JKL
STRUCTURAL ENGINEERING

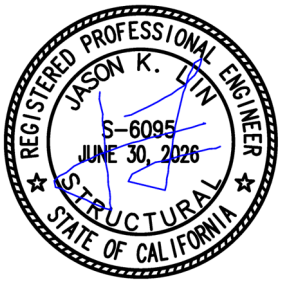
STRUCTURAL CALCULATIONS

Office Warehouse

2710 Durahart Street
Riverside, CA

JKL Project No. 25008

June 10, 2025



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(626) 524-2210

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General Information:

JKL Project #:	25008			
JKL Designer:	AH			
Project Name:	2710 Durahart TI			
Code:	2022 CBC			
Risk Category:	II	ASCE 7-22 (Section 1.5)		
Jurisdiction:	Riverside, CA			
Basic Wind Speed (mph):	110	ASCE 7-22 (Figure 26.5)		
Wind Exposure:	Exp C	ASCE 7-22 (Section 26.7.3)		
Soils Report by:	NA			
Soils Report #:	NA	Allowable Bearing (psf):		1500
Soils Report Dated:	NA		Sds =	1.37

These bound calculations have been prepared for Building Department review only. In addition to these calculations, the Engineer of Record has applied professional judgement and current standards of practice to prepare the construction drawings. These calculations shall not be used or applied independently of the approved structural drawings.

Weight Takeoff

Roof: Slope: 0.5 :12

Roof Material -	Built-up Roofing		2.6 psf
Sheathing -	5/8" Structural Sheathing		2.2 psf
Framing -	14" I-Joists @ 19.2" o.c.		1.9 psf
Ceiling -	5/8" drywall		3.1 psf
Misc -	Miscellaneous - 4		4.0 psf
Other -	Miscellaneous - 1		1.0 psf
Dead Load:	14.8 psf	Live Load:	20 psf
Use:	15.0 psf		

Ceiling:

Sheathing -	5/8" Structural Sheathing		2.2 psf
Framing -	2x10 @ 24" o.c.		1.7 psf
Topping -	None		.0 psf
Ceiling -	5/8" drywall		3.1 psf
Misc -	Miscellaneous - 4		4.0 psf
Dead Load:	11.0 psf	Live Load:	20 psf
Use	11.0 psf		

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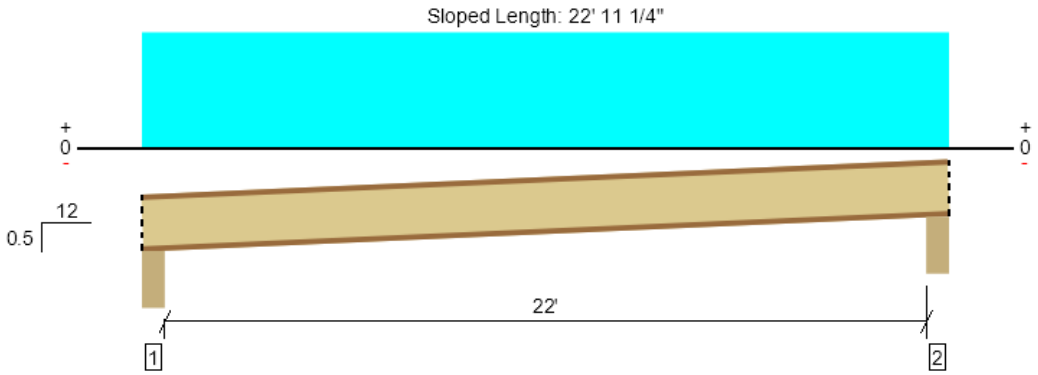
GRAVITY

STRUCTURAL DESIGN

Level, Roof: Joist

1 piece(s) 14" TJI® 230 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	802 @ 4 1/2"	1856 (3.50")	Passed (43%)	1.25	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	770 @ 5 1/2"	2431	Passed (32%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	4301 @ 11' 5 1/2"	6238	Passed (69%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.465 @ 11' 5 1/2"	1.109	Passed (L/572)	--	1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.814 @ 11' 5 1/2"	1.479	Passed (L/327)	--	1.0 D + 1.0 Lr (All Spans)

Member Length : 22' 11 13/16"
System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2021
Design Methodology : ASD
Member Pitch : 0.5/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories	Details
	Total	Available	Required	Dead	Roof Live	Factored		
1 - Beveled Plate - DF	5.50"	5.50"	1.75"	344	458	802	Blocking	R1
2 - Beveled Plate - DF	5.50"	5.50"	1.75"	344	458	802	Blocking	R1

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 5" o/c	
Bottom Edge (Lu)	22' 11" o/c	

•TJI joists are only analyzed using Maximum Allowable bracing solutions.
•Maximum allowable bracing intervals based on applied load.
•Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Vertical Load	Location	Spacing	Dead (0.90)	Roof Live (1.25)	Comments
1 - Uniform (PSF)	0 to 22' 11"	24"	15.0	20.0	Default Load

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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
andrew he JKL Structural Engineering Inc (626) 587-1354 andrewhe.jkl@gmail.com	

Weyerhaeuser

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 25008.ec6

LIC# : KW-06017733, Build:20.25.05.28 JASON LIN (c) ENERCALC, LLC 1982-2025

DESCRIPTION: Beam 1 - Ridge Beam at Warehouse Space

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019
Load Combination Set : ASCE 7-22 / IBC 2024 (L<=100psf)

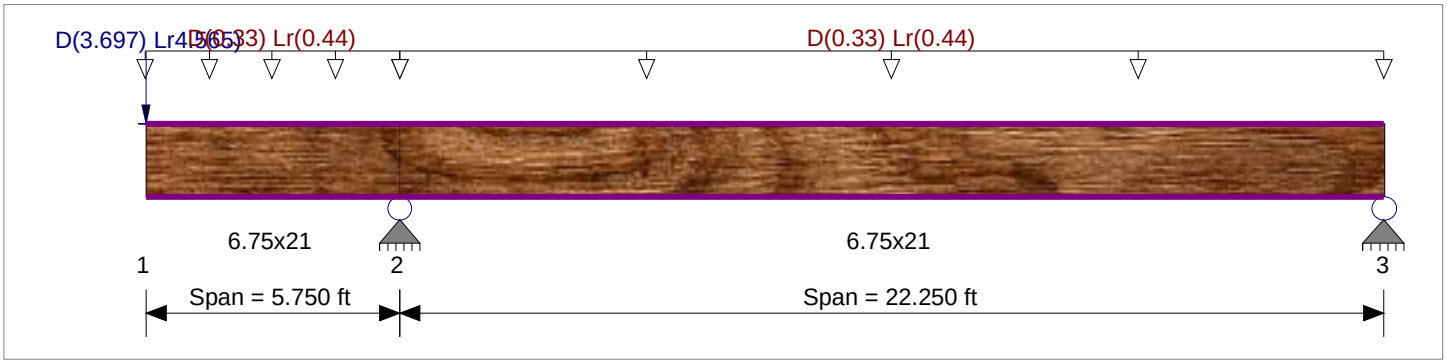
Material Properties

Analysis Method :	Allowable Stress Design
Load Combination :	ASCE 7-22 / IBC 2024 (L<=100psf)
Wood Species :	DF/DF
Wood Grade :	24F-V8
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling

Fb +	2,400.0 psi
Fb -	2,400.0 psi
Fc - Prll	1,650.0 psi
Fc - Perp	650.0 psi
Fv	265.0 psi
Ft	1,100.0 psi

E : Modulus of Elasticity

Ebend- xx	1,800.0 ksi
Eminbend - xx	950.0 ksi
Density	31.210 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Load for Span Number 1
Uniform Load : D = 0.0150, Lr = 0.020 ksf, Tributary Width = 22.0 ft, (R)
Load for Span Number 2
Uniform Load : D = 0.0150, Lr = 0.020 ksf, Tributary Width = 22.0 ft, (R)
Linked Load(s)
Beam Beam 1A - Ridge Beam at Warehouse Space, Support 2: D = 3.697, Lr = 4.565 k @ 0 ft from left end of beam

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.535 : 1	Maximum Shear Stress Ratio	=	0.367 : 1
Section used for this span		6.75x21	Section used for this span		6.75x21
fb: Actual	=	1,469.22 psi	fv: Actual	=	121.45 psi
F'b	=	2,743.76 psi	F'v	=	331.25 psi
Load Combination		+D+Lr	Load Combination		+D+Lr
Location of maximum on span	=	0.000 ft	Location of maximum on span	=	4.015 ft
Span # where maximum occurs	=	Span # 2	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.114 in	Ratio = 1208	>=480	Span: 1 : Lr Only
Max Upward Transient Deflection	-0.007 in	Ratio = 37158	>=480	Span: 2 : Lr Only
Max Downward Total Deflection	0.205 in	Ratio = 672	>=280	Span: 1 : +D+Lr
Max Upward Total Deflection	-0.013 in	Ratio = 21306	>=280	Span: 2 : +D+Lr

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_V	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 5.750 ft	1	0.305	0.228	0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00	27.22	658.4	2,160.0	5.15	54.4	238.5
Length = 22.250 ft	2	0.333	0.204	0.90	1.00	1.00	1.00	0.915	1.00	1.00	1.00	27.22	658.4	1,975.5	4.61	48.8	238.5
+D+Lr					1.00	1.00	1.00	0.915	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.750 ft	1	0.490	0.367	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	60.74	1,469.2	3,000.0	11.48	121.5	331.3

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 25008.ec6

LIC# : KW-06017733, Build:20.25.05.28 JASON LIN (c) ENERCALC, LLC 1982-2025

DESCRIPTION: Beam 1 - Ridge Beam at Warehouse Space

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_V	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 22.250 ft	**2**	0.535	0.327	1.25	1.00	1.00	1.00	0.915	1.00	1.00	1.00	60.74	1,469.2	2,743.8	10.24	108.4	331.3
+D+0.750Lr					1.00	1.00	1.00	0.915	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.750 ft	**1**	0.422	0.316	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	52.36	1,266.5	3,000.0	9.89	104.7	331.3
Length = 22.250 ft	**2**	0.462	0.282	1.25	1.00	1.00	1.00	0.915	1.00	1.00	1.00	52.36	1,266.5	2,743.8	8.84	93.5	331.3
+0.60D					1.00	1.00	1.00	0.915	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.750 ft	**1**	0.103	0.077	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	16.33	395.0	3,840.0	3.09	32.7	424.0
Length = 22.250 ft	**2**	0.112	0.069	1.60	1.00	1.00	1.00	0.915	1.00	1.00	1.00	16.33	395.0	3,512.0	2.77	29.3	424.0

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
1	+D+Lr	0.2051	0.000		0.0000	0.000
2	+D+Lr	0.1374	13.797	+D+Lr	-0.0125	1.616

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions		24.504	6.178
Max Upward from Load Combinations		24.504	6.178
Max Upward from Load Cases		13.497	3.388
D Only		11.008	2.790
+D+Lr		24.504	6.178
+D+0.750Lr		21.130	5.331
+0.60D		6.605	1.674
Lr Only		13.497	3.388

