

Strong-Wall Shearwalls

C-L-SW26 | (800) 999-5099 | strongtie.com

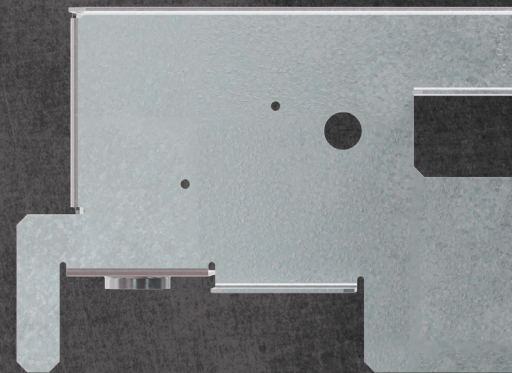
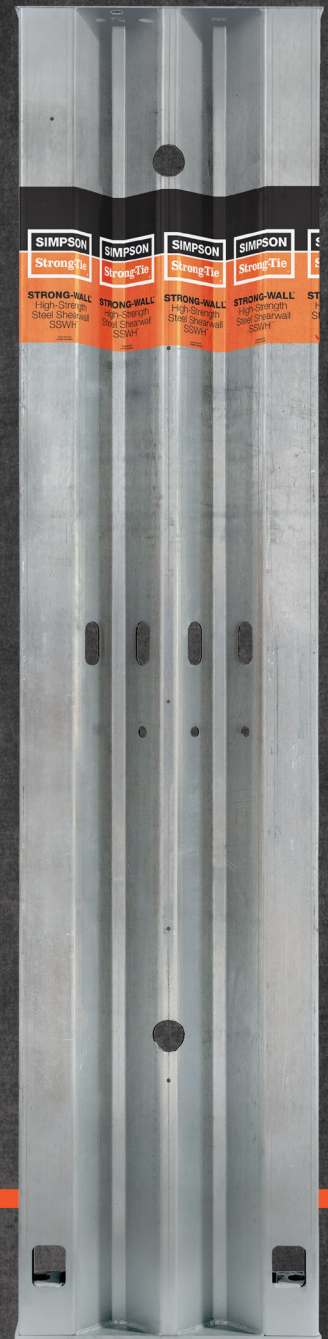


Strong-Wall® High-Strength Steel Shearwall

Higher load capacities for tight spaces.

The Strong-Wall high-strength steel shearwall (SSWH™) has exceptional strength and performance to resist lateral forces in seismic and high-wind areas. Utilizing a patent-pending holdown with fuse technology, the code-listed SSWH is designed to handle some of the highest load capacities of any prefabricated shearwalls on the market. It also provides easier access for faster anchorage installation. With a narrower profile than site-built shearwalls, the SSWH allows more room in structures with limited wall space. Use the SSWH for portal, raised floor, two-story stacked, wood and steel beam applications.

Our new universal anchorage makes installation simple and fast.

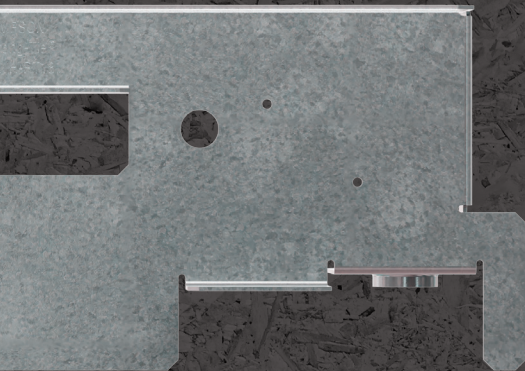


Strong-Wall® High-Strength Wood Shearwall

A versatile and field-trimmable solution.

The Strong-Wall high-strength wood shearwall (WSWH®) is a prefabricated, engineered wood panel that adds lateral bracing and resistance to structures in seismic and high-wind areas. Suitable for residential, multifamily and light-frame commercial construction, the code-listed WSWH is easy to specify. For optimal design flexibility and efficient installation, this field-trimmable shearwall can be adjusted onsite to accommodate varying heights or rake walls. The WSWH features patented wood fuse technology and predictable behavior that delivers superior strength, stiffness, ductility and design values.

Patented, reusable anchor bolt templates from Simpson Strong-Tie help ensure accurate anchor bolt placement in our Strong-Wall high-strength shearwalls. The same templates are used for steel shearwalls and wood shearwalls, which simplifies specification and installation. They're available in multiple sizes and configurations to accommodate common concrete foundation types.



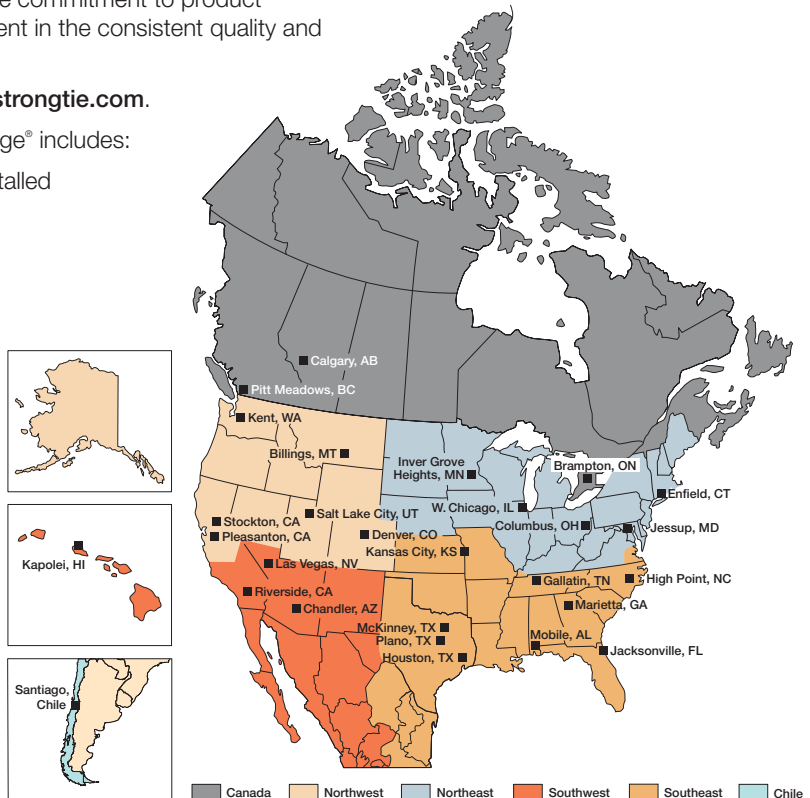
Introduction

For 70 years, Simpson Strong-Tie has focused on creating structural products that help people build safer and stronger homes and buildings. A leader in structural systems research and technology, Simpson Strong-Tie is one of the largest suppliers of structural building products in the world. The Simpson Strong-Tie commitment to product development, engineering, testing and training is evident in the consistent quality and delivery of its products and services.

For more information, visit the company's website at strongtie.com.

The Simpson Strong-Tie Company Inc. No-Equal Pledge® includes:

- Quality products value-engineered for the lowest installed cost at the highest-rated performance levels
- The most thoroughly tested and evaluated products in the industry
- Strategically located manufacturing and warehouse facilities
- National code agency listings
- The largest number of patented connectors in the industry
- Global locations with an international sales team
- In-house R&D and tool and die professionals
- In-house product testing and quality control engineers
- Support of industry groups including AISI, AITC, ASTM, ASCE, AWC, AWWA, ACI, AISC, CSI, CFSEI, ICFA, NBMDA, NLBMDA, SETMA, SFA, SFIA, STAFDA, SREA, NFBA, TPI, WDSC, WIJMA, WTCA and local engineering groups



The Simpson Strong-Tie Quality Policy

We help people build safer structures economically. We do this by designing, engineering and manufacturing No-Equal® structural connectors and other related products that meet or exceed our customers' needs and expectations. Everyone is responsible for product quality and is committed to ensuring the effectiveness of the Quality Management System.

Mike Olosky
Chief Executive Officer



FM 767499

Getting Fast Technical Support

When you call for engineering technical support, we can help you quickly if you have the following information at hand. This will help us to serve you promptly and efficiently.

- Which Simpson Strong-Tie® catalog are you using? (See the front cover for the form number.)
- Which Simpson Strong-Tie product are you using?
- What are the design requirements (i.e., loads, anchor diameter, base material, edge/spacing distance, etc.)?

800-999-5099 | strongtie.com

All Rights Reserved. This catalog may not be reproduced in whole or in part without the prior written approval of Simpson Strong-Tie Company Inc.

Table of Contents

Introduction 4
Table of Contents 5
Technology Tools 6
Important Information and General Notes 7

Strong-Wall High-Strength Steel Shearwall

Higher Loads Plus Design Flexibility 10
Standard Application on Concrete Foundation 11
Garage Portal Systems on Concrete Foundations 17
First-Story Wood Floor Systems 20
Cumulative Overturning 22
Two-Story Stacked on Concrete Foundations 24
Steel Shearwall Structural Details 30

Strong-Wall High-Strength Wood Shearwalls

Standard and Balloon Framing on Concrete Foundations 38
Garage Portal Systems on Concrete Foundations 43
First-Story Raised Foundation 46
Two-Story Stacked Application 48
Wood Beam Installation 51
Steel Beam Installation 55
Back-to-Back Installations on Concrete Foundations 59
Two-Story Nonstacked Application 60
Wood Shearwall Structural Details 64

Strong-Wall High-Strength Shearwall Anchorage

High-Strength Shearwall Anchorage Solutions 85
Standard Application on Concrete Foundations 92
Anchor Reinforcement Solutions on Grade Beams 94
Concrete Stemwall Shearwall Anchorage 96

**General
Information**

4-9 ▶

**Strong-Wall
High-Strength
Steel Shearwall**

10-37 ▶

**Strong-Wall
High-Strength
Wood Shearwalls**

38-84 ▶

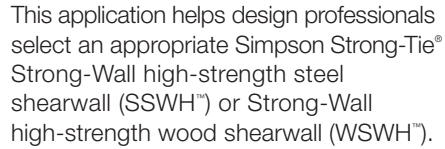
**Strong-Wall
High-Strength
Shearwall Anchorage**

85-98 ▶



Strong-Wall Shearwall Selector

General Information



Provides the most cost-effective Strong-Wall solution based on the input shear load.

Allows designers to choose which type and number of walls to meet their requirements.

- Finds lowest cost solution
- Provides actual drift and uplift values
- Provides solutions for different model codes
- Includes new anchorage solutions
- Saves, exports and prints solutions



The Strong-Wall Bracing Selector (SWBS) provides pre-engineered Strong-Wall alternatives to code-prescribed braced wall panels. Strong-Wall model numbers and foundation anchorage designs are determined to meet job specific requirements and provide the narrowest bracing solutions possible. The SWBS now includes the Strong-Wall high-strength steel shearwall (SSWH), expanding design options for demanding applications. This app can be used with the Wall-Bracing-Length Calculator: Start with the WBLC to determine wall bracing length requirements then export project information and bracing requirements to the SWBS. You can find the Strong-Wall Bracing Selector application at **strongtie.com/swbs**.

Strong-Wall® Bracing Selector

The Strong-Wall Bracing Selector (SWBS) provides pre-engineered Strong-Wall alternatives to code-prescribed braced wall panels. Strong-Wall model numbers and foundation anchorage designs are determined to meet job specific requirements and provide the narrowest bracing solutions possible. This app can be used with the Wall-Bracing-Length Calculator: Start with the WBLC to determine wall bracing length requirements then export project information and bracing requirements to the SWBS.

Wall-Bracing-Length Calculator

General Instructions for the Designer

SWBS Design Example

Report Application Issues or Provide Feedback

About SWBS

Project Information

Project Name

Project Address

Project City, State, Zip

Braced-Wall Line ID

UPLOAD A SAVED FILE

Total Length of Wall Bracing Required in Braced Wall Line
 ft

Total Length of Qualifying Site-Built Wall Bracing Provided
 ft

Remaining Wall Bracing Required
 0 ft

Important Information and General Notes

Warning

Simpson Strong-Tie Company Inc. structural connectors, anchors, and other products are designed and tested to provide specified design loads. To obtain optimal performance from Simpson Strong-Tie Company Inc. products and achieve maximum allowable design load, the products must be properly installed and used in accordance with the installation instructions and design limits provided by Simpson Strong-Tie Company Inc. To ensure proper installation and use, designers and installers must carefully read the following General Notes, General Instructions for the Installer and General Instructions for the Designer, as well as consult the applicable catalog pages for specific product installation instructions and notes.

Proper product installation requires careful attention to all notes and instructions, including these basic rules:

1. Be familiar with the application and correct use of the product.
2. Follow all installation instructions provided in the applicable catalog, website, *Installer's Pocket Guide* or any other Simpson Strong-Tie® publications.
3. Install all required fasteners per installation instructions provided by Simpson Strong-Tie Company Inc.: a) use proper fastener type; b) use proper fastener quantity; c) fill all fastener holes; d) do not overdrive or underdrive nails, including when using power nailers; and e) ensure screws are completely driven.
4. Only bend products that are specifically designed to be bent. For those products that require bending, do not bend more than once.
5. Wear head, skin, eye and ear protection when installing products or visiting a jobsite.

In addition to following the basic rules provided above as well as all notes, warnings and instructions provided in the catalog, installers, designers, engineers and consumers should consult the Simpson Strong-Tie

Company Inc. website at strongtie.com to obtain additional design and installation information, including:

- Instructional builder/contractor training is available in both English and Spanish;
- Information on workshops Simpson Strong-Tie conducts at various training centers throughout the country;
- Product specific installation videos;
- Specialty catalogs;
- Code reports;
- Technical fliers and bulletins;
- Engineering letters;
- Master format specifications;
- Safety data sheets;
- Corrosion information;
- Simpson Strong-Tie Drawing Finder;
- Simpson Strong-Tie Strong-Wall Shearwall Selector web application;
- Simpson Strong-Tie Strong-Wall Bracing Selector web application; and
- Answers to frequently asked questions and technical topics.

Failure to fully follow all of the notes and instructions provided by Simpson Strong-Tie Company Inc. may result in improper installation of products. Improperly installed products may not perform to the specifications set forth in this catalog and may reduce a structure's ability to resist the movement, stress, and loading that occurs from gravity loads as well as impact events such as earthquakes and high velocity winds.

Simpson Strong-Tie Company Inc. does not guarantee the performance or safety of products that are modified, improperly installed or not used in accordance with the design and load limits set forth in this catalog.

General Notes

These general notes are provided to ensure proper installation of Simpson Strong-Tie Company Inc. products and must be followed fully.

- a. Simpson Strong-Tie Company Inc. reserves the right to change specifications, designs and models without notice or liability for such changes. Allowable loads can change for various reasons including, but not limited to, building code updates, new test standards, calculation methods, and product modifications. Refer to strongtie.com or Simpson Strong-Tie software for the most up-to-date information.
- b. Steel used for each Simpson Strong-Tie product is individually selected based on the product's steel specifications, including strength, thickness, formability, finish and weldability. Contact Simpson Strong-Tie for steel information on specific products.
- c. Unless otherwise noted, dimensions are in inches, loads are in pounds.
- d. Unless otherwise noted, welds, screws, bolts and nails may not be combined to achieve highest load value. 0.131" x 2½", 0.148" x 3" and 0.162" x 3½" specify common nails that meet the requirements of ASTM F1667. When a shorter nail is specified, it will be noted (for example 0.131" x 1½"). Nails shall be concentric, full round head nails complying with ASTM F1667. Refer to Simpson Strong-Tie Nailing Guide, NDS (National Design Specification) and ASTM F1667 (American Society of Testing and Materials) for more nail info.
- e. Do not overload. Do not exceed catalog allowable loads.
- f. Unless otherwise noted, allowable loads are for Douglas Fir-Larch under continuously dry conditions. Allowable loads for other

species or conditions must be adjusted according to the code. Allowable loads for alternate species may be determined as outlined in Simpson Strong-Tie engineering letter L-ALTSPECIES on strongtie.com. This chart shows specific gravity and perpendicular-to-grain compression capacities for the different wood species:

Species	F _C ⊥	Specific Gravity
Douglas Fir-Larch (DFL)	625 psi	0.50
Southern Pine (SP)	565 psi	0.55
Spruce-Pine-Fir (SPF)	425 psi	0.42
Spruce-Pine-Fir South (SPF-S)	335 psi	0.36
Hem-Fir (HF)	405 psi	0.43
Glulam	650 psi	0.50
LVL (DF/SP)	750 psi	0.50
LSL (E = 1.3 x 10 ⁶)	680 psi	0.50
LSL (E ≥ 1.5 x 10 ⁶)	880 psi	0.50
Parallam PSL	750 psi	0.50

- g. All references to bolts are for structural quality through bolts (not lag screws or carriage bolts). Reference to standard strength threaded rods are equal to or better than ASTM F1554 Grade 36. Reference to high-strength threaded rods are equal to or better than ASTM A193 Grade B7. Nuts shall be ASTM A563, Grade A or better, unless noted otherwise.

Important Information and General Notes (continued)

- h. Unless otherwise noted, bending steel in the field may cause fractures at the bend line. Fractured steel will not carry load and must be replaced.
- i. A fastener that splits the wood will not resist the design load. Evaluate splits to determine if the connection will perform as required. Dry wood may split more easily and should be evaluated as required. If wood tends to split, consider pre-boring holes with diameters not exceeding 0.75 of the nail diameter (2024 NDS). Use a 5/32" bit for Strong-Drive® SDS Heavy-Duty Connector screws and a 3/32" bit for Strong-Drive SD9/SD10 and Strong-Wall SWS16150 Connector screws.
- j. Wood shrinks and expands as it loses and gains moisture, particularly perpendicular to its grain. Take wood shrinkage into account when designing and installing connections. Simpson Strong-Tie manufactures products to fit common dry lumber dimensions. If you need a connector with dimensions other than those listed in this catalog, Simpson Strong-Tie may be able to vary connector dimensions; contact Simpson Strong-Tie. The effects of wood shrinkage are increased in multiple lumber connections, such as floor-to-floor installations. This may result in the vertical rod nuts becoming loose, requiring post-installation tightening. (Contact Simpson Strong-Tie for information on Takeup Devices.)
- k. Built-up lumber (multiple members) must be fastened together to act as one unit to resist the applied load (excluding the connector fasteners). This must be determined by the designer.
- l. Some model configurations may differ from those shown in this catalog. Contact Simpson Strong-Tie for details.
- m. Do not weld products listed in this catalog unless this publication specifically identifies a product as acceptable for welding, or unless specific approval for welding is provided in writing by Simpson Strong-Tie. Some steels have poor weldability and a tendency to crack when welded. Cracked steel will not carry load and must be replaced.

General Instructions for the Installer

These general instructions for the installer are provided to ensure proper selection and installation of Simpson Strong-Tie Company Inc. products and must be followed carefully. These general instructions are in addition to the specific installation instructions and notes provided for each particular product, all of which should be consulted prior to and during installation of Simpson Strong-Tie Company Inc. products.

- a. All specified fasteners must be installed according to the instructions in this catalog. Incorrect fastener quantity, size, placement, type, material, or finish may cause the connection to fail. Prior to using a particular fastener, please consult the Connector Fastener Types page in our *Wood Construction Connectors* catalog.
 - Larger-diameter fasteners may be substituted for smaller-diameter fasteners in connectors provided the larger fastener does not cause splitting in the wood member and the connector holes are not enlarged.
 - Simpson Strong-Tie® Strong Drive SD Connector screws are available for use with our connectors. They are designed to replace nails in certain products. See strongtie.com/sd for information. Screws not manufactured by Simpson Strong-Tie are not supported in our products.
 - When using stainless-steel connectors, use stainless-steel fasteners. When using ZMAX®/HDG galvanized connectors, use fasteners that meet the zinc coating specifications of ASTM A153 or other fasteners allowed in this catalog.
- b. Fill all fastener holes as specified in the installation instructions for that product.
- c. Do not overdrive nails. Overdriven nails reduce shear capacity.
- d. Use the materials specified in the installation instructions. Substitution of or failure to use specified materials may cause the connection to fail.
- e. Do not add fastener holes or otherwise modify Simpson Strong-Tie Company Inc. products. The performance of modified products may be substantially weakened. Simpson Strong-Tie will not warrant or guarantee the performance of such modified products.
- f. Install products in the position specified in the catalog.
- g. Do not alter installation procedures from those set forth in this catalog. Specifically, do not alter, remove or add unspecified fasteners, anchors, etc. to the wall — including the holdowns and other preinstalled hardware. Removal or alteration of these engineered features may alter the performance of the wall.
- h. Bolt holes shall be at least a minimum of 1/32" and no more than a maximum of 1/16" larger than the bolt diameter (per the 2024 NDS and AISI S100-16, Table J3-1 if applicable).
- i. Install all specified fasteners before loading the shearwall.
- j. Some hardened fasteners may have premature failure if exposed to moisture. These fasteners are recommended to be used in dry interior applications.
- k. Use proper safety equipment.
- l. Welding shall be in accordance with American Welding Society AWS D1.1 or D1.3, as applicable. Allowable loads for welded connections require electrodes with minimum tensile strength of 70 ksi. Welding galvanized steel may produce harmful fumes; follow proper welding procedures and precautions. Unless otherwise noted, Simpson Strong-Tie connectors cannot be welded.
- m. Pneumatic or powder-actuated fasteners may deflect and injure the operator or others. Pneumatic nail tools may be used to install connectors, provided the correct quantity and type of nails (length and diameter) are properly installed in the nail holes. Nails shall be concentric, full round head nails complying with ASTM F1667. Tools with nail hole-locating mechanisms should be used. Follow the manufacturer's instructions and use the appropriate safety equipment. Overdriving nails may reduce allowable loads. Contact Simpson Strong-Tie. Powder-actuated fasteners should not be used to install connectors, unless noted otherwise.
- n. For cold-formed steel applications, all screws shall be installed in accordance with the screw manufacturer's recommendations. All screws shall penetrate and protrude through the joined materials a minimum of 3 full exposed threads per AISI Standard for Cold Formed Steel Framing — General Provisions, Section D1.3, if applicable.
- o. Nuts shall be installed such that the end of the threaded rod or bolt is at least flush with the top of the nut.
- p. To achieve tabulated values for embedded concrete/masonry products, full consolidation of concrete or grout is required.
- q. Drilling, sawing, sanding or machining wood products generates wood dust, a substance known to the State of California to cause cancer. For more information on Proposition 65, visit oehha.ca.gov.
- r. For additional installation information, visit the Simpson Strong-Tie page at youtube.com/strongtie.

Important Information and General Notes (continued)

General Instructions for the Designer

These general instructions for the designer are provided to ensure proper selection and installation of Simpson Strong-Tie Company Inc. products and must be followed carefully. These general instructions are in addition to the specific design and installation instructions and notes provided for each particular product, all of which should be consulted prior to and during the design process.

- The term “designer” used throughout this catalog is intended to mean a licensed/certified building design professional, a licensed professional engineer, or a licensed architect.
- All connected members and related elements shall be designed by the designer.
- All installations should be designed only in accordance with the allowable load values set forth in this catalog.
- Simpson Strong-Tie strongly recommends the following addition to construction drawings and specifications: “Simpson Strong-Tie® products are specifically required to meet the structural calculations of the plan. Before substituting another brand, confirm load capacity based on reliable published testing data or calculations. The Engineer/Designer of Record should evaluate and give written approval for substitution prior to installation.”
- For cold-formed steel applications, as a minimum all screws must comply with Society of Automotive Engineers (SAE) Standard J78, Steel Self-Drilling/Tapping Screws, and must have a Type II coating in accordance with ASTM B 633, Electrodeposited Coatings of Zinc on Iron and Steel. Screw strength shall be calculated in accordance with AISI S100-16 Section J4, if applicable, or shall be based on the manufacturer’s design capacity determined from testing.
- Local and/or regional building codes may require meeting special conditions. Building codes often require special inspection of anchors installed in concrete and masonry. For compliance with these requirements, it is necessary to contact the local and/or regional building authority. Except where mandated by code, Simpson Strong-Tie products do not require special inspection.
- For *MasterFormat*® specifications, visit go.strongtie.com/masterformat.
- Strong-Wall high-strength wood shearwalls are not available in markets where all lumber requires pressure treatment.
- Welding shall be in accordance with American Welding Society AWS D1.1 or D1.3, as applicable. Allowable loads for welded connections require electrodes with minimum tensile strength of 70 ksi. Welding galvanized steel may produce harmful fumes; follow proper welding procedures and precautions. Unless otherwise noted, Simpson Strong-Tie connectors cannot be welded.

Simpson Strong-Tie Limited Warranty

For the Limited Warranty that applies to Simpson Strong-Tie products, please consult strongtie.com/limited-warranties. To obtain a copy of the current Limited Warranty, contact us at limited_warranty@strongtie.com, (800) 999-5099 or Simpson Strong-Tie Company Inc., 5956 West Las Positas Boulevard, Pleasanton, CA 94588.

The Limited Warranty contains important disclaimers, limitations and exclusions, and applies only if the products have been properly specified, installed, maintained, and used in accordance with the design limits and the structural, technical, and environmental specifications in the Simpson Strong-Tie Documentation. All future purchases of Simpson Strong-Tie products are subject to the terms of the Limited Warranty in effect as of the purchase date.

Although products are designed for a wide variety of uses, Simpson Strong-Tie assumes no liability for confirming that any product is appropriate for an intended use, and each intended use of a product must be reviewed and approved by qualified professionals. Each product is designed for the load capacities and uses listed in the Simpson Strong-Tie Documentation, subject to the limitations and other information set forth therein. Due to the particular characteristics of potential impact events such as earthquakes and high velocity winds, the specific design and location of the structure, the building materials used, the quality of construction, or the condition of the soils or substrates involved, damage may nonetheless result to a structure and its contents even if the loads resulting from the impact event do not exceed Simpson Strong-Tie’s specifications and the products are properly installed in accordance with applicable building codes, laws, rules and regulations.

Terms and Conditions of Sale

Product Use

Products in this catalog are designed and manufactured for the specific purposes shown, and should not be used with other connectors not approved by a qualified licensed/certified building design professional, a licensed professional engineer or licensed architect (“designer”). You should review our website and consult a qualified designer familiar with all applicable building codes each time you use a Simpson Strong-Tie product.

Indemnity

Any designer or other person who modifies any products, changes any installation procedures or designs any non-catalog products for fabrication by Simpson Strong-Tie Company Inc. shall, regardless of specific instructions to the user, indemnify, defend, and hold harmless Simpson Strong-Tie Company Inc. for any and all claimed loss or damage occasioned in whole or in part by such products.

Non-catalog and Modified Products

Modifications to products or changes in installation procedures should only be made by a qualified professional designer. The performance of such modified products or altered installation procedures is the sole responsibility of the designer. Any person modifying Simpson Strong-Tie products must provide the installer with specific instructions on the modified products’ specifications, installation and use.

Consult Simpson Strong-Tie Company Inc. for applications for which there is no catalog product, or for connectors for use in hostile environments, with excessive wood shrinkage, or with abnormal loading or erection requirements.

Non-catalog products must be designed by a qualified designer and will be fabricated by Simpson Strong-Tie in accordance with customer specifications.

Any modified, special order or non-catalog products, or any products that are not installed strictly in accordance with Simpson Strong-Tie installation procedures, are provided “AS IS” and without any representation or warranty of any kind.

Higher Loads Plus Design Flexibility

Introducing the new Strong-Wall high-strength steel shearwall (SSWH™) from Simpson Strong-Tie. Engineered to resist lateral forces in seismic and high-wind areas, the SSWH are rigorously tested to achieve some of the highest load ratings among prefabricated shearwalls on the market. Added strength allows more room for window and garage door openings in single- and multifamily residential buildings with limited wall space. The SSWH also has a narrower profile than site-built shearwalls, requiring fewer shearwalls per project. Its updated design incorporates a holdown with fuse technology for added ductility under extreme loading, improved access to install anchor-bolt nuts from multiple positions for faster and more flexible installation, and predrilled holes that simplify attaching nailers. Like our popular WSWH™ high-strength wood shearwall, the code-listed SSWH uses a universal anchorage template and bolts that simplify and speed up installation. Available in 12", 15", 18", 21" and 24" panel widths for 7'-13' heights — and backed by our expert service and support — the SSWH high-strength shearwall is ready for your next build.



SSWH24x8, SSWH24x12,
and SSWH12x7

Standard Application on Concrete Foundation

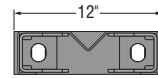
Simpson Strong-Tie® Strong-Wall high-strength steel shearwalls provide superior performance, design flexibility and ease of installation. All Strong-Wall high-strength steel shearwalls are evaluated to the 2024 IRC and IBC, and are listed by ICC-ES.

Material: Vertical Panel — 10 gauge

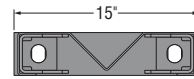
Finish: Vertical Panel — Galvanized
Top and Base Plates — Simpson Strong-Tie gray paint

Codes: ICC-ES ESR-1679;
City of LA Building Code Supplement;
State of Florida FL5113

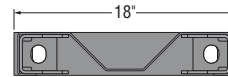
7'–10' tall walls come with predrilled holes for optional field installation of nailers with SDS screws.



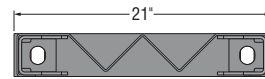
SSWH12



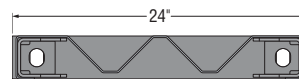
SSWH15



SSWH18

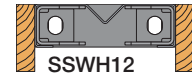


SSWH21



SSWH24

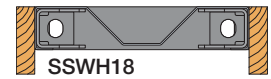
11'–13' tall walls come with preattached 2x6 nailers (required).



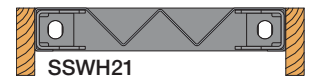
SSWH12



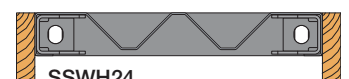
SSWH15



SSWH18

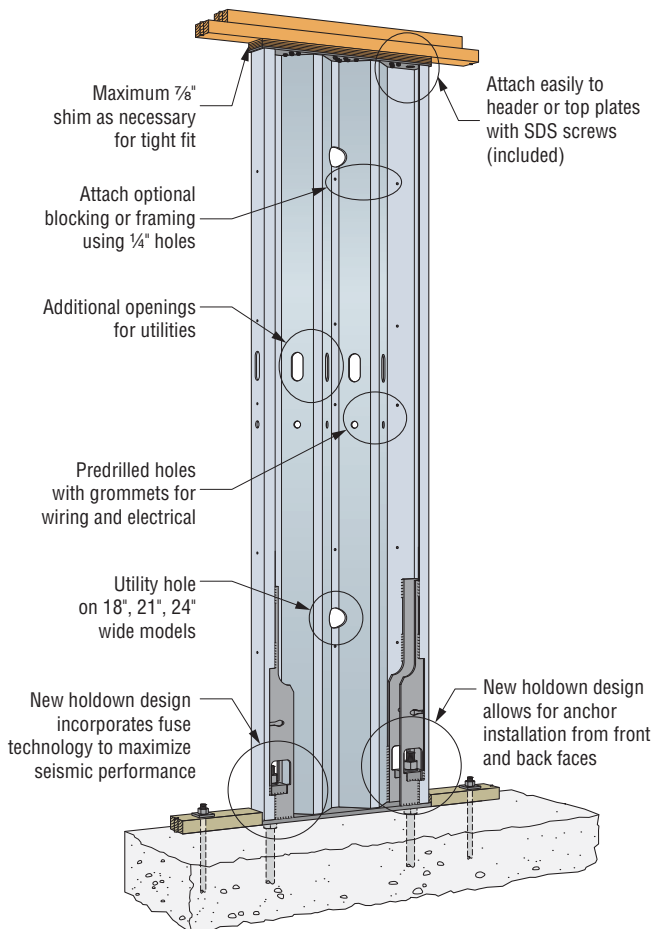
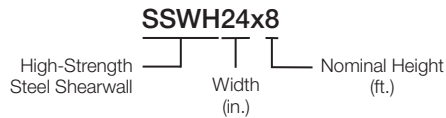


SSWH21



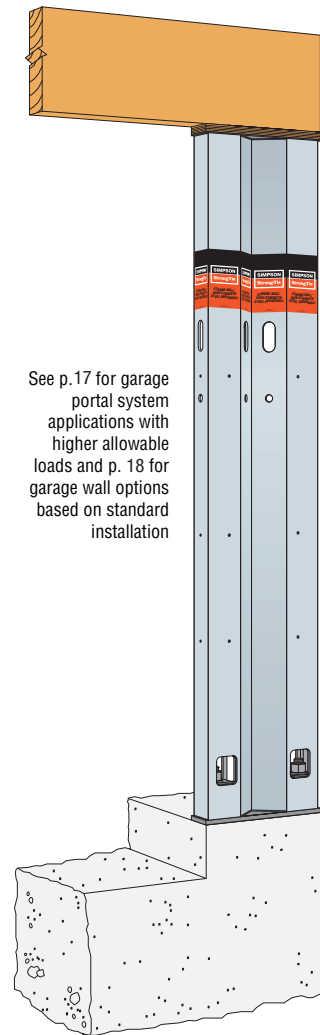
SSWH24

Naming Legend



SSWH™ Standard Installation
(SSWH24x8 shown)

US Patent pending, strongtie.com/patents.



See p.17 for garage portal system applications with higher allowable loads and p. 18 for garage wall options based on standard installation

SSWH Garage Installation

US Patent pending, strongtie.com/patents.

Standard Application on Concrete Foundations (continued)

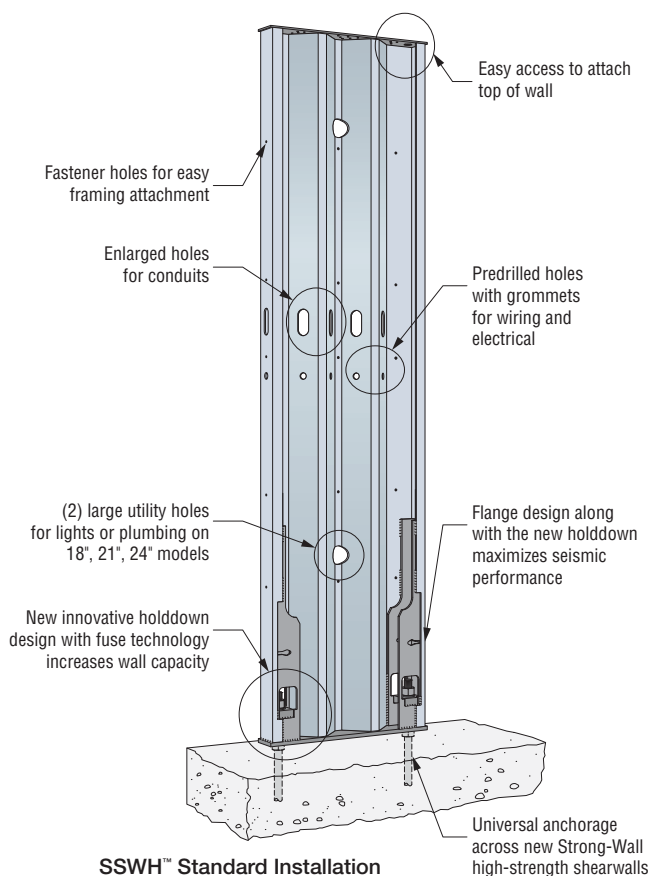
Installation Information

- Do not cut the Strong-Wall high-strength steel shearwall or enlarge existing holes. Doing so will compromise the performance of the wall.
- Anchor bolt nuts should be finger tight plus ½ turn.
- Do not use an impact wrench to tighten nuts on the anchor bolts.
- Maximum shim thickness between the Strong-Wall high-strength steel shearwall and top plates or header is ⅞" using Simpson Strong-Tie® Strong-Drive® ¼" x 3½" SDS Heavy-Duty Connector screws (included). For top-of-wall height adjustment of up to 12", see detail 9/SSWH2 on p. 31.
- SSWH™ may be used in 2x6 or 2x8 wall framing. Install the wall flush to one face of the framing and add furring to the opposite side as needed.
- Walls may be installed with solid or multi-ply headers, see detail 4/SSWH4 on p. 32.
- Utility holes (Diameter) centered: SSWH18x (2⅞"), SSWH21x (2½"), SSWH24x (2½").

Strong-Wall High-Strength Steel Shearwall Product Data

Strong-Wall High-Strength Steel Shearwall Model No.	Panel Information			Anchor Bolts		Number of Screws in Top of Wall	Total Wall Weight (lb.)
	Nominal Width, W (in.)	Height, H (in.)	Thickness, T (in.)	Qty.	Dia. (in.)		
SSWH12x7	12	78	3½	2	1	6	100
SSWH15x7	15	78	3½	2	1	8	115
SSWH18x7	18	78	3½	2	1	9	125
SSWH21x7	21	78	3½	2	1	12	140
SSWH24x7	24	78	3½	2	1	14	150
SSWH12x8	12	93¼	3½	2	1	6	115
SSWH15x8	15	93¼	3½	2	1	8	130
SSWH18x8	18	93¼	3½	2	1	9	140
SSWH21x8	21	93¼	3½	2	1	12	160
SSWH24x8	24	93¼	3½	2	1	14	170
SSWH12x9	12	105¼	3½	2	1	6	120
SSWH15x9	15	105¼	3½	2	1	8	140
SSWH18x9	18	105¼	3½	2	1	9	155
SSWH21x9	21	105¼	3½	2	1	12	175
SSWH24x9	24	105¼	3½	2	1	14	190
SSWH12x10	12	117¼	3½	2	1	6	130
SSWH15x10	15	117¼	3½	2	1	8	150
SSWH18x10	18	117¼	3½	2	1	9	165
SSWH21x10	21	117¼	3½	2	1	12	190
SSWH24x10	24	117¼	3½	2	1	14	205
SSWH12x11	15	129¼	5½	2	1	6	185
SSWH15x11	18	129¼	5½	2	1	8	205
SSWH18x11	21	129¼	5½	2	1	9	220
SSWH21x11	24	129¼	5½	2	1	12	245
SSWH24x11	27	129¼	5½	2	1	14	260
SSWH12x12	15	141¼	5½	2	1	6	195
SSWH15x12	18	141¼	5½	2	1	8	220
SSWH18x12	21	141¼	5½	2	1	9	235
SSWH21x12	24	141¼	5½	2	1	12	265
SSWH24x12	27	141¼	5½	2	1	14	280
SSWH15x13	18	153¼	5½	2	1	8	235
SSWH18x13	21	153¼	5½	2	1	9	255
SSWH21x13	24	153¼	5½	2	1	12	285
SSWH24x13	27	153¼	5½	2	1	14	300

1. Panel Thickness, T, and Panel Nominal Width, W, includes the required 2x6 studs that are preattached for 11'-13' -tall walls.



SSWH™ Standard Installation
US Patent pending,
strongtie.com/patents.

Standard Application on Concrete Foundations (continued)

Strong-Wall High-Strength Steel Shearwall Model	Panel Evaluation Height, H_e (in.)	Allow. Vertical Load, P (lb.)	2,500 psi Concrete						3,000 psi Concrete					
			Seismic			Wind			Seismic			Wind		
			Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)
SSWH12x7	78	1,000	2,155	0.27	20,710	2,155	0.31	20,710	2,325	0.29	22,310	2,520	0.36	24,175
		4,000	2,005	0.25	19,230	2,005	0.28	19,230	2,325	0.29	22,310	2,365	0.33	22,700
		7,500	1,825	0.23	17,510	1,825	0.26	17,510	2,185	0.28	20,975	2,185	0.31	20,975
SSWH15x7	78	1,000	3,600	0.29	27,060	3,600	0.33	27,060	3,645	0.29	27,410	4,235	0.38	31,855
		4,000	3,390	0.27	25,470	3,390	0.31	25,470	3,645	0.29	27,410	4,025	0.36	30,260
		7,500	3,140	0.25	23,615	3,140	0.28	23,615	3,645	0.29	27,410	3,780	0.34	28,405
SSWH18x7	78	1,000	5,025	0.31	31,050	5,035	0.33	31,115	5,025	0.31	31,050	5,300	0.35	32,740
		4,000	4,765	0.29	29,455	4,765	0.32	29,455	5,025	0.31	31,050	5,300	0.35	32,740
		7,500	4,455	0.27	27,515	4,455	0.29	27,515	5,025	0.31	31,050	5,300	0.35	32,740
SSWH21x7	78	1,000	6,350	0.28	33,740	6,550	0.31	34,820	6,350	0.28	33,740	6,810	0.32	36,200
		4,000	6,225	0.27	33,080	6,225	0.30	33,080	6,350	0.28	33,740	6,810	0.32	36,200
		7,500	5,840	0.25	31,055	5,840	0.28	31,055	6,350	0.28	33,740	6,810	0.32	36,200
SSWH24x7	78	1,000	7,870	0.25	35,070	8,055	0.28	35,905	7,870	0.25	35,070	8,055	0.28	35,905
		4,000	7,680	0.25	34,230	7,680	0.27	34,230	7,870	0.25	35,070	8,055	0.28	35,905
		7,500	7,230	0.23	32,230	7,230	0.25	32,230	7,870	0.25	35,070	8,055	0.28	35,905
SSWH12x8	93¼	1,000	1,805	0.34	20,710	1,805	0.38	20,710	1,915	0.36	21,965	2,105	0.45	24,175
		4,000	1,675	0.32	19,230	1,675	0.35	19,230	1,915	0.36	21,965	1,980	0.42	22,700
		7,500	1,525	0.29	17,510	1,525	0.32	17,510	1,830	0.35	20,975	1,830	0.39	20,975
SSWH15x8	93¼	1,000	2,900	0.42	26,080	3,010	0.44	27,060	2,900	0.42	26,080	3,545	0.51	31,855
		4,000	2,835	0.41	25,470	2,835	0.41	25,470	2,900	0.42	26,080	3,365	0.49	30,260
		7,500	2,630	0.38	23,615	2,630	0.38	23,615	2,900	0.42	26,080	3,160	0.46	28,405
SSWH18x8	93¼	1,000	4,090	0.42	30,220	4,215	0.43	31,115	4,090	0.42	30,220	4,655	0.48	34,385
		4,000	3,990	0.41	29,455	3,990	0.41	29,455	4,090	0.42	30,220	4,655	0.48	34,385
		7,500	3,725	0.38	27,515	3,725	0.38	27,515	4,090	0.42	30,220	4,480	0.46	33,095
SSWH21x8	93¼	1,000	5,285	0.35	33,585	5,480	0.39	34,820	5,285	0.35	33,585	5,695	0.41	36,200
		4,000	5,205	0.34	33,080	5,205	0.37	33,080	5,285	0.35	33,585	5,695	0.41	36,200
		7,500	4,885	0.32	31,055	4,885	0.35	31,055	5,285	0.35	33,585	5,695	0.41	36,200
SSWH24x8	93¼	1,000	6,530	0.33	34,805	6,740	0.37	35,905	6,530	0.33	34,805	6,740	0.37	35,905
		4,000	6,425	0.32	34,230	6,425	0.35	34,230	6,530	0.33	34,805	6,740	0.37	35,905
		7,500	6,050	0.30	32,230	6,050	0.33	32,230	6,530	0.33	34,805	6,740	0.37	35,905
SSWH12x9	105¼	1,000	1,595	0.42	20,680	1,600	0.46	20,710	1,595	0.42	20,680	1,865	0.53	24,175
		4,000	1,485	0.39	19,230	1,485	0.42	19,230	1,595	0.42	20,680	1,750	0.50	22,700
		7,500	1,350	0.36	17,510	1,350	0.39	17,510	1,595	0.42	20,680	1,620	0.46	20,975
SSWH15x9	105¼	1,000	2,425	0.42	24,625	2,670	0.50	27,060	2,425	0.42	24,625	3,140	0.59	31,855
		4,000	2,425	0.42	24,625	2,510	0.47	25,470	2,425	0.42	24,625	2,985	0.56	30,260
		7,500	2,330	0.40	23,615	2,330	0.44	23,615	2,425	0.42	24,625	2,800	0.53	28,405
SSWH18x9	105¼	1,000	3,505	0.43	29,235	3,735	0.49	31,115	3,505	0.43	29,235	4,125	0.54	34,385
		4,000	3,505	0.43	29,235	3,535	0.46	29,455	3,505	0.43	29,235	4,125	0.54	34,385
		7,500	3,300	0.40	27,515	3,300	0.43	27,515	3,505	0.43	29,235	3,970	0.52	33,095
SSWH21x9	105¼	1,000	4,650	0.40	33,340	4,855	0.46	34,820	4,650	0.40	33,340	5,045	0.47	36,200
		4,000	4,610	0.40	33,080	4,610	0.43	33,080	4,650	0.40	33,340	5,045	0.47	36,200
		7,500	4,330	0.38	31,055	4,330	0.41	31,055	4,650	0.40	33,340	5,045	0.47	36,200
SSWH24x9	105¼	1,000	5,725	0.38	34,445	5,970	0.43	35,905	5,725	0.38	34,445	5,970	0.43	35,905
		4,000	5,690	0.38	34,230	5,690	0.41	34,230	5,725	0.38	34,445	5,970	0.43	35,905
		7,500	5,360	0.36	32,230	5,360	0.39	32,230	5,725	0.38	34,445	5,970	0.43	35,905

See footnotes on p. 15.

Standard Application on Concrete Foundations (continued)

Strong-Wall High-Strength Steel Shearwall Model	Panel Evaluation Height, H_e (in.)	Allow. Vertical Load, P (lb.)	2,500 psi Concrete						3,000 psi Concrete					
			Seismic			Wind			Seismic			Wind		
			Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)
SSWH12x10	117¼	1,000	1,325	0.53	19,120	1,435	0.57	20,710	1,325	0.53	19,120	1,675	0.66	24,175
		4,000	1,325	0.53	19,120	1,335	0.53	19,230	1,325	0.53	19,120	1,575	0.62	22,700
		7,500	1,215	0.48	17,510	1,215	0.48	17,510	1,325	0.53	19,120	1,455	0.58	20,975
SSWH15x10	117¼	1,000	2,075	0.53	23,445	2,395	0.61	27,060	2,075	0.53	23,445	2,635	0.67	29,775
		4,000	2,075	0.53	23,445	2,255	0.57	25,470	2,075	0.53	23,445	2,635	0.67	29,775
		7,500	2,075	0.53	23,445	2,090	0.53	23,615	2,075	0.53	23,445	2,515	0.64	28,405
SSWH18x10	117¼	1,000	2,980	0.53	27,695	3,350	0.59	31,115	2,980	0.53	27,695	3,700	0.65	34,385
		4,000	2,980	0.53	27,695	3,170	0.56	29,455	2,980	0.53	27,695	3,700	0.65	34,385
		7,500	2,965	0.52	27,515	2,965	0.52	27,515	2,980	0.53	27,695	3,510	0.62	32,595
SSWH21x10	117¼	1,000	4,015	0.46	32,085	4,360	0.54	34,820	4,015	0.46	32,085	4,530	0.56	36,200
		4,000	4,015	0.46	32,085	4,140	0.52	33,080	4,015	0.46	32,085	4,530	0.56	36,200
		7,500	3,885	0.45	31,055	3,885	0.48	31,055	4,015	0.46	32,085	4,530	0.56	36,200
SSWH24x10	117¼	1,000	5,145	0.46	34,470	5,360	0.52	35,905	5,145	0.46	34,470	5,360	0.52	35,905
		4,000	5,110	0.45	34,230	5,110	0.49	34,230	5,145	0.46	34,470	5,360	0.52	35,905
		7,500	4,810	0.43	32,230	4,810	0.46	32,230	5,145	0.46	34,470	5,360	0.52	35,905
SSWH12x11	129¼	1,000	1,145	0.58	18,175	1,300	0.66	20,710	1,145	0.58	18,175	1,450	0.73	23,080
		4,000	1,145	0.58	18,175	1,210	0.61	19,230	1,145	0.58	18,175	1,425	0.72	22,700
		7,500	1,100	0.56	17,510	1,100	0.56	17,510	1,145	0.58	18,175	1,320	0.67	20,975
SSWH15x11	129¼	1,000	1,800	0.58	22,420	2,170	0.70	27,060	1,800	0.58	22,420	2,285	0.73	28,465
		4,000	1,800	0.58	22,420	2,045	0.66	25,470	1,800	0.58	22,420	2,285	0.73	28,465
		7,500	1,800	0.58	22,420	1,895	0.61	23,615	1,800	0.58	22,420	2,220	0.71	27,685
SSWH18x11	129¼	1,000	2,605	0.58	26,695	3,040	0.67	31,115	2,605	0.58	26,695	3,310	0.73	33,895
		4,000	2,605	0.58	26,695	2,875	0.64	29,455	2,605	0.58	26,695	3,310	0.73	33,895
		7,500	2,605	0.58	26,695	2,685	0.60	27,515	2,605	0.58	26,695	3,100	0.69	31,750
SSWH21x11	129¼	1,000	3,555	0.51	31,305	3,955	0.62	34,820	3,555	0.51	31,305	4,110	0.65	36,200
		4,000	3,555	0.51	31,305	3,755	0.59	33,080	3,555	0.51	31,305	4,110	0.65	36,200
		7,500	3,525	0.51	31,055	3,525	0.55	31,055	3,555	0.51	31,305	4,050	0.64	35,665
SSWH24x11	129¼	1,000	4,575	0.51	33,800	4,860	0.59	35,905	4,575	0.51	33,800	4,860	0.59	35,905
		4,000	4,575	0.51	33,800	4,635	0.56	34,230	4,575	0.51	33,800	4,860	0.59	35,905
		7,500	4,365	0.49	32,230	4,365	0.53	32,230	4,575	0.51	33,800	4,860	0.59	35,905
SSWH12x12	141¼	1,000	980	0.58	17,070	1,190	0.74	20,710	980	0.58	17,070	1,280	0.80	22,290
		4,000	980	0.58	17,070	1,105	0.69	19,230	980	0.58	17,070	1,280	0.80	22,290
		7,500	980	0.58	17,070	1,005	0.63	17,510	980	0.58	17,070	1,190	0.74	20,725
SSWH15x12	141¼	1,000	1,580	0.63	21,525	1,990	0.79	27,060	1,580	0.63	21,525	2,005	0.80	27,330
		4,000	1,580	0.63	21,525	1,870	0.75	25,470	1,580	0.63	21,525	2,005	0.80	27,330
		7,500	1,580	0.63	21,525	1,735	0.69	23,615	1,580	0.63	21,525	1,905	0.76	25,915
SSWH18x12	141¼	1,000	2,310	0.63	25,820	2,780	0.76	31,115	2,310	0.63	25,820	2,930	0.80	32,785
		4,000	2,310	0.63	25,820	2,635	0.72	29,455	2,310	0.63	25,820	2,930	0.80	32,785
		7,500	2,310	0.63	25,820	2,460	0.67	27,515	2,310	0.63	25,820	2,645	0.72	29,595
SSWH21x12	141¼	1,000	3,180	0.57	30,605	3,615	0.70	34,820	3,180	0.57	30,605	3,760	0.73	36,200
		4,000	3,180	0.57	30,605	3,435	0.66	33,080	3,180	0.57	30,605	3,760	0.73	36,200
		7,500	3,180	0.57	30,605	3,225	0.62	31,055	3,180	0.57	30,605	3,455	0.67	33,265
SSWH24x12	141¼	1,000	4,085	0.57	32,970	4,450	0.67	35,905	4,085	0.57	32,970	4,450	0.67	35,905
		4,000	4,085	0.57	32,970	4,240	0.64	34,230	4,085	0.57	32,970	4,450	0.67	35,905
		7,500	3,995	0.55	32,230	3,995	0.60	32,230	4,085	0.57	32,970	4,380	0.66	35,355

See footnotes on p. 15.

Standard Application on Concrete Foundations (continued)

Strong-Wall High-Strength Steel Shearwall Model	Panel Evaluation Height, H_e (in.)	Allow. Vertical Load, P (lb.)	2,500 psi Concrete						3,000 psi Concrete					
			Seismic			Wind			Seismic			Wind		
			Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)
SSWH15x13	153¼	1,000	1,405	0.62	19,120	1,840	0.87	25,025	1,405	0.62	19,120	1,840	0.87	25,025
		4,000	1,405	0.62	19,120	1,840	0.87	25,025	1,405	0.62	19,120	1,840	0.87	25,025
		7,500	1,405	0.62	19,120	1,630	0.77	22,205	1,405	0.62	19,120	1,630	0.77	22,205
SSWH18x13	153¼	1,000	2,050	0.63	24,900	2,565	0.83	31,115	2,050	0.63	24,900	2,670	0.87	32,405
		4,000	2,050	0.63	24,900	2,425	0.79	29,455	2,050	0.63	24,900	2,565	0.83	31,155
		7,500	2,050	0.63	24,900	2,265	0.74	27,515	2,050	0.63	24,900	2,285	0.74	27,745
SSWH21x13	153¼	1,000	2,840	0.62	29,640	3,335	0.78	34,820	2,840	0.62	29,640	3,465	0.81	36,200
		4,000	2,840	0.62	29,640	3,170	0.74	33,080	2,840	0.62	29,640	3,300	0.77	34,440
		7,500	2,840	0.62	29,640	2,975	0.70	31,055	2,840	0.62	29,640	2,985	0.70	31,170
SSWH24x13	153¼	1,000	3,680	0.62	32,210	4,100	0.74	35,905	3,680	0.62	32,210	4,100	0.74	35,905
		4,000	3,680	0.62	32,210	3,910	0.71	34,230	3,680	0.62	32,210	4,100	0.74	35,905
		7,500	3,680	0.62	32,210	3,680	0.67	32,230	3,680	0.62	32,210	3,785	0.68	33,125

1. Allowable ASD shear loads and anchor tension values are applicable to installations on concrete with specified compressive strengths as listed.
2. Load values include evaluation of bearing stresses on concrete foundations and do not require further evaluation by the designer.
For installations on masonry foundations, bearing capacity shall be evaluated by the designer.
3. For seismic designs based on the 2024 IBC using $R = 6.5$. For other codes, use the seismic coefficients corresponding to light-frame bearing walls with wood structural panels or sheet steel panels.
4. Allowable vertical load denotes the total maximum concentric vertical load permitted on the panel acting in combination with the allowable shear loads.
5. Allowable shear, drift and anchor tension values may be interpolated for intermediate height or vertical loads.
6. High-strength anchor bolts are required unless a lower strength grade is justified by the registered design professional. See pp. 85–87 for SWH-AB anchor bolt information and anchorage solutions.
7. See p. 16 for allowable out-of-plane values; see p. 16 for allowable axial values.
8. Drifts at lower design shear may be linearly reduced.
9. Tabulated anchor tension values assume no resisting vertical load. Anchor tension loads at design shear values and including the effect of vertical load may be determined using the following equation:

$$T = [(V \times H) / B] - P/2, \text{ where:}$$

T = Anchor tension load (lb.);

V = Design shear load (lb.);

P = Applied vertical load (lb.);

H = Panel height (in.)

B = Moment arm (in.): 7.75" for SSWH12, 9.5" for SSWH15, 12" for SSWH18, 14.675" for SSWH21 and 17.50" for SSWH24

NOTE: For design values for 4,000 psi concrete, refer to ESR-1679

Standard Application on Concrete Foundations (continued)

Allowable Out-of-Plane Loads for Single-Story Walls on Concrete Foundations (psf)

Panel Attachment	Strong-Wall High-Strength Steel Shearwall Model	Allow. Vertical Load, P (lb.)	Allowable ASD Out-of-Plane Loads						
			Nominal Height of Shearwall (ft.)						
			7	8	9	10	11	12	13
Top Plates	SSWH12	1,000	535	380	295	240	200	175	N/A
		4,000	485	340	260	205	170	145	N/A
		7,500	430	295	220	170	135	110	N/A
	SSWH15	1,000	515	365	285	230	195	165	140
		4,000	470	335	255	205	170	140	120
		7,500	425	295	225	175	140	115	95
	SSWH18	1,000	560	425	330	270	215	175	140
		4,000	555	395	300	245	200	170	140
		7,500	510	355	270	215	175	145	120
	SSWH21	1,000	455	325	255	205	175	145	120
		4,000	425	300	235	185	155	130	115
		7,500	390	275	210	165	135	110	95
Header ⁴	SSWH12	1,000	490	350	270	220	185	150	120
		4,000	465	330	250	205	170	145	120
		7,500	430	305	230	185	150	125	105
	SSWH15	1,000	455	315	255	210	180	160	N/A
		4,000	410	280	220	180	150	125	N/A
		7,500	360	240	185	145	120	95	N/A
	SSWH18	1,000	435	305	245	205	175	150	125
		4,000	400	275	215	180	150	125	110
		7,500	360	240	185	150	125	100	85
	SSWH21	1,000	510	355	285	235	185	150	125
		4,000	465	320	260	210	180	150	125
		7,500	420	290	230	185	150	125	105
Header ⁴	SSWH21	1,000	385	270	215	180	155	125	105
		4,000	355	245	195	165	140	120	100
		7,500	320	220	175	140	120	100	85
	SSWH24	1,000	415	290	235	195	160	130	105
		4,000	385	265	210	175	150	130	105
		7,500	345	240	190	155	130	110	95

1. Loads shown are at ASD level in lb./ft.² with no further increase allowed.
2. Loads consider a maximum deflection limit of $h/240$.
3. Allowable out-of-plane loads can be applied in combination with the allowable vertical loads shown on pp. 13–15.
4. Allowable values for header panel attachment assume a maximum header depth of 12". Use a load reduction factor of 0.93, 0.89 and 0.83 for 14", 16" and 18" deep headers respectively.
5. Values are applicable to either the ASD basic or alternative basic load combinations.
6. Allowable out-of-plane loads for the walls may be linearly interpolated between the axial loads shown.
7. Table loads apply only to single-story walls on concrete foundations.
8. N/A = Not Applicable.

