

Ledger Structural Fastening Applications

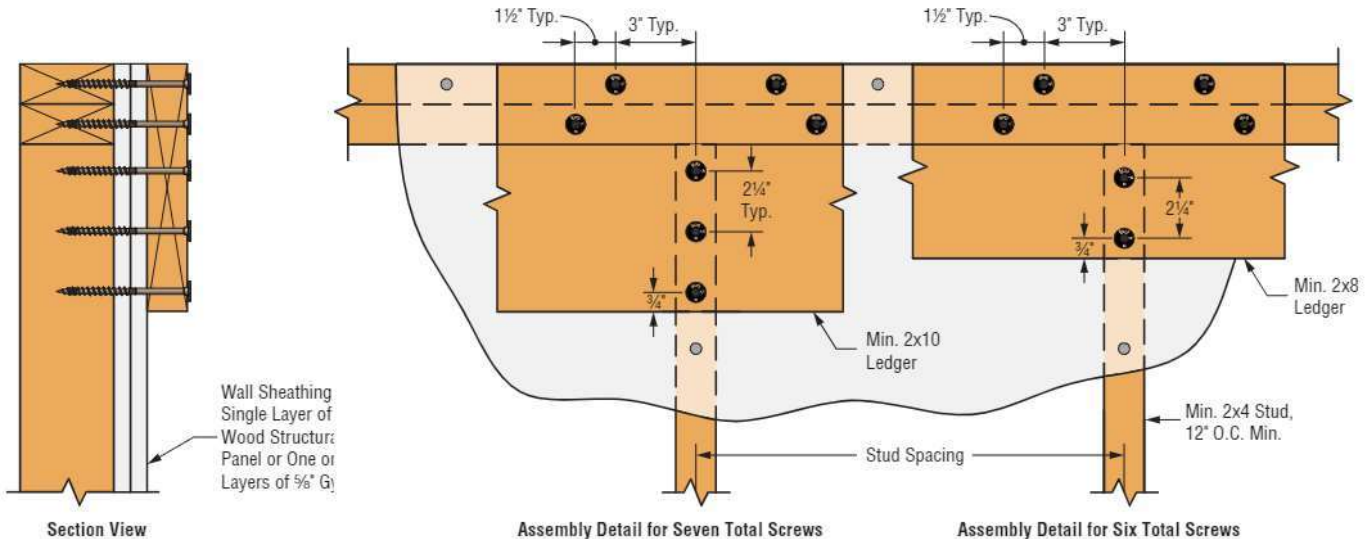
Strong-Drive® SDWS TIMBER Screw Ledger Attachment for Top-of-Wall Alignment

The 5" Strong-Drive SDWS Timber Screw (Exterior Grade), model SDWS22500DB, has been tested for use in attaching a ledger to minimum 2x4 wall framing when the ledger is flush with the top of the wall plates and installed over: a) one layer of ½" maximum wood structural panel sheathing, b) one or two layers of ⅝" maximum gypsum board, or c) one layer of ⅝" maximum gypsum over one layer of ½" maximum WSP. The allowable loads are the lesser of single-fastener testing (in accordance with ICC-ES AC233) or full-scale testing of the assemblies shown (in accordance with ICC-ES AC13) with a safety factor of 5.0.

SDWS Timber Screw (Exterior Grade) — Allowable Downloads for Ledger to Top-of-Wall over WSP or Gypsum Wall Sheathing

Number of SDWS22500DB Ledger Screws at Each Stud Connection			Min. Ledger Size	Allowable Download at Each Stud Connection ^{1,2} (lb.)	Allowable Unit Load Based on Stud Spacing ³ (plf)			
Total	Stud	Top Plates			24" O.C. Stud	19.2" O.C. Stud	16" O.C. Stud	12" O.C. Stud
6	2	4	2x8	855	430	535	640	855
7	3	4	2x10	1,430	715	895	1,075	1,430

