

**SUPPLEMENTAL
STRUCTURAL CALCULATIONS
BUILDING PERMIT CORRECTIONS #4**

FOR

**MERCER ISLAND MIXED USED
2885 78TH AVE SE
MERCER ISLAND, WA 98040**

**PREPARED BY
PCS STRUCTURAL SOLUTIONS**



**OCTOBER 27, 2023
19-028**

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DESIGN CRITERIA

MERCER ISLAND APARTMENTS – MERCER ISLAND, WA
 STRUCTURAL DESIGN NARRATIVE

PROJECT DESCRIPTION

The proposed project is located at 2885 78th Avenue SE Mercer Island, WA. The project consists of approximately 230,000 gross square feet including one below-grade parking level, ground level of retail, amenity and courtyard, elevated post-tensioned podium slab and 3 stories of Type V wood framing.

The proposed structural systems for the various building components are summarized below:

FOUNDATIONS & BASEMENT WALLS

The building will be supported by a combination of spread footings (at interior columns), linear footings (at basement walls and individual shear walls) and mat foundations (at core shear walls) that will rest on soil. The mat foundations may vary in thickness according to specific loading demands (gravity, overturning, and shear). The site will be permanently drained, therefore, the foundations will not be designed for hydrostatic uplift forces. Basement/retaining walls will consist of poured in place concrete walls.

Soil parameters are provided in the *Geotechnical Engineering Design Report Mercer Island Multi-Family Development* prepared by Hart Crowser and dated November 3, 2020.

Allowable soil bearing pressure for spread and linear footings is 3,000 psf.

Soil improvements are deemed required over portions of the site. Rammed aggregate piers (GeoPiers) are most suitable for the site per the Geotech Report.

TABLE 1. BASEMENT WALL DESIGN PARAMETERS

| Parameter | Value | Notes |
|------------------------|------------------|----------------------------------|
| Lateral Pressure (EFP) | 35 pcf 55 pcf | < 2H:1V slope >+ 2H:1V slope |
| Passive Resistance | 300 pcf | Safety Factor of 1.5 for sliding |
| Traffic Surcharge | 200 psf | 2 feet of soil |
| Seismic Surcharge | 8H | |

| Parameter | Value | Notes |
|----------------------|-------|----------------------------------|
| Friction Coefficient | 0.35 | Safety Factor of 1.5 for sliding |

CONCRETE FRAMING

The below-grade Parking Level, P-1, the Ground Level 1 and the Level 2 Podium slab will be cast-in-place concrete. The parking is entered from SE 29th Street on the South side at Level 1.

WOOD FRAMING

The building will have 3 stories of wood framing above the concrete Podium slab with floors consisting of I-joists and plywood sheathing with a 1" gypcrete topping slab. Roof framing will consist of I-joists and tapered insulation at certain locations and builder's trusses at others. Wood bearing walls of various thickness, from 2x4 to 2x6 and 2x8 at plumbing walls, will support the joists along with various engineered lumber headers and beams. See the Schematic Design drawings for preliminary member sizes.

LATERAL SYSTEM

The lateral forces (seismic and wind) will be resisted by special concrete shear walls and concrete diaphragms at the concrete portion of the structure and plywood shear walls and plywood diaphragms at the wood-framed portion.

SITE SHORING

It is assumed that the site will be shored directly behind the basement walls where required. The design and installation of this shoring is by others.

BUILDING CODE AND REFERENCES

BUILDING CODE

- 2015 International Building Code (IBC) with WA State Amendments.
- ASCE 7-10, "Minimum Design Loads for Buildings and Other Structures", American Society of Civil Engineers, 2010.
- ACI 318-14, "Building Code Requirements for Structural Concrete and Commentary", American Concrete Institute, 2014.
- ANSI/AISC 360-10, "Specification for Structural Steel Buildings", American Institute of Steel Construction, 2010.

LOADING CRITERIA

A summary of the project-specific loading criteria follows. This loading meets or exceeds the requirements of the 2015 IBC and incorporates loading requirements specific to this project.

GRAVITY LOADS

The following loads are in addition to the self-weight of the structure. The minimum live load requirements have been taken from Table 1607.1 of the 2015 IBC. Live loads are reduced where permitted in accordance with Section 1607.10 of the 2015 IBC.

TABLE 2. LIVE LOADS

| Use | Uniform Load (psf) | Concentrated Load (lbs) |
|--------------------------------|-----------------------|---|
| Assembly | 100 psf (not reduced) | 2,000 lbs |
| Courtyard | 100 psf (not reduced) | 2,000 lbs (Planters and other loadings greater than 2,000 lbs will be shown on plans) |
| Stairs/Exits/Corridors | 100 psf | 300 lbs at Stairs |
| Parking Garage | 40 psf | 3,000 lbs |
| Residential | 40 psf | N/A |
| Mechanical/Electrical/Plumbing | 125 psf (not reduced) | See Floor Plans for unit weights > 500 lbs |
| Office/Conference/BOH | 80 psf | 2,000 lbs |
| Roof | 20 psf | 300 lbs |
| Storage, Light | 125 psf (not reduced) | N/A |

TABLE 3. SUPERIMPOSED DEAD LOADS

| Use | Total Uniform Load (psf) | Materials |
|-----------|--------------------------|--|
| Assembly | 25 psf | Floor/Ceiling Allowance MEP/Fireproofing/Misc |
| Courtyard | 80 psf | Pedestal Pavers/Waterproofing/etc MEP/Fireproofing/Misc |

| Use | Total Uniform Load (psf) | Materials |
|----------------|--------------------------|---|
| Parking Garage | 5 psf | MEP/Fireproofing/Misc |
| Residential | 20 psf | Floor/Ceiling Allowance w/ 1" Gypcrete Partitions MEP/Fireproofing/Misc |
| Roof | 20 psf | Rigid Insulation Ceiling Allowance MEP/Fireproofing/Misc |
| Green Roof | 75 psf | Rigid Insulation Ceiling Allowance Soil (4") MEP/Fireproofing/Misc |
| Light Planter | 190 psf | Soil (1'-6") MEP/Fireproofing/Misc |
| Heavy Planter | 360 psf | Soil (3'-0") MEP/Fireproofing/Misc 2,500 lb Point Load at Trees |

SNOW LOADS

Snow loading is in accordance with ASCE 7-10 requirements. Snow drifting, unbalanced loading, and partial loading are considered in the design of the roof/roofdeck framing.

TABLE 4. SNOW DESIGN CRITERIA

| Parameter | Value |
|-------------------------------------|--------------------|
| Ground Snow Load (P_g) | 20 psf |
| Exposure | Terrain Category B |
| Exposure Factor (C_e) | 1.0 |
| Thermal Factor (C_t) | 1.0 |
| Importance Factor (I_s) | 1.0 |
| Flat Roof Snow Load (p_f) | |
| Maximum of: $p_f = 0.7C_eC_tI_sP_g$ | 14 psf |
| $P_f = 20(I_s)$ | 20 psf |
| P_f (Jurisdiction minimum) | 25 psf (controls) |
| Warm Roof Slope Factor | 1.0 |

| Parameter | Value |
|-------------------------------------|--------|
| Sloped Roof Snow Load = $C_s * p_f$ | 25 psf |

WIND LOADS

Wind loading is in accordance with ASCE 7-10 requirements.

TABLE 5. WIND DESIGN CRITERIA

| Parameter | Value |
|-------------------------------------|----------|
| Basic Wind Speed, 3-second gust (V) | 110 mph |
| Exposure | B |
| Importance Factor (I_w) | 1.00 |
| Enclosure Classification | Enclosed |
| K_{zt} | 1.0 |
| Mean Roof Height (h) | 52 feet |

SEISMIC LOADS

Seismic design parameters were provided in the Geotechnical Report and in accordance with the 2015 IBC and ASCE 7-10 requirements.

TABLE 6. PRELIMINARY SEISMIC DESIGN CRITERIA

| Parameter | Value |
|--|----------------------------|
| Latitude / Longitude | 47.58485°N 122.23438°W |
| Spectral Response Acceleration at Short Periods (S_s) | 1.380 |
| Spectral Response Acceleration at 1-Second Periods (S_1) | 0.531 |
| Occupancy Category | II |
| Seismic Importance Factor | 1.0 |
| Site Class | D |
| Seismic Parameters | $F_a = 1.0$ $F_v = 1.5$ |

| Parameter | Value |
|---|---|
| Latitude / Longitude | 47.58485°N 122.23438°W |
| Seismic Design Category (SDC) | D |
| Building Height (Seismic Base to Main Roof) | H = 52 feet |
| Structural System | Special Reinforced Concrete Shear Wall System; R = 5.0 Plywood Shear Walls; R = 6.5 |
| Seismic Force Amplification Factor | $\Omega_0 = 2.5$ |
| Seismic Deflection Amplification Factor | $C_d = 5.0$ |

MATERIALS

The material properties used for the design of various structural elements include the following:

TABLE 7. CONCRETE PROPERTIES

| Member | Strength |
|---|---|
| Slab on Grade, Sidewalks, Curbs, Mechanical Pads | f'c = 5.0 ksi at 28 days |
| Basement Walls, Shotcrete (Pilasters to be Cast-in-Place) | f'c = 5.0 ksi at 28 days |
| Mat Foundation | f'c = 5.0 ksi at 56 days |
| Mild Reinforced Beams and Slabs | f'c = 5.0 ksi at 28 days |
| Post-Tensioned Floors | f'ci = 3.0 ksi at 3 days (at stressing) f'c = 5.5 ksi at 28 days |
| Columns | f'c = 5.0 ksi at 28 days |
| Shear Walls and Coupling Beams | f'c = 5.0 ksi at 28 days |

TABLE 8. REINFORCEMENT PROPERTIES

| Standard | Strength |
|--|---|
| ASTM A615 Grade 60 | 60 ksi (Typical) |
| ASTM A706 Grade 60 | 60 ksi (Shear Walls) |
| ASTM A615 Grade 75 with special ductile requirements | 75 ksi (Coupling Beams, Column Ties, and Wall Tie Sets) |
| ASTM A615 Grade 75 | 75 ksi (Mat Foundation) |
| ½"φ ASTM A416 Grade 270, low relaxation strands | Post-Tensioned Reinforcing |

STRUCTURAL DESIGN CRITERIA

MERCER ISLAND MIXED USE
 2885 78TH AVE SE
 MERCER ISLAND, WA 98040

JOB NUMBER: 19-028

ASSEMBLY WEIGHTS

ROOF LOADS

| | GRAVITY: | SEISMIC: | COMMENTS |
|------------------------|-----------------|-----------------|-----------------|
| MEMBRANE ROOFING | 2.2 PSF | 2.2 PSF | |
| ½" PLYWOOD SHEATHING | 1.5 PSF | 1.5 PSF | |
| ROOF JOISTS @ 16" O.C. | 2.3 PSF | 2.3 PSF | |
| R30 INSULATION | 1.0 PSF | 1.0 PSF | |
| 5/8" GWB - 2 LAYERS | 5.2 PSF | 5.2 PSF | |
| SPRINKLERS | 3.0 PSF | 3.0 PSF | |
| LIGHTS, DUCTS | 1.0 PSF | 1.0 PSF | |
| MECH., ELEC. | 1.1 PSF | 0.7 PSF | |
| MISCELLANEOUS | 0.7 PSF | 1.6 PSF | |
| WALL SELF WEIGHT | - | 4.5 PSF | |
| ROOF DL | 18.0 PSF | 23.0 PSF | SL = 25 PSF |

WOOD FLOOR LOADS

| | GRAVITY: | SEISMIC: | COMMENTS |
|-------------------------|-----------------|-----------------|-----------------|
| FLOORING | 2.5 PSF | 2.5 PSF | |
| 1" GYPCRETE | 9.0 PSF | 9.0 PSF | |
| ¾" PLYWOOD SHEATHING | 2.3 PSF | 2.3 PSF | |
| FLOOR JOISTS @ 16" O.C. | 2.3 PSF | 2.3 PSF | |
| 5/8" GWB - 2 LAYERS | 5.2 PSF | 5.2 PSF | |
| SPRINKLERS | 2.0 PSF | 0.3 PSF | |
| LIGHTS, DUCTS | 1.0 PSF | 0.2 PSF | |
| MISCELLANEOUS | 0.7 PSF | 0.2 PSF | |
| WALL SELF WEIGHT | - | 8.0 PSF | |
| FLOOR DL | 25.0 PSF | 30.0 PSF | LL = 40/100 PSF |

EXTERIOR WALL LOADS

| | GRAVITY & SEISMIC: |
|--------------------------------|-----------------------------------|
| SIDING | 2.5 PSF |
| ½" PLYWOOD SHEATHING | 1.5 PSF |
| FRAMING - 2X6 @ 16" O.C. | 1.7 PSF |
| INSULATION | 0.5 PSF |
| ½" GWB | 2.2 PSF |
| MISCELLANEOUS MECHANICAL/ELEC. | 0.6 PSF |
| | 9.0 PSF |



Project: MERCER ISLAND Job Number: 19-028

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DESIGN CRITERIA CHECKLIST

CODE: IBC 2015, ASCE 7-10 LOCATION: SEATTLE, WA

VERTICAL DESIGN CRITERIA

| | DEAD | LIVE |
|----------------------|--------|---------|
| ROOF: | 18 PSF | 25 PSF |
| RESIDENTIAL: | 25 PSF | 40 PSF |
| STAIRS: | 10 PSF | 100 PSF |
| RESIDENTIAL BALCONY: | 15 PSF | 60 PSF |
| MECHANICAL ROOM: | 20 PSF | 40 PSF |

WIND DESIGN CRITERIA

BASIC WIND SPEED (V) = 110 MPH (Per ASCE 7-10 Sec. 26.5.1, Fig. 26.5-1A; 1B & 1C, or as required by Bld'g Dept.)
 RISK CATEGORY: II (Per ASCE 7-10 Table 1.5-1 & IBC Table 1604.5)
 EXPOSURE CATEGORY: B (Per ASCE 7-10 Section 26.7.3)
 TOPOGRAPHIC FACTOR (K_{zt}): 1.30 (Per ASCE 7-10 Section 26.8.2)
 MEAN ROOF HEIGHT: 55 FT (See ASCE 7-10 Section 26.2 - Definitions)
 ROOF SLOPE (____:12): 1.50:12 (Enter vertical rise in 12 horizontal units)
 θ (degrees): 7.13

SEISMIC DESIGN CRITERIA

RISK CATEGORY: I & II (Per ASCE 7-10 Table 1.5-1 & IBC Table 1604.5)
 SITE CLASS: D (Per IBC Section 1613.3.2, Assumed as "D" or per Geotech.)
 IMPORTANCE FACTOR (I_E): 1 (Per ASCE 7-10 Table 1.5-2)
 STRUCTURAL SYSTEM (R): 6.5 (Per ASCE 7-10 Table 12.2-1)
 OVERSTRENGTH FACTOR (Ω_o): 3.0 (Per ASCE 7-10 Table 12.2-1)
 INFORMATION BELOW FROM "EARTHQUAKE SPECTRAL RESPONSE ACCELERATION MAPS" PER USGS
 LATITUDE: 47.585 S_s = 1.380 F_a = 1.000
 LONGITUDE: -122.234 S₁ = 0.531 F_v = 1.500

DEFLECTION CRITERIA

FLOOR (LIVE): L/ 480 ROOF (LIVE): L/ 360
 FLOOR (TOTAL): L/ 360 ROOF (TOTAL): L/ 240
 WALLS: L/ 360 SPECIAL: L/

SOIL DESIGN CRITERIA

REPORT: YES **SEE SOILS REPORT FOR ACTIVE, PASSIVE PRESSURES AND FRICTION COEFFICIENT**
 BEARING: _____
 ACTIVE: 35 PCF
 PASSIVE: 300 PCF
 COEFFICIENT OF FRICTION: 0.35
 PILE TYPE: NONE
 MINIMUM FOOTING DIMENSIONS:
 CONTINUOUS: 1'-4"
 SPREAD: 1'-6"
 FROST DEPTH: 1'-6"
 VERTICAL CAPACITY = N/A LATERAL CAPACITY = N/A
 UPLIFT CAPACITY = N/A SIZE = N/A



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MATERIALS

GLULAM BEAMS

| <u>Simple Spans</u> | | <u>Cantilevers</u> |
|---------------------|--------------------------|--------------------|
| 24F-V4 | Grade = | 24F-V8 |
| 1.80E+06 PSI | E = | 1.80E+06 PSI |
| 2400 PSI | F _{b(BOTTOM)} = | 2400 PSI |
| 1850 PSI | F _{b(TOP)} = | 2400 PSI |
| 240 PSI | F _v = | 240 PSI |

SCL PRODUCTS

| | <u>2x SCL</u> | <u>1½" 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>2x DF #2</u> | <u>2x HF #1</u> | |
|----------------------------|-----------------|-----------------|-----------------|
| <u>Joists & Studs</u> | | | - |
| 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 & Headers</u> | <u>4x DF #2</u> | <u>4x HF #1</u> | <u>6x DF #1</u> |
| 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 & Timbers</u> | <u>6x DF #1</u> | - | - |
| E = | 1.60E+06 PSI | - | - |
| F _c = | 1000 PSI | - | - |



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DESIGN CRITERIA - WIND

BASIC WIND SPEED (V): 110 MPH
 RISK CATEGORY: II
 EXPOSURE CATEGORY: B
 TOPOGRAPHIC FACTOR (K_{zt}): 1.30
 MEAN ROOF HEIGHT: 55 FT
 ROOF SLOPE (∶12): 1.5:12
 θ (degrees): 7.13

**ASCE 7-10 CHAPTER 28.5 PART 2: ENCLOSED SIMPLE DIAPHRAGM LOW RISE BUILDINGS W/ H<60 FT
 ASCE 7-10 FIG. 28.6-1 - MAIN WIND FORCE RESISTING SYSTEM - DESIGN WIND PRESSURES - METHOD 2**

| HORIZONTAL PRESSURES | | | | | | |
|----------------------|-------|--------|-------|-------|---|---|
| ZONE: | A | B | C | D | - | - |
| CASE 1: | 31.28 | -14.81 | 20.76 | -8.67 | - | - |
| CASE 2: | N/A | N/A | N/A | N/A | - | - |

| VERTICAL PRESSURES | | | | | | |
|--------------------|--------|--------|--------|--------|----------|----------|
| ZONE: | E | F | G | H | E_{OH} | G_{OH} |
| CASE 1: | -35.74 | -20.92 | -24.75 | -16.08 | -49.97 | -39.14 |
| CASE 2: | N/A | N/A | N/A | N/A | N/A | N/A |

**ASCE 7-10 CH 30 PART 2: LOW RISE BUILDINGS (SIMPLIFIED) W/ H<60 FT
 ASCE 7-10 FIGURE 30.5-1 - COMPONENTS AND CLADDING - DESIGN WIND PRESSURES - METHOD 1**

| ROOF SURFACES | | | | | | |
|---------------------|--------------------|------|------|--------------------|-------|-------|
| Effective Wind Area | POSITIVE PRESSURES | | | NEGATIVE PRESSURES | | |
| | ZONE | | | | | |
| | 1 | 2 | 3 | 1 | 2 | 3 |
| 10 SF | 19.3 | 19.3 | 19.3 | -30.8 | -53.7 | -79.4 |
| 20 SF | 17.6 | 17.6 | 17.6 | -30.0 | -49.3 | -74.1 |
| 50 SF | 16.0 | 16.0 | 16.0 | -28.8 | -43.6 | -67.3 |
| 100 SF | 16.0 | 16.0 | 16.0 | -28.0 | -39.4 | -62.2 |

| WALL SURFACES & ROOF OVERHANGS | | | | | | |
|--------------------------------|--------------------|------|--------------------|-------|----------------|--------|
| Effective Wind Area | POSITIVE PRESSURES | | NEGATIVE PRESSURES | | ROOF OVERHANGS | |
| | ZONE | | | | | |
| | 4 | 5 | 4 | 5 | 2 | 3 |
| 10 SF | 33.7 | 33.7 | -36.5 | -45.0 | -62.8 | -105.7 |
| 20 SF | 32.2 | 32.2 | -35.0 | -42.1 | -62.8 | -95.3 |
| 50 SF | 30.2 | 30.2 | -33.0 | -38.1 | -62.8 | -81.7 |
| 100 SF | 28.6 | 28.6 | -31.6 | -35.0 | -62.8 | -71.3 |
| 500 SF | 25.1 | 25.1 | -28.0 | -28.0 | NA | NA |

ASCE 7-10 SECTION 28.6.4 & SECTION 30.2.2 - MINIMUM PRESSURES

MAIN WIND FORCE RESISTING SYSTEM - MINIMUM PRESSURES (ENVELOPE PROCEDURE)

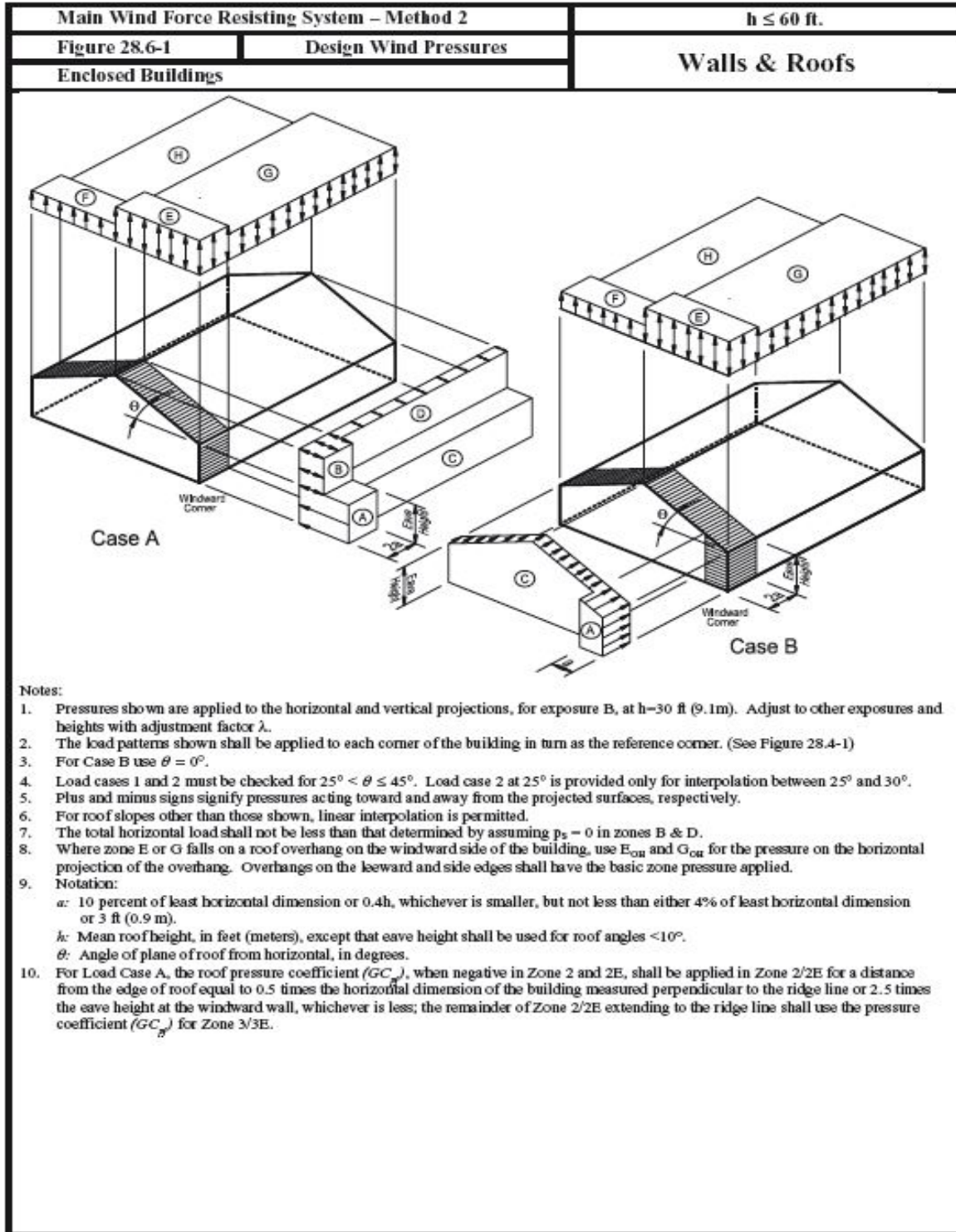
ASCE 7-10 28.6.4 The load effects of the design wind pressures from ASCE 7-10 Section 28.6.3 shall not be less than the minimum load defined by assuming the pressures, p_s , for Zones A and C equal to +16.0 psf, Zones B and D equal to +8 psf, while assuming Zones E, F, G, and H all equal to 0 psf.

COMPONENTS AND CLADDING - MINIMUM PRESSURES

ASCE 7-10 30.2.2 The design wind pressure for components and cladding of buildings shall not be less than a net pressure of 16 psf acting in either direction normal of the surface.

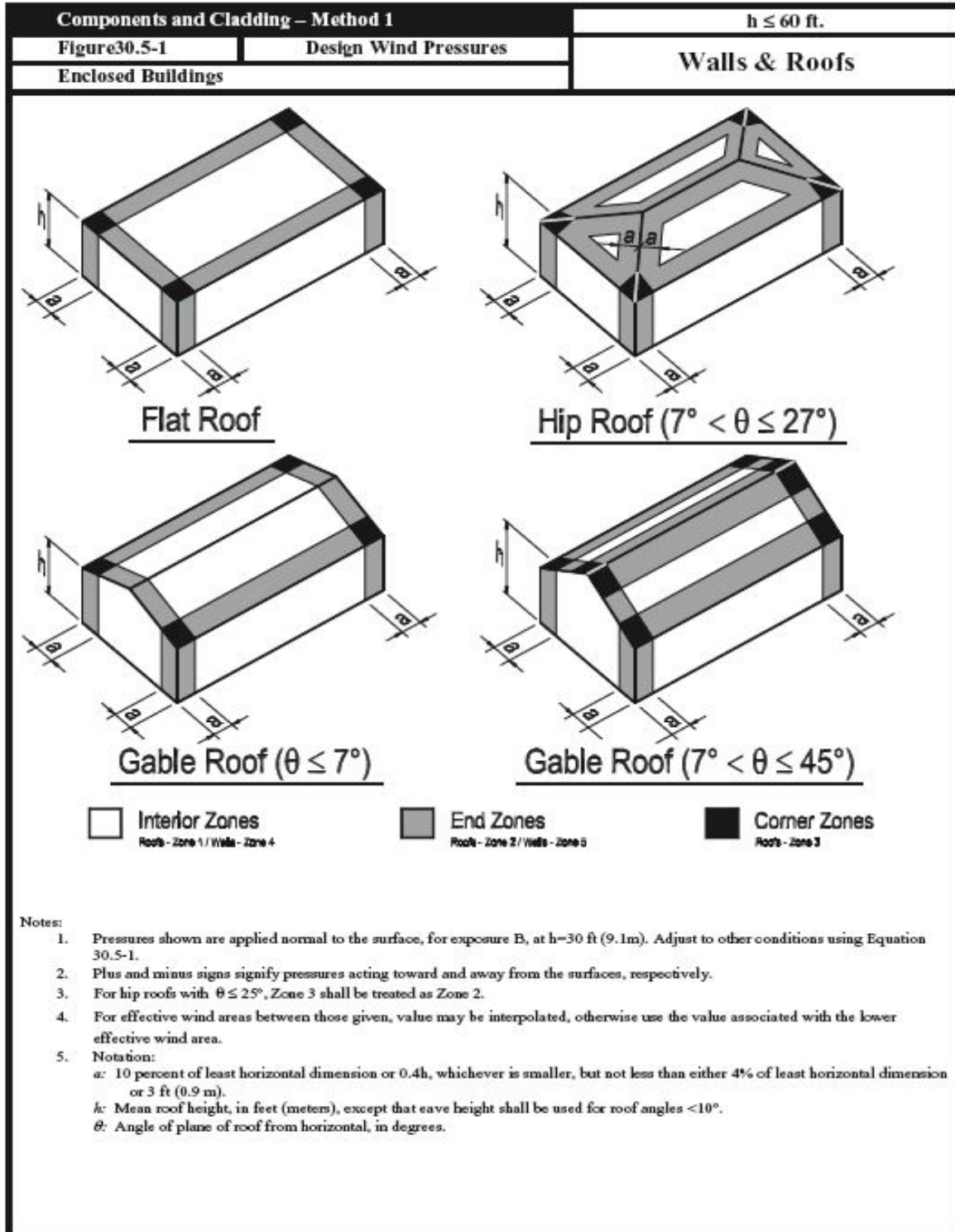
DESIGN CRITERIA - WIND

FIGURE 28.6-1, ASCE 7-10 3rd Printing



DESIGN CRITERIA - WIND

FIGURE 30.5-1, ASCE 7-10 3rd Printing





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DESIGN CRITERIA - SEISMIC

ASCE 7-10 SECTION 12.8 - EQUIVALENT LATERAL FORCE PROCEDURE

| | | | |
|--|--------|------------------|----------|
| OCCUPANCY CATEGORY: | I & II | LATITUDE: | 47.585 |
| SITE CLASS: | D | LONGITUDE: | -122.234 |
| IMPORTANCE FACTOR (I _E): | 1 | S _S = | 1.380 |
| STRUCTURAL SYSTEM (R): | 5 | S ₁ = | 0.531 |
| OVERSTRENGTH FACTOR (Ω ₀): | 3 | F _a = | 1.000 |
| | | F _v = | 1.500 |

ASCE 7-10 SECTION 11.4 SEISMIC GROUND MOTION VALUES

Section 11.4.3 - Adjusted Maximum Considered Earthquake Spectral Response Acceleration Parameters

$$S_{MS} = F_a * S_S = 1.380 \quad S_{M1} = F_v * S_1 = 0.797$$

Section 11.4.4 - Design Spectral Response Acceleration Parameters

$$S_{DS} = 2/3 * S_{MS} = 0.920 \quad S_{D1} = 2/3 * S_{M1} = 0.531$$

ASCE 7-10 SECTION 11.6 - SEISMIC DESIGN CATEGORY - SECTION 12.8.2 - PERIOD DETERMINATION

| ASCE 7-10 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 |
| >= 0.50g | D | D | D |
| D | | | |

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.

| ASCE 7-10 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 |
| >= 0.20g | D | D | D |
| D | | | |

| PERIOD DETERMINATION: | |
|--|-------|
| C _t = | 0.02 |
| h _n = | 26 FT |
| x = | 0.75 |
| T _a = C _t *h _n ^x = | 0.227 |

ASCE 7-10 SECTION 12.8.1.1 - SEISMIC RESPONSE COEFFICIENT

GENERAL EQUATION: $C_s = S_{DS}/(R/I) = 0.184$ <--CONTROLS EQ. 12.8-2

MAXIMUM: $C_s = S_{D1}/(T*(R/I)) = 0.468$ EQ. 12.8-3

MINIMUM: $C_s = 0.044 * S_{DS} * I > 0.01 = 0.040$ EQ. 12.8-5

For structures located where S₁ > 0.6g
 $C_s = 0.5 * S_1 / (R/I) = 0.000$ EQ. 12.8-6

ASCE 7-10 SECTION 12.8.1 - SEISMIC BASE SHEAR

$V = C_s * W = \mathbf{0.184 * W}$

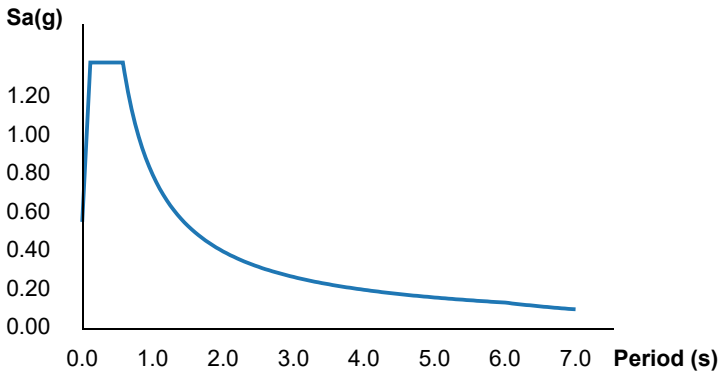
W = the total dead load and applicable portion of other loads as indicated in Section 12.7.2

Search Information

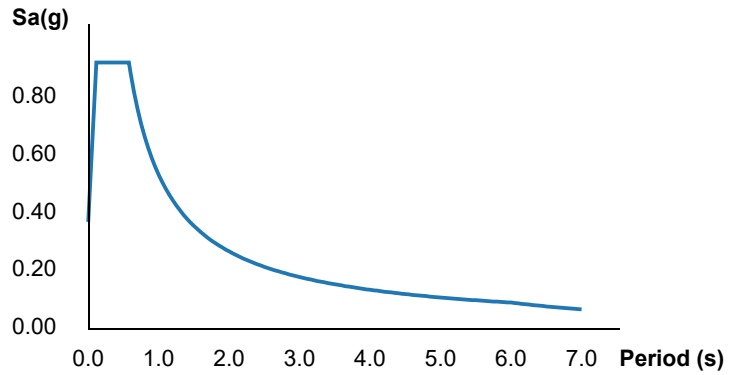
Address: 2885 78th Ave SE, Mercer Island, WA 98040, USA
Coordinates: 47.5846341, -122.234227
Elevation: 81 ft
Timestamp: 2020-10-08T22:39:03.889Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: II
Site Class: D



MCE_R Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

| Name | Value | Description |
|-----------------|-------|--|
| S _S | 1.38 | MCE _R ground motion (period=0.2s) |
| S ₁ | 0.531 | MCE _R ground motion (period=1.0s) |
| S _{MS} | 1.38 | Site-modified spectral acceleration value |
| S _{M1} | 0.797 | Site-modified spectral acceleration value |
| S _{DS} | 0.92 | Numeric seismic design value at 0.2s SA |
| S _{D1} | 0.531 | Numeric seismic design value at 1.0s SA |

Additional Information

| Name | Value | Description |
|----------------|-------|-----------------------------------|
| SDC | D | Seismic design category |
| F _a | 1 | Site amplification factor at 0.2s |
| F _v | 1.5 | Site amplification factor at 1.0s |

| | | |
|------------------|-------|--|
| CR _S | 0.962 | Coefficient of risk (0.2s) |
| CR ₁ | 0.936 | Coefficient of risk (1.0s) |
| PGA | 0.568 | MCE _G peak ground acceleration |
| F _{PGA} | 1 | Site amplification factor at PGA |
| PGA _M | 0.568 | Site modified peak ground acceleration |
| T _L | 6 | Long-period transition period (s) |
| SsRT | 1.38 | Probabilistic risk-targeted ground motion (0.2s) |
| SsUH | 1.435 | Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years) |
| SsD | 2.663 | Factored deterministic acceleration value (0.2s) |
| S1RT | 0.531 | Probabilistic risk-targeted ground motion (1.0s) |
| S1UH | 0.568 | Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years) |
| S1D | 1.101 | Factored deterministic acceleration value (1.0s) |
| PGAd | 1.019 | Factored deterministic acceleration value (PGA) |

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](#).

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the report.

Search Information

Address: 2885 78th Ave SE, Mercer Island, WA 98040, USA
Coordinates: 47.5846341, -122.234227
Elevation: 81 ft
Timestamp: 2020-10-08T22:36:32.107Z
Hazard Type: Wind



ASCE 7-16

MRI 10-Year 67 mph
 MRI 25-Year 73 mph
 MRI 50-Year 78 mph
 MRI 100-Year 83 mph
 Risk Category I 92 mph
 Risk Category II 97 mph
 Risk Category III 104 mph
 Risk Category IV 108 mph

ASCE 7-10

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

ASCE 7-05

ASCE 7-05 Wind Speed 85 mph

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

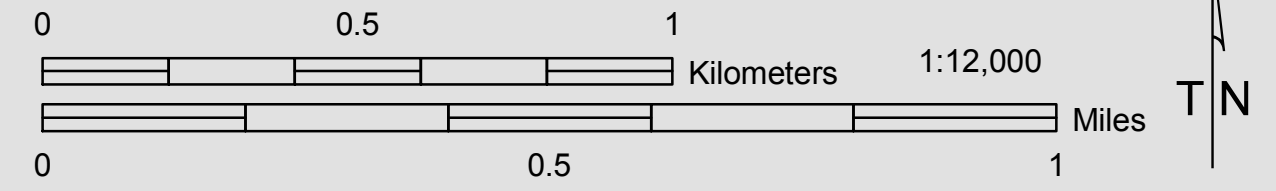
Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour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

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

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the

Mercer Island Wind Exposure and Wind Speed-Up (Topographic Effect)

by Development Services Group (DSG), City of Mercer Island
April 2009



WIND EXPOSURE CATEGORIES & WIND SPEED-UP FACTORS (ICC Section 1609 & ASCE 7-05 Chapter 6)

It is the responsibility of the Owner (or their Design Professional) to review site conditions and determine the K_{zt} factor to be utilized for each specific project. The K_{zt} factors and wind exposure categories indicated on this map are the minimum values accepted by the City of Mercer Island without requiring the design professional to submit additional calculations and supporting topographic documentation (to verify the values utilized in their wind load determination).

Please note – The K_{zt} values indicated on this map are approximations based upon periodic calculations of representative samplings around Mercer Island. These values are intended for City of Mercer Island's plan review purposes only.

WIND EXPOSURE CATEGORIES:

| | | |
|------------------------|--|------------------------------------|
| Wind Exposure Category | | Exposure 'C' (1500 feet from Lake) |
| | | Exposure 'B' (all other areas) |

WIND SPEED-UP (TOPOGRAPHIC EFFECT) - K_{zt} Factor :

| | | |
|-----------------|--|----------------|
| K_{zt} Factor | | $K_{zt} = 1.0$ |
| | | $K_{zt} = 1.3$ |
| | | $K_{zt} = 1.6$ |
| | | $K_{zt} = 1.9$ |

GENERAL NOTES FOR WIND EXPOSURE AND WIND SPEED-UP MAP

This map is the Wind Exposure Category and Wind Speed-up (Topographic Effects) Map for the City of Mercer Island. This map shows the minimum wind exposure category and the minimum wind speed-up, " K_{zt} " factor, which will be accepted without site specific documentation and calculation.

Other wind speed phenomena may occur on Mercer Island that is not specifically identified on this map. It is the responsibility of the Owner (or their Design Professional) to review site conditions and determine the appropriate design wind speed and exposure category for their specific project and location.

This map is for the sole use of the staff of the City of Mercer Island's Development Services Group (DSG) for the purposes of permit application evaluation. This map provides DSG staff a general assessment of Wind Exposure Category and Wind Speed-up (Topographic Effects). All areas have not been specifically evaluated and there may be locations that are not correctly represented on this map. It is the responsibility of individual property owners and map users to evaluate risk associated with their proposed development. No site-specific assessment of risk is implied or otherwise indicated by the City of Mercer Island with this map.

Information about data used for the map, references, and data limitation are all described the associated "Read Me" document. The digital version of this map is accompanied by a meta data file containing pertinent information about map construction. This data map is available on the City of Mercer Island website.

The City of Mercer Island is using guidance provided within ICC Section 1609 & ASCE 7-05 Chapter 6 regarding definitions used when creating this map.

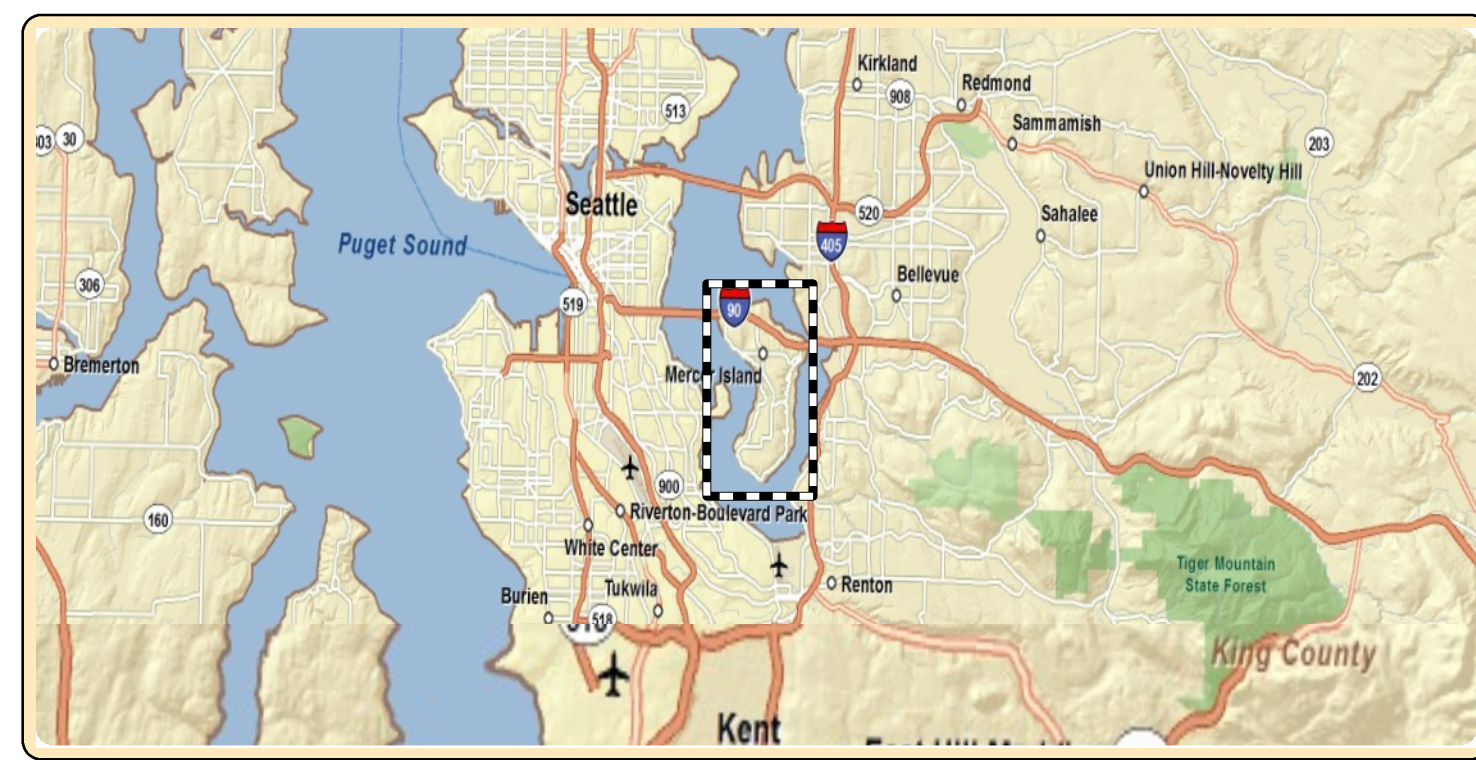
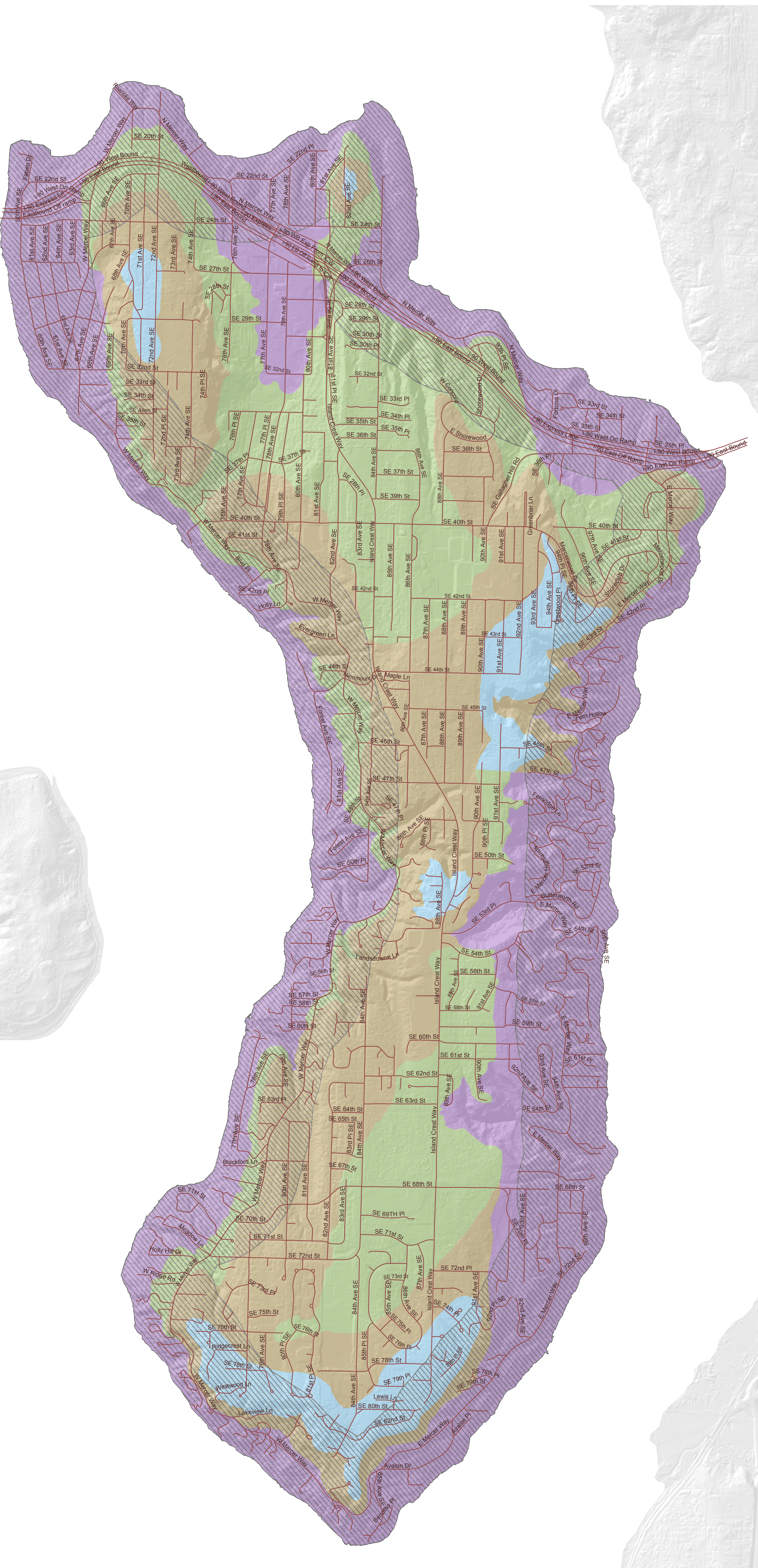
DEFINITIONS:

K_{zt} factor: The topographic effect of wind speed-up at isolated hills, ridges, and escarpments constituting abrupt changes in the general topography, located in any exposure category, that meet all of the conditions noted in ASCE 7-05 Minimum Design Loads for Buildings and Other Structures, Section 6.5.7.

Exposure B: The wind exposure category that applies where the site in question is located a minimum of 1500 feet from the shoreline and the mean roof height is less than or equal to 30 feet per IBC 2006 section 1609.4.3.

Exposure C: The wind exposure category that applies where the site in question is located within 1500 feet from the shoreline per IBC 2006 section 1609.4.3.

Wind Speed: Minimum 85 mph 3-second gust per IRC Figure R301.2(4)



Job No.: 19-028

Date: 9/15/2020

By:

M.K.

