STRUCTURAL CALCULATIONS

Project: The Moloney / O'Hanlon Residence Remodel
Address: 4016 92nd Ave SE,
Mercer Island, WA 98040
Project No.: 2458
Date: March 5, 2024

PERMIT SUBMITTAL

03/06/2024

Client:
Collin & Kelle Moloney

Contents:

1412 Beach Drive NE Unit A | Tacoma WA, WA | 98422

253.533.0835 | tel Structural Works, PLLC

These enclosed documents are to be used in conjunction with the plans referenced on the cover. It is essential that the contractor study the engineering requirements and required changes to the architectural plan prior to start of work. Changes may include additional foundation or footings, beam size changes, siding changes, etc.

Scope of Engineering: Engineering analyses and design to resist lateral and gravity loads in accordance with the 2018 IBC have been performed and incorporated into stamped "S" sheets. All analyses and calculations are included in this engineering report. Engineering assumptions are listed below. If these conditions are not present at the site, these calculations are void and Structural Works, PLLC must be contacted immediately.

Loading Criteria

- Building Code	2018 International Building Code
- Seismic Design Category	D
- Sds	1.126
- Response Mod Factor	6.5
- Site Class	D
- Basic Wind Speed	110 MPH, Exposure B

Live Loads U.N.O.

- Uninhabitable attics without storage	10 psf
- Uninhabitable attics with storage	20 psf
- Habitable attics and sleeping areas	30 psf
- Decks	60 psf
- All other areas	40 psf

Dead Loads U.N.O.

- Roof with composition roofing	15 psf
- Floor	10 psf

Snow Loads U.N.O.

- Snow	25 psf

Soils Criteria

- Soils consultant	None
- Soils Report #	None
- Bearing Pressure Required	1500 psf (min required – Assumed)
- Min Frost Depth	12"

Structural Works PLLC
1412 Beach Drive NE #A
Tacoma, WA 98422
(253) 533-0835

DATE:	3/2/2024	COMPANY:	
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--		

PROJECT SUMMARY

Project Name: 2458

Governing Codes:
Building Code: 2018 International Building Code
ASCE: ASCE 7-16
Steel: AISC 360-16
Concrete: ACI 318-14
Masonry: TMS 402/602-16

Module Location: 2RB-1
Module Level: Roof
Module Type: Roof Beam
Material Type: Solid Sawn Douglas Fir-Larch No. 2
Member Dimensions: (1) 5.5 in. X 11.5 in. X 7 ft
Section Adequacy: 75.03%
Controlling Factor: Bending Stress Y

Module Location: RB-1
Module Level: Upper Floor
Module Type: Roof Beam
Material Type: Solid Sawn Douglas Fir-Larch No. 2
Member Dimensions: (1) 5.5 in. X 11.5 in. X 15 ft
Section Adequacy: 51.74%
Controlling Factor: Bending Stress Y

Module Location: New Roof Rafter
Module Level: Upper Floor
Module Type: Roof Rafter
Material Type: Solid Sawn Douglas Fir-Larch No. 2
Member Dimensions: (1) 1.5 in. X 7.25 in. X 7.5 ft @ 24 in. Spacing
Section Adequacy: 78.5%
Controlling Factor: Bending-Tension

Module Location: New Floor Joist
Module Level: Upper Floor
Module Type: Floor Joist
Material Type: I-Joists Weyerhaeuser TJI 210
Member Dimensions: (1) 2.063 in. X 11.875 in. X 16 ft
Section Adequacy: 41.42%
Controlling Factor: Bending Moment

Module Location: New Floor Joist-1
Module Level: Upper Floor
Module Type: Floor Joist
Material Type: I-Joists Weyerhaeuser TJI 360
Member Dimensions: (1) 2.313 in. X 11.875 in. X 22 ft
Section Adequacy: 8.51%
Controlling Factor: Deflection Y

Module Location: 2FB-1
Module Level: Upper Floor
Module Type: Floor Beam
Material Type: Structural Composite Lumber Louisiana Pacific 2.0E LVL
Member Dimensions: (1) 3.5 in. X 11.875 in. X 3.5 ft
Section Adequacy: 90.85%
Controlling Factor: Bearing Stress

Module Location: 2FB-1 VERTICAL
Module Level: Upper Floor
Module Type: Floor Beam

Material Type: Structural Composite Lumber Louisiana Pacific 2.0E LVL
Member Dimensions: (1) 3.5 in. X 11.875 in. X 17.33 ft
Section Adequacy: 42.51%
Controlling Factor: Deflection Y

Module Location: 2FB-2
Module Level: Upper Floor
Module Type: Floor Beam
Material Type: Glulams Stress Class Rated 24F-1.8E 24F-V4 DF/DF
Member Dimensions: (1) 5.5 in. X 19.5 in. X 21 ft
Section Adequacy: 9.64%
Controlling Factor: Bearing Stress

Module Location: HDR-1
Module Level: Upper Floor
Module Type: Floor Beam
Material Type: Solid Sawn Douglas Fir-Larch No. 2
Member Dimensions: (1) 3.5 in. X 11.25 in. X 4.25 ft
Section Adequacy: 27.97%
Controlling Factor: Shear Stress Y

Module Location: POST TO 2FB-1
Module Level: Upper Floor
Module Type: Column
Material Type: Solid Sawn Douglas Fir-Larch No. 2
Member Dimensions: (1) 3.5 in. X 3.5 in. X 8 ft
Section Adequacy: 56.81%
Controlling Factor: Compressive Stress

Module Location: POST TO 2FB-2
Module Level: Upper Floor
Module Type: Column
Material Type: Solid Sawn Douglas Fir-Larch No. 2
Member Dimensions: (1) 3.5 in. X 5.5 in. X 8 ft
Section Adequacy: 25.01%
Controlling Factor: Compressive Stress

Module Location: TRIMMER TO HDR-1
Module Level: Upper Floor
Module Type: Column
Material Type: Solid Sawn Douglas Fir-Larch No. 2
Member Dimensions: (3) 1.5 in. X 3.5 in. X 8 ft
Section Adequacy: 54.27%
Controlling Factor: Compressive Stress

Module Location: GHDR
Module Level: Upper Floor
Module Type: Floor Beam
Material Type: Glulams Stress Class Rated 24F-1.8E 24F-V4 DF/DF
Member Dimensions: (1) 5.5 in. X 12 in. X 16 ft
Section Adequacy: 20.83%
Controlling Factor: Shear Stress Y

Module Location: FB-1
Module Level: Main Floor
Module Type: Floor Beam
Material Type: Solid Sawn Douglas Fir-Larch No. 2
Member Dimensions: (1) 3.5 in. X 11.25 in. X 5 ft
Section Adequacy: 25.66%
Controlling Factor: Shear Stress Y

Module Location: Existing Continuous Footing
Module Level: Main Floor
Module Type: Continuous Footing
Material Type: Concrete
Member Dimensions: 1 ft. wide X 8 in. tall
Section Adequacy: 16.75%
Controlling Factor: Soil Bearing Pressure
Reinforcement: #4 - Longitudinal: 0 Bars. Transversal: 12" O.C. Spacing

PASS

DATE:	3/2/2024	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	-- --	PROJECT NAME:	2458
LEVEL:	Roof	LOADING:	ASD
MEMBER NAME:	2RB-1	CODE:	2018 International Building Code
MEMBER TYPE:	ROOF BEAM	NDS:	2018 NDS
MATERIAL:	Solid Sawn		

Douglas Fir-Larch	No. 2	(1) 5.5 X 11.5	DRY		

2RB-1 DIAGRAM

BEAM PROPERTIES

Start (ft): 0 End (ft): 7 Member Slope: 0/12 Actual Length (ft): 7

Area (in^2)	Ix (in^4)	Iy (in^4)	BSW (lbf/ft)	Lams	G	Kcr Creep Factor
63.25	697.07	159.44	14.43	1	0.5	1

STRENGTH PROPERTIES

	Fb (psi)	Ft (psi)	Fv (psi)	Fc (psi)	Fc⊥ (psi)	E (psi) x10^3	Emin (psi) x10^3
Base Values	875	425	170	600	625	1300	470
Adjusted Values	875	425	170	600	625	1300	470
C_M	1	1	1	1	1	1	1
C_T	1	1	1	1	1	1	1
C_i	1	1	1	1	1	1	1
C_F	1	1	1	1	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_r = 1

BEAM DATA

Span	Length (ft)	Unbraced Length (ft) Top	Unbraced Length (ft) Bottom	Beam End Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	7	0	7	0				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Shear Stress Y (psi)	PASS (82.4%)	34.4	195.5	0	D+S	1.15
Bending Stress Y (psi)	PASS (75.0%)	251.3	1006.3	3.5	D+S	1.15
Deflection Y (in)	PASS (95.3%)	0.022 (=L/3818)	0.467 (=L/180)	3.5	D+Lr	1.25
Bearing Stress (psi)	PASS (85.9%)	87.9	625.0	0	D+S	1.15

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE ROOF	SNOW	TOTAL
A	575	700	875	2150
B	575	700	875	2150

Reaction Location

A B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft)	Uniform	200	200	0	7	RoofLive	Y
Uniform (lbf/ft)	Uniform	150	150	0	7	Dead	Y
Uniform (lbf/ft)	Uniform	250	250	0	7	Snow	Y
Self Weight (lbf/ft)	-	14.43	14.43	0	7	Dead	Y

PASS

DATE:	3/2/2024	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	RB-1	CODE:	2018 International Building Code
MEMBER TYPE:	ROOF BEAM	NDS:	2018 NDS
MATERIAL:	Solid Sawn		

Douglas Fir-Larch	No. 2	(1) 5.5 X 11.5	DRY		

RB-1 DIAGRAM

BEAM PROPERTIES

Start (ft): 0 End (ft): 15 Member Slope: 0/12 Actual Length (ft): 15

Area (in^2)	Ix (in^4)	Iy (in^4)	BSW (lbf/ft)	Lams	G	Kcr Creep Factor
63.25	697.07	159.44	14.43	1	0.5	1

STRENGTH PROPERTIES

	Fb (psi)	Ft (psi)	Fv (psi)	Fc (psi)	Fc⊥ (psi)	E (psi) x10^3	Emin (psi) x10^3
Base Values	875	425	170	600	625	1300	470
Adjusted Values	875	425	170	600	625	1300	470
C_M	1	1	1	1	1	1	1
C_T	1	1	1	1	1	1	1
C_i	1	1	1	1	1	1	1
C_F	1	1	1	1	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_r = 1

BEAM DATA

		Unbraced Length (ft)		Beam End				
Span	Length (ft)	Top	Bottom	Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	15	0	15	0				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Shear Stress Y (psi)	PASS (84.1%)	31.0	195.5	15	D+S	1.15
Bending Stress Y (psi)	PASS (51.7%)	485.6	1006.3	7.5	D+S	1.15
Deflection Y (in)	PASS (80.6%)	0.194 (=L/928)	1.000 (=L/180)	7.5	D+Lr	1.25
Bearing Stress (psi)	PASS (87.3%)	79.3	625.0	0	D+S	1.15

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE ROOF	SNOW	TOTAL
A	558	600	750	1908
B	558	600	750	1908

Reaction Location

A B

LOAD LIST

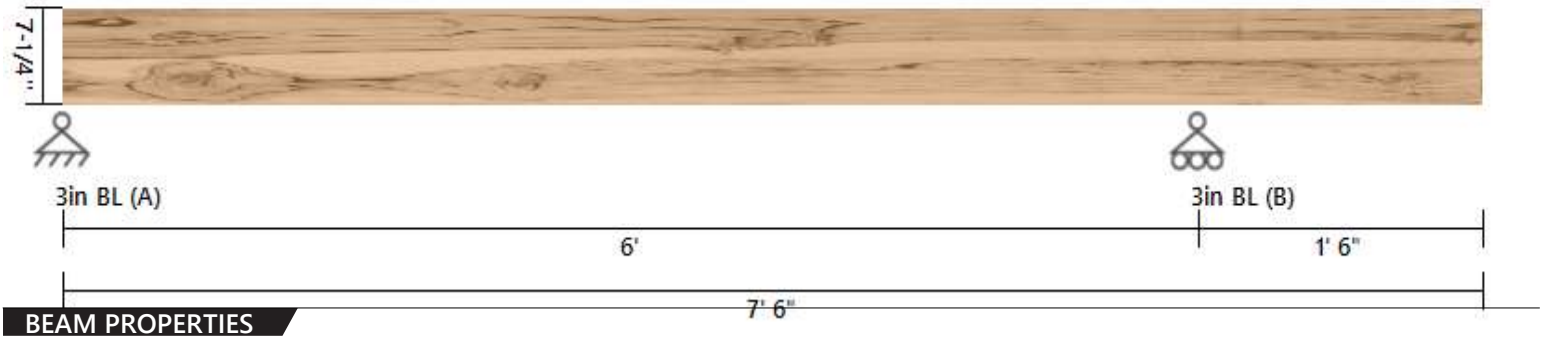
Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft)	Uniform	80	80	0	15	RoofLive	Y
Uniform (lbf/ft)	Uniform	60	60	0	15	Dead	Y
Uniform (lbf/ft)	Uniform	100	100	0	15	Snow	Y
Self Weight (lbf/ft)	-	14.43	14.43	0	15	Dead	Y

PASS

DATE:	3/2/2024	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	-- --	PROJECT NAME:	2458
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	New Roof Rafter	CODE:	2018 International Building Code
MEMBER TYPE:	ROOF RAFTER	NDS:	2018 NDS
MATERIAL:	Solid Sawn		

Douglas Fir-Larch	No. 2	(1) 1.5 X 7.25	24(in) O.C.	DRY	

New Roof Rafter DIAGRAM



BEAM PROPERTIES

Start (ft): 0 End (ft): 7.5 Member Slope: 3/12 Actual Length (ft): 7.73 Roof Pitch: 3/12 O.C. Spacing(in): 24

Area (in^2)	Ix (in^4)	Iy (in^4)	BSW (lbf/ft)	Lams	G	Kcr Creep Factor
10.88	47.63	2.04	2.48	1	0.5	1

STRENGTH PROPERTIES

	Fb (psi)	Ft (psi)	Fv (psi)	Fc (psi)	Fc⊥ (psi)	E (psi) x10^3	Emin (psi) x10^3
Base Values	900	575	180	1350	625	1600	580
Adjusted Values	1242	690	180	1418	625	1600	580
C_M	1	1	1	1	1	1	1
C_T	1	1	1	1	1	1	1
C_i	1	1	1	1	1	1	1
C_F	1.2	1.2	1	1.05	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_r = 1.15

BEAM DATA

Span	Length (ft)	Unbraced Length (ft) Top	Unbraced Length (ft) Bottom	Beam End Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	6	0	6	1.5				
2	1.5	0	1.5	0.375				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Shear Stress Y (psi)	PASS (82.5%)	36.3	207.0	6	D+S	1.15
Bending Stress Y (psi)	PASS (78.5%)	307.0	1428.3	2.775	D+S	1.15
Deflection Y (in)	PASS (92.0%)	0.017 (=L/5294)	0.206 (=L/437)	7.5	D+Lr	1.25
Compressive Stress (psi)	PASS (99.6%)	5.3	1496.0	0	D+S	1.15
Tensile Stress (psi)	PASS (99.2%)	6.0	793.5	6	D+S	1.15
Bearing Stress (psi)	PASS (88.1%)	83.4	703.1	6	D+S	1.15
Bending-Compression (Unit)	PASS (78.5%)	0.22	1.00	2.775	D+S	1.15
Bending-Tension (Unit)	PASS (78.5%)	0.22	1.00	2.85	D+S	1.15

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE ROOF	SNOW	TOTAL
A	94	116	145	355
B	157	193	242	592
C	0	0	0	0

Reaction Location

LOAD LIST

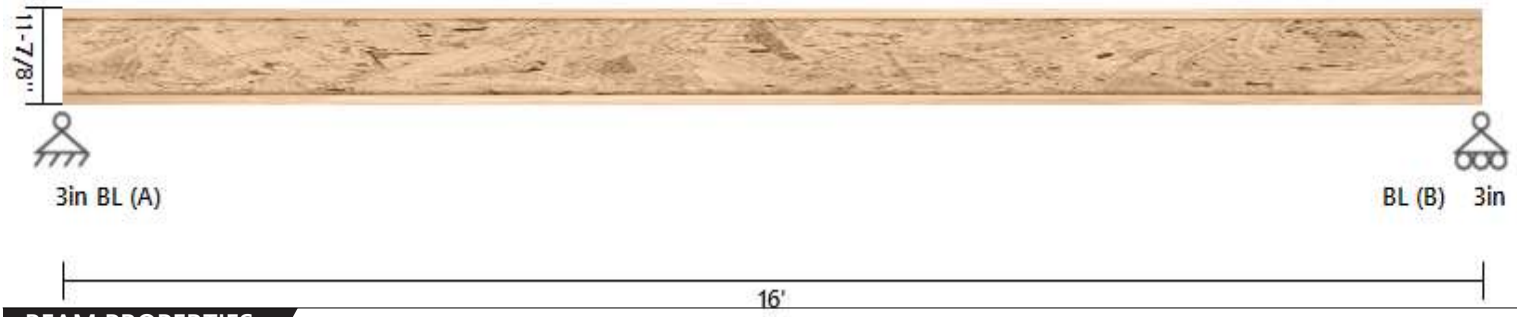
Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft^2)	Uniform	20	20	0	7.5	RoofLive	Y
Uniform (lbf/ft^2)	Uniform	15	15	0	7.5	Dead	Y
Uniform (lbf/ft^2)	Uniform	25	25	0	7.5	Snow	Y
Self Weight (lbf/ft)	-	2.48	2.48	0	7.5	Dead	Y

PASS

DATE:	3/2/2024	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	New Floor Joist	CODE:	2018 International Building Code
MEMBER TYPE:	FLOOR JOIST	NDS:	2018 NDS
MATERIAL:	I-Joists		

Weyerhaeuser	TJI 210	(1) 11.875	0(in) O.C.	DRY	

New Floor Joist DIAGRAM



BEAM PROPERTIES

Start (ft): 0 End (ft): 16 Member Slope: 0/12 Actual Length (ft): 16 O.C. Spacing(in): 16

						End Rcap	End Rcap	End Rcap	End Rcap	Int Rcap	Int Rcap	Int Rcap	Int Rcap
EI x10^6	BSW	Lams	K x10^6	Mcap	Vcap	1.75 NS	3.5 NS	1.75 WS	3.5 NS	3.5 NS	5.25 NS	3.5 WS	5.25 WS
(lbf-in^2)	(lbf/ft)		(lbf)	(lbf-ft)	(lbf)	(lbf)	(lbf)	(lbf)	(lbf)	(lbf)	(lbf)	(lbf)	(lbf)
315	2.8	1	4.5	3795	1655	1005	1460	1365	1655	2145	2565	2505	2925

BEAM DATA

		Unbraced Length (ft)		Beam End
Span	Length (ft)	Top	Bottom	Elev. Diff (ft)
1	16	0	16	0

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Shear Force (lbf)	PASS (66.4%)	555.7	1655.0	0	D+L	1
Bending Moment (lbf-ft)	PASS (41.4%)	2222.9	3795.0	8	D+L	1
Deflection Y (in)	PASS (53.2%)	0.250 (=L/768)	0.533 (=L/360)	8	L	0
Bearing Load (lbf)	PASS (58.2%)	555.7	1330.0	0	D+L	1

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE	TOTAL
A	129	427	556
B	129	427	556

Reaction Location WS-Web Stiffener Required NSR-No Stiffener Required

A B

NSR NSR

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft^2)	Uniform	40	40	0	16	Live	Y
Uniform (lbf/ft^2)	Uniform	10	10	0	16	Dead	Y
Self Weight (lbf/ft)	-	2.8	2.8	0	16	Dead	Y

PASS

DATE:	3/2/2024	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	New Floor Joist-1	CODE:	2018 International Building Code
MEMBER TYPE:	FLOOR JOIST	NDS:	2018 NDS
MATERIAL:	I-Joists		

Weyerhaeuser	TJI 360	(1) 11.875	0(in) O.C.	DRY	

New Floor Joist-1 DIAGRAM

BEAM PROPERTIES

Start (ft): 0 End (ft): 22 Member Slope: 0/12 Actual Length (ft): 22 O.C. Spacing(in): 16

						End Rcap	End Rcap	End Rcap	End Rcap	Int Rcap	Int Rcap	Int Rcap	Int Rcap
EI x10^6	BSW	Lams	K x10^6	Mcap	Vcap	1.75 NS	3.5 NS	1.75 WS	3.5 WS	3.5 NS	5.25 NS	3.5 WS	5.25 WS
(lbf-in^2)	(lbf/ft)		(lbf)	(lbf-ft)	(lbf)	(lbf)	(lbf)	(lbf)	(lbf)	(lbf)	(lbf)	(lbf)	(lbf)
419	3	1	4.5	6180	1705	1080	1505	1440	1705	2460	3000	2815	3360

BEAM DATA

		Unbraced Length (ft)		Beam End
Span	Length (ft)	Top	Bottom	Elev. Diff (ft)
1	22	0	22	0

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Shear Force (lbf)	PASS (55.1%)	766.3	1705.0	0	D+L	1
Bending Moment (lbf-ft)	PASS (31.8%)	4214.8	6180.0	11	D+L	1
Deflection Y (in)	PASS (8.5%)	0.671 (=L/393)	0.733 (=L/360)	11	L	0
Bearing Load (lbf)	PASS (44.6%)	766.3	1383.6	0	D+L	1

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE	TOTAL
A	180	587	767
B	180	587	767

Reaction Location WS-Web Stiffener Required NSR-No Stiffener Required

A B

NSR NSR

LOAD LIST

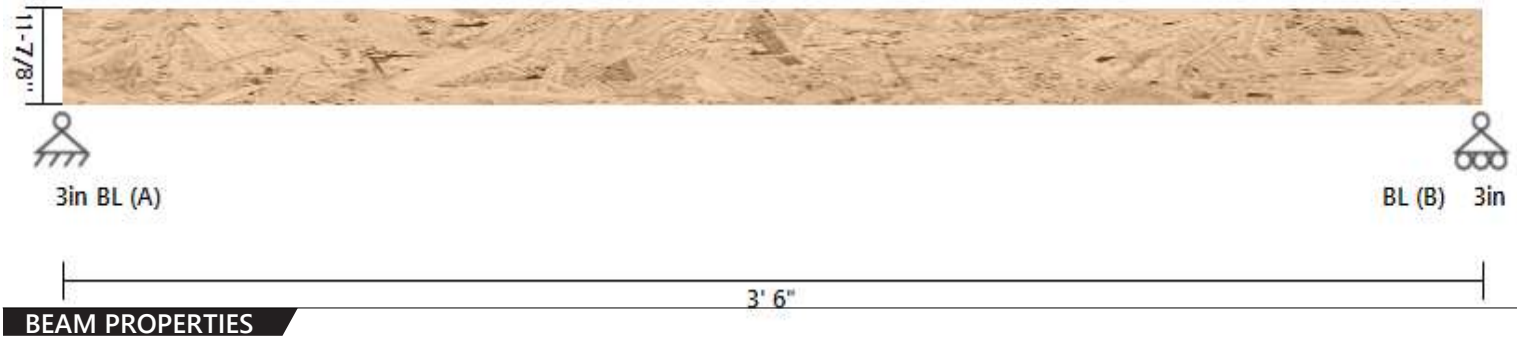
Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft^2)	Uniform	40	40	0	22	Live	Y
Uniform (lbf/ft^2)	Uniform	10	10	0	22	Dead	Y
Self Weight (lbf/ft)	-	3	3	0	22	Dead	Y

PASS

DATE:	3/2/2024	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	-- --	PROJECT NAME:	2458
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	2FB-1	CODE:	2018 International Building Code
MEMBER TYPE:	FLOOR BEAM	NDS:	2018 NDS
MATERIAL:	Structural Composite Lumber		

Louisiana Pacific	2.0E LVL	(1) 3.5 X 11.875	DRY		

2FB-1 DIAGRAM



BEAM PROPERTIES

Start (ft): 0 End (ft): 3.5 Member Slope: 0/12 Actual Length (ft): 3.5

Area (in^2)	Ix (in^4)	Iy (in^4)	BSW (lbf/ft)	Lams	Cfn	Kcr Creep Factor
41.56	488.41	42.43	11.83	1	9	1

STRENGTH PROPERTIES

	Fb (psi)	Ft (psi)	Fv (psi)	Fc (psi)	Fc⊥ (psi)	E (psi) x10^3	Emin (psi) x10^3
Base Values	2900	1800	285	3200	750	2000	1000
Adjusted Values	2900	1800	285	3200	750	2000	1000
C_M	1	1	1	1	1	1	1
C_T	1	1	1	1	1	1	1

Bending Adjustment Factors C_V = 1 C_r = 1 Volume factor Is applied on a load combination basis And Is Not reflected in the adjusted values

BEAM DATA

Span	Length (ft)	Unbraced Length (ft) Top	Unbraced Length (ft) Bottom	Beam End Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	3.5	0	3.5	0				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Shear Stress Y (psi)	PASS (90.9%)	26.0	285.0	0	D+L	1
Bending Stress Y (psi)	PASS (96.8%)	92.0	2903.4	1.75	D+L	1
Deflection Y (in)	PASS (99.1%)	0.001 (=L/42000)	0.117 (=L/359)	1.75	L	0
Bearing Stress (psi)	PASS (90.8%)	68.6	750.0	0	D+L	1

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE	TOTAL
A	161	560	721
B	161	560	721

Reaction Location

A B

LOAD LIST

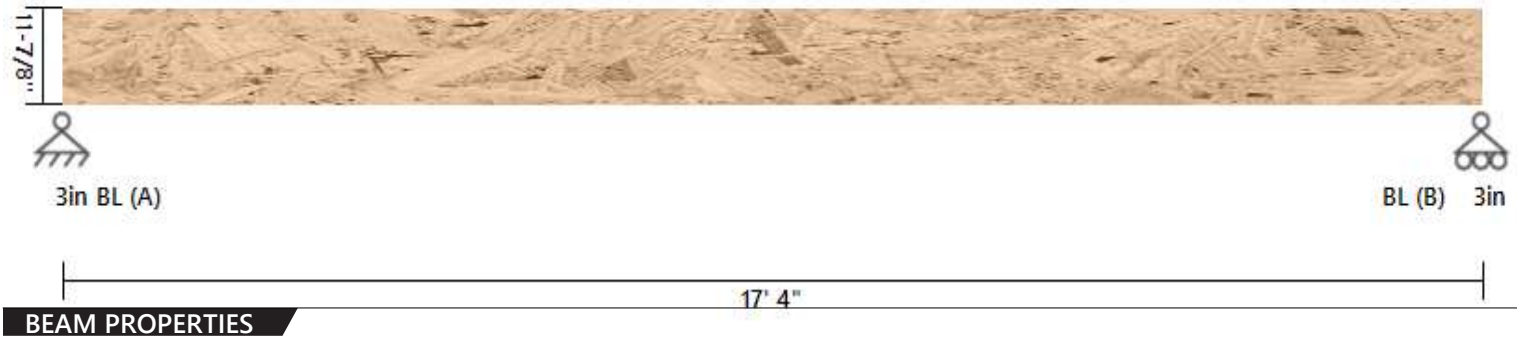
Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft)	Uniform	320	320	0	3.5	Live	Y
Uniform (lbf/ft)	Uniform	80	80	0	3.5	Dead	Y
Self Weight (lbf/ft)	-	11.83	11.83	0	3.5	Dead	Y

PASS

DATE:	3/2/2024	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	-- --	PROJECT NAME:	2458
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	2FB-1 VERTICAL	CODE:	2018 International Building Code
MEMBER TYPE:	FLOOR BEAM	NDS:	2018 NDS
MATERIAL:	Structural Composite Lumber		

Louisiana Pacific	2.0E LVL	(1) 3.5 X 11.875	DRY		

2FB-1 VERTICAL DIAGRAM



BEAM PROPERTIES

Start (ft): 0 End (ft): 17.333 Member Slope: 0/12 Actual Length (ft): 17.333

Area (in^2)	Ix (in^4)	Iy (in^4)	BSW (lbf/ft)	Lams	Cfn	Kcr Creep Factor
41.56	488.41	42.43	11.83	1	9	1

STRENGTH PROPERTIES

	Fb (psi)	Ft (psi)	Fv (psi)	Fc (psi)	Fc⊥ (psi)	E (psi) x10^3	Emin (psi) x10^3
Base Values	2900	1800	285	3200	750	2000	1000
Adjusted Values	2900	1800	285	3200	750	2000	1000
C_M	1	1	1	1	1	1	1
C_T	1	1	1	1	1	1	1

Bending Adjustment Factors C_V = 1 C_r = 1 Volume factor Is applied on a load combination basis And Is Not reflected in the adjusted values

BEAM DATA

Span	Length (ft)	Unbraced Length (ft) Top	Unbraced Length (ft) Bottom	Beam End Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	17.333	0	17.333	0				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Shear Stress Y (psi)	PASS (66.6%)	109.6	327.8	17.333	D+0.75L+0.75S	1.15
Bending Stress Y (psi)	PASS (55.1%)	1303.7	2903.4	8.493	D+L	1
Deflection Y (in)	PASS (42.5%)	0.498 (=L/418)	0.867 (=L/240)	8.667	D+L	1
Bearing Stress (psi)	PASS (61.4%)	289.3	750.0	17.333	D+0.75L+0.75S	1.15

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE	LIVE ROOF	SNOW	TOTAL
A	1361	753	350	438	2902
B	1411	1194	780	974	4359

Reaction Location

A B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft)	Uniform	80	80	0	17.333	Live	Y
Uniform (lbf/ft)	Uniform	20	20	0	17.333	Dead	Y
Uniform (lbf/ft)	WALL	108	108	0	10.75	Dead	Y
Uniform (lbf/ft)	ROOF	30	30	0	10.75	Dead	Y
Uniform (lbf/ft)	ROOF	40	40	0	10.75	RoofLive	Y
Uniform (lbf/ft)	ROOF	50	50	0	10.75	Snow	Y
Self Weight (lbf/ft)	-	11.83	11.83	0	17.333	Dead	Y

LINKED LOAD LIST

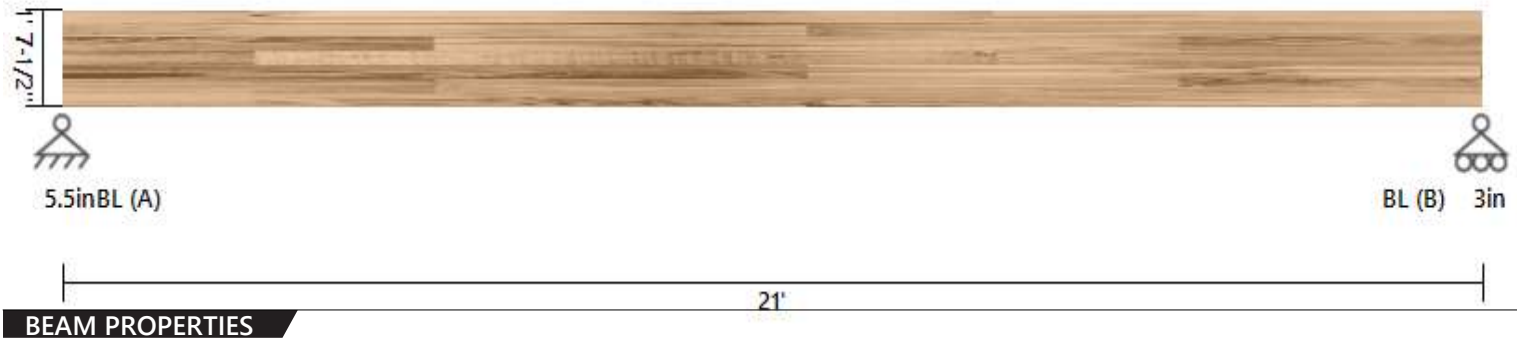
Type	Member	Support	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Point (lbf)	2RB-1	B	575.489	-	16	-	Dead	Y
Point (lbf)	2RB-1	B	875	-	16	-	Snow	Y
Point (lbf)	2RB-1	B	700	-	16	-	RoofLive	Y
Point (lbf)	2FB-1	B	160.709	-	15.5	-	Dead	Y
Point (lbf)	2FB-1	B	560	-	15.5	-	Live	Y

PASS

DATE:	3/2/2024	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	2FB-2	CODE:	2018 International Building Code
MEMBER TYPE:	FLOOR BEAM	NDS:	2018 NDS
MATERIAL:	Glulams		

Stress Class Rated 24F-1.8E	24F-V4 DF/DF	(1) 5.5 X 19.5	DRY		

2FB-2 DIAGRAM



BEAM PROPERTIES

Start (ft): 0 End (ft): 21 Member Slope: 0/12 Actual Length (ft): 21

Area (in^2)	Ix (in^4)	Iy (in^4)	BSW (lbf/ft)	Lams	G	Kcr Creep Factor
107.25	3398.48	270.36	24.46	1	0.5	1

STRENGTH PROPERTIES

	Fbx+ (psi)	Fbx- (psi)	Fby (psi)	Ft (psi)	Fvx (psi)	Fvy (psi)	Fc (psi)	Fc⊥ (psi)	Ex (psi)	Exmin (psi)	Ey (psi)	Eymin (psi)
Base Values	2400	1850	1450	1100	265	230	1650	650	1800000	950000	1600000	850000
Adjusted Values	2400	1850	1450	1100	265	230	1650	650	1800000	950000	1600000	850000
C_M	1	1	1	1	1	1	1	1	1	1	1	1
C_T	1	1	1	1	1	1	1	1	1	1	1	1

Bending Adjustment Factors C_{vr} = 1

BEAM DATA

Span	Length (ft)	Unbraced Length (ft) Top	Unbraced Length (ft) Bottom	Beam End Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	21	0	21	0				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Shear Stress Y (psi)	PASS (56.5%)	115.2	265.0	0	D+L	1
Bending Stress Y (psi)	PASS (34.3%)	1492.4	2270.2	10.5	D+L	1
Deflection Y (in)	PASS (46.4%)	0.563 (=L/448)	1.050 (=L/240)	10.5	D+L	1
Bearing Stress (psi)	PASS (9.6%)	506.0	560.0	21	D+0.75L+0.75Lr	1.25

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE	LIVE ROOF	SNOW	TOTAL
A	4036	4200	2158	1677	12071
B	3668	4200	2042	1823	11733

