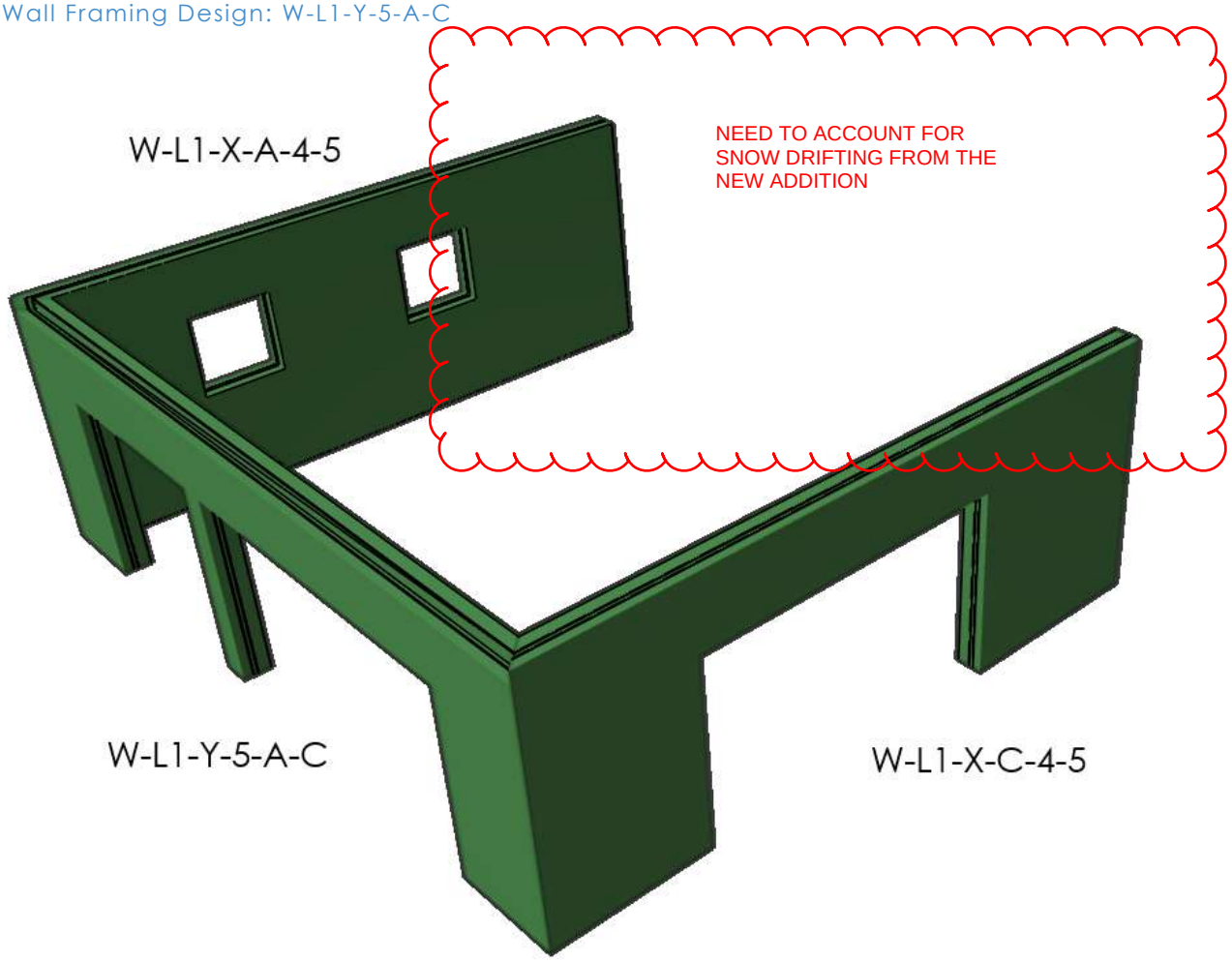
Wall Framing Design - Existing Area

First Storey Walls:

- Wall Framing Design: W-L1-X-A-4-5
- Wall Framing Design: W-L1-X-C-4-5
- Wall Framing Design: W-L1-Y-5-A-C



Wall Framing Design: W-L1-X-A-4-5

Components

Wall - Dimensions (L x H): 24.5 ft x 10 ft

Window Opening - Dimensions (L x H_{top}): 3.3 ft x 7.6 ft

Component	Section	Product / Species	Grade
Studs	2x6 @ 16 in O.C.	Southern Pine	Stud
Top plate	(2) 2x6	Southern Pine	Stud
Sill plate	2x6 Pressure Treated	Southern Pine	Stud

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Component	Section	Product / Species	Grade
Window Opening - Posts	(1) 2x6	Southern Pine	Stud
Window Opening - Lintel	(3) 2x6	Southern Pine	Stud

NB: Existing wall. Wood "Species" and "Grade" are assumed.