Allowable Axial Capacities for Single-Story Walls on Concrete Foundations (lb.)

Strong-Wall High-Strength Steel Shearwall Model	Compression Capacity (lb.)						
	Nominal Height of Shearwall (ft.)						
	7	8	9	10	11	12	13
SSWH12	43,980	39,920	36,545	33,100	29,665	23,070	N/A
SSWH15	52,385	51,710	48,430	45,000	41,480	37,935	34,420
SSWH18	59,980	58,360	54,850	51,170	47,380	43,540	39,715
SSWH21	65,520	65,520	61,900	57,050	52,115	47,190	42,355
SSWH24	73,525	73,525	68,855	63,760	58,555	53,335	48,175

1. Allowable ASD vertical load is the lesser of the SSWH™ panel buckling capacity and concrete bearing capacity beneath the walls assuming a minimum specified concrete compressive strength $f'_c = 2,500$ psi.
2. Allowable vertical loads assume concentric point load or uniformly distributed load without lateral loads present. For combined lateral and vertical loads, see pp. 13–15.
3. Tabulated loads apply to single-story panels on concrete foundations.
4. Compression capacity of wall assumes no lateral loads present. See allowable in-plane or out-of-plane load tables for combined lateral and axial loading conditions.
5. N/A = Not Applicable.

Garage Portal Systems on Concrete Foundations

Simpson Strong-Tie® offers a Strong-Wall high-strength steel shearwall option for garage portal systems which combines simplified installation with superior performance.

- Higher allowable loads with reduced concrete anchorage requirements (see *Alternate Garage Front Options* on p. 18 for other options)
- Complete kit available to simplify the connection to the header or beam

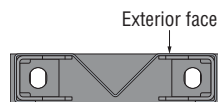
For product data and naming scheme information, see pp. 11–12.

Suggested Example Specification:
SSWH12x7 with SSWH-PKT

Garage Header Rough Opening Height

Model No.	H Curb (in.)	Rough Opening Height
SSWH12x7	5½	6'-11½"
SSWH15x7	6	7'-0"
SSWH12x8	5½	8'-2¾" ³
SSWH15x8	6	8'-3¼" ³

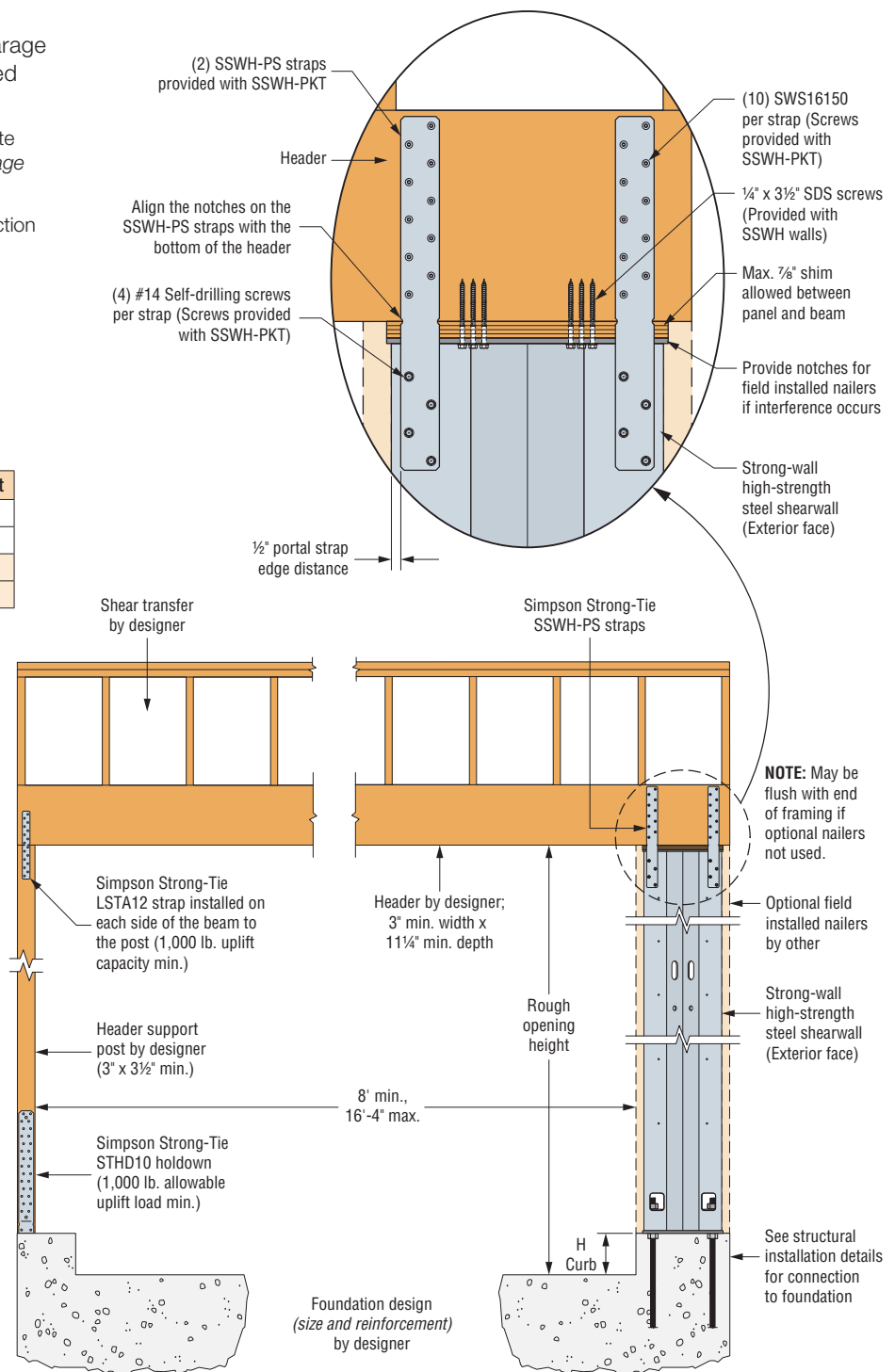
1. The height of the garage curb above the garage slab is critical for the rough header opening at garage return walls.
2. Shims are not provided with Strong-Wall high-strength steel shearwall. Max. 7/8" shim as required.
3. Furring down garage header may be required for correct rough opening height.
4. Refer to p. 12 for wall dimensions



For a complete set of wall profile drawings, see p. 11.

Installation

- Portal Frame Connection Kit is required to achieve increased load values listed for portal frame system.
- SSWH-PS straps must be installed on exterior face of the Strong-Wall high-strength steel shearwall. Position header flush with exterior face of the Strong-Wall high-strength steel shearwall.
- Do not cut the Strong-Wall high-strength steel shearwall or enlarge existing holes. Doing so will compromise the performance of the wall. See General Notes.
- Anchor bolt nuts should be finger tight plus ½ turn.
- Do not use an impact wrench to tighten nuts on the anchor bolts.
- Maximum shim thickness between the Strong-Wall high-strength steel shearwall and header is 7/8" using Simpson Strong-Tie Strong-Drive® ¼" x 3½" SDS Heavy-Duty Connector screws.
- SSWH™ may be used in 2x6 or 2x8 wall framing. Install the wall flush to exterior face of the framing and add furring to the opposite side.
- Walls may be installed with solid headers in all cases or multi-ply headers in Wind and SDC A-C, see 4/SSWH4 on p. 32 for details.



NOTE: This install reflects lateral load requirements of a single-wall portal system. It is the designer's responsibility to provide a complete load path for all loads in accordance with the governing codes. Refer to footnotes on next page.

Portal Frame Connection Kit

Model No.	Contents
SSWH-PKT	(2) 10-Gauge SSWH-PS Straps (8) #14 x 1" Self-Drilling Screws (20) SWS16150 Installation Instructions: TEB-L-SSWHPINS

Garage Portal Systems on Concrete Foundations (continued)

Portal Design Information

A portal frame under lateral loads causes the portal header to experience internal stresses in addition to those created by the primary loads. These additional stresses are called induced forces and must be considered when designing portal headers. For SSWH12 and SSWH15, the moment induced into the portal header shall be taken as 10% of the total lateral moments at the base. For SSWH18, SSH21, and SSWH24, the induced moment shall be taken as 0%. See p. 44, information on portal design for WSWH, for further discussion on these induced forces from lateral loads.

Strong-Wall High-Strength Steel Shearwall Portal Header Design Parameters^{2,3}

Header Design Parameter	Allowable Range
Width ¹	3" – 5½"
Depth	11¼" – 18"
Clear Span ⁴	8' – 16' 4"
K ⁵	90 lb./in. – 4,000 lb./in.

1. Single- or multi-ply header members may be used.
2. Secondary moment, shear and axial forces shall be considered in header design.
3. Header design shall be by designer and assume gravity loads only induce simple span moments in beam.
4. Longer header spans can be accommodated if larger headers are used such that equivalent stiffness is equal to or greater than that provided by the minimum header size and maximum length indicated.
5. Header stiffness (K) for use in SSWH™ portal system may be determined using the following equation:

$$K = (E \times b \times d^3) / 12L^3 \text{ where:}$$

E = Header modulus of elasticity (psi)

b = Header width (in.)

d = Header depth (in.)

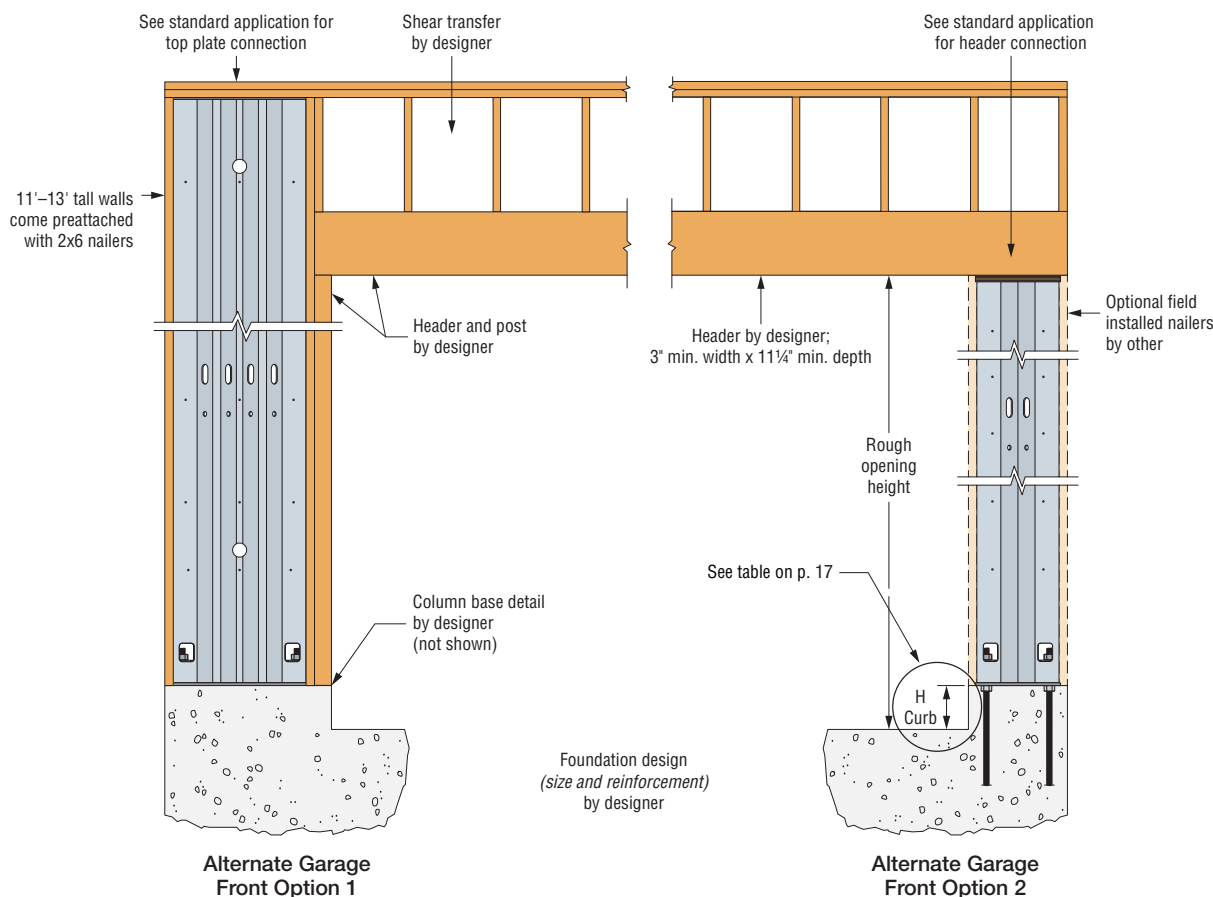
L = Header clear span (in.)

Alternate Garage Front Options

These alternate garage front options may be used for applications when the Strong-Wall high-strength steel shearwall is installed at the full height (*option 1*) or without the additional Portal Frame Kit (*option 2*), when higher capacity or reduced concrete anchorage are not needed. Refer to the Standard Application on Concrete Foundations on pp. 13–15 for product data and allowable load values.

For Alternate Garage Front Option 2, the designer shall design for:

1. Shear transfer
2. Out-of-plane loading effect
3. Increased overturning and drift due to additional height



Garage Portal Systems on Concrete Foundations (continued)

Strong-Wall High Strength Steel Shearwall Model	Panel Evaluation Height, H _e (in.)	Concrete Compressive Strength, f' _c (psi)	Allow. Vertical Load, P (lb.)	Seismic			Wind		
				Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)
SSWH12x7 w/ SSWH-PKT	78	2,500	1,000	2,395	0.34	21,710	2,395	0.38	21,710
			4,000	2,225	0.31	20,160	2,225	0.35	20,160
			7,500	2,025	0.28	18,355	2,025	0.32	18,355
		3,000	1,000	2,570	0.36	23,260	2,800	0.44	25,345
			4,000	2,570	0.36	23,260	2,625	0.41	23,800
			7,500	2,430	0.34	21,990	2,430	0.38	21,990
		4,000	1,000	2,570	0.36	23,260	3,385	0.53	30,680
			4,000	2,570	0.36	23,260	3,320	0.52	30,075
			7,500	2,570	0.36	23,260	3,110	0.49	28,160
SSWH15x7 w/ SSWH-PKT	78	2,500	1,000	3,805	0.35	28,110	4,000	0.42	29,555
			4,000	3,765	0.35	27,815	3,765	0.40	27,815
			7,500	3,490	0.33	25,790	3,490	0.37	25,790
		3,000	1,000	3,805	0.35	28,110	4,710	0.50	34,785
			4,000	3,805	0.35	28,110	4,475	0.47	33,050
			7,500	3,805	0.35	28,110	4,200	0.45	31,025
		4,000	1,000	3,805	0.35	28,110	4,710	0.50	34,805
			4,000	3,805	0.35	28,110	4,710	0.50	34,805
			7,500	3,805	0.35	28,110	4,655	0.49	34,395
SSWH12x8 w/ SSWH-PKT	93¼	2,500	1,000	2,005	0.41	21,710	2,005	0.45	21,710
			4,000	1,860	0.38	20,160	1,860	0.42	20,160
			7,500	1,695	0.34	18,355	1,695	0.38	18,355
		3,000	1,000	2,045	0.41	22,130	2,340	0.52	25,345
			4,000	2,045	0.41	22,130	2,200	0.49	23,800
			7,500	2,030	0.41	21,990	2,030	0.45	21,990
		4,000	1,000	2,045	0.41	22,130	2,690	0.60	29,130
			4,000	2,045	0.41	22,130	2,670	0.60	28,940
			7,500	2,045	0.41	22,130	2,480	0.55	26,865
SSWH15x8 w/ SSWH-PKT	93¼	2,500	1,000	2,980	0.42	26,310	3,345	0.52	29,555
			4,000	2,980	0.42	26,310	3,150	0.49	27,815
			7,500	2,920	0.41	25,790	2,920	0.45	25,790
		3,000	1,000	2,980	0.42	26,310	3,895	0.60	34,400
			4,000	2,980	0.42	26,310	3,740	0.58	33,050
			7,500	2,980	0.42	26,310	3,510	0.54	31,025
		4,000	1,000	2,980	0.42	26,310	3,895	0.60	34,400
			4,000	2,980	0.42	26,310	3,895	0.60	34,400
			7,500	2,980	0.42	26,310	3,730	0.57	32,965

1. Allowable shear loads are applicable to installations on concrete with specified compressive strengths as listed using the ASD basic (2024 IBC Section 1605.1) or the alternative basic (2024 IBC Section 1605.2) load combinations.
2. Load values include evaluation of bearing stresses on concrete foundations and do not require further evaluation by the designer. For installations on masonry foundations, bearing capacity shall be evaluated by the designer.
3. For seismic designs based on the 2024 IBC using R = 6.5. For other codes, use the seismic coefficients corresponding to light-frame bearing walls with wood structural panels or sheet steel panels.
4. A Double-Wall Garage Portal System consists of two walls with a header continuous across both panels. The allowable load is twice the Single-Wall Portal value.
5. Recommended header moisture content is 19% or less at time of installation.
6. Allowable vertical load denotes the total maximum concentric vertical load permitted on the panel in combination with the allowable shear loads.
7. Allowable shear, drift and anchor tension values may be interpolated for intermediate height or vertical loads.
8. High-strength anchor bolts are required unless a lower strength grade is justified by the registered design professional. See pp. 85–87 for SSWH-AB anchor bolt information and anchorage solutions.
9. See p. 16 of this report for allowable out-of-plane values; see p. 16 for allowable axial values.
10. Tabulated anchor tension values assume no resisting vertical load. Anchor tension loads at design shear values and including the effect of vertical load may be determined using the following equation:

$$T = [(k \times V \times H) / B] - P/2, \text{ where:}$$

T = Anchor tension load (lb.);
V = Design shear load (lb.);
P = Applied vertical load (lb.);
H = Panel height (in.)

B = Moment arm (in.): 7.75" for SSWH12, 9.5" for SSWH15, 12" for SSWH18, 14.675" for SSWH21 and 17.50" for SSWH24
k = Portal factor: 0.90 for SSWH12 and SSWH15 panels 93¼" or less in height, 1.00 for all other panels.

First-Story Wood Floor Systems

Strong-Wall high-strength steel shearwall designed for use on concrete foundations can be used with wood floor systems by extending the anchor bolts and installing compression nuts and solid blocking below the wall.

Material & Finish: See p. 11.

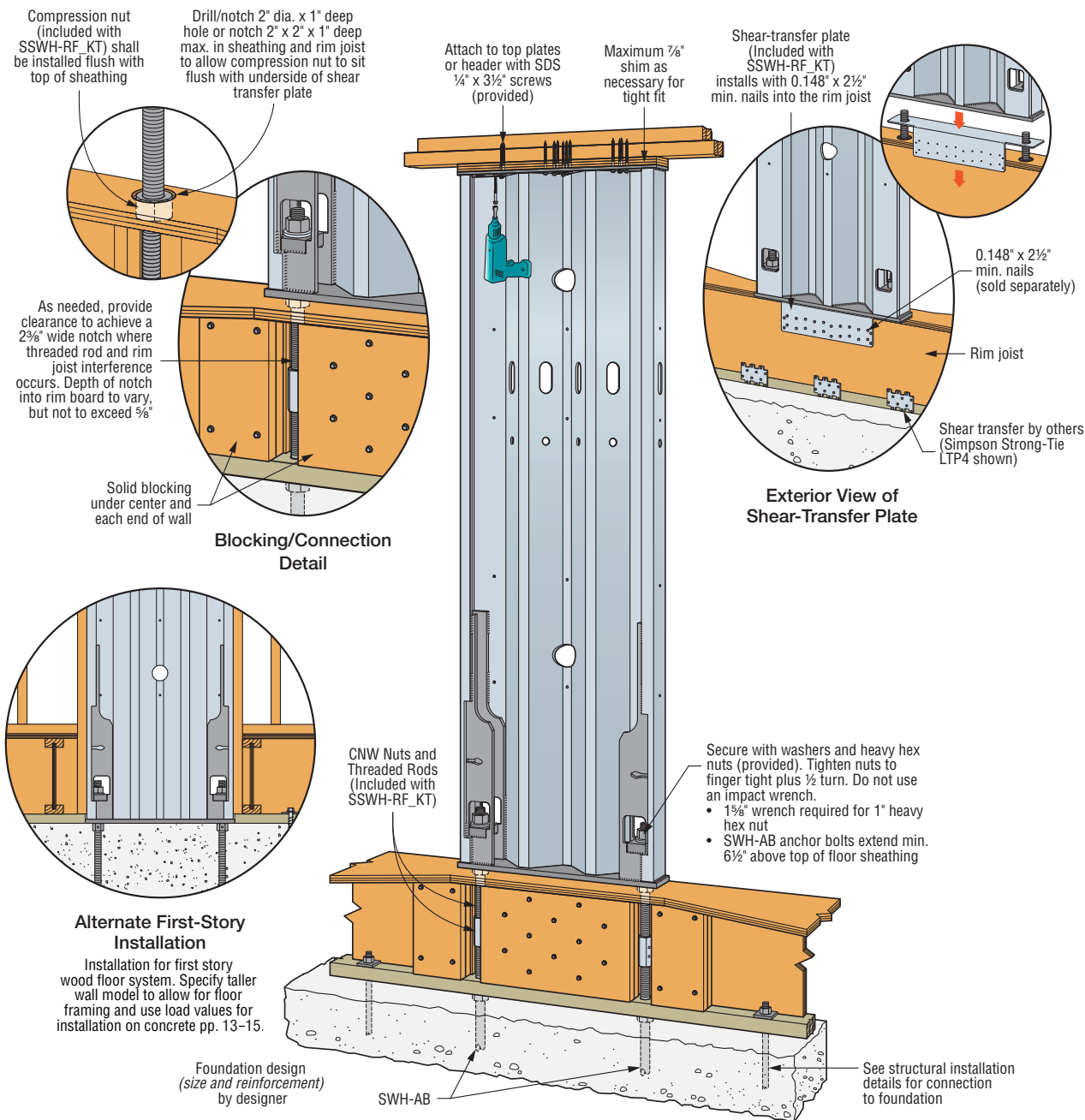
Codes: ICC-ES ESR-1679;
City of LA Building Code Supplement;
State of Florida FL5113

For product data and naming scheme information, see pp. 11–12.

Wood First-Floor Wall Connection Kit

Wall Width (in.)	Model No.	Contents
12	SSWH-RF12KT	(1) Shear transfer plate (2) 1"x18" threaded rods (ASTM A193 B7) (2) Coupler nuts (2) Heavy hex nuts Installation Instructions: TEB-L-SSWHRFKT
15	SSWH-RF15KT	
18	SSWH-RF18KT	
21	SSWH-RF21KT	
24	SSWH-RF24KT	

1. (2) heavy hex nuts included with each wall.



**SSWH™ First-Story
Wood Floor Installation**
US Patent pending,
strongtie.com/patents.

First-Story Wood Floor Systems (continued)

Strong-Wall High-Strength Steel Shearwall Model	Panel Evaluation Height, H_e (in.)	Seismic			Wind		
		Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)
SSWH12x7	78	1,000	0.34	9,740	1,270	0.43	12,370
SSWH15x7	78	1,625	0.34	11,520	2,065	0.43	14,625
SSWH18x7	78	2,415	0.34	13,465	2,655	0.38	14,805
SSWH21x7	78	3,380	0.34	15,515	4,045	0.41	18,560
SSWH24x7	78	4,435	0.31	17,305	4,565	0.34	17,805
SSWH12x8	93¼	835	0.42	9,710	1,060	0.53	12,335
SSWH15x8	93¼	1,355	0.42	11,485	1,720	0.53	14,585
SSWH18x8	93¼	2,070	0.39	13,795	2,655	0.53	17,695
SSWH21x8	93¼	2,820	0.42	15,470	3,580	0.53	19,645
SSWH24x8	93¼	3,775	0.42	17,590	4,565	0.51	21,285
SSWH12x9	105¼	720	0.47	9,475	915	0.60	12,030
SSWH15x9	105¼	1,170	0.47	11,205	1,485	0.60	14,225
SSWH18x9	105¼	1,740	0.47	13,095	2,210	0.60	16,630
SSWH21x9	105¼	2,435	0.47	15,090	3,095	0.60	19,160
SSWH24x9	105¼	3,200	0.43	16,845	4,150	0.60	21,830
SSWH12x10	117¼	630	0.53	9,270	805	0.67	11,770
SSWH15x10	117¼	1,030	0.53	10,960	1,305	0.67	13,920
SSWH18x10	117¼	1,520	0.49	12,710	1,965	0.67	16,470
SSWH21x10	117¼	2,140	0.53	14,765	2,720	0.67	18,745
SSWH24x10	117¼	2,865	0.53	16,785	3,635	0.67	21,315
SSWH12x11	129¼	565	0.58	9,090	715	0.73	11,540
SSWH15x11	129¼	915	0.58	10,750	1,160	0.73	13,650
SSWH18x11	129¼	1,360	0.58	12,565	1,730	0.73	15,955
SSWH21x11	129¼	1,905	0.58	14,475	2,420	0.73	18,385
SSWH24x11	129¼	2,545	0.58	16,460	3,235	0.73	20,900
SSWH12x12	141¼	495	0.58	8,740	645	0.80	11,355
SSWH15x12	141¼	820	0.63	10,560	1,045	0.80	13,410
SSWH18x12	141¼	1,225	0.63	12,345	1,555	0.80	15,675
SSWH21x12	141¼	1,710	0.63	14,225	2,175	0.80	18,060
SSWH24x12	141¼	2,290	0.63	16,175	2,910	0.80	20,535
SSWH15x13	153¼	745	0.68	10,390	945	0.87	13,195
SSWH18x13	153¼	1,110	0.68	12,145	1,410	0.87	15,425
SSWH21x13	153¼	1,555	0.68	13,995	1,970	0.87	17,775
SSWH24x13	153¼	2,155	0.64	16,525	2,790	0.87	21,360

1. Loads are applicable to first-story raised wood floor installations supported on concrete or masonry foundations using the ASD basic (2024 IBC Section 1605.1) or the alternative basic (2024 IBC Section 1605.2) load combinations. Load values include evaluation of anchor rod compression capacity and do not require further evaluation by the designer.
2. For seismic design based on 2024 IBC using $R = 6.5$. For other codes, use the seismic coefficients corresponding to light-frame bearing walls with wood structural panels or sheet steel panels.
3. Allowable shear, drift and anchor tension values may be interpolated for intermediate height or vertical loads.
4. Load Tables for SSWH™ wall are based on 2,000 lb. axial load. Contact Simpson Strong-Tie for conditions exceeding 2,000 lb. axial load.
5. Load Tables are based on LSL rim joist and blocking. For DFL rim joist and blocking, use a Reduction Factor of 0.84, unless other materials is specified by designer.
6. A First-Story Wood Floor connection kit (SSWH-RF_KT) is required to attach the panel to the first-story wood floor.
7. Allowable shear loads assume a maximum first floor joist depth of 12". For allowable shear load with joists up to 16" deep, multiply table values by 0.91.
8. High-strength anchor bolts are required unless a lower-strength grade is justified by the registered design professional. See pp. 85–87 for SWH-AB anchor bolt information and anchorage solutions.
9. Anchor tension loads at design shear values and including the effect of vertical load may be determined using the following equation:

$$T = [(V \times H) / B] - P/2, \text{ where:}$$

T = Anchor tension load (lb.);
 V = Design shear load (lb.);
 P = Applied vertical load (lb.);
 H = Panel height (in.)
 B = Panel Width – 4"

Cumulative Overturning

Key Consideration in Strong-Wall Shearwall Specification Process

When specifying a premanufactured shearwall for a project, several factors need to be considered, such as load values, seismic/wind requirements, wall width and height, wall placement, etc. Cumulative Overturning is another critical factor often overlooked in multistory applications.

Calculating Cumulative Overturning for Premanufactured Shearwalls

Designers are accustomed to accounting for cumulative overturning when specifying multistory, site-built plywood shearwalls. However, when specifying premanufactured shearwalls, designers typically calculate shear loads based on the building geometry and code loading requirements. A wall is then selected based on its ability to meet or exceed the required shear load using manufacturer-provided allowable shear load tables.

What can get lost when considering shear capacity only is that the shearwall is not only governed by shear, but also by a combination of other limit states, including *drift, tension and compression, flexure, anchor rod tension, and concrete or wood bearing stress*. For single-story walls, the allowable shear given in the load tables is the lowest value of the various limit states. However, additional care must be taken in the analysis of multistory shearwalls to account for the way the loads are distributed over the height of the building.

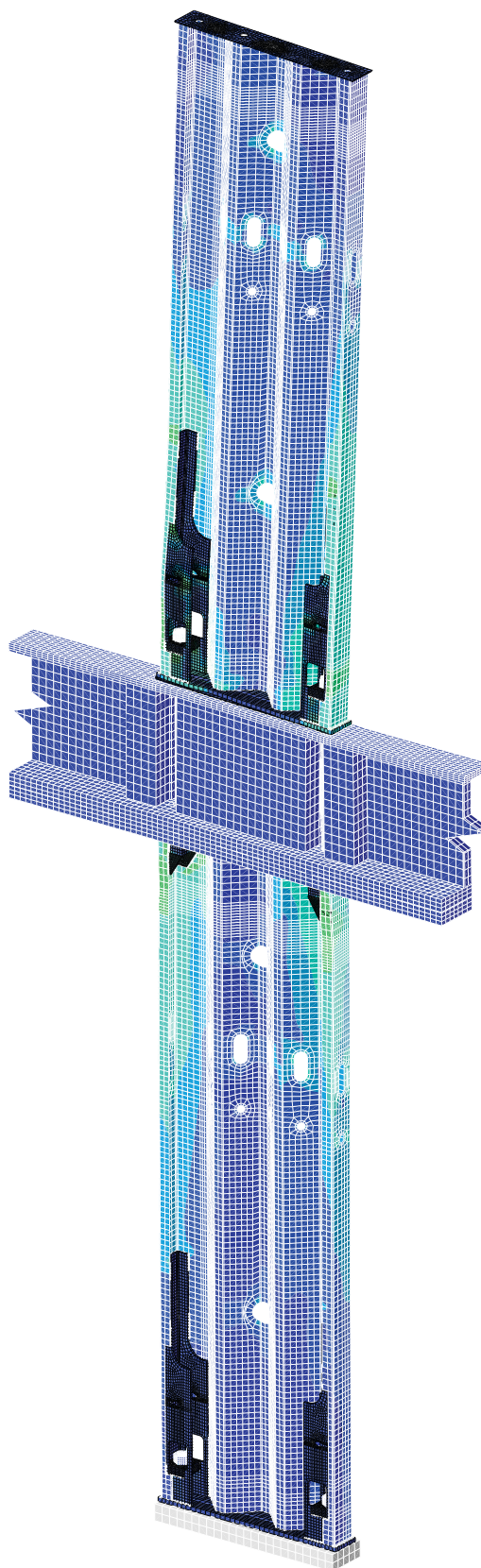
Cumulative Overturning and Stacked-Wall Applications

In multistory structures, shear and the associated overturning forces due to seismic/wind requirements must be carried down to the foundation by the building's lateral force resisting system. These forces are cumulative over the height of the building, and shear forces applied at the second or third levels of a structure will generate much larger base overturning moments than the same shears applied at the first story. If cumulative overturning is not considered, the design may result in forces several times higher than the capacity of the lower wall, anchor bolts and foundation anchorage.

When specifying stacked shearwall applications, it's imperative to consider cumulative overturning. The load values for Simpson Strong-Tie® stacked Strong-Wall high-strength steel shearwall applications reflect the impact of cumulative overturning and thus appear significantly different than other shearwall manufacturers.

The effects of cumulative overturning are automatically taken into account when designing shearwalls with the Strong-Wall Shearwall Selector web application. For more information on this design tool, visit strongtie.com/swss.

To learn more about cumulative overturning and Simpson Strong-Tie Strong-Wall shearwall testing, visit strongtie.com/co.



Simpson Strong-Tie Strong-Wall high-strength steel shearwall rendered in Finite Element Analysis (FEA). When evaluating the performance of complex structural components, our engineers use this computer simulation to complement our full-scale testing program.

Cumulative Overturning (continued)

Shear Only vs. Shear and Cumulative Overturning Analysis

The graphic illustration below compares how the total allowable shear load is impacted when the effects of cumulative overturning are included in the analysis. As a point of reference (Figure A), a one-story, 9'-tall shear wall with a 5,000-lb. lateral load capacity is used. The reference wall has a resulting base overturning moment capacity of 45,000 ft.-lb. and an overturning force of 22,500 lb. assuming

a 2' moment arm. As illustrated, if the same base shear is applied over two stories, the overturning at the base of the wall exceeds the one-story application by 60% (Figure B). When proper consideration of cumulative overturning is included in the design, the total allowable shear load on a stacked wall is reduced (Figure C).

	Figure A — One-Story Wall	Figure B — Two-Story Wall	Figure C — Two-Story Wall
	Reference	✗ Shear Only	✓ Shear and Cumulative Overturning
Total Base Shear Reaction	5,000 lb. Maximum Shear Capacity	5,000 lb. Adequate Design for Shear	3,125 lb. Adequate Design for Shear
Overturning Moment	45,000 ft.-lb. Maximum Moment Capacity	72,000 ft.-lb. Exceeds Moment by 60%*	45,000 ft.-lb. Adequate Design for Moment
Overturning Force (Assumes 2' Moment Arm)	22,500 lb. Maximum Overturning Force	36,000 lb. Exceeds Overturning Force by 60%*	22,500 lb. Adequate Design for Overturning Force

*Example calculations:

$(2\text{nd-Story Shear Load} \times \text{Total Story Height}) + (1\text{st-Floor Shear Load} \times 1\text{st-Story Height}) = \text{Overturning Moment} > \text{Baseline Limit of the Lowest Panel}$
 $(3,000 \text{ lb.} \times 18') + (2,000 \text{ lb.} \times 9') = 72,000 \text{ ft.-lb.} > 45,000 \text{ ft.-lb.}$

$(\text{Overturning Moment}) \div (\text{Moment Arm}) = \text{Overturning Force} > \text{Baseline Limit of the Lowest Panel}$
 $(72,000 \text{ ft.-lb.}) \div (2') = 36,000 \text{ lb.} > 22,500 \text{ lb.}$

Note: Loads shown are for illustrative purposes only. Redistribution of earthquake loads per building code requirements will compound the effects of cumulative overturning.

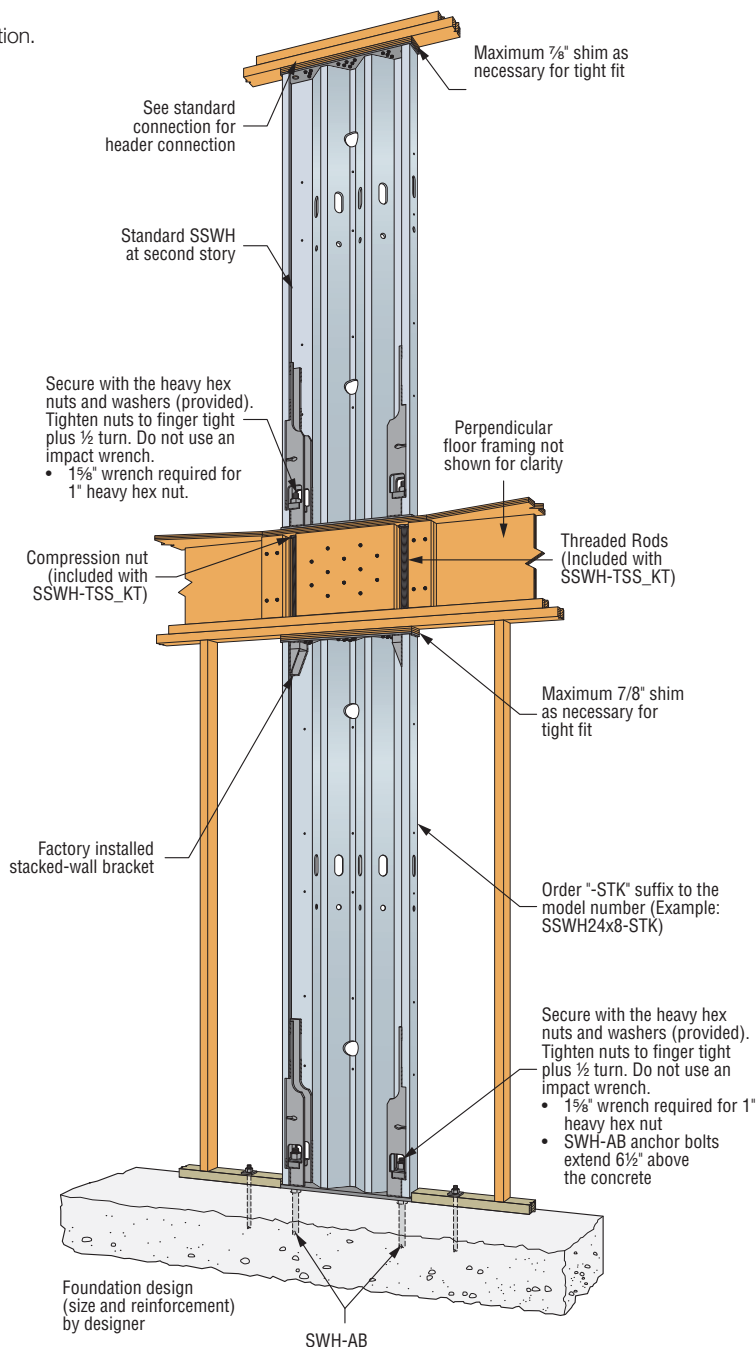
Two-Story Stacked on Concrete Foundations

Simpson Strong-Tie offers a complete stacked-wall solution for two-story applications. The Strong-Wall high-strength steel shearwall option combines simplified installation with superior performance. A new redesigned bracket simplifies anchorage installation.

- Some of the highest loads in the industry and design procedures that account for cumulative overturning, see p. 23 for more information.
- Complete concrete-anchorage designs for two-story applications (*foundation design by designer*)
- No bearing plates to install, walls can now be placed flush against a corner.
- Uses the same anchor bolt template as single-story installation.
- Compression loads transferred by nut/rod — reducing wood crushing under load.
- Refer to T-L-SSWHTSSKT for installation instructions and details.

Material & Finish: See p. 11.

Codes: ICC-ES ESR-1679;
City of LA Building Code Supplement;
State of Florida FL5113



SSWH™ Two-Story Stacked Installation
US Patent pending,
strongtie.com/patents.

Two-Story Stacked on Concrete Foundations (continued)

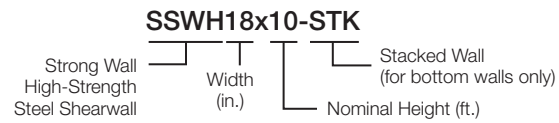
Top Wall:

Naming Legend



Bottom Wall:

Naming Legend



Suggested Example Specification: SSWH18x8 over SSWH18x10-STK

Two-Story Stacked-Wall Product Data - Bottom Walls (SSWH-STK)

Strong-Wall High-Strength Steel Shearwall STK Model No.	Panel Information			Anchor Bolts		Number of Screws in Top of Wall	Total Wall Weight (lb.)
	Width, W (in.)	Height, H (in.)	Thickness, T (in.)	Qty.	Dia. (in.)		
SSWH12x7-STK	12	78	3½	2	1	6	100
SSWH15x7-STK	15	78	3½	2	1	8	125
SSWH18x7-STK	18	78	3½	2	1	9	135
SSWH21x7-STK	21	78	3½	2	1	12	150
SSWH24x7-STK	24	78	3½	2	1	14	160
SSWH12x8-STK	12	93¼	3½	2	1	6	125
SSWH15x8-STK	15	93¼	3½	2	1	8	140
SSWH18x8-STK	18	93¼	3½	2	1	9	150
SSWH21x8-STK	21	93¼	3½	2	1	12	170
SSWH24x8-STK	24	93¼	3½	2	1	14	180
SSWH12x9-STK	12	105¼	3½	2	1	6	130
SSWH15x9-STK	15	105¼	3½	2	1	8	150
SSWH18x9-STK	18	105¼	3½	2	1	9	165
SSWH21x9-STK	21	105¼	3½	2	1	12	185
SSWH24x9-STK	24	105¼	3½	2	1	14	200
SSWH12x10-STK	12	117¼	3½	2	1	6	140
SSWH15x10-STK	15	117¼	3½	2	1	8	160
SSWH18x10-STK	18	117¼	3½	2	1	9	175
SSWH21x10-STK	21	117¼	3½	2	1	12	200
SSWH24x10-STK	24	117¼	3½	2	1	14	215
SSWH12x11-STK	15	129¼	5½	2	1	6	195
SSWH15x11-STK	18	129¼	5½	2	1	8	215
SSWH18x11-STK	21	129¼	5½	2	1	9	230
SSWH21x11-STK	24	129¼	5½	2	1	12	255
SSWH24x11-STK	27	129¼	5½	2	1	14	270
SSWH12x12-STK	15	141¼	5½	2	1	6	205
SSWH15x12-STK	18	141¼	5½	2	1	8	230
SSWH18x12-STK	21	141¼	5½	2	1	9	245
SSWH21x12-STK	24	141¼	5½	2	1	12	275
SSWH24x12-STK	27	141¼	5½	2	1	14	290
SSWH15x13-STK	18	153¼	5½	2	1	8	245
SSWH18x13-STK	21	153¼	5½	2	1	9	265
SSWH21x13-STK	24	153¼	5½	2	1	12	295
SSWH24x13-STK	27	153¼	5½	2	1	14	310

1. Required 2x6 studs are preattached for 11'-13' tall walls.
2. See p. 11 for product data on top wall (standard wall).

Two-Story Stacked-Wall Connction Kit

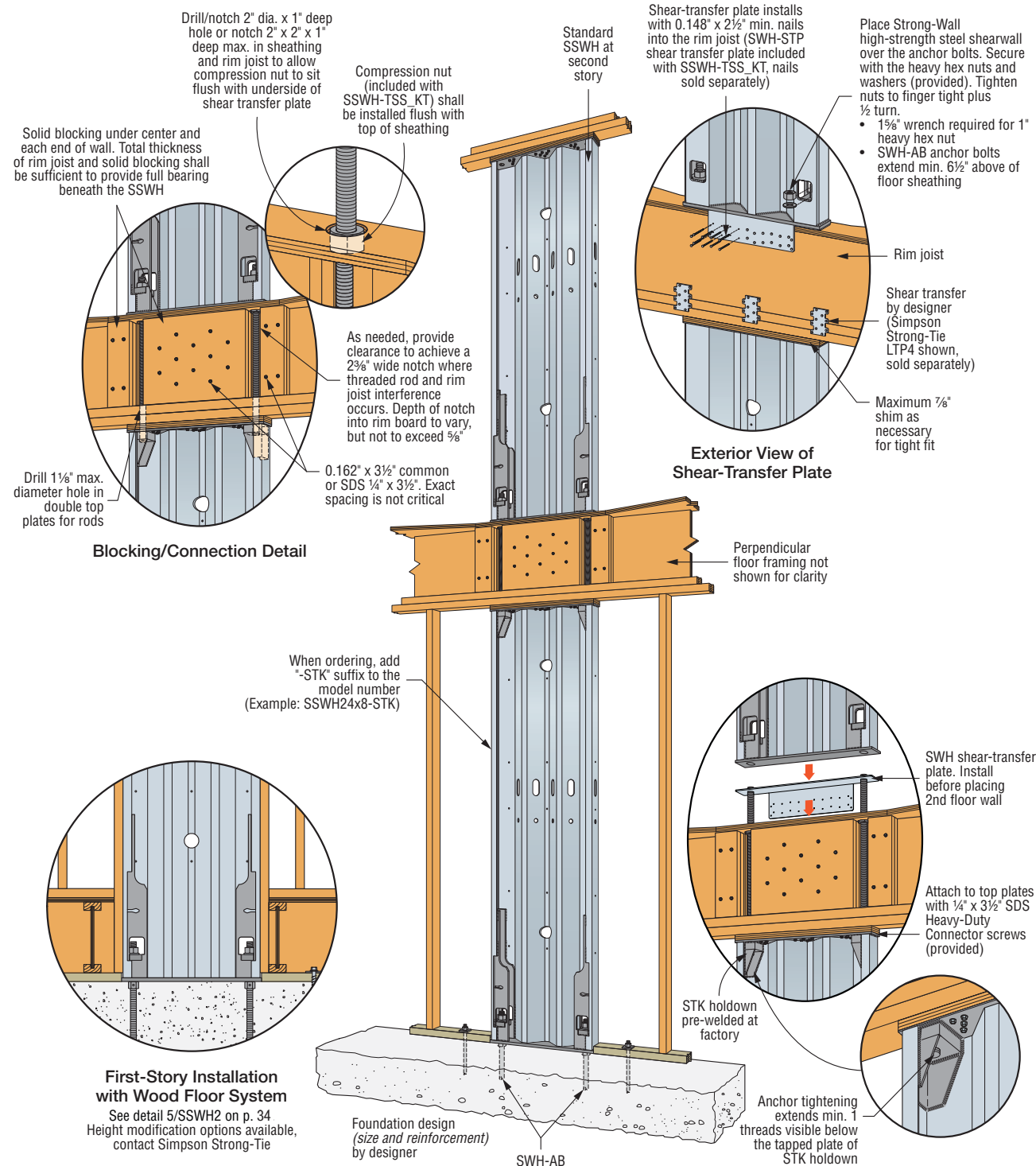
Wall Width (in.)	Model No.	Contents
12	SSWH-TSS12KT	(1) Shear transfer plate (2) 1" x 36" threaded rods (ASTM A193 B7) (2) Heavy hex nuts Installation Instructions: T-L-SSWHTSSKT
15	SSWH-TSS15KT	
18	SSWH-TSS18KT	
21	SSWH-TSS21KT	
24	SSWH-TSS24KT	

1. Two (2) heavy hex nuts included with each wall.

Two-Story Stacked on Concrete Foundations (continued)

Installation Notes

- Do not cut the Strong-Wall high-strength steel shearwall or enlarge existing holes, doing so will compromise the performance of the wall.
- Do not use an impact wrench to tighten nuts on the anchor bolts.
- Maximum shim thickness between the Strong-Wall high-strength steel shearwall and top plates is $\frac{7}{8}$ " using Simpson Strong-Tie® Strong-Drive® $\frac{1}{4}$ " x $3\frac{1}{2}$ " SDS Heavy-Duty Connector screws. For additional shim thicknesses, up to 12" in height, see detail 9/SSWH2 on p. 31 and 3/SSWH3 on p. 35.



SSWH™ Two-Story Stacked Installation
US Patent pending, strongtie.com/patents.

Two-Story Stacked on Concrete Foundations (continued)

Strong-Wall SSWH™ First-Story Walls on Concrete Foundations

SSWH First Story Wall Models	Panel E valuation Height, H _e (in.)	Seismic			Wind		
		Allowable ASD Base Moment, M (lb.-ft.)	Drift at Allowable Base Moment (in.)	Anchor Tension at Allowable Base Moment (lb.)	Allowable ASD Base Moment, M (lb.-ft.)	Drift at Allowable Base Moment (in.)	Anchor Tension at Allowable Base Moment (lb.)
SSWH12x7-STK	78	13,035	0.25	19,230	13,035	0.28	19,230
SSWH15x7-STK	78	22,035	0.27	25,470	22,035	0.31	25,470
SSWH18x7-STK	78	30,975	0.29	29,455	30,975	0.32	29,455
SSWH21x7-STK	78	40,465	0.27	33,080	40,465	0.30	33,080
SSWH24x7-STK	78	49,920	0.25	34,230	49,920	0.27	34,230
SSWH12x8-STK	93¼	13,015	0.32	19,230	13,015	0.35	19,230
SSWH15x8-STK	93¼	22,030	0.41	25,470	22,030	0.41	25,470
SSWH18x8-STK	93¼	31,005	0.41	29,455	31,005	0.41	29,455
SSWH21x8-STK	93¼	40,445	0.34	33,080	40,445	0.37	33,080
SSWH24x8-STK	93¼	49,930	0.32	34,230	49,930	0.35	34,230
SSWH12x9-STK	105¼	13,025	0.39	19,230	13,025	0.42	19,230
SSWH15x9-STK	105¼	21,270	0.42	24,625	22,015	0.47	25,470
SSWH18x9-STK	105¼	30,740	0.43	29,235	31,005	0.46	29,455
SSWH21x9-STK	105¼	40,435	0.40	33,080	40,435	0.43	33,080
SSWH24x9-STK	105¼	49,905	0.38	34,230	49,905	0.41	34,230
SSWH12x10-STK	117¼	12,945	0.53	19,120	13,045	0.53	19,230
SSWH15x10-STK	117¼	20,275	0.53	23,445	22,035	0.57	25,470
SSWH18x10-STK	117¼	29,115	0.53	27,695	30,975	0.56	29,455
SSWH21x10-STK	117¼	39,230	0.46	32,085	40,450	0.52	33,080
SSWH24x10-STK	117¼	49,930	0.45	34,230	49,930	0.49	34,230
SSWH12x11-STK	129¼	12,335	0.58	18,175	13,035	0.61	19,230
SSWH15x11-STK	129¼	19,390	0.58	22,420	22,025	0.66	25,470
SSWH18x11-STK	129¼	28,060	0.58	26,695	30,965	0.64	29,455
SSWH21x11-STK	129¼	38,290	0.51	31,305	40,445	0.59	33,080
SSWH24x11-STK	129¼	49,275	0.51	33,800	49,925	0.56	34,230
SSWH12x12-STK	141¼	11,535	0.58	17,070	13,005	0.69	19,230
SSWH15x12-STK	141¼	18,600	0.63	21,525	22,010	0.75	25,470
SSWH18x12-STK	141¼	27,190	0.63	25,820	31,015	0.72	29,455
SSWH21x12-STK	141¼	37,430	0.57	30,605	40,435	0.66	33,080
SSWH24x12-STK	141¼	48,085	0.57	32,970	49,910	0.64	34,230
SSWH15x13-STK	153¼	17,945	0.62	19,120	23,500	0.87	25,025
SSWH18x13-STK	153¼	26,180	0.63	24,900	30,970	0.79	29,455
SSWH21x13-STK	153¼	36,270	0.62	29,640	40,485	0.74	33,080
SSWH24x13-STK	153¼	46,995	0.62	32,210	49,935	0.71	34,230

See footnotes on p. 28

Two-Story Stacked on Concrete Foundations (continued)

Strong-Wall SSWH™ Second-Story Walls

SSWH Second Story Wall Models	Panel Evaluation Height, H _e (in.)	Seismic		Wind	
		Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)
SSWH12x7	78	775	0.34	985	0.43
SSWH15x7	78	1,250	0.34	1,585	0.43
SSWH18x7	78	1,840	0.34	2,335	0.43
SSWH21x7	78	2,555	0.34	3,245	0.43
SSWH24x7	78	3,615	0.35	4,560	0.46
SSWH12x8	93¼	655	0.42	830	0.53
SSWH15x8	93¼	1,050	0.42	1,335	0.53
SSWH18x8	93¼	1,460	0.42	1,860	0.53
SSWH21x8	93¼	2,150	0.42	2,730	0.53
SSWH24x8	93¼	2,855	0.42	3,625	0.53
SSWH12x9	105¼	570	0.47	725	0.60
SSWH15x9	105¼	915	0.47	1,160	0.60
SSWH18x9	105¼	1,345	0.47	1,710	0.60
SSWH21x9	105¼	1,870	0.47	2,375	0.60
SSWH24x9	105¼	2,555	0.45	3,280	0.60
SSWH12x10	117¼	505	0.53	640	0.67
SSWH15x10	117¼	810	0.53	1,025	0.67
SSWH18x10	117¼	1,205	0.49	1,560	0.67
SSWH21x10	117¼	1,650	0.53	2,095	0.67
SSWH24x10	117¼	2,195	0.53	2,785	0.67
SSWH12x11	129¼	450	0.58	570	0.73
SSWH15x11	129¼	720	0.58	915	0.73
SSWH18x11	129¼	1,065	0.58	1,350	0.73
SSWH21x11	129¼	1,475	0.58	1,875	0.73
SSWH24x11	129¼	1,960	0.58	2,490	0.73
SSWH12x12	141¼	400	0.61	510	0.80
SSWH15x12	141¼	650	0.63	830	0.80
SSWH18x12	141¼	960	0.63	1,220	0.80
SSWH21x12	141¼	1,335	0.63	1,695	0.80
SSWH24x12	141¼	1,770	0.63	2,250	0.80
SSWH15x13	153¼	595	0.68	755	0.87
SSWH18x13	153¼	875	0.68	1,110	0.87
SSWH21x13	153¼	1,215	0.68	1,545	0.87
SSWH24x13	153¼	1,700	0.65	2,190	0.87

1. Allowable base moment and anchor tension are applicable to installation on concrete foundations with minimum $f'c = 2,500$ psi using the ASD basic (2024 IBC Section 1605.1) or the alternative basic (2024 IBC Section 1605.2) load combinations. Load values include evaluation of anchor rod compression at second story and bearing stresses at foundation.
2. For seismic design based on 2024 IBC using $R = 6.5$. For other codes, use the seismic coefficients corresponding to light-frame bearing walls with wood structural panels or sheet steel panels.
3. Allowable shear, drift and anchor tension values may be interpolated for immediate height or vertical loads.
4. Two-story stacked-wall installations may consist of any height combination of equal width wall models listed in these tables.
5. Load tables for second-story and first-story walls are based on 2,000 lb. and 4,000 lb. axial loads, respectively. Contact Simpson Strong-Tie for conditions exceeding these axial loads.
6. Maximum permitted, uniformly distributed axial load acting on the second-story and first-story panels are 4,000 lb. and 7,500 lb., respectively. These axial loads are in combination with the tabulated shear and base moment. See example on p. 29.
7. Load tables for second-story wall are based on LSL rim joist and blocking. For DFL rim joist and blocking, use a Reduction Factor of 0.95, unless other materials are specified by designer.
8. Allowable shear loads assume a joist depth of 14". For allowable shear load with joists up to 18" deep, multiply table values by 0.96. Contact Simpson Strong-Tie for conditions exceeding 18" joist depth.
9. A two-story stacked connection kit (SSWH-TSS_KT) is required to attach the second-story panel to first-story panel. Order "STK" model for the first-story panel.
10. The designer must verify that the cumulative overturning moment at the base of the first-story Strong-Wall high-strength steel shearwall does not exceed the allowable base moment capacity. See design example on p. 23 for procedure.
11. High-strength anchor bolts are required at the second-story wall unless a lower-strength grade is justified by the registered design professional. See pp. 85–87 for SWH-AB anchor bolt information and anchorage solutions.
12. High-strength anchor bolts are required at the first-story wall for anchor tension forces exceeding the allowable load for standard-strength bolts tabulated on p. 85 for SWH-AB anchor bolt information and anchorage solutions.
13. Anchor tension loads at design shear values and including the effect of vertical load may be determined using the following equation:

$$T = [(V \times H) / B] - P/2, \text{ where:}$$

T = Anchor tension load (lb.);

V = Design shear load (lb.);

P = Applied vertical load (lb.);

H = Panel height (in.)

