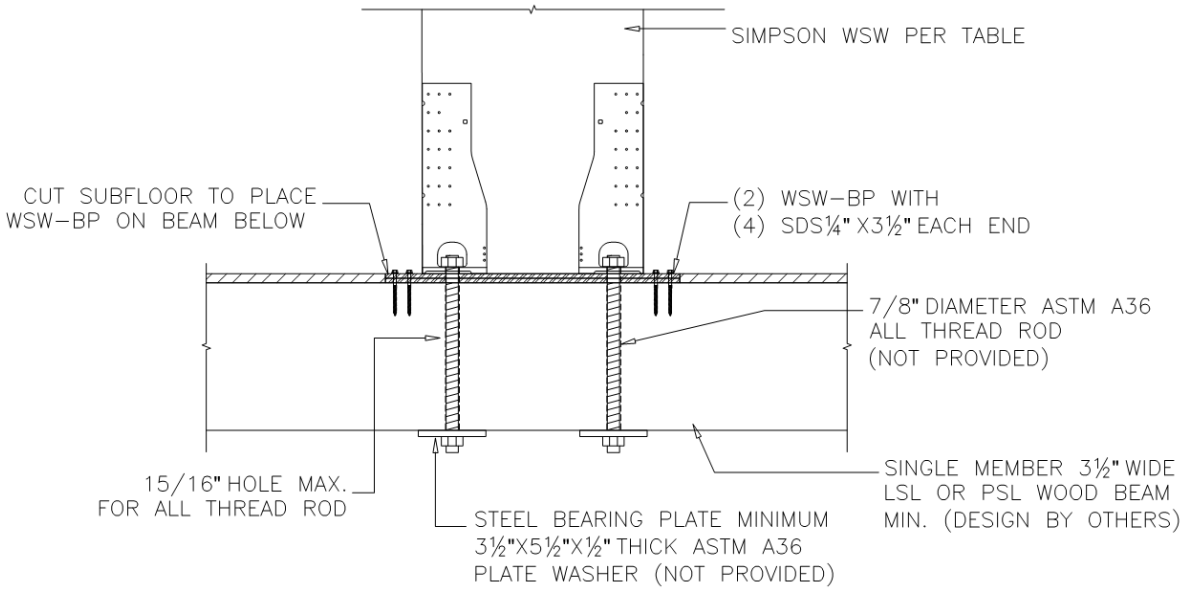
November 22, 2016

RE: Simpson Strong-Tie® Strong-Wall® Wood Shearwall (WSW) on top TimberStrand® LSL or Parallam® PSL wood beams

The Simpson Strong-Tie Strong-Wall Wood Shearwall (WSW) may be installed on TimberStrand LSL or Parallam PSL in accordance with the following:



- The beam shall be designed and detailed per code by the Engineer of Record (EOR) to resist the forces imposed by the Strong-Wall WSW panel above. The beam shall be designed for amplified seismic forces where required by code.
- A TimberStrand® **LSL** or Parallam® **PSL** single member, 3½" width wood member minimum is required.
- 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 EOR. See attached example.
- The allowable shear capacities of the Strong-Wall WSW panels installed on top of wood beams, prior to any reductions for beam deflections, shall be per the attached table. 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.
- The total vertical load acting on the entire panel in combination with the shear load shall not exceed 4,500 lbs. for WSW12 panels and 8,000 lbs. for WSW18 panels.
- 7/8-inch diameter ASTM A36, or ASTM F1554 Grade 36 threaded rods shall be used to connect to the LSL or PSL member below. 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.

Simpson Strong-Tie Company Inc. 5956 West Las Positas Boulevard Pleasanton, California, 94588 Phone: 800.999.5099 www.strongtie.com

ASD IN-PLANE SHEAR (lb.) for WSW installed on TimberStrand® LSL or Parallam® PSL (prior to adjustments for beam deflection)

Model ID	Height, h (in.)	Seismic Design		Wind Design	
		Allowable Shear, V (lb.)	Drift at Allowable Shear (in.)	Allowable Shear, V (lb.)	Drift at Allowable Shear (in.)
WSW12x8	93¼	580	0.42	715	0.53
WSW18x8	93¼	1,490	0.42	1,765	0.53
WSW12x9	105¼	500	0.47	615	0.60
WSW18x9	105¼	1,240	0.47	1,500	0.60
WSW18x10	117¼	1,095	0.52	1,335	0.67
WSW18x11	129¼	900	0.58	1,110	0.73
WSW18x12	141¼	715	0.63	875	0.80