Loads

Source	Dead	Live	Snow	Wind	Width
Self-weight and wind	10 psf	-	-	16.4 psf	-
Roof - Existing area	15 psf	-	23.4 psf	-	17.1 ft

I WOULD USE 20 PSF FOR THIS LOAD

I WOULD USE 30 PSF, PLUS TAKE INTO ACCOUNT THE SNOW DRIFTING ALONG THE NEW ADDITION

Analysis and

Studs

Strength Checks (ASD)

Combination	Check Type	Action	Resistance	Ratio	Check
D + S	Buckling	P: 0.94 kip , f_c: 114.2 psi	F_c: 598 psi , C_P: 0.65	0.19	✔
D + 0.6 W	Buckling + Bending	P: 0.41 kip , f_c: 49.5 psi M: 0.16 kip-ft , f_b: 260.2 psi	F_c: 665.6 psi , C_P: 0.52 F_b: 1242 psi	0.23	✔
D + 0.75 S + 0.45 W	Buckling + Bending	P: 0.81 kip , f_c: 98 psi M: 0.12 kip-ft , f_b: 195.2 psi	F_c: 665.6 psi , C_P: 0.52 F_b: 1242 psi	0.20	✔
D + 0.6 W	Shear	V: 0.066 kip , f_v: 11.9 psi	F_v: 280 psi	0.04	✔
D + 0.75 S + 0.45 W	Shear	V: 0.049 kip , f_v: 8.95 psi	F_v: 280 psi	0.03	✔

Serviceability Checks

Combination	Check Type	Action	Limit	Ratio	Check
0.42 W	Deflection	d: 0.058 in	d_U: 0.33 in (L / 360)	0.18	✔

Top plate

Strength Checks (ASD)

Combination	Check Type	Action	Resistance	Ratio	Check
D + S	Bending	M: 0.16 kip-ft , f_b: 456.8 psi	F_b: 760.4 psi	0.60	✔
D + S	Shear	V: 0.47 kip , f_v: 42.8 psi	F_v: 201.2 psi	0.21	✔

Serviceability Checks

Combination	Check Type	Action	Limit	Ratio	Check
S	Deflection	d: 0.008 in	d_U: 0.044 in (L / 360)	0.18	✔

Combination	Check Type	Action	Limit	Ratio	Check
1.5 D + S	Deflection	d: 0.017 in	d_U: 0.067 in (L / 240)	0.26	✔

Window Opening - Posts

Strength Checks (ASD)

Combination	Check Type	Action	Resistance	Ratio	Check
D + S	Buckling	P: 1.17 kip , f_c: 141.3 psi	F_c: 598 psi , C_P: 0.65	0.24	✔
D + 0.6 W	Buckling + Bending	P: 0.51 kip , f_c: 61.3 psi M: 0.2 kip-ft , f_b: 322 psi	F_c: 665.6 psi , C_P: 0.52 F_b: 1242 psi	0.29	✔
D + 0.75 S + 0.45 W	Buckling + Bending	P: 1 kip , f_c: 121.3 psi M: 0.15 kip-ft , f_b: 241.5 psi	F_c: 665.6 psi , C_P: 0.52 F_b: 1242 psi	0.26	✔
D + 0.6 W	Shear	V: 0.081 kip , f_v: 14.8 psi	F_v: 280 psi	0.05	✔
D + 0.75 S + 0.45 W	Shear	V: 0.061 kip , f_v: 11.1 psi	F_v: 280 psi	0.04	✔

Serviceability Checks

Combination	Check Type	Action	Limit	Ratio	Check
0.42 W	Deflection	d: 0.072 in	d_U: 0.33 in (L / 360)	0.22	✔

Window Opening - Lintel

Strength Checks (ASD)