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 25008.ec6

LIC# : KW-06017733, Build:20.25.05.28 JASON LIN (c) ENERCALC, LLC 1982-2025

DESCRIPTION: Beam 1A - Ridge Beam at Warehouse Space

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019
Load Combination Set : ASCE 7-22 / IBC 2024 (L<=100psf)

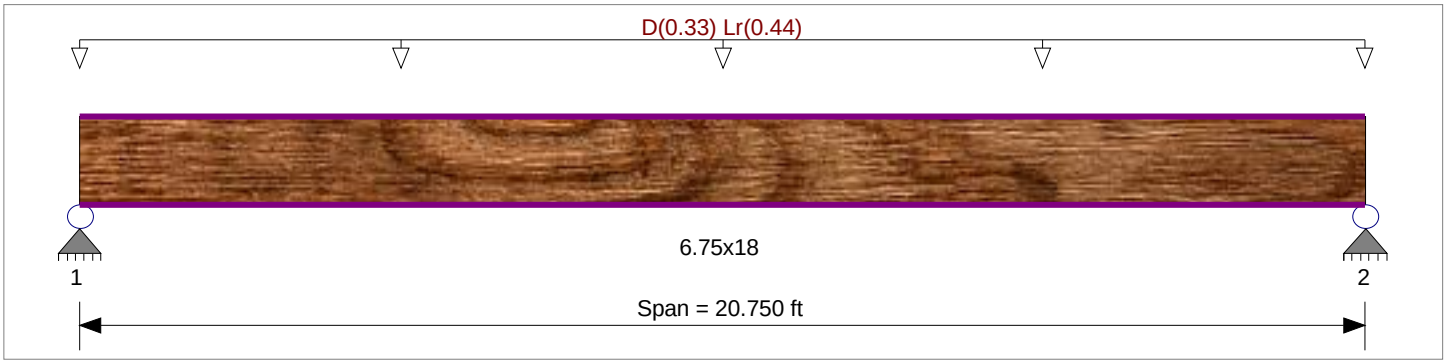
Material Properties

Analysis Method :	Allowable Stress Design
Load Combination :	ASCE 7-22 / IBC 2024 (L<=100psf)
Wood Species :	DF/DF
Wood Grade :	24F-V8
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling

Fb +	2,400.0 psi
Fb -	2,400.0 psi
Fc - Prll	1,650.0 psi
Fc - Perp	650.0 psi
Fv	265.0 psi
Ft	1,100.0 psi

E : Modulus of Elasticity

Ebend- xx	1,800.0 ksi
Eminbend - xx	950.0 ksi
Density	31.210 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Uniform Load : D = 0.0150, Lr = 0.020 ksf, Tributary Width = 22.0 ft, (R)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.503 : 1	Maximum Shear Stress Ratio	=	0.265 : 1
Section used for this span		6.75x18	Section used for this span		6.75x18
fb: Actual	=	1,410.99 psi	fv: Actual	=	87.85 psi
F'b	=	2,805.89 psi	F'v	=	331.25 psi
Load Combination		+D+Lr	Load Combination		+D+Lr
Location of maximum on span	=	10.375 ft	Location of maximum on span	=	19.311 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.313 in	Ratio =	796	>=480	Span: 1 : Lr Only
Max Upward Transient Deflection	0 in	Ratio =	0	<480	n/a
Max Downward Total Deflection	0.566 in	Ratio =	440	>=280	Span: 1 : +D+Lr
Max Upward Total Deflection	0 in	Ratio =	0	<280	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_V	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 20.750 ft	1	0.313	0.165	0.90	1.00	1.00	1.00	0.935	1.00	1.00	1.00	19.18	631.4	2,020.2	3.18	39.3	238.5
+D+Lr					1.00	1.00	1.00	0.935	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 20.750 ft	1	0.503	0.265	1.25	1.00	1.00	1.00	0.935	1.00	1.00	1.00	42.86	1,411.0	2,805.9	7.12	87.9	331.3
+D+0.750Lr					1.00	1.00	1.00	0.935	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 20.750 ft	1	0.433	0.229	1.25	1.00	1.00	1.00	0.935	1.00	1.00	1.00	36.94	1,216.1	2,805.9	6.13	75.7	331.3
+0.60D					1.00	1.00	1.00	0.935	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 20.750 ft	1	0.105	0.056	1.60	1.00	1.00	1.00	0.935	1.00	1.00	1.00	11.51	378.8	3,591.5	1.91	23.6	424.0

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 25008.ec6

LIC# : KW-06017733, Build:20.25.05.28 JASON LIN

DESCRIPTION: Beam 1A - Ridge Beam at Warehouse Space

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
1	+D+Lr	0.5658	10.451		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	8.262	8.262
Max Upward from Load Combinations	8.262	8.262
Max Upward from Load Cases	4.565	4.565
D Only	3.697	3.697
+D+Lr	8.262	8.262
+D+0.750Lr	7.121	7.121
+0.60D	2.218	2.218
Lr Only	4.565	4.565

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 25008.ec6

LIC# : KW-06017733, Build:20.25.05.28 JASON LIN (c) ENERCALC, LLC 1982-2025

DESCRIPTION: Beam 2 - Ridge Beam at Office2

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019
Load Combination Set : ASCE 7-22 / IBC 2024 (L<=100psf)

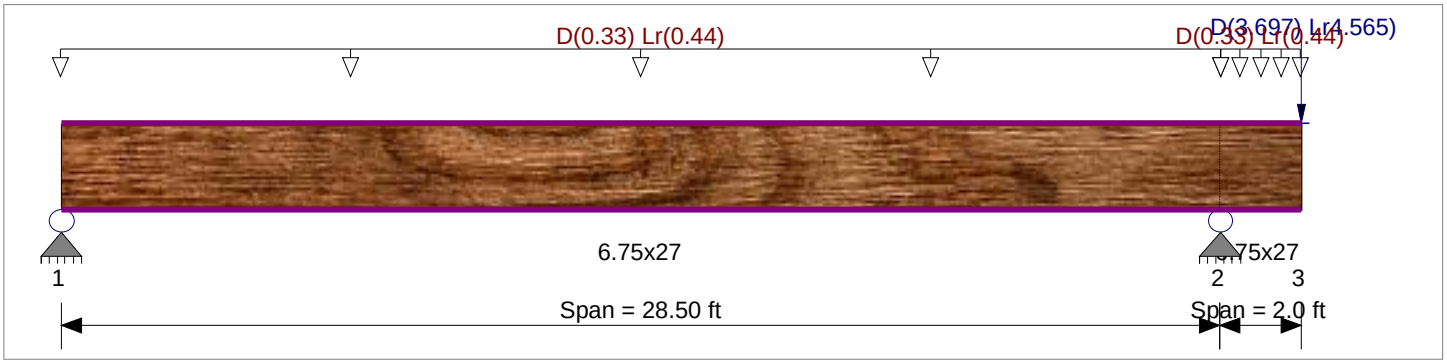
Material Properties

Analysis Method :	Allowable Stress Design
Load Combination :	ASCE 7-22 / IBC 2024 (L<=100psf)
Wood Species :	DF/DF
Wood Grade :	24F-V8
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling

Fb +	2,400.0 psi
Fb -	2,400.0 psi
Fc - Prll	1,650.0 psi
Fc - Perp	650.0 psi
Fv	265.0 psi
Ft	1,100.0 psi

E : Modulus of Elasticity

Ebend- xx	1,800.0 ksi
Eminbend - xx	950.0 ksi
Density	31.210 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Load for Span Number 1
Uniform Load : D = 0.0150, Lr = 0.020 ksf, Tributary Width = 22.0 ft, (R)
Load for Span Number 2
Uniform Load : D = 0.0150, Lr = 0.020 ksf, Tributary Width = 22.0 ft, (R)
Linked Load(s)
Beam Beam 1A - Ridge Beam at Warehouse Space, Support 1: D = 3.697, Lr = 4.565 k @ 30.5 ft from left end of beam

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.411 : 1	Maximum Shear Stress Ratio	=	0.258 : 1
Section used for this span		6.75x27	Section used for this span		6.75x27
fb: Actual	=	1,073.49 psi	fv: Actual	=	85.33 psi
F'b	=	2,610.23 psi	F'v	=	331.25 psi
Load Combination		+D+Lr	Load Combination		+D+Lr
Location of maximum on span	=	13.534 ft	Location of maximum on span	=	26.271 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.286 in	Ratio = 1193	>=480	Span: 1 : Lr Only
Max Upward Transient Deflection	-0.056 in	Ratio = 856	>=480	Span: 2 : Lr Only
Max Downward Total Deflection	0.528 in	Ratio = 647	>=280	Span: 1 : +D+Lr
Max Upward Total Deflection	-0.103 in	Ratio = 462	>=280	Span: 2 : +D+Lr

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_V	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 28.50 ft	1	0.261	0.163	0.90	1.00	1.00	1.00	0.870	1.00	1.00	1.00	33.56	491.0	1,879.4	4.73	38.9	238.5
Length = 2.0 ft	2	0.055	0.153	0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00	8.13	119.0	2,160.0	4.44	36.5	238.5
+D+Lr					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 28.50 ft	1	0.411	0.258	1.25	1.00	1.00	1.00	0.870	1.00	1.00	1.00	73.37	1,073.5	2,610.2	10.37	85.3	331.3

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 25008.ec6

LIC# : KW-06017733, Build:20.25.05.28 JASON LIN

DESCRIPTION: Beam 2 - Ridge Beam at Office2

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_V	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 2.0 ft	**2**	0.088	0.246	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	18.14	265.5	3,000.0	9.88	81.3	331.3
+D+0.750Lr					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 28.50 ft	**1**	0.355	0.223	1.25	1.00	1.00	1.00	0.870	1.00	1.00	1.00	63.41	927.9	2,610.2	8.96	73.7	331.3
Length = 2.0 ft	**2**	0.076	0.212	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	15.64	228.8	3,000.0	8.52	70.1	331.3
+0.60D					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 28.50 ft	**1**	0.088	0.055	1.60	1.00	1.00	1.00	0.870	1.00	1.00	1.00	20.14	294.6	3,341.1	2.84	23.3	424.0
Length = 2.0 ft	**2**	0.019	0.052	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	4.88	71.4	3,840.0	2.66	21.9	424.0

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
1	+D+Lr	0.5282	14.011		0.0000	0.000
2		0.0000	14.011	+D+Lr	-0.1035	2.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	10.899	22.053	
Max Upward from Load Combinations	10.899	22.053	
Max Upward from Load Cases	5.919	12.066	
D Only	4.980	9.987	
+D+Lr	10.899	22.053	
+D+0.750Lr	9.419	19.036	
+0.60D	2.988	5.992	
Lr Only	5.919	12.066	

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 25008.ec6

LIC# : KW-06017733, Build:20.25.05.28 JASON LIN (c) ENERCALC, LLC 1982-2025

DESCRIPTION: Beam 3 - Ridge Beam at Office1

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019
Load Combination Set : ASCE 7-22 / IBC 2024 (L<=100psf)

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-22 / IBC 2024 (L<=100psf)

