ICFVL®

Ledger Connector System

The ICFVL ledger connector system is engineered to solve the challenges of mounting wood or steel ledgers to insulated concrete form (ICF) walls. The ICFVL is designed to provide both vertical and lateral in-plane performance. The system offers many benefits over traditional anchor bolting, including better on-centre spacing in most cases, faster installation and no protrusions.

The ICFVL6 is designed to accommodate foam thickness up to 3¼" and the ICFVL8 can accommodate foam thickness up to 4½".

The embedded legs of the ICFVL are embossed for additional stiffness and the hole enables concrete to flow through and around the connector. The exposed flange on the face of the ICF provides a structural surface for mounting either a wood or steel ledger.

Material: ICFVL — 14 gauge;
ICFVL-CW and ICFVL-W — 16 gauge

Finish: Galvanized

Installation:

ICFVL in ICF

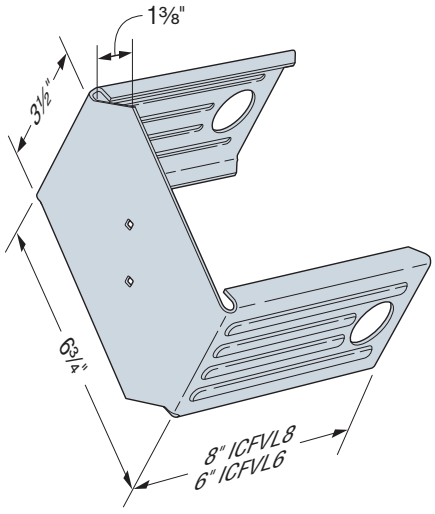
- Snap a chalk line for the bottom of the ledger
- Mark required on-centre spacing
- Use ICFVL to mark kerfs locations
- Cut kerfs as marked
- Insert ICFVL flush to the face of the ICF
- Pour concrete

Wood Ledger Attachment — ICFVL-W or ICFVL-CW

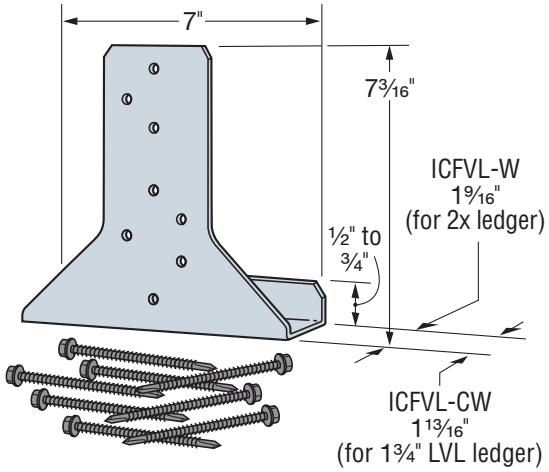
- Slip appropriate ledger connector underneath the ledger
- Install the eight ICF-D3.25 screws (included) partially into the ledger. ICF-D3.25 installs best using a low-speed drill with ⅜" hex-head driver.
- For dense wood species (SG > 0.49), such as SCL, predrilling the ledger using a 5⁄32" bit may be required.
- Position bottom of the ledger level to the chalk line and drive the screws through the wood and into the ICFVL

Steel Ledger Attachment

- Position bottom of the ledger level to the chalk line and against the ICFVL
- Attach with four ¼ – 14 x ¾", #3 drill point screws (not provided)
- All screws should be located at least ½" from the edge of the ICFVL
- Space screws evenly



ICFVL



ICFVL-W
and ICFVL-CW

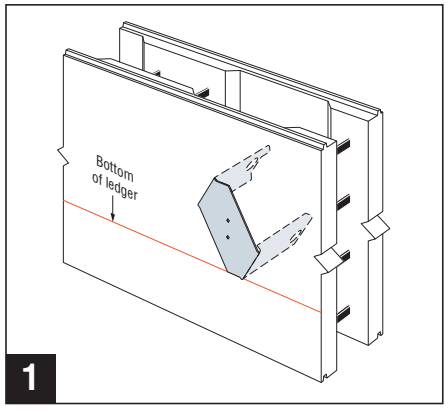
Warning:
Industry studies show that hardened fasteners can experience performance problems in wet environments. Accordingly, use this product in dry environments only.