Combination	Check Type	Action	Resistance	Ratio	Check
D + S	Bending	M: 0.96 kip-ft , f_b: 508.8 psi	F_b: 661.2 psi	0.77	✔
D + S	Shear	V: 1.17 kip , f_v: 70.7 psi	F_v: 201.2 psi	0.35	✔

Serviceability Checks

Combination	Check Type	Action	Limit	Ratio	Check
S	Deflection	d: 0.017 in	d_U: 0.11 in (L / 360)	0.16	✔
1.5 D + S	Deflection	d: 0.037 in	d_U: 0.17 in (L / 240)	0.22	✔

Wall Framing Design: W-L1-X-C-4-5

Components

Wall - Dimensions (L x H): 24.5 ft x 10 ft

Wide Door - Dimensions (L x H_{top}): 12 ft x 7.1 ft

Component	Section	Product / Species	Grade

Component	Section	Product / Species	Grade
Studs	2x6 @ 16 in O.C.	Southern Pine	Stud
Top plate	(2) 2x6	Southern Pine	Stud
Sill plate	2x6 Pressure Treated	Southern Pine	Stud
Wide Door - Posts	(2) 2x6	Southern Pine	Stud
Wide Door - Lintel	(3) 2x12	Southern Pine	Select Structural

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NB: Existing wall. Wood "Species" and "Grade" are assumed.

Loads

Source	Dead	Live	Snow	Wind	Width
Self-weight and wind	10 psf	-	-	16.4 psf	-
Roof - Existing area	15 psf	-	23.4 psf	-	17.1 ft

I WOULD USE 20 PSF FOR THIS LOAD

I WOULD USE 30 PSF, PLUS TAKE INTO ACCOUNT THE SNOW DRIFTING ALONG THE NEW ADDITION

Analysis and

Studs

Strength Checks (ASD)

Combination	Check Type	Action	Resistance	Ratio	Check
D + S	Buckling	P: 0.94 kip , f_c: 114.2 psi	F_c: 598 psi , C_P: 0.65	0.19	✔
D + 0.6 W	Buckling + Bending	P: 0.41 kip , f_c: 49.5 psi M: 0.16 kip-ft , f_b: 260.2 psi	F_c: 665.6 psi , C_P: 0.52 F_b: 1242 psi	0.23	✔
D + 0.75 S + 0.45 W	Buckling + Bending	P: 0.81 kip , f_c: 98 psi M: 0.12 kip-ft , f_b: 195.2 psi	F_c: 665.6 psi , C_P: 0.52 F_b: 1242 psi	0.20	✔
D + 0.6 W	Shear	V: 0.066 kip , f_v: 11.9 psi	F_v: 280 psi	0.04	✔
D + 0.75 S + 0.45 W	Shear	V: 0.049 kip , f_v: 8.95 psi	F_v: 280 psi	0.03	✔

Serviceability Checks

Combination	Check Type	Action	Limit	Ratio	Check
0.42 W	Deflection	d: 0.058 in	d_U: 0.33 in (L / 360)	0.18	✔

Top plate

Strength Checks (ASD)

Combination	Check Type	Action	Resistance	Ratio	Check
D + S	Bending	M: 0.16 kip-ft , f_b: 456.8 psi	F_b: 760.4 psi	0.60	✔
D + S	Shear	V: 0.47 kip , f_v: 42.8 psi	F_v: 201.2 psi	0.21	✔

Serviceability Checks

Combination	Check Type	Action	Limit	Ratio	Check
S	Deflection	d: 0.008 in	d_U: 0.044 in (L / 360)	0.18	✔
1.5 D + S	Deflection	d: 0.017 in	d_U: 0.067 in (L / 240)	0.26	✔

Wide Door - Posts

Strength Checks (ASD)

Combination	Check Type	Action	Resistance	Ratio	Check
D + S	Buckling	P: 4.24 kip , f_c: 257 psi	F_c: 598 psi , C_P: 0.65	0.43	✔
D + 0.6 W	Buckling + Bending	P: 1.84 kip , f_c: 111.5 psi M: 0.74 kip-ft , f_b: 585.5 psi	F_c: 665.6 psi , C_P: 0.52 F_b: 1242 psi	0.57	✔
D + 0.75 S + 0.45 W	Buckling + Bending	P: 3.64 kip , f_c: 220.6 psi M: 0.55 kip-ft , f_b: 439.1 psi	F_c: 665.6 psi , C_P: 0.52 F_b: 1242 psi	0.59	✔
D + 0.6 W	Shear	V: 0.3 kip , f_v: 26.8 psi	F_v: 280 psi	0.10	✔
D + 0.75 S + 0.45 W	Shear	V: 0.22 kip , f_v: 20.1 psi	F_v: 280 psi	0.07	✔

