



Structural Calculations

for

Autumn Sky 4-Plex Townhomes - Building 24 – The Springville Herriman, Utah

submitted to:

ARCFLO

Solutions you can build on for over 70 years



contact:

Jeff Turville, PE

jeff@reeve.co

5160 South 1500 West
Riverdale, Utah 84405

801.621.3100

Notice

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October 2022
Ref: 4899-B13

Project Information

Project Name: Autumn Sky 4-Plex Townhomes – Building 24
 Project Location: Herriman, Utah

Design Criteria

Governing Building Code: 2018 IBC
 Construction Type: Wood Bearing Wall
 Wind Zone and Exposure: 115mph. (3 sec. gust), Exp C
 Seismic Design Category: D
 Soil Site Class: D
 Spectral Accelerations $S_S = 1.024g$ $S_{DS} = 0.819g$
 $S_1 = 0.368g$ $S_{D1} = 0.474g$

Design Loads:
 Roof Dead Load = 15 psf
 Ground Snow Load = 45 psf
 Roof Snow Load = 35 psf
 Floor Dead Load = 15 psf
 Floor Live Load = 40 psf

Construction Materials

Concrete 28-Day Compressive Strength

Foundations: $f'_c = 3000$ psi (2500 psi design)
 Exterior Slabs on Grade: $f'_c = 4000$ psi
 Reinforcing Grade: ASTM A615 Grade 60

Structural Steel ASTM A992 ($f_y = 50000$ psi)

Wood

Sawn Lumber:
 DF#2 or better $F_b=875$ psi $F_v=95$ psi $E=1.6 \cdot 10^6$ psi
 Laminated Veneer Lumber:
 Microllam® $F_b=2600$ psi $F_v=285$ psi $E=1.9 \cdot 10^6$ psi
 Parallel Strand Lumber:
 Parallam® $F_b=2900$ psi $F_v=290$ psi $E=2.0 \cdot 10^6$ psi
 Glu-Laminated Beams:
 24F-V4 DF/DF $F_b=2400$ psi $F_v=195$ psi $E=1.8 \cdot 10^6$ psi

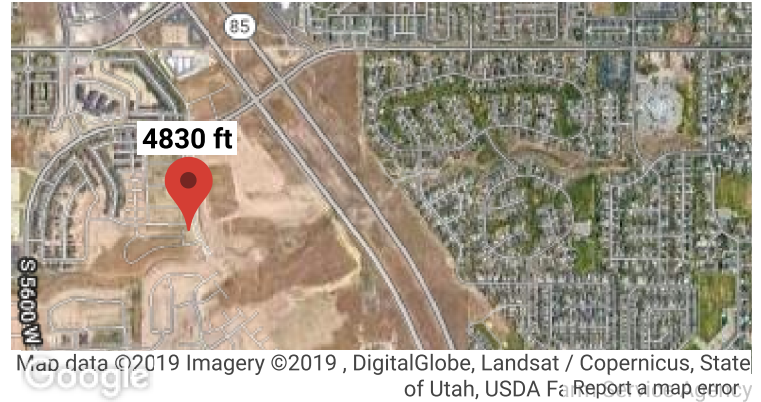
Roof Sheathing 15/32" OSB
 Floor Sheathing 3/4" OSB
 Wall Sheathing 7/16" OSB

Soil Criteria

Geotechnical Consultant: None
 Report Number: N/A
 Bearing Pressure: 1500 psf (Assumed)
 Min. Bearing Depth: 30" to bottom of footing
(Contractor/Owner to verify proper bearing conditions are provided)

Search Information

| | |
|----------------------------|--|
| Address: | 5309 W Autumn Moon Ln, Herriman, UT 84096, USA |
| Coordinates: | 40.5308037, -112.0175461 |
| Elevation: | 4830 ft |
| Timestamp: | 2019-07-09T13:38:16.741Z |
| Hazard Type: | Seismic |
| Reference Document: | ASCE7-16 |
| Risk Category: | II |
| Site Class: | D-default |



Basic Parameters

| Name | Value | Description |
|----------|--------|---|
| S_S | 1.024 | MCE_R ground motion (period=0.2s) |
| S_1 | 0.368 | MCE_R ground motion (period=1.0s) |
| S_{MS} | 1.229 | Site-modified spectral acceleration value |
| S_{M1} | * null | Site-modified spectral acceleration value |
| S_{DS} | 0.819 | Numeric seismic design value at 0.2s SA |
| S_{D1} | * null | Numeric seismic design value at 1.0s SA |

* See Section 11.4.8

Additional Information

| Name | Value | Description |
|-----------|--------|--|
| SDC | * null | Seismic design category |
| F_a | 1.2 | Site amplification factor at 0.2s |
| F_v | * null | Site amplification factor at 1.0s |
| CR_S | 0.877 | Coefficient of risk (0.2s) |
| CR_1 | 0.878 | Coefficient of risk (1.0s) |
| PGA | 0.449 | MCE_G peak ground acceleration |
| F_{PGA} | 1.2 | Site amplification factor at PGA |
| PGA_M | 0.538 | Site modified peak ground acceleration |

| | | |
|-------|-------|--|
| T_L | 8 | Long-period transition period (s) |
| SsRT | 1.024 | Probabilistic risk-targeted ground motion (0.2s) |
| SsUH | 1.168 | Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years) |
| SsD | 1.818 | Factored deterministic acceleration value (0.2s) |
| S1RT | 0.368 | Probabilistic risk-targeted ground motion (1.0s) |
| S1UH | 0.419 | Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years) |
| S1D | 0.657 | Factored deterministic acceleration value (1.0s) |
| PGAd | 0.725 | Factored deterministic acceleration value (PGA) |

* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey [Seismic Design Web Services](#).

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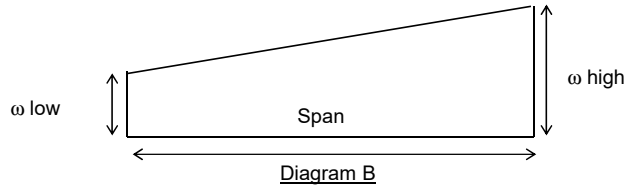
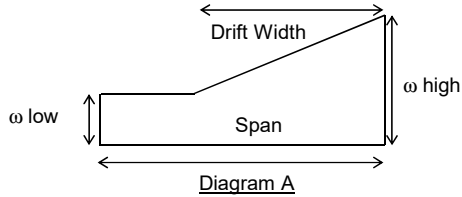


| | | | | |
|---------|--|--|----------|-------------|
| PROJECT | | | PROJ NO. | |
| | | | CALC NO. | |
| SUBJECT | Low Roof Snow Load per ASCE 7 Leeward and Windward Snow Drift | | BY JMT | DATE 7/9/19 |
| | | | CHK | DATE |
| | | | SHEET | OF REV |

Description:

GENERAL INPUT AND OUTPUT:

| | | | | |
|--------------------------------------|-----------------|------------------|--|------------------|
| "Leeward" or "Windward": | 1.00 | Leeward | Snow Load Density: | 19.83 pcf |
| Roof Slope: | 8:12 | 33.69 ° | h _b (Snow Depth): | 1.74 feet |
| County (State of Utah) | UTAH | | h _d (potential drift height): | -1.50 feet |
| Elevation at Site | 4700 ft | | h _c (Roof to Snow): | 0.00 feet |
| p _g (SEAU Flat Roof Snow) | 45 psf | <---Manual Entry | Maximum Drift Height: | 0.00 feet |
| C _e (Exposure Factor): | 1.0 | | Drift Width: | 0.00 feet |
| C _t (Thermal Factor): | 1.1 | | Maximum Snow Load: | 34.50 psf |
| I _s (Importance Factor): | 1.0 | | Maximum Drift Weight: | 0.00 psf |
| L _u (Length of Roof): | 0.00 feet | Upper Roof | Drift Width: | 0.00 feet |
| Elevation Difference: | 0.00 feet | | | |
| P _f (Roof Snow): | 34.5 psf | | | |
| C _s (Roof Slope Factor): | 1.0 | | | |
| P _s (Sloped Roof Snow): | 34.5 psf | | | |



| | | | | |
|---|--|-------|----|-----------------|
|  | Reeve & Associates, Inc. Land Planners · Civil Engineers · Land Surveyors Traffic Engineers · Structural Engineers · Landscape Architects 920 Chambers Street, Suite 14 -- Ogden, UT 84403 Phone: (801) 621-3100 Fax: (801) 621-2666 | | | |
| | Date: | Sheet | Of | |
| | Designed By: JMT | 1 | 1 | Project Number: |

Seismic Calculations

Earthquake Loads-Site Ground Motion

| | |
|-------------------------|---|
| $I = 1$ | $h_n = 28.00 \text{ ft}$ (Building Height) |
| $R = 6.5$ Wood Brg Wall | Structure Type = Other |
| $S_s = 1.024$ | $C_t = 0.02$ |
| $S_1 = 0.368$ | $x = 0.75$ |
| Site Class = D | |
| | Check Height for LFRS = 28.0ft > NP (per exception 12.2.5.6 where |
| | DL = 6.5 psf (Estimated) DL < 20psf allowed up to 65ft) |
| $F_a = 1.20$ | $S_{MS} = F_a * S_s$ |
| $S_{MS} = 1.229$ | $S_{DS} = 2 * S_{MS} / 3$ |
| $S_{DS} = 0.819$ | |
| $F_v = 1.93$ | $S_{M1} = F_v * S_1$ |
| $S_{M1} = 0.711$ | $S_{D1} = 2 * S_{M1} / 3$ |
| $S_{D1} = 0.474$ | |

