

This document includes questions submitted by attendees during the live webinar, *Innovations in Strength and Versatility: Overview of the Strong-Wall® High-Strength Wood Shearwall*, held on April 29, 2021, along with presenter responses. In some cases, similar or overlapping questions have been listed together, in which cases we've made notation to that effect. Please send any additional technical questions to AskSimpson@strongtie.com.

If you'd like to refer back to the webinar, you can [view the recording](#) and download the [presentation slides](#).

QUESTION

ANCHORAGE

ANSWER

Are the anchors required to be cast into the foundations with the wall lowered onto them?

Yes, it's recommended that anchors be placed using the appropriate anchor bolt templates in order to locate the anchor bolts correctly.

How far out of tolerance can those anchor bolts be?

The anchor bolt spacing is critical for a successful installation. Using the anchor bolt templates shown on page 27 of C-L-SW21 will ensure a successful anchor bolt installation. If not using the templates, care must be taken to ensure that the on-center spacing of the anchor bolts is within a tolerance of $\pm 1/8"$.

Can we use post-installed anchors for installation, if we have an existing footing?

It depends on whether your design criteria are based on wind or seismic. For seismic design category C through F, we must develop the full strength of the anchor to ensure a ductile failure mode. This means that we must preclude the more brittle concrete breakout and bond-strength failures. It is unlikely that we will be able to develop the full capacity of a post-installed anchor bolt, especially for near-edge conditions. Alternatively, if the demand force is sufficiently low, we are able to design the anchorage for omega-level forces. For wind application, if you can develop the capacity that you need based on your demand load with an adhesive anchor, then, yes, you can use post-installed anchorage. In cases where there is an existing footing, underpinning is another alternative when the full-capacity of the panel is required.

What are the minimum side and end distances for the anchors?

These dimensions will vary depending on the type of foundation, the concrete strength, and the WSWH panel being specified. It can also vary by the application. These variables are addressed in the C-L-SW21 catalog starting on page 22, online and in our Strong-Wall Shearwall Selector (SWSS) web app. I would recommend trying the SWSS because it allows you to enter the conditions and will do the calculations for you. It's all documented in the output, so you can check to make sure your design is adhered to.

Is the foundation element only the required size for adequate transfer of anchorage into the foundation?

The foundation requirements provided by Simpson Strong-Tie address anchorage only. The designer still

Meaning, the foundation size is not designed to resist the overturning forces produced from the tension/compression components?

needs to consider project-specific design loads, footing overturning, and allowable soil pressure.

Does your design for anchors into foundation take into account the overturning safety factor (1.5) and the associated bending moments in the foundation

The foundation requirements provided by Simpson Strong-Tie address anchorage only. The designer still needs to consider project-specific design loads, footing overturning, and allowable soil pressure.

Does your anchor design give the required thickness of the steel plate washer?

The steel plate washer for the double nut and plate arrangement at the bottom of the anchor bolts is 5/8" thick.

Can we use post-installed anchors with your products for anchorage?

It depends on whether your design criteria are based on wind or seismic. For seismic design category C through F, we must develop the full strength of the anchor to ensure a ductile failure mode. This means that we must preclude the more brittle concrete breakout and bond-strength failures. It is unlikely that we will be able to develop the full capacity of a post-installed anchor bolt, especially for near-edge conditions. Alternatively, if the demand force is sufficiently low, we are able to design the anchorage for omega-level forces. For wind application, if you can develop the capacity that you need based on your demand load with an adhesive anchor, then, yes, you can use post-installed anchorage. In cases where there is an existing footing, underpinning is another alternative when the full-capacity of the panel is required.

Is there a way to make this wall to work in seismic retrofit application and epoxy bolts?

It depends on whether your design criteria are based on wind or seismic. For seismic design category C through F, we must develop the full strength of the anchor to ensure a ductile failure mode. This means that we must preclude the more brittle concrete breakout and bond-strength failures. It is unlikely that we will be able to develop the full capacity of a post-installed anchor bolt, especially for near-edge conditions. Alternatively, if the demand force is sufficiently low, we are able to design the anchorage for omega-level forces. For wind applications, if you can develop the capacity that you need based on your demand load with an adhesive anchor, then, yes, you can use post-installed anchorage. In cases where there is an existing footing, underpinning is another alternative when the full-capacity of the panel is required.