Per ASCE 7-10-Code for Buildings with Flat or Low Slope Roofs (≤ 5 deg. or 1 in./ft.)
for Balanced Snow, Drift, and Rain-on-Snow Surcharge Loadings

Input Data:

| | |
|------------------------------|-----------|
| Building Risk Category = | II |
| Ground Snow Load, p_g = | 20.00 psf |
| Roof Snow P_{ij} = | 14.00 psf |
| Length of High Roof, L_u = | 8.33 ft |
| Length of Low Roof, L_l = | 33.25 ft |
| Obstruction Height, h_o = | 6.83 ft |
| Exposure Factor, C_e = | 1 |
| Thermal Factor, C_t = | 1 |

Table 1.5-1, page 2

Figure 7-1, page 32 and Table 7-1, page 30, (Verify w/ local jurisdiction)

As per local jurisdiction

Length of Roof Upwind of the Snow Drift

Length of Roof Downwind of the Snow Drift

High Roof - Low Roof Elevations

Table 7-2, page 30

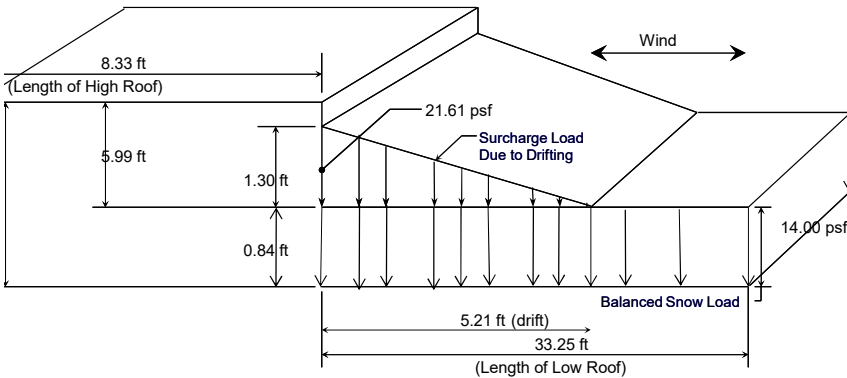
Table 7-3, page 30

Results:

| | |
|-----------------------------------|-----------|
| Importance Factor, I_s = | 1.00 |
| Snow Density, g = | 16.60 pcf |
| Flat Roof Snow Load, p_f = | 14.00 psf |
| $P_{f(usable)}$ = | 14.00 psf |
| Balanced Snow Load Ht., h_b = | 0.84 ft |
| Clear Height, h_c = | 5.99 ft |
| Leeward Drift Height, h_{dl} = | 1.23 ft |
| Windward Drift Height, h_{dw} = | 1.30 ft |
| Design Drift Height, h_d = | 1.30 ft |
| Ratio, h_c/h_b = | 7.10 |
| Drift Length, w = | 5.21 ft |
| Drift Length, $w_{(max)}$ = | 33.25 ft |
| Drift Length, $w_{(usable)}$ = | 5.21 ft |
| Wt. of Drift at High End, p_d = | 21.61 psf |
| *Total Snow Load, $P_{(total)}$ = | 35.61 psf |

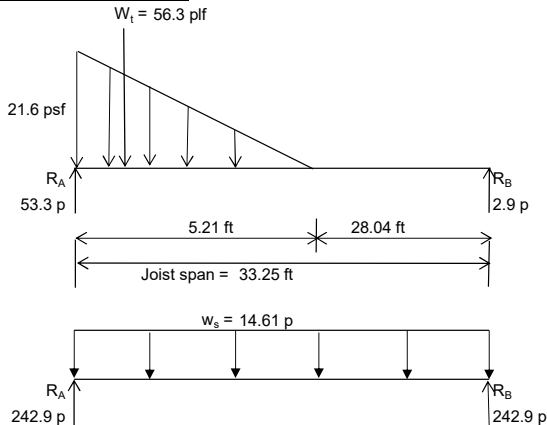
Table 1.5-2, page 5

 $g = 0.13 * p_g + 14 \leq 30$ (Eqn. 7.7-1, page 33) $p_f = 0.7 * C_e * C_t * I_s * p_g$ (Eqn. 7.3-1, page 29) $P_{f(usable)}$ = maximum of: p_f or p_j $h_b = p_f(usable)/g$ (Section 7.1, page 29) $h_c = h_o - h_b \geq 0$ (Section 7.1, page 29) $h_{dl} = 0.43 * L_u^{1/3} * (p_g + 10)^{1/4 - 1.5}$, with $L_u \geq 20'$ (Figure 7-9) $h_{dw} = 0.75 * (0.43 * L_l^{1/3} * (p_g + 10)^{1/4 - 1.5})$, with $L_l \geq 20'$ h_d = minimum of: (maximum of: (h_{dL} or h_{dW})) or h_c If $h_c/h_b \geq 0.2$, then snow drifts are required to be appliedIf $h_d \leq h_c$: $w = 4 * h_d$, if $h_d > h_c$: $w = 4 * h_d^2 / h_c$ (Sect. 7.7.1) $w_{(max)}$ = minimum of: $8 * h_c$ or L_L $w_{(usable)}$ = minimum of: w or $w_{(max)}$ $p_d = h_d * g$ (maximum value) $P_{(total)} = p_f(usable) + p_d$



Configuration of Snow Drift on Lower Roof

Equivalent uniform load on low roof joist due to snow drift:



Location of max. moment, $L_1 = 4.02 \text{ ft}$

Maximum moment, $M_{\max} = 84.74 \text{ pft}$

Equivalent uniform load due to drift, $w_o = 0.61 \text{ psf}$

Total snow load on joist, $w_s = 14.61 \text{ psf}$

**Per ASCE 7-10-Code for Buildings with Flat or Low Slope Roofs (<= 5 deg. or 1 in./ft.)
for Balanced Snow, Drift, and Rain-on-Snow Surcharge Loadings**

Input Data:

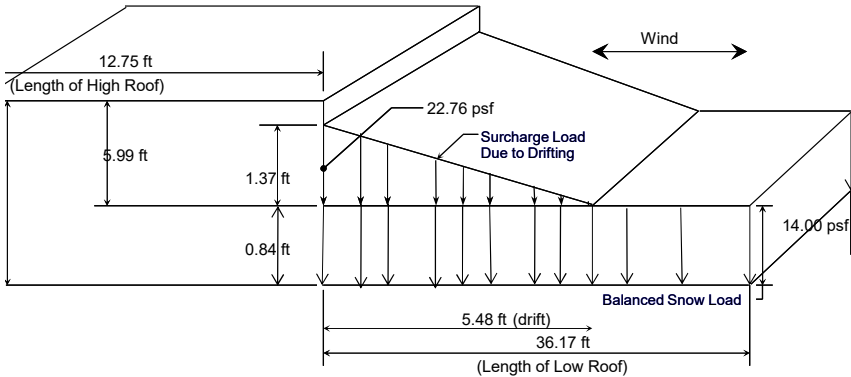
| | |
|------------------------------|-----------|
| Building Risk Category = | II |
| Ground Snow Load, p_g = | 20.00 psf |
| Roof Snow P_{ij} = | 14.00 psf |
| Length of High Roof, L_u = | 12.75 ft |
| Length of Low Roof, L_L = | 36.17 ft |
| Obstruction Height, h_o = | 6.83 ft |
| Exposure Factor, C_e = | 1 |
| Thermal Factor, C_t = | 1 |

Table 1.5-1, page 2
 Figure 7-1, page 32 and Table 7-1, page 30, (Verify w/ local jurisdiction)
 As per local jurisdiction
 Length of Roof Upwind of the Snow Drift
 Length of Roof Downwind of the Snow Drift
 High Roof - Low Roof Elevations
 Table 7-2, page 30
 Table 7-3, page 30

Results:

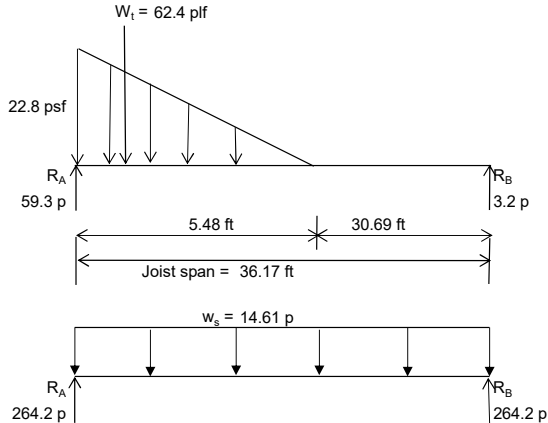
| | |
|-----------------------------------|-----------|
| Importance Factor, I_s = | 1.00 |
| Snow Density, g = | 16.60 pcf |
| Flat Roof Snow Load, p_f = | 14.00 psf |
| $P_{f(USE)}$ = | 14.00 psf |
| Balanced Snow Load Ht., h_b = | 0.84 ft |
| Clear Height, h_c = | 5.99 ft |
| Leeward Drift Height, h_{dL} = | 1.23 ft |
| Windward Drift Height, h_{dW} = | 1.37 ft |
| Design Drift Height, h_d = | 1.37 ft |
| Ratio, h_c/h_b = | 7.10 |
| Drift Length, w = | 5.48 ft |
| Drift Length, $w_{(max)}$ = | 36.17 ft |
| Drift Length, $w_{(use)}$ = | 5.48 ft |
| Wt. of Drift at High End, p_d = | 22.76 psf |
| *Total Snow Load, $P_{(total)}$ = | 36.76 psf |

Table 1.5-2, page 5
 $g = 0.13 * p_g + 14 \leq 30$ (Eqn. 7.7-1, page 33)
 $p_f = 0.7 * C_e * C_t * I_s * p_g$ (Eqn. 7.3-1, page 29)
 $P_{f(USE)}$ = maximum of: p_f or p_{fj}
 $h_b = p_{f(USE)} / g$ (Section 7.1, page 29)
 $h_c = h_o - h_b \geq 0$ (Section 7.1, page 29)
 $h_{dL} = 0.43 * L_u^{1/3} * (p_g + 10)^{1/4 - 1.5}$, with $L_u \geq 20'$ (Figure 7-9)
 $h_{dW} = 0.75 * (0.43 * L_L^{1/3} * (p_g + 10)^{1/4 - 1.5})$, with $L_L \geq 20'$
 h_d = minimum of: (maximum of: (h_{dL} or h_{dW})) or h_c
 If $h_c/h_b \geq 0.2$, then snow drifts are required to be applied
 If $h_d \leq h_c$: $w = 4 * h_d$, if $h_d > h_c$: $w = 4 * h_d^2 / h_c$ (Sect. 7.7.1)
 $w_{(max)}$ = minimum of: $8 * h_c$ or L_L
 $w_{(use)}$ = minimum of: w or $w_{(max)}$
 $p_d = h_d * g$ (maximum value)
 $P_{(total)} = p_{f(USE)} + p_d$



Configuration of Snow Drift on Lower Roof

Equivalent uniform load on low roof joist due to snow drift:



| | |
|---|-----------|
| Location of max. moment, $L_1 =$ | 4.25 ft |
| Maximum moment, $M_{max} =$ | 99.39 pft |
| Equivalent uniform load due to drift, $w_e =$ | 0.61 psf |
| Total snow load on joist, $w_s =$ | 14.61 psf |

Job No.: 19-028

Date: 9/15/2020

By:

M.K.

Per ASCE 7-10-Code for Buildings with Flat or Low Slope Roofs (≤ 5 deg. or 1 in./ft.)
for Balanced Snow, Drift, and Rain-on-Snow Surcharge Loadings

Input Data:

| | |
|------------------------------|-----------|
| Building Risk Category = | II |
| Ground Snow Load, p_g = | 20.00 psf |
| Roof Snow P_{ij} = | 14.00 psf |
| Length of High Roof, L_u = | 88.00 ft |
| Length of Low Roof, L_L = | 23.92 ft |
| Obstruction Height, h_o = | 6.83 ft |
| Exposure Factor, C_e = | 1 |
| Thermal Factor, C_t = | 1 |

Table 1.5-1, page 2

Figure 7-1, page 32 and Table 7-1, page 30, (Verify w/ local jurisdiction)

As per local jurisdiction

Length of Roof Upwind of the Snow Drift

Length of Roof Downwind of the Snow Drift

High Roof - Low Roof Elevations

Table 7-2, page 30

Table 7-3, page 30

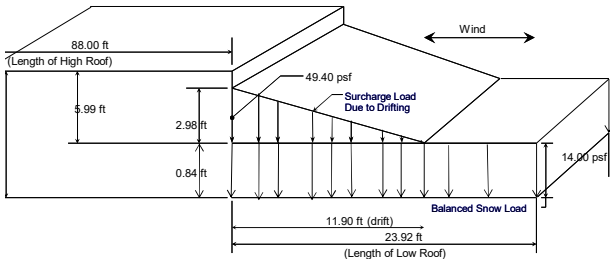
Results:

| | |
|-----------------------------------|-----------|
| Importance Factor, I_s = | 1.00 |
| Snow Density, g = | 16.60 pcf |
| Flat Roof Snow Load, p_f = | 14.00 psf |
| $P_{f(USE)}$ = | 14.00 psf |
| Balanced Snow Load Ht., h_b = | 0.84 ft |
| Clear Height, h_c = | 5.99 ft |
| Leeward Drift Height, h_{dL} = | 2.98 ft |
| Windward Drift Height, h_{dW} = | 1.05 ft |
| Design Drift Height, h_d = | 2.98 ft |
| Ratio, h_c/h_b = | 7.10 |
| Drift Length, w = | 11.90 ft |
| Drift Length, $w_{(max)}$ = | 23.92 ft |
| Drift Length, $w_{(USE)}$ = | 11.90 ft |
| Wt. of Drift at High End, p_d = | 49.40 psf |
| *Total Snow Load, $p_{(total)}$ = | 63.40 psf |

Table 1.5-2, page 5

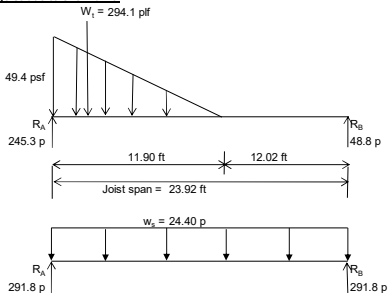
 $g = 0.13 * p_g + 14 \leq 30$ (Eqn. 7.7-1, page 33) $p_f = 0.7 * C_e * C_t * I_s * p_g$ (Eqn. 7.3-1, page 29) $P_{f(USE)}$ = maximum of: p_f or p_j $h_b = p_f(USE) / g$ (Section 7.1, page 29) $h_c = h_o - h_b \geq 0$ (Section 7.1, page 29) $h_{dL} = 0.43 * L_u^{1/3} * (p_g + 10)^{1/4 - 1.5}$, with $L_u \geq 20'$ (Figure 7-9) $h_{dW} = 0.75 * (0.43 * L_L^{1/3} * (p_g + 10)^{1/4 - 1.5})$, with $L_L \geq 20'$ h_d = minimum of: (maximum of: (h_{dL} or h_{dW})) or h_c If $h_c/h_b \geq 0.2$, then snow drifts are required to be appliedIf $h_d \leq h_c$: $w = 4 * h_d$, if $h_d > h_c$: $w = 4 * h_d^2 / h_c$ (Sect. 7.7.1) $w_{(max)}$ = minimum of: $8 * h_c$ or L_L $w_{(USE)}$ = minimum of: w or $w_{(max)}$ $p_d = h_d * g$ (maximum value) $p_{(total)} = p_f(USE) + p_d$

25



Configuration of Snow Drift on Lower Roof

Equivalent uniform load on low roof joist due to snow drift:



| | |
|---|------------|
| Location of max. moment, $L_1 =$ | 7.06 ft |
| Maximum moment, $M_{max} =$ | 743.89 pft |
| Equivalent uniform load due to drift, $w_s =$ | 10.40 psf |
| Total snow load on joist, $w_s =$ | 24.40 psf |

**Per ASCE 7-10-Code for Buildings with Flat or Low Slope Roofs (≤ 5 deg. or 1 in./ft.)
for Balanced Snow, Drift, and Rain-on-Snow Surcharge Loadings**

Input Data:

| | |
|------------------------------|-----------|
| Building Risk Category = | II |
| Ground Snow Load, p_g = | 20.00 psf |
| Roof Snow P_f = | 14.00 psf |
| Length of High Roof, L_u = | 31.75 ft |
| Length of Low Roof, L_L = | 36.17 ft |
| Obstruction Height, h_o = | 6.83 ft |
| Exposure Factor, C_e = | 1 |
| Thermal Factor, C_t = | 1 |

Table 1.5-1, page 2

Figure 7-1, page 32 and Table 7-1, page 30, (Verify w/ local jurisdiction)

As per local jurisdiction

Length of Roof Upwind of the Snow Drift

Length of Roof Downwind of the Snow Drift

High Roof - Low Roof Elevations

Table 7-2, page 30

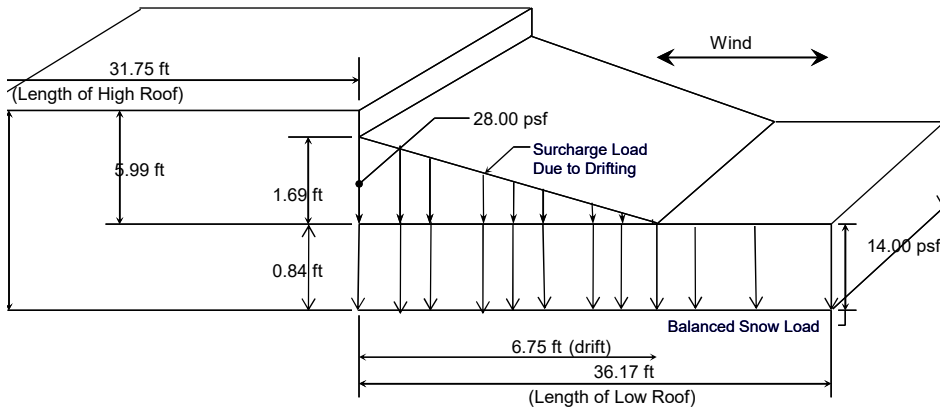
Table 7-3, page 30

Results:

| | |
|-----------------------------------|-----------|
| Importance Factor, I_s = | 1.00 |
| Snow Density, g = | 16.60 pcf |
| Flat Roof Snow Load, p_f = | 14.00 psf |
| $p_{f(usable)}$ = | 14.00 psf |
| Balanced Snow Load Ht., h_b = | 0.84 ft |
| Clear Height, h_c = | 5.99 ft |
| Leeward Drift Height, h_{dL} = | 1.69 ft |
| Windward Drift Height, h_{dW} = | 1.37 ft |
| Design Drift Height, h_d = | 1.69 ft |
| Ratio, h_r/h_b = | 7.10 |
| Drift Length, w = | 6.75 ft |
| Drift Length, $w_{(max)}$ = | 36.17 ft |
| Drift Length, $w_{(use)}$ = | 6.75 ft |
| Wt. of Drift at High End, p_d = | 28.00 psf |
| *Total Snow Load, $p_{(total)}$ = | 42.00 psf |

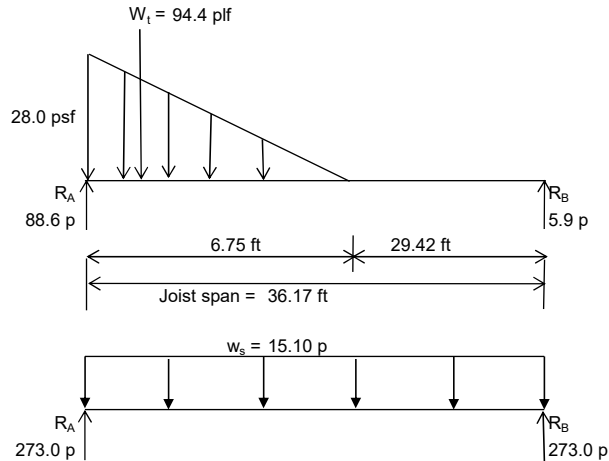
Table 1.5-2, page 5

 $g = 0.13 * p_g + 14 \leq 30$ (Eqn. 7.7-1, page 33) $p_f = 0.7 * C_e * C_t * I_s * p_g$ (Eqn. 7.3-1, page 29) $p_{f(usable)}$ = maximum of: p_f or p_{fj} $h_b = p_{f(usable)} / g$ (Section 7.1, page 29) $h_c = h_o - h_b \geq 0$ (Section 7.1, page 29) $h_{dL} = 0.43 * L_u^{1/3} * (p_g + 10)^{1/4 - 1.5}$, with $L_u \geq 20'$ (Figure 7-9) $h_{dW} = 0.75 * (0.43 * L_L^{1/3} * (p_g + 10)^{1/4 - 1.5})$, with $L_L \geq 20'$ h_d = minimum of: (maximum of: (h_{dL} or h_{dW})) or h_c If $h_c/h_b \geq 0.2$, then snow drifts are required to be appliedIf $h_d \leq h_c$: $w = 4 * h_d$, if $h_d > h_c$: $w = 4 * h_d^2 / h_c$ (Sect. 7.7.1) $w_{(max)}$ = minimum of: $8 * h_c$ or L_L $w_{(use)}$ = minimum of: w or $w_{(max)}$ $p_d = h_d * g$ (maximum value) $p_{(total)} = p_{f(usable)} + p_d$



Configuration of Snow Drift on Lower Roof

Equivalent uniform load on low roof joist due to snow drift:



| | |
|---|------------|
| Location of max. moment, $L_1 =$ | 5.06 ft |
| Maximum moment, $M_{max} =$ | 179.36 pft |
| Equivalent uniform load due to drift, $w_e =$ | 1.10 psf |
| Total snow load on joist, $w_s =$ | 15.10 psf |

**Per ASCE 7-10-Code for Buildings with Flat or Low Slope Roofs (<= 5 deg. or 1 in./ft.)
for Balanced Snow, Drift, and Rain-on-Snow Surcharge Loadings**

Input Data:

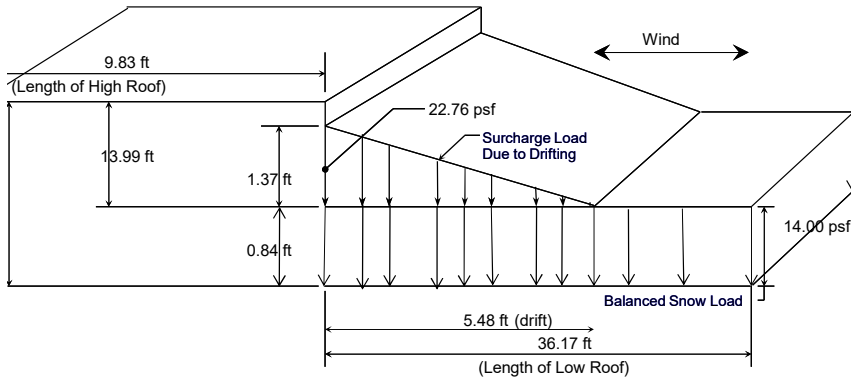
| | |
|------------------------------|-----------|
| Building Risk Category = | II |
| Ground Snow Load, p_g = | 20.00 psf |
| Roof Snow P_{ij} = | 14.00 psf |
| Length of High Roof, L_u = | 9.83 ft |
| Length of Low Roof, L_L = | 36.17 ft |
| Obstruction Height, h_o = | 14.83 ft |
| Exposure Factor, C_e = | 1 |
| Thermal Factor, C_t = | 1 |

Table 1.5-1, page 2
 Figure 7-1, page 32 and Table 7-1, page 30, (Verify w/ local jurisdiction)
 As per local jurisdiction
 Length of Roof Upwind of the Snow Drift
 Length of Roof Downwind of the Snow Drift
 High Roof - Low Roof Elevations
 Table 7-2, page 30
 Table 7-3, page 30

Results:

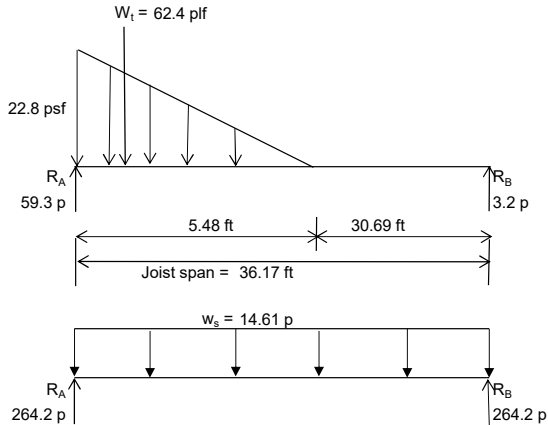
| | |
|-----------------------------------|-----------|
| Importance Factor, I_s = | 1.00 |
| Snow Density, g = | 16.60 pcf |
| Flat Roof Snow Load, p_r = | 14.00 psf |
| $P_{r(USE)}$ = | 14.00 psf |
| Balanced Snow Load Ht., h_b = | 0.84 ft |
| Clear Height, h_c = | 13.99 ft |
| Leeward Drift Height, h_{dL} = | 1.23 ft |
| Windward Drift Height, h_{dW} = | 1.37 ft |
| Design Drift Height, h_d = | 1.37 ft |
| Ratio, h_c/h_b = | 16.58 |
| Drift Length, w = | 5.48 ft |
| Drift Length, $w_{(max)}$ = | 36.17 ft |
| Drift Length, $w_{(USE)}$ = | 5.48 ft |
| Wt. of Drift at High End, p_d = | 22.76 psf |
| *Total Snow Load, $p_{(total)}$ = | 36.76 psf |

Table 1.5-2, page 5
 $g = 0.13 * p_g + 14 \leq 30$ (Eqn. 7.7-1, page 33)
 $p_r = 0.7 * C_e * C_t * I_s * p_g$ (Eqn. 7.3-1, page 29)
 $P_{r(USE)}$ = maximum of: p_f or p_{fj}
 $h_b = p_{f(USE)} / g$ (Section 7.1, page 29)
 $h_c = h_o - h_b \geq 0$ (Section 7.1, page 29)
 $h_{dL} = 0.43 * L_u^{1/3} * (p_g + 10)^{1/4 - 1.5}$, with $L_u \geq 20'$ (Figure 7-9)
 $h_{dW} = 0.75 * (0.43 * L_L^{1/3} * (p_g + 10)^{1/4 - 1.5})$, with $L_L \geq 20'$
 h_d = minimum of: (maximum of: (h_{dL} or h_{dW})) or h_c
 If $h_c/h_b \geq 0.2$, then snow drifts are required to be applied
 If $h_d \leq h_c$: $w = 4 * h_d$, if $h_d > h_c$: $w = 4 * h_d^2 / h_c$ (Sect. 7.7.1)
 $w_{(max)}$ = minimum of: $8 * h_c$ or L_L
 $w_{(USE)}$ = minimum of: w or $w_{(max)}$
 $p_d = h_d * g$ (maximum value)
 $p_{(total)} = p_{f(USE)} + p_d$



Configuration of Snow Drift on Lower Roof

Equivalent uniform load on low roof joist due to snow drift:



| | |
|---|-----------|
| Location of max. moment, $L_1 =$ | 4.25 ft |
| Maximum moment, $M_{\max} =$ | 99.39 pft |
| Equivalent uniform load due to drift, $w_e =$ | 0.61 psf |
| Total snow load on joist, $w_s =$ | 14.61 psf |

Per ASCE 7-10-Code for Buildings with Flat or Low Slope Roofs (≤ 5 deg. or 1 in./ft.)
for Balanced Snow, Drift, and Rain-on-Snow Surcharge Loadings

Input Data:

| | |
|------------------------------|-----------|
| Building Risk Category = | II |
| Ground Snow Load, p_g = | 20.00 psf |
| Roof Snow P_{rf} = | 14.00 psf |
| Length of High Roof, L_u = | 26.42 ft |
| Length of Low Roof, L_L = | 4.25 ft |
| Obstruction Height, h_o = | 9.58 ft |
| Exposure Factor, C_e = | 1 |
| Thermal Factor, C_t = | 1 |

Table 1.5-1, page 2

Figure 7-1, page 32 and Table 7-1, page 30, (Verify w/ local jurisdiction)

As per local jurisdiction

Length of Roof Upwind of the Snow Drift

Length of Roof Downwind of the Snow Drift

High Roof - Low Roof Elevations

Table 7-2, page 30

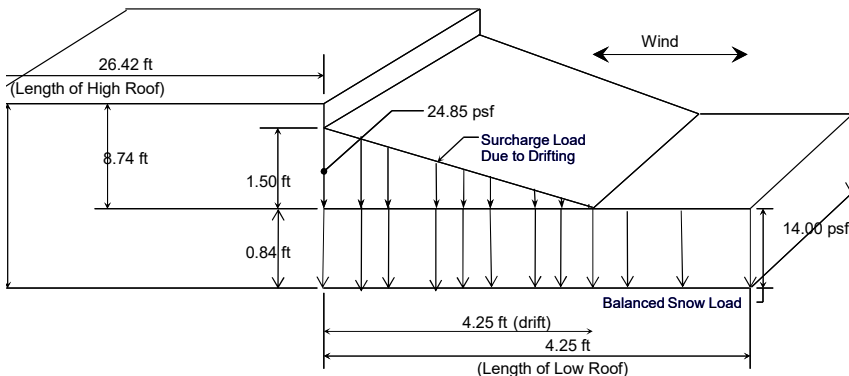
Table 7-3, page 30

Results:

| | |
|-----------------------------------|-----------|
| Importance Factor, I_s = | 1.00 |
| Snow Density, g = | 16.60 pcf |
| Flat Roof Snow Load, P_f = | 14.00 psf |
| $P_{f(usable)}$ = | 14.00 psf |
| Balanced Snow Load Ht., h_b = | 0.84 ft |
| Clear Height, h_c = | 8.74 ft |
| Leeward Drift Height, h_{dL} = | 1.50 ft |
| Windward Drift Height, h_{dW} = | 0.92 ft |
| Design Drift Height, h_d = | 1.50 ft |
| Ratio, h_r/h_b = | 10.36 |
| Drift Length, w = | 5.99 ft |
| Drift Length, $w_{(max)}$ = | 4.25 ft |
| Drift Length, $w_{(usable)}$ = | 4.25 ft |
| Wt. of Drift at High End, p_d = | 24.85 psf |
| *Total Snow Load, $p_{(total)}$ = | 38.85 psf |

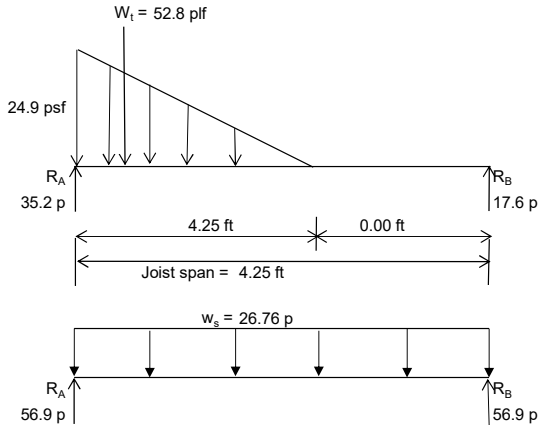
Table 1.5-2, page 5

 $g = 0.13 * p_g + 14 \leq 30$ (Eqn. 7.7-1, page 33) $P_f = 0.7 * C_e * C_t * I_s * p_g$ (Eqn. 7.3-1, page 29) $P_{f(usable)}$ = maximum of: p_f or p_{fj} $h_b = p_{f(usable)} / g$ (Section 7.1, page 29) $h_c = h_o - h_b \geq 0$ (Section 7.1, page 29) $h_{dL} = 0.43 * L_u^{1/3} * (p_g + 10)^{1/4 - 1.5}$, with $L_u \geq 20'$ (Figure 7-9) $h_{dW} = 0.75 * (0.43 * L_L^{1/3} * (p_g + 10)^{1/4 - 1.5})$, with $L_L \geq 20'$ h_d = minimum of: (maximum of: (h_{dL} or h_{dW})) or h_c If $h_c/h_b \geq 0.2$, then snow drifts are required to be appliedIf $h_d \leq h_c$: $w = 4 * h_d$, if $h_d > h_c$: $w = 4 * h_d^2 / h_c$ (Sect. 7.7.1) $w_{(max)}$ = minimum of: $8 * h_c$ or LL $w_{(usable)}$ = minimum of: w or $w_{(max)}$ $p_d = h_d * g$ (maximum value) $p_{(total)} = p_{f(usable)} + p_d$



Configuration of Snow Drift on Lower Roof

Equivalent uniform load on low roof joist due to snow drift:



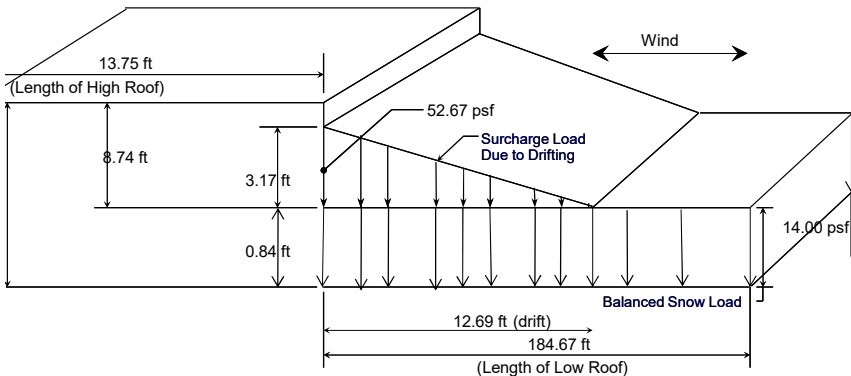
Location of max. moment, $L_1 = 1.80 \text{ ft}$

Maximum moment, $M_{\max} = 28.80 \text{ pft}$

Equivalent uniform load due to drift, $w_e = 12.76 \text{ psf}$

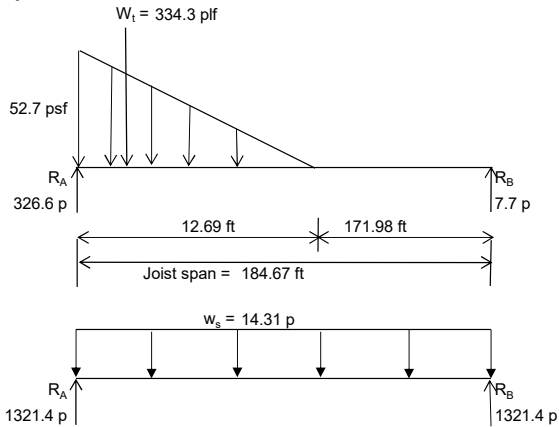
Total snow load on joist, $w_s = 26.76 \text{ psf}$

| | | | | | |
|--|-----------|--|-----------|-----|------|
| | | Job No.: | 19-028 | | |
| | | Date: | 9/15/2020 | By: | M.K. |
| Per ASCE 7-10-Code for Buildings with Flat or Low Slope Roofs (<= 5 deg. or 1 in./ft.) for Balanced Snow, Drift, and Rain-on-Snow Surcharge Loadings | | | | | |
| Input Data: | | | | | |
| Building Risk Category = | II | Table 1.5-1, page 2 | | | |
| Ground Snow Load, p_g = | 20.00 psf | Figure 7-1, page 32 and Table 7-1, page 30, (Verify w/ local jurisdiction) | | | |
| Roof Snow P_{rf} = | 14.00 psf | As per local jurisdiction | | | |
| Length of High Roof, L_u = | 13.75 ft | Length of Roof Upwind of the Snow Drift | | | |
| Length of Low Roof, L_L = | 184.67 ft | Length of Roof Downwind of the Snow Drift | | | |
| Obstruction Height, h_o = | 9.58 ft | High Roof - Low Roof Elevations | | | |
| Exposure Factor, C_e = | 1 | Table 7-2, page 30 | | | |
| Thermal Factor, C_t = | 1 | Table 7-3, page 30 | | | |
| Results: | | | | | |
| Importance Factor, I_s = | 1.00 | Table 1.5-2, page 5 | | | |
| Snow Density, g = | 16.60 pcf | $g = 0.13 \cdot p_g + 14 \leq 30$ (Eqn. 7.7-1, page 33) | | | |
| Flat Roof Snow Load, p_f = | 14.00 psf | $p_f = 0.7 \cdot C_e \cdot C_t \cdot I_s \cdot p_g$ (Eqn. 7.3-1, page 29) | | | |
| $p_{f(USE)}$ = | 14.00 psf | $p_{f(USE)}$ = maximum of: p_f or p_{fj} | | | |
| Balanced Snow Load H_t , h_b = | 0.84 ft | $h_b = p_{f(USE)} / g$ (Section 7.1, page 29) | | | |
| Clear Height, h_c = | 8.74 ft | $h_c = h_o - h_b \geq 0$ (Section 7.1, page 29) | | | |
| Leeward Drift Height, h_{dL} = | 1.23 ft | $h_{dL} = 0.43 \cdot L_u^{1/3} \cdot (p_g + 10)^{1/4 - 1.5}$, with $L_u > 20'$ (Figure 7-9) | | | |
| Windward Drift Height, h_{dW} = | 3.17 ft | $h_{dW} = 0.75 \cdot (0.43 \cdot L_L^{1/3} \cdot (p_g + 10)^{1/4 - 1.5})$, with $L_L > 20'$ | | | |
| Design Drift Height, h_d = | 3.17 ft | h_d = minimum of: (maximum of: (h_{dL} or h_{dW})) or h_c | | | |
| Ratio, h_c/h_b = | 10.36 | If $h_c/h_b \geq 0.2$, then snow drifts are required to be applied | | | |
| Drift Length, w = | 12.69 ft | If $h_d \leq h_c$: $w = 4 \cdot h_d$, if $h_d > h_c$: $w = 4 \cdot h_d^2 / h_c$ (Sect. 7.7.1) | | | |
| Drift Length, $w_{(MAX)}$ = | 69.89 ft | $w_{(MAX)}$ = minimum of: $8 \cdot h_c$ or L_L | | | |
| Drift Length, $w_{(USE)}$ = | 12.69 ft | $w_{(USE)}$ = minimum of: w or $w_{(MAX)}$ | | | |
| Wt. of Drift at High End, p_d = | 52.67 psf | $p_d = h_d \cdot g$ (maximum value) | | | |
| *Total Snow Load, $p_{(TOTAL)}$ = | 66.67 psf | $p_{(TOTAL)} = p_{f(USE)} + p_d$ | | | |



Configuration of Snow Drift on Lower Roof

Equivalent uniform load on low roof joist due to snow drift:



| | |
|---|-------------|
| Location of max. moment, $L_1 =$ | 10.77 ft |
| Maximum moment, $M_{\max} =$ | 1326.85 pft |
| Equivalent uniform load due to drift, $w_e =$ | 0.31 psf |
| Total snow load on joist, $w_s =$ | 14.31 psf |

Per ASCE 7-10-Code for Buildings with Flat or Low Slope Roofs (≤ 5 deg. or 1 in./ft.)
for Balanced Snow, Drift, and Rain-on-Snow Surcharge Loadings

Input Data:

| | |
|------------------------------|-----------|
| Building Risk Category = | II |
| Ground Snow Load, p_g = | 20.00 psf |
| Roof Snow P_f = | 14.00 psf |
| Length of High Roof, L_u = | 12.17 ft |
| Length of Low Roof, L_L = | 184.67 ft |
| Obstruction Height, h_o = | 6.83 ft |
| Exposure Factor, C_e = | 1 |
| Thermal Factor, C_t = | 1 |

Table 1.5-1, page 2

Figure 7-1, page 32 and Table 7-1, page 30, (Verify w/ local jurisdiction)

As per local jurisdiction

Length of Roof Upwind of the Snow Drift

Length of Roof Downwind of the Snow Drift

High Roof - Low Roof Elevations

Table 7-2, page 30

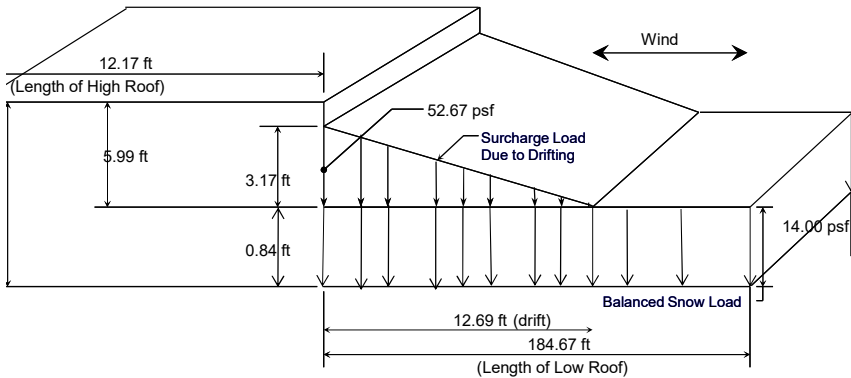
Table 7-3, page 30

Results:

| | |
|-----------------------------------|-----------|
| Importance Factor, I_s = | 1.00 |
| Snow Density, g = | 16.60 pcf |
| Flat Roof Snow Load, p_f = | 14.00 psf |
| $p_{f(USE)}$ = | 14.00 psf |
| Balanced Snow Load Ht., h_b = | 0.84 ft |
| Clear Height, h_c = | 5.99 ft |
| Leeward Drift Height, h_{dL} = | 1.23 ft |
| Windward Drift Height, h_{dW} = | 3.17 ft |
| Design Drift Height, h_d = | 3.17 ft |
| Ratio, h_c/h_b = | 7.10 |
| Drift Length, w = | 12.69 ft |
| Drift Length, $w_{(MAX)}$ = | 47.89 ft |
| Drift Length, $w_{(USE)}$ = | 12.69 ft |
| Wt. of Drift at High End, p_d = | 52.67 psf |
| *Total Snow Load, $p_{(TOTAL)}$ = | 66.67 psf |

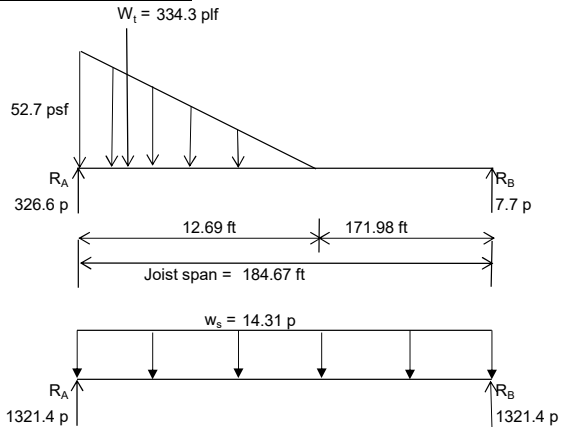
Table 1.5-2, page 5

 $g = 0.13 * p_g + 14 \leq 30$ (Eqn. 7.7-1, page 33) $p_f = 0.7 * C_e * C_t * I_s * p_g$ (Eqn. 7.3-1, page 29) $p_{f(USE)}$ = maximum of: p_f or p_{fj} $h_b = p_{f(USE)} / g$ (Section 7.1, page 29) $h_c = h_o - h_b \geq 0$ (Section 7.1, page 29) $h_{dL} = 0.43 * L_u^{1/3} * (p_g + 10)^{1/4 - 1.5}$, with $L_u \geq 20'$ (Figure 7-9) $h_{dW} = 0.75 * (0.43 * L_L^{1/3} * (p_g + 10)^{1/4 - 1.5})$, with $L_L \geq 20'$ h_d = minimum of: (maximum of: (h_{dL} or h_{dW})) or h_c If $h_c/h_b \geq 0.2$, then snow drifts are required to be appliedIf $h_d \leq h_c$: $w = 4 * h_d$, if $h_d > h_c$: $w = 4 * h_d^2 / h_c$ (Sect. 7.7.1) $w_{(MAX)}$ = minimum of: $8 * h_c$ or L_L $w_{(USE)}$ = minimum of: w or $w_{(MAX)}$ $p_d = h_d * g$ (maximum value) $p_{(TOTAL)} = p_{f(USE)} + p_d$



Configuration of Snow Drift on Lower Roof

Equivalent uniform load on low roof joist due to snow drift:



| | |
|---|-------------|
| Location of max. moment, $L_1 =$ | 10.77 ft |
| Maximum moment, $M_{\max} =$ | 1326.85 pft |
| Equivalent uniform load due to drift, $w_s =$ | 0.31 psf |
| Total snow load on joist, $w_s =$ | 14.31 psf |

**Per ASCE 7-10-Code for Buildings with Flat or Low Slope Roofs (<= 5 deg. or 1 in./ft.)
for Balanced Snow, Drift, and Rain-on-Snow Surcharge Loadings**

Input Data:

| | |
|------------------------------|-----------|
| Building Risk Category = | II |
| Ground Snow Load, p_g = | 20.00 psf |
| Roof Snow P_{rf} = | 14.00 psf |
| Length of High Roof, L_u = | 9.83 ft |
| Length of Low Roof, L_L = | 54.50 ft |
| Obstruction Height, h_o = | 6.83 ft |
| Exposure Factor, C_e = | 1 |
| Thermal Factor, C_t = | 1 |

Table 1.5-1, page 2

Figure 7-1, page 32 and Table 7-1, page 30, (Verify w/ local jurisdiction)

As per local jurisdiction

Length of Roof Upwind of the Snow Drift

Length of Roof Downwind of the Snow Drift

High Roof - Low Roof Elevations

Table 7-2, page 30

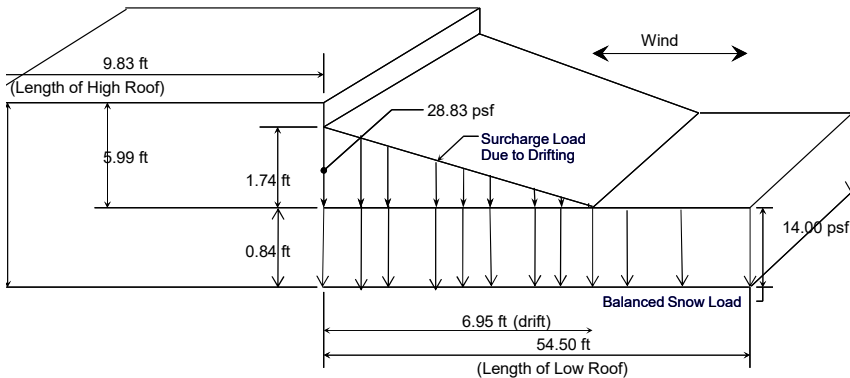
Table 7-3, page 30

Results:

| | |
|-----------------------------------|-----------|
| Importance Factor, I_s = | 1.00 |
| Snow Density, g = | 16.60 pcf |
| Flat Roof Snow Load, p_f = | 14.00 psf |
| $P_{f(USE)}$ = | 14.00 psf |
| Balanced Snow Load Ht., h_b = | 0.84 ft |
| Clear Height, h_c = | 5.99 ft |
| Leeward Drift Height, h_{dL} = | 1.23 ft |
| Windward Drift Height, h_{dW} = | 1.74 ft |
| Design Drift Height, h_d = | 1.74 ft |
| Ratio, h_c/h_b = | 7.10 |
| Drift Length, w = | 6.95 ft |
| Drift Length, $w_{(max)}$ = | 47.89 ft |
| Drift Length, $w_{(use)}$ = | 6.95 ft |
| Wt. of Drift at High End, p_d = | 28.83 psf |
| *Total Snow Load, $p_{(total)}$ = | 42.83 psf |

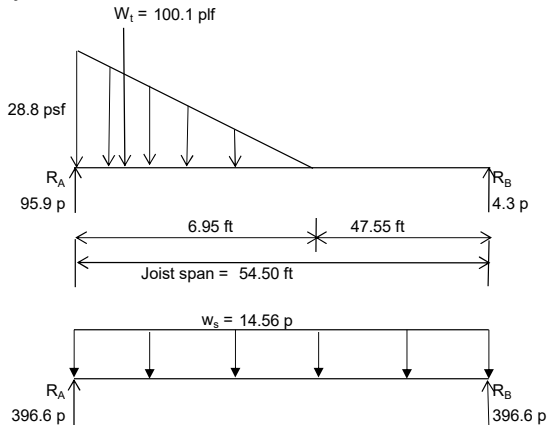
Table 1.5-2, page 5

 $g = 0.13 * p_g + 14 \leq 30$ (Eqn. 7.7-1, page 33) $p_f = 0.7 * C_e * C_t * I_s * p_g$ (Eqn. 7.3-1, page 29) $P_{f(USE)} = \text{maximum of: } p_f \text{ or } p_{fj}$ $h_b = p_{f(USE)} / g$ (Section 7.1, page 29) $h_c = h_o - h_b \geq 0$ (Section 7.1, page 29) $h_{dL} = 0.43 * L_u^{1/3} * (p_g + 10)^{1/4 - 1.5}$, with $L_u \geq 20'$ (Figure 7-9) $h_{dW} = 0.75 * (0.43 * L_L^{1/3} * (p_g + 10)^{1/4 - 1.5})$, with $L_L \geq 20'$ $h_d = \text{minimum of: (maximum of: } (h_{dL} \text{ or } h_{dW})) \text{ or } h_c$ If $h_c/h_b \geq 0.2$, then snow drifts are required to be appliedIf $h_d \leq h_c$: $w = 4 * h_d$, if $h_d > h_c$: $w = 4 * h_d^2 / h_c$ (Sect. 7.7.1) $w_{(max)} = \text{minimum of: } 8 * h_c \text{ or } L_L$ $w_{(use)} = \text{minimum of: } w \text{ or } w_{(max)}$ $p_d = h_d * g$ (maximum value) $p_{(total)} = p_{f(USE)} + p_d$



Configuration of Snow Drift on Lower Roof

Equivalent uniform load on low roof joist due to snow drift:



| | |
|---|-----------|
| Location of max. moment, $L_1 =$ | 5.51 ft |
| Maximum moment, $M_{\max} =$ | 206.35 pf |
| Equivalent uniform load due to drift, $w_e =$ | 0.56 psf |
| Total snow load on joist, $w_s =$ | 14.56 psf |

| | | | |
|----------|--|----------|-----------|
| Job: | | Job No.: | 19-028 |
| Subject: | | Date: | 9/15/2020 |
| | | By: | M.K. |

**Per ASCE 7-10-Code for Buildings with Flat or Low Slope Roofs (<= 5 deg. or 1 in./ft.)
for Balanced Snow, Drift, and Rain-on-Snow Surcharge Loadings**

➔ **Input Data:**

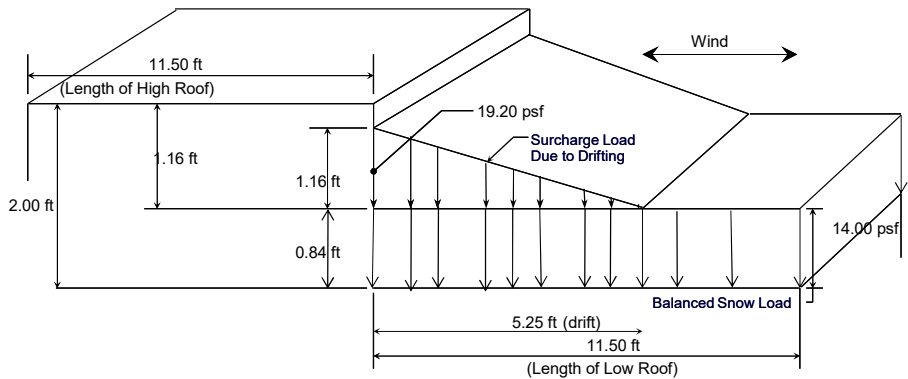
| | |
|------------------------------|-----------|
| Building Risk Category = | II |
| Ground Snow Load, p_g = | 20.00 psf |
| Roof Snow P_{rf} = | 14.00 psf |
| Length of High Roof, L_u = | 11.50 ft |
| Length of Low Roof, L_L = | 11.50 ft |
| Obstruction Height, h_o = | 2.00 ft |
| Exposure Factor, C_e = | 1 |
| Thermal Factor, C_t = | 1 |

Table 1.5-1, page 2
 Figure 7-1, page 32 and Table 7-1, page 30, (Verify w/ local jurisdiction)
 As per local jurisdiction
 Length of Roof Upwind of the Snow Drift
 Length of Roof Downwind of the Snow Drift
 High Roof - Low Roof Elevations
 Table 7-2, page 30
 Table 7-3, page 30