Serviceability Checks

Combination	Check Type	Action	Limit	Ratio	Check
0.42 W	Deflection	d: 0.13 in	d_U: 0.33 in (L / 360)	0.39	✔

Wide Door - Lintel

Strength Checks (ASD)

Combination	Check Type	Action	Resistance	Ratio	Check
D + S	Bending	M: 12.7 kip-ft , f_b: 1608 psi	F_b: 1840 psi	0.87	✔
D + S	Shear	V: 4.24 kip , f_v: 125.6 psi	F_v: 201.2 psi	0.62	✔

Serviceability Checks

Combination	Check Type	Action	Limit	Ratio	Check
S	Deflection	d: 0.21 in	d_U: 0.4 in (L / 360)	0.53	✔
1.5 D + S	Deflection	d: 0.46 in	d_U: 0.6 in (L / 240)	0.76	✔

Wall Framing Design: W-L1-Y-5-A-C

Components

Wall - Dimensions (L x H): 28.9 ft x 10 ft

Wide Door 1 - Dimensions (L x H_{top}): 8 ft x 7.1 ft

Wide Door 2 - Dimensions (L x H_{top}): 13.2 ft x 7.1 ft

Component	Section	Product / Species	Grade
Studs	2x6 @ 16 in O.C.	Southern Pine	Stud
Top plate	(2) 2x6	Southern Pine	Stud
Sill plate	2x6 Pressure Treated	Southern Pine	Stud
Wide Door 1 - Posts	(2) 2x6	Southern Pine	Stud
Wide Door 1 - Lintel	(3) 2x12	Southern Pine	Stud
Wide Door 2 - Posts	(2) 2x6	Southern Pine	Stud
Wide Door 2 - Lintel	(3) 2x12	Southern Pine	Stud

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NB: Existing wall. Wood "Species" and "Grade" are assumed.

Loads

Source	Dead	Live	Snow	Wind	Width
Self-weight and wind	10 psf	-	-	16.4 psf	-
Roof - Existing area	15 psf	-	23.4 psf	-	2.3 ft

I WOULD USE 20 PSF FOR THIS LOAD

I WOULD USE 30 PSF, PLUS TAKE INTO ACCOUNT THE SNOW DRIFTING ALONG THE NEW ADDITION

Analysis and [

Studs

Strength Checks (ASD)

Combination	Check Type	Action	Resistance	Ratio	Check
D + S	Buckling	P: 0.18 kip , f_c: 22.4 psi	F_c: 598 psi , C_P: 0.65	0.04	✔
D + 0.6 W	Buckling + Bending	P: 0.11 kip , f_c: 13.7 psi M: 0.16 kip-ft , f_b: 260.2 psi	F_c: 665.6 psi , C_P: 0.52 F_b: 1242 psi	0.21	✔
D + 0.75 S + 0.45 W	Buckling + Bending	P: 0.17 kip , f_c: 20.2 psi M: 0.12 kip-ft , f_b: 195.2 psi	F_c: 665.6 psi , C_P: 0.52 F_b: 1242 psi	0.16	✔
D + 0.6 W	Shear	V: 0.066 kip , f_v: 11.9 psi	F_v: 280 psi	0.04	✔
D + 0.75 S + 0.45 W	Shear	V: 0.049 kip , f_v: 8.95 psi	F_v: 280 psi	0.03	✔

Serviceability Checks

Combination	Check Type	Action	Limit	Ratio	Check
0.42 W	Deflection	d: 0.058 in	d_U: 0.33 in (L / 360)	0.18	✔

Top plate

Strength Checks (ASD)

Combination	Check Type	Action	Resistance	Ratio	Check
D + S	Bending	M: 0.031 kip-ft , f_b: 89.4 psi	F_b: 760.4 psi	0.12	✔
D + S	Shear	V: 0.092 kip , f_v: 8.38 psi	F_v: 201.2 psi	0.04	✔