Does the smaller black nut included have a witness hole?

The heavy hex nut does not include a Witness® hole. It should be fully engaged on the anchor bolt, so no Witness hole is required.

Is there a nut in the concrete in the current image (standard base connection)?

Yes, there's a compression nut installed flush with the top of the concrete. If you have the C-L-SW21 catalog, look at page 27, where there's a good illustration of that.

Does it come with foundation template?

Otherwise search WSWH-AB online and it should show the same information.

Are there specific solutions for misinstalled or misplaced anchor bolts for the Strong Wall?

No, the foundation template and anchor bolts are sold separately. Usually a concrete sub-contractor will install the anchor bolts (using the template), and the framer will install the wall. Two separate trades at two separate times.

We have a solution if the anchor bolts for the old WSW walls are installed but the new WSWH is to be used. For other cases, contact our engineering department. Call (800) 999-5099 and ask for technical support.

Is the additional heavy hex nut mandatory?

The additional heavy hex nut supplied with the anchor bolts is there for installation as a convenience to the concrete sub. They'll typically remove it with the templates.

There's also a heavy hex nut supplied with the wall that we expect the framer to use. So only one heavy hex nut on top of the heavy bearing plate is required.

With interior use of the bolts, I see the 2x4 on edge will make the bolt 3.5" higher. Is that okay?

Actually the geometry is such that everything lines up so the compression nut is flush with the top surface of the concrete, so there should be no worries about the bolt being higher if that means of installation is used.

Will the installation of the anchor bolt nuts require special inspection? If not, can an engineer require a contractor to torque another half a turn into a nut which may or may not have been torqued properly prior to the site visit by the engineer.

Periodic special inspection must be provided in accordance with Section 1705.1.1, 1705.11.1 or 1705.12.2 of the 2018 IBC, as applicable, with the exception of those structures that qualify under Section 1704.2, 1704.3, or 1705.3 of the 2018 IBC and subject to approval of the code official.

Are hairpins included with anchor bolts, or do they have to be ordered separately?

Hairpins are sold separately from the anchor bolts.

Is there a source for sample calc checks that the product tables are based on for the cast-in-place anchor bolts capacity in concrete that anyone can access online?

A full calculation package was submitted to ICC-ES for review and approval in order to obtain a code report for the WSWH. Currently, we have not made the calc package available for public review.

Your concrete coverage at stem wall seems minimal particularly when hair pins are used. Do you have stainless-steel hardware for corrosive soil environments?

If there are concerns about the concrete cover for either the anchor bolt or hairpins, there are a couple of options as follows: The WSWH may be installed flush to the inside face of a 2x6 wall, or epoxy-coated anchor reinforcement may be used, and finally, the anchor bolt may be specified as hot-dipped galvanized.

Are the hairpins required for all WSW and WSWH applications?

Hairpins or ties are required for all applications of the WSWH18 and WSWH24 panels, as well as the WSWH12 panels when governed by seismic. There are cases for the WSWH12, when governed by wind, where they are not required. See page 24 of the C-L-SW21 catalog for specifics. This information can also be found online at www.strongtie.com.

Using a T-bar or similar would require them to penetrate through the damp proof membrane, no?

The intent of the T bars in the anchor bolt stabilizer system is to go into the dirt, so if there were a membrane of any sort they would have to penetrate it. If that was an issue, then the bolt stabilizers should be avoided. Note that they are an optional installation aid and not part of the anchorage requirements.

Back to Back

Would back-to-back application be competitive with other options such as steel frames?

Yes, you need to look at demand loads and solutions for specific applications, but this is definitely what this application is intended for.

Is a glulam acceptable for the header at back-to-back installation?

Yes, for the back-to-back portal applications, we require a minimum 7" x 11 1/4" header. We're developing details to support alternative top connections with wider headers.

Can the back-to-back application also be applied for a standard framing condition? Is the allowable load then doubled from the table?

Yes, the back-to-back application can also be applied for a standard framing condition, and the allowable load is doubled from the table.

For back-to-back panels, are there holdown connection plates that are also back-to-back, and if so, how are the fasteners installed?

The SW16150 screws used to attach the holdown and baseplate to the WSWH panel are factory-installed.