Earthquake Loads-Minimum Design Lateral Force

| | | |
|---------------|-----------------------|--|
| $C_s = 0.126$ | $T = 0.243 \text{ s}$ | |
| $C_s = 0.3$ | | Load Combinations that control lateral: |
| $C_s = 0.036$ | | D+0.75L+0.75S+0.75(0.7*E) |
| | ASD Load Factor = 0.7 | 0.6D+0.7E |
| USE | Rho = 1.3 | |
| $C_s = 0.126$ | | |
| $V = C_s * W$ | | $V = \text{ASD Load Factor} * \text{Rho} * C_s * W = 0.11 * W$ |

Dead Load Effect

$$0.2 * S_{DS} = 0.164$$

$$(+/-) 0.2 * S_{DS} * D$$

Seismic Design Category

SDS => D

SD1 => D

Wind Design - ASCE 7-10 Chp 27

Risk Category = II
 Basic Wind Speed V = 115 mph
 Exposure Category = C 3
 Wind Directionality Factor, K_d = 0.85
 Topographic Factor, K_z = 1
 Gust Effect Factor, G = 0.85
 Total Stories = 2 (5 max)
 Internal Pressure Coefficient, G_{cp} = 0.18
 -0.18

Enclosure Classification
 Length Height Ag Ao % open Open Partial 1 Partial 2 Partial Total
 Wall 1 = 100 10 1000 800 80.0 Y Y N N
 Wall 2 = 100 10 1000 200 20.0 N N Y N
 Wall 3 = 25 10 250 30 12.0 N N Y N
 Wall 4 = 25 10 250 50 20.0 N N Y N
 Open Building: NO
 Partially Open: NO
 Enclosed: YES

| Wall Pressure | Front to Back | Side to Side |
|---------------------------------|---------------|--------------|
| Windward Wall, C _p = | 0.8 | 0.8 |
| Windward Wall Width, B = | 32 ft | 49 ft |
| Side Wall Width, L = | 49 ft | 32 ft |
| L/B = | 1.53125 | 0.653061 |
| Leeward Wall, C _p = | -0.3 | -0.5 |
| Side Wall, C _p = | -0.7 | -0.7 |

Parapet Wall Pressure
 Parapet Wall Height = 0 ft
 Building Height to top of parapet = 0 ft
 K_z = 0.85
 q_p = 24.4 psf
 WW GC_p = 1.50
 LW GC_p = -1.00
 P_p = 61.1 psf
 Adj. P_p = 36.6 psf
 Parapet Load per foot = 0.0 plf

| Roof Pressure | Gable 1 | Gable 1 |
|-----------------------|-------------|-------------|
| Roof Type = | Gable 1 | Gable 1 |
| Roof Pitch = | 8/12 33.7 ° | 8/12 33.7 ° |
| Ridge Height = | 28 ft | 28 ft |
| Eave Height = | 18 ft | 18 ft |
| Mean Roof Height, h = | 22.8 ft | 22.8 ft |
| h/L = | 0.46 | 0.71 |
| h/2 = | 11 ft | 11 ft |
| Kh = | 0.93 | 0.93 |
| qh = | 26.7 psf | 26.7 psf |

| Roof Pressure Coefficient, C _p | WW Area: 548 ft ² LW Area: 548 ft ² | | | | WW Area: 839 ft ² LW Area: 839 ft ² | | | | | |
|---|---|-------|-------|-------|---|-------|-------|-------|-------|-------|
| | Front to Back | | | | Side to Side | | | | | |
| | Distance from Windward Edge, ft | | | | Distance from Windward Edge, ft | | | | | |
| | 0 ft | 11 ft | 23 ft | 46 ft | 0 ft | 11 ft | 23 ft | 46 ft | | |
| Windward Normal to Ridge = | Max | 0.29 | 0.29 | 0.29 | 0.29 | Max | 0.24 | 0.24 | 0.24 | 0.24 |
| | Min | -0.18 | -0.18 | -0.18 | -0.18 | Min | -0.21 | -0.21 | -0.21 | -0.21 |
| Leeward Normal to Ridge = | Max | -0.60 | -0.60 | -0.60 | -0.60 | Max | -0.60 | -0.60 | -0.60 | -0.60 |
| | Min | -0.60 | -0.60 | -0.60 | -0.60 | Min | -0.60 | -0.60 | -0.60 | -0.60 |
| Parallel to Ridge = | Max | -0.18 | -0.18 | -0.18 | -0.18 | Max | -0.18 | -0.18 | -0.18 | -0.18 |
| | Min | -0.90 | -0.90 | -0.50 | -0.30 | Min | -1.07 | -1.07 | -0.58 | -0.47 |

| Load Description | Overall Height | Wall Trib | K _z | q _z | Front to Back | | | | Total WW+LW | Shear Force, lbs | Adj. Shear Force, lbs | ASD Factor 0.6 Adj. Wall Force |
|------------------|----------------|-----------|----------------|------------------------------------|----------------------|------------------------|------------------|---------------------|---------------------|----------------------|-----------------------|-----------------------------------|
| | | | | | WW | LW | SW | Int +/- | | | | |
| Roof | 22.8 ft | - | - | max--> 24.4 psf min--> -4.1 psf | 6.5 psf -13.6 psf | -13.6 psf -13.6 psf | varies varies | 4.8 psf -4.8 psf | 20.1 psf 9.5 psf | 6120 lbs 2902 lbs | 3672 lbs 1741 lbs | |
| Wall 2 | 8 ft | 4.5 | 0.85 | 24.4 psf | 16.6 psf | -6.8 psf | -15.9 psf | 4.8 psf | 23.4 psf | 3371 lbs | 2023 lbs | |
| Wall 1 | 9 ft | 8.5 | 0.85 | 24.4 psf | 16.6 psf | -6.8 psf | -15.9 psf | 4.8 psf | 23.4 psf | 6368 lbs | 3821 lbs | |
| | | | 0.85 | 24.4 psf | 16.6 psf | -6.8 psf | -15.9 psf | 4.8 psf | 23.4 psf | 0 lbs | 0 lbs | |
| | | | 0.85 | 24.4 psf | 16.6 psf | -6.8 psf | -15.9 psf | 4.8 psf | 23.4 psf | 0 lbs | 0 lbs | |
| Other | | | 0.85 | 24.4 psf | 16.6 psf | -6.8 psf | -15.9 psf | 4.8 psf | 23.4 psf | 0 lbs | 0 lbs | |

Front to Back Total Shear: 15859 lbs 9515 lbs

| Load Description | Overall Height | Wall Trib | K _z | q _z | Side to Side | | | | Total WW+LW | Shear Force, lbs | Adj. Shear Force, lbs | Adj. Wall Force |
|------------------|----------------|-----------|----------------|------------------------------------|----------------------|------------------------|------------------|---------------------|---------------------|----------------------|-----------------------|-----------------|
| | | | | | WW | LW | SW | Int +/- | | | | |
| Roof | 22.8 ft | - | - | max--> 24.4 psf min--> -4.8 psf | 6.5 psf -13.6 psf | -13.6 psf -13.6 psf | varies varies | 4.8 psf -4.8 psf | 19.1 psf 8.8 psf | 8892 lbs 4104 lbs | 5335 lbs 2462 lbs | |
| Wall 2 | 8 ft | 4.5 | 0.85 | 24.4 psf | 16.6 psf | -11.3 psf | -15.9 psf | 4.8 psf | 27.9 psf | 6162 lbs | 3697 lbs | |
| Wall 1 | 9 ft | 8.5 | 0.85 | 24.4 psf | 16.6 psf | -11.3 psf | -15.9 psf | 4.8 psf | 27.9 psf | 11639 lbs | 6984 lbs | |
| | | | 0.85 | 24.4 psf | 16.6 psf | -11.3 psf | -15.9 psf | 4.8 psf | 27.9 psf | 0 lbs | 0 lbs | |
| | | | 0.85 | 24.4 psf | 16.6 psf | -11.3 psf | -15.9 psf | 4.8 psf | 27.9 psf | 0 lbs | 0 lbs | |
| Other | | | 0.85 | 24.4 psf | 16.6 psf | -11.3 psf | -15.9 psf | 4.8 psf | 27.9 psf | 0 lbs | 0 lbs | |

Side to Side Total Shear: 26693 lbs 16016 lbs

LATERAL ANALYSIS

| | | | | | |
|--------------------|--------|--------|--------------|----------------------|--|
| Side-to-Side Dim: | 32 ft | Height | Roof Area = | 1568 ft ² | |
| Front-to-Back Dim: | 49 ft | | Floor Area = | 1568 | |
| Roof Trib: | 4.5 ft | | 18 ft | Floor Area = | |
| Floor Trib: | 8.5 ft | | 9 ft | Floor Area = | |
| Floor Trib: | | | | Floor Area = | |
| Floor Trib: | | | | | |
| Roof Seismic DL: | 15 psf | | | | |
| Floor Seismic DL: | 15 psf | | | | |
| Wall Seismic DL: | 12 psf | | | | |

Seismic: V = 0.11 *W

| F-front-to-back: | <u>V</u> | | <u>W</u> | <u>WxHx</u> | <u>Cvx</u> | <u>Fx</u> |
|------------------|----------|----|----------|-------------|------------|-----------|
| Roof | 3094 lbs | lb | 26976 | 485568 | 0.64 | 4201 lbs |
| Floor | 3446 lbs | lb | 30048 | 270432 | 0.36 | 2339 lbs |
| Floor | 0 lbs | lb | 0 | 0 | 0.00 | 0 lbs |
| Floor | 0 lbs | lb | 0 | 0 | 0.00 | 0 lbs |
| | 6540 lbs | | 57024 | 756000 | | 6540 lbs |
| <hr/> | | | | | | |
| F-side-to-side: | | | | | | |
| Roof | 3304 lbs | lb | 28812 | 518616 | 0.63 | 4520 lbs |
| Floor | 3844 lbs | lb | 33516 | 301644 | 0.37 | 2629 lbs |
| Floor | 0 lbs | lb | 0 | 0 | 0.00 | 0 lbs |
| Floor | 0 lbs | lb | 0 | 0 | 0.00 | 0 lbs |
| | 7148 lbs | | 62328 | 820260 | | 7148 lbs |