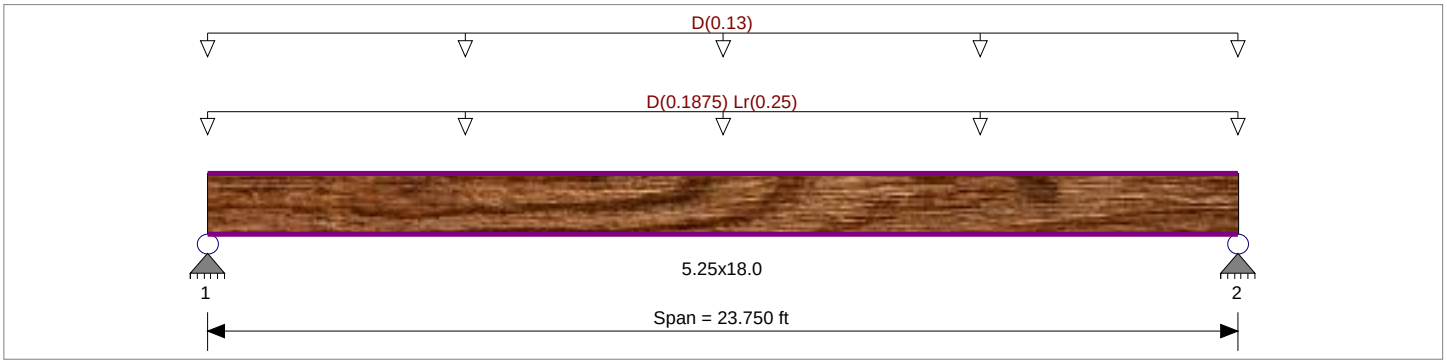
Wood Species : RedBuilt
Wood Grade : RedLam LVL Beam/Joist

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2,900.0 psi
Fb -	2,900.0 psi
Fc - Prll	2,635.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	1,660.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	42.010 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Uniform Load : D = 0.0150, Lr = 0.020 ksf, Tributary Width = 12.50 ft, (R)
Uniform Load : D = 0.020 ksf, Tributary Width = 6.50 ft, (W)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.512 : 1	Maximum Shear Stress Ratio	=	0.276 : 1
Section used for this span		5.25x18.0	Section used for this span		5.25x18.0
fb: Actual	=	1,775.96 psi	fv: Actual	=	98.25 psi
F'b	=	3,465.47 psi	F'v	=	356.25 psi
Load Combination		+D+Lr	Load Combination		+D+Lr
Location of maximum on span	=	11.875 ft	Location of maximum on span	=	22.276 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.353 in	Ratio =	807 >=480	Span: 1 : Lr Only
Max Upward Transient Deflection	0 in	Ratio =	0 <480	n/a
Max Downward Total Deflection	0.840 in	Ratio =	339 >=280	Span: 1 : +D+Lr
Max Upward Total Deflection	0 in	Ratio =	0 <280	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 23.750 ft	1	0.413	0.222	0.90	1.00	1.00	1.00	0.956	1.00	1.00	1.00	24.33	1,029.8	2,495.1	3.59	57.0	256.5
+D+Lr					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 23.750 ft	1	0.512	0.276	1.25	1.00	1.00	1.00	0.956	1.00	1.00	1.00	41.96	1,776.0	3,465.5	6.19	98.2	356.3
+D+0.750Lr					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 23.750 ft	1	0.459	0.247	1.25	1.00	1.00	1.00	0.956	1.00	1.00	1.00	37.55	1,589.4	3,465.5	5.54	87.9	356.3
+0.60D					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 23.750 ft	1	0.139	0.075	1.60	1.00	1.00	1.00	0.956	1.00	1.00	1.00	14.60	617.9	4,435.8	2.15	34.2	456.0

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 25008.ec6

LIC# : KW-06017733, Build:20.25.05.28 JASON LIN

DESCRIPTION: Beam 3 - Ridge Beam at Office1

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
1	+D+Lr	0.8397	11.962		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	7.066	7.066
Max Upward from Load Combinations	7.066	7.066
Max Upward from Load Cases	4.098	4.098
D Only	4.098	4.098
+D+Lr	7.066	7.066
+D+0.750Lr	6.324	6.324
+0.60D	2.459	2.459
Lr Only	2.969	2.969

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 25008.ec6

LIC# : KW-06017733, Build:20.25.05.28 JASON LIN (c) ENERCALC, LLC 1982-2025

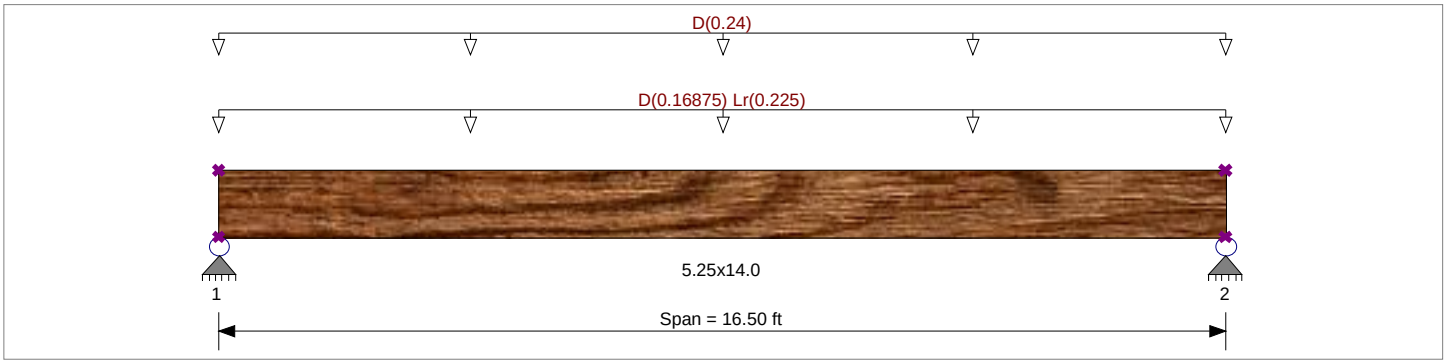
DESCRIPTION: Beam 4 - Header at Warehouse space

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019
Load Combination Set : ASCE 7-22 / IBC 2024 (L<=100psf)

Material Properties

Analysis Method :	Allowable Stress Design	Fb +	2900 psi	*E : Modulus of Elasticity*	
Load Combination :	ASCE 7-22 / IBC 2024 (L<=100psf)	Fb -	2900 psi	Ebend- xx	2000 ksi
		Fc - Prll	2635 psi	Eminbend - xx	2530120482 ksi
Wood Species :	RedBuilt	Fc - Perp	750 psi		
Wood Grade :	RedLam LVL Beam/Joist	Fv	285 psi		
		Ft	1660 psi	Density	42.01 pcf
Beam Bracing :	Completely Unbraced				



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Uniform Load : D = 0.0150, Lr = 0.020 ksf, Tributary Width = 11.250 ft, (R)
Uniform Load : D = 0.020 ksf, Tributary Width = 12.0 ft, (W)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.460 : 1	Maximum Shear Stress Ratio	=	0.267 : 1
Section used for this span		5.25x14.0	Section used for this span		5.25x14.0
fb: Actual	=	1,560.14 psi	fv: Actual	=	95.01 psi
F'b	=	3,390.63 psi	F'v	=	356.25 psi
Load Combination		+D+Lr	Load Combination		+D+Lr
Location of maximum on span	=	8.250 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.157 in	Ratio =	1259	>=480	Span: 1 : Lr Only
Max Upward Transient Deflection	0 in	Ratio =	0	<480	n/a
Max Downward Total Deflection	0.458 in	Ratio =	432	>=280	Span: 1 : +D+Lr
Max Upward Total Deflection	0 in	Ratio =	0	<280	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 16.50 ft	1	0.411	0.243	0.90	1.00	1.00	0.97	0.983	1.00	1.00	1.00	14.64	1,024.4	2,492.2	3.06	62.4	256.5
+D+Lr					1.00	1.00	0.97	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.50 ft	1	0.460	0.267	1.25	1.00	1.00	0.95	0.983	1.00	1.00	1.00	22.30	1,560.1	3,390.6	4.66	95.0	356.3
+D+0.750Lr					1.00	1.00	0.95	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.50 ft	1	0.421	0.244	1.25	1.00	1.00	0.95	0.983	1.00	1.00	1.00	20.38	1,426.2	3,390.6	4.26	86.9	356.3
+0.60D					1.00	1.00	0.95	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.50 ft	1	0.146	0.082	1.60	1.00	1.00	0.92	0.983	1.00	1.00	1.00	8.78	614.6	4,208.2	1.83	37.4	456.0

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 25008.ec6

LIC# : KW-06017733, Build:20.25.05.28 JASON LIN

DESCRIPTION: Beam 4 - Header at Warehouse space

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
1	+D+Lr	0.4577	8.310		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	5.405	5.405
Max Upward from Load Combinations	5.405	5.405
Max Upward from Load Cases	3.549	3.549
D Only	3.549	3.549
+D+Lr	5.405	5.405
+D+0.750Lr	4.941	4.941
+0.60D	2.129	2.129
Lr Only	1.856	1.856

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 25008.ec6

LIC# : KW-06017733, Build:20.25.03.24 JASON LIN (c) ENERCALC, LLC 1982-2025

DESCRIPTION: Beam 5 - Header at Office1

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019
Load Combination Set : ASCE 7-22 / IBC 2024 (L<=100psf)

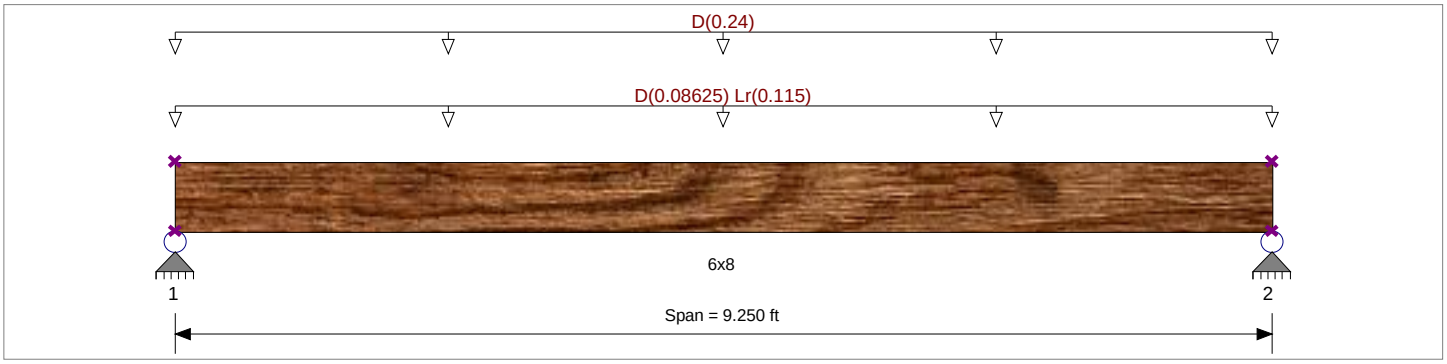
Material Properties

Analysis Method :	Allowable Stress Design
Load Combination :	ASCE 7-22 / IBC 2024 (L<=100psf)
Wood Species :	Douglas Fir-Larch
Wood Grade :	No.1
Beam Bracing :	Completely Unbraced