B = Panel Width – 4"

Two-Story Stacked on Concrete Foundations (continued)

Two-Story Design Example

Example: Standard Two-Story Wall Design

Given:

Wind Design, Concrete Strength: $f'_c = 2,500$ psi

Shear Load:

$V_{2\text{nd-story wall}} = 1,500$ lb.

$V_{1\text{st-story wall}} = 2,000$ lb.

Axial Load:

$P_{2\text{nd-story wall}} = 3,750$ lb.

$P_{1\text{st-story wall}} = 3,750$ lb.

$P_{\text{total-1st-story wall}} = 3,750 \text{ lb.} + 3,750 \text{ lb.} = 7,500$ lb.

Step 1 – Select First-Story Wall (See -STK table on p. 28)

$M_{\text{base}} = (1,500 \text{ lb.} \times 18 \text{ ft.}) + (2,000 \text{ lb.} \times 9 \text{ ft.}) = 45,000 \text{ ft.-lb.}$

Using First-Story SSWH-STK Wall Table, select a 9-foot wall with $M_{\text{allow}} \geq M_{\text{base}}$

Select SSWH24x9-STK

Calculate Allowable ASD Base Moment (ft.-lb.)

to account for added vertical load

$M_{\text{allow}} = V_{\text{allow}} \times H = 5,360 \text{ lb.} \times 105.25 \text{ in.} = 5,360 \text{ lb.} \times 8.77 \text{ ft.} = 47,007 \text{ ft.-lb.}$

Where:

$V_{\text{allow}} = \text{Allowable ASD Shear Load at } 7,500 \text{ lb. axial load}$

(See standard wall tables on p. 27)

$H = \text{Panel evaluation height}$

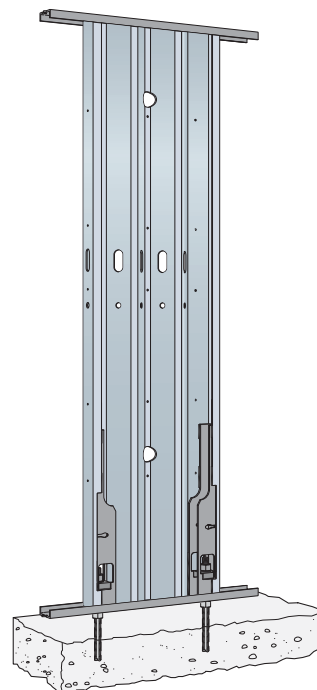
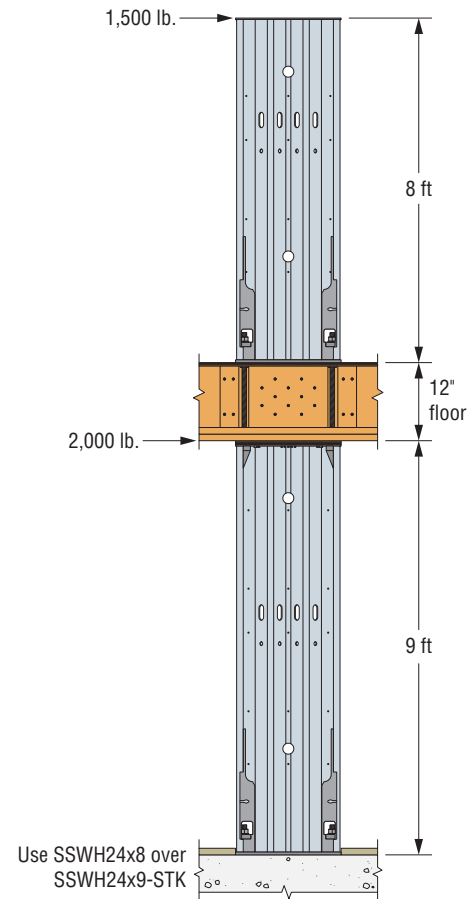
$M_{\text{allow}} = 47,007 \text{ ft.-lb.} > 45,000 \text{ ft.-lb.}$ **OK**

Step 2 – Check Second-Story Wall

Using the Second-Story SSWH™ Wall Table on p. 27, check the capacity of an 8-foot wall with the same width as the First-Story SSWH-STK Wall selected in Step 1:

Select SSWH24x8

$V_{\text{allow}} = 3,900 \text{ lb.} > 1,500 \text{ lb.}$ **OK**



Cold-Formed Steel Applications
(Standard, Raised Floor and Two-Story)

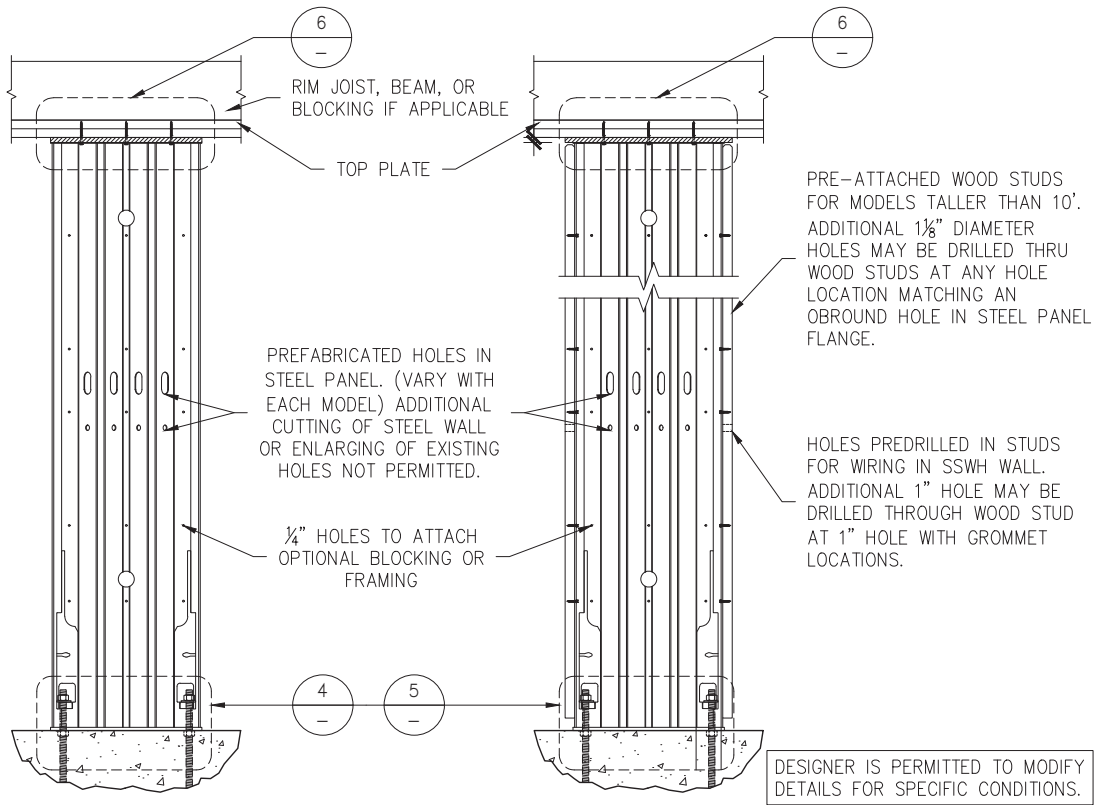
Cold-Formed Steel on Concrete Foundations

The Strong-Wall high-strength steel shearwall provides high-capacity, narrow-wall solutions for cold-formed steel (CFS) framing. All walls include predrilled holes located throughout the panel to allow easy attachment of interior and exterior finishes. Simpson Strong-Tie offers Strong-Wall high-strength steel shearwall solutions for standard CFS applications on concrete.

Cold-Formed Steel Connectors

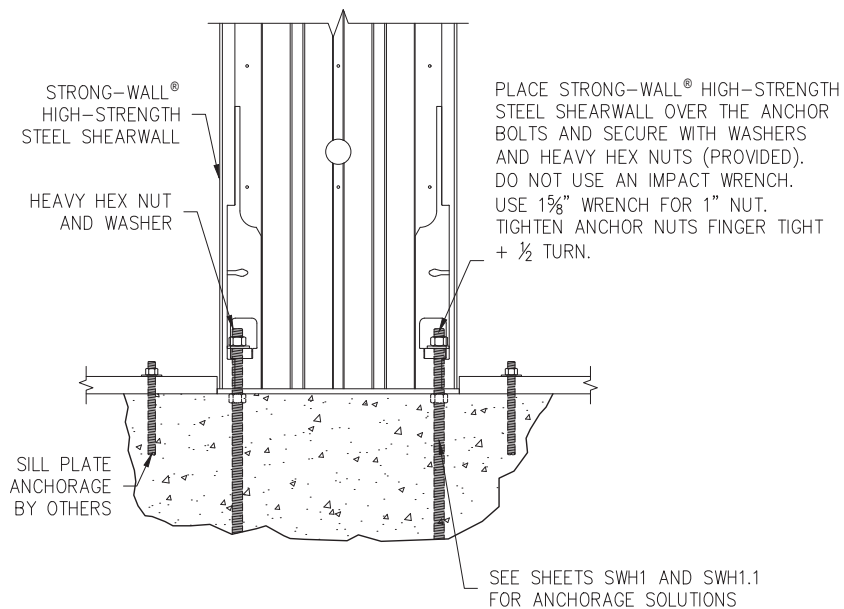
All of the design, specification and installation information you need on our Strong-Wall high-strength steel shearwall for CFS applications can be found at strongtie.com/cfs.

Steel Shearwall Structural Details



SINGLE-STORY STEEL STRONG-WALL SHEARWALL ON CONCRETE

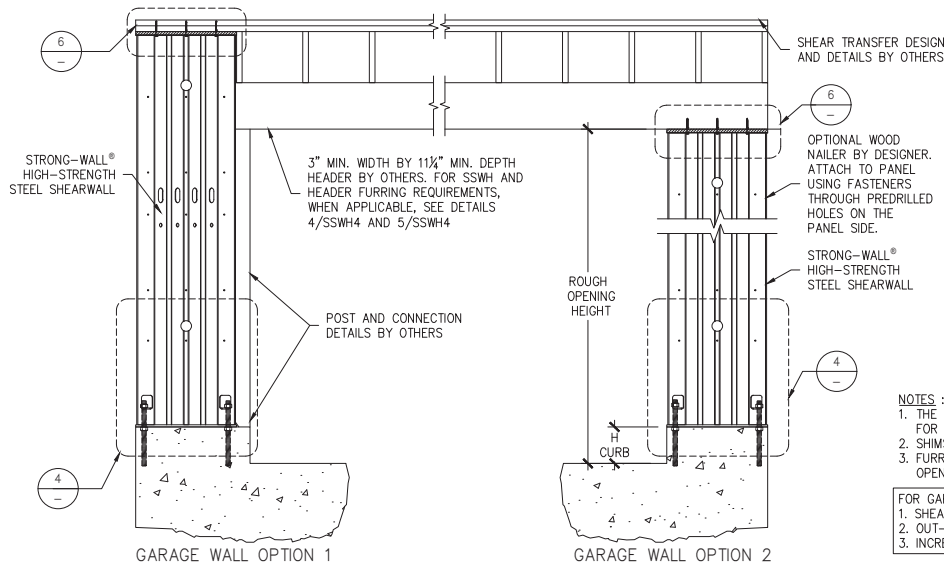
2/SSWH2



SSWH SHEARWALL ON CONCRETE

4/SSWH2

Steel Shearwall Structural Details (continued)



DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.

WHEN SSWH-PS STRAPS OMITTED, ALLOWABLE SHEAR VALUES FOR STANDARD PANEL APPLY.

GARAGE HEADER ROUGH OPENING HEIGHT

MODEL NO.	H CURB	ROUGH OPENING HEIGHT
SSWH12x7 SSWH15x7	5 1/2"	6'-11 1/2"
	6"	7'-0"
SSWH12x8 SSWH15x8	5 1/2"	8'-2 3/4"
	6"	8'-3 3/4"

NOTES :

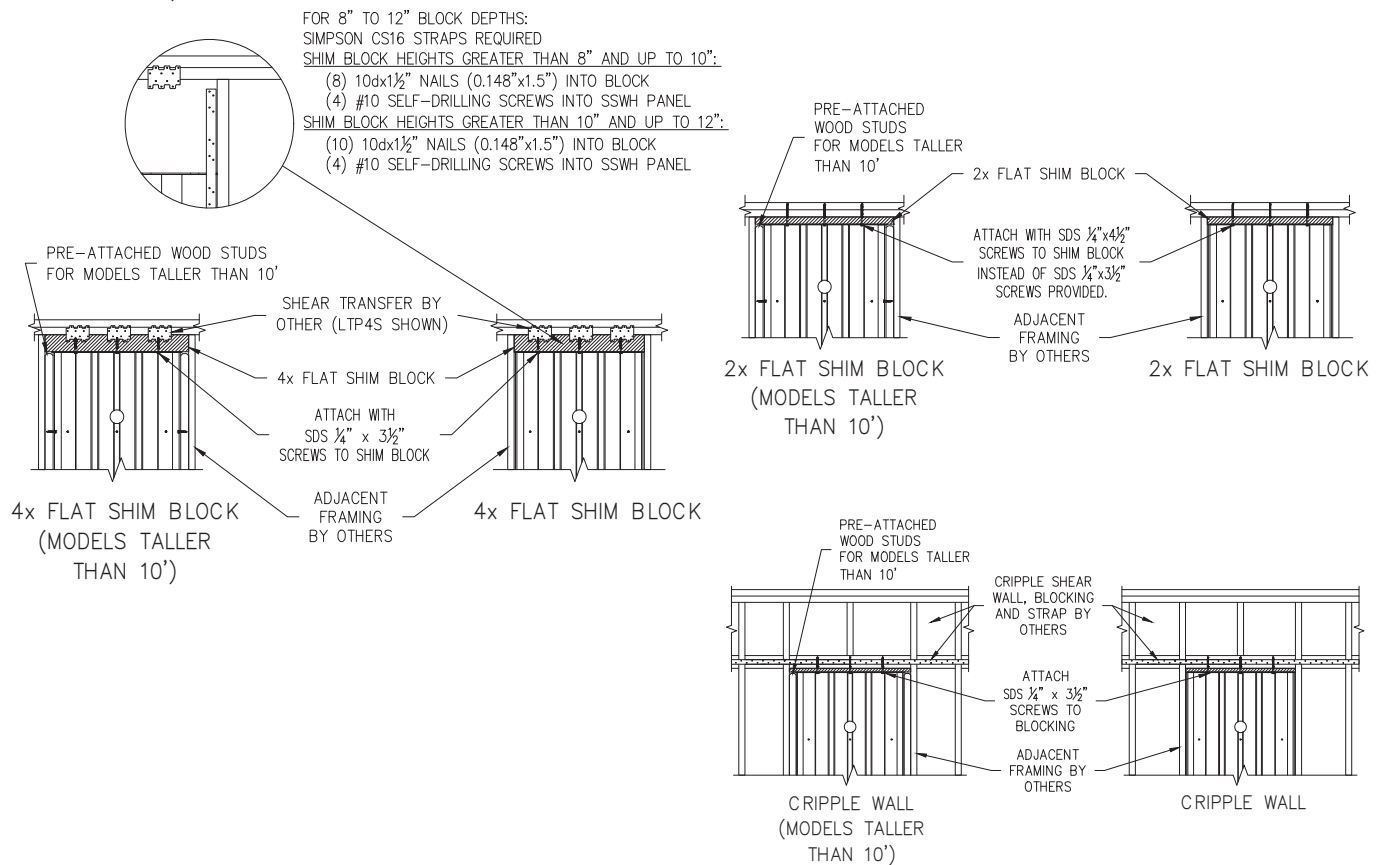
1. THE HEIGHT OF THE GARAGE CURB ABOVE THE GARAGE SLAB IS CRITICAL FOR THE ROUGH HEADER OPENING AT GARAGE RETURN WALLS.
2. SHIMS ARE NOT PROVIDED.
3. FURRING DOWN GARAGE HEADER MAY BE NECESSARY FOR CORRECT ROUGH OPENING HEIGHT.

FOR GARAGE WALL OPTION 2, DESIGNER SHALL DESIGN AND DETAIL FOR:

1. SHEAR TRANSFER
2. OUT-OF-PLANE LOADING EFFECT
3. INCREASED OVERTURNING AND DRIFT DUE TO ADDITIONAL HEIGHT

ALTERNATE GARAGE WALL OPTIONS

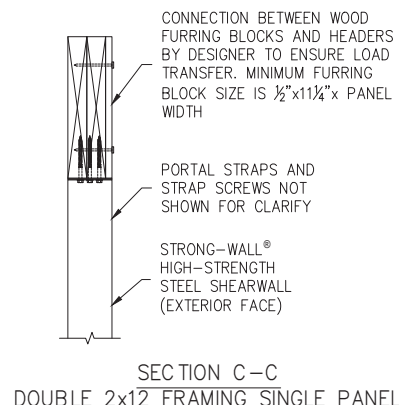
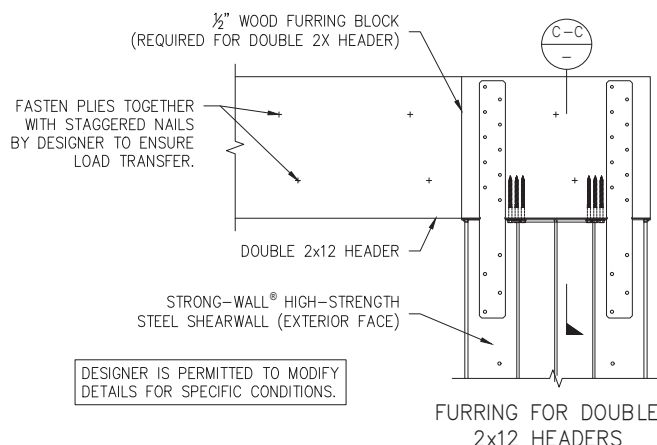
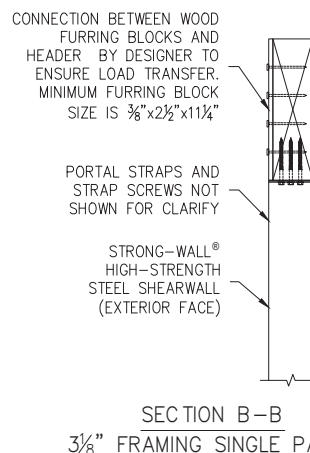
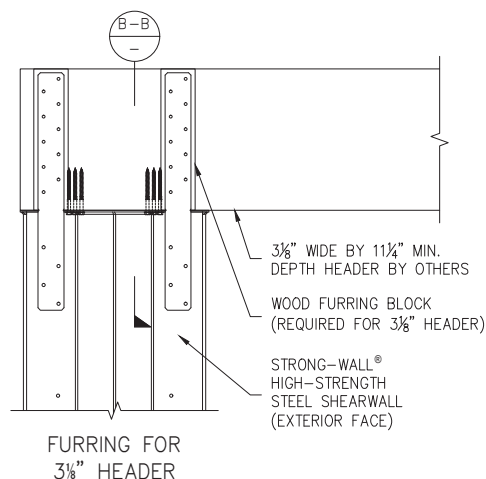
3/SSWH2



TOP OF WALL HEIGHT ADJUSTMENTS

9/SSWH2

Steel Shearwall Structural Details (continued)



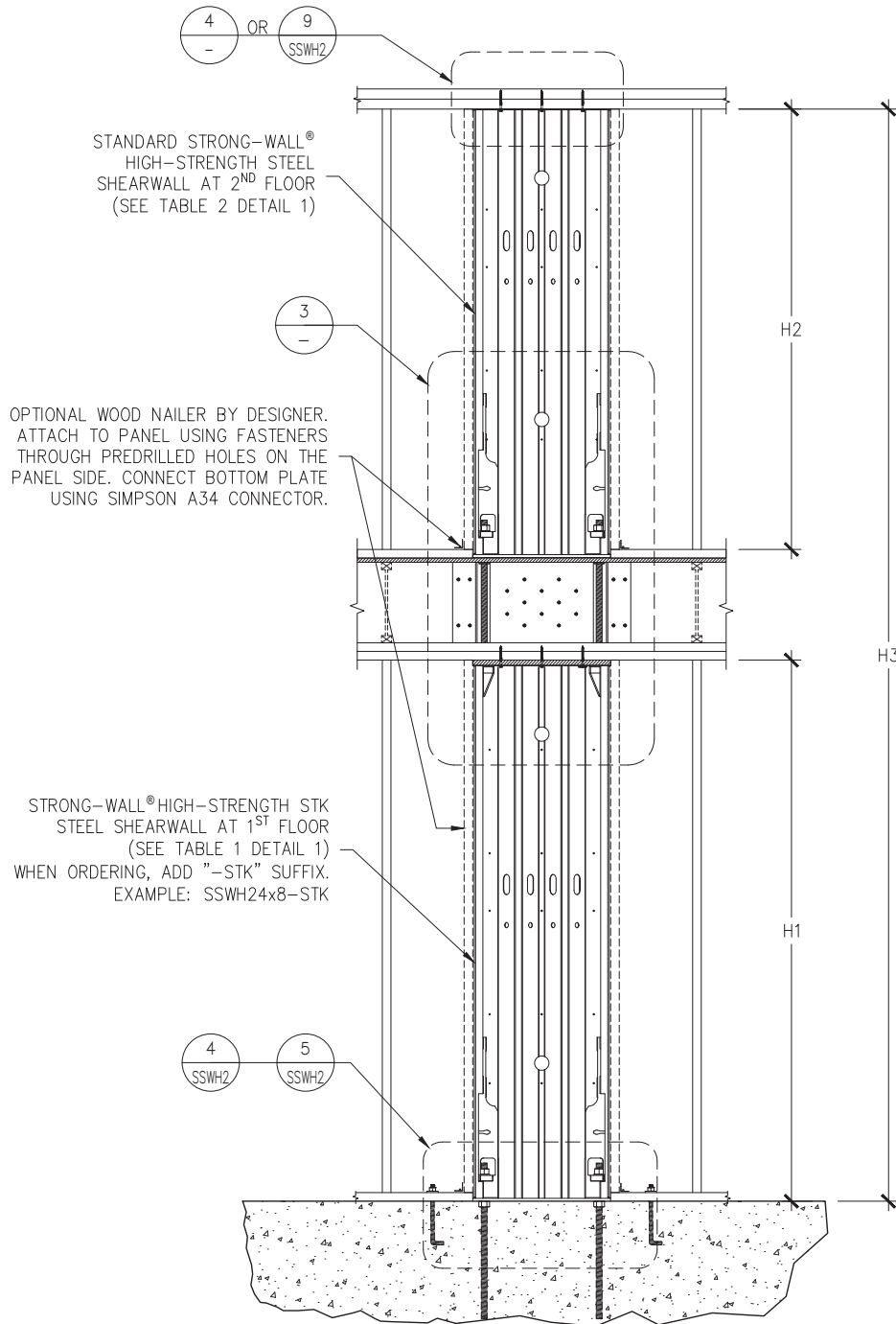
STRONG-WALL HIGH-STRENGTH WOOD SHEARWALL PORTAL HEADER DESIGN PARAMETERS	
HEADER DESIGN PARAMETER	ALLOWABLE RANGE
WIDTH	3" - 5 1/2"
DEPTH	11 1/4" - 18"
CLEAR SPAN	8' - 18'6"
K	90 LB./IN. - 4,000 LB./IN.

NOTES :

- SECONDARY MOMENT, SHEAR AND AXIAL FORCES SHALL BE CONSIDERED IN HEADER DESIGN.
- HEADER DESIGN SHALL BE BY DESIGNER AND ASSUME GRAVITY LOADS ONLY INDUCE SIMPLE SPAN MOMENTS IN BEAM.
- HEADER STIFFNESS (K) FOR USE IN WSWH PORTAL SYSTEM MAY BE DETERMINED USING THE FOLLOWING EQUATION:

$$K = (E \times b \times d^3) / 12L^3$$
 WHERE:
 E = HEADER MODULUS OF ELASTICITY (PSI)
 b = HEADER WIDTH (IN.)
 d = HEADER DEPTH (IN.)
 L = HEADER CLEAR SPAN (IN.)

Steel Shearwall Structural Details (continued)



DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.

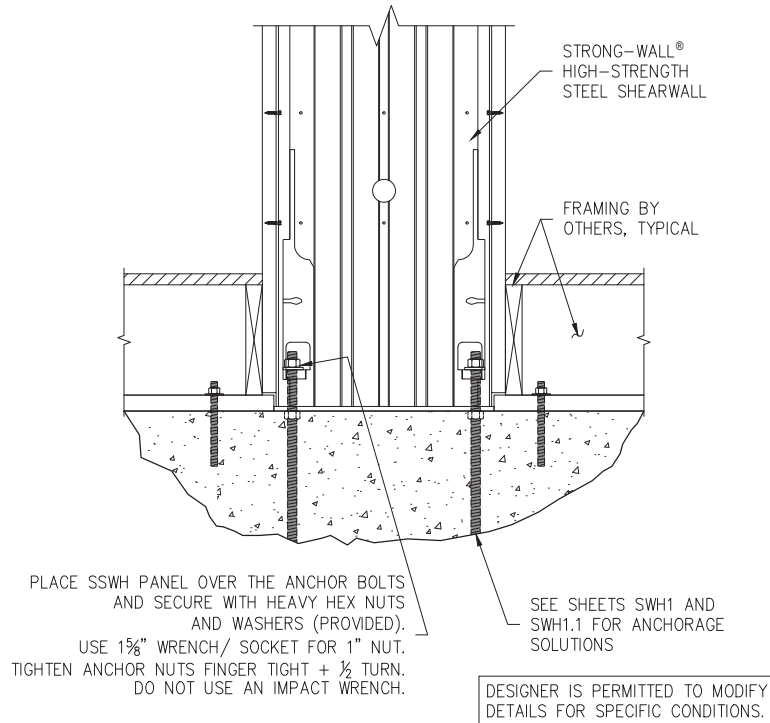
NOTE:

1. 1ST STORY SSWH MUST BE THE SAME WIDTH AS THE 2ND STORY SSWH. (EXCLUDING PANEL STUDS' WIDTH).

LEGEND :

- H_1 = 1ST STORY SSWH HEIGHT; TOP OF CONCRETE TO UNDERSIDE OF 1ST STORY TOP PLATES (IN.)
- H_2 = 2ND STORY SSWH HEIGHT; TOP OF FLOOR SHEATHING TO UNDERSIDE OF 2ND STORY TOP PLATES (IN.)
- H_3 = TOTAL ASSEMBLY HEIGHT; TOP OF CONCRETE TO UNDERSIDE OF 2ND STORY TOP PLATES (IN.)

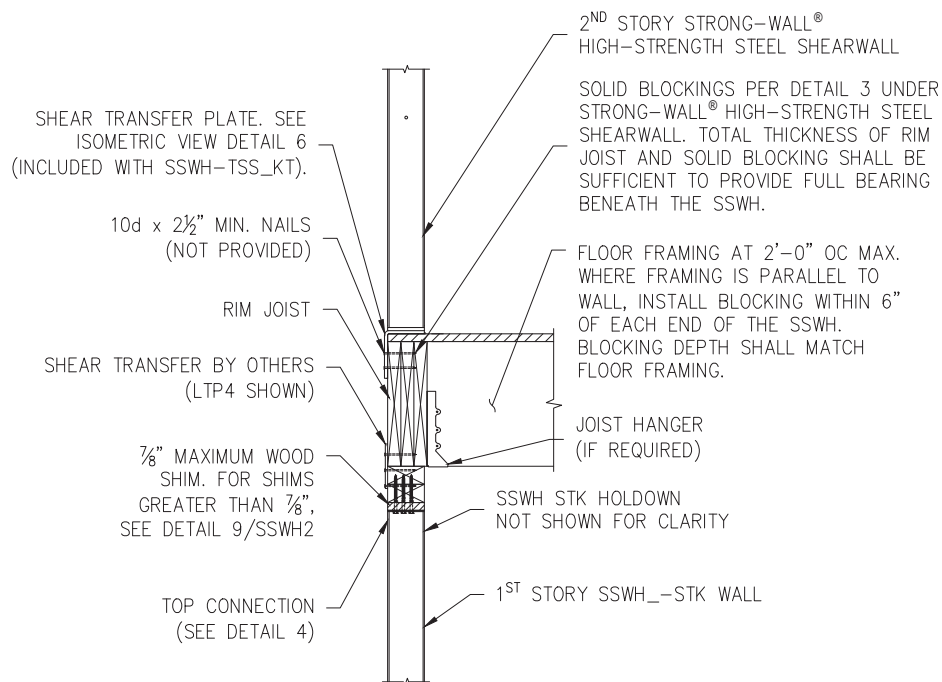
Steel Shearwall Structural Details (continued)



ALTERNATE FIRST-FLOOR WOOD FRAMING

5/SSWH2

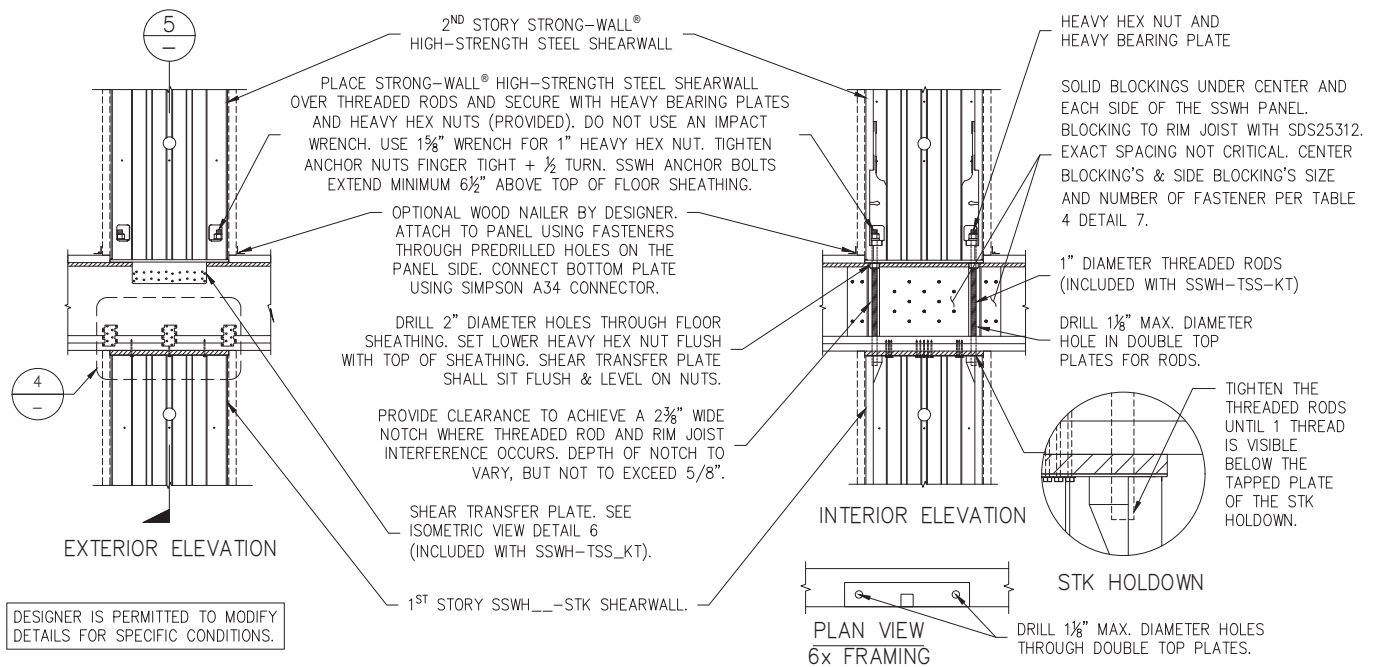
DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.



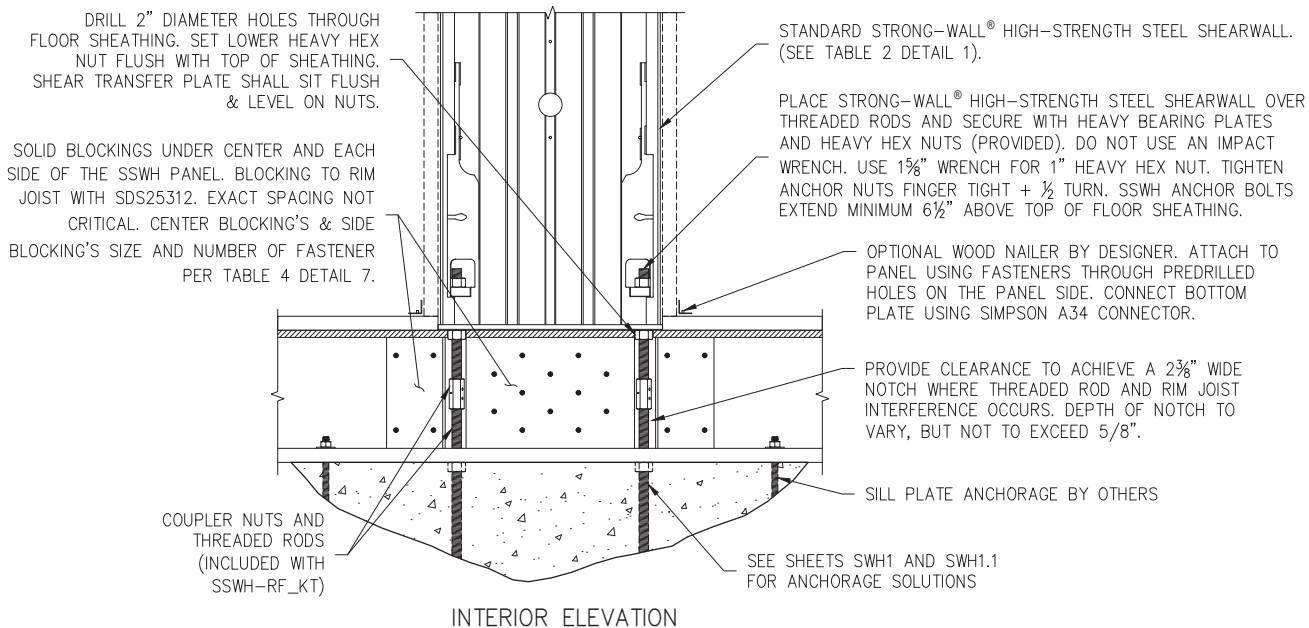
TWO-STORY STACKED FLOOR SECTION

5/SSWH3

Steel Shearwall Structural Details (continued)



Steel Shearwall Structural Details (continued)



DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.

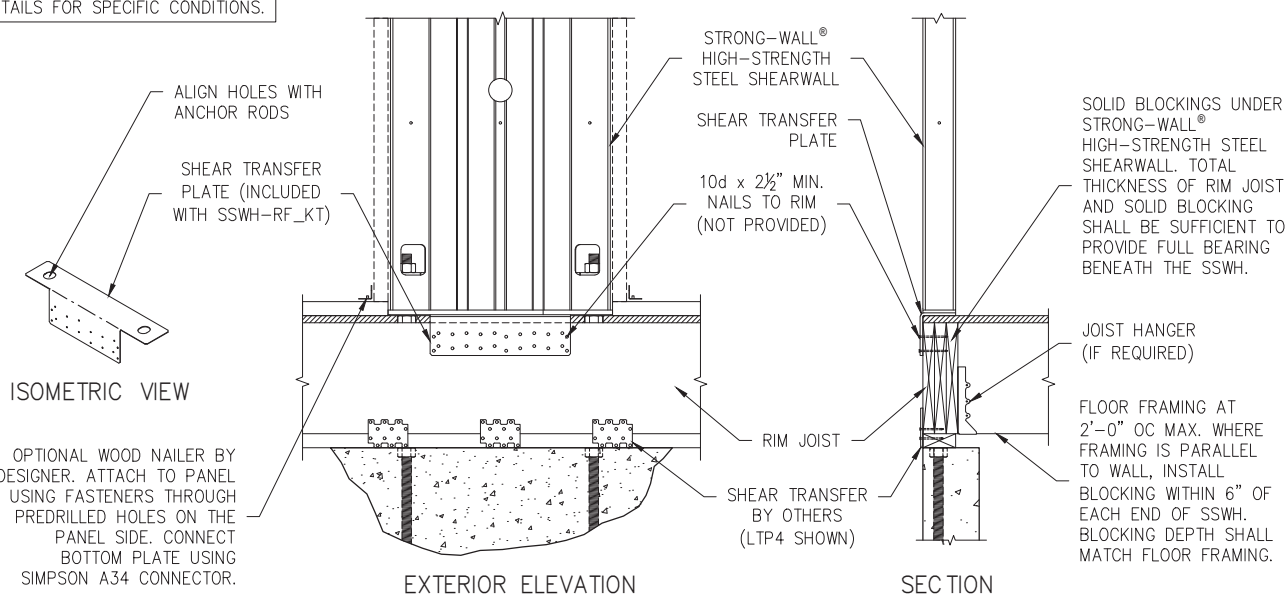


TABLE 6: FIRST-STORY WOOD FLOOR CONNECTION KIT

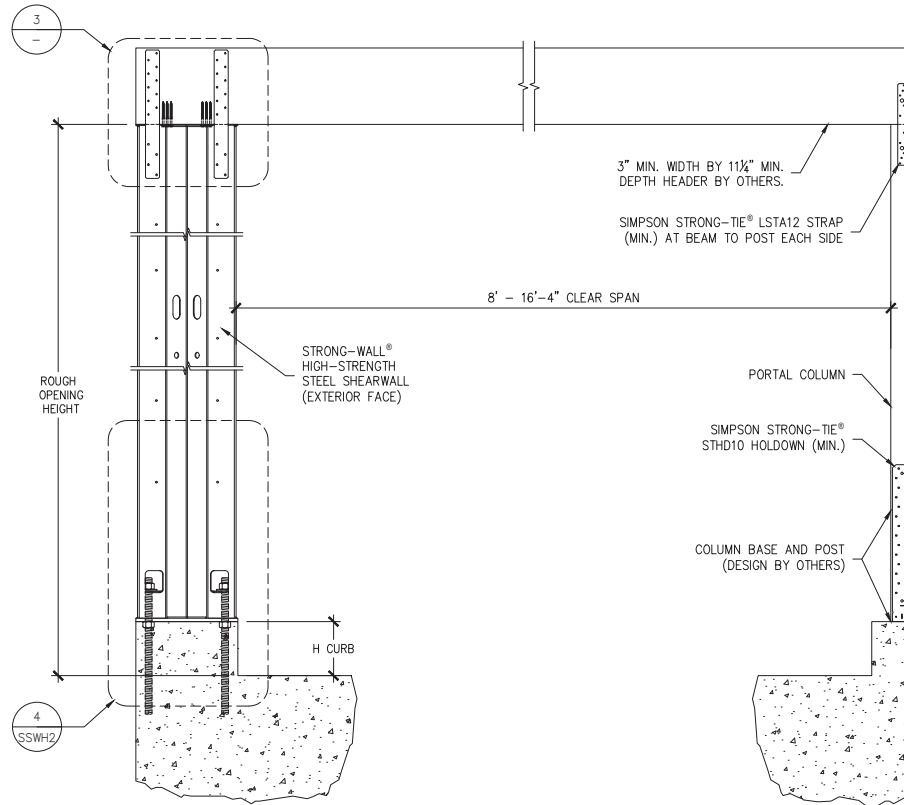
WALL WIDTH (in.)	MODEL NO.	CONTENTS
12	SSWH-RF12KT	EACH KIT CONTAINS: (1) SHEAR TRANSFER PLATE (2) 1" x 18" THREADED RODS (ASTM A193 B7) (2) COUPLER NUTS (2) HEAVY HEX NUTS INSTALLATION INSTRUCTIONS
15	SSWH-RF15KT	
18	SSWH-RF18KT	
21	SSWH-RF21KT	
24	SSWH-RF24KT	

NOTES:

1. USE WOOD FIRST-FLOOR ALLOWABLE LOAD TABLES IN THE EVALUATION REPORT FOR THIS INSTALLATION
2. USE ALTERNATE DETAIL 5/SSWH2 TO ACHIEVE MAXIMUM ON-CONCRETE ALLOWABLE LOADS.
3. FOR TWO-STORY STACKED STRONG-WALL HIGH-STRENGTH STEEL SHEARWALLS WITH WOOD FIRST FLOOR, USE ALTERNATE DETAIL 5/SSWH2.
4. DESIGNER SHALL DESIGN FOR SHEAR TRANSFER FROM RIM JOIST TO SILL PLATE AND SILL PLATE TO FOUNDATION.

ORDER FIRST-STORY WOOD FLOOR CONNECTION KIT SEPARATELY.
MODEL SSWH-RF_KT. EXAMPLE SSWH-RF18KT.

Steel Shearwall Structural Details (continued)



GARAGE HEADER ROUGH OPENING HEIGHT		
MODEL NO.	H CURB	ROUGH OPENING HEIGHT
SSWH12x7	5½"	6'-11½"
SSWH15x7	6"	7'-0"
SSWH12x8	5½"	8'-2¾"
SSWH15x8	6"	8'-3¼"

NOTES :

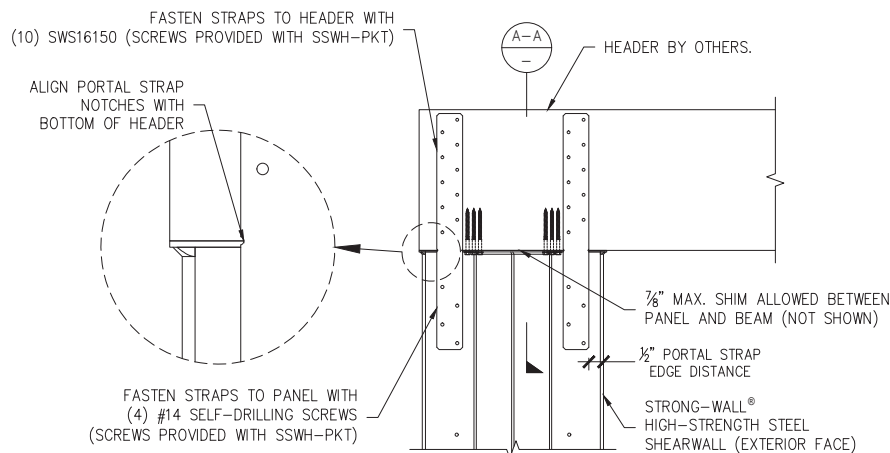
1. THE HEIGHT OF THE GARAGE CURB ABOVE THE GARAGE SLAB IS CRITICAL FOR THE ROUGH HEADER OPENING AT GARAGE RETURN WALLS.
2. SHIMS ARE NOT PROVIDED.
3. FURRING DOWN GARAGE HEADER MAY BE NECESSARY FOR CORRECT ROUGH OPENING HEIGHT.

DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.

ENSURE CONCRETE IS LEVEL AND SMOOTH BENEATH PANEL. GRIND OR FILL AS NECESSARY.

SINGLE PORTAL ASSEMBLY

1/SSWH4

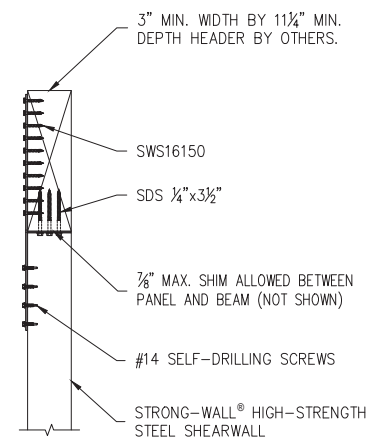


NOTES :

1. STRAPS MUST BE INSTALLED ON EXTERIOR FACE OF SSWH PANEL. POSITION HEADER FLUSH WITH EXTERIOR FACE OF SSWH PANEL.
2. FOR QUANTITY OF SDS SCREWS, SEE DETAIL 6/SSWH2.
3. MULTI-PLY HEADER MAY BE PERMITTED WHEN DESIGNED BY A REGISTERED DESIGN PROFESSIONAL TO ENSURE A CONTINUOUS LOAD PATH TO THE SSWH PANEL.

LOAD PATH DESIGN AND DETAILS ABOVE HEADER TO BE PROVIDED BY OTHERS.

DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.



SECTION A-A
4x FRAMING SINGLE PANEL

PORTAL TOP CONNECTION

3/SSWH4

Standard and Balloon Framing on Concrete Foundations

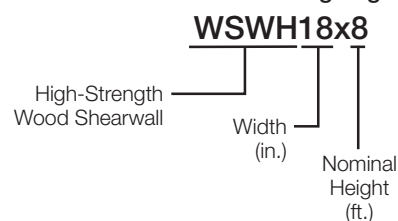
Simpson Strong-Tie® Strong-Wall high-strength wood shearwalls (WSWH™) combine design flexibility with performance. Field trimmable, they can be customized to accommodate varying heights or rake walls. They are evaluated to the 2024 IRC/IBC and are listed by ICC-ES.

Installation

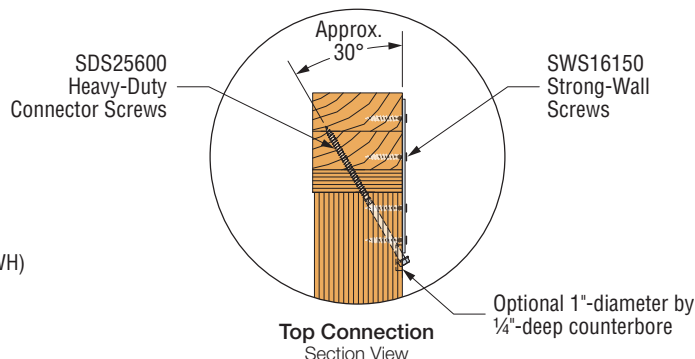
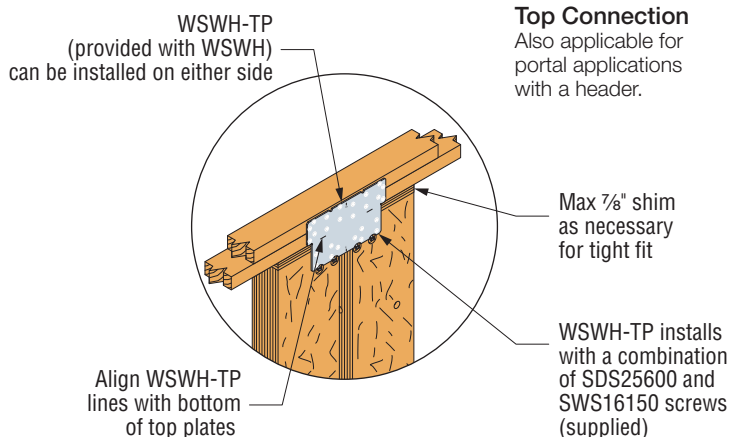
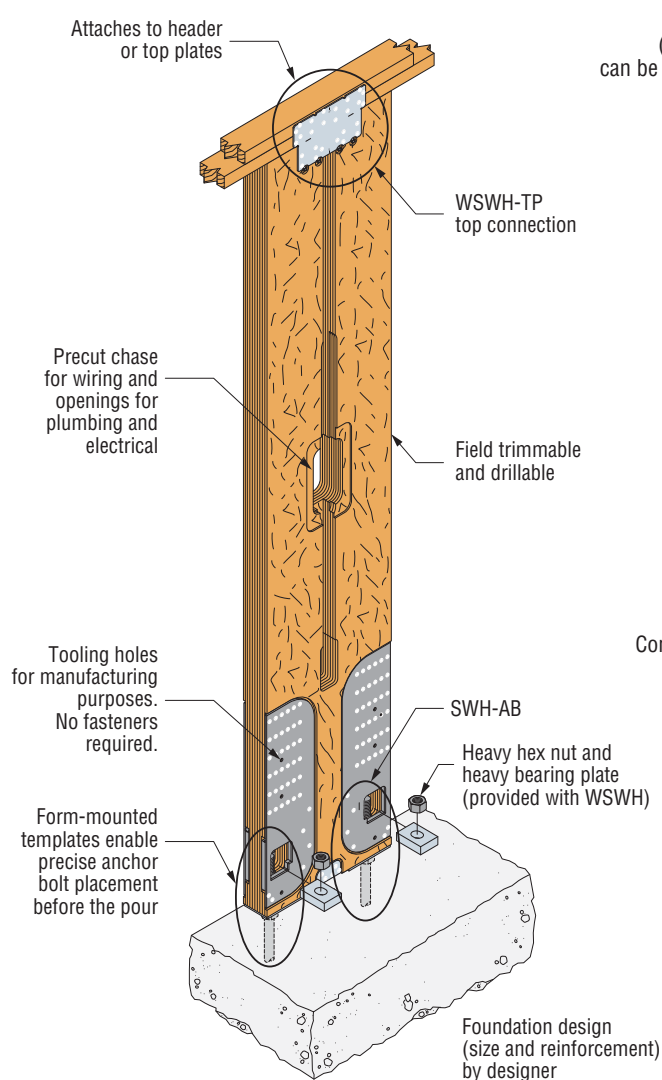
- All panels may be field trimmed to a minimum of 74½". Trim height from top of panel only, do not trim from sides or bottom. Drilling holes in the Strong-Wall high-strength wood shearwalls is not allowed except as shown on p. 69.
- Anchor bolt nuts should be finger tight plus ½ turn.
- Maximum shim thickness between the shearwall and top plates or header is 7⁄8". For additional shim thicknesses, see detail 9/WSWH2 on p. 68.
- Walls may be used in 2x6 and 2x8 wall framing. Install panel flush to one face of the framing and add furring to the opposite side as required to accommodate finish material. See detail 6/WSWH2 on p. 66.
- Top connection installs with a combination of SDS25600 Heavy-Duty Connector screws and SWS16150 Strong-Wall screws.

Codes: ICC-ES ESR-2652; City of LA Building Code Supplement; State of Florida FL5113

Strong-Wall High-Strength Wood Shearwall Naming Legend



Note: WSWH not available where pressure treatment of wood are required by local jurisdiction.



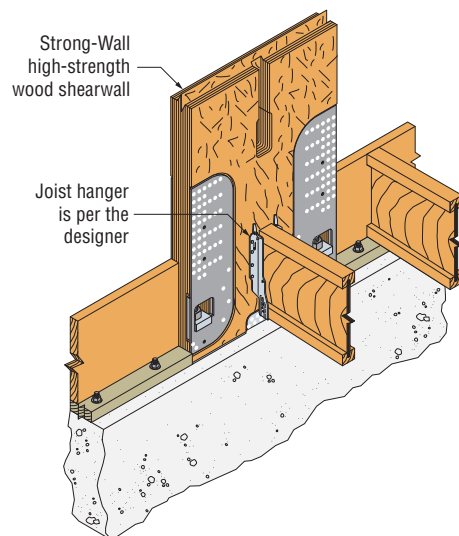
WSWH Standard Installation
US Patent, strongtie.com/patents.

Standard and Balloon Framing on Concrete Foundations

Strong-Wall High-Strength Wood Shearwall Product Data

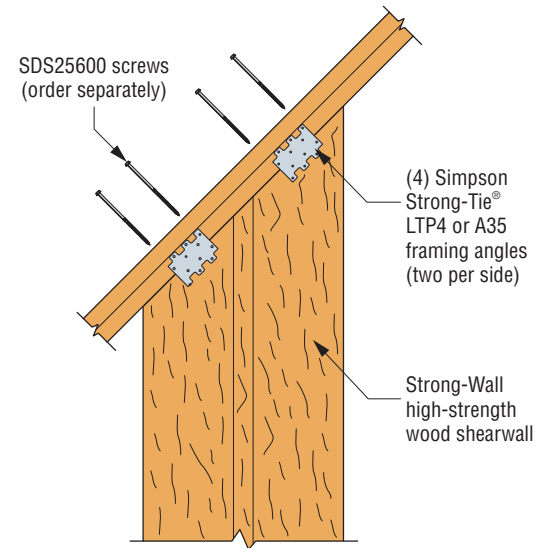
Model No.	Panel Information			Anchor Bolts	
	Width (in.)	Height (in.)	Weight (lb.)	Quantity	Diameter (in.)
WSWH12x7	12	84	105	2	1
WSWH18x7	18	84	155	2	1
WSWH12x8	12	96	120	2	1
WSWH18x8	18	96	175	2	1
WSWH24x8	24	96	225	2	1
WSWH12x9	12	108	130	2	1
WSWH18x9	18	108	195	2	1
WSWH24x9	24	108	250	2	1
WSWH12x10	12	120	145	2	1
WSWH18x10	18	120	210	2	1
WSWH24x10	24	120	275	2	1
WSWH12x12	12	144	165	2	1
WSWH18x12	18	144	245	2	1
WSWH24x12	24	144	325	2	1
WSWH18x14	18	168	285	2	1
WSWH24x14	24	168	370	2	1
WSWH24x16	24	192	420	2	1
WSWH18x20	18	240	390	2	1
WSWH24x20	24	240	520	2	1

1. To achieve evaluated panel heights listed in the allowable load table or for those not listed, order the next tallest panel and trim to fit. Minimum trimmed height for all panels is 74½".
2. All panels are supplied with preattached holdowns, two heavy hex nuts, two heavy bearing plates, one WSWH-TP top connection plate (width based on panel model), required fasteners and installation instructions. Replacement parts can be ordered separately.
3. All panels are 3½" thick.

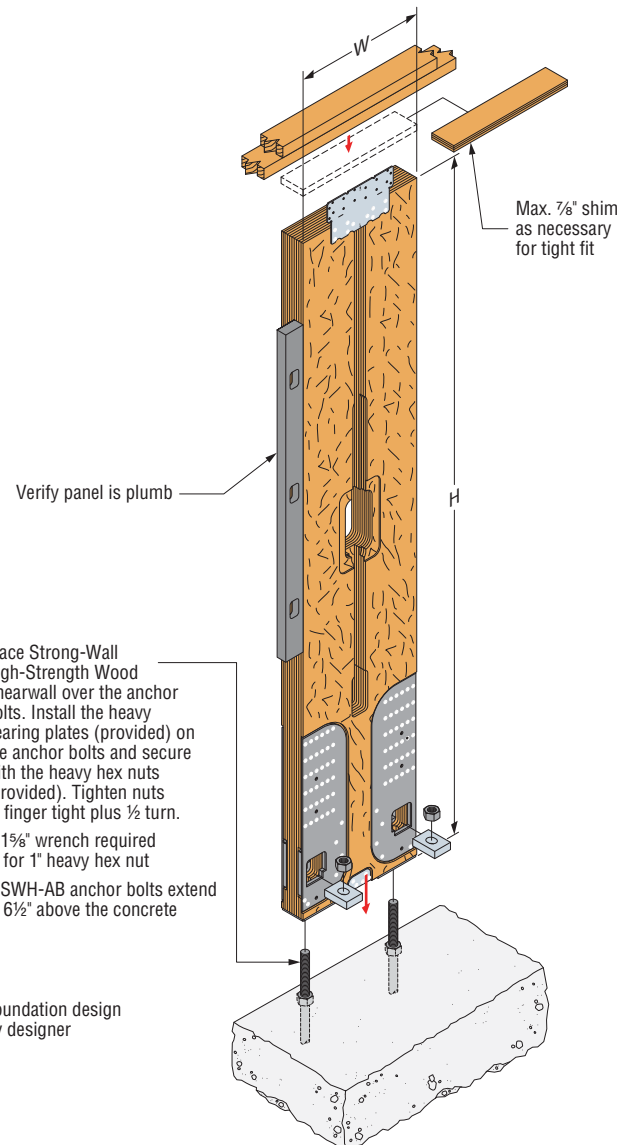


WSWH™ First-Story Installation with Wood Floor System

Specify panel height from top of foundation to underside of the top plates or beam.