How is 7" back-to-back wall width compatible with std. 2 x 6 framed wall?

A minimum 2x8 framed wall is required for back-to-back applications.

Sorry I missed this. What do you mean by back to back?

"Back-to-back" means panels are installed in tandem instead of side-by-side. With proper shear transfer and anchorage, "back-to-back" installations provide two times the allowable shear value of a standard panel without increasing the wall length.

What width of header do you need for back-to-back walls? Is the anchor bolt layout the same as the older SW?

We require a minimum double 2x8 top plate for standard applications and a minimum 7" x 11 1/4" header for portal applications.

4 walls back to back, what about group effect reducing capacity of anchorage? There must be a point of diminishing returns.

The anchor bolt layout is the same for both the WSW and WSWH. However, the anchor bolt diameter for the 12" and 18" wide panels has been increased from 7/8" to 1". We've calculated anchors as a group in WSWH back-to-back anchorage calculations.

With portal I thought I heard that the header had to be 7.25" wide, but slide 38 shows thinner widths. Did I hear wrong?

Slide 38 is showing detail 6/WSWH2 for a single panel. The minimum 7" header requirement applies to back-to-back portal applications.

CAD

Have Strong-Wall specifications been incorporated into RISA 3D?

No, we do not have any current plans to incorporate the WSWH solutions into RISA 3D.

DWG's of the details available?

Yes. DWG, DXF and PDF versions of the structural details can be found online at www.strongtie.com. Navigate to

Can you make available CAD details of these components?

the Strong-Wall landing page and then click the Additional Resources tile.

Are there details available to include in BIM, Revit or other 3D tools? I'll be working on a new multi-story wood building and the architect we are working with is performing all of the design in BIM.

We are in the process of developing 2D and 3D CAD models for each WSWH model. Once available, they will be posted to the website.

We are in the process of developing REVIT models for all WSWH panels. These will be posted to the website once available.

Canada

How can we help make it easier for contractors in Toronto to order this product? What is the availability and lead time in Canada?

Our branch in Pitt Meadows, BC, stocks the WSW panels, and will stock the WSWH offering once it is launched in Canada. I would suggest contacting your local territory manager, or customer service at the branch, and ask them for an accurate lead time to ship across the country.

Is design data available for using this product in Canada?

No, a Limit States Design catalog is in process, and we expect to release that in early third quarter.

Do you have limit states design data for Canadian codes?

No, a Limit States Design catalog is in process and we expect to release that in early third quarter.

Are there design guides for Canada yet?

No, a Limit States Design catalog is in process and we expect to release that in early third quarter.

Canadian code compliance?

No, a Limit States Design catalog is in process and we expect to release that in early third quarter.

Can we use $R_d = 3.0$ and $R_o = 1.7$? These values come from energy dissipation in shear walls from all the nails, so how does the Strong-Wall dissipate energy?

Yes, seismic design is based on NBC 2015 using $R_d = 3.0$ and $R_o = 1.7$. Energy dissipation occurs through LSL panel fuse fracture, LSL bearing and rod elongation.

Cost

Approx. cost for the complete assembly?

Cost will vary based on source, quantity, and model or component. We would recommend visiting your local lumberyard or building supply distributor for accurate pricing.

How do prices compare to Steel Strong-Wall Shearwalls?

It will vary depending on where you buy them, and in what quantities, but as a rule the WSWH will be the same or lower than the SSW.

How do WSWH compare to steel portal frames price-wise?

It will vary depending on where you buy them, and in what quantities, but as a rule the WSWH will be the same or lower than the SSW.

Cost for single-door and double-door one story?

Cost will vary based on source, quantity, and model or component. We would recommend visiting your local lumberyard or building supply distributor for accurate pricing.

How does the price of WSWH compare to WSW for same-dimensioned wall?

It will vary depending on where you buy them, and in what quantities, but as a rule the WSWH will be about the same as the WSW. It also varies based on the width and height combination, but again, roughly the same.

Which client types are the primary users for the WSWHs? Multi-family? Do you see commercial, QSR, or retail using this as much? Is it cost comparable to a steel moment frame or similar alternate options?