Fb +	1350 psi
Fb -	1350 psi
Fc - Prll	925 psi
Fc - Perp	625 psi
Fv	170 psi
Ft	675 psi

E : Modulus of Elasticity

Ebend- xx	1600 ksi
Eminbend - xx	580 ksi
Density	31.21 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Uniform Load : D = 0.0150, Lr = 0.020 ksf, Tributary Width = 5.750 ft, (R)
Uniform Load : D = 0.020 ksf, Tributary Width = 12.0 ft, (W)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.690 : 1	Maximum Shear Stress Ratio	=	0.320 : 1
Section used for this span		6x8	Section used for this span		6x8
fb: Actual	=	834.32 psi	fv: Actual	=	48.97 psi
F'b	=	1,209.17 psi	F'v	=	153.00 psi
Load Combination		D Only	Load Combination		D Only
Location of maximum on span	=	4.625 ft	Location of maximum on span	=	8.642 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.062 in	Ratio =	1802	>=480	Span: 1 : Lr Only
Max Upward Transient Deflection	0 in	Ratio =	0	<480	n/a
Max Downward Total Deflection	0.241 in	Ratio =	460	>=280	Span: 1 : +D+Lr
Max Upward Total Deflection	0 in	Ratio =	0	<280	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 9.250 ft	1	0.690	0.320	0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00	3.58	834.3	1,209.2	1.35	49.0	153.0
+D+Lr					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 9.250 ft	1	0.669	0.309	1.25	1.00	1.00	0.99	1.000	1.00	1.00	1.00	4.81	1,120.6	1,675.9	1.81	65.8	212.5
+D+0.750Lr					1.00	1.00	0.99	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 9.250 ft	1	0.626	0.290	1.25	1.00	1.00	0.99	1.000	1.00	1.00	1.00	4.51	1,049.0	1,675.9	1.69	61.6	212.5
+0.60D					1.00	1.00	0.99	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 9.250 ft	1	0.234	0.108	1.60	1.00	1.00	0.99	1.000	1.00	1.00	1.00	2.15	500.6	2,140.3	0.81	29.4	272.0

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 25008.ec6

LIC# : KW-06017733, Build:20.25.03.24 JASON LIN

DESCRIPTION: Beam 5 - Header at Office1

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
1	+D+Lr	0.2411	4.659		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	2.082	2.082
Max Upward from Load Combinations	2.082	2.082
Max Upward from Load Cases	1.550	1.550
D Only	1.550	1.550
+D+Lr	2.082	2.082
+D+0.750Lr	1.949	1.949
+0.60D	0.930	0.930
Lr Only	0.532	0.532

FOUNDATION

STRUCTURAL DESIGN

FOUNDATION DESIGN CHECK

SOIL BEARING: *1500* psf

Pad Size:	*Capacity:*
24 in x 24 in	6000 lbs
27 in x 27 in	7594 lbs
30 in x 30 in	9375 lbs
33 in x 33 in	11344 lbs
36 in x 36 in	13500 lbs
39 in x 39 in	15844 lbs
42 in x 42 in	18375 lbs
45 in x 45 in	21094 lbs
48 in x 48 in	24000 lbs
54 in x 54 in	30375 lbs
60 in x 60 in	37500 lbs

Continuous Footing:

18 in x 24 in

Max Line Load: 2250 plf

Max Point Load: 9000 lbs

Exterior Footing Line Load:

	DL (psf)	LL (psf)	Trib. (ft.)	DL (plf)	LL (plf)
Roof:	15	20	22.5	338	450
Ceiling:	11	40	0	0	0
Wall:	20	0	16	320	0
				Total Load:	1107.5

Interior Footing Line Load:

	DL (psf)	LL (psf)	Trib. (ft.)	DL (plf)	LL (plf)
Roof:	15	20	0	0	0
Ceiling:	11	40	5.75	63	230
Wall:	20	0	8	160	0
				Total Load:	453.25

LATERAL

STRUCTURAL DESIGN

WoodWorks® Shearwalls

25008 SW v.1.wswu **Jun. 10, 2025 14:16:44**

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 and MWFRS Deflection	For Deflection (Wind:Serviceability)
0.7 Seismic + 0.6 Dead	1.0 Seismic + 0.9 Dead
0.6 Basic wind + 0.6 Dead	1.0 MRI wind + 1.0 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	-

Maximum Height-to-width Ratio

Wood panels Blocked	Wood panels Unblocked	Fiberboard	Lumber Wind	Lumber Seismic	Gypsum Blocked	Gypsum Unblocked
3.5	2.0	-	-	-	2.0	1.5

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

Dead load in chord force for overturning design

Tension end	Compression end	When completely counteracts overturning
Wall length / 2	Wall length / 2	Wall length / 2

SITE INFORMATION

Wind — ASCE 7-16 Directional (All heights)

Design Wind Speed	110 mph
Serviceability Wind Speed	100 mph
Exposure	Exposure C
Enclosure	Partially enclosed
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: 0.670g **Ss:** 1.810g

Fundamental Period	E-W	N-S
T Used	0.201s	0.201s
Approximate Ta	0.201s	0.201s
Maximum T	0.282s	0.282s
Response Factor R	6.50	6.50

Fa: 1.20 **Fv:** 1.70

Structural Data

STORY INFORMATION

	Story Elev [ft]	Floor/Ceiling Depth [in]	Wall Height [ft]	Hold-down Length subject to shrinkage [in]	Bolt length [in]
Ceiling	22.58	1'-3.0			
Level 1	1.33	8.0	20.00	11.6	12.35
Foundation	0.67				

BLOCK and ROOF INFORMATION

	Block Dimensions [ft]		Roof Panels Face	Type	Slope	Overhang [ft]
Block 1	1 Story	E-W Ridge				
Location X,Y =	0.00	0.25	**North**	Side	2.5	0.00
Extent X,Y =	23.75	48.00	**South**	Side	2.3	0.00
Ridge Y Location, Offset	25.50	1.25	**East**	Gable	90.0	0.00
Ridge Elevation, Height	23.58	1.00	**West**	Gable	90.0	0.00
Block 2	1 Story	E-W Ridge				
Location X,Y =	23.75	3.25	**North**	Side	2.4	0.00
Extent X,Y =	36.50	45.00	**South**	Side	2.4	0.00
Ridge Y Location, Offset	25.50	-0.25	**East**	Gable	90.0	0.00
Ridge Elevation, Height	23.52	0.94	**West**	Joined	90.0	0.00
Block 3	1 Story	E-W Ridge				
Location X,Y =	60.25	8.25	**North**	Side	2.1	0.00
Extent X,Y =	20.00	40.00	**South**	Side	2.8	0.00
Ridge Y Location, Offset	25.50	-2.75	**East**	Gable	90.0	0.00
Ridge Elevation, Height	23.42	0.83	**West**	Joined	90.0	0.00

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	32/16	15/32	-	-	Horz	83500	10d	Common	N	4	12	Y	2,7
2	Ext	Plywood siding	32/16	5/16	-	3	Horz	25000	6d	Casing	N	4	6	Y	
	Int	Gyp. wallboard	24/0	5/8	-	1	Horz	40000	6d	Cooler	N	7	7	N	5

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)
7. Capacity has been reduced by a factor of 0.92 because of the use of hold-downs on walls with 10d nailing, as per Table 4.3A Note 10.
5. This material does not contribute to seismic shear resistance because the Design setting for ignoring contribution was set.

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	Stud	1.50	5.50	16	0.50	1.40	625	
2	D.Fir-L	Stud	1.50	5.50	16	0.50	1.40	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 1											
Line 1		1	0.00	0.25	48.25	48.00	33.25	-	20.00	-	-
Wall 1-1	NSW		0.00	0.25	15.00	14.75	0.00	0.81	-	2	2
Wall 1-2	FT	1	0.00	15.00	48.25	33.25	33.25	-	-	3	3
Segment 1		-	-	15.00	19.00	4.00	-	0.75	-	-	-
Opening 1		-	-	19.00	25.00	6.00	-	-	3.00	-	-
Segment 2		-	-	25.00	33.00	8.00	7.75	0.38	-	-	-
Opening 2		-	-	33.00	42.00	9.00	-	-	3.00	-	-
Segment 3		-	-	42.00	48.25	6.25	6.00	0.48	-	-	-
Line 2											
Level 1											
Line 2	NSW		23.75	0.25	3.25	3.00	0.00	-	20.00	-	-
Wall 2-1	NSW		23.75	0.25	3.25	3.00	0.00	6.67	-	2	2
Line 3											
Level 1											
Line 3	NSW		60.25	3.25	6.25	3.00	0.00	-	20.00	-	-
Wall 3-1	NSW		60.25	3.25	6.25	3.00	0.00	4.00	-	2	2
Line 4											
Level 1											
Line 4		1	80.25	6.25	48.25	42.00	20.25	-	20.00	-	-
Wall 4-1	NSW		80.25	6.25	14.25	8.00	0.00	3.33	-	2	2
Wall 4-2	Seg	1	80.25	14.25	34.75	20.50	20.25	0.98	-	3	3
Wall 4-3	NSW		80.25	34.75	48.25	13.50	0.00	1.48	-	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 1											
Line A		1	3.56	0.00	80.25	80.25	43.50	-	20.00	-	-
Wall A-1	NSW		0.25	0.00	8.25	8.25	0.00	2.42	-	2	2
Wall A-2	Seg	1	0.25	8.25	23.75	15.50	15.25	1.29	-	2	2
Wall A-3	NSW		3.25	23.75	30.00	6.25	0.00	3.20	-	2	2
Wall A-4	Seg	1	3.25	30.00	38.00	8.00	7.75	2.50	-	2	2
Wall A-5	NSW		3.25	38.00	60.25	22.25	0.00	0.90	-	2	2
Wall A-6	Seg	1	6.25	60.25	80.25	20.00	19.75	1.00	-	2	2
Line B											
Level 1											
Line B		1	48.25	0.00	80.25	80.25	29.75	-	20.00	-	-
Wall B-1	NSW		48.25	0.00	21.25	21.25	0.00	0.94	-	2	2
Wall B-2	Seg	1	48.25	21.25	51.25	30.00	29.75	0.67	-	3	3
Wall B-3	NSW		48.25	51.25	80.25	29.00	0.00	0.69	-	2	2

Legend:
Type – Seg: Segmented, Prf: Perforated, FT: FTAO (force transfer around openings), NSW: Non-shearwall, NW: Non-wood/Proprietary, ND: Not designed
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.
If two wall group numbers listed, they are for rigid diaphragm and flexible diaphragm design.

