

These calculations must be on site and made available by the Permittee for all inspections.

# STRUCTURAL CALCULATIONS FOR

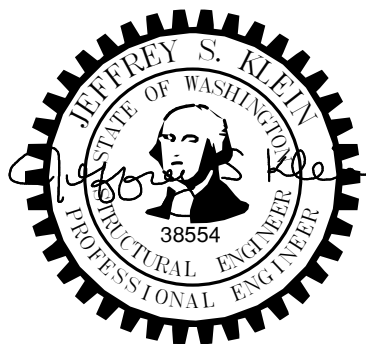
Todd Road Renovation  
320 Todd Road  
Puyallup, WA

**City of Puyallup**  
**Building**  
**REVIEWED**  
**FOR**  
**COMPLIANCE**

BSnowden  
08/28/2025  
1:52:30 PM



PREPARED BY  
**PCS STRUCTURAL SOLUTIONS**



July 15, 2025  
25-209

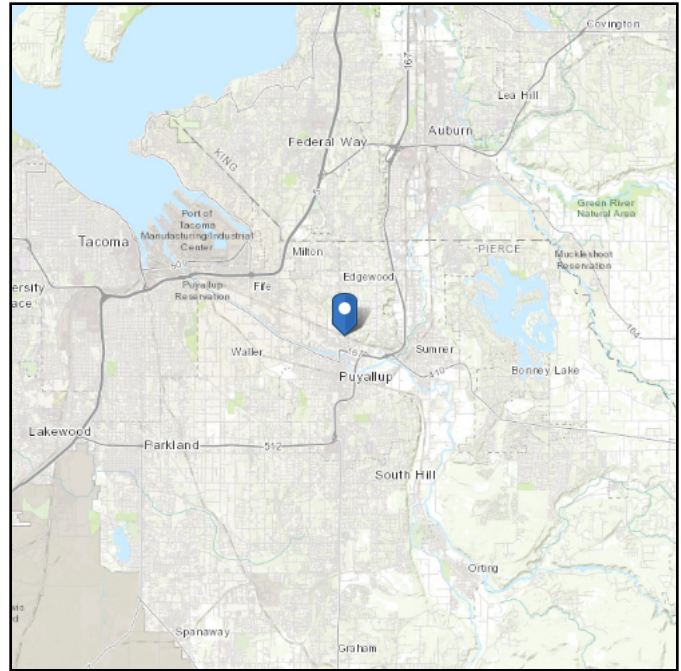
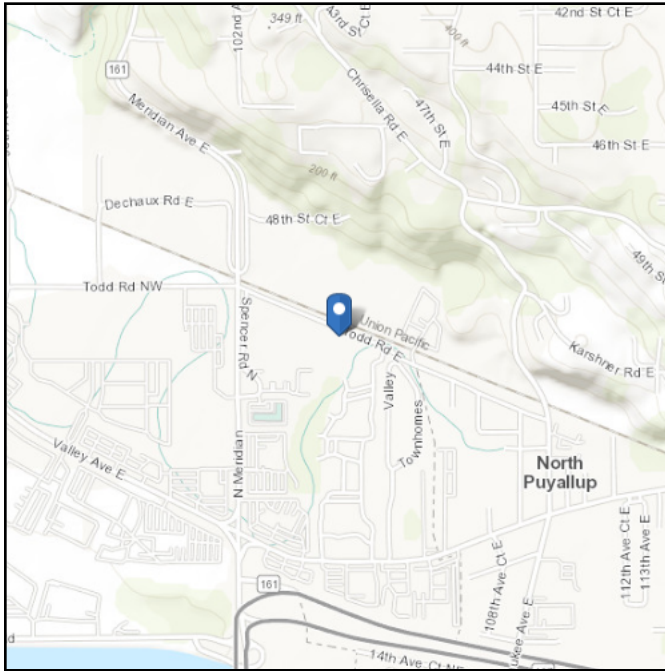
LATERAL CALCS

# ASCE Hazards Report

**Address:**  
320 Todd Rd NE  
Puyallup, Washington  
98372

**Standard:** ASCE/SEI 7-16  
**Risk Category:** II  
**Soil Class:** D - Default (see  
Section 11.4.3)

**Latitude:** 47.211045  
**Longitude:** -122.290326  
**Elevation:** 50.9429307148194 ft (NAVD  
88)



## Wind

### Results:

|              |         |
|--------------|---------|
| Wind Speed   | 98 Vmph |
| 10-year MRI  | 67 Vmph |
| 25-year MRI  | 73 Vmph |
| 50-year MRI  | 78 Vmph |
| 100-year MRI | 83 Vmph |

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Date Accessed: Tue Apr 15 2025

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

**Site Soil Class:** D - Default (see Section 11.4.3)

**Results:**

|            |       |                    |       |
|------------|-------|--------------------|-------|
| $S_S$ :    | 1.275 | $S_{D1}$ :         | N/A   |
| $S_1$ :    | 0.439 | $T_L$ :            | 6     |
| $F_a$ :    | 1.2   | PGA :              | 0.5   |
| $F_v$ :    | N/A   | PGA <sub>M</sub> : | 0.6   |
| $S_{MS}$ : | 1.531 | $F_{PGA}$ :        | 1.2   |
| $S_{M1}$ : | N/A   | $I_e$ :            | 1     |
| $S_{DS}$ : | 1.02  | $C_v$ :            | 1.355 |

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

**Data Accessed:** Tue Apr 15 2025

**Date Source:** [USGS Seismic Design Maps](#)

**Results:**

Ground Snow Load,  $p_g$  : 18 lb/ft<sup>2</sup>

Mapped Elevation: 50.9 ft

Data Source:

Date Accessed: Tue Apr 15 2025

Statutory requirements of the Authority Having Jurisdiction are not included.

Snow load values are mapped to a 0.5 mile resolution. This resolution can create a mismatch between the mapped elevation and the site-specific elevation in topographically complex areas. Engineers should consult the local authority having jurisdiction in locations where the reported 'elevation' and 'mapped elevation' differ significantly from each other.

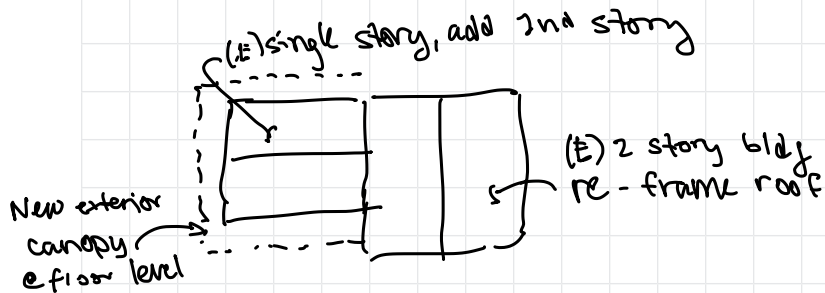
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Address: 320 Todd Road NE, Puyallup, Washington 98371



Roof Plan

No brick veneer, No gypcrete floors

New window locations

Exterior SW's

All wood framed



Project: Todd Road Job Number: 25-209  
Sheet: \_\_\_\_\_ of \_\_\_\_\_ Name: LMC  
Originating Office: Seattle Date: 4/28/2025

## DESIGN CRITERIA CHECKLIST

CODE: IBC 2021, ASCE 7-16 LOCATION: Puyallup, WA  
RISK CATEGORY: II (Per ASCE 7-16 Table 1.5-1 & IBC Table 1604.5)

### VERTICAL DESIGN CRITERIA

|        | DEAD          | LIVE          | PARTITION       | CONCENTRATED  |
|--------|---------------|---------------|-----------------|---------------|
| ROOF:  | <u>15 PSF</u> | <u>25 PSF</u> |                 |               |
| OFFICE | <u>15 PSF</u> | <u>50 PSF</u> | <u>+ 15 PSF</u> | <u>1000 #</u> |
|        |               |               |                 |               |
|        |               |               |                 |               |
|        |               |               |                 |               |
|        |               |               |                 |               |

### WIND DESIGN CRITERIA

BASIC WIND SPEED (V) = 98 MPH (Per ASCE 7-16 Sec. 26.5.1, Fig. 26.5-1A; 1B; 1C & 1D, or as required by Bld'g Dept.)  
EXPOSURE CATEGORY: B (Per ASCE 7-16 Section 26.7.3)  
DIRECTIONALITY FACTOR ( $K_d$ ): 0.85 (Per ASCE 7-16 Table 26.6-1)  
GUST EFFECT FACTOR (G): 0.85 (Per ASCE 7-16 Section 26.11)  
TOPOGRAPHIC FEATURE: None (See ASCE 7-16 Figure 26.8-1)   
HILL HEIGHT (H): 100 FT (See ASCE 7-16 Figure 26.8-1)  
UPWIND DISTANCE TO HALF HILL ( $L_h$ ): 100 FT (See ASCE 7-16 Figure 26.8-1)  
DISTANCE FROM CREST TO SITE (x): 100 FT UPWIND (See ASCE 7-16 Figure 26.8-1)  
MEAN ROOF HEIGHT: 20 FT (See ASCE 7-16 Section 26.2 - Definitions)  
ELEVATION: 0 FT (See ASCE 7-16 Section 26.9)  
ENCLOSURE CLASSIFICATION: Enclosed (See ASCE 7-16 Section 26.2 & Table 26.13-1)  
ROOF TYPE: Gable (See ASCE 7-16 Figure 27.3-1)  
ROOF SLOPE ( $\frac{\text{rise}}{\text{run}}$ ): 9.00:12 (Enter vertical rise in 12 horizontal units)  $\theta$  (degrees): 36.87

### SEISMIC DESIGN CRITERIA

SITE CLASS: D (Per IBC Section 1613.2.2, Assumed as "D" or per Geotech.)  
IMPORTANCE FACTOR ( $I_E$ ): 1 (Per ASCE 7-16 Table 1.5-2)  
STRUCTURAL SYSTEM (R): 6.5 (Per ASCE 7-16 Table 12.2-1)  
OVERSTRENGTH FACTOR ( $\Omega_o$ ): 2.5 (Per ASCE 7-16 Table 12.2-1)  
INFORMATION BELOW FROM "ASCE HAZARD TOOL"  
LATITUDE: 47.211  $S_s =$  1.275  $F_a =$  1.200  
LONGITUDE: 50.942  $S_1 =$  0.439  $F_v =$  1.850

### DEFLECTION CRITERIA

|                |               |  |               |               |
|----------------|---------------|--|---------------|---------------|
| FLOOR (LIVE):  | <u>L/ 480</u> |  | ROOF (LIVE):  | <u>L/ 360</u> |
| FLOOR (TOTAL): | <u>L/ 360</u> |  | ROOF (TOTAL): | <u>L/ 240</u> |
| WALLS:         | <u>L/ 360</u> |  | SPECIAL:      | <u>L/</u>     |

### SOIL DESIGN CRITERIA

REPORT: NO   
BEARING: 1500 PSF  
ACTIVE: 35 PCF  
PASSIVE: 200 PCF  
COEFFICIENT OF FRICTION: 0.35  
PILE TYPE: NONE  
VERTICAL CAPACITY: N/A  
UPLIFT CAPACITY: N/A  
MINIMUM FOOTING DIMENSIONS:  
CONTINUOUS: 1'-4"  
SPREAD: 1'-6"  
FROST DEPTH: 1'-6"  
LATERAL CAPACITY: N/A  
SIZE: N/A



Project: Todd Road

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Name: LMC

Originating Office: Seattle

Date: 04/28/25

**MATERIALS****CONCRETE**

|                 |          |
|-----------------|----------|
| Footings/Piles: | 3000 PSI |
| Slabs/Walls:    | 4000 PSI |
| -               | -        |

|          |          |
|----------|----------|
| Columns: | 4000 PSI |
| Beams:   | 4000 PSI |
| -        | -        |

**REINFORCING**Steel Grade = 60  $f_y = 60$  KSI**STRUCTURAL STEEL**

|                 |                    |                |
|-----------------|--------------------|----------------|
| W-Flange Beams  | ASTM A992          | $f_y = 50$ KSI |
| Shapes & Plates | ASTM A36           | $f_y = 36$ KSI |
| Pipes           | ASTM A53, Grade B  | $f_y = 35$ KSI |
| HSS Rect.       | ASTM A500, Grade C | $f_y = 50$ KSI |
| HSS Round       | ASTM A500, Grade C | $f_y = 46$ KSI |

**MASONRY**ASTM C90  $f_m = 2000$  PSI

SOLID GROUTED

**GLULAM BEAMS**Simple Spans24F-V4  
1.80E+06 PSI  
2400 PSI  
1850 PSI  
240 PSIGrade =  
E =  
 $F_{b(BOTTOM)} =$   
 $F_{b(TOP)} =$   
 $F_v =$ Cantilevers24F-V8  
1.80E+06 PSI  
2400 PSI  
2400 PSI  
240 PSI**SCL PRODUCTS**

|         | <u>2x SCL</u> | <u>1¾" SCL</u> | <u>3½, 5¼ SCL</u> |
|---------|---------------|----------------|-------------------|
| E =     | 1.30E+06 PSI  | 1.80E+06 PSI   | 2.00E+06 PSI      |
| $F_b =$ | 1700 PSI      | 2600 PSI       | 2900 PSI          |
| $F_v =$ | 285 PSI       | 285 PSI        | 285 PSI           |
| $F_c =$ | 1400 PSI      | 2400 PSI       | 2600 PSI          |

**FRAMING LUMBER**

|                            |              |              |              |
|----------------------------|--------------|--------------|--------------|
| <u>Joists &amp; Studs</u>  | 2x DF #2     | 2x HF #1     | -            |
| E =                        | 1.60E+06 PSI | 1.50E+06 PSI | -            |
| $F_b =$                    | 900 PSI      | 975 PSI      | -            |
| $F_v =$                    | 180 PSI      | 150 PSI      | -            |
| $F_c =$                    | 1350 PSI     | 1350 PSI     | -            |
| <u>Beams &amp; Headers</u> | 4x DF #2     | 4x HF #1     | 6x DF #1     |
| E =                        | 1.60E+06 PSI | 1.50E+06 PSI | 1.60E+06 PSI |
| $F_b =$                    | 900 PSI      | 975 PSI      | 1350 PSI     |
| $F_v =$                    | 180 PSI      | 150 PSI      | 170 PSI      |
| <u>Posts &amp; Timbers</u> | 6x DF #1     | -            | -            |
| E =                        | 1.60E+06 PSI | -            | -            |
| $F_c =$                    | 1000 PSI     | -            | -            |



Project: Todd Road

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Name: LMC

Originating Office: Seattle

Date: 04/28/25

**DESIGN CRITERIA - WIND**

BASIC WIND SPEED (V): 98 MPH  
RISK CATEGORY: II  
EXPOSURE CATEGORY: B  
DIRECTIONALITY FACTOR ( $K_d$ ): 0.85  
GUST EFFECT FACTOR (G): 0.85

MEAN ROOF HEIGHT: 20 FT  
GROUND ELEVATION FACTOR ( $K_e$ ): 1.00  
ENCLOSURE CLASSIFICATION: Enclosed  
ROOF TYPE: Gable  
ROOF SLOPE ( $\gamma$ ): 12: 9.0:12  
 $\theta$  (degrees): 36.87

| ROOF PRESSURES (Figure 27.3-1)                                                 |             |                                        |                                     |                   |                                           |
|--------------------------------------------------------------------------------|-------------|----------------------------------------|-------------------------------------|-------------------|-------------------------------------------|
|                                                                                |             | External Pressures ( $q_h^*(GC_p)$ ):  |                                     |                   | Internal Pressures ( $\pm q^*(GC_{pi})$ ) |
| Wind Direction:                                                                | h/L:        | Windward (Positive)                    | Windward (Negative)                 | Leeward           | All Roofs                                 |
| Normal to Ridge for $\theta \geq 10^\circ$                                     | $\leq 0.25$ | 4.4                                    | 0.0                                 | -6.6              | 2.3                                       |
|                                                                                | 0.50        | 3.5                                    | -1.8                                | -6.6              |                                           |
|                                                                                | $\geq 1.0$  | 2.4                                    | -1.8                                | -6.6              |                                           |
| Normal to Ridge for $\theta < 10^\circ$ and Parallel to Ridge for All $\theta$ | h/L:        | Horizontal Distance from Windward Edge | External Pressures ( $q^*(GC_p)$ ): |                   | Internal Pressures ( $\pm q^*(GC_{pi})$ ) |
|                                                                                |             |                                        | Positive Pressure                   | Negative Pressure | All Roofs                                 |
|                                                                                | $\leq 0.5$  | 0 to h                                 | -2.0                                | -9.9              | 2.3                                       |
|                                                                                |             | h to 2h                                |                                     | -5.5              |                                           |
|                                                                                |             | $> 2h$                                 |                                     | -3.3              |                                           |
|                                                                                | $> h/2$     | $> h/2$                                | -2.0                                | -14.3             |                                           |
|                                                                                |             |                                        |                                     | -7.7              |                                           |
|                                                                                |             |                                        |                                     | -7.7              |                                           |

**ASCE 7-16 CHAPTER 27: WIND LOADS ON BUILDINGS: MWFRS (DIRECTIONAL PROCEDURE)**  
**PART 1: ENCLOSED AND PARTIALLY ENCLOSED BUILDINGS OF ALL HEIGHTS**

**HORIZONTAL WALL PRESSURES (Figure 27.3-1)**

| Windward External Pressures ( $q_w^*(GC_p)$ ): |          |               | Leeward & Sidewall External Pressures ( $q_l^*(GC_p)$ ): |              |          | Internal Pressures ( $\pm q^*(GC_{pi})$ ) |
|------------------------------------------------|----------|---------------|----------------------------------------------------------|--------------|----------|-------------------------------------------|
| Height Above Ground Level, z                   | $K_{zt}$ | Windward wall | L/B:                                                     | Leeward wall | Sidewall | All walls                                 |
| 15                                             | 1.00     | 8.1           | 0-1                                                      | -5.5         | -7.7     | 2.3                                       |
| 20                                             | 1.00     | 8.8           | 2                                                        | -3.3         |          |                                           |
| 25                                             | 1.00     | 9.4           | $\geq 4$                                                 | -2.2         |          |                                           |

|     |      |      |
|-----|------|------|
| 30  | 1.00 | 9.9  |
| 40  | 1.00 | 10.8 |
| 50  | 1.00 | 11.5 |
| 60  | 1.00 | 12.1 |
| 70  | 1.00 | 12.6 |
| 80  | 1.00 | 13.2 |
| 90  | 1.00 | 13.6 |
| 100 | 1.00 | 14.1 |
| 120 | 1.00 | 14.8 |
| 140 | 1.00 | 15.5 |
| 160 | 1.00 | 16.1 |
| 180 | 1.00 | 16.6 |
| 200 | 1.00 | 17.1 |
| 250 | 1.00 | 18.2 |
| 300 | 1.00 | 19.2 |
| 350 | 1.00 | 20.0 |
| 400 | 1.00 | 20.9 |
| 450 | 1.00 | 21.6 |
| 500 | 1.00 | 22.2 |

**NOTES:**

- 1) Minimum Design Wind Loads (Per ASCE 7-16 27.1.5): The wind load used for design of the MWFRS shall not be less than 16 PSF multiplied by the wall area of the building, and 8 PSF multiplied by the roof area of the building projected on a vertical plane normal to the assumed wind direction. Wall and roof loads shall be applied simultaneously.
- 2)  $q_i$  has conservatively been taken equal to  $q_h$   
 $K_{ht} = 1.00$   
 $q_h = 13.0$  PSF



Project: Todd Road

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Name: LMC

Originating Office: Seattle

Date: 04/28/25

**DESIGN CRITERIA - WIND**

BASIC WIND SPEED (V): 98 MPH  
RISK CATEGORY: II  
EXPOSURE CATEGORY: B  
DIRECTIONALITY FACTOR ( $K_d$ ): 0.85  
GUST EFFECT FACTOR (G): 0.85

MEAN ROOF HEIGHT: 20 FT  
GROUND ELEVATION FACTOR ( $K_e$ ): 1.00  
ENCLOSURE CLASSIFICATION: Enclosed  
ROOF TYPE: Gable  
ROOF SLOPE ( $\alpha$ ): 12  
 $\theta$  (degrees): 36.87

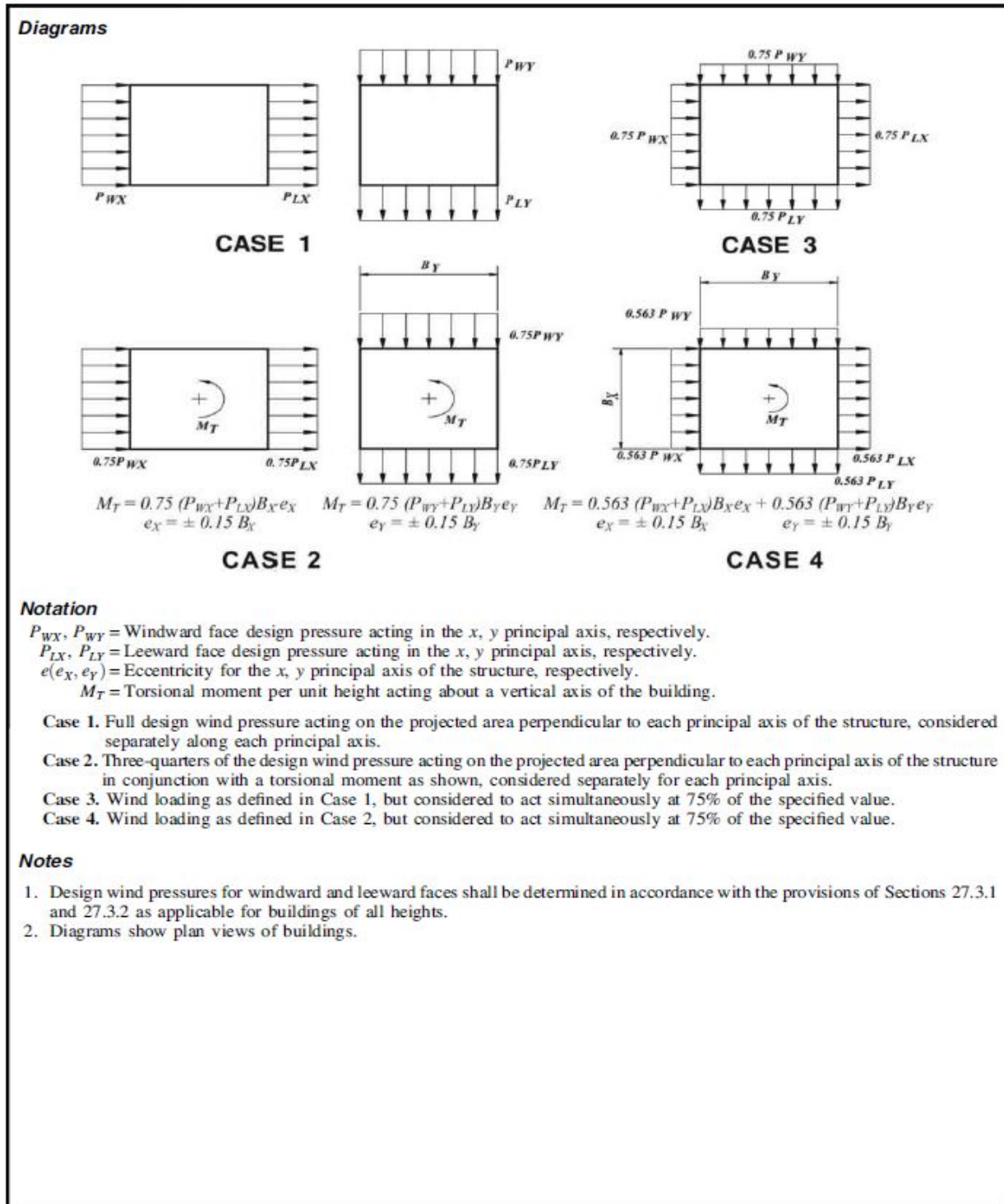
| ASCE 7-16 CHAPTER 30: WIND LOADS: COMPONENTS AND CLADDING |                    |      |                    |       |                     |       |       |       |       |       |
|-----------------------------------------------------------|--------------------|------|--------------------|-------|---------------------|-------|-------|-------|-------|-------|
| PART 1: LOW-RISE BUILDINGS (h≤60 ft)                      |                    |      |                    |       |                     |       |       |       |       |       |
| ROOF SURFACES                                             |                    |      |                    |       |                     |       |       |       |       |       |
| Effective Wind Area                                       | POSITIVE PRESSURES |      |                    |       | NEGATIVE PRESSURES  |       |       |       |       |       |
|                                                           |                    |      |                    |       | ZONE                |       |       |       |       |       |
|                                                           | ALL ZONES          |      |                    |       | 1                   | 2e    | 2n    | 2r    | 3e    | 3r    |
| 10 SF                                                     | 16.0               |      |                    |       | -25.7               | -25.7 | -28.2 | -25.7 | -34.6 | -28.2 |
| 20 SF                                                     | 16.0               |      |                    |       | -21.8               | -21.8 | -25.2 | -21.8 | -30.7 | -25.2 |
| 50 SF                                                     | 16.0               |      |                    |       | -16.6               | -16.6 | -21.3 | -16.6 | -25.5 | -21.3 |
| 100 SF                                                    | 16.0               |      |                    |       | -16.0               | -16.0 | -18.3 | -16.0 | -21.5 | -18.3 |
| WALL SURFACES & ROOF OVERHANGS                            |                    |      |                    |       |                     |       |       |       |       |       |
| Effective Wind Area                                       | WALL ZONES         |      |                    |       | ROOF OVERHANG ZONES |       |       |       |       |       |
|                                                           | POSITIVE PRESSURES |      | NEGATIVE PRESSURES |       | NEGATIVE PRESSURES  |       |       |       |       |       |
|                                                           | 4                  | 5    | 4                  | 5     | 1                   | 2e    | 2n    | 2r    | 3e    | 3r    |
| 10 SF                                                     | 16.0               | 16.0 | -16.6              | -20.5 | -33.7               | -33.7 | -36.3 | -33.7 | -42.7 | -36.3 |
| 20 SF                                                     | 16.0               | 16.0 | -16.0              | -19.1 | -29.8               | -29.8 | -33.3 | -29.8 | -38.7 | -33.3 |
| 50 SF                                                     | 16.0               | 16.0 | -16.0              | -17.3 | -24.6               | -24.6 | -29.3 | -24.6 | -33.5 | -29.3 |
| 100 SF                                                    | 16.0               | 16.0 | -16.0              | -16.0 | -20.7               | -20.7 | -26.3 | -20.7 | -29.6 | -26.3 |
| 500 SF                                                    | 16.0               | 16.0 | -16.0              | -16.0 | -20.7               | -20.7 | -23.3 | -20.7 | -25.6 | -23.3 |

**NOTES:**

- ASCE 7-16 30.2.2: Minimum Design Wind Loads: The design wind pressure for C&C of buildings shall not be less than a net pressure of 16 PSF acting in either direction normal to the surface.
- $q_i$  has conservatively been taken equal to  $q_h$   
 $K_{ht} = 1.00$   
 $q_h = 13.0$  PSF

## DESIGN CRITERIA - WIND

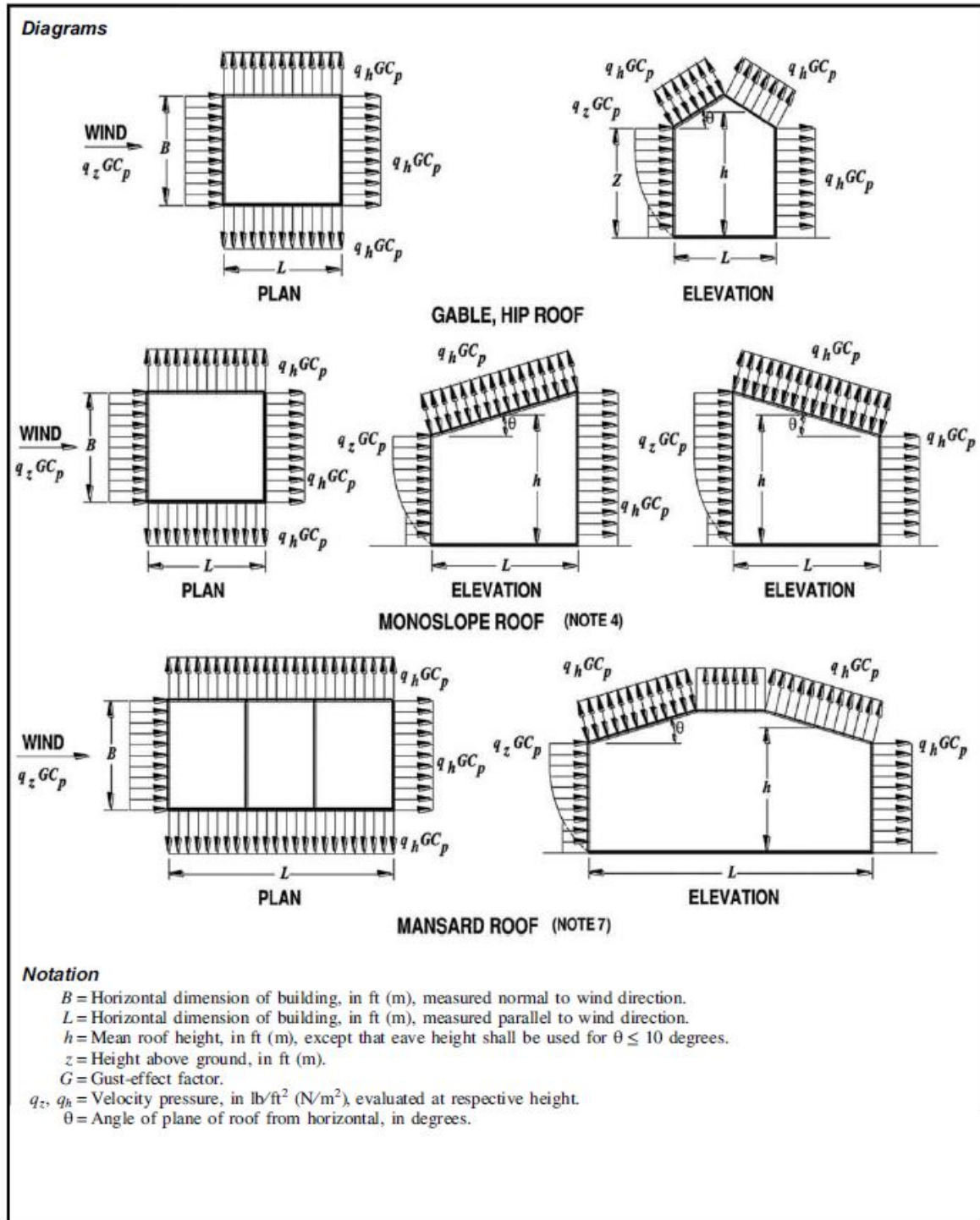
**FIGURE 27.3-8: Main Wind Force Resisting System, Part 1 (All Heights): Design Wind Load Cases per ASCE 7-16**



**FIGURE 27.3-8 Main Wind Force Resisting System, Part 1 (All Heights): Design Wind Load Cases**

## DESIGN CRITERIA - WIND

**FIGURE 27.3-1 Main Wind Force Resisting System, Part 1 (All Heights): External Pressure Coefficients,  $C_p$ , for Enclosed and Partially Enclosed Buildings - Walls and Roofs per ASCE 7-16**

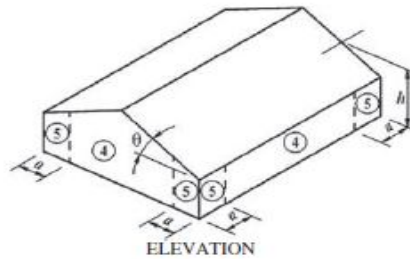


**FIGURE 27.3-1 Main Wind Force Resisting System, Part 1 (All Heights): External Pressure Coefficients,  $C_p$ , for Enclosed and Partially Enclosed Buildings—Walls and Roofs**

## DESIGN CRITERIA - WIND

**FIGURE 30.3-1: Components and Cladding [ $h \leq 60$  ft]: External Pressure Coefficients, ( $G C_p$ ), for Enclosed and Partially Enclosed Buildings - Walls**

### Diagram



### Notation

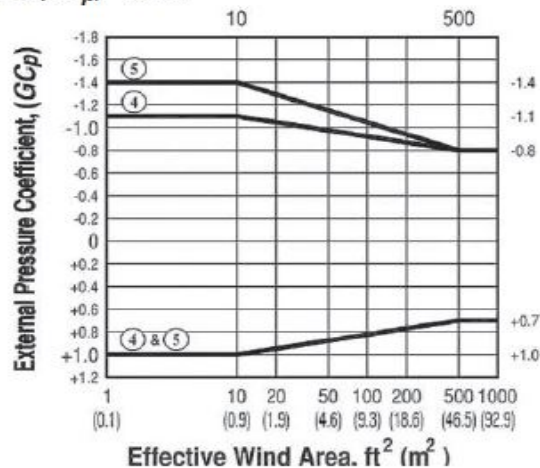
$a = 10\%$  of least horizontal dimension or  $0.4h$ , whichever is smaller, but not less than either  $4\%$  of least horizontal dimension or  $3$  ft ( $0.9$  m).

**Exception:** For buildings with  $\theta = 0^\circ$  to  $7^\circ$  and a least horizontal dimension greater than  $300$  ft ( $90$  m), dimension  $a$  shall be limited to a maximum of  $0.8h$ .

$h$  = Mean roof height, in ft (m), except that eave height shall be used for  $\theta \leq 10^\circ$ .

$\theta$  = Angle of plane of roof from horizontal, in degrees.

### External Pressure Coefficient, ( $G C_p$ ) - Walls



### Notes

1. Vertical scale denotes ( $G C_p$ ) to be used with  $q_h$ .
2. Horizontal scale denotes effective wind area, in  $\text{ft}^2$  ( $\text{m}^2$ ).
3. Plus and minus signs signify pressures acting toward and away from the surfaces, respectively.
4. Each component shall be designed for maximum positive and negative pressures.
5. Values of ( $G C_p$ ) for walls shall be reduced by  $10\%$  when  $\theta \leq 10^\circ$ .