Rake Wall Application



WSWH Standard Installation on Concrete

Standard and Balloon Framing on Concrete Foundations

Strong-Wall High-Strength Wood Shearwall Model No. ⁶	Panel Evaluation Height, H _e (in.) ⁶	Allow. Vertical Load, P (lb.) ⁴	2,500 psi Concrete						3,000 psi Concrete					
			Seismic ³			Wind			Seismic ³			Wind		
			Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁷	Anchor Tension at Allowable Shear, T (lb.) ¹¹	Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁷	Anchor Tension at Allowable Shear, T (lb.) ¹¹	Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁷	Anchor Tension at Allowable Shear, T (lb.) ¹¹	Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁷	Anchor Tension at Allowable Shear, T (lb.) ¹¹
WSWH12x7	78	1,000	1,300	0.32	13,295	1,670	0.43	17,075	1,300	0.32	13,295	1,670	0.43	17,075
		4,000	1,300	0.32	13,295	1,670	0.43	17,075	1,300	0.32	13,295	1,670	0.43	17,075
		7,500	1,300	0.32	13,295	1,670	0.43	17,075	1,300	0.32	13,295	1,670	0.43	17,075
WSWH18x7	78	1,000	3,795	0.32	23,680	4,470	0.39	27,890	3,795	0.32	23,680	4,470	0.39	27,890
		4,000	3,795	0.32	23,680	4,365	0.38	27,245	3,795	0.32	23,680	4,470	0.39	27,890
		7,500	3,795	0.32	23,680	4,050	0.36	25,285	3,795	0.32	23,680	4,470	0.39	27,890
WSWH24x7	78	1,000	7,450	0.30	33,210	7,795	0.34	34,755	7,450	0.30	33,210	7,795	0.34	34,755
		4,000	7,450	0.30	33,210	7,565	0.33	33,715	7,450	0.30	33,210	7,795	0.34	34,755
		7,500	7,115	0.28	31,715	7,115	0.31	31,715	7,450	0.30	33,210	7,795	0.34	34,755
WSWH12x8	93 1/4	1,000	1,030	0.40	12,580	1,325	0.53	16,195	1,030	0.40	12,580	1,325	0.53	16,195
		4,000	1,030	0.40	12,580	1,325	0.53	16,195	1,030	0.40	12,580	1,325	0.53	16,195
		7,500	1,030	0.40	12,580	1,325	0.53	16,195	1,030	0.40	12,580	1,325	0.53	16,195
WSWH18x8	93 1/4	1,000	3,060	0.39	22,835	3,880	0.52	28,925	3,060	0.39	22,835	3,955	0.53	29,490
		4,000	3,060	0.39	22,835	3,650	0.49	27,245	3,060	0.39	22,835	3,955	0.53	29,490
		7,500	3,060	0.39	22,835	3,390	0.46	25,285	3,060	0.39	22,835	3,955	0.53	29,490
WSWH24x8	93 1/4	1,000	6,240	0.37	33,240	6,650	0.43	35,430	6,240	0.37	33,240	6,910	0.45	36,815
		4,000	6,240	0.37	33,240	6,330	0.41	33,715	6,240	0.37	33,240	6,910	0.45	36,815
		7,500	5,950	0.35	31,715	5,950	0.38	31,715	6,240	0.37	33,240	6,910	0.45	36,815
WSWH12x9	105 1/4	1,000	850	0.45	11,750	1,095	0.60	15,145	850	0.45	11,750	1,095	0.60	15,145
		4,000	850	0.45	11,750	1,095	0.60	15,145	850	0.45	11,750	1,095	0.60	15,145
		7,500	850	0.45	11,750	1,095	0.60	15,145	850	0.45	11,750	1,095	0.60	15,145
WSWH18x9	105 1/4	1,000	2,575	0.45	21,680	3,325	0.60	27,975	2,575	0.45	21,680	3,325	0.60	27,975
		4,000	2,575	0.45	21,680	3,235	0.58	27,245	2,575	0.45	21,680	3,325	0.60	27,975
		7,500	2,575	0.45	21,680	3,005	0.54	25,285	2,575	0.45	21,680	3,325	0.60	27,975
WSWH24x9	105 1/4	1,000	5,150	0.43	30,975	5,890	0.52	35,430	5,150	0.43	30,975	6,120	0.54	36,815
		4,000	5,150	0.43	30,975	5,605	0.50	33,715	5,150	0.43	30,975	6,120	0.54	36,815
		7,500	5,150	0.43	30,975	5,275	0.47	31,715	5,150	0.43	30,975	6,120	0.54	36,815
WSWH12x10	117 1/4	1,000	700	0.50	10,750	900	0.67	13,855	700	0.50	10,750	900	0.67	13,855
		4,000	700	0.50	10,750	900	0.67	13,855	700	0.50	10,750	900	0.67	13,855
		7,500	700	0.50	10,750	900	0.67	13,855	700	0.50	10,750	900	0.67	13,855
WSWH18x10	117 1/4	1,000	2,140	0.50	20,055	2,755	0.67	25,840	2,140	0.50	20,055	2,755	0.67	25,840
		4,000	2,140	0.50	20,055	2,755	0.67	25,840	2,140	0.50	20,055	2,755	0.67	25,840
		7,500	2,140	0.50	20,055	2,695	0.65	25,285	2,140	0.50	20,055	2,755	0.67	25,840
WSWH24x10	117 1/4	1,000	4,010	0.48	26,860	5,215	0.67	34,935	4,010	0.48	26,860	5,215	0.67	34,935
		4,000	4,010	0.48	26,860	5,030	0.64	33,715	4,010	0.48	26,860	5,215	0.67	34,935
		7,500	4,010	0.48	26,860	4,735	0.61	31,715	4,010	0.48	26,860	5,215	0.67	34,935
WSWH12x11	129 1/4	1,000	595	0.56	10,055	765	0.73	12,930	595	0.56	10,055	765	0.73	12,930
		4,000	595	0.56	10,055	765	0.73	12,930	595	0.56	10,055	765	0.73	12,930
		7,500	595	0.56	10,055	765	0.73	12,930	595	0.56	10,055	765	0.73	12,930
WSWH18x11	129 1/4	1,000	1,960	0.55	20,240	2,520	0.73	26,060	1,960	0.55	20,240	2,520	0.73	26,060
		4,000	1,960	0.55	20,240	2,520	0.73	26,060	1,960	0.55	20,240	2,520	0.73	26,060
		7,500	1,960	0.55	20,240	2,445	0.71	25,285	1,960	0.55	20,240	2,520	0.73	26,060
WSWH24x11	129 1/4	1,000	4,000	0.54	29,550	4,795	0.68	35,430	4,000	0.54	29,550	4,985	0.70	36,815
		4,000	4,000	0.54	29,550	4,565	0.64	33,715	4,000	0.54	29,550	4,985	0.70	36,815
		7,500	4,000	0.54	29,550	4,295	0.60	31,715	4,000	0.54	29,550	4,985	0.70	36,815

See footnotes on p. 41.

Standard and Balloon Framing on Concrete Foundations

Strong-Wall High-Strength Wood Shearwall Model No. ⁵	Panel Evaluation Height, H _e (in.) ⁶	Allow. Vertical Load, P (lb.) ⁴	2,500 psi Concrete						3,000 psi Concrete					
			Seismic ³			Wind			Seismic ³			Wind		
			Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁷	Anchor Tension at Allowable Shear, T (lb.) ¹¹	Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁷	Anchor Tension at Allowable Shear, T (lb.) ¹¹	Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁷	Anchor Tension at Allowable Shear, T (lb.) ¹¹	Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁷	Anchor Tension at Allowable Shear, T (lb.) ¹¹
WSWH12x12	144	1,000	505	0.61	9,495	645	0.80	12,150	505	0.61	9,495	645	0.80	12,150
		4,000	505	0.61	9,495	645	0.80	12,150	505	0.61	9,495	645	0.80	12,150
		7,500	505	0.61	9,495	645	0.80	12,150	505	0.61	9,495	645	0.80	12,150
WSWH18x12	144	1,000	1,705	0.61	19,665	2,195	0.80	25,285	1,705	0.61	19,665	2,195	0.80	25,285
		4,000	1,705	0.61	19,665	2,195	0.80	25,285	1,705	0.61	19,665	2,195	0.80	25,285
		7,500	1,705	0.61	19,665	2,195	0.80	25,285	1,705	0.61	19,665	2,195	0.80	25,285
WSWH24x12	144	1,000	3,525	0.60	29,015	4,305	0.75	35,430	3,525	0.60	29,015	4,475	0.78	36,815
		4,000	3,525	0.60	29,015	4,100	0.72	33,715	3,525	0.60	29,015	4,475	0.78	36,815
		7,500	3,525	0.60	29,015	3,855	0.67	31,715	3,525	0.60	29,015	4,475	0.78	36,815
WSWH18x13	156	1,000	1,490	0.66	18,575	1,910	0.87	23,855	1,490	0.66	18,575	1,910	0.87	23,855
		4,000	1,490	0.66	18,575	1,910	0.87	23,855	1,490	0.66	18,575	1,910	0.87	23,855
		7,500	1,490	0.66	18,575	1,910	0.87	23,855	1,490	0.66	18,575	1,910	0.87	23,855
WSWH24x13	156	1,000	3,110	0.65	27,705	3,975	0.86	35,430	3,110	0.65	27,705	4,025	0.87	35,885
		4,000	3,110	0.65	27,705	3,780	0.81	33,715	3,110	0.65	27,705	4,025	0.87	35,885
		7,500	3,110	0.65	27,705	3,560	0.77	31,715	3,110	0.65	27,705	4,025	0.87	35,885
WSWH18x14	168	1,000	1,180	0.72	15,890	1,515	0.93	20,370	1,180	0.72	15,890	1,515	0.93	20,370
		4,000	1,180	0.72	15,890	1,515	0.93	20,370	1,180	0.72	15,890	1,515	0.93	20,370
WSWH24x14	168	1,000	2,620	0.71	25,160	3,365	0.93	32,290	2,620	0.71	25,160	3,365	0.93	32,290
		4,000	2,620	0.71	25,160	3,365	0.93	32,290	2,620	0.71	25,160	3,365	0.93	32,290
WSWH18x16	192	1,000	985	0.82	15,160	1,265	1.07	19,395	985	0.82	15,160	1,265	1.07	19,395
		4,000	985	0.82	15,160	1,265	1.07	19,395	985	0.82	15,160	1,265	1.07	19,395
WSWH24x16	192	1,000	2,130	0.82	23,345	2,735	1.07	29,990	2,130	0.82	23,345	2,735	1.07	29,990
		4,000	2,130	0.82	23,345	2,735	1.07	29,990	2,130	0.82	23,345	2,735	1.07	29,990
WSWH18x18	216	1,000	750	0.93	12,965	960	1.20	16,550	750	0.93	12,965	960	1.20	16,550
		4,000	750	0.93	12,965	960	1.20	16,550	750	0.93	12,965	960	1.20	16,550
WSWH24x18	216	1,000	1,655	0.93	20,400	2,110	1.20	26,060	1,655	0.93	20,400	2,110	1.20	26,060
		4,000	1,655	0.93	20,400	2,110	1.20	26,060	1,655	0.93	20,400	2,110	1.20	26,060
WSWH18x20	240	1,000	605	1.04	11,640	770	1.33	14,825	605	1.04	11,640	770	1.33	14,825
		4,000	605	1.04	11,640	770	1.33	14,825	605	1.04	11,640	770	1.33	14,825
WSWH24x20	240	1,000	1,350	1.04	18,500	1,720	1.33	23,590	1,350	1.04	18,500	1,720	1.33	23,590
		4,000	1,350	1.04	18,500	1,720	1.33	23,590	1,350	1.04	18,500	1,720	1.33	23,590

1. Allowable shear loads are applicable to installations on concrete with specified compressive strengths as listed using the ASD basic (2024 IBC Section 1605.1) or the alternative basic (2024 IBC Section 1605.2) load combinations.
2. Load values include evaluation of bearing stresses on concrete foundations and do not require further evaluation by the designer. For installations on masonry foundations, bearing capacity shall be evaluated by the designer.
3. Seismic design based on 2024 IBC using R = 6.5. For other codes, use the seismic coefficients corresponding to light-frame bearing walls with wood structural panels or sheet-steel panels.
4. Allowable vertical load denotes the total maximum concentric vertical load permitted on the panel acting in combination with the allowable shear loads.
5. Allowable shear, drift and anchor tension values may be interpolated for intermediate height or vertical loads. For panels 74½"-78" tall, use the values for a 78"-tall panel.
6. To achieve required WSWH™ panel evaluation height, trim next tallest full-height panel defined in table on p. 39.
7. Drifts at lower design shear may be linearly reduced.
8. See p. 42 for allowable out-of-plane and axial capacities.
9. Angled SDS screws may be omitted from the WSWH-TP for all panels taller than 100"; see p. 42 as reduced allowable out-of-plane loads may apply.
10. High-strength anchor bolts are required for anchor tension forces exceeding the allowable load for standard-strength bolts tabulated on pp. 86–87. See p. 85–87 for SWH-AB anchor bolt information and anchorage solutions.
11. Tabulated anchor tension values assume no resisting vertical load. Anchor tension loads at design shear values and including the effect of vertical load may be determined using the following equation:

$$T = [(V \times H) / B] - P/2, \text{ where:}$$

T = Anchor tension load (lb.)

V = Design shear load (lb.)

P = Applied vertical load (lb.)

H = Panel height (in.)

B = Moment arm (in.); 7½" for WSWH12, 12½" for WSWH18, 17½" for WSWH24.

Standard and Balloon Framing on Concrete Foundations

Allowable Out-of-Plane Loads for Single-Story Walls on Concrete Foundations (psf)

Panel Attachment	WSWH-TP Top Connection Fastening ⁴	Strong-Wall High-Strength Wood Shearwall Model No.	Nominal Height of Shearwall (ft.)										
			7	8	9	10	11	12	13	14	16	18	20
Top Plates	Angled SDS Screws Omitted	WSWH12	N/A	N/A	85	75	70	35	N/A	N/A	N/A	N/A	N/A
		WSWH18	N/A	N/A	125	115	105	80	65	50	35	25	15
		WSWH24	N/A	N/A	120	110	100	80	65	50	35	25	15
	Angled SDS Screws Installed	WSWH12	420	290	205	145	95	35	N/A	N/A	N/A	N/A	N/A
		WSWH18	395	290	205	145	110	80	65	50	35	25	15
		WSWH24	370	290	205	145	110	80	65	50	35	25	15
Header ^{5,6}	Angled SDS Screws Installed	WSWH12	330	205	150	110	85	45	N/A	N/A	N/A	N/A	N/A
		WSWH18	285	205	150	110	85	65	N/A	N/A	N/A	N/A	N/A
		WSWH24	215	180	150	110	85	65	N/A	N/A	N/A	N/A	N/A

1. Loads shown are at ASD level in pounds per square foot with no further increase allowed.

2. Loads consider a maximum deflection limit of H/240.

3. Allowable out-of-plane loads can be applied in combination with the allowable vertical loads shown on pp. 40–41.

4. Angled SDS screws may be omitted for WSWH™ panels taller than 100" in standard applications; however, SWS16150 screws must be installed for all fastening conditions. When angled SDS screws are omitted, a reduced allowable out-of-plane load may apply. See table for reduced loads.

5. Allowable values for header panel attachment assume a maximum header depth of 12". Use a load reduction factor of 0.94, 0.88 and 0.82 for 14", 16" and 18" deep headers respectively.

6. Allowable values shown for header panel attachment require the use of the portal straps to resist header rotation.

7. N/A = Not Applicable.

Allowable Axial Loads for Single-Story Walls on Concrete Foundations (lb.)

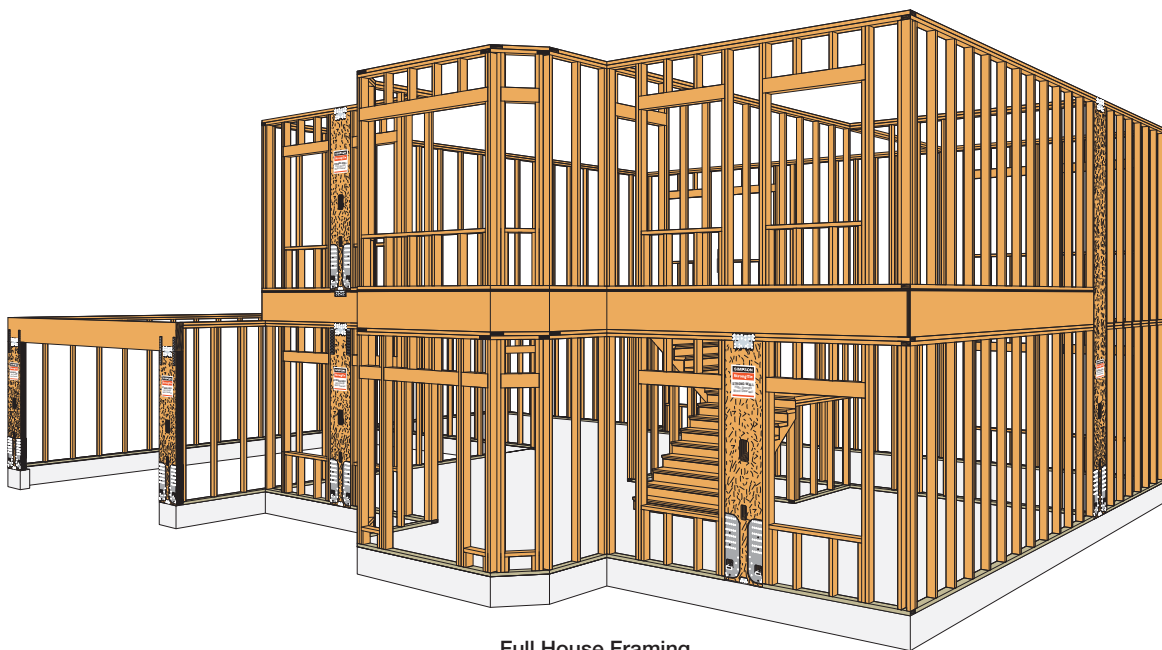
Strong-Wall High-Strength Wood Shearwall Model No.	Nominal Height of Shearwall (ft.)										
	7	8	9	10	11	12	13	14	16	18	20
WSWH12	30,700	22,400	17,900	14,600	12,100	9,800	N/A	N/A	N/A	N/A	N/A
WSWH18	53,500	39,100	31,200	25,400	21,000	17,000	14,500	12,600	9,600	7,600	6,200
WSWH24	72,000	56,100	44,700	36,400	30,200	24,400	20,900	18,000	13,900	11,000	8,900

1. Allowable ASD vertical load is the lesser of the WSWH panel buckling capacity and concrete bearing capacity beneath the holdowns assuming a minimum specified concrete compressive strength $f'_c = 2,500$ psi.

2. Allowable vertical loads assume concentric point load or uniformly distributed load without lateral loads present. For combined lateral and vertical loads, see pp. 40–41.

3. Tabulated loads apply to single-story panels on concrete foundations.

4. N/A = Not Applicable.



Full House Framing

Garage Portal Systems on Concrete Foundations

The Strong-Wall high-strength wood shearwall garage portal system provides higher allowable shear load with reduced concrete anchorage requirements. Portal walls may be used in single- or double-portal applications and shall be installed with a minimum 3" x 11¼" single- or multi-ply header depending upon loading and span requirements.

Codes: ICC-ES ESR-2652; City of LA Building Code Supplement; State of Florida FL5113

For product data and naming scheme information, see pp. 38–39.

Garage Header Rough Opening Height

Model No.	Trimmed Panel Height (in.)	H Curb (in.)	Rough Opening Height (in.)
WSWH12x7	78	5½	6'-11½" ¹
WSWH18x7		6	7'-0" ¹
WSWH24x7			
WSWH12x8	85½	0	7'-1½"
WSWH18x8	93¼	5½	8'-2¾" ²
WSWH24x8		6	8'-3¼" ²

1. If required rough opening height exceeds table value, specify next taller panel and trim as necessary. The Strong-Wall high-strength wood shearwalls may be trimmed to a minimum height of 74½".
2. Furring down garage header may be required for correct rough opening height.

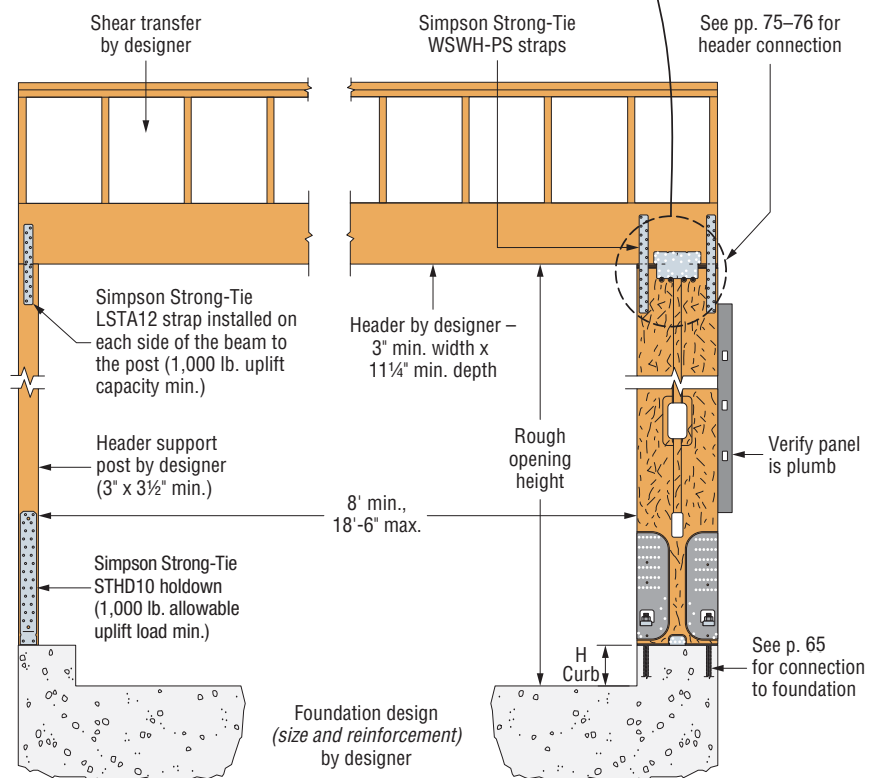
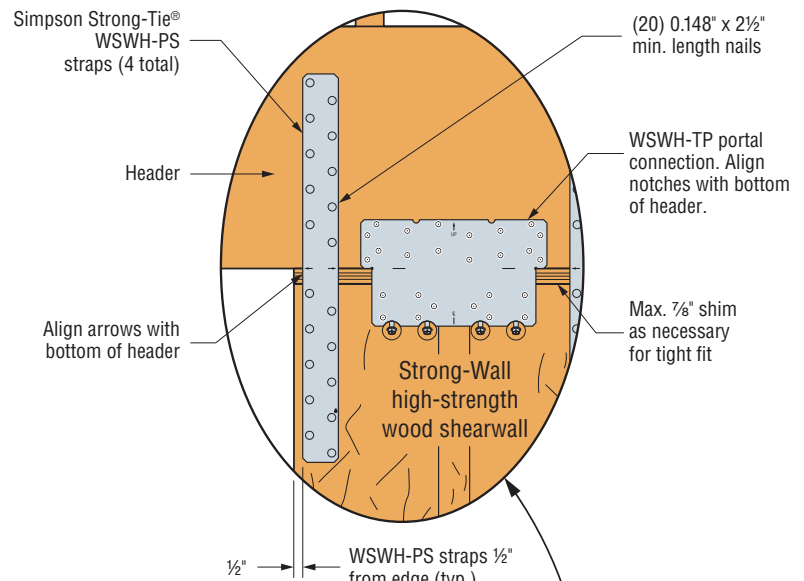
Installation

- Portal-frame connection kit is required for portal-frame applications.
- All panels may be trimmed to a minimum of 74½". Trim height from top of panel only, do not trim from sides or bottom. Drilling holes in the Strong-Wall high-strength wood shearwalls is not allowed except as shown on p. 69.
- Anchor bolt nuts should be finger tight plus ½ turn.
- Maximum shim thickness between Strong-Wall high-strength wood shearwalls and the top plates or header is ⅞".
- Top connection installs with a combination of ¼" x 6" SDS Heavy-Duty Connector screws and SWS16150 Strong-Wall screws.
- Walls may also be used in 2x6 wall framing. Install the panel flush to the outside face of the framing and add furring to the opposite side.
- Walls may be installed with solid or multi-ply headers, see details 3, 4, 5, 6/WSWH4 for fastening and furring requirements on pp. 75–76.

Portal Frame Connection Kit

Model No.	Contents
WSWH-PK	4 (10-gauge) WSWH-PS straps

1. Portal-frame connection kit comes with panels that are 100" or less in height. The kit must be ordered separately for panels over 100" tall.



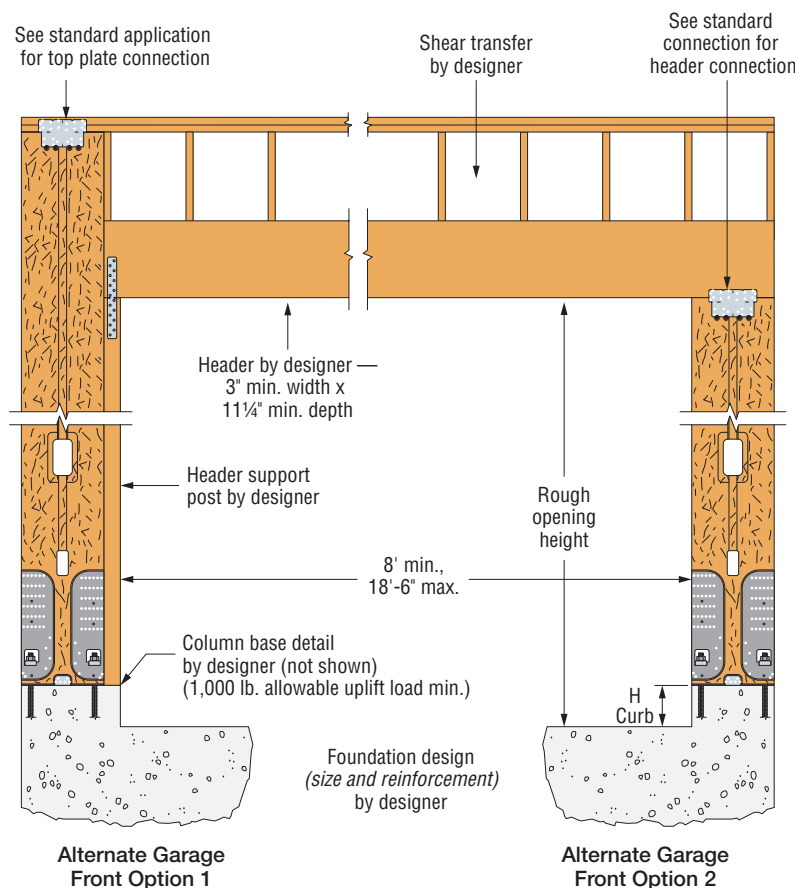
Single Portal Installation
US Patent, strongtie.com/patents.

Garage Portal Systems on Concrete Foundations (continued)

Portal Design Information

A portal frame under lateral loads causes the portal header to experience internal stresses in addition to those created by the primary loads (live, dead and snow). These additional stresses are called induced forces and must be considered when designing portal headers. To account for the induced forces from lateral loads, a concentrated end moment equal to the top-of-panel moment must be placed at the end of the header that is connected to the WSWH™ panel. For the WSWH12, WSWH18 and WSWH24, the moment induced into the portal header must be taken as 20%, 10% and 0%, respectively, of the total lateral moment at the base. The total lateral moment is calculated as the design shear times the panel height. For headers with typical residential uniform loads, the induced moment and shear forces from a portal-frame system do not control the design. This is due to the 1.60 load duration factor (C_D) used in design when wind and seismic loads are included.

The lateral and vertical loads shown on p. 45 for portal frames assume that the header size falls within the portal-frame parameters listed in the table below.



US Patent,
strongtie.com/patents.

Strong-Wall High-Strength Wood Shearwall Portal Header Design Parameters

Header Design Parameter	Allowable Range
Width ¹	3" – 5 1/2"
Depth	11 1/4" – 18"
Clear Span ⁵	8' – 18' 6"
K ⁶	90 lb./in. – 4,000 lb./in.

1. Single- or multi-ply header members may be used.
2. Maximum clear span for multi-ply 2x DF/SP header shall be limited to 16'-4".
3. Secondary moment, shear and axial forces shall be considered in header design.
4. Header design shall be by designer and assume gravity loads only induce simple span moments in beam.
5. Longer header spans can be accommodated if larger headers are used such that equivalent stiffness is equal to or greater than that provided by the minimum header size and maximum length indicated.
6. Header stiffness (K) for use in WSWH portal system may be determined using the following equation:

$$K = (E \times b \times d^3) / 12L^3 \text{ where:}$$

E = Header modulus of elasticity (psi)
b = Header width (in.)
d = Header depth (in.)
L = Header clear span (in.)

Alternative Garage Front Options

These alternative garage-front options may be used for applications when the Strong-Wall high-strength wood shearwall is installed at the full height (option 1) or without the additional Portal-Frame Kit (option 2), when higher allowable load or reduced concrete anchorage is not needed. Refer to the Standard Application on Concrete Foundations on pp. 40–41 for product data and allowable load values.

For Alternate Garage Front Option 2, the designer shall design for:

1. Shear transfer
2. Out-of-plane loading effect
3. Increased overturning and drift due to additional height

Garage Portal Systems on Concrete Foundations (continued)

Single-Wall Garage Portal System on Concrete Foundation

Strong-Wall High-Strength Wood Shearwall Model No. ⁷	Panel Evaluation Height, H _e (in.) ⁷	Allowable Vertical Load, P (lb.) ⁵	2,500 psi Concrete						3,000 psi Concrete					
			Seismic ³			Wind			Seismic ³			Wind		
			Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁸	Anchor Tension at Allowable Shear, T (lb.) ¹¹	Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁸	Anchor Tension at Allowable Shear, T (lb.) ¹¹	Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁸	Anchor Tension at Allowable Shear, T (lb.) ¹¹	Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.) ⁸	Anchor Tension at Allowable Shear, T (lb.) ¹¹
WSWH12x7	78	1,000	1,780	0.39	14,550	2,285	0.53	18,715	1,780	0.39	14,550	2,285	0.53	18,715
		4,000	1,780	0.39	14,550	2,285	0.53	18,715	1,780	0.39	14,550	2,285	0.53	18,715
		7,500	1,780	0.39	14,550	2,285	0.53	18,715	1,780	0.39	14,550	2,285	0.53	18,715
WSWH18x7	78	1,000	3,980	0.38	22,345	4,580	0.47	25,715	3,980	0.38	22,345	4,580	0.47	25,715
		4,000	3,980	0.38	22,345	4,580	0.47	25,715	3,980	0.38	22,345	4,580	0.47	25,715
		7,500	3,980	0.38	22,345	4,505	0.46	25,285	3,980	0.38	22,345	4,580	0.47	25,715
WSWH24x7	78	1,000	7,450	0.30	33,210	7,950	0.35	35,430	7,450	0.30	33,210	8,260	0.36	36,815
		4,000	7,450	0.30	33,210	7,565	0.33	33,715	7,450	0.30	33,210	8,260	0.36	36,815
		7,500	7,115	0.28	31,715	7,115	0.31	31,715	7,450	0.30	33,210	8,260	0.36	36,815
WSWH12x8	85½	1,000	1,590	0.42	14,280	2,065	0.57	18,520	1,590	0.42	14,280	2,065	0.57	18,520
		4,000	1,590	0.42	14,280	2,065	0.57	18,520	1,590	0.42	14,280	2,065	0.57	18,520
		7,500	1,590	0.42	14,280	2,065	0.57	18,520	1,590	0.42	14,280	2,065	0.57	18,520
WSWH18x8	85½	1,000	3,550	0.41	21,845	4,580	0.56	28,185	3,550	0.41	21,845	4,580	0.56	28,185
		4,000	3,550	0.41	21,845	4,425	0.54	27,245	3,550	0.41	21,845	4,580	0.56	28,185
		7,500	3,550	0.41	21,845	4,110	0.50	25,285	3,550	0.41	21,845	4,580	0.56	28,185
WSWH24x8	85½	1,000	6,425	0.33	31,385	7,250	0.41	35,430	6,425	0.33	31,385	7,535	0.43	36,815
		4,000	6,425	0.33	31,385	6,900	0.39	33,715	6,425	0.33	31,385	7,535	0.43	36,815
		7,500	6,425	0.33	31,385	6,490	0.37	31,715	6,425	0.33	31,385	7,535	0.43	36,815
WSWH12x8	93¼	1,000	1,435	0.45	14,050	1,860	0.60	18,190	1,435	0.45	14,050	1,860	0.60	18,190
		4,000	1,435	0.45	14,050	1,860	0.60	18,190	1,435	0.45	14,050	1,860	0.60	18,190
		7,500	1,435	0.45	14,050	1,860	0.60	18,190	1,435	0.45	14,050	1,860	0.60	18,190
WSWH18x8	93¼	1,000	3,170	0.44	21,290	4,130	0.60	27,735	3,170	0.44	21,290	4,130	0.60	27,735
		4,000	3,170	0.44	21,290	4,060	0.59	27,245	3,170	0.44	21,290	4,130	0.60	27,735
		7,500	3,170	0.44	21,290	3,765	0.55	25,285	3,170	0.44	21,290	4,130	0.60	27,735
WSWH24x8	93¼	1,000	6,240	0.37	33,240	6,650	0.43	35,430	6,240	0.37	33,240	6,910	0.45	36,815
		4,000	6,240	0.37	33,240	6,330	0.41	33,715	6,240	0.37	33,240	6,910	0.45	36,815
		7,500	5,950	0.35	31,715	5,950	0.38	31,715	6,240	0.37	33,240	6,910	0.45	36,815

- Allowable shear loads are applicable to installations on concrete with specified compressive strengths as listed using the ASD basic (2024 IBC Section 1605.3.1) or the alternative basic (2024 IBC Section 1605.3.2) load combinations.
- Load values include evaluation of bearing stresses on concrete foundations and do not require further evaluation by the designer. For installations on masonry foundations, bearing capacity shall be evaluated by the designer.
- Seismic design based on 2024 IBC using R = 6.5. For other codes, use the seismic coefficients corresponding to light-frame bearing walls with wood structural panels or sheet-steel panels.
- Allowable values shown apply to single-wall garage portal systems. The allowable shear load for a double-wall garage portal system, which consists of two walls with a header continuous across both panels, may be taken as twice the table value.
- Allowable vertical load denotes the total maximum concentric vertical load permitted on the panel acting in combination with the allowable shear loads.
- Allowable shear, drift and anchor tension values may be interpolated for intermediate height or vertical loads. For panels 74½"–78" tall, use the values for a 78"-tall panel.
- To achieve required WSWH™ panel evaluation height, trim next tallest full-height panel defined in table on p. 39.
- Drifts at lower design shear may be linearly reduced.
- See p. 42 for allowable out-of-plane and axial capacities.
- High-strength anchor bolts are required for anchor tension forces exceeding the allowable load for standard-strength bolts tabulated on pp. 86–87. See pp. 85–90 for SWH-AB anchor bolt information and anchorage solutions.
- Tabulated anchor tension values assume no resisting vertical load. Anchor tension loads at design shear values and including the effect of vertical load may be determined using the following equation:

$$T = [(k \times V \times H) / B] - P/2, \text{ where:}$$

T = Anchor tension load (lb.)

V = Design shear load (lb.)

P = Applied vertical load (lb.)

H = Panel height (in.)

B = Moment arm (in.); 7½" for WSWH12, 12½" for WSWH18 and 17½" for WSWH24

k = Portal factor; 0.80 for WSWH12 panels 93¼" or less in height, 0.90 for WSWH18 panels 93¼" or less in height, 1.00 for all other panels.

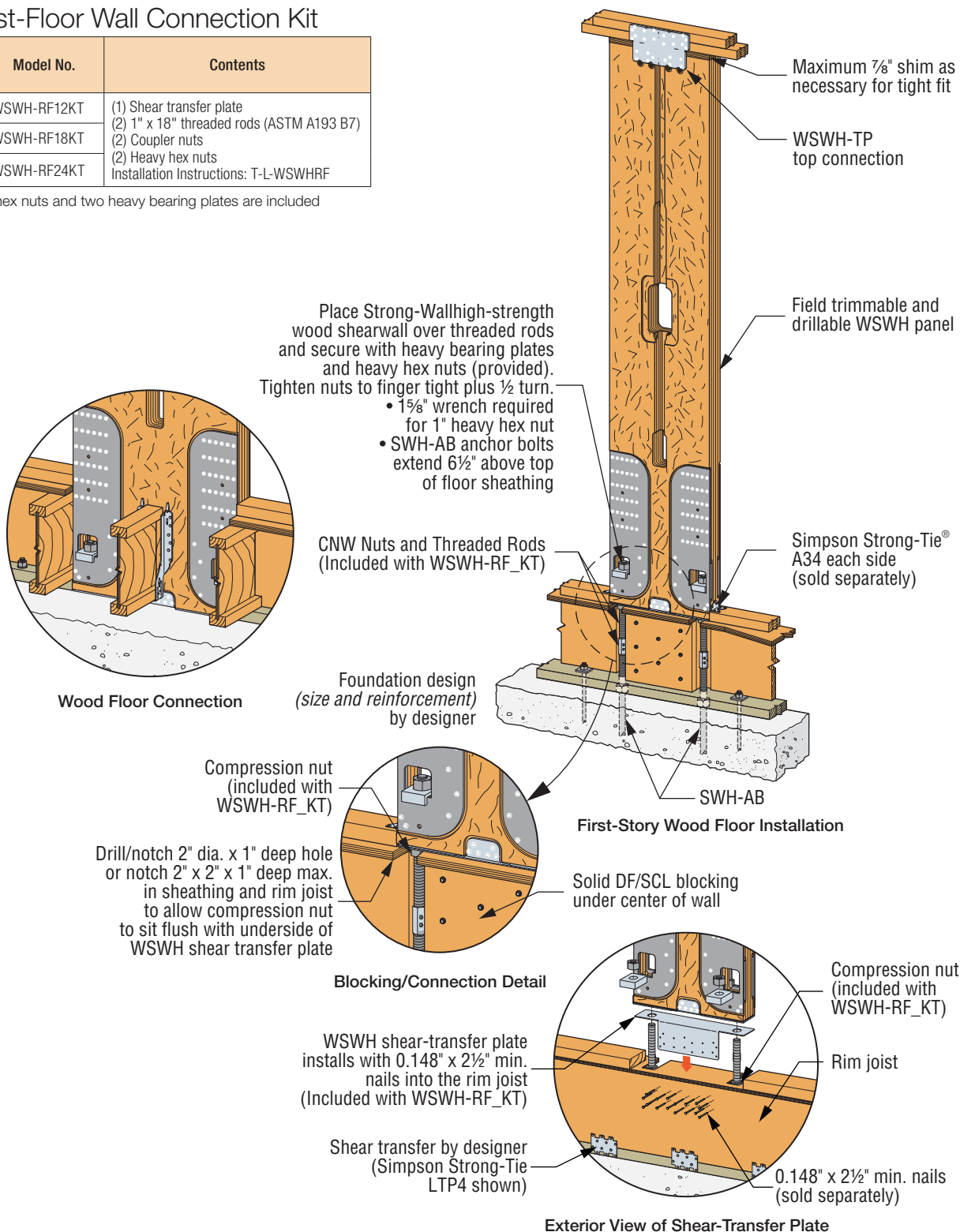
First-Story Raised Foundation

Strong-Wall high-strength wood shearwall (WSWH™), designed for use on concrete foundations, can also be used with wood floor systems by extending the anchor bolts and installing compression nuts and solid blocking below the wall. Width-specific WSWH shear-transfer plates are placed over the anchor bolts and under the walls, and the connection is made with 0.148" x 2½" min. length nails (refer to the exterior view of shear-transfer plate graphic below). Alternatively, the WSWH walls may be installed directly on the foundation using allowable values for standard application on concrete foundation by cutting them into the wood floor system as shown in the first-story installation with wood floor system graphic on p. 65.

Wood First-Floor Wall Connection Kit

Wall Width (in.)	Model No.	Contents
12	WSWH-RF12KT	(1) Shear transfer plate (2) 1" x 18" threaded rods (ASTM A193 B7)
18	WSWH-RF18KT	(2) Coupler nuts (2) Heavy hex nuts
24	WSWH-RF24KT	Installation Instructions: T-L-WSWHRF

1. Two (2) heavy hex nuts and two heavy bearing plates are included with each wall.



First-Story Raised Foundation (continued)

Strong-Wall High-Strength Wood Shearwall Product Data

Model No.	Panel Evaluation Height, H_e (in.)	Seismic ²			Wind		
		Allowable ASD Shear Load, V (lb.) ⁶	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.) ⁸	Allowable ASD Shear, V (lb.) ⁶	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.) ⁸
WSWH12x7	78	820	0.34	7,870	1,045	0.43	10,030
WSWH18x7	78	2,085	0.34	11,615	2,645	0.43	14,735
WSWH24x7	78	3,950	0.30	15,405	4,445	0.33	17,335
WSWH12x8	93¼	665	0.41	7,630	855	0.52	9,815
WSWH18x8	93¼	1,680	0.42	11,190	2,135	0.53	14,220
WSWH24x8	93¼	3,310	0.42	15,435	4,205	0.53	19,605
WSWH12x9	105¼	560	0.47	7,255	710	0.60	9,195
WSWH18x9	105¼	1,475	0.43	11,090	1,935	0.56	14,545
WSWH24x9	105¼	2,830	0.43	14,895	3,700	0.56	19,470
WSWH12x10	117¼	480	0.53	6,925	610	0.67	8,805
WSWH18x10	117¼	1,220	0.53	10,220	1,550	0.67	12,980
WSWH24x10	117¼	2,410	0.53	14,130	3,060	0.67	17,940
WSWH12x11	129¼	420	0.58	6,680	535	0.73	8,510
WSWH18x11	129¼	1,070	0.58	9,880	1,355	0.73	12,510
WSWH24x11	129¼	2,105	0.58	13,605	2,670	0.73	17,255
WSWH12x12	144	355	0.63	6,290	450	0.80	7,975
WSWH18x12	144	900	0.63	9,255	1,145	0.80	11,775
WSWH24x12	144	1,780	0.63	12,815	2,260	0.80	16,270
WSWH18x13	156	810	0.68	9,025	1,025	0.87	11,420
WSWH24x13	156	1,595	0.68	12,440	2,025	0.87	15,795
WSWH18x14	168	730	0.74	8,760	930	0.93	11,160
WSWH24x14	168	1,440	0.74	12,095	1,830	0.93	15,370
WSWH18x16	192	610	0.84	8,365	775	1.07	10,630
WSWH24x16	192	1,200	0.84	11,520	1,525	1.07	14,640
WSWH18x18	216	520	0.95	8,025	660	1.20	10,185
WSWH24x18	216	1,025	0.95	11,070	1,300	1.20	14,040
WSWH18x20	240	430	1.06	7,370	545	1.34	9,345
WSWH24x20	240	910	1.01	10,920	1,170	1.30	14,040

1. Loads are applicable to first-story raised wood floor installations supported on concrete or masonry foundations using the ASD basic (2024 IBC Section 1605.3.1) or the alternative basic (2024 IBC Section 1605.3.2) load combinations. Load values include evaluation of anchor rod compression capacity and do not require further evaluation by the designer.
2. Seismic design based on 2024 IBC using $R = 6.5$. For other codes, use the seismic coefficients corresponding to light-frame bearing walls with wood structural panels or sheet steel panels.
3. Allowable shear loads are based on a maximum 2,000 lb. uniformly distributed axial load acting in combination with the allowable shear loads.
4. Allowable shear, drift and anchor tension values may be interpolated for intermediate height or vertical loads. For panels 74½"–78" tall, use the values for a 78" tall panel.
5. High-strength anchor bolts are required unless a lower-strength grade is justified by the registered design professional. See pp. 85–90 for SWH-ABHS anchor bolt information and anchorage solutions.
6. Allowable shear loads assume a maximum first floor joist depth of 12" for allowable shear load with joists up to 16" deep, multiple table values by 0.92.
7. Drifts at lower design shear may be linearly reduced.
8. Tabulated anchor tension values assume no resisting vertical load. Anchor tension loads at design shear values and including the effect of vertical load may be determined using the following equation:

$$T = [(V \times H) / B] - P/2, \text{ where:}$$

T = Anchor tension load (lb.)

V = Design shear load (lb.)

P = Applied vertical load (lb.)

H = Panel height (in.)

B = Moment arm (in.); 8¼" for WSWH12, 14" for WSWH18, 20" for WSWH24

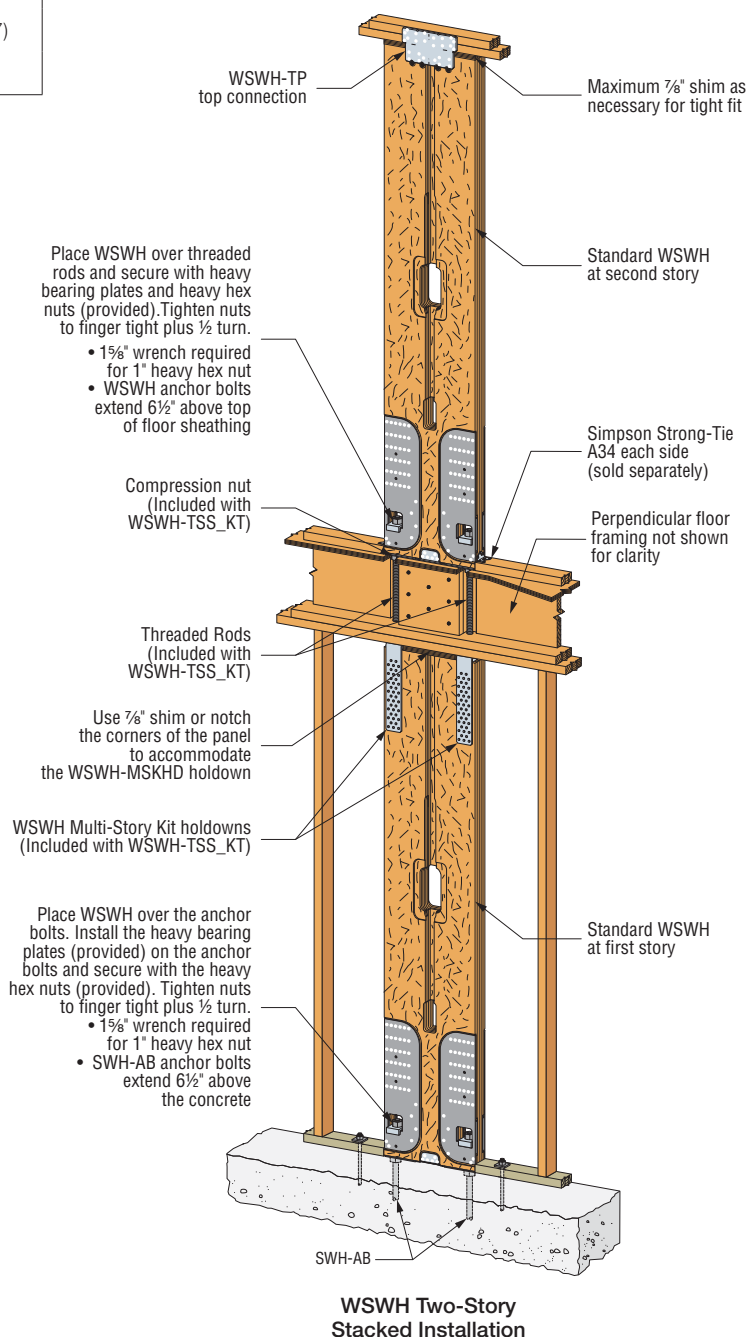
Two-Story Stacked Application

Simpson Strong-Tie offers a complete stacked-wall solution for Strong-Wall high-strength wood shearwall (WSWH™) two-story stacked applications. The same WSWH models used for standard applications on concrete may be used in stacked wall applications but require the two-story stacked connection kit to connect the second-story panel to the first-story panel. Anchor rods span the floor system to connect the two panels. In addition, WSWH shear-transfer plate, heavy hex compression nuts and solid blocking are installed beneath the second story panel. Width-specific WSWH shear-transfer plate is placed over the anchor rods and under the second story panel, and the connection is made with 0.148" x 2½" min. length nails (refer to the exterior view of shear-transfer plate graphic on p. 49).

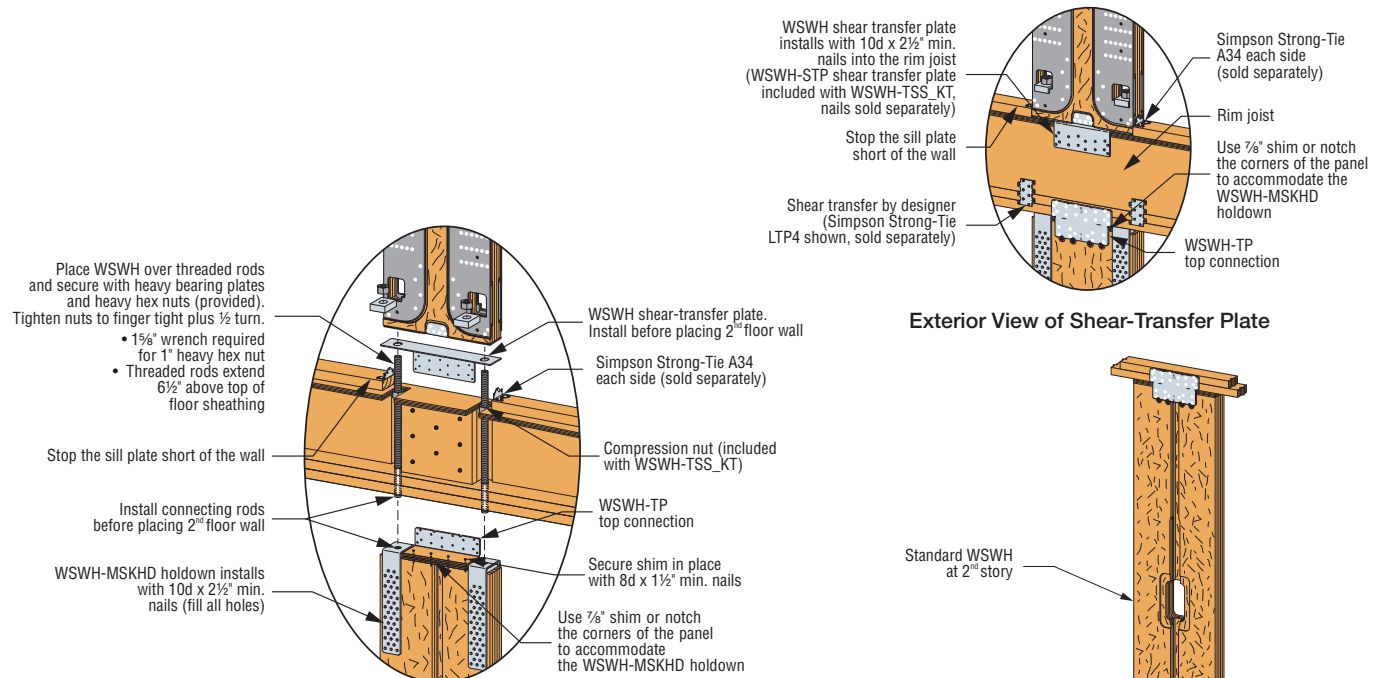
Strong-Wall WSWH Two-Story Stacked Wall Connection Kit

Wall Width (in.)	Model No.	Contents
12	WSWH-TSS12KT	(1) Shear transfer plate (2) Multi-story kit holdowns
18	WSWH-TSS18KT	(2) 1" x 30" threaded rods (ASTM A193 B7) (2) Heavy hex nuts
24	WSWH-TSS24KT	Installation Instructions: T-L-WSWHTSS

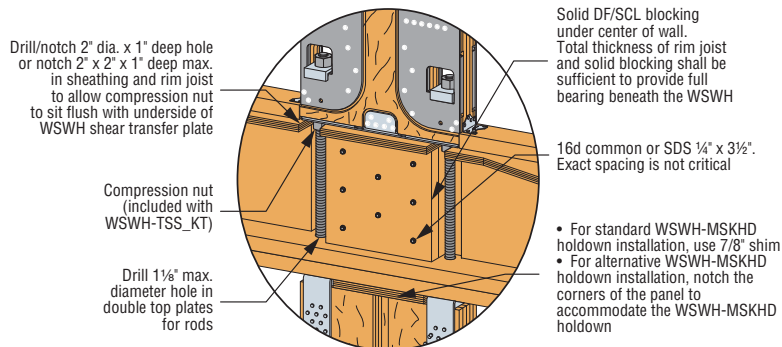
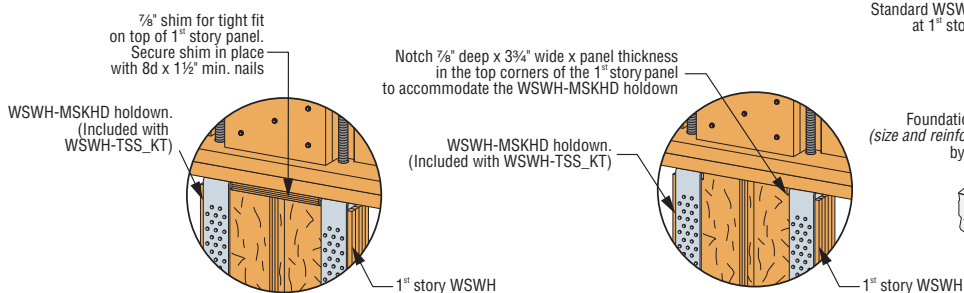
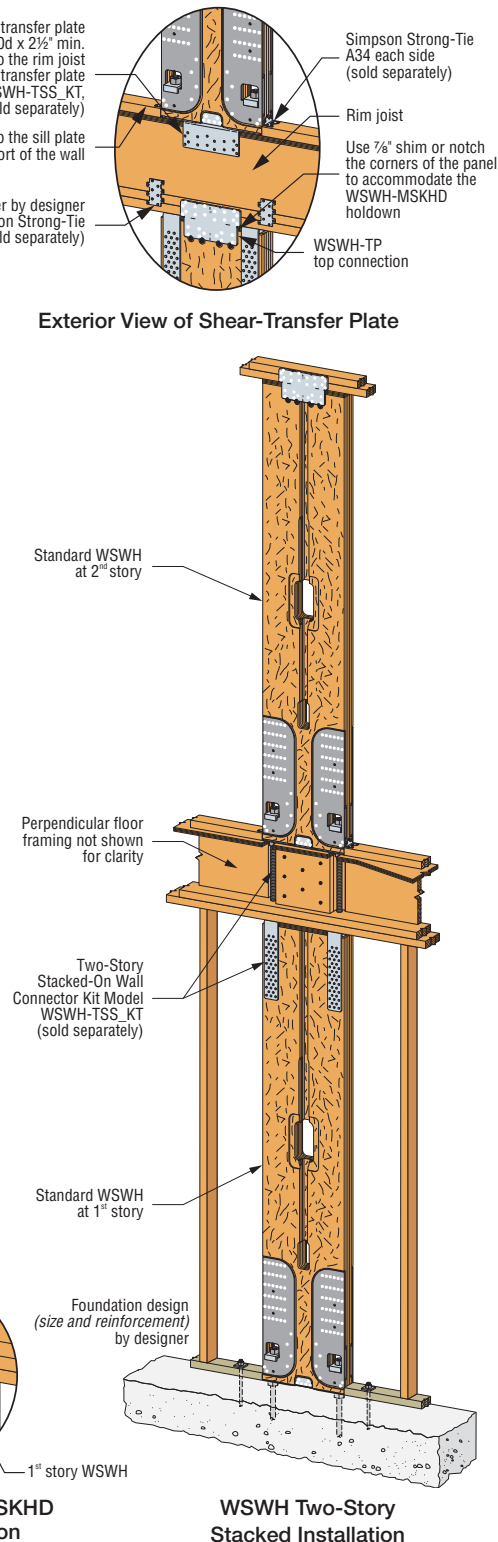
1. Two (2) heavy hex nuts and two heavy bearing plates are included with each wall. Two heavy hex nuts and two heavy bearing plates are included with each wall.