Reaction Location

A B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft)	Uniform	400	400	0	21	Live	Y
Uniform (lbf/ft)	Uniform	100	100	0	21	Dead	Y
Uniform (lbf/ft)	WALL	108	108	0	17.5	Dead	Y
Uniform (lbf/ft)	ROOF	150	150	0	17.5	Dead	Y
Uniform (lbf/ft)	ROOF	200	200	0	17.5	RoofLive	Y
Uniform (lbf/ft)	ROOF	150	150	0	17.5	Snow	Y
Self Weight (lbf/ft)	-	24.46	24.46	0	21	Dead	Y

LINKED LOAD LIST

Type	Member	Support	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Point (lbf)	2RB-1	A	575.489	-	17.5	-	Dead	Y
Point (lbf)	2RB-1	A	875	-	17.5	-	Snow	Y
Point (lbf)	2RB-1	A	700	-	17.5	-	RoofLive	Y

PASS

DATE:	3/2/2024	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	HDR-1	CODE:	2018 International Building Code
MEMBER TYPE:	FLOOR BEAM	NDS:	2018 NDS
MATERIAL:	Solid Sawn		

Douglas Fir-Larch	No. 2	(1) 3.5 X 11.25	DRY		

HDR-1 DIAGRAM

BEAM PROPERTIES

Start (ft): 0 End (ft): 4.25 Member Slope: 0/12 Actual Length (ft): 4.25

Area (in^2)	Ix (in^4)	Iy (in^4)	BSW (lbf/ft)	Lams	G	Kcr Creep Factor
39.38	415.28	40.19	8.98	1	0.5	1

STRENGTH PROPERTIES

	Fb (psi)	Ft (psi)	Fv (psi)	Fc (psi)	Fc⊥ (psi)	E (psi) x10^3	Emin (psi) x10^3
Base Values	900	575	180	1350	625	1600	580
Adjusted Values	990	575	180	1350	625	1600	580
C_M	1	1	1	1	1	1	1
C_T	1	1	1	1	1	1	1
C_i	1	1	1	1	1	1	1
C_F	1.1	1	1	1	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_r = 1

BEAM DATA

		Unbraced Length (ft)		Beam End				
Span	Length (ft)	Top	Bottom	Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	4.25	0	4.25	0				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Shear Stress Y (psi)	PASS (28.0%)	129.6	180.0	0	D+L	1
Bending Stress Y (psi)	PASS (69.0%)	306.6	990.0	1.955	D+L	1
Deflection Y (in)	PASS (95.6%)	0.009 (=L/5667)	0.213 (=L/239)	2.082	D+L	1
Bearing Stress (psi)	PASS (42.6%)	358.5	625.0	0	D+0.75L+0.75S	1.15

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE	LIVE ROOF	SNOW	TOTAL
A	2017	1386	755	944	5102
B	838	807	446	557	2648

Reaction Location

A B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft)	Uniform	360	360	0.25	4.25	Live	Y
Uniform (lbf/ft)	Uniform	90	90	0.25	4.25	Dead	Y
Uniform (lbf/ft)	WALL	108	108	0	4.25	Dead	Y
Uniform (lbf/ft)	ROOF	150	150	0	4.25	Dead	Y
Uniform (lbf/ft)	ROOF	200	200	0	4.25	RoofLive	Y
Uniform (lbf/ft)	ROOF	250	250	0	4.25	Snow	Y
Self Weight (lbf/ft)	-	8.98	8.98	0	4.25	Dead	Y

LINKED LOAD LIST

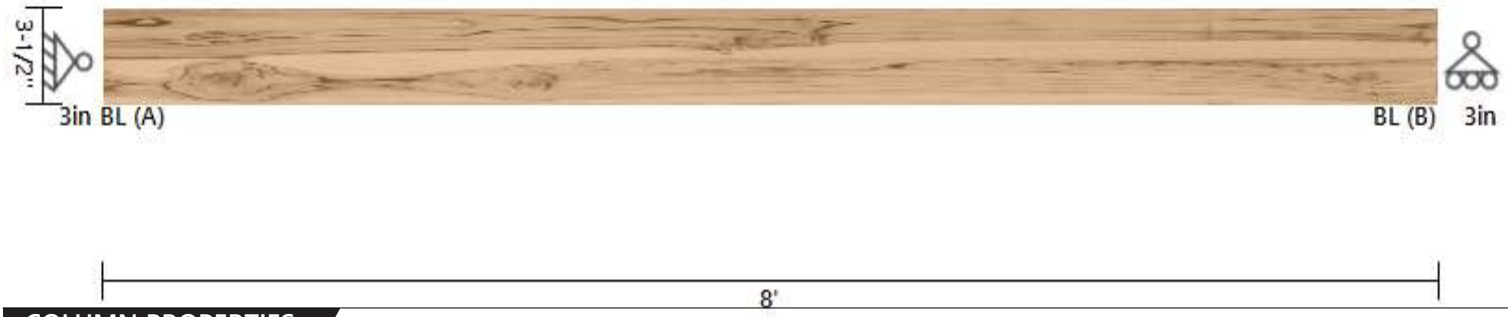
Type	Member	Support	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Point (lbf)	2FB-1 VERTICAL	A	1360.607	-	0.25	-	Dead	Y
Point (lbf)	2FB-1 VERTICAL	A	752.544	-	0.25	-	Live	Y
Point (lbf)	2FB-1 VERTICAL	A	438.114	-	0.25	-	Snow	Y
Point (lbf)	2FB-1 VERTICAL	A	350.491	-	0.25	-	RoofLive	Y

PASS

DATE:	3/2/2024	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	POST TO 2FB-1	CODE:	2018 International Building Code
MEMBER TYPE:	COLUMN	NDS:	2018 NDS
MATERIAL:	Solid Sawn		

Douglas Fir-Larch	No. 2	(1) 3.5 X 3.5	DRY		

POST TO 2FB-1 DIAGRAM



COLUMN PROPERTIES

Start(ft) 0 End(ft): 8

Area (in^2)	Ix (in^4)	Iy (in^4)	BSW (lbf/ft)	Lams	G	Kcr Creep Factor
12.25	12.51	12.51	2.79	1	0.5	1

STRENGTH PROPERTIES

	Fb (psi)	Ft (psi)	Fv (psi)	Fc (psi)	Fc⊥ (psi)	E (psi) x10^3	Emin (psi) x10^3
Base Values	900	575	180	1350	625	1600	580
Adjusted Values	1350	862	180	1552	625	1600	580
C_M	1	1	1	1	1	1	1
C_T	1	1	1	1	1	1	1
C_i	1	1	1	1	1	1	1
C_F	1.5	1.5	1	1.15	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_r = 1

COLUMN DATA

		Unbraced Length (ft)		Column End					
Span	Length (ft)	X	Y	Offset	CP	Ke(X Axis)	Ke(Y Axis)	KeL/d (X Axis)	KeL/d (Y Axis)
1	8	8	8	0	27.43	27.43			

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Compressive Stress (psi)	PASS (56.8%)	249.8	578.3	0	D+0.75L+0.75S	1.15

REACTIONS

Units for V: lbf Units for M: lbf-ft

Z axis	DEAD	LIVE	LIVE ROOF	SNOW	TOTAL
A	1433	1194	780	974	4381
B	0	0	0	0	0

Reaction Location

A B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Self Weight (lbf/ft)	-	2.79	2.79	0	8	Dead	Z

LINKED LOAD LIST

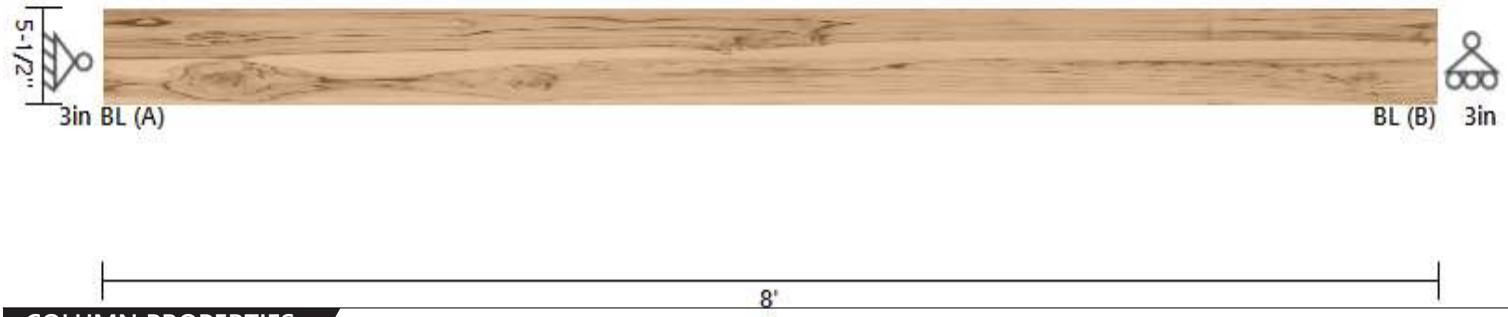
Type	Member	Support	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Axial (lbf)	2FB-1 VERTICAL	B	-1410.928	-1410.928	8	8	Dead	Z
Axial (lbf)	2FB-1 VERTICAL	B	-1194.14	-1194.14	8	8	Live	Z
Axial (lbf)	2FB-1 VERTICAL	B	-974.402	-974.402	8	8	Snow	Z
Axial (lbf)	2FB-1 VERTICAL	B	-779.523	-779.523	8	8	RoofLive	Z

PASS

DATE:	3/2/2024	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	POST TO 2FB-2	CODE:	2018 International Building Code
MEMBER TYPE:	COLUMN	NDS:	2018 NDS
MATERIAL:	Solid Sawn		

Douglas Fir-Larch	No. 2	(1) 3.5 X 5.5	DRY		

POST TO 2FB-2 DIAGRAM



COLUMN PROPERTIES

Start(ft) 0 End(ft): 8

Area (in^2)	Ix (in^4)	Iy (in^4)	BSW (lbf/ft)	Lams	G	Kcr Creep Factor
19.25	48.53	19.65	4.39	1	0.5	1

STRENGTH PROPERTIES

	Fb (psi)	Ft (psi)	Fv (psi)	Fc (psi)	Fc⊥ (psi)	E (psi) x10^3	Emin (psi) x10^3
Base Values	900	575	180	1350	625	1600	580
Adjusted Values	1170	748	180	1485	625	1600	580
C_M	1	1	1	1	1	1	1
C_T	1	1	1	1	1	1	1
C_i	1	1	1	1	1	1	1
C_F	1.3	1.3	1	1.1	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_r = 1

COLUMN DATA

		Unbraced Length (ft)		Column End					
Span	Length (ft)	X	Y	Offset	CP	Ke(X Axis)	Ke(Y Axis)	KeL/d (X Axis)	KeL/d (Y Axis)
1	8	8	8	0	17.45	27.43			

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Compressive Stress (psi)	PASS (25.0%)	435.5	580.8	0	D+0.75L+0.75Lr	1.25

REACTIONS

Units for V: lbf Units for M: lbf-ft

Z axis	DEAD	LIVE	LIVE ROOF	SNOW	TOTAL
A	3703	4200	2042	1823	11768
B	0	0	0	0	0

Reaction Location

A B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Self Weight (lbf/ft)	-	4.39	4.39	0	8	Dead	Z

LINKED LOAD LIST

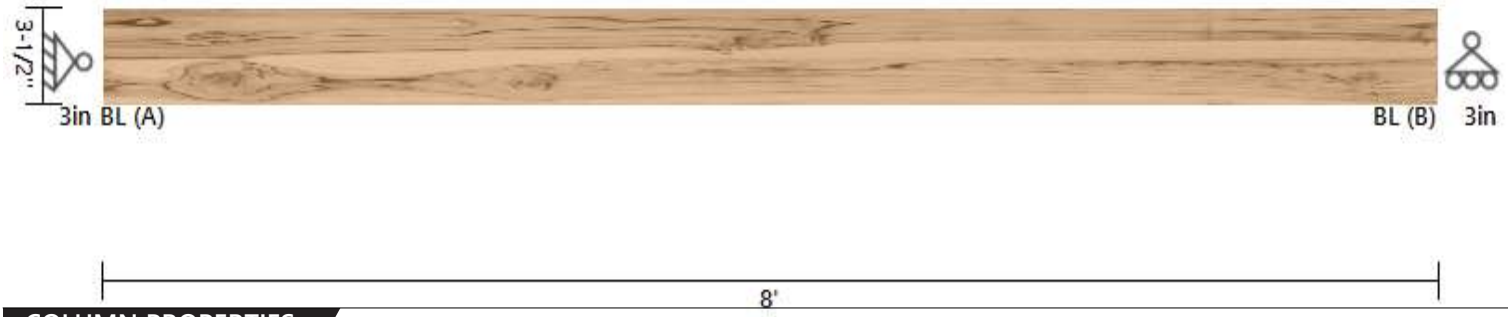
Type	Member	Support	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Axial (lbf)	2FB-2	B	-3667.673	-3667.673	8	8	Dead	Z
Axial (lbf)	2FB-2	B	-4200.023	-4200.023	8	8	Live	Z
Axial (lbf)	2FB-2	B	-1822.914	-1822.914	8	8	Snow	Z
Axial (lbf)	2FB-2	B	-2041.672	-2041.672	8	8	RoofLive	Z

PASS

DATE:	3/2/2024	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	-- --	PROJECT NAME:	2458
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	TRIMMER TO HDR-1	CODE:	2018 International Building Code
MEMBER TYPE:	COLUMN	NDS:	2018 NDS
MATERIAL:	Solid Sawn		

Douglas Fir-Larch	No. 2	(3) 1.5 X 3.5	DRY		

TRIMMER TO HDR-1 DIAGRAM



COLUMN PROPERTIES

Start(ft) 0 End(ft): 8

Area (in^2)	Ix (in^4)	Iy (in^4)	BSW (lbf/ft)	Lams	G	Kcr Creep Factor
15.75	16.08	26.58	3.59	3	0.5	1

STRENGTH PROPERTIES

	Fb (psi)	Ft (psi)	Fv (psi)	Fc (psi)	Fc⊥ (psi)	E (psi) x10^3	Emin (psi) x10^3
Base Values	900	575	180	1350	625	1600	580
Adjusted Values	1350	862	180	1552	625	1600	580
C_M	1	1	1	1	1	1	1
C_T	1	1	1	1	1	1	1
C_i	1	1	1	1	1	1	1
C_F	1.5	1.5	1	1.15	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_r = 1

COLUMN DATA

		Unbraced Length (ft)		Column End					
Span	Length (ft)	X	Y	Offset	CP	Ke(X Axis)	Ke(Y Axis)	KeL/d (X Axis)	KeL/d (Y Axis)
1	8	8	8	0	27.43	21.33			

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Compressive Stress (psi)	PASS (54.3%)	240.8	526.7	0	D+0.75L+0.75S	1.15

REACTIONS

Units for V: lbf Units for M: lbf-ft

Z axis	DEAD	LIVE	LIVE ROOF	SNOW	TOTAL
A	2046	1386	755	944	5131
B	0	0	0	0	0

Reaction Location

A B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Self Weight (lbf/ft)	-	3.59	3.59	0	8	Dead	Z

LINKED LOAD LIST

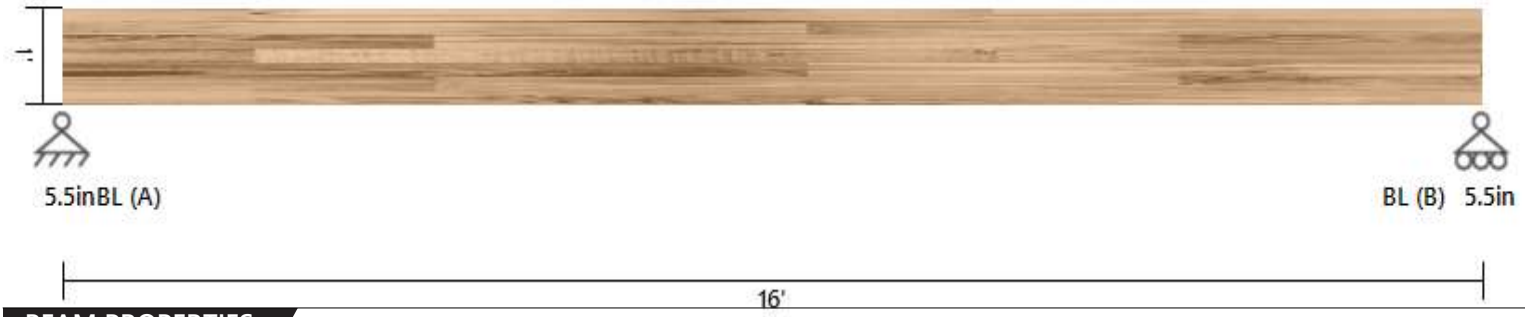
Type	Member	Support	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Axial (lbf)	HDR-1	A	-2017.31	-2017.31	8	8	Dead	Z
Axial (lbf)	HDR-1	A	-1385.922	-1385.922	8	8	Live	Z
Axial (lbf)	HDR-1	A	-943.594	-943.594	8	8	Snow	Z
Axial (lbf)	HDR-1	A	-754.867	-754.867	8	8	RoofLive	Z

PASS

DATE:	3/2/2024	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	GHDR	CODE:	2018 International Building Code
MEMBER TYPE:	FLOOR BEAM	NDS:	2018 NDS
MATERIAL:	Glulams		

Stress Class Rated 24F-1.8E	24F-V4 DF/DF	(1) 5.5 X 12	DRY		

GHDR DIAGRAM



BEAM PROPERTIES

Start (ft): 0 End (ft): 16 Member Slope: 0/12 Actual Length (ft): 16

Area	Ix	Iy	BSW	Lams	G	Kcr
(in^2)	(in^4)	(in^4)	(lbf/ft)			Creep Factor
66	792	166.38	15.05	1	0.5	1

STRENGTH PROPERTIES

	Fbx+	Fbx-	Fby	Ft	Fvx	Fvy	Fc	Fc⊥	Ex	Exmin	Ey	Eymin
	(psi)	(psi)	(psi)	(psi)	(psi)	(psi)	(psi)	(psi)	(psi)	(psi)	(psi)	(psi)
Base Values	2400	1850	1450	1100	265	230	1650	650	1800000	950000	1600000	850000
Adjusted Values	2400	1850	1450	1100	265	230	1650	650	1800000	950000	1600000	850000
C_M	1	1	1	1	1	1	1	1	1	1	1	1
C_T	1	1	1	1	1	1	1	1	1	1	1	1

Bending Adjustment Factors C_{vr} = 1

BEAM DATA

		Unbraced Length (ft)		Beam End				
Span	Length (ft)	Top	Bottom	Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	16	0	16	0				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Shear Stress Y (psi)	PASS (20.8%)	209.8	265.0	0	D+L	1
Bending Stress Y (psi)	PASS (30.2%)	1675.3	2400.0	4	D+L	1
Deflection Y (in)	PASS (27.7%)	0.578 (=L/332)	0.800 (=L/240)	7.36	D+L	1
Bearing Stress (psi)	PASS (42.1%)	324.3	560.0	0	D+0.75L+0.75Lr	1.25

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE	LIVE ROOF	SNOW	TOTAL
A	4916	4315	2209	1867	13307
B	1889	1165	590	610	4254

Reaction Location

A B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft)	Uniform	80	80	0	16	Live	Y
Uniform (lbf/ft)	Uniform	20	20	0	16	Dead	Y
Uniform (lbf/ft)	WALL	108	108	0	16	Dead	Y
Uniform (lbf/ft)	ROOF	30	30	0	16	Dead	Y
Uniform (lbf/ft)	ROOF	40	40	0	16	RoofLive	Y
Uniform (lbf/ft)	ROOF	50	50	0	16	Snow	Y
Self Weight (lbf/ft)	-	15.05	15.05	0	16	Dead	Y

LINKED LOAD LIST

Type	Member	Support	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Point (lbf)	2FB-2	A	4036.499	-	2	-	Dead	Y
Point (lbf)	2FB-2	A	4199.998	-	2	-	Live	Y
Point (lbf)	2FB-2	A	1677.082	-	2	-	Snow	Y
Point (lbf)	2FB-2	A	2158.332	-	2	-	RoofLive	Y

PASS

DATE:	3/2/2024	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Main Floor	LOADING:	ASD
MEMBER NAME:	FB-1	CODE:	2018 International Building Code
MEMBER TYPE:	FLOOR BEAM	NDS:	2018 NDS
MATERIAL:	Solid Sawn		

Douglas Fir-Larch	No. 2	(1) 3.5 X 11.25	DRY		

FB-1 DIAGRAM

BEAM PROPERTIES

Start (ft): 0 End (ft): 5 Member Slope: 0/12 Actual Length (ft): 5

Area (in^2)	Ix (in^4)	Iy (in^4)	BSW (lbf/ft)	Lams	G	Kcr Creep Factor
39.38	415.28	40.19	8.98	1	0.5	1

STRENGTH PROPERTIES

	Fb (psi)	Ft (psi)	Fv (psi)	Fc (psi)	Fc⊥ (psi)	E (psi) x10^3	Emin (psi) x10^3
Base Values	900	575	180	1350	625	1600	580
Adjusted Values	990	575	180	1350	625	1600	580
C_M	1	1	1	1	1	1	1
C_T	1	1	1	1	1	1	1
C_i	1	1	1	1	1	1	1
C_F	1.1	1	1	1	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_r = 1

BEAM DATA

		Unbraced Length (ft)		Beam End				
Span	Length (ft)	Top	Bottom	Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	5	0	5	0				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Shear Stress Y (psi)	PASS (25.7%)	133.8	180.0	0	D+L	1
Bending Stress Y (psi)	PASS (27.9%)	713.6	990.0	2.5	D+L	1
Deflection Y (in)	PASS (86.8%)	0.022 (=L/2727)	0.167 (=L/359)	2.5	L	0
Bearing Stress (psi)	PASS (46.5%)	334.5	625.0	0	D+L	1

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE	TOTAL
A	912	2600	3512
B	912	2600	3512

Reaction Location

A B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft)	1ST FLOOR	600	600	0	5	Live	Y
Uniform (lbf/ft)	1ST FLOOR	150	150	0	5	Dead	Y
Uniform (lbf/ft)	WALL	96	96	0	5	Dead	Y
Uniform (lbf/ft)	2ND FLOOR	440	440	0	5	Live	Y
Uniform (lbf/ft)	2ND FLOOR	110	110	0	5	Dead	Y
Self Weight (lbf/ft)	-	8.98	8.98	0	5	Dead	Y

PASS

DATE:	3/2/2024	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Main Floor	LOADING:	ASD
MEMBER NAME:	Existing Continuous Footing	CODE:	2018 International Building Code
MEMBER TYPE:	CONTINUOUS FOOTING	ACI:	ACI 318-14
MATERIAL:	Concrete		

1 (ft) Wide X 8 (in) Deep	Soil Depth TOF: 0 (ft)	Long. (2) #4 Bars, Transv: #4 @12(in) O.C.

MATERIAL PROPERTIES

FOOTING

Width (ft)	Depth (in)	Footing Weight (lb/ft)	Stemwall Weight (lb/ft)
1	8	96.66666	193.3333

CONCRETE

fc' (psi)	Ec (psi)	Density (lbf/ft^3)	Agg. Dia. (in)
2500	2850000	145	0.75

STEM WALL

Width (in)	Height (in)	Material	Stemwall Offset (in)
8	24	Concrete	0

SOIL

Bearing Strength (lbf/ft^2)	Density (lbf/ft^3)	Cohesion	Friction Angle	Depth (ft)	Rankine Coefficient (Kp)
1500	110	0	30	0	3

REBAR

Bottom Bar Size #	Bottom Bar Spacing (in.)	fy (psi)	Es (psi)
4	12	40000	2.9E+07

COVER

Top Cover (in.	Bottom Cover (in.	Side Cover (in.
3	3	3

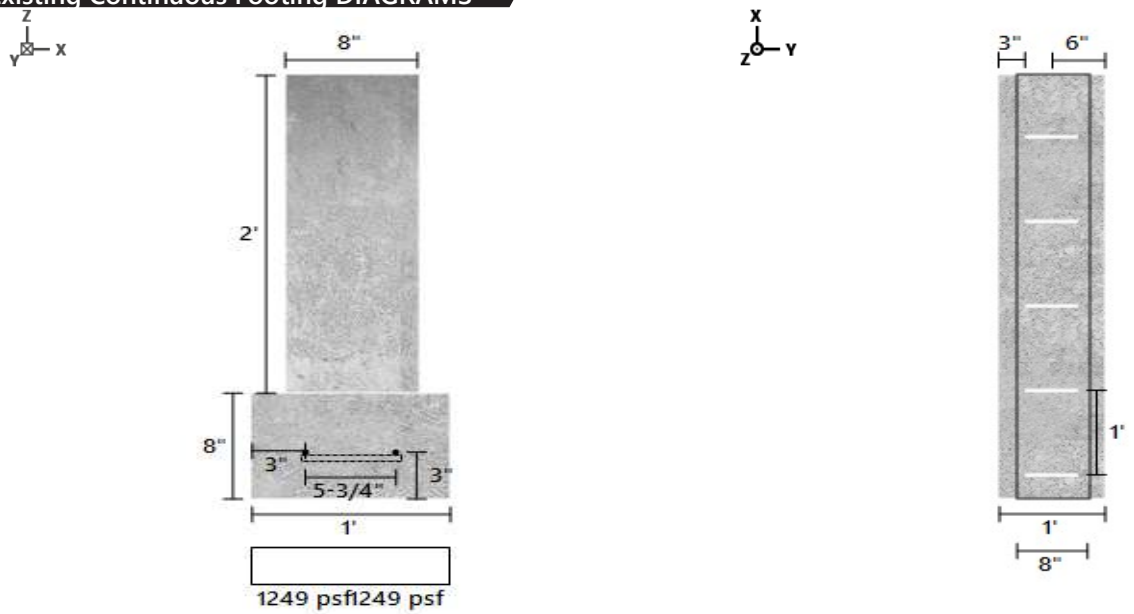
PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOAD COMBO	CALCULATION TYPE
Soil Bearing Pressure (lbf/ft^2)	PASS (16.8%)	1248.8	1500.0	D+0.75L+0.75S	ASD
Moment (lbf-ft)	PASS (99.3%)	19.7	2707.0	1.2D+1.6S+L	LRFD
Compression (ft^2)	PASS (100.0%)	1.0	1.0	D	LRFD

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft)	Uniform	400	400	0	1	Live	Z
Uniform (lbf/ft)	Uniform	100	100	0	1	Dead	Z
Uniform (lbf/ft)	Uniform	195	195	0	1	Dead	Z
Uniform (lbf/ft)	Uniform	260	260	0	1	RoofLive	Z
Uniform (lbf/ft)	Uniform	325	325	0	1	Snow	Z
Uniform (lbf/ft)	Uniform	120	120	0	1	Dead	Z

Existing Continuous Footing DIAGRAMS



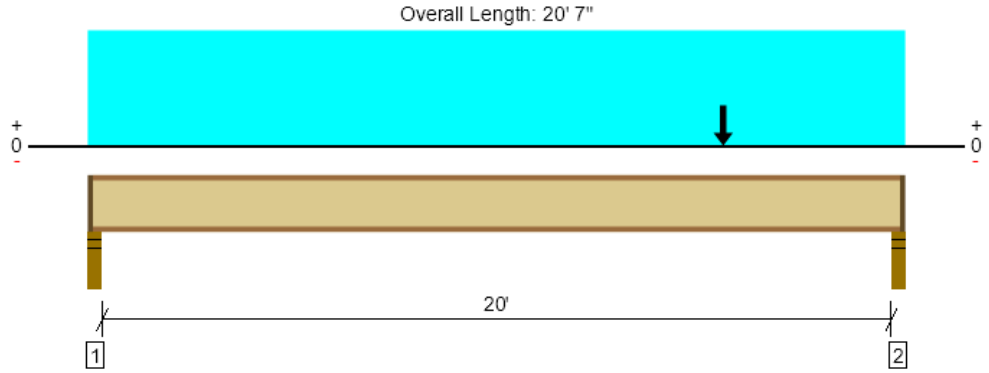
FORTEWEB

MEMBER REPORT

PASSED

Level, Floor: Joist

1 piece(s) 11 7/8" TJI® 560 @ 16" OC



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	949 @ 20' 4 1/2"	1396 (2.25")	Passed (68%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	936 @ 20' 3 1/2"	2050	Passed (46%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4183 @ 11' 4 15/16"	9500	Passed (44%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.317 @ 10' 3 1/2"	0.504	Passed (L/764)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.494 @ 10' 6 7/16"	1.008	Passed (L/490)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	43	40	Passed	--	--

Member Length : 20' 4 1/2"
System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Snow	Factored	
1 - Stud wall - SPF	3.50"	2.25"	1.75"	212	549	58	72	761	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	1.75"	407	549	209	261	1014	1 1/4" Rim Board

• Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	8' 8" o/c	
Bottom Edge (Lu)	20' 5" o/c	

•TJI joists are only analyzed using Maximum Allowable bracing solutions.
•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Roof Live (1.25)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 20' 7"	16"	10.0	40.0	-	-	Floor Load
2 - Point (PLF)	16'	16"	108.0	-	-	-	Wall Dead Load
3 - Point (PLF)	16'	16"	150.0	-	200.0	250.0	Roof Load

Weyerhaeuser Notes

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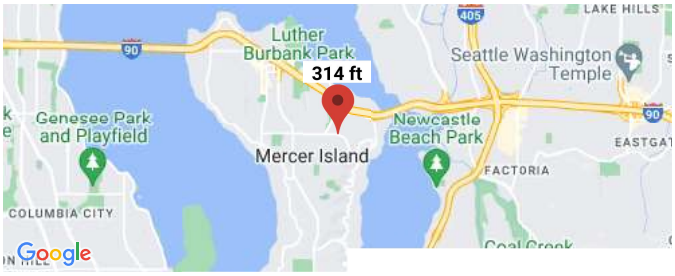
The product application, input design loads, dimensions and support information have been provided by UG

This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

The ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Hazards by Location

Search Information



Address:	4016 92nd Ave SE, Mercer Island, WA 98040
Coordinates:	47.5740522, -122.2158426
Elevation:	314 ft
Timestamp:	2024-03-02T12:19:43.520Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	II
Site Class:	D-default

Basic Parameters

Name	Value	Description
S_S	1.408	MCE_R ground motion (period=0.2s)
S_1	0.489	MCE_R ground motion (period=1.0s)
S_{MS}	1.689	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.126	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.903	Coefficient of risk (0.2s)
CR_1	0.897	Coefficient of risk (1.0s)
PGA	0.602	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.723	Site modified peak ground acceleration
T_L	6	Long-period transition period (s)
SsRT	1.408	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.56	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.622	Factored deterministic acceleration value (0.2s)
S1RT	0.489	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.545	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.447	Factored deterministic acceleration value (1.0s)
PGAd	1.234	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

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Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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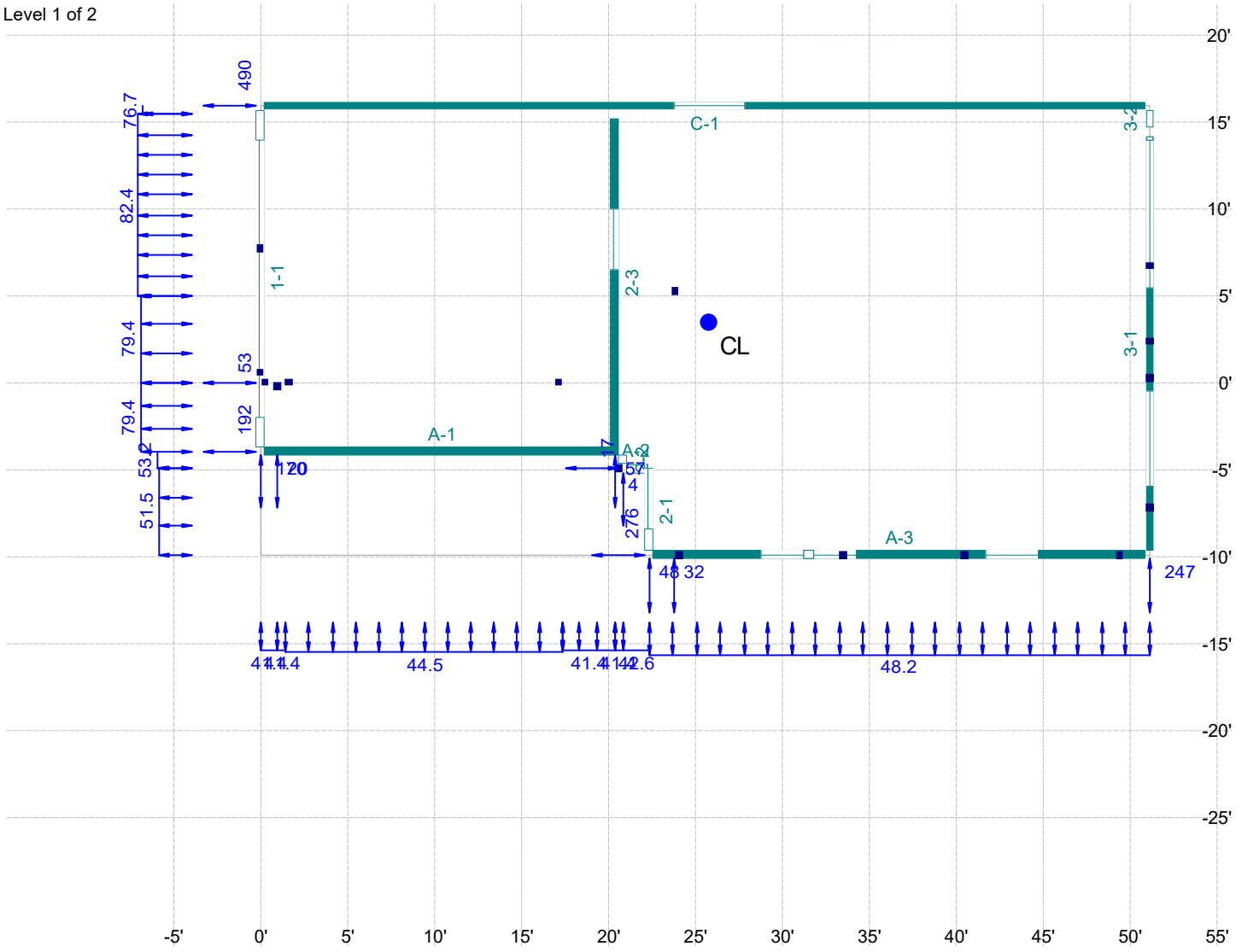
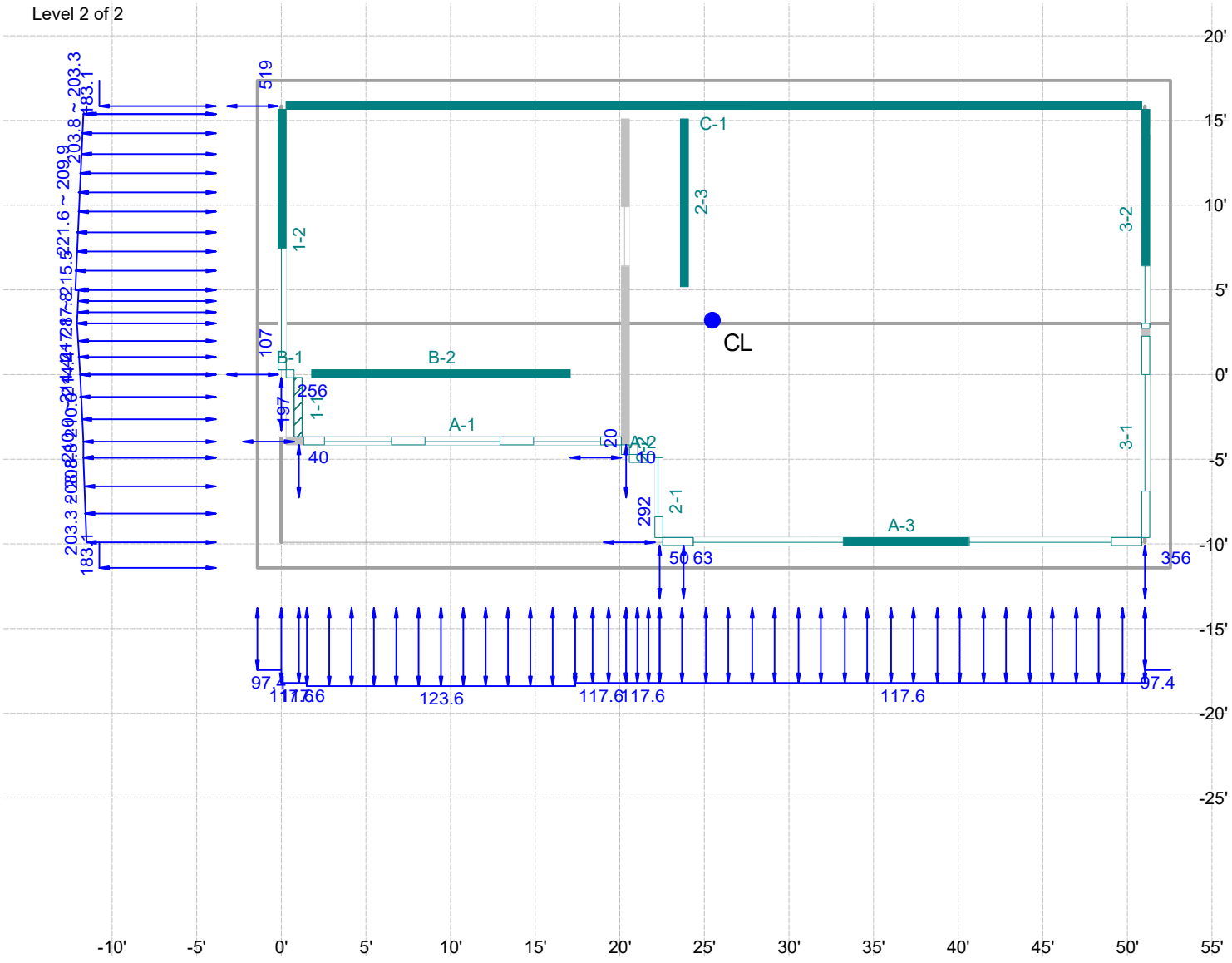
Level 1 of 2