Light-frame residential and multifamily are typical users, but the WSWH could also be used in light-frame commercial applications. As a rule, a steel moment frame will have higher capacities than a double portal pre-fabricated (Strong-Wall) portal frame system; however, the back-to-back application doubles the double portal load and that higher capacity will fit in between the two. It will vary depending on where you buy them, and in what quantities. It also varies based on the width and height combination. The WSWH panels are priced competitively with our Steel Strong-Wall product line as well as with our competitors' prefabricated shearwall products.

What is the cost of these Strong-Walls?

Design

When do you determine when to use a portal application or just a shear wall application?

The portal application will be used at garage location. A continuous garage header is required over the panel(s) and the (4) portal straps per panel must be installed.

Previous question has been answered. Are the minimum specified foundation sizes 'mandatory' or can the EOR design provide a different design?

The ESR-2652 page 20, detail 1/WSWH1 states that the designer is permitted to modify details for specific conditions.

Can we use the WSWH as a retaining wall?

The WSWH is designed to resist in-plane shear forces due to wind and seismic loading, out-of-plane forces, and vertical loads. It is not intended to be used as a retaining wall.

Is there a similar wall that can be used as in a second floor

We are developing multi-story applications, both stacked and non-stacked. We will have an engineering letter for those that will be found online. I expect that to be available by June.

How much extra flexibility is introduced into the system by having the concrete cracking around the anchors where they pass through the concrete upstand?

We are not relying on the concrete to compress, crush, crack, or otherwise fail in order to realize ductility within the system. We are utilizing wood bearing, fastener yield, and rod elongation to achieve the required ductility in the shearwall assembly.

Why are you calling it a 'wall' - 'shear post' or 'shear portal post' would be less confusing?

We have utilized the term "Strong-Wall" to describe our high-aspect-ratio prefabricated shearwall products for over 20 years. I'll also note that the term "post" implies a vertical load resisting element, whereas the primary purpose of a prefabricated shearwall is to resist lateral forces.

What is the response modification coefficient, R for this?

Seismic design based on 2018 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.

What is the WSWH's resistance to moisture, rot, and termites? I understand it is for interior use only. However, in our very humid environment, moisture, rot, and termites are always a concern.

Where design is supposed to meet ACI 318, can the engineer get calcs from Simpson to submit to the jurisdiction or do they need to create the calcs themselves? This would be where there was no approved third party test report to cover the exact condition the EOR is submitting to jurisdiction.

These look to be for near footings and grade beams. Have these been tested over 8"-10" poured concrete foundation walls (i.e., 7'-9' foundation walls)

What is the R value of this new shear wall?

As a designer, what should we do if the axial load on the SSW is greater than 7500 lb.? Adding a post and no axial load on the SSW? How does it work? Thank you for explanation

Raised floor solutions?

Any hope for a full moment connection in portal frames?

So this is a moment frame?

For portal frames, has any testing/evaluation been done to assess the impact of shrinkage of the beam if it is dimension lumber, specifically in regard to excess movement/deflection due to a little strap buckling due to the shrinkage?

What grade and allowable stress of wood and structural steel?

The LSL of the WSWH isn't treated, so I would recommend using our Steel Strong-Wall in a very humid environment.

A full calculation package was submitted to ICC-ES for review and approval in order to obtain a code report for the WSWH. Currently, we have not made the calc package available for public review.

We have an engineering letter to support our Steel Strong-Wall and the old WSW walls in this application. We're working on revising it to include the WSWH high-strength wood shearwalls. This will be found on our website. You can also call (800) 999-5099 and ask for technical support for the latest information on this.

Seismic design based on 2018 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.

You can have an axial load higher than 7,500 lb. provided that the overturning tension and compression forces imposed by the combination of vertical load and lateral load do not exceed the limit states that we consider: section capacity, anchor tension, and bearing.

This has been tested, and a solution is developed. We'll have an engineering letter available in May. We'll also submit this application for inclusion in the code report. The Strong-Wall Shearwall Selector web app, including raised-floor applications, has already been released.

A full moment connection is very difficult to achieve in wood construction. The partial moment connection achieved using (4) portal straps - (2) on each face - does provide sufficient moment resistance to significantly increase the in-plane shear capacity and reduce anchorage tension forces.

The WSWH is a prefabricated shearwall. The portal application is, in effect, to achieve a partial moment connection for portal frames.