**FIGURE 30.3-1 Components and Cladding [ $h \leq 60$  ft ( $h \leq 18.3$  m)]: External Pressure Coefficients, ( $G C_p$ ), for Enclosed and Partially Enclosed Buildings—Walls**



Project: Todd Road

Job Number: 25-209

Sheet: of

Name: LMC

Originating Office: Seattle

Date: 04/28/25

**DESIGN CRITERIA - SEISMIC****ASCE 7-16 SECTION 12.8 - EQUIVALENT LATERAL FORCE PROCEDURE**

|                                     |     |            |        |
|-------------------------------------|-----|------------|--------|
| RISK CATEGORY:                      | II  | LATITUDE:  | 47.211 |
| SITE CLASS:                         | D   | LONGITUDE: | 50.942 |
| IMPORTANCE FACTOR ( $I_E$ ):        | 1   | $S_S =$    | 1.275  |
| STRUCTURAL SYSTEM (R):              | 6.5 | $S_1 =$    | 0.439  |
| OVERSTRENGTH FACTOR ( $\Omega_o$ ): | 2.5 | $F_a =$    | 1.200  |
|                                     |     | $F_v =$    | 1.850  |

**ASCE 7-16 SECTION 11.4 SEISMIC GROUND MOTION VALUES**

Section 11.4.4 - Coefficients and Risk-Targeted Maximum Considered Earthquake (MCER) Spectral Response Acceleration Parameters

$$S_{MS} = F_a * S_S = 1.530 \quad S_{M1} = F_v * S_1 = 1.827 \quad \text{increased by 50\%}$$

Section 11.4.5 - Design Spectral Response Acceleration Parameters

$$S_{DS} = 2/3 * S_{MS} = 1.020 \quad S_{D1} = 2/3 * S_{M1} = 1.218$$

**ASCE 7-16 SECTION 11.6 - SEISMIC DESIGN CATEGORY - SECTION 12.8.2 - PERIOD DETERMINATION**

| ASCE 7-16 TABLE 11.6-1                    |                |     |    |
|-------------------------------------------|----------------|-----|----|
| SEISMIC DESIGN CATEGORY BASED ON $S_{DS}$ |                |     |    |
|                                           | RISK CATEGORY: |     |    |
|                                           | I & II         | III | IV |
| $< 0.167g$                                | A              | A   | A  |
| $< 0.33g$                                 | B              | B   | C  |
| $< 0.50g$                                 | C              | C   | D  |
| $\geq 0.50g$                              | D              | D   | D  |
|                                           | <b>D</b>       |     |    |

| ASCE 7-16 TABLE 11.6-2                    |                |     |    |
|-------------------------------------------|----------------|-----|----|
| SEISMIC DESIGN CATEGORY BASED ON $S_{D1}$ |                |     |    |
|                                           | RISK CATEGORY: |     |    |
|                                           | I & II         | III | IV |
| $< 0.067g$                                | A              | A   | A  |
| $< 0.133g$                                | B              | B   | C  |
| $< 0.20g$                                 | C              | C   | D  |
| $\geq 0.20g$                              | D              | D   | D  |
|                                           | <b>D</b>       |     |    |

Each building and structure shall be assigned to the most severe Seismic Design Category in accordance with Table 11.6-1 or Table 11.6-2, irrespective of the fundamental period of vibration of the structure.

**PERIOD DETERMINATION:**

$$\begin{aligned} C_t &= 0.02 \\ h_n &= 22 \text{ FT} \\ x &= 0.75 \\ T_a = C_t * h_n^x &= 0.203 \end{aligned}$$

**ASCE 7-16 SECTION 12.8.1.1 - SEISMIC RESPONSE COEFFICIENT**

$$\text{GENERAL EQUATION: } C_S = S_{DS}/(R/I) = 0.157 \quad \leftarrow \text{CONTROLS} \quad \text{EQ. 12.8-2}$$

$$\text{MAXIMUM: } C_S = 1.5 * S_{D1}/(T*(R/I)) = 0.923 \quad \text{EQ. 12.8-3}$$

$$\text{MINIMUM: } C_S = 0.044 * S_{DS} * I > 0.01 = 0.045 \quad \text{EQ. 12.8-5}$$

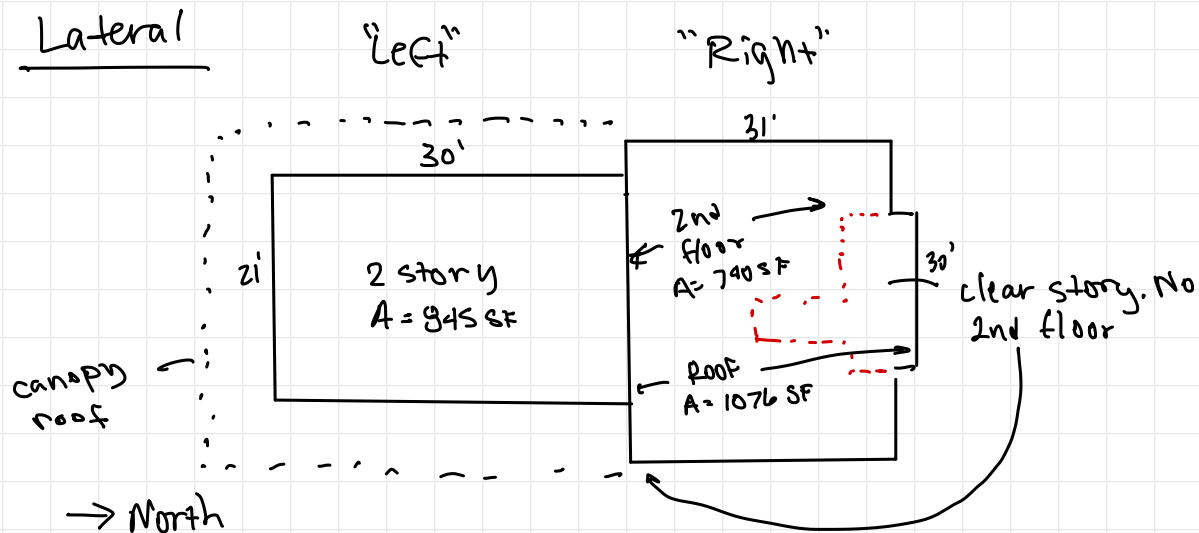
For structures located where  $S_1 > 0.6g$ 

$$C_S = 0.5 * S_1/(R/I) = 0.000 \quad \text{EQ. 12.8-6}$$

**ASCE 7-16 SECTION 12.8.1 - SEISMIC BASE SHEAR**

$$V = C_S * W = 0.157 * W$$

W = the total dead load and applicable portion of other loads as indicated in Section 12.7.2



Left

Wt to Roof:

$$\begin{aligned} \text{Roof} &= 15 \text{ PSF} \times 845 \text{ SF} = 12,675^{\#} \\ \text{Walls} &= 15 \text{ PSF} \times (30' \times 2) \times 10' / 2 = 4,500^{\#} \text{ (E-W)} \\ &+ 15 \text{ PSF} \times (21' \times 2) \times 11' / 2 = 3,465^{\#} \text{ (N-S)} \\ &+ 15 \text{ PSF} \times (70') \times 11' / 2 = 5,775^{\#} \\ &\quad \text{partitions} \end{aligned}$$

Wt to Floor:

$$\begin{aligned} \text{Floor} &= 15 \text{ PSF} \times 845 \text{ SF} = 12,675^{\#} \\ \text{Walls} &= 15 \text{ PSF} \times (30' \times 2) \times 10' \times 2 / 2 = 9,000^{\#} \text{ (E-W)} \\ &+ 15 \text{ PSF} \times (21' \times 2) \times (10' + 11') / 2 = 6,615^{\#} \text{ (N-S)} \\ &+ 15 \text{ PSF} \times (70') \times 11' / 2 = 5,775^{\#} \\ &\quad \text{partitions, none down stairs} \end{aligned}$$

$$V = C_s (\Sigma W_t) \quad C_s = 0.157$$

(Left) E-W loading: (LRFD)

$$V_{\text{Roof}} = 22,950^{\#} \times 0.157 = 3.6^k$$

$$V_{\text{FLR}} = 27,950^{\#} \times 0.157 = 4.3^k$$

(Left) N-S loading:

$$V_{\text{Roof}} = 21,915^{\#} \times 0.157 = 3.4^k$$

$$V_{\text{FLR}} = 25,065^{\#} \times 0.157 = 4.0^k$$

$$\begin{aligned} \text{Wind N-S Roof} &= 16 \text{ PSF} \times 740 \text{ SF} = 4.6^k \\ \text{N-S Floor} &= 16 \text{ PSF} \times 360 \text{ SF} = 5.8^k \\ \text{E-W Roof} &= 16 \text{ PSF} \times 500 \text{ SF} = 8^k \\ \text{E-W Floor} &= 16 \text{ PSF} \times 630 \text{ SF} = 10^k \end{aligned}$$

Right

Wt to Roof:

$$\begin{aligned} \text{Roof} &= 15 \text{ PSF} \times 1076 \text{ SF} = 16,140^{\#} \\ \text{Walls} &= 15 \text{ PSF} \times 31' \times 7 \times 9' / 2 = 9,185^{\#} \text{ (E-W)} \\ &+ 15 \text{ PSF} \times 30' \times 2 \times 9' / 2 = 4,050^{\#} \text{ (N-S)} \\ &+ 15 \text{ PSF} \times (10' \times 8) \times 9' / 2 = 5,400^{\#} \\ &\quad \text{partitions} \end{aligned}$$

Wt to floor:

$$\begin{aligned} \text{Floor} &= 15 \text{ PSF} \times 740 \text{ SF} = 11,100^{\#} \\ \text{Walls} &= 15 \text{ PSF} \times 31' \times 2 \times 9' = 8,370^{\#} \text{ (E-W)} \\ &+ 15 \text{ PSF} \times 31' \times 2 \times 9' = 8,100^{\#} \text{ (N-S)} \\ &+ 15 \text{ PSF} \times 80' \times 9' = 10,800^{\#} \end{aligned}$$

(Right) E-W loading: (LRFD)

$$V_{\text{Roof}} = 25,776^{\#} \times 0.157 = 4.0^k$$

$$V_{\text{FLR}} = 30,270^{\#} \times 0.157 = 4.8^k$$

(Right) N-S loading:

$$V_{\text{Roof}} = 25,590^{\#} \times 0.157 = 4.0^k$$

$$V_{\text{FLR}} = 30,000^{\#} \times 0.157 = 4.7^k$$

SEISMIC (LRFD)

$$\begin{aligned} &7.4^k \\ &8.7^k \\ &7.6^k \\ &9.1^k \end{aligned}$$

**VERTICAL DISTRIBUTION OF SEISMIC FORCES**

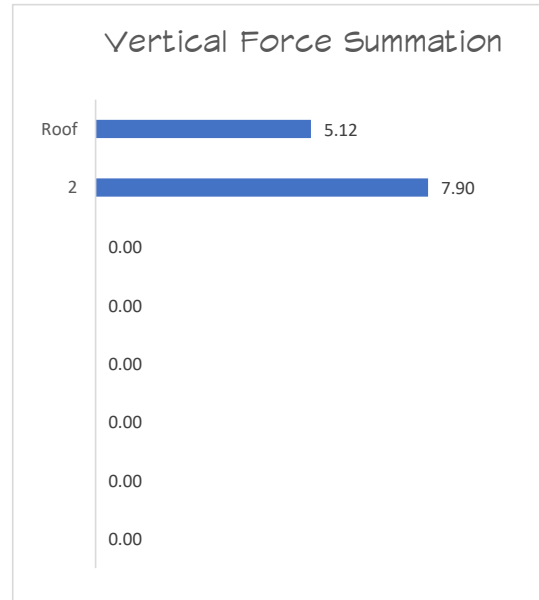
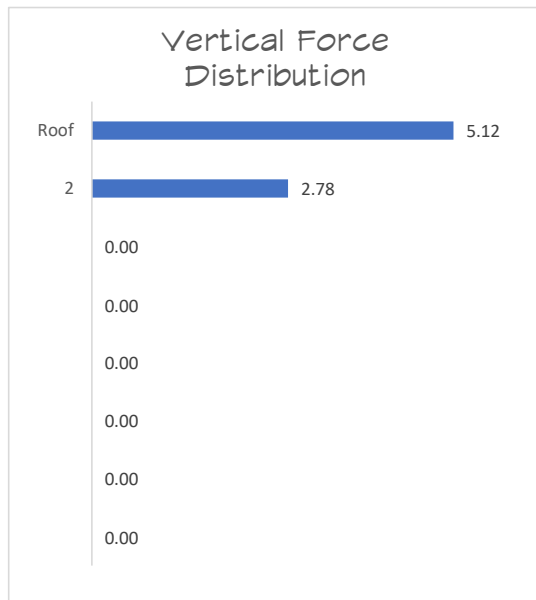
**ASCE 7-16 SEC. 12.8.3**

CODE: IBC 2021, ASCE 7-16  
Left side of building

LOCATION: Puyallup, WA

T = 0.203 Sec. ASCE 7-16 Sec. 12.8.2  
k = 1 ASCE 7-16 Sec. 12.8.3  
Base Shear, V = 7.9 k  
# OF Floors = 3

| LEVEL    | $h_x$<br>(ft) | Floor Weight<br>(k) | $Wh_n^k$<br>(k-ft) | $C_{vx}$     | $F_x$<br>(k) | $\Sigma F_x$<br>(k) |
|----------|---------------|---------------------|--------------------|--------------|--------------|---------------------|
| Roof     | <u>22</u>     | <u>3.6</u>          | <u>79.2</u>        | <u>0.648</u> | <u>5.12</u>  | <u>5.12</u>         |
| 2        | <u>10</u>     | <u>4.3</u>          | <u>43</u>          | <u>0.352</u> | <u>2.78</u>  | <u>7.90</u>         |
|          | <u>0</u>      | <u>0</u>            |                    |              |              |                     |
|          | <u>0</u>      | <u>0</u>            |                    |              |              |                     |
|          | <u>0</u>      | <u>0</u>            |                    |              |              |                     |
|          | <u>0</u>      | <u>0</u>            |                    |              |              |                     |
|          | <u>0</u>      | <u>0</u>            |                    |              |              |                     |
| $\Sigma$ |               | <u>7.9</u>          | <u>122.2</u>       |              |              |                     |





Project: Todd Road Job Number: 25-209

Sheet:        of        Name: LMC

Originating Office: Tacoma Date: 04/21/25

**DIAPHRAGM DESIGN FORCES**

**ASCE 7-16 SEC. 12.10.1.1**

CODE: IBC 2021, ASCE 7-16  
*Left side of building*

LOCATION: Puyallup, WA

$S_{DS} =$  1.02 ASCE 7-16 Sec. 11.4.5  
 $I_e =$  1 ASCE 7-16 Table 1.5-2

| LEVEL | $\Sigma F_x$<br>(k) | $W_{px}$<br>(k-ft) | $\Sigma W_i$<br>(k) | $F_{px}$<br>(k) | $F_{pxMIN}$<br>(k) | $F_{pxMAX}$<br>(k) |
|-------|---------------------|--------------------|---------------------|-----------------|--------------------|--------------------|
| Roof  | 5.12                | 3.6                | 3.6                 | 5.1             | 0.7                | 1.5                |
| 2     | 7.90                | 4.3                | 7.9                 | 4.3             | 0.9                | 1.8                |
|       |                     | 0                  |                     |                 |                    |                    |
|       |                     | 0                  |                     |                 |                    |                    |
|       |                     | 0                  |                     |                 |                    |                    |
|       |                     | 0                  |                     |                 |                    |                    |
|       |                     | 0                  |                     |                 |                    |                    |
|       |                     | 0                  |                     |                 |                    |                    |



Project: Todd Road Job Number: 25-209

Sheet:      of      Name: LMC

Originating Office: Tacoma Date: 04/21/25

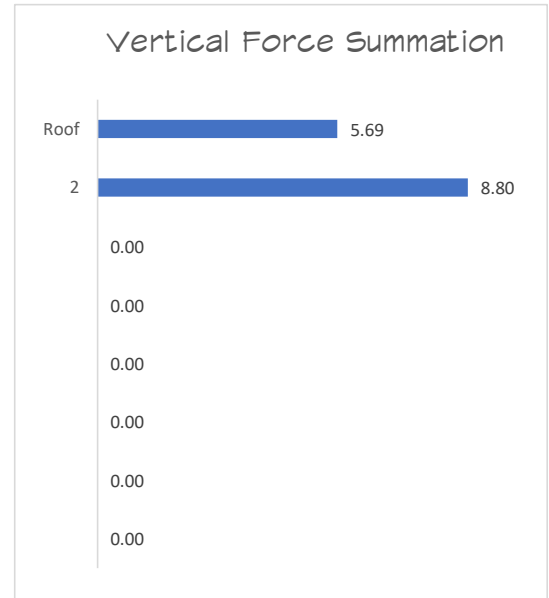
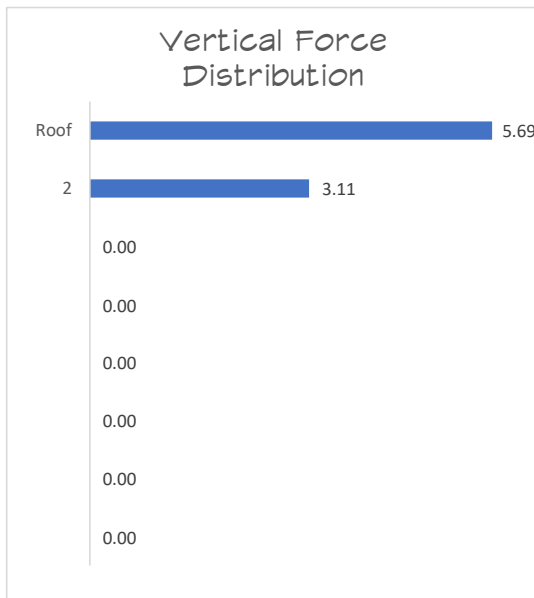
**VERTICAL DISTRIBUTION OF SEISMIC FORCES** **ASCE 7-16 SEC. 12.8.3**

CODE: IBC 2021, ASCE 7-16  
Right side of building

LOCATION: Puyallup, WA

T = 0.203 Sec. ASCE 7-16 Sec. 12.8.2  
k = 1 ASCE 7-16 Sec. 12.8.3  
Base Shear, V = 8.8 k  
# OF Floors = 3

| LEVEL    | $h_x$<br>(ft) | Floor Weight<br>(k) | $Wh_n^k$<br>(k-ft) | $C_{vx}$ | $F_x$<br>(k) | $\Sigma F_x$<br>(k) |
|----------|---------------|---------------------|--------------------|----------|--------------|---------------------|
| Roof     | 22            | 4                   | 88                 | 0.647    | 5.69         | 5.69                |
| 2        | 10            | 4.8                 | 48                 | 0.353    | 3.11         | 8.80                |
|          | 0             | 0                   |                    |          |              |                     |
|          | 0             | 0                   |                    |          |              |                     |
|          | 0             | 0                   |                    |          |              |                     |
|          | 0             | 0                   |                    |          |              |                     |
|          | 0             | 0                   |                    |          |              |                     |
| $\Sigma$ |               | 8.8                 | 136                |          |              |                     |





Project: Todd Road Job Number: 25-209

Sheet:        of        Name: LMC

Originating Office: Tacoma Date: 04/21/25

**DIAPHRAGM DESIGN FORCES** **ASCE 7-16 SEC. 12.10.1.1**

CODE: IBC 2021, ASCE 7-16  
*Right side of building*

LOCATION: Puyallup, WA

$S_{DS} = 1.02$  ASCE 7-16 Sec. 11.4.5  
 $I_e = 1$  ASCE 7-16 Table 1.5-2

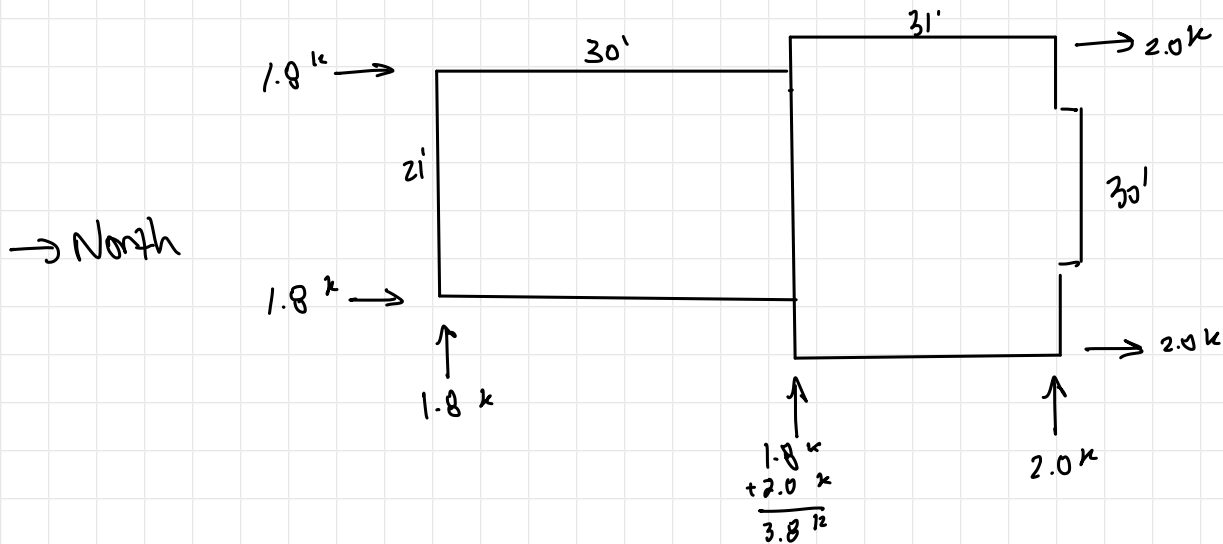
| LEVEL | $\Sigma F_x$<br>(k) | $W_{px}$<br>(k-ft) | $\Sigma W_i$<br>(k) | $F_{px}$<br>(k) | $F_{pxMIN}$<br>(k) | $F_{pxMAX}$<br>(k) |
|-------|---------------------|--------------------|---------------------|-----------------|--------------------|--------------------|
| Roof  | 5.69                | 4                  | 4                   | 5.7             | 0.8                | 1.6                |
| 2     | 8.80                | 4.8                | 8.8                 | 4.8             | 1                  | 2                  |
|       |                     | 0                  |                     |                 |                    |                    |
|       |                     | 0                  |                     |                 |                    |                    |
|       |                     | 0                  |                     |                 |                    |                    |
|       |                     | 0                  |                     |                 |                    |                    |
|       |                     | 0                  |                     |                 |                    |                    |
|       |                     | 0                  |                     |                 |                    |                    |



## Shear Load @ wall lines

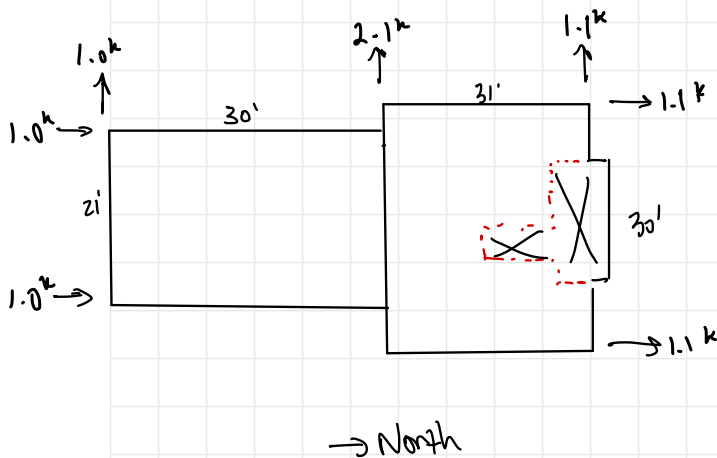
- See spreadsheet for vert distribution of lat force.

### ROOF (ASD loads)

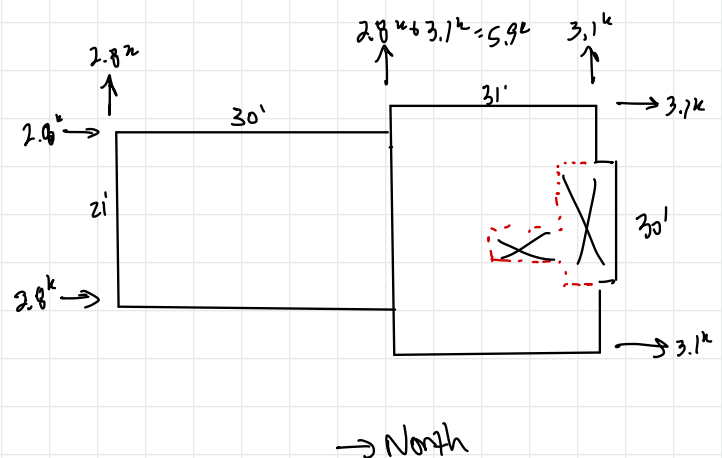


### FLOOR (ASD loads)

#### Vert Distribution:



#### Accumulated Shear





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Date: 4/21/2025

## WOOD SHEATHED SHEAR WALLS - 2021 SDPWS TABLE 4.3A

SEISMIC OR WIND: **SEISMIC**  
 DESIGN METHODOLOGY: **ASD**  
 SHEAR CAPACITY FACTOR: **2.8**  
 FRAMING SPECIES: **DFL**  
 SHEATHING MATERIAL: **SHEATHING**  
 PANEL THICKNESS: **15/32"**  
 S.G. ADJUSTMENT FACTOR: **1.00**

SHEATHING NAILS: **10d**  
 HOLDOWN SYSTEM: **INSIDE POST**  
 10d NAIL CAPACITY REDUCTION: **0.92**  
 SILL PLATE ANCHOR DIAMETER: **5/8"**  
 RIM MATERIAL: **HEM FIR**  
 TREATED MATERIAL FACTOR: **1.00**

| SHEAR WALL CAPACITIES |                |       |                 |              |              |              |                        |                         |
|-----------------------|----------------|-------|-----------------|--------------|--------------|--------------|------------------------|-------------------------|
| WALL MARK             | WALL SHEATHING | SIDES | SHEATHING NAILS | EDGE NAILING | EDGE FRAMING | BOTTOM PLATE | NOMINAL CAPACITY (PLF) | ADJUSTED CAPACITY (PLF) |
| <b>A</b>              | 15/32"         | (1)   | 10d             | 6" o.c.      | 2x           | 2x           | 870                    | <b>286</b>              |
| <b>B</b>              | 15/32"         | (1)   | 10d             | 4" o.c.      | 3x           | 2x           | 1290                   | <b>424</b>              |
| <b>C</b>              | 15/32"         | (1)   | 10d             | 3" o.c.      | 3x           | 2x           | 1680                   | <b>552</b>              |
| <b>D</b>              | 15/32"         | (1)   | 10d             | 2" o.c.      | 3x           | 2x           | 2155                   | <b>708</b>              |
| <b>E</b>              | 15/32"         | (2)   | 10d             | 6" o.c.      | 3x           | 2x           | 1740                   | <b>572</b>              |
| <b>F</b>              | 15/32"         | (2)   | 10d             | 4" o.c.      | 3x           | 2x           | 2580                   | <b>848</b>              |
| <b>G</b>              | 15/32"         | (2)   | 10d             | 3" o.c.      | 3x           | 2x           | 3360                   | <b>1104</b>             |
| <b>H</b>              | 15/32"         | (2)   | 10d             | 2" o.c.      | 3x           | 2x           | 4310                   | <b>1416</b>             |

| CONNECTION CALCULATOR |          |      |         |        |       |            |          |       |               |          |       |
|-----------------------|----------|------|---------|--------|-------|------------|----------|-------|---------------|----------|-------|
| SOLE PLATE            |          |      |         |        |       | SILL PLATE |          |       | RIM CONNECTOR |          |       |
| MARK                  | FASTENER | ROWS | SPACING | RIM    | CHECK | ANCHOR     | SPACING  | CHECK | CLIP          | SPACING  | CHECK |
| <b>A</b>              | 16d      | (1)  | 4" o.c. | 1-1/2" | OK    | 5/8"       | 48" o.c. | OK    | A35           | 16" o.c. | OK    |
| <b>B</b>              | 16d      | (1)  | 3" o.c. | 1-1/2" | OK    | 5/8"       | 32" o.c. | OK    | A35           | 12" o.c. | OK    |
| <b>C</b>              | 16d      | (2)  | 4" o.c. | 1-1/2" | OK    | 5/8"       | 24" o.c. | OK    | A35           | 9" o.c.  | OK    |
| <b>D</b>              | 16d      | (3)  | 5" o.c. | 3-1/2" | OK    | 5/8"       | 16" o.c. | OK    | A35           | 8" o.c.  | OK    |
| <b>E</b>              | 16d      | (2)  | 4" o.c. | 1-1/2" | OK    | 5/8"       | 24" o.c. | OK    | A35           | 9" o.c.  | OK    |
| <b>F</b>              | SDWS     | (2)  | 5" o.c. | 3-1/2" | OK    | 5/8"       | 16" o.c. | OK    | A35           | 6" o.c.  | OK    |
| <b>G</b>              | SDWS     | (2)  | 8" o.c. | 3-1/2" | OK    | 5/8"       | 12" o.c. | OK    | A35           | 5" o.c.  | OK    |
| <b>H</b>              | SDWS     | (2)  | 6" o.c. | 3-1/2" | OK    | 5/8"       | 10" o.c. | OK    | N/A           |          |       |

| CONNECTION CALCULATOR - REFERENCE VALUES |     |          |         |          |  |                                     |                         |     |     |  |  |
|------------------------------------------|-----|----------|---------|----------|--|-------------------------------------|-------------------------|-----|-----|--|--|
| CONNECTION CAPACITIES                    |     |          |         |          |  | NDS Table 11.3.1 Adjustment Factors |                         |     |     |  |  |
| SOLE PLATE:                              | 16d | 110 lbs  | SDWS    | 472 lbs  |  | ASD                                 | LRFD Adjustment Factors |     |     |  |  |
| 5/8" ANCHOR:                             | 2x  | 1488 lbs | 3x      | 1888 lbs |  | C <sub>D</sub>                      | K <sub>F</sub>          | Φ   | λ   |  |  |
| RIM:                                     | A35 | 650 lbs  | A35/LTP | 490 lbs  |  | 1.6                                 | N/A                     | N/A | N/A |  |  |



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Job Number: 25-209

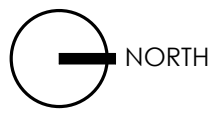
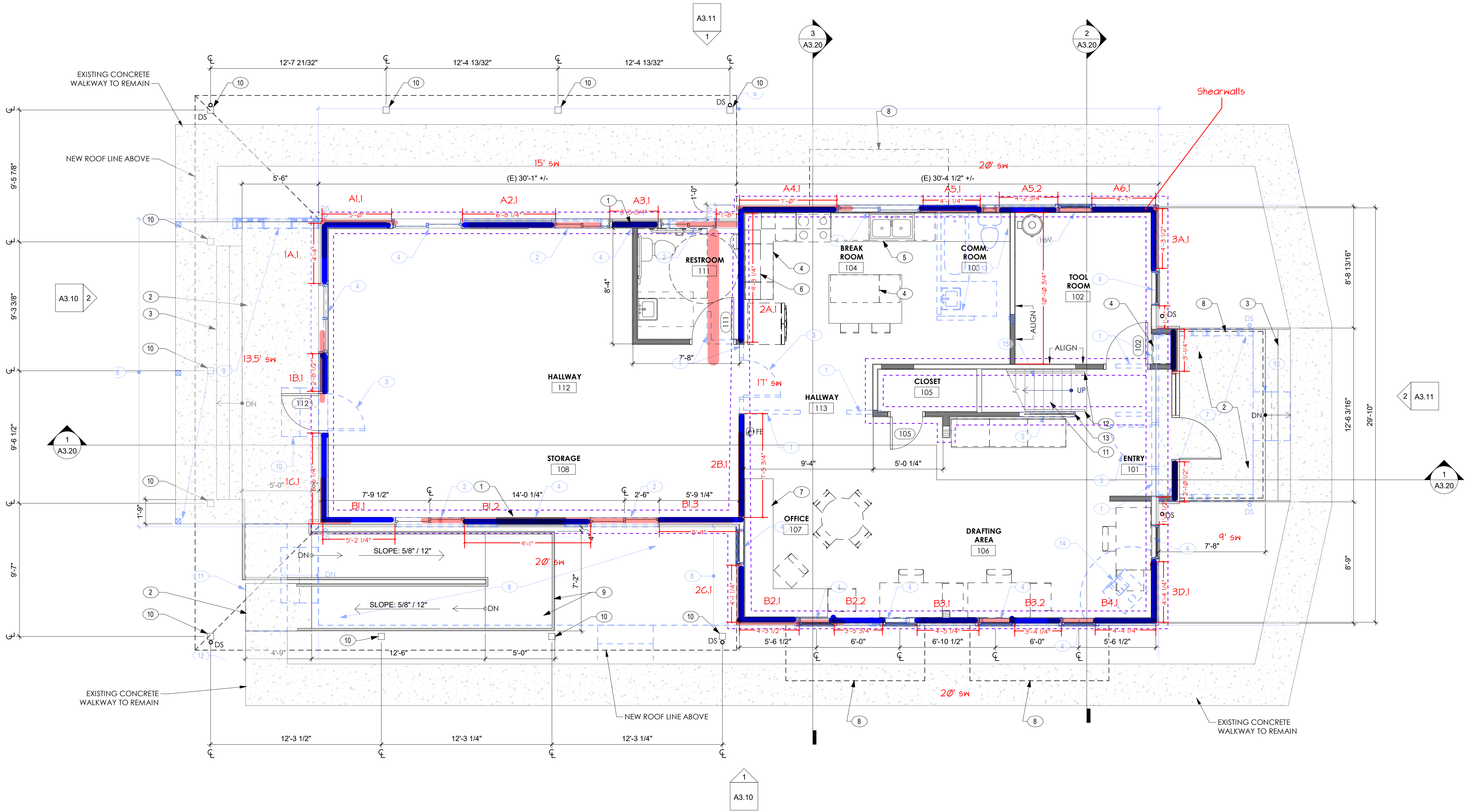
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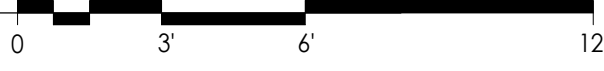
Originating Office: Tacoma