Factored shearline force (lbs)
Factored hold-down force (lbs)
C Factored compression force (lbs)
Vertical element required
Unfactored applied shear load (plf)
Unfactored dead load (plf,lbs)
Applied point load or discontinuous shearline force (lbs)

Loads: Seismic (Qe); Forces: 0.7E + 0.6D; E = pQe + 0.2 Sds D; p(NS) = 1.3; p(EW) = 1.3; Sds = 1.13; Rigid distribution

Level 2 of 2



Factored shearline force (lbs)
Factored hold-down force (lbs)
C Factored compression force (lbs)
Vertical element required
Unfactored applied shear load (plf)
Unfactored dead load (plf,lbs)
Applied point load or discontinuous shearline force (lbs)

Loads: Seismic (Qe); Forces: 0.7E + 0.6D; E = pQe + 0.2 Sds D; p(NS) = 1.3; p(EW) = 1.3; Sds = 1.13; Rigid distribution

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Hazards by Location

Search Information

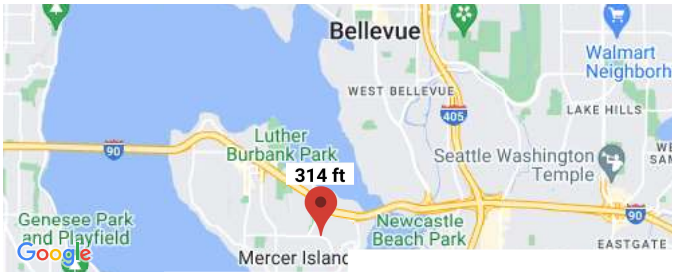
Address: 4016 92nd Ave SE, Mercer Island, WA 98040

Coordinates: 47.5740522, -122.2158426

Elevation: 314 ft

Timestamp: 2024-03-02T12:19:16.041Z

Hazard Type: Wind



ASCE 7-16

MRI 10-Year	67 mph
MRI 25-Year	73 mph
MRI 50-Year	78 mph
MRI 100-Year	83 mph
Risk Category I	92 mph
Risk Category II	98 mph
Risk Category III	105 mph
Risk Category IV	108 mph

ASCE 7-10

MRI 10-Year	72 mph
MRI 25-Year	79 mph
MRI 50-Year	85 mph
MRI 100-Year	91 mph
Risk Category I	100 mph
Risk Category II	110 mph
Risk Category III-IV	115 mph

ASCE 7-05

ASCE 7-05 Wind Speed	85 mph

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Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

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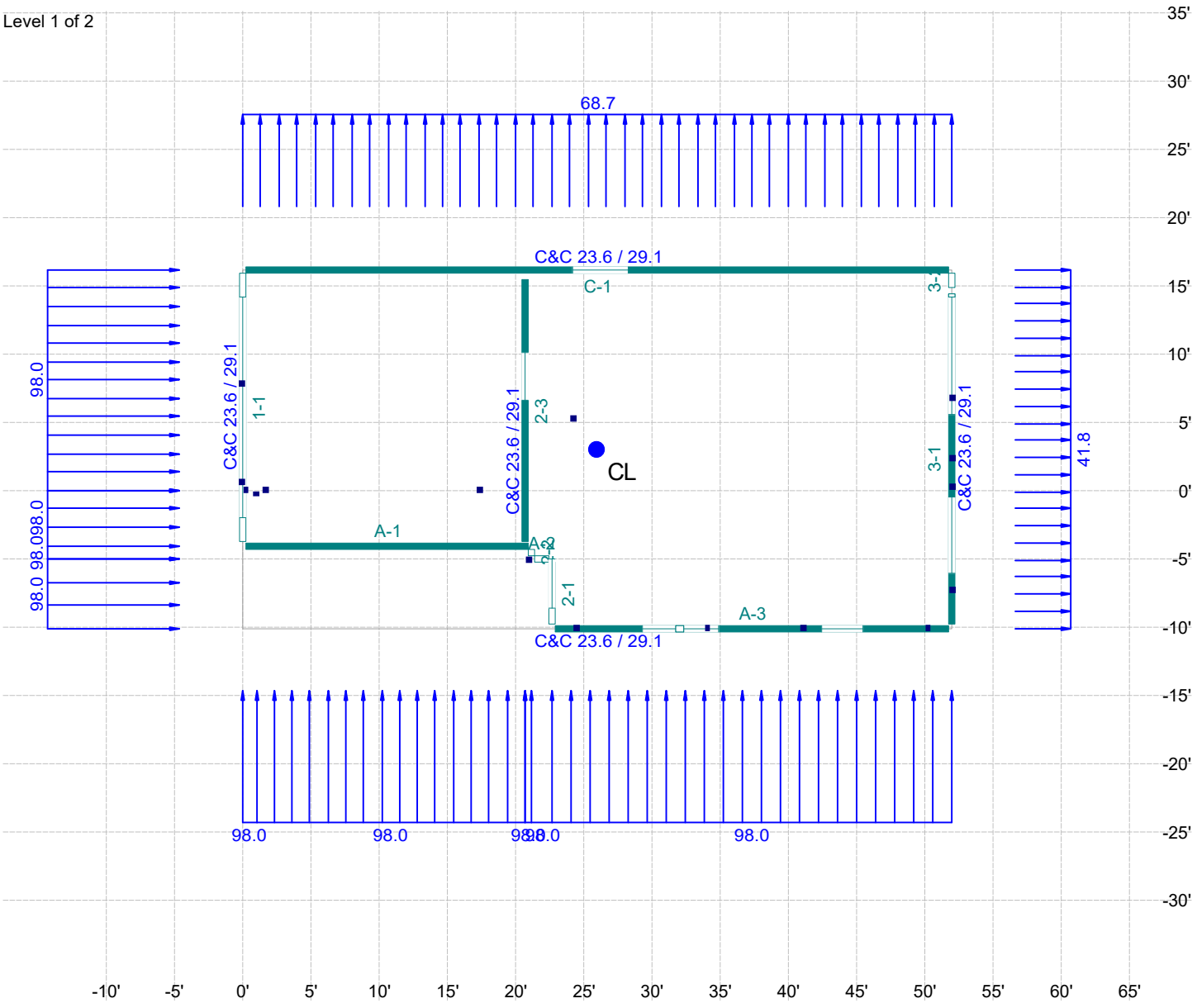
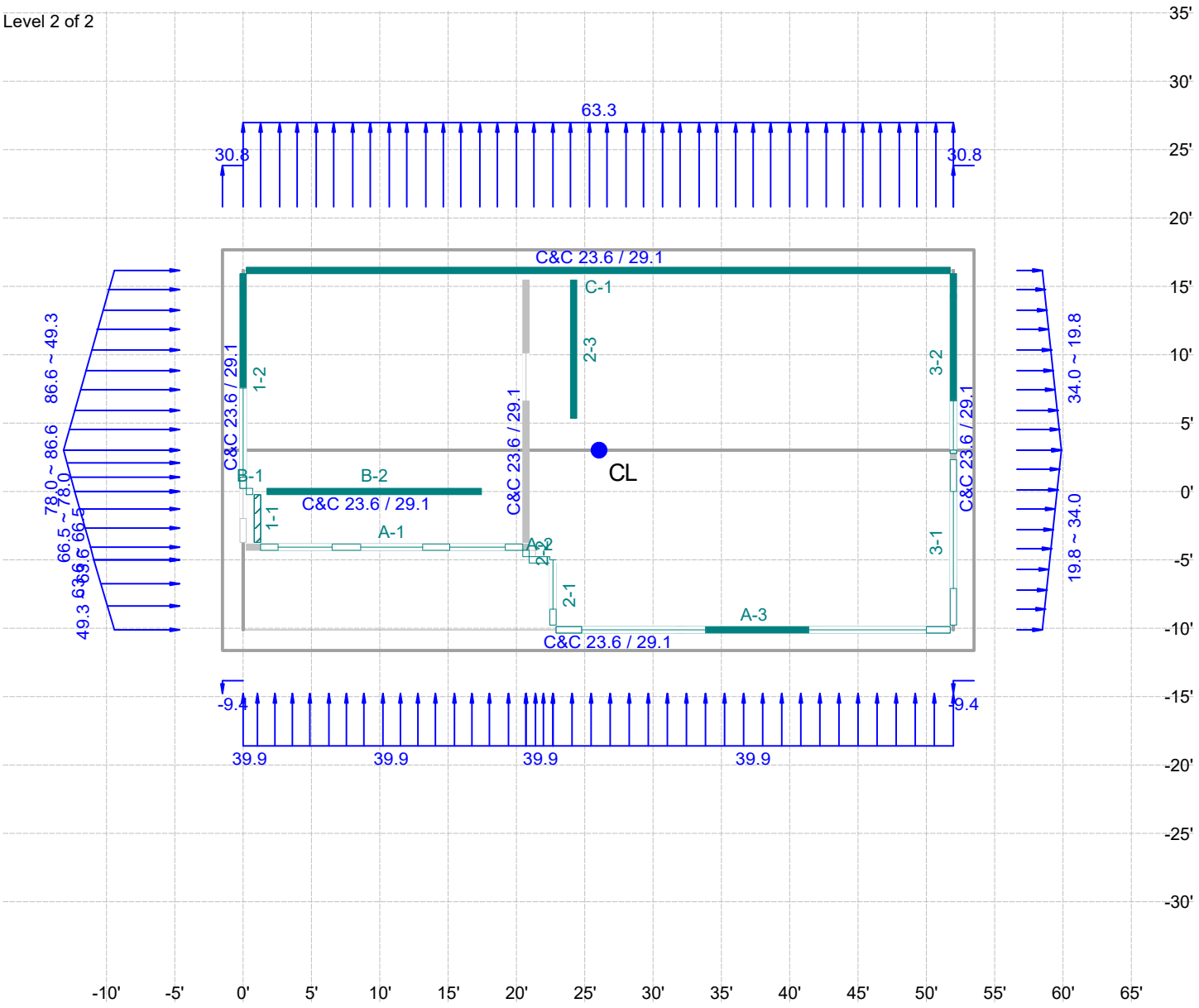
Level 1 of 2



Factored shearline force (lbs)
Factored hold-down force (lbs)
C Factored compression force (lbs)
Vertical element required
Unfactored applied shear load (plf)
Unfactored dead load (plf,lbs)
Unfactored uplift wind load (plf,lbs)
Applied point load or discontinuous shearline force (lbs)

Loads: Directional Case 1 Wind (W); Forces: 0.6W + 0.6D; Rigid distribution

Level 2 of 2



Factored shearline force (lbs)
Factored hold-down force (lbs)
C Factored compression force (lbs)
Vertical element required
Unfactored applied shear load (plf)
Unfactored dead load (plf,lbs)
Unfactored uplift wind load (plf,lbs)
Applied point load or discontinuous shearline force (lbs)

Loads: Directional Case 1 Wind (W); Forces: 0.6W + 0.6D; Rigid distribution

WoodWorks® Shearwalls 2023

2458.wsw **Mar. 2, 2024 16:40:31**

Project Information

DESIGN SETTINGS

Design Code	Wind Standard	Seismic Standard
IBC 2021/AWC SDPWS 2021	ASCE 7-16 Directional (All heights)	ASCE 7-16

Load Combinations

For Design (ASD)	For Deflection (Strength)
0.70 Seismic + 0.60 Dead	1.00 Seismic + 0.90 Dead
0.60 Wind + 0.60 Dead	1.00 Wind + 0.90 Dead

Building Code Capacity Modification

Wind	Seismic
1.00	1.00

Service Conditions and Load Duration

Duration Factor	Temperature Range	Moisture Content Fabrication	Moisture Content Service
1.60	T<=100F	19% (<=19%)	10% (<=19%)

Max Shearwall Offset [ft]

Plan (within story)	Elevation (between stories)
6.00	6.00

Maximum Height-to-width Ratio

Wood panels Blocked	Wood panels Unblocked	Fiberboard	Lumber Wind	Lumber Seismic	Gypsum Blocked	Gypsum Unblocked
3.5	2.0	-	-	-	-	-

Ignore shear resistance contribution of...

Wall segments	Seismic
Side with invalid aspect ratio	Any gypsum, lumber, fiberboard

Forces based on...

Hold-downs	Applied loads
Drag struts	Applied loads

Shearwall relative rigidity:	Wall capacity
Non-identical materials and construction on the shearline:	Allowed, except for material type
Deflection Equation:	3-term from SDPWS 4.3-1
Drift limit for wind design:	1 / 500 story height
FTAO strap:	Continuous at top of highest opening and bottom of lowest

SITE INFORMATION

Wind
ASCE 7-16 Directional (All heights)

Design Wind Speed	110 mph
Serviceability Wind Speed	100 mph
Exposure	Exposure B
Enclosure	Partially open
Min Wind Loads: Walls	16 psf
Roofs	8 psf

Topographic Information [ft]

Shape	Height	Length
-	-	-

Site Location: -

Elev: 0ft
Rigid building - Static analysis

Case 2	E-W loads	N-S loads
Eccentricity (%)	15	15
Loaded at	75%	

Seismic
ASCE 7-16 12.8 Equivalent Lateral Force Procedure

Risk Category	Category II - All others
Structure Type	Regular
Building System	Bearing Wall
Design Category	D
Site Class	D

Spectral Response Acceleration
S1: 0.490g **Ss:** 1.410g

Fundamental Period	E-W	N-S
T Used	0.186s	0.186s
Approximate Ta	0.186s	0.186s
Maximum T	0.261s	0.261s
Response Factor R	6.50	6.50

Fa: 1.20 **Fv:** 1.81

Structural Data

STORY INFORMATION

	Story Elev [ft]	Floor/Ceiling Depth [in]	Wall Height [ft]	Hold-down Length subject to shrinkage [in]	Hold-down Bolt length [in]
Ceiling	21.00	0.0			
Level 2	12.00	12.0	9.00	15.75	16.5
Level 1	3.00	12.0	8.00	15.75	16.5
Foundation	2.00				

BLOCK and ROOF INFORMATION

Block Dimensions [ft]			Roof Panels Face	Type	Slope	Overhang [ft]
Block 1	2 Story	E-W Ridge				
Location X,Y =	0.00	-10.00	**North**	Side	14.0	1.50
Extent X,Y =	51.50	26.00	**South**	Side	14.0	1.50
Ridge Y Location, Offset	3.00	0.00	**East**	Gable	90.0	1.50
Ridge Elevation, Height	24.24	3.24	**West**	Gable	90.0	1.50

SHEATHING MATERIALS by WALL GROUP

Grp	Surf	Material	Sheathing Ratng	Thick in	GU in	Ply	Or	Gvtv lbs/in	Fasteners Size	Type	RS	Eg in	Fd in	Bk	Apply Notes
1	Ext	Struct I OSB	24/16	7/16	-	-	Horz	83500	8d	Common	N	6	12	Y	3
2	1	Struct I OSB	24/16	7/16	-	-	Horz	83500	8d	Common	N	6	12	Y	3
3	1	Struct I OSB	24/16	7/16	-	-	Horz	83500	8d	Common	N	4	12	Y	2,3
4	Ext	Struct I OSB	24/16	7/16	-	-	Horz	83500	8d	Common	N	4	12	Y	3

Legend:
Grp – Wall Design Group number, used to reference wall in other tables (created by program)
Surf – Exterior or interior surface when applied to exterior wall
Ratng – Span rating, see SDPWS Table C4.2.3C
Thick – Nominal panel thickness
GU - Gypsum underlay thickness
Ply – Number of plies (or layers) in construction of plywood sheets
Or – Orientation of longer dimension of sheathing panels or lumber planks. Dbl. = Double diagonal.
Gvtv – Shear stiffness in lb/in. of depth from SDPWS Tables C4.2.3A-B
Type – Fastener type from SDPWS Tables 4.3A-D:
Common: common wire nail; Box: galvanized box nail; Casing: casing nail; Roof: galvanized roofing nail; Cooler: cooler nail; WBoard: wallboard nail; Screw: drywall screw; Gauge: nail measured by gauge; Galv: galvanized gauge nail; GWB: Gypsum wallboard blued nail
Size - From Tables 4.3A-D and Table A1; shown in Wall Input fastener dropdown
Common nails: 6d = 0.113 x 2", 8d = 0.131 x 2.5", 10d = 0.148 x 3", 12d = 0.148 x 3.5"
Box or casing nails: 6d = 0.099 x 2", 8d = 0.113 x 2.5", 10d = 0.128 x 3", 12d = 0.126 x 3.5"
Gauge, roofing and GWB nails: 13 ga = 0.92" x 1-1/8"; 11 ga = 0.120" x 1-1/8" (GWB nail for gypsum lath & plaster), 1-1/4" (gyp. L&P), 1-1/2" (wire lath & plaster, 1/2" fiberboard ,1/2" GWB), 1-3/4" (GSB, 5/8" GWB, 25/32" fiberboard, 2-ply GWB base), 2-3/8" (2-ply GWB face)
Cooler or wallboard nail: 5d = .086" x 1-5/8"; 6d = .092" x 1-7/8"; 8d = .113" x 2-3/8"; 6/8d = 6d base ply, 8d face ply for 2-ply GWB.
Drywall screws: No. 6, 1-1/4" long.
RS – Ring-shank nails (non-shearwalls only), with increased withdrawal capacity as per NDS 12.2.3.2.
Eg – Panel edge fastener spacing. For lumber sheathing, no. of nails per board at shear wall boundary. For 2-ply GWB, spacing of all nails in face ply.
Fd – Field spacing interior to panels. For lumber sheathing, no. of nails per board at interior studs. For 2-ply GWB, spacing of all nails in face ply.
Bk – Sheathing is nailed to blocking at all panel edges; Y(es) or N(o)
Apply Notes – Notes below table legend which apply to sheathing side

Notes:
2. Framing at adjoining panel edges must be 3" nominal or wider with staggered nailing according to SDPWS 4.3.7.1 (5)
3. Shear capacity for current design has been increased to the value for 15/32" sheathing with same nailing because stud spacing is 16" max. or panel orientation is horizontal. See SDPWS Table 4.3A Note 2.

FRAMING MATERIALS and STANDARD WALL by WALL GROUP

Wall Grp	Species	Grade	b in	d in	Spcg in	SG	E psi^6	Fcp	Standard Wall
1	D.Fir-L	No.2	1.50	5.50	16	0.50	1.60	625	
2	D.Fir-L	No.2	1.50	5.50	16	0.50	1.60	625	
3	D.Fir-L	No.2	1.50	5.50	16	0.50	1.60	625	
4	D.Fir-L	No.2	1.50	5.50	16	0.50	1.60	625	

Legend:
Wall Grp – Wall Design Group
b – Stud breadth (thickness)
d – Stud depth (width)
Spcg – Maximum on-centre spacing of studs for design, actual spacing may be less.
SG – Specific gravity
E – Modulus of elasticity
Standard Wall - Standard wall designed as group.
Fcp - Compressive strength perpendicular to grain

Notes:
Check manufacture requirements for stud size, grade and specific gravity (G) for all shearwall hold-downs.
The following factors are applied to Fcp for compressive design and deformation under wall segment end studs :
Bearing area factor Cb from NDS 3.10.4, under window openings.

SHEARLINE, WALL and OPENING DIMENSIONS

North-south Shearlines	Type	Wall Group	Location X [ft]	Extent [ft] Start	Extent [ft] End	Length [ft]	FHS [ft]	Aspect Ratio	Height [ft]	Studs S	Studs N
Line 1											
Level 2											
Line 1		1	0.20	-4.00	16.00	20.00	12.50	-	9.00	-	-
Wall 1-1	Seg	1	1.00	-4.00	0.00	4.00	3.75	2.25	-	2	2
Wall 1-2	Seg	1	0.00	0.00	16.00	16.00	8.50	-	-	2	2
Segment 1		-	-	0.00	1.00	1.00	0.75	9.00	-	2	2
Opening 1		-	-	1.00	7.50	6.50	-	-	5.00	2	2
Segment 2		-	-	7.50	16.00	8.50	8.25	1.06	-	2	2
Level 1											
Line 1		1	0.00	-4.00	16.00	20.00	0.00	-	8.00	-	-
Wall 1-1	Seg	1	0.00	-4.00	16.00	20.00	0.00	-	-	2	2
Segment 1		-	-	-4.00	-2.00	2.00	1.75	4.00	-	2	2
Opening 1		-	-	-2.00	14.00	16.00	-	-	5.00	2	2
Segment 2		-	-	14.00	16.00	2.00	1.75	4.00	-	2	2
Line 2											
Level 2											
Line 2		3	24.00	-10.00	16.00	26.00	10.25	-	9.00	-	-
Wall 2-1	NSW		22.50	-10.00	-5.00	5.00	0.00	-	-	2	2
Segment 1		-	-	-10.00	-8.50	1.50	-	1.80	-	2	2
Opening 1		-	-	-8.50	-5.00	3.50	-	-	5.00	2	2
Segment 2		-	-	-5.00	-5.00	0.00	-	-	-	2	2
Wall 2-2	NSW		20.50	-5.00	-4.00	1.00	0.00	1.00	-	2	2
Wall 2-3	Seg	3	24.00	5.00	15.50	10.50	10.25	0.86	-	2	2
Level 1											
Line 2		3,1	20.91	-10.00	16.00	26.00	16.00	-	8.00	-	-
Wall 2-1	Seg	1	22.50	-10.00	-5.00	5.00	0.00	-	-	2	2
Segment 1		-	-	-10.00	-8.50	1.50	1.25	5.33	-	2	2
Opening 1		-	-	-8.50	-5.00	3.50	-	-	5.00	2	2
Segment 2		-	-	-5.00	-5.00	0.00	-0.25	-	-	2	2
Wall 2-2	Seg	1	21.00	-5.00	-4.00	1.00	0.75	8.00	-	2	2
Wall 2-3	Seg	3	20.50	-4.00	15.50	19.50	16.00	-	-	2	2
Segment 1		-	-	-4.00	6.50	10.50	10.25	0.76	-	2	2
Opening 1		-	-	6.50	10.00	3.50	-	-	5.00	2	2
Segment 2		-	-	10.00	15.50	5.50	5.25	1.45	-	2	2
Line 3											
Level 2											
Line 3		1	51.50	-10.00	16.00	26.00	9.50	-	9.00	-	-
Wall 3-1	NSW		51.50	-10.00	2.50	12.50	0.00	-	-	2	2
Segment 1		-	-	-10.00	-7.00	3.00	-	3.00	-	2	2
Opening 1		-	-	-7.00	0.00	7.00	-	-	5.00	2	2
Segment 2		-	-	0.00	2.50	2.50	-	3.60	-	2	2
Wall 3-2	Seg	1	51.50	2.50	16.00	13.50	9.50	-	-	2	2
Segment 1		-	-	2.50	3.00	0.50	0.25	18.00	-	2	2
Opening 1		-	-	3.00	6.50	3.50	-	-	5.00	2	2
Segment 2		-	-	6.50	16.00	9.50	9.25	0.95	-	2	2
Level 1											
Line 3		4	51.50	-10.00	16.00	26.00	10.00	-	8.00	-	-
Wall 3-1	Seg	4	51.50	-10.00	14.50	24.50	10.00	-	-	2	2
Segment 1		-	-	-10.00	-6.00	4.00	3.75	2.00	-	2	2
Opening 1		-	-	-6.00	-0.50	5.50	-	-	5.00	2	2
Segment 2		-	-	-0.50	5.50	6.00	5.75	1.33	-	2	2
Opening 2		-	-	5.50	14.00	8.50	-	-	5.00	2	2
Segment 3		-	-	14.00	14.50	0.50	0.25	16.00	-	2	2
Wall 3-2	NSW		51.50	14.50	16.00	1.50	0.00	1.00	-	2	2

East-west Shearlines	Type	Wall Group	Location Y [ft]	Extent [ft] Start	Extent [ft] End	Length [ft]	FHS [ft]	Aspect Ratio	Height [ft]	Studs W	Studs E
Line A											
Level 2											
Line A		1	-7.59	1.00	51.50	50.50	7.50	-	9.00	-	-
Wall A-1	Seg	1	-4.00	1.00	20.50	19.50	0.00	-	-	2	2
Segment 1		-	-	1.00	2.50	1.50	1.25	6.00	-	2	2
Opening 1		-	-	2.50	6.50	4.00	-	-	5.00	2	2
Segment 2		-	-	6.50	8.50	2.00	1.75	4.50	-	2	2
Opening 2		-	-	8.50	13.00	4.50	-	-	5.00	2	2
Segment 3		-	-	13.00	15.00	2.00	1.75	4.50	-	2	2
Opening 3		-	-	15.00	19.00	4.00	-	-	5.00	2	2
Segment 4		-	-	19.00	20.50	1.50	1.25	6.00	-	2	2
Wall A-2	NSW		-5.00	20.50	22.50	2.00	0.00	0.29	-	2	2
Wall A-3	Seg	1	-10.00	22.50	51.50	29.00	7.50	-	-	2	2
Segment 1		-	-	22.50	24.50	2.00	1.75	4.50	-	2	2
Opening 1		-	-	24.50	33.50	9.00	-	-	5.00	2	2

SHEARLINE, WALL and OPENING DIMENSIONS (continued)

Segment 2		-	-	33.50	41.00	7.50	7.25	1.20	-	2	2
Opening 2		-	-	41.00	49.50	8.50	-	-	5.00	2	2
Segment 3		-	-	49.50	51.50	2.00	1.75	4.50	-	2	2
Level 1											
Line A		1	-7.41	0.00	51.50	51.50	41.50	-	8.00	-	-
Wall A-1	Seg	1	-4.00	0.00	21.00	21.00	20.75	0.38	-	2	2
Wall A-2	Seg	1	-5.00	21.00	22.50	1.50	1.25	5.33	-	2	2
Wall A-3	Seg	1	-10.00	22.50	51.50	29.00	20.50	-	-	2	2
Segment 1		-	-	22.50	29.00	6.50	6.25	1.23	-	2	2
Opening 1		-	-	29.00	31.50	2.50	-	-	5.00	2	2
Segment 2		-	-	31.50	32.00	0.50	0.25	16.00	-	2	2
Opening 2		-	-	32.00	34.50	2.50	-	-	5.00	2	2
Segment 3		-	-	34.50	42.00	7.50	7.25	1.07	-	2	2
Opening 3		-	-	42.00	45.00	3.00	-	-	5.00	2	2
Segment 4		-	-	45.00	51.50	6.50	6.25	1.23	-	2	2
Line B											
Level 2											
Line B		2	0.00	1.00	51.50	50.50	15.75	-	9.00	-	-
Wall B-1	NSW		0.00	0.00	1.00	1.00	0.00	1.00	-	2	2
Wall B-2	Seg	2	0.00	1.50	17.50	16.00	15.75	0.56	-	2	2
Line C											
Level 2											
Line C	Seg	1	16.00	0.00	51.50	51.50	51.25	-	9.00	-	-
Wall C-1	Seg	1	16.00	0.00	51.50	51.50	51.25	0.17	-	2	2
Level 1											
Line C		1	16.00	0.00	51.50	51.50	47.50	-	8.00	-	-
Wall C-1	Seg	1	16.00	0.00	51.50	51.50	47.50	-	-	2	2
Segment 1		-	-	0.00	24.00	24.00	23.75	0.33	-	2	2
Opening 1		-	-	24.00	28.00	4.00	-	-	5.00	2	2
Segment 2		-	-	28.00	51.50	23.50	23.25	0.34	-	2	2

Legend:
Type – Seg = Segmented, Prf = Perforated, FT = FTAO (force transfer around openings), NSW = non-shearwall
Location – Position in structure perpendicular to wall
Length – Shear line: Distance between exterior perpendicular walls defining the shear line extent
Wall, segment, or opening: End-to-end length of the element
FHS – Depending on element, shows different definitions of full-height sheathing length (FHS):
Shear lines with multiple walls, segmented walls, or FTAO walls: Total shear-resisting FHS
Individual wall segments or walls without openings: Distance between hold-downs beff
Perforated walls: Sum of factored segment lengths bi defined in SDPWS 4.3.5.6
Aspect Ratio – Ratio of wall height to segment length (h/b); for FTAO walls, the aspect ratio of the central pier
Wall Group – Wall design group defined in Sheathing and Framing Materials tables, where it shows associated Standard Wall
Studs: Number of end studs at the south and north or west and east ends of a wall segment or a perforated or FTAO wall.