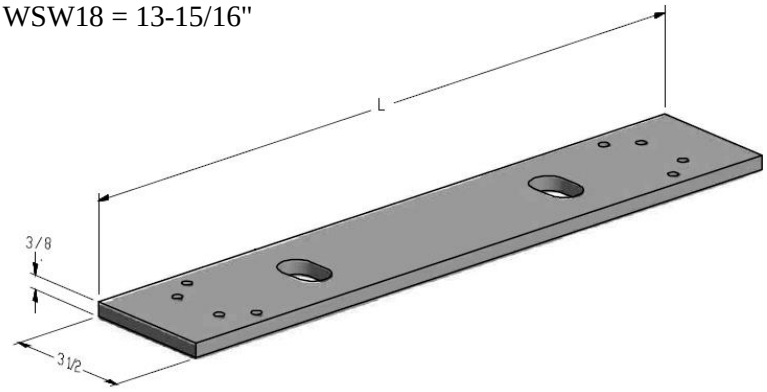
1. Allowable load shall be reduced as required due to added horizontal deflection of the panel from beam vertical deflection.
2. Anchor rod tension at design shear load and including the effect of axial load may be determined using the following equation:

   $T = [(V \times h) / B] - P/2$

   Where:
   - T = Anchor rod tension load (lb.)
   - V = ASD Design shear load (lb.)
   - h = Strong-Wall® WSW height (in.)
   - P = Applied axial load (lb.)
   - B = Moment arm, centerline of anchor bolt to center of compression area (in.)
   - B Dimension: WSW12 = 8-1/16", WSW18 = 13-15/16"

Wall Model	WSW-BPKT Model	Length, L (in.)
WSW12	WSW-BP12KT	18
WSW18	WSW-BP18KT	24

1. WSW-BP Kit includes (2) 3/8" thick WSW-BP plates and (8) SDS ¼" x 3½" screws required for installation.



The information in this letter is valid until **12/31/2018** when it will be re-evaluated by Simpson Strong-Tie. Please visit strongtie.com for additional pertinent information. If you have questions or need further assistance regarding this matter, please contact the Simpson Strong-Tie engineering department at (800) 999-5099.

Sincerely,
SIMPSON STRONG-TIE COMPANY INC.

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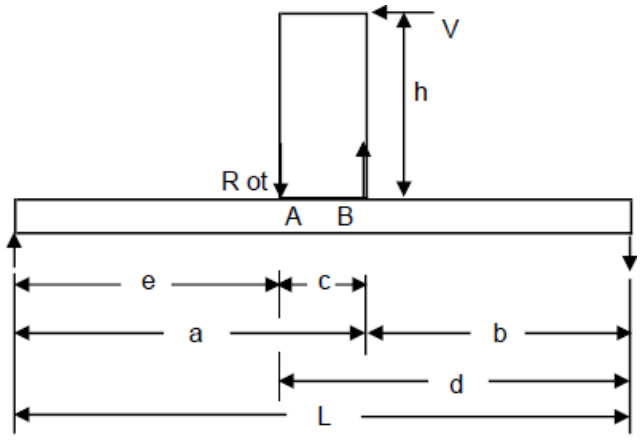

Strong-Wall® Wood Shearwall (WSW) Top of Panel Displacement Due to Deflection of Wood Beam.

Example similar to problem found in SEAOC Seismic Design Manual Volume II – Building Design Example (2009 IBC). See pages 82-83.

WSW18x9 bearing on a 5¼" x 14" PSL beam, E = 2.0E6

$\Delta v =$ Vertical beam deflection at point A minus deflection at point B due to wall overturning where:

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

$\Delta h =$ 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 Length, c	1.50 ft.	ESR-2652 Table 1
Design Shear, V_{act}	1,020 lb.	
Panel Allowable Seismic Shear, V_{all}	1,240 lb.	See Table on Page 2
Panel Drift at Allowable Shear, Δ_{all}	0.47 in.	See Table on Page 2
Panel Overturning Force, $R_{ot} = vh/c$	6120 lb.	
Beam Modulus of Elasticity, E	2,000,000 psi	TJ-9000
Beam Moment of Inertia, I	1201 $in.^4$	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	0.01 in.	
Δh	0.08 in.	
Total Drift (ASD), $\Delta_{ASD} = \Delta h + \Delta_{all}(V_{act}/V_{all})$	0.46 in.	
Total Drift (LRFD), $\delta_{xe} = \Delta_{ASD}/0.7$	0.66 in.	
Amplified Drift, $\delta_x = C_d\delta_{xe}/I$	2.64 in.	ASCE 7-10 Section 12.8.6
Allowable Code Drift, $\Delta_a = 0.025 \times h$	2.70 in.	ASCE 7-10 Table 12.12-1

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