Loads

WIND SHEAR LOADS (overlapping loads combined)

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]
Accum.	E		Min	W->E	Lee	Line	3.25	8.25	91.0	94.2	
Accum.	E		Min	W->E	Lee	Line	3.25	8.25	91.0	94.2	
Accum.	E		1	W->E	Lee	Line	3.25	8.25	118.2	122.5	
Accum.	E		1	W->E	Lee	Line	3.25	8.25	118.2	122.5	
Accum.	E		Min	W->E	Lee	Line	8.25	14.25	94.2	100.5	
Accum.	E		1	W->E	Lee	Line	8.25	14.25	122.4	130.5	
Accum.	E		Min	W->E	Lee	Line	8.25	14.25	94.2	100.5	
Accum.	E		1	W->E	Lee	Line	8.25	14.25	122.4	130.5	
Accum.	E		1	W->E	Lee	Line	25.50	48.25	262.7	233.9	
Accum.	E		Min	W->E	Lee	Line	25.50	48.25	202.2	180.0	
Accum.	E		1	W->E	Lee	Line	25.50	48.25	262.7	233.9	
Accum.	E		Min	W->E	Lee	Line	25.50	48.25	202.2	180.0	
Accum.	E		1	E->W	Wind	Line	3.25	8.25	178.4	185.2	
Accum.	E		Min	E->W	Wind	Line	3.25	8.25	91.0	94.2	
Accum.	E		Min	E->W	Wind	Line	3.25	8.25	91.0	94.2	
Accum.	E		1	E->W	Wind	Line	3.25	8.25	178.4	185.2	
Accum.	E		Min	E->W	Wind	Line	8.25	14.25	94.2	100.5	
Accum.	E		1	E->W	Wind	Line	8.25	14.25	185.2	198.2	
Accum.	E		Min	E->W	Wind	Line	8.25	14.25	94.2	100.5	
Accum.	E		1	E->W	Wind	Line	8.25	14.25	185.2	198.2	
Accum.	E		1	E->W	Wind	Line	25.50	48.25	398.9	352.9	
Accum.	E		1	E->W	Wind	Line	25.50	48.25	398.9	352.9	
Accum.	E		Min	E->W	Wind	Line	25.50	48.25	202.2	180.0	
Accum.	E		Min	E->W	Wind	Line	25.50	48.25	202.2	180.0	
Accum.	S		1	S->N	Wind	Line	23.75	30.00	173.0		
Accum.	S		1	S->N	Wind	Line	23.75	30.00	173.0		
Accum.	S		Min	S->N	Wind	Line	23.75	30.00	93.8		
Accum.	S		Min	S->N	Wind	Line	23.75	30.00	93.8		
Accum.	S		1	S->N	Wind	Line	60.25	80.25	173.3		
Accum.	S		1	S->N	Wind	Line	60.25	80.25	173.3		
Accum.	S		Min	S->N	Wind	Line	60.25	80.25	93.3		
Accum.	S		Min	S->N	Wind	Line	60.25	80.25	93.3		
Accum.	N		Min	S->N	Lee	Line	21.25	23.75	94.0		
Accum.	N		1	S->N	Lee	Line	21.25	23.75	115.5		
Accum.	N		Min	S->N	Lee	Line	21.25	23.75	94.0		
Accum.	N		1	S->N	Lee	Line	21.25	23.75	115.5		
Accum.	N		Min	S->N	Lee	Line	23.75	51.25	93.8		
Accum.	N		1	S->N	Lee	Line	23.75	51.25	115.5		
Accum.	N		1	S->N	Lee	Line	23.75	51.25	115.5		
Accum.	N		Min	S->N	Lee	Line	23.75	51.25	93.8		
Accum.	N		Min	S->N	Lee	Line	51.25	60.25	93.8		
Accum.	N		Min	S->N	Lee	Line	51.25	60.25	93.8		
Accum.	N		1	S->N	Lee	Line	51.25	60.25	79.7		
Accum.	N		1	S->N	Lee	Line	51.25	60.25	79.7		
Accum.	N		Min	S->N	Lee	Line	60.25	80.25	93.3		
Accum.	N		1	S->N	Lee	Line	60.25	80.25	80.4		
Accum.	N		Min	S->N	Lee	Line	60.25	80.25	93.3		
Accum.	N		1	S->N	Lee	Line	60.25	80.25	80.4		
Accum.	S		Min	N->S	Lee	Line	23.75	30.00	93.8		
Accum.	S		1	N->S	Lee	Line	23.75	30.00	115.3		
Accum.	S		Min	N->S	Lee	Line	23.75	30.00	93.8		
Accum.	S		1	N->S	Lee	Line	23.75	30.00	115.3		
Accum.	S		1	N->S	Lee	Line	60.25	80.25	79.0		
Accum.	S		Min	N->S	Lee	Line	60.25	80.25	93.3		
Accum.	S		Min	N->S	Lee	Line	60.25	80.25	93.3		
Accum.	S		1	N->S	Lee	Line	60.25	80.25	79.0		
Accum.	N		1	N->S	Wind	Line	21.25	23.75	172.7		
Accum.	N		Min	N->S	Wind	Line	21.25	23.75	94.0		
Accum.	N		1	N->S	Wind	Line	21.25	23.75	172.7		
Accum.	N		Min	N->S	Wind	Line	21.25	23.75	94.0		
Accum.	N		1	N->S	Wind	Line	23.75	51.25	173.0		
Accum.	N		Min	N->S	Wind	Line	23.75	51.25	93.8		
Accum.	N		1	N->S	Wind	Line	23.75	51.25	173.0		
Accum.	N		Min	N->S	Wind	Line	23.75	51.25	93.8		
Accum.	N		1	N->S	Wind	Line	51.25	60.25	173.0		
Accum.	N		1	N->S	Wind	Line	51.25	60.25	173.0		
Accum.	N		Min	N->S	Wind	Line	51.25	60.25	93.8		

WIND SHEAR LOADS (overlapping loads combined) (continued)

Accum.	N	Min	N->S	Wind	Line	51.25	60.25	93.8	
Accum.	N	Min	N->S	Wind	Line	60.25	80.25	93.3	
Accum.	N	1	N->S	Wind	Line	60.25	80.25	173.3	
Accum.	N	1	N->S	Wind	Line	60.25	80.25	173.3	
Accum.	N	Min	N->S	Wind	Line	60.25	80.25	93.3	
Block 1	W	1	W->E	Wind	Line	0.25	25.00	176.5	192.7
Block 1	W	1	W->E	Wind	Line	0.25	25.00	176.5	192.7
Block 1	W	Min	W->E	Wind	Line	0.25	25.00	90.0	97.8
Block 1	W	Min	W->E	Wind	Line	0.25	25.00	90.0	97.8
Block 1	W	Min	W->E	Wind	Line	25.00	25.50	187.8	188.0
Block 1	W	Min	W->E	Wind	Line	25.00	25.50	187.8	188.0
Block 1	W	1	W->E	Wind	Line	25.00	25.50	369.2	369.5
Block 1	W	1	W->E	Wind	Line	25.00	25.50	369.2	369.5
Block 1	W	Min	W->E	Wind	Line	25.50	48.25	188.0	180.0
Block 1	W	1	W->E	Wind	Line	25.50	48.25	369.5	352.9
Block 1	W	1	W->E	Wind	Line	25.50	48.25	369.5	352.9
Block 1	W	Min	W->E	Wind	Line	25.50	48.25	188.0	180.0
Block 1	E	Min	W->E	Lee	Line	0.25	3.25	90.0	91.0
Block 1	E	1	W->E	Lee	Line	0.25	3.25	117.0	118.3
Block 1	E	Min	W->E	Lee	Line	0.25	3.25	90.0	91.0
Block 1	E	1	W->E	Lee	Line	0.25	3.25	117.0	118.3
Block 1	W	1	E->W	Lee	Line	0.25	25.00	117.0	127.2
Block 1	W	1	E->W	Lee	Line	0.25	25.00	117.0	127.2
Block 1	W	Min	E->W	Lee	Line	0.25	25.00	90.0	97.8
Block 1	W	Min	E->W	Lee	Line	0.25	25.00	90.0	97.8
Block 1	W	Min	E->W	Lee	Line	25.00	25.50	187.8	188.0
Block 1	W	Min	E->W	Lee	Line	25.00	25.50	187.8	188.0
Block 1	W	1	E->W	Lee	Line	25.00	25.50	244.2	244.4
Block 1	W	1	E->W	Lee	Line	25.00	25.50	244.2	244.4
Block 1	W	1	E->W	Lee	Line	25.50	48.25	244.4	234.0
Block 1	W	Min	E->W	Lee	Line	25.50	48.25	188.0	180.0
Block 1	W	Min	E->W	Lee	Line	25.50	48.25	188.0	180.0
Block 1	W	1	E->W	Lee	Line	25.50	48.25	244.4	234.0
Block 1	E	1	E->W	Wind	Line	0.25	3.25	176.5	178.4
Block 1	E	Min	E->W	Wind	Line	0.25	3.25	90.0	91.0
Block 1	E	Min	E->W	Wind	Line	0.25	3.25	90.0	91.0
Block 1	E	1	E->W	Wind	Line	0.25	3.25	176.5	178.4
Block 1	S	1	S->N	Wind	Line	0.00	8.25	172.7	
Block 1	S	Min	S->N	Wind	Line	0.00	8.25	94.0	
Block 1	S	Min	S->N	Wind	Line	0.00	8.25	94.0	
Block 1	S	1	S->N	Wind	Line	0.00	8.25	172.7	
Block 1	S	Min	S->N	Wind	Line	8.25	23.75	184.0	
Block 1	S	1	S->N	Wind	Line	8.25	23.75	349.2	
Block 1	S	1	S->N	Wind	Line	8.25	23.75	349.2	
Block 1	S	Min	S->N	Wind	Line	8.25	23.75	184.0	
Block 1	N	Min	S->N	Lee	Line	0.00	21.25	94.0	
Block 1	N	1	S->N	Lee	Line	0.00	21.25	79.5	
Block 1	N	1	S->N	Lee	Line	0.00	21.25	79.5	
Block 1	N	Min	S->N	Lee	Line	0.00	21.25	94.0	
Block 1	S	Min	N->S	Lee	Line	0.00	8.25	94.0	
Block 1	S	1	N->S	Lee	Line	0.00	8.25	79.5	
Block 1	S	1	N->S	Lee	Line	0.00	8.25	79.5	
Block 1	S	Min	N->S	Lee	Line	0.00	8.25	94.0	
Block 1	S	1	N->S	Lee	Line	8.25	23.75	149.2	
Block 1	S	Min	N->S	Lee	Line	8.25	23.75	184.0	
Block 1	S	Min	N->S	Lee	Line	8.25	23.75	184.0	
Block 1	S	1	N->S	Lee	Line	8.25	23.75	149.2	
Block 1	N	1	N->S	Wind	Line	0.00	21.25	172.7	
Block 1	N	Min	N->S	Wind	Line	0.00	21.25	94.0	
Block 1	N	Min	N->S	Wind	Line	0.00	21.25	94.0	
Block 1	N	1	N->S	Wind	Line	0.00	21.25	172.7	
Block 2	S	Min	S->N	Wind	Line	30.00	60.25	183.8	
Block 2	S	1	S->N	Wind	Line	30.00	60.25	349.4	
Block 2	S	Min	S->N	Wind	Line	30.00	60.25	183.8	
Block 2	S	1	S->N	Wind	Line	30.00	60.25	349.4	
Block 2	S	1	N->S	Lee	Line	30.00	60.25	221.0	
Block 2	S	Min	N->S	Lee	Line	30.00	60.25	183.8	
Block 2	S	1	N->S	Lee	Line	30.00	60.25	221.0	
Block 2	S	Min	N->S	Lee	Line	30.00	60.25	183.8	
Block 3	E	1	W->E	Lee	Line	14.25	25.50	247.5	262.7
Block 3	E	Min	W->E	Lee	Line	14.25	25.50	190.5	202.2