Two-Story Stacked Application (continued)



Two-Story Stacked Connection Detail

Blocking/Connection Detail
(Standard MSKHD Holdown Installation)Standard WSWH-MSKHD
Holdown InstallationAlternative WSWH-MSKHD
Holdown InstallationWSWH Two-Story
Stacked Installation

Two-Story Stacked Application (continued)

Strong-Wall WSWH™ Second-Story Walls

Second Story Wall Models	Panel Evaluation Height, H_e (in.)	Seismic ²		Wind	
		Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)
WSWH12x7	78	600	0.34	765	0.43
WSWH18x7	78	1,495	0.34	1,895	0.43
WSWH24x7	78	2,780	0.31	3,635	0.43
WSWH12x8	93¼	490	0.42	620	0.53
WSWH18x8	93¼	1,215	0.42	1,545	0.53
WSWH24x8	93¼	2,365	0.42	3,000	0.53
WSWH12x9	105¼	410	0.46	525	0.59
WSWH18x9	105¼	1,095	0.44	1,420	0.57
WSWH24x9	105¼	2,045	0.43	2,665	0.56
WSWH12x10	117¼	360	0.53	455	0.67
WSWH18x10	117¼	895	0.53	1,135	0.67
WSWH24x10	117¼	1,735	0.53	2,205	0.67
WSWH12x11	129¼	315	0.56	400	0.73
WSWH18x11	129¼	790	0.57	1,005	0.73
WSWH24x11	129¼	1,540	0.57	1,955	0.73
WSWH12x12	144	260	0.61	335	0.79
WSWH18x12	144	665	0.63	845	0.80
WSWH24x12	144	1,295	0.63	1,645	0.80
WSWH18x13	156	605	0.68	770	0.87
WSWH24x13	156	1,175	0.68	1,495	0.87
WSWH18x14	168	545	0.74	690	0.93
WSWH24x14	168	1,055	0.74	1,345	0.93

1. Allowable base moment and anchor tension are applicable to installation on concrete foundations with minimum $f'_c = 2,500$ psi using the ASD basic (2024 IBC Section 1605.3.1) or the alternative basic (2024 IBC Section 1605.3.2) load combinations. Load values include evaluation of anchor rod compression at second story and bearing stresses at foundation.
2. For seismic design based on 2024 IBC using $R = 6.5$. For other codes, use the seismic coefficients corresponding to light-frame bearing walls with wood structural panels or sheet steel panels.
3. Allowable shear, drift, and base moment values may be interpolated for intermediate heights.
4. Two-story stacked-wall installations may consist of any height combination of equal width wall models listed in these tables.
5. Loads are based on a 2,000 lb. maximum uniformly distributed total axial load acting on the second-story panel and a 4,000 lb. maximum uniformly distributed total axial load acting on the first-story panel in combination with the tabulated shear load and base moment.
6. The allowable second-story shear loads assume a maximum floor joist depth of 18".
7. A two-story stacked connection kit (TSS) is required to attach the second-story panel to first-story panel.
8. The designer must verify that the cumulative overturning moment at the base of the first-story Strong-Wall high-strength wood shearwall does not exceed the allowable base moment capacity.
9. High-strength threaded rods are required at the second-story wall unless a lower-strength grade is justified by the registered design professional. See pp. 85–87 for SWH-AB anchor bolt information and anchorage solutions.
10. High-strength anchor bolts are required at the first-story wall for anchor tension forces exceeding the allowable load for standard-strength bolts tabulated on pp. 85–87. See pp. 85–90 for SWH-AB anchor bolt information and anchorage solutions.

Strong-Wall WSWH First-Story Walls on Concrete Foundations

First Story Wall Models	Panel Evaluation Height, H_e (in.)	Seismic ²			Wind		
		Allowable ASD Base Moment (lb.-ft.)	Drift at Allowable Base Moment (in.)	Anchor Tension at Allowable Base Moment (lb.)	Allowable ASD Base Moment (lb.-ft.)	Drift at Allowable Base Moment (in.)	Anchor Tension at Allowable Base Moment (lb.)
WSWH12x7	78	8,450	0.32	13,300	10,855	0.43	17,085
WSWH18x7	78	24,670	0.32	23,685	28,375	0.38	27,240
WSWH24x7	78	48,425	0.30	33,205	49,175	0.33	33,720
WSWH12x8	93¼	8,005	0.40	12,600	10,295	0.53	16,200
WSWH18x8	93¼	23,780	0.39	22,830	28,365	0.49	27,230
WSWH24x8	93¼	48,490	0.37	33,250	49,190	0.41	33,730
WSWH12x9	105¼	7,455	0.45	11,730	9,605	0.60	15,115
WSWH18x9	105¼	22,585	0.45	21,680	28,375	0.58	27,240
WSWH24x9	105¼	45,170	0.43	30,975	49,160	0.50	33,710
WSWH12x10	117¼	6,840	0.50	10,765	8,795	0.67	13,840
WSWH18x10	117¼	20,910	0.50	20,075	26,920	0.67	25,845
WSWH24x10	117¼	39,180	0.48	26,865	49,145	0.64	33,700
WSWH12x11	129¼	6,410	0.56	10,090	8,240	0.73	12,970
WSWH18x11	129¼	21,110	0.55	20,265	27,145	0.73	26,060
WSWH24x11	129¼	43,085	0.54	29,545	49,170	0.64	33,715
WSWH12x12	144	6,060	0.61	9,535	7,740	0.80	12,180
WSWH18x12	144	20,460	0.61	19,640	26,340	0.80	25,285
WSWH24x12	144	42,300	0.60	29,005	49,200	0.72	33,735
WSWH18x13	156	19,370	0.66	18,595	24,830	0.87	23,835
WSWH24x13	156	40,430	0.65	27,725	49,140	0.81	33,695
WSWH18x14	168	16,520	0.72	15,860	21,210	0.93	20,360
WSWH24x14	168	36,680	0.71	25,150	47,110	0.93	32,305

Wood Beam Installation

Simpson Strong-Tie performed physical testing for WSWH™ supported on a wood beam. The WSWH may be installed on SolidStart LSL, TimberStrand LSL, Parallam PSL, Douglas Fir–Larch DFL, Microlam Laminated Veneer Lumber LVL single member (See Figure 1 below for installation details) in accordance with the following:

- The beam shall be designed and detailed per code by the designer to resist the forces imposed by the Strong-Wall WSWH panel above. The beam shall be designed for amplified seismic forces where required by code.
- A SolidStart LSL, TimberStrand LSL, Parallam PSL, Douglas Fir–Larch DFL #2 and better, 2.0E Microlam Laminated Veneer Lumber LVL single member, 3½" width wood member minimum is required. The evaluation for the WSWH panel installation on Cross-Laminated Timber (CLT) slab, on top of Glulam beam, is included.
- The vertical deflection of the beam, due to the overturning moment of the wall, shall be multiplied by the aspect ratio of the wall and added to the horizontal deflection of the panel. The total horizontal deflection of the panel shall not exceed code drift in seismic applications, and a wind drift limit acceptable to the designer. See p. 54.
- The allowable shear capacities of the Strong-Wall WSWH panel installed on top of wood beam, prior to any reductions for beam deflections, shall be per the table on p. 53. The drift values listed do not exceed the code drift limit (nominal wall height/228.6) for seismic and (nominal wall height/180) for wind. Panel drift values may be linearly reduced for lesser shear loads.
- ASTM A193 Grade B7 high-strength threaded rods shall be used to connect to the LSL or PSL member below, unless lower strength rod is specified by designer. The bearing plate at the underside of the beam shall be a 3½" x 5½" x ½" thick ASTM A36 plate minimum. Straps are not permitted to connect from the panel to the beam below.
- For improved allowable shear capacity, add Strong-Drive® SDCF screws to be installed under the 3½" x 5½" bearing plates. See Figure 2 on p. 52 and Footnote 4 below the table on p. 53.
- The load values in the table on p. 53 are established using 1.55E TimberStrand LSL. In cases of using alternative beam materials, reduction factors specified in the table on p. 52 will be applied.

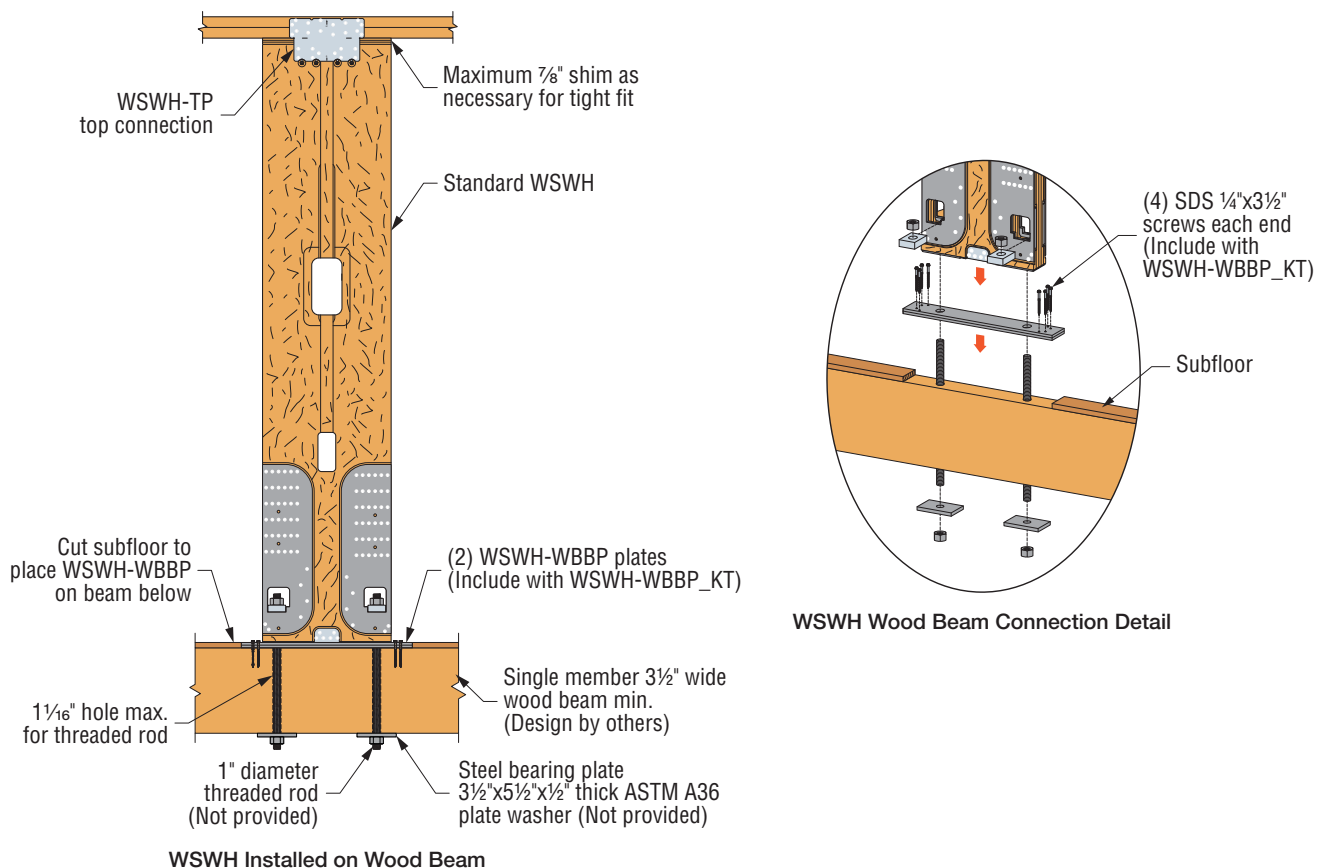
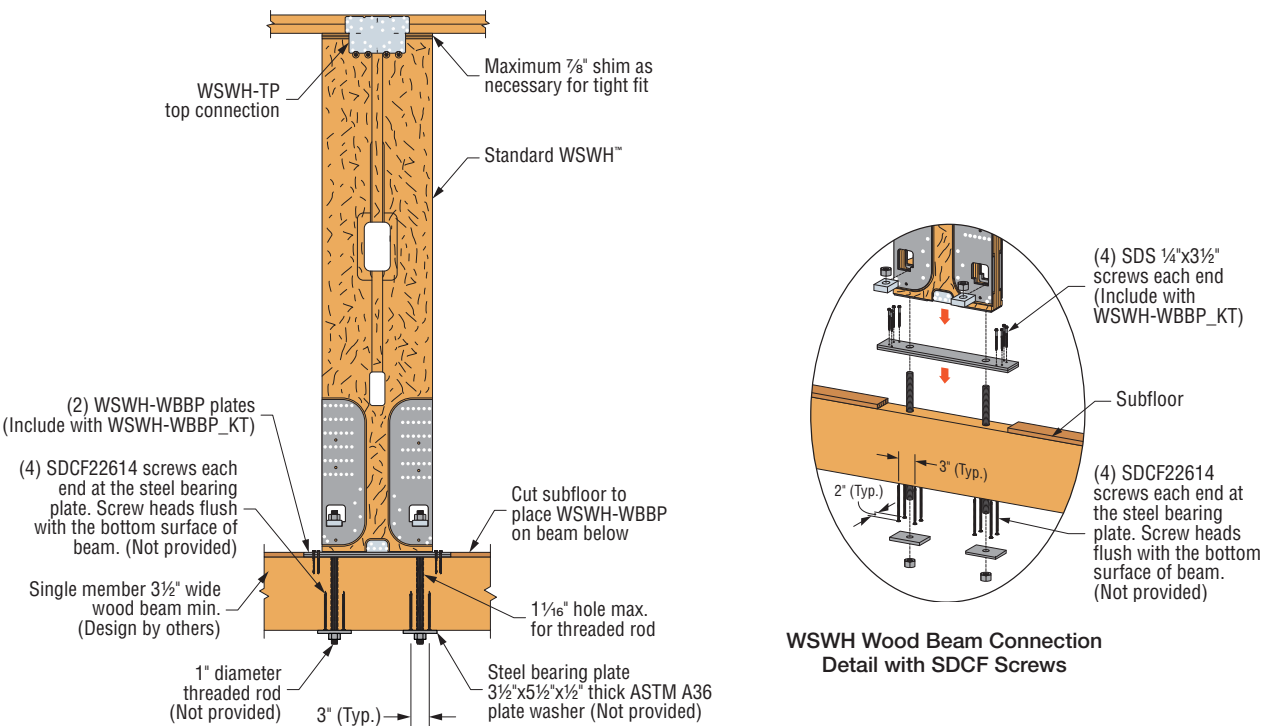


Figure 1: Strong-Wall WSWH on Wood Beam Details

Wood Beam Installation (continued)



WSWH Installed on Wood Beam with SDCF Screws

Figure 2: Strong-Wall WSWH on Wood Beam Details with SDCF Screws

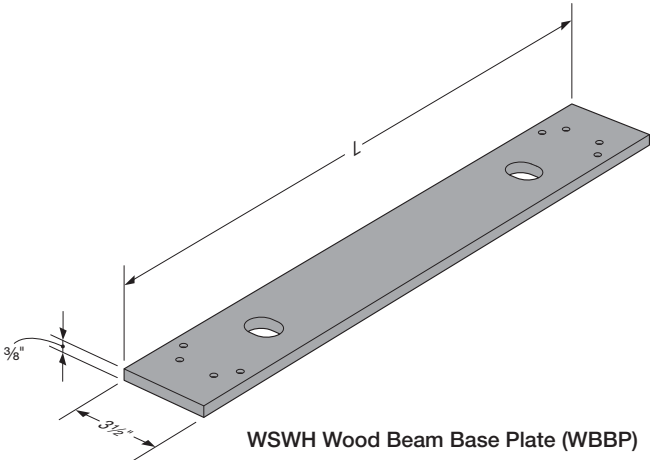
Reduction Factors

Type of Wood beam	Seismic		Wind	
	Reduction Factor for Allowable Shear	Adjustment Factor for Drift at Allowable Shear	Reduction Factor for Allowable Shear	Adjustment Factor for Drift at Allowable Shear
Douglas Fir–Larch (DFL)	0.62	1.00	0.62	1.02
2.0E Parallam (PSL)	0.75	1.00	0.74	1.02
2.0E Microlam (LVL)	0.81	1.03	0.80	1.02
CLT Slab (3-ply) (DFL North) on top of Glulam beam	0.65	1.01	0.69	1.07

Strong-Wall WSWH-WBBP Connection Kit

Wall Model No.	WSWH-WBBP Kit Model	Length, L (in.)
WSWH12	WSWH-WBBP12KT	18
WSWH18	WSWH-WBBP18KT	24
WSWH24	WSWH-WBBP24KT	30

1. WSWH-WBBP Kit includes (2) 3/8" thick WSWH-WBBP plates and (8) SDS 1/4" x 3 1/2" screws required for installation. Two heavy hex nuts and two heavy bearing plates are included with each wall.



Wood Beam Installation (continued)

ASD In-Plane Shear (lb.) for WSWH™ Installed on 1.55E TimberStrand LSL
(Prior to Adjustments for Beam Deflection)

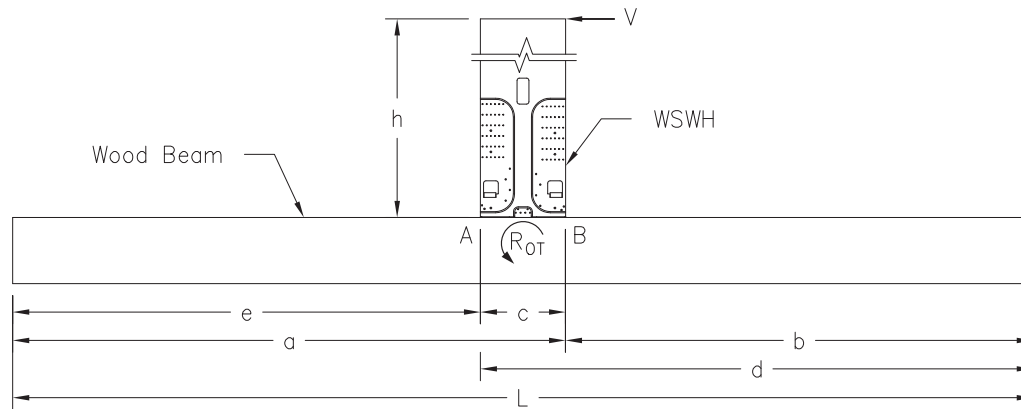
Model No.	Panel Evaluation Height, H_e (in.)	Seismic			Wind		
		Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)	Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)
WSWH12x7	78	645	0.34	6,190	815	0.43	7,825
WSWH18x7		1,620	0.34	9,025	2,020	0.43	11,255
WSWH24x7		3,435	0.33	13,395	3,710	0.40	14,470
WSWH12x8	93¼	590	0.42	6,770	710	0.53	8,150
WSWH18x8		1,325	0.42	8,825	1,670	0.53	11,125
WSWH24x8		2,510	0.41	11,705	3,025	0.50	14,105
WSWH12x9	105¼	450	0.47	5,830	570	0.60	7,385
WSWH18x9		1,130	0.47	8,495	1,440	0.60	10,825
WSWH24x9		2,165	0.46	11,395	2,610	0.57	13,735
WSWH12x10	117¼	390	0.53	5,630	495	0.67	7,145
WSWH18x10		985	0.53	8,250	1,250	0.67	10,470
WSWH24x10		1,900	0.52	11,140	2,285	0.63	13,395
WSWH12x11	129¼	345	0.58	5,490	435	0.73	6,920
WSWH18x11		865	0.58	7,985	1,100	0.73	10,155
WSWH24x11		1,685	0.58	10,890	2,030	0.70	13,120
WSWH12x12	144	295	0.63	5,230	370	0.80	6,560
WSWH18x12		735	0.63	7,560	935	0.80	9,615
WSWH24x12		1,435	0.63	10,330	1,755	0.77	12,635
WSWH18x13	156	665	0.68	7,410	845	0.87	9,415
WSWH24x13		1,295	0.68	10,100	1,590	0.84	12,400
WSWH18x14	168	605	0.74	7,260	765	0.93	9,180
WSWH24x14		1,175	0.74	9,870	1,455	0.91	12,220
WSWH18x16	192	510	0.84	6,995	645	1.07	8,845
WSWH24x16		990	0.84	9,505	1,235	1.05	11,855
WSWH18x18	216	435	0.95	6,710	555	1.20	8,565
WSWH24x18		850	0.95	9,180	1,070	1.19	11,555
WSWH18x20	240	395	1.05	6,770	485	1.33	8,315
WSWH24x20		740	1.05	8,880	940	1.33	11,280

1. All panels come with preattached holdowns, two heavy hex nuts, two heavy bearing plates, one WSWH-TP (width based on panel model) with required fasteners and installation instructions.
2. Allowable load shall be reduced as required due to added horizontal deflection of the panel from beam vertical deflection.
3. Order WSWH-WBBP kit separately for WSWH installed on wood beam application.
4. Adding (4) Strong-Drive® SDCF screws on each side of the panel, under the beam at the bearing plates will increase capacity by 10% compared to the value in table above (see Figure 2 for installation details).
5. Anchor rod tension at design shear load and including the effect of axial load may be determined using the following equation:

$$T = [(V \times h) / B] - P/2, \text{ where:}$$

T = Anchor rod tension load (lb.)
 V = ASD Design shear load (lb.)
 h = Strong-Wall WSWH height (in.)
 P = Applied axial load (lb.)
 B = Moment arm, centerline of anchor bolt to center of compression area (in.)
 B Dimension: WSWH12 = 7", WSWH18 = 12½", WSWH24 = 17½"

Wood Beam Installation (continued)



Strong-Wall High-Strength Wood Shearwall (WSWH)
Top of Panel Displacement Due to Deflection of Wood Beam

Example similar to problem found in SEAOC Seismic Design Manual Volume II – Building Design Example (2021 IBC). See pp. 78–79.

WSWH18x9 bearing on a 5¼" x 14" PSL beam, $E = 2.0E6$ psi

Δv = Vertical beam deflection at point A minus deflection at point B due to wall overturning where:

$$\Delta v = [R_{OT}/(3EL)] \times [e^2 d^2 - L^2 eb + b^3 e + e^3 b + a^2 b^2]$$

Δh = Horizontal top of wall displacement due to deflection of support beam where:

$$\Delta h = \Delta v \times h/c$$

Item	Value	Reference
Panel Height, h	9.00 ft.	ESR-2652 Table 1
Panel Width, c	1.50 ft.	ESR-2652 Table 1
Design Shear, V_{act}	700 lb.	—
Panel Allowable Seismic Shear, V_{all}	848 lb.	See pp. 52–53
Panel Drift at Allowable Shear, Δ_{all}	0.47 in.	See p. 53
Panel Overturning Force, $R_{OT} = vhc$	4,200 lb.	—
Beam Modulus of Elasticity, E	2,000,000 psi	TJ-9000
Beam Moment of Inertia, I	1,201 in. ⁴	TJ-9000
Beam Span, L	18.00 ft.	—
"a" Distance	10.00 ft.	—
"b" Distance	8.00 ft.	—
"d" Distance	9.50 ft.	—
"e" Distance	8.50 ft.	—
Δv	0.009 in.	—
Δh	0.052 in.	—
Total Drift (ASD), $\Delta_{ASD} = \Delta h + \Delta_{all} (V_{act}/V_{all})$	0.440 in.	—
Total Drift (LRFD), $\delta_{xe} = \Delta_{ASD}/0.7$	0.628 in.	—
Deflection amplification factor, C_d	4	ASCE 7-16 Table 12.2-1 (A.15)
Seismic Importance Factor, I_e	1.00	ASCE 7-16 Section 11.5.1
Amplified Drift, $\delta_x = (C_d \delta_{xe})/I_e$	2.513 in.	ASCE 7-16 Section 12.8.6
Allowable Code Drift, $\Delta_d = 0.025 \times h$	2.700 in.	ASCE 7-16 Table 12.12-1

1. Per Reduction Factor Table, apply a 0.75 factor to the allowable shear when using a PSL beam, $V_{all} = 0.75 \times 1,140 \text{ lb.} = 848 \text{ lb.}$

Steel Beam Installation

Simpson Strong-Tie offers a complete solution for Strong-Wall high-strength wood shearwall (WSWH™) to be installed on top of steel beam application. The same WSWH models used for standard applications on concrete may be used in steel beam applications using the Steel Beam Connector (SBC) to connect the panel to steel beam flange.

Simpson Strong-Tie performed full scale testing and have determined the WSWH may be installed on steel beam in accordance with the following:

- The steel beam shall be designed and detailed per code by the designer to resist the forces imposed by the Strong-Wall panel above. The beam shall be designed for amplified seismic forces where required by code.
- The steel beam flange should have adequate width to accommodate both the SBC plate and the weld including minimum clear distance to the beam edge per AWS D1.1 and AWS figure 8-13. Also note a minimum beam flange thickness of 0.4" and a minimum F_y of the steel beam to be 50 ksi.
- ASTM A193 Grade B7 threaded rods shall be used to connect to the SBC member below. The SBC plate connects to the steel beam's flange using fillet weld specified in table below.

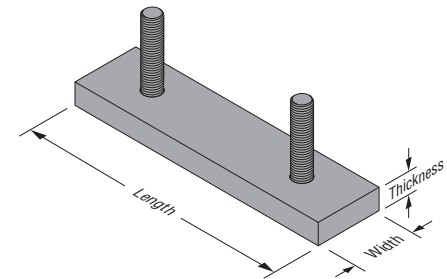
Wall Model	SBC Plate Model	SBC Plate Size			Fillet Weld Size (in.) x Length (in.)		Total Weld Length (in.)
		Length, L (in.)	Width, W (in.)	Thickness (in.)	Location A	Location B	
WSWH12	WSWH-SBC12	12 1/8	3 1/2	1 1/4	5/16 x 4	5/16 x 3	22
WSWH18	WSWH-SBC18	18	3 1/2	1 1/4	7/16 x 5	7/16 x 3	26
WSWH24	WSWH-SBC24	24	3 1/2	1 1/4	7/16 x 5	7/16 x 3	26

1. Total weld length refers to the length of the weld for both sides of the wall.

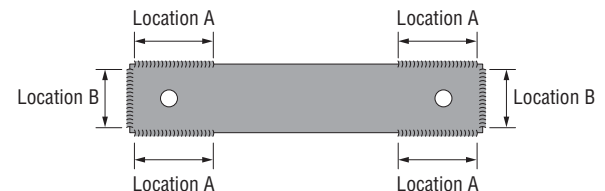
2. All fillet welds, F_{Exx} , to be greater than or equal to 70 ksi and to follow geometry and standards per AISC 360-22 and AWS 2018. Prepare base materials in accordance with AWS D1.1.

Strong-Wall WSWH Steel Beam Connection Kit

Wall Width (in.)	Model No.	Contents
12	WSWH-SBC12KT	(1) WSWH-SBC plate (2) 1" x 7 3/4" Threaded Rods (ASTM A193 B7)
18	WSWH-SBC18KT	
24	WSWH-SBC24KT	

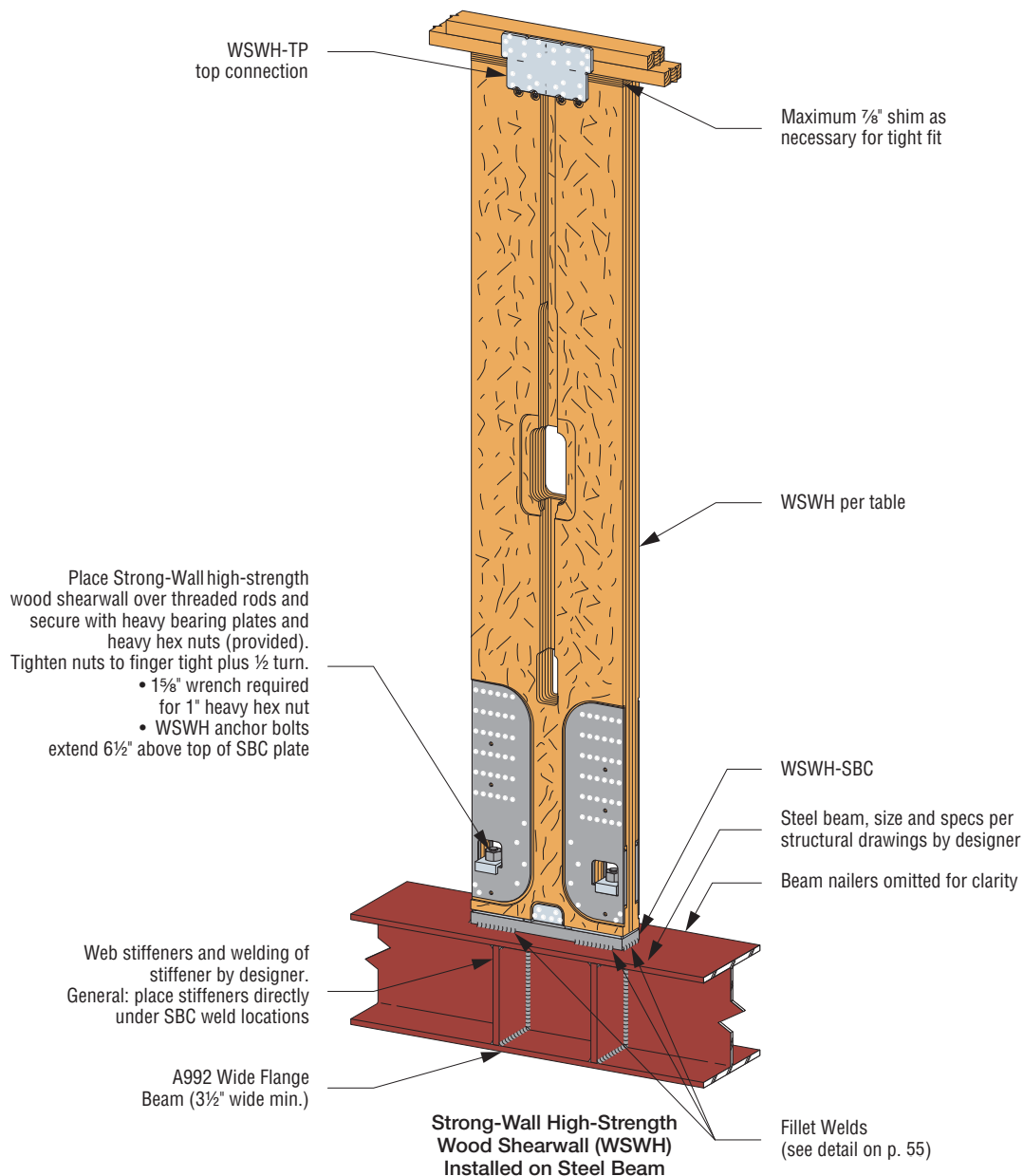
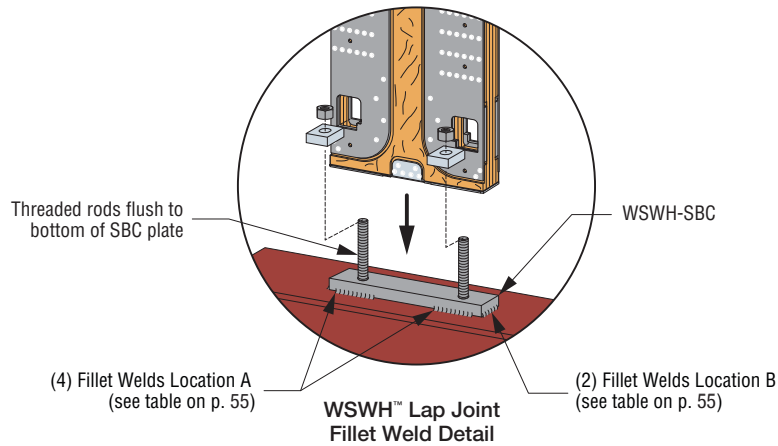


Strong-Wall-to-Steel-Beam Connector (SBC)



SBC Plan View

Steel Beam Installation (continued)



Steel Beam Installation (continued)

ASD In-plane Shear (lb.) for (WSWH™) Installed on Steel Beam

Model No.	Allow. Vertical Load, P (lb.)	Installation on Steel Beam					
		Seismic			Wind		
		Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)
WSWH12x7	1,000	1,225	0.34	11,760	1,555	0.43	14,930
	4,000	1,225	0.34	11,760	1,555	0.43	14,930
	7,500	1,225	0.34	11,760	1,555	0.43	14,930
WSWH18x7	1,000	3,080	0.34	17,160	3,910	0.43	21,785
	4,000	3,080	0.34	17,160	3,910	0.43	21,785
	7,500	3,080	0.34	17,160	3,910	0.43	21,785
WSWH24x7	1,000	6,370	0.28	24,845	7,795	0.40	30,400
	4,000	6,370	0.28	24,845	7,565	0.39	29,505
	7,500	6,370	0.28	24,845	7,115	0.36	27,750
WSWH12x8	1,000	1,030	0.38	11,820	1,325	0.51	15,205
	4,000	1,030	0.38	11,820	1,325	0.51	15,205
	7,500	1,030	0.38	11,820	1,325	0.51	15,205
WSWH18x8	1,000	2,495	0.42	16,620	3,165	0.53	21,080
	4,000	2,495	0.42	16,620	3,165	0.53	21,080
	7,500	2,495	0.42	16,620	3,165	0.53	21,080
WSWH24x8	1,000	4,885	0.42	22,775	6,200	0.53	28,905
	4,000	4,885	0.42	22,775	6,200	0.53	28,905
	7,500	4,885	0.42	22,775	5,950	0.51	27,740
WSWH12x9	1,000	840	0.47	10,880	1,065	0.60	13,795
	4,000	840	0.47	10,880	1,065	0.60	13,795
	7,500	840	0.47	10,880	1,065	0.60	13,795
WSWH18x9	1,000	2,195	0.41	16,500	2,945	0.60	22,140
	4,000	2,195	0.41	16,500	2,945	0.60	22,140
	7,500	2,195	0.41	16,500	2,945	0.60	22,140
WSWH24x9	1,000	4,140	0.47	21,785	5,255	0.60	27,655
	4,000	4,140	0.47	21,785	5,255	0.60	27,655
	7,500	4,140	0.47	21,785	5,255	0.60	27,655
WSWH12x10	1,000	700	0.49	10,100	900	0.66	12,990
	4,000	700	0.49	10,100	900	0.66	12,990
	7,500	700	0.49	10,100	900	0.66	12,990
WSWH18x10	1,000	1,825	0.53	15,285	2,315	0.67	19,390
	4,000	1,825	0.53	15,285	2,315	0.67	19,390
	7,500	1,825	0.53	15,285	2,315	0.67	19,390
WSWH24x10	1,000	3,570	0.53	20,930	4,535	0.67	26,585
	4,000	3,570	0.53	20,930	4,535	0.67	26,585
	7,500	3,570	0.53	20,930	4,535	0.67	26,585
WSWH12x11	1,000	595	0.54	9,465	765	0.69	12,170
	4,000	595	0.54	9,465	765	0.69	12,170
	7,500	595	0.54	9,465	765	0.69	12,170
WSWH18x11	1,000	1,595	0.58	14,725	2,025	0.73	18,695
	4,000	1,595	0.58	14,725	2,025	0.73	18,695
	7,500	1,595	0.58	14,725	2,025	0.73	18,695
WSWH24x11	1,000	3,125	0.58	20,195	3,970	0.73	25,655
	4,000	3,125	0.58	20,195	3,970	0.73	25,655
	7,500	3,125	0.58	20,195	3,970	0.73	25,655
WSWH12x12	1,000	505	0.59	8,950	645	0.75	11,430
	4,000	505	0.59	8,950	645	0.75	11,430
	7,500	505	0.59	8,950	645	0.75	11,430
WSWH18x12	1,000	1,350	0.63	13,885	1,715	0.80	17,640
	4,000	1,350	0.63	13,885	1,715	0.80	17,640
	7,500	1,350	0.63	13,885	1,715	0.80	17,640
WSWH24x12	1,000	2,645	0.63	19,045	3,360	0.80	24,190
	4,000	2,645	0.63	19,045	3,360	0.80	24,190
	7,500	2,645	0.63	19,045	3,360	0.80	24,190
WSWH18x13	1,000	1,215	0.68	13,540	1,540	0.87	17,160
	4,000	1,215	0.68	13,540	1,540	0.87	17,160
	7,500	1,215	0.68	13,540	1,540	0.87	17,160

See footnotes on p. 58.

Steel Beam Installation (continued)

ASD In-plane Shear (lb.) for (WSWH™) Installed on Steel Beam (continued)

Model No.	Allow. Vertical Load, P (lb.)	Installation on Steel Beam					
		Seismic			Wind		
		Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)
WSWH24x13	1,000	2,375	0.68	18,525	3,020	0.87	23,555
	4,000	2,375	0.68	18,525	3,020	0.87	23,555
	7,500	2,375	0.68	18,525	3,020	0.87	23,555
WSWH18x14	1,000	1,100	0.74	13,200	1,395	0.93	16,740
	4,000	1,100	0.74	13,200	1,395	0.93	16,740
WSWH24x14	1,000	2,150	0.74	18,060	2,735	0.93	22,975
	4,000	2,150	0.74	18,060	2,735	0.93	22,975
WSWH18x16	1,000	920	0.84	12,615	1,165	1.07	15,975
	4,000	920	0.84	12,615	1,165	1.07	15,975
WSWH24x16	1,000	1,800	0.84	17,280	2,285	1.07	21,935
	4,000	1,800	0.84	17,280	2,285	1.07	21,935
WSWH18x18	1,000	750	0.90	11,570	960	1.15	14,810
	4,000	750	0.90	11,570	960	1.15	14,810
WSWH24x18	1,000	1,535	0.95	16,580	1,950	1.20	21,060
	4,000	1,535	0.95	16,580	1,950	1.20	21,060
WSWH18x20	1,000	605	0.91	10,370	770	1.17	13,200
	4,000	605	0.91	10,370	770	1.17	13,200
WSWH24x20	1,000	1,335	1.05	16,020	1,695	1.33	20,340
	4,000	1,335	1.05	16,020	1,695	1.33	20,340

1. Support beam flange thickness for all WSWH panel sizes to be a minimum of 0.4". Minimum F_y steel beam yield strength to be 50 ksi.
2. Allowable vertical load denotes the total maximum vertical load permitted on the panel acting in combination with the allowable shear loads.
3. Allowable shear, drift and anchor tension values may be interpolated for intermediate heights or vertical loads.
4. High-strength anchor bolts are required unless a lower-strength grade is justified by the designer.
5. Drifts at lower design shear may be linearly reduced.
6. Tabulated anchor tension values assume no resisting vertical load. Anchor tension loads at design shear values and including the effect of vertical load may be determined using the following equation:

$$T = [(V \times H) / B] - P/2, \text{ where:}$$

T = Anchor rod tension load (lb.);

V = ASD Design shear load (lb.);

P = Applied vertical load (lb.);

H = Panel height (in.)

B = Moment arm (in.); 8 1/8" for WSWH12, 14" for WSWH18, 20" for WSWH24

Back-to-Back Installations on Concrete Foundations

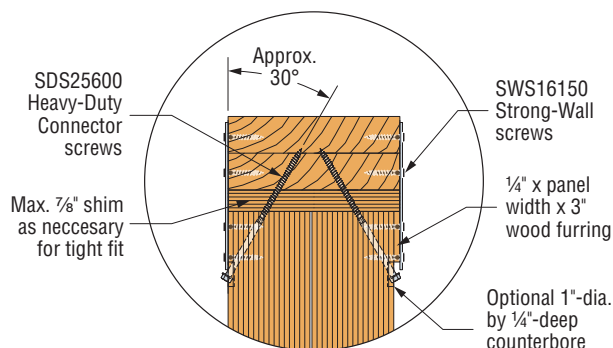
The Strong-Wall high-strength wood shearwall may be installed in a back-to-back orientation in residential, multi-family and light-commercial applications for cases where maximum allowable loads are required and a moment frame might otherwise be specified. The allowable loads for back-to-back installations may be taken as twice those listed for standard applications in the table on pp. 40–41. Double 2x8 or 2x10 top plates are required for standard applications and a minimum 7" x 11¼" header is required for single- or double-portal applications depending upon loading and span requirements. Back-to-back anchorage solutions for spread footings and reinforced grade beam foundations are provided in detail sheets SWH1.2 and SWH1.3, and may be downloaded in PDF, DWG or DXF format at strongtie.com.

Codes: ICC-ES ESR-2652; City of LA Building Code Supplement; State of Florida FL5113

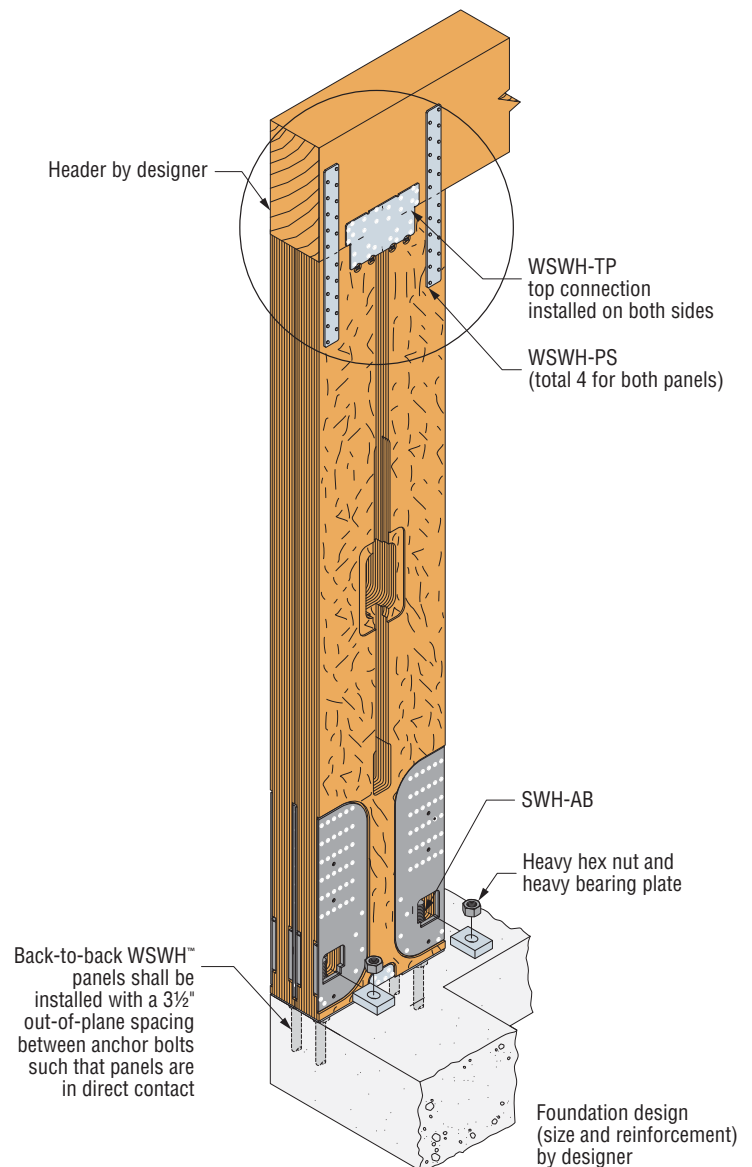
For product data and naming scheme information, see pp. 38–39.

Installation

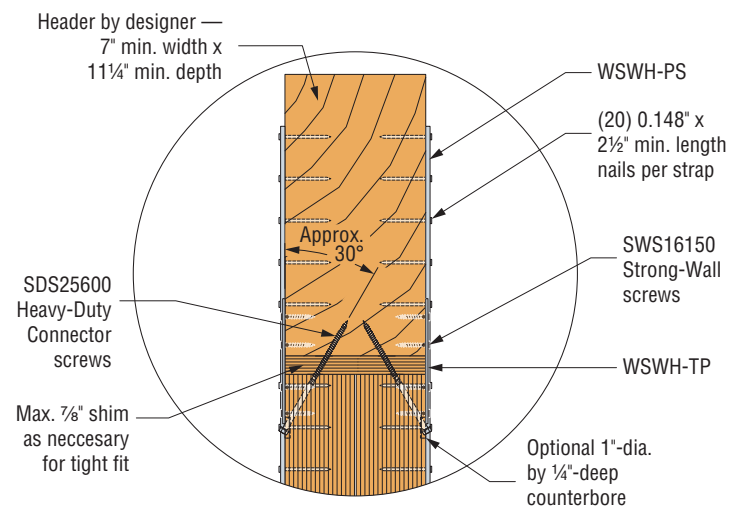
- See p. 93 for back-to-back spacer template.
- Portal-frame connection kit is required for portal frame applications (one WSWH-PK kit required for both panels; straps installed on outside panel faces only).
- Allowable out-of-plane loads listed on p. 42 for single-story walls on concrete foundations shall apply and may not be increased.
- See garage header rough opening height table on p. 43.
- All panels may be field trimmed to a minimum of 74½". Trim height from top of panel only, do not trim from sides or bottom. Drilling holes in the Strong-Wall high-strength wood shearwalls is not permitted except as shown on p. 69.
- Anchor bolt nuts should be finger tight plus ½ turn.
- Maximum shim thickness between the shearwall and top plates or header is ⅞". For additional thicknesses, see detail 9/WSWH2 on p. 68.
- Top connection installs with a combination of ¼" x 6" SDS Heavy-Duty Connector screws and SWS16150 Strong-Wall screws. See details 7/WSWH2 on p. 66 and 3/WSWH4 on p. 75 for standard and portal applications, respectively.



Top Connection for
Back-to-Back Standard Installation



Back-to-Back Portal Installation
(Standard Installation Similar)



Top Connection for
Back-to-Back Portal Installation

Two-Story Nonstacked Application

Simpson Strong-Tie offers solutions for two-story nonstacked applications with the Strong-Wall high-strength wood shearwall (WSWH™). This solution allows for the installation of WSWH panels on the second floor without requiring a directly stacked panel below based on full scale testing. The first option is WSWH stagger-stack installation with stacking panel below, and the second option is installing the WSWH with two supporting posts below (Lateral shear transfer at the first story is the responsibility of the designer). The second-story panels are the same WSWH18 and WSWH24 models used for standard concrete applications. They are connected to the first-story post or panel using a two-story nonstacked connection kit. Anchor rods span the floor system to facilitate this connection. In addition, WSWH shear-transfer plate (STP), heavy hex compression nuts and solid blocking are installed beneath the second story panel. Width-specific WSWH shear-transfer plate is placed over the anchor rods and under the second story panel, and the connection is made with 0.148" x 2½" min. length nails. A minimum 1.3E TimberStrand LSL wood post measuring 3½" x 5½" is required and is installed into concrete using WSWH-MSKHD holdown and 1" ASTM A193 Grade B7 threaded rods.

ASD In-Plane Shear (lb.) for WSWH Two-Story Nonstacked Application

Model No.	Panel Evaluation Height, H_e (in.)	Two-Story Nonstacked Application					
		Seismic ²			Wind		
		Allowable ASD Shear Load, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)	Allowable ASD Shear, V (lb.)	Drift at Allowable Shear, Δ (in.)	Anchor Tension at Allowable Shear, T (lb.)
WSWH18x7	78	585	0.34	3,260	745	0.43	4,150
WSWH24x7	78	925	0.34	3,610	1,170	0.43	4,565
WSWH18x8	93¼	480	0.42	3,195	610	0.53	4,065
WSWH24x8	93¼	925	0.42	4,315	1,175	0.53	5,480
WSWH18x9	105¼	480	0.42	3,195	610	0.53	4,065
WSWH24x9	105¼	925	0.42	4,315	1,175	0.53	5,480
WSWH18x10	117¼	355	0.53	2,975	450	0.67	3,770
WSWH24x10	117¼	685	0.53	4,015	870	0.67	5,100
WSWH18x11	129¼	315	0.57	2,865	400	0.73	3,625
WSWH24x11	129¼	605	0.57	3,860	770	0.73	4,910
WSWH18x12	144	265	0.63	2,725	335	0.80	3,445
WSWH24x12	144	510	0.63	3,670	650	0.80	4,680
WSWH18x13	156	240	0.68	2,655	305	0.87	3,375
WSWH24x13	156	465	0.68	3,600	590	0.87	4,565
WSWH18x14	168	215	0.74	2,580	275	0.93	3,300
WSWH24x14	168	420	0.74	3,530	530	0.93	4,450

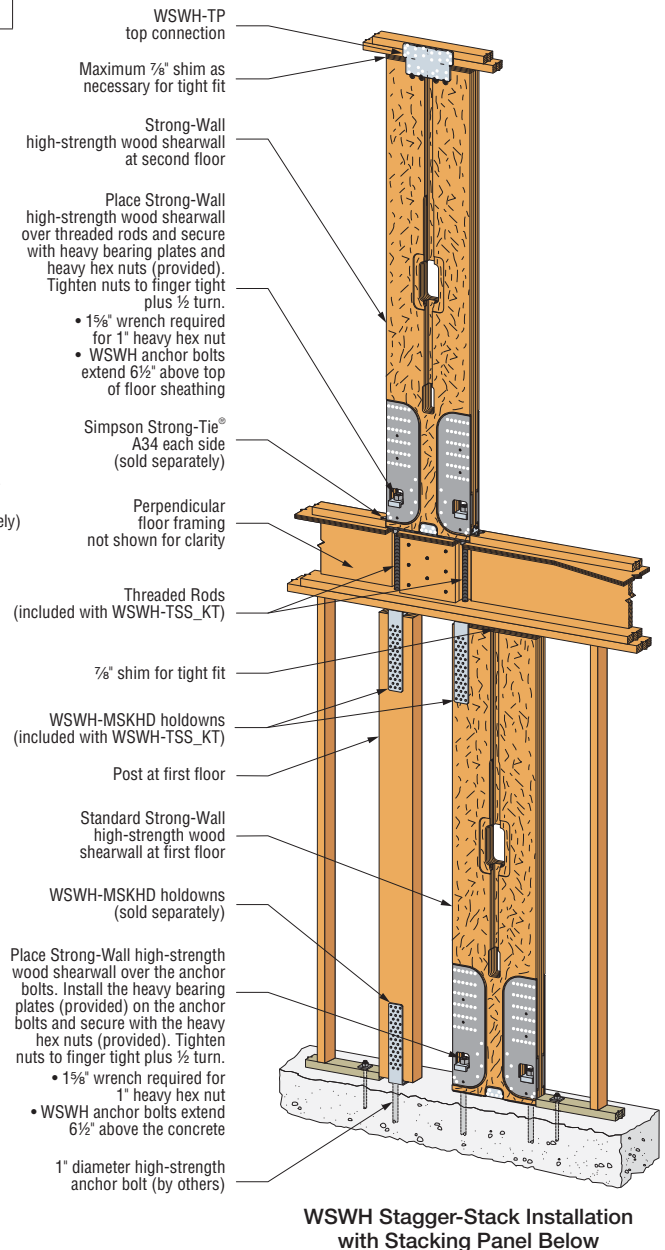
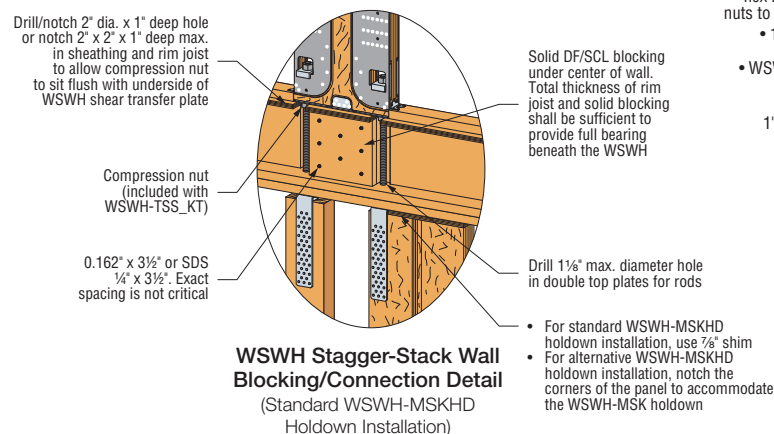
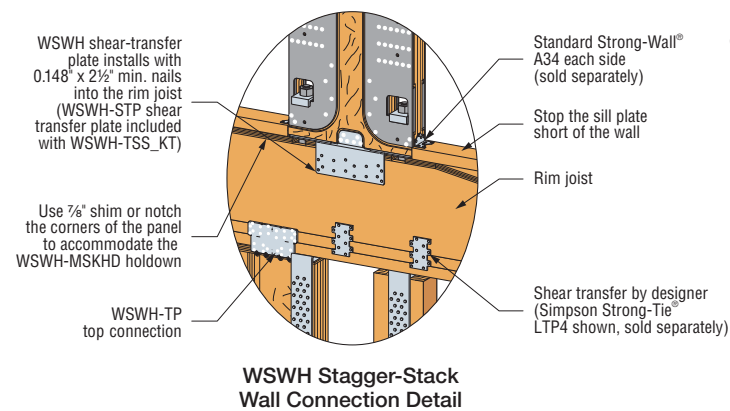
1. Allowable base moment and anchor tension are applicable to installation on concrete foundations with minimum $f'_c = 2,500$ psi using the ASD basic (2024 IBC Section 1605.1) or the alternative basic (2024 IBC Section 1605.2) load combinations. Load values include evaluation of anchor rod compression at second story and bearing stresses at foundation.
2. For seismic design based on 2024 IBC using $R = 6.5$. For other codes, use the seismic coefficients corresponding to light-frame bearing walls with wood structural panels or sheet steel panels.
3. Allowable shear, drift, and base moment values may be interpolated for intermediate heights.
4. Loads are based on a 2,000 lb. maximum uniformly distributed total axial load acting on the second-story panel and a 4,000 lb. maximum uniformly distributed total axial load acting on the first-story panel in combination with the tabulated shear load and base moment.
5. The allowable second-story shear loads assume a maximum floor joist depth of 18".
6. A two-story nonstacked connection kit is required to attach the second-story panel to first-story panel or 1.3E TimberStrand LSL wood post 3½" x 5½" min.
7. The designer is responsible for resolving the load path for wall shear to the first story and then foundation.
8. High-strength anchor bolts are required at the second-story wall unless a lower-strength grade is justified by the designer. See pp. 85-87 for SWH-AB anchor bolt information and anchorage solutions.
9. WSWH-MSKD and high-strength anchor rods are required at the first-story posts to be installed into concrete.

Two-Story Nonstacked Application (continued)

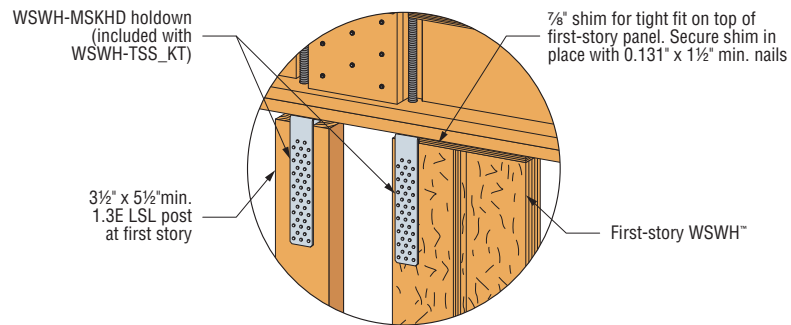
Strong-Wall WSWH™ Two-Story Nonstacked Wall Hardware

Wall Width (in.)	Model No.	Contents
18	WSWH-TSS18KT	(1) Shear transfer plate (2) Multi-story kit holdowns (2) 1" x 30" threaded rods (ASTM A193 B7)
24	WSWH-TSS24KT	(2) Heavy hex nuts Installation Instructions: L-L-WSWHTSNS

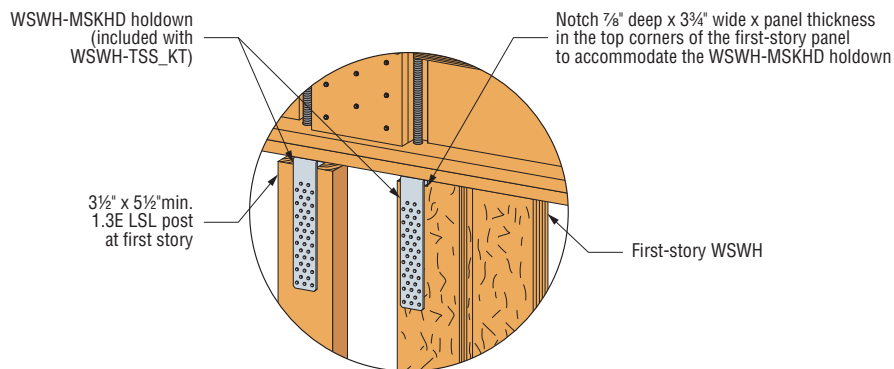
1. Order WSWH-MSKHD for post base separately.