Date: 4/21/2025

| STUD WALL CONSTRUCTION SCHEDULE SUMMARY |                |                      |                 |              |              |               |              |                         |      |                |                     |                |                        |  |
|-----------------------------------------|----------------|----------------------|-----------------|--------------|--------------|---------------|--------------|-------------------------|------|----------------|---------------------|----------------|------------------------|--|
| WALL MARK                               | WALL SHEATHING | SIDES WITH SHEATHING | SHEATHING NAILS | EDGE NAILING | EDGE FRAMING | FIELD NAILING | BOTTOM PLATE | BOTTOM PLATE CONNECTION |      |                | 5/8" ANCHOR SPACING | MIN. RIM WIDTH | RIM/BLOCKING CONNECTOR |  |
| A                                       | 15/32"         | (1)                  | 10d             | 6" o.c.      | 2x           | 12" o.c.      | 2x           | (1)                     | Row  | 16d @ 4" o.c.  | 48" o.c.            | 1-1/2"         | A35 @ 16" o.c.         |  |
| B                                       | 15/32"         | (1)                  | 10d             | 4" o.c.      | 3x           | 12" o.c.      | 2x           | (1)                     | Row  | 16d @ 3" o.c.  | 32" o.c.            | 1-1/2"         | A35 @ 12" o.c.         |  |
| C                                       | 15/32"         | (1)                  | 10d             | 3" o.c.      | 3x           | 12" o.c.      | 2x           | (2)                     | Rows | 16d @ 4" o.c.  | 24" o.c.            | 1-1/2"         | A35 @ 9" o.c.          |  |
| D                                       | 15/32"         | (1)                  | 10d             | 2" o.c.      | 3x           | 12" o.c.      | 2x           | (3)                     | Rows | 16d @ 5" o.c.  | 16" o.c.            | 3-1/2"         | A35 @ 8" o.c.          |  |
| E                                       | 15/32"         | (2)                  | 10d             | 6" o.c.      | 3x           | 12" o.c.      | 2x           | (2)                     | Rows | 16d @ 4" o.c.  | 24" o.c.            | 1-1/2"         | A35 @ 9" o.c.          |  |
| F                                       | 15/32"         | (2)                  | 10d             | 4" o.c.      | 3x           | 12" o.c.      | 2x           | (2)                     | Rows | SDWS @ 5" o.c. | 16" o.c.            | 3-1/2"         | A35 @ 6" o.c.          |  |
| G                                       | 15/32"         | (2)                  | 10d             | 3" o.c.      | 3x           | 12" o.c.      | 2x           | (2)                     | Rows | SDWS @ 8" o.c. | 12" o.c.            | 3-1/2"         | A35 @ 5" o.c.          |  |
| H                                       | 15/32"         | (2)                  | 10d             | 2" o.c.      | 3x           | 12" o.c.      | 2x           | (2)                     | Rows | SDWS @ 6" o.c. | 10" o.c.            | N/A            | - - -                  |  |



**1 NEW FLOOR PLAN - GROUND LEVEL**  
1/4" = 1'-0"

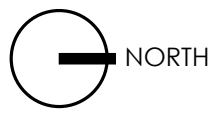
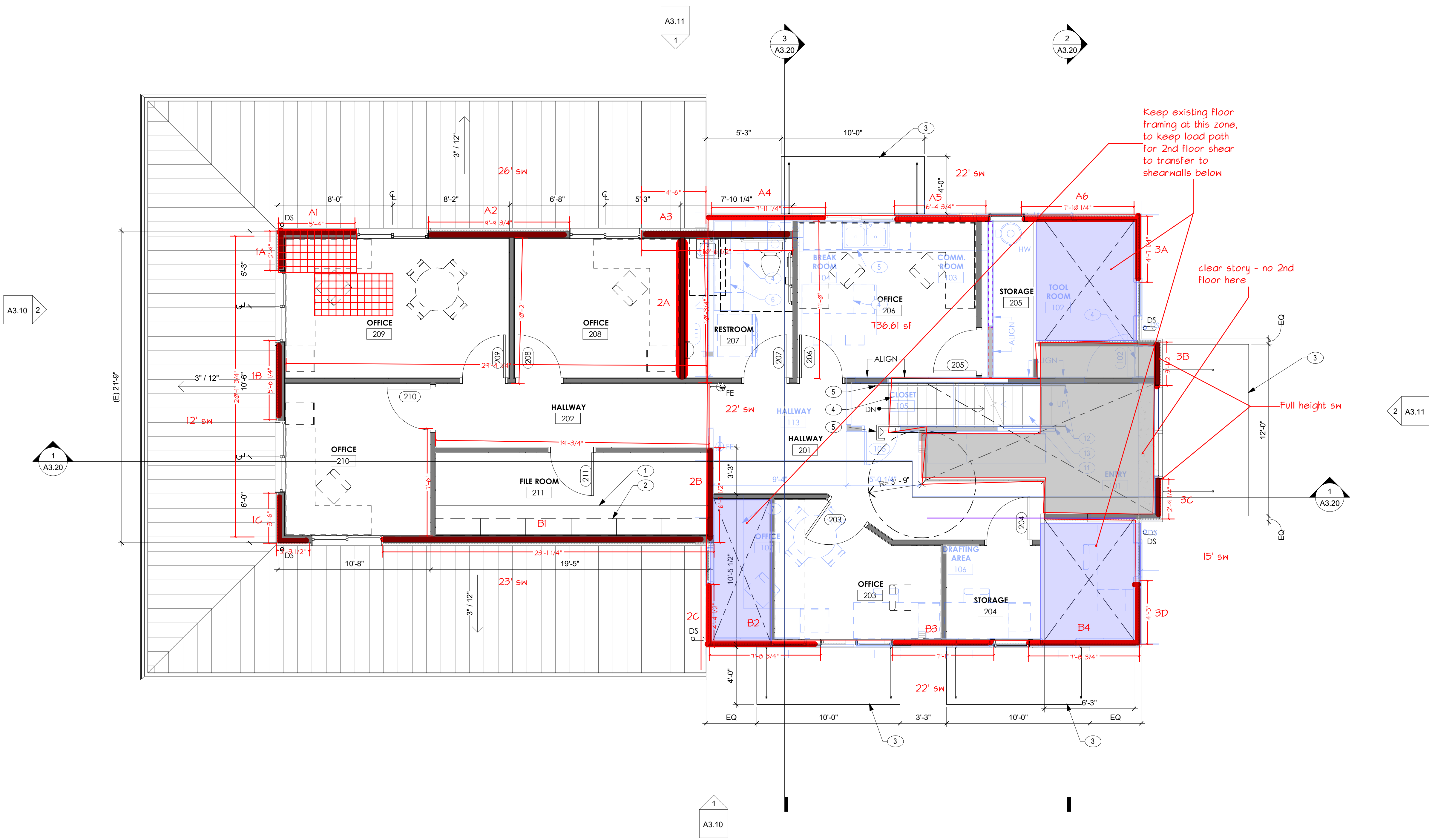


**KEYNOTES**

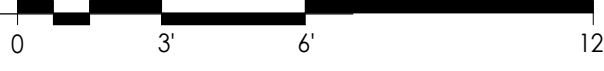
1. INFILL NEW WALL CONSTRUCTION TO MATCH EXISTING AT REMOVED DOOR/ WINDOW OPENING. PATCH AND PAINT THE DAMAGED SURROUNDS.
2. NEW 4" CONCRETE SLAB.
3. NEW CONCRETE STAIRS.
4. NEW BASE CABINET W/ SOLID COUNTER TOP.
5. NEW BASE CABINET W/ SOLID COUNTER TOP AND S.S. SINK, COOD W/ MECHANICAL.
6. NEW UPPER WALL CABINET. SEE INTERIOR FOR MOUNTING HEIGHT.
7. NEW WORKING COUNTER TOP.
8. NEW METAL CANOPY ABOVE.
9. NEW CONCRETE RAMP WITH  $\phi = 1-1/2"$  MTL PIPE RAILING.
10. NEW 6X6 HEAVY TIMBER COLUMN.
11. EXISTING STAIR TO REMAIN.
12. NEW  $\phi = 1-1/2"$  MTL HANDRAIL.
13. NEW MTL GUARDRAIL.

**LEGEND**

- NEW WALL, SEE A7.10 FOR WALL TYPES
- NEW DOOR WITH DOOR TAG, SEE A4.10 FOR TYPES
- NEW WINDOW WITH WINDOW TAG, SEE A4.10 FOR TYPES
- NEW FIRE EXTINGUISHER CABINET
- NEW FIRE EXTINGUISHER BRACKET
- FURNITURE N.I.C.
- NEW PRE-FINISHED METAL DOWNSPOUT



**1 NEW FLOOR PLAN - SECOND LEVEL**  
1/4" = 1'-0"



## KEYNOTES

1. NEW BASE CABINET W/ P-LAM COUNTER TOP.
2. NEW UPPER WALL CABINET. SEE INTERIOR FOR MOUNTING HEIGHT.
3. NEW METAL CANOPY.
4. EXISTING STAIR TO REMAIN.
5. NEW Ø = 1-1/2" MTL HANDRAIL.
6. NEW MTL GUARDRAIL.

## LEGEND

- NEW WALL, SEE A7.10 FOR WALL TYPES
- NEW DOOR WITH DOOR TAG, SEE A4.10 FOR TYPES
- NEW WINDOW WITH WINDOW TAG, SEE A4.10 FOR TYPES
- NEW FIRE EXTINGUISHER CABINET
- NEW FIRE EXTINGUISHER BRACKET
- FURNITURE N.I.C.
- NEW PRE-FINISHED METAL DOWNSPOUT



510 CAPITOL WAY SOUTH  
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360-943-6774 | www.carvearch.com

CHANGE OF USE  
**TODD ROAD**  
320 TODD ROAD NE., PUYALLUP, WASHINGTON 98371  
PROJECT NO. 23-108  
NEW FLOOR PLAN - SECOND LEVEL

DD

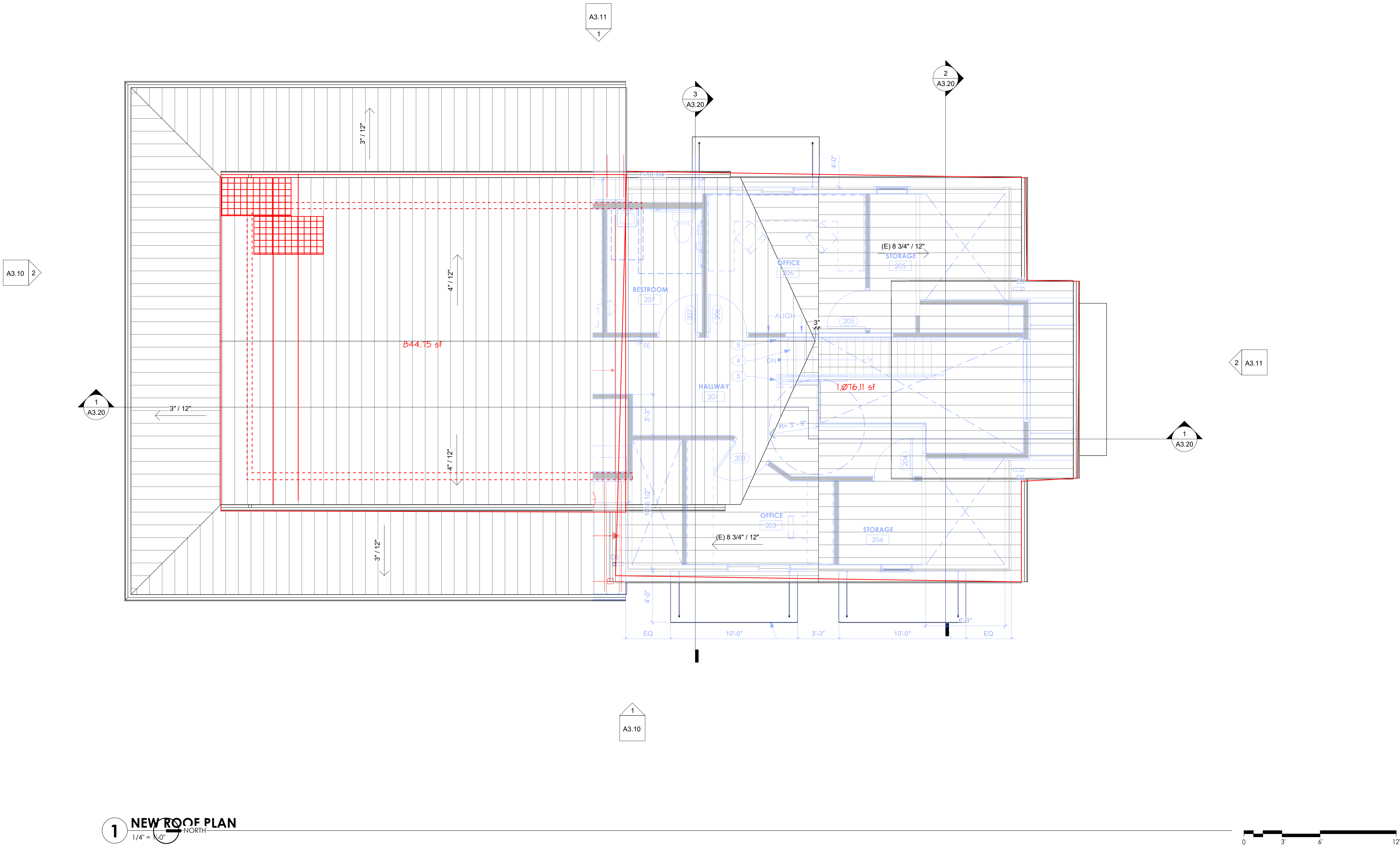
JAN 2025

| No. | Description | Date |
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|-----|-------------|------|

**A2.11**

PROJECT NO., 23-108

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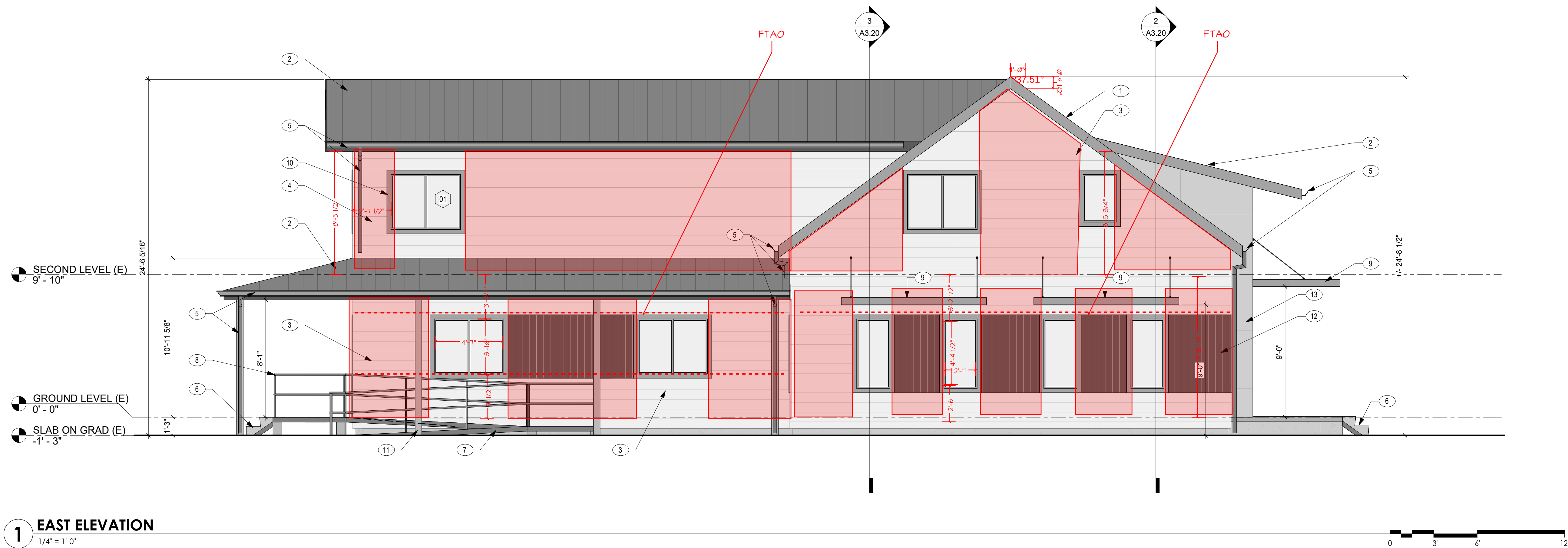
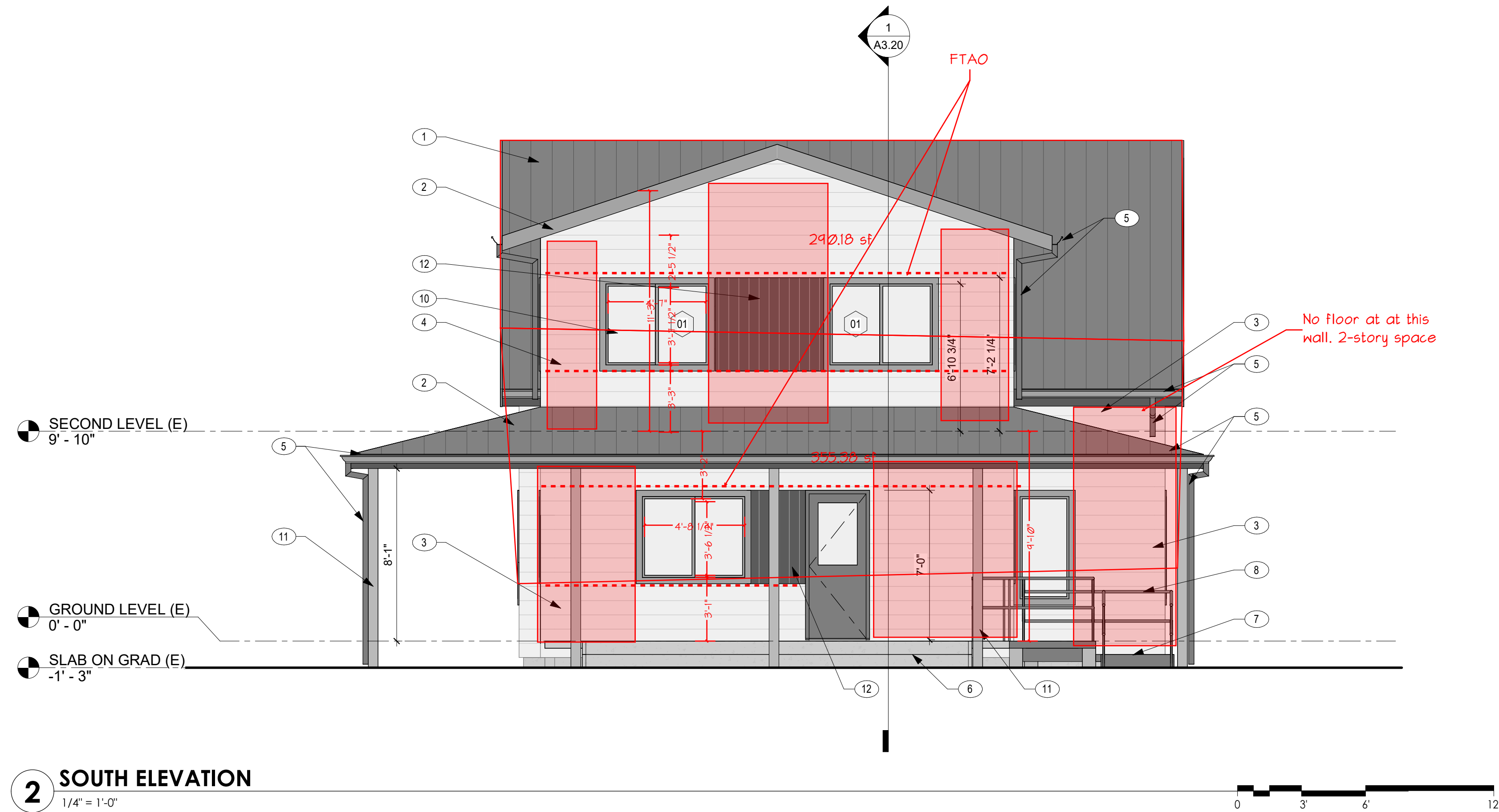


**1 NEW ROOF PLAN**  
1/4" = 1'-0" NORTH



KEYNOTES

1. NEW STANDING SEAM METAL ROOF PANEL OVER EXISTING ROOF SHEATHING.
2. NEW STANDING SEAM METAL PANEL ROOF SYSTEM.
3. NEW 6" SMOOTH FACE FIBER CEMENT BEVELED SIDING, PAINT.
4. NEW EXTERIOR WALL ASSEMBLY, SEE FLOOR PLAN FOR WALL TYPE.
5. PRE-FINISHED METAL GUTTER AND DOWNSPOUTS.
6. NEW CONCRETE STAIR.
7. NEW CONCRETE RAMP.
8. NEW 1-1/2" DIA. MTL PIPE HAND RAIL.
9. NEW METAL CANOPY.
10. NEW 4" H X 5" W VINYL WINDOW.
11. NEW 6X6 HEAVY TIMBER COLUMN.
12. NEW CEDAR VERTICAL SIDING.
13. NEW FIBER CEMENT WALL PANEL, SEE FLOOR PLAN FOR WALL TYPES.
14. INSTALL NEW WINDOW AT EXISTING REMOVED WINDOW LOCATION.
15. NEW STOREFRONT SYSTEM.

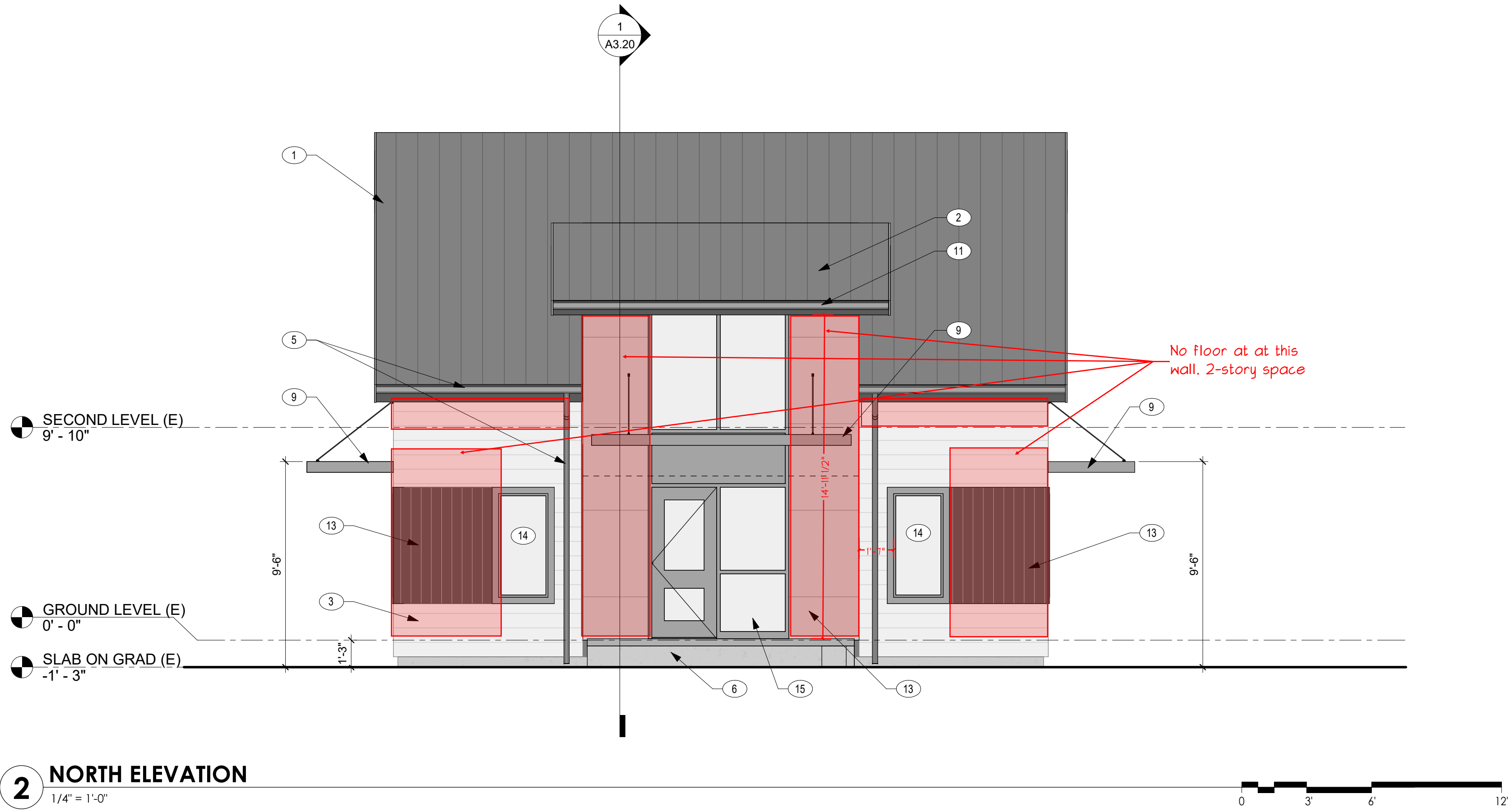


KEYNOTES

- 1. NEW STANDING SEAM METAL ROOF PANEL OVER EXISTING ROOF SHEATHING.
- 2. NEW STANDING SEAM METAL PANEL ROOF SYSTEM.
- 3. NEW 6" SMOOTH FACE FIBER CEMENT BEVELED SIDING, PAINT.
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- 14. INSTALL NEW WINDOW AT EXISTING REMOVED WINDOW LOCATION.
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CHANGE OF USE  
**TODD ROAD**  
320 TODD ROAD NE., PUYALLUP, WASHINGTON 98371  
PROJECT NO. 23-108  
NEW ELEVATIONS

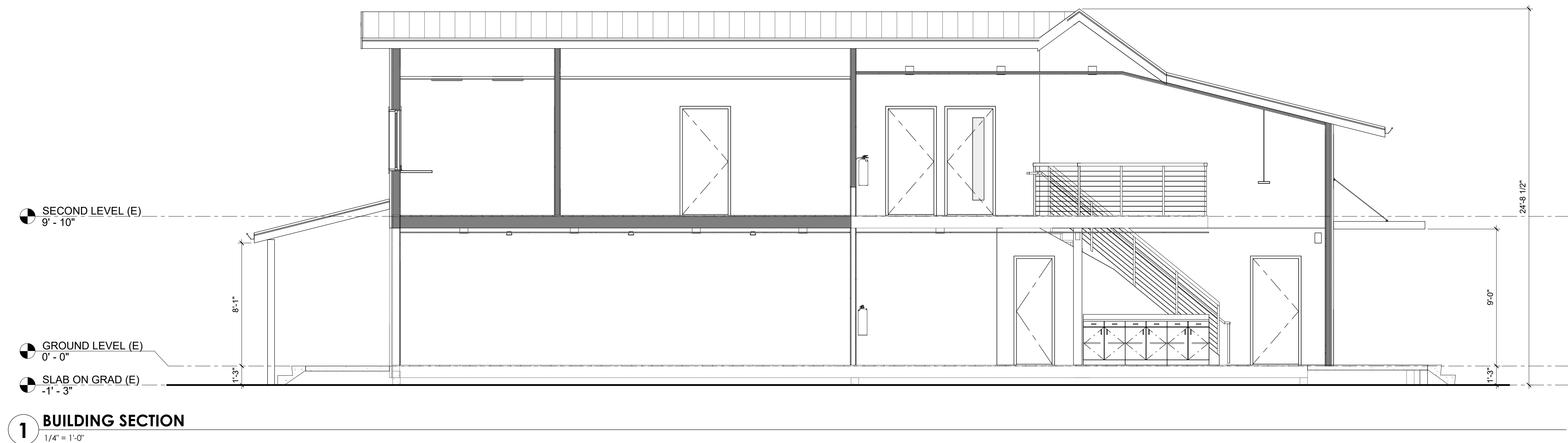
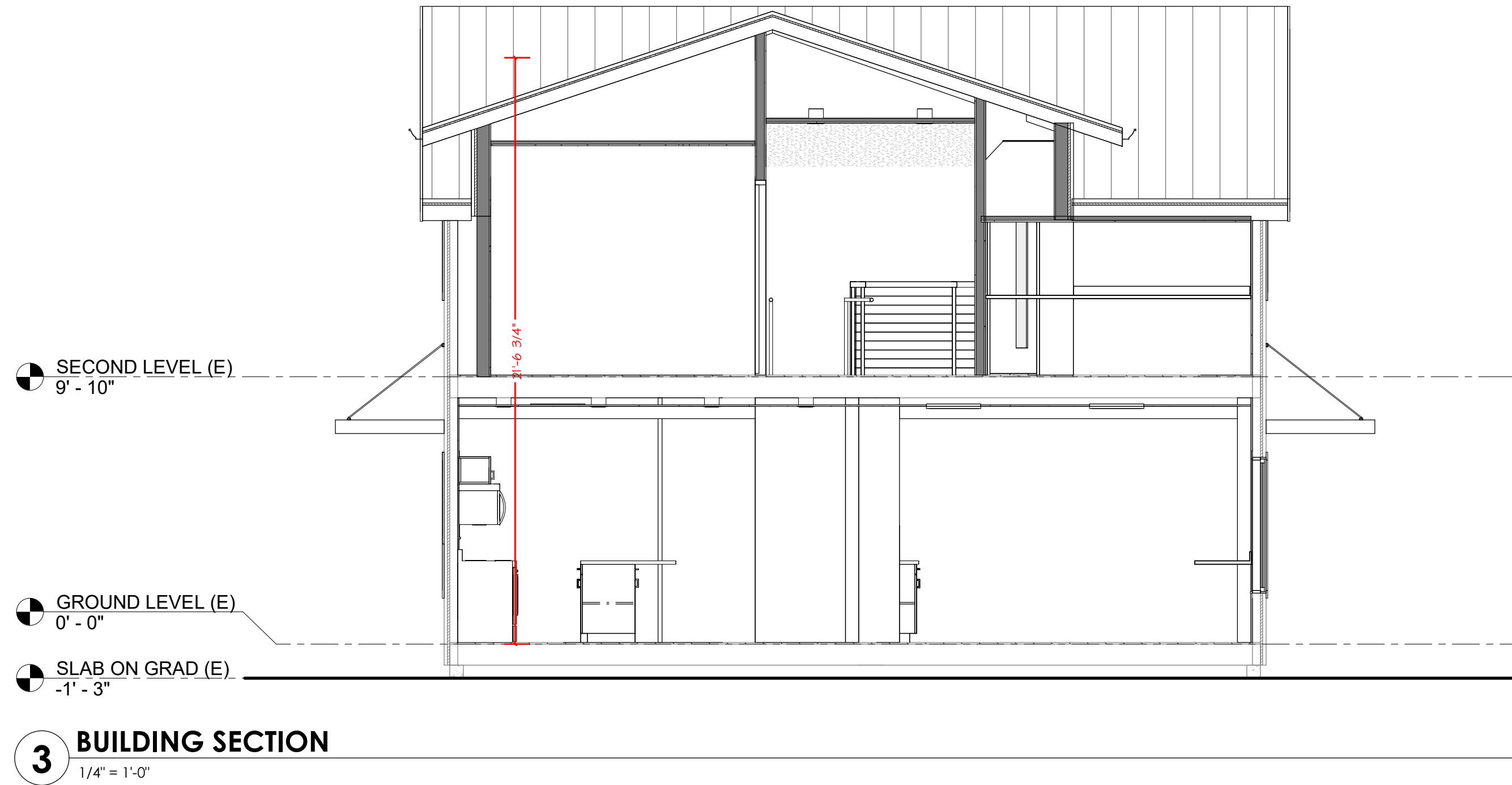
**DD**  
JAN 2025

| No. | Description | Date |
|-----|-------------|------|
|-----|-------------|------|

**A3.11**

PROJECT NO., 23-108

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Project: Todd Road  
 Sheet: \_\_\_\_\_ of \_\_\_\_\_  
 Originating Office: Tacoma

Job Number: 25-209  
 Name: LMC  
 Date: 4/16/2021

## MULTISTORY SHEARWALL DESIGN

### \*ENTER ALL LOADS UNFACTORED\*

$C_s = 0.157$   
 $SDS = 1.02$   
 ROOF DL = 15 psf  
 FLOOR DL = 15 psf  
 WALL WT = 15 psf  
 FLOOR DEPTH = 1 ft

Drift Limit  
 $D = 0.02$   
 $C_d = 4.0$

### LOAD COMBOS - ALLOWABLE STRESS DESIGN

|      | D   | L | S | E     |                  |
|------|-----|---|---|-------|------------------|
| LC 1 | 0.9 | 0 | 0 | 0.714 | } HOLDOWN DESIGN |
| LC 2 | 1.0 | 1 | 1 | 0.714 |                  |
| LC 3 | 1.0 | 0 | 0 | 0.714 | } POST DESIGN    |

| SPECIES | $F_{cp}$ | G    |
|---------|----------|------|
| HF      | 405 psi  | 0.43 |
| DF      | 625 psi  | 0.5  |
| DFpl    | 625 psi  | 0.43 |

### SHEARWALL TYPES

| TYPE | $V_{ALLOW}$ | $G_a$      |
|------|-------------|------------|
| A    | 286 plf     | 15.00 k-in |
| B    | 424 plf     | 11.00 k-in |
| C    | 552 plf     | 14.00 k-in |
| D    | 708 plf     | 18.00 k-in |
| E    | 572 plf     | 30.00 k-in |
| F    | 848 plf     | 21.00 k-in |