Loads

WIND SHEAR LOADS (as entered or generated)

Level 2 Block	F	Element	Load Case	Wnd Dir	Surf Dir	Prof	Location [ft] Start	Location [ft] End	Magnitude [lbs,plf,psf] Start	Magnitude [lbs,plf,psf] End	Trib Ht [ft]
Block 1	W	L Gable	Min	W->E	Wind	Line	-10.00	3.00	0.0	25.9	
Block 1	W	Wall	Min	W->E	Wind	Line	-10.00	-5.00	36.0		
Block 1	W	L Gable	1	W->E	Wind	Line	-10.00	3.00	0.0	37.2	
Block 1	W	Wall	1	W->E	Wind	Line	-10.00	-5.00	49.3		
Block 1	W	Wall	1	W->E	Wind	Line	-5.00	-4.00	49.3		
Block 1	W	Wall	Min	W->E	Wind	Line	-5.00	-4.00	36.0		
Block 1	W	Wall	Min	W->E	Wind	Line	-4.00	0.00	36.0		
Block 1	W	Wall	1	W->E	Wind	Line	-4.00	0.00	49.3		
Block 1	W	Wall	1	W->E	Wind	Line	0.00	16.00	49.3		
Block 1	W	Wall	Min	W->E	Wind	Line	0.00	16.00	36.0		
Block 1	W	R Gable	1	W->E	Wind	Line	3.00	16.00	37.2	0.0	
Block 1	W	R Gable	Min	W->E	Wind	Line	3.00	16.00	25.9	0.0	
Block 1	E	Wall	Min	W->E	Lee	Line	-10.00	16.00	36.0		
Block 1	E	L Gable	Min	W->E	Lee	Line	-10.00	3.00	0.0	25.9	
Block 1	E	L Gable	1	W->E	Lee	Line	-10.00	3.00	0.0	14.2	
Block 1	E	Wall	1	W->E	Lee	Line	-10.00	16.00	19.8		
Block 1	E	R Gable	Min	W->E	Lee	Line	3.00	16.00	25.9	0.0	
Block 1	E	R Gable	1	W->E	Lee	Line	3.00	16.00	14.2	0.0	
Block 1	W	L Gable	Min	E->W	Lee	Line	-10.00	3.00	0.0	25.9	
Block 1	W	Wall	1	E->W	Lee	Line	-10.00	-5.00	19.8		
Block 1	W	L Gable	1	E->W	Lee	Line	-10.00	3.00	0.0	14.2	
Block 1	W	Wall	Min	E->W	Lee	Line	-10.00	-5.00	36.0		
Block 1	W	Wall	1	E->W	Lee	Line	-5.00	-4.00	19.8		
Block 1	W	Wall	Min	E->W	Lee	Line	-5.00	-4.00	36.0		
Block 1	W	Wall	1	E->W	Lee	Line	-4.00	0.00	19.8		
Block 1	W	Wall	Min	E->W	Lee	Line	-4.00	0.00	36.0		
Block 1	W	Wall	Min	E->W	Lee	Line	0.00	16.00	36.0		
Block 1	W	Wall	1	E->W	Lee	Line	0.00	16.00	19.8		
Block 1	W	R Gable	1	E->W	Lee	Line	3.00	16.00	14.2	0.0	
Block 1	W	R Gable	Min	E->W	Lee	Line	3.00	16.00	25.9	0.0	
Block 1	E	Wall	1	E->W	Wind	Line	-10.00	16.00	49.3		
Block 1	E	L Gable	1	E->W	Wind	Line	-10.00	3.00	0.0	37.2	
Block 1	E	L Gable	Min	E->W	Wind	Line	-10.00	3.00	0.0	25.9	
Block 1	E	Wall	Min	E->W	Wind	Line	-10.00	16.00	36.0		
Block 1	E	R Gable	1	E->W	Wind	Line	3.00	16.00	37.2	0.0	
Block 1	E	R Gable	Min	E->W	Wind	Line	3.00	16.00	25.9	0.0	
Block 1	S	Roof	1	S->N	Wind	Line	-1.50	53.00	-9.4		
Block 1	S	Roof	Min	S->N	Wind	Line	-1.50	53.00	14.5		
Block 1	S	Wall	1	S->N	Wind	Line	0.00	1.00	49.3		
Block 1	S	Wall	Min	S->N	Wind	Line	0.00	1.00	36.0		
Block 1	S	Wall	1	S->N	Wind	Line	1.00	20.50	49.3		
Block 1	S	Wall	Min	S->N	Wind	Line	1.00	20.50	36.0		
Block 1	S	Wall	1	S->N	Wind	Line	20.50	22.50	49.3		
Block 1	S	Wall	Min	S->N	Wind	Line	20.50	22.50	36.0		
Block 1	S	Wall	Min	S->N	Wind	Line	22.50	51.50	36.0		
Block 1	S	Wall	1	S->N	Wind	Line	22.50	51.50	49.3		
Block 1	N	Roof	Min	S->N	Lee	Line	-1.50	53.00	14.5		
Block 1	N	Roof	1	S->N	Lee	Line	-1.50	53.00	30.8		
Block 1	N	Wall	1	S->N	Lee	Line	0.00	51.50	32.5		
Block 1	N	Wall	Min	S->N	Lee	Line	0.00	51.50	36.0		
Block 1	S	Roof	Min	N->S	Lee	Line	-1.50	53.00	14.5		
Block 1	S	Roof	1	N->S	Lee	Line	-1.50	53.00	30.8		
Block 1	S	Wall	1	N->S	Lee	Line	0.00	1.00	32.5		
Block 1	S	Wall	Min	N->S	Lee	Line	0.00	1.00	36.0		
Block 1	S	Wall	1	N->S	Lee	Line	1.00	20.50	32.5		
Block 1	S	Wall	Min	N->S	Lee	Line	1.00	20.50	36.0		
Block 1	S	Wall	Min	N->S	Lee	Line	20.50	22.50	36.0		
Block 1	S	Wall	1	N->S	Lee	Line	20.50	22.50	32.5		
Block 1	S	Wall	1	N->S	Lee	Line	22.50	51.50	32.5		
Block 1	S	Wall	Min	N->S	Lee	Line	22.50	51.50	36.0		
Block 1	N	Roof	1	N->S	Wind	Line	-1.50	53.00	-9.4		
Block 1	N	Roof	Min	N->S	Wind	Line	-1.50	53.00	14.5		
Block 1	N	Wall	Min	N->S	Wind	Line	0.00	51.50	36.0		
Block 1	N	Wall	1	N->S	Wind	Line	0.00	51.50	49.3		

Level 1 Block	F	Element	Load Case	Wnd Dir	Surf Dir	Prof	Location [ft] Start	Location [ft] End	Magnitude [lbs,plf,psf] Start	Magnitude [lbs,plf,psf] End	Trib Ht [ft]
Block 1	W	Wall	Min	W->E	Wind	Line	-10.00	-5.00	40.0		
Block 1	W	Wall	1	W->E	Wind	Line	-10.00	-5.00	46.5		

WIND SHEAR LOADS (as entered or generated) (continued)

Block 1	W	Wall	1	W->E	Wind	Line	-10.00	-5.00	51.4
Block 1	W	Wall	Min	W->E	Wind	Line	-10.00	-5.00	36.0
Block 1	W	Wall	Min	W->E	Wind	Line	-5.00	-4.00	36.0
Block 1	W	Wall	1	W->E	Wind	Line	-5.00	-4.00	46.5
Block 1	W	Wall	Min	W->E	Wind	Line	-5.00	-4.00	40.0
Block 1	W	Wall	1	W->E	Wind	Line	-5.00	-4.00	51.4
Block 1	W	Wall	Min	W->E	Wind	Line	-4.00	0.00	36.0
Block 1	W	Wall	1	W->E	Wind	Line	-4.00	16.00	51.4
Block 1	W	Wall	1	W->E	Wind	Line	-4.00	0.00	46.5
Block 1	W	Wall	Min	W->E	Wind	Line	-4.00	16.00	40.0
Block 1	W	Wall	1	W->E	Wind	Line	0.00	16.00	46.5
Block 1	W	Wall	Min	W->E	Wind	Line	0.00	16.00	36.0
Block 1	E	Wall	Min	W->E	Lee	Line	-10.00	16.00	36.0
Block 1	E	Wall	Min	W->E	Lee	Line	-10.00	16.00	40.0
Block 1	E	Wall	1	W->E	Lee	Line	-10.00	16.00	19.8
Block 1	E	Wall	1	W->E	Lee	Line	-10.00	16.00	22.0
Block 1	W	Wall	1	E->W	Lee	Line	-10.00	-5.00	22.0
Block 1	W	Wall	1	E->W	Lee	Line	-10.00	-5.00	19.8
Block 1	W	Wall	Min	E->W	Lee	Line	-10.00	-5.00	36.0
Block 1	W	Wall	Min	E->W	Lee	Line	-10.00	-5.00	40.0
Block 1	W	Wall	Min	E->W	Lee	Line	-5.00	-4.00	36.0
Block 1	W	Wall	1	E->W	Lee	Line	-5.00	-4.00	19.8
Block 1	W	Wall	Min	E->W	Lee	Line	-5.00	-4.00	40.0
Block 1	W	Wall	1	E->W	Lee	Line	-5.00	-4.00	22.0
Block 1	W	Wall	Min	E->W	Lee	Line	-4.00	16.00	40.0
Block 1	W	Wall	1	E->W	Lee	Line	-4.00	0.00	19.8
Block 1	W	Wall	1	E->W	Lee	Line	-4.00	16.00	22.0
Block 1	W	Wall	Min	E->W	Lee	Line	-4.00	0.00	36.0
Block 1	W	Wall	Min	E->W	Lee	Line	0.00	16.00	36.0
Block 1	W	Wall	1	E->W	Lee	Line	0.00	16.00	19.8
Block 1	E	Wall	1	E->W	Wind	Line	-10.00	16.00	46.5
Block 1	E	Wall	Min	E->W	Wind	Line	-10.00	16.00	36.0
Block 1	E	Wall	Min	E->W	Wind	Line	-10.00	16.00	40.0
Block 1	E	Wall	1	E->W	Wind	Line	-10.00	16.00	51.4
Block 1	S	Wall	Min	S->N	Wind	Line	0.00	1.00	36.0
Block 1	S	Wall	1	S->N	Wind	Line	0.00	1.00	46.5
Block 1	S	Wall	1	S->N	Wind	Line	0.00	21.00	51.4
Block 1	S	Wall	Min	S->N	Wind	Line	0.00	21.00	40.0
Block 1	S	Wall	1	S->N	Wind	Line	1.00	20.50	46.5
Block 1	S	Wall	Min	S->N	Wind	Line	1.00	20.50	36.0
Block 1	S	Wall	Min	S->N	Wind	Line	20.50	22.50	36.0
Block 1	S	Wall	1	S->N	Wind	Line	20.50	22.50	46.5
Block 1	S	Wall	Min	S->N	Wind	Line	21.00	22.50	40.0
Block 1	S	Wall	1	S->N	Wind	Line	21.00	22.50	51.4
Block 1	S	Wall	Min	S->N	Wind	Line	22.50	51.50	36.0
Block 1	S	Wall	Min	S->N	Wind	Line	22.50	51.50	40.0
Block 1	S	Wall	1	S->N	Wind	Line	22.50	51.50	46.5
Block 1	S	Wall	1	S->N	Wind	Line	22.50	51.50	51.4
Block 1	N	Wall	Min	S->N	Lee	Line	0.00	51.50	36.0
Block 1	N	Wall	1	S->N	Lee	Line	0.00	51.50	32.5
Block 1	N	Wall	1	S->N	Lee	Line	0.00	51.50	36.2
Block 1	N	Wall	Min	S->N	Lee	Line	0.00	51.50	40.0
Block 1	S	Wall	Min	N->S	Lee	Line	0.00	1.00	36.0
Block 1	S	Wall	1	N->S	Lee	Line	0.00	21.00	36.2
Block 1	S	Wall	1	N->S	Lee	Line	0.00	1.00	32.5
Block 1	S	Wall	Min	N->S	Lee	Line	0.00	21.00	40.0
Block 1	S	Wall	1	N->S	Lee	Line	1.00	20.50	32.5
Block 1	S	Wall	Min	N->S	Lee	Line	1.00	20.50	36.0
Block 1	S	Wall	Min	N->S	Lee	Line	20.50	22.50	36.0
Block 1	S	Wall	1	N->S	Lee	Line	20.50	22.50	32.5
Block 1	S	Wall	Min	N->S	Lee	Line	21.00	22.50	40.0
Block 1	S	Wall	1	N->S	Lee	Line	21.00	22.50	36.2
Block 1	S	Wall	Min	N->S	Lee	Line	22.50	51.50	36.0
Block 1	S	Wall	1	N->S	Lee	Line	22.50	51.50	32.5
Block 1	S	Wall	Min	N->S	Lee	Line	22.50	51.50	40.0
Block 1	S	Wall	1	N->S	Lee	Line	22.50	51.50	36.2
Block 1	N	Wall	Min	N->S	Wind	Line	0.00	51.50	36.0
Block 1	N	Wall	1	N->S	Wind	Line	0.00	51.50	46.5
Block 1	N	Wall	1	N->S	Wind	Line	0.00	51.50	51.4
Block 1	N	Wall	Min	N->S	Wind	Line	0.00	51.50	40.0

Legend:
Block - Block used in load generation
Accum. = loads from one block combined with another

Manual = user-entered loads (so no block)
F - Building face (north, south, east or west)
Element - Building surface on which loads generated or entered
Load Case - One of the following:
ASCE 7 All Heights: Case 1 or 2 from Fig 27.3-8 or minimum loads from 27.1.5
ASCE 7 Low-rise: Reference corner and Case A or B from Fig 28.3-1 or minimum loads from 28.3.4
Wind Dir - Direction of wind for loads with positive magnitude, also direction of MWFRS.
Surf Dir - Windward or leeward side of the building for loads in given direction
Prof - Profile (distribution)
Location - Start and end points on building element
Magnitude - Start = intensity of uniform and point loads or leftmost intensity of trapezoidal load, End = right intensity of trap load
Trib Ht - Tributary height of area loads only

Notes:
All loads entered by the user or generated by program are specified (unfactored) loads.The program applies a load factor of 0.60 to wind loads before distributing them to the shearlines.

WIND C&C LOADS

Block	Building Face	Wind Direction	Level	Magnitude [psf] Interior	Magnitude [psf] End Zone
Block 1	West	Windward	2	23.6	29.1
Block 1	West	Windward	2	23.6	29.1
Block 1	East	Leeward	2	23.6	29.1
Block 1	West	Leeward	2	23.6	29.1
Block 1	West	Leeward	2	23.6	29.1
Block 1	East	Windward	2	23.6	29.1
Block 1	South	Windward	2	23.6	29.1
Block 1	South	Windward	2	23.6	29.1
Block 1	North	Leeward	2	23.6	29.1
Block 1	South	Leeward	2	23.6	29.1
Block 1	South	Leeward	2	23.6	29.1
Block 1	North	Windward	2	23.6	29.1
Block 1	West	Windward	1	23.6	29.1
Block 1	West	Windward	1	23.6	29.1
Block 1	East	Leeward	1	23.6	29.1
Block 1	West	Leeward	1	23.6	29.1
Block 1	West	Leeward	1	23.6	29.1
Block 1	East	Windward	1	23.6	29.1
Block 1	South	Windward	1	23.6	29.1
Block 1	North	Leeward	1	23.6	29.1
Block 1	South	Leeward	1	23.6	29.1
Block 1	North	Windward	1	23.6	29.1

DEAD LOADS (for hold-down calculations)

Shear Line	Level	Profile	Tributary Width [ft]	Location [ft] Start	Location [ft] End	Mag [lbs,psf,psi] Start	Mag [lbs,psf,psi] End
A	2	Line		20.50	22.50	90.0*	
A	2	Line		22.50	51.50	90.0*	
B	2	Line		0.00	1.00	90.0*	
B	2	Line		1.00	20.50	90.0*	
B	2	Line		1.50	17.50	54.0*	
C	2	Line		0.00	51.50	90.0*	
1	2	Line		-4.00	0.00	90.0*	
1	2	Line		0.00	16.00	90.0*	
2	2	Line		-10.00	-5.00	90.0*	
2	2	Line		-5.00	-4.00	90.0*	
2	2	Line		5.00	15.50	54.0*	
3	2	Line		-10.00	16.00	90.0*	
A	1	Line		21.00	22.50	80.0*	
A	1	Line		22.50	51.50	80.0*	
B	1	Line		0.00	21.00	80.0*	
C	1	Line		0.00	51.50	80.0*	
1	1	Line		-4.00	16.00	80.0*	
2	1	Line		-10.00	-5.00	80.0*	
2	1	Line		-5.00	-4.00	80.0*	
2	1	Line		-4.00	15.50	48.0*	
3	1	Line		-10.00	16.00	80.0*	

BUILDING MASSES

Level 2 Force Dir	Building Element	Block	Wall Line	Profile	Location [ft] Start	Location [ft] End	Magnitude [lbs,plf,psf] Start	Magnitude [lbs,plf,psf] End	Trib Width [ft]
E-W	Roof	Block 1	1	Line	-11.50	17.50	408.8	408.8	
E-W	Roof	Block 1	3	Line	-11.50	17.50	408.8	408.8	
E-W	R Gable	Block 1	1	Line	-10.00	3.00	32.4	0.0	
E-W	L Gable	Block 1	1	Line	3.00	16.00	0.0	32.4	
E-W	L Gable	Block 1	3	Line	-10.00	3.00	32.4	0.0	
E-W	R Gable	Block 1	3	Line	3.00	16.00	0.0	32.4	
N-S	Roof	Block 1	A	Line	-1.50	53.00	217.5	217.5	
N-S	Roof	Block 1	C	Line	-1.50	53.00	217.5	217.5	
Both	Wall 1-2	n/a	1	Line	0.00	16.00	45.0	45.0	
Both	Wall 1-1	n/a		Line	-4.00	0.00	45.0	45.0	
Both	Wall 2-2	n/a	2	Line	-5.00	-4.00	45.0	45.0	
Both	Wall 2-1	n/a		Line	-10.00	-5.00	45.0	45.0	
Both	Wall 2-3	n/a		Line	5.00	15.50	27.0	27.0	
Both	Wall 3-1	n/a	3	Line	-10.00	16.00	45.0	45.0	
Both	Wall A-3	n/a	A	Line	22.50	51.50	45.0	45.0	
Both	Wall A-2	n/a		Line	20.50	22.50	45.0	45.0	
Both	Wall A-1	n/a		Line	1.00	20.50	45.0	45.0	
Both	Wall B-1	n/a	B	Line	0.00	1.00	45.0	45.0	
Both	Wall B-2	n/a	B	Line	1.50	17.50	27.0	27.0	
Both	Wall C-1	n/a	C	Line	0.00	51.50	45.0	45.0	

Level 1 Force Dir	Building Element	Block	Wall Line	Profile	Location [ft] Start	Location [ft] End	Magnitude [lbs,plf,psf] Start	Magnitude [lbs,plf,psf] End	Trib Width [ft]
E-W	Floor F3	n/a	1	Line	-4.00	16.00	257.5	257.5	
Both	Wall 1-2	n/a	1	Line	0.00	16.00	45.0	45.0	
Both	Wall 1-1	n/a		Line	-4.00	0.00	45.0	45.0	
Both	Wall 2-2	n/a	2	Line	-5.00	-4.00	45.0	45.0	
E-W	Floor F2	n/a		Line	-5.00	-4.00	152.5	152.5	
Both	Wall 2-1	n/a		Line	-10.00	-5.00	45.0	45.0	
E-W	Floor F1	n/a		Line	-10.00	-5.00	145.0	145.0	
Both	Wall 2-3	n/a		Line	5.00	15.50	27.0	27.0	
E-W	Floor F1	n/a	3	Line	-10.00	-5.00	145.0	145.0	
Both	Wall 3-1	n/a	3	Line	-10.00	16.00	45.0	45.0	
E-W	Floor F2	n/a	3	Line	-5.00	-4.00	152.5	152.5	
E-W	Floor F3	n/a	3	Line	-4.00	16.00	257.5	257.5	
Both	Wall A-3	n/a	A	Line	22.50	51.50	45.0	45.0	
N-S	Floor F3	n/a	A	Line	22.50	51.50	130.0	130.0	
Both	Wall A-2	n/a		Line	20.50	22.50	45.0	45.0	
N-S	Floor F2	n/a		Line	21.00	22.50	105.0	105.0	
N-S	Floor F1	n/a		Line	0.00	21.00	100.0	100.0	
Both	Wall A-1	n/a		Line	1.00	20.50	45.0	45.0	
Both	Wall B-1	n/a	B	Line	0.00	1.00	45.0	45.0	
Both	Wall B-2	n/a	B	Line	1.50	17.50	27.0	27.0	
N-S	Floor F1	n/a	C	Line	0.00	21.00	100.0	100.0	
Both	Wall C-1	n/a	C	Line	0.00	51.50	45.0	45.0	
N-S	Floor F2	n/a	C	Line	21.00	22.50	105.0	105.0	
N-S	Floor F3	n/a	C	Line	22.50	51.50	130.0	130.0	
Both	Wall 1-1	n/a	1	Line	-4.00	16.00	40.0	40.0	
Both	Wall 2-3	n/a	2	Line	-4.00	15.50	24.0	24.0	

BUILDING MASSES (continued)

Both	Wall 2-2	n/a		Line	-5.00	-4.00	40.0	40.0
Both	Wall 2-1	n/a		Line	-10.00	-5.00	40.0	40.0
Both	Wall 3-1	n/a	3	Line	-10.00	16.00	40.0	40.0
Both	Wall A-3	n/a	A	Line	22.50	51.50	40.0	40.0
Both	Wall A-2	n/a		Line	21.00	22.50	40.0	40.0
Both	Wall A-1	n/a		Line	0.00	21.00	40.0	40.0
Both	Wall C-1	n/a	C	Line	0.00	51.50	40.0	40.0

Legend:
Force Dir - Direction in which the mass is used for seismic load generation, E-W, N-S, or Both
Building element - Roof, gable end, wall or floor area used to generate mass, wall line for user-applied masses, Floor F# - refer to Plan View for floor area number
Wall line - Shearline that equivalent line load is assigned to
Location - Start and end points of equivalent line load on wall line
Trib Width. - Tributary width; for user applied area loads only

SEISMIC LOADS

Level 2 Force Dir	Profile	Location [ft] Start	Location [ft] End	Mag [lbs,plf,psf] Start	Mag [lbs,plf,psf] End
E-W	Line	-11.50	-10.00	183.1	183.1
E-W	Point	-10.00	-10.00	292	292
E-W	Line	-10.00	-5.00	203.3	208.8
E-W	Point	-5.00	-5.00	20	20
E-W	Line	-5.00	-4.00	208.8	210.0
E-W	Point	-4.00	-4.00	197	197
E-W	Line	-4.00	0.00	210.0	214.4
E-W	Point	0.00	0.00	107	107
E-W	Line	0.00	3.00	214.4	217.8
E-W	Line	3.00	5.00	217.8	215.5
E-W	Line	5.00	15.50	221.6	209.9
E-W	Line	15.50	16.00	203.8	203.3
E-W	Point	16.00	16.00	519	519
E-W	Line	16.00	17.50	183.1	183.1
N-S	Line	-1.50	0.00	97.4	97.4
N-S	Point	0.00	0.00	256	256
N-S	Line	0.00	1.00	117.6	117.6
N-S	Point	1.00	1.00	40	40
N-S	Line	1.00	1.50	117.6	117.6
N-S	Line	1.50	17.50	123.6	123.6
N-S	Line	17.50	20.50	117.6	117.6
N-S	Point	20.50	20.50	10	10
N-S	Line	20.50	22.50	117.6	117.6
N-S	Point	22.50	22.50	50	50
N-S	Line	22.50	51.50	117.6	117.6
N-S	Point	24.00	24.00	63	63
N-S	Point	51.50	51.50	356	356
N-S	Line	51.50	53.00	97.4	97.4

Level 1 Force Dir	Profile	Location [ft] Start	Location [ft] End	Mag [lbs,plf,psf] Start	Mag [lbs,plf,psf] End
E-W	Point	-10.00	-10.00	276	276
E-W	Line	-10.00	-5.00	51.5	51.5
E-W	Point	-5.00	-5.00	17	17
E-W	Line	-5.00	-4.00	53.2	53.2
E-W	Point	-4.00	-4.00	192	192
E-W	Line	-4.00	0.00	79.4	79.4
E-W	Point	0.00	0.00	2125	2125
E-W	Point	0.00	0.00	2125	2125
E-W	Point	0.00	0.00	53	53
E-W	Point	0.00	0.00	2744	2744
E-W	Line	0.00	5.00	79.4	79.4
E-W	Line	5.00	15.50	82.4	82.4
E-W	Line	15.50	16.00	76.7	76.7
E-W	Point	16.00	16.00	490	490
N-S	Point	0.00	0.00	2345	2345
N-S	Point	0.00	0.00	2345	2345
N-S	Point	0.00	0.00	170	170
N-S	Point	0.00	0.00	1927	1927
N-S	Line	0.00	1.00	41.4	41.4
N-S	Point	1.00	1.00	20	20
N-S	Line	1.00	1.50	41.4	41.4
N-S	Line	1.50	17.50	44.5	44.5
N-S	Line	17.50	20.50	41.4	41.4
N-S	Point	20.50	20.50	57	57
N-S	Line	20.50	21.00	41.4	41.4
N-S	Point	21.00	21.00	4	4
N-S	Line	21.00	22.50	42.6	42.6
N-S	Point	22.50	22.50	48	48
N-S	Line	22.50	51.50	48.2	48.2
N-S	Point	24.00	24.00	32	32
N-S	Point	51.50	51.50	247	247

Legend:
Loads in table can be accumulation of loads from several building masses, so they do not correspond with a particular building element.
Location - Start and end of load in direction perpendicular to seismic force direction

Notes:
All loads entered by the user or generated by program are specified (unfactored) loads.The program applies a load factor of 0.70 and redundancy factor to seismic loads before distributing them to the shearlines.

Design Summary

SHEARWALL DESIGN

Wind Shear Loads, Flexible Diaphragm
All shearwalls have sufficient design capacity.

Wind Shear Loads, Rigid Diaphragm
All shearwalls have sufficient design capacity.

Components and Cladding Wind Loads, Out-of-plane Sheathing
The following under-capacity walls were found:

Components and Cladding Wind Loads, Nail Withdrawal
All shearwalls have sufficient design capacity.

Seismic Loads, Flexible Diaphragm
All shearwalls have sufficient design capacity.

Seismic Loads, Rigid Diaphragm
All shearwalls have sufficient design capacity.

HOLD-DOWN DESIGN

Wind Loads, Flexible Diaphragm
All hold-downs have sufficient design capacity.

Wind Loads, Rigid Diaphragm
All hold-downs have sufficient design capacity.

Seismic Loads, Flexible Diaphragm
All hold-downs have sufficient design capacity.

Seismic Loads, Rigid Diaphragm
All hold-downs have sufficient design capacity.

COMPRESSION FORCE DESIGN

Wind Loads, Flexible Diaphragm
Bottom plate has sufficient perpendicular-to-grain compressive capacity under all wall end studs.

Wind Loads, Rigid Diaphragm
Bottom plate has sufficient perpendicular-to-grain compressive capacity under all wall end studs.

Seismic Loads, Flexible Diaphragm
Bottom plate has sufficient perpendicular-to-grain compressive capacity under all wall end studs.

Seismic Loads, Rigid Diaphragm
Bottom plate has sufficient perpendicular-to-grain compressive capacity under all wall end studs.

Refer to the Deflection table for possible issues regarding fastener slippage (SDPWS Table C4.2.3D) for walls that otherwise pass.

Flexible Diaphragm Wind Design
ASCE 7 Directional (All Heights) Loads

SHEAR RESULTS

N-S Shearlines	W Gp	For Dir	ASD Shear Force [plf] v	vmax/vft	V [lbs]	Asp-Cub Int	Asp-Cub Ext	Allowable Shear [plf] Int	Ext	Co	C	Cmb	V [lbs]	Resp. Ratio
Line 1														
Level 2														
Ln1, Lev2	-	Both	-	-	769	-	-	-	-	-		-	4732	-
Wall 1-1	1	Both	56.7	-	227	-	.89	-	393	-		349	1396	0.16
Wall 1-2	1	Both	-	-	542	-	1.0	-	393	-		-	3336	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Seg. 2	-	Both	63.8	-	542	-	1.0	-	393	-		393	3336	0.16
Line 2														
Ln2, Lev2	-	Both	-	-	1589	-	-	-	-	-		-	6326	-
Wall 2-3	3	Both	151.3	-	1589	-	1.0	-	602	-		602	6326	0.25
Level 1														
Ln2, Lev1	-	Both	-	-	5979	-	-	-	-	-		-	9640	-
Wall 2-1	1	Both	0.0	-	0	-	1.0	-	393	-		-	-	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Seg. 2	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Wall 2-2	1^	Both	0.0	-	0	-	1.0	-	0	-		-	-	-
Wall 2-3	3	Both	-	-	5979	-	1.0	-	602	-		-	9640	-
Seg. 1	-	Both	373.7	-	3923	-	1.0	-	602	-		602	6326	0.62
Seg. 2	-	Both	373.7	-	2055	-	1.0	-	602	-		602	3314	0.62
Line 3														
Level 2														
Ln3, Lev2	-	Both	-	-	871	-	-	-	-	-		-	3729	-
Wall 3-2	1	Both	-	-	871	-	1.0	-	393	-		-	3729	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Seg. 2	-	Both	91.7	-	871	-	1.0	-	393	-		393	3729	0.23
Level 1														
Ln3, Lev1	-	Both	-	-	2401	-	-	-	-	-		-	6025	-
Wall 3-1	4	Both	-	-	2401	-	1.0	-	602	-		-	6025	-
Seg. 1	-	Both	240.1	-	960	-	1.0	-	602	-		602	2410	0.40
Seg. 2	-	Both	240.1	-	1440	-	1.0	-	602	-		602	3615	0.40
Seg. 3	-	Both	0.0	-	0	-	1.0	-	602	-		602	-	-

E-W Shearlines	W Gp	For Dir	ASD Shear Force [plf] v	vmax/vft	V [lbs]	Asp-Cub Int	Asp-Cub Ext	Allowable Shear [plf] Int	Ext	Co	C	Cmb	V [lbs]	Resp. Ratio
Line A														
Level 2														
LnA, Lev2	-	Both	-	-	320	-	-	-	-	-		-	2944	-
Wall A-1	1	Both	0.0	-	0	-	1.0	-	393	-		-	-	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Seg. 2	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Seg. 3	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Seg. 4	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Wall A-3	1	Both	-	-	320	-	1.0	-	393	-		-	2944	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Seg. 2	-	Both	42.7	-	320	-	1.0	-	393	-		393	2944	0.11
Seg. 3	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Level 1														
LnA, Lev1	-	Both	-	-	2144	-	-	-	-	-		-	16289	-
Wall A-1	1	Both	51.7	-	1085	-	1.0	-	393	-		393	8243	0.13
Wall A-2	1^	Both	0.0	-	0	-	1.0	-	0	-		-	-	-
Wall A-3	1	Both	-	-	1059	-	1.0	-	393	-		-	8046	-
Seg. 1	-	Both	51.7	-	336	-	1.0	-	393	-		393	2551	0.13
Seg. 2	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Seg. 3	-	Both	51.7	-	388	-	1.0	-	393	-		393	2944	0.13
Seg. 4	-	Both	51.7	-	336	-	1.0	-	393	-		393	2551	0.13
Line B														
Level 2														
LnB, Lev2	-	Both	-	-	761	-	-	-	-	-		-	6280	-
Wall B-2	2	Both	47.6	-	761	-	1.0	-	393	-		393	6280	0.12
Line C														
LnC, Lev2	1	Both	8.7	-	446	-	1.0	-	393	-		393	20214	0.02
Level 1														
LnC, Lev1	-	Both	-	-	1755	-	-	-	-	-		-	18644	-
Wall C-1	1	Both	-	-	1755	-	1.0	-	393	-		-	18644	-
Seg. 1	-	Both	36.9	-	887	-	1.0	-	393	-		393	9420	0.09
Seg. 2	-	Both	36.9	-	868	-	1.0	-	393	-		393	9224	0.09

SHEAR RESULTS (flexible wind design, continued)

Legend:
W Gp - Wall design group defined in Sheathing and Framing Materials tables, where it shows associated Standard Wall. "^" means that this wall is critical for all walls in the Standard Wall group.
For Dir - Direction of wind force along shearline.
v – Design shear force on segment = ASD-factored shear force per unit length of full-height sheathing (FHS)
vmax/vft - Perforated walls: Collector and in-plane anchorage force as per SDPWS eqn. 4.3-9 = V/FHS/Co. FHS is factored for narrow segments as per 4.3.3.4
FTAO walls: Shear force in piers above and below either openings or piers beside opening(s). Aspect ratio factor does not apply to these piers.
V – ASD factored shear force. For shearline: total shearline force. For wall: total of all segments on wall. For segment: force on segment
Asp/Cub – For wall: Unblocked structural wood panel factor Cub from SDPWS 4.3.5.3. For segment or FTAO pier: Aspect ratio factor from SDPWS 4.3.5.5.1. For perforated wall: Either Cub or sum bi / FHS, where bi is segment length adjusted per SDPWS 4.3.3.4.
Int, Ext - Nominal unit shear capacity of interior and exterior sheathing, factored by Table 4.3-1 Note 3 for framing specific gravity and Note 10 for presence of hold-downs. For wall segments, also include unblocked factor Cub and aspect ratio adjustments.
Co - Adjustment factor for perforated walls from SDPWS Equation 4.3-6.
C - Sheathing combination rule, A = Add capacities, S = Strongest side or twice weakest, G = Stiffness-based using Eqns. 4.3-3,-4.
Cmb - Combined interior and exterior unit shear capacity including perforated wall factor Co.
V – Total factored shear capacity of shearline, wall or segment.
Crit Resp – Response ratio = v/Cmb = design shear force/unit shear capacity. "S" indicates that the seismic design criterion was critical in selecting wall.

Notes:
Refer to Elevation View diagrams for individual level for uplift anchorage force t for perforated walls given by SDPWS 4.3.6.4.2,1.