ICFVL®

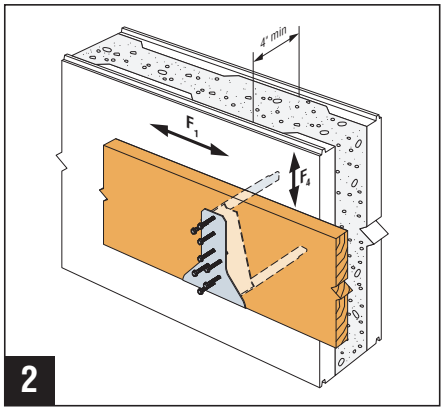
Ledger Connector System (cont.)

Ledger Type	Model No.	Fasteners	Factored Resistance				
			Vertical		Lateral	Tension	Compression
			D.Fir–L	S-P-F			
			lb.	lb.	lb.	lb.	lb.
			kN	kN	kN	kN	kN
2x Lumber	ICFVL6 or ICFVL8 with ICFVL-W	(8) ICF-D3.25	2865	2655	1765	1055	7555
			12.74	11.81	7.85	4.69	33.61
1¾" SCL	ICFVL6 or ICFVL8 with ICFVL-CW	(8) ICF-D3.25	3110	2865	1765	1055	7555
			13.83	12.74	7.85	4.69	33.61
Steel	ICFVL6 or ICFVL8	(4) #14 x ¾"	2630	2630	1610	1055	7555
			11.70	11.70	7.16	4.69	33.61

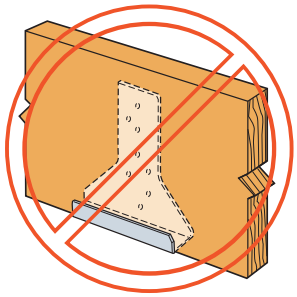
1. Factored resistances shown in the vertical direction for 2x Lumber and 1¾" SCL are for standard term loading (K_D = 1.00). Values may be increased to a maximum of 3145 lb. (13.99 kN) for short-term loading (K_D = 1.15). Reduce where other load durations govern.
2. Steel ledger shall have a minimum design thickness of 16 ga. (0.0598 in.) with minimum steel properties of f_y = 33 ksi (230 MPa) and f_u = 45 ksi (310 MPa) in accordance with CSA S136-16.
3. Minimum concrete compressive strength shall be 15 MPa.
4. Values shown require a minimum embedment depth into the concrete wall of 2¾" for ICFVL6 and 3½" for ICFVL8. Connector spacing shall be determined by the design professional up to a maximum of 48" (1.22 m) on centre.
5. Values shown apply to ICF foam thicknesses up to 3¼" (83 mm) for ICFVL6 and 4½" (114 mm) for ICFVL8.
6. When combining simultaneous loads in multiple directions, the following interaction equation shall be checked: Vertical Load/Vertical Resistance + Lateral Load/Lateral Resistance + Tension Load/Tension Resistance + Compression Load/Compression Resistance ≤ 1.0.
7. The ICFVL shall be installed no closer than 4" (102 mm) from the top of the wall.
8. Screws shall be located no closer than ½" from the edge of the ICFVL.
9. **Fasteners:** ICF-D3.25 = ¼"-20 x 3¼" Simpson Ledger Connector screw; #14 x ¾" = #14 x ¾" #3 drill point self-tapping screw.



ICFVL



Typical Wood Ledger Installation with ICFVL and ICFVL-W



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Ledger Connector System (cont.)

The following spacing tables are an alternative to the ICFVL spacing to replace the building code prescribed anchor bolts spacing for vertical loads only. They provide the recommended spacing of the ICFVL ledger connectors based on the factored vertical resistance of the connector, the load on the floor, and the span of the joist. The designer must determine the design load, the ledger design and the joist design. This table is useful if the designer already has loads and spans, but not necessarily anchor bolt spacing.