### CONT. ROD HOLDDOWNS

| TYPE      | $T_{ALLOW}$ | GRADE           |
|-----------|-------------|-----------------|
| 0.500 in  | 4470 lbs    | ASTM A307       |
| 0.625 in  | 7120 lbs    | ASTM A307       |
| 0.750 in  | 10540 lbs   | ASTM A307       |
| 0.875 in  | 14540 lbs   | ASTM A307       |
| 1.000 in  | 19080 lbs   | ASTM A307       |
| 1.125 in  | 24040 lbs   | ASTM A307       |
| 1.250 in  | 30530 lbs   | ASTM A307       |
| 1.500 in  | 44270 lbs   | ASTM A307       |
| 1.750 in  | 59830 lbs   | ASTM A307       |
| M - 0.625 | 8900 lbs    | ASTM F1554 GR55 |
| M - 0.750 | 13170 lbs   | ASTM F1554 GR55 |
| M - 0.875 | 18180 lbs   | ASTM F1554 GR55 |
| M - 1.000 | 23850 lbs   | ASTM F1554 GR55 |
| M - 1.125 | 30050 lbs   | ASTM F1554 GR55 |
| M - 1.250 | 38160 lbs   | ASTM F1554 GR55 |
| M - 1.500 | 55330 lbs   | ASTM F1554 GR55 |
| M - 1.750 | 74790 lbs   | ASTM F1554 GR55 |

### POST TYPES

| TYPE | E        | AREA      | D        | CF  | $F_c$    | $F_t$   |
|------|----------|-----------|----------|-----|----------|---------|
| 2x6  | 1.50E+06 | 8.25 in2  | 5.500 in | 1.1 | 1350 psi | 575 psi |
| 3x6  | 1.50E+06 | 13.75 in2 | 5.500 in | 1.1 | 1350 psi | 575 psi |
| 4x6  | 1.50E+06 | 19.25 in2 | 5.500 in | 1.1 | 1350 psi | 575 psi |
| 6x6  | 1.60E+06 | 30.25 in2 | 5.500 in | 1.1 | 1000 psi | 825 psi |
| 6x8  | 1.60E+06 | 41.25 in2 | 5.500 in | 1.1 | 1000 psi | 825 psi |
| 6x10 | 1.60E+06 | 52.25 in2 | 5.500 in | 1.0 | 925 psi  | 675 psi |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **A1** 2nd floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **11.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **8.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 5.0$  ft Total Wall Length  
 $L_{HD} = 4.5$  ft Distance from Holddown to comp post

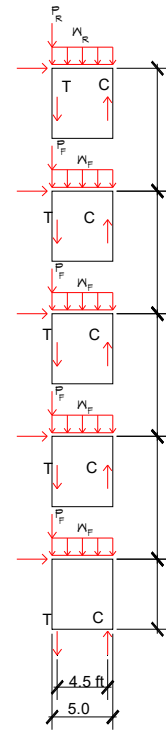
**WALL SUMMARY**

| Level | DF? | Sv | WALL | %    | Post    | %     | CHECKS |
|-------|-----|----|------|------|---------|-------|--------|
| Roof  | DF  | T1 | A    | 0.25 | (1) 2x6 | 0.123 | OK     |

**HOLDDOWN**

| Level | $V_u$ | Add Load | V      | SV   | P'   | W'   | h      | Sh  | $M_{OT}$ | $M_R$ | $T_{ASD}$ |
|-------|-------|----------|--------|------|------|------|--------|-----|----------|-------|-----------|
|       | plf   | lbs      | k      | k    | k    | k/ft | ft     | ft  | k/ft     | k/ft  | k         |
| Roof  | 99    | 0        | 0.50 K | 0.50 | 0.12 | 0.30 | 9.0 ft | 9.0 | 4.5      | 4.4   | 0.0       |

LRFD



DEFLECTION = PER SDPWS 4.3.2

| Level | $V_u$ | $G_u$ | $D_u$ | $A_{u,avg}$     | E      | h   | $d_{wall}$ | $Sd_{wall}$ | $d_{hd}$ | Sh  | $Sd_{hd}$ | $d_{comp}$ | Stretch |
|-------|-------|-------|-------|-----------------|--------|-----|------------|-------------|----------|-----|-----------|------------|---------|
|       | plf   | k-in  | in    | in <sup>2</sup> | psi    | ft  | in         | in          | in       | ft  | in        | in         | in      |
| Roof  | 99    | 15    | 0.010 | 0.3             | 185000 | 9.0 | 0.060      | 0.060       | 0.020    | 9.0 | 0.020     | 0.060      | 0.010   |

**CHORDS - COMPRESSION CONTROLS**

| Level | D    | L    | S    | E   | $C_{ASD}$ | h   | $C_p$ | $f_c$ | $F_{cp}$ | $F_c'$ | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|------|------|------|-----|-----------|-----|-------|-------|----------|--------|--------------|------------|-------|
|       | k    | k    | k    | k   | k         | ft  |       | psi   | psi      | psi    |              |            |       |
| Roof  | 0.00 | 0.00 | 0.00 | 0.9 | 0.636     | 8.0 | 0.513 | 77    | 625      | 1220   | 0.123        | 0.063      | 0.123 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **A1.1** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **11.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **8.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **5.0** ft Total Wall Length  
 $L_{HD} = 4.5$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 139 | A    | 0.49 | (2) 2x6 | 0.700 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 0.50 K | 0.50    |         |           |         |          | 4.5             | 4.4          |                |
| 2nd   | 96           | 0                  | 0.48 K | 0.98    | 0.12    | 0.45      | 19.0 ft | 19.0     | 23.0            | 10.6         | 1.9            |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s, reqd}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|----------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 195          | 15            | 0.010       | 15.4305-06                       | 29000    | 10.0    | 0.234            | 0.216             | 0.043          | 19.0     | 0.043           | 0.050           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 4.6    | 3.283          | 18.0    | 0.120 | 199          | 625             | 284           | 0.318        | 0.700      | 0.700 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **A2** 2nd floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **11.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **21.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 9.8$  ft Total Wall Length  
 $L_{HD} = 9.3$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv | WALL | %    | Post    | %     | CHECKS |
|-------|-----|----|------|------|---------|-------|--------|
| Roof  | DF  | T1 | A    | 0.25 | (1) 2x6 | 0.123 | OK     |

**HOLDDOWN**

| Level | $V_u$ | Add Load | V      | SV   | P'   | W'   | h      | Sh  | $M_{OT}$ | $M_R$ | $T_{ASD}$ |
|-------|-------|----------|--------|------|------|------|--------|-----|----------|-------|-----------|
|       | plf   | lbs      | k      | k    | k    | k/ft | ft     | ft  | k/ft     | k/ft  | k         |
| Roof  | 99    | 0        | 0.97 K | 0.97 | 0.32 | 0.30 | 9.0 ft | 9.0 | 8.8      | 17.6  | 0.0       |

LRFD

DEFLECTION = PER SDPWS 4.3.2

| Level | $V_u$ | $G_u$ | $D_u$ | $A_{max}$       | E      | h   | $d_{wall}$ | $Sd_{wall}$ | $d_{hd}$ | Sh  | $Sd_{hd}$ | $d_{comp}$ | Stretch |
|-------|-------|-------|-------|-----------------|--------|-----|------------|-------------|----------|-----|-----------|------------|---------|
|       | plf   | k-in  | in    | in <sup>2</sup> | psi    | ft  | in         | in          | in       | ft  | in        | in         | in      |
| Roof  | 99    | 15    | 0.010 | 2.3             | 185000 | 8.0 | 0.056      | 0.056       | 0.010    | 8.0 | 0.010     | 0.066      | 0.010   |

**CHORDS - COMPRESSION CONTROLS**

| Level | D    | L    | S    | E   | $C_{ASD}$ | h   | $C_p$ | $f_c$ | $F_{cp}$ | $F_c'$ | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|------|------|------|-----|-----------|-----|-------|-------|----------|--------|--------------|------------|-------|
|       | k    | k    | k    | k   | k         | ft  |       | psi   | psi      | psi    |              |            |       |
| Roof  | 0.00 | 0.00 | 0.00 | 0.9 | 0.636     | 8.0 | 0.513 | 77    | 625      | 1220   | 0.123        | 0.063      | 0.123 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **A2.1** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9-0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **11.00** ft  $1+0.14S_{DS} = 1.14$   
Trib Area = **8.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **6.7** ft Total Wall Length  
 $L_{HD} = 6.2$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 139 | A    | 0.49 | (2) 2x6 | 0.898 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 0.97 K | 0.97    |         |           |         |          | 8.8             | 0.0          |                |
| 2nd   | 96           | 0                  | 0.64 K | 1.62    | 0.12    | 0.45      | 19.0 ft | 19.0     | 39.5            | 10.9         | 9.2            |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s,reqd}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|---------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 2nd   | 139          | 15            | 0.010       | 15.4305-06                      | 29000    | 19.0    | 0.898            | 0.898             | 0.001          | 19.0     | 0.001           | 0.004           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 5.9    | 4.208          | 18.0    | 0.120 | 255          | 625             | 284           | 0.408        | 0.898      | 0.898 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **A3** 2nd floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **11.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **5.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 10.0$  ft Total Wall Length  
 $L_{HD} = 9.5$  ft Distance from Holddown to comp post

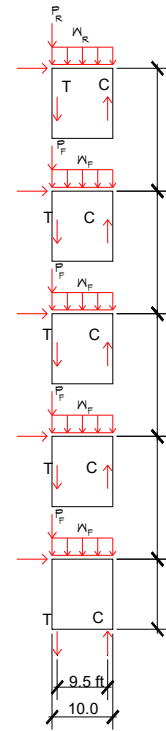
**WALL SUMMARY**

| Level | DF? | Sv | WALL | %    | Post    | %     | CHECKS |
|-------|-----|----|------|------|---------|-------|--------|
| Roof  | DF  | T1 | A    | 0.25 | (1) 2x6 | 0.123 | OK     |

**HOLDDOWN**

| Level | $V_u$ | Add Load | V      | SV   | P'   | W'   | h      | Sh  | $M_{OT}$ | $M_R$ | $T_{ASD}$ |
|-------|-------|----------|--------|------|------|------|--------|-----|----------|-------|-----------|
|       | plf   | lbs      | k      | k    | k    | k/ft | ft     | ft  | k/ft     | k/ft  | k         |
| Roof  | 99    | 0        | 0.99 K | 0.99 | 0.08 | 0.30 | 9.0 ft | 9.0 | 8.9      | 15.8  | 0.0       |

LRFD



DEFLECTION = PER SDPWS 4.3.2

| Level | $V_u$ | $G_u$ | $D_u$ | $A_{u,wall}$    | $E$     | $h$ | $d_{wall}$ | $Sd_{wall}$ | $d_{hd}$ | $Sh$ | $Sd_{hd}$ | $d_{comp}$ | Stretch |
|-------|-------|-------|-------|-----------------|---------|-----|------------|-------------|----------|------|-----------|------------|---------|
|       | plf   | k-in  | in    | in <sup>2</sup> | psi     | ft  | in         | in          | in       | ft   | in        | in         | in      |
| Roof  | 99    | 15    | 0.010 | 0.3             | 1500000 | 9.0 | 0.056      | 0.056       | 0.004    | 8.0  | 0.004     | 0.004      | 0.010   |

**CHORDS - COMPRESSION CONTROLS**

| Level | D    | L    | S    | E   | $C_{ASD}$ | h   | $C_p$ | $f_c$ | $F_{cp}$ | $F_c'$ | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|------|------|------|-----|-----------|-----|-------|-------|----------|--------|--------------|------------|-------|
|       | k    | k    | k    | k   | k         | ft  |       | psi   | psi      | psi    |              |            |       |
| Roof  | 0.00 | 0.00 | 0.00 | 0.9 | 0.636     | 8.0 | 0.513 | 77    | 625      | 1220   | 0.123        | 0.063      | 0.123 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **A3.1** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **11.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **8.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 3.5$  ft Total Wall Length  
 $L_{HD} = 3.0$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 139 | A    | 0.49 | (2) 2x6 | 0.882 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>k/ft | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|------------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 0.50 K | 0.50    |         |            |         |          | 4.5             | 0.0          |                |
| 2nd   | 96           | 0                  | 0.34 K | 0.83    | 0.12    | 0.45       | 19.0 ft | 19.0     | 20.2            | 3.2          | 4.0            |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s,reqd}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|---------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 195          | 15            | 0.010       | 15.4305-06                      | 29000    | 19.0    | 0.882            | 0.882             | 0.043          | 19.0     | 0.043           | 0.400           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 5.8    | 4.131          | 18.0    | 0.120 | 250          | 625             | 284           | 0.401        | 0.882      | 0.882 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **A4** 2nd floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **11.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 8.0$  ft Total Wall Length  
 $L_{HD} = 7.5$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv | WALL | %    | Post    | %     | CHECKS |
|-------|-----|----|------|------|---------|-------|--------|
| Roof  | DF  | 91 | A    | 0.32 | (1) 2x6 | 0.160 | OK     |

**HOLDDOWN**

| Level | $V_u$ | Add Load | V      | SV   | P'   | W'   | h      | Sh  | $M_{OT}$ | $M_R$ | $T_{ASD}$ |
|-------|-------|----------|--------|------|------|------|--------|-----|----------|-------|-----------|
|       | plf   | lbs      | k      | k    | k    | k/ft | ft     | ft  | k/ft     | k/ft  | k         |
| Roof  | 128   | 0        | 1.02 K | 1.02 | 0.17 | 0.17 | 9.0 ft | 9.0 | 9.2      | 6.6   | 0.2       |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$ | $G_s$ | $D_s$ | $A_{s, req'd}$  | E          | h   | $d_{wall}$ | $Sd_{wall}$ | $d_{hd}$ | Sh  | $Sd_{hd}$ | $d_{comp}$ | Stretch |
|-------|-------|-------|-------|-----------------|------------|-----|------------|-------------|----------|-----|-----------|------------|---------|
|       | plf   | k-in  | in    | in <sup>2</sup> | psi        | ft  | in         | in          | in       | ft  | in        | in         | in      |
| Roof  | 128   | 15    | 0.010 | 0.3             | 29,000,000 | 8.0 | 0.074      | 0.074       | 0.012    | 8.0 | 0.012     | 0.086      | 0.010   |

**CHORDS - COMPRESSION CONTROLS**

| Level | D    | L    | S    | E   | $C_{ASD}$ | h   | $C_p$ | $f_c$ | $F_{cp}$ | $F_c'$ | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|------|------|------|-----|-----------|-----|-------|-------|----------|--------|--------------|------------|-------|
|       | k    | k    | k    | k   | k         | ft  |       | psi   | psi      | psi    |              |            |       |
| Roof  | 0.00 | 0.00 | 0.00 | 1.2 | 0.823     | 8.0 | 0.513 | 100   | 625      | 1220   | 0.160        | 0.082      | 0.160 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **A4.1** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9-0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **6.00** ft  $1+0.14S_{DS} = 1.14$   
Trib Area = **12.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **7.0** ft Total Wall Length  
 $L_{HD} = 6.5$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 148 | A    | 0.52 | (3) 2x6 | 0.696 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 1.49 K | 1.49    |         |           |         |          | 9.2             | 6.6          |                |
| 2nd   | 79           | 0                  | 0.55 K | 2.04    | 0.18    | 0.38      | 19.0 ft | 19.0     | 47.9            | 17.0         | 3.3            |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s,req'd}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|----------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 329          | 15            | 0.010       | 25                               | 2900000  | 10.0    | 0.008            | 0.008             | 0.008          | 19.0     | 0.008           | 0.010           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 6.8    | 4.892          | 18.0    | 0.120 | 198          | 625             | 284           | 0.316        | 0.696      | 0.696 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **A5** 2nd floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **11.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 6.5$  ft Total Wall Length  
 $L_{HD} = 6.0$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF?       | Sv | WALL     | %    | Post           | %     | CHECKS    |
|-------|-----------|----|----------|------|----------------|-------|-----------|
| Roof  | <b>DF</b> | 92 | <b>A</b> | 0.32 | (1) <b>2x6</b> | 0.161 | <b>OK</b> |

**HOLDDOWN**

| Level | $V_u$      | Add Load | V      | SV   | P'   | W'   | h             | Sh  | $M_{OT}$ | $M_R$ | $T_{ASD}$  |
|-------|------------|----------|--------|------|------|------|---------------|-----|----------|-------|------------|
|       | plf        | lbs      | k      | k    | k    | k/ft | ft            | ft  | k/ft     | k/ft  | k          |
| Roof  | <b>129</b> | <b>0</b> | 0.84 K | 0.84 | 0.17 | 0.17 | <b>9.0 ft</b> | 9.0 | 7.5      | 4.6   | <b>0.3</b> |

**LRFD**

DEFLECTION = PER SDPWS 4.3.2

| Level | $V_u$      | $G_s$     | $D_s$        | $A_{s, req'd}$  | E             | h          | $d_{WALL}$   | $Sd_{WALL}$  | $d_{HD}$     | Sh         | $Sd_{HD}$    | $d_{TOP}$    | Stretch      |
|-------|------------|-----------|--------------|-----------------|---------------|------------|--------------|--------------|--------------|------------|--------------|--------------|--------------|
|       | plf        | k-in      | in           | in <sup>2</sup> | psi           | ft         | in           | in           | in           | ft         | in           | in           | in           |
| Roof  | <b>129</b> | <b>15</b> | <b>0.010</b> | <b>0.3</b>      | <b>29,000</b> | <b>8.0</b> | <b>0.076</b> | <b>0.076</b> | <b>0.076</b> | <b>8.0</b> | <b>0.015</b> | <b>0.081</b> | <b>0.010</b> |

**CHORDS - COMPRESSION CONTROLS**

| Level | D           | L           | S           | E          | $C_{ASD}$    | h          | $C_p$        | $f_c$      | $F_{cp}$   | $F_c'$      | $f_c/F_{cp}$ | $f_c/F_c'$   | MAX          |
|-------|-------------|-------------|-------------|------------|--------------|------------|--------------|------------|------------|-------------|--------------|--------------|--------------|
|       | k           | k           | k           | k          | k            | ft         |              | psi        | psi        | psi         |              |              |              |
| Roof  | <b>0.00</b> | <b>0.00</b> | <b>0.00</b> | <b>1.2</b> | <b>0.829</b> | <b>8.0</b> | <b>0.513</b> | <b>101</b> | <b>625</b> | <b>1220</b> | <b>0.161</b> | <b>0.082</b> | <b>0.161</b> |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **A5.1** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **6.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **12.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **4.2** ft Total Wall Length  
 $L_{HD} = 3.7$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 149 | A    | 0.52 | (2) 2x6 | 0.792 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 0.42 K | 0.42    |         |           |         |          | 7.5             | 0.0          |                |
| 2nd   | 79           | 0                  | 0.33 K | 0.75    | 0.18    | 0.38      | 19.0 ft | 19.0     | 21.8            | 4.1          | 3.4            |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s,reqd}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|---------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 0.00         | 15            | 0.010       | 15.430506                       | 29000    | 10.0    | 0.354            | 0.356             | 0.051          | 19.0     | 0.051           | 0.403           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 5.2    | 3.710          | 18.0    | 0.120 | 225          | 625             | 284           | 0.360        | 0.792      | 0.792 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **A5.2** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **6.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **12.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **4.2** ft Total Wall Length  
 $L_{HD} = 3.7$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 149 | A    | 0.52 | (2) 2x6 | 0.966 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 0.67 K | 0.67    |         |           |         |          | 7.5             | 0.0          |                |
| 2nd   | 79           | 0                  | 0.33 K | 1.00    | 0.18    | 0.38      | 19.0 ft | 19.0     | 26.6            | 4.1          | 4.3            |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s,reqd}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|---------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 0.00         | 15            | 0.010       | 15.4305-06                      | 29000    | 18.0    | 0.354            | 0.056             | 0.051          | 18.0     | 0.051           | 0.403           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 6.3    | 4.526          | 18.0    | 0.120 | 274          | 625             | 284           | 0.439        | 0.966      | 0.966 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **A6** 2nd floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **11.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 7.8$  ft Total Wall Length  
 $L_{HD} = 7.3$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv | WALL | %    | Post    | %     | CHECKS |
|-------|-----|----|------|------|---------|-------|--------|
| Roof  | DF  | 92 | A    | 0.32 | (1) 2x6 | 0.161 | OK     |

**HOLDDOWN**

| Level | $V_u$ | Add Load | V      | SV   | P'   | W'   | h      | Sh  | $M_{OT}$ | $M_R$ | $T_{ASD}$ |
|-------|-------|----------|--------|------|------|------|--------|-----|----------|-------|-----------|
|       | plf   | lbs      | k      | k    | k    | k/ft | ft     | ft  | k/ft     | k/ft  | k         |
| Roof  | 129   | 0        | 1.01 K | 1.01 | 0.17 | 0.17 | 9.0 ft | 9.0 | 9.1      | 6.3   | 0.2       |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$ | $G_s$ | $D_s$ | $A_{s, req'd}$  | E     | h   | $d_{wall}$ | $Sd_{wall}$ | $d_{HD}$ | Sh  | $Sd_{HD}$ | $d_{comp}$ | Stretch |
|-------|-------|-------|-------|-----------------|-------|-----|------------|-------------|----------|-----|-----------|------------|---------|
|       | plf   | k-in  | in    | in <sup>2</sup> | psi   | ft  | in         | in          | in       | ft  | in        | in         | in      |
| Roof  | 129   | 15    | 0.010 | 0.3             | 29000 | 9.0 | 0.075      | 0.075       | 0.012    | 9.0 | 0.012     | 0.007      | 0.010   |

**CHORDS - COMPRESSION CONTROLS**

| Level | D    | L    | S    | E   | $C_{ASD}$ | h   | $C_p$ | $f_c$ | $F_{cp}$ | $F_c'$ | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|------|------|------|-----|-----------|-----|-------|-------|----------|--------|--------------|------------|-------|
|       | k    | k    | k    | k   | k         | ft  |       | psi   | psi      | psi    |              |            |       |
| Roof  | 0.00 | 0.00 | 0.00 | 1.2 | 0.829     | 8.0 | 0.513 | 101   | 625      | 1220   | 0.161        | 0.082      | 0.161 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **A6.1** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **6.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **12.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **4.6** ft Total Wall Length  
 $L_{HD} = 4.1$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 149 | A    | 0.52 | (2) 2x6 | 0.956 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 0.76 K | 0.76    |         |           |         |          | 7.5             | 0.0          |                |
| 2nd   | 79           | 0                  | 0.36 K | 1.12    | 0.18    | 0.38      | 19.0 ft | 19.0     | 28.8            | 4.8          | 4.1            |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s,reqd}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|---------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 228          | 15            | 0.010       | 15.430506                       | 29000    | 18.0    | 8.345            | 0.045             | 0.045          | 18.0     | 0.045           | 0.045           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 6.3    | 4.479          | 18.0    | 0.120 | 271          | 625             | 284           | 0.434        | 0.956      | 0.956 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **B1** 2nd floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9-0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **11.00** ft  $1+0.14S_{DS} = 1.14$   
Trib Area = **8.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 23.0$  ft Total Wall Length  
 $L_{HD} = 22.5$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv | WALL | %    | Post    | %     | CHECKS |
|-------|-----|----|------|------|---------|-------|--------|
| Roof  | DF  | 80 | A    | 0.28 | (1) 2x6 | 0.140 | OK     |

**HOLDDOWN**

| Level | $V_u$ | Add Load | V      | SV   | P'   | W'   | h      | Sh  | $M_{OT}$ | $M_R$ | $T_{ASD}$ |
|-------|-------|----------|--------|------|------|------|--------|-----|----------|-------|-----------|
|       | plf   | lbs      | k      | k    | k    | k/ft | ft     | ft  | k/ft     | k/ft  | k         |
| Roof  | 112   | 0        | 2.58 K | 2.58 | 0.12 | 0.30 | 9.0 ft | 9.0 | 23.2     | 82.1  | 0.0       |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$ | $G_u$ | $D_u$ | $A_{max}$       | E      | h   | $d_{wall}$ | $Sd_{wall}$ | $d_{HD}$ | Sh  | $Sd_{HD}$ | $d_{comp}$ | Stretch |
|-------|-------|-------|-------|-----------------|--------|-----|------------|-------------|----------|-----|-----------|------------|---------|
|       | plf   | k-in  | in    | in <sup>2</sup> | psi    | ft  | in         | in          | in       | ft  | in        | in         | in      |
| Roof  | 112   | 15    | 0.010 | 2.3             | 29,000 | 8.0 | 0.061      | 0.061       | 0.004    | 8.0 | 0.004     | 0.005      | 0.010   |

**CHORDS - COMPRESSION CONTROLS**

| Level | D    | L    | S    | E   | $C_{ASD}$ | h   | $C_p$ | $f_c$ | $F_{cp}$ | $F_c'$ | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|------|------|------|-----|-----------|-----|-------|-------|----------|--------|--------------|------------|-------|
|       | k    | k    | k    | k   | k         | ft  |       | psi   | psi      | psi    |              |            |       |
| Roof  | 0.00 | 0.00 | 0.00 | 1.0 | 0.720     | 8.0 | 0.513 | 87    | 625      | 1220   | 0.140        | 0.072      | 0.140 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **B1.1** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **11.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **31.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **5.0** ft Total Wall Length  
 $L_{HD} = 4.5$  ft Distance from Holddown to comp post

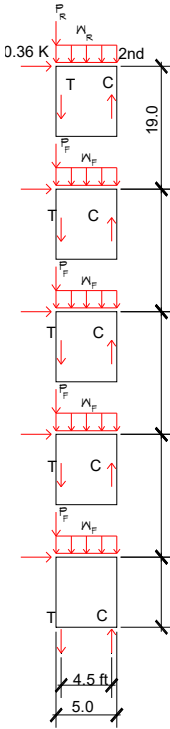
**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 131 | A    | 0.46 | (1) 2x6 | 0.411 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 0.00 K | 0.00    |         |           |         |          | 0.0             | 0.0          |                |
| 2nd   | 71           | 0                  | 0.36 K | 0.36    | 0.47    | 0.45      | 19.0 ft | 19.0     | 6.7             | 8.0          | 0.0            |

LRFD



DEFLECTION = PER SDPWS 4.3.2

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s,reqd}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|---------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 143          | 15            | 0.010       | 0.3                             | 2900000  | 19.0    | 0.375            | 0.375             | 0.043          | 19.0     | 0.043           | 0.415           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 1.3    | 0.964          | 18.0    | 0.120 | 117          | 625             | 284           | 0.187        | 0.411      | 0.411 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **B1.2** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **11.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **31.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **9.0** ft Total Wall Length  
 $L_{HD} = 8.5$  ft Distance from Holddown to comp post

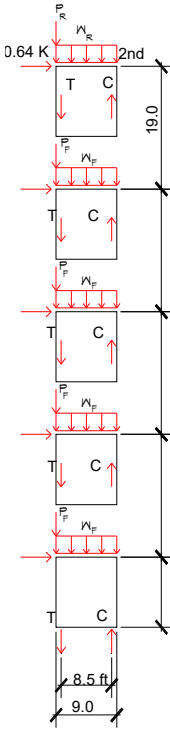
**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 131 | A    | 0.46 | (3) 2x6 | 0.730 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 1.55 K | 1.55    |         |           |         |          | 23.2            | 0.0          |                |
| 2nd   | 71           | 0                  | 0.64 K | 2.18    | 0.47    | 0.45      | 19.0 ft | 19.0     | 64.7            | 22.4         | 3.4            |

LRFD



DEFLECTION = PER SDPWS 4.3.2

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s, reqd}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|----------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 143          | 15            | 0.010       | 25                               | 2900000  | 10.0    | 0.345            | 0.345             | 0.000          | 19.0     | 0.000           | 0.345           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 7.2    | 5.134          | 18.0    | 0.120 | 207          | 625             | 284           | 0.332        | 0.730      | 0.730 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **B1.3** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9-0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **11.00** ft  $1+0.14S_{DS} = 1.14$   
Trib Area = **31.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **5.7 ft** Total Wall Length  
 $L_{HD} = 5.2$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 131 | A    | 0.46 | (3) 2x6 | 0.894 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 1.03 K | 1.03    |         |           |         |          | 23.2            | 0.0          |                |
| 2nd   | 71           | 0                  | 0.41 K | 1.44    | 0.47    | 0.45      | 19.0 ft | 19.0     | 50.5            | 10.1         | 5.4            |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s,reqd}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|---------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 143          | 15            | 0.010       | 25                              | 2900000  | 10.0    | 0.005            | 0.005             | 0.005          | 10.0     | 0.004           | 0.000           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 8.8    | 6.285          | 18.0    | 0.120 | 254          | 625             | 284           | 0.406        | 0.894      | 0.894 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **B2** 2nd floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **17.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 7.7$  ft Total Wall Length  
 $L_{HD} = 7.2$  ft Distance from Holddown to comp post

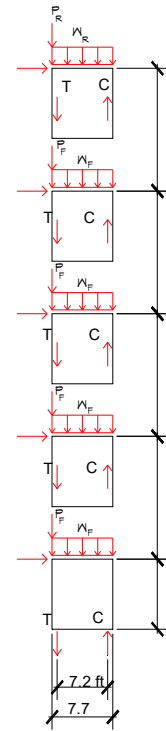
**WALL SUMMARY**

| Level | DF? | Sv | WALL | %    | Post    | %     | CHECKS |
|-------|-----|----|------|------|---------|-------|--------|
| Roof  | DF  | 93 | A    | 0.32 | (1) 2x6 | 0.162 | OK     |

**HOLDDOWN**

| Level | $V_u$ | Add Load | V      | SV   | P'   | W'   | h      | Sh  | $M_{OT}$ | $M_R$ | $T_{ASD}$ |
|-------|-------|----------|--------|------|------|------|--------|-----|----------|-------|-----------|
|       | plf   | lbs      | k      | k    | k    | k/ft | ft     | ft  | k/ft     | k/ft  | k         |
| Roof  | 130   | 0        | 1.00 K | 1.00 | 0.26 | 0.17 | 9.0 ft | 9.0 | 9.0      | 6.8   | 0.2       |

LRFD



DEFLECTION - PER SDPWS 4.3.2

| Level | $V_u$ | $G_s$ | $D_s$ | $A_{chord}$     | E          | h   | $d_{wall}$ | $Sd_{wall}$ | $d_{hd}$ | Sh  | $Sd_{hd}$ | $d_{comp}$ | Stretch |
|-------|-------|-------|-------|-----------------|------------|-----|------------|-------------|----------|-----|-----------|------------|---------|
|       | plf   | k-in  | in    | in <sup>2</sup> | psi        | ft  | in         | in          | in       | ft  | in        | in         | in      |
| Roof  | 130   | 15    | 0.010 | 2.3             | 29,000,000 | 8.0 | 0.078      | 0.078       | 0.013    | 8.0 | 0.013     | 0.088      | 0.010   |

**CHORDS - COMPRESSION CONTROLS**

| Level | D    | L    | S    | E   | $C_{ASD}$ | h   | $C_p$ | $f_c$ | $F_{cp}$ | $F_c'$ | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|------|------|------|-----|-----------|-----|-------|-------|----------|--------|--------------|------------|-------|
|       | k    | k    | k    | k   | k         | ft  |       | psi   | psi      | psi    |              |            |       |
| Roof  | 0.00 | 0.00 | 0.00 | 1.2 | 0.836     | 8.0 | 0.513 | 101   | 625      | 1220   | 0.162        | 0.083      | 0.162 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **B2.1** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **6.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **11.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **4.3** ft Total Wall Length  
 $L_{HD} = 3.8$  ft Distance from Holddown to comp post

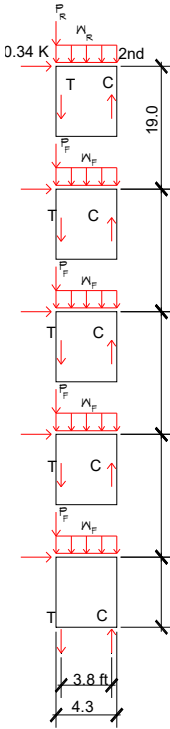
**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 149 | A    | 0.52 | (3) 2x6 | 0.729 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 0.80 K | 0.80    |         |           |         |          | 9.0             | 0.0          |                |
| 2nd   | 79           | 0                  | 0.34 K | 1.13    | 0.17    | 0.38      | 19.0 ft | 19.0     | 30.5            | 4.1          | 5.0            |

LRFD



DEFLECTION = PER SDPWS 4.3.2

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s,reqd}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|---------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 209          | 15            | 0.010       | 0.25                            | 2900000  | 10.0    | 0.831            | 0.831             | 0.051          | 19.0     | 0.051           | 0.010           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 7.2    | 5.128          | 18.0    | 0.120 | 207          | 625             | 284           | 0.331        | 0.729      | 0.729 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **B2.2** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **6.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **11.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **3.4** ft Total Wall Length  
 $L_{HD} = 2.9$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 149 | A    | 0.52 | (2) 2x6 | 0.801 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 0.20 K | 0.20    |         |           |         |          | 9.0             | 0.0          |                |
| 2nd   | 79           | 0                  | 0.27 K | 0.47    | 0.17    | 0.38      | 19.0 ft | 19.0     | 17.9            | 2.7          | 3.7            |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s, reqd}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|----------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 224          | 15            | 0.010       | 15.430506                        | 29000    | 18.0    | 0.895            | 0.895             | 0.046          | 18.0     | 0.046           | 0.453           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 5.3    | 3.753          | 18.0    | 0.120 | 227          | 625             | 284           | 0.364        | 0.801      | 0.801 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **B3** 2nd floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **17.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 7.1$  ft Total Wall Length  
 $L_{HD} = 6.6$  ft Distance from Holddown to comp post

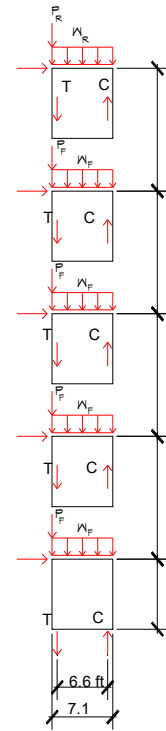
**WALL SUMMARY**

| Level | DF? | SV | WALL | %    | Post    | %     | CHECKS |
|-------|-----|----|------|------|---------|-------|--------|
| Roof  | DF  | 93 | A    | 0.32 | (1) 2x6 | 0.162 | OK     |