➔ **Results:**

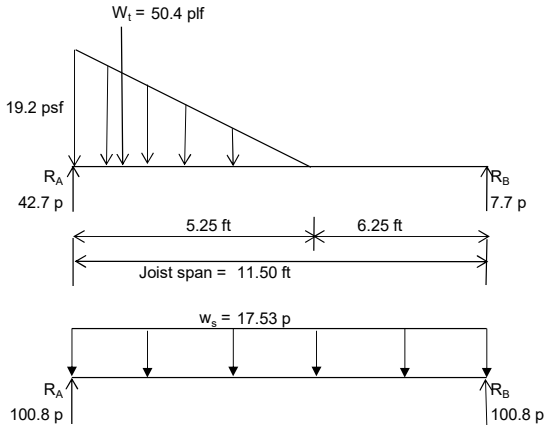
| | |
|-----------------------------------|-----------|
| Importance Factor, I_s = | 1.00 |
| Snow Density, g = | 16.60 pcf |
| Flat Roof Snow Load, p_f = | 14.00 psf |
| $p_{f(used)}$ = | 14.00 psf |
| Balanced Snow Load Ht., h_b = | 0.84 ft |
| Clear Height, h_c = | 1.16 ft |
| Leeward Drift Height, h_{dL} = | 1.23 ft |
| Windward Drift Height, h_{dW} = | 0.92 ft |
| Design Drift Height, h_d = | 1.16 ft |
| Ratio, h_r/h_b = | 1.37 |
| Drift Length, w = | 5.25 ft |
| Drift Length, $w_{(max)}$ = | 9.25 ft |
| Drift Length, $w_{(used)}$ = | 5.25 ft |
| Wt. of Drift at High End, p_d = | 19.20 psf |
| *Total Snow Load, $p_{(total)}$ = | 33.20 psf |

Table 1.5-2, page 5
 $g = 0.13 * p_g + 14 \leq 30$ (Eqn. 7.7-1, page 33)
 $p_f = 0.7 * C_e * C_t * I_s * p_g$ (Eqn. 7.3-1, page 29)
 $p_{f(used)}$ = maximum of: p_f or p_{fj}
 $h_b = p_{f(used)} / g$ (Section 7.1, page 29)
 $h_c = h_o - h_b \geq 0$ (Section 7.1, page 29)
 $h_{dL} = 0.43 * L_u^{1/3} * (p_g + 10)^{1/4 - 1.5}$, with $L_u \geq 20'$ (Figure 7-9)
 $h_{dW} = 0.75 * (0.43 * L_L^{1/3} * (p_g + 10)^{1/4 - 1.5})$, with $L_L \geq 20'$
 h_d = minimum of: (maximum of: (h_{dL} or h_{dW})) or h_c
 If $h_c/h_b \geq 0.2$, then snow drifts are required to be applied
 If $h_d \leq h_c$: $w = 4 * h_d$, if $h_d > h_c$: $w = 4 * h_d^2 / h_c$ (Sect. 7.7.1)
 $w_{(max)}$ = minimum of: $8 * h_c$ or L_L
 $w_{(used)}$ = minimum of: w or $w_{(max)}$
 $p_d = h_d * g$ (maximum value)
 $p_{(total)} = p_{f(used)} + p_d$



Configuration of Snow Drift on Lower Roof

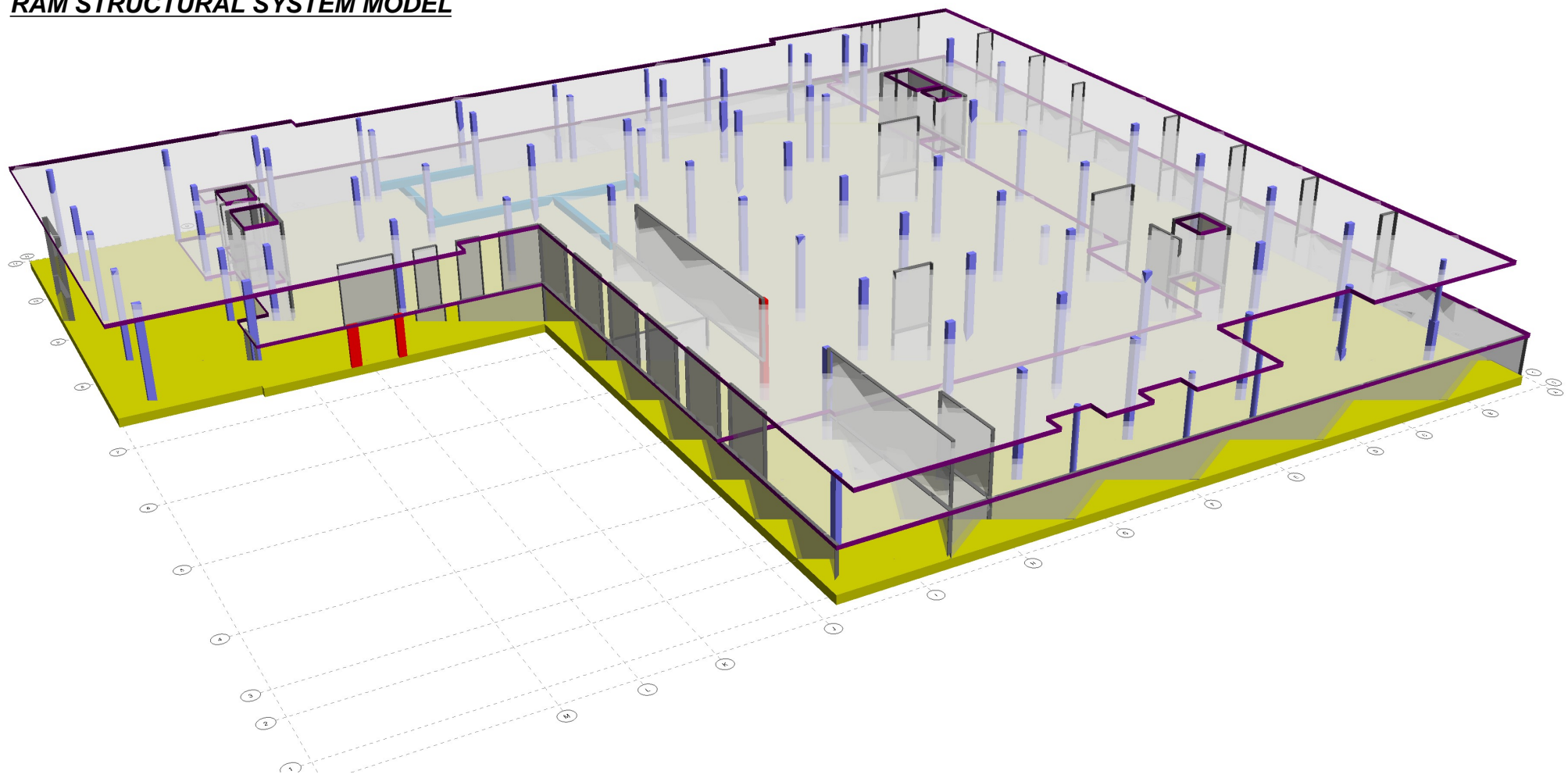
➔ **Equivalent uniform load on low roof joist due to snow drift:**



| | |
|---|-----------|
| Location of max. moment, $L_1 =$ | 3.20 ft |
| Maximum moment, $M_{max} =$ | 58.34 pft |
| Equivalent uniform load due to drift, $w_e =$ | 3.53 psf |
| Total snow load on joist, $w_s =$ | 17.53 psf |

CONCRETE GRAVITY

RAM STRUCTURAL SYSTEM MODEL





Bentley

Concrete Model Data

RAM Concrete Analysis v23.00.00.92
Database: MIMU - Revised Design_v2.0
Building Code: IBC Alt

10/10/23 13:58:48
Concrete Code: ACI 318-14

STORY DATA:

| Level | Story Label | Layout Type | Height (ft) |
|-------|-------------|-------------|-------------|
| 2 | Second | LEVEL 2 | 15.000 |
| 1 | First | LEVEL 1 | 10.500 |

COLUMN SECTION PROPERTIES:

| # | Label | Shape | Depth/Diam in | Width in | Cracked Factor | | |
|---|-------|--------|------------------|-------------|----------------|------|------|
| | | | | | Axial | Flex | Tors |
| 1 | 16x22 | Rect | 22.00 | 16.00 | 1.00 | 0.70 | 1.00 |
| 2 | 12x24 | Rect | 22.00 | 16.00 | 1.00 | 0.70 | 1.00 |
| 3 | 16"Ø | Circle | 16.00 | ---- | 1.00 | 0.70 | 1.00 |
| 4 | 18"Ø | Circle | 18.00 | ---- | 1.00 | 0.50 | 1.00 |
| 5 | 20"Ø | Circle | 20.00 | ---- | 1.00 | 0.50 | 1.00 |
| 6 | 12x22 | Rect | 22.00 | 16.00 | 1.00 | 0.70 | 1.00 |
| 7 | 10x24 | Rect | 24.00 | 10.00 | 1.00 | 0.70 | 1.00 |
| 8 | 10x30 | Rect | 30.00 | 10.00 | 1.00 | 0.70 | 1.00 |

BEAM SECTION PROPERTIES:

| # | Label | Shape | Depth in | Width in | Flange | | Thick in | Cracked Factor | | |
|---|---------|-------|-------------|-------------|----------------|-------------|-------------|----------------|------|------|
| | | | | | Overhang in | Thick in | | Axial | Flex | Tors |
| 1 | 30Wx24D | Rect | 24.00 | 30.00 | ---- | ---- | ---- | 1.00 | 0.35 | 0.10 |
| 2 | 30Wx30D | Rect | 30.00 | 30.00 | ---- | ---- | ---- | 1.00 | 0.35 | 0.10 |
| 3 | 22Wx24D | Rect | 24.00 | 22.00 | ---- | ---- | ---- | 1.00 | 0.35 | 0.10 |
| 4 | 24Wx16D | Rect | 16.00 | 24.00 | ---- | ---- | ---- | 1.00 | 0.35 | 0.10 |
| 5 | 10Wx18D | Rect | 18.00 | 10.00 | ---- | ---- | ---- | 1.00 | 0.35 | 0.10 |

MEMBERS:

Level: Second

Columns

| # | X ft | Y ft | Z-Offset ft | RigMaj in | RigMin in | FrameType | Fixity | Section |
|---|---------|---------|----------------|--------------|--------------|-----------|--------|---------|
| 1 | -16.63 | 108.05 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| 2 | -16.63 | 128.53 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| 3 | -16.63 | 153.28 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| 4 | -16.63 | 171.11 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| 5 | -16.63 | 199.78 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 5 |
| 6 | 6.87 | 108.05 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |



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| # | X | Y | Z-Offset | RigMaj | RigMin | FrameType | Fixity | Section |
|----|--------|--------|----------|--------|--------|-----------|--------|---------|
| | | | | 0.00 | 0.00 | | FFF | |
| 7 | 6.87 | 128.53 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 8 | 8.25 | 153.28 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 9 | 11.70 | 171.11 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 10 | 11.70 | 199.78 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 5 |
| | | | | 0.00 | 0.00 | | FFF | |
| 11 | 16.45 | 125.54 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 12 | 34.45 | 187.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 13 | 34.45 | 198.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 14 | 46.37 | 125.54 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 15 | 47.37 | 156.78 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 16 | 65.70 | 156.78 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 17 | 62.28 | 187.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 18 | 62.28 | 198.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 3 |
| | | | | 0.00 | 0.00 | | FFF | |
| 19 | 74.70 | 125.54 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 20 | 94.04 | 156.78 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 21 | 90.45 | 187.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 22 | 90.45 | 198.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 23 | 99.54 | 15.88 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 24 | 99.79 | 43.21 | 0.00 | 0.00 | 0.00 | Lateral | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 25 | 99.79 | 120.29 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 12.00 | 0.00 | | FFF | |
| 26 | 123.95 | 41.70 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 27 | 123.95 | 69.63 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 28 | 123.95 | 97.46 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |



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| # | X | Y | Z-Offset | RigMaj | RigMin | FrameType | Fixity | Section |
|----|--------|--------|----------|--------|--------|-----------|--------|---------|
| 29 | 123.95 | 125.54 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 30 | 123.95 | 153.63 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 31 | 123.95 | 162.29 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 32 | 118.78 | 187.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 33 | 118.78 | 198.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 3 |
| | | | | 0.00 | 0.00 | | FFF | |
| 34 | 128.20 | -29.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 3 |
| | | | | 0.00 | 0.00 | | FFF | |
| 35 | 128.20 | -11.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 36 | 128.12 | 13.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 37 | 156.95 | 13.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 38 | 152.28 | 125.54 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 39 | 152.29 | 41.70 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 40 | 152.29 | 69.63 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 41 | 152.29 | 97.46 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 42 | 152.79 | 153.63 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 43 | 152.79 | 162.29 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 44 | 166.45 | 187.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 45 | 166.45 | 198.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 46 | 156.45 | -29.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 3 |
| | | | | 0.00 | 0.00 | | FFF | |
| 47 | 156.54 | -11.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 48 | 180.12 | 13.96 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 49 | 180.12 | 41.79 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 50 | 180.12 | 69.63 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 51 | 180.12 | 97.46 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |



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| # | X | Y | Z-Offset | RigMaj | RigMin | FrameType | Fixity | Section |
|----|--------|--------|----------|--------|--------|-----------|--------|---------|
| | | | | 0.00 | 0.00 | | FFF | |
| 53 | 180.12 | 153.63 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 54 | 180.12 | 162.29 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 55 | 194.33 | 187.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 56 | 194.33 | 198.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 3 |
| | | | | 0.00 | 0.00 | | FFF | |
| 57 | 184.87 | -14.04 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 5 |
| | | | | 0.00 | 0.00 | | FFF | |
| 58 | 209.79 | 75.60 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 59 | 209.79 | 102.44 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 60 | 213.45 | 187.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 61 | 213.45 | 198.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 62 | 212.54 | 129.27 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 63 | 212.82 | 13.96 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 64 | 213.20 | -14.04 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 5 |
| | | | | 0.00 | 0.00 | | FFF | |
| 65 | 238.70 | 12.45 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 66 | 238.70 | 38.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 67 | 238.70 | 65.45 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 68 | 238.70 | 91.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 69 | 238.70 | 153.28 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 70 | 238.70 | 179.78 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 72 | 241.45 | -14.04 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 3 |
| | | | | 0.00 | 0.00 | | FFF | |
| 73 | 74.95 | -29.05 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 74 | 173.95 | -29.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 3 |
| | | | | 0.00 | 0.00 | | FFF | |
| 75 | 147.16 | 198.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 3 |
| | | | | 0.00 | 0.00 | | FFF | |



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| # | X | Y | Z-Offset | RigMaj | RigMin | FrameType | Fixity | Section |
|----|--------|--------|----------|--------|--------|-----------|--------|---------|
| 76 | 147.16 | 187.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |

**Level: First
Columns**

| # | X ft | Y ft | Z-Offset ft | RigMaj in | RigMin in | FrameType | Fixity | Section |
|----|---------|---------|----------------|--------------|--------------|-----------|--------|---------|
| 1 | -16.63 | 108.05 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 2 | -16.63 | 128.53 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 3 | -16.63 | 153.28 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 4 | -16.63 | 171.11 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 5 | -16.63 | 199.78 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 5 |
| | | | | 0.00 | 0.00 | | FFF | |
| 6 | 6.87 | 108.05 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 7 | 6.87 | 128.53 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 8 | 8.25 | 153.28 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 9 | 11.70 | 171.11 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 10 | 11.70 | 199.78 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 5 |
| | | | | 0.00 | 0.00 | | FFF | |
| 11 | 16.45 | 125.54 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 12 | 24.20 | 187.88 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 13 | 34.45 | 187.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 14 | 34.45 | 198.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 15 | 46.37 | 125.54 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 16 | 47.37 | 156.78 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 17 | 65.70 | 156.78 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 18 | 62.28 | 187.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 19 | 62.28 | 198.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |



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| # | X | Y | Z-Offset | RigMaj | RigMin | FrameType | Fixity | Section |
|----|--------|--------|----------|--------|--------|-----------|--------|---------|
| 20 | 74.70 | 125.54 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 21 | 94.04 | 156.78 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 22 | 90.45 | 187.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 23 | 90.45 | 198.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 24 | 99.54 | 15.88 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 25 | 99.79 | 43.21 | 0.00 | 0.00 | 0.00 | Lateral | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 26 | 123.95 | 41.70 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 27 | 123.95 | 69.63 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 28 | 123.95 | 97.46 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 29 | 123.95 | 125.54 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 30 | 123.95 | 153.63 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 31 | 123.95 | 162.29 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 32 | 118.78 | 187.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 33 | 118.78 | 198.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 34 | 128.20 | -11.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 35 | 128.12 | 13.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 36 | 156.95 | 13.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 37 | 152.28 | 125.54 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 38 | 152.29 | 41.70 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 39 | 152.29 | 69.63 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 40 | 152.29 | 97.46 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 41 | 152.79 | 153.63 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 42 | 152.79 | 162.29 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |



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| # | X | Y | Z-Offset | RigMaj | RigMin | FrameType | Fixity | Section |
|----|--------|--------|----------|--------|--------|-----------|--------|---------|
| | | | | 0.00 | 0.00 | | FFF | |
| 43 | 166.45 | 187.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 44 | 166.45 | 198.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 45 | 156.54 | -11.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 46 | 180.12 | 13.96 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 47 | 180.12 | 41.79 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 48 | 180.12 | 69.63 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 49 | 180.12 | 97.46 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 51 | 180.12 | 153.63 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 52 | 180.12 | 162.29 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 53 | 194.33 | 187.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 54 | 194.33 | 198.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 55 | 184.87 | -14.04 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 56 | 209.79 | 75.60 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 57 | 209.79 | 102.44 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 58 | 213.45 | 187.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 59 | 213.45 | 198.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 60 | 212.54 | 129.27 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 61 | 212.82 | 13.96 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 62 | 213.20 | -14.04 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 63 | 238.70 | 12.45 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 64 | 238.70 | 38.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 65 | 238.70 | 65.45 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |



Concrete Model Data

RAM Concrete Analysis v23.00.00.92
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| # | X | Y | Z-Offset | RigMaj | RigMin | FrameType | Fixity | Section |
|----|--------|--------|----------|--------|--------|-----------|--------|---------|
| 66 | 238.70 | 91.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 67 | 238.70 | 153.28 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 68 | 238.70 | 179.78 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 70 | 241.45 | -14.04 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 71 | 147.16 | 187.95 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 72 | 147.16 | 198.62 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |
| 73 | 39.38 | 106.30 | 0.00 | 0.00 | 0.00 | Lateral | FFF | 2 |
| | | | | 0.00 | 0.00 | | FFF | |
| 74 | 28.50 | 106.30 | 0.00 | 0.00 | 0.00 | Lateral | FFF | 8 |
| | | | | 0.00 | 0.00 | | FFF | |
| 75 | 198.54 | 75.60 | 0.00 | 0.00 | 0.00 | Gravity | FFF | 1 |
| | | | | 0.00 | 0.00 | | FFF | |

Beams

BeamLine #1

| # | X ft | Y ft | Z-Offset ft | RigEnd in | FrameType | Fixity | f'c psi | Section |
|---|---------|---------|----------------|--------------|-----------|--------|------------|---------|
| 1 | 65.70 | 156.78 | 0.00 | 8.00 | Gravity | PPF | 5000.0 | 3 |
| | 94.04 | 156.78 | 0.00 | 8.00 | | PPF | | |
| 3 | 94.04 | 156.78 | 0.00 | 8.00 | Gravity | PPF | 5000.0 | 3 |
| | 123.95 | 156.78 | 0.00 | 0.00 | | PPF | | |

BeamLine #2

| # | X ft | Y ft | Z-Offset ft | RigEnd in | FrameType | Fixity | f'c psi | Section |
|---|---------|---------|----------------|--------------|-----------|--------|------------|---------|
| 5 | 99.79 | 120.29 | 0.00 | 0.00 | Gravity | PPF | 5000.0 | 3 |
| | 99.79 | 156.78 | 0.00 | 0.00 | | PPF | | |

BeamLine #3

| # | X ft | Y ft | Z-Offset ft | RigEnd in | FrameType | Fixity | f'c psi | Section |
|---|---------|---------|----------------|--------------|-----------|--------|------------|---------|
| 6 | 123.95 | 153.63 | 0.00 | 8.00 | Gravity | PPF | 5000.0 | 3 |
| | 123.95 | 162.29 | 0.00 | 8.00 | | PPF | | |

BeamLine #4

| # | X ft | Y ft | Z-Offset ft | RigEnd in | FrameType | Fixity | f'c psi | Section |
|---|---------|---------|----------------|--------------|-----------|--------|------------|---------|
| 7 | 62.28 | 187.95 | 0.00 | 8.00 | Gravity | PPF | 5000.0 | 3 |
| | 90.45 | 187.95 | 0.00 | 8.00 | | PPF | | |



Concrete Model Data

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BeamLine #5

| # | X ft | Y ft | Z-Offset ft | RigEnd in | FrameType | Fixity | f'c psi | Section |
|---|---------|---------|----------------|--------------|-----------|--------|------------|---------|
| 8 | 68.45 | 156.78 | 0.00 | 0.00 | Gravity | PPF | 5000.0 | 3 |
| | 68.45 | 187.95 | 0.00 | 0.00 | | PPF | | |



Bentley

RAM Steel 23.00.00.92
DataBase: MIMU - Revised Design_v2.0
Building Code: IBC Alt

Floor Map

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Steel Code: AISC 360-16 LRFD

Floor Type: LEVEL 1





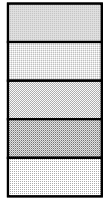
Bentley

RAM Steel 23.00.00.92
DataBase: MIMU - Revised Design_v2.0
Building Code: IBC Alt

Floor Map

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Steel Code: AISC 360-16 LRFD

Surface Loads



| Label | DL psf | CDL psf | LL Reduction psf Type | PLL psf | CLL psf | Mass DL psf |
|------------------|-----------|------------|--------------------------|------------|------------|----------------|
| Garage | 5.0 | 0.0 | 40.0 Unreducible | 0.0 | 0.0 | 5.0 |
| Residential | 20.0 | 0.0 | 40.0 Reducible | 15.0 | 0.0 | 20.0 |
| Lobby Assembly | 25.0 | 0.0 | 100.0 Unreducible | 15.0 | 0.0 | 20.0 |
| Retail | 25.0 | 0.0 | 100.0 Unreducible | 0.0 | 0.0 | 25.0 |
| Retail wBuild Up | 75.0 | 0.0 | 100.0 Unreducible | 0.0 | 0.0 | 75.0 |

Line Loads

| Label | DL k/ft | CDL k/ft | LL Reduction k/ft Type | PLL k/ft | CLL k/ft | Mass DL k/ft |
|-------------------|------------|-------------|---------------------------|-------------|-------------|-----------------|
| L1 8inCMU Wall | 1.120 | 0.000 | 0.000 Reducible | 0.000 | 0.000 | 1.120 |

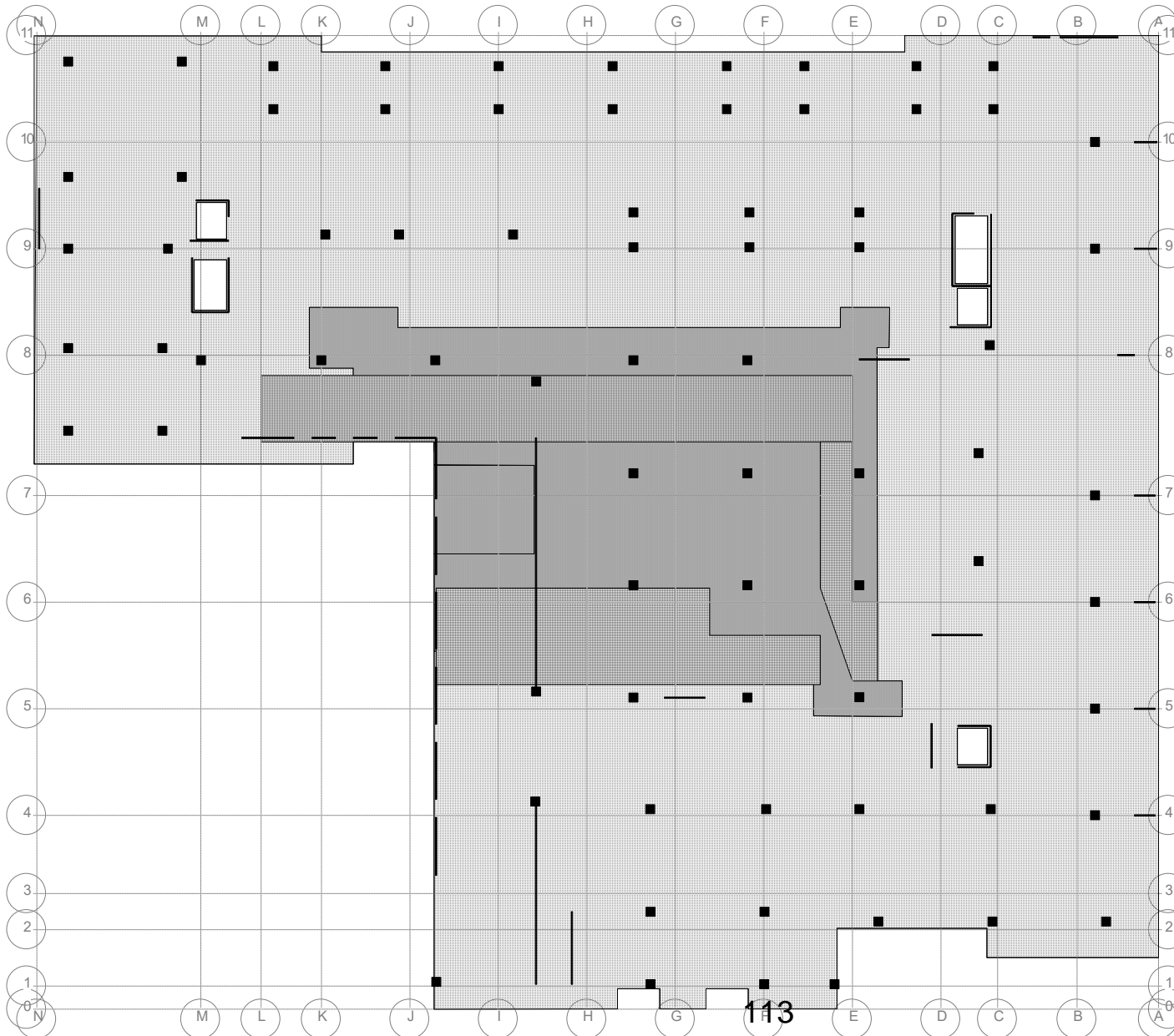


RAM Steel 23.00.00.92
DataBase: MIMU - Revised Design_v2.0
Building Code: IBC Alt

Floor Map

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Steel Code: AISC 360-16 LRFD




Floor Type: LEVEL 2





Floor Map

Surface Loads

| | Label | DL psf | CDL psf | LL Reduction psf Type | PLL psf | CLL psf | Mass DL psf |
|---|-----------------|-------------------|--------------------|----------------------------------|--------------------|--------------------|------------------------|
|  | Podium Transfer | 130.0 | 0.0 | 125.0 Unreducible | 0.0 | 0.0 | 130.0 |
|  | Courtyard | 80.0 | 0.0 | 100.0 Unreducible | 0.0 | 0.0 | 65.0 |
|  | Planters | 235.0 | 0.0 | 100.0 Unreducible | 0.0 | 0.0 | 235.0 |

CONCRETE COLUMNS

Gravity Column Design Criteria

Code

ACI 318-14

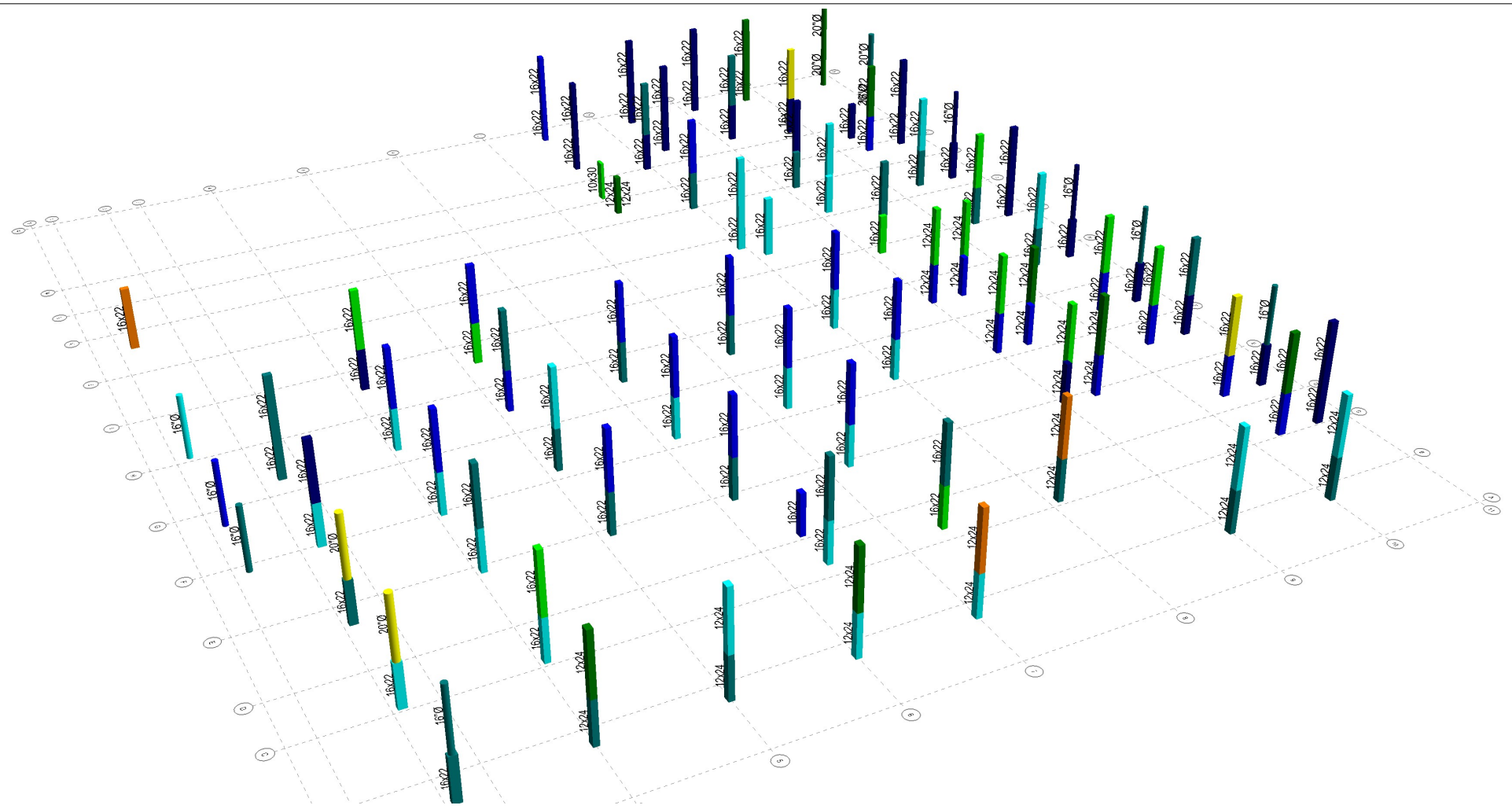
Materials

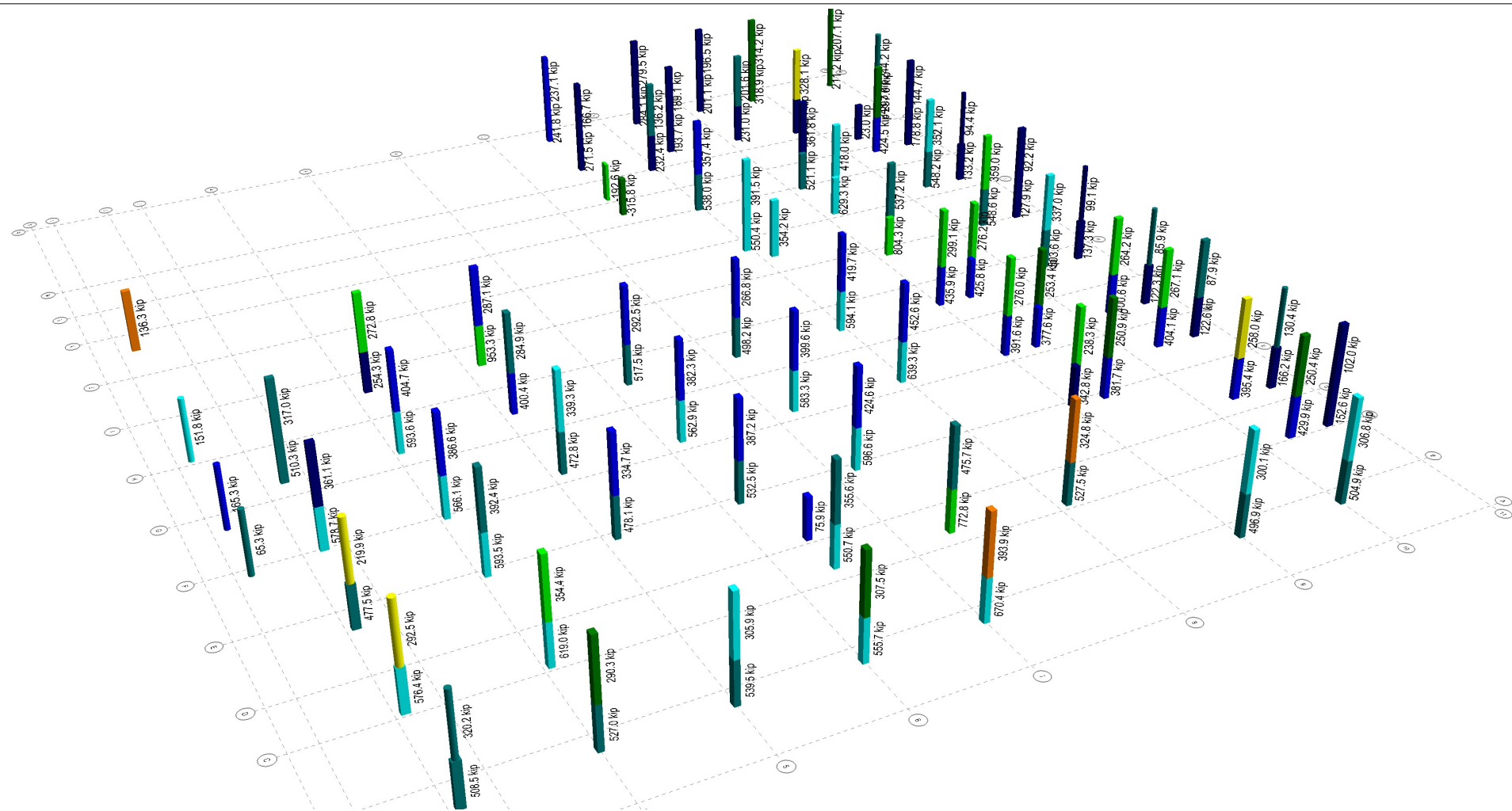
Concrete f'_c = 5,000 psi at 28 days

Reinforcing Steel f_y = 60,000 psi

Analysis:

Column design was performed using the RAM Structural System software with corresponding dead load (self weight of structure plus superimposed load) and live load, see General Notes for loading information.







Concrete Column Design

RAM Concrete Column v23.00.00.92
 Database: MIMU - Revised Design_v2.0
 Building Code: IBC Alt

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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 72
 Size: _____ 16"Ø
 Grid Location: _____ (241.45ft--14.04ft)
 Diameter (in) _____ 16.00

Reinforcement
 Longitudinal: _____ 8-#7
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Circular
 Longitudinal Bars Max Tension Stress Ratio: 0.08
 As (in²) _____ 4.80 (2.39%)
 Clear Cover (in) _____ 1.50

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00
 f_{ct} (ksi): _____ 0.00
 Conc. Weight (pcf): _____ 145.00
 Conc. Modulus (ksi): _____ 4074.28
 f_y Long (ksi): _____ 60.00
 f_{yt} Trans (ksi): _____ 60.00
 Conc. Type: _____ NWC
 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 320.25
 Moment Top Major(kip-ft) _____ 52.58
 Minor(kip-ft) _____ -33.01
 Moment Bottom Major(kip-ft) _____ -10.43
 Minor(kip-ft) _____ -33.01

Calculated Parameters (Angle = 32.12 degrees): L_d/Cap = 0.58

0.65 P_n(kip): _____ 320.25
 0.65 M_n Major(kip-ft): _____ 90.91
 0.65 M_n Minor(kip-ft): _____ 57.07

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 45.00 | 45.00 |
| Slender _____ | Yes | Yes |

Slenderness:

| | | |
|---|---------|---------|
| Pu (kip) _____ | 320.25 | 320.25 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.52 | 0.68 |
| k _{ns} _____ | 1.00 | 1.00 |
| δ _{ns} _____ | 1.00 | 1.21 |
| β _d _____ | 0.63 | 0.63 |
| P _c (kip) _____ | 979.01 | 979.01 |
| I _g (in ⁴) _____ | 3216.99 | 3216.99 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



Concrete Column Design

RAM Concrete Column v23.00.00.92
Database: MIMU - Revised Design_v2.0
Building Code: IBC Alt



| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 4.58 | 54.62 | 166.63 | 0.75 | 165.93 | 0.03 |
| 1 Minor: | 2 | 1.83 | 45.69 | 166.63 | 0.75 | 159.24 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 163.64 | 22.81 | 166.18 | 23.35 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



Concrete Column Design

RAM Concrete Column v23.00.00.92
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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (238.70ft-179.78ft) |
| Column Number: _____ | 70 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 12x24 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (2 x 2) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.70 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 306.79 |
| Moment Top | Major(kip-ft) _____ | -158.27 |
| | Minor(kip-ft) _____ | 27.61 |
| Moment Bottom | Major(kip-ft) _____ | 71.54 |
| | Minor(kip-ft) _____ | 27.61 |

Calculated Parameters (Angle = 9.90 degrees): L_d/Cap = 0.62

| | | | |
|--|--------|--|-------|
| 0.65 P _n (kip): _____ | 306.79 | 0.65 M _n Minor(kip-ft): _____ | 44.47 |
| 0.65 M _n Major(kip-ft): _____ | 254.89 | | |
| | Major | Minor | |
| Kl/r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 306.79 |
| Combination _____ | 2 |
| C _m _____ | 0.71 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.64 |
| P _c (kip) _____ | 2279.32 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



Concrete Column Design

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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 15.32 | 63.15 | 241.03 | 0.75 | 228.13 | 0.07 |
| 1 Minor: | 2 | 0.45 | 53.39 | 166.63 | 0.75 | 165.01 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 330.06 | 53.38 | 244.65 | 42.15 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



Concrete Column Design

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (238.70ft-153.28ft) |
| Column Number: _____ | 69 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 12x24 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (2 x 2) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.77 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 300.12 |
| Moment Top | Major(kip-ft) _____ | -164.70 |
| | Minor(kip-ft) _____ | -27.01 |
| Moment Bottom | Major(kip-ft) _____ | 34.06 |
| | Minor(kip-ft) _____ | 27.01 |

Calculated Parameters (Angle = 9.31 degrees): L_d/Cap = 0.65

| | | | |
|--|-------------|--|-------|
| 0.65 P _n (kip): _____ | 300.12 | 0.65 M _n Minor(kip-ft): _____ | 41.70 |
| 0.65 M _n Major(kip-ft): _____ | 254.26 | | |
| K _l /r _____ | Major 28.34 | Minor 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 300.12 |
| Combination _____ | 2 |
| C _m _____ | 0.59 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.64 |
| P _c (kip) _____ | 2279.52 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 14.97 | 62.73 | 241.03 | 0.75 | 227.82 | 0.07 |
| 1 Minor: | 2 | 0.90 | 59.63 | 166.63 | 0.75 | 169.69 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 328.00 | 53.12 | 242.84 | 41.85 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

Level _____ Second

Column Number: _____ 68

Grid Location: _____ (238.70ft-91.95ft)

Size: _____ 12x24

Depth x Width (in) _____ 22.00x16.00

Reinforcement

Longitudinal: _____ 8-#9 (2 x 2)

As (in²) _____ 8.00 (2.27%)

Transverse: _____ #5@ 3.0" 0'-0"-3'-0"

#5@ 6.0" 3'-0"-12'-0" #5@ 3.0" 12'-0"-15'-0"

Confinement _____ Tie

Clear Cover (in) _____ 1.50

Shear Legs Major _____ 2

Shear Legs Minor _____ 2

Longitudinal Bars Max Tension Stress Ratio: 0.85

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00

f_y Long (ksi): _____ 60.00

f_{ct} (ksi): _____ 0.00

f_y Trans (ksi): _____ 60.00

Conc. Weight (pcf): _____ 145.00

Conc. Type: _____ NWC

Conc. Modulus (ksi): _____ 4074.28

Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

Axial Load (kip) _____ 393.94

Moment Top Major(kip-ft) _____ -187.52

Minor(kip-ft) _____ 165.54

Moment Bottom Major(kip-ft) _____ 67.10

Minor(kip-ft) _____ -35.45

Calculated Parameters (Angle = 41.44 degrees): L_d/Cap = 0.99

0.65 P_n(kip): _____ 393.94

0.65 M_n Major(kip-ft): _____ 189.06 0.65 M_n Minor(kip-ft): _____ 166.90

K_l/r _____ Major 28.34 Minor 38.97

Slender _____ No Yes

Slenderness:

P_u (kip) _____ 393.94

Combination _____ 2

C_m _____ 0.58

k_{ns} _____ 1.00

δ_{ns} _____ 1.00

β_d _____ 0.63

P_c (kip) _____ 2281.64

I_g (in⁴) _____ 7509.33

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



Concrete Column Design

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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 20.13 | 68.15 | 239.46 | 0.75 | 230.70 | 0.09 |
| 1 Minor: | 2 | 12.53 | 64.59 | 165.06 | 0.75 | 172.23 | 0.07 |
| 2 Major: | 2 | 20.13 | 68.15 | 119.73 | 0.75 | 140.91 | 0.14 |
| 2 Minor: | 2 | 12.53 | 64.59 | 82.53 | 0.75 | 110.34 | 0.11 |
| 3 Major: | 2 | 20.13 | 68.15 | 239.46 | 0.75 | 230.70 | 0.09 |
| 3 Minor: | 2 | 12.53 | 64.59 | 165.06 | 0.75 | 172.23 | 0.07 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 445.95 | 68.50 | 345.74 | 58.53 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



Concrete Column Design

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (238.70ft-65.45ft) |
| Column Number: _____ | 67 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 12x24 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (2 x 2) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.83 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| fc (ksi): _____ | 5.00 | fy Long (ksi): _____ | 60.00 |
| fc _t (ksi): _____ | 0.00 | fy _t Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 307.46 |
| Moment Top | Major(kip-ft) _____ | -184.71 |
| | Minor(kip-ft) _____ | -27.67 |
| Moment Bottom | Major(kip-ft) _____ | 44.24 |
| | Minor(kip-ft) _____ | 27.67 |

Calculated Parameters (Angle = 8.52 degrees): L_d/Cap = 0.71

| | | | |
|--|--------|--|-------|
| 0.65 P _n (kip): _____ | 307.46 | 0.65 M _n Minor(kip-ft): _____ | 38.88 |
| 0.65 M _n Major(kip-ft): _____ | 259.55 | | |
| | Major | Minor | |
| Kl/r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 307.46 |
| Combination _____ | 2 |
| C _m _____ | 0.56 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.64 |
| P _c (kip) _____ | 2279.21 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 17.13 | 63.19 | 241.03 | 0.75 | 228.16 | 0.08 |
| 1 Minor: | 2 | 1.83 | 60.07 | 166.63 | 0.75 | 170.02 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 330.28 | 53.40 | 244.84 | 42.18 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (238.70ft-38.95ft) |
| Column Number: _____ | 66 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 12x24 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (2 x 2) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.80 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 305.88 |
| Moment Top | Major(kip-ft) _____ | -172.22 |
| | Minor(kip-ft) _____ | 27.53 |
| Moment Bottom | Major(kip-ft) _____ | 47.04 |
| | Minor(kip-ft) _____ | -27.53 |

Calculated Parameters (Angle = 9.08 degrees): L_d/Cap = 0.67

| | | | |
|--|--------|--|-------|
| 0.65 P _n (kip): _____ | 305.88 | 0.65 M _n Minor(kip-ft): _____ | 40.82 |
| 0.65 M _n Major(kip-ft): _____ | 255.35 | | |
| | Major | Minor | |
| K _l /r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 305.88 |
| Combination _____ | 2 |
| C _m _____ | 0.50 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.64 |
| P _c (kip) _____ | 2279.44 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 16.59 | 63.09 | 241.03 | 0.75 | 228.09 | 0.07 |
| 1 Minor: | 2 | 1.82 | 59.97 | 166.63 | 0.75 | 169.95 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| At Column | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| | 329.77 | 53.34 | 244.39 | 42.11 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (238.70ft-12.45ft) |
| Column Number: _____ | 65 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 12x24 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (2 x 2) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.81 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| fc (ksi): _____ | 5.00 | fy Long (ksi): _____ | 60.00 |
| fc _t (ksi): _____ | 0.00 | fy _t Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 290.27 |
| Moment Top | Major(kip-ft) _____ | -146.71 |
| | Minor(kip-ft) _____ | -70.82 |
| Moment Bottom | Major(kip-ft) _____ | 46.41 |
| | Minor(kip-ft) _____ | 26.12 |

Calculated Parameters (Angle = 25.77 degrees): L_d/Cap = 0.71

| | | | |
|--|--------|--|-------|
| 0.65 P _n (kip): _____ | 290.27 | 0.65 M _n Minor(kip-ft): _____ | 99.48 |
| 0.65 M _n Major(kip-ft): _____ | 206.07 | | |
| | Major | Minor | |
| Kl/r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 290.27 |
| Combination _____ | 2 |
| C _m _____ | 0.55 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.64 |
| P _c (kip) _____ | 2278.77 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 14.75 | 62.12 | 241.03 | 0.75 | 227.36 | 0.06 |
| 1 Minor: | 2 | 5.62 | 59.05 | 166.63 | 0.75 | 169.25 | 0.03 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 325.06 | 52.68 | 240.25 | 41.39 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (213.45ft-198.62ft) |
| Column Number: _____ | 61 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.69 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| fc (ksi): _____ | 5.00 | fy Long (ksi): _____ | 60.00 |
| fc _t (ksi): _____ | 0.00 | fy _t Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 101.97 |
| Moment Top | Major(kip-ft) _____ | 28.77 |
| | Minor(kip-ft) _____ | -35.48 |
| Moment Bottom | Major(kip-ft) _____ | 0.68 |
| | Minor(kip-ft) _____ | 9.31 |

Calculated Parameters (Angle = 50.96 degrees): L_d/Cap = 0.29

| | | | |
|--|--------|--|--------|
| 0.65 P _n (kip): _____ | 101.97 | 0.65 M _n Minor(kip-ft): _____ | 124.27 |
| 0.65 M _n Major(kip-ft): _____ | 100.77 | | |
| | Major | Minor | |
| Kl/r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 101.97 |
| Combination _____ | 2 |
| C _m _____ | 0.50 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.65 |
| P _c (kip) _____ | 2256.56 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 44.68 | 0.00 | 241.03 | 0.75 | 180.77 | 0.25 |
| 1 Minor: | 2 | 30.83 | 0.00 | 166.63 | 0.75 | 124.97 | 0.25 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 270.23 | 44.68 | 187.36 | 30.83 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (213.45ft-187.95ft) |
| Column Number: _____ | 60 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.99 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| fc (ksi): _____ | 5.00 | fy Long (ksi): _____ | 60.00 |
| fc _t (ksi): _____ | 0.00 | fy _t Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 250.42 |
| Moment Top | Major(kip-ft) _____ | -161.14 |
| | Minor(kip-ft) _____ | -80.20 |
| Moment Bottom | Major(kip-ft) _____ | 34.04 |
| | Minor(kip-ft) _____ | 22.54 |

Calculated Parameters (Angle = 26.46 degrees): L_d/Cap = 0.78

| | | | |
|--|-------------|--|--------|
| 0.65 P _n (kip): _____ | 250.42 | 0.65 M _n Minor(kip-ft): _____ | 102.27 |
| 0.65 M _n Major(kip-ft): _____ | 205.49 | | |
| Kl/r _____ | Major 28.34 | Minor 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 250.42 |
| Combination _____ | 2 |
| C _m _____ | 0.52 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.64 |
| P _c (kip) _____ | 2277.75 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 14.75 | 59.63 | 241.03 | 0.75 | 225.49 | 0.07 |
| 1 Minor: | 2 | 7.27 | 56.68 | 166.63 | 0.75 | 167.48 | 0.04 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 325.70 | 54.39 | 225.38 | 37.49 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (213.20ft--14.04ft) |
| Column Number: _____ | 64 | Diameter (in) _____ | 20.00 |
| Size: _____ | 20"Ø | | |
| Reinforcement | | | |
| Longitudinal: _____ | 10-#8 | As (in ²) _____ | 7.90 (2.51%) |
| Transverse: _____ | #4@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Circular | Clear Cover (in) _____ | 1.50 |
| Longitudinal Bars Max Tension Stress Ratio: 1.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 292.49 |
| Moment Top | Major(kip-ft) _____ | 209.43 |
| | Minor(kip-ft) _____ | -59.44 |
| Moment Bottom | Major(kip-ft) _____ | -49.97 |
| | Minor(kip-ft) _____ | -27.59 |