WIND SHEAR LOADS (overlapping loads combined) (continued)

Block 3	E	1	W->E	Lee	Line	14.25	25.50	247.5	262.7
Block 3	E	Min	W->E	Lee	Line	14.25	25.50	190.5	202.2
Block 3	E	Min	E->W	Wind	Line	14.25	25.50	190.5	202.2
Block 3	E	1	E->W	Wind	Line	14.25	25.50	374.6	398.9
Block 3	E	1	E->W	Wind	Line	14.25	25.50	374.6	398.9
Block 3	E	Min	E->W	Wind	Line	14.25	25.50	190.5	202.2

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	1	40.4	47.7
Block 1	East	Leeward	1	40.4	47.7
Block 1	West	Leeward	1	40.4	47.7
Block 1	East	Windward	1	40.4	47.7
Block 1	South	Windward	1	37.5	44.1
Block 1	North	Leeward	1	37.5	44.1
Block 1	South	Leeward	1	37.5	44.1
Block 1	North	Windward	1	37.5	44.1
Block 2	East	Leeward	1	40.4	47.7
Block 2	East	Windward	1	40.4	47.7
Block 2	South	Windward	1	37.5	44.1
Block 2	North	Leeward	1	37.5	44.1
Block 2	South	Leeward	1	37.5	44.1
Block 2	North	Windward	1	37.5	44.1
Block 3	East	Leeward	1	40.4	47.7
Block 3	East	Windward	1	40.4	47.7
Block 3	North	Leeward	1	37.5	44.1
Block 3	North	Windward	1	37.5	44.1

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	1	Line		0.00	8.25	400.0*	
A	1	Line		8.25	23.75	400.0*	
	1	Line		23.75	30.00	400.0*	
	1	Line		30.00	38.00	400.0*	
	1	Line		38.00	60.25	400.0*	
	1	Line		60.25	80.25	400.0*	
B	1	Line		0.00	21.25	400.0*	
B	1	Line		21.25	51.25	400.0*	
B	1	Line		51.25	80.25	400.0*	
1	1	Line		0.25	25.00	400.0*	
1	1	Line		25.00	48.25	400.0*	
2	1	Line		0.25	3.25	400.0*	
3	1	Line		3.25	8.25	400.0*	
4	1	Line		8.25	14.25	400.0*	
4	1	Line		14.25	34.75	400.0*	
4	1	Line		34.75	48.25	400.0*	

BUILDING MASSES

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	Roof	Block 1	1	Line	0.25	48.25	178.1	178.1	
E-W	Roof	Block 1	2	Line	0.25	48.25	178.1	178.1	
E-W	Roof	Block 2	2	Line	3.25	48.25	273.8	273.8	
E-W	Roof	Block 2	3	Line	3.25	48.25	273.8	273.8	
E-W	Roof	Block 3	3	Line	8.25	48.25	150.0	150.0	
E-W	Roof	Block 3	4	Line	8.25	48.25	150.0	150.0	
E-W	R Gable	Block 1	1	Line	0.25	25.50	20.0	0.0	
E-W	L Gable	Block 1	1	Line	25.50	48.25	0.0	20.0	
E-W	L Gable	Block 1	2	Line	0.25	25.50	20.0	0.0	
E-W	R Gable	Block 1	2	Line	25.50	48.25	0.0	20.0	
E-W	L Gable	Block 2	3	Line	3.25	25.50	18.8	0.0	
E-W	R Gable	Block 2	3	Line	25.50	48.25	0.0	18.8	
E-W	L Gable	Block 3	4	Line	8.25	25.50	16.7	0.0	
E-W	R Gable	Block 3	4	Line	25.50	48.25	0.0	16.7	
N-S	Roof	Block 1	A	Line	0.00	23.75	360.0	360.0	
N-S	Roof	Block 1	B	Line	0.00	23.75	360.0	360.0	
N-S	Roof	Block 2		Line	23.75	60.25	337.5	337.5	
N-S	Roof	Block 2	B	Line	23.75	60.25	337.5	337.5	
N-S	Roof	Block 3		Line	60.25	80.25	300.0	300.0	
N-S	Roof	Block 3	B	Line	60.25	80.25	300.0	300.0	
Both	Wall 1-1	n/a	1	Line	0.25	25.00	200.0	200.0	
Both	Wall 1-2	n/a	1	Line	25.00	48.25	200.0	200.0	
Both	Wall 2-1	n/a	2	Line	0.25	3.25	200.0	200.0	
Both	Wall 3-1	n/a	3	Line	3.25	8.25	200.0	200.0	
Both	Wall 4-1	n/a	4	Line	8.25	14.25	200.0	200.0	
Both	Wall 4-2	n/a	4	Line	14.25	34.75	200.0	200.0	
Both	Wall 4-3	n/a	4	Line	34.75	48.25	200.0	200.0	
Both	Wall A-1	n/a	A	Line	0.00	8.25	200.0	200.0	
Both	Wall A-2	n/a	A	Line	8.25	23.75	200.0	200.0	
Both	Wall A-3	n/a		Line	23.75	30.00	200.0	200.0	
Both	Wall A-4	n/a		Line	30.00	38.00	200.0	200.0	
Both	Wall A-5	n/a		Line	38.00	60.25	200.0	200.0	
Both	Wall B-1	n/a		Line	60.25	80.25	200.0	200.0	
Both	Wall C-1	n/a	B	Line	0.00	21.25	200.0	200.0	
Both	Wall C-2	n/a	B	Line	21.25	51.25	200.0	200.0	
Both	Wall C-3	n/a	B	Line	51.25	80.25	200.0	200.0	

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 1 Force Dir	Profile	Location [ft] Start	Location [ft] End	Mag [lbs,plf,psf] Start	Mag [lbs,plf,psf] End
E-W	Point	0.25	0.25	741	741
E-W	Line	0.25	3.25	117.9	118.7
E-W	Point	3.25	3.25	1138	1138
E-W	Line	3.25	8.25	204.0	205.9
E-W	Point	8.25	8.25	624	624
E-W	Line	8.25	14.25	252.7	255.9
E-W	Line	14.25	25.00	255.9	261.6
E-W	Line	25.00	25.50	261.6	261.8
E-W	Line	25.50	34.75	261.8	257.1
E-W	Line	34.75	48.25	257.1	250.1
E-W	Point	48.25	48.25	2503	2503
N-S	Point	0.00	0.00	1572	1572
N-S	Line	0.00	8.25	174.7	174.7
N-S	Line	8.25	21.25	174.7	174.7
N-S	Line	21.25	23.75	174.7	174.7
N-S	Point	23.75	23.75	168	168
N-S	Line	23.75	30.00	167.6	167.6
N-S	Line	30.00	38.00	167.6	167.6
N-S	Line	38.00	51.25	167.6	167.6
N-S	Line	51.25	60.25	167.6	167.6
N-S	Point	60.25	60.25	222	222
N-S	Line	60.25	80.25	155.9	155.9
N-S	Point	80.25	80.25	1299	1299

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.

Components and Cladding Wind Loads, Out-of-plane Sheathing
All shearwalls have sufficient design capacity.

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

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

HOLD-DOWN DESIGN

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

Seismic Loads, Flexible 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.

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

This Design Summary does not include failures that occur due to excessive story drift from ASCE 7 12.12 (seismic).
Refer to Story Drift table in this report to verify this design criterion.
Refer to the Deflection table for possible issues regarding fastener slippage (SDPWS Table C4.2.3D).

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	Allowable Shear [plf] Ext	Co	C	Allowable Shear [plf] Cmb	V [lbs]	Resp. Ratio
Line 1														
Level 1														
Ln1, Lev1	-	S->N	-	-	9148	-	-	-	-	-		-	21872	-
	-	N->S	-	-	7807	-	-	-	-	-		-	21872	-
Wall 1-2	1	S->N	-	-	9148	-	1.0	-	658	-		-	21872	-
	1	N->S	-	-	7807	-	1.0	-	658	-		-	21872	-
Seg. 1	-	S->N	412.7	250.8	1651	-	1.0	-	658	-		658	2631	0.63
	-	N->S	352.2	214.1	1409	-	1.0	-	658	-		658	2631	0.54
Open. 1	-	S->N	-	323.7	1942	-	-	-	658	-		658	3947	0.49
	-	N->S	-	276.2	1657	-	-	-	658	-		658	3947	0.42
Seg. 2	-	S->N	586.4	220.2	4691	-	1.0	-	658	-		658	5262	0.89
	-	N->S	500.5	187.9	4004	-	1.0	-	658	-		658	5262	0.76
Open. 2	-	S->N	-	323.7	2913	-	-	-	658	-		658	5920	0.49
	-	N->S	-	276.2	2486	-	-	-	658	-		658	5920	0.42
Seg. 3	-	S->N	448.9	244.5	2805	-	1.0	-	658	-		658	4111	0.68
	-	N->S	383.1	208.6	2394	-	1.0	-	658	-		658	4111	0.58
Line 4														
Ln4, Lev1	-	S->N	-	-	8512	-	-	-	-	-		-	13485	-
	-	N->S	-	-	7694	-	-	-	-	-		-	13485	-
Wall 4-2	1^	S->N	415.2	-	8512	-	1.0	-	658	-		658	13485	0.63
	1	N->S	375.3	-	7694	-	1.0	-	658	-		658	13485	0.57