**HOLDDOWN**

| Level | $V_u$ | Add Load | V      | SV   | P'   | W'   | h      | Sh  | $M_{OT}$ | $M_R$ | $T_{ASD}$ |
|-------|-------|----------|--------|------|------|------|--------|-----|----------|-------|-----------|
|       | plf   | lbs      | k      | k    | k    | k/ft | ft     | ft  | k/ft     | k/ft  | k         |
| Roof  | 130   | 0        | 0.92 K | 0.92 | 0.26 | 0.17 | 9.0 ft | 9.0 | 8.3      | 6.0   | 0.2       |

LRFD



DEFLECTION = PER SDPWS 4.3.2

| Level | $V_u$ | $G_u$ | $D_u$ | $A_{max}$       | E      | h   | $d_{wall}$ | $Sd_{wall}$ | $d_{HD}$ | Sh  | $Sd_{HD}$ | $d_{comp}$ | Stretch |
|-------|-------|-------|-------|-----------------|--------|-----|------------|-------------|----------|-----|-----------|------------|---------|
|       | plf   | k-in  | in    | in <sup>2</sup> | psi    | ft  | in         | in          | in       | ft  | in        | in         | in      |
| Roof  | 130   | 15    | 0.010 | 2.3             | 185000 | 8.0 | 0.076      | 0.076       | 0.014    | 8.0 | 0.014     | 0.008      | 0.010   |

**CHORDS - COMPRESSION CONTROLS**

| Level | D    | L    | S    | E   | $C_{ASD}$ | h   | $C_p$ | $f_c$ | $F_{cp}$ | $F_c'$ | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|------|------|------|-----|-----------|-----|-------|-------|----------|--------|--------------|------------|-------|
|       | k    | k    | k    | k   | k         | ft  |       | psi   | psi      | psi    |              |            |       |
| Roof  | 0.00 | 0.00 | 0.00 | 1.2 | 0.836     | 8.0 | 0.513 | 101   | 625      | 1220   | 0.162        | 0.083      | 0.162 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **B3.1** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **6.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **11.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **4.4** ft Total Wall Length  
 $L_{HD} = 3.9$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 149 | A    | 0.52 | (2) 2x6 | 0.977 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 0.70 K | 0.70    |         |           |         |          | 8.3             | 0.0          |                |
| 2nd   | 79           | 0                  | 0.35 K | 1.05    | 0.17    | 0.38      | 19.0 ft | 19.0     | 28.2            | 4.4          | 4.3            |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s,reqd}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|---------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 324          | 15            | 0.010       | 15.4305-06                      | 29000    | 18.0    | 0.355            | 0.553             | 0.048          | 18.0     | 0.048           | 0.401           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 6.4    | 4.580          | 18.0    | 0.120 | 278          | 625             | 284           | 0.444        | 0.977      | 0.977 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **B3.2** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **6.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **11.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 3.3$  ft Total Wall Length  
 $L_{HD} = 2.8$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 149 | A    | 0.52 | (3) 2x6 | 0.707 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 0.52 K | 0.52    |         |           |         |          | 0.3             | 0.0          |                |
| 2nd   | 79           | 0                  | 0.26 K | 0.70    | 0.17    | 0.30      | 19.0 ft | 19.0     | 23.2            | 2.6          | 5.1            |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{chord}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|--------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 209          | 15            | 0.010       | 25                             | 2900000  | 10.0    | 0.344            | 0.344             | 0.047          | 10.0     | 0.047           | 0.411           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 7.0    | 4.973          | 10.0    | 0.120 | 201          | 625             | 284           | 0.322        | 0.707      | 0.707 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **B4** 2nd floor

$C_b = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **17.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 7.7$  ft Total Wall Length  
 $L_{HD} = 7.2$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv | WALL | %    | Post    | %     | CHECKS |
|-------|-----|----|------|------|---------|-------|--------|
| Roof  | DF  | 93 | A    | 0.32 | (1) 2x6 | 0.162 | OK     |

**HOLDDOWN**

| Level | $V_u$ | Add Load | V      | SV   | P'   | W'   | h      | Sh  | $M_{OT}$ | $M_R$ | $T_{ASD}$ |
|-------|-------|----------|--------|------|------|------|--------|-----|----------|-------|-----------|
|       | plf   | lbs      | k      | k    | k    | k/ft | ft     | ft  | k/ft     | k/ft  | k         |
| Roof  | 130   | 0        | 1.00 K | 1.00 | 0.26 | 0.17 | 9.0 ft | 9.0 | 9.0      | 6.8   | 0.2       |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$ | $G_s$ | $D_s$ | $A_{s,req'd}$   | E          | h   | $d_{wall}$ | $Sd_{wall}$ | $d_{HD}$ | Sh  | $Sd_{HD}$ | $d_{comp}$ | Stretch |
|-------|-------|-------|-------|-----------------|------------|-----|------------|-------------|----------|-----|-----------|------------|---------|
|       | plf   | k-in  | in    | in <sup>2</sup> | psi        | ft  | in         | in          | in       | ft  | in        | in         | in      |
| Roof  | 130   | 15    | 0.010 | 0.3             | 29,000,000 | 8.0 | 0.078      | 0.078       | 0.013    | 8.0 | 0.013     | 0.088      | 0.010   |

**CHORDS - COMPRESSION CONTROLS**

| Level | D    | L    | S    | E   | $C_{ASD}$ | h   | $C_p$ | $f_c$ | $F_{cp}$ | $F_c'$ | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|------|------|------|-----|-----------|-----|-------|-------|----------|--------|--------------|------------|-------|
|       | k    | k    | k    | k   | k         | ft  |       | psi   | psi      | psi    |              |            |       |
| Roof  | 0.00 | 0.00 | 0.00 | 1.2 | 0.836     | 8.0 | 0.513 | 101   | 625      | 1220   | 0.162        | 0.083      | 0.162 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **B4.1** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **6.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **11.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 4.3$  ft Total Wall Length  
 $L_{HD} = 3.8$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 149 | A    | 0.52 | (2) 2x6 | 0.998 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 0.67 K | 0.67    |         |           |         |          | 9.0             | 0.0          |                |
| 2nd   | 79           | 0                  | 0.34 K | 1.01    | 0.17    | 0.38      | 19.0 ft | 19.0     | 28.2            | 4.2          | 4.5            |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{comp}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|-------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 224          | 15            | 0.010       | 15                            | 2900000  | 18.0    | 0.354            | 0.354             | 0.050          | 18.0     | 0.050           | 0.404           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 6.5    | 4.677          | 18.0    | 0.120 | 283          | 625             | 284           | 0.454        | 0.998      | 0.998 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **1A** 2nd floor

$C_b = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **8.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 2.7$  ft Total Wall Length  
 $L_{HD} = 2.2$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| Roof  | DF  | 153 | A    | 0.53 | (1) 2x6 | 0.267 | OK     |

**HOLDDOWN**

| Level | $V_u$ | Add Load | V      | SV   | P'   | W'   | h      | Sh  | $M_{OT}$ | $M_R$ | $T_{ASD}$ |
|-------|-------|----------|--------|------|------|------|--------|-----|----------|-------|-----------|
|       | plf   | lbs      | k      | k    | k    | k/ft | ft     | ft  | k/ft     | k/ft  | k         |
| Roof  | 214   | 0        | 0.58 K | 0.58 | 0.12 | 0.17 | 9.0 ft | 9.0 | 5.2      | 0.9   | 1.4       |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$ | $G_m$ | $D_v$ | $A_{chord}$     | E          | h   | $d_{wall}$ | $Sd_{wall}$ | $d_{hd}$ | Sh  | $Sd_{hd}$ | $d_{comp}$ | Stretch |
|-------|-------|-------|-------|-----------------|------------|-----|------------|-------------|----------|-----|-----------|------------|---------|
|       | plf   | k-in  | in    | in <sup>2</sup> | psi        | ft  | in         | in          | in       | ft  | in        | in         | in      |
| Roof  | 214   | 15    | 0.010 | 2.3             | 29,000,000 | 8.0 | 0.146      | 0.146       | 0.041    | 8.0 | 0.041     | 0.187      | 0.010   |

**CHORDS - COMPRESSION CONTROLS**

| Level | D    | L    | S    | E   | $C_{ASD}$ | h   | $C_p$ | $f_c$ | $F_{cp}$ | $F_c'$ | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|------|------|------|-----|-----------|-----|-------|-------|----------|--------|--------------|------------|-------|
|       | k    | k    | k    | k   | k         | ft  |       | psi   | psi      | psi    |              |            |       |
| Roof  | 0.00 | 0.00 | 0.00 | 1.9 | 1,376     | 8.0 | 0.513 | 167   | 625      | 1220   | 0.267        | 0.137      | 0.267 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **1A.1** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **8.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **4.3** ft Total Wall Length  
 $L_{HD} = 3.8$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 153 | A    | 0.80 | (2) 2x6 | 0.880 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 0.58 K | 0.58    |         |           |         |          | 5.2             | 0.0          |                |
| 2nd   | 106          | 0                  | 0.46 K | 1.03    | 0.12    | 0.32      | 19.0 ft | 19.0     | 24.8            | 3.4          | 4.0            |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s,reqd}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|---------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 229          | 15            | 0.010       | 15.430506                       | 29000    | 19.0    | 8.543            | 0.543             | 0.050          | 19.0     | 0.050           | 0.050           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 5.8    | 4.126          | 18.0    | 0.120 | 250          | 625             | 284           | 0.400        | 0.880      | 0.880 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **1B** 2nd floor

$C_b = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9-0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft  $1+0.14S_{DS} = 1.14$   
Trib Area = **10.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 5.5$  ft Total Wall Length  
 $L_{HD} = 5.0$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| Roof  | DF  | 153 | A    | 0.53 | (1) 2x6 | 0.267 | OK     |

**HOLDDOWN**

| Level | $V_u$ | Add Load | V      | SV   | P'   | W'   | h      | Sh  | $M_{OT}$ | $M_R$ | $T_{ASD}$ |
|-------|-------|----------|--------|------|------|------|--------|-----|----------|-------|-----------|
|       | plf   | lbs      | k      | k    | k    | k/ft | ft     | ft  | k/ft     | k/ft  | k         |
| Roof  | 214   | 0        | 1.18 K | 1.18 | 0.15 | 0.17 | 9.0 ft | 9.0 | 10.6     | 3.3   | 1.0       |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$ | $G_u$ | $D_u$ | $A_{max}$       | E      | h   | $d_{wall}$ | $Sd_{wall}$ | $d_{HD}$ | Sh  | $Sd_{HD}$ | $d_{comp}$ | Stretch |
|-------|-------|-------|-------|-----------------|--------|-----|------------|-------------|----------|-----|-----------|------------|---------|
|       | plf   | k-in  | in    | in <sup>2</sup> | psi    | ft  | in         | in          | in       | ft  | in        | in         | in      |
| Roof  | 214   | 15    | 0.010 | 2.3             | 185000 | 8.0 | 0.125      | 0.125       | 0.015    | 8.0 | 0.015     | 0.145      | 0.010   |

**CHORDS - COMPRESSION CONTROLS**

| Level | D    | L    | S    | E   | $C_{ASD}$ | h   | $C_p$ | $f_c$ | $F_{cp}$ | $F_c'$ | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|------|------|------|-----|-----------|-----|-------|-------|----------|--------|--------------|------------|-------|
|       | k    | k    | k    | k   | k         | ft  |       | psi   | psi      | psi    |              |            |       |
| Roof  | 0.00 | 0.00 | 0.00 | 1.9 | 1.376     | 8.0 | 0.513 | 167   | 625      | 1220   | 0.267        | 0.137      | 0.267 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **1B.1** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9-0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft  $1+0.14S_{DS} = 1.14$   
Trib Area = **12.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **2.7** ft Total Wall Length  
 $L_{HD} = 2.2$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS    |
|-------|-----|-----|------|------|---------|-------|-----------|
| 2nd   | DF  | 229 | A    | 0.80 | (1) 6x6 | 0.927 | <b>OK</b> |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 0.82 K | 0.82    |         |           |         |          | 10.6            | 3.3          |                |
| 2nd   | 106          | 0                  | 0.29 K | 1.11    | 0.18    | 0.32      | 19.0 ft | 19.0     | 31.7            | 5.0          | 8.6            |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{comp}$<br>in <sup>2</sup> | E<br>psi   | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|-------------------------------|------------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 229          | 15            | 0.010       | 22.4                          | 29,000,000 | 19.0    | 0.834            | 0.834             | 0.006          | 19.0     | 0.006           | 0.91            | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 11.7   | 8.382          | 18.0    | 0.170 | 277          | 625             | 299           | 0.443        | 0.927      | 0.927 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **1C** 2nd floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9-0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft  $1+0.14S_{DS} = 1.14$   
Trib Area = **10.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 3.5$  ft Total Wall Length  
 $L_{HD} = 3.0$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| Roof  | DF  | 153 | A    | 0.53 | (1) 2x6 | 0.267 | OK     |

**HOLDDOWN**

| Level | $V_u$ | Add Load | V      | SV   | P'   | W'   | h      | Sh  | $M_{OT}$ | $M_R$ | $T_{ASD}$ |
|-------|-------|----------|--------|------|------|------|--------|-----|----------|-------|-----------|
|       | plf   | lbs      | k      | k    | k    | k/ft | ft     | ft  | k/ft     | k/ft  | k         |
| Roof  | 214   | 0        | 0.75 K | 0.75 | 0.15 | 0.17 | 9.0 ft | 9.0 | 6.7      | 1.5   | 1.2       |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$ | $G_s$ | $D_s$ | $A_{chord}$     | E          | h   | $d_{wall}$ | $Sd_{wall}$ | $d_{hd}$ | Sh  | $Sd_{hd}$ | $d_{comp}$ | Stretch |
|-------|-------|-------|-------|-----------------|------------|-----|------------|-------------|----------|-----|-----------|------------|---------|
|       | plf   | k-in  | in    | in <sup>2</sup> | psi        | ft  | in         | in          | in       | ft  | in        | in         | in      |
| Roof  | 214   | 15    | 0.010 | 2.5             | 29,000,000 | 8.0 | 0.135      | 0.135       | 0.000    | 8.0 | 0.000     | 0.165      | 0.010   |

**CHORDS - COMPRESSION CONTROLS**

| Level | D    | L    | S    | E   | $C_{ASD}$ | h   | $C_p$ | $f_c$ | $F_{cp}$ | $F_c'$ | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|------|------|------|-----|-----------|-----|-------|-------|----------|--------|--------------|------------|-------|
|       | k    | k    | k    | k   | k         | ft  |       | psi   | psi      | psi    |              |            |       |
| Roof  | 0.00 | 0.00 | 0.00 | 1.9 | 1.376     | 8.0 | 0.513 | 167   | 625      | 1220   | 0.267        | 0.137      | 0.267 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **1C.1** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9-0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft  $1+0.14S_{DS} = 1.14$   
Trib Area = **5.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **6.5** ft Total Wall Length  
 $L_{HD} = 6.0$  ft Distance from Holddown to comp post

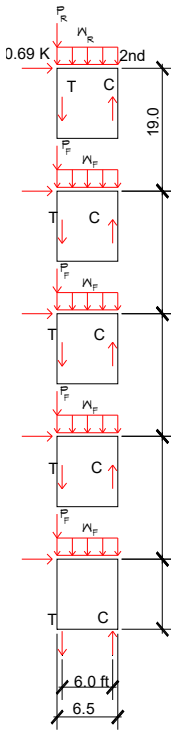
**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 229 | A    | 0.80 | (2) 2x6 | 0.956 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 1.10 K | 1.10    |         |           |         |          |                 |              |                |
| 2nd   | 106          | 0                  | 0.69 K | 1.79    | 0.08    | 0.32      | 19.0 ft | 19.0     | 40.8            | 0.0          | 3.9            |

LRFD



DEFLECTION = PER SDPWS 4.3.2

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s,reqd}$<br>in <sup>2</sup> | E<br>psi | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|---------------------------------|----------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 229          | 15            | 0.010       | 15.4305-06                      | 29000    | 19.0    | 0.405            | 0.405             | 0.000          | 19.0     | 0.000           | 0.016           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 6.3    | 4.480          | 18.0    | 0.120 | 272          | 625             | 284           | 0.434        | 0.956      | 0.956 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **2A** 2nd floor

$C_b = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft 1+ 0.14S<sub>DS</sub> = **1.14**  
Trib Area = **5.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **11.0** ft Total Wall Length  
 $L_{HD} = 10.5$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| Roof  | DF  | 176 | A    | 0.62 | (1) 2x6 | 0.308 | OK     |

**HOLDDOWN**

| Level | V <sub>u</sub> | Add Load | V      | SV   | P'   | W'   | h      | Sh  | M <sub>OT</sub> | M <sub>R</sub> | T <sub>ASD</sub> |
|-------|----------------|----------|--------|------|------|------|--------|-----|-----------------|----------------|------------------|
|       | plf            | lbs      | k      | k    | k    | k/ft | ft     | ft  | k/ft            | k/ft           | k                |
| Roof  | 247            | 0        | 2.72 K | 2.72 | 0.08 | 0.17 | 9.0 ft | 9.0 | 24.5            | 10.8           | 0.9              |

LRFD

DEFLECTION = PER SDPWS 4.3.2

| Level | V <sub>u</sub> | G <sub>u</sub> | D <sub>u</sub> | A <sub>u</sub>  | E    | h   | d <sub>WALL</sub> | Sd <sub>WALL</sub> | d <sub>HD</sub> | Sh  | Sd <sub>HD</sub> | d <sub>COMP</sub> | Stretch |
|-------|----------------|----------------|----------------|-----------------|------|-----|-------------------|--------------------|-----------------|-----|------------------|-------------------|---------|
|       | plf            | k-in           | in             | in <sup>2</sup> | psi  | ft  | in                | in                 | in              | ft  | in               | in                | in      |
| Roof  | 247            | 15             | 0.010          | 2.2             | 1588 | 8.0 | 0.142             | 0.142              | 0.008           | 8.0 | 0.008            | 0.148             | 0.010   |

**CHORDS - COMPRESSION CONTROLS**

| Level | D    | L    | S    | E   | C <sub>ASD</sub> | h   | C <sub>p</sub> | f <sub>c</sub> | F <sub>cp</sub> | F <sub>c</sub> ' | f <sub>c</sub> /F <sub>cp</sub> | f <sub>c</sub> /F <sub>c</sub> ' | MAX   |
|-------|------|------|------|-----|------------------|-----|----------------|----------------|-----------------|------------------|---------------------------------|----------------------------------|-------|
|       | k    | k    | k    | k   | k                | ft  |                | psi            | psi             | psi              |                                 |                                  |       |
| Roof  | 0.00 | 0.00 | 0.00 | 2.2 | 1.588            | 8.0 | 0.513          | 192            | 625             | 1220             | 0.308                           | 0.158                            | 0.308 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **2A.1** 1st Floor

$C_b = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **5.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 9.3$  ft Total Wall Length  
 $L_{HD} = 8.8$  ft Distance from Holdown to comp post

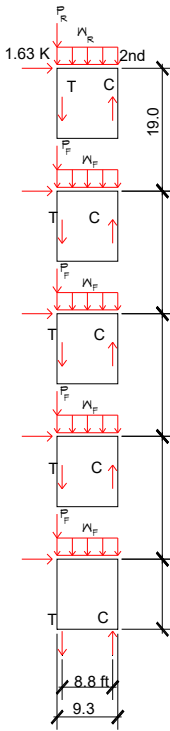
**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 176 | B    | 0.71 | (3) 2x6 | 0.907 | OK     |

**HOLDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 2.72 K | 2.72    |         |           |         |          | 0.0             | 0.0          |                |
| 2nd   | 176          | 0                  | 1.63 K | 4.35    | 0.08    | 0.32      | 19.0 ft | 19.0     | 82.6            | 14.2         | 5.5            |

LRFD



DEFLECTION = PER SDPWS 4.3.2

| Level | $V_u$<br>plf | $G_u$<br>k-in | $D_u$<br>in | $A_{s,reqd}$<br>in <sup>2</sup> | E<br>psi   | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|---------------------------------|------------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 176          | 423           | 11          | 0.010                           | 29,000,000 | 19.0    | 0.155            | 0.155             | 0.003          | 19.0     | 0.003           | 0.115           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 8.9    | 6.375          | 18.0    | 0.120 | 258          | 625             | 284           | 0.412        | 0.907      | 0.907 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **2B** 2nd floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft 1+ 0.14S<sub>DS</sub> = **1.14**  
Trib Area = **5.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **6.7 ft** Total Wall Length  
 $L_{HD} = 6.2$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| Roof  | DF  | 176 | A    | 0.62 | (1) 2x6 | 0.308 | OK     |

**HOLDDOWN**

| Level | $V_u$ | Add Load | V      | SV   | P'   | W'   | h      | Sh  | $M_{OT}$ | $M_R$ | $T_{ASD}$ |
|-------|-------|----------|--------|------|------|------|--------|-----|----------|-------|-----------|
|       | plf   | lbs      | k      | k    | k    | k/ft | ft     | ft  | k/ft     | k/ft  | k         |
| Roof  | 247   | 0        | 1.65 K | 1.65 | 0.08 | 0.17 | 9.0 ft | 9.0 | 14.9     | 4.2   | 1.2       |

LRFD

DEFLECTION = PER SDPWS 4.3.2

| Level | $V_u$ | $G_s$ | $D_s$ | $A_{s, req'd}$  | E     | h   | $d_{WALL}$ | $Sd_{WALL}$ | $d_{HD}$ | Sh  | $Sd_{HD}$ | $d_{TOP}$ | Stretch |
|-------|-------|-------|-------|-----------------|-------|-----|------------|-------------|----------|-----|-----------|-----------|---------|
|       | plf   | k-in  | in    | in <sup>2</sup> | psi   | ft  | in         | in          | in       | ft  | in        | in        | in      |
| Roof  | 247   | 15    | 0.010 | 2.2             | 29000 | 8.0 | 0.145      | 0.145       | 0.015    | 8.0 | 0.015     | 0.155     | 0.010   |

**CHORDS - COMPRESSION CONTROLS**

| Level | D    | L    | S    | E   | $C_{ASD}$ | h   | $C_p$ | $f_c$ | $F_{cp}$ | $F_c'$ | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|------|------|------|-----|-----------|-----|-------|-------|----------|--------|--------------|------------|-------|
|       | k    | k    | k    | k   | k         | ft  |       | psi   | psi      | psi    |              |            |       |
| Roof  | 0.00 | 0.00 | 0.00 | 2.2 | 1.588     | 8.0 | 0.513 | 192   | 625      | 1220   | 0.308        | 0.158      | 0.308 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **2B.1** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9-0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft  $1+0.14S_{DS} = 1.14$   
Trib Area = **5.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **7.6** ft Total Wall Length  
 $L_{HD} = 7.1$  ft Distance from Holddown to comp post

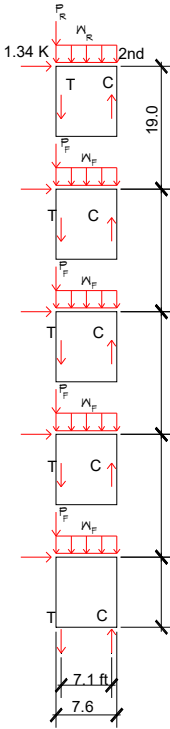
**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post | %   | CHECKS |
|-------|-----|-----|------|------|------|-----|--------|
| 2nd   | DF  | 176 | B    | 0.71 | (3)  | 2x6 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 1.65 K | 1.65    |         |           |         |          | 14.9            | 4.2          |                |
| 2nd   | 176          | 0                  | 1.34 K | 2.99    | 0.08    | 0.32      | 19.0 ft | 19.0     | 71.8            | 13.9         | 5.7            |

LRFD



DEFLECTION = PER SDPWS 4.3.2

| Level | $V_u$<br>plf | $G_u$<br>k-in | $D_u$<br>in | $A_{SHALL}$<br>in <sup>2</sup> | E<br>psi   | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|--------------------------------|------------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 1st   | 176          | 423           | 11          | 0.010                          | 29,000,000 | 19.0    | 0.0001           | 0.0001            | 0.0001         | 19.0     | 0.0001          | 0.0001          | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 9.4    | 6.744          | 18.0    | 0.120 | 272          | 625             | 284           | 0.436        | 0.959      | 0.959 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **2C** 2nd floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9-0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **8.00** ft 1+ 0.14S<sub>DS</sub> = **1.14**  
Trib Area = **16.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
L = **4.3** ft Total Wall Length  
 $L_{HD} = 3.8$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF?       | Sv  | WALL     | %    | Post           | %     | CHECKS    |
|-------|-----------|-----|----------|------|----------------|-------|-----------|
| Roof  | <b>DF</b> | 176 | <b>A</b> | 0.62 | (1) <b>2x6</b> | 0.308 | <b>OK</b> |

**HOLDDOWN**

| Level | $V_u$      | Add Load | V      | SV   | P'   | W'   | h             | Sh  | $M_{OT}$ | $M_R$ | $T_{ASD}$ |
|-------|------------|----------|--------|------|------|------|---------------|-----|----------|-------|-----------|
|       | plf        | lbs      | k      | k    | k    | k/ft | ft            | ft  | k/ft     | k/ft  | k         |
| Roof  | <b>247</b> | <b>0</b> | 1.06 K | 1.06 | 0.24 | 0.26 | <b>9.0</b> ft | 9.0 | 9.6      | 3.4   | 1.1       |

**LRFD**

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$      | $G_s$     | $D_s$        | $A_{s,req'd}$   | E             | h          | $d_{wall}$   | $Sd_{wall}$  | $d_{hd}$     | Sh         | $Sd_{hd}$    | $d_{comp}$   | Stretch      |
|-------|------------|-----------|--------------|-----------------|---------------|------------|--------------|--------------|--------------|------------|--------------|--------------|--------------|
|       | plf        | k-in      | in           | in <sup>2</sup> | psi           | ft         | in           | in           | in           | ft         | in           | in           | in           |
| Roof  | <b>247</b> | <b>15</b> | <b>0.010</b> | <b>2.2</b>      | <b>29,000</b> | <b>8.0</b> | <b>0.153</b> | <b>0.153</b> | <b>0.024</b> | <b>8.0</b> | <b>0.024</b> | <b>0.177</b> | <b>0.010</b> |

**CHORDS - COMPRESSION CONTROLS**

| Level | D           | L           | S           | E          | $C_{ASD}$    | h          | $C_p$        | $f_c$      | $F_{cp}$   | $F_c'$      | $f_c/F_{cp}$ | $f_c/F_c'$   | MAX          |
|-------|-------------|-------------|-------------|------------|--------------|------------|--------------|------------|------------|-------------|--------------|--------------|--------------|
|       | k           | k           | k           | k          | k            | ft         |              | psi        | psi        | psi         |              |              |              |
| Roof  | <b>0.00</b> | <b>0.00</b> | <b>0.00</b> | <b>2.2</b> | <b>1.588</b> | <b>8.0</b> | <b>0.513</b> | <b>192</b> | <b>625</b> | <b>1220</b> | <b>0.308</b> | <b>0.158</b> | <b>0.308</b> |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **2C.1** 1st Floor

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9-0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **2.00** ft  $1+0.14S_{DS} = 1.14$   
Trib Area = **5.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 4.3$  ft Total Wall Length  
 $L_{HD} = 3.8$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 176 | B    | 0.71 | (1) 6x8 | 0.594 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 1.06 K | 1.06    |         |           |         |          | 9.6             | 3.4          |                |
| 2nd   | 176          | 0                  | 0.76 K | 1.82    | 0.08    | 0.32      | 19.0 ft | 19.0     | 44.1            | 6.6          | 7.0            |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s,reqd}$<br>in <sup>2</sup> | E<br>psi    | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|---------------------------------|-------------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 2nd   | 176          | 423           | 11          | 0.010                           | 414,000,000 | 19.0    | 0.71             | 0.71              | 0.050          | 19.0     | 0.050           | 0.001           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 10.3   | 7.329          | 18.0    | 0.170 | 178          | 625             | 299           | 0.284        | 0.594      | 0.594 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **3A** 2nd floor  
# 3D

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **8.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **32.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 4.5$  ft Total Wall Length  
 $L_{HD} = 4.0$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | SV  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| Roof  | DF  | 136 | A    | 0.48 | (1) 2x6 | 0.238 | OK     |

**HOLDDOWN**

| Level | $V_u$ | Add Load | V      | SV   | P'   | W'   | h      | Sh  | $M_{OT}$ | $M_R$ | $T_{ASD}$ |
|-------|-------|----------|--------|------|------|------|--------|-----|----------|-------|-----------|
|       | plf   | lbs      | k      | k    | k    | k/ft | ft     | ft  | k/ft     | k/ft  | k         |
| Roof  | 191   | 0        | 0.86 K | 0.86 | 0.48 | 0.26 | 9.0 ft | 9.0 | 7.7      | 4.7   | 0.5       |

LRFD

DEFLECTION = PER SDPWS 4.3.2

| Level | $V_u$ | $G_s$ | $D_s$ | $A_{s, req'd}$  | E          | h   | $d_{wall}$ | $Sd_{wall}$ | $d_{hd}$ | Sh  | $Sd_{hd}$ | $d_{comp}$ | Stretch |
|-------|-------|-------|-------|-----------------|------------|-----|------------|-------------|----------|-----|-----------|------------|---------|
|       | plf   | k-in  | in    | in <sup>2</sup> | psi        | ft  | in         | in          | in       | ft  | in        | in         | in      |
| Roof  | 191   | 15    | 0.010 | 0.3             | 29,000,000 | 8.0 | 0.118      | 0.118       | 0.023    | 8.0 | 0.023     | 0.140      | 0.010   |

**CHORDS - COMPRESSION CONTROLS**

| Level | D    | L    | S    | E   | $C_{ASD}$ | h   | $C_p$ | $f_c$ | $F_{cp}$ | $F_c'$ | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|------|------|------|-----|-----------|-----|-------|-------|----------|--------|--------------|------------|-------|
|       | k    | k    | k    | k   | k         | ft  |       | psi   | psi      | psi    |              |            |       |
| Roof  | 0.00 | 0.00 | 0.00 | 1.7 | 1.228     | 8.0 | 0.513 | 149   | 625      | 1220   | 0.238        | 0.122      | 0.238 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **3A.1** 1st Floor  
# 3D.1

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **1.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **8.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 4.5$  ft Total Wall Length  
 $L_{HD} = 4.0$  ft Distance from Holddown to comp post

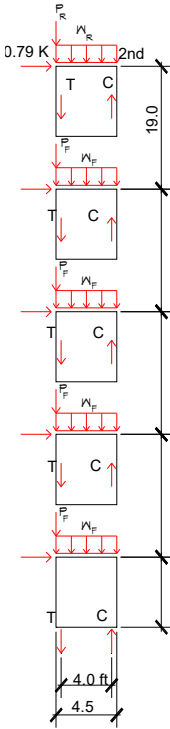
**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| 2nd   | DF  | 136 | A    | 0.91 | (3) 2x6 | 0.881 | OK     |

**HOLDDOWN**

| Level | $V_u$<br>plf | Add<br>Load<br>lbs | V<br>k | SV<br>k | P'<br>k | W'<br>klf | h<br>ft | Sh<br>ft | $M_{OT}$<br>kft | $M_R$<br>kft | $T_{ASD}$<br>k |
|-------|--------------|--------------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| Roof  |              |                    | 0.86 K | 0.86    |         |           |         |          | 7.7             | 4.7          |                |
| 2nd   | 175          | 0                  | 0.79 K | 1.65    | 0.12    | 0.30      | 19.0 ft | 19.0     | 39.0            | 8.3          | 5.4            |

LRFD



DEFLECTION = PER SDPWS 4.3.2

| Level | $V_u$<br>plf | $G_s$<br>k-in | $D_s$<br>in | $A_{s, reqd}$<br>in <sup>2</sup> | E<br>psi   | h<br>ft | $d_{WALL}$<br>in | $Sd_{WALL}$<br>in | $d_{HD}$<br>in | Sh<br>ft | $Sd_{HD}$<br>in | $d_{TOP}$<br>in | Stretch<br>in |
|-------|--------------|---------------|-------------|----------------------------------|------------|---------|------------------|-------------------|----------------|----------|-----------------|-----------------|---------------|
| 2nd   | 175          | 15            | 0.010       | 0.000                            | 29,000,000 | 19.0    | 0.854            | 0.854             | 0.043          | 19.0     | 0.043           | 0.853           | 0.010         |

**CHORDS - COMPRESSION CONTROLS**

| Level | D<br>k | L<br>k | S<br>k | E<br>k | $C_{ASD}$<br>k | h<br>ft | $C_p$ | $f_c$<br>psi | $F_{cp}$<br>psi | $F_c'$<br>psi | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| 2nd   | 0.00   | 0.00   | 0.00   | 8.7    | 6.195          | 18.0    | 0.120 | 250          | 625             | 284           | 0.400        | 0.881      | 0.881 |

STATUS: **OK**

**MULTI-STORY SHEARWALL DESIGN:**

WALL **3B** 2nd floor  
# 3C

$C_s = 0.157$  Wall Weight = **15** psf  
 $S_{DS} = 1.02$  sec Roof Dead = **15** psf  
 $0.9 + 0.14S_{DS} = 0.76$  Floor Dead = **15** psf  
Trib Width = **8.00** ft  $1 + 0.14S_{DS} = 1.14$   
Trib Area = **32.00** ft<sup>2</sup> Resists uplift only (due to near walls)  
 $L = 3.0$  ft Total Wall Length  
 $L_{HD} = 2.5$  ft Distance from Holddown to comp post

**WALL SUMMARY**

| Level | DF? | Sv  | WALL | %    | Post    | %     | CHECKS |
|-------|-----|-----|------|------|---------|-------|--------|
| Roof  | DF  | 136 | A    | 0.48 | (1) 2x6 | 0.539 | OK     |

**HOLDDOWN**

| Level | $V_u$ | Add Load | V      | SV   | P'   | W'   | h       | Sh   | $M_{OT}$ | $M_R$ | $T_{ASD}$ |
|-------|-------|----------|--------|------|------|------|---------|------|----------|-------|-----------|
|       | plf   | lbs      | k      | k    | k    | k/ft | ft      | ft   | k/ft     | k/ft  | k         |
| Roof  | 191   | 0        | 0.57 K | 0.57 | 0.48 | 0.35 | 15.0 ft | 15.0 | 8.6      | 3.0   | 1.5       |

LRFD

**DEFLECTION - PER SDPWS 4.3.2**

| Level | $V_u$ | $G_s$ | $D_s$ | $A_{chord}$     | E     | h    | $d_{wall}$ | $Sd_{wall}$ | $d_{hd}$ | Sh   | $Sd_{hd}$ | $d_{comp}$ | Stretch |
|-------|-------|-------|-------|-----------------|-------|------|------------|-------------|----------|------|-----------|------------|---------|
|       | plf   | k-in  | in    | in <sup>2</sup> | psi   | ft   | in         | in          | in       | ft   | in        | in         | in      |
| Roof  | 191   | 15    | 0.010 | 2.3             | 29000 | 14.0 | 0.314      | 0.314       | 0.000    | 14.0 | 0.000     | 0.374      | 0.010   |

**CHORDS - COMPRESSION CONTROLS**

| Level | D    | L    | S    | E   | $C_{ASD}$ | h    | $C_p$ | $f_c$ | $F_{cp}$ | $F_c'$ | $f_c/F_{cp}$ | $f_c/F_c'$ | MAX   |
|-------|------|------|------|-----|-----------|------|-------|-------|----------|--------|--------------|------------|-------|
|       | k    | k    | k    | k   | k         | ft   |       | psi   | psi      | psi    |              |            |       |
| Roof  | 0.00 | 0.00 | 0.00 | 2.9 | 2.046     | 14.0 | 0.194 | 248   | 625      | 460    | 0.397        | 0.539      | 0.539 |



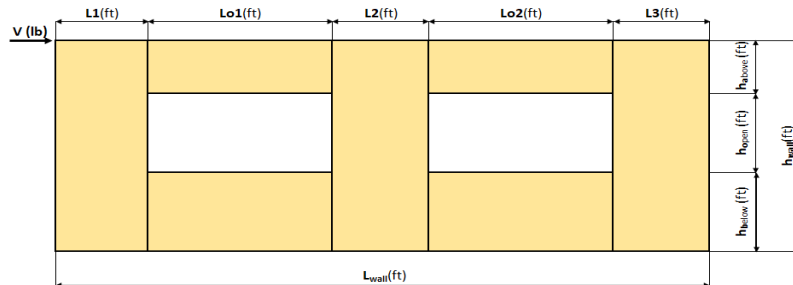
# Force Transfer Around Openings Calculator

## TWO OPENINGS

The force transfer around openings (FTAO) method of shear wall analysis is an approach that aims to reinforce the wall such that it performs as if there was no opening. This approach lends certain advantages over segmented shear walls: more versatility, because it allows for narrower wall segments while still meeting the height-to-width ratios and, often, fewer required hold-downs.