ICFVL Spacing for 1¾" LVL or 2x D.Fir–L (in.)

Specified Load (psf)		Joist Span (ft.)											
Live	Dead	10	12	14	16	18	20	22	24	26	28	30	32
40	10	48	48	48	47	42	37	34	31	29	27	25	23
	15	48	48	48	43	38	34	31	29	26	24	23	21
	20	48	48	46	40	35	32	29	26	24	23	21	20
	25	48	48	43	37	33	30	27	25	23	21	20	18
	30	48	47	40	35	31	28	25	23	21	20	18	17
50	10	48	48	44	39	34	31	28	26	24	22	20	19
	20	48	45	39	34	30	27	25	22	21	19	18	17
	30	48	40	34	30	27	24	22	20	18	17	16	15
	40	44	36	31	27	24	22	20	18	16	15	14	13
100	10	33	28	24	21	18	16	15	14	13	—	—	—
	20	31	26	22	19	17	15	14	13	—	—	—	—
	30	29	24	20	18	16	14	13	12	—	—	—	—
	40	27	22	19	17	15	13	12	—	—	—	—	—

Values in the cells highlighted in yellow represent the maximum allowable spacing of 48".

See footnotes below.

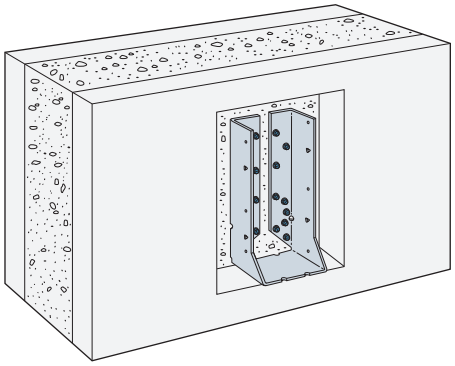
ICFVL Spacing for Steel Ledger or 2x S-P-F Ledger (in.)

Specified Load (psf)		Joist Span (ft.)											
Live	Dead	10	12	14	16	18	20	22	24	26	28	30	32
40	10	48	48	48	43	38	34	31	29	26	24	23	21
	15	48	48	45	40	35	32	29	26	24	22	21	20
	20	48	48	42	37	33	29	27	24	22	21	19	18
	25	48	46	39	34	30	27	25	23	21	19	18	17
	30	48	43	36	32	28	25	23	21	19	18	17	16
50	10	48	48	41	36	32	28	26	24	22	20	19	18
	20	48	42	36	31	28	25	22	21	19	18	16	15
	30	44	37	32	28	24	22	20	18	17	16	14	14
	40	40	33	28	25	22	20	18	16	15	14	13	12
100	10	31	25	22	19	17	15	14	12	—	—	—	—
	20	28	24	20	18	16	14	13	—	—	—	—	—
	30	26	22	19	16	14	13	12	—	—	—	—	—
	40	25	21	18	15	14	12	—	—	—	—	—	—

1. Values shown are maximum spacing distances (inches) based on two-span ledger and simple supported joists. It does not consider concentrated loads. The engineer of record can modify the spacing accordingly for other conditions.
2. Joist and ledger are to be designed by others.
3. Table above address vertical loads only. If connection is designed to resist lateral loads, spacing will decrease. Contact Simpson Strong-Tie for current information.
4. The ICFVL must be installed no closer than 4" below the top of wall to achieve the connector spacing.
5. The maximum distance between the end of the ledger and the first ICFVL is 12" as per the recommended splicing installation.
6. Tables above assume principal loads only with importance factor = 1.00. For other cases adjust spacing accordingly.
7. Values shown apply to ICF foam thicknesses up to 3¼" for ICFVL6 and 4½" for ICFVL8.

Alternative Retrofit Solution for Direct Attachment of Joist to Wall

The HU and HUC hangers are heavy-duty face-mount joist hangers made from 14-gauge galvanized steel. These hangers can be directly attached to concrete wall using Simpson Strong-Tie ¼" x 1¾" Titen Turbo™ hex head screws. See p. 29 for more information on installation and use.



HUC410 Installed on Face of Concrete in ICF