Two-Story Nonstacked Application (continued)

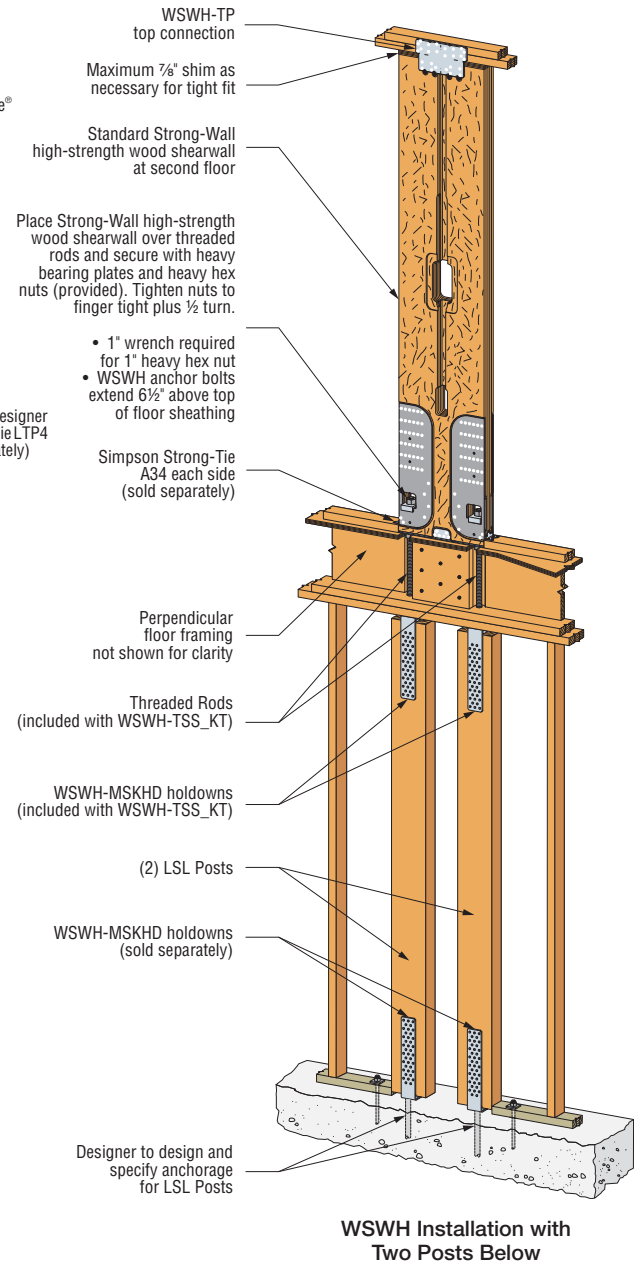
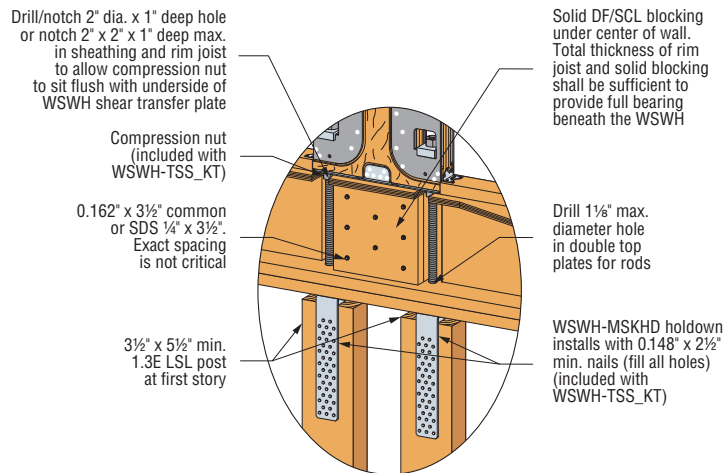
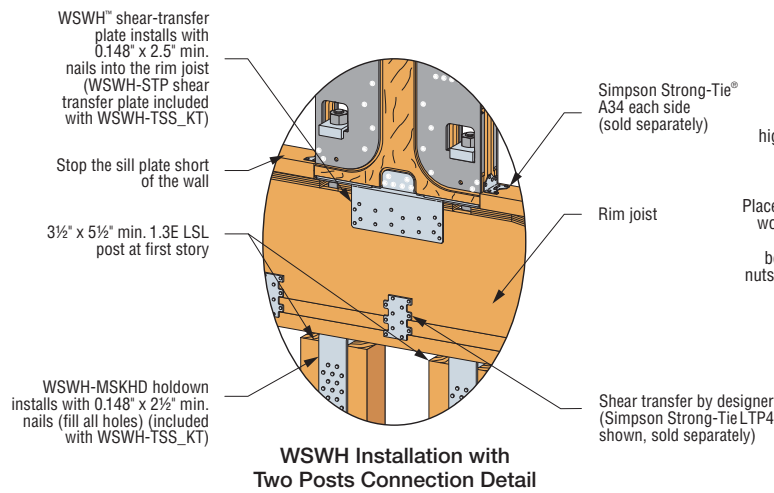


**Standard WSWH-MSKHD
Holdown Installation**

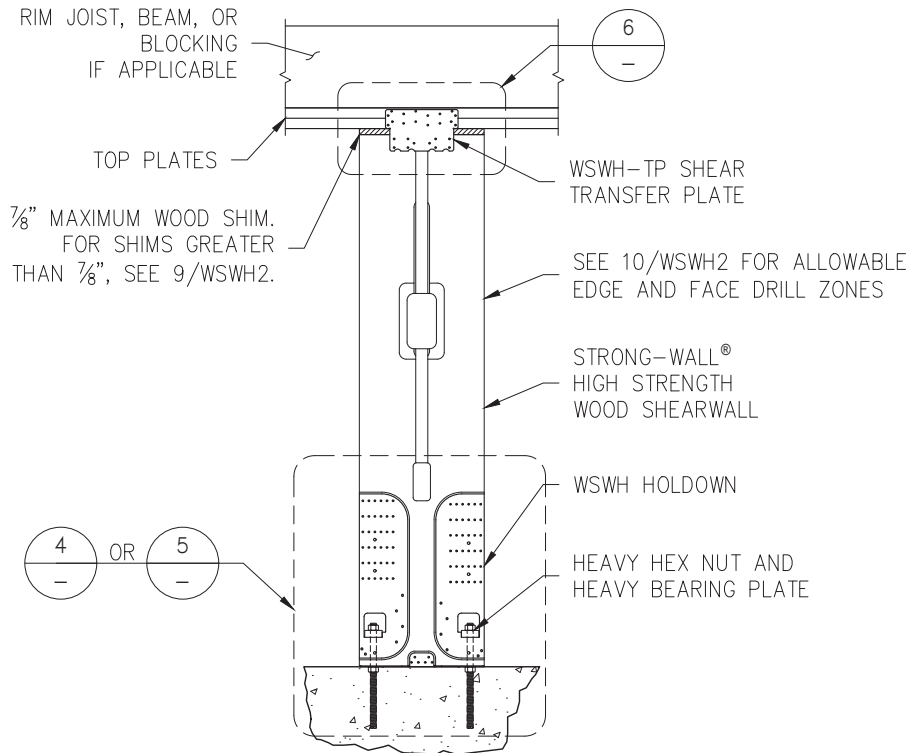


**Alternative WSWH-MSKHD
Holdown Installation
(With Notched Panel)**

Two-Story Nonstacked Application (continued)



Wood Shearwall Structural Details

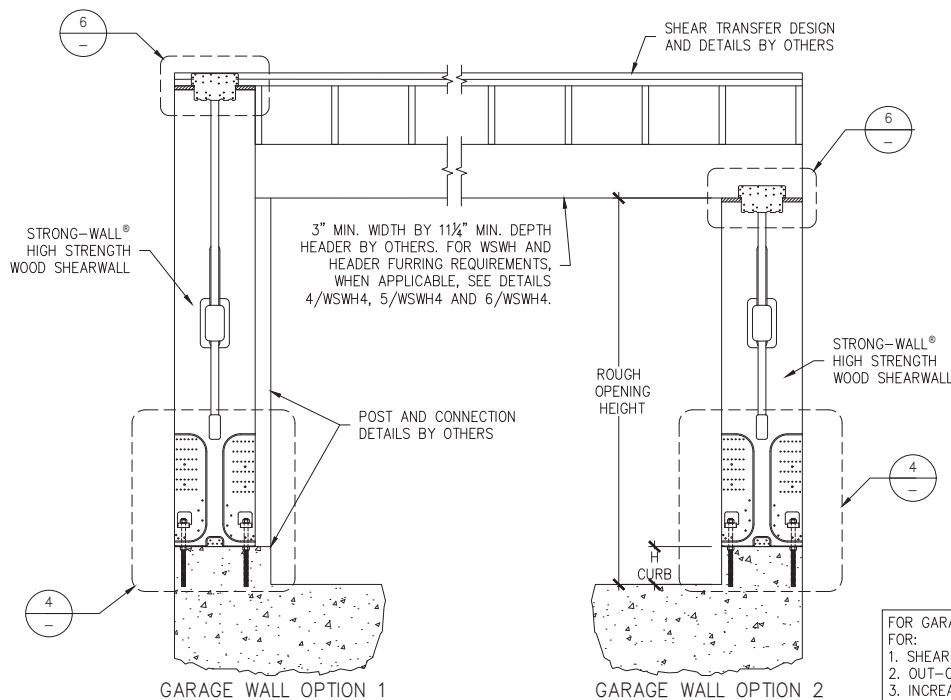


DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.

ENSURE CONCRETE IS LEVEL AND SMOOTH BENEATH PANEL. GRIND OR FILL AS NECESSARY.

SINGLE-STORY WSWH™ ON CONCRETE

2/WSWH2



DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.

WHEN WSWH-PS STRAPS OMITTED, ALLOWABLE SHEAR VALUES FOR STANDARD PANEL APPLY.

GARAGE HEADER ROUGH OPENING HEIGHT			
MODEL NO.	TRIMMED PANEL HEIGHT	H CURB	ROUGH OPENING HEIGHT
WSWH12x7 WSWH18x7 WSWH24x7	78"	5½"	6'-11½"
		6"	7'-0"
WSWH12x8 WSWH18x8 WSWH24x8	85½"	0"	7'-1½"
	93¼"	5½"	8'-2¾"
		6"	8'-3¼"

NOTES:

- IF REQUIRED ROUGH OPENING HEIGHT EXCEEDS TABLE VALUE, SPECIFY NEXT TALLER PANEL AND TRIM AS NECESSARY. THE STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL MAY BE TRIMMED TO A MINIMUM HEIGHT OF 74½".
- FURRING DOWN GARAGE HEADER MAY BE REQUIRED FOR CORRECT ROUGH OPENING HEIGHT.

FOR GARAGE WALL OPTION 2, DESIGNER SHALL DESIGN AND DETAIL FOR:

- SHEAR TRANSFER
- OUT-OF-PLANE LOADING EFFECT
- INCREASED OVERTURNING AND DRIFT DUE TO ADDITIONAL HEIGHT

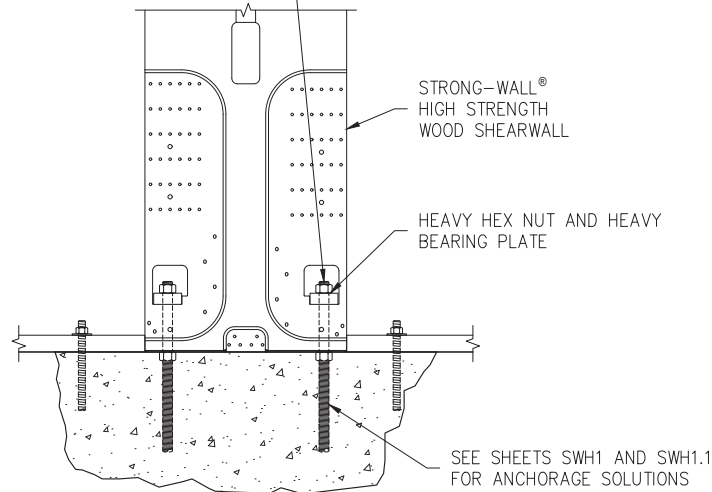
ALTERNATE WSWH™ GARAGE FRONT OPTIONS

3/WSWH2

Wood Shearwall Structural Details (continued)

PLACE STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL OVER THE ANCHOR BOLTS AND SECURE WITH HEAVY BEARING PLATES AND HEAVY HEX NUTS (PROVIDED). DO NOT USE AN IMPACT WRENCH. USE 1½" WRENCH FOR 1" NUT. TIGHTEN ANCHOR NUTS FINGER TIGHT + ½" TURN.

DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.



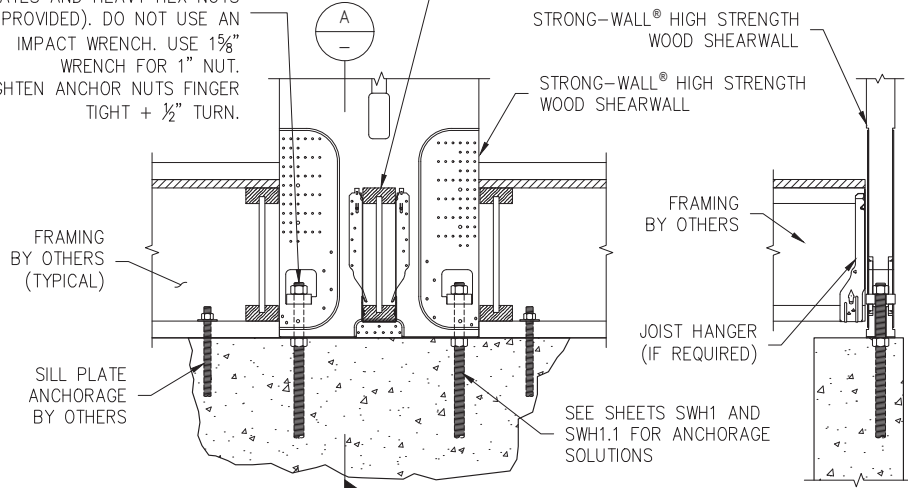
STANDARD INSTALLATION BASE CONNECTION

4/WSWH2

PLACE STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL OVER THE ANCHOR BOLTS AND SECURE WITH HEAVY BEARING PLATES AND HEAVY HEX NUTS (PROVIDED). DO NOT USE AN IMPACT WRENCH. USE 1½" WRENCH FOR 1" NUT. TIGHTEN ANCHOR NUTS FINGER TIGHT + ½" TURN.

* FRAMING BY OTHERS (NOT SHOWN FOR CLARITY)

DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.



STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL HEIGHT TO INCLUDE THE DEPTH OF THE FLOOR SYSTEM AND SHALL BE INSTALLED DIRECTLY ON THE FOUNDATION. SPECIFY PANEL HEIGHT FROM TOP OF FOUNDATION TO UNDERSIDE OF TOP PLATES OR BEAM.

*THIS DETAIL APPLICABLE ONLY FOR WSWH18 & WSWH24. JOISTS MAY NOT FRAME INTO WSWH12 MODELS..

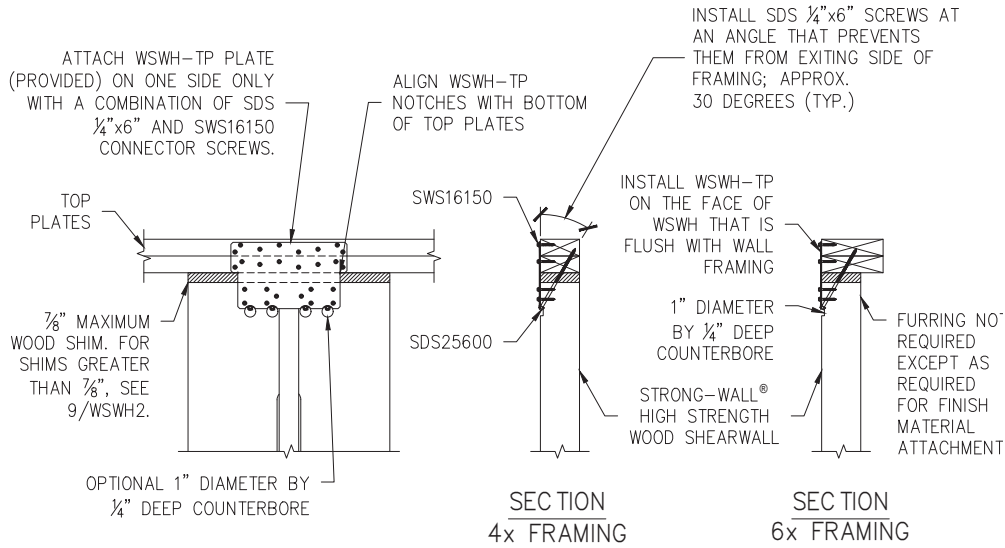
WOOD FLOOR SYSTEM BASE CONNECTION

5/WSWH2

Wood Shearwall Structural Details (continued)

WSWH-TP CONNECTION		
MODEL NO.	FASTENER QUANTITY	
	SWS16150	SDS25600
WSWH-TP12	14	2
WSWH-TP18	26	4
WSWH-TP24	46	8

DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.

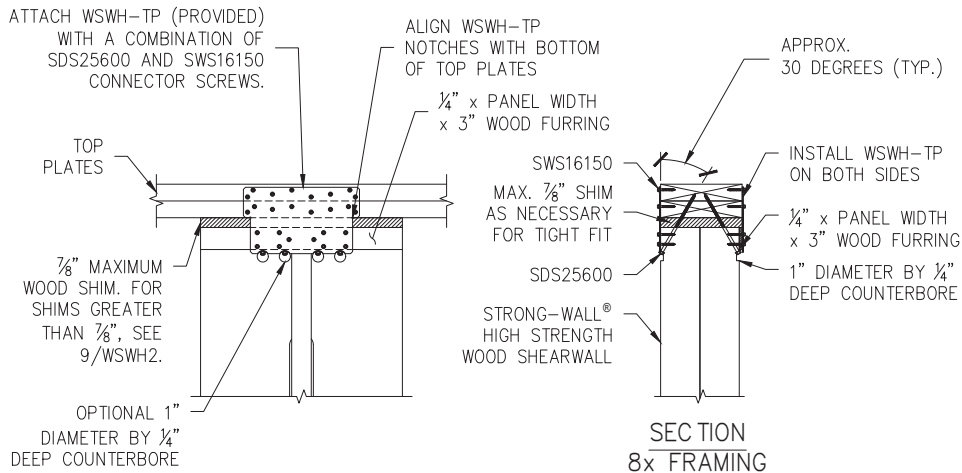


TOP CONNECTION

6/WSWH2

WSWH-TP CONNECTION		
MODEL NO.	FASTENER QUANTITY	
	SWS16150	SDS25600
WSWH-TP12	28	4
WSWH-TP18	52	8
WSWH-TP24	92	16

DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.



BACK-TO-BACK TOP CONNECTION

7/WSWH2

Wood Shearwall Structural Details (continued)

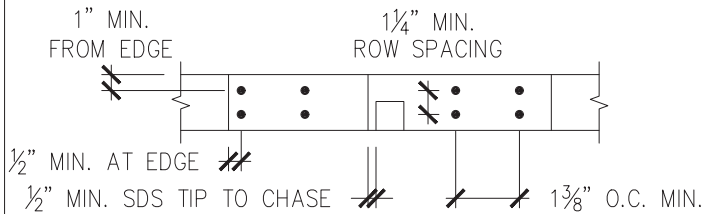
QTY. OF SDS ¼"x6" SCREWS REQ'D.	
WSWH12	4
WSWH18	8
WSWH24	16

DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.

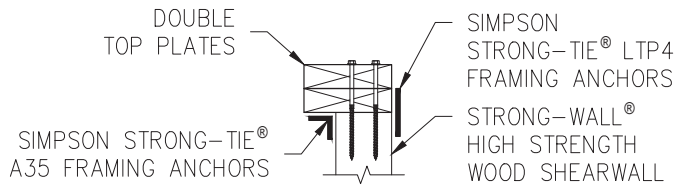
EDGE DISTANCE FOR SCREWS		
SLOPE	A (in.)	B (in.)
0:12-4:12	2	3
5:12-8:12	1½	4½
9:12-12:12	1½	5½

NOTES :

1. MAINTAIN END DISTANCES TO PREVENT SCREWS FROM PENETRATING THROUGH THE OUTER EDGES.
2. INSTALL SCREWS PERPENDICULAR TO THE TOP PLATE.
3. EDGE DISTANCES ASSUME DOUBLE TOP PLATE.

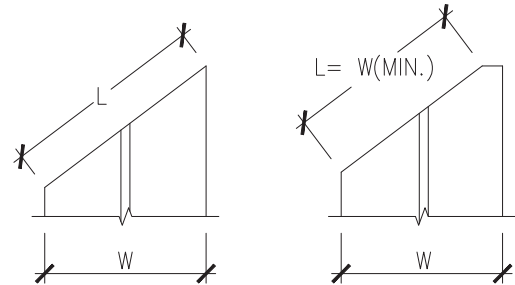
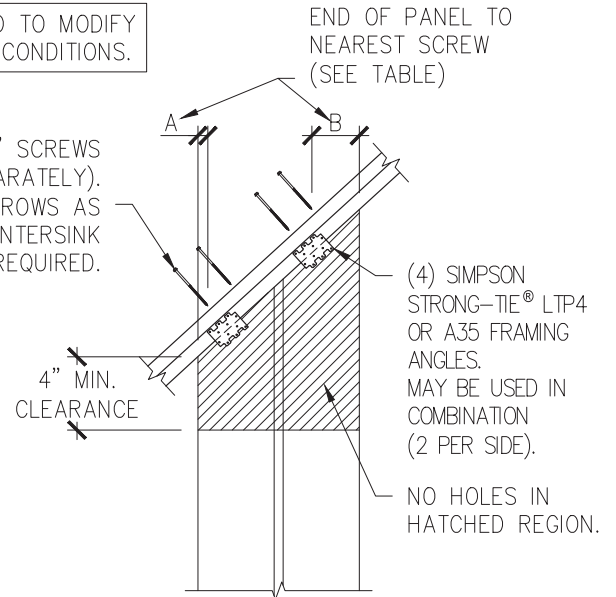


PLAN VIEW
SDS SCREW SPACING



SECTION VIEW
2X6 OR WIDER FRAMING

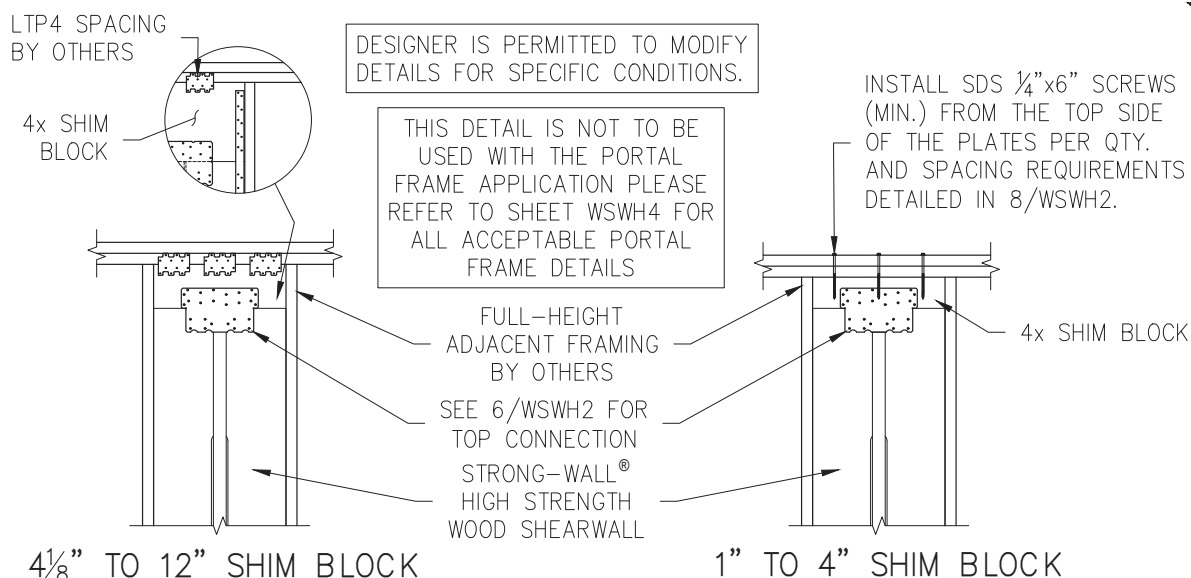
INSTALL SDS ¼"x6" SCREWS (ORDER SEPARATELY).
INSTALL IN 2 ROWS AS SHOWN AND COUNTERSINK AS REQUIRED.



INSTALLATION NOTES :

1. ACTUAL CUT LENGTH (L) MUST BE GREATER THAN OR EQUAL TO PANEL WIDTH (W).
2. THIS DETAIL APPLICABLE FOR SLOPES UP TO 12:12.
3. PANELS TALLER THAN 12' MUST BE DESIGNED FOR THE APPLICATION.

Wood Shearwall Structural Details (continued)



DESIGNER SHALL DESIGN AND DETAIL FOR:

1. SHEAR TRANSFER
2. OUT-OF-PLANE LOADING EFFECT
3. INCREASED OVERTURNING AND DRIFT DUE TO ADDITIONAL HEIGHT

FOR 8" TO 12" BLOCK DEPTHS:

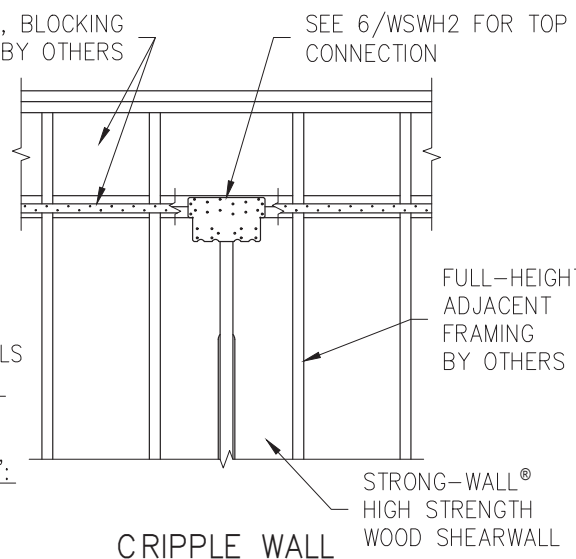
ATTACH SIMPSON STRONG-TIE® CS16 STRAPS AT EDGE OF WSWH PANEL (EACH SIDE) USING 10d x 1 1/2" NAILS

SHIM BLOCK HEIGHTS GREATER THAN 8" AND UP TO 10":

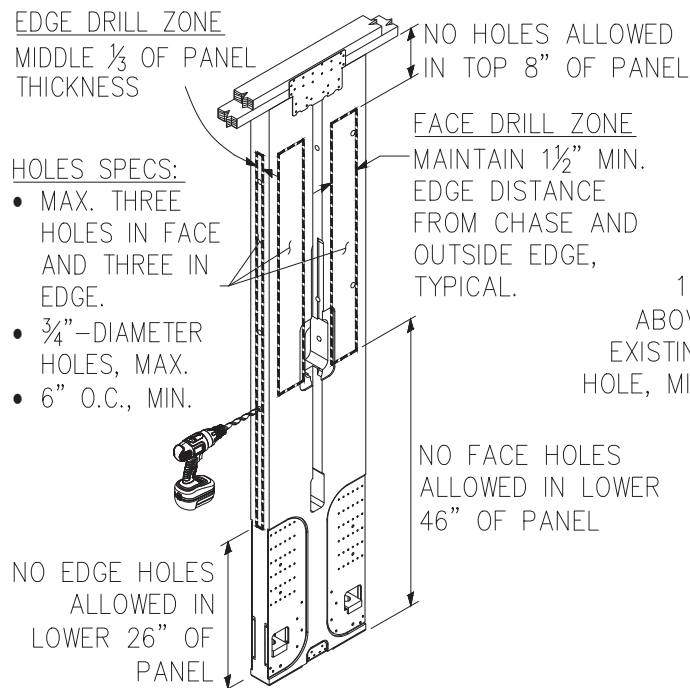
- 8 NAILS INTO BLOCK
- 8 NAILS INTO WSWH PANEL

SHIM BLOCK HEIGHTS GREATER THAN 10" AND UP TO 12":

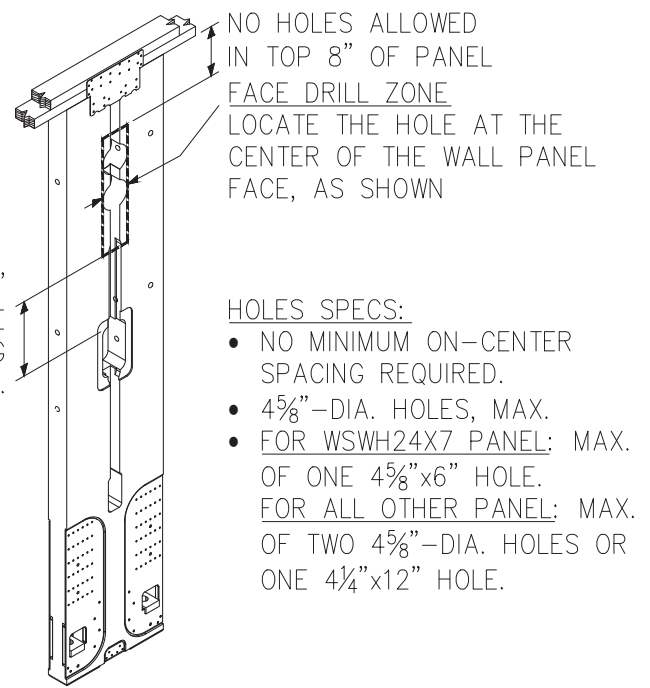
- 10 NAILS INTO BLOCK
- 10 NAILS INTO WSWH PANEL



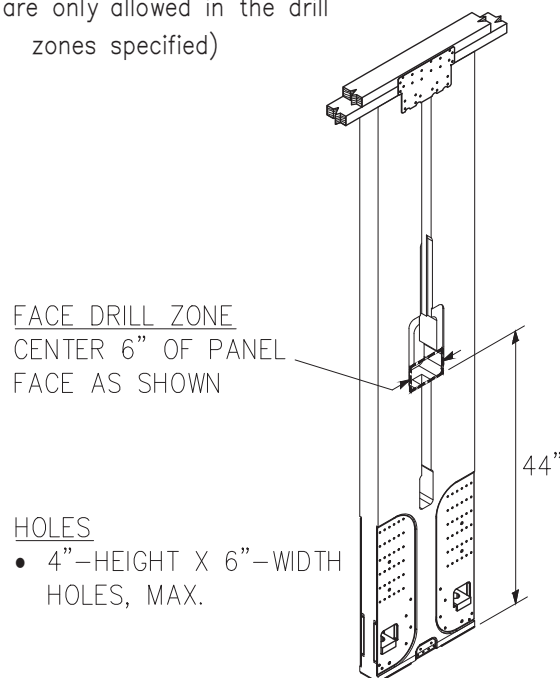
Wood Shearwall Structural Details (continued)

SMALL HOLE REQUIREMENTS
AND DRILL ZONES

(holes are only allowed in the drill zones specified)

LARGE HOLES REQUIREMENTS
AND DRILL ZONES

(holes are only allowed in the drill zones specified)

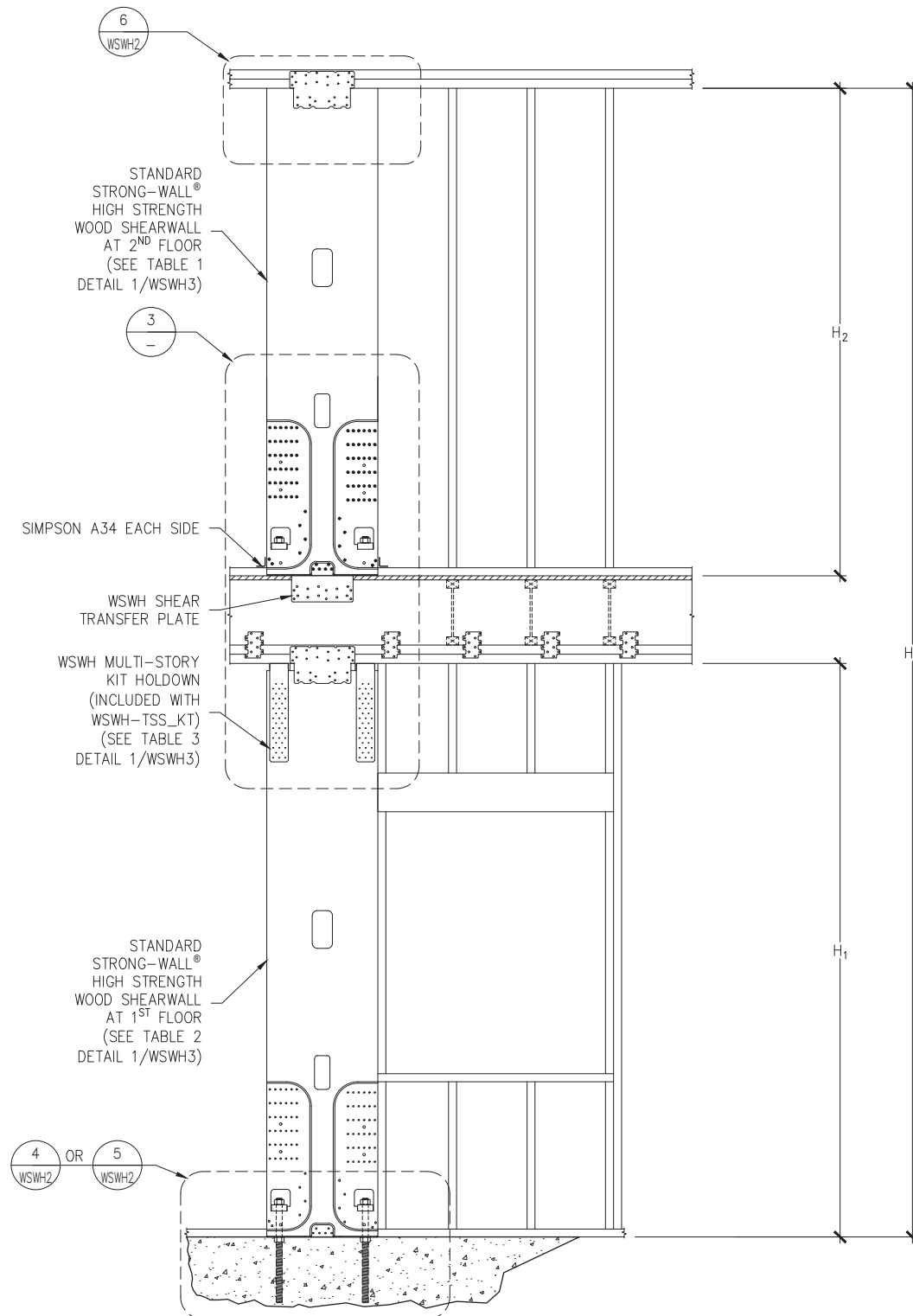
ALLOWABLE LIGHT SWITCH HOLE
FACE DRILL ZONE

MODEL NO.	W (IN.)	REDUCTION FACTORS
WSWH18	18	0.90
WSWH24	24	0.95

NOTES :

1. DO NOT DRILL THE MENTIONED LIGHT SWITCH HOLE IN WSWH12.
2. FOR WSWH18 AND WSWH24, ALLOWABLE SHEAR LOAD MUST BE MULTIPLIED BY THE LOAD REDUCTION FACTOR.

Wood Shearwall Structural Details (continued)

**NOTE:**

1. 1ST STORY WSWH MUST BE THE SAME WIDTH AS THE 2ND STORY WSWH.

DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.

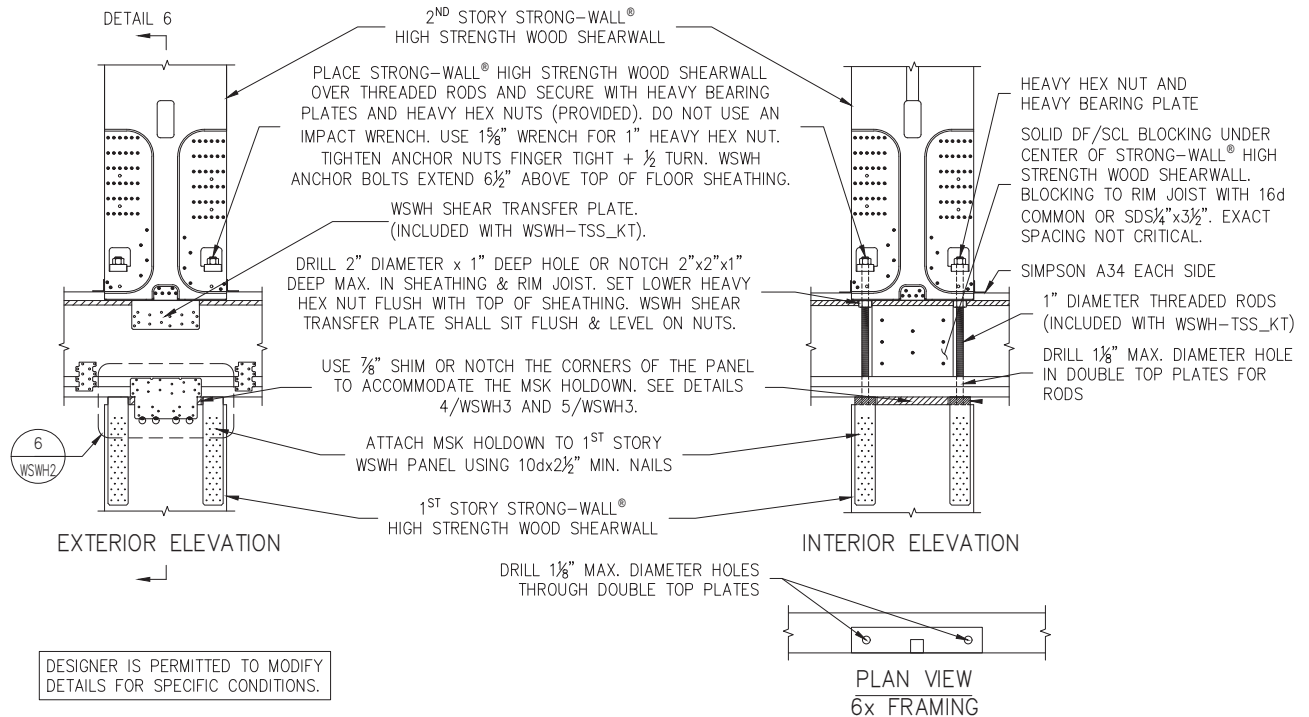
LEGEND :

- H₁ = 1ST STORY WSWH HEIGHT; TOP OF CONCRETE TO UNDERSIDE OF 1ST STORY TOP PLATES (IN.)
- H₂ = 2ND STORY WSWH HEIGHT; TOP OF FLOOR SHEATHING TO UNDERSIDE OF 2ND STORY TOP PLATES (IN.)
- H₃ = TOTAL ASSEMBLY HEIGHT; TOP OF CONCRETE TO UNDERSIDE OF 2ND STORY TOP PLATES (IN.)

TWO-STORY STACKED

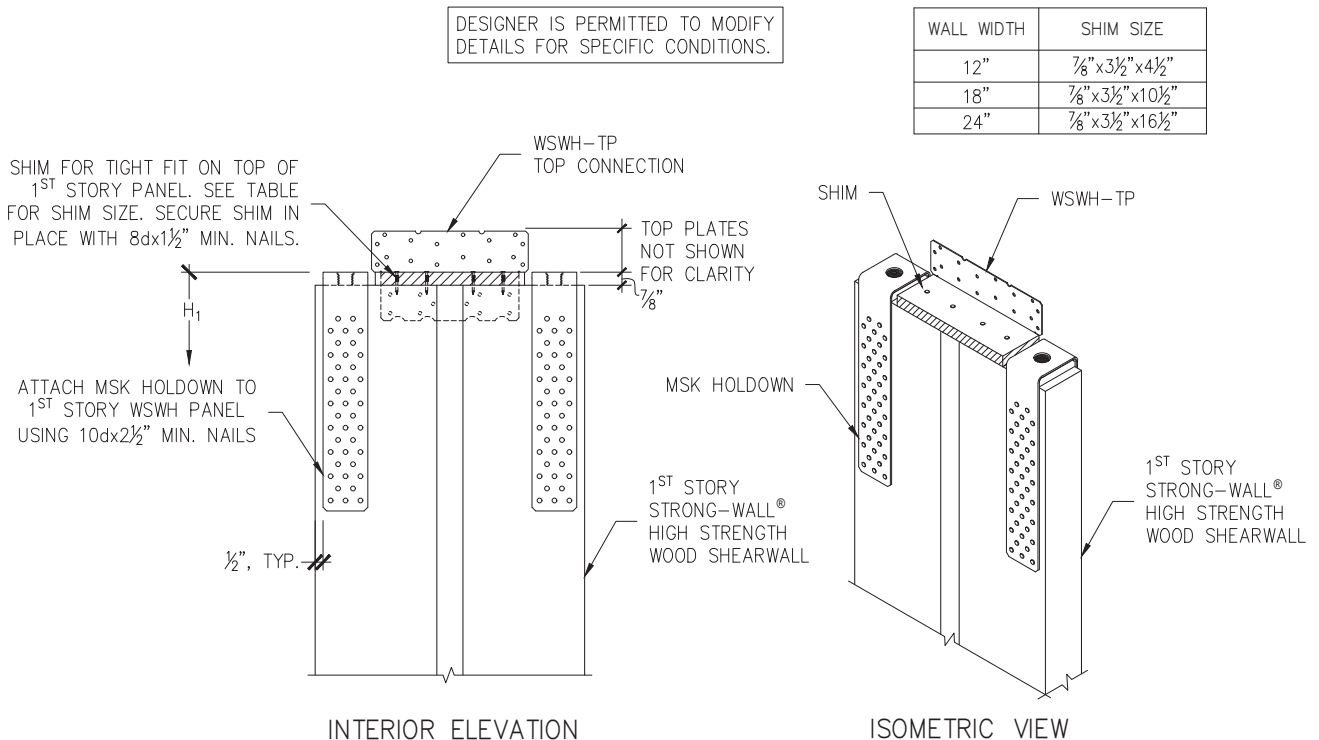
2/WSWH3

Wood Shearwall Structural Details (continued)



TWO-STORY STACKED FLOOR FRAMING

3/WSWH3

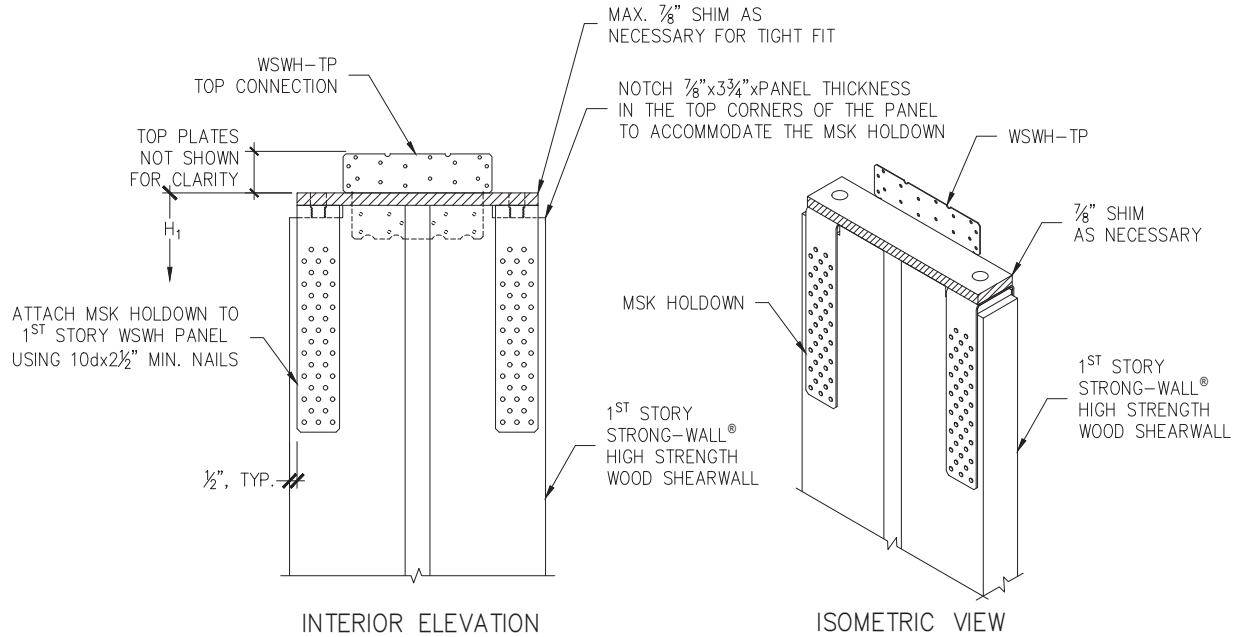


TOP OF FIRST-STORY PANEL CONNECTION

4/WSWH3

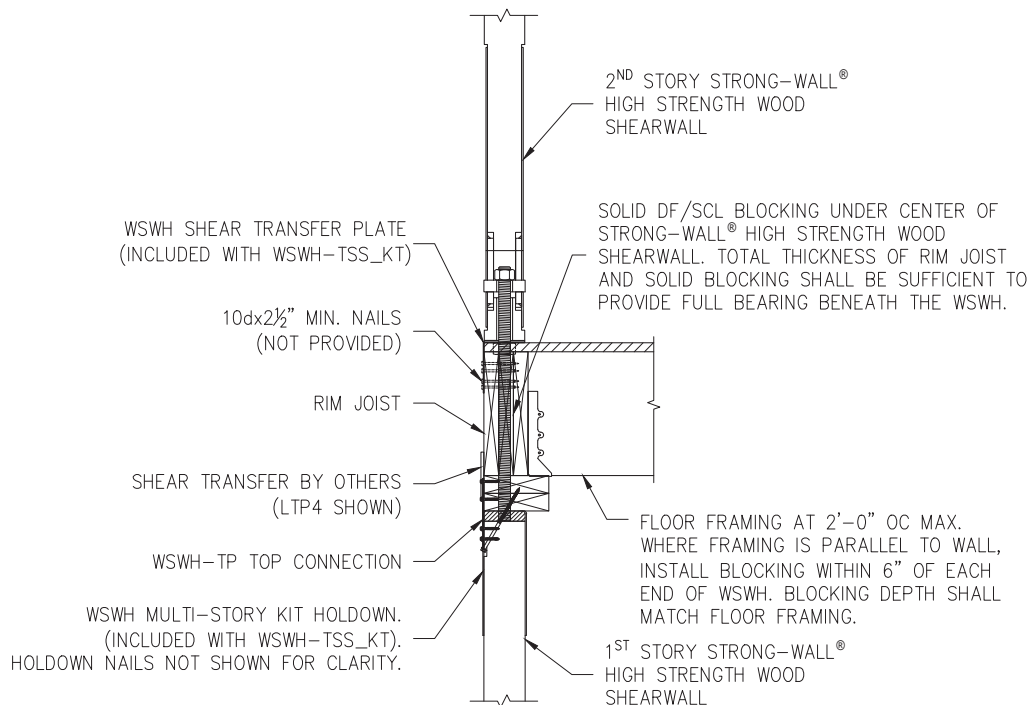
Wood Shearwall Structural Details (continued)

DESIGNER IS PERMITTED TO MODIFY
DETAILS FOR SPECIFIC CONDITIONS.



ALTERNATIVE TOP OF FIRST-STORY PANEL CONNECTION

5/WSWH3

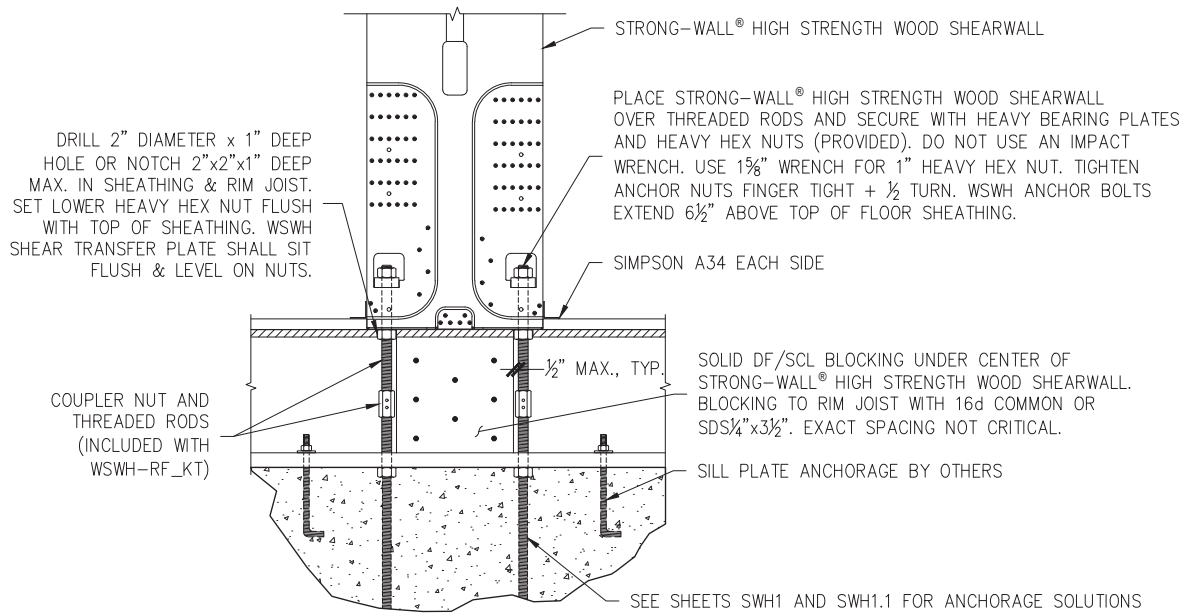


DESIGNER IS PERMITTED TO MODIFY
DETAILS FOR SPECIFIC CONDITIONS.

TWO-STORY STACKED FLOOR SECTION

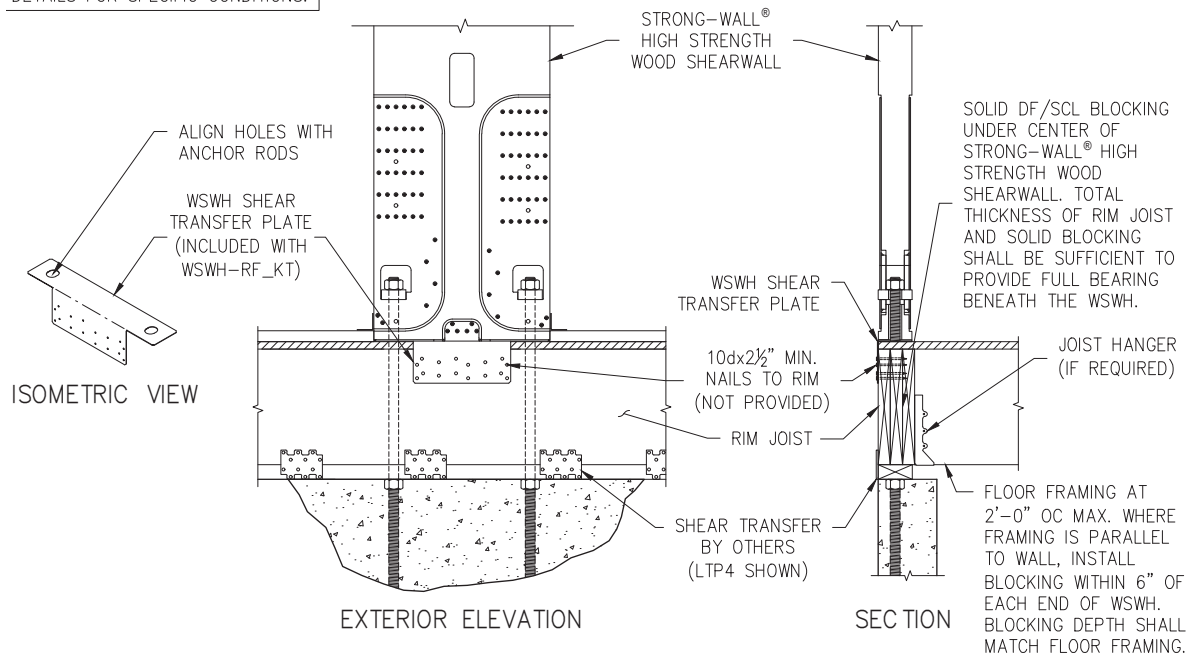
6/WSWH3

Wood Shearwall Structural Details (continued)



INTERIOR ELEVATION

DESIGNER IS PERMITTED TO MODIFY
DETAILS FOR SPECIFIC CONDITIONS.



EXTERIOR ELEVATION

SECTION

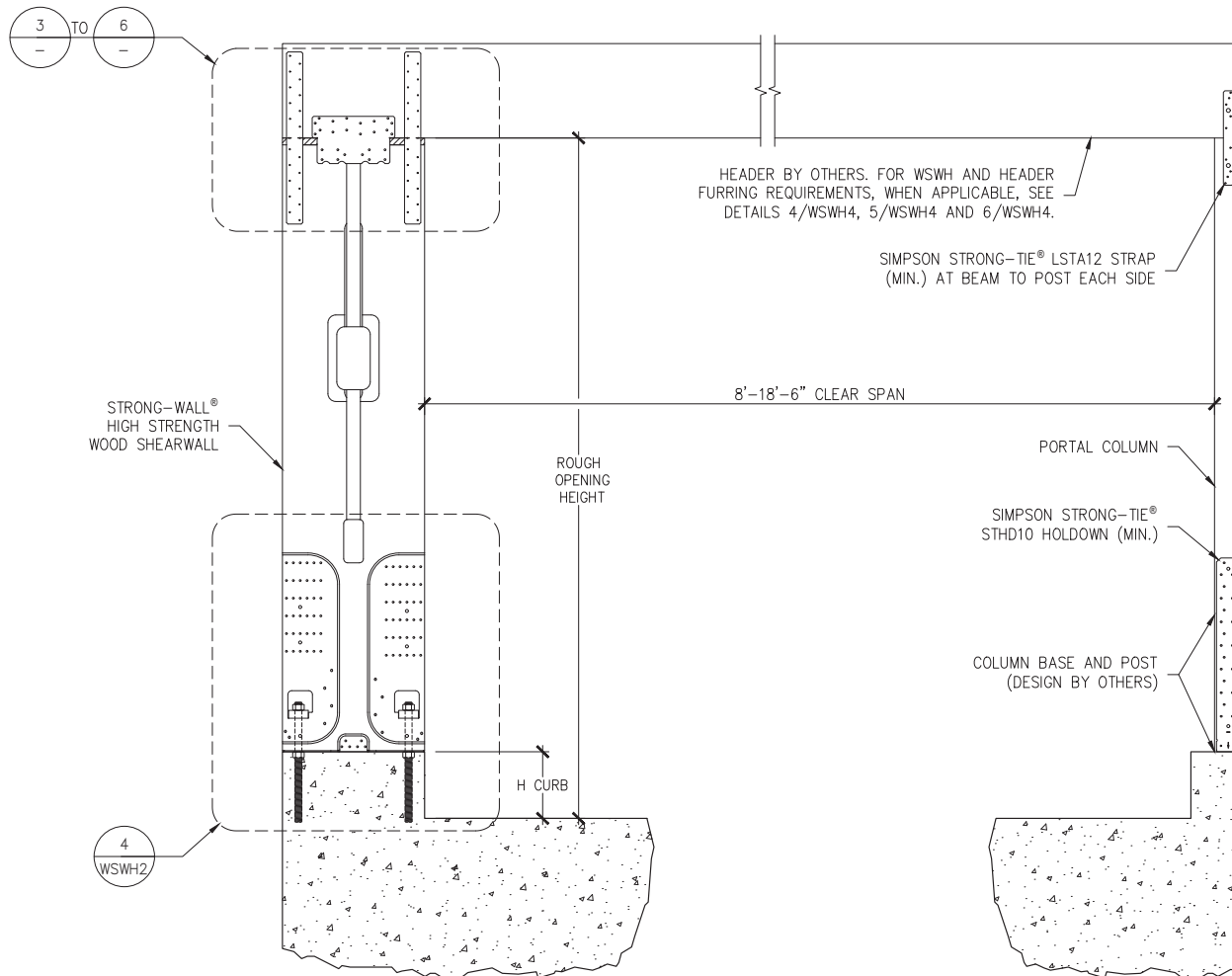
WOOD FIRST-FLOOR WALL CONNECTION KIT

WALL WIDTH (in.)	MODEL NO.	CONTENTS
12	WSWH-RF12KT	EACH KIT CONTAINS: (1) SHEAR TRANSFER PLATE (2) 1" x 18" THREADED RODS (ASTM A193 B7) (2) COUPLER NUTS (2) HEAVY HEX NUTS INSTALLATION INSTRUCTIONS
18	WSWH-RF18KT	
24	WSWH-RF24KT	

ORDER FIRST FLOOR CONNECTION KIT SEPARATELY.
MODEL WSWH-RF_KT. EXAMPLE WSWH-RF18KT

FIRST FLOOR AT WOOD FRAMING NOTES :

1. USE WOOD FIRST-FLOOR ALLOWABLE LOAD TABLES FROM THE STRONG-WALL CATALOG FOR THIS INSTALLATION.
2. USE ALTERNATE DETAIL 5/WSWH2 TO ACHIEVE MAXIMUM ON-CONCRETE ALLOWABLE LOADS.
3. FOR TWO-STORY STACKED STRONG-WALL HIGH STRENGTH WOOD SHEARWALLS WITH WOOD FIRST FLOOR, USE ALTERNATE DETAIL 5/WSWH2.
4. DESIGNER SHALL DESIGN FOR SHEAR TRANSFER FROM RIM JOIST TO SILL PLATE AND SILL PLATE TO FOUNDATION.