### Project Information

|            |                                           |       |           |
|------------|-------------------------------------------|-------|-----------|
| Code:      | IBC 2021                                  | Date: | 4/22/2025 |
| Designer:  | LMC                                       |       |           |
| Client:    |                                           |       |           |
| Project:   | Todd Road                                 |       |           |
| Wall Line: | Right Bldg - West exterior wall - level 1 |       |           |



### Shear Wall Calculation Variables

|                   |          |                 |         |                 |         |                                     |             |     |
|-------------------|----------|-----------------|---------|-----------------|---------|-------------------------------------|-------------|-----|
| V                 | 2300 lbf | Opening 1       |         | Opening 2       |         | Adj. Factor Method = 1.25-0.125h/bs |             |     |
| L1                | 4.20 ft  | h <sub>a1</sub> | 2.75 ft | h <sub>a2</sub> | 2.75 ft | Wall Pier Aspect Ratio              | Adj. Factor |     |
| L2                | 4.20 ft  | h <sub>o1</sub> | 3.30 ft | h <sub>o2</sub> | 3.30 ft | P1=h <sub>o</sub> /L1=              | 0.79        | N/A |
| L3                | 7.00 ft  | h <sub>b1</sub> | 3.75 ft | h <sub>b2</sub> | 3.75 ft | P2=h <sub>o</sub> /L2=              | 0.79        | N/A |
| h <sub>wall</sub> | 9.80 ft  | Lo1             | 1.50 ft | Lo2             | 6.33 ft | P3=h <sub>o</sub> /L3=              | 0.47        | N/A |
| L <sub>wall</sub> | 23.23 ft |                 |         |                 |         |                                     |             |     |

1. Hold-down forces:  $H = Vh_{wall}/L_{wall}$  970 lbf

2. Unit shear above + below opening  
First opening:  $va1 = vb1 = H/(h_{a1}+h_{b1}) = 149$  plf  
Second opening:  $va2 = vb2 = H/(h_{a2}+h_{b2}) = 149$  plf

3. Total boundary force above + below openings  
First opening:  $O1 = va1 \times (Lo1) = 224$  lbf  
Second opening:  $O2 = va2 \times (Lo2) = 945$  lbf

4. Corner forces  
 $F1 = O1(L1)/(L1+L2) = 112$  lbf  
 $F2 = O1(L2)/(L1+L2) = 112$  lbf  
 $F3 = O2(L2)/(L2+L3) = 354$  lbf  
 $F4 = O2(L3)/(L2+L3) = 591$  lbf

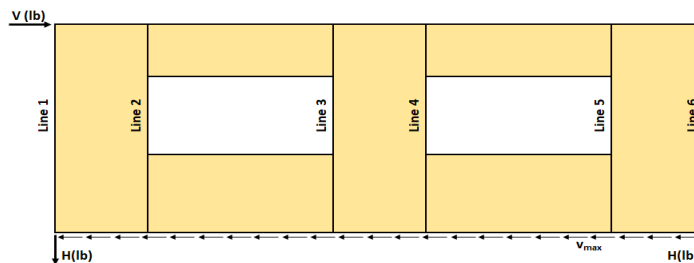
5. Tributary length of openings  
 $T1 = (L1 \times Lo1)/(L1+L2) = 0.75$  ft  
 $T2 = (L2 \times Lo1)/(L1+L2) = 0.75$  ft  
 $T3 = (L2 \times Lo2)/(L2+L3) = 2.37$  ft  
 $T4 = (L3 \times Lo2)/(L2+L3) = 3.96$  ft

6. Unit shear beside opening  
 $v1 = (V/L)/(L1+T1)/L1 = 117$  plf  
 $v2 = (V/L)/(T2+L2+T3)/L2 = 173$  plf  
 $v3 = (V/L)/(T4+L3)/L3 = 155$  plf  
Check  $v1 \times L1 + v2 \times L2 + v3 \times L3 = V?$  2300 lbf OK

7. Resistance to corner forces  
 $R1 = v1 \times L1 = 490$  lbf  
 $R2 = v2 \times L2 = 725$  lbf  
 $R3 = v3 \times L3 = 1085$  lbf

8. Difference corner force + resistance  
 $R1-F1 = 378$  lbf  
 $R2-F2-F3 = 259$  lbf  
 $R3-F4 = 494$  lbf

9. Unit shear in corner zones  
 $vc1 = (R1-F1)/L1 = 90$  plf  
 $vc2 = (R2-F2-F3)/L2 = 62$  plf  
 $vc3 = (R3-F4)/L3 = 71$  plf



### Check Summary of Shear Values for Two Openings

|                                                               |     |     |         |
|---------------------------------------------------------------|-----|-----|---------|
| Line 1: $vc1(h_{a1}+h_{b1})+v1(h_{o1})=H?$                    | 585 | 385 | 970 lbf |
| Line 2: $va1(h_{a1}+h_{b1})-vc1(h_{a1}+h_{b1})-v1(h_{o1})=0?$ | 970 | 585 | 0       |
| Line 3: $vc2(h_{a1}+h_{b1})+v2(h_{o1})-va1(h_{a1}+h_{b1})=0?$ | 401 | 570 | 0       |
| Line 4: $va2(h_{a2}+h_{b2})-v2(h_{o2})-vc2(h_{a2}+h_{b2})=0?$ | 970 | 570 | 0       |
| Line 5: $va2(h_{a2}+h_{b2})-vc3(h_{a2}+h_{b2})-v3(h_{o2})=0?$ | 970 | 459 | 0       |
| Line 6: $vc3(h_{a2}+h_{b2})+v3(h_{o2})=H?$                    | 459 | 511 | 970 lbf |

### Design Summary\*

|                                 |         |
|---------------------------------|---------|
| Req. Sheathing Capacity         | 173 plf |
| Req. Strap Force                | 591 lbf |
| Req. HD Force                   | 970 lbf |
| Req. Shear Wall Anchorage Force | 99 plf  |

\*The Design Summary assumes that the shear wall is designed as blocked.



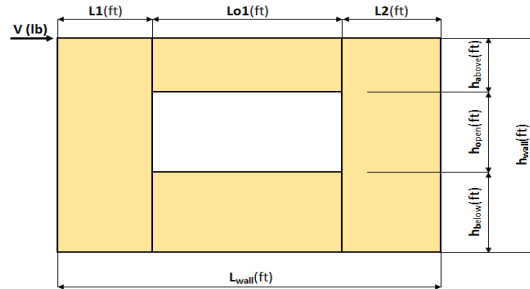
# Force Transfer Around Openings Calculator

## ONE OPENING

The force transfer around openings (FTAO) method of shear wall analysis is an approach that aims to reinforce the wall such that it performs as if there was no opening. This approach lends certain advantages over segmented shear walls: more versatility, because it allows for narrower wall segments while still meeting the height-to-width ratios and, often, fewer required hold-downs.

### Project Information

|            |                                       |       |           |
|------------|---------------------------------------|-------|-----------|
| Code:      | 2021 IBC                              | Date: | 4/22/2025 |
| Designer:  | LMC                                   |       |           |
| Client:    |                                       |       |           |
| Project:   | Todd Road                             |       |           |
| Wall Line: | Right Bldg - West - Lvl 1 - 1 opening |       |           |



### Shear Wall Calculation Variables

|       |         |           |                        |                |
|-------|---------|-----------|------------------------|----------------|
| V     | 800 lbf | Opening 1 | Adj. Factor Method =   | 1.25-0.125h/bs |
| L1    | 4.10 ft | ha        | Wall Pier Aspect Ratio | Adj. Factor    |
| L2    | 4.10 ft | ho        | P1=ha/L1=              | 0.98           |
| hwall | 8.42 ft | hb        | P2=hb/L2=              | 0.98           |
| Lwall | 9.20 ft | Lo1       |                        |                |

1. Hold-down forces:  $H = Vh_{wall}/L_{wall}$  732 lbf

2. Unit shear above + below opening  
First opening:  $va1 = vb1 = H/(h_a + h_b) =$  166 plf

3. Total boundary force above + below openings  
First opening:  $O1 = va1 \times (Lo1) =$  166 lbf

4. Corner forces  
 $F1 = O1(L1)/(L1+L2) =$  83 lbf  
 $F2 = O1(L2)/(L1+L2) =$  83 lbf

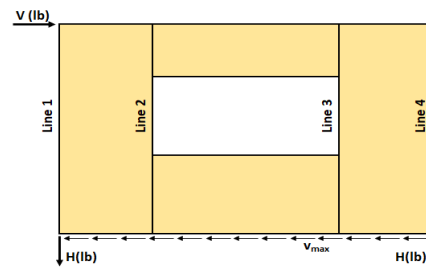
5. Tributary length of openings  
 $T1 = (L1 \times Lo1)/(L1+L2) =$  0.50 ft  
 $T2 = (L2 \times Lo1)/(L1+L2) =$  0.50 ft

6. Unit shear beside opening  
 $v1 = (V/L)(L1+T1)/L1 =$  98 plf  
 $v2 = (V/L)(T2+L2)/L2 =$  98 plf  
Check  $v1 \times L1 + v2 \times L2 = V?$  800 lbf OK

7. Resistance to corner forces  
 $R1 = v1 \times L1 =$  400 lbf  
 $R2 = v2 \times L2 =$  400 lbf

8. Difference corner force + resistance  
 $R1 - F1 =$  317 lbf  
 $R2 - F2 =$  317 lbf

9. Unit shear in corner zones  
 $vc1 = (R1 - F1)/L1 =$  77 plf  
 $vc2 = (R2 - F2)/L2 =$  77 plf



### Check Summary of Shear Values for One Opening

|                                                          |     |     |     |         |
|----------------------------------------------------------|-----|-----|-----|---------|
| Line 1: $vc1(h_a + h_b) + v1(h_o) = H?$                  |     | 342 | 390 | 732 lbf |
| Line 2: $va1(h_a + h_b) - vc1(h_a + h_b) - v1(h_o) = 0?$ | 732 | 342 | 390 | 0       |
| Line 3: $va1(h_a + h_b) - vc2(h_a + h_b) - v1(h_o) = 0?$ | 732 | 342 | 390 | 0       |
| Line 4: $vc2(h_a + h_b) + v2(h_o) = H?$                  |     | 342 | 390 | 732 lbf |

### Design Summary\*

|                                               |         |
|-----------------------------------------------|---------|
| Req. Sheathing Capacity                       | 166 plf |
| Req. Strap Force                              | 83 lbf  |
| Req. HD Force (H)                             | 732 lbf |
| Req. Shear Wall Anchorage Force ( $v_{max}$ ) | 87 plf  |

\*The Design Summary assumes that the shear wall is designed as blocked.



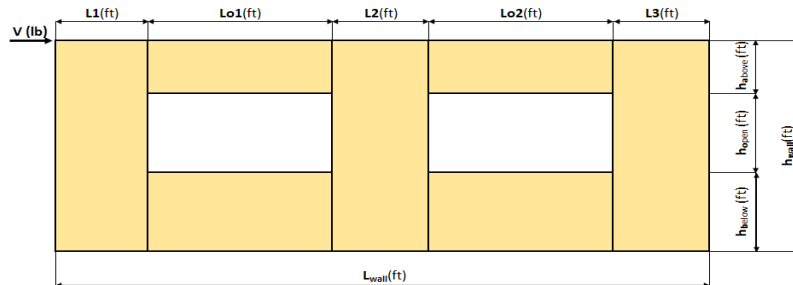
# Force Transfer Around Openings Calculator

## TWO OPENINGS

The force transfer around openings (FTAO) method of shear wall analysis is an approach that aims to reinforce the wall such that it performs as if there was no opening. This approach lends certain advantages over segmented shear walls: more versatility, because it allows for narrower wall segments while still meeting the height-to-width ratios and, often, fewer required hold-downs.

### Project Information

|            |                                          |       |           |
|------------|------------------------------------------|-------|-----------|
| Code:      | IBC 2021                                 | Date: | 4/22/2025 |
| Designer:  | LMC                                      |       |           |
| Client:    |                                          |       |           |
| Project:   | Todd Road                                |       |           |
| Wall Line: | Left Bldg - West exterior wall - level 2 |       |           |



### Shear Wall Calculation Variables

|                   |          |                 |         |                 |         |                                     |             |     |
|-------------------|----------|-----------------|---------|-----------------|---------|-------------------------------------|-------------|-----|
| V                 | 1800 lbf | Opening 1       |         | Opening 2       |         | Adj. Factor Method = 1.25-0.125h/bs |             |     |
| L1                | 10.50 ft | h <sub>a1</sub> | 1.60 ft | h <sub>a2</sub> | 1.60 ft | Wall Pier Aspect Ratio              | Adj. Factor |     |
| L2                | 9.80 ft  | h <sub>o1</sub> | 3.67 ft | h <sub>o2</sub> | 3.67 ft | P1=h <sub>o</sub> /L1=              | 0.35        | N/A |
| L3                | 5.30 ft  | h <sub>b1</sub> | 3.10 ft | h <sub>b2</sub> | 3.10 ft | P2=h <sub>o</sub> /L2=              | 0.37        | N/A |
| h <sub>wall</sub> | 8.37 ft  | Lo1             | 5.00 ft | Lo2             | 5.00 ft | P3=h <sub>o</sub> /L3=              | 0.69        | N/A |
| L <sub>wall</sub> | 35.60 ft |                 |         |                 |         |                                     |             |     |

1. Hold-down forces:  $H = Vh_{wall}/L_{wall}$  423 lbf

2. Unit shear above + below opening  
First opening:  $va1 = vb1 = H/(h_{a1}+h_{b1}) = 90$  plf  
Second opening:  $va2 = vb2 = H/(h_{a2}+h_{b2}) = 90$  plf

3. Total boundary force above + below openings  
First opening:  $O1 = va1 \times (Lo1) = 450$  lbf  
Second opening:  $O2 = va2 \times (Lo2) = 450$  lbf

4. Corner forces  
 $F1 = O1(L1)/(L1+L2) = 233$  lbf  
 $F2 = O1(L2)/(L1+L2) = 217$  lbf  
 $F3 = O2(L2)/(L2+L3) = 292$  lbf  
 $F4 = O2(L3)/(L2+L3) = 158$  lbf

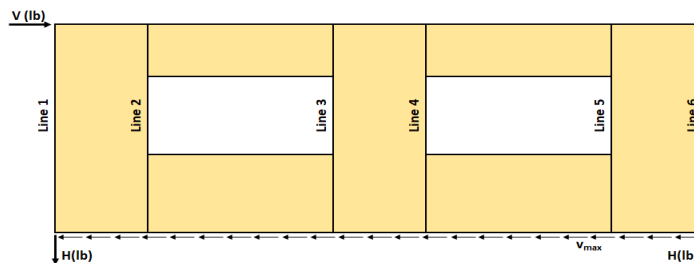
5. Tributary length of openings  
 $T1 = (L1 \times Lo1)/(L1+L2) = 2.59$  ft  
 $T2 = (L2 \times Lo1)/(L1+L2) = 2.41$  ft  
 $T3 = (L2 \times Lo2)/(L2+L3) = 3.25$  ft  
 $T4 = (L3 \times Lo2)/(L2+L3) = 1.75$  ft

6. Unit shear beside opening  
 $v1 = (V/L)/(L1+T1)/L1 = 63$  plf  
 $v2 = (V/L)/(T2+L2+T3)/L2 = 80$  plf  
 $v3 = (V/L)/(T4+L3)/L3 = 67$  plf  
Check  $v1 \times L1 + v2 \times L2 + v3 \times L3 = V?$  1800 lbf OK

7. Resistance to corner forces  
 $R1 = v1 \times L1 = 662$  lbf  
 $R2 = v2 \times L2 = 782$  lbf  
 $R3 = v3 \times L3 = 357$  lbf

8. Difference corner force + resistance  
 $R1-F1 = 429$  lbf  
 $R2-F2-F3 = 272$  lbf  
 $R3-F4 = 199$  lbf

9. Unit shear in corner zones  
 $vc1 = (R1-F1)/L1 = 41$  plf  
 $vc2 = (R2-F2-F3)/L2 = 28$  plf  
 $vc3 = (R3-F4)/L3 = 37$  plf



### Check Summary of Shear Values for Two Openings

|                                                               |     |     |         |
|---------------------------------------------------------------|-----|-----|---------|
| Line 1: $vc1(h_{a1}+h_{b1})+v1(h_{o1})=H?$                    | 192 | 231 | 423 lbf |
| Line 2: $va1(h_{a1}+h_{b1})-vc1(h_{a1}+h_{b1})-v1(h_{o1})=0?$ | 423 | 192 | 0       |
| Line 3: $vc2(h_{a2}+h_{b2})+v2(h_{o2})-va1(h_{a1}+h_{b1})=0?$ | 130 | 293 | 0       |
| Line 4: $va2(h_{a2}+h_{b2})-v2(h_{o2})-vc2(h_{a2}+h_{b2})=0?$ | 423 | 293 | 0       |
| Line 5: $va2(h_{a2}+h_{b2})-vc3(h_{a2}+h_{b2})-v3(h_{o2})=0?$ | 423 | 176 | 0       |
| Line 6: $vc3(h_{a2}+h_{b2})+v3(h_{o2})=H?$                    | 176 | 247 | 423 lbf |

### Design Summary\*

|                                 |         |
|---------------------------------|---------|
| Req. Sheathing Capacity         | 90 plf  |
| Req. Strap Force                | 292 lbf |
| Req. HD Force                   | 423 lbf |
| Req. Shear Wall Anchorage Force | 51 plf  |

\*The Design Summary assumes that the shear wall is designed as blocked.



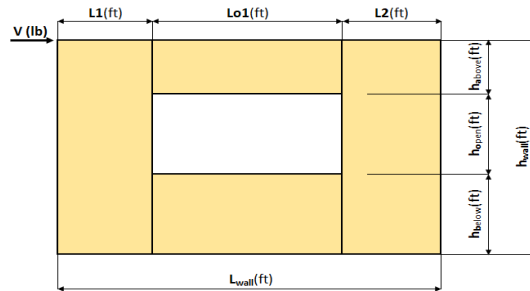
# Force Transfer Around Openings Calculator

## ONE OPENING

The force transfer around openings (FAO) method of shear wall analysis is an approach that aims to reinforce the wall such that it performs as if there was no opening. This approach lends certain advantages over segmented shear walls: more versatility, because it allows for narrower wall segments while still meeting the height-to-width ratios and, often, fewer required hold-downs.

### Project Information

|            |                          |       |           |
|------------|--------------------------|-------|-----------|
| Code:      | 2021 IBC                 | Date: | 4/22/2025 |
| Designer:  | LMC                      |       |           |
| Client:    |                          |       |           |
| Project:   | Todd Road                |       |           |
| Wall Line: | Left Bldg - West - Lvl 1 |       |           |



Shear Wall Calculation Variables

|                   |          |                |         |                                     |             |     |
|-------------------|----------|----------------|---------|-------------------------------------|-------------|-----|
| V                 | 2100 lbf | Opening 1      |         | Adj. Factor Method = 1.25-0.125h/bs |             |     |
| L1                | 3.40 ft  | h <sub>a</sub> | 2.75 ft | Wall Pier Aspect Ratio              | Adj. Factor |     |
| L2                | 6.67 ft  | h <sub>o</sub> | 2.00 ft | P1=h <sub>a</sub> /L1=              | 0.59        | N/A |
| h <sub>wall</sub> | 9.75 ft  | h <sub>b</sub> | 5.00 ft | P2=h <sub>b</sub> /L2=              | 0.30        | N/A |
| L <sub>wall</sub> | 14.07 ft | Lo1            | 4.00 ft |                                     |             |     |

1. Hold-down forces:  $H = Vh_{wall}/L_{wall}$  1455 lbf

2. Unit shear above + below opening  
First opening:  $va1 = vb1 = H/(h_a + h_b) =$  188 plf

3. Total boundary force above + below openings  
First opening:  $O1 = va1 \times (Lo1) =$  751 lbf

4. Corner forces  
 $F1 = O1(L1)/(L1+L2) =$  254 lbf  
 $F2 = O1(L2)/(L1+L2) =$  497 lbf

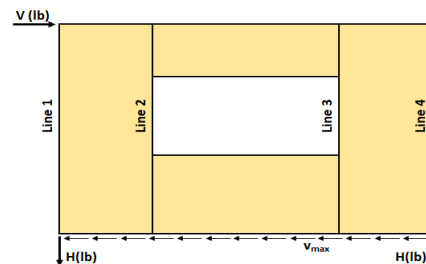
5. Tributary length of openings  
 $T1 = (L1 \times Lo1)/(L1+L2) =$  1.35 ft  
 $T2 = (L2 \times Lo1)/(L1+L2) =$  2.65 ft

6. Unit shear beside opening  
 $v1 = (V/L)(L1+T1)/L1 =$  209 plf  
 $v2 = (V/L)(T2+L2)/L2 =$  209 plf  
Check  $v1 \times L1 + v2 \times L2 = V?$  2100 lbf OK

7. Resistance to corner forces  
 $R1 = v1 \times L1 =$  709 lbf  
 $R2 = v2 \times L2 =$  1391 lbf

8. Difference corner force + resistance  
 $R1 - F1 =$  455 lbf  
 $R2 - F2 =$  893 lbf

9. Unit shear in corner zones  
 $vc1 = (R1 - F1)/L1 =$  134 plf  
 $vc2 = (R2 - F2)/L2 =$  134 plf



### Check Summary of Shear Values for One Opening

|                                                          |      |      |     |          |
|----------------------------------------------------------|------|------|-----|----------|
| Line 1: $vc1(h_a + h_b) + v1(h_o) = H?$                  |      | 1038 | 417 | 1455 lbf |
| Line 2: $va1(h_a + h_b) - vc1(h_a + h_b) - v1(h_o) = 0?$ | 1455 | 1038 | 417 | 0        |
| Line 3: $va1(h_a + h_b) - vc2(h_a + h_b) - v1(h_o) = 0?$ | 1455 | 1038 | 417 | 0        |
| Line 4: $vc2(h_a + h_b) + v2(h_o) = H?$                  |      | 1038 | 417 | 1455 lbf |

### Design Summary\*

|                                               |          |
|-----------------------------------------------|----------|
| Req. Sheathing Capacity                       | 209 plf  |
| Req. Strap Force                              | 497 lbf  |
| Req. HD Force (H)                             | 1455 lbf |
| Req. Shear Wall Anchorage Force ( $v_{max}$ ) | 149 plf  |

\*The Design Summary assumes that the shear wall is designed as blocked.



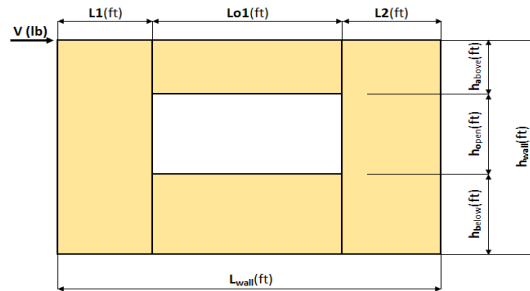
# Force Transfer Around Openings Calculator

## ONE OPENING

The force transfer around openings (FTAO) method of shear wall analysis is an approach that aims to reinforce the wall such that it performs as if there was no opening. This approach lends certain advantages over segmented shear walls: more versatility, because it allows for narrower wall segments while still meeting the height-to-width ratios and, often, fewer required hold-downs.

### Project Information

|            |                          |       |           |
|------------|--------------------------|-------|-----------|
| Code:      | 2021 IBC                 | Date: | 4/22/2025 |
| Designer:  | LMC                      |       |           |
| Client:    |                          |       |           |
| Project:   | Todd Road                |       |           |
| Wall Line: | Left Bldg - West - Lvl 1 |       |           |



### Shear Wall Calculation Variables

|                   |          |                |         |                                     |             |     |
|-------------------|----------|----------------|---------|-------------------------------------|-------------|-----|
| V                 | 2100 lbf | Opening 1      |         | Adj. Factor Method = 1.25-0.125h/bs |             |     |
| L1                | 6.67 ft  | h <sub>a</sub> | 2.75 ft | Wall Pier Aspect Ratio              | Adj. Factor |     |
| L2                | 5.00 ft  | h <sub>o</sub> | 3.67 ft | P1=h <sub>a</sub> /L1=              | 0.55        | N/A |
| h <sub>wall</sub> | 9.42 ft  | h <sub>b</sub> | 3.00 ft | P2=h <sub>b</sub> /L2=              | 0.73        | N/A |
| L <sub>wall</sub> | 16.67 ft | Lo1            | 5.00 ft |                                     |             |     |

1. Hold-down forces:  $H = Vh_{wall}/L_{wall}$  1187 lbf

2. Unit shear above + below opening  
First opening:  $va1 = vb1 = H/(h_a + h_b) =$  206 plf

3. Total boundary force above + below openings  
First opening:  $O1 = va1 \times (Lo1) =$  1032 lbf

4. Corner forces  
 $F1 = O1(L1)/(L1+L2) =$  590 lbf  
 $F2 = O1(L2)/(L1+L2) =$  442 lbf

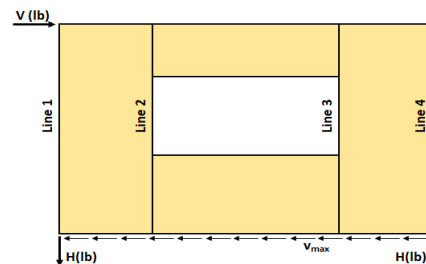
5. Tributary length of openings  
 $T1 = (L1 \times Lo1)/(L1+L2) =$  2.86 ft  
 $T2 = (L2 \times Lo1)/(L1+L2) =$  2.14 ft

6. Unit shear beside opening  
 $v1 = (V/L)(L1+T1)/L1 =$  180 plf  
 $v2 = (V/L)(T2+L2)/L2 =$  180 plf  
Check  $v1 \times L1 + v2 \times L2 = V?$  2100 lbf OK

7. Resistance to corner forces  
 $R1 = v1 \times L1 =$  1200 lbf  
 $R2 = v2 \times L2 =$  900 lbf

8. Difference corner force + resistance  
 $R1 - F1 =$  610 lbf  
 $R2 - F2 =$  458 lbf

9. Unit shear in corner zones  
 $vc1 = (R1 - F1)/L1 =$  92 plf  
 $vc2 = (R2 - F2)/L2 =$  92 plf



### Check Summary of Shear Values for One Opening

|                                                          |      |     |     |          |
|----------------------------------------------------------|------|-----|-----|----------|
| Line 1: $vc1(h_a + h_b) + v1(h_o) = H?$                  |      | 526 | 660 | 1187 lbf |
| Line 2: $va1(h_a + h_b) - vc1(h_a + h_b) - v1(h_o) = 0?$ | 1187 | 526 | 660 | 0        |
| Line 3: $va1(h_a + h_b) - vc2(h_a + h_b) - v1(h_o) = 0?$ | 1187 | 526 | 660 | 0        |
| Line 4: $vc2(h_a + h_b) + v2(h_o) = H?$                  |      | 526 | 660 | 1187 lbf |

### Design Summary\*

|                                               |          |
|-----------------------------------------------|----------|
| Req. Sheathing Capacity                       | 206 plf  |
| Req. Strap Force                              | 590 lbf  |
| Req. HD Force (H)                             | 1187 lbf |
| Req. Shear Wall Anchorage Force ( $v_{max}$ ) | 126 plf  |

\*The Design Summary assumes that the shear wall is designed as blocked.



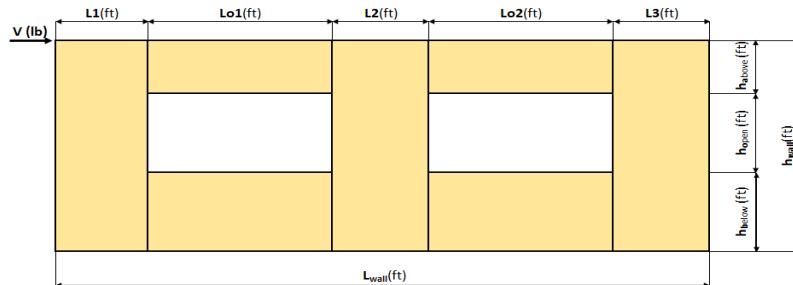
# Force Transfer Around Openings Calculator

## TWO OPENINGS

The force transfer around openings (FTAO) method of shear wall analysis is an approach that aims to reinforce the wall such that it performs as if there was no opening. This approach lends certain advantages over segmented shear walls: more versatility, because it allows for narrower wall segments while still meeting the height-to-width ratios and, often, fewer required hold-downs.

### Project Information

|            |                                          |       |           |
|------------|------------------------------------------|-------|-----------|
| Code:      | IBC 2021                                 | Date: | 4/22/2025 |
| Designer:  | LMC                                      |       |           |
| Client:    |                                          |       |           |
| Project:   | Todd Road                                |       |           |
| Wall Line: | Left Bldg - East exterior wall - level 1 |       |           |



Shear Wall Calculation Variables

|                   |          |                 |         |                 |         |                                     |             |     |
|-------------------|----------|-----------------|---------|-----------------|---------|-------------------------------------|-------------|-----|
| V                 | 2800 lbf | Opening 1       |         | Opening 2       |         | Adj. Factor Method = 1.25-0.125h/bs |             |     |
| L1                | 5.20 ft  | h <sub>a1</sub> | 3.00 ft | h <sub>a2</sub> | 3.00 ft | Wall Pier Aspect Ratio              | Adj. Factor |     |
| L2                | 9.00 ft  | h <sub>o1</sub> | 4.00 ft | h <sub>o2</sub> | 4.00 ft | P1=h <sub>o</sub> /L1=              | 0.77        | N/A |
| L3                | 5.75 ft  | h <sub>b1</sub> | 3.00 ft | h <sub>b2</sub> | 3.00 ft | P2=h <sub>o</sub> /L2=              | 0.44        | N/A |
| h <sub>wall</sub> | 10.00 ft | Lo1             | 4.60 ft | Lo2             | 4.60 ft | P3=h <sub>o</sub> /L3=              | 0.70        | N/A |
| L <sub>wall</sub> | 29.15 ft |                 |         |                 |         |                                     |             |     |

1. Hold-down forces:  $H = Vh_{wall}/L_{wall}$  961 lbf

2. Unit shear above + below opening  
First opening:  $va1 = vb1 = H/(h_{a1}+h_{b1}) = 160$  plf  
Second opening:  $va2 = vb2 = H/(h_{a2}+h_{b2}) = 160$  plf

3. Total boundary force above + below openings  
First opening:  $O1 = va1 \times (Lo1) = 736$  lbf  
Second opening:  $O2 = va2 \times (Lo2) = 736$  lbf

4. Corner forces  
 $F1 = O1(L1)/(L1+L2) = 270$  lbf  
 $F2 = O1(L2)/(L1+L2) = 467$  lbf  
 $F3 = O2(L2)/(L2+L3) = 449$  lbf  
 $F4 = O2(L3)/(L2+L3) = 287$  lbf

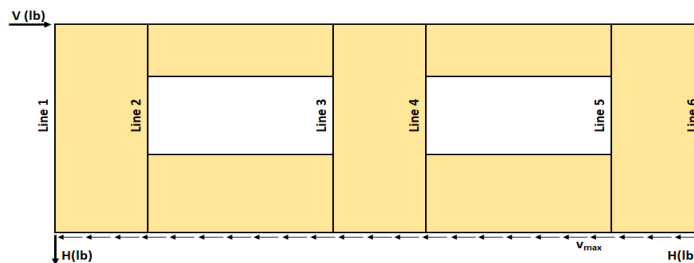
5. Tributary length of openings  
 $T1 = (L1 \times Lo1)/(L1+L2) = 1.68$  ft  
 $T2 = (L2 \times Lo1)/(L1+L2) = 2.92$  ft  
 $T3 = (L2 \times Lo2)/(L2+L3) = 2.81$  ft  
 $T4 = (L3 \times Lo2)/(L2+L3) = 1.79$  ft

6. Unit shear beside opening  
 $v1 = (V/L)/(L1+T1)/L1 = 127$  plf  
 $v2 = (V/L)/(T2+L2+T3)/L2 = 157$  plf  
 $v3 = (V/L)/(T4+L3)/L3 = 126$  plf  
Check  $v1 \times L1 + v2 \times L2 + v3 \times L3 = V?$  2800 lbf OK

7. Resistance to corner forces  
 $R1 = v1 \times L1 = 661$  lbf  
 $R2 = v2 \times L2 = 1414$  lbf  
 $R3 = v3 \times L3 = 725$  lbf

8. Difference corner force + resistance  
 $R1-F1 = 392$  lbf  
 $R2-F2-F3 = 498$  lbf  
 $R3-F4 = 437$  lbf

9. Unit shear in corner zones  
 $vc1 = (R1-F1)/L1 = 75$  plf  
 $vc2 = (R2-F2-F3)/L2 = 55$  plf  
 $vc3 = (R3-F4)/L3 = 76$  plf



### Check Summary of Shear Values for Two Openings

|                                                               |     |     |     |         |
|---------------------------------------------------------------|-----|-----|-----|---------|
| Line 1: $vc1(h_{a1}+h_{b1})+v1(h_{o1})=H?$                    |     | 452 | 509 | 961 lbf |
| Line 2: $va1(h_{a1}+h_{b1})-vc1(h_{a1}+h_{b1})-v1(h_{o1})=0?$ | 961 | 452 | 509 | 0       |
| Line 3: $vc2(h_{a1}+h_{b1})+v2(h_{o1})-va1(h_{a1}+h_{b1})=0?$ | 332 | 629 | 961 | 0       |
| Line 4: $va2(h_{a2}+h_{b2})-v2(h_{o2})-vc2(h_{a2}+h_{b2})=0?$ | 961 | 629 | 332 | 0       |
| Line 5: $va2(h_{a2}+h_{b2})-vc3(h_{a2}+h_{b2})-v3(h_{o2})=0?$ | 961 | 457 | 504 | 0       |
| Line 6: $vc3(h_{a2}+h_{b2})+v3(h_{o2})=H?$                    |     | 457 | 504 | 961 lbf |

### Design Summary\*

|                                 |         |
|---------------------------------|---------|
| Req. Sheathing Capacity         | 160 plf |
| Req. Strap Force                | 467 lbf |
| Req. HD Force                   | 961 lbf |
| Req. Shear Wall Anchorage Force | 96 plf  |

\*The Design Summary assumes that the shear wall is designed as blocked.