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	Allowable Shear [plf] Ext	Co	C	Allowable Shear [plf] Cmb	V [lbs]	Resp. Ratio
Line A														
Level 1														
LnA, Lev1	-	W->E	-	-	6384	-	-	-	-	-		-	27562	-
	-	E->W	-	-	6700	-	-	-	-	-		-	27562	-
Wall A-2	1	W->E	152.4	-	2362	-	1.0	-	658	-		658	10196	0.23
	1	E->W	159.9	-	2479	-	1.0	-	658	-		658	10196	0.24
Wall A-4	1	W->E	121.9	-	975	-	.80	-	658	-		526	4210	0.23
	1	E->W	127.9	-	1023	-	.80	-	658	-		526	4210	0.24
Wall A-6	1	W->E	152.4	-	3047	-	1.0	-	658	-		658	13156	0.23
	1	E->W	159.9	-	3198	-	1.0	-	658	-		658	13156	0.24
Line B														
LnB, Lev1	-	W->E	-	-	7537	-	-	-	-	-		-	19734	-
	-	E->W	-	-	7748	-	-	-	-	-		-	19734	-
Wall B-2	1	W->E	251.2	-	7537	-	1.0	-	658	-		658	19734	0.38
	1	E->W	258.3	-	7748	-	1.0	-	658	-		658	19734	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 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 – Unblocked wood structural panel factor Cub from SDPWS 4.3.5.3 or Aspect Ratio factor from 4.3.5.5.1, which for perforated walls is sum bi / FHS from 4.3.5.6 with bi defined in 4.3.3.4. For multi-segment walls, wall row shows Cub and segment rows show Asp. For single-segment walls and perforated walls, value shown is Asp for blocked walls and Cub for unblocked walls.
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											
1-2	L End	0.00	15.13	1	6056	3990		2066	HDU8-SDS	7870	0.26
1-2	L End	0.00	15.13	1	5168	6650		11818	Compression	15469	0.76
1-2	R End	0.00	48.13	1	5168	3990		1178	HDU8-SDS	7870	0.15
1-2	R End	0.00	48.13	1	6056	6650		12705	Compression	16758	0.76
Line 4											
4-2	L End	80.25	14.38	1	9189	2460		6729	HDU8-SDS	7870	0.86
4-2	L End	80.25	14.38	1	8306	4100		12406	Compression	15469	0.80
4-2	R End	80.25	34.63	1	8306	2460		5846	HDU8-SDS	7870	0.74
4-2	R End	80.25	34.63	1	9189	4100		13289	Compression	15469	0.86
Line A											
A-2	L End	8.38	0.25	1	3097	1860		1237	HTT4 16d	4235	0.29
A-2	L End	8.38	0.25	1	3251	3100		6351	Compression	10312	0.62
A-2	R End	23.63	0.25	1	3251	1860		1391	HTT4 16d	4235	0.33
A-2	R End	23.63	0.25	1	3097	3100		6197	Compression	10312	0.60
A-4	L End	30.13	3.25	1	2517	960		1557	HTT4 16d	4235	0.37
A-4	L End	30.13	3.25	1	2641	1600		4241	Compression	10312	0.41
A-4	R End	37.88	3.25	1	2641	960		1681	HTT4 16d	4235	0.40
A-4	R End	37.88	3.25	1	2517	1600		4116	Compression	10312	0.40
A-6	L End	60.38	6.25	1	3086			3086	HTT4 16d	4235	0.73
A-6	L End	60.38	6.25	1	3239			3239	Compression	10312	0.31
A-6	R End	80.13	6.25	1	3239			3239	HTT4 16d	4235	0.76
A-6	R End	80.13	6.25	1	3086			3086	Compression	10312	0.30
Line B											
B-2	L End	21.38	48.25	1	5067	3600		1467	HTT4 16d	4235	0.35
B-2	L End	21.38	48.25	1	5209	6000		11209	Compression	15469	0.72
B-2	R End	51.13	48.25	1	5209	3600		1609	HTT4 16d	4235	0.38
B-2	R End	51.13	48.25	1	5067	6000		11066	Compression	15469	0.72

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'-4.5" and depth > 0'-3.5" : Uses 20 1/4" x 2.5" SDS heavy-duty screws; 7/8" anchor bolt.
HTT4 (18-16d x 2.5) for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 18 0.162" x 2.5" 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 1								
1-2	Left Wall End	0.00	15.00		-2811	2399		
1-2	Left Opening 1	0.00	19.00		-2570	2193		
1-2	Right Opening 1	0.00	25.00		-1771	1512		
1-2	Left Opening 2	0.00	33.00		-1535	1310		
1-2	Right Opening 2	0.00	42.00		-337	287		
1-2	Left Opening 1	0.00	19.00				647	552
1-2	Right Opening 1	0.00	25.00				1295	1105
1-2	Left Opening 2	0.00	33.00				1635	1396
1-2	Right Opening 2	0.00	42.00				1278	1090
Line 4								
4-2	Left Wall End	80.25	14.25		-1621	1466		
4-2	Right Wall End	80.25	34.75		2736	-2473		
Line A								
A-2	Left Wall End	8.25	0.25		-656	689		
A-2	Right Wall End	23.75	0.25		472	-496		
A-4	Left Wall End	30.00	3.25		-25	26		
A-4	Right Wall End	38.00	3.25		314	-329		
A-6	Left Wall End	60.25	6.25		-1456	1528		
Line B								
B-2	Left Wall End	21.25	48.25		-1996	2052		
B-2	Right Wall End	51.25	48.25		2723	-2800		

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 1														
1-2	1	W->E	-	-	33.25	20.00	-	-	-	-	-	-	-	1.71
		E->W	-	-	33.25	20.00	-	-	-	-	-	-	-	1.56
1-2,1		S->N	ExtS	412.7	4.00	18.75	19.8	.199	32.6	219	.016	.237	1.74	2.17
		N->S	ExtS	352.2	4.00	18.75	19.8	.170	32.6	219	.016	.203	1.63	2.00
1-2,2		S->N	ExtS	586.4	8.00	17.50	16.5	.136	32.6	219	.016	.315	1.03	1.48
		N->S	ExtS	500.5	8.00	17.50	16.5	.116	32.6	219	.016	.269	0.87	1.26
1-2,3		S->N	ExtS	448.9	6.25	18.75	19.8	.138	32.6	219	.016	.258	1.07	1.46
		N->S	ExtS	383.1	6.25	18.75	19.8	.118	32.6	219	.016	.220	1.10	1.43
Line 4														
4-2	1	S->N	ExtS	415.2	20.50	20.00	24.8	.037	32.6	219	.016	.255	0.33	0.63
		N->S	ExtS	375.3	20.50	20.00	24.8	.034	32.6	219	.016	.230	0.32	0.58
Line A														
A-2	1	W->E	ExtS	152.4	15.50	20.00	16.5	.027	32.6	219	.016	.093	0.34	0.46
		E->W	ExtS	159.9	15.50	20.00	16.5	.029	32.6	219	.016	.098	0.35	0.48
A-4	1	W->E	ExtS	121.9	8.00	20.00	16.5	.042	32.6	219	.016	.075	0.69	0.80
		E->W	ExtS	127.9	8.00	20.00	16.5	.044	32.6	219	.016	.078	0.70	0.82
A-6	1	W->E	ExtS	152.4	20.00	20.00	16.5	.021	32.6	219	.016	.093	0.31	0.43
		E->W	ExtS	159.9	20.00	20.00	16.5	.022	32.6	219	.016	.098	0.32	0.44
Line B														
B-2	1	W->E	ExtS	251.2	30.00	20.00	24.8	.015	32.6	219	.016	.154	0.18	0.35
		E->W	ExtS	258.3	30.00	20.00	24.8	.016	32.6	219	.016	.158	0.19	0.36

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 ij / (i + j) 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, varies linearly to value at capacity 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	Tens. 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 1													
1-2,1	S->N	HDU8-SDS	8253	.119	.003	0.122	-	-	.209	9453	0.02	0.35	1.74
	N->S	HDU8-SDS	6324	.103	.002	0.105	-	-	.209	7044	0.01	0.33	1.63
1-2,2	S->N	HDU8-SDS	8914	.145	.003	0.148	-	-	.209	13994	0.10	0.46	1.03
	N->S	HDU8-SDS	7001	.114	.003	0.116	-	-	.209	11841	0.06	0.39	0.87
1-2,3	S->N	HDU8-SDS	6937	.113	.003	0.115	-	-	.209	10017	0.02	0.34	1.07
	N->S	HDU8-SDS	6732	.097	.002	0.099	-	-	.209	10532	0.04	0.35	1.10
Line 4													
4-2	S->N	HDU8-SDS	6729	.097	.002	0.099	-	-	.209	13289	0.03	0.34	0.33
	N->S	HDU8-SDS	5846	.084	.002	0.086	-	-	.209	12406	0.03	0.32	0.32
Line A													
A-2	W->E	HTT4 16d	1237	.036	.001	0.037	-	-	.209	6197	0.02	0.26	0.34
	E->W	HTT4 16d	1391	.040	.001	0.042	-	-	.209	6351	0.02	0.27	0.35
A-4	W->E	HTT4 16d	1557	.045	.001	0.047	-	-	.209	4117	0.01	0.27	0.69
	E->W	HTT4 16d	1681	.049	.001	0.050	-	-	.209	4241	0.01	0.27	0.70
A-6	W->E	HTT4 16d	3086	.090	.003	0.092	-	-	.209	3086	0.01	0.31	0.31
	E->W	HTT4 16d	3239	.094	.003	0.097	-	-	.209	3239	0.01	0.31	0.32
Line B													
B-2	W->E	HTT4 16d	1467	.043	.001	0.044	-	-	.209	11067	0.02	0.27	0.18
	E->W	HTT4 16d	1609	.047	.001	0.048	-	-	.209	11209	0.02	0.28	0.19

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. – Accumulated ASD hold-down tension force T and end stud compression force C from overturning, dead and wind uplift 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 tension 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
1	106753	3582.5	11653	11653	33783	25255	21641	21641	21641	21641
All	**106753**	-	**11653**	**11653**	-	-	-	-	-	-

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.

Redundancy Factor p (rho):
E-W 1.00, N-S 1.00
Automatically calculated according to ASCE 7 12.3.4.2.

Vertical Earthquake Load Ev
Ev = 0.2 Sds D; Sds = 1.01; Ev = 0.203 D unfactored; 0.142 D factored; total dead load factor: 0.6 - 0.142 = 0.458 tension, 1.0 + 0.142 = 1.142 compression.

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 1														
Ln1, Lev1	-	Both	-	-	6009	-	-	-	-	-		-	15623	-
Wall 1-2	1	Both	-	-	6009	-	1.0	-	470	-		-	15623	-
Seg. 1	-	Both	271.1	164.8	1084	-	1.0	-	470	-		470	1879	0.58
Open. 1	-	Both	-	212.6	1276	-	-	-	470	-		470	2819	0.45
Seg. 2	-	Both	385.2	144.6	3082	-	1.0	-	470	-		470	3759	0.82
Open. 2	-	Both	-	212.6	1914	-	-	-	470	-		470	4229	0.45
Seg. 3	-	Both	294.9	160.6	1843	-	1.0	-	470	-		470	2937	0.63
Line 4														
Ln4, Lev1	-	Both	-	-	5643	-	-	-	-	-		-	9632	-
Wall 4-2	1	Both	275.3	-	5643	-	1.0	-	470	-		470	9632	0.59

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 1														
LnA, Lev1	-	Both	-	-	5860	-	-	-	-	-		-	19687	-
Wall A-2	1	Both	139.9	-	2168	-	1.0	-	470	-		470	7283	0.30
Wall A-4	1	Both	111.9	-	895	-	.80	-	470	-		376	3007	0.30
Wall A-6	1	Both	139.9	-	2797	-	1.0	-	470	-		470	9397	0.30
Line B														
LnB, Lev1	-	Both	-	-	5793	-	-	-	-	-		-	14096	-
Wall B-2	1	Both	193.1	-	5793	-	1.0	-	470	-		470	14096	0.41

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 – Unblocked wood structural panel factor Cub from SDPWS 4.3.5.3 or Aspect Ratio factor from 4.3.5.5.1, which for perforated walls is sum bi / FHS from 4.3.5.6 with bi defined in 4.3.3.4. For multi-segment walls, wall row shows Cub and segment rows show Asp. For single-segment walls and perforated walls, value shown is Asp for blocked walls and Cub for unblocked walls.
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.
The contribution to shear resistance from gypsum, fiberboard, or lumber sheathing is taken as zero because of the Design setting for ignoring contribution was set. Refer to the Sheathing Materials table for the wall groups affected.