Wind:

| | |
|------------------|----------|
| F-front-to-back: | |
| Roof | 5695 lbs |
| Floor | 3821 lbs |
| Floor | 0 lbs |
| Floor | 0 lbs |
| F-side-to-side: | |
| Roof | 9032 lbs |
| Floor | 6984 lbs |
| Floor | 0 lbs |
| Floor | 0 lbs |

Use for Design:

| | | | |
|------------------|----------|---------------------|-----|
| F-front-to-back: | | | |
| Roof | 5695 lbs | Wind Governs | 1.4 |
| Floor | 3821 lbs | Wind Governs | 1.4 |
| Floor | 0 lbs | | 1 |
| Floor | 0 lbs | | 1 |
| F-side-to-side: | | | |
| Roof | 9032 lbs | Wind Governs | 1.4 |
| Floor | 6984 lbs | Wind Governs | 1.4 |
| Floor | 0 lbs | | 1 |
| Floor | 0 lbs | | 1 |

| | SW capacities (plf): | | Hold Down capacities (lb): | | | | | |
|------|----------------------|------|----------------------------|--------|------|-------|-----------|-------|
| | seismic | wind | 0 | NONE | 0 | NONE | | |
| SW-1 | 260 | 365 | 200 | LSTD8 | 1610 | 200 | MST37 | 1725 |
| SW-2 | 380 | 532 | 1610 | STHD10 | 2175 | 1725 | MST48 | 3215 |
| SW-3 | 490 | 685 | 2175 | STHD14 | 5345 | 3215 | MST60 | 5240 |
| SW-4 | 640 | 896 | 5345 | HDU4 | 4565 | 5240 | MST72 | 6730 |
| SW-5 | 760 | 1065 | 4565 | HDU5 | 5645 | 6730 | (2) MST60 | 10480 |
| SW-6 | 980 | 1370 | 5645 | HDU8 | 7870 | 10480 | (2) MST72 | 13460 |
| | | | 7870 | HDU11 | 9535 | 13460 | NG | |

Simple Span Beam Calculation

Adjustment Factors - ASD

| | |
|----------|----------|
| Cd: 1.15 | Cfu: NA |
| Om: 1.00 | Ci: 1.00 |
| Ct: 1.00 | Cr: 1.00 |
| Ci: 1.00 | Cv: - |
| Cf: - | Cc: 1.00 |

Glu-Lam & LVL Only
Glu-Lam Only

| | | | |
|----------|--------|------------------|----|
| Roof DL | 10 psf | Include Self Wt? | No |
| Floor DL | 15 psf | | |
| Live | 40 psf | | |
| Snow | 35 psf | | |

--> Point Load distance must be >= midspan distance.

Active Member for Deflection Calc and Shear Diagram: RB-7

| member ID | span ft | trib ft | roof ft | floor ft | wall load plf | point load | | | dist from left, ft | left reaction | | | right reaction | | | applied moment lb-ft | applied shear lbs | Selected Member | Live/Total Deflection | actual Δ, in. | Δ limit, L/ | Δ act, L/ | check | Max Defl Location, ft | Min Bearing Length, in |
|-----------|---------|---------|---------|----------|---------------|------------|----------|----------|--------------------|---------------|----------|----------|----------------|----------|----------|----------------------|-------------------|-----------------------|-----------------------|---------------|-------------|-----------|-------|-----------------------|------------------------|
| | | | | | | dead lbs | live lbs | snow lbs | | dead lbs | live lbs | snow lbs | dead lbs | live lbs | snow lbs | | | | | | | | | | |
| RB-1 | 4 | 21 | | | | | | | 1.833 | 420 | 0 | 1470 | 420 | 0 | 1470 | 1890 | 69.5 | (2) 2x8 | Live | 0.03 | L/240 | L/1728 | Pass | 2.0 | 1.0 |
| RB-2 | 6 | 5 | | | | | | | | 150 | 0 | 525 | 150 | 0 | 525 | 1013 | 37.2 | (2) 2x8 | Live | 0.03 | L/240 | L/2151 | Pass | 3.0 | 0.4 |
| RB-3 | 6 | 26 | | | | | | | | 780 | 0 | 2730 | 780 | 0 | 2730 | 5265 | 64.4 | (2) 1-3/4"x7-1/4" LVL | Live | 0.12 | L/240 | L/603 | Pass | 3.0 | 1.3 |
| RB-4 | 8 | 8 | | | | | | | | 320 | 0 | 1120 | 320 | 0 | 1120 | 2880 | 70.6 | (3) 2x8 | Live | 0.11 | L/240 | L/851 | Pass | 4.0 | 0.5 |
| RB-5 | 10.5 | 19 | | | | | | | | 1131 | 0 | 3806 | 1564 | 0 | 4827 | 14250 | 73.7 | (3) 1-3/4"x9-1/4" LVL | Live | 0.32 | L/360 | L/393 | Pass | 5.4 | 1.6 |
| RB-6 | 14 | 5 | | | 100 | | | | | 1050 | 0 | 1225 | 1050 | 0 | 1225 | 7963 | 41.2 | (3) 1-3/4"x9-1/4" LVL | Live | 0.22 | L/360 | L/769 | Pass | 7.0 | 0.6 |
| RB-7 | 2.5 | 21 | | | | | | | | 449 | 0 | 1359 | 776 | 0 | 2129 | 1727 | 63.5 | (2) 2x8 | Live | 0.01 | L/360 | L/3398 | Pass | 1.3 | 1.5 |
| RB-8 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-9 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-10 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-11 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-12 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-13 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-14 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-15 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-16 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-17 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-18 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-19 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-20 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-21 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-22 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-23 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-24 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-25 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-26 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |
| RB-27 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Live | | | | | | |

Simple Span Beam Calculation

Adjustment Factors - ASD

| | |
|----------|---------------------|
| Cd: 1.00 | Cfu: NA |
| Cr: 1.00 | Cr: 1.00 |
| Ct: 1.00 | Cv: 1.15 |
| Cf: - | Cc: - |
| | 1.00 |
| | Glue-Lam & LVL Only |
| | Glue-Lam Only |

Roof DL 15 psf
 Floor DL 40 psf
 Live 40 psf
 Snow 35 psf

Include Self Wt? No

--> Point Load distance must be >= midspan distance!

Active Member for Deflection Calc and Shear Diagram: FB-15

| member ID | span ft | trib ft | floor ft | trib ft | wall load plf | point load | | | dist from left, ft | left reaction | | | right reaction | | | applied moment lb-ft | % Str | applied shear lbs | % Str | Selected Member | Live/Total Deflection | actual Δ, in. | Δ limit L/ | Δ act L/ | check | Max Defl Location, ft | Min Bearing Length, in |
|-----------|---------|---------|----------|---------|---------------|------------|----------|----------|--------------------|---------------|----------|----------|----------------|----------|----------|----------------------|-------|-------------------|-------|------------------------|-----------------------|---------------|------------|----------|-------|-----------------------|------------------------|
| | | | | | | dead lbs | live lbs | snow lbs | | dead lbs | live lbs | snow lbs | dead lbs | live lbs | snow lbs | | | | | | | | | | | | |
| FB-1 | 4 | | 16 | | | | | | | 480 | 1280 | 0 | 480 | 1280 | 0 | 1760 | 64.7 | 1760 | 67.4 | (2) 2x8 | Live | 0.04 | L/360 | L/1227 | Pass | 3.2 | 0.9 |
| FB-2 | 6 | | 13 | | | | | | | 585 | 1560 | 0 | 585 | 1560 | 0 | 3218 | 78.9 | 2145 | 54.8 | (3) 2x8 | Live | 0.07 | L/360 | L/1086 | Pass | 3.0 | 0.8 |
| FB-3 | 6 | | 13 | | | | | | | 585 | 1560 | 0 | 585 | 1560 | 0 | 3218 | 79.3 | 2145 | 54.4 | (2) 2x10 | Live | 0.05 | L/360 | L/1503 | Pass | 3.0 | 1.1 |
| FB-4 | 3 | | 7 | | | | | | | 210 | 560 | 0 | 210 | 560 | 0 | 770 | 3.8 | 770 | 9.8 | (2) 1-3/4"x11-7/8" LVL | Live | 0.00 | L/480 | L/29072 | Pass | 2.0 | 0.3 |
| FB-5 | 4 | 22 | 7 | | | | | | | 630 | 360 | 1155 | 630 | 360 | 1155 | 1339 | 49.2 | 1785 | 68.4 | (2) 2x8 | Live | 0.01 | L/480 | L/3910 | Pass | 1.5 | 1.1 |
| FB-6 | 10 | 5 | 8 | | 100 | | | | | 1475 | 1600 | 875 | 1475 | 1600 | 875 | 8328 | 40.6 | 3331 | 42.2 | (2) 1-3/4"x11-7/8" LVL | Live | 0.09 | L/480 | L/1403 | Pass | 5.0 | 1.5 |
| FB-7 | 5.5 | 18 | 5 | | 100 | | | | | 1224 | 550 | 1733 | 1224 | 550 | 1733 | 4065 | 19.8 | 2956 | 37.4 | (2) 1-3/4"x11-7/8" LVL | Live | 0.01 | L/480 | L/14970 | Pass | 2.7 | 1.3 |
| FB-8 | 4.5 | 8 | 7 | | 100 | | | | | 731 | 630 | 630 | 731 | 630 | 630 | 1886 | 9.2 | 1676 | 21.2 | (2) 1-3/4"x11-7/8" LVL | Live | 0.00 | L/480 | L/13612 | Pass | 2.2 | 0.8 |
| FB-9 | 20 | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | #N/A | 0 | #N/A | see calc | Live | | | | | | |
| FB-10 | 20 | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | #N/A | 0 | #N/A | see calc | Live | | | | | | |
| FB-11 | 16 | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | #N/A | 0 | #N/A | see calc | Live | | | | | | |
| FB-12 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | #N/A | 0 | #N/A | not used | Live | | | | | | |
| FB-13 | 15 | | 14 | | | | | | | 1575 | 4200 | 0 | 1575 | 4200 | 0 | 21656 | 70.3 | 5775 | 48.8 | (3) 1-3/4"x11-7/8" LVL | Live | 0.44 | L/360 | L/413 | Pass | 7.5 | 1.5 |
| FB-14 | 3 | | 28 | | 100 | | | | | 780 | 1680 | 0 | 780 | 1680 | 0 | 1945 | 45.5 | 2460 | 73.9 | (2) 2x10 | Live | 0.01 | L/480 | L/5833 | Pass | 1.5 | 1.3 |
| FB-15 | 8 | | 18 | | 100 | | | | | 1480 | 2880 | 0 | 1480 | 2880 | 0 | 8720 | 71.1 | 4360 | 60.3 | (3) 1-3/4"x7-1/4" LVL | Live | 0.20 | L/480 | L/482 | Pass | 4.0 | 1.1 |
| FB-16 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | | | | | |
| FB-17 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | | | | | |
| FB-18 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | | | | | |
| FB-19 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | | | | | |
| FB-20 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | | | | | |
| FB-21 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | | | | | |
| FB-22 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | | | | | |
| FB-23 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | | | | | |
| FB-24 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | | | | | |
| FB-25 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | | | | | |
| FB-26 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | | | | | |
| FB-27 | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | | | | | |

Simple Span Beam Calculation

Mid Unit

Adjustment Factors - ASD

| | | | |
|-----|------|------|------|
| Cd: | 1.15 | Cfu: | NA |
| Cm: | 1.00 | Ci: | 1.00 |
| Ct: | 1.00 | Cr: | 1.00 |
| Ci: | 1.00 | Cv: | - |
| Cf: | - | Cc: | 1.00 |

Glu-Lam & LVL Only
Glu-Lam Only

| | | | |
|----------|----|-----|------------------|
| Roof DL | 10 | psf | Include Self Wt? |
| Floor DL | 15 | psf | No |
| Live | 40 | psf | |
| Snow | 35 | psf | |

---> Point Load distance must be >= midspan distance!

Active Member for RB-7
Deflection Calc and Shear Diagram:

| member ID | span ft | roof trib ft | floor trib ft | wall load plf | point load | | | dist from left, ft | left reaction | | | | right reaction | | | | applied moment lb-ft | % Str | applied shear lbs | % Str | Selected Member | Live/Total Deflection | actual Δ, in. | Δ limit, L/ | Δ act, L/ | check | Max Defl Location, ft | Min Bearing Length, in |
|-----------|---------|--------------|---------------|---------------|------------|----------|----------|--------------------|---------------|----------|----------|----------|----------------|----------|----------|----------|----------------------|-----------------------|-------------------|-------|-----------------|-----------------------|---------------|-------------|-----------|-------|-----------------------|------------------------|
| | | | | | dead lbs | live lbs | snow lbs | | dead lbs | live lbs | snow lbs | dead lbs | live lbs | snow lbs | dead lbs | live lbs | | | | | | | | | | | | |
| RB-1 | 4 | 21 | | | | | | 420 | 0 | 1470 | 420 | 0 | 1470 | 1890 | 69.5 | 1890 | 63.0 | (2) 2x8 | Live | 0.03 | L/240 | L/1728 | Pass | 2.0 | 1.0 | | | |
| RB-2 | 6 | 21 | | | | | | 630 | 0 | 2205 | 630 | 0 | 2205 | 4253 | 33.0 | 2835 | 40.1 | (2) 1-3/4"x9-1/4" LVL | Live | 0.05 | L/240 | L/1551 | Pass | 3.0 | 1.1 | | | |
| RB-3 | 6 | 26 | | | | | | 780 | 0 | 2730 | 780 | 0 | 2730 | 5265 | 64.4 | 3510 | 63.3 | (2) 1-3/4"x7-1/4" LVL | Live | 0.12 | L/240 | L/603 | Pass | 3.0 | 1.3 | | | |
| RB-4 | 12 | 8 | | | | | | 480 | 0 | 1680 | 480 | 0 | 1680 | 6480 | 52.8 | 2160 | 26.0 | (3) 1-3/4"x7-1/4" LVL | Live | 0.33 | L/240 | L/443 | Pass | 4.0 | 0.5 | | | |
| RB-5 | 10.5 | 19 | | | | | 8.5 | 1131 | 0 | 3806 | 1564 | 0 | 4827 | 14250 | 73.7 | 6391 | 60.2 | (3) 1-3/4"x9-1/4" LVL | Live | 0.32 | L/360 | L/393 | Pass | 5.4 | 1.6 | | | |
| RB-6 | 14 | 5 | | 100 | | | | 1050 | 0 | 1225 | 1050 | 0 | 1225 | 7963 | 41.2 | 2275 | 21.4 | (3) 1-3/4"x9-1/4" LVL | Live | 0.22 | L/360 | L/769 | Pass | 7.0 | 0.6 | | | |
| RB-7 | 2.5 | 21 | | | | | 1.833 | 449 | 0 | 1359 | 776 | 0 | 2129 | 1727 | 63.5 | 2904 | 96.8 | (2) 2x8 | Live | 0.01 | L/360 | L/3398 | Pass | 1.3 | 1.5 | | | |
| RB-8 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-9 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-10 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-11 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-12 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-13 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-14 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-15 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-16 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-17 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-18 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-19 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-20 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-21 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-22 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-23 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-24 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-25 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-26 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |
| RB-27 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/360 | | | | | | | |

Simple Span Beam Calculation

Mid Unit

Adjustment Factors - ASD

| | | | |
|-----|------|------|------|
| Cd: | 1.00 | Cfu: | NA |
| Cm: | 1.00 | Ci: | 1.00 |
| Ct: | 1.00 | Cr: | 1.15 |
| Cl: | 1.00 | Cv: | - |
| Cf: | - | Cc: | 1.00 |

Glu-Lam & LVL Only
Glu-Lam Only

| | | | |
|----------|----|-----|------------------|
| Roof DL | 15 | psf | Include Self Wt? |
| Floor DL | 15 | psf | No |
| Live | 40 | psf | |
| Snow | 35 | psf | |

---> Point Load distance must be >= midspan distance!

Active Member for Deflection Calc and Shear Diagram: FB-15

| member ID | span ft | roof trib ft | floor trib ft | wall load plf | point load | | | dist from left, ft | left reaction | | | | right reaction | | | | applied moment lb-ft | % Str | applied shear lbs | % Str | Selected Member | Live/Total Deflection | actual Δ, in. | Δ limit L/ | Δ act L/ | check | Max Defl Location, ft | Min Bearing Length, in |
|-----------|---------|--------------|---------------|---------------|------------|----------|----------|--------------------|---------------|----------|----------|----------|----------------|----------|------|------|----------------------|------------------------|-------------------|-------|-----------------|-----------------------|---------------|------------|----------|-------|-----------------------|------------------------|
| | | | | | dead lbs | live lbs | snow lbs | | dead lbs | live lbs | snow lbs | dead lbs | live lbs | snow lbs | | | | | | | | | | | | | | |
| FB-1 | 4 | | 16 | | | | | 480 | 1280 | 0 | 480 | 1280 | 0 | 1760 | 64.7 | 1760 | 67.4 | (2) 2x8 | Live | 0.04 | L/360 | L/1227 | Pass | 3.2 | 0.9 | | | |
| FB-2 | 6 | | 13 | | | | | 585 | 1560 | 0 | 585 | 1560 | 0 | 3218 | 78.9 | 2145 | 54.8 | (3) 2x8 | Live | 0.07 | L/360 | L/1086 | Pass | 3.0 | 0.8 | | | |
| FB-3 | 6 | | 13 | | | | | 585 | 1560 | 0 | 585 | 1560 | 0 | 3218 | 79.3 | 2145 | 64.4 | (2) 2x10 | Live | 0.05 | L/360 | L/1503 | Pass | 3.0 | 1.1 | | | |
| FB-4 | 6 | | 7 | | | | | 315 | 840 | 0 | 315 | 840 | 0 | 1733 | 8.4 | 1155 | 14.6 | (2) 1-3/4"x11-7/8" LVL | Live | 0.01 | L/480 | L/10383 | Pass | 2.0 | 0.4 | | | |
| FB-5 | 3 | 22 | 6 | | | | | 630 | 360 | 1155 | 630 | 360 | 1155 | 1339 | 49.2 | 1785 | 68.4 | (2) 2x8 | Live | 0.01 | L/480 | L/3910 | Pass | 1.5 | 1.1 | | | |
| FB-6 | 10 | 5 | 8 | 100 | | | | 1475 | 1600 | 875 | 1475 | 1600 | 875 | 8328 | 40.6 | 3331 | 42.2 | (2) 1-3/4"x11-7/8" LVL | Live | 0.09 | L/480 | L/1403 | Pass | 5.0 | 1.5 | | | |
| FB-7 | 5.5 | 18 | 5 | 100 | | | | 1224 | 550 | 1733 | 1224 | 550 | 1733 | 4065 | 19.8 | 2956 | 37.4 | (2) 1-3/4"x11-7/8" LVL | Live | 0.01 | L/480 | L/4970 | Pass | 2.7 | 1.3 | | | |
| FB-8 | 4.5 | 8 | 7 | 100 | | | | 731 | 630 | 630 | 731 | 630 | 630 | 1886 | 9.2 | 1676 | 21.2 | (2) 1-3/4"x11-7/8" LVL | Live | 0.00 | L/480 | L/13612 | Pass | 2.2 | 0.8 | | | |
| FB-9 | 20 | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | #N/A | 0 | #N/A | see calc | Live | | L/360 | ##### | ##### | | | | | |
| FB-10 | 20 | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | #N/A | 0 | #N/A | see calc | Live | | L/480 | ##### | ##### | | | | | |
| FB-11 | 16 | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | #N/A | 0 | #N/A | see calc | Live | | L/480 | ##### | ##### | | | | | |
| FB-12 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | not used | Live | | L/480 | | | | 6.5 | | | |
| FB-13b | 17.5 | | 14 | | | | | 1838 | 4900 | 0 | 1838 | 4900 | 0 | 29477 | 71.8 | 6738 | 42.7 | (4) 1-3/4"x11-7/8" LVL | Live | 0.57 | L/360 | L/369 | Pass | 7.5 | 1.3 | | | |
| FB-14 | 3 | | 28 | 100 | | | | 780 | 1680 | 0 | 780 | 1680 | 0 | 1845 | 45.5 | 2460 | 73.9 | (2) 2x10 | Live | 0.01 | L/480 | L/5583 | Pass | 1.5 | 1.3 | | | |
| FB-15 | 10.5 | | 18 | 100 | | | | 1943 | 3780 | 0 | 1943 | 3780 | 0 | 15022 | 77.7 | 5723 | 62.0 | (3) 1-3/4"x9-1/4" LVL | Live | 0.28 | L/360 | L/443 | Pass | 5.2 | 1.5 | | | |
| FB-16 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/480 | | | | | | | |
| FB-17 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/480 | | | | | | | |
| FB-18 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/480 | | | | | | | |
| FB-19 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/480 | | | | | | | |
| FB-20 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/480 | | | | | | | |
| FB-21 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/480 | | | | | | | |
| FB-22 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/480 | | | | | | | |
| FB-23 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/480 | | | | | | | |
| FB-24 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/480 | | | | | | | |
| FB-25 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/480 | | | | | | | |
| FB-26 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/480 | | | | | | | |
| FB-27 | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | Live | | L/480 | | | | | | | |