Hold-Down and Compression Design (flexible wind design)

Level 1 Line-Wall	Posit'n	Location [ft] X	Location [ft] Y	Load Case	Tensile Hold-down or Compressive Stud Force [lbs] Shear	Dead	Uplift	Cmb'd	Hold-down	Cap [lbs]	Crit Resp.
Line 1											
	V Elem	0.00	-3.87	1	544	156		388	Refer to upper level		
	V Elem	0.00	-3.87	1	-544	260		804	Compression		
	V Elem	0.00	-2.12	1	263	185		78	Refer to upper level		
	V Elem	0.00	-2.12	1	-263	308		572	Compression		
	V Elem	0.00	-0.12	1	544	108		436	Refer to upper level		
	V Elem	0.00	-0.12	1	-544	180		724	Compression		
	V Elem	0.00	14.13	1	398	194		203	Refer to upper level		
	V Elem	0.00	14.13	1	-398	324		722	Compression		
	V Elem	0.00	15.88	1	661	278		383	Refer to upper level		
	V Elem	0.00	15.88	1	-661	463		1123	Compression		
Line 2											
	V Elem	22.50	-9.87	1	0	128		127	Compression		
	V Elem	22.50	-8.62	1	0	128		127	Compression		
	V Elem	21.00	-4.87	1	0	85		85	Compression		
	V Elem	21.00	-4.12	1	0	85		85	Compression		
2-3	L End	20.50	-3.87	1	3062	151		2911	HDU8-SDS	6765	0.43
2-3	L End	20.50	-3.87	1	-3062	252		3314	Compression	10312	0.32
	V Elem	24.00	5.13	1	1395	170		1225	Refer to upper level		
	V Elem	24.00	5.13	1	-1395	284		1679	Compression		
2-3	L Op 1	20.50	6.38	1	3062	151		2911	HDU8-SDS	6765	0.43
2-3	L Op 1	20.50	6.38	1	-3062	252		3314	Compression	10312	0.32
2-3	R Op 1	20.50	10.13	1	3132	79		3052	HDU8-SDS	6765	0.45
2-3	R Op 1	20.50	10.13	1	-3132	132		3264	Compression	10312	0.32
2-3	R End	20.50	15.38	1	4527	249		4278	HDU8-SDS	6765	0.63
2-3	R End	20.50	15.38	1	-4527	416		4942	Compression	10312	0.48
Line 3											
3-1	L End	51.50	-9.87	1	2048	177		1871	HDU5-SDS	5645	0.33
3-1	L End	51.50	-9.87	1	-2048	295		2343	Compression	10312	0.23
	V Elem	51.50	-7.12	1	0	135		135	Compression		
3-1	L Op 1	51.50	-6.12	1	2048	96		1952	HDU5-SDS	5645	0.35
3-1	L Op 1	51.50	-6.12	1	-2048	160		2208	Compression	10312	0.21
3-1	R Op 1	51.50	-0.37	1	2004	144		1860	HDU5-SDS	5645	0.33
3-1	R Op 1	51.50	-0.37	1	-2004	240		2244	Compression	10312	0.22
	V Elem	51.50	0.12	1	0	113		112	Compression		
	V Elem	51.50	2.38	1	0	113		112	Compression		
	V Elem	51.50	2.62	1	0	23		22	Compression		
	V Elem	51.50	2.88	1	0	23		22	Compression		
3-1	L Op 2	51.50	5.38	1	1172	367		805	HDU5-SDS	5645	0.14
3-1	L Op 2	51.50	5.38	1	-1172	611		1783	Compression	10312	0.17
	V Elem	51.50	14.13	1	127	46		81	Refer to upper level		
	V Elem	51.50	14.13	1	-127	77		203	Compression		
	V Elem	51.50	14.38	1	0	20		20	Compression		
	V Elem	51.50	14.63	1	0	60		60	Compression		
	V Elem	51.50	15.88	1	959	293		667	Refer to upper level		
	V Elem	51.50	15.88	1	-959	488		1446	Compression		
Line A											
A-1	L End	0.12	-4.00	Min	418			418	HDU2-SDS	3075	0.14
A-1	L End	0.12	-4.00	Min	-418			418	Compression	10312	0.04
	V Elem	20.63	-10.00	1	0	90		90	Compression		
A-1	R End	20.88	-4.00	Min	418			418	HDU2-SDS	3075	0.14
A-1	R End	20.88	-4.00	Min	-418			418	Compression	10312	0.04
	V Elem	21.13	-5.00	1	0	60		60	Compression		
	V Elem	22.38	-5.00	1	0	150		150	Compression		
A-3	L End	22.63	-10.00	Min	430	210		220	HDU2-SDS	3075	0.07
A-3	L End	22.63	-10.00	Min	-430	350		780	Compression	10312	0.08
	V Elem	24.38	-10.00	1	0	90		90	Compression		
A-3	L Op 1	28.88	-10.00	Min	430	156		274	HDU2-SDS	3075	0.09
A-3	L Op 1	28.88	-10.00	Min	-430	260		690	Compression	10312	0.07
	V Elem	31.63	-10.00	1	0	20		20	Compression		
	V Elem	31.88	-10.00	Min	139	83		56	Refer to upper level		
	V Elem	31.88	-10.00	Min	-139	138		277	Compression		
A-3	R Op 2	34.63	-10.00	Min	686	312		374	HDU2-SDS	3075	0.12
A-3	R Op 2	34.63	-10.00	Min	-686	519		1205	Compression	10312	0.12
	V Elem	40.88	-10.00	Min	397	203		195	Refer to upper level		
	V Elem	40.88	-10.00	Min	-397	338		735	Compression		
A-3	L Op 3	41.88	-10.00	Min	428	180		248	HDU2-SDS	3075	0.08
A-3	L Op 3	41.88	-10.00	Min	-427	300		727	Compression	10312	0.07
A-3	R Op 3	45.13	-10.00	Min	430	156		274	HDU2-SDS	3075	0.09
A-3	R Op 3	45.13	-10.00	Min	-430	260		690	Compression	10312	0.07
	V Elem	49.63	-10.00	1	0	90		90	Compression		
A-3	R End	51.38	-10.00	Min	430	210		220	HDU2-SDS	3075	0.07

Hold-Down and Compression Design (flexible wind design, continued)

A-3	R End	51.38	-10.00	Min	-430	350	780	Compression	10312	0.08
Line B										
	V Elem	0.12	0.00	1	0	45	45	Compression		
	V Elem	0.88	0.00	1	0	45	45	Compression		
	V Elem	1.63	0.00	Min	-435	1152	1587	Compression		
	V Elem	17.38	0.00	Min	-435	1152	1587	Compression		
Line C										
C-1	L End	0.12	16.00	Min	-377	3278	3654	Compression	10312	0.35
C-1	L Op 1	23.88	16.00	Min	-299	960	1259	Compression	10312	0.12
C-1	R Op 1	28.13	16.00	Min	-299	940	1239	Compression	10312	0.12
C-1	R End	51.38	16.00	Min	-377	3258	3634	Compression	10312	0.35

Level 2					Tensile Hold-down						
Line-		Location [ft]		Load	or Compressive Stud Force [lbs]					Cap	Crit
Wall	Posit'n	X	Y	Case	Shear	Dead	Uplift	Cmb'd	Hold-down	[lbs]	Resp.
Line 1											
1-1	L End	1.00	-3.87	1	544	108		436	HDU2-SDS	3075	0.14
1-1	L End	1.00	-3.87	1	-544	180		724	Compression	10312	0.07
1-1	R End	1.00	-0.12	1	544	108		436	HDU2-SDS	3075	0.14
1-1	R End	1.00	-0.12	1	-544	180		724	Compression	10312	0.07
	V Elem	0.00	0.12	1	0	45		45	Compression		
	V Elem	0.00	0.88	1	0	45		45	Compression		
1-2	R Op 1	0.00	7.63	1	661	230		431	HDU2-SDS	3075	0.14
1-2	R Op 1	0.00	7.63	1	-661	383		1043	Compression	10312	0.10
1-2	R End	0.00	15.88	1	661	230		431	HDU2-SDS	3075	0.14
1-2	R End	0.00	15.88	1	-661	383		1043	Compression	10312	0.10
Line 2											
	V Elem	22.50	-9.87	1	0	68		67	Compression		
	V Elem	22.50	-8.62	1	0	68		67	Compression		
	V Elem	20.50	-4.87	1	0	45		45	Compression		
	V Elem	20.50	-4.12	1	0	45		45	Compression		
2-3	L End	24.00	5.13	1	1395	170		1225	HDU2-SDS	3075	0.40
2-3	L End	24.00	5.13	1	-1395	284		1679	Compression	10312	0.16
2-3	R End	24.00	15.38	1	1395	170		1225	HDU2-SDS	3075	0.40
2-3	R End	24.00	15.38	1	-1395	284		1679	Compression	10312	0.16
Line 3											
3-1	L End	51.50	-9.87	1	0	135		135	Compression		-
3-1	L Op 1	51.50	-7.12	1	0	135		135	Compression		-
	V Elem	51.50	0.12	1	0	113		112	Compression		
	V Elem	51.50	2.38	1	0	113		112	Compression		
	V Elem	51.50	2.62	1	0	23		22	Compression		
	V Elem	51.50	2.88	1	0	23		22	Compression		
3-2	R Op 1	51.50	6.63	1	959	257		703	HDU2-SDS	3075	0.23
3-2	R Op 1	51.50	6.63	1	-959	428		1386	Compression	10312	0.13
3-2	R End	51.50	15.88	1	959	257		703	HDU2-SDS	3075	0.23
3-2	R End	51.50	15.88	1	-959	428		1386	Compression	10312	0.13
Line A											
	V Elem	20.63	-5.00	1	0	90		90	Compression		
	V Elem	22.38	-5.00	1	0	90		90	Compression		
	V Elem	22.63	-10.00	1	0	90		90	Compression		
	V Elem	24.38	-10.00	1	0	90		90	Compression		
A-3	R Op 1	33.63	-10.00	Min	397	203		195	HDU2-SDS	3075	0.06
A-3	R Op 1	33.63	-10.00	Min	-397	338		735	Compression	10312	0.07
A-3	L Op 2	40.88	-10.00	Min	397	203		195	HDU2-SDS	3075	0.06
A-3	L Op 2	40.88	-10.00	Min	-397	338		735	Compression	10312	0.07
	V Elem	49.63	-10.00	1	0	90		90	Compression		
	V Elem	51.38	-10.00	1	0	90		90	Compression		
Line B											
	V Elem	0.12	0.00	1	0	45		45	Compression		
	V Elem	0.88	0.00	1	0	45		45	Compression		
B-2	L End	1.63	0.00	Min	-435	1152		1587	Compression	10312	0.15
B-2	R End	17.38	0.00	Min	-435	1152		1587	Compression	10312	0.15
Line C											
C-1	L End	0.12	16.00	Min	-78	2318		2396	Compression	10312	0.23
C-1	R End	51.38	16.00	Min	-78	2318		2396	Compression	10312	0.23

Legend:
Line-Wall:
At wall or opening – Shearline and wall number
At vertical element – Shearline
Posit'n – Position of stud pack that hold-down is attached to or which is applying compression force:
V Elem – Vertical element: column or strengthened studs required where not at wall end or opening
L or R End – At left or right wall end

L or R Op n – At left or right side of opening n
t @ Op n – Uplift force t at opening n from offset opening in perforated wall above, from SDPWS 4.3.6.4.2.1
Location – Co-ordinates in Plan View
Load Case – Results are for critical load case:
ASCE 7 All Heights: Case 1 or 2 from Fig. 27.3-8
ASCE 7 Low-rise: Windward corner(s) and Case A or B from Fig. 28.3-1
ASCE 7 Minimum loads (27.1.5 / 28.3.4): "Min"
Tensile Hold-down or Compressive Stud Force – Upwards force on hold-down at one end of the wall or downward force on bottom plate under studs at the other end, for each force direction. Includes forces transferred from upper levels.
Shear – Overturning component = V x h / beff from SDPWS Eqn. 4.3-7; V = force on segment, ASD-factored by 0.60; h = wall height, beff = wall segment length – (tension stud pack width + hold-down anchor bolt offset) – (1/2 compression stud pack width). For perforated walls = V x h / Co sum (bi) from SDPWS Eqn. 4.3-8.
Dead – Dead load resisting component, factored for ASD by 0.60 for tension and 1.0 for compression
Uplift – Uplift wind load component, factored for ASD by 0.60
Cmb'd – Sum of ASD-factored overturning, dead and uplift forces. May also include the uplift force t from perforated walls from SDPWS 4.3.6.4.2.1 when openings are staggered.
Hold-down – Device model number from hold-down database; "Compression" for bearing of end stud pack on bottom plate
Cap – Hold-downs: Allowable ASD tension load from database; Compression: allowable ASD bearing force = Ct CM Cb Fcp A; A = cross sectional area of end studs. Refer to Framing materials table for details
Crit. Resp. – Critical Response = Combined ASD force / Allowable ASD tension load

Notes:
HDU8-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 20 1/4" x 2.5" SDS heavy-duty screws; 7/8" anchor bolt.
HDU5-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 14 1/4" x 2.5" SDS heavy-duty screws; 5/8" anchor bolt.
HDU2-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 6 1/4" x 2.5" SDS heavy-duty screws; 5/8" anchor bolt.
Refer to the Shear Line Dimensions table for wall height h, effective segment length beff and perforated wall adjusted sum of bi, to the Story Table for joist depth, and to the Shear Results table for perforated factor Co.
Most severe of wind load cases is used for overturning calculation.
Designer is responsible for design of connection from wall to floor or foundation for shear force shown in Shear Results table. Refer to SDPWS 4.3.6.4.3 for foundation anchor bolt requirements.

COLLECTOR FORCES (flexible wind design)

Level 1 Line-Wall	Position on Wall or Opening	Location [ft] X	Location [ft] Y	Load Case	Drag Strut Force [lbs] --->	Drag Strut Force [lbs] <---	Strap/Blocking Force [lbs] --->	Strap/Blocking Force [lbs] <---
Line 2								
2-3	Left Wall End	20.50	-4.00		-1380	1380		
2-3	Left Opening 1	20.50	6.50		129	-129		
2-3	Right Opening 1	20.50	10.00		-675	675		
2-3	Right Wall End	20.50	15.50		115	-115		
Line 3								
3-1	Left Opening 1	51.50	-6.00		591	-591		
3-1	Right Opening 1	51.50	-0.50		83	-83		
3-1	Left Opening 2	51.50	5.50		969	-969		
Line A								
A-1	Right Wall End	21.00	-4.00		211	-211		
A-3	Left Wall End	22.50	-10.00		148	-148		
A-3	Left Opening 1	29.00	-10.00		213	-213		
A-3	Right Opening 2	34.50	-10.00		-16	16		
A-3	Left Opening 3	42.00	-10.00		60	-60		
A-3	Right Opening 3	45.00	-10.00		-65	65		
Line C								
C-1	Left Opening 1	24.00	16.00		69	-69		
C-1	Right Opening 1	28.00	16.00		-67	67		

Level 2 Line-Wall	Position on Wall or Opening	Location [ft] X	Location [ft] Y	Load Case	Drag Strut Force [lbs] --->	Drag Strut Force [lbs] <---	Strap/Blocking Force [lbs] --->	Strap/Blocking Force [lbs] <---
Line 1								
1-1	Right Wall End	1.00	0.00		73	-73		
1-2	Right Opening 1	0.00	7.50		-215	215		
Line 2								
2-3	Left Wall End	24.00	5.00		-917	917		
2-3	Right Wall End	24.00	15.50		31	-31		
Line 3								
3-2	Right Opening 1	51.50	6.50		-553	553		
Line A								
A-3	Right Opening 1	33.50	-10.00		-206	206		
A-3	Left Opening 2	41.00	-10.00		67	-67		
Line B								
B-2	Left Wall End	1.50	0.00		-23	23		
B-2	Right Wall End	17.50	0.00		498	-498		

Legend:
Line-Wall - Shearline and wall number
Position…- Side of opening or wall end that drag strut is attached to
Location - Co-ordinates in Plan View
Load Case - Results are for critical load case:
ASCE 7 All heights Case 1 or 2
ASCE 7 Low-rise corner; Case A or B
Drag strut Force - Axial force in transfer element at openings, gaps, or changes in design shear along shearline. + : tension; - : compression.
Based on ASD-factored shearline force (vmax from 4.3.6.4.1.1 for perforated walls)
Strap/Blocking Force – For FTAO walls, force transferred from above and below opening to shearwall pier.
-> Due to shearline force in the west-to-east or south-to-north direction
<- Due to shearline force in the east-to-west or north-to-south direction

MWFRS DEFLECTION (flexible wind design)

These deflections are used to determine shearwall stiffness for force distribution

Wall, segment	W Gp	Dir	Srf	v plf	b ft	h ft	Bending A sq.in	Bending Defl in	Ga kips/ in	Nail slip Vn lbs	Nail slip en in	Shear Defl in	Hold Defl in	Total Defl in
Level 1														
Line 2														
2-3,1	3	Both	1S	373.7	10.50	8.00	16.5	.006	18.4	201	.034	.162	0.27	0.43
2-3,2		S->N	1S	373.7	5.50	8.00	16.5	.011	18.4	201	.034	.162	0.53	0.70
		N->S	1S	373.7	5.50	8.00	16.5	.011	18.4	201	.034	.162	0.56	0.73
Line 3														
3-1,1	4	Both	ExtS	240.1	4.00	8.00	16.5	.009	18.4	201	.034	.104	0.70	0.82
3-1,2		S->N	ExtS	240.1	6.00	8.00	16.5	.006	18.4	201	.034	.104	0.46	0.57
		N->S	ExtS	240.1	6.00	8.00	16.5	.006	18.4	201	.034	.104	0.42	0.53
Line A														
A-1	1	Both	ExtS	51.7	21.00	8.00	16.5	.000	13.8	196	.032	.030	0.11	0.14
A-3,1	1	W->E	ExtS	51.7	6.50	8.00	16.5	.001	13.8	196	.032	.030	0.37	0.40
		E->W	ExtS	51.7	6.50	8.00	16.5	.001	13.8	196	.032	.030	0.38	0.41
A-3,3		Both	ExtS	51.7	7.50	8.00	16.5	.001	13.8	196	.032	.030	0.33	0.36
A-3,4		W->E	ExtS	51.7	6.50	8.00	16.5	.001	13.8	196	.032	.030	0.38	0.41
		E->W	ExtS	51.7	6.50	8.00	16.5	.001	13.8	196	.032	.030	0.37	0.40
Line C														
C-1,1	1	Both	ExtS	36.9	24.00	8.00	16.5	.000	13.8	196	.032	.021	0.00	0.02
C-1,2		Both	ExtS	36.9	23.50	8.00	16.5	.000	13.8	196	.032	.021	0.00	0.02

Wall, segment	W Gp	Dir	Srf	v plf	b ft	h ft	Bending A sq.in	Bending Defl in	Ga kips/ in	Nail slip Vn lbs	Nail slip en in	Shear Defl in	Hold Defl in	Total Defl in
Level 2														
Line 1														
1-1	1	S->N	ExtS	56.7	4.00	9.00	16.5	.003	13.8	196	.032	.037	0.75	0.79
		N->S	ExtS	56.7	4.00	9.00	16.5	.003	13.8	196	.032	.037	0.72	0.76
1-2,2	1	S->N	ExtS	63.8	8.50	9.00	16.5	.002	13.8	196	.032	.042	0.34	0.38
		N->S	ExtS	63.8	8.50	9.00	16.5	.002	13.8	196	.032	.042	0.33	0.37
Line 2														
2-3	3	S->N	1S	151.3	10.50	9.00	16.5	.003	18.4	201	.034	.074	0.31	0.39
		N->S	1S	151.3	10.50	9.00	16.5	.003	18.4	201	.034	.074	0.28	0.36
Line 3														
3-2,2	1	S->N	ExtS	91.7	9.50	9.00	16.5	.002	13.8	196	.032	.060	0.32	0.38
		N->S	ExtS	91.7	9.50	9.00	16.5	.002	13.8	196	.032	.060	0.30	0.36
Line A														
A-3,2	1	W->E	ExtS	42.7	7.50	9.00	16.5	.001	13.8	196	.032	.028	0.37	0.40
		E->W	ExtS	42.7	7.50	9.00	16.5	.001	13.8	196	.032	.028	0.36	0.39
Line B														
B-2	2	Both	1S	47.6	16.00	9.00	16.5	.001	13.8	196	.032	.031	0.00	0.03
Line C														
C-1	1	Both	ExtS	8.7	51.50	9.00	16.5	.000	13.8	196	.032	.006	0.00	0.01

Legend:

Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B.

W Gp – Wall design group, refer to Sheathing and Framing Materials tables.

Dir – Force direction.

Srf – Wall surface = Int(erior) or Ext(erior) for perimeter walls, 1 or 2 for interior partitions; Comb = Combined v and Ga for identical materials on each side; S = Ga from side with stronger shear resistance; W = 2 x Ga of weaker side.

v – ASD shear force per unit distance on wall segment.

Unblocked walls = v / Cub as per SDPWS 4.3.4.3, Cub = Unblocked factor from 4.3.5.3, shown in the Shear Results table.

Perforated walls = vmax from Eqn. 4.3-9, as per 4.3.4.2.

FTAO walls = Unit shear force in pier beside opening(s).

b – Wall or segment length.

Segmented wall or FTAO wall segments = Width of wall segment between openings.

Perforated wall = Sum of FHS segments, modified as in 4.3.3.4 per 4.3.4.2.

FTAO wall = Length of wall including openings.

h – Wall height.

FTAO piers = Distance from bottom of opening to top of wall; for end segments, results using that distance and the wall height are averaged.

Defl – Horizontal shear wall deflection due to given term:

Bending = 8vh^3 / EAb; A = Effective cross sectional area of segment end stud(s), E = stud mod. of elasticity in Framing Materials table

For i studs at one end and j at the other, A = 2 (i^2 j + j^2 i) / (i + j)^2 x area of one stud, based on Ex. C4.3.4-3

Shear = vh / 1000 Ga; Ga = vw / (vw / Gvtv + 0.75 en), from SDPWS Ex. C4.3.4-1.

vw = ASD sheathing capacity.

Gvtv = Shear stiffness from C4.3.4, shown in Sheathing Materials table.

en = Nail slip from Table C4.2.3D of form aVn^b for WSP, constant for other materials.

Vn = Shear force per nail along panel edge at ASD capacity vw.

Hold – Anchorage system (hold-down) = da x h / beff.

da = Vertical hold-down displacement; refer to Hold-down Displacement table for components.

beff = Effective wall segment length = b - (tension stud pack width + hold-down anchor bolt offset) - (1/2 compression stud pack width)
beff is given in the Shear Wall Dimensions table.
For FTAO walls, hold-down device at end of wall is applied to all segments, as per APA T555.
Total Defl – Deflection from bending + shear + hold-down, as per Eqn. 4.3-2.
For FTAO walls, the average of the values for the segments, as per APA T555.

MWFRS HOLD-DOWN DISPLACEMENT (flexible wind design)

These displacements are used to determine deflections for force distribution

Wall, segment	Dir	Hold-down	Tension force lbs	Vert. Displacement Manuf in	Add in	da in	Slippage Vf lbs	da in	Shrink +Extra in	Comp. force lbs	Crush da in	Total da in	Horz Defl in
Level 1													
Line 2													
2-3,1	Both	HDU8-SDS	2911	.047	.002	0.049	-	-	.283	3314	0.01	0.34	0.27
2-3,2	S->N	HDU8-SDS	3052	.050	.002	0.051	-	-	.283	4942	0.01	0.35	0.53
	N->S	HDU8-SDS	4278	.070	.003	0.072	-	-	.283	3264	0.01	0.36	0.56
Line 3													
3-1,1	S->N	HDU5-SDS	1871	.038	.002	0.040	-	-	.283	2208	0.01	0.33	0.70
	N->S	HDU5-SDS	1952	.040	.002	0.042	-	-	.283	2343	0.01	0.33	0.71
3-1,2	S->N	HDU5-SDS	1860	.038	.002	0.040	-	-	.283	1656	0.00	0.33	0.46
	N->S	HDU5-SDS	678	.014	.001	0.015	-	-	.283	2244	0.01	0.30	0.42
Line A													
A-1	Both	HDU2-SDS	418	.012	.000	0.012	-	-	.283	418	0.00	0.30	0.11
A-3,1	W->E	HDU2-SDS	220	.006	.000	0.007	-	-	.283	690	0.00	0.29	0.37
	E->W	HDU2-SDS	274	.008	.000	0.008	-	-	.283	780	0.00	0.29	0.38
A-3,3	W->E	HDU2-SDS	513	.015	.001	0.015	-	-	.283	728	0.00	0.30	0.33
	E->W	HDU2-SDS	248	.007	.000	0.007	-	-	.283	1344	0.00	0.29	0.32
A-3,4	W->E	HDU2-SDS	274	.008	.000	0.008	-	-	.283	780	0.00	0.29	0.38
	E->W	HDU2-SDS	220	.006	.000	0.007	-	-	.283	690	0.00	0.29	0.37
Line C													
C-1,1	W->E	HDU2-SDS	-1589	.000	.000	0.000	-	-	.000	1259	0.00	0.00	0.00
	E->W	HDU2-SDS	-277	.000	.000	0.000	-	-	.000	3655	0.01	0.01	0.00
C-1,2	W->E	HDU2-SDS	-265	.000	.000	0.000	-	-	.000	3635	0.01	0.01	0.00
	E->W	HDU2-SDS	-1577	.000	.000	0.000	-	-	.000	1239	0.00	0.00	0.00

Wall, segment	Dir	Hold-down	Tension force lbs	Vert. Displacement Manuf in	Add in	da in	Slippage Vf lbs	da in	Shrink +Extra in	Comp. force lbs	Crush da in	Total da in	Horz Defl in
Level 2													
Line 1													
1-1	S->N	HDU2-SDS	436	.025	.000	0.025	-	-	.283	724	0.00	0.31	0.75
	N->S	HDU2-SDS	436	.012	.001	0.013	-	-	.283	724	0.00	0.30	0.72
1-2,2	S->N	HDU2-SDS	431	.025	.000	0.025	-	-	.283	1043	0.00	0.31	0.34
	N->S	HDU2-SDS	431	.012	.001	0.013	-	-	.283	1043	0.00	0.30	0.33
Line 2													
2-3	S->N	HDU2-SDS	1225	.070	.001	0.071	-	-	.283	1679	0.00	0.36	0.31
	N->S	HDU2-SDS	1225	.035	.001	0.037	-	-	.283	1679	0.00	0.32	0.28
Line 3													
3-2,2	S->N	HDU2-SDS	703	.040	.000	0.041	-	-	.283	1387	0.00	0.33	0.32
	N->S	HDU2-SDS	703	.020	.001	0.021	-	-	.283	1387	0.00	0.31	0.30
Line A													
A-3,2	W->E	HDU2-SDS	195	.011	.000	0.011	-	-	.283	735	0.00	0.30	0.37
	E->W	HDU2-SDS	195	.006	.000	0.006	-	-	.283	735	0.00	0.29	0.36
Line B													
B-2	Both	HDU2-SDS	-256	.000	.000	0.000	-	-	.000	1587	0.00	0.00	0.00
Line C													
C-1	Both	HDU2-SDS	-1312	.000	.000	0.000	-	-	.000	2396	0.01	0.01	0.00

Legend:

Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B

Dir – Force direction

Tens., Comp. force – Accumulated ASD hold-down tension force T and end stud compression force C from overturning, dead loads and wind uplift

da – Vertical displacements due to the following components:

Vert. Displacement – Elongation when slippage calculated separately; displacement when combined elongation/slippage used

Manuf – Using manufacturer's value for anchor bolt length, or no bolt contribution for connector-only elongation

*Unless marked with * = (ASD uplift force / ASD hold-down capacity) x max ASD elongation or displacement*

** - Maximum strength-level elongation or displacement is used. May result in higher than actual displacements for lightly loaded hold-downs, causing the segment to draw less force due to lower than actual stiffness.*

Add – Due to longer anchor bolt length than manufacturer's value, or entire bolt length for connector-only elongation = TL / (Ab x Es)

Ab = bolt cross-sectional area

Es = steel modulus = 29000000 psi

L = Lb – Lh

Lb = Total bolt length shown in Storey Information table

Lh = Manufacturer's anchor bolt length for given displacement/elongation from hold-down database

Slippage – Due to vertical slippage of hold-down fasteners attached to stud(s) when not combined with elongation

Nails = en from SDPWS Table C4.2.3D using values for wood structural panels

Bolts = Vf / (270,000 D^1.5) (NDS 11.3.6); D = bolt diameter, Vf = Tension force T / number of fasteners

Shrink + Extra – Wood shrinkage plus extra displacement due to mis-cuts, gaps, etc.

Shrinkage = 0.002 x (19% fabrication – 10% in-service moisture contents) x Ls
Ls = Length between anchor bolt fasteners subject to perp-to-grain shrinkage; see Story Information table
Crush – Deformation of bottom plate at compression end of wall segment
= 0.02" x [r / 0.73, r < 0.73; (1 + (r - 0.73) / 0.27), 0.73 < r < 1; 2 r^3, r > 1]
r = fcp / Fcp'; Fcp' = Ct CM Fcp; fcp = C / A, A = cross sectional area of end studs
Total da – Vert. Displacement + Slippage + Shrink + Crush + Extra
Horz Defl – Anchorage deflection term in SDPWS Eqn. C.4.3.4-1 = h / beff x da
h = Wall height. For end segments in FTAO walls, h is the average of the wall height and the distance from the bottom of opening to top of wall
beff = Effective wall segment length = b - (tension stud pack width + hold-down anchor bolt offset) - (1/2 compression stud pack width)
h and b are shown in Deflection table, beff in the Shear Wall Dimensions table

Rigid Diaphragm Wind Design
ASCE 7 Directional (All Heights) Loads

SHEAR RESULTS

N-S Shearlines	W Gp	For Dir	ASD Shear Force [plf] v	vmax/vft	V [lbs]	Asp-Cub Int	Asp-Cub Ext	Allowable Shear [plf] Int	Ext	Co	C	Cmb	V [lbs]	Resp. Ratio
Line 1														
Level 2														
Ln1, Lev2	-	Both	-	-	923	-	-	-	-	-		-	4732	-
Wall 1-1	1	Both	68.0	-	272	-	.89	-	393	-		349	1396	0.19
Wall 1-2	1	Both	-	-	650	-	1.0	-	393	-		-	3336	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Seg. 2	-	Both	76.5	-	650	-	1.0	-	393	-		393	3336	0.19
Line 2														
Ln2, Lev2	-	Both	-	-	1386	-	-	-	-	-		-	6326	-
Wall 2-3	3	Both	132.0	-	1386	-	1.0	-	602	-		602	6326	0.22
Level 1														
Ln2, Lev1	-	Both	-	-	5956	-	-	-	-	-		-	9640	-
Wall 2-1	1	Both	0.0	-	0	-	1.0	-	393	-		-	-	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Seg. 2	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Wall 2-2	1^	Both	0.0	-	0	-	1.0	-	0	-		-	-	-
Wall 2-3	3	Both	-	-	5956	-	1.0	-	602	-		-	9640	-
Seg. 1	-	Both	372.2	-	3909	-	1.0	-	602	-		602	6326	0.62
Seg. 2	-	Both	372.2	-	2047	-	1.0	-	602	-		602	3314	0.62
Line 3														
Level 2														
Ln3, Lev2	-	Both	-	-	921	-	-	-	-	-		-	3729	-
Wall 3-2	1	Both	-	-	921	-	1.0	-	393	-		-	3729	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Seg. 2	-	Both	96.9	-	921	-	1.0	-	393	-		393	3729	0.25
Level 1														
Ln3, Lev1	-	Both	-	-	2423	-	-	-	-	-		-	6025	-
Wall 3-1	4	Both	-	-	2423	-	1.0	-	602	-		-	6025	-
Seg. 1	-	Both	242.3	-	969	-	1.0	-	602	-		602	2410	0.40
Seg. 2	-	Both	242.3	-	1454	-	1.0	-	602	-		602	3615	0.40
Seg. 3	-	Both	0.0	-	0	-	1.0	-	602	-		602	-	-

E-W Shearlines	W Gp	For Dir	ASD Shear Force [plf] v	vmax/vft	V [lbs]	Asp-Cub Int	Asp-Cub Ext	Allowable Shear [plf] Int	Ext	Co	C	Cmb	V [lbs]	Resp. Ratio
Line A														
Level 2														
LnA, Lev2	-	Both	-	-	227	-	-	-	-	-		-	2944	-
Wall A-1	1	Both	0.0	-	0	-	1.0	-	393	-		-	-	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Seg. 2	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Seg. 3	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Seg. 4	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Wall A-3	1	Both	-	-	227	-	1.0	-	393	-		-	2944	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Seg. 2	-	Both	30.3	-	227	-	1.0	-	393	-		393	2944	0.08
Seg. 3	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Level 1														
LnA, Lev1	-	Both	-	-	2019	-	-	-	-	-		-	16289	-
Wall A-1	1	Both	48.7	-	1022	-	1.0	-	393	-		393	8243	0.12
Wall A-2	1^	Both	0.0	-	0	-	1.0	-	0	-		-	-	-
Wall A-3	1	Both	-	-	997	-	1.0	-	393	-		-	8046	-
Seg. 1	-	Both	48.7	-	316	-	1.0	-	393	-		393	2551	0.12
Seg. 2	-	Both	0.0	-	0	-	1.0	-	393	-		393	-	-
Seg. 3	-	Both	48.7	-	365	-	1.0	-	393	-		393	2944	0.12
Seg. 4	-	Both	48.7	-	316	-	1.0	-	393	-		393	2551	0.12
Line B														
Level 2														
LnB, Lev2	-	Both	-	-	417	-	-	-	-	-		-	6280	-
Wall B-2	2	Both	26.1	-	417	-	1.0	-	393	-		393	6280	0.07
Line C														
LnC, Lev2	1	Both	17.1	-	883	-	1.0	-	393	-		393	20214	0.04
Level 1														
LnC, Lev1	-	Both	-	-	1880	-	-	-	-	-		-	18644	-
Wall C-1	1	Both	-	-	1880	-	1.0	-	393	-		-	18644	-
Seg. 1	-	Both	39.6	-	950	-	1.0	-	393	-		393	9420	0.10
Seg. 2	-	Both	39.6	-	930	-	1.0	-	393	-		393	9224	0.10

SHEAR RESULTS (rigid wind design, continued)

Legend:
W Gp - Wall design group defined in Sheathing and Framing Materials tables, where it shows associated Standard Wall. "^" means that this wall is critical for all walls in the Standard Wall group.
For Dir - Direction of wind force along shearline.
v – Design shear force on segment = ASD-factored shear force per unit length of full-height sheathing (FHS)
vmax/vft - Perforated walls: Collector and in-plane anchorage force as per SDPWS eqn. 4.3-9 = V/FHS/Co. FHS is factored for narrow segments as per 4.3.3.4
FTAO walls: Shear force in piers above and below either openings or piers beside opening(s). Aspect ratio factor does not apply to these piers.
V – ASD factored shear force. For shearline: total shearline force. For wall: total of all segments on wall. For segment: force on segment
Asp/Cub – For wall: Unblocked structural wood panel factor Cub from SDPWS 4.3.5.3. For segment or FTAO pier: Aspect ratio factor from SDPWS 4.3.5.5.1. For perforated wall: Either Cub or sum bi / FHS, where bi is segment length adjusted per SDPWS 4.3.3.4.
Int, Ext - Nominal unit shear capacity of interior and exterior sheathing, factored by Table 4.3-1 Note 3 for framing specific gravity and Note 10 for presence of hold-downs. For wall segments, also include unblocked factor Cub and aspect ratio adjustments.
Co - Adjustment factor for perforated walls from SDPWS Equation 4.3-6.
C - Sheathing combination rule, A = Add capacities, S = Strongest side or twice weakest, G = Stiffness-based using Eqns. 4.3-3,-4.
Cmb - Combined interior and exterior unit shear capacity including perforated wall factor Co.
V – Total factored shear capacity of shearline, wall or segment.
Crit Resp – Response ratio = v/Cmb = design shear force/unit shear capacity. "S" indicates that the seismic design criterion was critical in selecting wall.

Notes:
Refer to Elevation View diagrams for individual level for uplift anchorage force t for perforated walls given by SDPWS 4.3.6.4.2,1.