Calculated Parameters (Angle = 15.85 degrees): L_d/Cap = 0.90

| | | | |
|--|--------|--|-------|
| 0.66 P _n (kip): _____ | 292.49 | 0.66 M _n Minor(kip-ft): _____ | 65.89 |
| 0.66 M _n Major(kip-ft): _____ | 232.17 | | |
| | Major | Minor | |
| Kl/r _____ | 36.00 | 36.00 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 292.49 |
| Combination _____ | 2 |
| C _m _____ | 0.61 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.63 |
| P _c (kip) _____ | 2385.78 |
| I _g (in ⁴) _____ | 7853.98 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 17.29 | 72.54 | 140.00 | 0.75 | 159.40 | 0.11 |
| 1 Minor: | 2 | 3.90 | 72.54 | 140.00 | 0.75 | 159.40 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 320.16 | 48.52 | 324.09 | 49.57 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 63
 Size: _____ 16x22
 Grid Location: _____ (212.82ft-13.96ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 3 Shear Legs Minor _____ 4
 Longitudinal Bars Max Tension Stress Ratio: 0.80

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fyt Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp
 Axial Load (kip) _____ 354.36
 Moment Top Major(kip-ft) _____ 17.78
 Minor(kip-ft) _____ -170.47
 Moment Bottom Major(kip-ft) _____ -3.52
 Minor(kip-ft) _____ 51.43

Calculated Parameters (Angle = 84.04 degrees): Ld/Cap = 0.82

0.65 P_n(kip): _____ 354.36
 0.65 M_n Major(kip-ft): _____ 21.60 0.65 M_n Minor(kip-ft): _____ 207.09

| | Major | Minor |
|---------------|-------|-------|
| Kl/r _____ | 28.34 | 38.97 |
| Slender _____ | No | Yes |

Slenderness:

P_u (kip) _____ 354.36
 Combination _____ 2
 C_m _____ 0.48
 k_{ns} _____ 1.00
 δ_{ns} _____ 1.00
 β_d _____ 0.63
 P_c (kip) _____ 2281.47
 I_g (in⁴) _____ 7509.33

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 1.56 | 66.12 | 361.54 | 0.75 | 320.74 | 0.00 |
| 1 Minor: | 2 | 16.80 | 62.85 | 333.25 | 0.75 | 297.08 | 0.06 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 360.01 | 59.68 | 248.98 | 41.12 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|----------------------|-----------------------------|------------------------|
| Level _____ | Second | Grid Location: _____ | (212.54ft-129.27ft) |
| Column Number: _____ | 62 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 12x24 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#9 (2 x 2) | As (in ²) _____ | 8.00 (2.27%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-3'-0" | #5@ 6.0" 3'-0"-12'-0" | #5@ 3.0" 12'-0"-15'-0" |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.96 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|-----------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _y Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 324.79 |
| Moment Top | Major(kip-ft) _____ | 196.56 |
| | Minor(kip-ft) _____ | -148.07 |
| Moment Bottom | Major(kip-ft) _____ | -31.25 |
| | Minor(kip-ft) _____ | 34.02 |

Calculated Parameters (Angle = 36.99 degrees): L_d/Cap = 0.97

| | | | |
|--|--------|--|--------|
| 0.65 P _n (kip): _____ | 324.79 | 0.65 M _n Minor(kip-ft): _____ | 151.93 |
| 0.65 M _n Major(kip-ft): _____ | 201.68 | | |
| | Major | Minor | |
| K _l /r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 324.79 |
| Combination _____ | 2 |
| C _m _____ | 0.51 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.64 |
| P _c (kip) _____ | 2277.49 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 16.79 | 63.85 | 239.46 | 0.75 | 227.48 | 0.07 |
| 1 Minor: | 2 | 13.93 | 60.52 | 165.06 | 0.75 | 169.18 | 0.08 |
| 2 Major: | 2 | 16.79 | 63.85 | 119.73 | 0.75 | 137.69 | 0.12 |
| 2 Minor: | 2 | 13.93 | 60.52 | 82.53 | 0.75 | 107.29 | 0.13 |
| 3 Major: | 2 | 16.79 | 63.85 | 239.46 | 0.75 | 227.48 | 0.07 |
| 3 Minor: | 2 | 13.93 | 60.52 | 165.06 | 0.75 | 169.18 | 0.08 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 431.14 | 66.80 | 329.69 | 55.70 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 59
 Size: _____ 16x22
 Grid Location: _____ (209.79ft-102.44ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.18

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fyt Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp
 Axial Load (kip) _____ 475.70
 Moment Top Major(kip-ft) _____ 115.15
 Minor(kip-ft) _____ 42.81
 Moment Bottom Major(kip-ft) _____ -34.20
 Minor(kip-ft) _____ -42.81

Calculated Parameters (Angle = 20.39 degrees): Ld/Cap = 0.52

0.65 P_n(kip): _____ 475.70
 0.65 M_n Major(kip-ft): _____ 242.13 0.65 M_n Minor(kip-ft): _____ 90.02

| | Major | Minor |
|---------------|-------|-------|
| Kl/r _____ | 28.34 | 38.97 |
| Slender _____ | No | Yes |

Slenderness:

P_u (kip) _____ 475.70
 Combination _____ 2
 C_m _____ 0.58
 k_{ns} _____ 1.00
 δ_{ns} _____ 1.00
 β_d _____ 0.63
 P_c (kip) _____ 2286.75
 I_g (in⁴) _____ 7509.33

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 11.97 | 73.70 | 241.03 | 0.75 | 236.04 | 0.05 |
| 1 Minor: | 2 | 1.25 | 59.61 | 166.63 | 0.75 | 169.68 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 395.11 | 64.18 | 273.29 | 44.22 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (209.79ft-75.60ft) |
| Column Number: _____ | 58 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.50 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 355.61 |
| Moment Top | Major(kip-ft) _____ | 44.41 |
| | Minor(kip-ft) _____ | 94.47 |
| Moment Bottom | Major(kip-ft) _____ | -58.15 |
| | Minor(kip-ft) _____ | -32.00 |

Calculated Parameters (Angle = 64.82 degrees): L_d/Cap = 0.51

| | | | | | |
|----------------------------------|--------|--|-------|--|--------|
| 0.65 P _n (kip): _____ | 355.61 | 0.65 M _n Major(kip-ft): _____ | 87.07 | 0.65 M _n Minor(kip-ft): _____ | 185.24 |
| | Major | | Minor | | |
| K _l /r _____ | 28.34 | | 38.97 | | |
| Slender _____ | No | | Yes | | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 355.61 |
| Combination _____ | 2 |
| C _m _____ | 0.51 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.63 |
| P _c (kip) _____ | 2285.69 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 9.34 | 66.20 | 241.03 | 0.75 | 230.42 | 0.04 |
| 1 Minor: | 2 | 8.62 | 62.93 | 166.63 | 0.75 | 172.16 | 0.05 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 359.87 | 59.73 | 248.89 | 41.15 |

TORSION CAPACITY:

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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 56
 Size: _____ 16"Ø
 Grid Location: _____ (194.33ft-198.62ft)
 Diameter (in) _____ 16.00

Reinforcement
 Longitudinal: _____ 8-#7
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Circular
 Longitudinal Bars Max Tension Stress Ratio: 0.72
 As (in²) _____ 4.80 (2.39%)
 Clear Cover (in) _____ 1.50

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00
 f_{ct} (ksi): _____ 0.00
 Conc. Weight (pcf): _____ 145.00
 Conc. Modulus (ksi): _____ 4074.28
 f_y Long (ksi): _____ 60.00
 f_{yt} Trans (ksi): _____ 60.00
 Conc. Type: _____ NWC
 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 130.45
 Moment Top Major(kip-ft) _____ 32.16
 Minor(kip-ft) _____ 43.50
 Moment Bottom Major(kip-ft) _____ 11.15
 Minor(kip-ft) _____ -3.71

Calculated Parameters (Angle = 53.52 degrees): L_d/Cap = 0.50

0.65 P_n(kip): _____ 130.45
 0.65 M_n Major(kip-ft): _____ 64.02
 0.65 M_n Minor(kip-ft): _____ 86.58

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 45.00 | 45.00 |
| Slender _____ | Yes | Yes |

Slenderness:

| | | |
|---|---------|---------|
| P _u (kip) _____ | 130.45 | 130.45 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.61 | 0.57 |
| k _{ns} _____ | 1.00 | 1.00 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.64 | 0.64 |
| P _c (kip) _____ | 975.23 | 975.23 |
| I _g (in ⁴) _____ | 3216.99 | 3216.99 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 2.07 | 40.27 | 166.63 | 0.75 | 155.17 | 0.01 |
| 1 Minor: | 2 | 3.33 | 40.27 | 166.63 | 0.75 | 155.17 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 142.76 | 21.77 | 144.55 | 22.15 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (194.33ft-187.95ft) |
| Column Number: _____ | 55 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 1.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 258.02 |
| Moment Top | Major(kip-ft) _____ | -197.10 |
| | Minor(kip-ft) _____ | 96.93 |
| Moment Bottom | Major(kip-ft) _____ | 47.59 |
| | Minor(kip-ft) _____ | -23.22 |

Calculated Parameters (Angle = 26.19 degrees): L_d/Cap = 0.91

| | | | |
|--|-------------|--|--------|
| 0.69 P _n (kip): _____ | 258.02 | 0.69 M _n Minor(kip-ft): _____ | 105.96 |
| 0.69 M _n Major(kip-ft): _____ | 215.46 | | |
| K _l /r _____ | Major 28.34 | Minor 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 258.02 |
| Combination _____ | 2 |
| C _m _____ | 0.52 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.64 |
| P _c (kip) _____ | 2278.00 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 16.66 | 60.10 | 241.03 | 0.75 | 225.85 | 0.07 |
| 1 Minor: | 2 | 8.33 | 57.13 | 166.63 | 0.75 | 167.82 | 0.05 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 328.30 | 54.81 | 227.17 | 37.78 |

TORSION CAPACITY:

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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 57
 Size: _____ 20"Ø
 Grid Location: _____ (184.87ft--14.04ft)
 Diameter (in) _____ 20.00

Reinforcement
 Longitudinal: _____ 10-#8
 Transverse: _____ #4@ 3.0" 0'-0"-15'-0"
 Confinement _____ Circular
 Longitudinal Bars Max Tension Stress Ratio: 1.00
 As (in²) _____ 7.90 (2.51%)
 Clear Cover (in) _____ 1.50

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00
 f_{ct} (ksi): _____ 0.00
 Conc. Weight (pcf): _____ 145.00
 Conc. Modulus (ksi): _____ 4074.28
 f_y Long (ksi): _____ 60.00
 f_{yt} Trans (ksi): _____ 60.00
 Conc. Type: _____ NWC
 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 219.87
 Moment Top Major(kip-ft) _____ 236.37
 Minor(kip-ft) _____ -1.02
 Moment Bottom Major(kip-ft) _____ -20.74
 Minor(kip-ft) _____ 7.08

Calculated Parameters (Angle = 0.25 degrees): L_d/Cap = 0.94

0.73 P_n(kip): _____ 219.87
 0.73 M_n Major(kip-ft): _____ 251.57
 0.73 M_n Minor(kip-ft): _____ 1.09

| | Major | Minor |
|---------------|-------|-------|
| Kl/r _____ | 36.00 | 36.00 |
| Slender _____ | Yes | Yes |

Slenderness:

| | | |
|---|---------|---------|
| P _u (kip) _____ | 219.87 | 219.87 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.57 | 0.54 |
| k _{ns} _____ | 1.00 | 1.00 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.63 | 0.63 |
| P _c (kip) _____ | 2386.67 | 2386.67 |
| I _g (in ⁴) _____ | 7853.98 | 7853.98 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 17.71 | 66.82 | 140.00 | 0.75 | 155.11 | 0.11 |
| 1 Minor: | 2 | 0.75 | 66.82 | 140.00 | 0.75 | 155.11 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 307.37 | 47.28 | 310.98 | 48.12 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (180.12ft-162.29ft) |
| Column Number: _____ | 54 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 12x24 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (2 x 2) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 1.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| fc (ksi): _____ | 5.00 | fy Long (ksi): _____ | 60.00 |
| fc _t (ksi): _____ | 0.00 | fy _t Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 250.87 |
| Moment Top | Major(kip-ft) _____ | -35.50 |
| | Minor(kip-ft) _____ | 150.96 |
| Moment Bottom | Major(kip-ft) _____ | 7.09 |
| | Minor(kip-ft) _____ | -40.55 |

Calculated Parameters (Angle = 76.77 degrees): L_d/Cap = 0.76

| | | | |
|--|--------|--|--------|
| 0.66 P _n (kip): _____ | 250.87 | 0.66 M _n Minor(kip-ft): _____ | 199.67 |
| 0.66 M _n Major(kip-ft): _____ | 46.95 | | |
| | Major | Minor | |
| Kl/r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 250.87 |
| Combination _____ | 2 |
| C _m _____ | 0.49 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.64 |
| P _c (kip) _____ | 2276.20 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 2.87 | 59.65 | 241.03 | 0.75 | 225.51 | 0.01 |
| 1 Minor: | 2 | 14.59 | 56.71 | 166.63 | 0.75 | 167.50 | 0.09 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 313.21 | 50.93 | 229.84 | 39.51 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (180.12ft-153.63ft) |
| Column Number: _____ | 53 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 12x24 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (2 x 2) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 1.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 238.30 |
| Moment Top | Major(kip-ft) _____ | -76.66 |
| | Minor(kip-ft) _____ | -145.82 |
| Moment Bottom | Major(kip-ft) _____ | 11.12 |
| | Minor(kip-ft) _____ | 29.59 |

Calculated Parameters (Angle = 62.27 degrees): L_d/Cap = 0.81

| | | | |
|--|-------------|--|--------|
| 0.68 P _n (kip): _____ | 238.30 | 0.68 M _n Minor(kip-ft): _____ | 181.00 |
| 0.68 M _n Major(kip-ft): _____ | 95.15 | | |
| K _l /r _____ | Major 28.34 | Minor 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 238.30 |
| Combination _____ | 2 |
| C _m _____ | 0.52 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.63 |
| P _c (kip) _____ | 2282.55 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 5.85 | 58.87 | 241.03 | 0.75 | 224.92 | 0.03 |
| 1 Minor: | 2 | 12.63 | 55.96 | 166.63 | 0.75 | 166.94 | 0.08 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 308.83 | 50.31 | 225.99 | 38.87 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (180.12ft-97.46ft) |
| Column Number: _____ | 51 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| fc (ksi): _____ | 5.00 | fy Long (ksi): _____ | 60.00 |
| fc _t (ksi): _____ | 0.00 | fy _t Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 424.59 |
| Moment Top | Major(kip-ft) _____ | -21.00 |
| | Minor(kip-ft) _____ | 38.21 |
| Moment Bottom | Major(kip-ft) _____ | 11.21 |
| | Minor(kip-ft) _____ | -38.21 |

Calculated Parameters (Angle = 61.21 degrees): L_d/Cap = 0.46

| | | | |
|--|--------|--|--------|
| 0.65 P _n (kip): _____ | 424.59 | 0.65 M _n Minor(kip-ft): _____ | 181.17 |
| 0.65 M _n Major(kip-ft): _____ | 99.56 | | |
| | Major | Minor | |
| Kl/r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 424.59 |
| Combination _____ | 2 |
| C _m _____ | 0.55 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.67 |
| P _c (kip) _____ | 2226.37 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (1) 1.400 D



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 1 | 2.50 | 64.85 | 241.03 | 0.75 | 229.41 | 0.01 |
| 1 Minor: | 1 | 0.93 | 61.65 | 166.63 | 0.75 | 171.20 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 389.04 | 62.50 | 269.08 | 43.05 |

TORSION CAPACITY:

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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 50
 Size: _____ 16x22
 Grid Location: _____ (180.12ft-69.63ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.17

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 387.15
 Moment Top Major(kip-ft) _____ -72.56
 Minor(kip-ft) _____ 34.84
 Moment Bottom Major(kip-ft) _____ 41.87
 Minor(kip-ft) _____ 34.84

Calculated Parameters (Angle = 25.65 degrees): L_d/Cap = 0.42

0.65 P_n(kip): _____ 387.15
 0.65 M_n Major(kip-ft): _____ 220.38 0.65 M_n Minor(kip-ft): _____ 105.82

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 28.34 | 38.97 |
| Slender _____ | No | Yes |

Slenderness:

P_u (kip) _____ 387.15
 Combination _____ 2
 C_m _____ 0.64
 k_{ns} _____ 1.00
 δ_{ns} _____ 1.00
 β_d _____ 0.68
 P_c (kip) _____ 2221.53
 I_g (in⁴) _____ 7509.33

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 6.85 | 60.38 | 241.03 | 0.75 | 226.06 | 0.03 |
| 1 Minor: | 2 | 1.33 | 64.80 | 166.63 | 0.75 | 173.57 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 378.28 | 61.06 | 261.61 | 42.06 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (180.12ft-41.79ft) |
| Column Number: _____ | 49 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.45 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| fc (ksi): _____ | 5.00 | fy Long (ksi): _____ | 60.00 |
| fc _t (ksi): _____ | 0.00 | fy _t Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 334.73 |
| Moment Top | Major(kip-ft) _____ | -130.91 |
| | Minor(kip-ft) _____ | 30.13 |
| Moment Bottom | Major(kip-ft) _____ | 37.24 |
| | Minor(kip-ft) _____ | -30.13 |

Calculated Parameters (Angle = 12.96 degrees): L_d/Cap = 0.49

| | | | |
|--|--------|--|-------|
| 0.65 P _n (kip): _____ | 334.73 | 0.65 M _n Minor(kip-ft): _____ | 61.43 |
| 0.65 M _n Major(kip-ft): _____ | 266.93 | | |
| | Major | Minor | |
| Kl/r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 334.73 |
| Combination _____ | 2 |
| C _m _____ | 0.43 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.67 |
| P _c (kip) _____ | 2237.99 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 11.21 | 64.89 | 241.03 | 0.75 | 229.44 | 0.05 |
| 1 Minor: | 1 | 2.74 | 57.25 | 166.63 | 0.75 | 167.90 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 359.10 | 58.76 | 248.36 | 40.48 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (180.12ft-13.96ft) |
| Column Number: _____ | 48 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 3 | Shear Legs Minor _____ | 4 |
| Longitudinal Bars Max Tension Stress Ratio: 0.33 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 392.36 |
| Moment Top | Major(kip-ft) _____ | 42.88 |
| | Minor(kip-ft) _____ | -98.69 |
| Moment Bottom | Major(kip-ft) _____ | -17.31 |
| | Minor(kip-ft) _____ | 35.31 |

Calculated Parameters (Angle = 66.52 degrees): L_d/Cap = 0.52

| | | | |
|--|-------------|--|--------|
| 0.65 P _n (kip): _____ | 392.36 | 0.65 M _n Minor(kip-ft): _____ | 188.37 |
| 0.65 M _n Major(kip-ft): _____ | 81.84 | | |
| K _l /r _____ | Major 28.34 | Minor 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 392.36 |
| Combination _____ | 2 |
| C _m _____ | 0.46 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.63 |
| P _c (kip) _____ | 2284.61 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 5.05 | 68.49 | 361.54 | 0.75 | 322.52 | 0.02 |
| 1 Minor: | 2 | 10.54 | 65.11 | 333.25 | 0.75 | 298.77 | 0.04 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 371.57 | 61.29 | 256.96 | 42.22 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 74
 Size: _____ 16"Ø
 Grid Location: _____ (173.95ft--29.62ft)
 Diameter (in) _____ 16.00

Reinforcement
 Longitudinal: _____ 8-#7
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Circular
 Longitudinal Bars Max Tension Stress Ratio: 1.00
 As (in²) _____ 4.80 (2.39%)
 Clear Cover (in) _____ 1.50

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00
 f_{ct} (ksi): _____ 0.00
 Conc. Weight (pcf): _____ 145.00
 Conc. Modulus (ksi): _____ 4074.28
 f_y Long (ksi): _____ 60.00
 f_{yt} Trans (ksi): _____ 60.00
 Conc. Type: _____ NWC
 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 65.31
 Moment Top Major(kip-ft) _____ 37.99
 Minor(kip-ft) _____ 45.54
 Moment Bottom Major(kip-ft) _____ -16.70
 Minor(kip-ft) _____ -5.58

Calculated Parameters (Angle = 50.16 degrees): L_d/Cap = 0.55

0.74 P_n(kip): _____ 65.31
 0.74 M_n Major(kip-ft): _____ 68.64
 0.74 M_n Minor(kip-ft): _____ 82.28

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 40.50 | 40.50 |
| Slender _____ | Yes | Yes |

Slenderness:

| | | |
|---|---------|---------|
| P _u (kip) _____ | 65.31 | 65.31 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.42 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.65 | 0.65 |
| P _c (kip) _____ | 1196.18 | 1196.18 |
| I _g (in ⁴) _____ | 3216.99 | 3216.99 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 20.47 | 0.00 | 166.63 | 0.75 | 124.97 | 0.16 |
| 1 Minor: | 2 | 20.76 | 0.00 | 166.63 | 0.75 | 124.97 | 0.17 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| At Column | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| | 132.86 | 20.47 | 134.40 | 20.76 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 45
 Size: _____ 16x22
 Grid Location: _____ (166.45ft-198.62ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fyt Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp
 Axial Load (kip) _____ 87.95
 Moment Top Major(kip-ft) _____ 1.01
 Minor(kip-ft) _____ -103.74
 Moment Bottom Major(kip-ft) _____ 2.47
 Minor(kip-ft) _____ 7.92

Calculated Parameters (Angle = 89.44 degrees): Ld/Cap = 0.57

0.90 P_n(kip): _____ 87.95
 0.90 M_n Major(kip-ft): _____ 1.75 0.90 M_n Minor(kip-ft): _____ 180.70

| | Major | Minor |
|---------------|-------|-------|
| Kl/r _____ | 28.34 | 38.97 |
| Slender _____ | No | Yes |

Slenderness:

P_u (kip) _____ 87.95
 Combination _____ 2
 C_m _____ 0.57
 k_{ns} _____ 1.00
 δ_{ns} _____ 1.00
 β_d _____ 0.65
 P_c (kip) _____ 2252.60
 I_g (in⁴) _____ 7509.33

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (1) 1.400 D



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 1 | 43.62 | 0.00 | 241.03 | 0.75 | 180.77 | 0.24 |
| 1 Minor: | 1 | 30.10 | 0.00 | 166.63 | 0.75 | 124.97 | 0.24 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 264.65 | 43.62 | 183.53 | 30.10 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (166.45ft-187.95ft) |
| Column Number: _____ | 44 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 1.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|-----------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _y Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 267.15 |
| Moment Top | Major(kip-ft) _____ | -184.16 |
| | Minor(kip-ft) _____ | -88.50 |
| Moment Bottom | Major(kip-ft) _____ | 36.55 |
| | Minor(kip-ft) _____ | 24.04 |

Calculated Parameters (Angle = 25.67 degrees): L_d/Cap = 0.87

| | | | |
|--|-------------|--|--------|
| 0.67 P _n (kip): _____ | 267.15 | 0.67 M _n Minor(kip-ft): _____ | 102.25 |
| 0.67 M _n Major(kip-ft): _____ | 212.77 | | |
| Kl/r _____ | Major 28.34 | Minor 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 267.15 |
| Combination _____ | 2 |
| C _m _____ | 0.53 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.64 |
| P _c (kip) _____ | 2278.52 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 16.26 | 60.67 | 241.03 | 0.75 | 226.27 | 0.07 |
| 1 Minor: | 2 | 7.61 | 57.67 | 166.63 | 0.75 | 168.22 | 0.05 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 331.40 | 55.30 | 229.30 | 38.12 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|------------------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (156.54ft--11.62ft) |
| Column Number: _____ | 47 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.21 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 361.09 |
| Moment Top | Major(kip-ft) _____ | 58.31 |
| | Minor(kip-ft) _____ | 9.63 |
| Moment Bottom | Major(kip-ft) _____ | -35.23 |
| | Minor(kip-ft) _____ | -5.17 |

Calculated Parameters (Angle = 8.36 degrees): L_d/Cap = 0.39

| | | | |
|--|--------|--|-------|
| 0.65 P _n (kip): _____ | 361.09 | 0.65 M _n Minor(kip-ft): _____ | 41.73 |
| 0.65 M _n Major(kip-ft): _____ | 284.09 | | |

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 28.34 | 38.97 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 8.50 | 66.54 | 241.03 | 0.75 | 230.67 | 0.04 |
| 1 Minor: | 2 | 1.38 | 63.25 | 166.63 | 0.75 | 172.41 | 0.01 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 362.24 | 59.96 | 250.52 | 41.31 |



Bentley

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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 46
 Size: _____ 16"Ø
 Grid Location: _____ (156.45ft--29.62ft)
 Diameter (in) _____ 16.00

Reinforcement
 Longitudinal: _____ 8-#7
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Circular
 Longitudinal Bars Max Tension Stress Ratio: 0.46
 As (in²) _____ 4.80 (2.39%)
 Clear Cover (in) _____ 1.50

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00
 f_{ct} (ksi): _____ 0.00
 Conc. Weight (pcf): _____ 145.00
 Conc. Modulus (ksi): _____ 4074.28
 f_y Long (ksi): _____ 60.00
 f_{yt} Trans (ksi): _____ 60.00
 Conc. Type: _____ NWC
 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 165.34
 Moment Top Major(kip-ft) _____ 26.21
 Minor(kip-ft) _____ 46.35
 Moment Bottom Major(kip-ft) _____ -16.05
 Minor(kip-ft) _____ -14.13

Calculated Parameters (Angle = 60.51 degrees): L_d/Cap = 0.48

0.65 P_n(kip): _____ 165.34
 0.65 M_n Major(kip-ft): _____ 54.42
 0.65 M_n Minor(kip-ft): _____ 96.23

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 40.50 | 40.50 |
| Slender _____ | Yes | Yes |

Slenderness:

| | | |
|---|---------|---------|
| P _u (kip) _____ | 165.34 | 165.34 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.36 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.63 | 0.63 |
| P _c (kip) _____ | 1205.92 | 1205.92 |
| I _g (in ⁴) _____ | 3216.99 | 3216.99 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 3.69 | 42.91 | 166.63 | 0.75 | 157.15 | 0.02 |
| 1 Minor: | 2 | 3.10 | 42.91 | 166.63 | 0.75 | 157.15 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 147.64 | 22.26 | 149.58 | 22.70 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (152.79ft-162.29ft) |
| Column Number: _____ | 43 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 12x24 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (2 x 2) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.96 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 253.37 |
| Moment Top | Major(kip-ft) _____ | 26.60 |
| | Minor(kip-ft) _____ | 146.55 |
| Moment Bottom | Major(kip-ft) _____ | 26.60 |
| | Minor(kip-ft) _____ | -32.86 |

Calculated Parameters (Angle = 79.71 degrees): L_d/Cap = 0.73

| | | | |
|--|--------|--|--------|
| 0.65 P _n (kip): _____ | 253.37 | 0.65 M _n Minor(kip-ft): _____ | 201.24 |
| 0.65 M _n Major(kip-ft): _____ | 36.53 | | |
| | Major | Minor | |
| K _l /r _____ | 28.34 | 38.97 | |
| Slender _____ | Yes | Yes | |

Slenderness:

| | | |
|---|----------|---------|
| P _u (kip) _____ | 253.37 | 253.37 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.79 | 0.51 |
| k _{ns} _____ | 1.00 | 1.00 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.64 | 0.64 |
| P _c (kip) _____ | 4299.04 | 2273.87 |
| I _g (in ⁴) _____ | 14197.33 | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 0.44 | 54.10 | 241.03 | 0.75 | 221.35 | 0.00 |
| 1 Minor: | 2 | 13.39 | 56.85 | 166.63 | 0.75 | 167.61 | 0.08 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| At Column | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| | 314.18 | 51.04 | 230.70 | 39.63 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (152.79ft-153.63ft) |
| Column Number: _____ | 42 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 12x24 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (2 x 2) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 3 | Shear Legs Minor _____ | 3 |
| Longitudinal Bars Max Tension Stress Ratio: 1.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 276.04 |
| Moment Top | Major(kip-ft) _____ | -15.08 |
| | Minor(kip-ft) _____ | -175.18 |
| Moment Bottom | Major(kip-ft) _____ | 0.10 |
| | Minor(kip-ft) _____ | 37.74 |

Calculated Parameters (Angle = 85.08 degrees): L_d/Cap = 0.82

| | | | |
|--|-------------|--|--------|
| 0.67 P _n (kip): _____ | 276.04 | 0.67 M _n Minor(kip-ft): _____ | 214.50 |
| 0.67 M _n Major(kip-ft): _____ | 18.46 | | |
| K _l /r _____ | Major 28.34 | Minor 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 276.04 |
| Combination _____ | 2 |
| C _m _____ | 0.51 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.63 |
| P _c (kip) _____ | 2292.42 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 1.08 | 61.23 | 361.54 | 0.75 | 317.07 | 0.00 |
| 1 Minor: | 2 | 15.25 | 58.20 | 249.94 | 0.75 | 231.10 | 0.07 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 319.40 | 52.05 | 235.29 | 40.71 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (152.29ft-97.46ft) |
| Column Number: _____ | 41 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.01 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| fc (ksi): _____ | 5.00 | fy Long (ksi): _____ | 60.00 |
| fc _t (ksi): _____ | 0.00 | fy _t Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 399.64 |
| Moment Top | Major(kip-ft) _____ | -4.09 |
| | Minor(kip-ft) _____ | 59.17 |
| Moment Bottom | Major(kip-ft) _____ | 9.33 |
| | Minor(kip-ft) _____ | -35.97 |

Calculated Parameters (Angle = 75.46 degrees): L_d/Cap = 0.44

| | | | |
|--|--------|--|--------|
| 0.65 P _n (kip): _____ | 399.64 | 0.65 M _n Minor(kip-ft): _____ | 199.37 |
| 0.65 M _n Major(kip-ft): _____ | 51.70 | | |
| | Major | Minor | |
| K _l /r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 399.64 |
| Combination _____ | 2 |
| C _m _____ | 0.58 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.68 |
| P _c (kip) _____ | 2216.43 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (1) 1.400 D



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 0.89 | 68.95 | 241.03 | 0.75 | 232.48 | 0.00 |
| 1 Minor: | 1 | 4.95 | 60.69 | 166.63 | 0.75 | 170.49 | 0.03 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| At Column | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| | 382.80 | 61.59 | 264.75 | 42.43 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 40
 Size: _____ 16x22
 Grid Location: _____ (152.29ft-69.63ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.05

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 382.31
 Moment Top Major(kip-ft) _____ -42.38
 Minor(kip-ft) _____ -35.56
 Moment Bottom Major(kip-ft) _____ -42.38
 Minor(kip-ft) _____ 0.93

Calculated Parameters (Angle = 1.26 degrees): L_d/Cap = 0.42

| | | | |
|--|--------|--|------|
| 0.65 P _n (kip): _____ | 382.31 | | |
| 0.65 M _n Major(kip-ft): _____ | 306.41 | 0.65 M _n Minor(kip-ft): _____ | 6.76 |
| | Major | Minor | |
| Kl/r _____ | 28.34 | 38.97 | |
| Slender _____ | Yes | Yes | |

Slenderness:

| | | |
|---|----------|---------|
| P _u (kip) _____ | 382.31 | 382.31 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.93 | 0.59 |
| k _{ns} _____ | 1.00 | 1.00 |
| δ _{ns} _____ | 1.06 | 1.00 |
| β _d _____ | 0.67 | 0.67 |
| P _c (kip) _____ | 4213.10 | 2228.41 |
| I _g (in ⁴) _____ | 14197.33 | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (1) 1.400 D



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 0.14 | 67.87 | 241.03 | 0.75 | 231.67 | 0.00 |
| 1 Minor: | 1 | 2.84 | 59.63 | 166.63 | 0.75 | 169.69 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 375.90 | 60.86 | 259.96 | 41.92 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (152.29ft-41.70ft) |
| Column Number: _____ | 39 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.64 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 339.30 |
| Moment Top | Major(kip-ft) _____ | 175.52 |
| | Minor(kip-ft) _____ | 30.54 |
| Moment Bottom | Major(kip-ft) _____ | -27.43 |
| | Minor(kip-ft) _____ | -30.54 |

Calculated Parameters (Angle = 9.87 degrees): L_d/Cap = 0.64

| | | | |
|--|--------|--|-------|
| 0.65 P _n (kip): _____ | 339.30 | 0.65 M _n Minor(kip-ft): _____ | 47.92 |
| 0.65 M _n Major(kip-ft): _____ | 275.47 | | |
| | Major | Minor | |
| K _l /r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 339.30 |
| Combination _____ | 2 |
| C _m _____ | 0.47 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.68 |
| P _c (kip) _____ | 2224.17 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 14.26 | 65.18 | 241.03 | 0.75 | 229.65 | 0.06 |
| 1 Minor: | 1 | 2.85 | 57.70 | 166.63 | 0.75 | 168.24 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 362.37 | 58.98 | 250.61 | 40.64 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (152.28ft-125.54ft) |
| Column Number: _____ | 38 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 452.56 |
| Moment Top | Major(kip-ft) _____ | -5.23 |
| | Minor(kip-ft) _____ | -40.73 |
| Moment Bottom | Major(kip-ft) _____ | -0.54 |
| | Minor(kip-ft) _____ | -40.73 |

Calculated Parameters (Angle = 82.69 degrees): L_d/Cap = 0.49

| | | | |
|--|-------------|--|--------|
| 0.65 P _n (kip): _____ | 452.56 | 0.65 M _n Minor(kip-ft): _____ | 206.69 |
| 0.65 M _n Major(kip-ft): _____ | 26.52 | | |
| K _l /r _____ | Major 28.34 | Minor 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 452.56 |
| Combination _____ | 2 |
| C _m _____ | 0.65 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.68 |
| P _c (kip) _____ | 2213.38 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (1) 1.400 D



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 0.33 | 72.26 | 241.03 | 0.75 | 234.96 | 0.00 |
| 1 Minor: | 1 | 3.05 | 63.26 | 166.63 | 0.75 | 172.42 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 399.10 | 63.49 | 276.08 | 43.73 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (156.95ft-13.95ft) |
| Column Number: _____ | 37 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.01 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|-----------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _y Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 386.58 |
| Moment Top | Major(kip-ft) _____ | -63.95 |
| | Minor(kip-ft) _____ | -34.79 |
| Moment Bottom | Major(kip-ft) _____ | 17.77 |
| | Minor(kip-ft) _____ | 34.79 |

Calculated Parameters (Angle = 28.55 degrees): L_d/Cap = 0.42

| | | | |
|--|-------------|--|--------|
| 0.65 P _n (kip): _____ | 386.58 | 0.65 M _n Minor(kip-ft): _____ | 114.62 |
| 0.65 M _n Major(kip-ft): _____ | 210.68 | | |
| K _l /r _____ | Major 28.34 | Minor 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 386.58 |
| Combination _____ | 2 |
| C _m _____ | 0.59 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.63 |
| P _c (kip) _____ | 2288.81 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 5.45 | 68.13 | 241.03 | 0.75 | 231.87 | 0.02 |
| 1 Minor: | 2 | 1.23 | 56.24 | 166.63 | 0.75 | 167.15 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 369.17 | 61.04 | 255.30 | 42.05 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | | |
| Column Number: _____ | 75 | Grid Location: _____ | (147.16ft-198.62ft) |
| Size: _____ | 16"Ø | Diameter (in) _____ | 16.00 |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 | As (in ²) _____ | 4.80 (2.39%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Circular | Clear Cover (in) _____ | 1.50 |
| Longitudinal Bars Max Tension Stress Ratio: 1.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|-------|
| Axial | Load (kip) _____ | 85.92 |
| Moment Top | Major(kip-ft) _____ | 7.34 |
| | Minor(kip-ft) _____ | 58.41 |
| Moment Bottom | Major(kip-ft) _____ | 7.34 |
| | Minor(kip-ft) _____ | -4.34 |

Calculated Parameters (Angle = 82.84 degrees): L_d/Cap = 0.57

| | | | |
|--|-------|--|--------|
| 0.68 P _n (kip): _____ | 85.92 | | |
| 0.68 M _n Major(kip-ft): _____ | 12.93 | 0.68 M _n Minor(kip-ft): _____ | 102.91 |

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 45.00 | 45.00 |
| Slender _____ | Yes | Yes |

Slenderness:

| | | |
|---|---------|---------|
| P _u (kip) _____ | 85.92 | 85.92 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.72 | 0.57 |
| k _{ns} _____ | 1.00 | 1.00 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.64 | 0.64 |
| P _c (kip) _____ | 971.87 | 971.87 |
| I _g (in ⁴) _____ | 3216.99 | 3216.99 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 20.94 | 34.58 | 166.63 | 0.75 | 150.91 | 0.14 |
| 1 Minor: | 2 | 21.26 | 34.58 | 166.63 | 0.75 | 150.91 | 0.14 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 136.22 | 20.94 | 137.84 | 21.26 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (147.16ft-187.95ft) |
| Column Number: _____ | 76 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 1.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| fc (ksi): _____ | 5.00 | fy Long (ksi): _____ | 60.00 |
| fc _t (ksi): _____ | 0.00 | fy _t Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 264.21 |
| Moment Top | Major(kip-ft) _____ | -174.59 |
| | Minor(kip-ft) _____ | 97.58 |
| Moment Bottom | Major(kip-ft) _____ | 36.62 |
| | Minor(kip-ft) _____ | -23.78 |

Calculated Parameters (Angle = 29.20 degrees): L_d/Cap = 0.88

| | | | |
|--|--------|--|--------|
| 0.67 P _n (kip): _____ | 264.21 | 0.67 M _n Minor(kip-ft): _____ | 111.28 |
| 0.67 M _n Major(kip-ft): _____ | 199.11 | | |
| | Major | Minor | |
| Kl/r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 264.21 |
| Combination _____ | 2 |
| C _m _____ | 0.53 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.64 |
| P _c (kip) _____ | 2278.23 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 15.64 | 60.49 | 241.03 | 0.75 | 226.14 | 0.07 |
| 1 Minor: | 2 | 8.22 | 57.50 | 166.63 | 0.75 | 168.09 | 0.05 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 330.42 | 55.14 | 228.63 | 38.01 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (128.12ft-13.95ft) |
| Column Number: _____ | 36 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 404.75 |
| Moment Top | Major(kip-ft) _____ | 24.57 |
| | Minor(kip-ft) _____ | 36.43 |
| Moment Bottom | Major(kip-ft) _____ | -9.08 |
| | Minor(kip-ft) _____ | 36.43 |

Calculated Parameters (Angle = 56.00 degrees): L_d/Cap = 0.44

| | | | |
|--|-------------|--|--------|
| 0.65 P _n (kip): _____ | 404.75 | 0.65 M _n Minor(kip-ft): _____ | 173.45 |
| 0.65 M _n Major(kip-ft): _____ | 116.98 | | |
| Kl/r _____ | Major 28.34 | Minor 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 404.75 |
| Combination _____ | 2 |
| C _m _____ | 0.69 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.63 |
| P _c (kip) _____ | 2290.97 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



Concrete Column Design

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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 2.24 | 69.27 | 241.03 | 0.75 | 232.72 | 0.01 |
| 1 Minor: | 2 | 0.97 | 56.88 | 166.63 | 0.75 | 167.63 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 374.37 | 61.78 | 258.90 | 42.55 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (128.20ft--11.62ft) |
| Column Number: _____ | 35 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.47 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 317.05 |
| Moment Top | Major(kip-ft) _____ | 85.09 |
| | Minor(kip-ft) _____ | -74.69 |
| Moment Bottom | Major(kip-ft) _____ | -25.55 |
| | Minor(kip-ft) _____ | 28.53 |

Calculated Parameters (Angle = 41.27 degrees): L_d/Cap = 0.53

| | | | |
|--|--------|--|--------|
| 0.65 P _n (kip): _____ | 317.05 | 0.65 M _n Minor(kip-ft): _____ | 140.94 |
| 0.65 M _n Major(kip-ft): _____ | 160.57 | | |
| | Major | Minor | |
| K _l /r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 317.05 |
| Combination _____ | 2 |
| C _m _____ | 0.50 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.64 |
| P _c (kip) _____ | 2278.79 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 8.09 | 63.79 | 241.03 | 0.75 | 228.61 | 0.04 |
| 1 Minor: | 2 | 7.00 | 60.64 | 166.63 | 0.75 | 170.45 | 0.04 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 348.53 | 57.90 | 241.07 | 39.90 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 34
 Size: _____ 16"Ø
 Grid Location: _____ (128.20ft--29.62ft)
 Diameter (in) _____ 16.00

Reinforcement
 Longitudinal: _____ 8-#7
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Circular
 Longitudinal Bars Max Tension Stress Ratio: 0.88
 As (in²) _____ 4.80 (2.39%)
 Clear Cover (in) _____ 1.50

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00
 f_{ct} (ksi): _____ 0.00
 Conc. Weight (pcf): _____ 145.00
 Conc. Modulus (ksi): _____ 4074.28
 f_y Long (ksi): _____ 60.00
 f_{yt} Trans (ksi): _____ 60.00
 Conc. Type: _____ NWC
 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 151.79
 Moment Top Major(kip-ft) _____ 51.44
 Minor(kip-ft) _____ -54.89
 Moment Bottom Major(kip-ft) _____ -13.91
 Minor(kip-ft) _____ 12.97

Calculated Parameters (Angle = 46.86 degrees): L_d/Cap = 0.69

0.65 P_n(kip): _____ 151.79
 0.65 M_n Major(kip-ft): _____ 74.41
 0.65 M_n Minor(kip-ft): _____ 79.40

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 40.50 | 40.50 |
| Slender _____ | Yes | Yes |

Slenderness:

| | | |
|---|---------|---------|
| P _u (kip) _____ | 151.79 | 151.79 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.49 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.64 | 0.64 |
| P _c (kip) _____ | 1205.16 | 1205.16 |
| I _g (in ⁴) _____ | 3216.99 | 3216.99 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 5.12 | 41.88 | 166.63 | 0.75 | 156.38 | 0.03 |
| 1 Minor: | 2 | 3.67 | 41.88 | 166.63 | 0.75 | 156.38 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 145.89 | 22.11 | 147.77 | 22.53 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (123.95ft-162.29ft) |
| Column Number: _____ | 31 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 12x24 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (2 x 2) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 1.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| fc (ksi): _____ | 5.00 | fy Long (ksi): _____ | 60.00 |
| fc _t (ksi): _____ | 0.00 | fy _t Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 276.19 |
| Moment Top | Major(kip-ft) _____ | -41.94 |
| | Minor(kip-ft) _____ | 166.40 |
| Moment Bottom | Major(kip-ft) _____ | 14.88 |
| | Minor(kip-ft) _____ | -33.20 |

Calculated Parameters (Angle = 75.85 degrees): L_d/Cap = 0.81

| | | | |
|--|--------|--|--------|
| 0.66 P _n (kip): _____ | 276.19 | 0.66 M _n Minor(kip-ft): _____ | 204.80 |
| 0.66 M _n Major(kip-ft): _____ | 51.62 | | |
| | Major | Minor | |
| K _l /r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 276.19 |
| Combination _____ | 2 |
| C _m _____ | 0.52 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.64 |
| P _c (kip) _____ | 2275.18 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 4.11 | 61.24 | 241.03 | 0.75 | 226.70 | 0.02 |
| 1 Minor: | 2 | 14.81 | 58.21 | 166.63 | 0.75 | 168.63 | 0.09 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 321.09 | 52.06 | 236.76 | 40.71 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (123.95ft-153.63ft) |
| Column Number: _____ | 30 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 12x24 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (2 x 2) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 3 | Shear Legs Minor _____ | 3 |
| Longitudinal Bars Max Tension Stress Ratio: 1.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 299.13 |
| Moment Top | Major(kip-ft) _____ | -38.43 |
| | Minor(kip-ft) _____ | -190.76 |
| Moment Bottom | Major(kip-ft) _____ | 20.38 |
| | Minor(kip-ft) _____ | 28.54 |

Calculated Parameters (Angle = 78.61 degrees): L_d/Cap = 0.89

| | | | |
|--|-------------|--|--------|
| 0.67 P _n (kip): _____ | 299.13 | 0.67 M _n Minor(kip-ft): _____ | 215.47 |
| 0.67 M _n Major(kip-ft): _____ | 43.41 | | |
| K _l /r _____ | Major 28.34 | Minor 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 299.13 |
| Combination _____ | 2 |
| C _m _____ | 0.54 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.63 |
| P _c (kip) _____ | 2291.55 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 4.27 | 62.67 | 361.54 | 0.75 | 318.16 | 0.01 |
| 1 Minor: | 2 | 15.42 | 59.57 | 249.94 | 0.75 | 232.13 | 0.07 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 326.46 | 53.08 | 241.48 | 41.81 |

TORSION CAPACITY:

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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 29
 Size: _____ 16x22
 Grid Location: _____ (123.95ft-125.54ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 419.65
 Moment Top Major(kip-ft) _____ 42.21
 Minor(kip-ft) _____ 24.58
 Moment Bottom Major(kip-ft) _____ -2.76
 Minor(kip-ft) _____ -11.29

Calculated Parameters (Angle = 30.21 degrees): L_d/Cap = 0.46

0.65 P_n(kip): _____ 419.65
 0.65 M_n Major(kip-ft): _____ 205.97 0.65 M_n Minor(kip-ft): _____ 119.93

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 28.34 | 38.97 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 3.13 | 70.20 | 241.03 | 0.75 | 233.42 | 0.01 |
| 1 Minor: | 2 | 2.68 | 66.73 | 166.63 | 0.75 | 175.02 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 388.56 | 62.32 | 268.74 | 42.92 |



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (123.95ft-97.46ft) |
| Column Number: _____ | 28 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.42 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|-----------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _y Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (1) 1.400 D

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 266.79 |
| Moment Top | Major(kip-ft) _____ | 71.86 |
| | Minor(kip-ft) _____ | 53.43 |
| Moment Bottom | Major(kip-ft) _____ | -18.13 |
| | Minor(kip-ft) _____ | 24.01 |

Calculated Parameters (Angle = 36.63 degrees): Ld/Cap = 0.42

| | | | |
|--|--------|--|--------|
| 0.65 P _n (kip): _____ | 266.79 | 0.65 M _n Minor(kip-ft): _____ | 127.43 |
| 0.65 M _n Major(kip-ft): _____ | 171.38 | | |
| | Major | Minor | |
| Kl/r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 266.79 |
| Combination _____ | 1 |
| C _m _____ | 0.61 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 1.00 |
| P _c (kip) _____ | 1863.96 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 7.61 | 65.17 | 241.03 | 0.75 | 229.65 | 0.03 |
| 1 Minor: | 1 | 3.48 | 57.65 | 166.63 | 0.75 | 168.21 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 362.01 | 58.97 | 250.36 | 40.63 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (123.95ft-69.63ft) |
| Column Number: _____ | 27 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.39 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| fc (ksi): _____ | 5.00 | fy Long (ksi): _____ | 60.00 |
| fc _t (ksi): _____ | 0.00 | fy _t Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (1) 1.400 D

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 292.54 |
| Moment Top | Major(kip-ft) _____ | 57.84 |
| | Minor(kip-ft) _____ | -64.96 |
| Moment Bottom | Major(kip-ft) _____ | -9.97 |
| | Minor(kip-ft) _____ | -26.33 |

Calculated Parameters (Angle = 48.32 degrees): Ld/Cap = 0.42

| | | | |
|--|--------|--|--------|
| 0.65 P _n (kip): _____ | 292.54 | 0.65 M _n Minor(kip-ft): _____ | 153.65 |
| 0.65 M _n Major(kip-ft): _____ | 136.81 | | |
| | Major | Minor | |
| Kl/r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 292.54 |
| Combination _____ | 1 |
| C _m _____ | 0.62 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 1.00 |
| P _c (kip) _____ | 1863.96 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 5.75 | 66.40 | 241.03 | 0.75 | 230.57 | 0.02 |
| 1 Minor: | 1 | 4.13 | 59.18 | 166.63 | 0.75 | 169.35 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| At Column | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| | 372.97 | 59.87 | 257.92 | 41.25 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (123.95ft-41.70ft) |
| Column Number: _____ | 26 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.54 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 284.88 |
| Moment Top | Major(kip-ft) _____ | -138.24 |
| | Minor(kip-ft) _____ | 25.64 |
| Moment Bottom | Major(kip-ft) _____ | 27.03 |
| | Minor(kip-ft) _____ | 25.64 |

Calculated Parameters (Angle = 10.51 degrees): L_d/Cap = 0.52

| | | | |
|--|--------|--|-------|
| 0.65 P _n (kip): _____ | 284.88 | 0.65 M _n Minor(kip-ft): _____ | 49.34 |
| 0.65 M _n Major(kip-ft): _____ | 266.02 | | |
| | Major | Minor | |
| K _l /r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 284.88 |
| Combination _____ | 2 |
| C _m _____ | 0.82 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.68 |
| P _c (kip) _____ | 2215.03 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 11.78 | 61.78 | 241.03 | 0.75 | 227.10 | 0.05 |
| 1 Minor: | 1 | 1.74 | 55.29 | 166.63 | 0.75 | 166.44 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 344.78 | 56.26 | 238.49 | 38.77 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 33
 Size: _____ 16"Ø
 Grid Location: _____ (118.78ft-198.62ft)
 Diameter (in) _____ 16.00

Reinforcement
 Longitudinal: _____ 8-#7
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Circular
 Longitudinal Bars Max Tension Stress Ratio: 0.00
 As (in²) _____ 4.80 (2.39%)
 Clear Cover (in) _____ 1.50

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00
 f_{ct} (ksi): _____ 0.00
 Conc. Weight (pcf): _____ 145.00
 Conc. Modulus (ksi): _____ 4074.28
 f_y Long (ksi): _____ 60.00
 f_{yt} Trans (ksi): _____ 60.00
 Conc. Type: _____ NWC
 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 99.10
 Moment Top Major(kip-ft) _____ 11.03
 Minor(kip-ft) _____ -9.06
 Moment Bottom Major(kip-ft) _____ 8.47
 Minor(kip-ft) _____ -0.14

