore holes or © 2019 Louisiana-Pacific Corporation. All rights reserved. APA and notch unless APA Rated are registered trademarks of APA – The Engineered Wood Association, FastenMaster® and TrussLok® are trademarks of are NOT permitted! reviewed by OMG, Inc., SIMPSON Strong-Tie $^{\circ}$ is a registered trademark of a design Simpson Strong-Tie Company, Inc., USP® is a registered trademark of MiTek Holdings, Inc., SFI and the associated logo are trademarks professional. of Sustainable Forestry Initiative, Inc., PEFC and the associated Do not use visually damaged products logo are trademarks of Programme for the Endorsement of Forest Certification, LP® and SolidStart® are registered trademarks of without first checking with your local Louisiana-Pacific Corporation. Printed in USA. Specifications (details) subject to change without notice LP SolidStart Engineered Wood Products NOTE: Louisiana-Pacific Corporation periodically updates and distributor or sales office. revises its product information. To verify that this version is current, contact the nearest sales office, visit LPCorp.com, or call 1-888-820-0325

## LP SolidStart LVL & LSL Details