FOOTINGS:

ALLOWABLE BEARING PRESSURE = 1.5 KSF
 Assumed Coefficient of Friction Soil to Foundation = 0.3

| Frame Line | GRAVITY | | | | | | | | | Factored | | | Required | Specified |
|------------|---------|----------|----------|--------------------|--------------------|--------------------|---------|----------------------|--------|----------|------|---------|----------|-----------|
| | DL | LL | SL | Trib _{DL} | Trib _{LL} | Trib _{SL} | Wall | Trib _{Wall} | DL | LL | SL | FTG | FTG | |
| Grid L | L | 15.0 psf | 40.0 psf | 35.0 psf | 28.0ft | 28.0ft | 0.0ft | 53.0 psf | 17.0ft | 1.3 k | 1.1k | 19.5 in | FC- 24 | |
| rear left | T | 15.0 psf | 40.0 psf | 35.0 psf | 28.0ft | 7.0ft | 21.0ft | 45.0 psf | 21.0ft | 1.4 k | 0.8k | 17.0 in | FC- 20 | |
| rear right | T | 15.0 psf | 40.0 psf | 35.0 psf | 19.0ft | 14.0ft | 5.0ft | 40.0 psf | 25.0ft | 1.3 k | 0.6k | 14.8 in | FC- 20 | |
| side | 1 | 15.0 psf | 40.0 psf | 35.0 psf | 10.0ft | 5.0ft | 5.0ft | 40.0 psf | 25.0ft | 1.2 k | 0.3k | 11.5 in | FC- 20 | |
| marriage | 2 | 15.0 psf | 40.0 psf | 35.0 psf | 21.0ft | 4.0ft | 17.0ft | 15.0 psf | 50.0ft | 1.1 k | 0.6k | 13.3 in | FC- 20 | |
| Grid P | P | 15.0 psf | 40.0 psf | 35.0 psf | 28.0ft | 28.0ft | 0.0ft | 12.0 psf | 17.0ft | 0.6 k | 1.1k | 14.0 in | FC- 18 | |
| Grid 1.4 | 1.4 | 15.0 psf | 40.0 psf | 35.0 psf | 14.0ft | 5.0ft | 9.0ft | 12.0 psf | 17.0ft | 0.4 k | 0.4k | 6.4 in | FC- 18 | |
| SPOT FTGS | | | | | | | | | | | | | | |
| | B | 0.0 psf | 0.0 psf | 0.0 psf | 0.0sf | 0.0sf | 0.0sf | 0.0 psf | 0.0sf | 0.0 k | 0.0k | 0.0 in | FS- 0 | |
| F porch | C | 15.0 psf | 40.0 psf | 35.0 psf | 50.0sf | 0.0sf | 25.0sf | 0.0 psf | 0.0sf | 0.8 k | 0.9k | 12.5 in | FS- 24 | |
| 1.4 - P | D | 15.0 psf | 40.0 psf | 35.0 psf | 205.0sf | 105.0sf | 100.0sf | 0.0 psf | 0.0sf | 3.1 k | 5.8k | 29.1 in | FS- 36 | |

TYPICAL FOOTINGS AND REINFORCING

| Footing Parameters | | | |
|----------------------------------|-------------------------------|--|--|
| Soil Bearing Pressure = 1500 psf | f _c = 2500 psi | Note: Not all footings were used on this project | |
| | f _y steel = 60 ksi | | |
| | p _{max} = 0.016 | | |

| Continuous Footings | | | | | | Trial Reinf | | | | |
|---------------------|------------|----------------|-----------|-------------|----------------------|----------------------|---------|-------|---------|------|
| Callout | Typ Eccent | Allowable Load | Ftg Req'd | Nom Ftg | Asmin/ft | As Req'd/ft | Num Bar | Bar # | As Prov | / As |
| FC-1.5 | 0.1% | <u>2.2 klf</u> | 1.48' | <u>1.5'</u> | 0.18 in ² | 0.36 in ² | (2) | 4 | 0.4 | OK |
| FC-2.0 | 0.1% | <u>3.0 klf</u> | 1.98' | <u>2.0'</u> | 0.24 in ² | 0.48 in ² | (3) | 4 | 0.6 | OK |
| FC-2.5 | 0.1% | <u>3.7 klf</u> | 2.48' | <u>2.5'</u> | 0.30 in ² | 0.60 in ² | (3) | 5 | 0.93 | OK |
| FC-3.0 | 0.1% | <u>4.5 klf</u> | 2.98' | <u>3.0'</u> | 0.36 in ² | 0.72 in ² | (3) | 5 | 0.93 | OK |
| FC-3.5 | 0.1% | <u>5.2 klf</u> | 3.48' | <u>3.5'</u> | 0.42 in ² | 0.84 in ² | (3) | 5 | 0.93 | OK |
| FC-4.0 | 0.1% | <u>6.0 klf</u> | 3.98' | <u>4.0'</u> | 0.48 in ² | 0.96 in ² | (4) | 5 | 1.24 | OK |
| FC-4.5 | 0.1% | <u>6.7 klf</u> | 4.48' | <u>4.5'</u> | 0.54 in ² | 1.08 in ² | (4) | 5 | 1.24 | OK |
| FC-5.0 | 0.1% | <u>7.5 klf</u> | 4.98' | <u>5.0'</u> | 0.60 in ² | 1.20 in ² | (5) | 5 | 1.55 | OK |
| | | | | | | | | | | |
| FTS-1.5 | 0.1% | <u>2.2 klf</u> | 1.48' | <u>1.5'</u> | 0.18 in ² | 0.36 in ² | (2) | 4 | 0.4 | OK |
| FTS-2.0 | 0.1% | <u>3.0 klf</u> | 1.98' | <u>2.0'</u> | 0.24 in ² | 0.48 in ² | (3) | 4 | 0.6 | OK |
| FTS-2.5 | 0.1% | <u>3.7 klf</u> | 2.48' | <u>2.5'</u> | 0.30 in ² | 0.60 in ² | (3) | 5 | 0.93 | OK |
| FTS-3.0 | 0.1% | <u>4.5 klf</u> | 2.98' | <u>3.0'</u> | 0.36 in ² | 0.72 in ² | (3) | 5 | 0.93 | OK |
| FTS-3.5 | 0.1% | <u>5.2 klf</u> | 3.48' | <u>3.5'</u> | 0.42 in ² | 0.84 in ² | (3) | 5 | 0.93 | OK |