We expect header and/or rim joist shrinkage to be minimal in the applications for which the WSWH was intended. We further require the WSWH to be installed in continuously dry conditions for its service life. Finally, we require the header to have a moisture content less than or equal to 19% at the time of installation.

I would recommend referencing Weyerhaeuser's ESR-1387 for LSL properties and ESR-2652 for all WSWH steel component properties.

Stiffness is based on the EEEP method?

It can be analyzed using either the EEEP method or the method defined in AC130 and AC436. For our purposes, it is analyzed using the procedures defined in AC130 and AC436 to determine allowable load and verify compatibility with code-based methods.

How does the shear load get into the Strong-Wall from the roof or floor?

The shear transfer plate with the Strong-Wall screws combined with the angled SDS screws. See details on page 12 of the C-L-SW21 catalog, or in the Structural Details starting on page 33. This information can also be found on our website, www.strongtie.com

What is the min. width of the Strong-Wall?

The narrowest WSWH panels are 12".

What do they weigh?

It varies by the width and height configuration. See page 13 of the C-L-SW21 Strong-Wall catalog, or visit our website, www.strongtie.com, for specifics.

Ductility

What are the ductility modification factors for these strong walls? $R_d - R_o = 1.0$?

Seismic design based on 2018 IBC using $R = 6.5$. Seismic design based on NBC 2015 using $R_d = 3.0$ and $R_o = 1.7$.

How much ductility is achievable with a WSWH?

Ductility is equal to $\Delta_v / \Delta_{A\Sigma\Delta}$ (AC436 Table 2). Where:
 Δ_v = Ultimate displacement.

$\Delta_{A\Sigma\Delta} = A\Sigma\Delta$ drift corresponding to allowable seismic in-plane shear.

With respect to the WSWH ductility, it is greater than 11 for all cases. Most of them vary from 14 - 16 and we achieved a maximum ductility of approx. 26.

Does the anchorage comply with ACI ductile anchorage, to avoid Omega0?

Yes, the anchorage solutions do comply with the ductility provisions in ACI 318. Those provisions are intended to make sure that we don't have brittle concrete failure so we design anchorage force amplified anchor bolt force to ensure that the bolt will fail before the concrete does.

Ductility is Ultimate displacement / (Yield displacement or the Allowable load displacement)??

Ductility is equal to $\Delta_v / \Delta_{A\Sigma\Delta}$ (AC436 Table 2). Where:
 Δ_v = Ultimate displacement.

$\Delta_{A\Sigma\Delta} = A\Sigma\Delta$ drift corresponding to allowable seismic in-plane shear.

A ductility of 17 seems really high. How do the panels interact with non-structural elements/systems?

The WSWH is designed to maintain a high degree of in-plane stiffness at design-level forces, thereby protecting nonstructural elements or systems. At larger inelastic drifts, nonstructural elements, e.g., interior and exterior finish materials, may exhibit cracking as expected during seismic events. Note that the ductility requirements defined in the acceptance criteria to which we test are based upon benchmark testing of code-based site-built wood shearwalls with varying aspect ratios, framing members, sheathing thicknesses and types, and fastening (diameter, length and spacing). Observed ductility ratios ranged from 6 to 43 depending on the configuration. The

Intentionally to increase the deflection (ductility)?

performance of the high-aspect-ratio WSWH falls within the range of benchmark testing.

The fuse is designed to remain intact to maximize bending stiffness at design-level loads, then fail at a certain force threshold to facilitate larger inelastic panel drifts while still preserving the load-carrying capacity of the panel.

Electrical

Can electric wiring or conduits be located inside the wall (if it has a cavity)?

Absolutely! There are a precut chase and cutouts to accommodate mechanicals. There are also allowable hole zones if the electrician or plumber needs to drill in through the side or face of the wall.

How about getting an electrical wire through it, laterally?

Yes, there are allowable edge hole zones designed to accommodate mechanicals - electrical, plumbing, etc.

The cutouts at the middle of the wall panel - are those for electrical/misc. fit up? Or are there any structural uses for such?

The cutouts are intended for a light switch or outlet or other mechanicals.

Fuse

If the fuse is fractured, how to replace it?