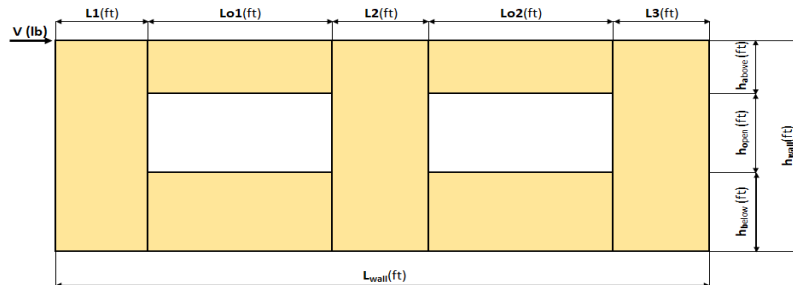
# Force Transfer Around Openings Calculator

## TWO OPENINGS

The force transfer around openings (FTAO) method of shear wall analysis is an approach that aims to reinforce the wall such that it performs as if there was no opening. This approach lends certain advantages over segmented shear walls: more versatility, because it allows for narrower wall segments while still meeting the height-to-width ratios and, often, fewer required hold-downs.

### Project Information

|            |                                           |       |           |
|------------|-------------------------------------------|-------|-----------|
| Code:      | IBC 2021                                  | Date: | 4/22/2025 |
| Designer:  | LMC                                       |       |           |
| Client:    |                                           |       |           |
| Project:   | Todd Road                                 |       |           |
| Wall Line: | Left Bldg - South exterior wall - level 2 |       |           |



### Shear Wall Calculation Variables

|                   |          |                 |                 |                        |                |
|-------------------|----------|-----------------|-----------------|------------------------|----------------|
| V                 | 1800 lbf | Opening 1       | Opening 2       | Adj. Factor Method =   | 1.25-0.125h/bs |
| L1                | 2.75 ft  | h <sub>a1</sub> | h <sub>a2</sub> | Wall Pier Aspect Ratio | Adj. Factor    |
| L2                | 5.50 ft  | h <sub>o1</sub> | h <sub>o2</sub> | P1=h <sub>o</sub> /L1= | 1.31           |
| L3                | 3.50 ft  | h <sub>b1</sub> | h <sub>b2</sub> | P2=h <sub>o</sub> /L2= | 0.65           |
| h <sub>wall</sub> | 9.35 ft  | Lo1             | Lo2             | P3=h <sub>o</sub> /L3= | 1.03           |
| L <sub>wall</sub> | 20.95 ft |                 |                 |                        |                |

1. Hold-down forces:  $H = Vh_{wall}/L_{wall}$  803 lbf

2. Unit shear above + below opening  
First opening:  $va1 = vb1 = H/(h_{a1}+h_{b1}) = 140$  plf  
Second opening:  $va2 = vb2 = H/(h_{a2}+h_{b2}) = 140$  plf

3. Total boundary force above + below openings  
First opening:  $O1 = va1 \times (Lo1) = 643$  lbf  
Second opening:  $O2 = va2 \times (Lo2) = 643$  lbf

4. Corner forces  
 $F1 = O1(L1)/(L1+L2) = 214$  lbf  
 $F2 = O1(L2)/(L1+L2) = 428$  lbf  
 $F3 = O2(L2)/(L2+L3) = 393$  lbf  
 $F4 = O2(L3)/(L2+L3) = 250$  lbf

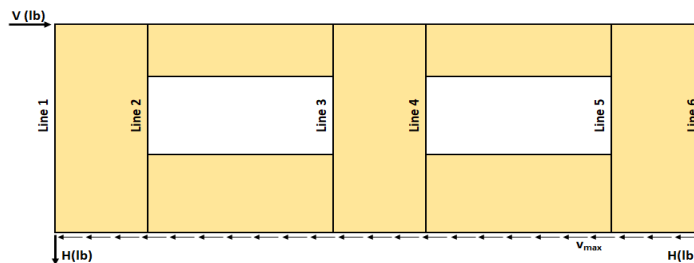
5. Tributary length of openings  
 $T1 = (L1 \times Lo1)/(L1+L2) = 1.53$  ft  
 $T2 = (L2 \times Lo1)/(L1+L2) = 3.07$  ft  
 $T3 = (L2 \times Lo2)/(L2+L3) = 2.81$  ft  
 $T4 = (L3 \times Lo2)/(L2+L3) = 1.79$  ft

6. Unit shear beside opening  
 $v1 = (V/L)/(L1+T1)/L1 = 134$  plf  
 $v2 = (V/L)/(T2+L2+T3)/L2 = 178$  plf  
 $v3 = (V/L)/(T4+L3)/L3 = 130$  plf  
Check  $v1 \times L1 + v2 \times L2 + v3 \times L3 = V?$  1800 lbf OK

7. Resistance to corner forces  
 $R1 = v1 \times L1 = 368$  lbf  
 $R2 = v2 \times L2 = 978$  lbf  
 $R3 = v3 \times L3 = 454$  lbf

8. Difference corner force + resistance  
 $R1-F1 = 154$  lbf  
 $R2-F2-F3 = 156$  lbf  
 $R3-F4 = 204$  lbf

9. Unit shear in corner zones  
 $vc1 = (R1-F1)/L1 = 56$  plf  
 $vc2 = (R2-F2-F3)/L2 = 28$  plf  
 $vc3 = (R3-F4)/L3 = 58$  plf



### Check Summary of Shear Values for Two Openings

|                                                               |     |     |         |
|---------------------------------------------------------------|-----|-----|---------|
| Line 1: $vc1(h_{a1}+h_{b1})+v1(h_{o1})=H?$                    | 322 | 482 | 803 lbf |
| Line 2: $va1(h_{a1}+h_{b1})-vc1(h_{a1}+h_{b1})-v1(h_{o1})=0?$ | 803 | 322 | 0       |
| Line 3: $vc2(h_{a2}+h_{b2})+v2(h_{o2})-va1(h_{a1}+h_{b1})=0?$ | 163 | 640 | 0       |
| Line 4: $va2(h_{a2}+h_{b2})-v2(h_{o2})-vc2(h_{a2}+h_{b2})=0?$ | 803 | 640 | 0       |
| Line 5: $va2(h_{a2}+h_{b2})-vc3(h_{a2}+h_{b2})-v3(h_{o2})=0?$ | 803 | 336 | 0       |
| Line 6: $vc3(h_{a2}+h_{b2})+v3(h_{o2})=H?$                    | 336 | 467 | 803 lbf |

### Design Summary\*

|                                 |         |
|---------------------------------|---------|
| Req. Sheathing Capacity         | 178 plf |
| Req. Strap Force                | 428 lbf |
| Req. HD Force                   | 803 lbf |
| Req. Shear Wall Anchorage Force | 86 plf  |

\*The Design Summary assumes that the shear wall is designed as blocked.



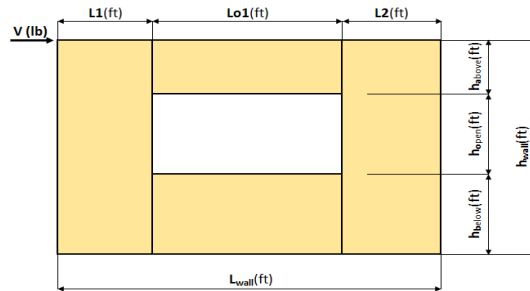
# Force Transfer Around Openings Calculator

## ONE OPENING

The force transfer around openings (FIAO) method of shear wall analysis is an approach that aims to reinforce the wall such that it performs as if there was no opening. This approach lends certain advantages over segmented shear walls: more versatility, because it allows for narrower wall segments while still meeting the height-to-width ratios and, often, fewer required hold-downs.

### Project Information

|            |                                         |       |           |
|------------|-----------------------------------------|-------|-----------|
| Code:      | 2021 IBC                                | Date: | 4/22/2025 |
| Designer:  | LMC                                     |       |           |
| Client:    |                                         |       |           |
| Project:   | Todd Road                               |       |           |
| Wall Line: | Left Bldg - South exterior wall - Lvl 1 |       |           |



Shear Wall Calculation Variables

|                   |          |                |         |                                     |             |     |
|-------------------|----------|----------------|---------|-------------------------------------|-------------|-----|
| V                 | 2800 lbf | Opening 1      |         | Adj. Factor Method = 1.25-0.125h/bs |             |     |
| L1                | 4.33 ft  | h <sub>a</sub> | 3.20 ft | Wall Pier Aspect Ratio              | Adj. Factor |     |
| L2                | 2.67 ft  | h <sub>o</sub> | 3.50 ft | P1=h <sub>a</sub> /L1=              | 0.81        | N/A |
| h <sub>wall</sub> | 9.80 ft  | h <sub>b</sub> | 3.10 ft | P2=h <sub>b</sub> /L2=              | 1.31        | N/A |
| L <sub>wall</sub> | 11.67 ft | Lo1            | 4.67 ft |                                     |             |     |

1. Hold-down forces:  $H = Vh_{wall}/L_{wall}$  2351 lbf

2. Unit shear above + below opening  
First opening:  $va1 = vb1 = H/(h_a + h_b) =$  373 plf

3. Total boundary force above + below openings  
First opening:  $O1 = va1 \times (Lo1) =$  1743 lbf

4. Corner forces  
 $F1 = O1(L1)/(L1+L2) =$  1078 lbf  
 $F2 = O1(L2)/(L1+L2) =$  665 lbf

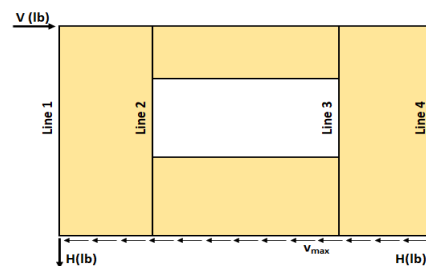
5. Tributary length of openings  
 $T1 = (L1 \times Lo1)/(L1+L2) =$  2.89 ft  
 $T2 = (L2 \times Lo1)/(L1+L2) =$  1.78 ft

6. Unit shear beside opening  
 $v1 = (V/L)(L1+T1)/L1 =$  400 plf  
 $v2 = (V/L)(T2+L2)/L2 =$  400 plf  
Check  $v1 \times L1 + v2 \times L2 = V?$  2800 lbf OK

7. Resistance to corner forces  
 $R1 = v1 \times L1 =$  1732 lbf  
 $R2 = v2 \times L2 =$  1068 lbf

8. Difference corner force + resistance  
 $R1 - F1 =$  654 lbf  
 $R2 - F2 =$  403 lbf

9. Unit shear in corner zones  
 $vc1 = (R1 - F1)/L1 =$  151 plf  
 $vc2 = (R2 - F2)/L2 =$  151 plf



### Check Summary of Shear Values for One Opening

|                                                |      |     |      |          |
|------------------------------------------------|------|-----|------|----------|
| Line 1: $vc1(h_a+h_b)+v1(h_o)=H?$              |      | 951 | 1400 | 2351 lbf |
| Line 2: $va1(h_a+h_b)-vc1(h_a+h_b)-v1(h_o)=0?$ | 2351 | 951 | 1400 | 0        |
| Line 3: $va1(h_a+h_b)-vc2(h_a+h_b)-v1(h_o)=0?$ | 2351 | 951 | 1400 | 0        |
| Line 4: $vc2(h_a+h_b)+v2(h_o)=H?$              |      | 951 | 1400 | 2351 lbf |

### Design Summary\*

|                                               |          |
|-----------------------------------------------|----------|
| Req. Sheathing Capacity                       | 400 plf  |
| Req. Strap Force                              | 1078 lbf |
| Req. HD Force (H)                             | 2351 lbf |
| Req. Shear Wall Anchorage Force ( $v_{max}$ ) | 240 plf  |

\*The Design Summary assumes that the shear wall is designed as blocked.



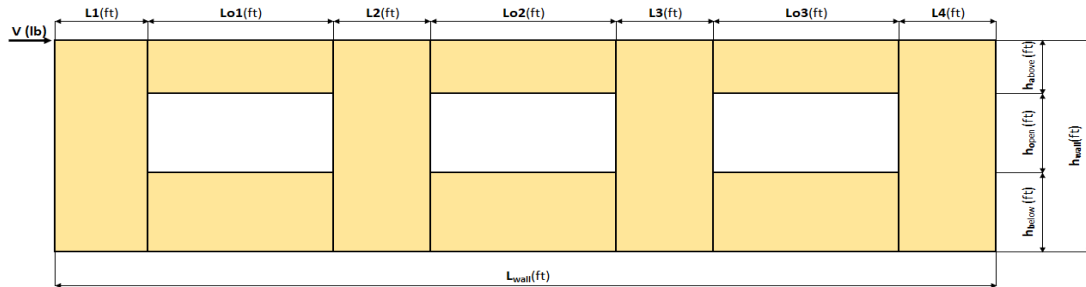
# Force Transfer Around Openings Calculator

## THREE OPENINGS

The force transfer around openings (FTAO) method of shear wall analysis is an approach that aims to reinforce the wall such that it performs as if there was no opening. This approach lends certain advantages over segmented shear walls: more versatility, because it allows for narrower wall segments while still meeting the height-to-width ratios and, often, fewer required hold-downs.

### Project Information

|            |                                      |       |           |
|------------|--------------------------------------|-------|-----------|
| Code:      | 2021 IBC                             | Date: | 4/22/2025 |
| Designer:  | LMC                                  |       |           |
| Client:    |                                      |       |           |
| Project:   | Todd Road                            |       |           |
| Wall Line: | Right Building - East wall - level 1 |       |           |



Shear Wall Calculation Variables

|                   |          |                 |         |                 |         |                 |         |                                     |             |     |
|-------------------|----------|-----------------|---------|-----------------|---------|-----------------|---------|-------------------------------------|-------------|-----|
| V                 | 2480 lbf | Opening 1       |         | Opening 2       |         | Opening 3       |         | Adj. Factor Method = 1.25-0.125h/bs |             |     |
| L1                | 4.25 ft  | h <sub>a1</sub> | 3.20 ft | h <sub>a2</sub> | 3.20 ft | h <sub>a3</sub> | 3.20 ft | Wall Pier Aspect Ratio              | Adj. Factor |     |
| L2                | 3.40 ft  | h <sub>b1</sub> | 4.33 ft | h <sub>b2</sub> | 4.33 ft | h <sub>b3</sub> | 4.33 ft | P1=h <sub>a</sub> /L1=              | 1.02        | N/A |
| L3                | 4.33 ft  | h <sub>b1</sub> | 2.50 ft | h <sub>b2</sub> | 2.50 ft | h <sub>b3</sub> | 2.50 ft | P2=h <sub>a</sub> /L2=              | 1.27        | N/A |
| L4                | 3.33 ft  | Lo1             | 2.00 ft | Lo2             | 2.00 ft | Lo3             | 2.00 ft | P3=h <sub>a</sub> /L3=              | 1.00        | N/A |
| h <sub>wall</sub> | 10.03 ft |                 |         |                 |         |                 |         | P4=h <sub>a</sub> /L4=              | 1.30        | N/A |
| L <sub>wall</sub> | 21.31 ft |                 |         |                 |         |                 |         |                                     |             |     |

1. Hold-down forces:  $H = Vh_{wall}/L_{wall}$  1167 lbf

#### 2. Unit shear above + below opening

|                                                 |         |
|-------------------------------------------------|---------|
| First opening: $va1 = vb1 = H/(h_{a1}+h_{b1})$  | 205 plf |
| Second opening: $va2 = vb2 = H/(h_{a2}+h_{b2})$ | 205 plf |
| Third opening: $va3 = vb3 = H/(h_{a3}+h_{b3})$  | 205 plf |

#### 3. Total boundary force above + below openings

|                                         |         |
|-----------------------------------------|---------|
| First opening: $O1 = va1 \times (Lo1)$  | 410 lbf |
| Second opening: $O2 = va2 \times (Lo2)$ | 410 lbf |
| Third opening: $O3 = va3 \times (Lo3)$  | 410 lbf |

#### 4. Corner forces

|                       |         |
|-----------------------|---------|
| $F1 = O1(L1)/(L1+L2)$ | 228 lbf |
| $F2 = O1(L2)/(L1+L2)$ | 182 lbf |
| $F3 = O2(L2)/(L2+L3)$ | 180 lbf |
| $F4 = O2(L3)/(L2+L3)$ | 229 lbf |
| $F5 = O3(L3)/(L3+L4)$ | 232 lbf |
| $F6 = O3(L4)/(L3+L4)$ | 178 lbf |

#### 5. Tributary length of openings

|                         |         |
|-------------------------|---------|
| $T1 = (L1*Lo1)/(L1+L2)$ | 1.11 ft |
| $T2 = (L2*Lo1)/(L1+L2)$ | 0.89 ft |
| $T3 = (L2*Lo2)/(L2+L3)$ | 0.88 ft |
| $T4 = (L3*Lo2)/(L2+L3)$ | 1.12 ft |
| $T5 = (L3*Lo3)/(L3+L4)$ | 1.13 ft |
| $T6 = (L4*Lo3)/(L3+L4)$ | 0.87 ft |

#### 6. Unit shear beside opening

|                                    |             |
|------------------------------------|-------------|
| $v1 = (V/L)(L1+T1)/L1$             | 147 plf     |
| $v2 = (V/L)(T2+L2+T3)/L2$          | 177 plf     |
| $v3 = (V/L)(T4+L3+T5)/L3$          | 177 plf     |
| $v4 = (V/L)(T6+L4)/L4$             | 147 plf     |
| Check $v1*L1+v2*L2+v3*L3+v4*L4=V?$ | 2480 lbf OK |

#### 7. Resistance to corner forces

|              |         |
|--------------|---------|
| $R1 = v1*L1$ | 624 lbf |
| $R2 = v2*L2$ | 602 lbf |
| $R3 = v3*L3$ | 766 lbf |
| $R4 = v4*L4$ | 489 lbf |

#### 8. Difference corner force + resistance

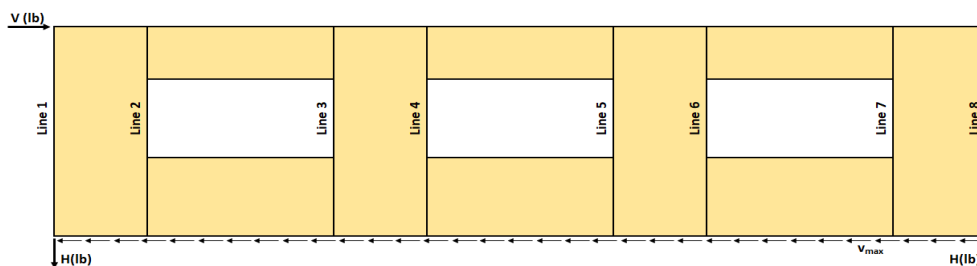
|            |         |
|------------|---------|
| $R1-F1$    | 396 lbf |
| $R2-F2-F3$ | 239 lbf |
| $R3-F4-F5$ | 305 lbf |
| $R4-F6$    | 311 lbf |

#### 9. Unit shear in corner zones

|                       |        |
|-----------------------|--------|
| $vc1 = (R1-F1)/L1$    | 93 plf |
| $vc2 = (R2-F2-F3)/L2$ | 70 plf |
| $vc3 = (R3-F4-F5)/L3$ | 70 plf |
| $vc4 = (R4-F6)/L4$    | 93 plf |

**Project Information**

|                   |                                      |              |           |
|-------------------|--------------------------------------|--------------|-----------|
| <b>Code:</b>      | 2021 IBC                             | <b>Date:</b> | 4/22/2025 |
| <b>Designer:</b>  | LMC                                  |              |           |
| <b>Client:</b>    |                                      |              |           |
| <b>Project:</b>   | Todd Road                            |              |           |
| <b>Wall Line:</b> | Right Building - East wall - level 1 |              |           |


**Check Summary of Shear Values for Three Openings**

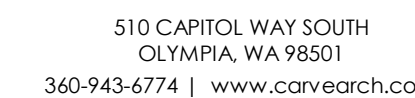
|                                                               |      |     |      |          |
|---------------------------------------------------------------|------|-----|------|----------|
| Line 1: $vc1(h_{a1}+h_{b1})+v1(h_{o1})=H?$                    |      | 532 | 636  | 1167 lbf |
| Line 2: $va1(h_{a1}+h_{b1})-vc1(h_{a1}+h_{b1})-v1(h_{o1})=0?$ | 1167 | 532 | 636  | 0        |
| Line 3: $vc2(h_{a1}+h_{b1})+v2(h_{o1})-va1(h_{a1}+h_{b1})=0?$ | 401  | 766 | 1167 | 0        |
| Line 4: $va2(h_{a2}+h_{b2})-vc2(h_{a2}+h_{b2})-v2(h_{o2})=0?$ | 1167 | 766 | 401  | 0        |
| Line 5: $va2(h_{a2}+h_{b2})-vc3(h_{a2}+h_{b2})-v3(h_{o2})=0?$ | 1167 | 401 | 766  | 0        |
| Line 6: $va3(h_{a3}+h_{b3})-vc3(h_{a3}+h_{b3})-v3(h_{o3})=0?$ | 1167 | 766 | 401  | 0        |
| Line 7: $va3(h_{a3}+h_{b3})-vc4(h_{a3}+h_{b3})-v4(h_{o3})=0?$ | 1167 | 532 | 635  | 0        |
| Line 8: $vc4(h_{a3}+h_{b3})+v4(h_{o3})=H?$                    |      | 532 | 635  | 1167 lbf |

**Design Summary\***

|                                                               |          |
|---------------------------------------------------------------|----------|
| <b>Req. Sheathing Capacity</b>                                | 205 plf  |
| <b>Req. Strap Force</b>                                       | 232 lbf  |
| <b>Req. HD Force (H)</b>                                      | 1167 lbf |
| <b>Req. Shear Wall Anchorage Force (<math>v_{max}</math>)</b> | 116 plf  |

\*The Design Summary assumes that the shear wall is designed as blocked.

VERTICAL CALCS



PROJECT NO. 23-108  
NEW POOL PLANT

JAN 20

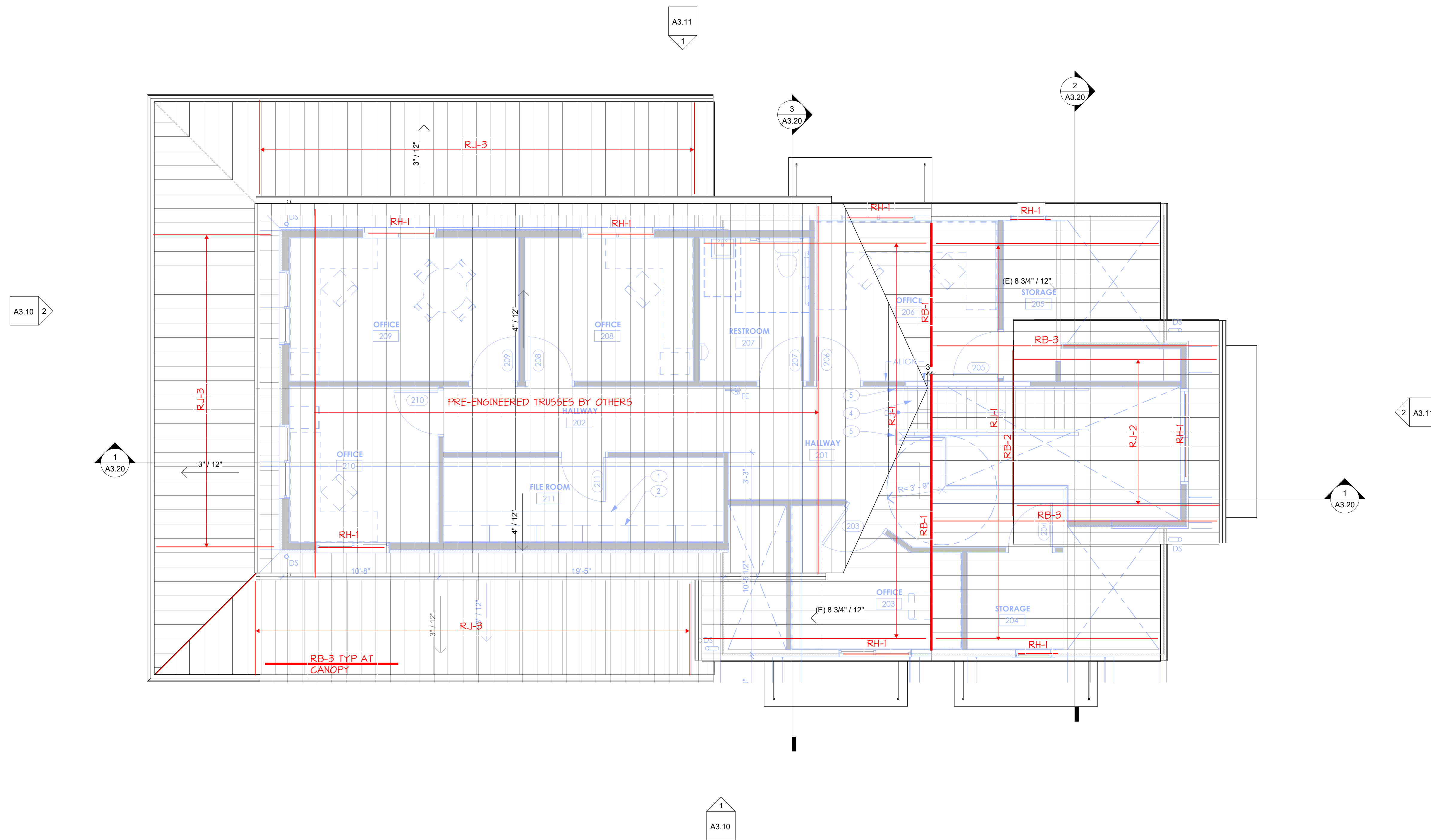
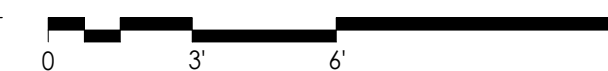
| No. | Description | Date |
|-----|-------------|------|
|-----|-------------|------|

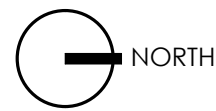
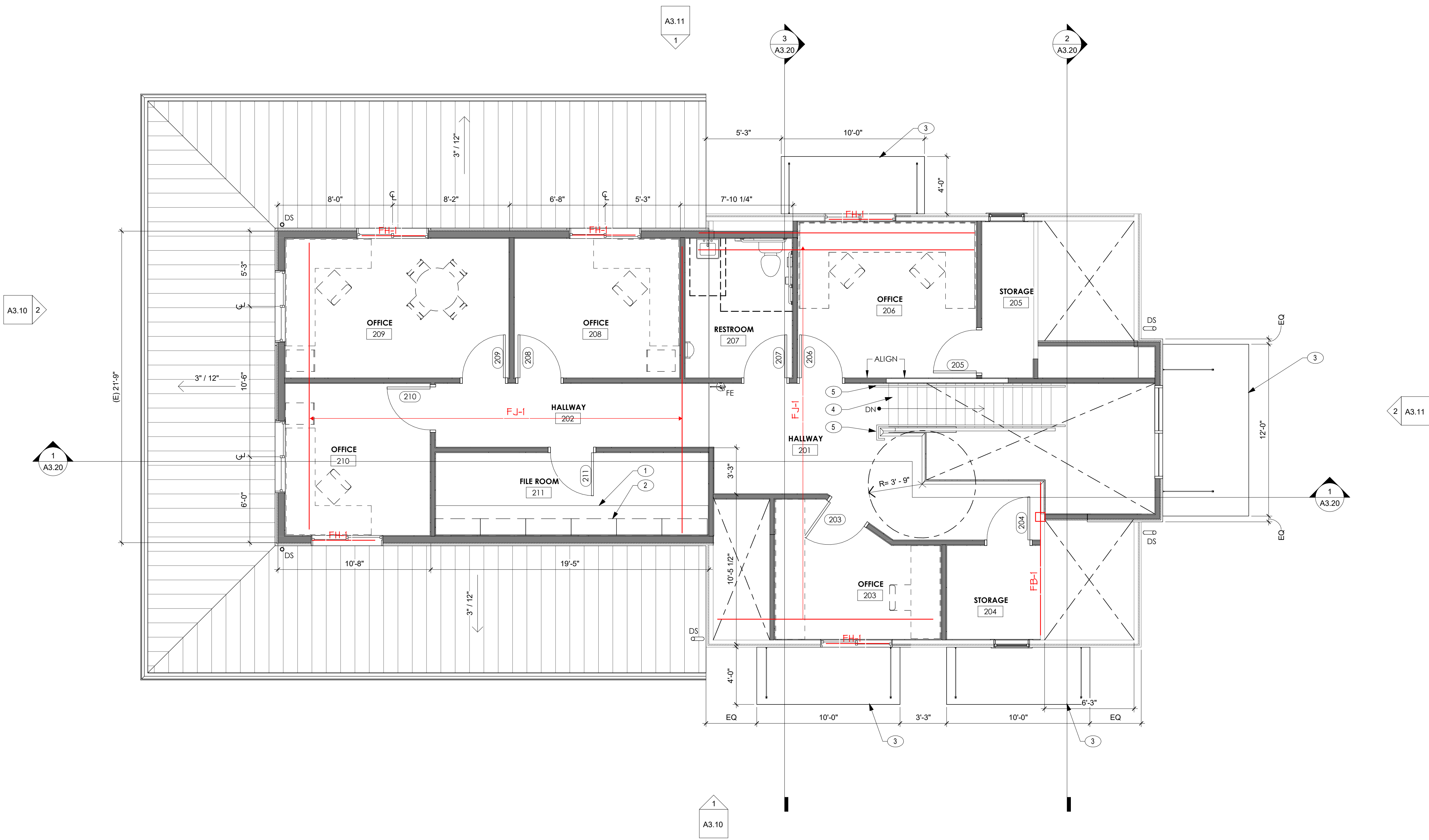
PROJECT NO. 23-10

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Author  
11/14/2025 11:14:37 AM

1/4" = 1'-0"





**1 NEW FLOOR PLAN - SECOND LEVEL**  
1/4" = 1'-0"



## KEYNOTES

1. NEW BASE CABINET W/ P-LAM COUNTER TOP.
2. NEW UPPER WALL CABINET. SEE INTERIOR FOR MOUNTING HEIGHT.
3. NEW METAL CANOPY.
4. EXISTING STAIR TO REMAIN.
5. NEW Ø = 1-1/2" MTL HANDRAIL.
6. NEW MTL GUARDRAIL.