Calculated Parameters (Angle = 0.96 degrees): L_d/Cap = 0.17

| | | |
|--|---------|---|
| 0.65 P _n (kip): _____ | 99.10 | |
| 0.65 M _n Major(kip-ft): _____ | 101.74 | 0.65 M _n Minor(kip-ft): _____ 1.70 |
| | Major | Minor |
| Kl/r _____ | 45.00 | 45.00 |
| Slender _____ | Yes | Yes |
| Slenderness: | | |
| P _u (kip) _____ | 99.10 | 99.10 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.63 | 0.61 |
| k _{ns} _____ | 1.00 | 1.00 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.64 | 0.64 |
| P _c (kip) _____ | 973.28 | 973.28 |
| I _g (in ⁴) _____ | 3216.99 | 3216.99 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 21.24 | 35.21 | 166.63 | 0.75 | 151.37 | 0.14 |
| 1 Minor: | 2 | 21.58 | 35.21 | 166.63 | 0.75 | 151.37 | 0.14 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 138.15 | 21.24 | 139.82 | 21.58 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|------------------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (118.78ft-187.95ft) |
| Column Number: _____ | 32 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.77 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 337.01 |
| Moment Top | Major(kip-ft) _____ | -206.65 |
| | Minor(kip-ft) _____ | 3.36 |
| Moment Bottom | Major(kip-ft) _____ | 35.98 |
| | Minor(kip-ft) _____ | -3.26 |

Calculated Parameters (Angle = 0.93 degrees): L_d/Cap = 0.69

| | | | |
|--|--------|--|------|
| 0.65 P _n (kip): _____ | 337.01 | | |
| 0.65 M _n Major(kip-ft): _____ | 301.59 | 0.65 M _n Minor(kip-ft): _____ | 4.91 |
| | Major | Minor | |
| K _l /r _____ | 28.34 | 38.97 | |
| Slender _____ | No | No | |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 17.71 | 65.04 | 241.03 | 0.75 | 229.55 | 0.08 |
| 1 Minor: | 2 | 0.59 | 61.82 | 166.63 | 0.75 | 171.33 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 354.59 | 58.87 | 245.25 | 40.56 |



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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 25
 Size: _____ 16x22
 Grid Location: _____ (99.79ft-120.29ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.61

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fyt Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 14.00 | 15.00 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp
 Axial Load (kip) _____ 354.16
 Moment Top Major(kip-ft) _____ 200.81
 Minor(kip-ft) _____ 8.62
 Moment Bottom Major(kip-ft) _____ -89.94
 Minor(kip-ft) _____ -2.98

Calculated Parameters (Angle = 2.46 degrees): Ld/Cap = 0.66

| | | | |
|--|--------|--|-------|
| 0.65 P _n (kip): _____ | 354.16 | | |
| 0.65 M _n Major(kip-ft): _____ | 302.33 | 0.65 M _n Minor(kip-ft): _____ | 12.97 |
| | Major | Minor | |
| Kl/r _____ | 23.81 | 35.07 | |
| Slender _____ | No | No | |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | Ld/Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|--------|
| 1 Major: | 2 | 23.19 | 66.11 | 241.03 | 0.75 | 230.35 | 0.10 |
| 1 Minor: | 2 | 0.86 | 62.84 | 166.63 | 0.75 | 172.10 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 368.76 | 59.67 | 255.02 | 41.11 |



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COLUMN INFORMATION:

| | | | |
|--|------------------------|-----------------------------|-------------------|
| Level _____ | Second | Frame Number: _____ | 0 |
| Column Number: _____ | 24 | Grid Location: _____ | (99.79ft-43.21ft) |
| Size: _____ | 16x22 | Depth x Width (in) _____ | 22.00x16.00 |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#10 (3 x 1) | As (in ²) _____ | 10.16 (2.89%) |
| Transverse: _____ | #5@ 15.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 1.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| fc (ksi): _____ | 5.00 | fy Long (ksi): _____ | 60.00 |
| fc _t (ksi): _____ | 0.00 | fy _t Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | |
|--------|------------------|---------------------|---------|
| Axial | Load (kip) _____ | 287.10 | |
| Moment | Top | Major(kip-ft) _____ | -154.67 |
| | | Minor(kip-ft) _____ | 30.72 |
| Moment | Bottom | Major(kip-ft) _____ | 4.87 |
| | | Minor(kip-ft) _____ | 30.72 |

Calculated Parameters (Angle = 11.23 degrees): L_d/Cap = 0.45

| | | | |
|--|--------|--|-------|
| 0.65 P _n (kip): _____ | 287.10 | | |
| 0.65 M _n Major(kip-ft): _____ | 344.27 | 0.65 M _n Minor(kip-ft): _____ | 68.37 |
| | Major | Minor | |
| K _l /r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 287.10 |
| Combination _____ | 2 |
| C _m _____ | 0.99 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.19 |
| β _d _____ | 0.66 |
| P _c (kip) _____ | 2239.14 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (38) 1.384 D + 0.500 L_p + 1.300 E₃₆



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|-----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 38 | 18.21 | 56.41 | 47.72 | 0.75 | 78.10 | 0.23 |
| 1 Minor: | 209 | 4.68 | 48.19 | 32.84 | 0.75 | 60.77 | 0.08 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|-------------------|
| Level _____ | Second | Grid Location: _____ | (99.54ft-15.88ft) |
| Column Number: _____ | 23 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 1.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 272.77 |
| Moment Top | Major(kip-ft) _____ | 236.80 |
| | Minor(kip-ft) _____ | -25.00 |
| Moment Bottom | Major(kip-ft) _____ | -27.73 |
| | Minor(kip-ft) _____ | -25.00 |

Calculated Parameters (Angle = 6.03 degrees): L_d/Cap = 0.82

| | | | |
|--|-------------|--|-------|
| 0.70 P _n (kip): _____ | 272.77 | 0.70 M _n Minor(kip-ft): _____ | 30.51 |
| 0.70 M _n Major(kip-ft): _____ | 289.05 | | |
| Kl/r _____ | Major 28.34 | Minor 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 272.77 |
| Combination _____ | 2 |
| C _m _____ | 0.86 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.02 |
| β _d _____ | 0.64 |
| P _c (kip) _____ | 2268.49 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 17.64 | 61.02 | 241.03 | 0.75 | 226.54 | 0.08 |
| 1 Minor: | 2 | 0.39 | 58.01 | 166.63 | 0.75 | 168.47 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 334.42 | 55.61 | 231.37 | 38.32 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (90.45ft-198.62ft) |
| Column Number: _____ | 22 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|-----------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _y Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|-------|
| Axial | Load (kip) _____ | 92.19 |
| Moment Top | Major(kip-ft) _____ | 9.68 |
| | Minor(kip-ft) _____ | -3.03 |
| Moment Bottom | Major(kip-ft) _____ | 9.68 |
| | Minor(kip-ft) _____ | 1.03 |

Calculated Parameters (Angle = 6.08 degrees): L_d/Cap = 0.10

| | | | |
|--|--------|--|-------|
| 0.65 P _n (kip): _____ | 92.19 | 0.65 M _n Minor(kip-ft): _____ | 21.40 |
| 0.65 M _n Major(kip-ft): _____ | 200.93 | | |
| | Major | Minor | |
| Kl/r _____ | 28.34 | 38.97 | |
| Slender _____ | Yes | Yes | |

Slenderness:

| | | |
|---|----------|---------|
| P _u (kip) _____ | 92.19 | 92.19 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.96 | 0.46 |
| k _{ns} _____ | 1.00 | 1.00 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.65 | 0.65 |
| P _c (kip) _____ | 4262.97 | 2254.79 |
| I _g (in ⁴) _____ | 14197.33 | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 43.94 | 0.00 | 241.03 | 0.75 | 180.77 | 0.24 |
| 1 Minor: | 2 | 30.32 | 0.00 | 166.63 | 0.75 | 124.97 | 0.24 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 266.30 | 43.94 | 184.67 | 30.32 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (90.45ft-187.95ft) |
| Column Number: _____ | 21 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.89 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 359.01 |
| Moment Top | Major(kip-ft) _____ | -241.24 |
| | Minor(kip-ft) _____ | 32.31 |
| Moment Bottom | Major(kip-ft) _____ | 89.51 |
| | Minor(kip-ft) _____ | 32.31 |

Calculated Parameters (Angle = 7.63 degrees): L_d/Cap = 0.85

| | | | |
|--|-------------|--|-------|
| 0.65 P _n (kip): _____ | 359.01 | 0.65 M _n Minor(kip-ft): _____ | 38.10 |
| 0.65 M _n Major(kip-ft): _____ | 284.47 | | |
| K _l /r _____ | Major 28.34 | Minor 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 359.01 |
| Combination _____ | 2 |
| C _m _____ | 0.71 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.63 |
| P _c (kip) _____ | 2281.43 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 22.05 | 66.41 | 241.03 | 0.75 | 230.58 | 0.10 |
| 1 Minor: | 2 | 0.78 | 63.13 | 166.63 | 0.75 | 172.31 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 361.48 | 59.88 | 250.00 | 41.25 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (94.04ft-156.78ft) |
| Column Number: _____ | 20 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| fc (ksi): _____ | 5.00 | fy Long (ksi): _____ | 60.00 |
| fc _t (ksi): _____ | 0.00 | fy _t Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 537.22 |
| Moment Top | Major(kip-ft) _____ | -50.68 |
| | Minor(kip-ft) _____ | 61.69 |
| Moment Bottom | Major(kip-ft) _____ | 2.02 |
| | Minor(kip-ft) _____ | 61.69 |

Calculated Parameters (Angle = 50.59 degrees): L_d/Cap = 0.59

| | | | |
|--|--------|--|--------|
| 0.65 P _n (kip): _____ | 537.22 | 0.65 M _n Minor(kip-ft): _____ | 163.46 |
| 0.65 M _n Major(kip-ft): _____ | 134.30 | | |
| | Major | Minor | |
| K _l /r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 537.22 |
| Combination _____ | 2 |
| C _m _____ | 0.88 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.28 |
| β _d _____ | 0.63 |
| P _c (kip) _____ | 2286.84 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 4.38 | 77.54 | 241.03 | 0.75 | 238.93 | 0.02 |
| 1 Minor: | 2 | 0.25 | 61.91 | 166.63 | 0.75 | 171.40 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 410.73 | 65.82 | 284.24 | 44.48 |

TORSION CAPACITY:

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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 73
 Size: _____ 16x22
 Grid Location: _____ (74.95ft--29.05ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#10 (3 x 1) As (in²) _____ 10.16 (2.89%)
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 136.26
 Moment Top Major(kip-ft) _____ 98.16
 Minor(kip-ft) _____ -245.68
 Moment Bottom Major(kip-ft) _____ 5.07
 Minor(kip-ft) _____ 31.01

Calculated Parameters (Angle = 68.22 degrees): L_d/Cap = 0.97

| | | | |
|--|--------|--|--------|
| 0.78 P _n (kip): _____ | 136.26 | | |
| 0.78 M _n Major(kip-ft): _____ | 100.95 | 0.78 M _n Minor(kip-ft): _____ | 252.68 |
| | Major | Minor | |
| Kl/r _____ | 25.51 | 35.07 | |
| Slender _____ | No | No | |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 76.91 | 0.00 | 238.58 | 0.75 | 178.93 | 0.43 |
| 1 Minor: | 2 | 51.10 | 0.00 | 164.18 | 0.75 | 123.13 | 0.42 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 481.97 | 76.91 | 322.40 | 51.10 |



Bentley

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (74.70ft-125.54ft) |
| Column Number: _____ | 19 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.49 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 391.54 |
| Moment Top | Major(kip-ft) _____ | 184.31 |
| | Minor(kip-ft) _____ | -35.24 |
| Moment Bottom | Major(kip-ft) _____ | -53.82 |
| | Minor(kip-ft) _____ | -35.24 |

Calculated Parameters (Angle = 10.82 degrees): L_d/Cap = 0.66

| | | | |
|--|--------|--|-------|
| 0.65 P _n (kip): _____ | 391.54 | 0.65 M _n Minor(kip-ft): _____ | 53.25 |
| 0.65 M _n Major(kip-ft): _____ | 278.54 | | |
| | Major | Minor | |
| K _l /r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 391.54 |
| Combination _____ | 2 |
| C _m _____ | 0.66 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.67 |
| P _c (kip) _____ | 2235.74 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 15.88 | 68.44 | 241.03 | 0.75 | 232.10 | 0.07 |
| 1 Minor: | 2 | 1.08 | 65.06 | 166.63 | 0.75 | 173.76 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| At Column | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| | 377.74 | 61.25 | 261.23 | 42.19 |

TORSION CAPACITY:

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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 18
 Size: _____ 16"Ø
 Grid Location: _____ (62.28ft-198.62ft)
 Diameter (in) _____ 16.00

Reinforcement
 Longitudinal: _____ 8-#7
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Circular
 Longitudinal Bars Max Tension Stress Ratio: 0.00
 As (in²) _____ 4.80 (2.39%)
 Clear Cover (in) _____ 1.50

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00
 f_{ct} (ksi): _____ 0.00
 Conc. Weight (pcf): _____ 145.00
 Conc. Modulus (ksi): _____ 4074.28
 f_y Long (ksi): _____ 60.00
 f_{yt} Trans (ksi): _____ 60.00
 Conc. Type: _____ NWC
 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 94.40
 Moment Top Major(kip-ft) _____ 8.07
 Minor(kip-ft) _____ 6.63
 Moment Bottom Major(kip-ft) _____ 8.07
 Minor(kip-ft) _____ -0.70

Calculated Parameters (Angle = 4.98 degrees): L_d/Cap = 0.16

0.65 P_n(kip): _____ 94.40
 0.65 M_n Major(kip-ft): _____ 100.24
 0.65 M_n Minor(kip-ft): _____ 8.74

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 45.00 | 45.00 |
| Slender _____ | Yes | Yes |

Slenderness:

| | | |
|---|---------|---------|
| P _u (kip) _____ | 94.40 | 94.40 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.69 | 0.56 |
| k _{ns} _____ | 1.00 | 1.00 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.64 | 0.64 |
| P _c (kip) _____ | 972.90 | 972.90 |
| I _g (in ⁴) _____ | 3216.99 | 3216.99 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 21.13 | 34.98 | 166.63 | 0.75 | 151.21 | 0.14 |
| 1 Minor: | 2 | 21.46 | 34.98 | 166.63 | 0.75 | 151.21 | 0.14 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 137.46 | 21.13 | 139.11 | 21.46 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (62.28ft-187.95ft) |
| Column Number: _____ | 17 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.67 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| fc (ksi): _____ | 5.00 | fy Long (ksi): _____ | 60.00 |
| fc _t (ksi): _____ | 0.00 | fy _t Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 352.11 |
| Moment Top | Major(kip-ft) _____ | -191.38 |
| | Minor(kip-ft) _____ | -31.69 |
| Moment Bottom | Major(kip-ft) _____ | 84.03 |
| | Minor(kip-ft) _____ | 31.69 |

Calculated Parameters (Angle = 9.40 degrees): L_d/Cap = 0.69

| | | | |
|--|--------|--|-------|
| 0.65 P _n (kip): _____ | 352.11 | 0.65 M _n Minor(kip-ft): _____ | 45.92 |
| 0.65 M _n Major(kip-ft): _____ | 277.32 | | |
| | Major | Minor | |
| Kl/r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 352.11 |
| Combination _____ | 2 |
| C _m _____ | 0.45 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.63 |
| P _c (kip) _____ | 2281.40 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 18.36 | 65.98 | 241.03 | 0.75 | 230.25 | 0.08 |
| 1 Minor: | 2 | 1.10 | 62.72 | 166.63 | 0.75 | 172.01 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 359.31 | 59.58 | 248.50 | 41.05 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (65.70ft-156.78ft) |
| Column Number: _____ | 16 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.42 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 417.99 |
| Moment Top | Major(kip-ft) _____ | 31.76 |
| | Minor(kip-ft) _____ | -136.60 |
| Moment Bottom | Major(kip-ft) _____ | -11.43 |
| | Minor(kip-ft) _____ | 37.62 |

Calculated Parameters (Angle = 76.91 degrees): L_d/Cap = 0.68

| | | | |
|--|--------|--|--------|
| 0.65 P _n (kip): _____ | 417.99 | 0.65 M _n Minor(kip-ft): _____ | 200.48 |
| 0.65 M _n Major(kip-ft): _____ | 46.62 | | |
| | Major | Minor | |
| K _l /r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 417.99 |
| Combination _____ | 2 |
| C _m _____ | 0.51 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.63 |
| P _c (kip) _____ | 2284.60 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 3.86 | 70.10 | 241.03 | 0.75 | 233.34 | 0.02 |
| 1 Minor: | 2 | 11.91 | 66.63 | 166.63 | 0.75 | 174.94 | 0.07 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 378.98 | 62.26 | 262.09 | 42.88 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 15
 Size: _____ 16x22
 Grid Location: _____ (47.37ft-156.78ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.15

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 361.85 |
| Moment Top | Major(kip-ft) _____ | 30.60 |
| | Minor(kip-ft) _____ | 32.79 |
| Moment Bottom | Major(kip-ft) _____ | -18.60 |
| | Minor(kip-ft) _____ | -19.20 |

Calculated Parameters (Angle = 46.98 degrees): L_d/Cap = 0.39

0.65 P_n(kip): _____ 361.85
 0.65 M_n Major(kip-ft): _____ 145.70 0.65 M_n Minor(kip-ft): _____ 156.16

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 28.34 | 38.97 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 4.42 | 66.59 | 241.03 | 0.75 | 230.71 | 0.02 |
| 1 Minor: | 2 | 4.77 | 63.30 | 166.63 | 0.75 | 172.44 | 0.03 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 362.17 | 60.00 | 250.47 | 41.33 |



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (46.37ft-125.54ft) |
| Column Number: _____ | 14 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.34 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 357.42 |
| Moment Top | Major(kip-ft) _____ | 121.63 |
| | Minor(kip-ft) _____ | -32.17 |
| Moment Bottom | Major(kip-ft) _____ | -31.15 |
| | Minor(kip-ft) _____ | -32.17 |

Calculated Parameters (Angle = 14.81 degrees): L_d/Cap = 0.46

| | | | |
|--|--------|--|-------|
| 0.65 P _n (kip): _____ | 357.42 | 0.65 M _n Minor(kip-ft): _____ | 69.31 |
| 0.65 M _n Major(kip-ft): _____ | 262.08 | | |
| | Major | Minor | |
| K _l /r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 357.42 |
| Combination _____ | 2 |
| C _m _____ | 0.71 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.67 |
| P _c (kip) _____ | 2231.85 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 10.19 | 66.31 | 241.03 | 0.75 | 230.50 | 0.04 |
| 1 Minor: | 2 | 0.34 | 63.03 | 166.63 | 0.75 | 172.24 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 367.44 | 59.81 | 254.11 | 41.20 |

TORSION CAPACITY:

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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 13
 Size: _____ 16x22
 Grid Location: _____ (34.45ft-198.62ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.66

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fyt Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp
 Axial Load (kip) _____ 144.69
 Moment Top Major(kip-ft) _____ 41.88
 Minor(kip-ft) _____ -47.51
 Moment Bottom Major(kip-ft) _____ 2.48
 Minor(kip-ft) _____ 13.02

Calculated Parameters (Angle = 48.60 degrees): Ld/Cap = 0.36

0.65 P_n(kip): _____ 144.69
 0.65 M_n Major(kip-ft): _____ 115.96 0.65 M_n Minor(kip-ft): _____ 131.55

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 28.34 | 38.97 |
| Slender _____ | No | Yes |

Slenderness:

P_u (kip) _____ 144.69
 Combination _____ 2
 C_m _____ 0.54
 k_{ns} _____ 1.00
 δ_{ns} _____ 1.00
 β_d _____ 0.64
 P_c (kip) _____ 2267.24
 I_g (in⁴) _____ 7509.33

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 47.72 | 49.81 | 241.03 | 0.75 | 218.12 | 0.22 |
| 1 Minor: | 2 | 32.91 | 47.34 | 166.63 | 0.75 | 160.48 | 0.21 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| At Column | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| | 287.01 | 47.72 | 198.86 | 32.91 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|------------------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (34.45ft-187.95ft) |
| Column Number: _____ | 12 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.95 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 296.96 |
| Moment Top | Major(kip-ft) _____ | -204.86 |
| | Minor(kip-ft) _____ | -43.56 |
| Moment Bottom | Major(kip-ft) _____ | 35.28 |
| | Minor(kip-ft) _____ | 22.49 |

Calculated Parameters (Angle = 12.00 degrees): L_d/Cap = 0.78

| | | | | | |
|----------------------------------|----------------|--|--------|--|-------|
| 0.65 P _n (kip): _____ | 296.96 | 0.65 M _n Major(kip-ft): _____ | 262.54 | 0.65 M _n Minor(kip-ft): _____ | 55.82 |
| K _l /r _____ | Major 28.34 | Minor 38.97 | | | |
| Slender _____ | No | No | | | |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 17.59 | 62.53 | 241.03 | 0.75 | 227.67 | 0.08 |
| 1 Minor: | 2 | 5.26 | 59.44 | 166.63 | 0.75 | 169.55 | 0.03 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 341.58 | 56.92 | 236.29 | 39.22 |



Bentley

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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 11
 Size: _____ 16x22
 Grid Location: _____ (16.45ft-125.54ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fy_t Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 136.17
 Moment Top Major(kip-ft) _____ -48.58
 Minor(kip-ft) _____ -71.85
 Moment Bottom Major(kip-ft) _____ 17.81
 Minor(kip-ft) _____ 30.92

Calculated Parameters (Angle = 55.93 degrees): L_d/Cap = 0.51

| | | | | | |
|----------------------------------|-------------|--|-------|--|--------|
| 0.67 P _n (kip): _____ | 136.17 | 0.67 M _n Major(kip-ft): _____ | 95.22 | 0.67 M _n Minor(kip-ft): _____ | 140.82 |
| K _l /r _____ | Major 28.34 | Minor 38.97 | | | |
| Slender _____ | No | No | | | |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 47.11 | 49.60 | 241.03 | 0.75 | 217.97 | 0.22 |
| 1 Minor: | 2 | 32.50 | 47.15 | 166.63 | 0.75 | 160.33 | 0.20 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 284.93 | 47.11 | 197.43 | 32.50 |



Bentley

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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 10
 Size: _____ 20"Ø
 Grid Location: _____ (11.70ft-201.29ft)
 Diameter (in) _____ 20.00

Reinforcement
 Longitudinal: _____ 10-#8
 Transverse: _____ #4@ 3.0" 0'-0"-15'-0"
 Confinement _____ Circular
 Longitudinal Bars Max Tension Stress Ratio: 0.71
 As (in²) _____ 7.90 (2.51%)
 Clear Cover (in) _____ 1.50

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00
 f_{ct} (ksi): _____ 0.00
 Conc. Weight (pcf): _____ 145.00
 Conc. Modulus (ksi): _____ 4074.28
 f_y Long (ksi): _____ 60.00
 f_{yt} Trans (ksi): _____ 60.00
 Conc. Type: _____ NWC
 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 25.50 | 25.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 244.20
 Moment Top Major(kip-ft) _____ -105.32
 Minor(kip-ft) _____ 70.22
 Moment Bottom Major(kip-ft) _____ -23.03
 Minor(kip-ft) _____ 0.00

Calculated Parameters (Angle = 33.69 degrees): L_d/Cap = 0.55

0.65 P_n(kip): _____ 244.20
 0.65 M_n Major(kip-ft): _____ 192.52
 0.65 M_n Minor(kip-ft): _____ 128.34

| | Major | Minor |
|---------------|-------|-------|
| Kl/r _____ | 55.08 | 55.08 |
| Slender _____ | Yes | Yes |

Slenderness:

| | | |
|---|---------|---------|
| P _u (kip) _____ | 244.20 | 244.20 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.60 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.63 | 0.63 |
| P _c (kip) _____ | 1018.99 | 1018.99 |
| I _g (in ⁴) _____ | 7853.98 | 7853.98 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 4.13 | 68.74 | 140.00 | 0.75 | 156.55 | 0.03 |
| 1 Minor: | 2 | 2.75 | 68.74 | 140.00 | 0.75 | 156.55 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 311.96 | 28.10 | 315.68 | 28.63 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|--------------------|
| Level _____ | Second | Grid Location: _____ | (11.70ft-174.28ft) |
| Column Number: _____ | 9 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.93 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 328.09 |
| Moment Top | Major(kip-ft) _____ | 189.08 |
| | Minor(kip-ft) _____ | 102.37 |
| Moment Bottom | Major(kip-ft) _____ | 12.00 |
| | Minor(kip-ft) _____ | 29.53 |

Calculated Parameters (Angle = 28.43 degrees): L_d/Cap = 0.91

| | | | |
|--|--------|--|--------|
| 0.65 P _n (kip): _____ | 328.09 | 0.65 M _n Minor(kip-ft): _____ | 112.06 |
| 0.65 M _n Major(kip-ft): _____ | 206.98 | | |
| | Major | Minor | |
| K _l /r _____ | 28.34 | 38.97 | |
| Slender _____ | No | Yes | |

Slenderness:

| | |
|---|---------|
| P _u (kip) _____ | 328.09 |
| Combination _____ | 2 |
| C _m _____ | 0.61 |
| k _{ns} _____ | 1.00 |
| δ _{ns} _____ | 1.00 |
| β _d _____ | 0.63 |
| P _c (kip) _____ | 2281.13 |
| I _g (in ⁴) _____ | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 12.23 | 64.48 | 241.03 | 0.75 | 229.13 | 0.05 |
| 1 Minor: | 2 | 6.70 | 61.29 | 166.63 | 0.75 | 170.94 | 0.04 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 351.75 | 58.44 | 243.29 | 40.26 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|-------------------|
| Level _____ | Second | Grid Location: _____ | (8.25ft-156.78ft) |
| Column Number: _____ | 8 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.84 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|-----------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _y Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 1.00 | 1.00 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 201.58 |
| Moment Top | Major(kip-ft) _____ | -21.17 |
| | Minor(kip-ft) _____ | 96.16 |
| Moment Bottom | Major(kip-ft) _____ | -21.17 |
| | Minor(kip-ft) _____ | -1.22 |

Calculated Parameters (Angle = 77.59 degrees): L_d/Cap = 0.55

| | | | |
|--|-------------|--|--------|
| 0.65 P _n (kip): _____ | 201.58 | 0.65 M _n Minor(kip-ft): _____ | 174.64 |
| 0.65 M _n Major(kip-ft): _____ | 38.44 | | |
| K _l /r _____ | Major 28.34 | Minor 38.97 | |
| Slender _____ | Yes | Yes | |

Slenderness:

| | | |
|---|----------|---------|
| P _u (kip) _____ | 201.58 | 201.58 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.91 | 0.59 |
| k _{ns} _____ | 1.00 | 1.00 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.64 | 0.64 |
| P _c (kip) _____ | 4296.46 | 2272.51 |
| I _g (in ⁴) _____ | 14197.33 | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 0.27 | 56.58 | 241.03 | 0.75 | 223.20 | 0.00 |
| 1 Minor: | 2 | 6.49 | 53.78 | 166.63 | 0.75 | 165.30 | 0.04 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 308.33 | 51.47 | 213.47 | 35.49 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|-------------------|
| Level _____ | Second | Grid Location: _____ | (6.87ft-135.88ft) |
| Column Number: _____ | 7 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.46 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 25.50 | 25.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 189.10 |
| Moment Top | Major(kip-ft) _____ | 20.01 |
| | Minor(kip-ft) _____ | 63.10 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 17.02 |

Calculated Parameters (Angle = 72.41 degrees): L_d/Cap = 0.38

| | | | |
|--|--------|--|--------|
| 0.65 P _n (kip): _____ | 189.10 | 0.65 M _n Minor(kip-ft): _____ | 168.03 |
| 0.65 M _n Major(kip-ft): _____ | 53.29 | | |
| | Major | Minor | |
| Kl/r _____ | 43.36 | 59.63 | |
| Slender _____ | Yes | Yes | |

Slenderness:

| | | |
|---|----------|---------|
| P _u (kip) _____ | 189.10 | 189.10 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.60 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.64 | 0.64 |
| P _c (kip) _____ | 1836.08 | 971.15 |
| I _g (in ⁴) _____ | 14197.33 | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 0.78 | 55.80 | 241.03 | 0.75 | 222.62 | 0.00 |
| 1 Minor: | 2 | 2.47 | 53.04 | 166.63 | 0.75 | 164.75 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| At Column | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| | 303.57 | 29.80 | 210.21 | 20.55 |

TORSION CAPACITY:

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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 6
 Size: _____ 16x22
 Grid Location: _____ (6.87ft-108.05ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.42

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 15.00 | 15.00 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 166.73
 Moment Top Major(kip-ft) _____ -37.18
 Minor(kip-ft) _____ -39.13
 Moment Bottom Major(kip-ft) _____ -18.91
 Minor(kip-ft) _____ -15.01

Calculated Parameters (Angle = 46.46 degrees): L_d/Cap = 0.29

0.65 P_n(kip): _____ 166.73
 0.65 M_n Major(kip-ft): _____ 126.36 0.65 M_n Minor(kip-ft): _____ 132.97

| | Major | Minor |
|-------------------------|-------|-------|
| K _l /r _____ | 25.51 | 35.07 |
| Slender _____ | No | Yes |

Slenderness:

P_u (kip) _____ 166.73
 Combination _____ 2
 C_m _____ 0.71
 k_{ns} _____ 0.90
 δ_{ns} _____ 1.00
 β_d _____ 0.65
 P_c (kip) _____ 2784.40
 I_g (in⁴) _____ 7509.33

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 49.19 | 50.78 | 241.03 | 0.75 | 218.86 | 0.22 |
| 1 Minor: | 2 | 33.92 | 48.27 | 166.63 | 0.75 | 161.17 | 0.21 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 296.46 | 49.19 | 205.33 | 33.92 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | | |
| Column Number: _____ | 5 | Grid Location: _____ | (-16.63ft-201.29ft) |
| Size: _____ | 20"Ø | Diameter (in) _____ | 20.00 |
| Reinforcement | | | |
| Longitudinal: _____ | 10-#8 | As (in ²) _____ | 7.90 (2.51%) |
| Transverse: _____ | #4@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Circular | Clear Cover (in) _____ | 1.50 |
| Longitudinal Bars Max Tension Stress Ratio: 1.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 25.50 | 25.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 207.08 |
| Moment Top | Major(kip-ft) _____ | -146.05 |
| | Minor(kip-ft) _____ | -95.12 |
| Moment Bottom | Major(kip-ft) _____ | -19.53 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 33.08 degrees): L_d/Cap = 0.74

| | | | |
|--|--------|--|--------|
| 0.68 P _n (kip): _____ | 207.08 | | |
| 0.68 M _n Major(kip-ft): _____ | 197.44 | 0.68 M _n Minor(kip-ft): _____ | 128.59 |

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 55.08 | 55.08 |
| Slender _____ | Yes | Yes |

Slenderness:

| | | |
|---|---------|---------|
| P _u (kip) _____ | 207.08 | 207.08 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.60 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.64 | 0.64 |
| P _c (kip) _____ | 1013.65 | 1013.65 |
| I _g (in ⁴) _____ | 7853.98 | 7853.98 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 5.73 | 65.81 | 140.00 | 0.75 | 154.36 | 0.04 |
| 1 Minor: | 2 | 3.73 | 65.81 | 140.00 | 0.75 | 154.36 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 305.49 | 27.66 | 309.07 | 28.13 |

TORSION CAPACITY:

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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 4
 Size: _____ 16x22
 Grid Location: _____ (-16.63ft-174.28ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.73

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fyt Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 25.50 | 25.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 314.23
 Moment Top Major(kip-ft) _____ 127.86
 Minor(kip-ft) _____ -90.73
 Moment Bottom Major(kip-ft) _____ 32.99
 Minor(kip-ft) _____ -0.00

Calculated Parameters (Angle = 35.36 degrees): L_d/Cap = 0.71

| | | | |
|--|--------|--|--------|
| 0.65 P _n (kip): _____ | 314.23 | 0.65 M _n Minor(kip-ft): _____ | 126.96 |
| 0.65 M _n Major(kip-ft): _____ | 178.91 | | |
| | Major | Minor | |
| Kl/r _____ | 43.36 | 59.63 | |
| Slender _____ | Yes | Yes | |

Slenderness:

| | | |
|---|----------|---------|
| P _u (kip) _____ | 314.23 | 314.23 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.60 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.05 |
| β _d _____ | 0.64 | 0.64 |
| P _c (kip) _____ | 1838.01 | 972.17 |
| I _g (in ⁴) _____ | 14197.33 | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 5.01 | 63.61 | 241.03 | 0.75 | 228.48 | 0.02 |
| 1 Minor: | 2 | 3.37 | 60.47 | 166.63 | 0.75 | 170.32 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| At Column | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| | 347.98 | 33.98 | 240.69 | 23.42 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | Second | Grid Location: _____ | (-16.63ft-156.78ft) |
| Column Number: _____ | 3 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-15'-0" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.47 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 25.50 | 25.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 196.51 |
| Moment Top | Major(kip-ft) _____ | -20.63 |
| | Minor(kip-ft) _____ | -66.55 |
| Moment Bottom | Major(kip-ft) _____ | -20.63 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 72.77 degrees): L_d/Cap = 0.39

| | | | |
|--|-------------|--|--------|
| 0.65 P _n (kip): _____ | 196.51 | 0.65 M _n Minor(kip-ft): _____ | 170.31 |
| 0.65 M _n Major(kip-ft): _____ | 52.80 | | |
| Kl/r _____ | Major 43.36 | Minor 59.63 | |
| Slender _____ | Yes | Yes | |

Slenderness:

| | | |
|---|----------|---------|
| P _u (kip) _____ | 196.51 | 196.51 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.60 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.64 | 0.64 |
| P _c (kip) _____ | 1837.84 | 972.08 |
| I _g (in ⁴) _____ | 14197.33 | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 0.32 | 56.26 | 241.03 | 0.75 | 222.96 | 0.00 |
| 1 Minor: | 2 | 2.61 | 53.48 | 166.63 | 0.75 | 165.08 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 306.17 | 30.09 | 211.99 | 20.74 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 2
 Size: _____ 16x22
 Grid Location: _____ (-16.63ft-135.88ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.32

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fyt Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 25.50 | 25.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp
 Axial Load (kip) _____ 279.49
 Moment Top Major(kip-ft) _____ -69.86
 Minor(kip-ft) _____ -40.70
 Moment Bottom Major(kip-ft) _____ -29.35
 Minor(kip-ft) _____ -0.00

Calculated Parameters (Angle = 30.23 degrees): Ld/Cap = 0.36

| | | |
|--|----------|---|
| 0.65 P _n (kip): _____ | 279.49 | |
| 0.65 M _n Major(kip-ft): _____ | 194.80 | 0.65 M _n Minor(kip-ft): _____ 113.50 |
| | Major | Minor |
| Kl/r _____ | 43.36 | 59.63 |
| Slender _____ | Yes | Yes |
| Slenderness: | | |
| P _u (kip) _____ | 279.49 | 279.49 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.60 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.64 | 0.64 |
| P _c (kip) _____ | 1837.56 | 971.93 |
| I _g (in ⁴) _____ | 14197.33 | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 2.74 | 61.44 | 241.03 | 0.75 | 226.85 | 0.01 |
| 1 Minor: | 2 | 1.60 | 58.41 | 166.63 | 0.75 | 168.77 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 336.03 | 32.92 | 232.48 | 22.69 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

Level _____ Second
 Column Number: _____ 1
 Size: _____ 16x22
 Grid Location: _____ (-16.63ft-108.05ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.43

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fyt Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 25.50 | 25.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp
 Axial Load (kip) _____ 237.15
 Moment Top Major(kip-ft) _____ 31.83
 Minor(kip-ft) _____ 72.49
 Moment Bottom Major(kip-ft) _____ 24.90
 Minor(kip-ft) _____ 0.00

Calculated Parameters (Angle = 66.30 degrees): Ld/Cap = 0.42

| | | | |
|--|--------|--|--------|
| 0.65 P _n (kip): _____ | 237.15 | | |
| 0.65 M _n Major(kip-ft): _____ | 75.77 | 0.65 M _n Minor(kip-ft): _____ | 172.59 |
| | Major | Minor | |
| Kl/r _____ | 43.36 | 59.63 | |
| Slender _____ | Yes | Yes | |

Slenderness:

| | | |
|---|----------|---------|
| P _u (kip) _____ | 237.15 | 237.15 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.60 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.64 | 0.64 |
| P _c (kip) _____ | 1837.68 | 971.99 |
| I _g (in ⁴) _____ | 14197.33 | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 1.25 | 58.80 | 241.03 | 0.75 | 224.87 | 0.01 |
| 1 Minor: | 2 | 2.84 | 55.89 | 166.63 | 0.75 | 166.89 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 321.33 | 31.53 | 222.39 | 21.74 |

TORSION CAPACITY:

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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 70
 Size: _____ 16x22
 Grid Location: _____ (241.45ft--14.04ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fy_t Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 508.45 |
| Moment Top | Major(kip-ft) _____ | 75.00 |
| | Minor(kip-ft) _____ | 73.62 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.55

0.65 P_n(kip): _____ 508.45
 0.65 M_n Major(kip-ft): _____ 299.74 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 7.14 | 75.75 | 241.03 | 0.75 | 237.58 | 0.03 |
| 1 Minor: | 2 | 7.01 | 72.00 | 166.63 | 0.75 | 178.97 | 0.04 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 402.98 | 93.02 | 278.80 | 63.53 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 68
 Size: _____ 12x24
 Grid Location: _____ (238.70ft-179.78ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (2 x 2) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 504.92 |
| Moment Top | Major(kip-ft) _____ | -75.72 |
| | Minor(kip-ft) _____ | -9.01 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.55

0.65 P_n(kip): _____ 504.92
 0.65 M_n Major(kip-ft): _____ 280.97 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 7.21 | 75.52 | 241.03 | 0.75 | 237.41 | 0.03 |
| 1 Minor: | 2 | 0.86 | 71.79 | 166.63 | 0.75 | 178.81 | 0.00 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 376.76 | 84.71 | 288.67 | 69.95 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 67
 Size: _____ 12x24
 Grid Location: _____ (238.70ft-153.28ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (2 x 2) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 496.89
 Moment Top Major(kip-ft) _____ -62.97
 Minor(kip-ft) _____ -0.87
 Moment Bottom Major(kip-ft) _____ -0.00
 Minor(kip-ft) _____ 0.00
Calculated Parameters (Angle = 0.79 degrees): L_d/Cap = 0.54
 0.65 P_n(kip): _____ 496.89
 0.65 M_n Major(kip-ft): _____ 281.69 0.65 M_n Minor(kip-ft): _____ 3.87

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 6.00 | 75.02 | 241.03 | 0.75 | 237.04 | 0.03 |
| 1 Minor: | 2 | 0.08 | 71.31 | 166.63 | 0.75 | 178.45 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 375.10 | 84.49 | 286.98 | 70.01 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 66
 Size: _____ 12x24
 Grid Location: _____ (238.70ft-91.95ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#8 (2 x 2) As (in²) _____ 6.32 (1.80%)
 Transverse: _____ #5@ 3.0" 0'-0"-2'-0" #5@ 6.0" 2'-0"-8'-6" #5@ 3.0" 8'-6"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.96

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fyt Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 670.40 |
| Moment Top | Major(kip-ft) _____ | -121.82 |
| | Minor(kip-ft) _____ | 23.96 |
| Moment Bottom | Major(kip-ft) _____ | -0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.70

| | | | | | |
|----------------------------------|--------|--|--------|--|------|
| 0.65 P _n (kip): _____ | 670.40 | 0.65 M _n Major(kip-ft): _____ | 272.23 | 0.65 M _n Minor(kip-ft): _____ | 0.00 |
| | Major | | Minor | | |
| Kl/r _____ | 17.86 | | 24.55 | | |
| Slender _____ | No | | No | | |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 11.60 | 85.59 | 240.25 | 0.75 | 244.38 | 0.05 |
| 1 Minor: | 2 | 2.28 | 81.24 | 165.85 | 0.75 | 185.32 | 0.01 |
| 2 Major: | 2 | 11.60 | 85.59 | 120.13 | 0.75 | 154.29 | 0.08 |
| 2 Minor: | 2 | 2.28 | 81.24 | 82.93 | 0.75 | 123.12 | 0.02 |
| 3 Major: | 2 | 11.60 | 85.59 | 240.25 | 0.75 | 244.38 | 0.05 |
| 3 Minor: | 2 | 2.28 | 81.24 | 165.85 | 0.75 | 185.32 | 0.01 |



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SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 447.42 | 91.82 | 360.17 | 77.40 |

TORSION CAPACITY:

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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 65
 Size: _____ 12x24
 Grid Location: _____ (238.70ft-65.45ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (2 x 2) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 555.66 |
| Moment Top | Major(kip-ft) _____ | -76.15 |
| | Minor(kip-ft) _____ | -4.51 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.61

| | | | | | |
|----------------------------------|-------------|--|--------|--|------|
| 0.65 P _n (kip): _____ | 555.66 | 0.65 M _n Major(kip-ft): _____ | 275.22 | 0.65 M _n Minor(kip-ft): _____ | 0.00 |
| K _l /r _____ | Major 17.86 | Minor 24.55 | | | |
| Slender _____ | No | No | | | |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 7.25 | 78.70 | 241.03 | 0.75 | 239.79 | 0.03 |
| 1 Minor: | 2 | 0.43 | 74.81 | 166.63 | 0.75 | 181.07 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 391.14 | 85.47 | 303.38 | 69.60 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 64
 Size: _____ 12x24
 Grid Location: _____ (238.70ft-38.95ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (2 x 2) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 539.50 |
| Moment Top | Major(kip-ft) _____ | -80.86 |
| | Minor(kip-ft) _____ | 8.73 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.59

0.65 P_n(kip): _____ 539.50
 0.65 M_n Major(kip-ft): _____ 277.23 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 7.70 | 77.69 | 241.03 | 0.75 | 239.03 | 0.03 |
| 1 Minor: | 2 | 0.83 | 73.85 | 166.63 | 0.75 | 180.35 | 0.00 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 387.72 | 85.44 | 299.85 | 69.72 |



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Concrete Column Design

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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 63
 Size: _____ 12x24
 Grid Location: _____ (238.70ft-12.45ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (2 x 2) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 526.99
 Moment Top Major(kip-ft) _____ -78.54
 Minor(kip-ft) _____ -14.67
 Moment Bottom Major(kip-ft) _____ -0.00
 Minor(kip-ft) _____ 0.00
Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.57
 0.65 P_n(kip): _____ 526.99
 0.65 M_n Major(kip-ft): _____ 278.72 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 7.48 | 76.91 | 241.03 | 0.75 | 238.45 | 0.03 |
| 1 Minor: | 2 | 1.40 | 73.10 | 166.63 | 0.75 | 179.80 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 385.40 | 85.27 | 297.48 | 69.80 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 59
 Size: _____ 16x22
 Grid Location: _____ (213.45ft-198.62ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 152.55 |
| Moment Top | Major(kip-ft) _____ | -1.54 |
| | Minor(kip-ft) _____ | -17.48 |
| Moment Bottom | Major(kip-ft) _____ | -0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.17

0.65 P_n(kip): _____ 152.55
 0.65 M_n Major(kip-ft): _____ 237.25 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 68.95 | 50.00 | 241.03 | 0.75 | 218.27 | 0.32 |
| 1 Minor: | 2 | 47.55 | 47.53 | 166.63 | 0.75 | 160.62 | 0.30 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 288.99 | 68.95 | 200.21 | 47.55 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 58
 Size: _____ 16x22
 Grid Location: _____ (213.45ft-187.95ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 429.88 |
| Moment Top | Major(kip-ft) _____ | -36.88 |
| | Minor(kip-ft) _____ | -18.42 |
| Moment Bottom | Major(kip-ft) _____ | -0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.47

0.65 P_n(kip): _____ 429.88
 0.65 M_n Major(kip-ft): _____ 309.09 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 6.21 | 70.84 | 241.03 | 0.75 | 233.90 | 0.03 |
| 1 Minor: | 2 | 3.03 | 67.32 | 166.63 | 0.75 | 175.46 | 0.02 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 377.87 | 89.55 | 261.32 | 61.68 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 62
 Size: _____ 16x22
 Grid Location: _____ (213.20ft--14.04ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-15'-0"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 576.36
 Moment Top Major(kip-ft) _____ 134.27
 Minor(kip-ft) _____ 1.16
 Moment Bottom Major(kip-ft) _____ 0.00
 Minor(kip-ft) _____ -0.00
Calculated Parameters (Angle = 0.50 degrees): L_d/Cap = 0.63
 0.65 P_n(kip): _____ 576.36
 0.65 M_n Major(kip-ft): _____ 288.32 0.65 M_n Minor(kip-ft): _____ 2.49

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 12.79 | 79.99 | 241.03 | 0.75 | 240.76 | 0.05 |
| 1 Minor: | 2 | 0.11 | 76.04 | 166.63 | 0.75 | 182.00 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 419.52 | 93.75 | 290.44 | 63.50 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 61
 Size: _____ 16x22
 Grid Location: _____ (212.82ft-13.96ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 3 Shear Legs Minor _____ 4
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 618.97
 Moment Top Major(kip-ft) _____ 7.95
 Minor(kip-ft) _____ -87.92
 Moment Bottom Major(kip-ft) _____ 0.00
 Minor(kip-ft) _____ -0.00

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.67

0.65 P_n(kip): _____ 618.97
 0.65 M_n Major(kip-ft): _____ 279.40 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 0.76 | 82.65 | 361.54 | 0.75 | 333.14 | 0.00 |
| 1 Minor: | 2 | 8.37 | 78.57 | 333.25 | 0.75 | 308.86 | 0.03 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | Major | | Minor | |
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 429.42 | 93.33 | 297.48 | 63.38 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 60
 Size: _____ 12x24
 Grid Location: _____ (212.54ft-129.27ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement

Longitudinal: _____ 8-#8 (2 x 2) As (in²) _____ 6.32 (1.80%)
 Transverse: _____ #5@ 3.0" 0'-0"-2'-0" #5@ 6.0" 2'-0"-8'-6" #5@ 3.0" 8'-6"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 f_y Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_y Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 527.49
 Moment Top Major(kip-ft) _____ 61.24
 Minor(kip-ft) _____ -65.72
 Moment Bottom Major(kip-ft) _____ 0.00
 Minor(kip-ft) _____ 0.00

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.55

0.65 P_n(kip): _____ 527.49
 0.65 M_n Major(kip-ft): _____ 297.03 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 5.83 | 76.69 | 240.25 | 0.75 | 237.70 | 0.02 |
| 1 Minor: | 2 | 6.26 | 72.79 | 165.85 | 0.75 | 178.98 | 0.03 |
| 2 Major: | 2 | 5.83 | 76.69 | 120.13 | 0.75 | 147.61 | 0.04 |
| 2 Minor: | 2 | 6.26 | 72.79 | 82.93 | 0.75 | 116.79 | 0.05 |
| 3 Major: | 2 | 5.83 | 76.69 | 240.25 | 0.75 | 237.70 | 0.02 |
| 3 Minor: | 2 | 6.26 | 72.79 | 165.85 | 0.75 | 178.98 | 0.03 |



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SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 423.50 | 92.61 | 331.10 | 76.84 |

TORSION CAPACITY:

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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 57
 Size: _____ 16x22
 Grid Location: _____ (209.79ft-102.44ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.76

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 772.78 |
| Moment Top | Major(kip-ft) _____ | 71.16 |
| | Minor(kip-ft) _____ | 19.22 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.84

0.65 P_n(kip): _____ 772.78
 0.65 M_n Major(kip-ft): _____ 232.99 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 6.78 | 92.26 | 241.03 | 0.75 | 249.96 | 0.03 |
| 1 Minor: | 2 | 1.83 | 87.70 | 166.63 | 0.75 | 190.74 | 0.01 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 453.51 | 93.97 | 315.13 | 63.54 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 56
 Size: _____ 16x22
 Grid Location: _____ (209.79ft-75.60ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 550.67 |
| Moment Top | Major(kip-ft) _____ | 104.96 |
| | Minor(kip-ft) _____ | 37.26 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.60

0.65 P_n(kip): _____ 550.67
 0.65 M_n Major(kip-ft): _____ 293.11 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 10.00 | 78.38 | 241.03 | 0.75 | 239.56 | 0.04 |
| 1 Minor: | 2 | 3.55 | 74.51 | 166.63 | 0.75 | 180.85 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 410.72 | 93.96 | 284.22 | 63.54 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 75
 Size: _____ 16x22
 Grid Location: _____ (198.54ft-75.60ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 f_y Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 75.94
 Moment Top Major(kip-ft) _____ -43.30
 Minor(kip-ft) _____ 58.79
 Moment Bottom Major(kip-ft) _____ 0.00
 Minor(kip-ft) _____ -0.00

Calculated Parameters (Angle = 53.63 degrees): L_d/Cap = 0.44

| | | | | | |
|----------------------------------|-------|--|-------|--|--------|
| 0.75 P _n (kip): _____ | 75.94 | 0.75 M _n Major(kip-ft): _____ | 98.77 | 0.75 M _n Minor(kip-ft): _____ | 134.10 |
| | Major | | Minor | | |
| Kl/r _____ | 17.86 | | 24.55 | | |
| Slender _____ | No | | No | | |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (1) 1.400 D