When the wood fuse fractures in tension or compression, the panel must be replaced. You need to remove the panel by first removing the heavy hex nut and release the top connection which means you'll either have to gain access to the screws and cut the screws and then install the top connection on the inside face, or you'll have to remove your exterior finish material and then remove the top connection plate and reinstall a new one.

If the fuse breaks in an earthquake now, would the wall still work for future earthquakes?

The fuse is designed to remain intact to maximize bending stiffness at design-level loads, then fail at a certain force threshold to facilitate larger inelastic panel drifts while still preserving the load-carrying capacity of the panel. But no, when the fuse fractures, the panel must be replaced.

How is deflection of the panel related to the wood fuse? Is the Cd factor in ASCE 7 chapter 12 accurate for inelastic drift on these panels? How might one apply this system to ASCE 41?

When the fuse is intact, the bending stiffness is maximized and it's going to lead to a much stiffer system. When the fuse fractures, the effective bending stiffness is significantly reduced, which allows the panel to flex and accommodate larger and larger inelastic panel drift without failing.

As long as we satisfy the seismic equivalency parameters defined in the acceptance criteria (AC 436), we're able to use the same seismic design coefficients for the R, Cd, and Ω that you're able to use for code-based wood frame shear walls. It's compatible with wood frame shearwalls

If the wood fuse fails, does the panel need to be replaced?

taken out of the code of SDPWS.

As for applying this system to ASCE41, yes, we're developing solutions for that which will be available shortly.

The fuse is designed to remain intact to maximize bending stiffness at design-level loads, then fail at a certain force threshold to facilitate larger inelastic panel drifts while still preserving the load-carrying capacity of the panel. But, yes, when the fuse fractures, the panel must be replaced.

If an electrical fuse blows, it is replaced. When your structural fuse blows, what happens next? Does the wall need to be replaced?

The fuse is designed to remain intact to maximize bending stiffness at design-level loads, then fail at a certain force threshold to facilitate larger inelastic panel drifts while still preserving the load-carrying capacity of the panel. But, yes, when the fuse fractures, the panel must be replaced.

When an electrical fuse blows, you can easily replace it. When this wood fuse "blows", what happens? Does the panel need to be replaced? If so, how does the typical single-family home owner know that it needs to be replaced, being that this is covered by finish (and/or a pop=out)? Also, with a 6" hold down bolt, how hard is it to replace or install as a retrofit condition?

When the wood fuse fractures in tension or compression, the panel must be replaced. You need to remove the panel by first removing the heavy hex nut and release the top connection, which means you'll either have to gain access to the screws and cut the screws and then install the top connection on the inside face, or you'll have to remove your exterior finish material and then remove the top connection plate and install a new one.

In case the "fuse" breaks, how do you repair/replace the shearwall on existing building?

When the wood fuse fractures in tension or compression, the panel must be replaced. You need to remove the panel by first removing the heavy hex nut and release the top connection, which means you'll either have to gain access to the screws and cut the screws and then install the top connection on the inside face, or you'll have to remove your exterior finish material and then remove the top connection plate and install a new one.

When the "fuse" element in the LSL fails, does the wall then need to be replaced?

The fuse is designed to remain intact to maximize bending stiffness at design-level loads, then fail at a certain force threshold to facilitate larger inelastic panel drifts while still preserving the load-carrying capacity of the panel. But, yes, when the fuse fractures, the panel must be replaced.

Regarding the fuse, does it actually reduce cross section and I (moment of inertia)?

Yes, the reduced effective bending stiffness, EI, at the fuse location allows for higher inelastic panel drifts without a significant reduction in load-carrying capacity.

Once the shear wall fuse load is compromised, does the shear wall need replacing? For example, after an earthquake or similar event.

The fuse is designed to remain intact to maximize bending stiffness at design-level loads, then fail at a certain force threshold to facilitate larger inelastic panel drifts while still preserving the load-carrying capacity of the panel. But, yes, when the fuse fractures, the panel must be replaced.

By the time the “fuse” fails, more structural components from the lateral force resisting system will have failed. The role of the fuse is to ensure ductility.

In case of the fuse failure and wall replacement situation, can you slide the wall over the existing bolt?

What is the structural benefit of the wall fuse?

Not a question, but more of a suggestion: It would be nice to have a fuse load part replacement, instead of replacing the entire shear wall.