Serviceability Checks

Combination	Check Type	Action	Limit	Ratio	Check
S	Deflection	d: 0.001 in	d_U: 0.044 in (L / 360)	0.02	✔
1.5 D + S	Deflection	d: 0.004 in	d_U: 0.067 in (L / 240)	0.05	✔

Wide Door 1 - Posts

Strength Checks (ASD)

Combination	Check Type	Action	Resistance	Ratio	Check
D + S	Buckling	P: 0.55 kip , f_c: 33.5 psi	F_c: 598 psi , C_P: 0.65	0.06	✔
D + 0.6 W	Buckling + Bending	P: 0.34 kip , f_c: 20.5 psi M: 0.49 kip-ft , f_b: 390.3 psi	F_c: 665.6 psi , C_P: 0.52 F_b: 1242 psi	0.32	✔
D + 0.75 S + 0.45 W	Buckling + Bending	P: 0.5 kip , f_c: 30.3 psi M: 0.37 kip-ft , f_b: 292.8 psi	F_c: 665.6 psi , C_P: 0.52 F_b: 1242 psi	0.25	✔
D + 0.6 W	Shear	V: 0.2 kip , f_v: 17.9 psi	F_v: 280 psi	0.06	✔
D + 0.75 S + 0.45 W	Shear	V: 0.15 kip , f_v: 13.4 psi	F_v: 280 psi	0.05	✔

Serviceability Checks

Combination	Check Type	Action	Limit	Ratio	Check
0.42 W	Deflection	d: 0.088 in	d_U: 0.33 in (L / 360)	0.26	✔

Wide Door 1 - Lintel

Strength Checks (ASD)

Combination	Check Type	Action	Resistance	Ratio	Check
D + S	Bending	M: 1.11 kip-ft , f_b: 139.9 psi	F_b: 546.2 psi	0.26	✔
D + S	Shear	V: 0.55 kip , f_v: 16.4 psi	F_v: 201.2 psi	0.08	✔

Serviceability Checks

Combination	Check Type	Action	Limit	Ratio	Check
S	Deflection	d: 0.009 in	d_U: 0.27 in (L / 360)	0.03	✔
1.5 D + S	Deflection	d: 0.029 in	d_U: 0.4 in (L / 240)	0.07	✔

Wide Door 2 - Posts

Strength Checks (ASD)

Combination	Check Type	Action	Resistance	Ratio	Check
D + S	Buckling	P: 0.92 kip , f_c: 55.5 psi	F_c: 598 psi , C_P: 0.65	0.09	✔
D + 0.6 W	Buckling + Bending	P: 0.56 kip , f_c: 33.9 psi M: 0.81 kip-ft , f_b: 646.5 psi	F_c: 665.6 psi , C_P: 0.52 F_b: 1242 psi	0.55	✔
D + 0.75 S + 0.45 W	Buckling + Bending	P: 0.83 kip , f_c: 50.1 psi M: 0.61 kip-ft , f_b: 484.9 psi	F_c: 665.6 psi , C_P: 0.52 F_b: 1242 psi	0.42	✔
D + 0.6 W	Shear	V: 0.33 kip , f_v: 29.6 psi	F_v: 280 psi	0.11	✔
D + 0.75 S + 0.45 W	Shear	V: 0.24 kip , f_v: 22.2 psi	F_v: 280 psi	0.08	✔

Serviceability Checks

Combination	Check Type	Action	Limit	Ratio	Check
0.42 W	Deflection	d: 0.15 in	d_U: 0.33 in (L / 360)	0.44	✔

Wide Door 2 - Lintel

Strength Checks (ASD)

Combination	Check Type	Action	Resistance	Ratio	Check
D + S	Bending	M: 3.04 kip-ft , f_b: 383.7 psi	F_b: 546.2 psi	0.70	✔
D + S	Shear	V: 0.92 kip , f_v: 27.2 psi	F_v: 201.2 psi	0.13	✔

Serviceability Checks

Combination	Check Type	Action	Limit	Ratio	Check
S	Deflection	d: 0.058 in	d_U: 0.44 in (L / 360)	0.13	✔
1.5 D + S	Deflection	d: 0.19 in	d_U: 0.66 in (L / 240)	0.29	✔