Hold-Down and Compression Design (rigid wind design)

Level 1 Line-Wall	Posit'n	Location [ft] X	Location [ft] Y	Load Case	Tensile Hold-down or Compressive Stud Force [lbs] Shear	Dead	Uplift	Cmb'd	Hold-down	Cap [lbs]	Crit Resp.
Line 1											
	V Elem	0.00	-3.87	1	653	156		497	Refer to upper level		
	V Elem	0.00	-3.87	1	-653	260		913	Compression		
	V Elem	0.00	-2.12	1	316	185		131	Refer to upper level		
	V Elem	0.00	-2.12	1	-316	308		624	Compression		
	V Elem	0.00	-0.12	1	653	108		545	Refer to upper level		
	V Elem	0.00	-0.12	1	-653	180		833	Compression		
	V Elem	0.00	14.13	1	477	194		283	Refer to upper level		
	V Elem	0.00	14.13	1	-477	324		801	Compression		
	V Elem	0.00	15.88	1	793	278		516	Refer to upper level		
	V Elem	0.00	15.88	1	-793	463		1256	Compression		
Line 2											
2-3	L End	20.50	-3.87	1	3051	151		2899	HDU8-SDS	6765	0.43
2-3	L End	20.50	-3.87	1	-3050	252		3302	Compression	10312	0.32
	V Elem	24.00	5.13	1	1217	170		1047	Refer to upper level		
	V Elem	24.00	5.13	1	-1217	284		1500	Compression		
2-3	L Op 1	20.50	6.38	1	3051	151		2899	HDU8-SDS	6765	0.43
2-3	L Op 1	20.50	6.38	1	-3050	252		3302	Compression	10312	0.32
2-3	R Op 1	20.50	10.13	1	3120	79		3041	HDU8-SDS	6765	0.45
2-3	R Op 1	20.50	10.13	1	-3120	132		3252	Compression	10312	0.32
2-3	R End	20.50	15.38	1	4337	249		4087	HDU8-SDS	6765	0.60
2-3	R End	20.50	15.38	1	-4336	416		4752	Compression	10312	0.46
Line 3											
3-1	L End	51.50	-9.87	1	2068	177		1891	HDU5-SDS	5645	0.33
3-1	L End	51.50	-9.87	1	-2068	295		2363	Compression	10312	0.23
3-1	L Op 1	51.50	-6.12	1	2068	96		1972	HDU5-SDS	5645	0.35
3-1	L Op 1	51.50	-6.12	1	-2068	160		2228	Compression	10312	0.22
3-1	R Op 1	51.50	-0.37	1	2023	144		1879	HDU5-SDS	5645	0.33
3-1	R Op 1	51.50	-0.37	1	-2023	240		2263	Compression	10312	0.22
3-1	L Op 2	51.50	5.38	1	1143	367		777	HDU5-SDS	5645	0.14
3-1	L Op 2	51.50	5.38	1	-1143	611		1754	Compression	10312	0.17
	V Elem	51.50	14.13	1	134	46		88	Refer to upper level		
	V Elem	51.50	14.13	1	-134	77		211	Compression		
	V Elem	51.50	15.88	1	1014	293		721	Refer to upper level		
	V Elem	51.50	15.88	1	-1013	488		1501	Compression		
Line A											
A-1	L End	0.12	-4.00	Min	394			394	HDU2-SDS	3075	0.13
A-1	L End	0.12	-4.00	Min	-394			394	Compression	10312	0.04
A-1	R End	20.88	-4.00	Min	394			394	HDU2-SDS	3075	0.13
A-1	R End	20.88	-4.00	Min	-394			394	Compression	10312	0.04
A-3	L End	22.63	-10.00	Min	405	210		195	HDU2-SDS	3075	0.06
A-3	L End	22.63	-10.00	Min	-405	350		755	Compression	10312	0.07
A-3	L Op 1	28.88	-10.00	Min	405	156		249	HDU2-SDS	3075	0.08
A-3	L Op 1	28.88	-10.00	Min	-405	260		665	Compression	10312	0.06
	V Elem	31.88	-10.00	Min	99	83		16	Refer to upper level		
	V Elem	31.88	-10.00	Min	-99	138		237	Compression		
A-3	R Op 2	34.63	-10.00	Min	586	312		274	HDU2-SDS	3075	0.09
A-3	R Op 2	34.63	-10.00	Min	-586	519		1105	Compression	10312	0.11
	V Elem	40.88	-10.00	Min	282	203		80	Refer to upper level		
	V Elem	40.88	-10.00	Min	-282	338		620	Compression		
A-3	L Op 3	41.88	-10.00	Min	403	180		223	HDU2-SDS	3075	0.07
A-3	L Op 3	41.88	-10.00	Min	-403	300		703	Compression	10312	0.07
A-3	R Op 3	45.13	-10.00	Min	405	156		249	HDU2-SDS	3075	0.08
A-3	R Op 3	45.13	-10.00	Min	-405	260		665	Compression	10312	0.06
A-3	R End	51.38	-10.00	Min	405	210		195	HDU2-SDS	3075	0.06
A-3	R End	51.38	-10.00	Min	-405	350		755	Compression	10312	0.07
Line B											
	V Elem	1.63	0.00	Min	-238	1152		1390	Compression		
	V Elem	17.38	0.00	Min	-238	1152		1390	Compression		
Line C											
C-1	L End	0.12	16.00	Min	-475	3278		3752	Compression	10312	0.36
C-1	L Op 1	23.88	16.00	Min	-320	960		1280	Compression	10312	0.12
C-1	R Op 1	28.13	16.00	Min	-320	940		1260	Compression	10312	0.12
C-1	R End	51.38	16.00	Min	-475	3258		3732	Compression	10312	0.36

Level 2 Line-Wall	Posit'n	Location [ft] X	Location [ft] Y	Load Case	Tensile Hold-down or Compressive Stud Force [lbs] Shear	Dead	Uplift	Cmb'd	Hold-down	Cap [lbs]	Crit Resp.
Line 1											
1-1	L End	1.00	-3.87	1	653	108		545	HDU2-SDS	3075	0.18
1-1	L End	1.00	-3.87	1	-653	180		833	Compression	10312	0.08
1-1	R End	1.00	-0.12	1	653	108		545	HDU2-SDS	3075	0.18

Hold-Down and Compression Design (rigid wind design, continued)

1-1	R End	1.00	-0.12	1	-653	180	833	Compression	10312	0.08
1-2	R Op 1	0.00	7.63	1	793	230	564	HDU2-SDS	3075	0.18
1-2	R Op 1	0.00	7.63	1	-793	383	1176	Compression	10312	0.11
1-2	R End	0.00	15.88	1	793	230	564	HDU2-SDS	3075	0.18
1-2	R End	0.00	15.88	1	-793	383	1176	Compression	10312	0.11
Line 2										
2-3	L End	24.00	5.13	1	1217	170	1047	HDU2-SDS	3075	0.34
2-3	L End	24.00	5.13	1	-1217	284	1500	Compression	10312	0.15
2-3	R End	24.00	15.38	1	1217	170	1047	HDU2-SDS	3075	0.34
2-3	R End	24.00	15.38	1	-1217	284	1500	Compression	10312	0.15
Line 3										
3-2	R Op 1	51.50	6.63	1	1014	257	757	HDU2-SDS	3075	0.25
3-2	R Op 1	51.50	6.63	1	-1013	428	1441	Compression	10312	0.14
3-2	R End	51.50	15.88	1	1014	257	757	HDU2-SDS	3075	0.25
3-2	R End	51.50	15.88	1	-1013	428	1441	Compression	10312	0.14
Line A										
A-3	R Op 1	33.63	-10.00	Min	282	203	80	HDU2-SDS	3075	0.03
A-3	R Op 1	33.63	-10.00	Min	-282	338	620	Compression	10312	0.06
A-3	L Op 2	40.88	-10.00	Min	282	203	80	HDU2-SDS	3075	0.03
A-3	L Op 2	40.88	-10.00	Min	-282	338	620	Compression	10312	0.06
Line B										
B-2	L End	1.63	0.00	Min	-238	1152	1390	Compression	10312	0.13
B-2	R End	17.38	0.00	Min	-238	1152	1390	Compression	10312	0.13
Line C										
C-1	L End	0.12	16.00	Min	-155	2318	2472	Compression	10312	0.24
C-1	R End	51.38	16.00	Min	-155	2318	2472	Compression	10312	0.24

Legend:
Line-Wall:
At wall or opening – Shearline and wall number
At vertical element – Shearline
Posit'n – Position of stud pack that hold-down is attached to or which is applying compression force:
V Elem – Vertical element: column or strengthened studs required where not at wall end or opening
L or R End – At left or right wall end
L or R Op n – At left or right side of opening n
t @ Op n – Uplift force t at opening n from offset opening in perforated wall above, from SDPWS 4.3.6.4.2.1
Location – Co-ordinates in Plan View
Load Case – Results are for critical load case:
ASCE 7 All Heights: Case 1 or 2 from Fig. 27.3-8
ASCE 7 Low-rise: Windward corner(s) and Case A or B from Fig. 28.3-1
ASCE 7 Minimum loads (27.1.5 / 28.3.4): "Min"
Tensile Hold-down or Compressive Stud Force – Upwards force on hold-down at one end of the wall or downward force on bottom plate under studs at the other end, for each force direction. Includes forces transferred from upper levels.
Shear – Overturning component = V x h / beff from SDPWS Eqn. 4.3-7; V = force on segment, ASD-factored by 0.60; h = wall height, beff = wall segment length – (tension stud pack width + hold-down anchor bolt offset) – (1/2 compression stud pack width). For perforated walls = V x h / Co sum (bi) from SDPWS Eqn. 4.3-8.
Dead – Dead load resisting component, factored for ASD by 0.60 for tension and 1.0 for compression
Uplift – Uplift wind load component, factored for ASD by 0.60
Cmb'd – Sum of ASD-factored overturning, dead and uplift forces. May also include the uplift force t from perforated walls from SDPWS 4.3.6.4.2.1 when openings are staggered.
Hold-down – Device model number from hold-down database; "Compression" for bearing of end stud pack on bottom plate
Cap – Hold-downs: Allowable ASD tension load from database; Compression: allowable ASD bearing force = Ct CM Cb Fcp A; A = cross sectional area of end studs. Refer to Framing materials table for details
Crit. Resp. – Critical Response = Combined ASD force / Allowable ASD tension load

Notes:
HDU8-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 20 1/4" x 2.5" SDS heavy-duty screws; 7/8" anchor bolt.
HDU5-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 14 1/4" x 2.5" SDS heavy-duty screws; 5/8" anchor bolt.
HDU2-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 6 1/4" x 2.5" SDS heavy-duty screws; 5/8" anchor bolt.
Refer to the Shear Line Dimensions table for wall height h, effective segment length beff and perforated wall adjusted sum of bi, to the Story Table for joist depth, and to the Shear Results table for perforated factor Co.
Most severe of wind load cases is used for overturning calculation.
Designer is responsible for design of connection from wall to floor or foundation for shear force shown in Shear Results table. Refer to SDPWS 4.3.6.4.3 for foundation anchor bolt requirements.

COLLECTOR FORCES (rigid wind design)

Level 1 Line-Wall	Position on Wall or Opening	Location [ft] X	Location [ft] Y	Load Case	Drag Strut Force [lbs] --->	Drag Strut Force [lbs] <---	Strap/Blocking Force [lbs] --->	Strap/Blocking Force [lbs] <---
Line 2								
2-3	Left Wall End	20.50	-4.00		-1374	1374		
2-3	Left Opening 1	20.50	6.50		129	-129		
2-3	Right Opening 1	20.50	10.00		-673	673		
2-3	Right Wall End	20.50	15.50		115	-115		
Line 3								
3-1	Left Opening 1	51.50	-6.00		596	-596		
3-1	Right Opening 1	51.50	-0.50		84	-84		
3-1	Left Opening 2	51.50	5.50		979	-979		
Line A								
A-1	Right Wall End	21.00	-4.00		198	-198		
A-3	Left Wall End	22.50	-10.00		140	-140		
A-3	Left Opening 1	29.00	-10.00		201	-201		
A-3	Right Opening 2	34.50	-10.00		-15	15		
A-3	Left Opening 3	42.00	-10.00		56	-56		
A-3	Right Opening 3	45.00	-10.00		-61	61		
Line C								
C-1	Left Opening 1	24.00	16.00		74	-74		
C-1	Right Opening 1	28.00	16.00		-72	72		

Level 2 Line-Wall	Position on Wall or Opening	Location [ft] X	Location [ft] Y	Load Case	Drag Strut Force [lbs] --->	Drag Strut Force [lbs] <---	Strap/Blocking Force [lbs] --->	Strap/Blocking Force [lbs] <---
Line 1								
1-1	Right Wall End	1.00	0.00		88	-88		
1-2	Right Opening 1	0.00	7.50		-258	258		
Line 2								
2-3	Left Wall End	24.00	5.00		-799	799		
2-3	Right Wall End	24.00	15.50		27	-27		
Line 3								
3-2	Right Opening 1	51.50	6.50		-584	584		
Line A								
A-3	Right Opening 1	33.50	-10.00		-146	146		
A-3	Left Opening 2	41.00	-10.00		47	-47		
Line B								
B-2	Left Wall End	1.50	0.00		-12	12		
B-2	Right Wall End	17.50	0.00		273	-273		

Legend:
Line-Wall - Shearline and wall number
Position…- Side of opening or wall end that drag strut is attached to
Location - Co-ordinates in Plan View
Load Case - Results are for critical load case:
ASCE 7 All heights Case 1 or 2
ASCE 7 Low-rise corner; Case A or B
Drag strut Force - Axial force in transfer element at openings, gaps, or changes in design shear along shearline. + : tension; - : compression.
Based on ASD-factored shearline force (vmax from 4.3.6.4.1.1 for perforated walls)
Strap/Blocking Force – For FTAO walls, force transferred from above and below opening to shearwall pier.
-> Due to shearline force in the west-to-east or south-to-north direction
<- Due to shearline force in the east-to-west or north-to-south direction

MWFRS DEFLECTION (rigid wind design)

These deflections are used to determine shearwall stiffness for force distribution

Wall, segment	W Gp	Dir	Srf	v plf	b ft	h ft	Bending A sq.in	Bending Defl in	Ga kips/ in	Nail slip Vn lbs	Nail slip en in	Shear Defl in	Hold Defl in	Total Defl in
Level 1														
Line 2														
2-3,1	3	Both	1S	372.2	10.50	8.00	16.5	.006	18.4	201	.034	.162	0.27	0.43
2-3,2		S->N	1S	372.2	5.50	8.00	16.5	.011	18.4	201	.034	.162	0.53	0.70
		N->S	1S	372.2	5.50	8.00	16.5	.011	18.4	201	.034	.162	0.55	0.72
Line 3														
3-1,1	4	Both	ExtS	242.3	4.00	8.00	16.5	.009	18.4	201	.034	.105	0.70	0.82
3-1,2		S->N	ExtS	242.3	6.00	8.00	16.5	.006	18.4	201	.034	.105	0.46	0.57
		N->S	ExtS	242.3	6.00	8.00	16.5	.006	18.4	201	.034	.105	0.42	0.53
Line A														
A-1	1	Both	ExtS	48.7	21.00	8.00	16.5	.000	13.8	196	.032	.028	0.11	0.14
A-3,1	1	Both	ExtS	48.7	6.50	8.00	16.5	.001	13.8	196	.032	.028	0.37	0.40
A-3,3		W->E	ExtS	48.7	7.50	8.00	16.5	.001	13.8	196	.032	.028	0.33	0.36
		E->W	ExtS	48.7	7.50	8.00	16.5	.001	13.8	196	.032	.028	0.32	0.35
A-3,4		Both	ExtS	48.7	6.50	8.00	16.5	.001	13.8	196	.032	.028	0.37	0.40
Line C														
C-1,1	1	W->E	ExtS	39.6	24.00	8.00	16.5	.000	13.8	196	.032	.023	0.00	0.02
		E->W	ExtS	39.6	24.00	8.00	16.5	.000	13.8	196	.032	.023	0.00	0.03
C-1,2		W->E	ExtS	39.6	23.50	8.00	16.5	.000	13.8	196	.032	.023	0.00	0.03
		E->W	ExtS	39.6	23.50	8.00	16.5	.000	13.8	196	.032	.023	0.00	0.02
Wall, segment	**W Gp**	**Dir**	**Srf**	**v plf**	**b ft**	**h ft**	**Bending A sq.in**	**Bending Defl in**	**Ga kips/ in**	**Nail slip Vn lbs**	**Nail slip en in**	**Shear Defl in**	**Hold Defl in**	**Total Defl in**
Level 2														
Line 1														
1-1	1	S->N	ExtS	68.0	4.00	9.00	16.5	.004	13.8	196	.032	.044	0.76	0.81
		N->S	ExtS	68.0	4.00	9.00	16.5	.004	13.8	196	.032	.044	0.72	0.77
1-2,2	1	S->N	ExtS	76.5	8.50	9.00	16.5	.002	13.8	196	.032	.050	0.35	0.40
		N->S	ExtS	76.5	8.50	9.00	16.5	.002	13.8	196	.032	.050	0.33	0.38
Line 2														
2-3	3	S->N	1S	132.0	10.50	9.00	16.5	.003	18.4	201	.034	.064	0.31	0.37
		N->S	1S	132.0	10.50	9.00	16.5	.003	18.4	201	.034	.064	0.28	0.35
Line 3														
3-2,2	1	S->N	ExtS	96.9	9.50	9.00	16.5	.002	13.8	196	.032	.063	0.32	0.39
		N->S	ExtS	96.9	9.50	9.00	16.5	.002	13.8	196	.032	.063	0.30	0.37
Line A														
A-3,2	1	Both	ExtS	30.3	7.50	9.00	16.5	.001	13.8	196	.032	.020	0.36	0.38
Line B														
B-2	2	Both	1S	26.1	16.00	9.00	16.5	.000	13.8	196	.032	.017	0.00	0.02
Line C														
C-1	1	Both	ExtS	17.1	51.50	9.00	16.5	.000	13.8	196	.032	.011	0.00	0.01

Legend:

Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B.

W Gp – Wall design group, refer to Sheathing and Framing Materials tables.

Dir – Force direction.

Srf – Wall surface = Int(erior) or Ext(erior) for perimeter walls, 1 or 2 for interior partitions; Comb = Combined v and Ga for identical materials on each side; S = Ga from side with stronger shear resistance; W = 2 x Ga of weaker side.

v – ASD shear force per unit distance on wall segment.

Unblocked walls = v / Cub as per SDPWS 4.3.4.3, Cub = Unblocked factor from 4.3.5.3, shown in the Shear Results table.

Perforated walls = vmax from Eqn. 4.3-9, as per 4.3.4.2.

FTAO walls = Unit shear force in pier beside opening(s).

b – Wall or segment length.

Segmented wall or FTAO wall segments = Width of wall segment between openings.

Perforated wall = Sum of FHS segments, modified as in 4.3.3.4 per 4.3.4.2.

FTAO wall = Length of wall including openings.

h – Wall height.

FTAO piers = Distance from bottom of opening to top of wall; for end segments, results using that distance and the wall height are averaged.

Defl – Horizontal shear wall deflection due to given term:

Bending = 8vh^3 / EAb; A = Effective cross sectional area of segment end stud(s), E = stud mod. of elasticity in Framing Materials table

For i studs at one end and j at the other, A = 2 (i^2 j + j^2 i) / (i + j)^2 x area of one stud, based on Ex. C4.3.4-3

Shear = vh / 1000 Ga; Ga = vw / (vw / Gvtv + 0.75 en), from SDPWS Ex. C4.3.4-1.

vw = ASD sheathing capacity.

Gvtv = Shear stiffness from C4.3.4, shown in Sheathing Materials table.

en = Nail slip from Table C4.2.3D of form aVn^b for WSP, constant for other materials.

Vn = Shear force per nail along panel edge at ASD capacity vw.

Hold – Anchorage system (hold-down) = da x h / beff.

da = Vertical hold-down displacement; refer to Hold-down Displacement table for components.

beff = Effective wall segment length = b - (tension stud pack width + hold-down anchor bolt offset) - (1/2 compression stud pack width)
beff is given in the Shear Wall Dimensions table.
For FTAO walls, hold-down device at end of wall is applied to all segments, as per APA T555.
Total Defl – Deflection from bending + shear + hold-down, as per Eqn. 4.3-2.
For FTAO walls, the average of the values for the segments, as per APA T555.

MWFRS HOLD-DOWN DISPLACEMENT (rigid wind design)

These displacements are used to determine deflections for force distribution

Wall, segment	Dir	Hold-down	Tension force lbs	Vert. Displacement Manuf in	Add in	da in	Slippage Vf lbs	da in	Shrink +Extra in	Comp. force lbs	Crush da in	Total da in	Horz Defl in
Level 1													
Line 2													
2-3,1	Both	HDU8-SDS	2899	.047	.002	0.049	-	-	.283	3303	0.01	0.34	0.27
2-3,2	S->N	HDU8-SDS	3041	.049	.002	0.051	-	-	.283	4752	0.01	0.35	0.53
	N->S	HDU8-SDS	4087	.066	.002	0.069	-	-	.283	3252	0.01	0.36	0.55
Line 3													
3-1,1	S->N	HDU5-SDS	1891	.039	.002	0.041	-	-	.283	2228	0.01	0.33	0.70
	N->S	HDU5-SDS	1972	.040	.002	0.042	-	-	.283	2363	0.01	0.33	0.71
3-1,2	S->N	HDU5-SDS	1879	.038	.002	0.040	-	-	.283	1620	0.00	0.33	0.46
	N->S	HDU5-SDS	643	.013	.001	0.014	-	-	.283	2263	0.01	0.30	0.42
Line A													
A-1	Both	HDU2-SDS	394	.011	.000	0.012	-	-	.283	394	0.00	0.30	0.11
A-3,1	W->E	HDU2-SDS	195	.006	.000	0.006	-	-	.283	665	0.00	0.29	0.37
	E->W	HDU2-SDS	249	.007	.000	0.007	-	-	.283	755	0.00	0.29	0.37
A-3,3	W->E	HDU2-SDS	373	.011	.000	0.011	-	-	.283	703	0.00	0.30	0.33
	E->W	HDU2-SDS	223	.006	.000	0.007	-	-	.283	1204	0.00	0.29	0.32
A-3,4	W->E	HDU2-SDS	249	.007	.000	0.007	-	-	.283	755	0.00	0.29	0.37
	E->W	HDU2-SDS	195	.006	.000	0.006	-	-	.283	665	0.00	0.29	0.37
Line C													
C-1,1	W->E	HDU2-SDS	-1491	.000	.000	0.000	-	-	.000	1280	0.00	0.00	0.00
	E->W	HDU2-SDS	-256	.000	.000	0.000	-	-	.000	3753	0.01	0.01	0.00
C-1,2	W->E	HDU2-SDS	-244	.000	.000	0.000	-	-	.000	3733	0.01	0.01	0.00
	E->W	HDU2-SDS	-1479	.000	.000	0.000	-	-	.000	1260	0.00	0.00	0.00

Wall, segment	Dir	Hold-down	Tension force lbs	Vert. Displacement Manuf in	Add in	da in	Slippage Vf lbs	da in	Shrink +Extra in	Comp. force lbs	Crush da in	Total da in	Horz Defl in
Level 2													
Line 1													
1-1	S->N	HDU2-SDS	545	.031	.000	0.031	-	-	.283	833	0.00	0.32	0.76
	N->S	HDU2-SDS	545	.016	.001	0.016	-	-	.283	833	0.00	0.30	0.72
1-2,2	S->N	HDU2-SDS	564	.032	.000	0.033	-	-	.283	1176	0.00	0.32	0.35
	N->S	HDU2-SDS	564	.016	.001	0.017	-	-	.283	1176	0.00	0.30	0.33
Line 2													
2-3	S->N	HDU2-SDS	1047	.060	.001	0.060	-	-	.283	1500	0.00	0.35	0.31
	N->S	HDU2-SDS	1047	.030	.001	0.031	-	-	.283	1500	0.00	0.32	0.28
Line 3													
3-2,2	S->N	HDU2-SDS	757	.043	.000	0.044	-	-	.283	1441	0.00	0.33	0.32
	N->S	HDU2-SDS	757	.022	.001	0.023	-	-	.283	1441	0.00	0.31	0.30
Line A													
A-3,2	W->E	HDU2-SDS	80	.005	.000	0.005	-	-	.283	620	0.00	0.29	0.36
	E->W	HDU2-SDS	80	.002	.000	0.002	-	-	.283	620	0.00	0.29	0.36
Line B													
B-2	Both	HDU2-SDS	-453	.000	.000	0.000	-	-	.000	1390	0.00	0.00	0.00
Line C													
C-1	Both	HDU2-SDS	-1235	.000	.000	0.000	-	-	.000	2473	0.01	0.01	0.00

Legend:

Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B

Dir – Force direction

Tens., Comp. force – Accumulated ASD hold-down tension force T and end stud compression force C from overturning, dead loads and wind uplift

da – Vertical displacements due to the following components:

Vert. Displacement – Elongation when slippage calculated separately; displacement when combined elongation/slippage used

Manuf – Using manufacturer's value for anchor bolt length, or no bolt contribution for connector-only elongation

*Unless marked with * = (ASD uplift force / ASD hold-down capacity) x max ASD elongation or displacement*

** - Maximum strength-level elongation or displacement is used. May result in higher than actual displacements for lightly loaded hold-downs, causing the segment to draw less force due to lower than actual stiffness.*

Add – Due to longer anchor bolt length than manufacturer's value, or entire bolt length for connector-only elongation = TL / (Ab x Es)

Ab = bolt cross-sectional area

Es = steel modulus = 29000000 psi

L = Lb – Lh

Lb = Total bolt length shown in Storey Information table

Lh = Manufacturer's anchor bolt length for given displacement/elongation from hold-down database

Slippage – Due to vertical slippage of hold-down fasteners attached to stud(s) when not combined with elongation

Nails = en from SDPWS Table C4.2.3D using values for wood structural panels

Bolts = Vf / (270,000 D^1.5) (NDS 11.3.6); D = bolt diameter, Vf = Tension force T / number of fasteners

Shrink + Extra – Wood shrinkage plus extra displacement due to mis-cuts, gaps, etc.

Shrinkage = 0.002 x (19% fabrication – 10% in-service moisture contents) x Ls
Ls = Length between anchor bolt fasteners subject to perp-to-grain shrinkage; see Story Information table
Crush – Deformation of bottom plate at compression end of wall segment
= 0.02" x [r / 0.73, r < 0.73; (1 + (r - 0.73) / 0.27), 0.73 < r < 1; 2 r^3, r > 1]
r = fcp / Fcp'; Fcp' = Ct CM Fcp; fcp = C / A, A = cross sectional area of end studs
Total da – Vert. Displacement + Slippage + Shrink + Crush + Extra
Horz Defl – Anchorage deflection term in SDPWS Eqn. C.4.3.4-1 = h / beff x da
h = Wall height. For end segments in FTAO walls, h is the average of the wall height and the distance from the bottom of opening to top of wall
beff = Effective wall segment length = b - (tension stud pack width + hold-down anchor bolt offset) - (1/2 compression stud pack width)
h and b are shown in Deflection table, beff in the Shear Wall Dimensions table

Flexible Diaphragm Seismic Design

SEISMIC INFORMATION

Level	Mass [lbs]	Area [sq.ft]	Story Shear Fx [lbs] E-W	Story Shear Fx [lbs] N-S	Shear Resistance [lbs] E-W	Shear Resistance [lbs] N-S	Diaphragm Force [lbs] E-W Fpx	Diaphragm Force [lbs] E-W Design	Diaphragm Force [lbs] N-S Fpx	Diaphragm Force [lbs] N-S Design
2	32241	1202.0	5055	5055	21027	10562	5091	5091	5091	5091
1	26414	1205.5	2071	2071	24952	11189	4171	8973	4171	7544
All	**58654**	-	**10179**	**10179**	-	-	-	-	-	-

Legend:
Mass – Sum of all generated and input building masses on level = wx in ASCE 7 Eqn. 12.8-12.
Story Shear – Total ASD-factored shear force induced at level x from Eqn. 12.8-11.
Shear Resistance – Lateral design strength of all shear-resisting elements on story, for use in weak story evaluation (4.1.8).
Diaphragm Force – used by Shearwalls only for drag strut forces, as per Exception to 12.10.2.1.
Fpx - Minimum ASD-factored force for diaphragm design from Eqns. 12.10-1, -2, and -3.
Design = The greater of the story shear and Fpx + transfer forces from discontinuous shearlines, factored by overstrength (omega) as per 12.10.1.1. Omega = 2.5 as per 12.2-1.
Design force for drag struts are determined on a shearline-by-shearline basis, and can use Fx, Fpx, or "Design" depending on the location of transfer forces.

Redundancy Factor p (rho):
E-W 1.30, N-S 1.30
Input by user (overriding calculated value).
Applies to shearwall design, hold-down forces and the drag strut force component based on shearline forces; does not apply to story drift, out-of-plane force, or the diaphragm force Fpx and the drag strut force component based on it.

Vertical Earthquake Load Ev
Ev = 0.2 Sds D; Sds = 1.13; Ev = 0.226 D unfactored; 0.158 D factored; total dead load factor: 0.6 - 0.158 = 0.442 tension, 1.0 + 0.158 = 1.158 compression.

Weak Story (SDPWS 4.1.8)
The lateral resistance of each story is greater than or equal to that of the story above. This vertical distribution of SFRS is permitted.

SHEAR RESULTS (flexible seismic design)

N-S Shearlines	W Gp	For Dir	ASD Shear Force [plf] v	vmax/vft	V [lbs]	Asp-Cub Int	Asp-Cub Ext	Allowable Shear [plf] Int	Ext	Co	C	Cmb	V [lbs]	Resp. Ratio
Line 1														
Level 2														
Ln1, Lev2	-	Both	-	-	1754	-	-	-	-	-		-	3380	-
Wall 1-1	1	Both	129.3	-	517	-	.89	-	280	-		249	997	0.52
Wall 1-2	1	Both	-	-	1236	-	1.0	-	280	-		-	2383	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Seg. 2	-	Both	145.5	-	1236	-	1.0	-	280	-		280	2383	0.52
Line 2														
Ln2, Lev2	-	Both	-	-	2889	-	-	-	-	-		-	4519	-
Wall 2-3	3	Both	275.1	-	2889	-	1.0	-	430	-		430	4519	0.64
Level 1														
Ln2, Lev1	-	Both	-	-	6434	-	-	-	-	-		-	6886	-
Wall 2-1	1	Both	0.0	-	0	-	1.0	-	280	-		-	-	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Seg. 2	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Wall 2-2	1^	Both	0.0	-	0	-	1.0	-	0	-		-	-	-
Wall 2-3	3	Both	-	-	6434	-	1.0	-	430	-		-	6886	-
Seg. 1	-	Both	402.1	-	4222	-	1.0	-	430	-		430	4519	0.93
Seg. 2	-	Both	402.1	-	2212	-	1.0	-	430	-		430	2367	0.93
Line 3														
Level 2														
Ln3, Lev2	-	Both	-	-	1929	-	-	-	-	-		-	2663	-
Wall 3-2	1	Both	-	-	1929	-	1.0	-	280	-		-	2663	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Seg. 2	-	Both	203.0	-	1929	-	1.0	-	280	-		280	2663	0.72
Level 1														
Ln3, Lev1	-	Both	-	-	2829	-	-	-	-	-		-	4304	-
Wall 3-1	4	Both	-	-	2829	-	1.0	-	430	-		-	4304	-
Seg. 1	-	Both	282.9	-	1132	-	1.0	-	430	-		430	1721	0.66
Seg. 2	-	Both	282.9	-	1697	-	1.0	-	430	-		430	2582	0.66
Seg. 3	-	Both	0.0	-	0	-	1.0	-	430	-		430	-	-

E-W Shearlines	W Gp	For Dir	ASD Shear Force [plf] v	vmax/vft	V [lbs]	Asp-Cub Int	Asp-Cub Ext	Allowable Shear [plf] Int	Ext	Co	C	Cmb	V [lbs]	Resp. Ratio
Line A														
Level 2														
LnA, Lev2	-	Both	-	-	1792	-	-	-	-	-		-	2103	-
Wall A-1	1	Both	0.0	-	0	-	1.0	-	280	-		-	-	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Seg. 2	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Seg. 3	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Seg. 4	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Wall A-3	1	Both	-	-	1792	-	1.0	-	280	-		-	2103	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Seg. 2	-	Both	239.0	-	1792	-	1.0	-	280	-		280	2103	0.85
Seg. 3	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Level 1														
LnA, Lev1	-	Both	-	-	4842	-	-	-	-	-		-	11635	-
Wall A-1	1	Both	116.7	-	2450	-	1.0	-	280	-		280	5888	0.42
Wall A-2	1^	Both	0.0	-	0	-	1.0	-	0	-		-	-	-
Wall A-3	1	Both	-	-	2392	-	1.0	-	280	-		-	5747	-
Seg. 1	-	Both	116.7	-	758	-	1.0	-	280	-		280	1822	0.42
Seg. 2	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Seg. 3	-	Both	116.7	-	875	-	1.0	-	280	-		280	2103	0.42
Seg. 4	-	Both	116.7	-	758	-	1.0	-	280	-		280	1822	0.42
Line B														
Level 2														
LnB, Lev2	-	Both	-	-	2497	-	-	-	-	-		-	4486	-
Wall B-2	2^	Both	156.1	-	2497	-	1.0	-	280	-		280	4486	0.56
Line C														
LnC, Lev2	1	Both	44.3	-	2282	-	1.0	-	280	-		280	14438	0.16
Level 1														
LnC, Lev1	-	Both	-	-	4421	-	-	-	-	-		-	13317	-
Wall C-1	1	Both	-	-	4421	-	1.0	-	280	-		-	13317	-
Seg. 1	-	Both	93.1	-	2234	-	1.0	-	280	-		280	6729	0.33
Seg. 2	-	Both	93.1	-	2187	-	1.0	-	280	-		280	6588	0.33

Legend:
W Gp - Wall design group defined in Sheathing and Framing Materials tables, where it shows associated Standard Wall. "^" means that this wall is critical for all walls in the Standard Wall group.
For Dir – Direction of seismic force along shearline.

v – Design shear force on segment = ASD-factored shear force per unit length of full-height sheathing (FHS)
vmax/vft - Perforated walls: Collector and in-plane anchorage force as per SDPWS eqn. 4.3-9 = V/FHS/Co. FHS is factored for narrow segments as per 4.3.3.4
FTAO walls: Shear force in piers above and below either openings or piers beside opening(s). Aspect ratio factor does not apply to these piers.
V – ASD factored shear force. For shearline: total shearline force. For wall: total of all segments on wall. For segment: force on segment
Asp/Cub – For wall: Unblocked structural wood panel factor Cub from SDPWS 4.3.5.3. For segment or FTAO pier: Aspect ratio factor from SDPWS 4.3.5.5.1. For perforated wall: Either Cub or sum bi / FHS, where bi is segment length adjusted per SDPWS 4.3.3.4.
Int, Ext - Nominal unit shear capacity of interior and exterior sheathing, factored by Table 4.3-1 Note 3 for framing specific gravity and Note 10 for presence of hold-downs. For wall segments, also include unblocked factor Cub and aspect ratio adjustments.
Co - Adjustment factor for perforated walls from SDPWS Equation 4.3-6.
C - Sheathing combination rule, A = Add capacities, S = Strongest side or twice weakest, G = Stiffness-based using Eqns. 4.3-3,-4.
Cmb - Combined interior and exterior unit shear capacity including perforated wall factor Co.
V – Total factored shear capacity of shearline, wall or segment.
Crit Resp – Response ratio = v/Cmb = design shear force/unit shear capacity. "W" indicates that the wind design criterion was critical in selecting wall.

Notes:
Refer to Elevation View diagrams for individual level for uplift anchorage force t for perforated walls given by SDPWS 4.3.6.4.2,1.