| Spot Footings | | | | | | | Trial Reinf | | | | | | |
|---------------|------------|----------------|-----------|-------------|------------|-------|-------------|----------------------|----------------------|---------|-------|---------|------|
| Callout | Typ Eccent | Allowable Load | Ftg Req'd | Nom Ftg | Mu | p | / p | Asmin | As Req'd | Num Bar | Bar # | As Prov | / As |
| FS-2.0 | 0.1% | <u>5.9 k</u> | 1.99' | <u>2.0'</u> | 1.02 k-ft | 0.000 | OK | 0.43 in ² | 0.05 in ² | (2) | 5 | 0.62 | OK |
| FS-2.5 | 0.1% | <u>9.2 k</u> | 2.49' | <u>2.5'</u> | 2.16 k-ft | 0.000 | OK | 0.54 in ² | 0.10 in ² | (3) | 5 | 0.93 | OK |
| FS-3.0 | 0.1% | <u>13.3 k</u> | 2.99' | <u>3.0'</u> | 3.95 k-ft | 0.001 | OK | 0.65 in ² | 0.18 in ² | (3) | 5 | 0.93 | OK |
| FS-3.5 | 0.1% | <u>18.2 k</u> | 3.49' | <u>3.5'</u> | 6.52 k-ft | 0.000 | OK | 0.90 in ² | 0.22 in ² | (3) | 5 | 0.93 | OK |
| FS-4.0 | 0.1% | <u>23.8 k</u> | 3.99' | <u>4.0'</u> | 10.02 k-ft | 0.001 | OK | 1.03 in ² | 0.33 in ² | (4) | 5 | 1.24 | OK |
| FS-4.5 | 0.1% | <u>30.1 k</u> | 4.49' | <u>4.5'</u> | 14.58 k-ft | 0.001 | OK | 1.16 in ² | 0.48 in ² | (4) | 5 | 1.24 | OK |
| FS-5.0 | 0.1% | <u>37.2 k</u> | 4.99' | <u>5.0'</u> | 19.63 k-ft | 0.001 | OK | 1.29 in ² | 0.65 in ² | (5) | 5 | 1.55 | OK |
| FS-5.5 | 0.1% | <u>45.0 k</u> | 5.50' | <u>5.5'</u> | 26.59 k-ft | 0.001 | OK | 1.42 in ² | 0.89 in ² | (5) | 5 | 1.55 | OK |
| FS-6.0 | 0.1% | <u>53.5 k</u> | 5.99' | <u>6.0'</u> | 33.81 k-ft | 0.001 | OK | 1.60 in ² | 1.07 in ² | (6) | 5 | 1.86 | OK |

PUNCHING SHEAR CHECK

Note: Not all footings were used on this project

| Callout | Factored Load | Min Col. Dim | factored qu | Assumed depth | d | bo | Vu | Vc | / Capacity |
|---------|---------------|--------------|-------------|---------------|------|-----|--------|--------|------------|
| FS-2.0 | 8.5 k | 4" | 2.12 ksf | 10" | 7.0" | 44" | 6.7 k | 52.4 k | OK |
| FS-2.5 | 13.3 k | 4" | 2.13 ksf | 10" | 7.0" | 44" | 11.5 k | 52.4 k | OK |
| FS-3.0 | 19.2 k | 4" | 2.13 ksf | 10" | 7.0" | 44" | 17.4 k | 52.4 k | OK |
| FS-3.5 | 26.2 k | 4" | 2.14 ksf | 12" | 9.0" | 52" | 23.7 k | 79.6 k | OK |
| FS-4.0 | 34.2 k | 4" | 2.14 ksf | 12" | 9.0" | 52" | 31.7 k | 79.6 k | OK |
| FS-4.5 | 43.4 k | 4" | 2.14 ksf | 12" | 9.0" | 52" | 40.8 k | 79.6 k | OK |
| FS-5.0 | 53.6 k | 5" | 2.14 ksf | 12" | 9.0" | 56" | 50.7 k | 85.7 k | OK |
| FS-5.5 | 64.9 k | 5" | 2.14 ksf | 12" | 9.0" | 56" | 61.9 k | 85.7 k | OK |
| FS-6.0 | 77.0 k | 6" | 2.14 ksf | 12" | 9.4" | 62" | 73.5 k | 98.4 k | OK |

| | |
|-------------|-----|
| Sht Number: | |
| Job Number: | -- |
| Date: | |
| By: | JMT |

Blue Cells Must be Entered Manually

| WOOD COLUMNS Species & Grade Designation | WOOD (1) 2x6 DF #2 Column 1 | | WOOD (1) 2x6 DF #2 Column 2 | | WOOD (1) 2x6 DF #2 Column 3 | | WOOD (2) 2x6 DF #2 Column 4 | | WOOD (2) 2x6 DF #2 Column 5 | | STEEL COLUMNS Species & Grade Designation |
|--|--------------------------------------|-------------|--------------------------------------|-------------|--------------------------------------|-------------|--------------------------------------|-------------|--------------------------------------|-------------|--|
| | Description | | Description | | Description | | Description | | Description | | |
| L_{ux} (ft) | 9.0 | | 9.0 | | 9.0 | | 9.0 | | 9.0 | | L_{ux} (ft) |
| L_{uy} (ft) | 1.0 | | 1.0 | | 1.0 | | 1.0 | | 1.0 | | L_{uy} (ft) |
| P or T DL LL(kip) | 0.50 | 1.33 | 0.70 | 1.86 | 0.35 | 0.93 | 0.35 | 0.93 | 0.35 | 0.93 | P or T DL LL(kip) |
| P_u or T_u (kip) | 1.83 | | 2.56 | | 1.28 | | 1.28 | | 1.28 | | P_u or T_u (kip) |
| e_x e_y | | | | | | | | | | | e_x e_y |
| Column γ (pcf) SW (plf) | 34.0 | 1.9 | 34.0 | 1.9 | 34.0 | 1.9 | 34.0 | 3.9 | 34.0 | 3.9 | Column γ (pcf) SW (plf) |
| w_x w_y (plf) | 26.60 | | 26.60 | | 53.30 | | 73.30 | | 93.30 | | w_x w_y (plf) |
| w_{u,x} w_{u,y} (plf) | 26.60 | | 26.60 | | 53.30 | | 73.30 | | 93.30 | | w_{u,x} w_{u,y} (plf) |
| w_{part,x} w_{part,y} (plf) | | | | | | | | | | | w_{part,x} w_{part,y} (plf) |
| Strt Dist From Bot | | | | | | | | | | | Strt Dist From Bot |
| End Dist From Bot | | | | | | | | | | | End Dist From Bot |
| w_{part,x} w_{part,y} (plf) | | | | | | | | | | | w_{part,x} w_{part,y} (plf) |
| P_{L1,x} P_{L1,y} (lbs) | | | | | | | | | | | P_{L1,x} P_{L1,y} (lbs) |
| Location x-x y-y (ft) | | | | | | | | | | | Location x-x y-y (ft) |
| P_{L1,x} P_{L1,y} (lbs) | | | | | | | | | | | P_{L1,x} P_{L1,y} (lbs) |
| P_{L2,x} P_{L2,y} (lbs) | | | | | | | | | | | P_{L2,x} P_{L2,y} (lbs) |
| Location x-x y-y (ft) | | | | | | | | | | | Location x-x y-y (ft) |
| P_{L2,x} P_{L2,y} (lbs) | | | | | | | | | | | P_{L2,x} P_{L2,y} (lbs) |
| C_{p,vert} C_{p,lat} | 1.00 | 1.60 | 1.00 | 1.60 | 1.00 | 1.60 | 1.00 | 1.60 | 1.00 | 1.60 | C_b D.N.A. |
| C_r Wet Use (Y/N) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | U A_y-A_n (in²) |
| C_t C_i | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | D.N.A. |
| C_T C_{Tu} | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | K_z D.N.A. |
| K_{ex} K_{ey} | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | K_x K_y |
| % W_{cc} for Δ | | | | | | | | | | | % W_{cc} for Δ |