1. Allowable loads are applicable to DF/SP/SPF stud and top plate species and DF/SP ledger species. For SPF ledger, allowable load per stud is 855 pounds for assembly with six total screws and 1,230 pounds for assembly with seven total screws.
2. Allowable loads are shown at the wood load duration factor of $C_D = 1.00$. Loads may be increased for load duration as permitted by the building code up to a $C_D = 1.60$. All adjustment factors shall be applied per the National Design Specification (NDS). For in-service moisture content greater than 19%, use $C_M = 0.70$.
3. Minimum stud spacing is 12" on center. Allowable unit loads listed based on specified fastening at every stud.
4. Fasteners shall be centered in the stud and wall plates and spaced as shown in the figures below. The minimum distance from a fastener to the end of a ledger is 6" for full values. For connections where fastener to ledger end distances are between 1½" and 6" use 50% of the table loads. For end distances between 1½" and 4", predrill using a ⅜" bit.
5. Design of wall assembly and ledger is the responsibility of the designer. Wall sheathing must be attached to wall framing as required per the building code.



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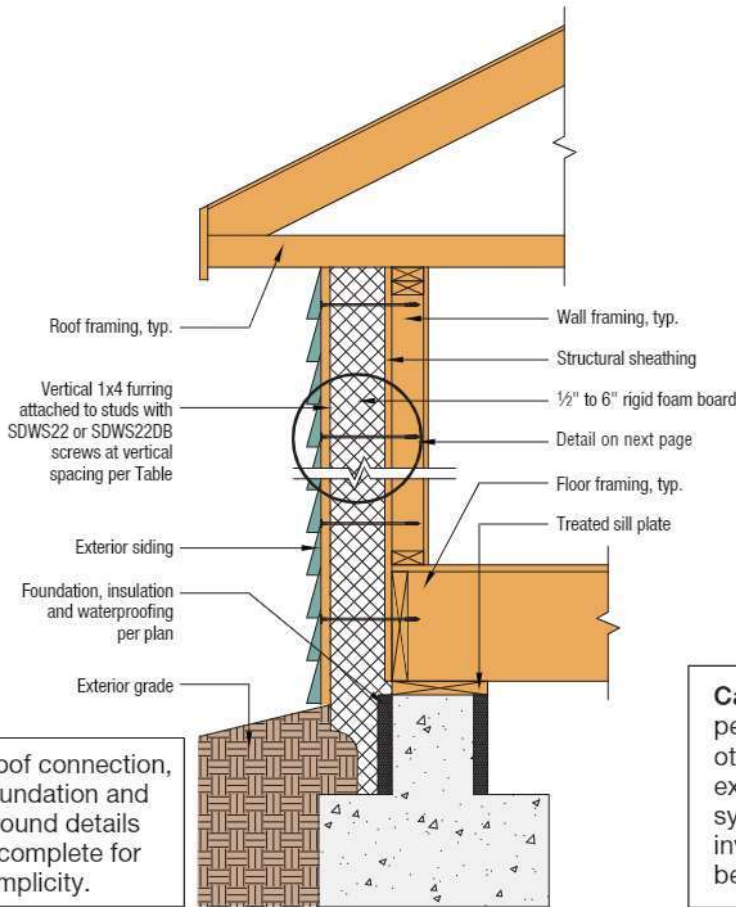
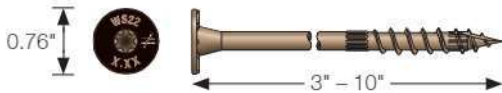
Wood and Engineered Wood Fastening

Exterior Foam-to-Wood Fastening

Strong-Drive® SDWS **TIMBER** Screw (Exterior Grade) for Attaching Exterior Foam Insulation

Simpson Strong-Tie Strong-Drive SDWS Timber screws may be used for installing exterior rigid-foam board insulation over wood structural panel (WSP) sheathing. Each fastener installs through furring strips, rigid-foam board and WSP sheathing into the wood wall stud framing. The fasteners do not typically require predrilling. Preservative-treated wood suitable for dry service (AWPA UC1, UC2, UC3A) and untreated wood may be used depending on the protection needs of the construction. The SDWS products with "DB" in the model number have a double-barrier coating that provides corrosion resistance equivalent to hot-dip galvanization, while the products without "DB" in the model number can only be used in conditions with dry service and no wood treatment chemicals. The table on p. 81 provides recommended spacing for fastening vertical furring strips through ½" to 6" of rigid foam insulation board into each wall stud. The SDWS22DB and SDWS22 screws were evaluated as alternate threaded fasteners using ICC-ES AC233 and are the subject of IAPMO UES ER-192. The Strong-Drive SDWS22DB Structural Wood screws were evaluated for corrosion resistance using ICC-ES AC257.