Hold-Down and Compression Design (flexible seismic design)

Level 1 Line-Wall	Posit'n	Location [ft] X	Location [ft] Y	Tensile Hold-down or Compressive Stud Force [lbs] Shear	Dead	Ev	Cmb'd	Hold-down	Cap [lbs]	Crit Resp.
Line 1										
	V Elem	0.00	-3.87	1241	156	41	1126	Refer to upper level		
	V Elem	0.00	-3.87	-1241	260	41	1542	Compression		
	V Elem	0.00	-2.12	601	185	49	464	Refer to upper level		
	V Elem	0.00	-2.12	-601	308	49	958	Compression		
	V Elem	0.00	-0.12	1241	108	28	1162	Refer to upper level		
	V Elem	0.00	-0.12	-1241	180	28	1450	Compression		
	V Elem	0.00	14.13	907	194	51	764	Refer to upper level		
	V Elem	0.00	14.13	-907	324	51	1282	Compression		
	V Elem	0.00	15.88	1508	278	73	1303	Refer to upper level		
	V Elem	0.00	15.88	-1508	463	73	2043	Compression		
Line 2										
	V Elem	22.50	-9.87	0	128	20	148	Compression		
	V Elem	22.50	-8.62	0	128	20	148	Compression		
	V Elem	21.00	-4.87	0	85	13	98	Compression		
	V Elem	21.00	-4.12	0	85	13	98	Compression		
2-3	L End	20.50	-3.87	3295	151	40	3184	HDU8-SDS	6765	0.47
2-3	L End	20.50	-3.87	-3295	252	40	3587	Compression	10312	0.35
	V Elem	24.00	5.13	2536	170	45	2411	Refer to upper level		
	V Elem	24.00	5.13	-2536	284	45	2865	Compression		
2-3	L Op 1	20.50	6.38	3295	151	40	3184	HDU8-SDS	6765	0.47
2-3	L Op 1	20.50	6.38	-3295	252	40	3587	Compression	10312	0.35
2-3	R Op 1	20.50	10.13	3370	79	21	3312	HDU8-SDS	6765	0.49
2-3	R Op 1	20.50	10.13	-3370	132	21	3523	Compression	10312	0.34
2-3	R End	20.50	15.38	5907	249	66	5723	HDU8-SDS	6765	0.85
2-3	R End	20.50	15.38	-5906	416	66	6388	Compression	10312	0.62
Line 3										
3-1	L End	51.50	-9.87	2414	177	47	2284	HDU5-SDS	5645	0.40
3-1	L End	51.50	-9.87	-2414	295	47	2756	Compression	10312	0.27
	V Elem	51.50	-7.12	0	135	21	156	Compression		
3-1	L Op 1	51.50	-6.12	2414	96	25	2343	HDU5-SDS	5645	0.42
3-1	L Op 1	51.50	-6.12	-2414	160	25	2599	Compression	10312	0.25
3-1	R Op 1	51.50	-0.37	2362	144	38	2255	HDU5-SDS	5645	0.40
3-1	R Op 1	51.50	-0.37	-2361	240	38	2639	Compression	10312	0.26
	V Elem	51.50	0.12	0	113	18	130	Compression		
	V Elem	51.50	2.38	0	113	18	130	Compression		
	V Elem	51.50	2.62	0	23	4	26	Compression		
	V Elem	51.50	2.88	0	23	4	26	Compression		
3-1	L Op 2	51.50	5.38	519	367	96	249	HDU5-SDS	5645	0.04
3-1	L Op 2	51.50	5.38	-519	611	96	1226	Compression	10312	0.12
	V Elem	51.50	14.13	281	46	12	247	Refer to upper level		
	V Elem	51.50	14.13	-281	77	12	370	Compression		
	V Elem	51.50	14.38	0	20	3	23	Compression		
	V Elem	51.50	14.63	0	60	9	69	Compression		
	V Elem	51.50	15.88	2123	293	77	1908	Refer to upper level		
	V Elem	51.50	15.88	-2123	488	77	2688	Compression		
Line A										
A-1	L End	0.12	-4.00	945			945	HDU2-SDS	3075	0.31
A-1	L End	0.12	-4.00	-945			945	Compression	10312	0.09
	V Elem	20.63	-10.00	0	90	14	104	Compression		
A-1	R End	20.88	-4.00	945			945	HDU2-SDS	3075	0.31
A-1	R End	20.88	-4.00	-945			945	Compression	10312	0.09
	V Elem	21.13	-5.00	0	60	9	69	Compression		
	V Elem	22.38	-5.00	0	150	24	174	Compression		
A-3	L End	22.63	-10.00	971	210	55	816	HDU2-SDS	3075	0.27
A-3	L End	22.63	-10.00	-971	350	55	1376	Compression	10312	0.13
	V Elem	24.38	-10.00	0	90	14	104	Compression		
A-3	L Op 1	28.88	-10.00	971	156	41	856	HDU2-SDS	3075	0.28
A-3	L Op 1	28.88	-10.00	-971	260	41	1272	Compression	10312	0.12
	V Elem	31.63	-10.00	0	20	3	23	Compression		
	V Elem	31.88	-10.00	779	83	22	718	Refer to upper level		
	V Elem	31.88	-10.00	-779	138	22	938	Compression		
A-3	R Op 2	34.63	-10.00	2412	312	82	2182	HDU2-SDS	3075	0.71
A-3	R Op 2	34.63	-10.00	-2412	519	82	3013	Compression	10312	0.29
	V Elem	40.88	-10.00	2225	203	53	2076	Refer to upper level		
	V Elem	40.88	-10.00	-2225	338	53	2615	Compression		
A-3	L Op 3	41.88	-10.00	966	180	47	833	HDU2-SDS	3075	0.27
A-3	L Op 3	41.88	-10.00	-965	300	47	1313	Compression	10312	0.13
A-3	R Op 3	45.13	-10.00	971	156	41	856	HDU2-SDS	3075	0.28
A-3	R Op 3	45.13	-10.00	-971	260	41	1272	Compression	10312	0.12
	V Elem	49.63	-10.00	0	90	14	104	Compression		
A-3	R End	51.38	-10.00	971	210	55	816	HDU2-SDS	3075	0.27

Hold-Down and Compression Design (flexible seismic design, continued)

A-3	R End	51.38	-10.00	-971	350	55	1376	Compression	10312	0.13
Line B										
	V Elem	0.12	0.00	0	45	7	52	Compression		
	V Elem	0.88	0.00	0	45	7	52	Compression		
	V Elem	1.63	0.00	1427	691	182	918	Refer to upper level		
	V Elem	1.63	0.00	-1427	1152	182	2761	Compression		
	V Elem	17.38	0.00	1427	691	182	918	Refer to upper level		
	V Elem	17.38	0.00	-1427	1152	182	2761	Compression		
Line C										
C-1	L End	0.12	16.00	-1153	3278	518	4948	Compression	10312	0.48
C-1	L Op 1	23.88	16.00	752	576	152	328	HDU2-SDS	3075	0.11
C-1	L Op 1	23.88	16.00	-752	960	152	1864	Compression	10312	0.18
C-1	R Op 1	28.13	16.00	753	564	148	337	HDU2-SDS	3075	0.11
C-1	R Op 1	28.13	16.00	-752	940	148	1841	Compression	10312	0.18
C-1	R End	51.38	16.00	-1153	3258	514	4925	Compression	10312	0.48

Level 2				Tensile Hold-down or Compressive Stud Force [lbs]						
Line-Wall	Posit'n	Location [ft] X	Y	Shear	Dead	Ev	Cmb'd	Hold-down	Cap [lbs]	Crit Resp.
Line 1										
1-1	L End	1.00	-3.87	1241	108	28	1162	HDU2-SDS	3075	0.38
1-1	L End	1.00	-3.87	-1241	180	28	1450	Compression	10312	0.14
1-1	R End	1.00	-0.12	1241	108	28	1162	HDU2-SDS	3075	0.38
1-1	R End	1.00	-0.12	-1241	180	28	1450	Compression	10312	0.14
	V Elem	0.00	0.12	0	45	7	52	Compression		
	V Elem	0.00	0.88	0	45	7	52	Compression		
1-2	R Op 1	0.00	7.63	1508	230	60	1339	HDU2-SDS	3075	0.44
1-2	R Op 1	0.00	7.63	-1508	383	60	1950	Compression	10312	0.19
1-2	R End	0.00	15.88	1508	230	60	1339	HDU2-SDS	3075	0.44
1-2	R End	0.00	15.88	-1508	383	60	1950	Compression	10312	0.19
Line 2										
	V Elem	22.50	-9.87	0	68	11	78	Compression		
	V Elem	22.50	-8.62	0	68	11	78	Compression		
	V Elem	20.50	-4.87	0	45	7	52	Compression		
	V Elem	20.50	-4.12	0	45	7	52	Compression		
2-3	L End	24.00	5.13	2536	170	45	2411	HDU2-SDS	3075	0.78
2-3	L End	24.00	5.13	-2536	284	45	2865	Compression	10312	0.28
2-3	R End	24.00	15.38	2536	170	45	2411	HDU2-SDS	3075	0.78
2-3	R End	24.00	15.38	-2536	284	45	2865	Compression	10312	0.28
Line 3										
3-1	L End	51.50	-9.87	0	135	21	156	Compression		-
3-1	L Op 1	51.50	-7.12	0	135	21	156	Compression		-
	V Elem	51.50	0.12	0	113	18	130	Compression		
	V Elem	51.50	2.38	0	113	18	130	Compression		
	V Elem	51.50	2.62	0	23	4	26	Compression		
	V Elem	51.50	2.88	0	23	4	26	Compression		
3-2	R Op 1	51.50	6.63	2123	257	68	1934	HDU2-SDS	3075	0.63
3-2	R Op 1	51.50	6.63	-2123	428	68	2618	Compression	10312	0.25
3-2	R End	51.50	15.88	2123	257	68	1934	HDU2-SDS	3075	0.63
3-2	R End	51.50	15.88	-2123	428	68	2618	Compression	10312	0.25
Line A										
	V Elem	20.63	-5.00	0	90	14	104	Compression		
	V Elem	22.38	-5.00	0	90	14	104	Compression		
	V Elem	22.63	-10.00	0	90	14	104	Compression		
	V Elem	24.38	-10.00	0	90	14	104	Compression		
A-3	R Op 1	33.63	-10.00	2225	203	53	2076	HDU2-SDS	3075	0.68
A-3	R Op 1	33.63	-10.00	-2225	338	53	2615	Compression	10312	0.25
A-3	L Op 2	40.88	-10.00	2225	203	53	2076	HDU2-SDS	3075	0.68
A-3	L Op 2	40.88	-10.00	-2225	338	53	2615	Compression	10312	0.25
	V Elem	49.63	-10.00	0	90	14	104	Compression		
	V Elem	51.38	-10.00	0	90	14	104	Compression		
Line B										
	V Elem	0.12	0.00	0	45	7	52	Compression		
	V Elem	0.88	0.00	0	45	7	52	Compression		
B-2	L End	1.63	0.00	1427	691	182	918	HDU2-SDS	3075	0.30
B-2	L End	1.63	0.00	-1427	1152	182	2761	Compression	10312	0.27
B-2	R End	17.38	0.00	1427	691	182	918	HDU2-SDS	3075	0.30
B-2	R End	17.38	0.00	-1427	1152	182	2761	Compression	10312	0.27
Line C										
C-1	L End	0.12	16.00	-401	2318	366	3084	Compression	10312	0.30
C-1	R End	51.38	16.00	-401	2318	366	3084	Compression	10312	0.30

Legend:
Line-Wall:

At wall or opening – Shearline and wall number
At vertical element – Shearline
Posit'n – Position of stud pack that hold-down is attached to:
V Elem – Vertical element: column or strengthened studs required where not at wall end or opening
L or R End – At left or right wall end
L or R Op n – At left or right side of opening n
t @ Op n – Uplift force t at opening n from offset opening in perforated wall above, from SDPWS 4.3.6.4.2.1
Location – Co-ordinates in Plan View
Tensile Hold-down or Compressive Stud Force – Upwards force on hold-down at one end of the wall or downward force on bottom plate under studs at the other end, for each force direction. Includes forces transferred from upper levels.
Shear – Overturning component = V x h / beff from SDPWS Eqn. 4.3-7; V = force on segment, ASD-factored by 0.70; h = wall height , beff = wall segment length – (tension stud pack width + hold-down anchor bolt offset) – (1/2 compression stud pack width). For perforated walls = V x h / Co sum (bi) from SDPWS Eqn. 4.3-8.
Dead – Dead load resisting component, factored for ASD by 0.60 for tension and 1.0 for compression
Ev – Vertical seismic load effect from ASCE 7 12.4.2.2 = -0.2 Sds x ASD factor x unfactored D = 0.263 SDS x factored D. Refer to Seismic Information table for more details.
Cmb'd – Sum of ASD-factored overturning, dead and vertical seismic forces. May also include the uplift force t from perforated walls from SDPWS 4.3.6.4.2.1 when openings are staggered.
Hold-down – Device model number from hold-down database; "Compression" for bearing of end stud pack on bottom plate
Cap – Hold-downs: Allowable ASD tension load from database; Compression: Allowable ASD bearing force = Ct CM Cb Fcp A; A = cross sectional area of end studs. Refer to Framing materials table for details.
Crit. Resp. – Critical Response = Combined ASD force/Allowable ASD tension load

Notes:
HDU8-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 20 1/4" x 2.5" SDS heavy-duty screws; 7/8" anchor bolt.
HDU5-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 14 1/4" x 2.5" SDS heavy-duty screws; 5/8" anchor bolt.
HDU2-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 6 1/4" x 2.5" SDS heavy-duty screws; 5/8" anchor bolt.
Combined force from ASCE 7 2.4.1 load combination 10 = - (0.6D - 0.7Ev + 0.7Eh); Eh (from 12.4.2.1) = - shear overturning force
Refer to the Shear Line Dimensions table for wall height h, effective segment length beff and perforated wall adjusted sum of bi, to the Story Table for joist depth, and to the Shear Results table for perforated factor Co.
Designer is responsible for design of connection from wall to floor or foundation for shear force shown in Shear Results table. Refer to SDPWS 4.3.6.4.3 for foundation anchor bolt requirements.

COLLECTOR FORCES (flexible seismic design)

Level 1 Line-Wall	Position on Wall or Opening	Location [ft] X	Location [ft] Y	Drag Strut Force [lbs] --->	Drag Strut Force [lbs] <---	Strap/Blocking Force [lbs] --->	Strap/Blocking Force [lbs] <---
Line 2							
	Shearline force			13177	13177		
2-3	Left Wall End	20.50	-4.00	-3041	3041		
2-3	Left Opening 1	20.50	6.50	285	-285		
2-3	Right Opening 1	20.50	10.00	-1489	1489		
2-3	Right Wall End	20.50	15.50	253	-253		
Line 3							
	Shearline force			5100	5100		
3-1	Left Opening 1	51.50	-6.00	1255	-1255		
3-1	Right Opening 1	51.50	-0.50	177	-177		
3-1	Left Opening 2	51.50	5.50	2060	-2060		
Line A							
	Shearline force			7992	7992		
A-1	Right Wall End	21.00	-4.00	785	-785		
A-3	Left Wall End	22.50	-10.00	552	-552		
A-3	Left Opening 1	29.00	-10.00	796	-796		
A-3	Right Opening 2	34.50	-10.00	-58	58		
A-3	Left Opening 3	42.00	-10.00	222	-222		
A-3	Right Opening 3	45.00	-10.00	-243	243		
Line C							
	Shearline force			6407	6407		
C-1	Left Opening 1	24.00	16.00	251	-251		
C-1	Right Opening 1	28.00	16.00	-246	246		

Level 2 Line-Wall	Position on Wall or Opening	Location [ft] X	Location [ft] Y	Drag Strut Force [lbs] --->	Drag Strut Force [lbs] <---	Strap/Blocking Force [lbs] --->	Strap/Blocking Force [lbs] <---
Line 1							
	Shearline force			1754	1754		
1-1	Right Wall End	1.00	0.00	166	-166		
1-2	Right Opening 1	0.00	7.50	-491	491		
Line 2							
	Shearline force			2889	2889		
2-3	Left Wall End	24.00	5.00	-1667	1667		
2-3	Right Wall End	24.00	15.50	56	-56		
Line 3							
	Shearline force			1929	1929		
3-2	Right Opening 1	51.50	6.50	-1224	1224		
Line A							
	Shearline force			1792	1792		
A-3	Right Opening 1	33.50	-10.00	-1153	1153		
A-3	Left Opening 2	41.00	-10.00	373	-373		
Line B							
	Shearline force			2497	2497		
B-2	Left Wall End	1.50	0.00	-74	74		
B-2	Right Wall End	17.50	0.00	1632	-1632		

Legend:
Line-Wall - Shearline and wall number
Position…- Side of opening or wall end that drag strut is attached to
Location - Co-ordinates in Plan View
Drag strut Force - Axial force in transfer element at openings, gaps, or changes in design shear along shearline. + : tension; - : compression.
Based on ASD-factored shearline force shown. For SDC C-F, it is the greater of the design shearline force and the diaphragm force Fpx, added to shearline force from story above and to forces transferred from discontinuous shearlines factored by overstrength (omega) as per 12.10.1.1. Refer to Seismic Information table for diaphragm forces and omega factor.
For SDC D-F, if horizontal torsional irregularities 2, 3, or 4 are input, or vertical irregularity 4 detected or input, 25% increase from 12.3.3.4 applied. For perforated walls, this force is converted to vmax using 4.3.6.4.1.1.
Strap/Blocking Force – For FTAO walls, force transferred from above and below opening to shearwall pier.
-> Due to shearline force in the west-to-east or south-to-north direction
<- Due to shearline force in the east-to-west or north-to-south direction

DEFLECTION (flexible seismic design)

Wall, segment	W Gp	Dir	Srf	v plf	b ft	h ft	Bending A sq.in	Bending Defl in	Ga kips/ in	Nail slip Vn lbs	Nail slip en in	Shear Defl in	Hold Defl in	Total Defl in
Level 1														
Line 2														
2-3,1	3	Both	1S	441.9	10.50	8.00	16.5	.007	18.4	201	.034	.192	0.29	0.49
2-3,2		S->N	1S	441.9	5.50	8.00	16.5	.012	18.4	201	.034	.192	0.58	0.79
		N->S	1S	441.9	5.50	8.00	16.5	.012	18.4	201	.034	.192	0.66	0.87
Line 3														
3-1,1	4	S->N	ExtS	310.9	4.00	8.00	16.5	.012	18.4	201	.034	.135	0.76	0.91
		N->S	ExtS	310.9	4.00	8.00	16.5	.012	18.4	201	.034	.135	0.77	0.92
3-1,2		S->N	ExtS	310.9	6.00	8.00	16.5	.008	18.4	201	.034	.135	0.49	0.63
		N->S	ExtS	310.9	6.00	8.00	16.5	.008	18.4	201	.034	.135	0.01	0.15
Line A														
A-1	1	Both	ExtS	128.2	21.00	8.00	16.5	.001	13.8	196	.032	.074	0.12	0.20
A-3,1	1	Both	ExtS	128.2	6.50	8.00	16.5	.003	13.8	196	.032	.074	0.41	0.49
A-3,3		W->E	ExtS	128.2	7.50	8.00	16.5	.003	13.8	196	.032	.074	0.45	0.52
		E->W	ExtS	128.2	7.50	8.00	16.5	.003	13.8	196	.032	.074	0.36	0.44
A-3,4		Both	ExtS	128.2	6.50	8.00	16.5	.003	13.8	196	.032	.074	0.41	0.49
Line C														
C-1,1	1	W->E	ExtS	102.3	24.00	8.00	16.5	.001	13.8	196	.032	.059	0.00	0.06
		E->W	ExtS	102.3	24.00	8.00	16.5	.001	13.8	196	.032	.059	0.11	0.17
C-1,2		W->E	ExtS	102.3	23.50	8.00	16.5	.001	13.8	196	.032	.059	0.11	0.17
		E->W	ExtS	102.3	23.50	8.00	16.5	.001	13.8	196	.032	.059	0.00	0.06
Wall, segment	**W Gp**	**Dir**	**Srf**	**v plf**	**b ft**	**h ft**	**Bending A sq.in**	**Bending Defl in**	**Ga kips/ in**	**Nail slip Vn lbs**	**Nail slip en in**	**Shear Defl in**	**Hold Defl in**	**Total Defl in**
Level 2														
Line 1														
1-1	1	S->N	ExtS	142.1	4.00	9.00	16.5	.008	13.8	196	.032	.093	0.91	1.01
		N->S	ExtS	142.1	4.00	9.00	16.5	.008	13.8	196	.032	.093	0.80	0.90
1-2,2	1	S->N	ExtS	159.9	8.50	9.00	16.5	.004	13.8	196	.032	.104	0.43	0.54
		N->S	ExtS	159.9	8.50	9.00	16.5	.004	13.8	196	.032	.104	0.37	0.48
Line 2														
2-3	3	S->N	1S	302.3	10.50	9.00	16.5	.006	18.4	201	.034	.148	0.42	0.57
		N->S	1S	302.3	10.50	9.00	16.5	.006	18.4	201	.034	.148	0.34	0.49
Line 3														
3-2,2	1	S->N	ExtS	223.1	9.50	9.00	16.5	.005	13.8	196	.032	.146	0.43	0.58
		N->S	ExtS	223.1	9.50	9.00	16.5	.005	13.8	196	.032	.146	0.36	0.51
Line A														
A-3,2	1	W->E	ExtS	262.6	7.50	9.00	16.5	.008	13.8	196	.032	.171	0.56	0.74
		E->W	ExtS	262.6	7.50	9.00	16.5	.008	13.8	196	.032	.171	0.46	0.64
Line B														
B-2	2	W->E	1S	171.5	16.00	9.00	16.5	.002	13.8	196	.032	.112	0.21	0.32
		E->W	1S	171.5	16.00	9.00	16.5	.002	13.8	196	.032	.112	0.19	0.30
Line C														
C-1	1	Both	ExtS	48.7	51.50	9.00	16.5	.000	13.8	196	.032	.032	0.00	0.03

Legend:
Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B.
W Gp – Wall design group, refer to Sheathing and Framing Materials tables.
Dir – Force direction.
Srf – Wall surface = Int(erior) or Ext(erior) for perimeter walls, 1 or 2 for interior partitions; Comb = Combined v and Ga for identical materials on each side; S = Ga from side with stronger shear resistance; W = 2 x Ga of weaker side.
v – Unfactored (strength-level) shear force per unit distance on wall segment = ASD force / 0.70, as per ASCE 7 12.8.6,.
Unblocked walls = v / Cub as per SDPWS 4.3.4.3, Cub = Unblocked factor from 4.3.5.3, shown in the Shear Results table.
Perforated walls = vmax from Eqn. 4.3-9, as per 4.3.4.2.
FTAO walls = Unit shear force in pier beside opening(s).
b – Wall or segment length.
Segmented wall or FTAO wall segments = Width of wall segment between openings.
Perforated wall = Sum of FHS segments, modified as in 4.3.3.4 per 4.3.4.2.
FTAO wall = Length of wall including openings.
h – Wall height.
FTAO piers = Distance from bottom of opening to top of wall; for end segments, results using that distance and the wall height are averaged.
Defl – Horizontal shear wall deflection due to given term:
Bending = 8vh^3 / EAb; A = Effective cross sectional area of segment end stud(s), E = stud mod. of elasticity in Framing Materials table
For i studs at one end and j at the other, A = 2 (i^2 j + j^2 i) / (i + j)^2 x area of one stud, based on Ex. C4.3.4-3
Shear = vh / 1000 Ga; Ga = 1.4 vs / (1.4 vs / Gvtv + 0.75 en) from SDPWS Eqn. C4.2.3-3.
vs = ASD sheathing capacity.
Gvtv = Shear stiffness from C4.3.4, shown in Sheathing Materials table.
en = Nail slip from Table C4.2.3D, of form aVn^b for WSP, constant for other materials.
Vn = Strength-level shear force per nail along panel edge at ASD capacity = 1.4 vs.

Hold – Anchorage system (hold-down) = da x h / beff.
da = Vertical hold-down displacement; refer to Hold-down Displacement table for components.
beff = Effective wall segment length = b - (tension stud pack width + hold-down anchor bolt offset) - (1/2 compression stud pack width)
beff is given in the Shear Wall Dimensions table.
For FTAO walls, hold-down device at end of wall is applied to all segments, as per APA T555.
Total Defl – Deflection from bending + shear + hold-down, as per Eqn. 4.3-2.
For FTAO walls, the average of the values for the segments, as per APA T555.

HOLD-DOWN DISPLACEMENT (flexible seismic design)

Wall, segment	Dir	Hold-down	Tension force lbs	Vert. Displacement Manuf in	Add in	da in	Slippage Vf lbs	da in	Shrink +Extra in	Comp. force lbs	Crush da in	Total da in	Horz Defl in
Level 1													
Line 2													
2-3,1	Both	HDU8-SDS	3451	.076	.002	0.078	-	-	.283	4031	0.01	0.37	0.29
2-3,2	S->N	HDU8-SDS	3614	.079	.002	0.081	-	-	.283	7166	0.02	0.38	0.58
	N->S	HDU8-SDS	6210	.136	.004	0.140	-	-	.283	3918	0.01	0.43	0.66
Line 3													
3-1,1	S->N	HDU5-SDS	2454	.064	.003	0.067	-	-	.283	2913	0.01	0.36	0.76
	N->S	HDU5-SDS	2545	.066	.003	0.069	-	-	.283	3132	0.01	0.36	0.77
3-1,2	S->N	HDU5-SDS	2433	.063	.003	0.066	-	-	.283	1255	0.00	0.35	0.49
	N->S	HDU5-SDS	-150	.000	.000	0.000	-	-	.000	2985	0.01	0.01	0.01
Line A													
A-1	Both	HDU2-SDS	1038	.036	.001	0.037	-	-	.283	1038	0.00	0.32	0.12
A-3,1	W->E	HDU2-SDS	831	.031	.001	0.032	-	-	.283	1489	0.00	0.32	0.41
	E->W	HDU2-SDS	891	.033	.001	0.034	-	-	.283	1636	0.00	0.32	0.41
A-3,3	W->E	HDU2-SDS	3156	.114	.004	0.117	-	-	.283	1549	0.00	0.40	0.45
	E->W	HDU2-SDS	859	.032	.001	0.033	-	-	.283	4350	0.01	0.33	0.36
A-3,4	W->E	HDU2-SDS	891	.033	.001	0.034	-	-	.283	1636	0.00	0.32	0.41
	E->W	HDU2-SDS	831	.031	.001	0.032	-	-	.283	1489	0.00	0.32	0.41
Line C													
C-1,1	W->E	HDU2-SDS	-943	.000	.000	0.000	-	-	.000	2387	0.01	0.01	0.00
	E->W	HDU2-SDS	179	.013	.000	0.013	-	-	.283	6595	0.02	0.31	0.11
C-1,2	W->E	HDU2-SDS	193	.013	.000	0.013	-	-	.283	6563	0.02	0.31	0.11
	E->W	HDU2-SDS	-929	.000	.000	0.000	-	-	.000	2355	0.01	0.01	0.00

Wall, segment	Dir	Hold-down	Tension force lbs	Vert. Displacement Manuf in	Add in	da in	Slippage Vf lbs	da in	Shrink +Extra in	Comp. force lbs	Crush da in	Total da in	Horz Defl in
Level 2													
Line 1													
1-1	S->N	HDU2-SDS	1243	.089	.001	0.090	-	-	.283	1657	0.00	0.38	0.91
	N->S	HDU2-SDS	1243	.045	.001	0.046	-	-	.283	1657	0.00	0.33	0.80
1-2,2	S->N	HDU2-SDS	1399	.103	.001	0.103	-	-	.283	2279	0.01	0.39	0.43
	N->S	HDU2-SDS	1399	.051	.002	0.053	-	-	.283	2279	0.01	0.34	0.37
Line 2													
2-3	S->N	HDU2-SDS	2596	.185	.001	0.186	-	-	.283	3248	0.01	0.48	0.42
	N->S	HDU2-SDS	2596	.093	.003	0.096	-	-	.283	3248	0.01	0.39	0.34
Line 3													
3-2,2	S->N	HDU2-SDS	2045	.148	.001	0.149	-	-	.283	3028	0.01	0.44	0.43
	N->S	HDU2-SDS	2045	.074	.002	0.077	-	-	.283	3028	0.01	0.37	0.36
Line A													
A-3,2	W->E	HDU2-SDS	2217	.159	.001	0.160	-	-	.283	2993	0.01	0.45	0.56
	E->W	HDU2-SDS	2217	.080	.003	0.082	-	-	.283	2993	0.01	0.37	0.46
Line B													
B-2	W->E	HDU2-SDS	791	.070	.000	0.071	-	-	.283	3441	0.01	0.36	0.21
	E->W	HDU2-SDS	791	.035	.001	0.036	-	-	.283	3441	0.01	0.33	0.19
Line C													
C-1	Both	HDU2-SDS	-1123	.000	.000	0.000	-	-	.000	4208	0.01	0.01	0.00

Legend:
Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B
Dir – Force direction
Tens., Comp. force – Accumulated strength-level hold-down tension force T and end compression force C from overturning, dead loads and vertical earthquake loads
da – Vertical displacements due to the following components:
Vert. Displacement – Elongation when slippage calculated separately; displacement when combined elongation/slippage used
Manuf – Using manufacturer's value for anchor bolt length, or no bolt contribution for connector-only elongation
*Unless marked with * = (ASD uplift force / ASD hold-down capacity) x max strength-level elongation or displacement*
** - Maximum strength-level elongation or displacement is used. May result in higher than actual displacements for lightly loaded hold-downs, causing the segment to draw less force due to lower than actual stiffness.*
Add – Due to longer anchor bolt length than manufacturer's value, or entire bolt length for connector-only elongation = TL / (Ab x Es)
Ab = bolt cross-sectional area
Es = steel modulus = 29000000 psi
L = Lb – Lh
Lb = Total bolt length shown in Storey Information table
Lh = Manufacturer's anchor bolt length for given displacement/elongation from hold-down database
Slippage – Due to vertical slippage of hold-down fasteners attached to stud(s) when not combined with elongation
Nails = en from SDPWS Table C4.2.3D using values for wood structural panels
Bolts = Vf / (270,000 D^1.5) (NDS 11.3.6); D = bolt diameter, Vf = Tension force T / number of fasteners

Shrink + Extra – Wood shrinkage plus extra displacement due to mis-cuts, gaps, etc.
Shrinkage = 0.002 x (19% fabrication – 10% in-service moisture contents) x Ls
Ls = Length between anchor bolt fasteners subject to perp-to-grain shrinkage; see Story Information table
Crush – Deformation of bottom plate at compression end of wall segment
= 0.02" x [r / 0.73, r < 0.73; (1 + (r - 0.73) / 0.27), 0.73 < r < 1; 2 r^3, r > 1]
r = fcp / Fcp'; Fcp' = Ct CM Fcp; fcp = C / A, A = cross sectional area of end studs
Total da – Vert. Displacement + Slippage + Shrink + Crush + Extra
Horz Defl – Anchorage deflection term in SDPWS Eqn. C.4.3.4-1 = h / beff x da
h = Wall height. For end segments in FTAO walls, h is the average of the wall height and the distance from the bottom of opening to top of wall
beff = Effective wall segment length = b - (tension stud pack width + hold-down anchor bolt offset) - (1/2 compression stud pack width)
h and b are shown in Deflection table, beff in the Shear Wall Dimensions table

Rigid Diaphragm Seismic Design

SEISMIC INFORMATION

Level	Mass [lbs]	Area [sq.ft]	Story Shear Fx [lbs] E-W	Story Shear Fx [lbs] N-S	Shear Resistance [lbs] E-W	Shear Resistance [lbs] N-S	Diaphragm Force [lbs] E-W Fpx	Diaphragm Force [lbs] E-W Design	Diaphragm Force [lbs] N-S Fpx	Diaphragm Force [lbs] N-S Design
2	32241	1202.0	5055	5055	21027	10562	5091	5091	5091	5091
1	26414	1205.5	2071	2071	24952	11189	4171	8634	4171	9095
All	**58654**	-	**10179**	**10179**	-	-	-	-	-	-

Legend:
Mass – Sum of all generated and input building masses on level = wx in ASCE 7 Eqn. 12.8-12.
Story Shear – Total ASD-factored shear force induced at level x from Eqn. 12.8-11.
Shear Resistance – Lateral design strength of all shear-resisting elements on story, for use in weak story evaluation (4.1.8).
Diaphragm Force – used by Shearwalls only for drag strut forces, as per Exception to 12.10.2.1.
Fpx - Minimum ASD-factored force for diaphragm design from Eqns. 12.10-1, -2, and -3.
Design = The greater of the story shear and Fpx + transfer forces from discontinuous shearlines, factored by overstrength (omega) as per 12.10.1.1. Omega = 3.0 as per 12.2-1.
Design force for drag struts are determined on a shearline-by-shearline basis, and can use Fx, Fpx, or "Design" depending on the location of transfer forces.

On at least one level and force direction, a torsional irregularity was detected and torsional amplification factor Ax applied according to 12.8.4.3. Refer to the Torsional Analysis section of the Log File output for the values of Ax.

Redundancy Factor p (rho):
E-W 1.30, N-S 1.30
Input by user (overriding calculated value).
Applies to shearwall design, hold-down forces and the drag strut force component based on shearline forces; does not apply to story drift, out-of-plane force, or the diaphragm force Fpx and the drag strut force component based on it.

Vertical Earthquake Load Ev
Ev = 0.2 Sds D; Sds = 1.13; Ev = 0.226 D unfactored; 0.158 D factored; total dead load factor: 0.6 - 0.158 = 0.442 tension, 1.0 + 0.158 = 1.158 compression.

Weak Story (SDPWS 4.1.8)
The lateral resistance of each story is greater than or equal to that of the story above. This vertical distribution of SFRS is permitted.