When the fuse is intact, the bending stiffness is maximized, and it's going to lead to a much stiffer system. When the fuse fractures, the effective bending stiffness is significantly reduced, which allows the panel to flex and accommodate larger and larger inelastic panel drift without failing.

If the panel needs to be replaced following a wind or seismic event, the existing anchorage and foundation will need to be inspected to ensure that the load-carrying capacity has not been compromised. If it has not, then the existing anchorage may be reused.

The fuse is designed to remain intact to maximize bending stiffness at design-level loads, then fail at a certain force threshold to facilitate larger inelastic panel drifts while still preserving the load-carrying capacity of the panel.

Thank you for the feedback.

Install

Can wall be drilled for light?

Yes, there are allowable hole zones and trim zones that can be accommodated. See our detail 10/WSWH2 on page 36 of the C-L-SW21 catalog or on the web for additional information.

Can the heavy-duty screws be installed through the top plate into the end grain of the top of the wall, instead of skewed as shown?

Yes, providing the installer has access to get them installed perpendicular through the top plates. The Rake Wall detail (8/WSWH2) on page 34 of the C-L-SW21 catalog shows end, edge, and on-center spacings that would serve as reasonable guidance for how to install the SDS screws.

Can the standard framing allowable loads be used in a 1st story installation when 2nd story plywood shear walls are above? Do any of the allowable loads need to be changed?

Yes, as long as it provides a complete load path from the second story to the first-story panel, i.e., overturning tension and compression forces. Forces from second-story shearwall need to be transferred into the foundation.

Can straps be placed/nailed over the walls?

Yes, straps and connectors may be attached to the WSWH. However, the designer must consider the effects of the applied load and any eccentricity introduced into the shearwall.

Do you have something similar for metal stud applications?

I would suggest our Steel Strong-Wall for a metal stud application.

Does the wood need to be protected from any moisture coming up through the concrete?

There is a 10-gauge galvanized steel plate across the bottom of the walls. The plate is sufficient to protect against moisture from the concrete below.

What are the connections for the condition where WSWH panels sit on top of a wood diaphragm and aligned over a steel support beam? (Wood nailer on top of steel beam.)

We currently offer solutions for WSWH installations connected directly to a steel beam. See the following link:

<https://embed.widencdn.net/pdf/plus/ssttoolbox/jm4cm01wgy/L-L-WSWSBEAM21.pdf?u=cjmyin>

Options to install on top of, e.g., 8" wide masonry wall?

We are finalizing solutions for masonry applications. The forthcoming solutions will support the WSWH installed flush to the inside face of a 2x6 framed wall.

How will the performance of this shear wall will be affected if it's subjected to moisture during installation/construction?

The WSWH must be protected from exposure to the elements during transport and while on the jobsite per instructions listed on the panel. If exposed to incidental moisture during construction, the panel must be allowed to dry to 12% moisture content before it is enclosed within the building envelope.

Plastic barrier or equivalent membrane required between bottom of wood wall and concrete wall/footing?

No, there is a 10-gauge steel plate on the bottom of the wall and that provides the barrier between the LSL and the concrete.

Can the walls be used in the existing footing situation for remodel projects?

The WSWH may be used in retrofit/remodel applications provided all required installation details are satisfied. This may require underpinning to satisfy anchorage solution requirements.

For applications where there are multiple Strong-Walls on the same gridline, is there any gap requirement between the end of one Strong-Wall and the start of another?

The Strong-Walls may be installed in series in direct contact with each other without the need for a gap.

Are the top plates required to be SYP or equal? Reduction for less SG wood?

The minimum requirement is Douglas fir (DF) or southern yellow pine (SYP). Reductions may be required if the double top plates/header have a SG (or equivalent SG) less than 0.50.

Are both screws required at the top plate - sloped and perpendicular SDS screws?

For walls taller than 100" (i.e., greater than 8') the angled screws may be omitted, but a reduced out-of-plane load may apply. See page 16 of the C-L-SW21 catalog for additional information.

For OoP Wind pressures: just relying on SDS toe screws to provide that capacity? Noted/Tested capacities for this or just use standard NDS screw equations to determine capacity?