## LEGEND

- NEW WALL, SEE A7.10 FOR WALL TYPES
- NEW DOOR WITH DOOR TAG, SEE A4.10 FOR TYPES
- NEW WINDOW WITH WINDOW TAG, SEE A4.10 FOR TYPES
- NEW FIRE EXTINGUISHER CABINET
- NEW FIRE EXTINGUISHER BRACKET
- FURNITURE N.I.C.
- DS NEW PRE-FINISHED METAL DOWNSPOUT

DD

JAN 2025

| No. | Description | Date |
|-----|-------------|------|
|-----|-------------|------|

**A2.11**

PROJECT NO., 23-108

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Structural Solutions

Project: TOPPO ROAD Job No: 25-209  
 Subject: \_\_\_\_\_ Sheet: \_\_\_\_\_ Name: JSK  
 Originating Office: ☐ Seattle ☒ Tacoma ☐ Portland Date: \_\_\_\_\_

# VERTICAL ANALYSES:

Roof DL: 15psf  
 SL = 25psf

FLOOR DL = 15psf  
 LL = 80psf + 15psf PARTITION

## Roof MEMBERS:

USE PRE-ENG TRUSSES @ 24' o.c.  
 BY STEELS @ NEW 2<sup>ND</sup> STORY

RH-1

$l = 5'$

$w_{D+S} = 40psf (18') = 720 \text{ lb/ft}$

$V = 13000 \text{ lb} < 37520$

$M = 1625 \text{ lb-ft} < 4692 \text{ lb-ft}$

USE (3) 2x8  
 SEE ATTACHED

RJ-1

$l = 14'-6" < 17.7'$

$w_D = 15psf$

$w_S = 25psf$

USE 2x12 @ 24' o.c.  
 SEE ATTACHED EXCEL  
 FILE

RJ-2

$l = 10'-6" < 12.6'$

USE 2x8 @ 24' o.c.

# ROOF BEAMS

2018 NDS/2018 IBC

|               |         |              |         |                 |
|---------------|---------|--------------|---------|-----------------|
| Doug-Fir #2   | $F_b =$ | 900 psi      | $C_r =$ | 1.15 repetitive |
| or Hem-Fir #1 | $F_v =$ | 150 psi      | $C_D =$ | 1.15 SNOW       |
|               | $E =$   | 1.50E+06 psi | $C_F =$ | (varies) size   |

## BUILT - UP HEADERS & BEAMS

|                                   |                 |               |
|-----------------------------------|-----------------|---------------|
| $V_{allow} = A * F_v * C_D / 1.5$ | $V_{applied} =$ | VARIES #      |
| $M_{allow} = S * F_b * C_D * C_F$ | $M_{applied} =$ | VARIES ft - # |

| 2x6's                 |        |                    | 2x6  | (2) 2x6  | (3) 2x6  | (4) 2x6  |
|-----------------------|--------|--------------------|------|----------|----------|----------|
| A (in <sup>2</sup> )= | 8.25   | $V_{allow}$ (#)    | 949  | 1898     | 2846     | 3795     |
| S (in <sup>3</sup> )= | 7.56   | $M_{allow}$ (ft-#) | 848  | 1696     | 2925     | 3901     |
| I (in <sup>4</sup> )= | 20.80  |                    |      |          |          |          |
| $C_F =$               | 1.3    |                    |      |          |          |          |
| 2x8's                 |        |                    | 2x8  | (2) 2x8  | (3) 2x8  | (4) 2x8  |
| A (in <sup>2</sup> )= | 10.88  | $V_{allow}$ (#)    | 1251 | 2501     | 3752     | 5003     |
| S (in <sup>3</sup> )= | 13.14  | $M_{allow}$ (ft-#) | 1360 | 2720     | 4692     | 6256     |
| I (in <sup>4</sup> )= | 47.63  |                    |      |          |          |          |
| $C_F =$               | 1.2    |                    |      |          |          |          |
| 2x10's                |        |                    | 2x10 | (2) 2x10 | (3) 2x10 | (4) 2x10 |
| A (in <sup>2</sup> )= | 13.88  | $V_{allow}$ (#)    | 1596 | 3191     | 4787     | 6383     |
| S (in <sup>3</sup> )= | 21.39  | $M_{allow}$ (ft-#) | 2029 | 4059     | 7002     | 9335     |
| I (in <sup>4</sup> )= | 98.93  |                    |      |          |          |          |
| $C_F =$               | 1.1    |                    |      |          |          |          |
| 2x12's                |        |                    | 2x12 | (2) 2x12 | (3) 2x12 | (4) 2x12 |
| A (in <sup>2</sup> )= | 16.88  | $V_{allow}$ (#)    | 1941 | 3881     | 5822     | 7763     |
| S (in <sup>3</sup> )= | 31.64  | $M_{allow}$ (ft-#) | 2729 | 5458     | 9415     | 12553    |
| I (in <sup>4</sup> )= | 177.98 |                    |      |          |          |          |
| $C_F =$               | 1.0    |                    |      |          |          |          |

## SOLID SAWN BEAMS

|      | $F_b$ (psi)        | $F_v$ (psi)     |       | $F_b$ (psi)        | $F_v$ (psi)     |                      |
|------|--------------------|-----------------|-------|--------------------|-----------------|----------------------|
|      | 900                | 180             |       | 975                | 150             |                      |
| SIZE | $M_{allow}$ (ft-#) | $V_{allow}$ (#) | $C_F$ | $M_{allow}$ (ft-#) | $V_{allow}$ (#) | I (in <sup>4</sup> ) |
| 4x6  | 1979               | 2657            | 1.30  | 2144               | 2214            | 49                   |
| 4x8  | 3438               | 3502            | 1.30  | 3724               | 2919            | 111                  |
| 4x10 | 5166               | 4468            | 1.20  | 5596               | 3724            | 231                  |
| 4x12 | 7005               | 5434            | 1.10  | 7588               | 4529            | 415                  |
| 4x14 | 8832               | 6400            | 1.00  | 9568               | 5334            | 679                  |
|      | $F_b$ (psi)        | $F_v$ (psi)     |       |                    |                 |                      |
|      | 1350               | 170             |       |                    |                 |                      |
| SIZE | $M_{allow}$ (ft-#) | $V_{allow}$ (#) | $C_F$ |                    |                 | I (in <sup>4</sup> ) |
| 6x6  | 3588               | 3943            | 1.00  |                    |                 | 76                   |
| 6x8  | 6671               | 5376            | 1.00  |                    |                 | 193                  |
| 6x10 | 10703              | 6810            | 1.00  |                    |                 | 393                  |
| 6x12 | 15680              | 8244            | 1.00  |                    |                 | 697                  |
| 6x14 | 21338              | 9677            | 0.987 |                    |                 | 1128                 |

## ROOF FRAMING

2018 NDS/2018 IBC

|               |         |              |         |                  |
|---------------|---------|--------------|---------|------------------|
| Doug-Fir #2   | $F_b =$ | 900 psi      | $C_r =$ | 1.15 repetitive  |
| or Hem-Fir #1 | $F_v =$ | 150 psi      | $C_D =$ | <b>1.15 SNOW</b> |
|               | $E =$   | 1.50E+06 psi | $C_F =$ | (varies) size    |

### 2x8's

|        |           |        |         |                       |
|--------|-----------|--------|---------|-----------------------|
| Loads: | Live      | 25 psf | $A =$   | 10.88 in <sup>2</sup> |
|        | Dead      | 15 psf | $S =$   | 13.14 in <sup>3</sup> |
|        | Partition | 0 psf  | $I =$   | 47.63 in <sup>4</sup> |
|        | Total     | 40 psf | $C_F =$ | 1.2                   |

|                  |        |                      |         |
|------------------|--------|----------------------|---------|
| (16.0" o.c.) w = | 53 plf | Max Allowable Span = | 14.4 ft |
| (24.0" o.c.) w = | 80 plf | Max Allowable Span = | 12.5 ft |

|                                                                                     | @ 16.0" o.c.   | @ 24.0" o.c. | Control       |
|-------------------------------------------------------------------------------------|----------------|--------------|---------------|
| $L_{v\text{allow}} = \{[A \cdot F_v \cdot C_D / (1.5 \cdot w)] + d\} \cdot 2$       | Lv (ft) = 48.1 | 32.5         | Shear         |
| $L_{b\text{allow}} = (S \cdot F_b \cdot C_D \cdot C_r \cdot C_f \cdot 8 / w)^{1/2}$ | Lb (ft) = 15.3 | 12.5         | Bending       |
| $L_{d\text{allow}} = [384 \cdot E \cdot I / (5 \cdot LL \cdot 360)]^{1/3}$          | Ld (ft) = 14.7 | 12.8         | LL Deflection |
| $L_{d\text{allow}} = [384 \cdot E \cdot I / (5 \cdot TL \cdot 240)]^{1/3}$          | Ld (ft) = 14.4 | 12.6         | TL Deflection |

### 2x6's

|        |           |        |         |                       |
|--------|-----------|--------|---------|-----------------------|
| Loads: | Live      | 25 psf | $A =$   | 8.25 in <sup>2</sup>  |
|        | Dead      | 15 psf | $S =$   | 7.56 in <sup>3</sup>  |
|        | Partition | 0 psf  | $I =$   | 20.80 in <sup>4</sup> |
|        | Total     | 40 psf | $C_F =$ | 1.1                   |

|                  |        |                      |         |
|------------------|--------|----------------------|---------|
| (16.0" o.c.) w = | 53 plf | Max Allowable Span = | 10.9 ft |
| (24.0" o.c.) w = | 80 plf | Max Allowable Span = | 9.1 ft  |

|                                                                                     | @ 16.0" o.c.   | @ 24.0" o.c. | Control       |
|-------------------------------------------------------------------------------------|----------------|--------------|---------------|
| $L_{v\text{allow}} = \{[A \cdot F_v \cdot C_D / (1.5 \cdot w)] + d\} \cdot 2$       | Lv (ft) = 36.5 | 24.6         | Shear         |
| $L_{b\text{allow}} = (S \cdot F_b \cdot C_D \cdot C_r \cdot C_f \cdot 8 / w)^{1/2}$ | Lb (ft) = 11.1 | 9.1          | Bending       |
| $L_{d\text{allow}} = [384 \cdot E \cdot I / (5 \cdot LL \cdot 360)]^{1/3}$          | Ld (ft) = 11.2 | 9.7          | LL Deflection |
| $L_{d\text{allow}} = [384 \cdot E \cdot I / (5 \cdot TL \cdot 240)]^{1/3}$          | Ld (ft) = 10.9 | 9.5          | TL Deflection |

### 2x12's

|        |           |        |         |                        |
|--------|-----------|--------|---------|------------------------|
| Loads: | Live      | 25 psf | $A =$   | 16.88 in <sup>2</sup>  |
|        | Dead      | 15 psf | $S =$   | 31.64 in <sup>3</sup>  |
|        | Partition | 0 psf  | $I =$   | 177.98 in <sup>4</sup> |
|        | Total     | 40 psf | $C_F =$ | 1.0                    |

|                  |        |                      |         |
|------------------|--------|----------------------|---------|
| (16.0" o.c.) w = | 53 plf | Max Allowable Span = | 21.7 ft |
| (24.0" o.c.) w = | 80 plf | Max Allowable Span = | 17.7 ft |

|                                                                                     | @ 16.0" o.c.   | @ 24.0" o.c. | Control       |
|-------------------------------------------------------------------------------------|----------------|--------------|---------------|
| $L_{v\text{allow}} = \{[A \cdot F_v \cdot C_D / (1.5 \cdot w)] + d\} \cdot 2$       | Lv (ft) = 74.6 | 50.4         | Shear         |
| $L_{b\text{allow}} = (S \cdot F_b \cdot C_D \cdot C_r \cdot C_f \cdot 8 / w)^{1/2}$ | Lb (ft) = 21.7 | 17.7         | Bending       |
| $L_{d\text{allow}} = [384 \cdot E \cdot I / (5 \cdot LL \cdot 360)]^{1/3}$          | Ld (ft) = 22.8 | 19.9         | LL Deflection |
| $L_{d\text{allow}} = [384 \cdot E \cdot I / (5 \cdot TL \cdot 240)]^{1/3}$          | Ld (ft) = 22.3 | 19.5         | TL Deflection |

### VERTICAL ANALYSIS:

RB-1

$$L = 18' - 6"$$

$$W_D = 15 \text{ psf} (18') = 225 \text{ plf}$$

$$W_S = 25 \text{ psf} (18') = 375 \text{ plf}$$

$$V = 5550 \text{ lb} < 14057 \text{ lb}$$

$$M = 25669 \text{ lb-ft} < 35805 \text{ lb-ft}$$

$$A = .84'' \Rightarrow \text{OK}$$

USE A  $5\frac{1}{2} \times 13\frac{1}{2}$  G.L.  
SEE ATTACHED

RB-2

$$L = 12'$$

$$W_D = 15 \text{ psf} (5.5') = 82.5 \text{ plf}$$

$$W_S = 25 \text{ psf} (5.5') = 138 \text{ plf}$$

$$V = 1820 \text{ lb} < 10233 \text{ lb}$$

$$M = 8760 \text{ lb-ft} < 21460 \text{ lb-ft}$$

USE  $5\frac{1}{2} \times 10\frac{1}{2}$  G.L.  
SEE ATTACHED

SIZED FOR  
CONNECTIONS

RB-3

$$L = 10'$$

$$W_D = 15 \text{ psf} (5') = 75 \text{ plf}$$

$$W_S = 25 \text{ psf} (5') = 125 \text{ plf}$$

$$V = 1300 \text{ lb} < 5376 \text{ lb}$$

$$M = 4225 \text{ lb-ft} < 6671 \text{ lb-ft}$$

USE A 648 TYP.

VERTICAL ANALYSIS: FLOOR FRAMING

FJ-1

USE 16" RED 3-65 @ 16" o.c.  
SEE ATTACHED

FJ-2

$$L = 14.5'$$

$$W_D = 15 \text{ psf} (14.5') = 217.5 \text{ lb}$$

$$W_L = 65 \text{ psf} (14.5') = 942.5 \text{ lb}$$

↓ 24"      ↓ 5" SCL

$$V = 775 \text{ lb} < 1088 \text{ lb}$$

$$M = 2780 \text{ lb-ft} < 1183 \text{ lb-ft} + 3555 \text{ lb-ft}$$

USE (6) 2x8 + 1 3/4" x 7 1/4" SCL  
@ 16" o.c.

Ft-1

$$L = 5'-0" \quad \begin{matrix} \swarrow \text{FLOOR} \\ \searrow \text{CANOPY} \end{matrix}$$

$$W_D = 15 \text{ psf} (11') + 15 \text{ psf} (4') = 225 \text{ lb}$$

$$W_L = 65 \text{ psf} (11') + 25 \text{ psf} (4') = 815 \text{ lb}$$

$$V = 2605 \text{ lb}$$

$$M = 3250 \text{ lb-ft}$$

USE (3) 2x8  
SEE ATTACHED

# FLOOR BEAMS

2018 NDS/2018 IBC

Doug-Fir #2  $F_b = 900$  psi  $C_r = 1.15$  repetitive  
or Hem-Fir #1  $F_v = 150$  psi  $C_D = 1.0$  LIVE  
 $E = 1.50E+06$  psi  $C_F =$  (varies) size

## BUILT - UP HEADERS & BEAMS

$V_{allow} = A * F_v * C_D / 1.5$   $V_{applied} =$  VARIES #  
 $M_{allow} = S * F_b * C_D * C_F$   $M_{applied} =$  VARIES ft - #

| 2x6's                 |        |                    | 2x6  | (2) 2x6  | (3) 2x6  | (4) 2x6  |
|-----------------------|--------|--------------------|------|----------|----------|----------|
| A (in <sup>2</sup> )= | 8.25   | $V_{allow}$ (#)    | 825  | 1650     | 2475     | 3300     |
| S (in <sup>3</sup> )= | 7.56   | $M_{allow}$ (ft-#) | 137  | 1475     | 2544     | 3392     |
| I (in <sup>4</sup> )= | 20.80  |                    |      |          |          |          |
| $C_F =$               | 1.3    |                    |      |          |          |          |
| 2x8's                 |        |                    | 2x8  | (2) 2x8  | (3) 2x8  | (4) 2x8  |
| A (in <sup>2</sup> )= | 10.88  | $V_{allow}$ (#)    | 1088 | 2175     | 3263     | 4350     |
| S (in <sup>3</sup> )= | 13.14  | $M_{allow}$ (ft-#) | 1183 | 2365     | 4080     | 5440     |
| I (in <sup>4</sup> )= | 47.63  |                    |      |          |          |          |
| $C_F =$               | 1.2    |                    |      |          |          |          |
| 2x10's                |        |                    | 2x10 | (2) 2x10 | (3) 2x10 | (4) 2x10 |
| A (in <sup>2</sup> )= | 13.88  | $V_{allow}$ (#)    | 1388 | 2775     | 4163     | 5550     |
| S (in <sup>3</sup> )= | 21.39  | $M_{allow}$ (ft-#) | 1765 | 3529     | 6088     | 8118     |
| I (in <sup>4</sup> )= | 98.93  |                    |      |          |          |          |
| $C_F =$               | 1.1    |                    |      |          |          |          |
| 2x12's                |        |                    | 2x12 | (2) 2x12 | (3) 2x12 | (4) 2x12 |
| A (in <sup>2</sup> )= | 16.88  | $V_{allow}$ (#)    | 1688 | 3375     | 5063     | 6750     |
| S (in <sup>3</sup> )= | 31.64  | $M_{allow}$ (ft-#) | 2373 | 4746     | 8187     | 10916    |
| I (in <sup>4</sup> )= | 177.98 |                    |      |          |          |          |
| $C_F =$               | 1.0    |                    |      |          |          |          |

## SOLID SAWN BEAMS

|      | $F_b$ (psi)        | $F_v$ (psi)     |       | $F_b$ (psi)        | $F_v$ (psi)     |                      |
|------|--------------------|-----------------|-------|--------------------|-----------------|----------------------|
|      | 900                | 180             |       | 975                | 150             |                      |
| SIZE | DOUG-FIR LARCH #2  |                 | $C_F$ | HEM-FIR #1         |                 | I (in <sup>4</sup> ) |
|      | $M_{allow}$ (ft-#) | $V_{allow}$ (#) |       | $M_{allow}$ (ft-#) | $V_{allow}$ (#) |                      |
| 4x6  | 1721               | 2310            | 1.30  | 1864               | 1925            | 49                   |
| 4x8  | 2989               | 3046            | 1.30  | 3238               | 2538            | 111                  |
| 4x10 | 4492               | 3886            | 1.20  | 4866               | 3238            | 231                  |
| 4x12 | 6091               | 4726            | 1.10  | 6599               | 3938            | 415                  |
| 4x14 | 7680               | 5566            | 1.00  | 8320               | 4638            | 679                  |
|      | $F_b$ (psi)        | $F_v$ (psi)     |       |                    |                 |                      |
|      | 1350               | 170             |       |                    |                 |                      |
| SIZE | DOUG-FIR LARCH #1  |                 | $C_F$ |                    |                 | I (in <sup>4</sup> ) |
|      | $M_{allow}$ (ft-#) | $V_{allow}$ (#) |       |                    |                 |                      |
| 6x6  | 3120               | 3428            | 1.00  |                    |                 | 76                   |
| 6x8  | 5801               | 4675            | 1.00  |                    |                 | 193                  |
| 6x10 | 9307               | 5922            | 1.00  |                    |                 | 393                  |
| 6x12 | 13635              | 7168            | 1.00  |                    |                 | 697                  |
| 6x14 | 18554              | 8415            | 0.987 |                    |                 | 1128                 |



RedSpec™ by RedBuilt™  
v7.1.17

**Project:** Project  
**Location:** Todd Road Renovation  
**Folder:** Folder  
**Date:** 7/15/25 2:27 PM  
**Designer:**  
**Comment:**

**Type:** Type

## 16" Red-I65™ @ 16" o.c. with Glued Sheathing

This product meets or exceeds the set design controls for the application and loads listed

| DESIGN CONTROLS         |  | %   | Design | Allow. | DOL         | Combination       | Pattern         | Pass/Fail |           |
|-------------------------|--|-----|--------|--------|-------------|-------------------|-----------------|-----------|-----------|
| Shear (lb)              |  | 41% | 1150   | 2810   | Floor(100%) | Concentrated Load | Left End Span 1 | PASS      |           |
| Positive Moment (ft-lb) |  | 69% | 6352   | 9210   | Floor(100%) | Concentrated Load | Middle Span 1   | PASS      |           |
| DEFLECTIONS (in)        |  | %   | Design | Allow. | Design      | Allow.            | Combination     | Pattern   | Pass/Fail |
| Span Live               |  | 78% | 0.412  | 0.525  | L / 612     | L / 480           | 1.0L            | All Spans | PASS      |
| Span Total              |  | 48% | 0.507  | 1.050  | L / 497     | L / 240           | 1.0D+1.0L       | All Spans | PASS      |

FloorChoice™ Rating: 5.6

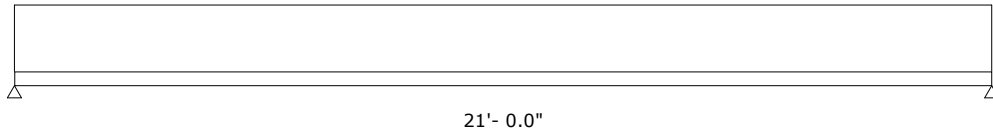


Performance rating is based on: 24 oc (23/32", 3/4") sheathing, glued and nailed, simple span, rigid supports. RedSpec has not performed a structural analysis of the sheathing.

| SUPPORTS                            | Support 1   | Support 2   |
|-------------------------------------|-------------|-------------|
| Live Reaction, Critical (lb) (DOL%) | 940 (100)   | 940 (100)   |
| Dead Reaction (lb)                  | 210         | 210         |
| Total Reaction (lb) (DOL%)          | 1150 (100)  | 1150 (100)  |
| Bearing Support                     | Bottom Wall | Bottom Wall |
| Req'd Bearing, No Stiffeners (in)   | 1.75        | 1.75        |
| Req'd Bearing, Stiffeners (in)      | -           | -           |

### SPANS AND LOADS

Dimensions represent horizontal design spans.



### APPLICATION LOADS

| Type    | Units | DOL         | Live | Dead | Partition | Tributary | Member Type       |
|---------|-------|-------------|------|------|-----------|-----------|-------------------|
| Uniform | psf   | Floor(100%) | 50   | 15   | 15        | 16"       | Glued Floor Joist |

### NOTES

- Building code and design methodology: 2021 IBC ASD (US).
- Product Acceptance: ICC-ES ESR-2994 and LABC/LARC Supplement.
- Deflection analysis is based on composite action with 24 oc (23/32", 3/4") sheathing, glued and nailed.
- Continuous lateral support required at top edge. Lateral support at bottom edge shall be per RedBuilt recommendations.
- Joist design includes consideration for a 2000 lb load distributed over a 30" square area and all live loads removed.

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Project : Folder : Type

Page 1 of 1

The products noted are intended for interior, untreated, non-corrosive applications with normal temperatures and dry conditions of use, and must be installed in accordance with local building code requirements and RedBuilt™ recommendations. The loads, spans, and spacing have been provided by others and must be approved for the specific application by the design professional for the project. Unless otherwise noted, this output has not been reviewed by a RedBuilt™ associate. PRODUCT SUBSTITUTION VOIDS THIS ANALYSIS.

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## GLU-LAM BEAMS

2018 NDS/2018 IBC

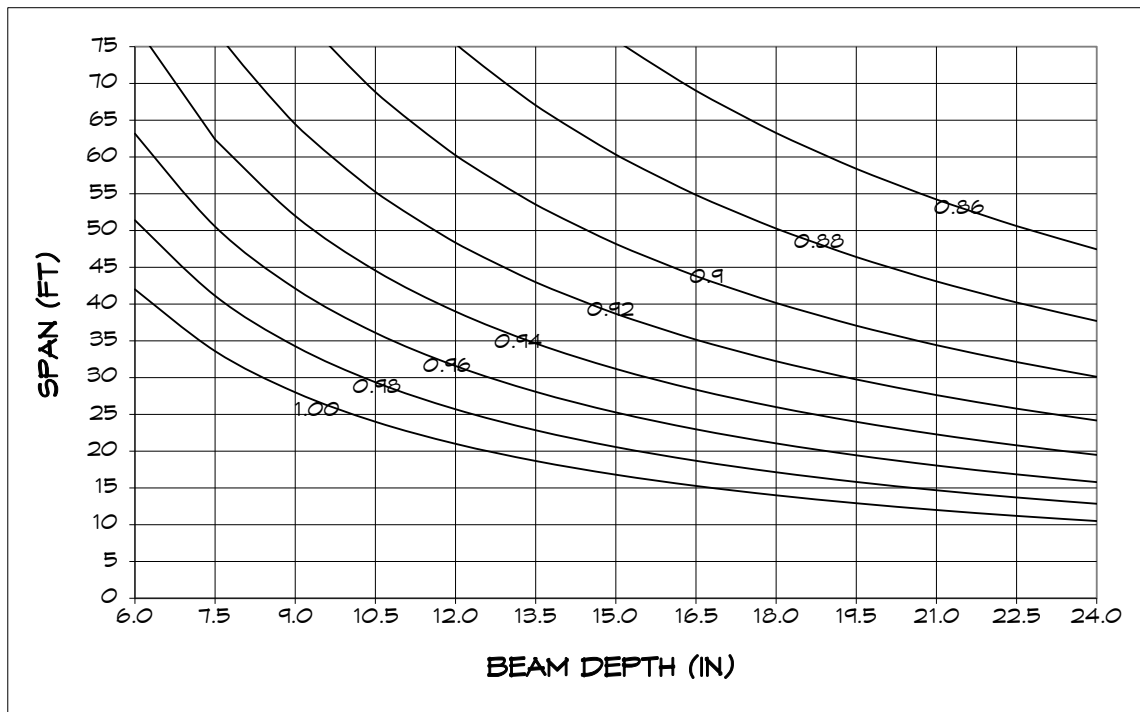
|           |         |              |         |                    |
|-----------|---------|--------------|---------|--------------------|
| 24F-V4 OR | $F_b =$ | 2400 psi     | $C_v =$ | (see chart) volume |
| 24F-V8    | $F_v =$ | 265 psi      | $C_D =$ | (varies) duration  |
|           | $E =$   | 1.80E+06 psi | $C_L =$ | 1.0 stability      |

### 5.125" GLU-LAM BEAMS

|                                               |                 |               |
|-----------------------------------------------|-----------------|---------------|
| $V_{allow} = A \cdot F_v \cdot C_D / 1.5$     | $V_{applied} =$ | VARIES #      |
| $M_{allow} = S \cdot F_b \cdot C_D \cdot C_v$ | $M_{applied} =$ | VARIES ft - # |

|                | FLOOR (1.0)        |                 |                        | ROOF (1.15)        |                 |                        |
|----------------|--------------------|-----------------|------------------------|--------------------|-----------------|------------------------|
| SIZE           | $M_{allow}$ (ft-#) | $V_{allow}$ (#) | $I$ (in <sup>4</sup> ) | $M_{allow}$ (ft-#) | $V_{allow}$ (#) | $I$ (in <sup>4</sup> ) |
| 5.125" x 6"    | 6150               | 5433            | 92                     | 7073               | 6247            | 92                     |
| 5.125" x 7.5"  | 9609               | 6791            | 180                    | 11051              | 7809            | 180                    |
| 5.125" x 9"    | 13838              | 8149            | 311                    | 15913              | 9371            | 311                    |
| 5.125" x 10.5" | 18834              | 9507            | 494                    | 21660              | 10933           | 494                    |
| 5.125" x 12"   | 24600              | 10865           | 738                    | 28290              | 12495           | 738                    |
| 5.125" x 13.5" | 31134              | 12223           | 1051                   | 35805              | 14057           | 1051                   |
| 5.125" x 15"   | 38438              | 13581           | 1441                   | 44203              | 15618           | 1441                   |
| 5.125" x 16.5" | 46509              | 14939           | 1919                   | 53486              | 17180           | 1919                   |
| 5.125" x 18"   | 55350              | 16298           | 2491                   | 63653              | 18742           | 2491                   |
| 5.125" x 19.5" | 64959              | 17656           | 3167                   | 74703              | 20304           | 3167                   |
| 5.125" x 21"   | 75338              | 19014           | 3955                   | 86638              | 21866           | 3955                   |
| 5.125" x 22.5" | 86484              | 20372           | 4865                   | 99457              | 23428           | 4865                   |
| 5.125" x 24"   | 98400              | 21730           | 5904                   | 113160             | 24990           | 5904                   |

### VOLUME FACTOR, $C_v$



# DESIGN PROPERTIES

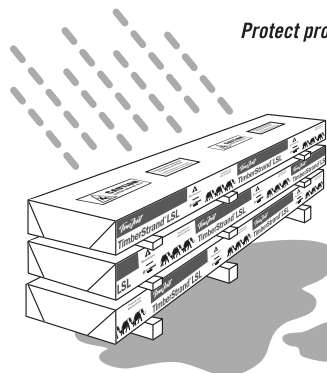
## Allowable Design Properties<sup>(1)</sup> (100% Load Duration)

| Grade             | Width | Design Property                       | Depth |       |                             |       |        |        |        |        |        |        |        |        |
|-------------------|-------|---------------------------------------|-------|-------|-----------------------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|
|                   |       |                                       | 4⅜"   | 5½"   | 5½"<br>Plank<br>Orientation | 7¼"   | 9¼"    | 9½"    | 11¼"   | 11⅝"   | 14"    | 16"    | 18"    | 20"    |
| TimberStrand® LSL |       |                                       |       |       |                             |       |        |        |        |        |        |        |        |        |
| 1.3E              | 3½"   | Moment (ft-lbs)                       | 1,735 | 2,685 | 1,780                       | 4,550 |        |        |        |        |        |        |        |        |
|                   |       | Shear (lbs)                           | 4,340 | 5,455 | 1,925                       | 7,190 |        |        |        |        |        |        |        |        |
|                   |       | Moment of Inertia (in. <sup>4</sup> ) | 24    | 49    | 20                          | 111   |        |        |        |        |        |        |        |        |
|                   |       | Weight (plf)                          | 4.5   | 5.6   | 5.6                         | 7.4   |        |        |        |        |        |        |        |        |
| 1.55E             | 1¾"   | Moment (ft-lbs)                       |       |       |                             |       |        | 5,210  |        | 7,975  | 10,920 | 14,090 |        |        |
|                   |       | Shear (lbs)                           |       |       |                             |       |        | 3,435  |        | 4,295  | 5,065  | 5,785  |        |        |
|                   |       | Moment of Inertia (in. <sup>4</sup> ) |       |       |                             |       |        | 125    |        | 244    | 400    | 597    |        |        |
|                   |       | Weight (plf)                          |       |       |                             |       |        | 5.2    |        | 6.5    | 7.7    | 8.8    |        |        |
|                   | 3½"   | Moment (ft-lbs)                       |       |       |                             |       |        | 10,420 |        | 15,955 | 21,840 | 28,180 |        |        |
|                   |       | Shear (lbs)                           |       |       |                             |       |        | 6,870  |        | 8,590  | 10,125 | 11,575 |        |        |
|                   |       | Moment of Inertia (in. <sup>4</sup> ) |       |       |                             |       |        | 250    |        | 488    | 800    | 1,195  |        |        |
|                   |       | Weight (plf)                          |       |       |                             |       |        | 10.4   |        | 13     | 15.3   | 17.5   |        |        |
| Microllam® LVL    |       |                                       |       |       |                             |       |        |        |        |        |        |        |        |        |
| 2.0E              | 1¾"   | Moment (ft-lbs)                       |       | 2,125 |                             | 3,555 | 5,600  | 5,885  | 8,070  | 8,925  | 12,130 | 15,555 | 19,375 | 23,580 |
|                   |       | Shear (lbs)                           |       | 1,830 |                             | 2,410 | 3,075  | 3,160  | 3,740  | 3,950  | 4,655  | 5,320  | 5,985  | 6,650  |
|                   |       | Moment of Inertia (in. <sup>4</sup> ) |       | 24    |                             | 56    | 115    | 125    | 208    | 244    | 400    | 597    | 851    | 1,167  |
|                   |       | Weight (plf)                          |       | 2.8   |                             | 3.7   | 4.7    | 4.8    | 5.7    | 6.1    | 7.1    | 8.2    | 9.2    | 10.2   |
| Parallam® PSL     |       |                                       |       |       |                             |       |        |        |        |        |        |        |        |        |
| 2.0E              | 3½"   | Moment (ft-lbs)                       |       |       |                             |       | 12,415 | 13,055 | 17,970 | 19,900 | 27,160 | 34,955 | 43,665 |        |
|                   |       | Shear (lbs)                           |       |       |                             |       | 6,260  | 6,430  | 7,615  | 8,035  | 9,475  | 10,825 | 12,180 |        |
|                   |       | Moment of Inertia (in. <sup>4</sup> ) |       |       |                             |       | 231    | 250    | 415    | 488    | 800    | 1,195  | 1,701  |        |
|                   |       | Weight (plf)                          |       |       |                             |       | 10.1   | 10.4   | 12.3   | 13.0   | 15.3   | 17.5   | 19.7   |        |
|                   | 5¼"   | Moment (ft-lbs)                       |       |       |                             |       | 18,625 | 19,585 | 26,955 | 29,855 | 40,745 | 52,430 | 65,495 |        |
|                   |       | Shear (lbs)                           |       |       |                             |       | 9,390  | 9,645  | 11,420 | 12,055 | 14,210 | 16,240 | 18,270 |        |
|                   |       | Moment of Inertia (in. <sup>4</sup> ) |       |       |                             |       | 346    | 375    | 623    | 733    | 1,201  | 1,792  | 2,552  |        |
|                   |       | Weight (plf)                          |       |       |                             |       | 15.2   | 15.6   | 18.5   | 19.5   | 23.0   | 26.3   | 29.5   |        |
|                   | 7"    | Moment (ft-lbs)                       |       |       |                             |       | 24,830 | 26,115 | 35,940 | 39,805 | 54,325 | 69,910 | 87,330 |        |
|                   |       | Shear (lbs)                           |       |       |                             |       | 12,520 | 12,855 | 15,225 | 16,070 | 18,945 | 21,655 | 24,360 |        |
|                   |       | Moment of Inertia (in. <sup>4</sup> ) |       |       |                             |       | 462    | 500    | 831    | 977    | 1,601  | 2,389  | 3,402  |        |
|                   |       | Weight (plf)                          |       |       |                             |       | 20.2   | 20.8   | 24.6   | 26.0   | 30.6   | 35.0   | 39.4   |        |

(1) For product in beam orientation, unless otherwise noted.

Some sizes may not be available in your region.

## PRODUCT STORAGE



Protect product from sun and water

**CAUTION:**  
Wrap is slippery when wet or icy

Align stickers (2x3 or larger)  
directly over support blocks

Use support blocks (6x6 or larger)  
at 10' on-center to keep bundles  
out of mud and water