SHEAR RESULTS (rigid seismic design)

N-S Shearlines	W Gp	For Dir	ASD Shear Force [plf] v	vmax/vft	V [lbs]	Asp-Cub Int	Asp-Cub Ext	Allowable Shear [plf] Int	Ext	Co	C	Cmb	V [lbs]	Resp. Ratio
Line 1														
Level 2														
Ln1, Lev2	-	Both	-	-	2134	-	-	-	-	-		-	3380	-
Wall 1-1	1	Both	157.3	-	629	-	.89	-	280	-		249	997	0.63
Wall 1-2	1	Both	-	-	1504	-	1.0	-	280	-		-	2383	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Seg. 2	-	Both	177.0	-	1504	-	1.0	-	280	-		280	2383	0.63
Line 2														
Ln2, Lev2	-	Both	-	-	2830	-	-	-	-	-		-	4519	-
Wall 2-3	3	Both	269.5	-	2830	-	1.0	-	430	-		430	4519	0.63
Level 1														
Ln2, Lev1	-	Both	-	-	6900	-	-	-	-	-		-	6886	-
Wall 2-1	1	Both	0.0	-	0	-	1.0	-	280	-		-	-	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Seg. 2	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Wall 2-2	1^	Both	0.0	-	0	-	1.0	-	0	-		-	-	-
Wall 2-3	3^	Both	-	-	6900	-	1.0	-	430	-		-	6886	-
Seg. 1	-	Both	431.3	-	4528	-	1.0	-	430	-		430	4519	1.00
Seg. 2	-	Both	431.3	-	2372	-	1.0	-	430	-		430	2367	1.00
Line 3														
Level 2														
Ln3, Lev2	-	Both	-	-	2112	-	-	-	-	-		-	2663	-
Wall 3-2	1	Both	-	-	2112	-	1.0	-	280	-		-	2663	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Seg. 2	-	Both	222.3	-	2112	-	1.0	-	280	-		280	2663	0.79
Level 1														
Ln3, Lev1	-	Both	-	-	3047	-	-	-	-	-		-	4304	-
Wall 3-1	4^	Both	-	-	3047	-	1.0	-	430	-		-	4304	-
Seg. 1	-	Both	304.7	-	1219	-	1.0	-	430	-		430	1721	0.71
Seg. 2	-	Both	304.7	-	1828	-	1.0	-	430	-		430	2582	0.71
Seg. 3	-	Both	0.0	-	0	-	1.0	-	430	-		430	-	-

E-W Shearlines	W Gp	For Dir	ASD Shear Force [plf] v	vmax/vft	V [lbs]	Asp-Cub Int	Asp-Cub Ext	Allowable Shear [plf] Int	Ext	Co	C	Cmb	V [lbs]	Resp. Ratio
Line A														
Level 2														
LnA, Lev2	-	Both	-	-	1092	-	-	-	-	-		-	2103	-
Wall A-1	1	Both	0.0	-	0	-	1.0	-	280	-		-	-	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Seg. 2	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Seg. 3	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Seg. 4	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Wall A-3	1	Both	-	-	1092	-	1.0	-	280	-		-	2103	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Seg. 2	-	Both	145.6	-	1092	-	1.0	-	280	-		280	2103	0.52
Seg. 3	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Level 1														
LnA, Lev1	-	Both	-	-	5279	-	-	-	-	-		-	11635	-
Wall A-1	1	Both	127.2	-	2671	-	1.0	-	280	-		280	5888	0.45
Wall A-2	1^	Both	0.0	-	0	-	1.0	-	0	-		-	-	-
Wall A-3	1	Both	-	-	2608	-	1.0	-	280	-		-	5747	-
Seg. 1	-	Both	127.2	-	827	-	1.0	-	280	-		280	1822	0.45
Seg. 2	-	Both	0.0	-	0	-	1.0	-	280	-		280	-	-
Seg. 3	-	Both	127.2	-	954	-	1.0	-	280	-		280	2103	0.45
Seg. 4	-	Both	127.2	-	827	-	1.0	-	280	-		280	1822	0.45
Line B														
Level 2														
LnB, Lev2	-	Both	-	-	1934	-	-	-	-	-		-	4486	-
Wall B-2	2	Both	120.9	-	1934	-	1.0	-	280	-		280	4486	0.43
Line C														
LnC, Lev2	1	Both	79.5	-	4093	-	1.0	-	280	-		280	14438	0.28
Level 1														
LnC, Lev1	-	Both	-	-	5154	-	-	-	-	-		-	13317	-
Wall C-1	1	Both	-	-	5154	-	1.0	-	280	-		-	13317	-
Seg. 1	-	Both	108.5	-	2604	-	1.0	-	280	-		280	6729	0.39
Seg. 2	-	Both	108.5	-	2550	-	1.0	-	280	-		280	6588	0.39

Legend:
W Gp - Wall design group defined in Sheathing and Framing Materials tables, where it shows associated Standard Wall. "^" means that this wall is critical for all walls in the Standard Wall group.
For Dir – Direction of seismic force along shearline.

v – Design shear force on segment = ASD-factored shear force per unit length of full-height sheathing (FHS)
vmax/vft - Perforated walls: Collector and in-plane anchorage force as per SDPWS eqn. 4.3-9 = V/FHS/Co. FHS is factored for narrow segments as per 4.3.3.4
FTAO walls: Shear force in piers above and below either openings or piers beside opening(s). Aspect ratio factor does not apply to these piers.
V – ASD factored shear force. For shearline: total shearline force. For wall: total of all segments on wall. For segment: force on segment
Asp/Cub – For wall: Unblocked structural wood panel factor Cub from SDPWS 4.3.5.3. For segment or FTAO pier: Aspect ratio factor from SDPWS 4.3.5.5.1. For perforated wall: Either Cub or sum bi / FHS, where bi is segment length adjusted per SDPWS 4.3.3.4.
Int, Ext - Nominal unit shear capacity of interior and exterior sheathing, factored by Table 4.3-1 Note 3 for framing specific gravity and Note 10 for presence of hold-downs. For wall segments, also include unblocked factor Cub and aspect ratio adjustments.
Co - Adjustment factor for perforated walls from SDPWS Equation 4.3-6.
C - Sheathing combination rule, A = Add capacities, S = Strongest side or twice weakest, G = Stiffness-based using Eqns. 4.3-3,-4.
Cmb - Combined interior and exterior unit shear capacity including perforated wall factor Co.
V – Total factored shear capacity of shearline, wall or segment.
Crit Resp – Response ratio = v/Cmb = design shear force/unit shear capacity. "W" indicates that the wind design criterion was critical in selecting wall.

Notes:
Refer to Elevation View diagrams for individual level for uplift anchorage force t for perforated walls given by SDPWS 4.3.6.4.2,1.

Hold-Down and Compression Design (rigid seismic design)

Level 1 Line-Wall	Posit'n	Location [ft] X	Location [ft] Y	Tensile Hold-down or Compressive Stud Force [lbs] Shear	Dead	Ev	Cmb'd	Hold-down	Cap [lbs]	Crit Resp.
Line 1										
	V Elem	0.00	-3.87	1510	156	41	1395	Refer to upper level		
	V Elem	0.00	-3.87	-1510	260	41	1811	Compression		
	V Elem	0.00	-2.12	731	185	49	595	Refer to upper level		
	V Elem	0.00	-2.12	-731	308	49	1088	Compression		
	V Elem	0.00	-0.12	1510	108	28	1431	Refer to upper level		
	V Elem	0.00	-0.12	-1510	180	28	1719	Compression		
	V Elem	0.00	14.13	1104	194	51	960	Refer to upper level		
	V Elem	0.00	14.13	-1103	324	51	1479	Compression		
	V Elem	0.00	15.88	1834	278	73	1630	Refer to upper level		
	V Elem	0.00	15.88	-1834	463	73	2370	Compression		
Line 2										
2-3	L End	20.50	-3.87	3534	151	40	3423	HDU8-SDS	6765	0.51
2-3	L End	20.50	-3.87	-3534	252	40	3826	Compression	10312	0.37
	V Elem	24.00	5.13	2485	170	45	2360	Refer to upper level		
	V Elem	24.00	5.13	-2485	284	45	2813	Compression		
2-3	L Op 1	20.50	6.38	3534	151	40	3423	HDU8-SDS	6765	0.51
2-3	L Op 1	20.50	6.38	-3534	252	40	3826	Compression	10312	0.37
2-3	R Op 1	20.50	10.13	3614	79	21	3556	HDU8-SDS	6765	0.53
2-3	R Op 1	20.50	10.13	-3614	132	21	3767	Compression	10312	0.37
2-3	R End	20.50	15.38	6099	249	66	5916	HDU8-SDS	6765	0.87
2-3	R End	20.50	15.38	-6099	416	66	6580	Compression	10312	0.64
Line 3										
3-1	L End	51.50	-9.87	2600	177	47	2469	HDU5-SDS	5645	0.44
3-1	L End	51.50	-9.87	-2600	295	47	2941	Compression	10312	0.29
3-1	L Op 1	51.50	-6.12	2600	96	25	2529	HDU5-SDS	5645	0.45
3-1	L Op 1	51.50	-6.12	-2600	160	25	2785	Compression	10312	0.27
3-1	R Op 1	51.50	-0.37	2543	144	38	2437	HDU5-SDS	5645	0.43
3-1	R Op 1	51.50	-0.37	-2543	240	38	2821	Compression	10312	0.27
3-1	L Op 2	51.50	5.38	526	367	96	255	HDU5-SDS	5645	0.05
3-1	L Op 2	51.50	5.38	-525	611	96	1233	Compression	10312	0.12
	V Elem	51.50	14.13	308	46	12	274	Refer to upper level		
	V Elem	51.50	14.13	-308	77	12	396	Compression		
	V Elem	51.50	15.88	2326	293	77	2110	Refer to upper level		
	V Elem	51.50	15.88	-2325	488	77	2890	Compression		
Line A										
A-1	L End	0.12	-4.00	1030			1030	HDU2-SDS	3075	0.33
A-1	L End	0.12	-4.00	-1030			1030	Compression	10312	0.10
A-1	R End	20.88	-4.00	1030			1030	HDU2-SDS	3075	0.33
A-1	R End	20.88	-4.00	-1030			1030	Compression	10312	0.10
A-3	L End	22.63	-10.00	1058	210	55	904	HDU2-SDS	3075	0.29
A-3	L End	22.63	-10.00	-1058	350	55	1464	Compression	10312	0.14
A-3	L Op 1	28.88	-10.00	1058	156	41	943	HDU2-SDS	3075	0.31
A-3	L Op 1	28.88	-10.00	-1058	260	41	1359	Compression	10312	0.13
	V Elem	31.88	-10.00	474	83	22	413	Refer to upper level		
	V Elem	31.88	-10.00	-474	138	22	634	Compression		
A-3	R Op 2	34.63	-10.00	1934	312	82	1704	HDU2-SDS	3075	0.55
A-3	R Op 2	34.63	-10.00	-1934	519	82	2535	Compression	10312	0.25
	V Elem	40.88	-10.00	1355	203	53	1206	Refer to upper level		
	V Elem	40.88	-10.00	-1355	338	53	1746	Compression		
A-3	L Op 3	41.88	-10.00	1053	180	47	920	HDU2-SDS	3075	0.30
A-3	L Op 3	41.88	-10.00	-1053	300	47	1400	Compression	10312	0.14
A-3	R Op 3	45.13	-10.00	1058	156	41	943	HDU2-SDS	3075	0.31
A-3	R Op 3	45.13	-10.00	-1058	260	41	1359	Compression	10312	0.13
A-3	R End	51.38	-10.00	1058	210	55	904	HDU2-SDS	3075	0.29
A-3	R End	51.38	-10.00	-1058	350	55	1464	Compression	10312	0.14
Line B										
	V Elem	1.63	0.00	1105	691	182	596	Refer to upper level		
	V Elem	1.63	0.00	-1105	1152	182	2439	Compression		
	V Elem	17.38	0.00	1105	691	182	596	Refer to upper level		
	V Elem	17.38	0.00	-1105	1152	182	2439	Compression		
Line C										
C-1	L End	0.12	16.00	1596	1967	518	147	HDU2-SDS	3075	0.05
C-1	L End	0.12	16.00	-1596	3278	518	5391	Compression	10312	0.52
C-1	L Op 1	23.88	16.00	877	576	152	453	HDU2-SDS	3075	0.15
C-1	L Op 1	23.88	16.00	-877	960	152	1989	Compression	10312	0.19
C-1	R Op 1	28.13	16.00	877	564	148	462	HDU2-SDS	3075	0.15
C-1	R Op 1	28.13	16.00	-877	940	148	1966	Compression	10312	0.19
C-1	R End	51.38	16.00	1596	1955	514	156	HDU2-SDS	3075	0.05
C-1	R End	51.38	16.00	-1596	3258	514	5368	Compression	10312	0.52
Level 2				**Tensile Hold-down**						

Hold-Down and Compression Design (rigid seismic design, continued)

Line-Wall	Posit'n	Location [ft] X	Location [ft] Y	or Compressive Stud Force [lbs] Shear	Dead	Ev	Cmb'd	Hold-down	Cap [lbs]	Crit Resp.
Line 1										
1-1	L End	1.00	-3.87	1510	108	28	1431	HDU2-SDS	3075	0.47
1-1	L End	1.00	-3.87	-1510	180	28	1719	Compression	10312	0.17
1-1	R End	1.00	-0.12	1510	108	28	1431	HDU2-SDS	3075	0.47
1-1	R End	1.00	-0.12	-1510	180	28	1719	Compression	10312	0.17
1-2	R Op 1	0.00	7.63	1834	230	60	1665	HDU2-SDS	3075	0.54
1-2	R Op 1	0.00	7.63	-1834	383	60	2277	Compression	10312	0.22
1-2	R End	0.00	15.88	1834	230	60	1665	HDU2-SDS	3075	0.54
1-2	R End	0.00	15.88	-1834	383	60	2277	Compression	10312	0.22
Line 2										
2-3	L End	24.00	5.13	2485	170	45	2360	HDU2-SDS	3075	0.77
2-3	L End	24.00	5.13	-2485	284	45	2813	Compression	10312	0.27
2-3	R End	24.00	15.38	2485	170	45	2360	HDU2-SDS	3075	0.77
2-3	R End	24.00	15.38	-2485	284	45	2813	Compression	10312	0.27
Line 3										
3-2	R Op 1	51.50	6.63	2326	257	68	2137	HDU2-SDS	3075	0.69
3-2	R Op 1	51.50	6.63	-2325	428	68	2820	Compression	10312	0.27
3-2	R End	51.50	15.88	2326	257	68	2137	HDU2-SDS	3075	0.69
3-2	R End	51.50	15.88	-2325	428	68	2820	Compression	10312	0.27
Line A										
A-3	R Op 1	33.63	-10.00	1355	203	53	1206	HDU2-SDS	3075	0.39
A-3	R Op 1	33.63	-10.00	-1355	338	53	1746	Compression	10312	0.17
A-3	L Op 2	40.88	-10.00	1355	203	53	1206	HDU2-SDS	3075	0.39
A-3	L Op 2	40.88	-10.00	-1355	338	53	1746	Compression	10312	0.17
Line B										
B-2	L End	1.63	0.00	1105	691	182	596	HDU2-SDS	3075	0.19
B-2	L End	1.63	0.00	-1105	1152	182	2439	Compression	10312	0.24
B-2	R End	17.38	0.00	1105	691	182	596	HDU2-SDS	3075	0.19
B-2	R End	17.38	0.00	-1105	1152	182	2439	Compression	10312	0.24
Line C										
C-1	L End	0.12	16.00	-719	2318	366	3402	Compression	10312	0.33
C-1	R End	51.38	16.00	-719	2318	366	3402	Compression	10312	0.33

Legend:
Line-Wall:
At wall or opening – Shearline and wall number
At vertical element – Shearline
Posit'n – Position of stud pack that hold-down is attached to:
V Elem – Vertical element: column or strengthened studs required where not at wall end or opening
L or R End – At left or right wall end
L or R Op n – At left or right side of opening n
t @ Op n – Uplift force t at opening n from offset opening in perforated wall above, from SDPWS 4.3.6.4.2.1
Location – Co-ordinates in Plan View
Tensile Hold-down or Compressive Stud Force – Upwards force on hold-down at one end of the wall or downward force on bottom plate under studs at the other end, for each force direction. Includes forces transferred from upper levels.
Shear – Overturning component = V x h / beff from SDPWS Eqn. 4.3-7; V = force on segment, ASD-factored by 0.70; h = wall height , beff = wall segment length – (tension stud pack width + hold-down anchor bolt offset) – (1/2 compression stud pack width). For perforated walls = V x h / Co sum (bi) from SDPWS Eqn. 4.3-8.
Dead – Dead load resisting component, factored for ASD by 0.60 for tension and 1.0 for compression
Ev – Vertical seismic load effect from ASCE 7 12.4.2.2 = -0.2 Sds x ASD factor x unfactored D = 0.263 SDS x factored D. Refer to Seismic Information table for more details.
Cmb'd – Sum of ASD-factored overturning, dead and vertical seismic forces. May also include the uplift force t from perforated walls from SDPWS 4.3.6.4.2.1 when openings are staggered.
Hold-down – Device model number from hold-down database; "Compression" for bearing of end stud pack on bottom plate
Cap – Hold-downs: Allowable ASD tension load from database; Compression: Allowable ASD bearing force = Ct CM Cb Fcp A; A = cross sectional area of end studs. Refer to Framing materials table for details.
Crit. Resp. – Critical Response = Combined ASD force/Allowable ASD tension load

Notes:
HDU8-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 20 1/4" x 2.5" SDS heavy-duty screws; 7/8" anchor bolt.
HDU5-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 14 1/4" x 2.5" SDS heavy-duty screws; 5/8" anchor bolt.
HDU2-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 6 1/4" x 2.5" SDS heavy-duty screws; 5/8" anchor bolt.
Combined force from ASCE 7 2.4.1 load combination 10 = - (0.6D - 0.7Ev + 0.7Eh); Eh (from 12.4.2.1) = - shear overturning force
Refer to the Shear Line Dimensions table for wall height h, effective segment length beff and perforated wall adjusted sum of bi, to the Story Table for joist depth, and to the Shear Results table for perforated factor Co.
Designer is responsible for design of connection from wall to floor or foundation for shear force shown in Shear Results table. Refer to SDPWS 4.3.6.4.3 for foundation anchor bolt requirements.

COLLECTOR FORCES (rigid seismic design)

Level 1 Line-Wall	Position on Wall or Opening	Location [ft] X	Location [ft] Y	Drag Strut Force [lbs] --->	Drag Strut Force [lbs] <---	Strap/Blocking Force [lbs] --->	Strap/Blocking Force [lbs] <---
Line 2							
	Shearline force			18385	18385		
2-3	Left Wall End	20.50	-4.00	-4243	4243		
2-3	Left Opening 1	20.50	6.50	398	-398		
2-3	Right Opening 1	20.50	10.00	-2077	2077		
2-3	Right Wall End	20.50	15.50	354	-354		
Line 3							
	Shearline force			4911	4911		
3-1	Left Opening 1	51.50	-6.00	1209	-1209		
3-1	Right Opening 1	51.50	-0.50	170	-170		
3-1	Left Opening 2	51.50	5.50	1983	-1983		
Line A							
	Shearline force			7043	7043		
A-1	Right Wall End	21.00	-4.00	692	-692		
A-3	Left Wall End	22.50	-10.00	487	-487		
A-3	Left Opening 1	29.00	-10.00	701	-701		
A-3	Right Opening 2	34.50	-10.00	-51	51		
A-3	Left Opening 3	42.00	-10.00	196	-196		
A-3	Right Opening 3	45.00	-10.00	-214	214		
Line C							
	Shearline force			7861	7861		
C-1	Left Opening 1	24.00	16.00	309	-309		
C-1	Right Opening 1	28.00	16.00	-302	302		

Level 2 Line-Wall	Position on Wall or Opening	Location [ft] X	Location [ft] Y	Drag Strut Force [lbs] --->	Drag Strut Force [lbs] <---	Strap/Blocking Force [lbs] --->	Strap/Blocking Force [lbs] <---
Line 1							
	Shearline force			2134	2134		
1-1	Right Wall End	1.00	0.00	203	-203		
1-2	Right Opening 1	0.00	7.50	-598	598		
Line 2							
	Shearline force			2830	2830		
2-3	Left Wall End	24.00	5.00	-1633	1633		
2-3	Right Wall End	24.00	15.50	54	-54		
Line 3							
	Shearline force			2112	2112		
3-2	Right Opening 1	51.50	6.50	-1340	1340		
Line A							
	Shearline force			1092	1092		
A-3	Right Opening 1	33.50	-10.00	-703	703		
A-3	Left Opening 2	41.00	-10.00	227	-227		
Line B							
	Shearline force			1934	1934		
B-2	Left Wall End	1.50	0.00	-57	57		
B-2	Right Wall End	17.50	0.00	1264	-1264		

Legend:
Line-Wall - Shearline and wall number
Position…- Side of opening or wall end that drag strut is attached to
Location - Co-ordinates in Plan View
Drag strut Force - Axial force in transfer element at openings, gaps, or changes in design shear along shearline. + : tension; - : compression.
Based on ASD-factored shearline force shown. For SDC C-F, it is the greater of the design shearline force and the diaphragm force Fpx, added to shearline force from story above and to forces transferred from discontinuous shearlines factored by overstrength (omega) as per 12.10.1.1. Refer to Seismic Information table for diaphragm forces and omega factor.
For SDC D-F, if horizontal torsional irregularities 1a or 1b are detected, or if other horizontal irregularities are input, or if vertical irregularity 4 detected or input, 25% increase from 12.3.3.4 applied.
For perforated walls, this force is converted to vmax using 4.3.6.4.1.1.
Strap/Blocking Force – For FTAO walls, force transferred from above and below opening to shearwall pier.
-> Due to shearline force in the west-to-east or south-to-north direction
<- Due to shearline force in the east-to-west or north-to-south direction

DEFLECTION (rigid seismic design)

Wall, segment	W Gp	Dir	Srf	v plf	b ft	h ft	Bending A sq.in	Bending Defl in	Ga kips/ in	Nail slip Vn lbs	Nail slip en in	Shear Defl in	Hold Defl in	Total Defl in
Level 1														
Line 2														
2-3,1	3	Both	1S	473.9	10.50	8.00	16.5	.007	18.4	201	.034	.206	0.30	0.51
2-3,2		S->N	1S	473.9	5.50	8.00	16.5	.013	18.4	201	.034	.206	0.59	0.81
		N->S	1S	473.9	5.50	8.00	16.5	.013	18.4	201	.034	.206	0.67	0.89
Line 3														
3-1,1	4	S->N	ExtS	334.8	4.00	8.00	16.5	.013	18.4	201	.034	.145	0.78	0.93
		N->S	ExtS	334.8	4.00	8.00	16.5	.013	18.4	201	.034	.145	0.78	0.94
3-1,2		S->N	ExtS	334.8	6.00	8.00	16.5	.009	18.4	201	.034	.145	0.50	0.65
		N->S	ExtS	334.8	6.00	8.00	16.5	.009	18.4	201	.034	.145	0.01	0.17
Line A														
A-1	1	Both	ExtS	139.8	21.00	8.00	16.5	.001	13.8	196	.032	.081	0.13	0.21
A-3,1	1	Both	ExtS	139.8	6.50	8.00	16.5	.003	13.8	196	.032	.081	0.41	0.50
A-3,3		W->E	ExtS	139.8	7.50	8.00	16.5	.003	13.8	196	.032	.081	0.41	0.50
		E->W	ExtS	139.8	7.50	8.00	16.5	.003	13.8	196	.032	.081	0.36	0.45
A-3,4		Both	ExtS	139.8	6.50	8.00	16.5	.003	13.8	196	.032	.081	0.42	0.50
Line C														
C-1,1	1	W->E	ExtS	119.2	24.00	8.00	16.5	.001	13.8	196	.032	.069	0.00	0.07
		E->W	ExtS	119.2	24.00	8.00	16.5	.001	13.8	196	.032	.069	0.11	0.18
C-1,2		W->E	ExtS	119.2	23.50	8.00	16.5	.001	13.8	196	.032	.069	0.11	0.18
		E->W	ExtS	119.2	23.50	8.00	16.5	.001	13.8	196	.032	.069	0.00	0.07
Wall, segment	**W Gp**	**Dir**	**Srf**	**v plf**	**b ft**	**h ft**	**Bending A sq.in**	**Bending Defl in**	**Ga kips/ in**	**Nail slip Vn lbs**	**Nail slip en in**	**Shear Defl in**	**Hold Defl in**	**Total Defl in**
Level 2														
Line 1														
1-1	1	S->N	ExtS	172.9	4.00	9.00	16.5	.010	13.8	196	.032	.113	0.96	1.08
		N->S	ExtS	172.9	4.00	9.00	16.5	.010	13.8	196	.032	.113	0.83	0.95
1-2,2	1	S->N	ExtS	194.5	8.50	9.00	16.5	.005	13.8	196	.032	.127	0.46	0.59
		N->S	ExtS	194.5	8.50	9.00	16.5	.005	13.8	196	.032	.127	0.39	0.52
Line 2														
2-3	3	S->N	1S	296.2	10.50	9.00	16.5	.006	18.4	201	.034	.145	0.42	0.57
		N->S	1S	296.2	10.50	9.00	16.5	.006	18.4	201	.034	.145	0.34	0.49
Line 3														
3-2,2	1	S->N	ExtS	244.3	9.50	9.00	16.5	.006	13.8	196	.032	.159	0.44	0.61
		N->S	ExtS	244.3	9.50	9.00	16.5	.006	13.8	196	.032	.159	0.37	0.53
Line A														
A-3,2	1	W->E	ExtS	159.9	7.50	9.00	16.5	.005	13.8	196	.032	.104	0.47	0.58
		E->W	ExtS	159.9	7.50	9.00	16.5	.005	13.8	196	.032	.104	0.42	0.53
Line B														
B-2	2	W->E	1S	132.8	16.00	9.00	16.5	.002	13.8	196	.032	.087	0.19	0.28
		E->W	1S	132.8	16.00	9.00	16.5	.002	13.8	196	.032	.087	0.18	0.27
Line C														
C-1	1	Both	ExtS	87.3	51.50	9.00	16.5	.000	13.8	196	.032	.057	0.00	0.06

Legend:
Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B.
W Gp – Wall design group, refer to Sheathing and Framing Materials tables.
Dir – Force direction.
Srf – Wall surface = Int(erior) or Ext(erior) for perimeter walls, 1 or 2 for interior partitions; Comb = Combined v and Ga for identical materials on each side; S = Ga from side with stronger shear resistance; W = 2 x Ga of weaker side.
v – Unfactored (strength-level) shear force per unit distance on wall segment = ASD force / 0.70, as per ASCE 7 12.8.6,.
Unblocked walls = v / Cub as per SDPWS 4.3.4.3, Cub = Unblocked factor from 4.3.5.3, shown in the Shear Results table.
Perforated walls = vmax from Eqn. 4.3-9, as per 4.3.4.2.
FTAO walls = Unit shear force in pier beside opening(s).
b – Wall or segment length.
Segmented wall or FTAO wall segments = Width of wall segment between openings.
Perforated wall = Sum of FHS segments, modified as in 4.3.3.4 per 4.3.4.2.
FTAO wall = Length of wall including openings.
h – Wall height.
FTAO piers = Distance from bottom of opening to top of wall; for end segments, results using that distance and the wall height are averaged.
Defl – Horizontal shear wall deflection due to given term:
Bending = 8vh^3 / EAb; A = Effective cross sectional area of segment end stud(s), E = stud mod. of elasticity in Framing Materials table
For i studs at one end and j at the other, A = 2 (i^2 j + j^2 i) / (i + j)^2 x area of one stud, based on Ex. C4.3.4-3
Shear = vh / 1000 Ga; Ga = 1.4 vs / (1.4 vs / Gvtv + 0.75 en) from SDPWS Eqn. C4.2.3-3.
vs = ASD sheathing capacity.
Gvtv = Shear stiffness from C4.3.4, shown in Sheathing Materials table.
en = Nail slip from Table C4.2.3D, of form aVn^b for WSP, constant for other materials.
Vn = Strength-level shear force per nail along panel edge at ASD capacity = 1.4 vs.

Hold – Anchorage system (hold-down) = da x h / beff.
da = Vertical hold-down displacement; refer to Hold-down Displacement table for components.
beff = Effective wall segment length = b - (tension stud pack width + hold-down anchor bolt offset) - (1/2 compression stud pack width)
beff is given in the Shear Wall Dimensions table.
For FTAO walls, hold-down device at end of wall is applied to all segments, as per APA T555.
Total Defl – Deflection from bending + shear + hold-down, as per Eqn. 4.3-2.
For FTAO walls, the average of the values for the segments, as per APA T555.

HOLD-DOWN DISPLACEMENT (rigid seismic design)

Wall, segment	Dir	Hold-down	Tension force lbs	Vert. Displacement Manuf in	Add in	da in	Slippage Vf lbs	da in	Shrink +Extra in	Comp. force lbs	Crush da in	Total da in	Horz Defl in
Level 1													
Line 2													
2-3,1	Both	HDU8-SDS	3714	.081	.002	0.084	-	-	.283	4294	0.01	0.38	0.30
2-3,2	S->N	HDU8-SDS	3883	.085	.002	0.087	-	-	.283	7378	0.02	0.39	0.59
	N->S	HDU8-SDS	6422	.141	.004	0.145	-	-	.283	4187	0.01	0.44	0.67
Line 3													
3-1,1	S->N	HDU5-SDS	2658	.069	.003	0.072	-	-	.283	3117	0.01	0.36	0.78
	N->S	HDU5-SDS	2749	.071	.003	0.074	-	-	.283	3336	0.01	0.37	0.78
3-1,2	S->N	HDU5-SDS	2633	.068	.003	0.071	-	-	.283	1232	0.00	0.36	0.50
	N->S	HDU5-SDS	-173	.000	.000	0.000	-	-	.000	3185	0.01	0.01	0.01
Line A													
A-1	Both	HDU2-SDS	1132	.040	.001	0.041	-	-	.283	1132	0.00	0.33	0.13
A-3,1	W->E	HDU2-SDS	927	.035	.001	0.036	-	-	.283	1586	0.00	0.32	0.41
	E->W	HDU2-SDS	988	.036	.001	0.037	-	-	.283	1732	0.00	0.33	0.42
A-3,3	W->E	HDU2-SDS	2296	.084	.003	0.086	-	-	.283	1645	0.00	0.37	0.41
	E->W	HDU2-SDS	955	.035	.001	0.036	-	-	.283	3490	0.01	0.33	0.36
A-3,4	W->E	HDU2-SDS	988	.036	.001	0.037	-	-	.283	1732	0.00	0.33	0.42
	E->W	HDU2-SDS	927	.035	.001	0.036	-	-	.283	1586	0.00	0.32	0.41
Line C													
C-1,1	W->E	HDU2-SDS	-456	.000	.000	0.000	-	-	.000	2525	0.01	0.01	0.00
	E->W	HDU2-SDS	317	.017	.000	0.018	-	-	.283	7082	0.02	0.32	0.11
C-1,2	W->E	HDU2-SDS	330	.018	.000	0.018	-	-	.283	7049	0.02	0.32	0.11
	E->W	HDU2-SDS	-443	.000	.000	0.000	-	-	.000	2492	0.01	0.01	0.00

Wall, segment	Dir	Hold-down	Tension force lbs	Vert. Displacement Manuf in	Add in	da in	Slippage Vf lbs	da in	Shrink +Extra in	Comp. force lbs	Crush da in	Total da in	Horz Defl in
Level 2													
Line 1													
1-1	S->N	HDU2-SDS	1538	.110	.001	0.111	-	-	.283	1952	0.01	0.40	0.96
	N->S	HDU2-SDS	1538	.055	.002	0.057	-	-	.283	1952	0.01	0.35	0.83
1-2,2	S->N	HDU2-SDS	1758	.128	.001	0.129	-	-	.283	2638	0.01	0.42	0.46
	N->S	HDU2-SDS	1758	.064	.002	0.066	-	-	.283	2638	0.01	0.36	0.39
Line 2													
2-3	S->N	HDU2-SDS	2539	.181	.001	0.182	-	-	.283	3191	0.01	0.47	0.42
	N->S	HDU2-SDS	2539	.091	.003	0.094	-	-	.283	3191	0.01	0.39	0.34
Line 3													
3-2,2	S->N	HDU2-SDS	2267	.164	.001	0.165	-	-	.283	3250	0.01	0.46	0.44
	N->S	HDU2-SDS	2267	.082	.003	0.085	-	-	.283	3250	0.01	0.38	0.37
Line A													
A-3,2	W->E	HDU2-SDS	1262	.093	.001	0.093	-	-	.283	2038	0.01	0.38	0.47
	E->W	HDU2-SDS	1262	.046	.001	0.048	-	-	.283	2038	0.01	0.34	0.42
Line B													
B-2	W->E	HDU2-SDS	438	.046	.000	0.046	-	-	.283	3087	0.01	0.34	0.19
	E->W	HDU2-SDS	438	.023	.001	0.023	-	-	.283	3087	0.01	0.32	0.18
Line C													
C-1	Both	HDU2-SDS	-773	.000	.000	0.000	-	-	.000	4557	0.01	0.01	0.00

Legend:
Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B
Dir – Force direction
Tens., Comp. force – Accumulated strength-level hold-down tension force T and end compression force C from overturning, dead loads and vertical earthquake loads
da – Vertical displacements due to the following components:
Vert. Displacement – Elongation when slippage calculated separately; displacement when combined elongation/slippage used
Manuf – Using manufacturer's value for anchor bolt length, or no bolt contribution for connector-only elongation
*Unless marked with * = (ASD uplift force / ASD hold-down capacity) x max strength-level elongation or displacement*
** - Maximum strength-level elongation or displacement is used. May result in higher than actual displacements for lightly loaded hold-downs, causing the segment to draw less force due to lower than actual stiffness.*
Add – Due to longer anchor bolt length than manufacturer's value, or entire bolt length for connector-only elongation = TL / (Ab x Es)
Ab = bolt cross-sectional area
Es = steel modulus = 29000000 psi
L = Lb – Lh
Lb = Total bolt length shown in Storey Information table
Lh = Manufacturer's anchor bolt length for given displacement/elongation from hold-down database
Slippage – Due to vertical slippage of hold-down fasteners attached to stud(s) when not combined with elongation
Nails = en from SDPWS Table C4.2.3D using values for wood structural panels
Bolts = Vf / (270,000 D^1.5) (NDS 11.3.6); D = bolt diameter, Vf = Tension force T / number of fasteners

Shrink + Extra – Wood shrinkage plus extra displacement due to mis-cuts, gaps, etc.
Shrinkage = 0.002 x (19% fabrication – 10% in-service moisture contents) x Ls
Ls = Length between anchor bolt fasteners subject to perp-to-grain shrinkage; see Story Information table
Crush – Deformation of bottom plate at compression end of wall segment
= 0.02" x [r / 0.73, r < 0.73; (1 + (r - 0.73) / 0.27), 0.73 < r < 1; 2 r^3, r > 1]
r = fcp / Fcp'; Fcp' = Ct CM Fcp; fcp = C / A, A = cross sectional area of end studs
Total da – Vert. Displacement + Slippage + Shrink + Crush + Extra
Horz Defl – Anchorage deflection term in SDPWS Eqn. C.4.3.4-1 = h / beff x da
h = Wall height. For end segments in FTAO walls, h is the average of the wall height and the distance from the bottom of opening to top of wall
beff = Effective wall segment length = b - (tension stud pack width + hold-down anchor bolt offset) - (1/2 compression stud pack width)
h and b are shown in Deflection table, beff in the Shear Wall Dimensions table