Wood Shearwall Structural Details (continued)

GARAGE HEADER ROUGH OPENING HEIGHT

MODEL NO.	TRIMMED PANEL HEIGHT	H CURB	ROUGH OPENING HEIGHT
WSWH12x7 WSWH18x7 WSWH24x7	78"	5½"	6'-11½"
		6"	7'-0"
WSWH12x8 WSWH18x8 WSWH24x8	85½"	0"	7'-1½"
	93¼"	5½"	8'-2¾"
		6"	8'-3¼"

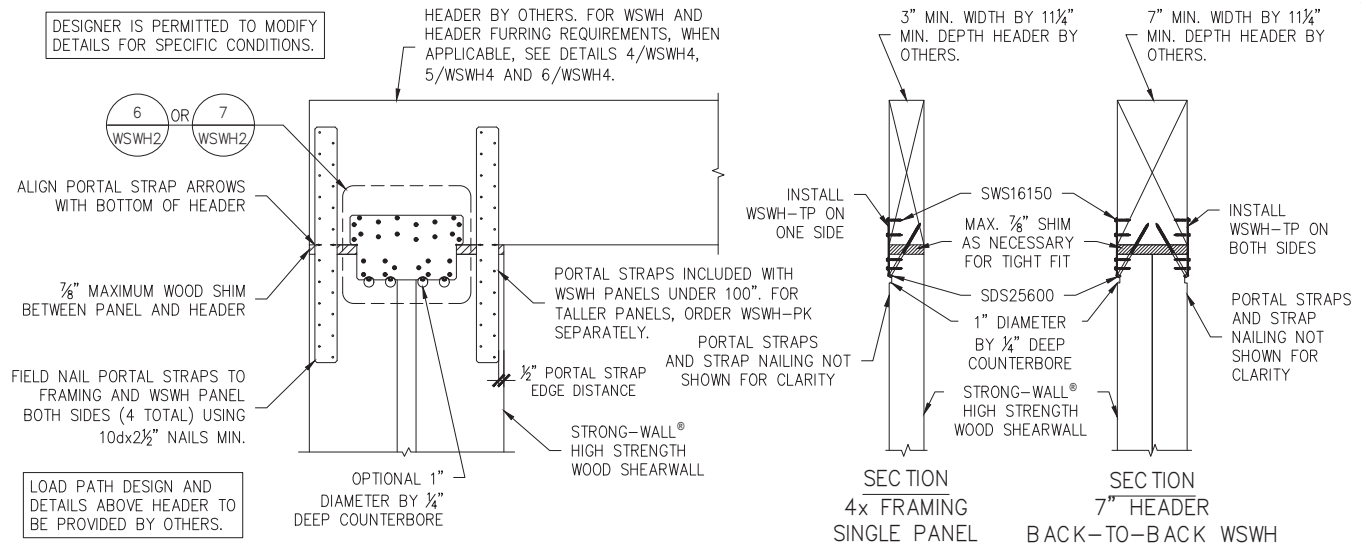
NOTES :

1. IF REQUIRED ROUGH OPENING HEIGHT EXCEEDS TABLE VALUE, SPECIFY NEXT TALLER PANEL AND TRIM AS NECESSARY. THE STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL MAY BE TRIMMED TO A MINIMUM HEIGHT OF 74½".
2. FURRING DOWN GARAGE HEADER MAY BE REQUIRED FOR CORRECT ROUGH OPENING HEIGHT.

DESIGNER IS PERMITTED TO MODIFY
DETAILS FOR SPECIFIC CONDITIONS.

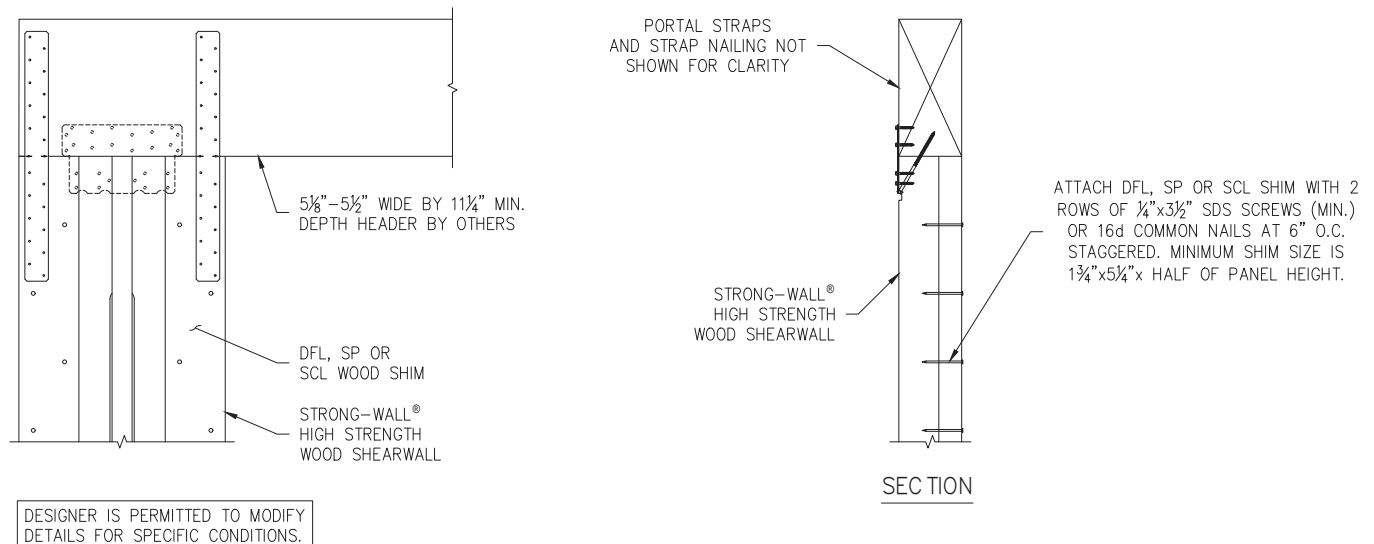
ENSURE CONCRETE IS LEVEL AND
SMOOTH BENEATH PANEL. GRIND OR
FILL AS NECESSARY.

Wood Shearwall Structural Details (continued)



PORTAL TOP CONNECTION

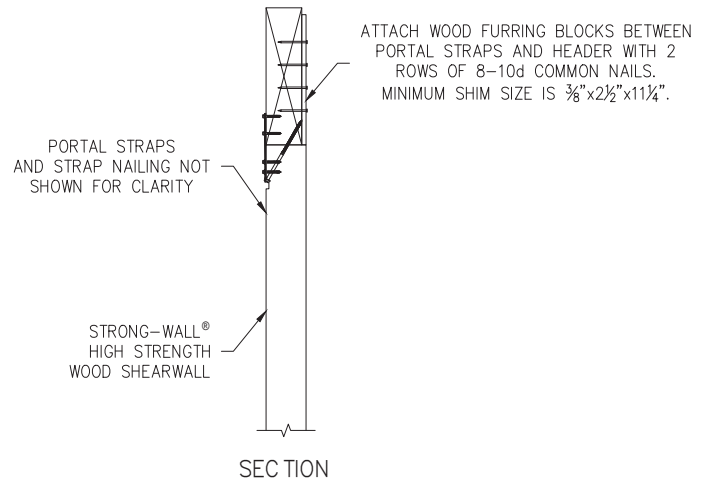
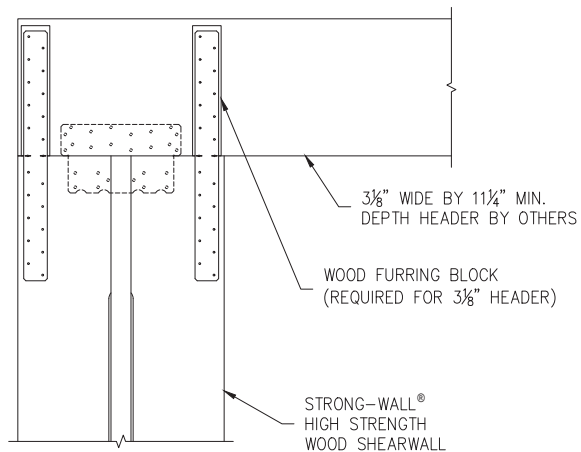
3/WSWH4



FURRING FOR 5 1/8" TO 5 1/2" HEADER

4/WSWH4

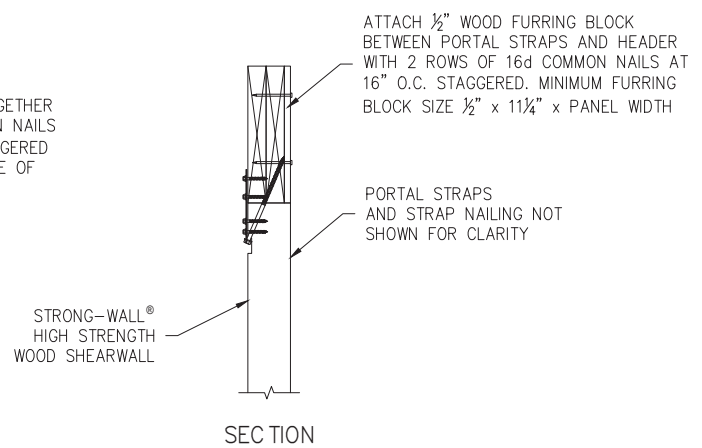
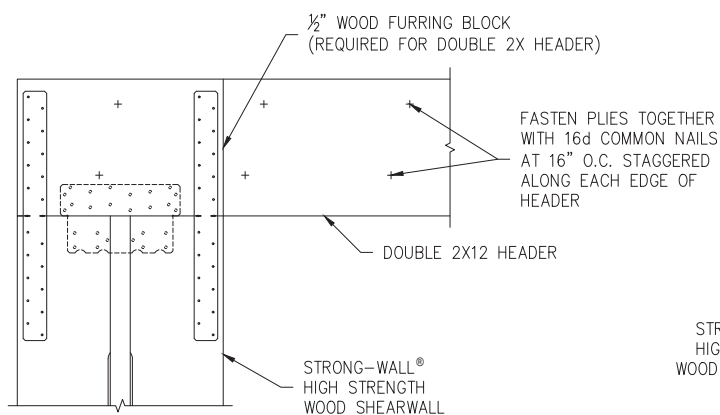
Wood Shearwall Structural Details (continued)



DESIGNER IS PERMITTED TO MODIFY
DETAILS FOR SPECIFIC CONDITIONS.

FURRING FOR 3 1/8" HEADER

5/WSWH4

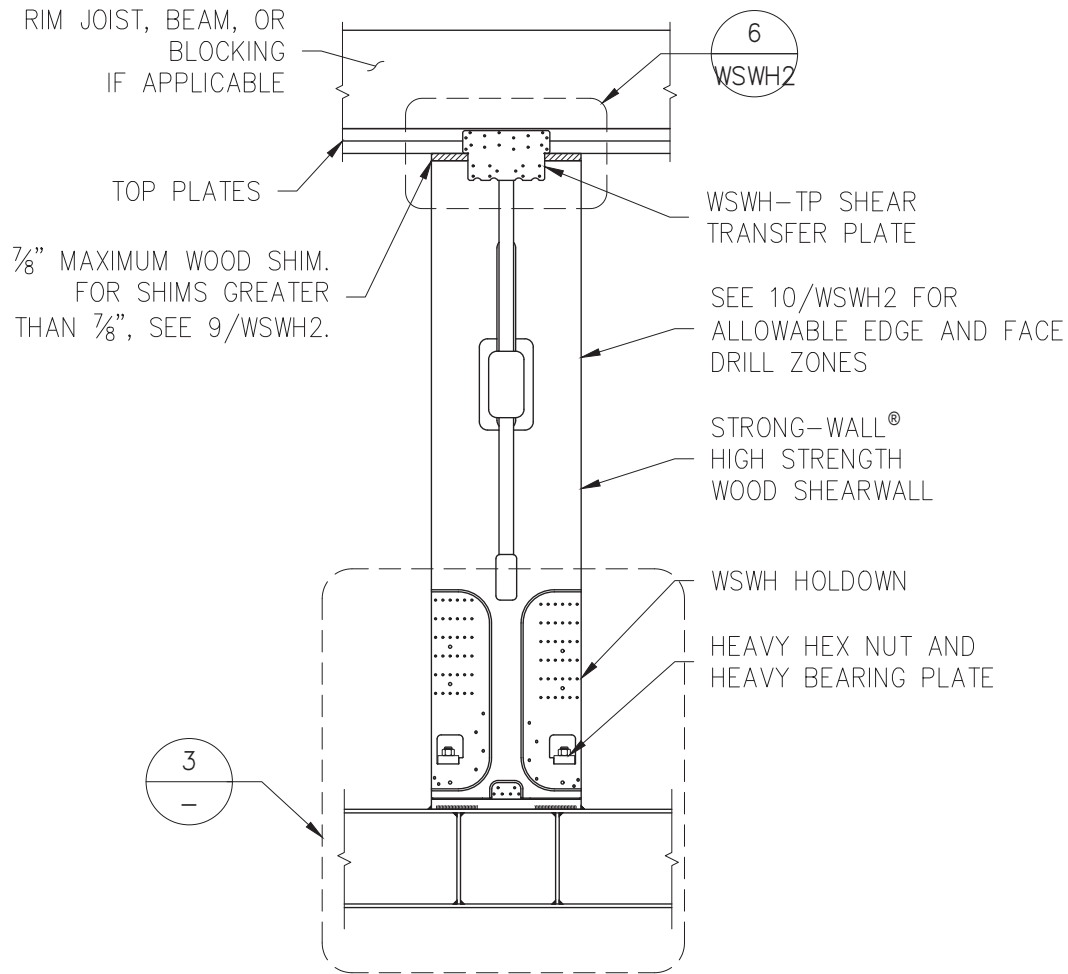


DESIGNER IS PERMITTED TO MODIFY
DETAILS FOR SPECIFIC CONDITIONS.

FURRING FOR DOUBLE 2X12 HEADERS

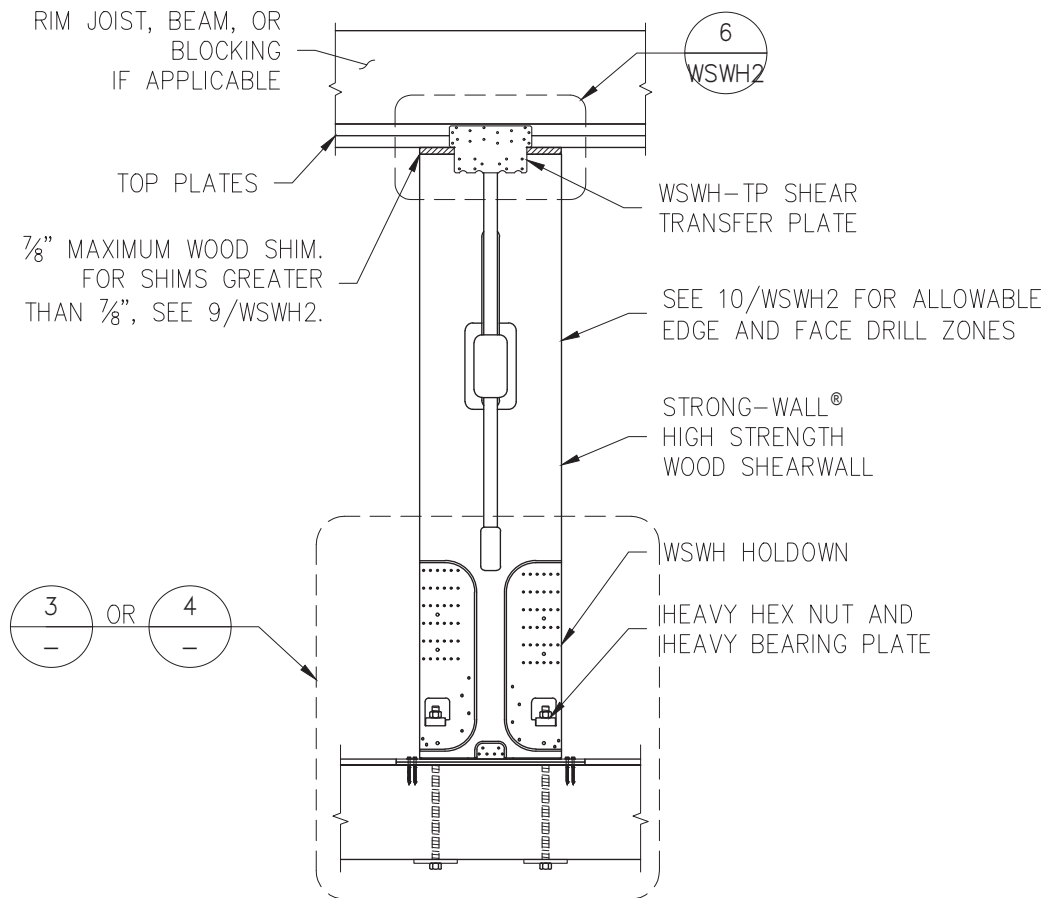
6/WSWH4

Wood Shearwall Structural Details (continued)



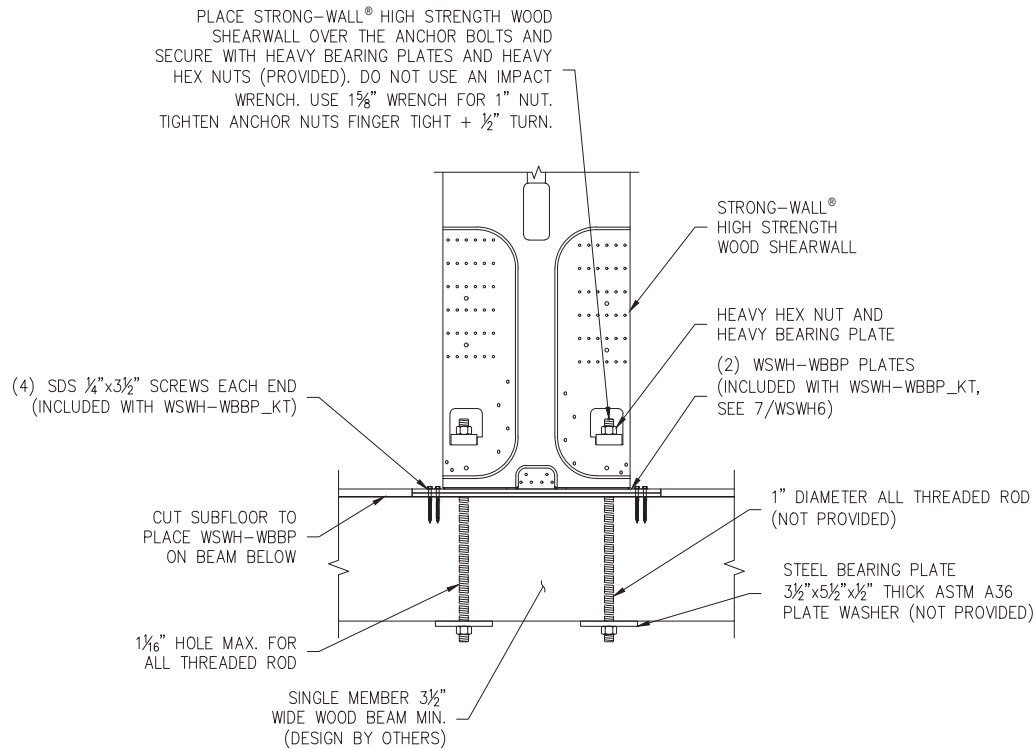
DESIGNER IS PERMITTED TO MODIFY
DETAILS FOR SPECIFIC CONDITIONS.

Wood Shearwall Structural Details (continued)



DESIGNER IS PERMITTED TO MODIFY
DETAILS FOR SPECIFIC CONDITIONS.

Wood Shearwall Structural Details (continued)

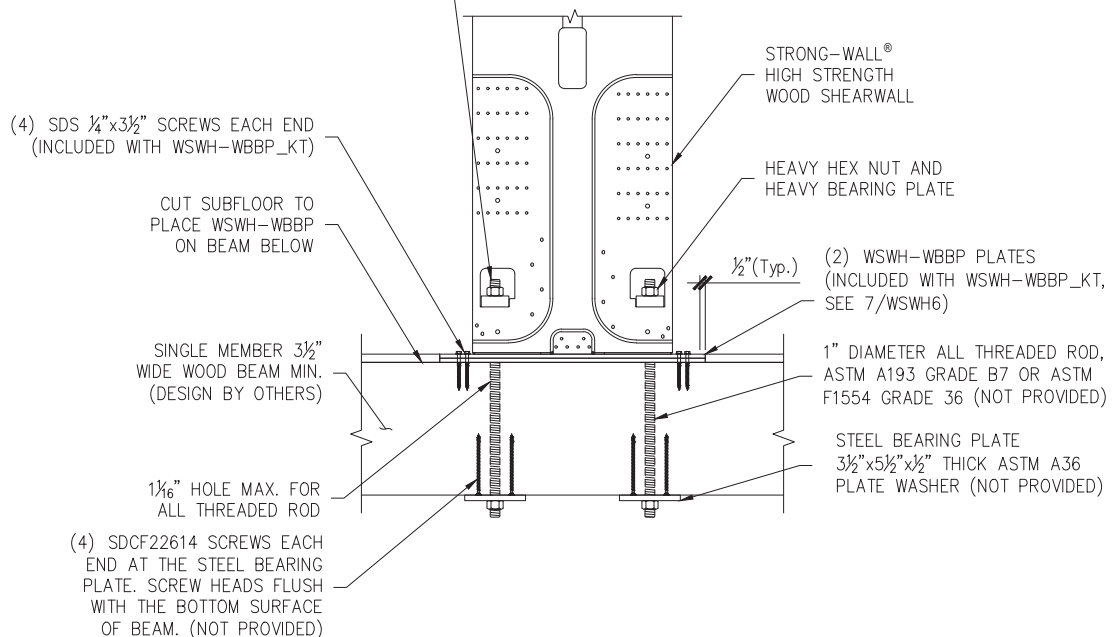


DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.

WSWH™ ON WOOD BEAM CONNECTION

3/WSWH6

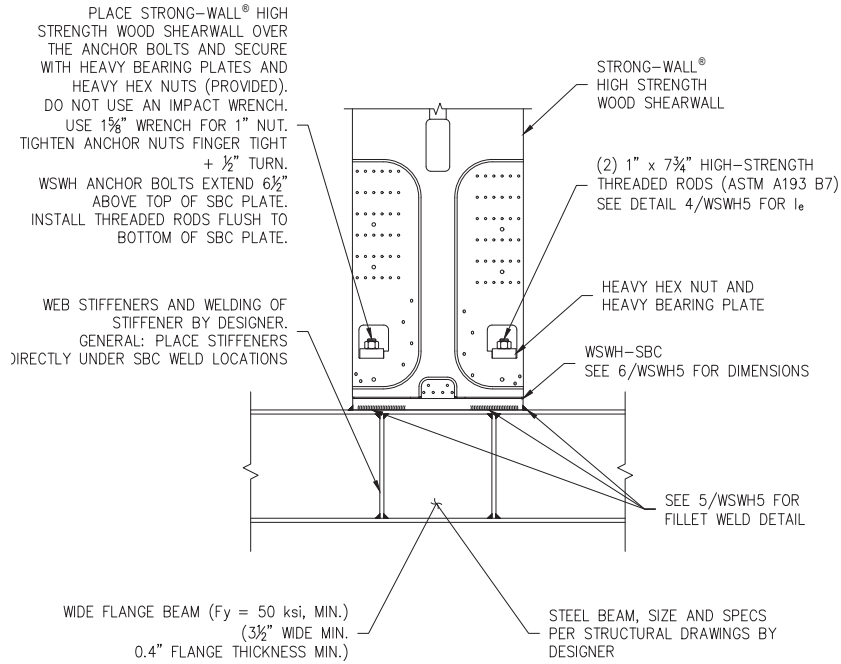
PLACE STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL OVER THE ANCHOR BOLTS AND SECURE WITH HEAVY BEARING PLATES AND HEAVY HEX NUTS (PROVIDED). DO NOT USE AN IMPACT WRENCH. USE $1\frac{1}{8}$ " WRENCH FOR 1" NUT. TIGHTEN ANCHOR NUTS FINGER TIGHT + $\frac{1}{2}$ " TURN.



WSWH ON WOOD BEAM CONNECTION WITH SDCF SCREWS

4/WSWH6

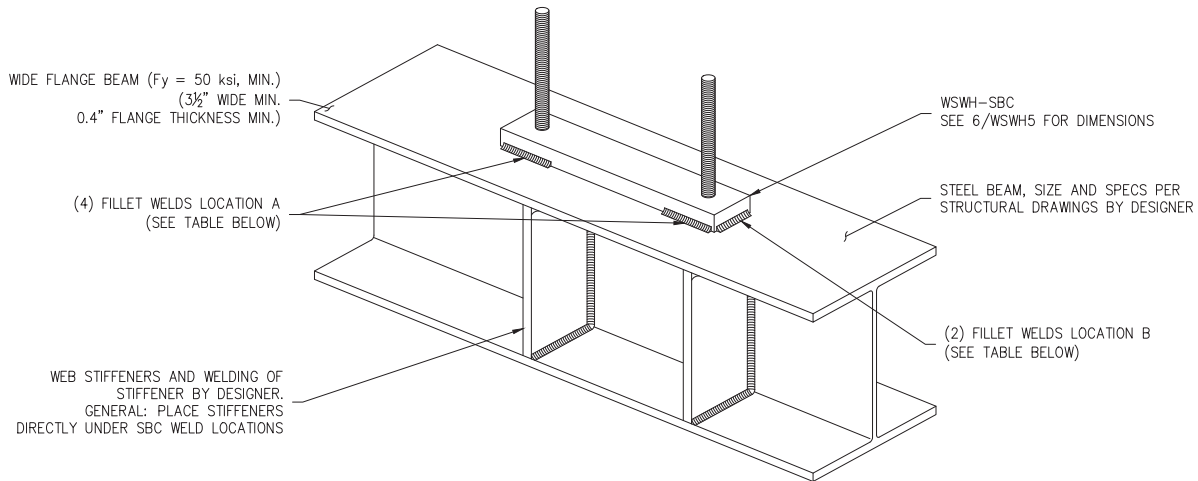
Wood Shearwall Structural Details (continued)



DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.

WSWH™ ON STEEL BEAM BASE CONNECTION

3/WSWH5



WSWH – LAP JOINT FILLET WELD DETAIL

WALL MODEL	SBC PLATE MODEL	FILLET WELD SIZE (in.) x LENGTH (in.)		TOTAL WELD LENGTH (in.)
		LOCATION A	LOCATION B	
WSWH12	WSWH-SBC12-PL	⅝" x 4	⅝" x 3	22
WSWH18	WSWH-SBC18-PL	⅝" x 5	⅝" x 3	26
WSWH24	WSWH-SBC24-PL	⅝" x 5	⅝" x 3	26

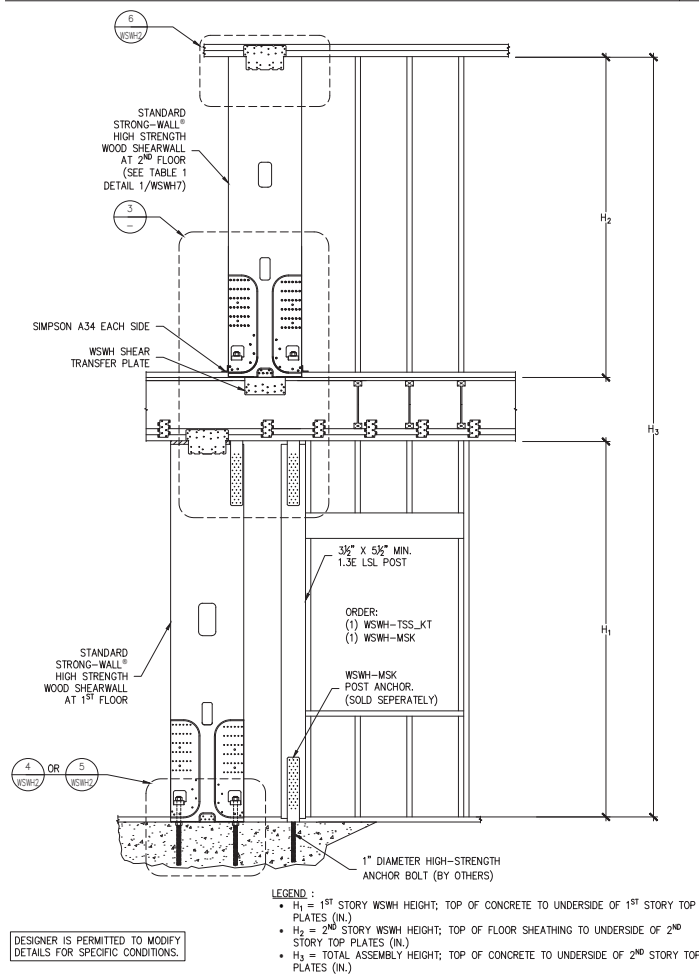
NOTES :

1. TOTAL WELD LENGTH REFERS TO THE LENGTH OF THE WELD FOR BOTH SIDES OF THE WALL.

WSWH ON STEEL BEAM FILLET WELD DETAIL

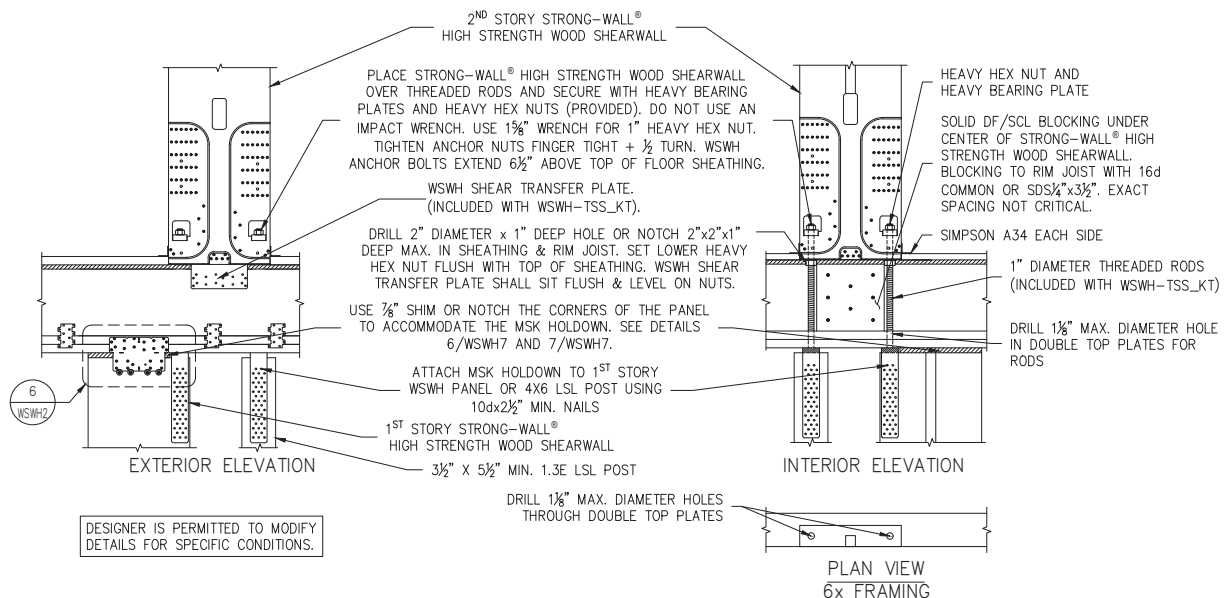
5/WSWH5

Wood Shearwall Structural Details (continued)



TWO-STORY NONSTACKED WITH STACKING PANEL BELOW

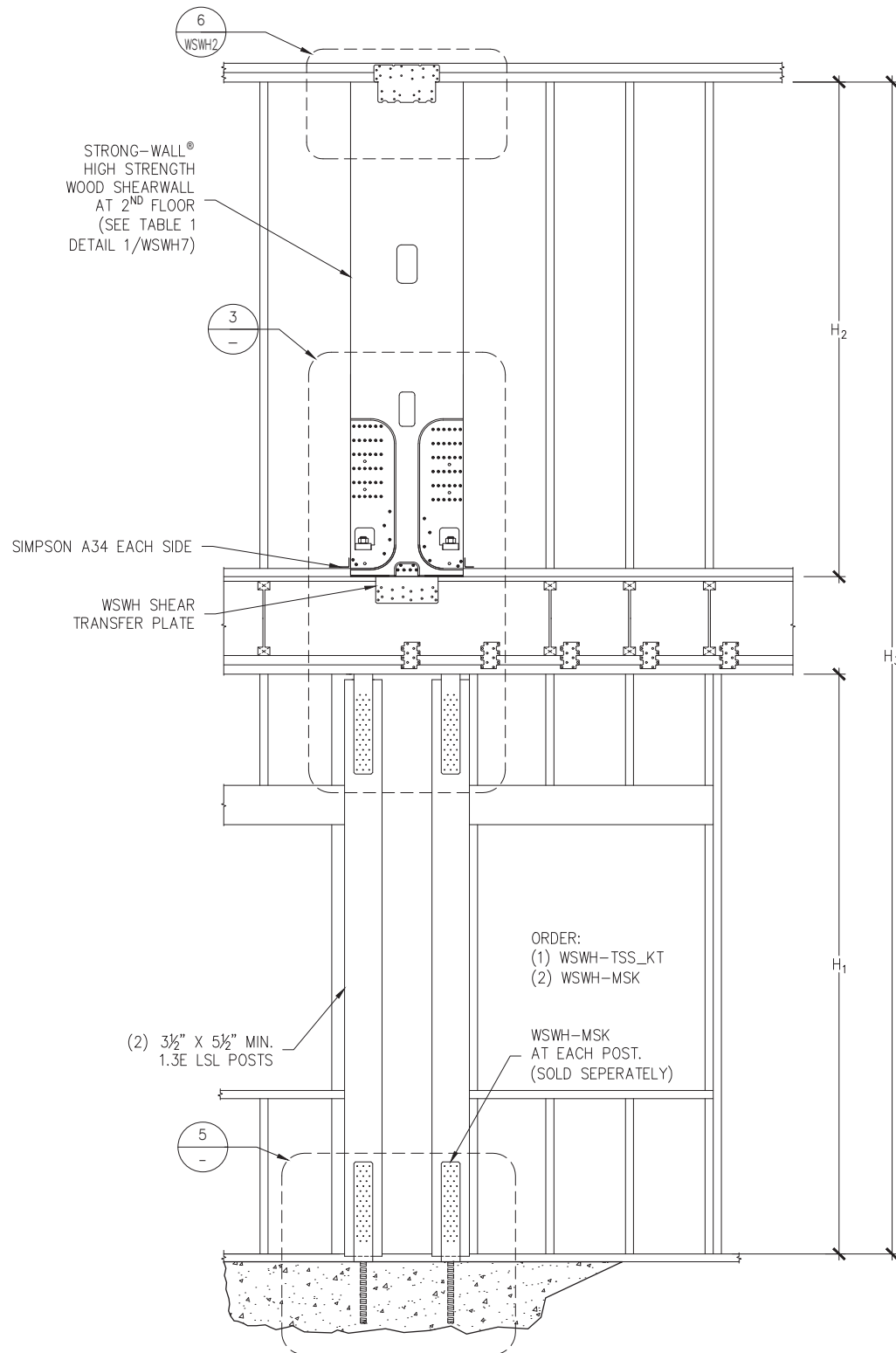
2/WSWH7



TWO-STORY NONSTACKED FLOOR FRAMING

3/WSWH7

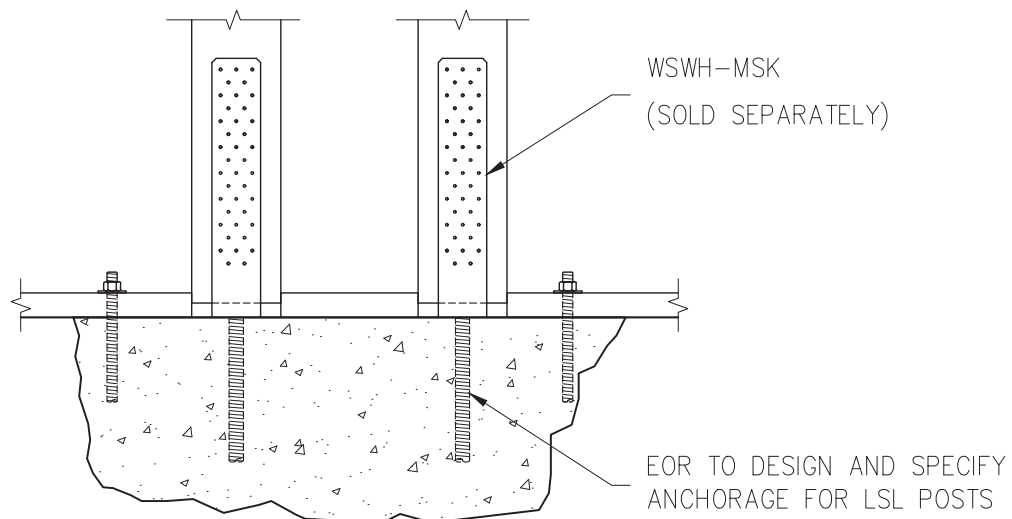
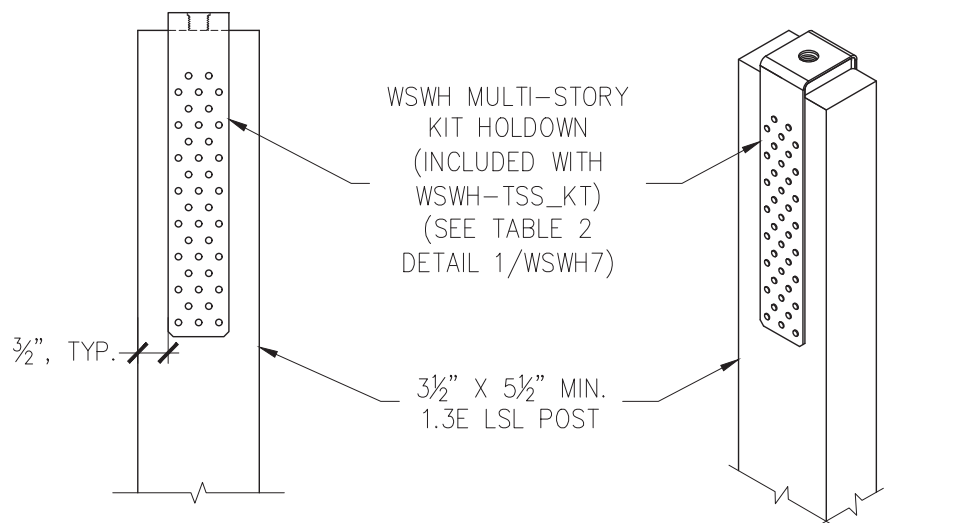
Wood Shearwall Structural Details (continued)


LEGEND :

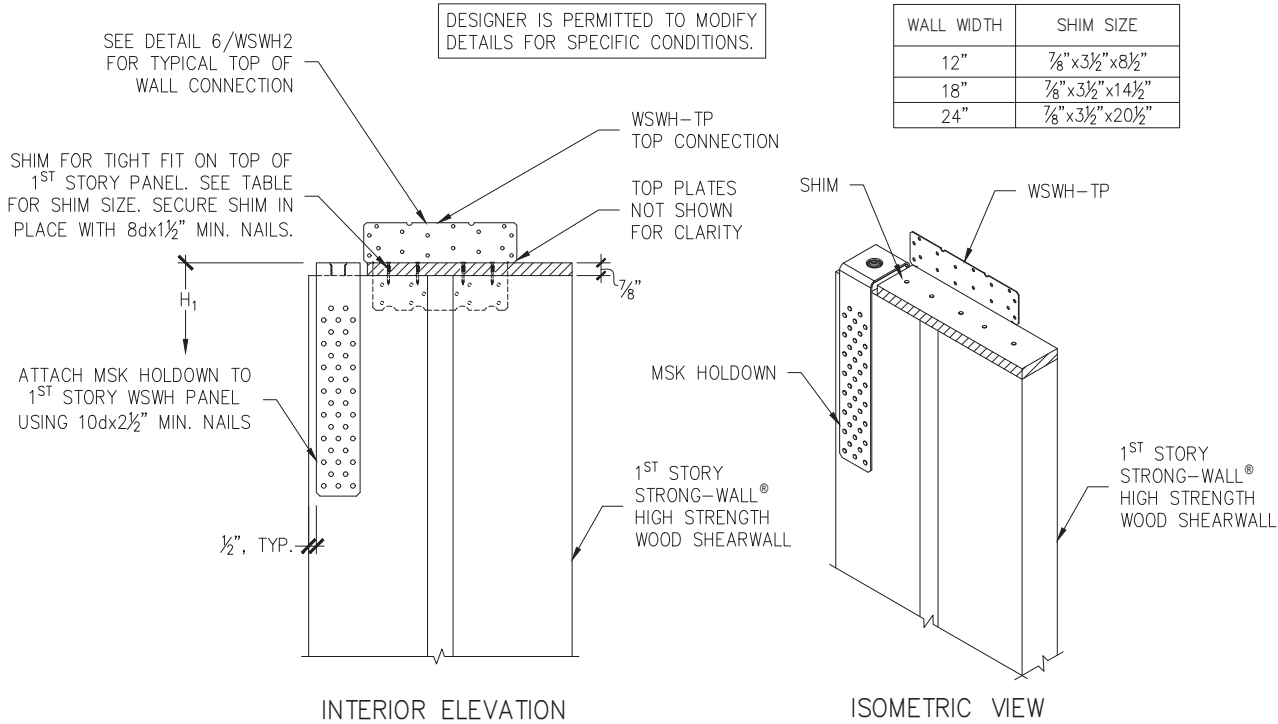
- H_1 = 1ST STORY WSWH HEIGHT; TOP OF CONCRETE TO UNDERSIDE OF 1ST STORY TOP PLATES (IN.)
- H_2 = 2ND STORY WSWH HEIGHT; TOP OF FLOOR SHEATHING TO UNDERSIDE OF 2ND STORY TOP PLATES (IN.)
- H_3 = TOTAL ASSEMBLY HEIGHT; TOP OF CONCRETE TO UNDERSIDE OF 2ND STORY TOP PLATES (IN.)

DESIGNER IS PERMITTED TO MODIFY
DETAILS FOR SPECIFIC CONDITIONS.

Wood Shearwall Structural Details (continued)

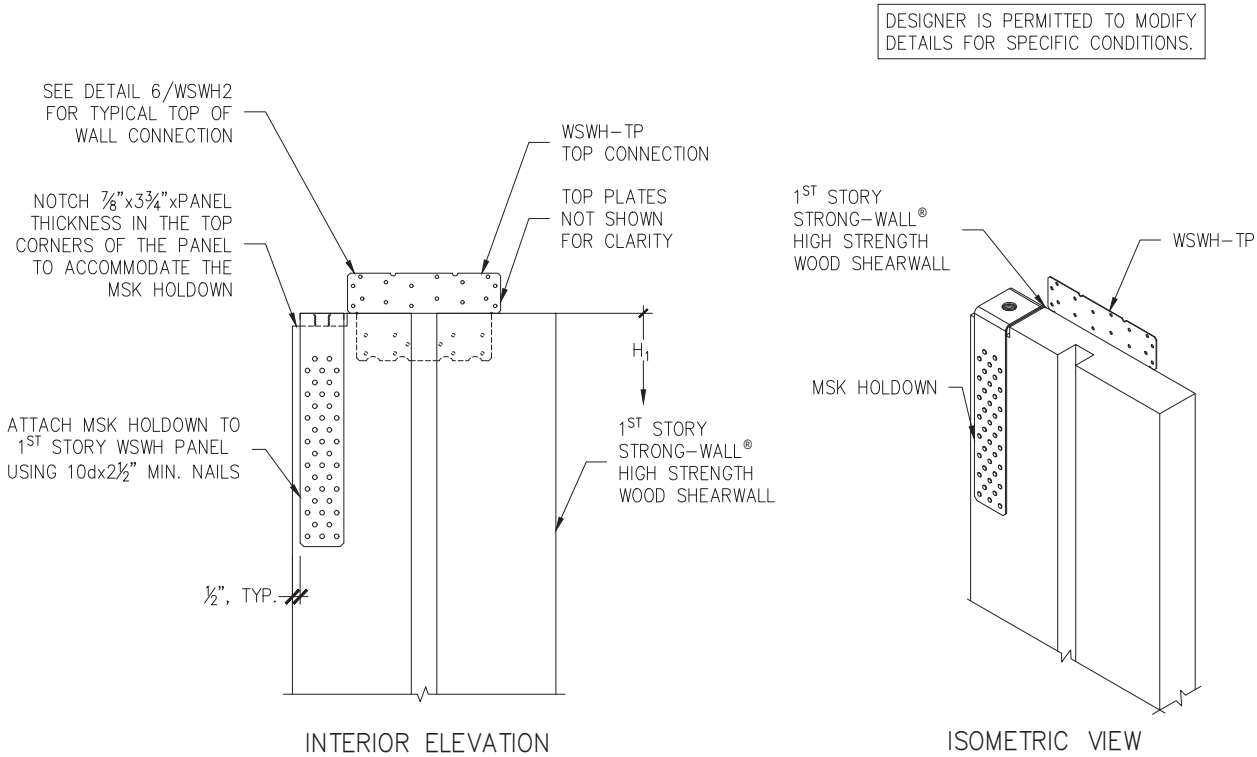


Wood Shearwall Structural Details (continued)



TOP OF FIRST-STORY PANEL CONNECTION

6/WSWH7



ALTERNATIVE TO TOP OF FIRST-STORY PANEL CONNECTION

7/WSWH7

High-Strength Shearwall Anchorage Solutions

SWH-AB Anchor Bolts

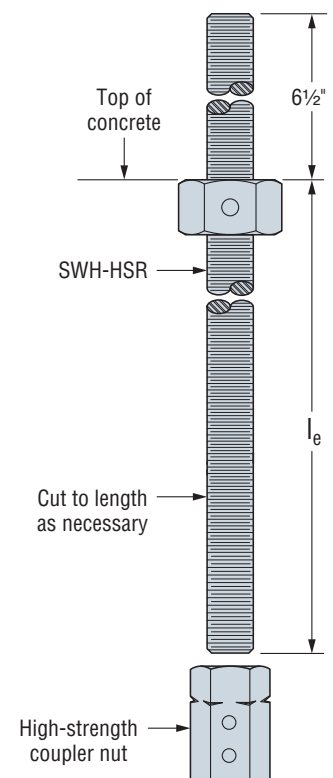
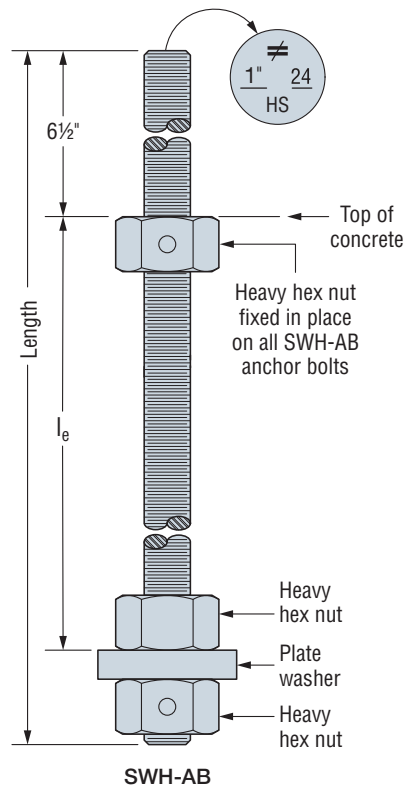
The 1" diameter SWH-AB anchor bolt is compatible to both SSWH™ and WSWH™ Strong-Wall shearwalls, offering flexibility to meet specific project demands. Inspection is easy; the head is stamped with a No-Equal® symbol for identification, bolt length, bolt diameter and "HS" for "High-Strength."

Material: High-Strength (HS) ASTM A193 Grade B7

An additional nut for template installation is provided with each SWH-AB.

Model No.	Diameter (in.)	Total Length (in.)	l_e (in.)
SWH-AB1x24HS	1	24	15½
SWH-AB1x30HS	1	30	21½
SWH-AB1x36HS	1	36	27½
SWH-AB1x42HS	1	42	33½
SWH-AB1x48HS	1	48	39½

1. Anchor models are compatible with all WSWH and SSWH panel models.

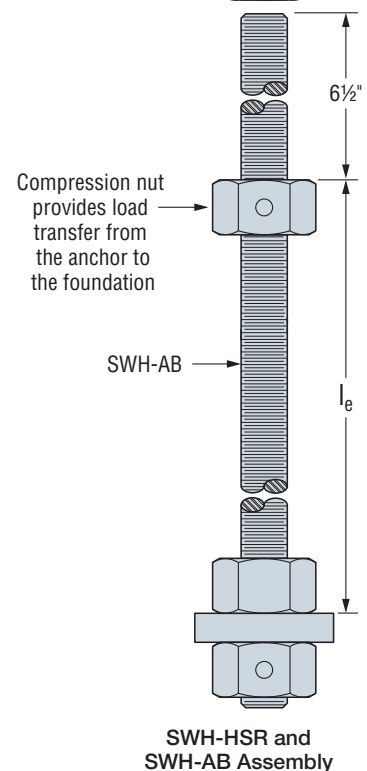
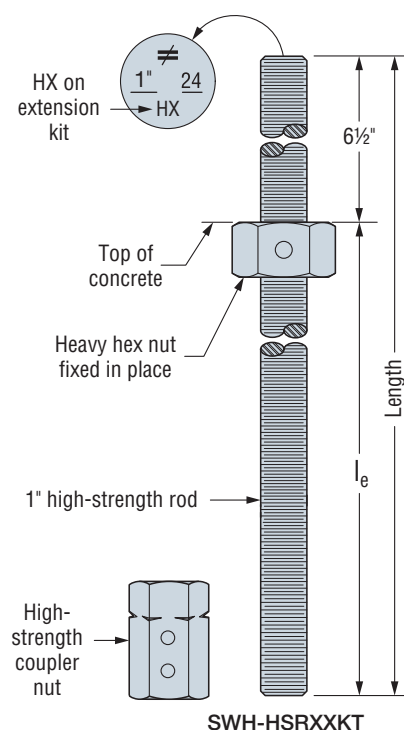


SWH-HSR Extension Kit

SWH-HSR allows for anchorage in tall stemwall applications where full embedment of a SWH-AB into the footing is required. The head is stamped for identification like a SWH-AB. Kit includes ASTM A193 Grade B7 high-strength rod with heavy hex nut fixed in place and high-strength coupler nut.

Model No.	Diameter (in.)	Total Length (in.)	l_e (in.)
SWH-HSR1x24KT	1	24	17½
SWH-HSR1x36KT	1	36	29½

- Do not use in place of SWH-AB.
- When used in combination with SWH-AB, Total l_e = SWH-HSR l_e + SWH-AB l_e + 6½"



High-Strength Shearwall Anchorage Solutions (continued)

Tension Anchorage Solutions — 2,500 psi Concrete^{1,5,6}

Design Criteria	Concrete Condition	Anchor Strength ²	SWH-AB Anchor Bolt		
			ASD Allowable Tension (lb.)	W (in.)	d _e (in.)
Seismic ³	Cracked	Standard	16,000	33	11
			17,100	35	12
		High-Strength	34,100	52	18
			36,800	55	19
	Uncracked	Standard	15,700	28	10
			17,100	30	10
		High-Strength	33,500	45	15
			36,800	48	16
Wind ⁴	Cracked	Standard	6,200	16	6
			11,400	24	8
			17,100	32	11
			21,100	36	12
		High-Strength	27,300	42	14
			34,100	48	16
			36,800	51	17
			36,800	51	17
	Uncracked	Standard	6,400	14	6
			12,500	22	8
			17,100	28	10
			17,100	28	10
		High-Strength	22,900	33	11
			26,400	36	12
			34,200	42	14
			36,800	44	15

See footnotes on p. 87.

Tension Anchorage Solutions — 3,000 psi Concrete^{1,5,6}

Design Criteria	Concrete Condition	Anchor Strength ²	SWH-AB Anchor Bolt		
			ASD Allowable Tension (lb.)	W (in.)	d _e (in.)
Seismic ³	Cracked	Standard	16,000	31	11
			17,100	33	11
		High-Strength	33,900	49	17
			36,800	52	18
	Uncracked	Standard	16,300	27	9
			17,100	28	10
		High-Strength	34,000	43	15
			36,800	46	16
Wind ⁴	Cracked	Standard	5,600	14	6
			10,200	21	7
			17,100	30	10
			17,100	30	10
		High-Strength	20,000	33	11
			26,500	39	13
			33,600	45	15
			36,800	48	16
	Uncracked	Standard	6,200	13	6
			12,800	21	7
			17,100	26	9
			17,100	26	9
		High-Strength	21,800	30	10
			28,900	36	12
			33,100	39	13
			36,800	42	14

See footnotes on p. 87.

High-Strength Shearwall Anchorage Solutions (continued)

Tension Anchorage Solutions — 4,500 psi Concrete^{1,5,6}

Design Criteria	Concrete Condition	Anchor Strength ²	SWH-AB Anchor Bolt		
			ASD Allowable Tension (lb.)	W (in.)	d _e (in.)
Seismic ³	Cracked	Standard	16,000	27	9
			17,100	29	10
		High-Strength	34,700	44	15
			36,800	46	16
	Uncracked	Standard	15,700	23	8
			17,100	25	9
		High-Strength	33,900	38	13
			36,800	40	14
Wind ⁴	Cracked	Standard	6,800	14	6
			11,600	20	7
			17,100	26	9
			21,400	30	10
		High-Strength	28,400	36	12
			32,400	39	13
			36,800	43	15
			36,800	43	15
	Uncracked	Standard	6,800	12	6
			12,400	18	6
			17,100	23	8
			17,100	23	8
		High-Strength	22,800	27	9
			26,700	30	10
			30,700	33	11
			36,800	37	13

1. Anchorage designs conform to ACI 318-14 Chapter 17 and ACI 318-19 with no supplementary reinforcement for cracked and uncracked concrete as noted.

2. Anchor strength indicates required grade of SWH-AB anchor bolt. Standard (ASTM F1554 Grade 36) or high-strength (HS) (ASTM A193 Grade B7).

3. Seismic indicates Seismic Design Categories (SDC) C–F. Detached one- and two-family dwellings in SDC C may use wind anchorage solutions. Seismic anchorage designs conform to ACI 318-14 Section 17.2.3.4.3 and ACI 318-19.