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 1 | 61.00 | 0.00 | 241.03 | 0.75 | 180.77 | 0.34 |
| 1 Minor: | 1 | 42.09 | 0.00 | 166.63 | 0.75 | 124.97 | 0.34 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 259.54 | 61.00 | 180.03 | 42.09 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 54
 Size: _____ 16x22
 Grid Location: _____ (194.33ft-198.62ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7
 As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Circular
 Clear Cover (in) _____ 1.50
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00
 f_y Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00
 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00
 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28
 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 166.18 |
| Moment Top | Major(kip-ft) _____ | -7.41 |
| | Minor(kip-ft) _____ | 15.60 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.18

| | | | |
|--|--------|--|------|
| 0.65 P _n (kip): _____ | 166.18 | | |
| 0.65 M _n Major(kip-ft): _____ | 204.66 | 0.65 M _n Minor(kip-ft): _____ | 0.00 |

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 57.97 | 35.10 | 241.03 | 0.75 | 207.09 | 0.28 |
| 1 Minor: | 2 | 45.54 | 48.26 | 166.63 | 0.75 | 161.16 | 0.28 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|-------------|----------|-------------|----------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 260.97 | 57.97 | 197.68 | 45.54 |

TORSION CAPACITY:

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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 53
 Size: _____ 16x22
 Grid Location: _____ (194.33ft-187.95ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 395.40 |
| Moment Top | Major(kip-ft) _____ | -38.84 |
| | Minor(kip-ft) _____ | 29.68 |
| Moment Bottom | Major(kip-ft) _____ | -0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.43

0.65 P_n(kip): _____ 395.40
 0.65 M_n Major(kip-ft): _____ 310.54 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 5.47 | 68.68 | 241.03 | 0.75 | 232.28 | 0.02 |
| 1 Minor: | 2 | 2.83 | 57.89 | 166.63 | 0.75 | 168.38 | 0.02 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 372.59 | 87.73 | 257.66 | 60.43 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 55
 Size: _____ 16x22
 Grid Location: _____ (184.87ft--14.04ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 477.49 |
| Moment Top | Major(kip-ft) _____ | 137.09 |
| | Minor(kip-ft) _____ | -26.53 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.52

0.65 P_n(kip): _____ 477.49
 0.65 M_n Major(kip-ft): _____ 303.88 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 13.06 | 73.81 | 241.03 | 0.75 | 236.13 | 0.06 |
| 1 Minor: | 2 | 2.53 | 70.16 | 166.63 | 0.75 | 177.59 | 0.01 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 393.36 | 91.76 | 272.07 | 63.23 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 52
 Size: _____ 12x24
 Grid Location: _____ (180.12ft-162.29ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (2 x 2) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 381.67
 Moment Top Major(kip-ft) _____ -3.79
 Minor(kip-ft) _____ 65.91
 Moment Bottom Major(kip-ft) _____ 0.00
 Minor(kip-ft) _____ -0.00
Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.42
 0.65 P_n(kip): _____ 381.67
 0.65 M_n Major(kip-ft): _____ 284.91 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 1 | 0.75 | 61.57 | 241.03 | 0.75 | 226.95 | 0.00 |
| 1 Minor: | 2 | 6.94 | 64.47 | 166.63 | 0.75 | 173.32 | 0.04 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 350.45 | 80.15 | 263.28 | 64.78 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 51
 Size: _____ 12x24
 Grid Location: _____ (180.12ft-153.63ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (2 x 2) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 342.84 |
| Moment Top | Major(kip-ft) _____ | -9.01 |
| | Minor(kip-ft) _____ | -47.19 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.37

0.65 P_n(kip): _____ 342.84
 0.65 M_n Major(kip-ft): _____ 280.37 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 1 | 1.23 | 60.34 | 241.03 | 0.75 | 226.02 | 0.01 |
| 1 Minor: | 2 | 4.49 | 62.17 | 166.63 | 0.75 | 171.59 | 0.03 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 343.09 | 78.25 | 256.53 | 62.49 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 49
 Size: _____ 16x22
 Grid Location: _____ (180.12ft-97.46ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.97

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 596.62
 Moment Top Major(kip-ft) _____ -12.30
 Minor(kip-ft) _____ 1.91
 Moment Bottom Major(kip-ft) _____ -0.00
 Minor(kip-ft) _____ -0.00
Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.65
 0.65 P_n(kip): _____ 596.62
 0.65 M_n Major(kip-ft): _____ 284.22 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (1) 1.400 D

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 1 | 1.23 | 73.74 | 241.03 | 0.75 | 236.07 | 0.01 |
| 1 Minor: | 2 | 0.18 | 77.24 | 166.63 | 0.75 | 182.90 | 0.00 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 435.51 | 93.58 | 301.85 | 63.47 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 48
 Size: _____ 16x22
 Grid Location: _____ (180.12ft-69.63ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 532.49
 Moment Top Major(kip-ft) _____ -43.42
 Minor(kip-ft) _____ -2.53
 Moment Bottom Major(kip-ft) _____ 0.00
 Minor(kip-ft) _____ 0.00
Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.58
 0.65 P_n(kip): _____ 532.49
 0.65 M_n Major(kip-ft): _____ 296.08 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 4.14 | 77.25 | 241.03 | 0.75 | 238.71 | 0.02 |
| 1 Minor: | 2 | 0.24 | 73.43 | 166.63 | 0.75 | 180.04 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 421.40 | 93.86 | 291.77 | 63.54 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 47
 Size: _____ 16x22
 Grid Location: _____ (180.12ft-41.79ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 478.08
 Moment Top Major(kip-ft) _____ -38.35
 Minor(kip-ft) _____ 11.86
 Moment Bottom Major(kip-ft) _____ 0.00
 Minor(kip-ft) _____ -0.00
Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.52
 0.65 P_n(kip): _____ 478.08
 0.65 M_n Major(kip-ft): _____ 303.81 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 3.65 | 73.85 | 241.03 | 0.75 | 236.16 | 0.02 |
| 1 Minor: | 2 | 1.13 | 70.20 | 166.63 | 0.75 | 177.62 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 405.81 | 91.79 | 280.79 | 63.24 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 46
 Size: _____ 16x22
 Grid Location: _____ (180.12ft-13.96ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 3 Shear Legs Minor _____ 4
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 593.52 |
| Moment Top | Major(kip-ft) _____ | 37.28 |
| | Minor(kip-ft) _____ | -64.11 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.65

0.65 P_n(kip): _____ 593.52
 0.65 M_n Major(kip-ft): _____ 284.89 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 3.55 | 81.06 | 361.54 | 0.75 | 331.95 | 0.01 |
| 1 Minor: | 2 | 6.11 | 77.05 | 333.25 | 0.75 | 307.73 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 427.17 | 93.61 | 295.88 | 63.47 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 44
 Size: _____ 16x22
 Grid Location: _____ (166.45ft-198.62ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 122.62 |
| Moment Top | Major(kip-ft) _____ | -4.04 |
| | Minor(kip-ft) _____ | -11.80 |
| Moment Bottom | Major(kip-ft) _____ | -0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.13

0.65 P_n(kip): _____ 122.62
 0.65 M_n Major(kip-ft): _____ 222.02 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 65.92 | 0.00 | 241.03 | 0.75 | 180.77 | 0.36 |
| 1 Minor: | 2 | 45.48 | 0.00 | 166.63 | 0.75 | 124.97 | 0.36 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 280.59 | 65.92 | 194.46 | 45.48 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 43
 Size: _____ 16x22
 Grid Location: _____ (166.45ft-187.95ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 404.07 |
| Moment Top | Major(kip-ft) _____ | -64.88 |
| | Minor(kip-ft) _____ | -28.32 |
| Moment Bottom | Major(kip-ft) _____ | -0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.44

0.65 P_n(kip): _____ 404.07
 0.65 M_n Major(kip-ft): _____ 311.18 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 6.18 | 69.23 | 241.03 | 0.75 | 232.69 | 0.03 |
| 1 Minor: | 2 | 2.70 | 65.80 | 166.63 | 0.75 | 174.32 | 0.02 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 376.69 | 88.22 | 260.50 | 60.77 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 36
 Size: _____ 16x22
 Grid Location: _____ (156.95ft-13.95ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 566.09 |
| Moment Top | Major(kip-ft) _____ | -11.96 |
| | Minor(kip-ft) _____ | -9.75 |
| Moment Bottom | Major(kip-ft) _____ | -0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.62

0.65 P_n(kip): _____ 566.09
 0.65 M_n Major(kip-ft): _____ 290.26 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 1.65 | 79.35 | 241.03 | 0.75 | 240.28 | 0.01 |
| 1 Minor: | 2 | 1.63 | 75.43 | 166.63 | 0.75 | 181.54 | 0.01 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 423.34 | 93.84 | 293.16 | 63.52 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 45
 Size: _____ 16x22
 Grid Location: _____ (156.54ft--11.62ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 578.70 |
| Moment Top | Major(kip-ft) _____ | 37.48 |
| | Minor(kip-ft) _____ | 4.52 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.63

0.65 P_n(kip): _____ 578.70
 0.65 M_n Major(kip-ft): _____ 287.89 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 3.57 | 80.14 | 241.03 | 0.75 | 240.87 | 0.01 |
| 1 Minor: | 1 | 0.40 | 66.77 | 166.63 | 0.75 | 175.05 | 0.00 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 419.00 | 93.73 | 290.07 | 63.50 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 42
 Size: _____ 12x24
 Grid Location: _____ (152.79ft-162.29ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (2 x 2) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 377.62
 Moment Top Major(kip-ft) _____ -7.33
 Minor(kip-ft) _____ 58.18
 Moment Bottom Major(kip-ft) _____ -0.00
 Minor(kip-ft) _____ -0.00
Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.41
 0.65 P_n(kip): _____ 377.62
 0.65 M_n Major(kip-ft): _____ 284.51 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 0.70 | 67.57 | 241.03 | 0.75 | 231.45 | 0.00 |
| 1 Minor: | 2 | 5.54 | 64.23 | 166.63 | 0.75 | 173.14 | 0.03 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 350.46 | 79.96 | 263.29 | 64.54 |



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COLUMN INFORMATION:

| | | | |
|--|------------------------------|-----------------------------|---------------------|
| Level _____ | First | Grid Location: _____ | (152.79ft-153.63ft) |
| Column Number: _____ | 41 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 12x24 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (2 x 2) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-10'-6" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 3 | Shear Legs Minor _____ | 3 |
| Longitudinal Bars Max Tension Stress Ratio: 1.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | |
|--------|------------------|---------------------|--------|
| Axial | Load (kip) _____ | 391.60 | |
| Moment | Top | Major(kip-ft) _____ | 0.36 |
| | | Minor(kip-ft) _____ | -57.81 |
| Moment | Bottom | Major(kip-ft) _____ | 0.00 |
| | | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.43

| | | | | | |
|----------------------------------|--------|--|--------|--|------|
| 0.65 P _n (kip): _____ | 391.60 | 0.65 M _n Major(kip-ft): _____ | 285.83 | 0.65 M _n Minor(kip-ft): _____ | 0.00 |
| | | | Major | Minor | |
| Kl/r _____ | 17.86 | | 24.55 | | |
| Slender _____ | No | | No | | |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 1 | 0.09 | 62.82 | 361.54 | 0.75 | 318.26 | 0.00 |
| 1 Minor: | 2 | 5.51 | 65.06 | 249.94 | 0.75 | 236.25 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 357.48 | 80.62 | 269.89 | 65.36 |



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COLUMN INFORMATION:

| | | | |
|--|------------------------------|-----------------------------|--------------------|
| Level _____ | First | Grid Location: _____ | (152.29ft-97.46ft) |
| Column Number: _____ | 40 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-10'-6" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.99 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | |
|--------|------------------|---------------------|-------|
| Axial | Load (kip) _____ | 583.31 | |
| Moment | Top | Major(kip-ft) _____ | -8.38 |
| | | Minor(kip-ft) _____ | 3.24 |
| Moment | Bottom | Major(kip-ft) _____ | 0.00 |
| | | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.64

| | | | |
|--|--------|--|------|
| 0.65 P _n (kip): _____ | 583.31 | | |
| 0.65 M _n Major(kip-ft): _____ | 287.03 | 0.65 M _n Minor(kip-ft): _____ | 0.00 |

| | Major | Minor |
|-------------------------|-------|-------|
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 0.80 | 80.42 | 241.03 | 0.75 | 241.09 | 0.00 |
| 1 Minor: | 2 | 0.31 | 76.45 | 166.63 | 0.75 | 182.30 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 434.30 | 93.69 | 300.97 | 63.49 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 39
 Size: _____ 16x22
 Grid Location: _____ (152.29ft-69.63ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 562.88 |
| Moment Top | Major(kip-ft) _____ | 4.10 |
| | Minor(kip-ft) _____ | -1.79 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.61

0.65 P_n(kip): _____ 562.88
 0.65 M_n Major(kip-ft): _____ 290.86 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 0.39 | 79.15 | 241.03 | 0.75 | 240.13 | 0.00 |
| 1 Minor: | 2 | 0.17 | 75.23 | 166.63 | 0.75 | 181.39 | 0.00 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 428.30 | 93.87 | 296.68 | 63.52 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 38
 Size: _____ 16x22
 Grid Location: _____ (152.29ft-41.70ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 472.76 |
| Moment Top | Major(kip-ft) _____ | 43.30 |
| | Minor(kip-ft) _____ | 8.84 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.52

0.65 P_n(kip): _____ 472.76
 0.65 M_n Major(kip-ft): _____ 304.45 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 4.12 | 73.52 | 241.03 | 0.75 | 235.91 | 0.02 |
| 1 Minor: | 2 | 0.84 | 69.88 | 166.63 | 0.75 | 177.38 | 0.00 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 405.59 | 91.56 | 280.63 | 63.09 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 37
 Size: _____ 16x22
 Grid Location: _____ (152.28ft-125.54ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.85

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 639.30 |
| Moment Top | Major(kip-ft) _____ | 1.88 |
| | Minor(kip-ft) _____ | 5.74 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.70

0.65 P_n(kip): _____ 639.30
 0.65 M_n Major(kip-ft): _____ 274.49 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 1 | 0.17 | 76.31 | 241.03 | 0.75 | 238.00 | 0.00 |
| 1 Minor: | 2 | 0.55 | 79.77 | 166.63 | 0.75 | 184.79 | 0.00 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 446.11 | 93.34 | 309.56 | 63.53 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 72
 Size: _____ 16x22
 Grid Location: _____ (147.16ft-198.62ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Circular
 Longitudinal Bars Max Tension Stress Ratio: 1.00

As (in²) _____ 4.80 (1.36%)
 Clear Cover (in) _____ 1.50

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00
 f_{ct} (ksi): _____ 0.00
 Conc. Weight (pcf): _____ 145.00
 Conc. Modulus (ksi): _____ 4074.28

f_y Long (ksi): _____ 60.00
 f_{yt} Trans (ksi): _____ 60.00
 Conc. Type: _____ NWC
 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 122.34 |
| Moment Top | Major(kip-ft) _____ | -4.38 |
| | Minor(kip-ft) _____ | 12.50 |
| Moment Bottom | Major(kip-ft) _____ | -0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.13

0.65 P_n(kip): _____ 122.34
 0.65 M_n Major(kip-ft): _____ 190.15
 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 55.26 | 0.00 | 241.03 | 0.75 | 180.77 | 0.31 |
| 1 Minor: | 2 | 43.04 | 0.00 | 166.63 | 0.75 | 124.97 | 0.34 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 248.82 | 55.26 | 187.43 | 43.04 |

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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 71
 Size: _____ 16x22
 Grid Location: _____ (147.16ft-187.95ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 400.64 |
| Moment Top | Major(kip-ft) _____ | -65.27 |
| | Minor(kip-ft) _____ | 26.86 |
| Moment Bottom | Major(kip-ft) _____ | -0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.44

0.65 P_n(kip): _____ 400.64
 0.65 M_n Major(kip-ft): _____ 311.05 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 6.22 | 69.01 | 241.03 | 0.75 | 232.53 | 0.03 |
| 1 Minor: | 2 | 2.56 | 65.60 | 166.63 | 0.75 | 174.17 | 0.01 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 375.61 | 88.04 | 259.76 | 60.65 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 34
 Size: _____ 16x22
 Grid Location: _____ (128.20ft--11.62ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 510.25 |
| Moment Top | Major(kip-ft) _____ | 38.53 |
| | Minor(kip-ft) _____ | -33.67 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.56

0.65 P_n(kip): _____ 510.25
 0.65 M_n Major(kip-ft): _____ 299.49 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 3.67 | 75.86 | 241.03 | 0.75 | 237.66 | 0.02 |
| 1 Minor: | 2 | 3.21 | 72.11 | 166.63 | 0.75 | 179.05 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 402.81 | 93.08 | 278.69 | 63.53 |



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 Database: MIMU - Revised Design_v2.0
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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 35
 Size: _____ 16x22
 Grid Location: _____ (128.12ft-13.95ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 593.63
 Moment Top Major(kip-ft) _____ 11.69
 Minor(kip-ft) _____ -14.01
 Moment Bottom Major(kip-ft) _____ 0.00
 Minor(kip-ft) _____ 0.00
Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.65
 0.65 P_n(kip): _____ 593.63
 0.65 M_n Major(kip-ft): _____ 284.86 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 1.11 | 81.07 | 241.03 | 0.75 | 241.57 | 0.00 |
| 1 Minor: | 2 | 1.33 | 77.06 | 166.63 | 0.75 | 182.76 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 429.40 | 93.60 | 297.46 | 63.47 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 31
 Size: _____ 12x24
 Grid Location: _____ (123.95ft-162.29ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (2 x 2) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fy_t Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 425.85 |
| Moment Top | Major(kip-ft) _____ | -19.77 |
| | Minor(kip-ft) _____ | 59.66 |
| Moment Bottom | Major(kip-ft) _____ | -0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.46

0.65 P_n(kip): _____ 425.85
 0.65 M_n Major(kip-ft): _____ 286.24 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 1.88 | 70.59 | 241.03 | 0.75 | 233.71 | 0.01 |
| 1 Minor: | 2 | 5.68 | 67.10 | 166.63 | 0.75 | 175.29 | 0.03 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 363.34 | 82.04 | 275.55 | 67.20 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 30
 Size: _____ 12x24
 Grid Location: _____ (123.95ft-153.63ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (2 x 2) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 3 Shear Legs Minor _____ 3
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 f_y Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_y Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 435.92
 Moment Top Major(kip-ft) _____ -26.13
 Minor(kip-ft) _____ -43.95
 Moment Bottom Major(kip-ft) _____ -0.00
 Minor(kip-ft) _____ 0.00
Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.48
 0.65 P_n(kip): _____ 435.92
 0.65 M_n Major(kip-ft): _____ 285.76 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 1 | 2.34 | 65.25 | 361.54 | 0.75 | 320.09 | 0.01 |
| 1 Minor: | 2 | 4.19 | 67.70 | 249.94 | 0.75 | 238.22 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 370.41 | 82.44 | 282.37 | 67.73 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 29
 Size: _____ 16x22
 Grid Location: _____ (123.95ft-125.54ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.96

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 594.09 |
| Moment Top | Major(kip-ft) _____ | 6.59 |
| | Minor(kip-ft) _____ | 16.45 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.65

0.65 P_n(kip): _____ 594.09
 0.65 M_n Major(kip-ft): _____ 284.77 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 0.64 | 81.08 | 241.03 | 0.75 | 241.58 | 0.00 |
| 1 Minor: | 2 | 1.57 | 77.08 | 166.63 | 0.75 | 182.78 | 0.01 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 436.19 | 93.60 | 302.35 | 63.47 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 28
 Size: _____ 16x22
 Grid Location: _____ (123.95ft-97.46ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 498.21
 Moment Top Major(kip-ft) _____ 25.25
 Minor(kip-ft) _____ -1.65
 Moment Bottom Major(kip-ft) _____ 0.00
 Minor(kip-ft) _____ 0.00

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.54

0.65 P_n(kip): _____ 498.21
 0.65 M_n Major(kip-ft): _____ 301.18 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 2.40 | 75.11 | 241.03 | 0.75 | 237.10 | 0.01 |
| 1 Minor: | 2 | 0.16 | 71.39 | 166.63 | 0.75 | 178.51 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 412.41 | 92.65 | 285.41 | 63.52 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 27
 Size: _____ 16x22
 Grid Location: _____ (123.95ft-69.63ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 517.52 |
| Moment Top | Major(kip-ft) _____ | 14.77 |
| | Minor(kip-ft) _____ | 3.66 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.56

0.65 P_n(kip): _____ 517.52
 0.65 M_n Major(kip-ft): _____ 298.47 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 1.41 | 76.31 | 241.03 | 0.75 | 238.00 | 0.01 |
| 1 Minor: | 2 | 0.35 | 72.54 | 166.63 | 0.75 | 179.37 | 0.00 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 420.51 | 93.34 | 291.15 | 63.53 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 26
 Size: _____ 16x22
 Grid Location: _____ (123.95ft-41.70ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 400.44
 Moment Top Major(kip-ft) _____ -28.09
 Minor(kip-ft) _____ -1.31
 Moment Bottom Major(kip-ft) _____ 0.00
 Minor(kip-ft) _____ 0.00
Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.44
 0.65 P_n(kip): _____ 400.44
 0.65 M_n Major(kip-ft): _____ 311.03 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 3.77 | 69.00 | 241.03 | 0.75 | 232.52 | 0.02 |
| 1 Minor: | 2 | 0.17 | 65.59 | 166.63 | 0.75 | 174.16 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 385.36 | 88.03 | 266.52 | 60.64 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 33
 Size: _____ 16x22
 Grid Location: _____ (118.78ft-198.62ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Circular
 Longitudinal Bars Max Tension Stress Ratio: 1.00
 As (in²) _____ 4.80 (1.36%)
 Clear Cover (in) _____ 1.50

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00
 f_{ct} (ksi): _____ 0.00
 Conc. Weight (pcf): _____ 145.00
 Conc. Modulus (ksi): _____ 4074.28
 f_y Long (ksi): _____ 60.00
 f_{yt} Trans (ksi): _____ 60.00
 Conc. Type: _____ NWC
 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 137.25 |
| Moment Top | Major(kip-ft) _____ | -7.39 |
| | Minor(kip-ft) _____ | -0.44 |
| Moment Bottom | Major(kip-ft) _____ | -0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.15

| | | | |
|--|--------|--|------|
| 0.65 P _n (kip): _____ | 137.25 | | |
| 0.65 M _n Major(kip-ft): _____ | 195.37 | 0.65 M _n Minor(kip-ft): _____ | 0.00 |

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 56.23 | 34.35 | 241.03 | 0.75 | 206.53 | 0.27 |
| 1 Minor: | 2 | 43.92 | 47.23 | 166.63 | 0.75 | 160.39 | 0.27 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | Major | | Minor | |
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 253.25 | 56.23 | 191.14 | 43.92 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 32
 Size: _____ 16x22
 Grid Location: _____ (118.78ft-187.95ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 503.58 |
| Moment Top | Major(kip-ft) _____ | -64.32 |
| | Minor(kip-ft) _____ | 5.17 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.55

0.65 P_n(kip): _____ 503.58
 0.65 M_n Major(kip-ft): _____ 300.43 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 6.13 | 75.44 | 241.03 | 0.75 | 237.35 | 0.03 |
| 1 Minor: | 2 | 0.49 | 71.71 | 166.63 | 0.75 | 178.75 | 0.00 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 403.77 | 92.85 | 279.35 | 63.53 |



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COLUMN INFORMATION:

Level _____ First Frame Number: _____ 0
 Column Number: _____ 25 Grid Location: _____ (99.79ft-43.21ft)
 Size: _____ 16x22 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#10 (3 x 1) As (in²) _____ 10.16 (2.89%)
 Transverse: _____ #5@ 6.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 f_y Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_y Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (75) 1.384 D + 0.500 L_p - 1.300 E₃₆

| | | |
|------------------|---------------------|--------|
| Axial | Load (kip) _____ | 953.29 |
| Moment Top | Major(kip-ft) _____ | -75.25 |
| | Minor(kip-ft) _____ | -43.71 |
| Moment Bottom | Major(kip-ft) _____ | 21.14 |
| | Minor(kip-ft) _____ | 16.87 |

Calculated Parameters (Angle = 30.15 degrees): L_d/Cap = 0.89

| | | | |
|--|--------|--|--------|
| 0.65 P _n (kip): _____ | 953.29 | | |
| 0.65 M _n Major(kip-ft): _____ | 178.12 | 0.65 M _n Minor(kip-ft): _____ | 103.45 |
| | Major | Minor | |
| K _l /r _____ | 17.86 | 24.55 | |
| Slender _____ | No | No | |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (212) 0.716 D - 1.300 E₂₅

| | | | | | | | |
|----------|-----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 223 | 7.83 | 83.27 | 119.29 | 0.75 | 151.92 | 0.05 |
| 1 Minor: | 212 | 15.25 | 54.17 | 82.09 | 0.75 | 102.20 | 0.15 |

TORSION CAPACITY:

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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 24
 Size: _____ 16x22
 Grid Location: _____ (99.54ft-15.88ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 254.28
 Moment Top Major(kip-ft) _____ 29.28
 Minor(kip-ft) _____ 6.21
 Moment Bottom Major(kip-ft) _____ 0.00
 Minor(kip-ft) _____ 0.00

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.28

0.65 P_n(kip): _____ 254.28
 0.65 M_n Major(kip-ft): _____ 279.44 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 2.79 | 59.87 | 241.03 | 0.75 | 225.67 | 0.01 |
| 1 Minor: | 2 | 0.59 | 56.91 | 166.63 | 0.75 | 167.65 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 332.24 | 78.01 | 229.88 | 53.77 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 21
 Size: _____ 16x22
 Grid Location: _____ (94.04ft-156.78ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.57

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 804.35 |
| Moment Top | Major(kip-ft) _____ | -2.82 |
| | Minor(kip-ft) _____ | -7.95 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.88

0.65 P_n(kip): _____ 804.35
 0.65 M_n Major(kip-ft): _____ 220.42 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (1) 1.400 D

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 1 | 1.84 | 82.68 | 241.03 | 0.75 | 242.78 | 0.01 |
| 1 Minor: | 1 | 0.72 | 78.60 | 166.63 | 0.75 | 183.92 | 0.00 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 457.94 | 93.81 | 320.00 | 63.54 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 23
 Size: _____ 16x22
 Grid Location: _____ (90.45ft-198.62ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 127.93 |
| Moment Top | Major(kip-ft) _____ | -5.03 |
| | Minor(kip-ft) _____ | -3.38 |
| Moment Bottom | Major(kip-ft) _____ | -0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.14

0.65 P_n(kip): _____ 127.93
 0.65 M_n Major(kip-ft): _____ 224.90 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 66.46 | 0.00 | 241.03 | 0.75 | 180.77 | 0.37 |
| 1 Minor: | 2 | 45.85 | 0.00 | 166.63 | 0.75 | 124.97 | 0.37 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 282.89 | 66.46 | 196.04 | 45.85 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 22
 Size: _____ 16x22
 Grid Location: _____ (90.45ft-187.95ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 548.65 |
| Moment Top | Major(kip-ft) _____ | -60.26 |
| | Minor(kip-ft) _____ | 0.53 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.50 degrees): L_d/Cap = 0.60

0.65 P_n(kip): _____ 548.65
 0.65 M_n Major(kip-ft): _____ 293.43 0.65 M_n Minor(kip-ft): _____ 2.56

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 9.26 | 78.26 | 241.03 | 0.75 | 239.46 | 0.04 |
| 1 Minor: | 2 | 0.38 | 74.39 | 166.63 | 0.75 | 180.76 | 0.00 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 416.61 | 93.98 | 288.37 | 63.54 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 20
 Size: _____ 16x22
 Grid Location: _____ (74.70ft-125.54ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.52

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 550.37 |
| Moment Top | Major(kip-ft) _____ | 57.29 |
| | Minor(kip-ft) _____ | 1.71 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.60

0.65 P_n(kip): _____ 550.37
 0.65 M_n Major(kip-ft): _____ 293.16 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 5.46 | 78.33 | 241.03 | 0.75 | 239.51 | 0.02 |
| 1 Minor: | 2 | 0.16 | 74.45 | 166.63 | 0.75 | 180.81 | 0.00 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 424.24 | 93.97 | 293.80 | 63.54 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 17
 Size: _____ 16x22
 Grid Location: _____ (65.70ft-156.78ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.95

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 629.26 |
| Moment Top | Major(kip-ft) _____ | 27.40 |
| | Minor(kip-ft) _____ | -46.00 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.69

0.65 P_n(kip): _____ 629.26
 0.65 M_n Major(kip-ft): _____ 276.91 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 2.61 | 83.29 | 241.03 | 0.75 | 243.24 | 0.01 |
| 1 Minor: | 2 | 4.38 | 79.18 | 166.63 | 0.75 | 184.35 | 0.02 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 437.39 | 93.22 | 303.22 | 63.41 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 19
 Size: _____ 16x22
 Grid Location: _____ (62.28ft-198.62ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Circular
 Longitudinal Bars Max Tension Stress Ratio: 1.00

As (in²) _____ 4.80 (1.36%)
 Clear Cover (in) _____ 1.50

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00
 f_{ct} (ksi): _____ 0.00
 Conc. Weight (pcf): _____ 145.00
 Conc. Modulus (ksi): _____ 4074.28

f_y Long (ksi): _____ 60.00
 f_{yt} Trans (ksi): _____ 60.00
 Conc. Type: _____ NWC
 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 133.18 |
| Moment Top | Major(kip-ft) _____ | -8.54 |
| | Minor(kip-ft) _____ | 3.37 |
| Moment Bottom | Major(kip-ft) _____ | -0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.15

| | | | |
|--|--------|--|------|
| 0.65 P _n (kip): _____ | 133.18 | | |
| 0.65 M _n Major(kip-ft): _____ | 194.04 | 0.65 M _n Minor(kip-ft): _____ | 0.00 |
| | Major | Minor | |
| Kl/r _____ | 17.86 | 24.55 | |
| Slender _____ | No | No | |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 55.96 | 34.24 | 241.03 | 0.75 | 206.45 | 0.27 |
| 1 Minor: | 2 | 43.68 | 47.08 | 166.63 | 0.75 | 160.28 | 0.27 |

SPECIAL PROVISIONS - :

| | Major | Minor | | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 252.08 | 55.96 | 190.16 | 43.68 |

TORSION CAPACITY:

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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 18
 Size: _____ 16x22
 Grid Location: _____ (62.28ft-187.95ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 548.23 |
| Moment Top | Major(kip-ft) _____ | -91.39 |
| | Minor(kip-ft) _____ | -5.06 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.60

0.65 P_n(kip): _____ 548.23
 0.65 M_n Major(kip-ft): _____ 293.51 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 8.70 | 78.23 | 241.03 | 0.75 | 239.44 | 0.04 |
| 1 Minor: | 1 | 0.75 | 66.43 | 166.63 | 0.75 | 174.79 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 417.28 | 93.98 | 288.85 | 63.54 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 16
 Size: _____ 16x22
 Grid Location: _____ (47.37ft-156.78ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 521.05 |
| Moment Top | Major(kip-ft) _____ | 19.31 |
| | Minor(kip-ft) _____ | 19.83 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.57

0.65 P_n(kip): _____ 521.05
 0.65 M_n Major(kip-ft): _____ 297.95 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 1.84 | 76.53 | 241.03 | 0.75 | 238.17 | 0.01 |
| 1 Minor: | 2 | 1.89 | 72.75 | 166.63 | 0.75 | 179.53 | 0.01 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 410.13 | 93.46 | 283.81 | 63.53 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 15
 Size: _____ 16x22
 Grid Location: _____ (46.37ft-125.54ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 538.03 |
| Moment Top | Major(kip-ft) _____ | 32.75 |
| | Minor(kip-ft) _____ | 3.28 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.59

0.65 P_n(kip): _____ 538.03
 0.65 M_n Major(kip-ft): _____ 295.18 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 3.12 | 77.56 | 241.03 | 0.75 | 238.94 | 0.01 |
| 1 Minor: | 1 | 0.66 | 68.01 | 166.63 | 0.75 | 175.98 | 0.00 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 425.15 | 94.04 | 294.44 | 63.54 |



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COLUMN INFORMATION:

Level _____ First Frame Number: _____ 0
 Column Number: _____ 73 Grid Location: _____ (39.38ft-106.30ft)
 Size: _____ 12x24 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#9 (2 x 2) As (in²) _____ 8.00 (2.27%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 f_y Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_y Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (209) 0.716 D - 1.300 E22

| | | |
|------------------|---------------------|---------|
| Axial | Load (kip) _____ | -315.79 |
| Moment Top | Major(kip-ft) _____ | 9.22 |
| | Minor(kip-ft) _____ | 21.19 |
| Moment Bottom | Major(kip-ft) _____ | -20.10 |
| | Minor(kip-ft) _____ | -10.61 |

Calculated Parameters (Angle = 27.84 degrees): L_d/Cap = 0.73

| | | | |
|--|---------|--|-------|
| 0.90 P _n (kip): _____ | -315.79 | | |
| 0.90 M _n Major(kip-ft): _____ | 87.35 | 0.90 M _n Minor(kip-ft): _____ | 46.13 |
| | Major | Minor | |
| Kl/r _____ | 17.86 | 24.55 | |
| Slender _____ | No | No | |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (74) 1.384 D + 0.500 L_p - 1.300 E35

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 64 | 6.25 | 75.21 | 239.46 | 0.75 | 236.00 | 0.03 |
| 1 Minor: | 74 | 6.29 | 42.61 | 165.06 | 0.75 | 155.75 | 0.04 |

TORSION CAPACITY:

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COLUMN INFORMATION:

| | | | |
|--|------------------------------|-----------------------------|--------------------|
| Level _____ | First | Grid Location: _____ | (34.45ft-198.62ft) |
| Column Number: _____ | 14 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-10'-6" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 1.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | |
|--------|------------------|---------------------|--------|
| Axial | Load (kip) _____ | 178.79 | |
| Moment | Top | Major(kip-ft) _____ | -4.35 |
| | | Minor(kip-ft) _____ | -13.26 |
| Moment | Bottom | Major(kip-ft) _____ | -0.00 |
| | | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.19

| | | | |
|--|--------|--|------|
| 0.65 P _n (kip): _____ | 178.79 | | |
| 0.65 M _n Major(kip-ft): _____ | 249.56 | 0.65 M _n Minor(kip-ft): _____ | 0.00 |

| | Major | Minor |
|-------------------------|-------|-------|
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 0.42 | 51.93 | 241.03 | 0.75 | 219.72 | 0.00 |
| 1 Minor: | 2 | 1.26 | 52.43 | 166.63 | 0.75 | 164.29 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 301.95 | 71.40 | 209.10 | 49.24 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 13
 Size: _____ 16x22
 Grid Location: _____ (34.45ft-187.95ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 424.50
 Moment Top Major(kip-ft) _____ -64.40
 Minor(kip-ft) _____ -38.80
 Moment Bottom Major(kip-ft) _____ -0.00
 Minor(kip-ft) _____ 0.00
Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.46
 0.65 P_n(kip): _____ 424.50
 0.65 M_n Major(kip-ft): _____ 309.63 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 6.13 | 70.50 | 241.03 | 0.75 | 233.65 | 0.03 |
| 1 Minor: | 2 | 3.70 | 67.02 | 166.63 | 0.75 | 175.23 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 381.98 | 89.28 | 264.17 | 61.49 |



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COLUMN INFORMATION:

Level _____ First Frame Number: _____ 0
 Column Number: _____ 74 Grid Location: _____ (28.50ft-106.30ft)
 Size: _____ 10x30 Depth x Width (in) _____ 30.00x10.00

Reinforcement
 Longitudinal: _____ 8-#9 (2 x 2) As (in²) _____ 8.00 (2.67%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 f_y Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_y Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (56) 1.384 D + 0.500 L_p - 1.300 E17

| | | |
|------------------|---------------------|---------|
| Axial | Load (kip) _____ | -192.64 |
| Moment Top | Major(kip-ft) _____ | 21.31 |
| | Minor(kip-ft) _____ | 57.03 |
| Moment Bottom | Major(kip-ft) _____ | 18.61 |
| | Minor(kip-ft) _____ | -25.20 |

Calculated Parameters (Angle = 69.51 degrees): L_d/Cap = 0.84

| | | | |
|--|---------|--|-------|
| 0.87 P _n (kip): _____ | -192.64 | | |
| 0.87 M _n Major(kip-ft): _____ | 25.48 | 0.87 M _n Minor(kip-ft): _____ | 68.19 |
| | Major | Minor | |
| Kl/r _____ | 13.09 | 39.28 | |
| Slender _____ | No | No | |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (60) 1.384 D + 0.500 L_p - 1.300 E21

| | | | | | | | |
|----------|-----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 120 | 0.70 | 72.59 | 338.66 | 0.75 | 308.44 | 0.00 |
| 1 Minor: | 60 | 8.44 | 34.39 | 90.66 | 0.75 | 93.79 | 0.09 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 12
 Size: _____ 16x22
 Grid Location: _____ (24.20ft-187.88ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fyt Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp
 Axial Load (kip) _____ 23.00
 Moment Top Major(kip-ft) _____ -26.05
 Minor(kip-ft) _____ -15.73
 Moment Bottom Major(kip-ft) _____ 0.00
 Minor(kip-ft) _____ 0.00

Calculated Parameters (Angle = 31.14 degrees): Ld/Cap = 0.18

| | | | |
|--|--------|--|-------|
| 0.77 P _n (kip): _____ | 23.00 | | |
| 0.77 M _n Major(kip-ft): _____ | 147.23 | 0.77 M _n Minor(kip-ft): _____ | 88.94 |
| | Major | Minor | |
| Kl/r _____ | 17.86 | 24.55 | |
| Slender _____ | No | No | |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (1) 1.400 D

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|--------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | Ld/Cap |
| 1 Major: | 1 | 55.01 | 0.00 | 241.03 | 0.75 | 180.77 | 0.30 |
| 1 Minor: | 1 | 37.98 | 0.00 | 166.63 | 0.75 | 124.97 | 0.30 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 237.54 | 55.01 | 164.95 | 37.98 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 11
 Size: _____ 16x22
 Grid Location: _____ (16.45ft-125.54ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 232.44
 Moment Top Major(kip-ft) _____ -24.55
 Minor(kip-ft) _____ -43.76
 Moment Bottom Major(kip-ft) _____ -0.00
 Minor(kip-ft) _____ 0.00

Calculated Parameters (Angle = 60.71 degrees): L_d/Cap = 0.27

0.65 P_n(kip): _____ 232.44
 0.65 M_n Major(kip-ft): _____ 92.51 0.65 M_n Minor(kip-ft): _____ 164.89

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| 1 Major: | 2 | 2.34 | 58.50 | 241.03 | 0.75 | 224.64 | 0.01 |
| 1 Minor: | 2 | 4.17 | 55.61 | 166.63 | 0.75 | 166.68 | 0.03 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------------------|----------------------|-------------------------|----------------------|
| | M _n (kip-ft) | V _u (kip) | M _n (kip-ft) | V _u (kip) |
| At Column | 328.87 | 76.17 | 227.56 | 52.51 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 10
 Size: _____ 20"Ø
 Grid Location: _____ (11.70ft-201.29ft)
 Diameter (in) _____ 20.00

Reinforcement
 Longitudinal: _____ 10-#8
 Transverse: _____ #4@ 3.0" 0'-0"-10'-6"
 Confinement _____ Circular
 Longitudinal Bars Max Tension Stress Ratio: 0.70
 As (in²) _____ 7.90 (2.51%)
 Clear Cover (in) _____ 1.50

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00
 f_{ct} (ksi): _____ 0.00
 Conc. Weight (pcf): _____ 145.00
 Conc. Modulus (ksi): _____ 4074.28
 f_y Long (ksi): _____ 60.00
 f_{yt} Trans (ksi): _____ 60.00
 Conc. Type: _____ NWC
 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 25.50 | 25.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 248.33
 Moment Top Major(kip-ft) _____ -105.32
 Minor(kip-ft) _____ 70.22
 Moment Bottom Major(kip-ft) _____ -23.42
 Minor(kip-ft) _____ 0.00

Calculated Parameters (Angle = 33.69 degrees): L_d/Cap = 0.55

0.65 P_n(kip): _____ 248.33
 0.65 M_n Major(kip-ft): _____ 192.90
 0.65 M_n Minor(kip-ft): _____ 128.60

| | Major | Minor |
|-------------------------|-------|-------|
| K _l /r _____ | 55.08 | 55.08 |
| Slender _____ | Yes | Yes |

Slenderness:

| | | |
|---|---------|---------|
| P _u (kip) _____ | 248.33 | 248.33 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.60 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.64 | 0.64 |
| P _c (kip) _____ | 1015.22 | 1015.22 |
| I _g (in ⁴) _____ | 7853.98 | 7853.98 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 4.13 | 69.06 | 140.00 | 0.75 | 156.80 | 0.03 |
| 1 Minor: | 2 | 2.75 | 69.06 | 140.00 | 0.75 | 156.80 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| At Column | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| | 313.07 | 28.15 | 316.81 | 28.68 |

TORSION CAPACITY:

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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 9
 Size: _____ 16x22
 Grid Location: _____ (11.70ft-174.28ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fyt Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 362.07 |
| Moment Top | Major(kip-ft) _____ | -13.61 |
| | Minor(kip-ft) _____ | -3.83 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.39

0.65 P_n(kip): _____ 362.07
 0.65 M_n Major(kip-ft): _____ 306.21 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 1.32 | 66.59 | 241.03 | 0.75 | 230.71 | 0.01 |
| 1 Minor: | 2 | 0.36 | 63.31 | 166.63 | 0.75 | 172.45 | 0.00 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 361.35 | 85.72 | 249.91 | 59.06 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 8
 Size: _____ 16x22
 Grid Location: _____ (8.25ft-156.78ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 231.03 |
| Moment Top | Major(kip-ft) _____ | 4.15 |
| | Minor(kip-ft) _____ | 0.49 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.25

0.65 P_n(kip): _____ 231.03
 0.65 M_n Major(kip-ft): _____ 271.23 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 0.39 | 58.41 | 241.03 | 0.75 | 224.58 | 0.00 |
| 1 Minor: | 2 | 0.05 | 55.52 | 166.63 | 0.75 | 166.61 | 0.00 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 318.31 | 76.05 | 220.31 | 52.43 |



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 7
 Size: _____ 16x22
 Grid Location: _____ (6.87ft-135.88ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.45

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fyt Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | Major | Minor |
|-------------------------------|-------|-------|
| Unbraced Length (ft) _____ | 25.50 | 25.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp
 Axial Load (kip) _____ 193.72
 Moment Top Major(kip-ft) _____ 20.34
 Minor(kip-ft) _____ 63.10
 Moment Bottom Major(kip-ft) _____ 20.34
 Minor(kip-ft) _____ 0.00

Calculated Parameters (Angle = 72.13 degrees): Ld/Cap = 0.37

| | | | |
|--|--------|--|--------|
| 0.65 P _n (kip): _____ | 193.72 | | |
| 0.65 M _n Major(kip-ft): _____ | 54.48 | 0.65 M _n Minor(kip-ft): _____ | 169.01 |
| | Major | Minor | |
| Kl/r _____ | 43.36 | 59.63 | |
| Slender _____ | Yes | Yes | |

Slenderness:

| | | |
|---|----------|---------|
| P _u (kip) _____ | 193.72 | 193.72 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.60 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.65 | 0.65 |
| P _c (kip) _____ | 1826.52 | 966.09 |
| I _g (in ⁴) _____ | 14197.33 | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 0.78 | 56.08 | 241.03 | 0.75 | 222.83 | 0.00 |
| 1 Minor: | 2 | 2.47 | 53.31 | 166.63 | 0.75 | 164.95 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 306.28 | 29.98 | 212.07 | 20.67 |

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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 6
 Size: _____ 16x22
 Grid Location: _____ (6.87ft-108.05ft)
 Depth x Width (in) _____ 22.00x16.00
Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 1.00

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 f_{yt} Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 10.50 | 10.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 271.52 |
| Moment Top | Major(kip-ft) _____ | 29.63 |
| | Minor(kip-ft) _____ | 12.32 |
| Moment Bottom | Major(kip-ft) _____ | 0.00 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 0.00 degrees): L_d/Cap = 0.30

0.65 P_n(kip): _____ 271.52
 0.65 M_n Major(kip-ft): _____ 284.93 0.65 M_n Minor(kip-ft): _____ 0.00

| | | |
|-------------------------|-------|-------|
| | Major | Minor |
| K _l /r _____ | 17.86 | 24.55 |
| Slender _____ | No | No |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | | | | | | |
|----------|----|----------------------|----------------------|----------------------|------|--|---------------------|
| | LC | V _u (kip) | V _c (kip) | V _s (kip) | φ | φ (V _c + V _s) (kip) | L _d /Cap |
| 1 Major: | 2 | 2.82 | 60.95 | 241.03 | 0.75 | 226.48 | 0.01 |
| 1 Minor: | 2 | 1.17 | 57.93 | 166.63 | 0.75 | 168.42 | 0.01 |

SPECIAL PROVISIONS - :

| | | | | |
|-----------|--------------------|-----------------|--------------------|-----------------|
| | Major | | Minor | |
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 338.77 | 79.34 | 234.37 | 54.68 |



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COLUMN INFORMATION:

| | | | |
|--|-----------------------|-----------------------------|---------------------|
| Level _____ | First | | |
| Column Number: _____ | 5 | Grid Location: _____ | (-16.63ft-201.29ft) |
| Size: _____ | 20"Ø | Diameter (in) _____ | 20.00 |
| Reinforcement | | | |
| Longitudinal: _____ | 10-#8 | As (in ²) _____ | 7.90 (2.51%) |
| Transverse: _____ | #4@ 3.0" 0'-0"-10'-6" | | |
| Confinement _____ | Circular | Clear Cover (in) _____ | 1.50 |
| Longitudinal Bars Max Tension Stress Ratio: 1.00 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 25.50 | 25.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|---------|
| Axial | Load (kip) _____ | 211.20 |
| Moment Top | Major(kip-ft) _____ | -146.05 |
| | Minor(kip-ft) _____ | -95.12 |
| Moment Bottom | Major(kip-ft) _____ | -19.92 |
| | Minor(kip-ft) _____ | -0.00 |

Calculated Parameters (Angle = 33.08 degrees): L_d/Cap = 0.74

| | | | |
|--|--------|--|--------|
| 0.68 P _n (kip): _____ | 211.20 | | |
| 0.68 M _n Major(kip-ft): _____ | 197.15 | 0.68 M _n Minor(kip-ft): _____ | 128.40 |

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 55.08 | 55.08 |
| Slender _____ | Yes | Yes |

Slenderness:

| | | |
|---|---------|---------|
| P _u (kip) _____ | 211.20 | 211.20 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.60 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.65 | 0.65 |
| P _c (kip) _____ | 1009.37 | 1009.37 |
| I _g (in ⁴) _____ | 7853.98 | 7853.98 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 5.73 | 66.14 | 140.00 | 0.75 | 154.60 | 0.04 |
| 1 Minor: | 2 | 3.73 | 66.14 | 140.00 | 0.75 | 154.60 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 306.75 | 27.71 | 310.36 | 28.19 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 4
 Size: _____ 16x22
 Grid Location: _____ (-16.63ft-174.28ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.72

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fyt Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 25.50 | 25.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 318.85
 Moment Top Major(kip-ft) _____ 127.86
 Minor(kip-ft) _____ -91.98
 Moment Bottom Major(kip-ft) _____ 33.48
 Minor(kip-ft) _____ -0.00

Calculated Parameters (Angle = 35.73 degrees): L_d/Cap = 0.72

| | | |
|--|----------|---|
| 0.65 P _n (kip): _____ | 318.85 | |
| 0.65 M _n Major(kip-ft): _____ | 178.49 | 0.65 M _n Minor(kip-ft): _____ 128.41 |
| | Major | Minor |
| Kl/r _____ | 43.36 | 59.63 |
| Slender _____ | Yes | Yes |
| Slenderness: | | |
| P _u (kip) _____ | 318.85 | 318.85 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.60 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.07 |
| β _d _____ | 0.64 | 0.64 |
| P _c (kip) _____ | 1832.14 | 969.07 |
| I _g (in ⁴) _____ | 14197.33 | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 5.01 | 63.90 | 241.03 | 0.75 | 228.70 | 0.02 |
| 1 Minor: | 2 | 3.37 | 60.74 | 166.63 | 0.75 | 170.53 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 350.28 | 34.11 | 242.28 | 23.51 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 3
 Size: _____ 16x22
 Grid Location: _____ (-16.63ft-156.78ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.46

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fyt Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 25.50 | 25.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp
 Axial Load (kip) _____ 201.13
 Moment Top Major(kip-ft) _____ -21.12
 Minor(kip-ft) _____ -66.55
 Moment Bottom Major(kip-ft) _____ -21.12
 Minor(kip-ft) _____ -0.00

Calculated Parameters (Angle = 72.39 degrees): Ld/Cap = 0.39

| | | |
|--|----------|---|
| 0.65 P _n (kip): _____ | 201.13 | |
| 0.65 M _n Major(kip-ft): _____ | 54.27 | 0.65 M _n Minor(kip-ft): _____ 171.02 |
| | Major | Minor |
| Kl/r _____ | 43.36 | 59.63 |
| Slender _____ | Yes | Yes |
| Slenderness: | | |
| P _u (kip) _____ | 201.13 | 201.13 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.60 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.65 | 0.65 |
| P _c (kip) _____ | 1828.56 | 967.17 |
| I _g (in ⁴) _____ | 14197.33 | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 Lp



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 0.32 | 56.55 | 241.03 | 0.75 | 223.18 | 0.00 |
| 1 Minor: | 2 | 2.61 | 53.75 | 166.63 | 0.75 | 165.28 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 308.88 | 30.26 | 213.85 | 20.86 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

Level _____ First
 Column Number: _____ 2
 Size: _____ 16x22
 Grid Location: _____ (-16.63ft-135.88ft)
 Depth x Width (in) _____ 22.00x16.00

Reinforcement
 Longitudinal: _____ 8-#7 (3 x 1) As (in²) _____ 4.80 (1.36%)
 Transverse: _____ #5@ 3.0" 0'-0"-10'-6"
 Confinement _____ Tie Clear Cover (in) _____ 1.50
 Shear Legs Major _____ 2 Shear Legs Minor _____ 2
 Longitudinal Bars Max Tension Stress Ratio: 0.30