For walls taller than 100" (i.e., greater than 8') the angled screws may be omitted, but a reduced out-of-plane load may apply. See page 16 of the C-L-SW21 catalog for additional information. The OOP capacities were determined through testing only, as it is difficult to characterize the complex behavior of that connection through calculations.

Do headers in portal frames need to be solid members or can multiple-ply headers be used?

We support multi-ply headers. See structural details 3, 4, 5, 6/WSWH4 for details. These can be found starting on page 38 of the C-L-SW21 catalog, or in the structural details on our website, www.strongtie.com.

Can the WSWH be installed over steel members in 2nd story applications?

Yes. There is an engineering letter online (www.strongtie.com.) Go to the Strong-Wall landing page and search for support info. You can also call (800) 999-

The portal straps are one side only. The connections account for eccentric load.

5099 and ask for technical support. They can help get the letter to you.

Portal straps are required on both sides of the WSWH-to-header connection. The shear transfer plate is only required on one side.

We need a template for flush on the panel. Most forms don't fill to top of form

Norm! The panel form templates are what you want.

Can we cut the top to follow top plates slope?

The WSWH can be cut at an angle. See the rake wall detail - 8/WSWH2 on page 34 of the C-L-SW21 Strong-Wall catalog.

Can you use a w shape Steel header if it is packed out to fasten the straps?

The engineer of record or designer would need to evaluate this specific condition. Our guidance is that the beam stiffness, defined as EI / L^3 , must fall between 90 lb. / in. and 4,000 lb. / in. for portal applications. If the beam is stiffer than allowed, the capacity of the portal connection may be exceeded.

Are there any requirements to exterior sheathing attachment nailing once the final wall is completed?

There are no specific requirements for a sheathing attachment.

Are there acceptable solutions for lapping the portal straps with strap hold downs from floors above?

We would recommend that any attachment from floors above be transferred directly to the WSWH panel rather than attempting to lap with the WSWH-PS portal straps. Any eccentricity introduced into the WSWH from forces above must also be considered in the final panel design.

Loads

You are giving the allowable lateral loads. Does the catalog give the allowable vertical loads?

Yes, that data is included in the load tables in the catalog and online.

Is tension load based on embedment plain concrete cone?

The spread footing tension anchorage solutions are based on plain concrete and the grade beam anchorage solutions require anchor reinforcement to preclude breakout failures.

Web App

Currently the online shear wall selector still specifies WSW - when will the transition to WSWH occur and will it offer both WSW and WSWH solutions?

The Strong-Wall Shearwall Selector has now been updated to include the WSWH for standard, balloon framing, portal and raised-floor applications.

When will these be available on the Strong-Wall Shearwall Selector?

The Strong-Wall Shearwall Selector has now been updated to include the WSWH for standard, balloon framing, portal and raised-floor applications.

Misc.

Is a copy of the presentation available for download/notes?

Yes, today's presentation slides are available here: http://training.strongtie.com/courseware/webinars/VC/WSWH21/webinar_slides.pdf

I was having trouble with my audio at the beginning but got it squared away. How do we get certification for the CEUs if we are attending? Do we need to do a test?

For those that meet the minimum attendance requirement (45 minutes), an attendance email will be sent with your PDH certificate. If you need CEUs, there will be a link in that email to take a short online quiz. If you have any trouble, please contact training@strongtie.com

Are these walls insulated?

No, walls are not insulated, they are solid slabs of LSL. As a result, we recommend using the R value that the LSL manufacturer recommends for the material.

What does WSWH-PS stand for?

The PS stands for portal strap.

FYI, the poll was not a multiple selection.

Thank you for the feedback.

Also, are these walls available at lumberyards?

Yes, many lumberyards carry our Strong-Wall products, but for some they may be a special-order item. We have many sources for our products. Search for distributors on our website (www.strongtie.com) or call (800) 999-5099 and ask for customer service.

What are the lead times for these, and are they comparable to alternate local options in more remote locations?

Lead times will vary based on model, quantity, and purchase location.

Are these walls insulated?

No, the WSWH walls are not insulated.

Where may I locate a Structural Engineer that is knowledgeable to specify WSWH? Northern IL / Southern WI. Have sized a few thru online but current project is above my pay grade.

I would recommend contacting your local building department or referencing the following link <https://www.seaoi.org/find-structural-engineer>.