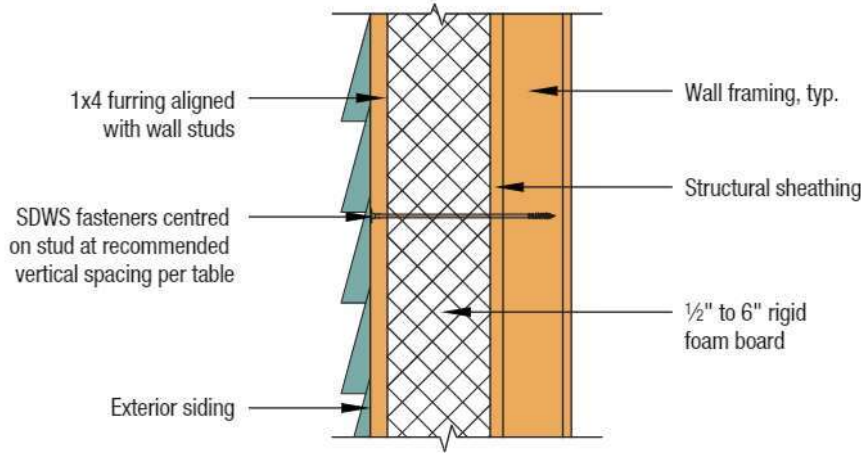
For more information, see p. 59, C-F-2023 Fastening Systems catalog



Wall Cross-Section

Exterior Foam-to-Wood Fastening

Strong-Drive SDWS **TIMBER** Screw (Exterior Grade) for Attaching Exterior Foam Insulation (cont.)



Furring and Rigid Foam Attachment Detail

Recommended Vertical Fastener Spacing

Length (in.)	Model No.	Foam Thickness (in.)	Stud Spacing (in.)	Maximum Allowable Cladding Weight to Be Supported (psf)		
				≤ 20	25	30
4	SDWS22400DB SDWS22400	1/2	16	24" o.c.	24" o.c.	24" o.c.
			24			
5	SDWS22500DB SDWS22500	1 to 1 1/2	16			
			24			
6	SDWS22600DB SDWS22600	2	16			
			24			
8	SDWS22800DB SDWS22800	4	16			
			24			
10	SDWS221000DB SDWS221000	6	16			
			24			

- Caution: Fasteners can penetrate wiring, plumbing and other mechanical systems in exterior walls. All mechanical systems in the exterior wall involved with the fastening shall be mapped before driving screws.
- Foam sheathing shall have a minimum compressive strength of 15 psi in accordance with ASTM C578 or ASTM C1289.
- Wood wall framing (studs) shall be a minimum of 2" nominal thickness. Wood framing and furring shall be a minimum spruce-pine-fir species with specific gravity of 0.42 or greater. Table assumes furring strip thickness of 3/4" and full thread embedment in the framing member.
- Wood framing, furring and WSP sheathing shall meet the design requirements in accordance with the applicable building codes. WSP sheathing shall be fastened to the framing as required by the applicable building code.
- Each fastener is capable of resisting 172 lb. of out-of-plane wind loading ($C_D = 1.60$) with no further increase allowed.
- Spacing recommendations are based on a loading that produced 0.015" of assembly movement with 6"-thick rigid foam board insulation.
- Maximum allowable cladding weight shall be the additive weight of furring, cladding including foam insulation, environmental effects (i.e., ice) and other supported materials.
- Metal fasteners conduct heat, and it is recommended that exposed screw heads are covered with foam and sealed.
- Screws shall be installed such that they close gaps between connected components. Furring and sheathing shall provide the required thickness and performance for siding manufacturer installation instructions.

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