MATERIAL PROPERTIES:

f_c (ksi): _____ 5.00 fy Long (ksi): _____ 60.00
 f_{ct} (ksi): _____ 0.00 fyt Trans (ksi): _____ 60.00
 Conc. Weight (pcf): _____ 145.00 Conc. Type: _____ NWC
 Conc. Modulus (ksi): _____ 4074.28 Reinf. Modulus (ksi): _____ 29000.00

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 25.50 | 25.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p
 Axial Load (kip) _____ 284.11
 Moment Top Major(kip-ft) _____ -69.86
 Minor(kip-ft) _____ -40.70
 Moment Bottom Major(kip-ft) _____ -29.83
 Minor(kip-ft) _____ -0.00

Calculated Parameters (Angle = 30.23 degrees): L_d/Cap = 0.36

0.65 P_n(kip): _____ 284.11
 0.65 M_n Major(kip-ft): _____ 195.40 0.65 M_n Minor(kip-ft): _____ 113.85

| | | |
|---------------|-------|-------|
| | Major | Minor |
| Kl/r _____ | 43.36 | 59.63 |
| Slender _____ | Yes | Yes |

Slenderness:

| | | |
|---|----------|---------|
| P _u (kip) _____ | 284.11 | 284.11 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.60 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.64 | 0.64 |
| P _c (kip) _____ | 1830.99 | 968.46 |
| I _g (in ⁴) _____ | 14197.33 | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 2.74 | 61.73 | 241.03 | 0.75 | 227.07 | 0.01 |
| 1 Minor: | 2 | 1.60 | 58.68 | 166.63 | 0.75 | 168.98 | 0.01 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 338.54 | 33.07 | 234.20 | 22.79 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



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COLUMN INFORMATION:

| | | | |
|--|------------------------------|-----------------------------|---------------------|
| Level _____ | First | Grid Location: _____ | (-16.63ft-108.05ft) |
| Column Number: _____ | 1 | Depth x Width (in) _____ | 22.00x16.00 |
| Size: _____ | 16x22 | | |
| Reinforcement | | | |
| Longitudinal: _____ | 8-#7 (3 x 1) | As (in ²) _____ | 4.80 (1.36%) |
| Transverse: _____ | #5@ 3.0" 0'-0"-10'-6" | | |
| Confinement _____ | Tie | Clear Cover (in) _____ | 1.50 |
| Shear Legs Major _____ | 2 | Shear Legs Minor _____ | 2 |
| Longitudinal Bars Max Tension Stress Ratio: 0.42 | | | |

MATERIAL PROPERTIES:

| | | | |
|------------------------------|---------|------------------------------------|----------|
| f _c (ksi): _____ | 5.00 | f _y Long (ksi): _____ | 60.00 |
| f _{ct} (ksi): _____ | 0.00 | f _{yt} Trans (ksi): _____ | 60.00 |
| Conc. Weight (pcf): _____ | 145.00 | Conc. Type: _____ | NWC |
| Conc. Modulus (ksi): _____ | 4074.28 | Reinf. Modulus (ksi): _____ | 29000.00 |

DESIGN PARAMETERS:

| | | |
|-------------------------------|-------|-------|
| | Major | Minor |
| Unbraced Length (ft) _____ | 25.50 | 25.50 |
| K _____ | 0.90 | 0.90 |
| Braced Against Sidesway _____ | Yes | Yes |

LONGITUDINAL REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p

| | | |
|---------------|---------------------|--------|
| Axial | Load (kip) _____ | 241.77 |
| Moment Top | Major(kip-ft) _____ | 31.83 |
| | Minor(kip-ft) _____ | 72.49 |
| Moment Bottom | Major(kip-ft) _____ | 25.39 |
| | Minor(kip-ft) _____ | 0.00 |

Calculated Parameters (Angle = 66.30 degrees): L_d/Cap = 0.42

| | | | | | |
|----------------------------------|--------|--|-------|--|--------|
| 0.65 P _n (kip): _____ | 241.77 | 0.65 M _n Major(kip-ft): _____ | 76.14 | 0.65 M _n Minor(kip-ft): _____ | 173.42 |
| | Major | Minor | | | |
| Kl/r _____ | 43.36 | 59.63 | | | |
| Slender _____ | Yes | Yes | | | |

Slenderness:

| | | |
|---|----------|---------|
| P _u (kip) _____ | 241.77 | 241.77 |
| Combination _____ | 2 | 2 |
| C _m _____ | 0.60 | 0.60 |
| k _{ns} _____ | 0.90 | 0.90 |
| δ _{ns} _____ | 1.00 | 1.00 |
| β _d _____ | 0.65 | 0.65 |
| P _c (kip) _____ | 1829.96 | 967.91 |
| I _g (in ⁴) _____ | 14197.33 | 7509.33 |

TRANSVERSE REINFORCEMENT:

Controlling Load Combination: (2) 1.200 D + 1.600 L_p



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| | LC | Vu (kip) | Vc (kip) | Vs (kip) | ϕ | $\phi (Vc + Vs)$ (kip) | Ld/Cap |
|----------|----|----------|----------|----------|--------|------------------------|--------|
| 1 Major: | 2 | 1.25 | 59.09 | 241.03 | 0.75 | 225.08 | 0.01 |
| 1 Minor: | 2 | 2.84 | 56.17 | 166.63 | 0.75 | 167.09 | 0.02 |

SPECIAL PROVISIONS - :

| | Major | | Minor | |
|-----------|-------------|----------|-------------|----------|
| | Mn (kip-ft) | Vu (kip) | Mn (kip-ft) | Vu (kip) |
| At Column | 323.84 | 31.69 | 224.11 | 21.85 |

TORSION CAPACITY:

Torsional Capacity Code Check Not Performed



Bentley

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Location: -16.63ft - 108.05ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 1 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.42 | #5@ 3.0" 0'-0"-15'-0" | 0.02 |
| 1 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.42 | #5@ 3.0" 0'-0"-10'-6" | 0.02 |

Location: -16.63ft - 135.88ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 2 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.36 | #5@ 3.0" 0'-0"-15'-0" | 0.01 |
| 2 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.36 | #5@ 3.0" 0'-0"-10'-6" | 0.01 |

Location: -16.63ft - 156.78ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 3 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.39 | #5@ 3.0" 0'-0"-15'-0" | 0.02 |
| 3 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.39 | #5@ 3.0" 0'-0"-10'-6" | 0.02 |

Location: -16.63ft - 174.28ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 4 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.71 | #5@ 3.0" 0'-0"-15'-0" | 0.02 |
| 4 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.72 | #5@ 3.0" 0'-0"-10'-6" | 0.02 |

Location: -16.63ft - 201.29ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|--------------------------|--------|
| 5 | Second | 20"Ø | 5.00 | 10-#8 | 2.51 | 0.74 | #4(C)@ 3.0" 0'-0"-15'-0" | 0.04 |
| 5 | First | 20"Ø | 5.00 | 10-#8 | 2.51 | 0.74 | #4(C)@ 3.0" 0'-0"-10'-6" | 0.04 |

Location: 6.87ft - 108.05ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 6 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.29 | #5@ 3.0" 0'-0"-15'-0" | 0.22 |
| 6 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.30 | #5@ 3.0" 0'-0"-10'-6" | 0.01 |

Location: 6.87ft - 135.88ft



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| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 7 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.38 | #5@ 3.0" 0'-0"-15'-0" | 0.02 |
| 7 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.37 | #5@ 3.0" 0'-0"-10'-6" | 0.02 |

Location: 8.25ft - 156.78ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 8 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.55 | #5@ 3.0" 0'-0"-15'-0" | 0.04 |
| 8 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.25 | #5@ 3.0" 0'-0"-10'-6" | 0.00 |

Location: 11.70ft - 174.28ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 9 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.91 | #5@ 3.0" 0'-0"-15'-0" | 0.05 |
| 9 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.39 | #5@ 3.0" 0'-0"-10'-6" | 0.01 |

Location: 11.70ft - 201.29ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|--------------------------|--------|
| 10 | Second | 20"Ø | 5.00 | 10-#8 | 2.51 | 0.55 | #4(C)@ 3.0" 0'-0"-15'-0" | 0.03 |
| 10 | First | 20"Ø | 5.00 | 10-#8 | 2.51 | 0.55 | #4(C)@ 3.0" 0'-0"-10'-6" | 0.03 |

Location: 16.45ft - 125.54ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 11 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.51 | #5@ 3.0" 0'-0"-15'-0" | 0.22 |
| 11 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.27 | #5@ 3.0" 0'-0"-10'-6" | 0.03 |

Location: 24.20ft - 187.88ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|-------|---------|------|--------------|-------|--------|-----------------------|--------|
| 12 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.18 | #5@ 3.0" 0'-0"-10'-6" | 0.30 |

Location: 28.50ft - 106.30ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|-------|---------|------|--------------|-------|--------|-----------------------|--------|
| 74 | First | 10x30 | 5.00 | 8-#9 (2 x 2) | 2.67 | 0.84 | #5@ 3.0" 0'-0"-10'-6" | 0.09 |

Location: 34.45ft - 187.95ft



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| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 12 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.78 | #5@ 3.0" 0'-0"-15'-0" | 0.08 |
| 13 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.46 | #5@ 3.0" 0'-0"-10'-6" | 0.03 |

Location: 34.45ft - 198.62ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 13 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.36 | #5@ 3.0" 0'-0"-15'-0" | 0.22 |
| 14 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.19 | #5@ 3.0" 0'-0"-10'-6" | 0.01 |

Location: 39.38ft - 106.30ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|-------|---------|------|--------------|-------|--------|-----------------------|--------|
| 73 | First | 12x24 | 5.00 | 8-#9 (2 x 2) | 2.27 | 0.73 | #5@ 3.0" 0'-0"-10'-6" | 0.04 |

Location: 46.37ft - 125.54ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 14 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.46 | #5@ 3.0" 0'-0"-15'-0" | 0.04 |
| 15 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.59 | #5@ 3.0" 0'-0"-10'-6" | 0.01 |

Location: 47.37ft - 156.78ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 15 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.39 | #5@ 3.0" 0'-0"-15'-0" | 0.03 |
| 16 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.57 | #5@ 3.0" 0'-0"-10'-6" | 0.01 |

Location: 62.28ft - 187.95ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 17 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.69 | #5@ 3.0" 0'-0"-15'-0" | 0.08 |
| 18 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.60 | #5@ 3.0" 0'-0"-10'-6" | 0.04 |

Location: 62.28ft - 198.62ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|--------------------------|--------|
| 18 | Second | 16"Ø | 5.00 | 8-#7 | 2.39 | 0.16 | #5(C)@ 3.0" 0'-0"-15'-0" | 0.14 |
| 19 | First | 16x22 | 5.00 | 8-#7 | 1.36 | 0.15 | #5(C)@ 3.0" 0'-0"-10'-6" | 0.27 |

Location: 65.70ft - 156.78ft



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| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 16 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.68 | #5@ 3.0" 0'-0"-15'-0" | 0.07 |
| 17 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.69 | #5@ 3.0" 0'-0"-10'-6" | 0.02 |

Location: 74.70ft - 125.54ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 19 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.66 | #5@ 3.0" 0'-0"-15'-0" | 0.07 |
| 20 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.60 | #5@ 3.0" 0'-0"-10'-6" | 0.02 |

Location: 90.45ft - 187.95ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 21 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.85 | #5@ 3.0" 0'-0"-15'-0" | 0.10 |
| 22 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.60 | #5@ 3.0" 0'-0"-10'-6" | 0.04 |

Location: 90.45ft - 198.62ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 22 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.10 | #5@ 3.0" 0'-0"-15'-0" | 0.24 |
| 23 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.14 | #5@ 3.0" 0'-0"-10'-6" | 0.37 |

Location: 94.04ft - 156.78ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 20 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.59 | #5@ 3.0" 0'-0"-15'-0" | 0.02 |
| 21 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.88 | #5@ 3.0" 0'-0"-10'-6" | 0.01 |

Location: 99.54ft - 15.88ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 23 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.82 | #5@ 3.0" 0'-0"-15'-0" | 0.08 |
| 24 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.28 | #5@ 3.0" 0'-0"-10'-6" | 0.01 |

Location: 99.79ft - 43.21ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|---------------|-------|--------|------------------------|--------|
| 24 | Second | 16x22 | 5.00 | 8-#10 (3 x 1) | 2.89 | 0.45 | #5@ 15.0" 0'-0"-15'-0" | 0.23 |
| 25 | First | 16x22 | 5.00 | 8-#10 (3 x 1) | 2.89 | 0.89 | #5@ 6.0" 0'-0"-10'-6" | 0.15 |



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Location: 118.78ft - 187.95ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 32 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.69 | #5@ 3.0" 0'-0"-15'-0" | 0.08 |
| 32 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.55 | #5@ 3.0" 0'-0"-10'-6" | 0.03 |

Location: 118.78ft - 198.62ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|--------------------------|--------|
| 33 | Second | 16"Ø | 5.00 | 8-#7 | 2.39 | 0.17 | #5(C)@ 3.0" 0'-0"-15'-0" | 0.14 |
| 33 | First | 16x22 | 5.00 | 8-#7 | 1.36 | 0.15 | #5(C)@ 3.0" 0'-0"-10'-6" | 0.27 |

Location: 123.95ft - 41.70ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 26 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.52 | #5@ 3.0" 0'-0"-15'-0" | 0.05 |
| 26 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.44 | #5@ 3.0" 0'-0"-10'-6" | 0.02 |

Location: 123.95ft - 69.63ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 27 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.42 | #5@ 3.0" 0'-0"-15'-0" | 0.02 |
| 27 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.56 | #5@ 3.0" 0'-0"-10'-6" | 0.01 |

Location: 123.95ft - 97.46ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 28 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.42 | #5@ 3.0" 0'-0"-15'-0" | 0.03 |
| 28 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.54 | #5@ 3.0" 0'-0"-10'-6" | 0.01 |

Location: 123.95ft - 125.54ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 29 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.46 | #5@ 3.0" 0'-0"-15'-0" | 0.02 |
| 29 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.65 | #5@ 3.0" 0'-0"-10'-6" | 0.01 |

Location: 123.95ft - 153.63ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 30 | Second | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.89 | #5@ 3.0" 0'-0"-15'-0" | 0.07 |
| 30 | First | 12x24 | 5.00 | 8-#7 (2x2) | 1.36 | 0.48 | #5@ 3.0" 0'-0"-10'-6" | 0.02 |



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Location: 123.95ft - 162.29ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 31 | Second | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.81 | #5@ 3.0" 0'-0"-15'-0" | 0.09 |
| 31 | First | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.46 | #5@ 3.0" 0'-0"-10'-6" | 0.03 |

Location: 128.12ft - 13.95ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 36 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.44 | #5@ 3.0" 0'-0"-15'-0" | 0.01 |
| 35 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.65 | #5@ 3.0" 0'-0"-10'-6" | 0.01 |

Location: 128.20ft - -11.62ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 35 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.53 | #5@ 3.0" 0'-0"-15'-0" | 0.04 |
| 34 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.56 | #5@ 3.0" 0'-0"-10'-6" | 0.02 |

Location: 147.16ft - 187.95ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 76 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.88 | #5@ 3.0" 0'-0"-15'-0" | 0.07 |
| 71 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.44 | #5@ 3.0" 0'-0"-10'-6" | 0.03 |

Location: 147.16ft - 198.62ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|--------------------------|--------|
| 75 | Second | 16"Ø | 5.00 | 8-#7 | 2.39 | 0.57 | #5(C)@ 3.0" 0'-0"-15'-0" | 0.14 |
| 72 | First | 16x22 | 5.00 | 8-#7 | 1.36 | 0.13 | #5(C)@ 3.0" 0'-0"-10'-6" | 0.34 |

Location: 152.28ft - 125.54ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 38 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.49 | #5@ 3.0" 0'-0"-15'-0" | 0.02 |
| 37 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.70 | #5@ 3.0" 0'-0"-10'-6" | 0.00 |

Location: 152.29ft - 41.70ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 39 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.64 | #5@ 3.0" 0'-0"-15'-0" | 0.06 |
| 38 | First | 16x22 | 5.00 | 8-#7 (4 x 1) | 1.36 | 0.52 | #5@ 3.0" 0'-0"-10'-6" | 0.02 |



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Location: 152.29ft - 69.63ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 40 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.42 | #5@ 3.0" 0'-0"-15'-0" | 0.02 |
| 39 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.61 | #5@ 3.0" 0'-0"-10'-6" | 0.00 |

Location: 152.29ft - 97.46ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 41 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.44 | #5@ 3.0" 0'-0"-15'-0" | 0.03 |
| 40 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.64 | #5@ 3.0" 0'-0"-10'-6" | 0.00 |

Location: 152.79ft - 153.63ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 42 | Second | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.82 | #5@ 3.0" 0'-0"-15'-0" | 0.07 |
| 41 | First | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.43 | #5@ 3.0" 0'-0"-10'-6" | 0.02 |

Location: 152.79ft - 162.29ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 43 | Second | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.73 | #5@ 3.0" 0'-0"-15'-0" | 0.08 |
| 42 | First | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.41 | #5@ 3.0" 0'-0"-10'-6" | 0.03 |

Location: 156.54ft - -11.62ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 47 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.39 | #5@ 3.0" 0'-0"-15'-0" | 0.04 |
| 45 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.63 | #5@ 3.0" 0'-0"-10'-6" | 0.01 |

Location: 156.95ft - 13.95ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 37 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.42 | #5@ 3.0" 0'-0"-15'-0" | 0.02 |
| 36 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.62 | #5@ 3.0" 0'-0"-10'-6" | 0.01 |

Location: 166.45ft - 187.95ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 44 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.87 | #5@ 3.0" 0'-0"-15'-0" | 0.07 |
| 43 | First | 16x22 | 5.00 | 8-#7 (4 x 2) | 1.36 | 0.44 | #5@ 3.0" 0'-0"-10'-6" | 0.03 |



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Location: 166.45ft - 198.62ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 45 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.57 | #5@ 3.0" 0'-0"-15'-0" | 0.24 |
| 44 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.13 | #5@ 3.0" 0'-0"-10'-6" | 0.36 |

Location: 180.12ft - 13.96ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 48 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.52 | #5@ 3.0" 0'-0"-15'-0" | 0.04 |
| 46 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.65 | #5@ 3.0" 0'-0"-10'-6" | 0.02 |

Location: 180.12ft - 41.79ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 49 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.49 | #5@ 3.0" 0'-0"-15'-0" | 0.05 |
| 47 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.52 | #5@ 3.0" 0'-0"-10'-6" | 0.02 |

Location: 180.12ft - 69.63ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 50 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.42 | #5@ 3.0" 0'-0"-15'-0" | 0.03 |
| 48 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.58 | #5@ 3.0" 0'-0"-10'-6" | 0.02 |

Location: 180.12ft - 97.46ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 51 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.46 | #5@ 3.0" 0'-0"-15'-0" | 0.01 |
| 49 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.65 | #5@ 3.0" 0'-0"-10'-6" | 0.01 |

Location: 180.12ft - 153.63ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 53 | Second | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.81 | #5@ 3.0" 0'-0"-15'-0" | 0.08 |
| 51 | First | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.37 | #5@ 3.0" 0'-0"-10'-6" | 0.03 |

Location: 180.12ft - 162.29ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 54 | Second | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.76 | #5@ 3.0" 0'-0"-15'-0" | 0.09 |
| 52 | First | 12x24 | 5.00 | 8-#7 (2x3) | 1.36 | 0.42 | #5@ 3.0" 0'-0"-10'-6" | 0.04 |



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Location: 184.87ft - -14.04ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|--------------------------|--------|
| 57 | Second | 20"Ø | 5.00 | 10-#8 | 2.51 | 0.94 | #4(C)@ 3.0" 0'-0"-15'-0" | 0.11 |
| 55 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.52 | #5@ 3.0" 0'-0"-10'-6" | 0.06 |

Location: 194.33ft - 187.95ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 55 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.91 | #5@ 3.0" 0'-0"-15'-0" | 0.07 |
| 53 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.43 | #5@ 3.0" 0'-0"-10'-6" | 0.02 |

Location: 194.33ft - 198.62ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|--------------------------|--------|
| 56 | Second | 16"Ø | 5.00 | 8-#7 | 2.39 | 0.50 | #5(C)@ 3.0" 0'-0"-15'-0" | 0.02 |
| 54 | First | 16x22 | 5.00 | 8-#7 | 1.36 | 0.18 | #5(C)@ 3.0" 0'-0"-10'-6" | 0.28 |

Location: 198.54ft - 75.60ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|-------|---------|------|--------------|-------|--------|-----------------------|--------|
| 75 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.44 | #5@ 3.0" 0'-0"-10'-6" | 0.34 |

Location: 209.79ft - 75.60ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 58 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.51 | #5@ 3.0" 0'-0"-15'-0" | 0.05 |
| 56 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.60 | #5@ 3.0" 0'-0"-10'-6" | 0.04 |

Location: 209.79ft - 102.44ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 59 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.52 | #5@ 3.0" 0'-0"-15'-0" | 0.05 |
| 57 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.84 | #5@ 3.0" 0'-0"-10'-6" | 0.03 |

Location: 212.54ft - 129.27ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|------------------------|--------|
| 62 | Second | 12x24 | 5.00 | 8-#9 (2 x 2) | 2.27 | 0.97 | #5@ 3.0" 0'-0"-3'-0" | 0.08 |
| | | | | | | | #5@ 6.0" 3'-0"-12'-0" | 0.13 |
| | | | | | | | #5@ 3.0" 12'-0"-15'-0" | 0.08 |



Concrete Column Design Summary

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Database: MIMU - Revised Design_v2.0
Building Code: IBC Alt

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Concrete Code: ACI 318-14



| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|-------|---------|------|--------------|-------|--------|-----------------------|--------|
| 60 | First | 12x24 | 5.00 | 8-#8 (2 x 2) | 1.80 | 0.55 | #5@ 3.0" 0'-0"-2'-0" | 0.03 |
| | | | | | | | #5@ 6.0" 2'-0"-8'-6" | 0.05 |
| | | | | | | | #5@ 3.0" 8'-6"-10'-6" | 0.03 |

Location: 212.82ft - 13.96ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 63 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.82 | #5@ 3.0" 0'-0"-15'-0" | 0.06 |
| 61 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.67 | #5@ 3.0" 0'-0"-10'-6" | 0.03 |

Location: 213.20ft - -14.04ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|--------------------------|--------|
| 64 | Second | 20"Ø | 5.00 | 10-#8 | 2.51 | 0.90 | #4(C)@ 3.0" 0'-0"-15'-0" | 0.11 |
| 62 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.63 | #5@ 3.0" 0'-0"-15'-0" | 0.05 |

Location: 213.45ft - 187.95ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 60 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.78 | #5@ 3.0" 0'-0"-15'-0" | 0.07 |
| 58 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.47 | #5@ 3.0" 0'-0"-10'-6" | 0.03 |

Location: 213.45ft - 198.62ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 61 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.29 | #5@ 3.0" 0'-0"-15'-0" | 0.25 |
| 59 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.17 | #5@ 3.0" 0'-0"-10'-6" | 0.32 |

Location: 238.70ft - 12.45ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 65 | Second | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.71 | #5@ 3.0" 0'-0"-15'-0" | 0.06 |
| 63 | First | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.57 | #5@ 3.0" 0'-0"-10'-6" | 0.03 |

Location: 238.70ft - 38.95ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 66 | Second | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.67 | #5@ 3.0" 0'-0"-15'-0" | 0.07 |
| 64 | First | 12x24 | 5.00 | 8-#7 (2x2) | 1.36 | 0.59 | #5@ 3.0" 0'-0"-10'-6" | 0.03 |



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Location: 238.70ft - 65.45ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 67 | Second | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.71 | #5@ 3.0" 0'-0"-15'-0" | 0.08 |
| 65 | First | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.61 | #5@ 3.0" 0'-0"-10'-6" | 0.03 |

Location: 238.70ft - 91.95ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|---|----------------------|
| 68 | Second | 12x24 | 5.00 | 8-#9 (2 x 2) | 2.27 | 0.99 | #5@ 3.0" 0'-0"-3'-0" #5@ 6.0" 3'-0"-12'-0" #5@ 3.0" 12'-0"-15'-0" | 0.09 0.14 0.09 |
| 66 | First | 12x24 | 5.00 | 8-#8 (2 x 2) | 1.80 | 0.70 | #5@ 3.0" 0'-0"-2'-0" #5@ 6.0" 2'-0"-8'-6" #5@ 3.0" 8'-6"-10'-6" | 0.05 0.08 0.05 |

Location: 238.70ft - 153.28ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 69 | Second | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.65 | #5@ 3.0" 0'-0"-15'-0" | 0.07 |
| 67 | First | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.54 | #5@ 3.0" 0'-0"-10'-6" | 0.03 |

Location: 238.70ft - 179.78ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 70 | Second | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.62 | #5@ 3.0" 0'-0"-15'-0" | 0.07 |
| 68 | First | 12x24 | 5.00 | 8-#7 (2 x 2) | 1.36 | 0.55 | #5@ 3.0" 0'-0"-10'-6" | 0.03 |

Location: 241.45ft - -14.04ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|--------------------------|--------|
| 72 | Second | 16"Ø | 5.00 | 8-#7 | 2.39 | 0.58 | #5(C)@ 3.0" 0'-0"-15'-0" | 0.03 |
| 70 | First | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.55 | #5@ 3.0" 0'-0"-10'-6" | 0.04 |

Location: 74.95ft - -29.05ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|---------------|-------|--------|-----------------------|--------|
| 73 | Second | 16x22 | 5.00 | 8-#10 (3 x 1) | 2.89 | 0.97 | #5@ 3.0" 0'-0"-15'-0" | 0.43 |

Location: 99.79ft - 120.29ft



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| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|-----------------------|--------|
| 25 | Second | 16x22 | 5.00 | 8-#7 (3 x 1) | 1.36 | 0.66 | #5@ 3.0" 0'-0"-15'-0" | 0.10 |

Location: 128.20ft - -29.62ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|--------------------------|--------|
| 34 | Second | 16"Ø | 5.00 | 8-#7 | 2.39 | 0.69 | #5(C)@ 3.0" 0'-0"-15'-0" | 0.03 |

Location: 156.45ft - -29.62ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|--------------------------|--------|
| 46 | Second | 16"Ø | 5.00 | 8-#7 | 2.39 | 0.48 | #5(C)@ 3.0" 0'-0"-15'-0" | 0.02 |

Location: 173.95ft - -29.62ft

| No. | Level | Section | f'c | Longitudinal | Rho % | Ld/Cap | Transverse | Ld/Cap |
|-----|--------|---------|------|--------------|-------|--------|--------------------------|--------|
| 74 | Second | 16"Ø | 5.00 | 8-#7 | 2.39 | 0.55 | #5(C)@ 3.0" 0'-0"-15'-0" | 0.17 |

ELEVATED SLABS

Mild Slab Design Criteria

Code

ACI 318-14

Materials

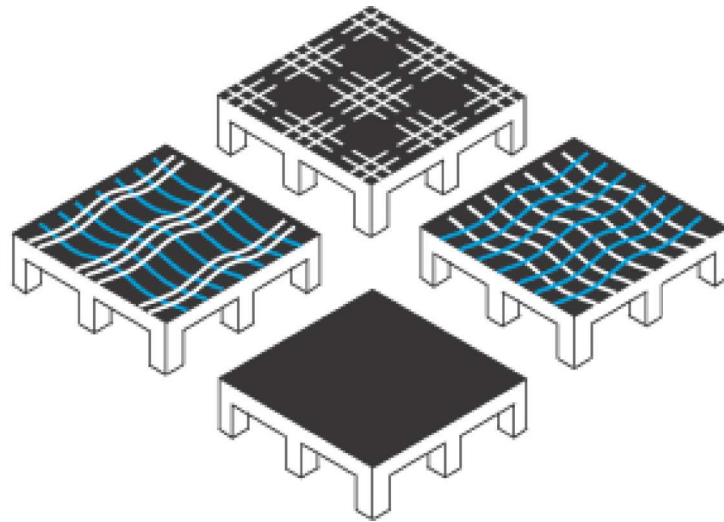
Concrete $f'_c = 5,000$ psi at 28 days
Reinforcing Steel $f_y = 60,000$ psi

Analysis

Gravity loads on elevated slabs were considered according to the Design Criteria in the General Notes of the structural drawings including structure self-weight added to the noted superimposed dead load. Strength design was performed using the governing load combination $1.2DL + 1.6LL$. Unfactored service loads were used to calculate long-term cracked deflection under dead load conditions and a long term cracked deflection under dead load and live load with target deflections depending on span length. Unbalanced live load was considered for the worst-case conditions.

The building was modeled in RAM Structural System with conventionally reinforced slabs designed in the Finite Element software RAM Concept as two-way, non-post-tensioned slabs with pinned connections assumed at wall supports. Minimum steel was provided, $A_{smin} = .0018 * \text{thickness}$. Punching shear was checked using RAM Concept output and then Decon STDesign software to design studrails.

LEVEL 1 CONCRETE SLAB DESIGN



Level 1.cpt
10/10/2023

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Units

Geometry Unit:

Plan Dimensions: feet

Angles: degrees

Slab Thickness: inches

Elevations: inches

Support Dimensions: inches

Support Height: feet

Loading and Reaction Unit

Point Force: Kips

- Report As Zero: 0 Kips

Point Moment: kip-ft

- Report As Zero: 0 kip-ft

Line Force: kips/ft

- Report As Zero: 0 kips/ft

Line Moment: Kips

- Report As Zero: 0 Kips

Area Force: psf

- Report As Zero: 0 psf

Area Moment: #/foot

- Report As Zero: 0 #/foot

Spring and Stiffness Unit

Point Force Spring: kips/in

Point Moment Spring: k-ft/°

Line Force Spring: ksi

Line Moment Spring: k/°

Area Force Spring: pci

Area Moment Spring: k/ft°

Slab Analysis Unit:

Force: Kips

- Report As Zero: 0 Kips

Force Per Width: kips/ft

- Report As Zero: 0 kips/ft

Moment: kip-ft

- Report As Zero: 0 kip-ft

Moment Per Width: Kips

- Report As Zero: 0 Kips

Concrete Stress: psi

- Report As Zero: 0 psi

Deflection: inches

- Report As Zero: 0 inches

Materials Unit:

Concrete Volume: yd³

Tendon Force: Kips

Reinforcing Stress: ksi

Reinforcing Area: in²

Tendon Force Per Width: kips/ft

PT Weight: pounds

Reinforcement Weight: tons

Tendon Profile: inches

Cover: inches

Miscellaneous Unit

Floor Area: ft²

Tendon Angles (for friction): radians

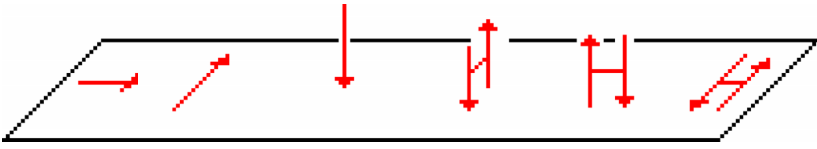
Density: pcf

Temperature Change: °F

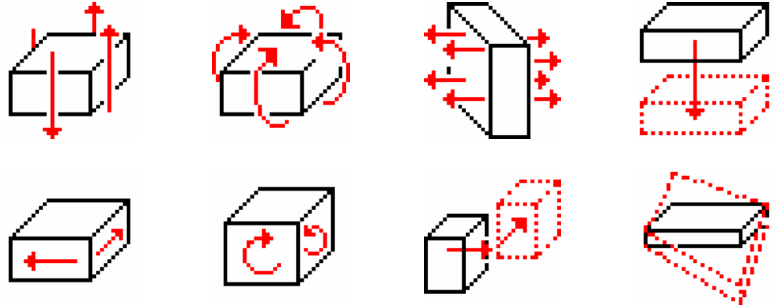
Elongations: inches

Signs

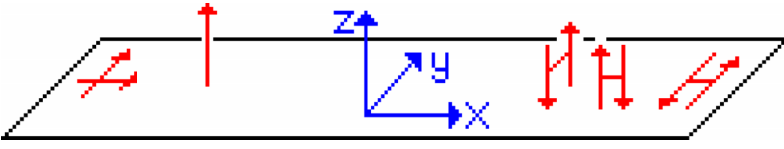
Positive Loads



Positive Analysis



Positive Reactions



Materials

Concrete Mix

| Mix Name | Density (pcf) | Density For Loads (pcf) | f_{ci} (psi) | f_c (psi) | f_{cui} (psi) | f_{cu} (psi) | Poissons Ratio | Thermal Exp Coeff | E_c Calc | User E_{ci} (psi) | User E_c (psi) |
|--------------|---------------|-------------------------|----------------|-------------|-----------------|----------------|----------------|-------------------|------------|---------------------|------------------|
| 5000 psi (2) | 145 | 150 | 3750 | 5000 | 4558 | 6399 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 6000 psi | 145 | 150 | 4500 | 6000 | 5590 | 7450 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 4000 psi | 145 | 150 | 3000 | 4000 | 3725 | 4975 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |

PT Systems

| System Name | Type | A_{ps} (in ²) | E_{ps} (ksi) | f_{se} (ksi) | f_{py} (ksi) | f_{pu} (ksi) | Duct Width (inches) | Strands Per Duct | Min Radius (feet) |
|---------------|----------|-----------------------------|----------------|----------------|----------------|----------------|---------------------|------------------|-------------------|
| 1/2" Unbonded | unbonded | 0.153 | 28000 | 175 | 243 | 270 | 0.5 | 1 | 6 |
| 1/2" Bonded | bonded | 0.153 | 28000 | 160 | 243 | 270 | 3 | 4 | 6 |
| 0.6" Unbonded | unbonded | 0.217 | 28000 | 175 | 243 | 270 | 0.6 | 1 | 8 |
| 0.6" Bonded | bonded | 0.217 | 28000 | 160 | 243 | 270 | 4 | 4 | 8 |

PT Stressing Parameters

| System Name | Jacking Stress (ksi) | Seating Loss (inches) | Anchor Friction | Wobble Friction (1/feet) | Angular Friction (1/radians) | Long-Term Losses (ksi) |
|---------------|----------------------|-----------------------|-----------------|--------------------------|------------------------------|------------------------|
| 1/2" Unbonded | 216 | 0.25 | 0 | 0.0014 | 0.07 | 22 |
| 1/2" Bonded | 216 | 0.25 | 0.02 | 0.001 | 0.2 | 22 |
| 0.6" Unbonded | 216 | 0.25 | 0 | 0.0014 | 0.07 | 22 |
| 0.6" Bonded | 216 | 0.25 | 0.02 | 0.001 | 0.2 | 22 |

Reinforcing Bars

| Bar Name | A_s (in ²) | E_s (ksi) | F_y (ksi) | Coating | Straight Ld/Db | 90 Hook Ld/Db | 180 Hook Ld/Db |
|----------|--------------------------|-------------|-------------|---------|----------------|---------------|----------------|
| #3 | 0.11 | 29000 | 60 | None | Code | Code | Code |
| #4 | 0.2 | 29000 | 60 | None | Code | Code | Code |
| #5 | 0.31 | 29000 | 60 | None | Code | Code | Code |
| #6 | 0.44 | 29000 | 60 | None | Code | Code | Code |
| #7 | 0.6 | 29000 | 60 | None | Code | Code | Code |
| #8 | 0.79 | 29000 | 60 | None | Code | Code | Code |
| #9 | 1 | 29000 | 60 | None | Code | Code | Code |
| #10 | 1.27 | 29000 | 60 | None | Code | Code | Code |
| #11 | 1.56 | 29000 | 60 | None | Code | Code | Code |

SSR Systems

| SSR System Name | Stud Area (in ²) | Head Area (in ²) | Min Clear Head Spacing (inches) | Specified Stud Spacing (inches) | F_y (ksi) | Stud Spacing Increment | Rounding (inches) | Min Studs Per Rail | System Type |
|---------------------------|------------------------------|------------------------------|---------------------------------|---------------------------------|-------------|------------------------|-------------------|--------------------|-------------|
| 3/4" SSR | 0.442 | 4.42 | 0.5 | None | 50 | 1 | | 4 | Rail |
| Ancon Shearfix Auto-Sizer | 0.1217 | 1.096 | 0.5906 | None | 72.52 | 0.03937 | | 2 | Rail |
| Ancon Shearfix 10 mm | 0.1217 | 1.096 | 0.5906 | None | 72.52 | 0.03937 | | 2 | Rail |
| Ancon Shearfix 12 mm | 0.1753 | 1.578 | 0.5906 | None | 72.52 | 0.03937 | | 2 | Rail |
| Ancon Shearfix 14 mm | 0.2386 | 2.147 | 0.5906 | None | 72.52 | 0.03937 | | 2 | Rail |
| Ancon Shearfix 16 mm | 0.3116 | 2.805 | 0.5906 | None | 72.52 | 0.03937 | | 2 | Rail |
| Ancon Shearfix 20 mm | 0.4869 | 4.383 | 0.5906 | None | 72.52 | 0.03937 | | 2 | Rail |
| Ancon Shearfix 24 mm | 0.7012 | 6.311 | 0.5906 | None | 72.52 | 0.03937 | | 2 | Rail |

Loadings

| <i>Loading Name</i> | <i>Type</i> | <i>Analysis</i> | <i>On-Pattern Factor</i> | <i>Off-Pattern Factor</i> |
|----------------------------------|-------------------------------|-----------------|--------------------------|---------------------------|
| Self-Dead Loading | Self-Weight | Normal | 1 | 1 |
| Balance Loading | Balance | Normal | 1 | 1 |
| Balanced Load (transfer) | Balance (transfer) | Normal | 1 | 1 |
| Hyperstatic Loading | Hyperstatic | Hyperstatic | 1 | 1 |
| Construction Dead Load | Stressing Dead | Normal | 1 | 1 |
| Dead Load | Dead | Normal | 1 | 1 |
| Dead Load (transfer) | Dead (transfer) | Normal | 1 | 1 |
| Live Load Reducible | Live (Reducible) | Normal | 1 | 0 |
| Live Load Reducible (transfer) | Live (Reducible) (transfer) | Normal | 1 | 0 |
| Live Load Unreducible | Live (Unreducible) | Normal | 1 | 0 |
| Partition Load | Live (Unreducible) | Normal | 1 | 0 |
| Live Load Unreducible (transfer) | Live (Unreducible) (transfer) | Normal | 1 | 0 |
| Live Load Storage | Live (Storage) | Normal | 1 | 0 |
| Live Load Storage (transfer) | Live (Storage) (transfer) | Normal | 1 | 0 |
| Live Load Roof | Live (Roof) | Normal | 1 | 0 |
| Live Load Roof (transfer) | Live (Roof) (transfer) | Normal | 1 | 0 |

Load Combinations

All Dead LC

Active Design Criteria: <none>

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Dead Load | 1 | 1 |
| Dead Load (transfer) | 1 | 1 |

Dead + Balance LC

Active Design Criteria: <none>

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|--------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Balanced Load (transfer) | 1 | 1 |
| Dead Load | 1 | 1 |
| Dead Load (transfer) | 1 | 1 |

Initial Service LC

Active Design Criteria: Initial Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1.13 | 1.13 |
| Construction Dead Load | 1 | 1 |

Service LC: D + L

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Balanced Load (transfer) | 1 | 1 |
| Dead Load | 1 | 1 |
| Dead Load (transfer) | 1 | 1 |
| Live Load Reducible | 1 | 0 |
| Live Load Reducible (transfer) | 1 | 0 |
| Live Load Unreducible | 1 | 0 |
| Partition Load | 1 | 0 |
| Live Load Unreducible (transfer) | 1 | 0 |
| Live Load Storage | 1 | 0 |
| Live Load Storage (transfer) | 1 | 0 |

Load Combinations (2)

Service LC: D + Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|---------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Balanced Load (transfer) | 1 | 1 |
| Dead Load | 1 | 1 |
| Dead Load (transfer) | 1 | 1 |
| Live Load Roof | 1 | 0 |
| Live Load Roof (transfer) | 1 | 0 |

Service LC: D + S

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|--------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Balanced Load (transfer) | 1 | 1 |
| Dead Load | 1 | 1 |
| Dead Load (transfer) | 1 | 1 |

Service LC: D + 0.75L + 0.75Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Balanced Load (transfer) | 1 | 1 |
| Dead Load | 1 | 1 |
| Dead Load (transfer) | 1 | 1 |
| Live Load Reducible | 0.75 | 0 |
| Live Load Reducible (transfer) | 0.75 | 0 |
| Live Load Unreducible | 0.75 | 0 |
| Partition Load | 0.75 | 0 |
| Live Load Unreducible (transfer) | 0.75 | 0 |
| Live Load Storage | 0.75 | 0 |
| Live Load Storage (transfer) | 0.75 | 0 |
| Live Load Roof | 0.75 | 0 |
| Live Load Roof (transfer) | 0.75 | 0 |

Load Combinations (3)

Service LC: D + 0.75L + 0.75S

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Balanced Load (transfer) | 1 | 1 |
| Dead Load | 1 | 1 |
| Dead Load (transfer) | 1 | 1 |
| Live Load Reducible | 0.75 | 0 |
| Live Load Reducible (transfer) | 0.75 | 0 |
| Live Load Unreducible | 0.75 | 0 |
| Partition Load | 0.75 | 0 |
| Live Load Unreducible (transfer) | 0.75 | 0 |
| Live Load Storage | 0.75 | 0 |
| Live Load Storage (transfer) | 0.75 | 0 |

Sustained Service LC

Active Design Criteria: Sustained Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Balanced Load (transfer) | 1 | 1 |
| Dead Load | 1 | 1 |
| Dead Load (transfer) | 1 | 1 |
| Live Load Reducible | 0.5 | 0.5 |
| Live Load Reducible (transfer) | 0.5 | 0.5 |
| Live Load Unreducible | 0.5 | 0.5 |
| Partition Load | 0.5 | 0.5 |
| Live Load Unreducible (transfer) | 0.5 | 0.5 |
| Live Load Storage | 1 | 1 |
| Live Load Storage (transfer) | 1 | 1 |
| Live Load Roof | 0.5 | 0.5 |
| Live Load Roof (transfer) | 0.5 | 0.5 |

Factored LC: 1.4D

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1.4 | 0.9 |
| Hyperstatic Loading | 1 | 1 |
| Dead Load | 1.4 | 0.9 |
| Dead Load (transfer) | 1.4 | 0.9 |

Load Combinations (4)

Factored LC: 1.2D + 1.6L + 0.5Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1.2 | 0.9 |
| Hyperstatic Loading | 1 | 1 |
| Dead Load | 1.2 | 0.9 |
| Dead Load (transfer) | 1.2 | 0.9 |
| Live Load Reducible | 1.6 | 0 |
| Live Load Reducible (transfer) | 1.6 | 0 |
| Live Load Unreducible | 1.6 | 0 |
| Partition Load | 1.6 | 0 |
| Live Load Unreducible (transfer) | 1.6 | 0 |
| Live Load Storage | 1.6 | 0 |
| Live Load Storage (transfer) | 1.6 | 0 |
| Live Load Roof | 0.5 | 0 |
| Live Load Roof (transfer) | 0.5 | 0 |

Factored LC: 1.2D + f1L + 1.6Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1.2 | 0.9 |
| Hyperstatic Loading | 1 | 1 |
| Dead Load | 1.2 | 0.9 |
| Dead Load (transfer) | 1.2 | 0.9 |
| Live Load Reducible | 0.5 | 0 |
| Live Load Reducible (transfer) | 0.5 | 0 |
| Live Load Unreducible | 1 | 0 |
| Partition Load | 1 | 0 |
| Live Load Unreducible (transfer) | 1 | 0 |
| Live Load Storage | 1 | 0 |
| Live Load Storage (transfer) | 1 | 0 |
| Live Load Roof | 1.6 | 0 |
| Live Load Roof (transfer) | 1.6 | 0 |

Factored LC: 1.2D + 1.6L + 0.5S

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1.2 | 0.9 |
| Hyperstatic Loading | 1 | 1 |
| Dead Load | 1.2 | 0.9 |
| Dead Load (transfer) | 1.2 | 0.9 |
| Live Load Reducible | 1.6 | 0 |
| Live Load Reducible (transfer) | 1.6 | 0 |
| Live Load Unreducible | 1.6 | 0 |
| Partition Load | 1.6 | 0 |
| Live Load Unreducible (transfer) | 1.6 | 0 |
| Live Load Storage | 1.6 | 0 |
| Live Load Storage (transfer) | 1.6 | 0 |

Load Combinations (5)

Factored LC: 1.2D + f1L + 1.6S

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1.2 | 0.9 |
| Hyperstatic Loading | 1 | 1 |
| Dead Load | 1.2 | 0.9 |
| Dead Load (transfer) | 1.2 | 0.9 |
| Live Load Reducible | 0.5 | 0 |
| Live Load Reducible (transfer) | 0.5 | 0 |
| Live Load Unreducible | 1 | 0 |
| Partition Load | 1 | 0 |
| Live Load Unreducible (transfer) | 1 | 0 |
| Live Load Storage | 1 | 0 |
| Live Load Storage (transfer) | 1 | 0 |

Design Rules

Code Minimum Desig

318-14 Min. Reinforcement

User Minimum Desig

Specified Min. Reinforcement

Initial Service Desig

318-14 Initial Service Design

Service Design

318-14 Service Design

Include detailed section analysis

Sustained Service Desig

318-14 Sustained Service Design

Strength Design

318-14 Strength Design

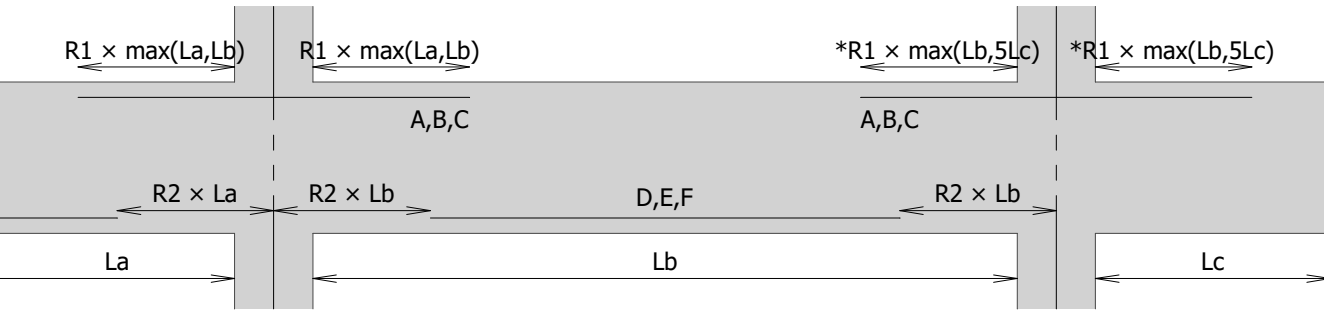
Punching Shear Design

Ductility Desig

318-14 Ductility Design

Detailing Rules

Custom Span Detailing Rules



| Rule Name | A Fraction | A R1 | B Fraction | B R1 | C Fraction | C R1 | D Fraction | D R2 | E Fraction | E R2 | F Fraction | F R2 |
|-----------|------------|------|------------|------|------------|------|------------|------|------------|------|------------|------|
| None | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

"A", "B" and "C", are support reinforcement sets, based on the peak reinforcement in the support zone.

"D", "E" and "F", are span reinforcement sets, based on the peak reinforcement in the span zone.

"*R1" is never taken as greater than 0.2 when multiplied by Lc (or Lcc).

"Fraction" is the ratio of set reinforcement to peak reinforcement. It is always in the 0.0 to 1.0 range.