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										
1-2	L End	0.00	15.13	3978	3990	944	932	HDU8-SDS	7870	0.12
1-2	L End	0.00	15.13	3978	6650	944	11572	Compression	15469	0.75
1-2	R End	0.00	48.13	3978	3990	944	932	HDU8-SDS	7870	0.12
1-2	R End	0.00	48.13	3978	6650	944	11572	Compression	16758	0.69
Line 4										
4-2	L End	80.25	14.38	6093	2460	582	4214	HDU8-SDS	7870	0.54
4-2	L End	80.25	14.38	6093	4100	582	10774	Compression	15469	0.70
4-2	R End	80.25	34.63	6093	2460	582	4214	HDU8-SDS	7870	0.54
4-2	R End	80.25	34.63	6093	4100	582	10774	Compression	15469	0.70
Line A										
A-2	L End	8.38	0.25	2843	1860	440	1423	HTT4 16d	4235	0.34
A-2	L End	8.38	0.25	2843	3100	440	6383	Compression	10312	0.62
A-2	R End	23.63	0.25	2843	1860	440	1423	HTT4 16d	4235	0.34
A-2	R End	23.63	0.25	2843	3100	440	6383	Compression	10312	0.62
A-4	L End	30.13	3.25	2310	960	227	1577	HTT4 16d	4235	0.37
A-4	L End	30.13	3.25	2310	1600	227	4137	Compression	10312	0.40
A-4	R End	37.88	3.25	2310	960	227	1577	HTT4 16d	4235	0.37
A-4	R End	37.88	3.25	2310	1600	227	4137	Compression	10312	0.40
A-6	L End	60.38	6.25	2832			2832	HTT4 16d	4235	0.67
A-6	L End	60.38	6.25	2832			2832	Compression	10312	0.27
A-6	R End	80.13	6.25	2832			2832	HTT4 16d	4235	0.67
A-6	R End	80.13	6.25	2832			2832	Compression	10312	0.27
Line B										
B-2	L End	21.38	48.25	3895	3600	851	1146	HTT4 16d	4235	0.27
B-2	L End	21.38	48.25	3895	6000	851	10746	Compression	15469	0.69
B-2	R End	51.13	48.25	3895	3600	851	1146	HTT4 16d	4235	0.27
B-2	R End	51.13	48.25	3895	6000	851	10746	Compression	15469	0.69

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 = 0.237 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'-4.5" and depth > 0'-3.5" : Uses 20 1/4" x 2.5" SDS heavy-duty screws; 7/8" anchor bolt.
HTT4 (18-16d x 2.5) for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 18 0.162" x 2.5" 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	Y	Drag Strut Force [lbs] --->	<---	Strap/Blocking Force [lbs] --->	<---
Line 1							
	Shearline force			11160	11160		
1-2	Left Wall End	0.00	15.00	-3429	3429		
1-2	Left Opening 1	0.00	19.00	-3135	3135		
1-2	Right Opening 1	0.00	25.00	-2161	2161		
1-2	Left Opening 2	0.00	33.00	-1872	1872		
1-2	Right Opening 2	0.00	42.00	-411	411		
1-2	Left Opening 1	0.00	19.00			425	425
1-2	Right Opening 1	0.00	25.00			851	851
1-2	Left Opening 2	0.00	33.00			1074	1074
1-2	Right Opening 2	0.00	42.00			839	839
Line 4							
	Shearline force			10481	10481		
4-2	Left Wall End	80.25	14.25	-1996	1996		
4-2	Right Wall End	80.25	34.75	3369	-3369		
Line A							
	Shearline force			10882	10882		
A-2	Left Wall End	8.25	0.25	-1119	1119		
A-2	Right Wall End	23.75	0.25	805	-805		
A-4	Left Wall End	30.00	3.25	-42	42		
A-4	Right Wall End	38.00	3.25	535	-535		
A-6	Left Wall End	60.25	6.25	-2482	2482		
Line B							
	Shearline force			10759	10759		
B-2	Left Wall End	21.25	48.25	-2849	2849		
B-2	Right Wall End	51.25	48.25	3888	-3888		

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 1														
1-2	1	W->E	-	-	33.25	20.00	-	-	-	-	-	-	-	1.67
		E->W	-	-	33.25	20.00	-	-	-	-	-	-	-	1.72
1-2,1		S->N	ExtS	387.3	4.00	18.75	19.8	.187	32.6	219	.016	.223	1.69	2.10
		N->S	ExtS	387.3	4.00	18.75	19.8	.187	32.6	219	.016	.223	1.70	2.11
1-2,2		S->N	ExtS	550.4	8.00	17.50	16.5	.128	32.6	219	.016	.295	1.08	1.50
		N->S	ExtS	550.4	8.00	17.50	16.5	.128	32.6	219	.016	.295	1.01	1.44
1-2,3		S->N	ExtS	421.3	6.25	18.75	19.8	.130	32.6	219	.016	.242	1.04	1.41
		N->S	ExtS	421.3	6.25	18.75	19.8	.130	32.6	219	.016	.242	1.25	1.62
Line 4														
4-2	1	Both	ExtS	393.3	20.50	20.00	24.8	.035	32.6	219	.016	.241	0.33	0.61
Line A														
A-2	1	Both	ExtS	199.8	15.50	20.00	16.5	.036	32.6	219	.016	.123	0.40	0.56
A-4	1	Both	ExtS	159.8	8.00	20.00	16.5	.055	32.6	219	.016	.098	0.78	0.93
A-6	1	Both	ExtS	199.8	20.00	20.00	16.5	.028	32.6	219	.016	.123	0.36	0.51
Line B														
B-2	1	Both	ExtS	275.9	30.00	20.00	24.8	.017	32.6	219	.016	.169	0.20	0.39

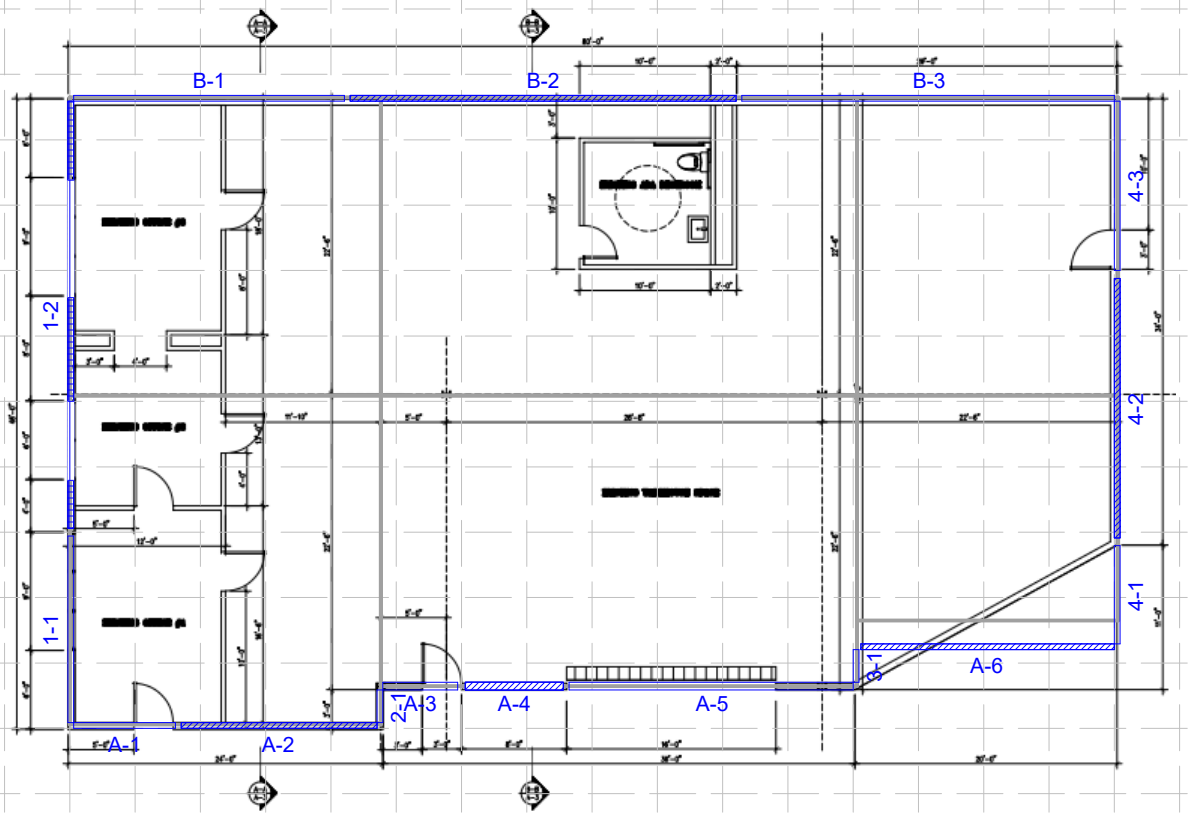
Legend:
Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B.
W Gp – Wall design group, refer to Sheathing and Framing Materials tables.
Dir – Force direction.
Srf – Wall surface = Int(erior) or Ext(erior) for perimeter walls, 1 or 2 for interior partitions; 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 ij / (i + j) 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, varies linearly to value at capacity 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	Tens. 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 1													
1-2,1	S->N	HDU8-SDS	5422	.111	.002	0.113	-	-	.209	9669	0.02	0.34	1.69
	N->S	HDU8-SDS	4872	.116	.002	0.118	-	-	.209	7746	0.01	0.34	1.70
1-2,2	S->N	HDU8-SDS	5677	.135	.002	0.137	-	-	.209	15391	0.13	0.48	1.08
	N->S	HDU8-SDS	5402	.129	.002	0.131	-	-	.209	14430	0.11	0.45	1.01
1-2,3	S->N	HDU8-SDS	4362	.104	.002	0.105	-	-	.209	10231	0.02	0.33	1.04
	N->S	HDU8-SDS	5187	.106	.002	0.108	-	-	.209	13116	0.08	0.40	1.25
Line 4													
4-2	Both	HDU8-SDS	4214	.086	.002	0.088	-	-	.209	15275	0.04	0.34	0.33
Line A													
A-2	Both	HTT4 16d	1423	.068	.001	0.069	-	-	.209	9030	0.03	0.31	0.40
A-4	Both	HTT4 16d	1577	.075	.001	0.076	-	-	.209	5864	0.02	0.30	0.78
A-6	Both	HTT4 16d	2832	.134	.002	0.137	-	-	.209	4046	0.01	0.36	0.36
Line B													
B-2	Both	HTT4 16d	1146	.054	.001	0.055	-	-	.209	15180	0.04	0.30	0.20

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. – Accumulated ASD hold-down tension force T and strength-level end compression force C from overturning, dead and vertical earthquake loads.
Tens. – ASD-factored force, used for proportion of manufacturer's maximum elongation
Comp. – Strength level force as per ASCE 12.8.6
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 tension 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)
T = Strength level tension force (not shown)
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

Level 1 of 1



NEW FLOOR PLAN/ NO CHANGE

Segmented Perforated FTAO Non-shearwall Non-wood / Proprietary Orange = Selected wall(s)