| b d (in) | 1.5 | 5.5 | 1.5 | 5.5 | 1.5 | 5.5 | 1.5 | 5.5 | 1.5 | 5.5 | b_f d (in) |
| E_x E_y (psi) | 1,600,000.0 | 1,600,000.0 | 1,600,000.0 | 1,600,000.0 | 1,600,000.0 | 1,600,000.0 | 1,600,000.0 | 1,600,000.0 | 1,600,000.0 | 1,600,000.0 | A_g A_n (in) |
| E_x' E_y' (psi) | 1,600,000 | 1,600,000 | 1,600,000 | 1,600,000 | 1,600,000 | 1,600,000 | 1,600,000 | 1,600,000 | 1,600,000 | 1,600,000 | E_x E_y (psi) |
| E_{min-x} E_{min-y} (psi) | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | r_x r_y (in) |
| E_{min-x}' E_{min-y}' (psi) | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | T_{ny} T_{nr} (kips) |
| C_{M-E} C_{M-Fc} | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | λ_{p-c}FL λ_{r-c}FL |
| C_{M-b} C_{M-Fc,Perp} | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | λ_{p-c}WEB λ_{r-c}WEB |
| C_{M-t} C_{F-c} | 1.00 | 1.10 | 1.00 | 1.10 | 1.00 | 1.10 | 1.00 | 1.10 | 1.00 | 1.10 | b_p/2t_f or b/t h/t_w or h/t |
| C_v C_i | 1.00 | 0.99 | 1.00 | 0.99 | 1.00 | 0.99 | 1.00 | 0.99 | 1.00 | 0.99 | Q_{s-c} Q_{a-c} |
| L_{ex}/d L_{ey}/b | 19.6 | 8.0 | 19.6 | 8.0 | 19.6 | 8.0 | 19.6 | 8.0 | 19.6 | 8.0 | KL_w/r_x KL_w/r_y |
| L_y/(d or b) Max c | 50 | 0.80 | 50 | 0.80 | 50 | 0.80 | 50 | 0.80 | 50 | 0.80 | KL/r Max 4.71(E/F_y)^{1/2} |
| f_t f_c (psi) | 221.7 | 0.0 | 310.3 | 0.0 | 155.2 | 0.0 | 77.6 | 0.0 | 77.6 | 0.0 | F_{cr} F_{cr,FTB} (ksi) |
| F_c F_T (psi) | 1350.00 | 575.00 | 1350.00 | 575.00 | 1350.00 | 575.00 | 1350.00 | 575.00 | 1350.00 | 575.00 | Ω_{TRV} Ω_{TR} |
| F_c' F_T' (psi) | 928 | 632.50 | 928 | 632.50 | 928 | 632.50 | 928 | 632.50 | 928 | 632.50 | P_n (Kips) Ω_c |
| P_{TL,ALL} T_{TL,ALL} (kip) | P = 7.65 | T = 5.22 | P = 7.65 | T = 5.22 | P = 7.65 | T = 5.22 | P = 15.31 | T = 10.44 | P = 15.31 | T = 10.44 | P_u/Ω T_u/Ω (kip) |
| Comp or Tension | 23.9% Stressed | | 33.5% Stressed | | 16.7% Stressed | | 8.4% Stressed | | 8.4% Stressed | | Comp or Tension |
| e_x (in) e_y (in) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | e_x (in) e_y (in) |
| C_{F-b} D.N.A. | 1.30 | | 1.30 | | 1.30 | | 1.30 | | 1.30 | | M_{px} M_{py} (k*ft) |
| F_{bx} F_{by} (psi) | 900.00 | 900.00 | 900.00 | 900.00 | 900.00 | 900.00 | 900.00 | 900.00 | 900.00 | 900.00 | M_n LTB or WLB (k*ft) |
| D.N.A. D.N.A. | | | | | | | | | | | M_n FLB (k*ft) |
| I_x I_y (in⁴) | 20.80 | 1.55 | 20.80 | 1.55 | 20.80 | 1.55 | 41.59 | 3.09 | 41.59 | 3.09 | I_x I_y (in⁴) |
| Lateral Rxn (lbs) x y | 119.7 | 0.0 | 119.7 | 0.0 | 239.8 | 0.0 | 329.9 | 0.0 | 419.9 | 0.0 | Lateral Rxn (lbs) x y |
| Z_{naill} - PLT C_{eg}/C_{tn} (lbs) | 97.00 | 0.67 | 97.00 | 0.67 | 97.00 | 0.67 | 97.00 | 0.67 | 97.00 | 0.67 | λ_{p,FL-B} λ_{r,FL-B} |
| Plate Nails/Mmbr | 1.2 | 0.0 | 1.2 | 0.0 | 2.3 | 0.0 | 1.6 | 0.0 | 2.0 | 0.0 | λ_{p,WEB-B} λ_{r,WEB-B} |
| A34 or A35 Req'd | 1 A34 | | 1 A34 | | 1 A34 | | 1 A34 | | 1 A35 | | L_p L_r (ft) |
| F[*]_{bx} F_{bx} | 1872.00 | 1854.21 | 1872.00 | 1854.21 | 1872.00 | 1854.21 | 1872.00 | 1854.21 | 1872.00 | 1854.21 | F_y (ksi) Ω_b |
| F[*]_{by} F_{by} | 1872.00 | 1854.21 | 1872.00 | 1854.21 | 1872.00 | 1854.21 | 1872.00 | 1854.21 | 1872.00 | 1854.21 | Z_x (in³) Z_y (in³) |
| f_{bx} f_{by} (psi) | 427.36 | 0.00 | 427.36 | 0.00 | 856.32 | 0.00 | 588.82 | 0.00 | 749.48 | 0.00 | f_{bx} f_{by} (ksi) |
| S_x S_y (in³) | 7.56 | 2.06 | 7.56 | 2.06 | 7.56 | 2.06 | 15.13 | 4.13 | 15.13 | 4.13 | S_x S_y (in³) |
| M_{TL,Max} (k-ft) | 0.27 | 0.00 | 0.27 | 0.00 | 0.54 | 0.00 | 0.74 | 0.00 | 0.94 | 0.00 | M_{TL,Max} (k-ft) |
| M_{TL,ALL} (k-ft) | 1.2 | 0.3 | 1.2 | 0.3 | 1.2 | 0.3 | 2.3 | 0.6 | 2.3 | 0.6 | M_w/Ω (k*ft) |
| Bending | 23.05% | | 23.05% | | 46.18% | | 31.76% | | 40.42% | | Bending |
| Max TL Δ Ratio | L/ 150 | | L/ 150 | | L/ 150 | | L/ 240 | | L/ 180 | | Max TL Δ Ratio |
| Allowable TL Δ | | | | | | | | | | | Allowable TL Δ |
| Δ_{TL,Max} (in) | 0.121 | 0.000 | 0.119 | 0.000 | 0.238 | 0.000 | 0.170 | 0.000 | 0.217 | 0.000 | Δ_{TL,Max} (in) |
| Δ_{TL,ALL} (in) | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 | 0.45 | 0.45 | 0.60 | 0.60 | Δ_{TL,ALL} (in) |
| Actual TL Δ | L/ 890 | | L/ 907 | | L/ 453 | | L/ 634 | | L/ 498 | | Actual TL Δ |
| Plate Material | DF #2 | | DF #2 | | DF #2 | | DF #2 | | DF #2 | | D.N.A. |
| F_{c,Perp} F_{c,Perp} (psi) | 625.0 | 625.00 | 625.0 | 625.00 | 625.0 | 625.00 | 625.0 | 625.00 | 625.0 | 625.00 | F_c (ksi) Jc/S_b0 |
| P_{ALL} (kip) F_{c,Perp} (psi) | P = 5.16 | 221.70 | P = 5.16 | 310.33 | P = 5.16 | 155.15 | P = 10.31 | 77.58 | P = 10.31 | 77.58 | D.N.A. |
| Plate Bearing | 35.47% | | 49.65% | | 24.82% | | 12.41% | | 12.41% | | D.N.A. |
| L_e Bending (ft) | 2.06 | 16.56 | 2.06 | 16.56 | 2.06 | 16.56 | 2.06 | 16.56 | 2.06 | 16.56 | L_b Bending (ft) |
| R_B D.N.A. | 7.77 | | 7.77 | | 7.77 | | 7.77 | | 7.77 | | Max (H1-1a) or (H1-1b) |
| F_{BE} (psi) | 11518.1 | | 11518.1 | | 11518.1 | | 11518.1 | | 11518.1 | | Tension or Compression |
| Comp OR Tens & Bend Interaction | 33.79% | | 41.96% | | 55.61% | | 34.58% | | 43.83% | | Comp OR Tens & Bend Interaction |
| Adequate | Adequate | | Adequate | | Adequate | | Adequate | | Adequate | | Adequate |
| Grade Class | DIM | | DIM | | DIM | | DIM | | DIM | | Shape |