4. Wind includes Seismic Design Categories A&B and detached one- and two-family dwellings in SDC C.

5. Foundation dimensions are for anchorage only. Foundation design (size and reinforcement) by others. The registered design professional may specify alternative embedment, footing size or anchor bolt.

6. Refer to slab on grade, curb, stemwall and interior footing details for W and d_e as shown on pp. 88–90.

7. Standard grade anchor bolts may be used where designers have determined the reduced strength meets the anchorage design requirements. Requirements for standard grade anchor bolts are by designer.

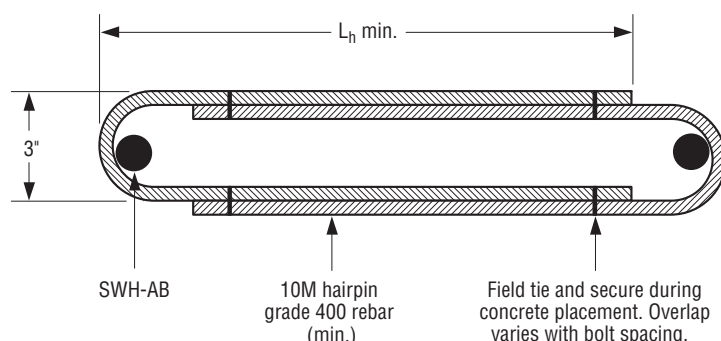
High-Strength Shearwall Anchorage Solutions (continued)

Foundation shear reinforcement to resist shear forces from Strong-Wall high-strength steel shearwall (SSWH™) and high-strength wood shearwall (WSWH™), located at the edge of concrete is shown in the table below. The SSWH12 and WSWH12 used in wind applications do not require shear reinforcement when the panel design shear force is less than the anchorage allowable shear load shown in the table below.

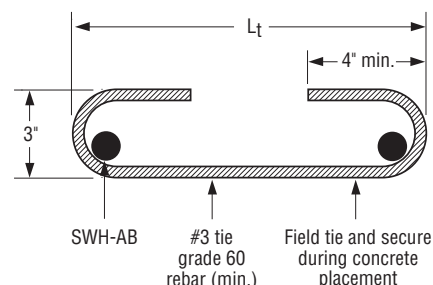
Shear Anchorage Solutions

Strong-Wall High-Strength Steel Shearwall Model No.	Strong-Wall High-Strength Wood Shearwall Model No.	L _t or L _h (in.)	Seismic ³		Wind ⁴			
			Shear Reinforcement	Minimum Curb/Stemwall Width (in.)	Shear Reinforcement	Minimum Curb/Stemwall Width (in.)	ASD Allowable Shear Load, V (lb.) ⁷	
							Uncracked	Cracked
SSWH12	WSWH12	10¼	(1) #3 Tie	6	See Note 7	6	1,080	770
SSWH15	—	12	(1) #3 Tie	6	(1) #3 Hairpin	6	Hairpin reinforcement acheives maximum allowable shear load of the Strong-Wall panels	
SSWH18	WSWH18	15	(2) #3 Hairpins ⁵	6	(1) #3 Hairpin	6		
SSWH21	—	16	(2) #3 Hairpins ⁵	6	(2) #3 Hairpins ⁵	6		
SSWH24	WSWH24	19	(2) #3 Hairpins ⁵	6	(2) #3 Hairpins ⁵	6		

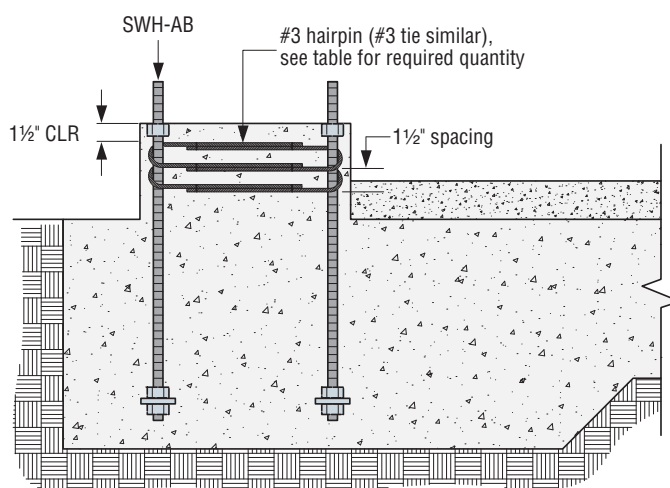
1. Shear anchorage designs conform to ACI 318-19 Chapter 17 and ACI 318-14 Chapter 17, and assume 2,500 psi concrete. See pp. 86–87 for tension anchorage.
2. Shear reinforcement is not required for interior foundation applications (panel installed at 6" or more away from edge of concrete), or braced wall panel applications.
3. Seismic indicates Seismic Design Category (SDC) C-F. Detached one- and two- family dwellings in SDC C may use wind anchorage solutions. Seismic shear reinforcement designs conform to ACI 318-19, Section 17.10.6.2 and 17.10.6.3 and ACI 318-14, Section 17.2.3.5.3.
4. Wind includes Seismic Design Category (SDC) A&B and detached one- and two- family dwellings in SDC C.
5. Additional ties may be required at garage curb or stemwall installations below anchor reinforcement per designer.
6. Use (1) #3 hairpin for SSWH18 and WSWH18 when standard strength anchor is used.
7. Use (1) #3 tie for SSWH12 and WSWH12 when panel design shear force exceeds tabulated anchorage allowable shear load.
8. #4 grade 40 shear reinforcement may be substituted for SWH shear anchorage solutions.
9. Concrete edge distance must comply with ACI 318-19 Section 17.9.2 and 20.5.1.3 (ACI 318-14 Section 17.7.2 and 20.6.1.3). Where the concrete surface is exposed to weather or in contact with ground, consider alternate protection methods if necessary. Anchor templates are available to locate the Strong-Wall at inside face of 2x6 framing. Hot-dip galvanized (HDG) anchor bolts are available. For coating reinforcing, refer to ACI 318-19 Section 20.5.2.
10. The designer may specify alternate shear anchorage.



Hairpin Shear Reinforcement



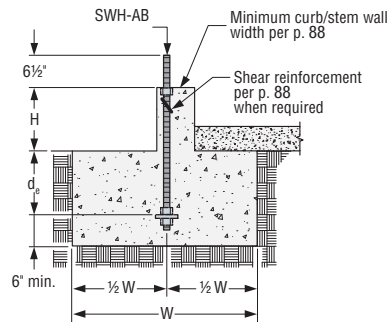
Tie Shear Reinforcement



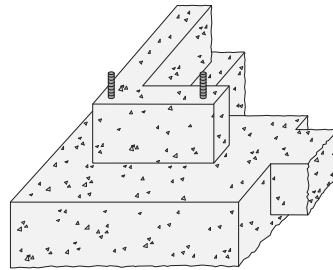
Hairpin Installation
(Garage curb shown, other footing types similar)

High-Strength Shearwall Anchorage Solutions (continued)

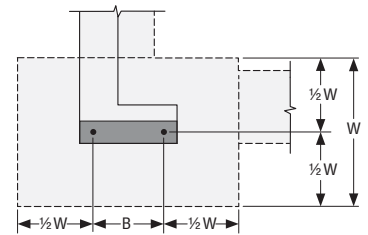
Curb or Stem Wall Installation



**Curb or Stem Wall
Section View**

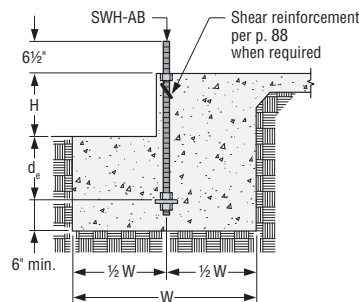


Perspective View
(Slab not shown for clarity)

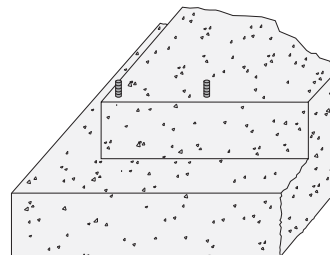


Footing Plan

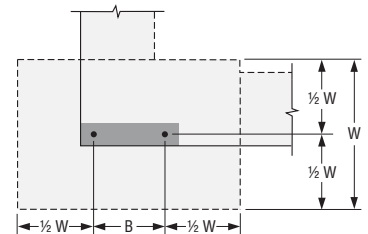
Slab-on-Grade Installation



**Slab-on-Grade
Section View**

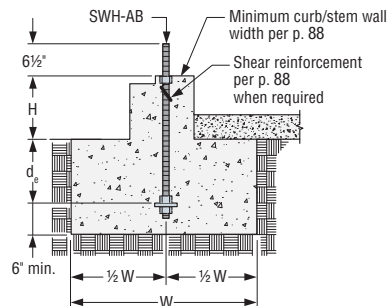


Perspective View

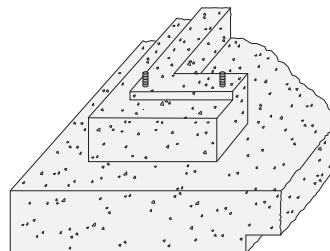


Footing Plan

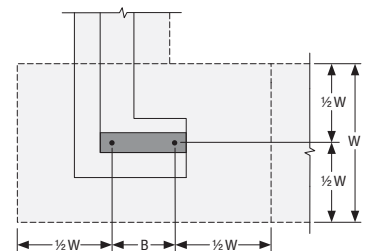
Brick Ledge Installation



**Brick Ledge
Section View**



Perspective View



Footing Plan

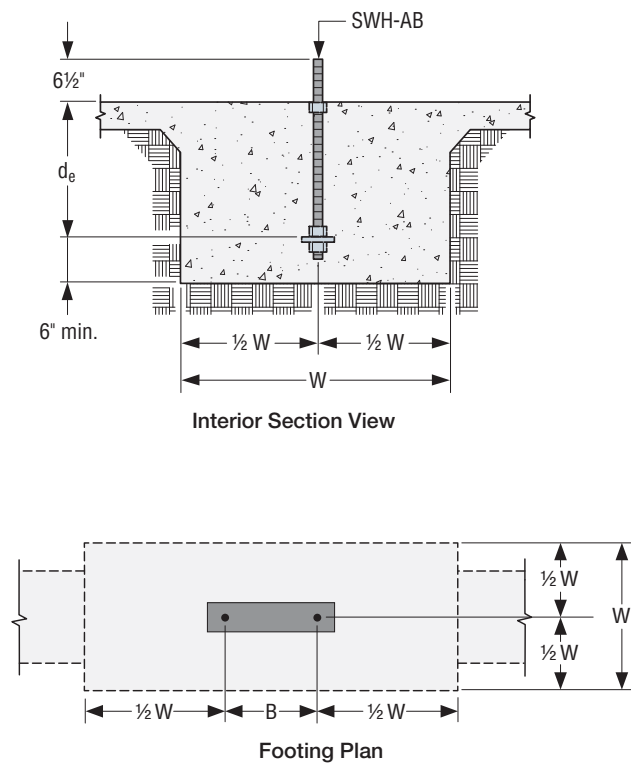
Anchorage Solutions General Notes

1. The designer may specify alternate embedment, footing size or bolt grade.
2. Footing dimensions and rebar requirements are for anchorage only.
3. See pp. 86–87 for W and d_e and p. 90 for B definitions.
4. When H exceeds height that prevents full d_e embedment plus 6 1/2" anchor extension, see p. 85 for SWH-HSR Extension Kit. See engineering letter L-L-STEMANCHR for concrete stemwall solutions when H exceeds length greater than extension kit.
5. The compression nut (heavy hex nut fixed in place) should be installed such that the top of nut is flush with the top of concrete. This nut allows compression load to be transferred into the anchor rod.

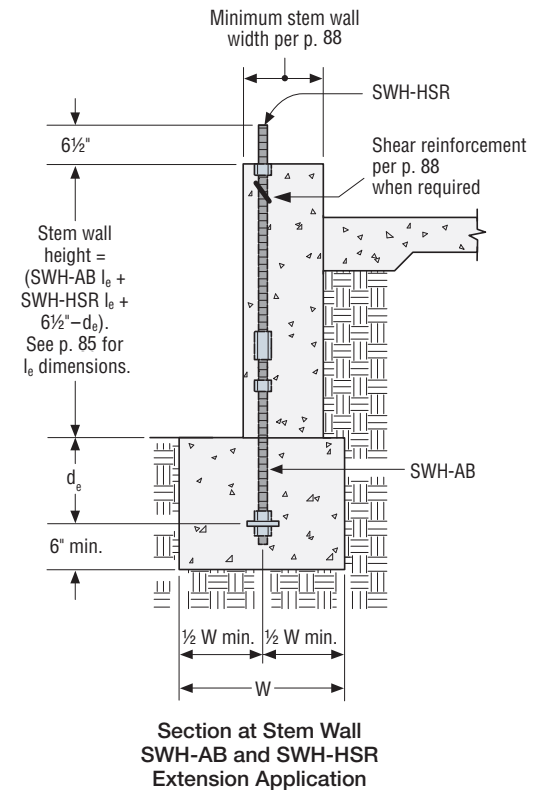
Foundation design
(size and reinforcement)
by designer.

High-Strength Shearwall Anchorage Solutions (continued)

Interior Installation



Stem Wall Extension Installation

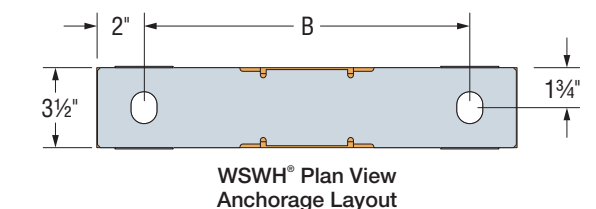
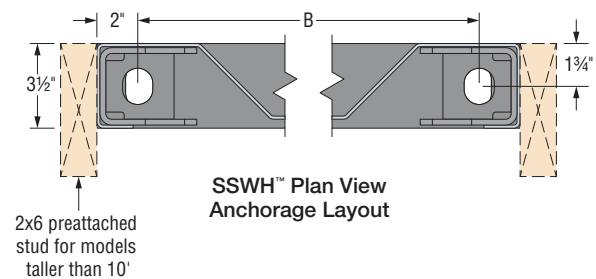


Anchorage Solutions General Notes

1. The designer may specify alternate embedment, footing size or bolt grade.
2. Footing dimensions and rebar requirements are for anchorage only.
3. See pp. 86–87 for W and d_e definitions.

Anchor Bolt Layout

Model No.	Distance from Center-to-Center of SWH-AB, B (in.)
SSWH12	8 1/8
SSWH15	11
SSWH18	14
SSWH21	17
SSWH24	20



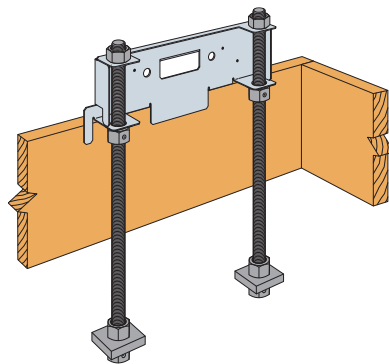
High-Strength Shearwall Anchorage Solutions (continued)

The patented, reusable anchor bolt templates from Simpson Strong-Tie help ensure accurate anchor bolt placement for the Strong-Wall high-strength shearwall. Designed for versatility, these templates can be used interchangeably with both the Strong-Wall high-strength steel shearwall (SSWH™) and the Strong-Wall high-strength wood shearwall (WSWH™). They are available in multiple configurations to accommodate common concrete foundation types.

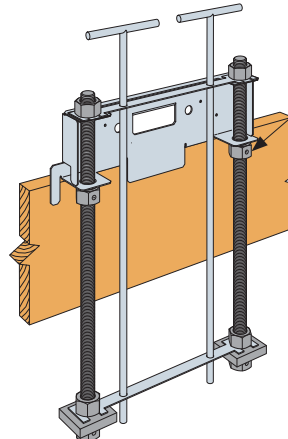
Anchor Bolt Templates

Strong-Wall High-Strength Steel Shearwall Model No.	Strong-Wall High-Strength Wood Shearwall Model No.	Anchor Bolt Stabilizer Model No.	Reversible Model No.	Panel Form Model No.	Brick Ledge Model No.	Extended Leg Model No.
SSWH12	WSWH12	SWH-BS12	SWH-RT12	SWH-RTPF12	SWH-RTBL12	SWH-RTBL12
SSWH15	—	SWH-BS15	SWH-RT15	SWH-RTPF15	SWH-RTBL15	SWH-RTBL15
SSWH18	WSWH18	SWH-BS18	SWH-RT18	SWH-RTPF18	SWH-RTBL18	SWH-RTBL18
SSWH21	—	SWH-BS21	SWH-RT21	SWH-RTPF21	SWH-RTBL21	SWH-RTBL21
SSWH24	WSWH24	SWH-BS24	SWH-RT24	SWH-RTPF24	SWH-RTBL24	SWH-RTBL24

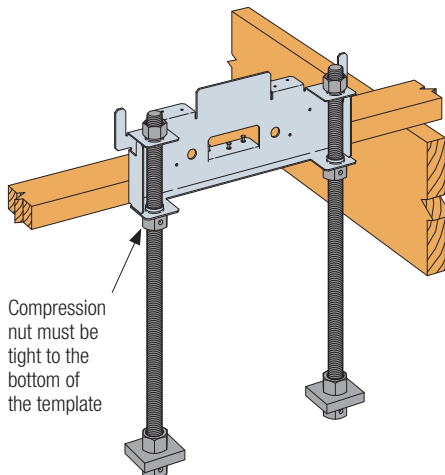
1. Templates are recommended and are required in some jurisdictions.
2. Foundation design by the designer.
3. See L-L-WSWHAPT for detailed description of proper placement of anchor template to ensure anchor compression nut is flush with top of finished concrete and to attain proper 6½" projection. For misinstallations of the compression nut, see L-L-SWHRETRO.
4. Extended Leg template, SWH-RTBL, may be used for wall placement flush with inside face of 2x6 walls. See "Strong-Wall Flush with Inside of 2x6 Wall" detail on page 97 for sample installation.



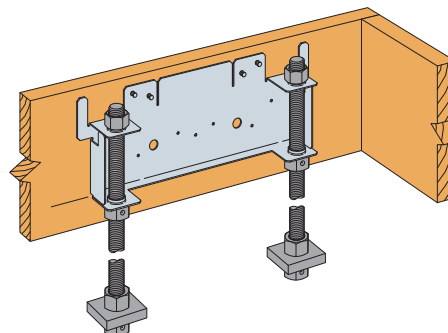
SWH-RT Exterior Installation*



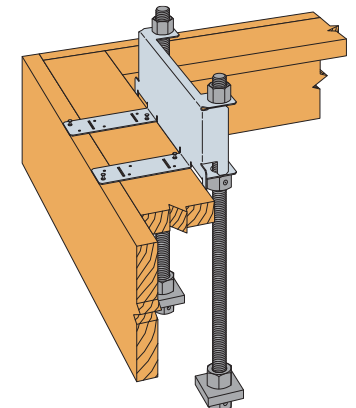
SWH-RT with Anchor Bolt Stabilizers
(Anchor bolt stabilizers, SWH-BS, are sold separately. Optional T-shape dowel by others.)



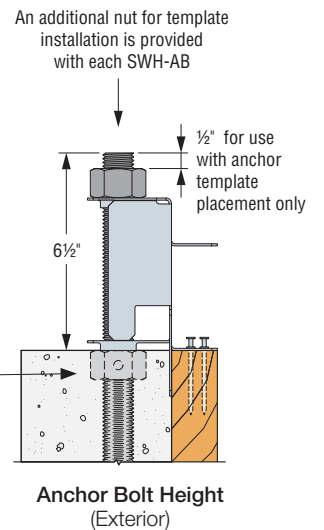
SWH-RT Interior Installation*



SWH-RTPF
(Panel form)

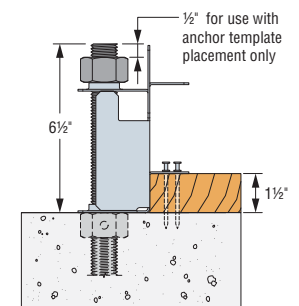


SWH-RTBL
(Brick ledge)



Anchor Bolt Height
(Exterior)

The compression nut (heavy hex nut fixed in place) should be installed such that the top of nut is flush with top of concrete. This nut allows compression load to be transferred into the anchor rod.



Anchor Bolt Height
(Interior)

Templates ensure proper bolt alignment, spacing, and projection, minimizing installation errors, delays, and structural performance issues after concrete curing.

*SWH-RT templates are reversible. Use the same template for interior or exterior applications.

Standard Application on Concrete Foundations

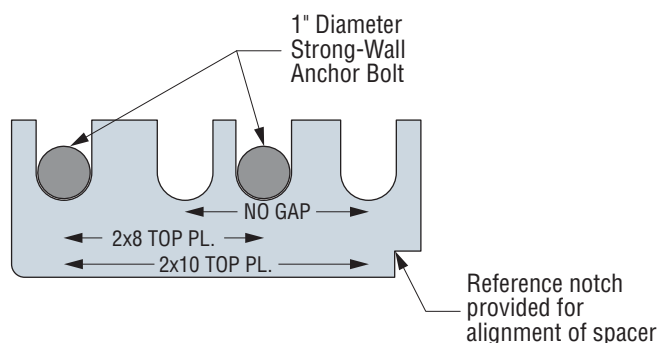
Strong-Wall Back-to-Back Spacer Solutions

The Simpson Strong-Tie® reusable back-to-back spacer easily locates the anchorage templates with the correct spacing when Strong-Wall panels are installed back to back. The spacer locates the anchor templates (sold separately) for common framing sizes. The spacer is compatible with all anchor templates using 1" diameter anchor bolts.

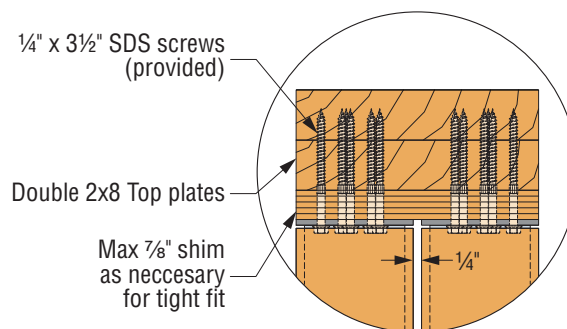
SW-BBS

Marking	Back-to-Back Spacing (in.)	Top plate or Header
NO GAP	3½	7"
2X8 Top PL	3⅞	2x8 or 8X Header
2X10 Top PL	5⅞	2x10 or 10X Header

Installation of SW-BBS with SWH Anchor Bolt Template



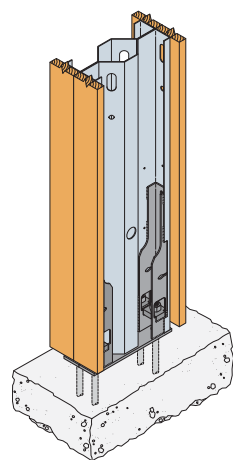
Example placement for 2x8 framing



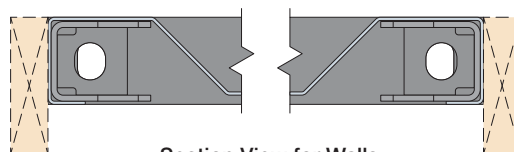
Top Connection for Back-to-Back install for 2x8 Double Top Plates

For walls 11'–13' tall, 2x6 preattached wood studs will create an 11" wide wall cavity (2x12 wall) and 11" minimum wide header.

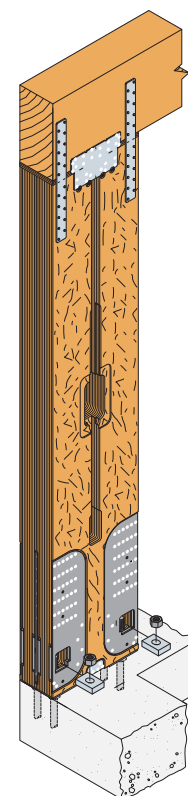
Note that a 3½" anchor center-to-center spacing will be maintained.



Back-to-Back Install for Walls Taller than 10'



Section View for Walls Taller than 10'

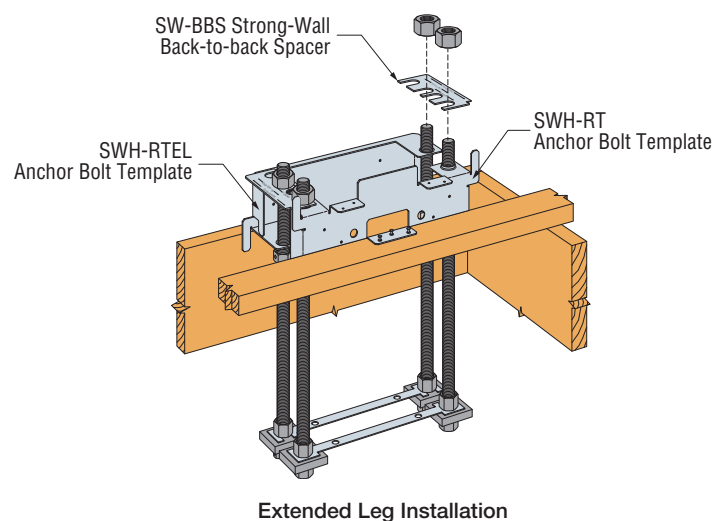
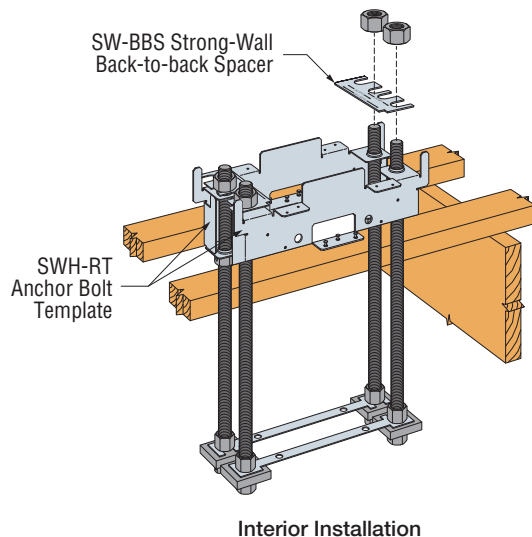
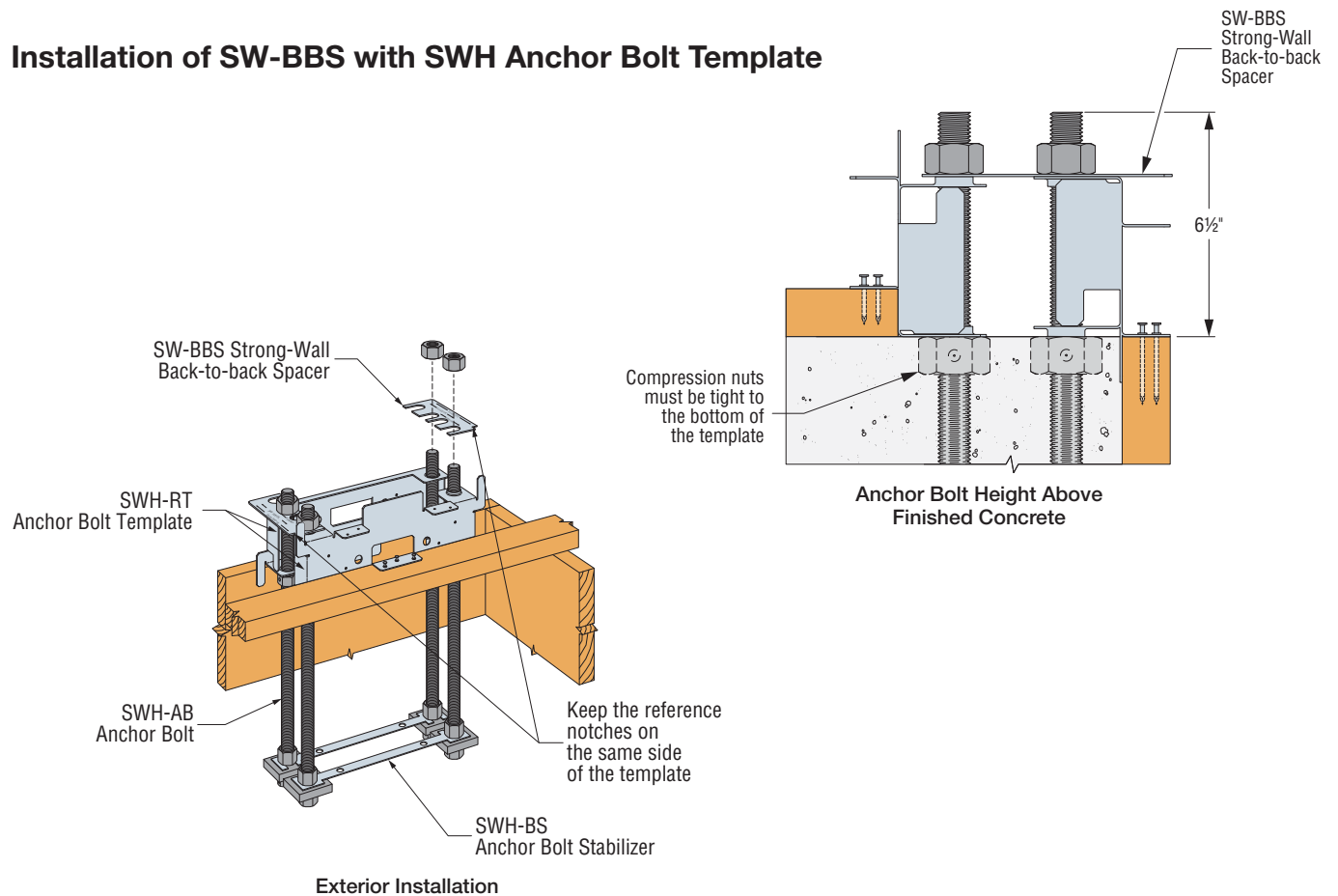


WSWH with SW-BBS

Standard Application on Concrete Foundations (continued)

Strong-Wall Back-to-Back Spacer Solutions

Installation of SW-BBS with SWH Anchor Bolt Template



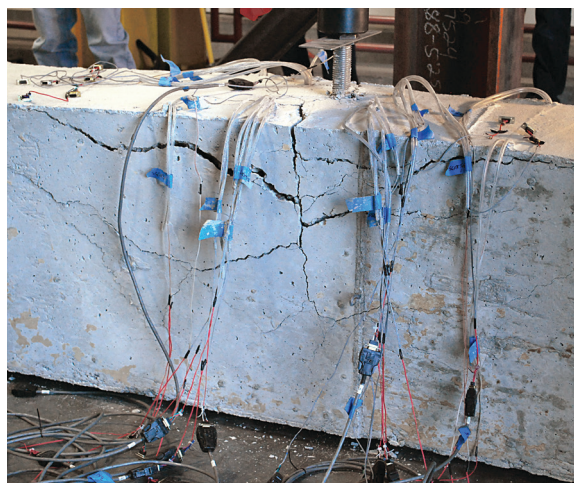
Anchor Reinforcement Solutions on Grade Beams

Simpson Strong-Tie now provides grade beam anchorage solutions for the high-strength steel shearwall (SSWH™) and high-strength wood shearwall (WSWH™), which have been calculated to conform to ACI 318-19. Through funding from the Structural Engineers Association of Northern California, initial testing at Scientific Construction Laboratories Inc. confirmed the need to comply with ACI 318 requirements to prevent plastic hinging at anchor locations. Follow-up testing at the Simpson Strong-Tie® Tyrell Gilb Research Laboratory was then used to confirm these findings and validate performance. The testing consisted of specimens with closed tie anchor reinforcement, non-closed u-stirrups and control specimens without anchor reinforcement. Flexural and shear reinforcement were designed to resist amplified anchorage forces and compared to test beams designed for non-amplified strength level forces. The test program has proven the performance of the anchor reinforcement details developed by Simpson Strong-Tie.

Significant Findings from Testing

Grade beam flexural and shear capacity is critical to anchor performance and must be designed to exceed the demands created by the attached structure. In wind load applications, this demand includes the factored demand from the high-strength steel shearwall (SSWH). In seismic applications, testing and analysis have shown that in order to achieve the anchor performance expected by ACI 318 anchorage design methodologies, the concrete member design strength needs to resist the amplified anchor design demand from ACI 318-19 Section 17.2.3.4.3. To help designers achieve this, Simpson Strong-Tie recommends designers apply the seismic design moment listed in the table below at the Strong-Wall high-strength steel shearwall location when evaluating the grade beam design strength under seismic loads. The tabulated moment correlates to the lowest of the anchor tension design limits defined in the sections listed above as they relate to each Strong-Wall high-strength steel shearwall.

Closed tie anchor reinforcement is critical to maintain the integrity of the reinforced core where the anchor is located. Testing with u-stirrups that did not include complete closed ties showed premature splitting failure of the grade beam.



Grade Beam Testing

Strong-Wall High-Strength Shearwall Grade-Beam Anchorage Solutions

Strong-Wall High-Strength Steel Shearwall Model No.	Strong-Wall High-Strength Wood Shearwall Model No.	Anchor Diameter (in.)	Anchor Reinforcement for Wind and Seismic ^{3,8,9}		Amplified LRF _D Applied Design Seismic Moment (ft.-lb.) ^{4,5,6,7,8,9}	
			Standard-Strength Anchor	High-Strength SWH-AB1HS	Standard-Strength Anchor	High-Strength SWH-AB1HS
SSWH12	WSWH12	1	(3) #4 Closed Ties / Wall	(7) #4 Closed Ties / Wall	30,700	42,100
SSWH15	—				37,100	56,100
SSWH18	WSWH18				46,800	75,700
SSWH21	—		(2) #4 Closed Ties / Anchor	(4) #4 Closed Ties / Anchor	57,400	87,700
SSWH24	WSWH24				68,500	108,700

1. Anchor Reinforcement conforms to ACI 318-19 Section 17.5.2.1. Full-scale testing was used to validate anchor reinforcement configuration and placement.

2. Minimum concrete compressive strength, $f'_c = 2,500$ psi.

3. Closed tie anchor reinforcement to be ASTM A615 Grade 60 (min.) #4 rebar.

4. Grade-beam longitudinal and tie reinforcement shall be specified by the designer for flexure and shear loading. Design should consider project-specific design loads and allowable soil pressure.

5. Simpson Strong-Tie recommends using the tabulated minimum amplified LRF_D applied seismic design moment to ensure grade-beam design flexure and shear strength is adequate to prevent plastic hinge formation under demands associated with anchorage forces corresponding to ACI 318-19 Section 17.10.5.3.

6. Designer may use reduced moment due to applied Strong-Wall high-strength shear wall lateral load. Minimum moment shall be the lesser of the tabulated moment or the amplified LRF_D design moment for seismic: (ASD design demand shear / 0.7) x Ω_o x Strong-Wall wall height for grade-beam design.

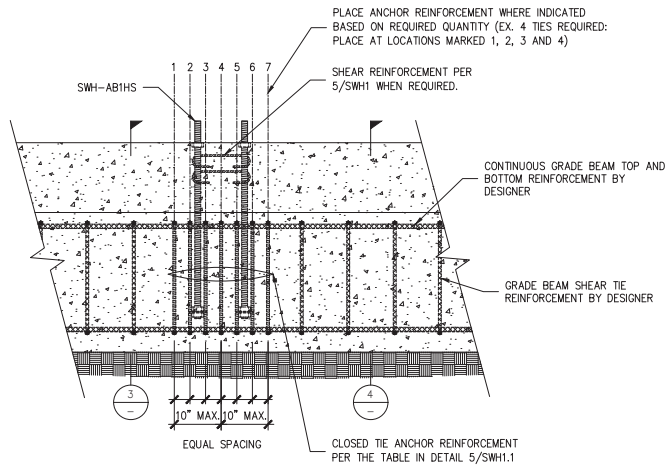
7. Minimum grade-beam design moment for wind and seismic in Seismic Design Category (SDC) A&B and detached one- and two- family dwellings in SDC C: (ASD design demand shear / 0.6) x Strong-Wall height.

8. Closed tie may be single-piece hoop or two-piece assembly with a u-stirrup with standard 135° hooks and a top cross-tie cap. See detail 6/SSWH1.3.

9. See details for grade-beam anchor reinforcement placement, installation and spacing requirements. Closed-tie anchor reinforcement quantity is per wall for the 12" and 15" wall models, and per anchor for the 18", 21" and 24" models.

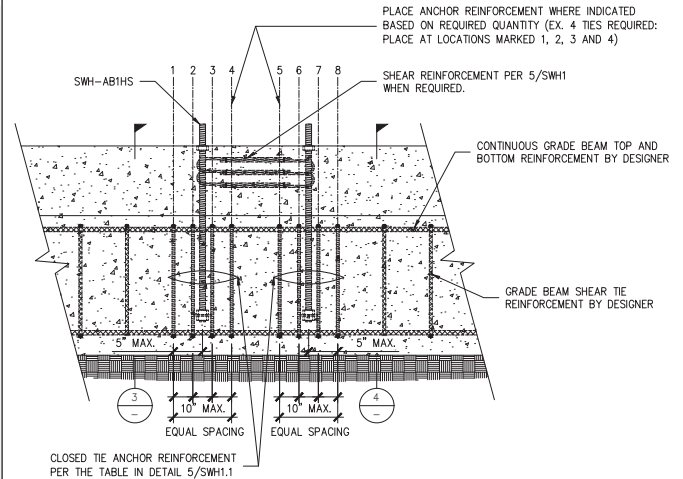
10. For final product offering, only high-strength anchor product (ASTM A193 B7) will be available for the Strong-Wall panels. Standard anchor (ASTM F1554 Gr. 36) values shown only for reference.

Anchor Reinforcement Solutions on Grade Beams (continued)



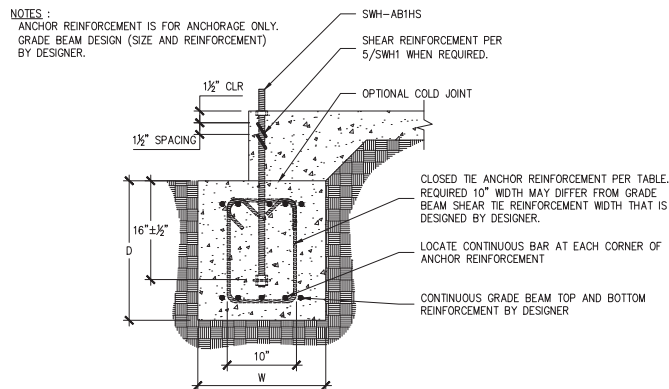
GRADE BEAM ELEVATION AT 12" WALL MODEL

1/SWH1.1



GRADE BEAM ELEVATION AT 15", 18", 21" AND 24" WALL MODELS

2/SWH1.1

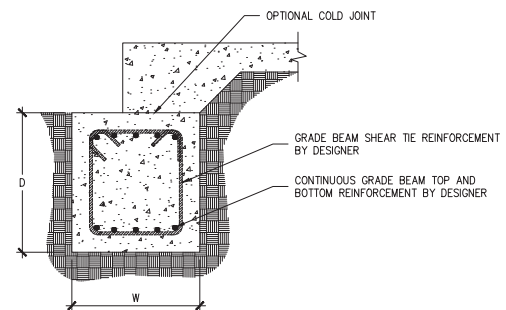


ANCHOR REIN. NOTE :
MINIMUM DISTANCES FROM THE ANCHOR BOLT PLATE WASHER TO TOP AND BOTTOM OF CLOSED TIE REINFORCEMENT ARE 13" AND 5" RESPECTIVELY.

DIMENSIONING NOTES :
D: DEPTH BY DESIGNER (24" MIN.)
W: WIDTH BY DESIGNER (18" MIN.)

GRADE BEAM SECTION AT ANCHOR REINFORCEMENT

3/SWH1.1



DIMENSIONING NOTES :
D: DEPTH BY DESIGNER (24" MIN.)
W: WIDTH BY DESIGNER (18" MIN.)

GRADE BEAM SECTION AWAY FROM ANCHOR REINFORCEMENT

4/SWH1.1

Concrete Stemwall Shearwall Anchorage

Typical anchorage solutions for Simpson Strong-Tie® Strong-Wall shearwalls in concrete stemwall applications require the anchor bolt to be embedded in the footing beneath the stemwall. In certain cases, such as daylight/walkout basements or other tall stemwall applications, this requirement may result in installation challenges or additional expense. As an alternative, Simpson Strong-Tie has developed anchorage solutions for the high-strength steel shearwall (SSWH™) and high-strength wood shearwall (WSWH™) on concrete stemwall applications using supplemental anchor reinforcement. When supplemental anchor reinforcement is included and developed on both sides of the breakout surface, evaluation of the concrete breakout strength is not required per ACI 318-19 Section 17.5.2.1. This allows the Strong-Wall anchor bolt to terminate in the stemwall which eliminates the need for the anchor to extend into the footing. All other limit states defined in ACI 318-19 Table 17.5.2 and the seismic design requirements defined in ACI 318-19 Section 17.10.1 are used to determine the anchor strengths.

Stemwall anchor reinforcement solutions for the SSWH and WSWH located at the inside face of a 2x6 framed wall are presented in the table below and in the figures on pp. 97–98. The table on p. 97 provides the required standard or high-strength anchor model for each bolt diameter and corresponding Strong-Wall shearwall model. High-strength anchor bolts are required for the SSWH and WSWH when the anchor tension force exceeds the allowable load for standard strength anchor bolts. The table on p. 98 provides minimum required distances from edge of concrete to center of Strong-Wall anchor bolt.

Two anchor reinforcement development configurations have also been considered. The first may apply for shorter concrete stemwalls with or without a cold joint between the stemwall and footing. In this case, a lap splice and standard hook are used to develop the anchor reinforcement below the breakout surface as shown in the figure on p. 97. The second configuration applies for taller stemwalls and uses continuous anchor reinforcement below the breakout surface as shown in the figure on p. 97. In all cases, a minimum 8-inch-thick concrete stemwall with a compressive strength of 2,500 psi is required. In some applications, depending upon the anchor bolt diameter and grade and Strong-Wall location, concrete compressive strengths above 2,500 psi and up to 4,500 psi are required.

Anchor Bolt Layout

Design Criteria	Anchor Diameter (in.)	Anchor Strength	ASD Allowable Tension (lb.)	Minimum Concrete Strength, f'_c (psi) ⁴	Anchor Reinforcement Schedule ^{3,8}
Seismic ⁶	1	Standard	17,100	2,500	4- #4 Bars
		High-Strength	36,800	<u>4,500</u>	8- #4 Bars
Wind ⁷	1	Standard	10,800	2,500	2- #4 Bars
			17,100	2,500	4- #4 Bars
		High-Strength	21,600	2,500	4- #4 Bars
			32,400	2,500	6- #8 Bars
			36,800	<u>4,500</u>	8- #4 Bars

1. Anchorage designs conform to ACI318-19 with reinforcement used to develop the tension anchorage in cracked concrete.
2. Anchor reinforcement has been designed in accordance with ACI318-19 Section 17.5.2.1(a) and shall be developed on both sides of the breakout surface.
3. Anchor reinforcement schedule is per anchor bolt and shall be ASTM A615 Grade 60, No.4.
4. Stemwall anchorage solutions based on minimum concrete strength, f'_c , noted in the table. Concrete strengths above 2,500 psi appear bold and underlined.
5. For final product offering, only high-strength anchors will be an available Simpson Strong-Tie anchor product for the SSWH and WSWH. Standard-strength anchor values shown only for reference.
6. Seismic indicates Seismic Design Category (SDC) C-F. Seismic anchorage designs conform to ACI 318-19 Section 17.10.5.3(a).
7. Wind includes SDC A&B and Detached one- and two-family dwellings in SDC C.
8. Anchor reinforcement is for development of tension anchorage solutions only. Concrete stemwall and footing design (size and reinforcement) by designer.
9. Anchor reinforcement development and lap splice requirements are provided per 3/SWH1.4 and are in accordance with ACI 318-19 Sections 25.4 and 25.5.2 respectively.
10. Concrete cover for anchor bolt and reinforcement shall be in accordance with ACI 318-19 Section 20.5.1.3 requirements.

Concrete Stemwall Shearwall Anchorage (continued)

Strong-Wall Shearwall and Anchor Bolt Model^{1,2}

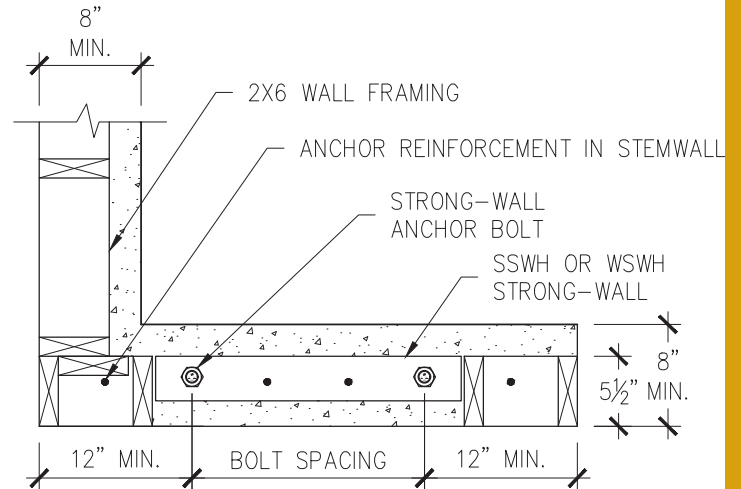
Anchor Model	Applicable Strong-Wall Models	Anchor Diameter (in.)	Anchor Strength ³
SWH-AB1x36HS	WSWH12, WSWH18, WSWH24	1	High-Strength
	SSWH12, SSWH15, SSWH18, SSWH21, SSWH24		

1. Anchor bolt models provided ensure adequate anchor reinforcement development length. See strongtie.com for product, design and installation information.
2. Galvanized anchor bolts available, contact Simpson Strong-Tie for details.
3. For final product offering, only high-strength anchor product (ASTM A193 B7) will be available for the Strong-Wall panels.

Strong-Wall Anchor Bolt Flush with Inside Face of 2x6 Wall Edge Distance^{1,2}

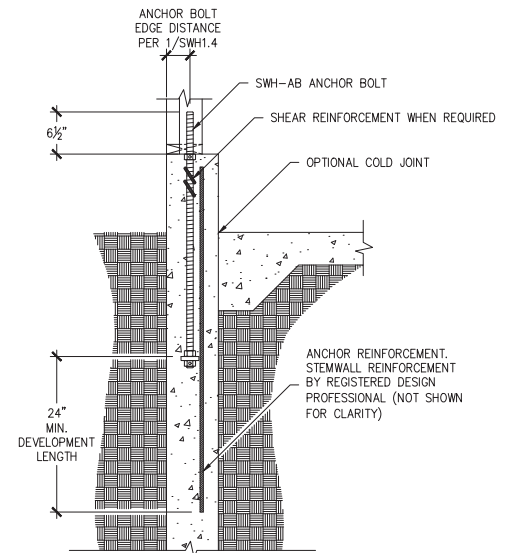
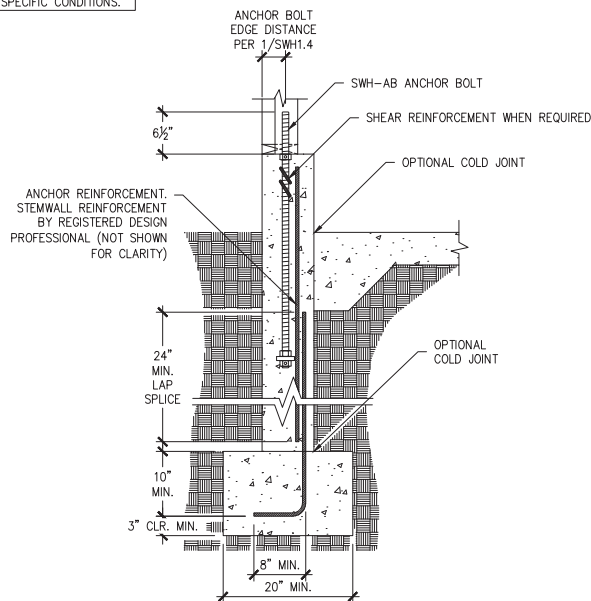
Applicable Strong-Wall Models	Anchor Bolt Edge Distance
WSWH12, WSWH18, WSWH24	3 5/8"
SSWH12, SSWH15, SSWH18, SSWH21, SSWH24	3 3/4"

1. Anchor bolt templates are recommended to properly locate bolts and are required in some jurisdictions.
2. See strongtie.com for product, design and installation information.



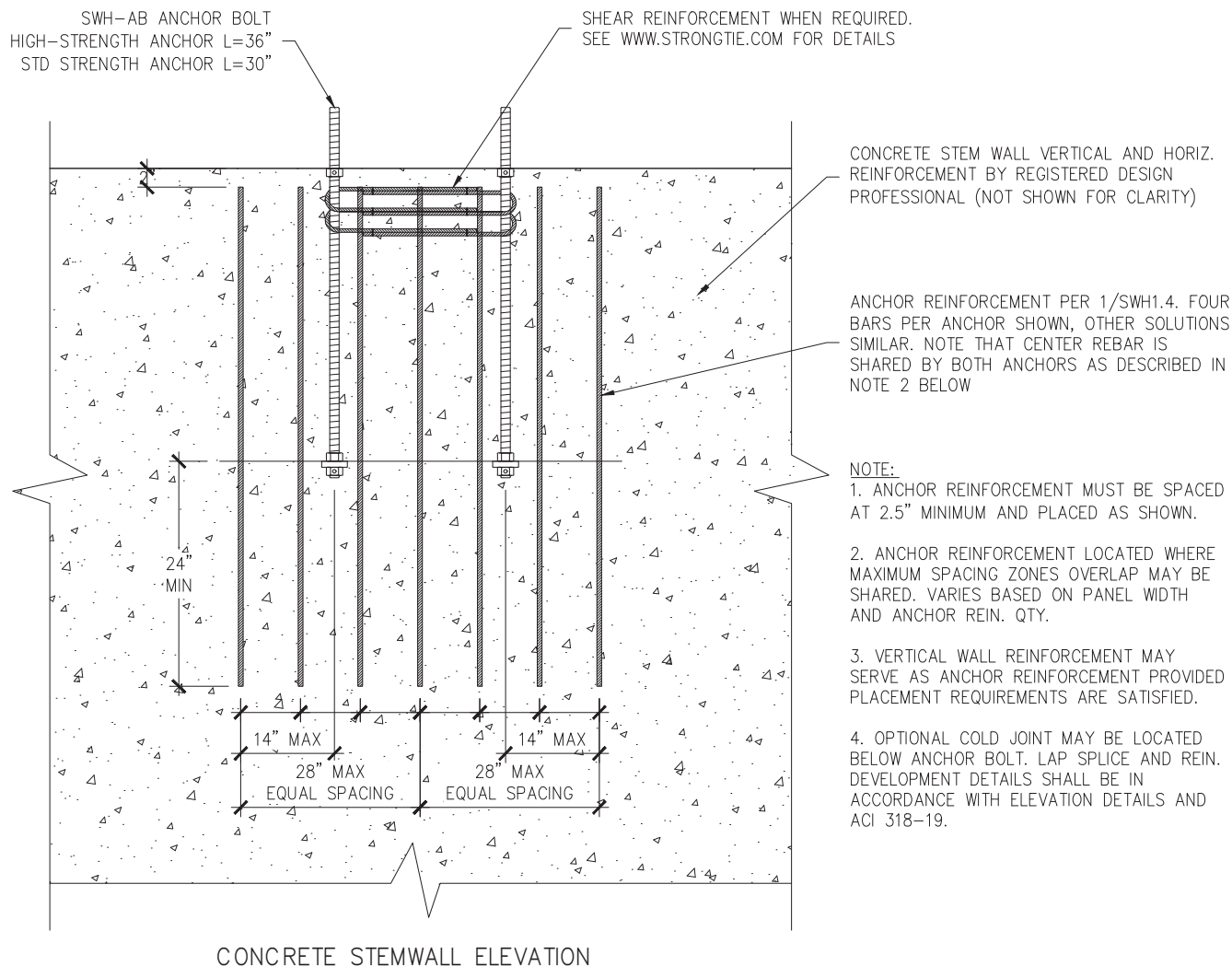
STRONG-WALL FLUSH WITH INSIDE OF 2X6 WALL — PLAN VIEW

DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.



STRONG-WALL WITH LAP SPLICE (REBAR HOOK & STRAIGHT BAR) — SECTION VIEW

Concrete Stemwall Shearwall Anchorage (continued)

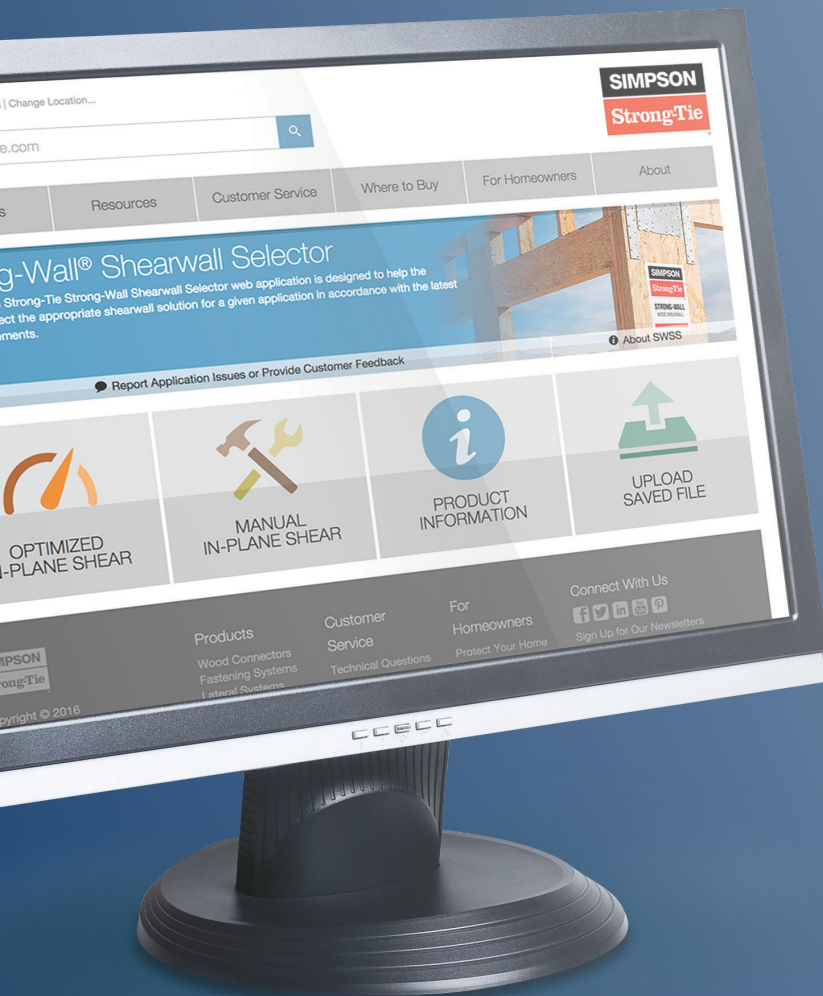
Strong-Wall Anchor Bolt Flush with Inside Face of 2x6 Wall Edge Distance^{1,2}

Applicable Strong-Wall Models	Anchor Bolt Edge Distance
WSWH12, WSWH18, WSWH24	3 5/8"
SSWH12, SSWH15, SSWH18, SSWH21, SSWH24	3 3/4"

1. Anchor bolt templates are recommended to properly locate bolts and are required in some jurisdictions.
2. See strongtie.com for product, design and installation information.

CONCRETE STEMWALL ELEVATION WITH STRONG-WALL ANCHOR REINFORCEMENT

Simplify the process.



Select the right shearwall with the Strong-Wall® Shearwall Selector.

The Simpson Strong-Tie® Shearwall Selector web application helps designers choose shearwall solutions based on usage and building code. The web app complies with the 2024 International Building Code and includes our new Strong-Wall high-strength steel shearwall.

For more information, call (800) 999-5099 or visit strongtie.com/swss.

SIMPSON
Strong-Tie®

70
YEARS
OF BREAKING
NEW GROUND



C-L-SW26 Effective 6/1/2026 Expires 6/30/2028
© 2026 Simpson Strong-Tie Company Inc.