| | |
|-------------|-----|
| Sht Number: | |
| Job Number: | -- |
| Date: | |
| By: | JMT |

Blue Cells Must be Entered Manually

| WOOD COLUMNS Species & Grade Designation | WOOD (2) 2x6 DF #2 Column 1 | | WOOD (4) 2x4 DF #2 Column 2 | | WOOD (2) 2x6 DF #2 Column 3 | | WOOD (2) 2x6 DF #2 Column 4 | | WOOD (2) 2x6 DF #2 Column 5 | | STEEL COLUMNS Species & Grade Designation |
|--|--------------------------------------|-------------|--------------------------------------|-------------|--------------------------------------|-------------|--------------------------------------|-------------|--------------------------------------|-------------|---|
| | Girder load 2x6 | | Grider Load 2x4 | | basement column Grid P and 1.4 | | | | | | |
| Description | | | | | | | | | | | Description |
| L_{ux} (ft) | 9.0 | | 9.0 | | 9.0 | | 9.0 | | 9.0 | | L_{ux} (ft) |
| L_{uy} (ft) | 1.0 | | 1.0 | | 1.0 | | 1.0 | | 1.0 | | L_{uy} (ft) |
| P or T DL LL(kip) | 2.14 | 5.00 | 2.14 | 5.00 | 3.10 | 5.80 | 0.35 | 0.93 | 0.35 | 0.93 | P or T DL LL(kip) |
| P_u or T_u (kip) | 7.14 | | 7.14 | | 8.90 | | 1.28 | | 1.28 | | P_u or T_u (kip) |
| e_x e_y | | | | | | | | | | | e_x e_y |
| Column γ (pcf) SW (plf) | 34.0 | 3.9 | 34.0 | 5.0 | 34.0 | 3.9 | 34.0 | 3.9 | 34.0 | 3.9 | Column γ (pcf) SW (plf) |
| w_x w_y (plf) | 5.00 | | 5.00 | | 5.00 | | 5.00 | | 5.00 | | w_x w_y (plf) |
| $w_{u,x}$ $w_{u,y}$ (plf) | 5.00 | | 5.00 | | 5.00 | | 5.00 | | 5.00 | | $w_{u,x}$ $w_{u,y}$ (plf) |
| $w_{part,x}$ $w_{part,y}$ (plf) | | | | | | | | | | | $w_{part,x}$ $w_{part,y}$ (plf) |
| Strt Dist From Bot | | | | | | | | | | | Strt Dist From Bot |
| End Dist From Bot | | | | | | | | | | | End Dist From Bot |
| $w_{part,x}$ $w_{part,y}$ (plf) | | | | | | | | | | | $w_{part,x}$ $w_{part,y}$ (plf) |
| $P_{L1,x}$ $P_{L1,y}$ (lbs) | | | | | | | | | | | $P_{L1,x}$ $P_{L1,y}$ (lbs) |
| Location x-x y-y (ft) | | | | | | | | | | | Location x-x y-y (ft) |
| $P_{L1,x}$ $P_{L1,y}$ (lbs) | | | | | | | | | | | $P_{L1,x}$ $P_{L1,y}$ (lbs) |
| $P_{L2,x}$ $P_{L2,y}$ (lbs) | | | | | | | | | | | $P_{L2,x}$ $P_{L2,y}$ (lbs) |
| Location x-x y-y (ft) | | | | | | | | | | | Location x-x y-y (ft) |
| $P_{L2,x}$ $P_{L2,y}$ (lbs) | | | | | | | | | | | $P_{L2,x}$ $P_{L2,y}$ (lbs) |
| $C_{p,vert}$ $C_{p,lat}$ | 1.00 | 1.60 | 1.00 | 1.60 | 1.00 | 1.60 | 1.00 | 1.60 | 1.00 | 1.60 | C_b D.N.A. |
| C_r Wet Use (Y/N) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | U A_g - A_n (in ²) |
| C_t C_i | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | D.N.A. |
| C_T C_{Fu} | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | K_x K_y |
| K_{ex} K_{ey} | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | K_z D.N.A. |
| % W_{cc} for Δ | | | | | | | | | | | % W_{cc} for Δ |
| b d (in) | 1.5 | 5.5 | 1.5 | 3.5 | 1.5 | 5.5 | 1.5 | 5.5 | 1.5 | 5.5 | b_f d (in) |
| E_x E_y (psi) | 1,600,000.0 | 1,600,000.0 | 1,600,000.0 | 1,600,000.0 | 1,600,000.0 | 1,600,000.0 | 1,600,000.0 | 1,600,000.0 | 1,600,000.0 | 1,600,000.0 | A_g A_n (in) |
| E'_x E'_y (psi) | 1,600,000 | 1,600,000 | 1,600,000 | 1,600,000 | 1,600,000 | 1,600,000 | 1,600,000 | 1,600,000 | 1,600,000 | 1,600,000 | E_x E_y (psi) |
| E_{min-x} E_{min-y} (psi) | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | r_x r_y (in) |
| E_{min-x} E_{min-y} (psi) | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | 580,000.0 | T_{ny} T_{nr} (kips) |
| C_{M-E} C_{M-Fc} | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | $\lambda_{p-c,FL}$ $\lambda_{r-c,FL}$ |
| C_{M-b} $C_{M-Fc,Perp}$ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | $\lambda_{p-c,WEB}$ $\lambda_{r-c,WEB}$ |
| C_{M-t} C_{F-c} | 1.00 | 1.10 | 1.00 | 1.15 | 1.00 | 1.10 | 1.00 | 1.10 | 1.00 | 1.10 | $b_p/2t_f$ or b/t h/t_w or h/t |
| C_v C_i | 1.00 | 0.99 | 1.00 | 0.99 | 1.00 | 0.99 | 1.00 | 0.99 | 1.00 | 0.99 | Q_{s-c} Q_{a-c} |
| L_{ex}/d L_{ey}/b | 19.6 | 8.0 | 30.9 | 8.0 | 19.6 | 8.0 | 19.6 | 8.0 | 19.6 | 8.0 | KL_x/r_x KL_y/r_y |
| $L_y/(d$ or $b)$ Max c | 50 | 0.80 | 50 | 0.80 | 50 | 0.80 | 50 | 0.80 | 50 | 0.80 | KL/r Max $4.71(E/F_y)^{1/2}$ |
| f_t f_c (psi) | 432.7 | 0.0 | 340.0 | 0.0 | 539.4 | 0.0 | 77.6 | 0.0 | 77.6 | 0.0 | F_{cr} $F_{cr,FTB}$ (ksi) |
| F_c F_T (psi) | 1350.00 | 575.00 | 1350.00 | 575.00 | 1350.00 | 575.00 | 1350.00 | 575.00 | 1350.00 | 575.00 | Ω_{TY} Ω_{TR} |
| F_c F_T (psi) | 928 | 632.50 | 462 | 661.25 | 928 | 632.50 | 928 | 632.50 | 928 | 632.50 | P_n (Kips) Ω_c |
| $P_{TL,ALL}$ $T_{TL,ALL}$ (kip) | P = 15.31 | T = 10.44 | P = 9.69 | T = 13.89 | P = 15.31 | T = 10.44 | P = 15.31 | T = 10.44 | P = 15.31 | T = 10.44 | $P_u/2$ T_u/Ω (kip) |
| Comp or Tension | 46.6% Stressed | | 73.7% Stressed | | 58.1% Stressed | | 8.4% Stressed | | 8.4% Stressed | | Comp or Tension |
| e_x (in) e_y (in) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | e_x (in) e_y (in) |
| C_{F-b} D.N.A. | 1.30 | | 1.50 | | 1.30 | | 1.30 | | 1.30 | | M_{px} M_{py} (k*ft) |
| F_{bx} F_{by} (psi) | 900.00 | 900.00 | 900.00 | 900.00 | 900.00 | 900.00 | 900.00 | 900.00 | 900.00 | 900.00 | M_n LTB or WLB (k*ft) |
| D.N.A. D.N.A. | | | | | | | | | | | M_n FLB (k*ft) |
| I_x I_y (in ⁴) | 41.59 | 3.09 | 21.44 | 3.94 | 41.59 | 3.09 | 41.59 | 3.09 | 41.59 | 3.09 | I_x I_y (in ⁴) |
| Lateral Rxn (lbs) x y | 22.5 | 0.0 | 22.5 | 0.0 | 22.5 | 0.0 | 22.5 | 0.0 | 22.5 | 0.0 | Lateral Rxn (lbs) x y |
| Z_{nail} - PLT C_{eg}/C_{tn} (lbs) | 97.00 | 0.67 | 97.00 | 0.67 | 97.00 | 0.67 | 97.00 | 0.67 | 97.00 | 0.67 | $\lambda_{p,FL-B}$ $\lambda_{r,FL-B}$ |
| Plate Nails/Mmbr | 0.1 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | $\lambda_{p,WEB-B}$ $\lambda_{r,WEB-B}$ |
| A34 or A35 Req'd | 1 A34 | | 1 A34 | | 1 A34 | | 1 A34 | | 1 A34 | | L_p L_r (ft) |
| F_{bx}^* F_{by}^* | 1872.00 | 1854.21 | 2160.00 | 2145.57 | 1872.00 | 1854.21 | 1872.00 | 1854.21 | 1872.00 | 1854.21 | F_y (ksi) Ω_b |
| F_{bx}^* F_{by}^* | 1872.00 | 1854.21 | 2160.00 | 2145.57 | 1872.00 | 1854.21 | 1872.00 | 1854.21 | 1872.00 | 1854.21 | Z_x (in ³) Z_y (in ³) |
| f_{bx} f_{by} (psi) | 40.17 | 0.00 | 49.59 | 0.00 | 40.17 | 0.00 | 40.17 | 0.00 | 40.17 | 0.00 | f_{bx} f_{by} (ksi) |
| S_x S_y (in ³) | 15.13 | 4.13 | 12.25 | 5.25 | 15.13 | 4.13 | 15.13 | 4.13 | 15.13 | 4.13 | S_x S_y (in ³) |
| $M_{TL,Max}$ (k-ft) | 0.05 | 0.00 | 0.05 | 0.00 | 0.05 | 0.00 | 0.05 | 0.00 | 0.05 | 0.00 | $M_{TL,Max}$ (k-ft) |
| $M_{TL,ALL}$ (k-ft) | 2.3 | 0.6 | 2.2 | 0.9 | 2.3 | 0.6 | 2.3 | 0.6 | 2.3 | 0.6 | M_{ny}/Ω (k*ft) |
| Bending | 2.17% | | 2.31% | | 2.17% | | 2.17% | | 2.17% | | Bending |
| Max TL Δ Ratio | L/ 150 | | L/ 150 | | L/ 150 | | L/ 240 | | L/ 180 | | Max TL Δ Ratio |
| Allowable TL Δ | | | | | | | | | | | Allowable TL Δ |
| $\Delta_{TL,Max}$ (in) | 0.013 | 0.000 | 0.023 | 0.000 | 0.012 | 0.000 | 0.019 | 0.000 | 0.021 | 0.000 | $\Delta_{TL,Max}$ (in) |
| $\Delta_{TL,ALL}$ (in) | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 | 0.45 | 0.45 | 0.60 | 0.60 | $\Delta_{TL,ALL}$ (in) |
| Actual TL Δ | L/ 8471 | | L/ 4795 | | L/ 8973 | | L/ 5718 | | L/ 5187 | | Actual TL Δ |
| Plate Material | DF #2 | | DF #2 | | DF #2 | | DF #2 | | DF #2 | | D.N.A. |
| $F_{c,Perp}$ $F'_{c,Perp}$ (psi) | 625.0 | 625.00 | 625.0 | 625.00 | 625.0 | 625.00 | 625.0 | 625.00 | 625.0 | 625.00 | F_{cr} (ksi) $J_c/S_y h_0$ |
| P_{ALL} (kip) $f_{c,Perp}$ (psi) | P = 10.31 | 432.73 | P = 13.13 | 340.00 | P = 10.31 | 539.39 | P = 10.31 | 77.58 | P = 10.31 | 77.58 | D.N.A. |
| Plate Bearing | 69.24% | | 54.40% | | 86.30% | | 12.41% | | 12.41% | | D.N.A. |
| L_e Bending (ft) | 2.06 | 16.56 | 2.06 | 16.56 | 2.06 | 16.56 | 2.06 | 16.56 | 2.06 | 16.56 | L_u Bending (ft) |
| R_g D.N.A. | 7.77 | | 6.20 | | 7.77 | | 7.77 | | 7.77 | | Max (H1-1a) or (H1-1b) |
| F_{BE} (psi) | 11518.1 | | 18099.9 | | 11518.1 | | 11518.1 | | 11518.1 | | Tension or Compression |
| Comp OR Tens & Bend Interaction | 46.65% | | 73.65% | | 58.15% | | 8.36% | | 8.36% | | Comp OR Tens & Bend Interaction |
| Interaction | Adequate | | Adequate | | Adequate | | Adequate | | Adequate | | Interaction |
| Grade Class | DIM | | DIM | | DIM | | DIM | | DIM | | Shape |



contact:
Jeff Turville, PE
5160 South 1500 West
Riverdale, Utah 84405
801.621.3100