Load History

| <i>Load History Step Name</i> | <i>Load Combination</i> | <i>Duration (days)</i> | <i>Total Age (days)</i> |
|----------------------------------|-------------------------|----------------------------|-----------------------------|
| Construction Loads | Initial Service LC | 30 | 33 |
| Nonstructural Element Attach | Dead + Balance LC | 0 | 33 |
| Immediate Live Load | Service LC: D + L | 0 | 33 |
| Sustained Loads | Sustained Service LC | 5000 | 5033 |
| Sustained + Immediate Live Loads | Service LC: D + L | 0 | 5033 |

Tendon Parameters Groups

Banded Tendon Polyline Groups

| <i>Group</i> | <i>PT</i> | <i>I.P.</i> | <i>Eff. Force</i> | <i>Number of</i> | <i>Min Force</i> | <i>Max Force</i> | <i>Force Incr.</i> | <i>Min</i> | <i>Max</i> | <i>Strands</i> | |
|--------------|---------------|--------------|-------------------|------------------|------------------|------------------|--------------------|---------------|----------------|----------------|------------------|
| <i>Name</i> | <i>System</i> | <i>Ratio</i> | <i>(Kips)</i> | <i>Strands</i> | <i>Optimize</i> | <i>(Kips)</i> | <i>(Kips)</i> | <i>(Kips)</i> | <i>Strands</i> | <i>Strands</i> | <i>Increment</i> |

Distributed Tendon Quadrilateral Groups

| <i>Group</i> | <i>PT</i> | <i>I.P.</i> | <i>Spacing</i> | <i>Eff. Force</i> | <i># Strands</i> | <i>Min Force</i> | <i>Max Force</i> | <i>Force Incr.</i> | <i>Min Strands</i> | <i>Max Strand</i> | <i>Strands Inc</i> | |
|--------------|---------------|--------------|----------------|-------------------|------------------|------------------|------------------|--------------------|--------------------|-------------------|--------------------|-----------------|
| <i>Name</i> | <i>System</i> | <i>Ratio</i> | <i>(feet)</i> | <i>(kips/ft)</i> | <i>(1/feet)</i> | <i>Optimize</i> | <i>(kips/ft)</i> | <i>(kips/ft)</i> | <i>(kips/ft)</i> | <i>(1/feet)</i> | <i>(1/feet)</i> | <i>(1/feet)</i> |

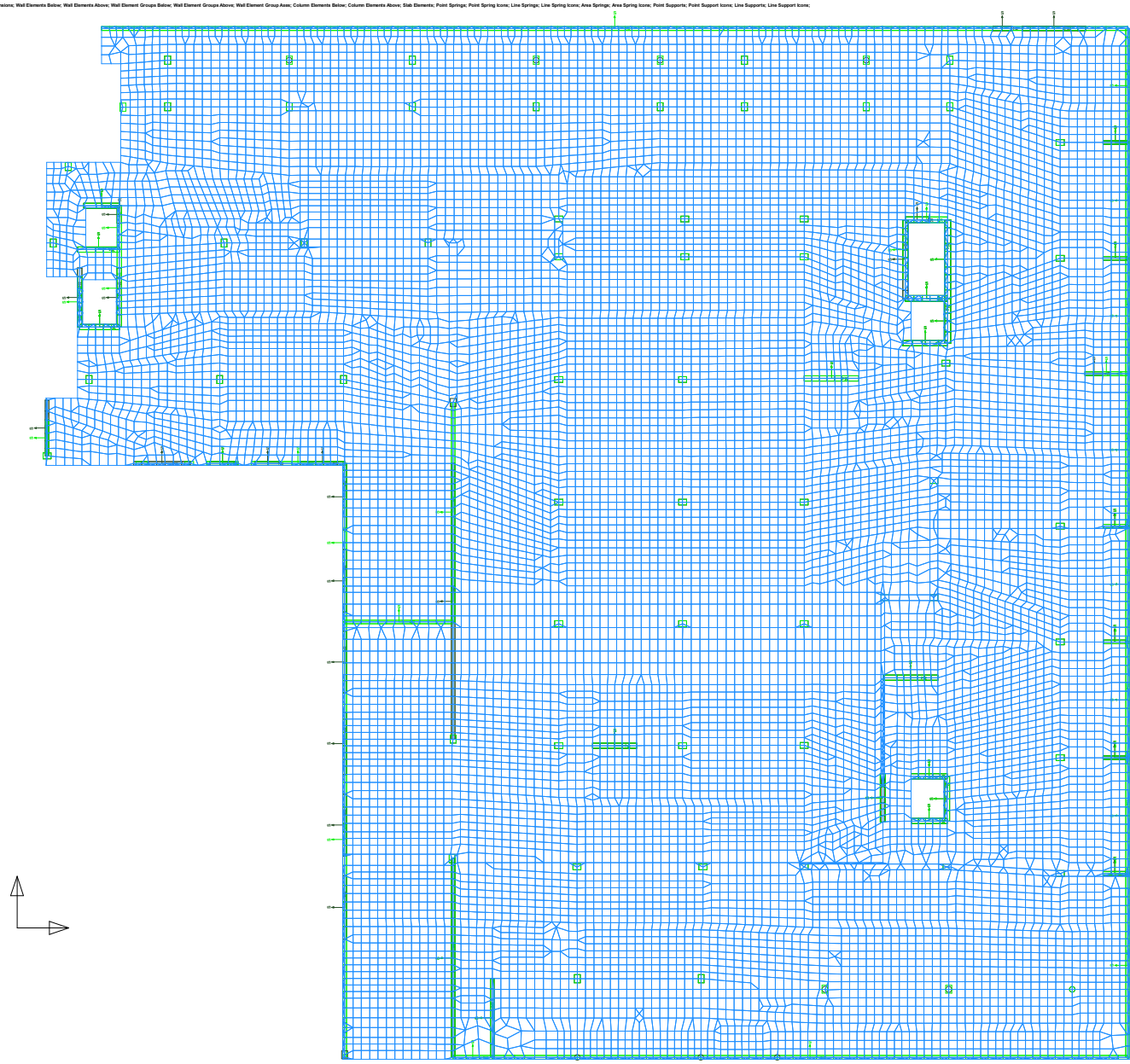
Profile Polyline Groups

| <i>Group</i> | <i>Elevation</i> | <i>Elevation</i> | <i>Min Elevation</i> | <i>Max Elevation</i> | <i>Elevation Incr.</i> | |
|--------------|------------------|------------------|----------------------|----------------------|------------------------|-----------------|
| <i>Name</i> | <i>Reference</i> | <i>(inches)</i> | <i>Optimize</i> | <i>(inches)</i> | <i>(inches)</i> | <i>(inches)</i> |

Element: Standard Plan

Element: User Lines, User Nodes, User Dimensions, Wall Elements Below, Wall Elements Above, Wall Element Group Below, Wall Element Group Above, Wall Element Group Ass, Column Elements Below, Column Elements Above, Slab Elements, Point Springs, Point Spring Node, Line Springs, Line Spring Node, Area Springs, Area Spring Node, Point Supports, Point Support Node, Line Supports, Line Support Node

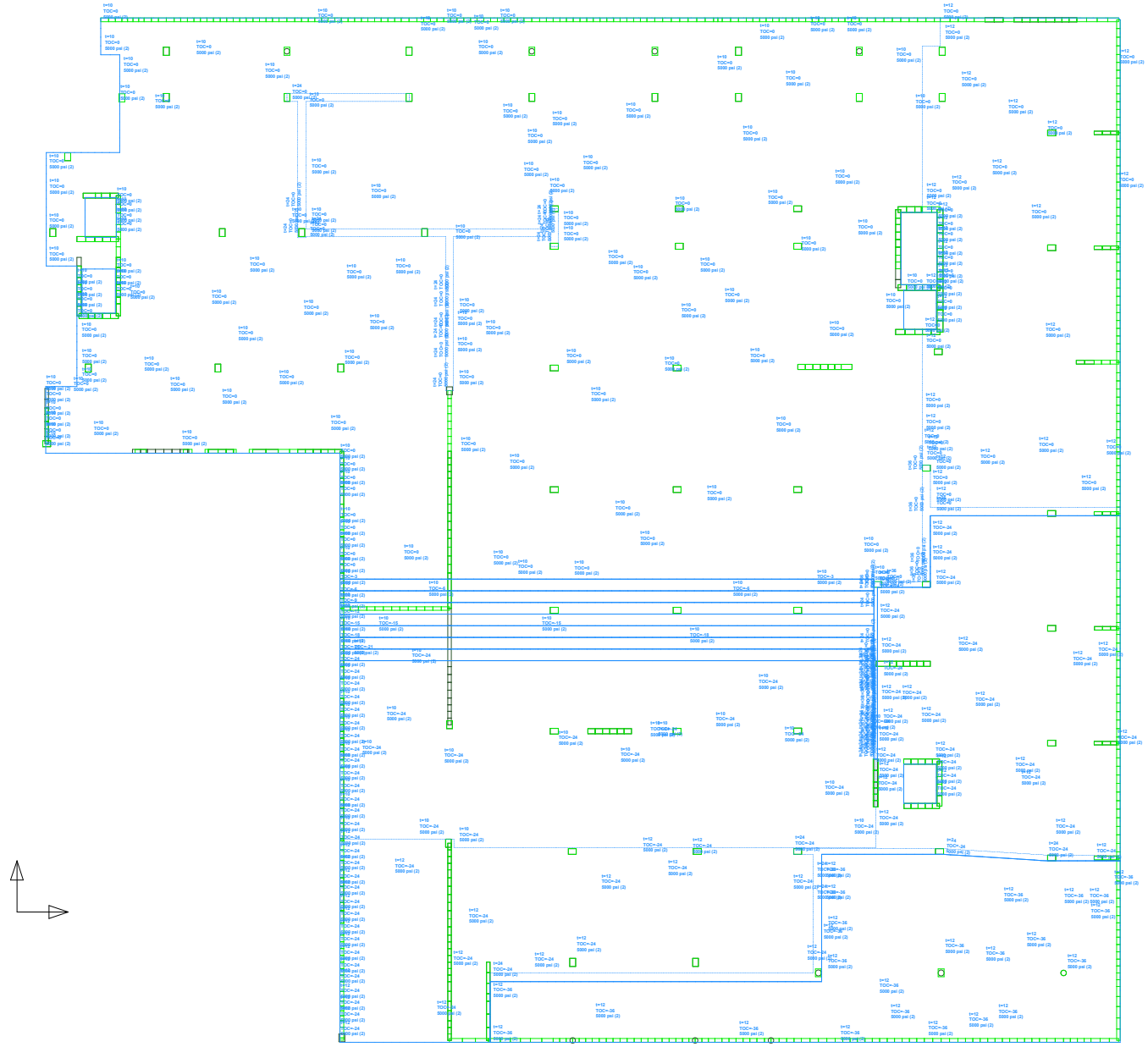
Scale = 1:400



Element: Slab Summary Plan

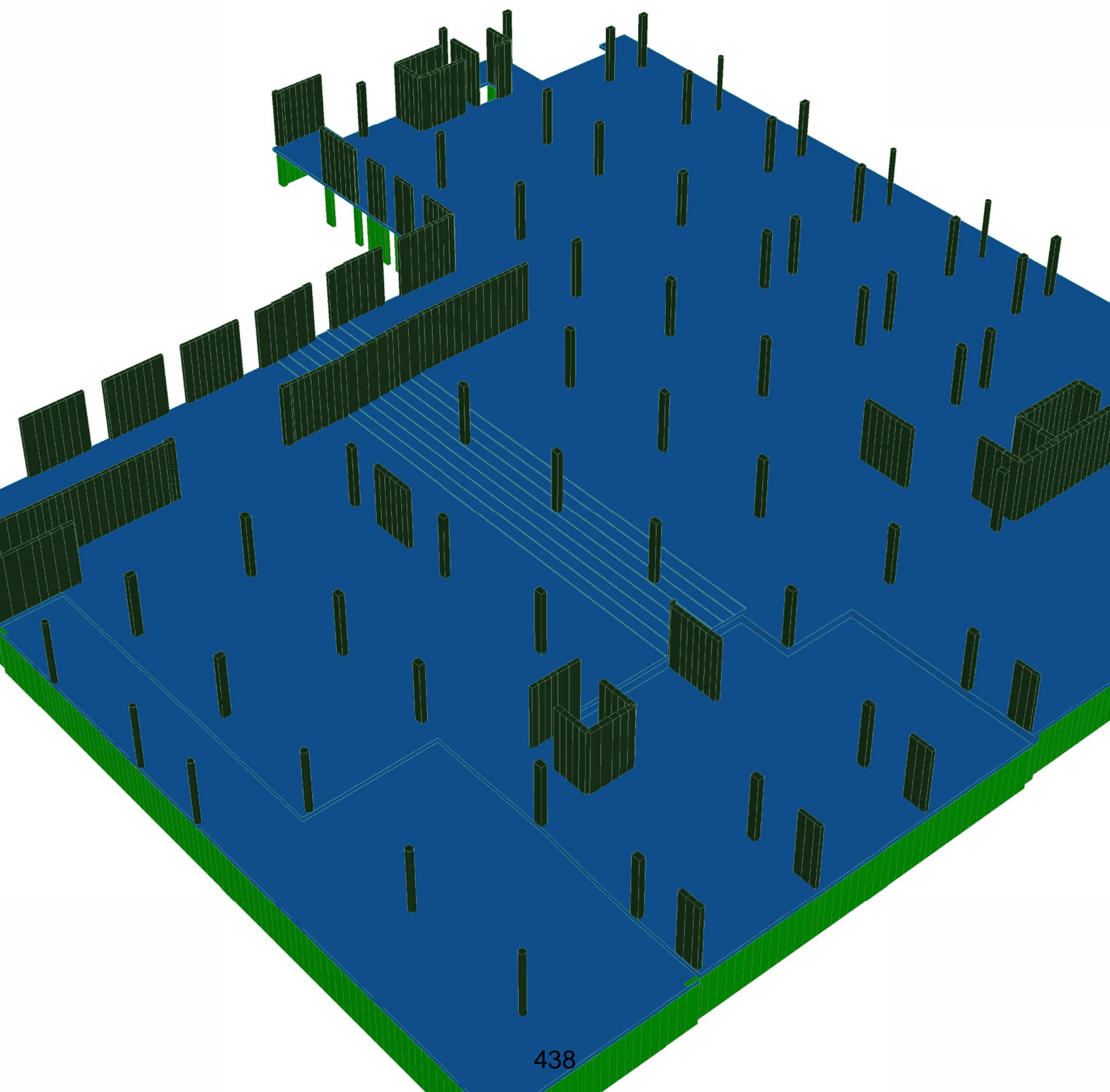
Element: User Lines, User Notes, User Dimensions, Wall Elements Below, Wall Elements Above, Column Elements Below, Column Elements Above, Point Springs, Point Spring Name, Line Springs, Line Spring Name, Slab Element, Slab Element Outline Only, Slab Element Thickness, Slab Element Elevation, Slab Element Concrete Mark;

Scale: 1:100



Element: Structure Summary Perspective

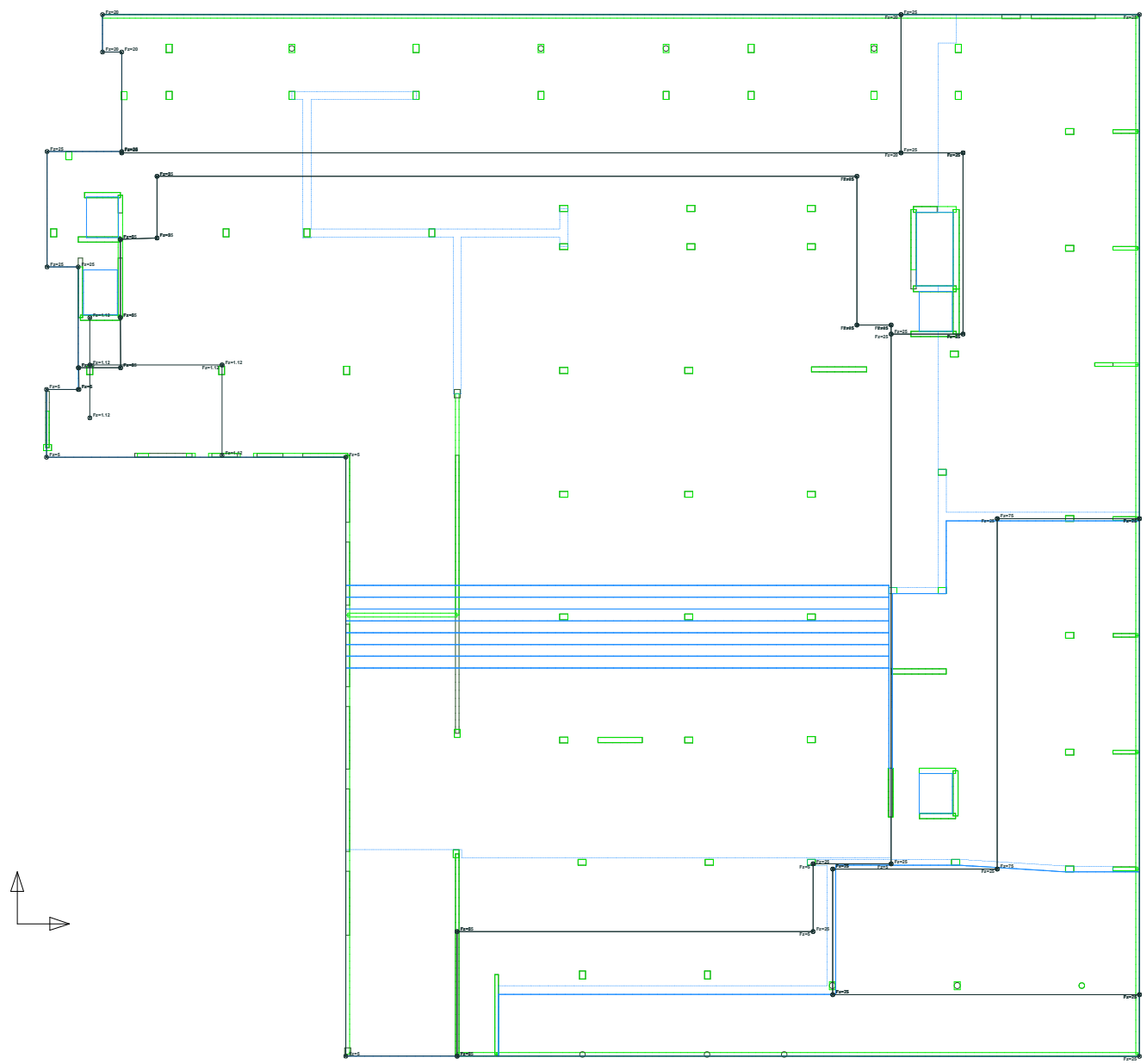
Wall Elements Below; Wall Elements Above; Column Elements Below; Column Elements Above; Slab Elements



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Dead Load: All Loads Plan

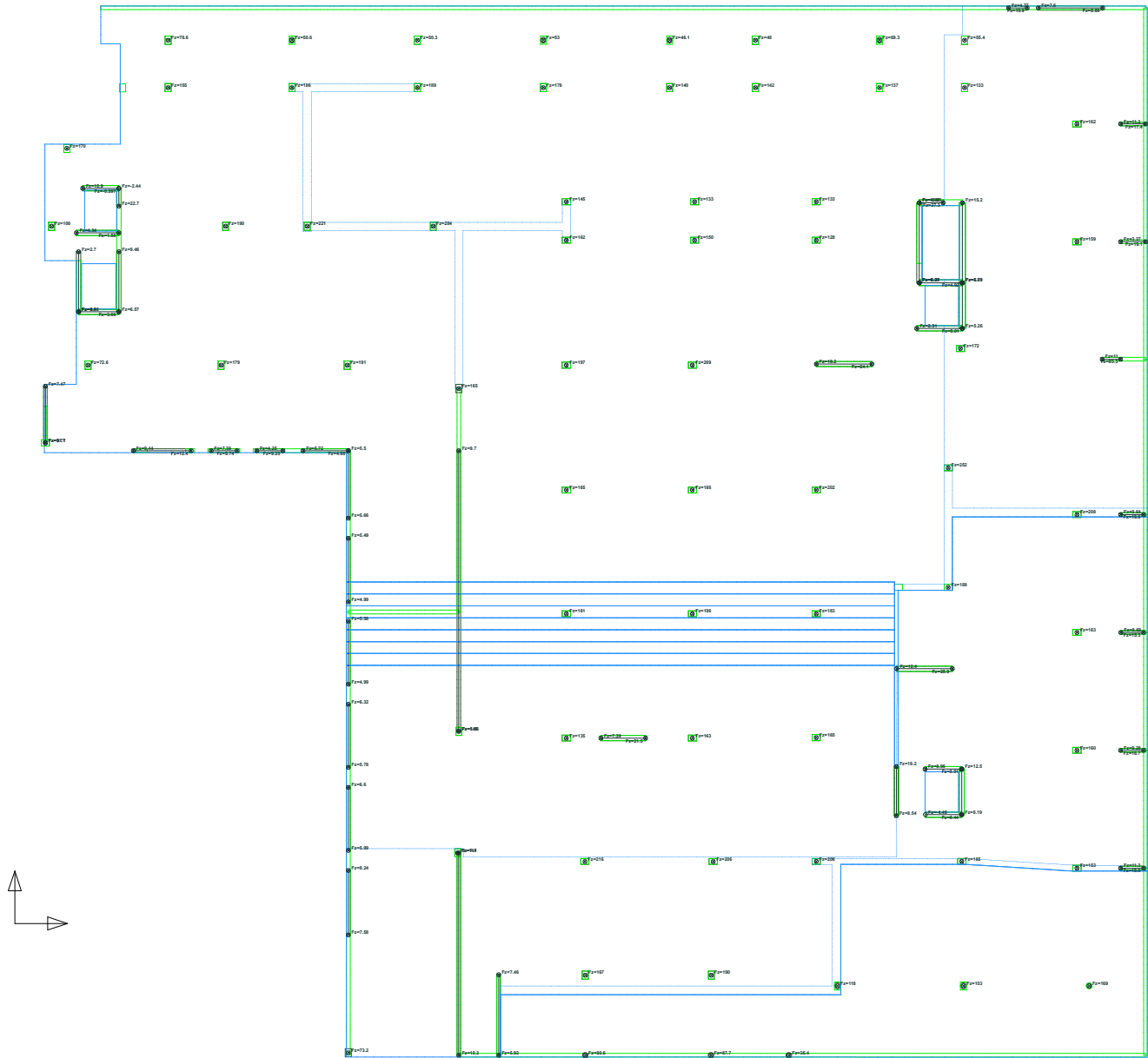
Dead Load: User Levels, User Risers, User Dimensions, Point Loads, Point Load Icons, Line Loads, Line Load Icons, Area Loads, Area Load Icons, Area Load Values;
Risers: Wall Elements Below, Wall Elements Above, Wall Element Outline Only; Column Elements Below, Column Elements Above, Wall Element Outline Only;
Scale = 1/4" = 1'-0"



Dead Load (transfer): All Loads Plan

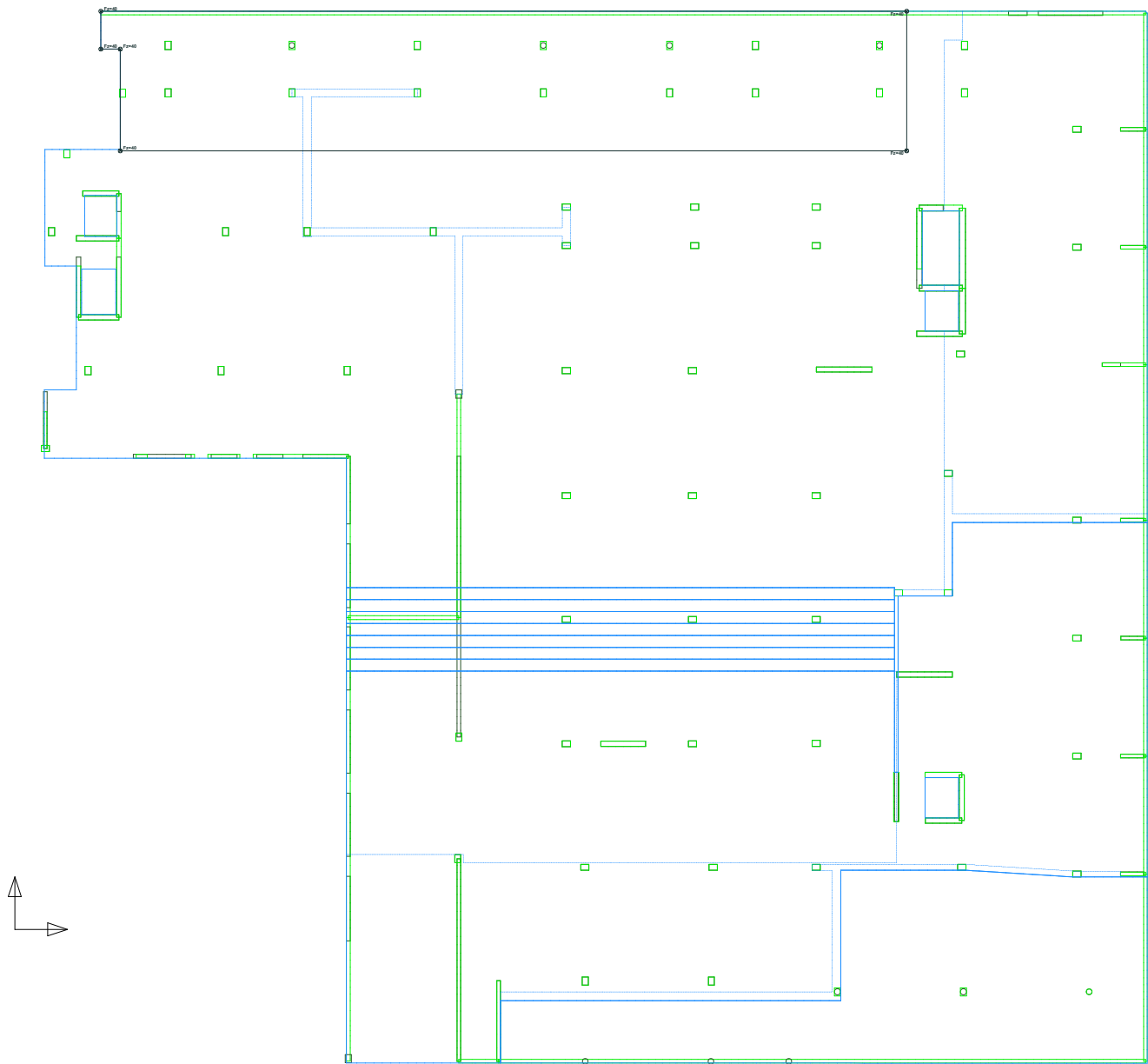
Dead Load (transfer): User Lines, User Nodes, User Dimensions, Point Loads, Point Load Icons, Point Load Values, Line Loads, Line Load Icons, Line Load Values, Area Loads, Area Load Icons, Area Load Values, Column Elements Below, Column Elements Above, Wall Elements, Slab Elements, Slab Element Outline Only.

Scale = 1:425



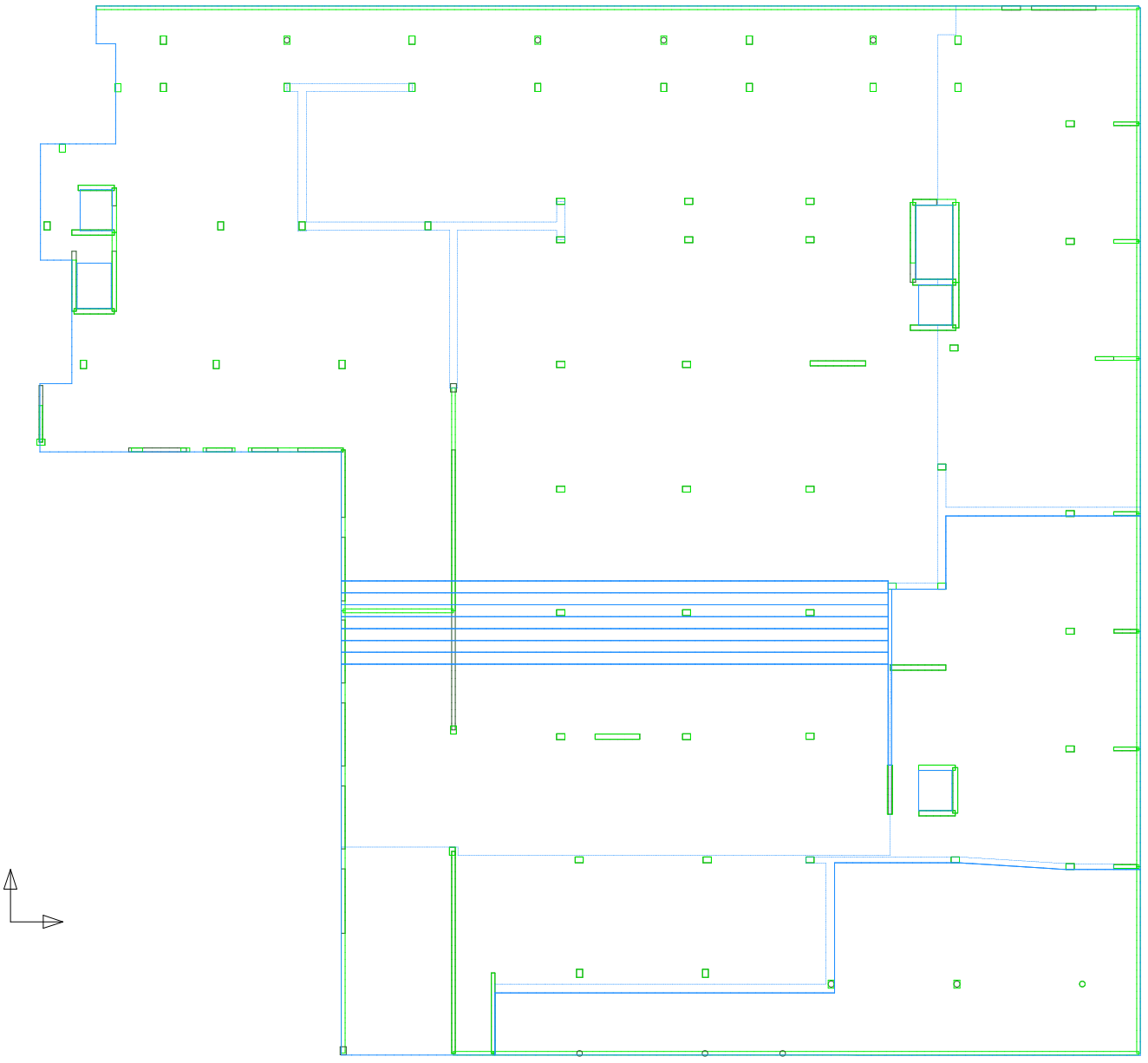
Live Load Reducible: All Loads Plan

Live Load Reducible: User Lines, User Notes, User Dimensions, Point Loads, Point Load Icons, Point Load Values, Line Loads, Line Load Icons, Line Load Values, Area Loads, Area Load Icons, Area Load Values.
Show: Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only.
Scale = 1/48



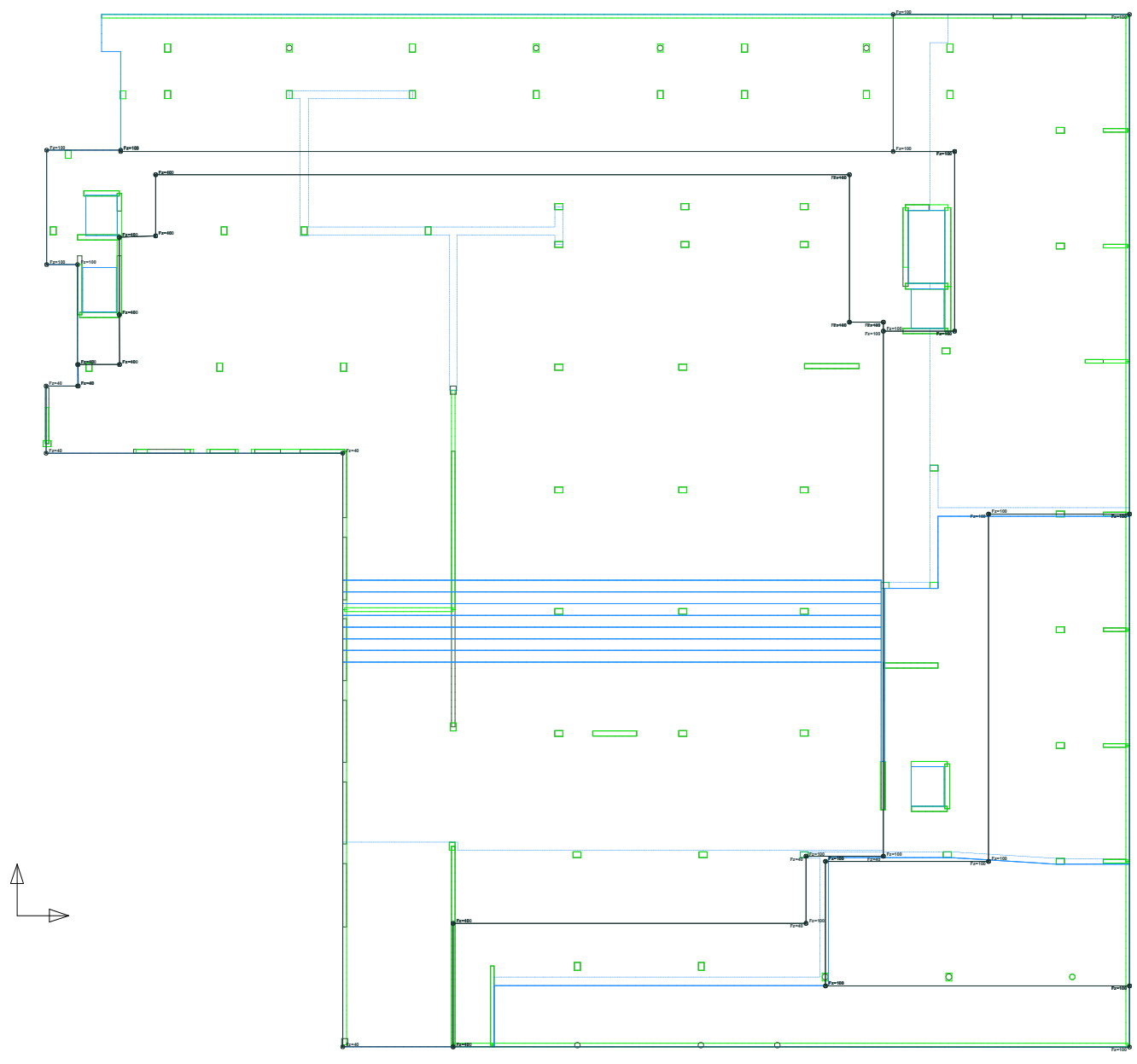
Live Load Reducible (transfer): All Loads Plan

Live Load Reducible (transfer): User Lines, User Notes, User Dimensions, Point Loads, Point Load Icons, Point Load Values, Line Loads, Line Load Icons, Line Load Values, Area Loads, Area Load Icons, Area Load Values.
Elements: Wall Elements (Name, Wall Element Outline Only), Column Elements (Name, Column Element Above, Wall Element Outline Only), Slab Elements (Slab Element, Outline Only).
Scale = 1/48



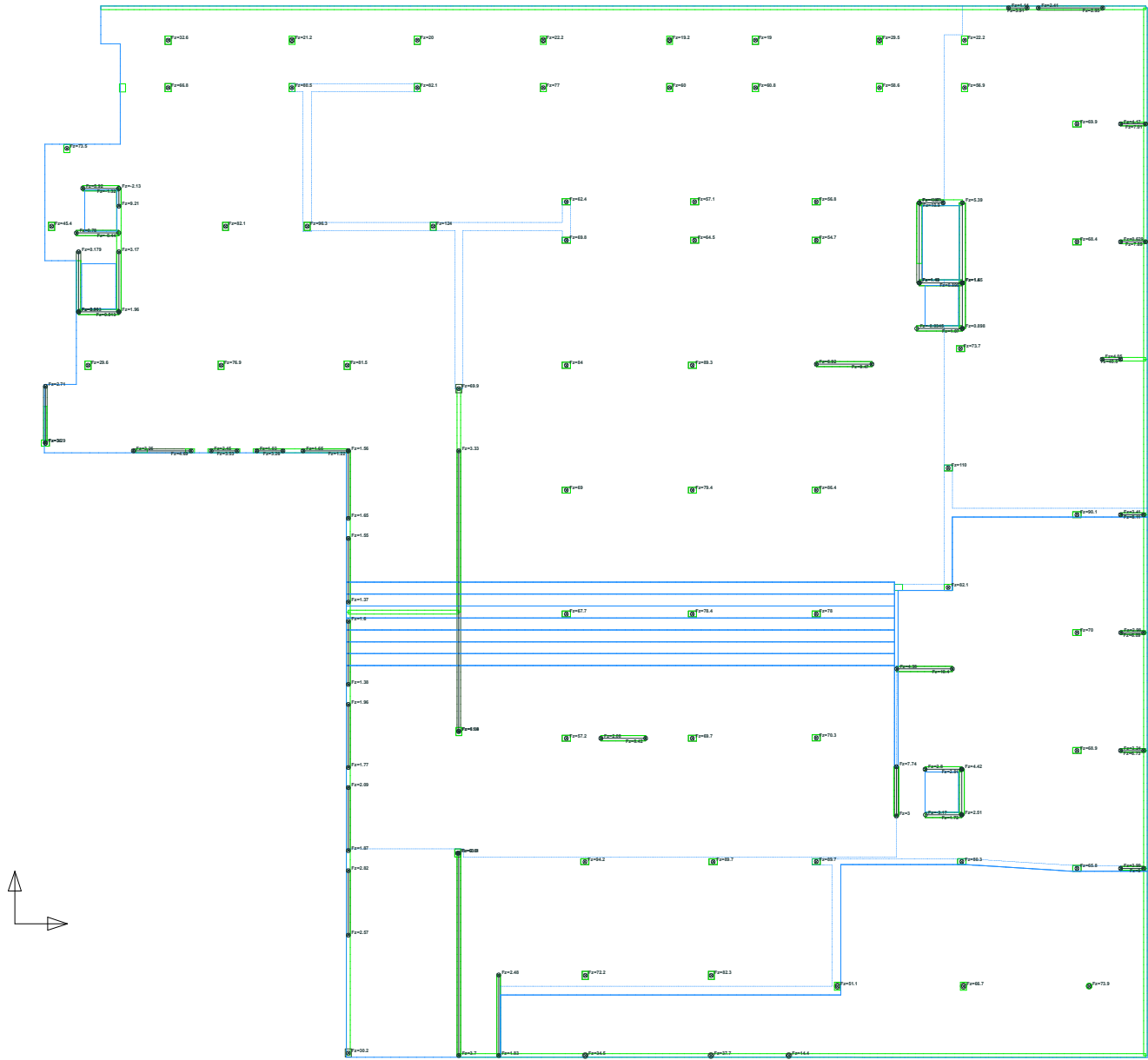
Live Load Unreducible: All Loads Plan

Line Load Unreducible: Clear Lines; User Notes; User Dimensions; Point Loads; Point Load Icons; Line Loads; Line Load Icons; Line Load Values; Area Loads; Area Load Icons; Area Load Values;
Dimension: Wall Elements Below; Wall Elements Above; Wall Elements Outside Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1/48



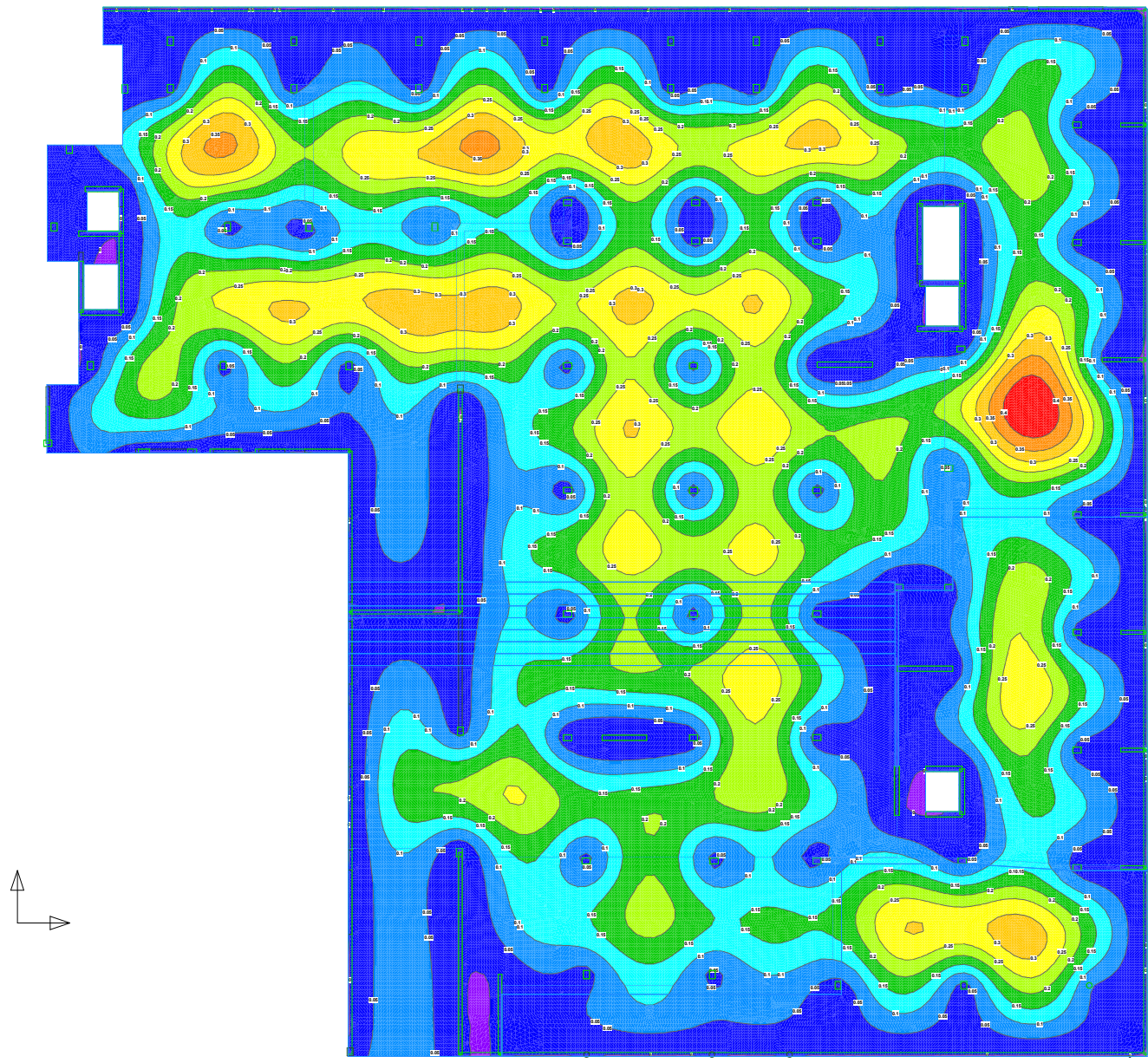
Live Load Unreducible (transfer): All Loads Plan

Live Load Unreducible (transfer): Open Lines: User Notes: User Dimensions: Point Loads: Point Load Name: Point Load Value: Line Loads: Line Load Name: Line Load Value: Area Loads: Area Load Name: Area Load Value:
Shaded: Wall Elements Below: Wall Elements Above: Wall Element Outline Only: Column Elements Below: Column Elements Above: Slab Elements: Slab Element Outline Only:
Scale = 1/432



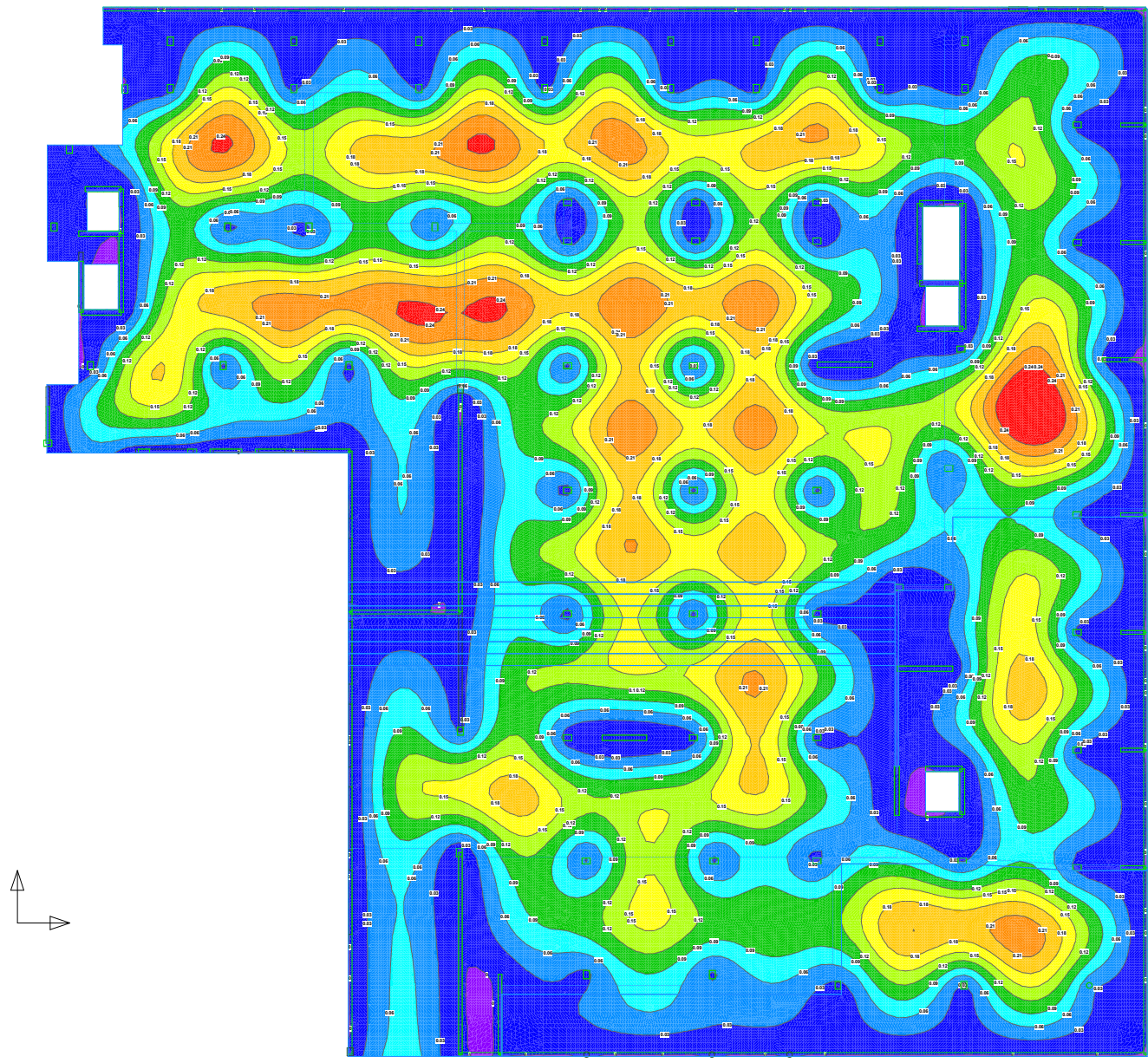
Service LC: D + L: Max Deflection Plan

Service LC: D + L: User Control, User Define, User Dimension.
Element: Wall Elements Define, Wall Element Outline Only, Column Elements Define, Column Elements Define, Wall Element Outline Only.
Scale = 1/48
Service LC: D + L: Vertical Deflection Plan (Maximum Values)
Min Value = -0.046788 inches @ (15, 83, 127.8) Max Value = 5.446 inches @ (226.5, 116.7)



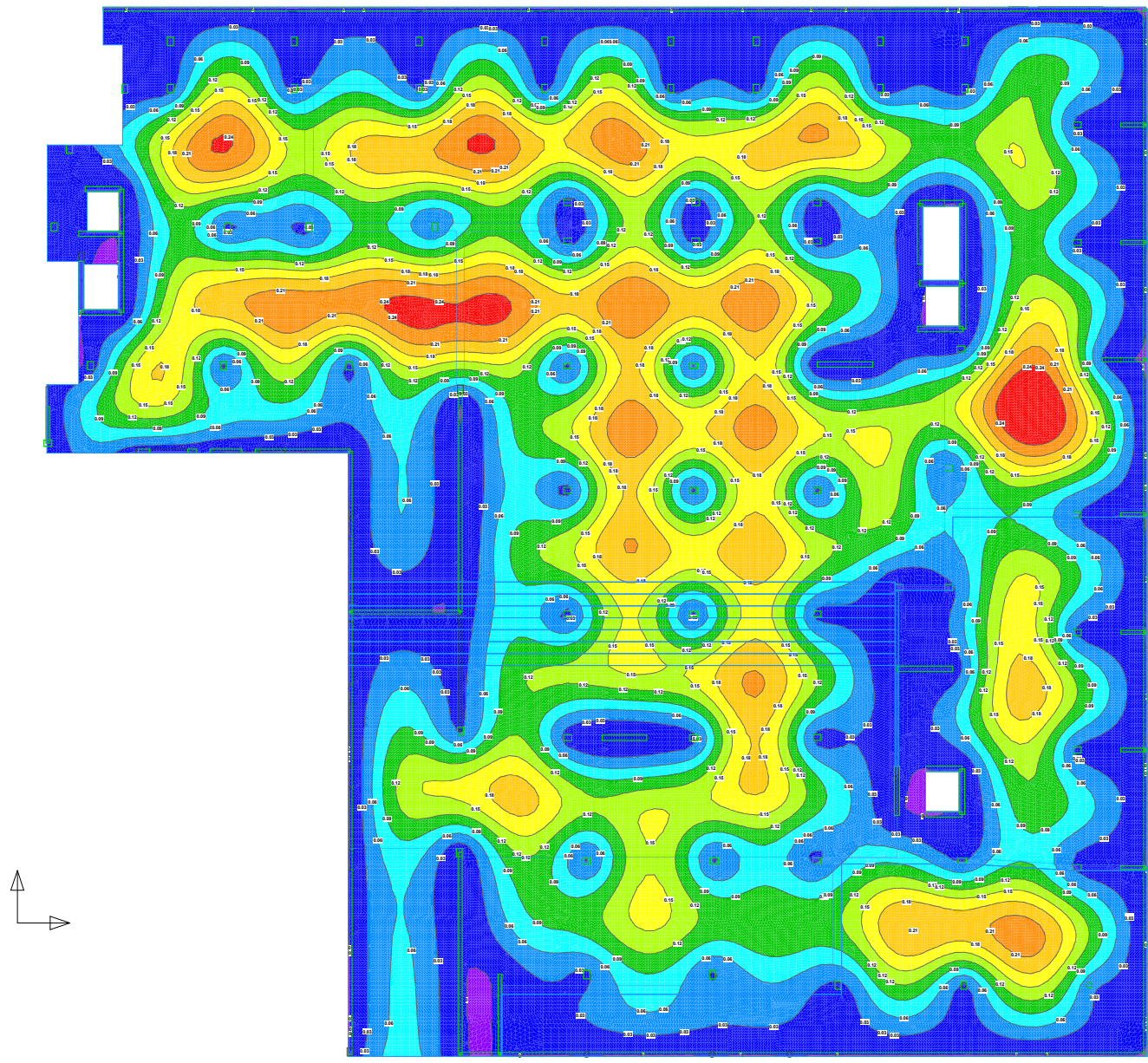
Service LC: D + L: Min Deflection Plan

Service LC: D + L: User Defined, User Defined, User Defined
Element: Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only
Scale = 1/400
Service LC: D + L: Vertical Deflection Plot (Minimum Values)
Min Value = -0.00822 inches @ (15,43,127.8) Max Value = 0.2863 inches @ (228.6,116.7)



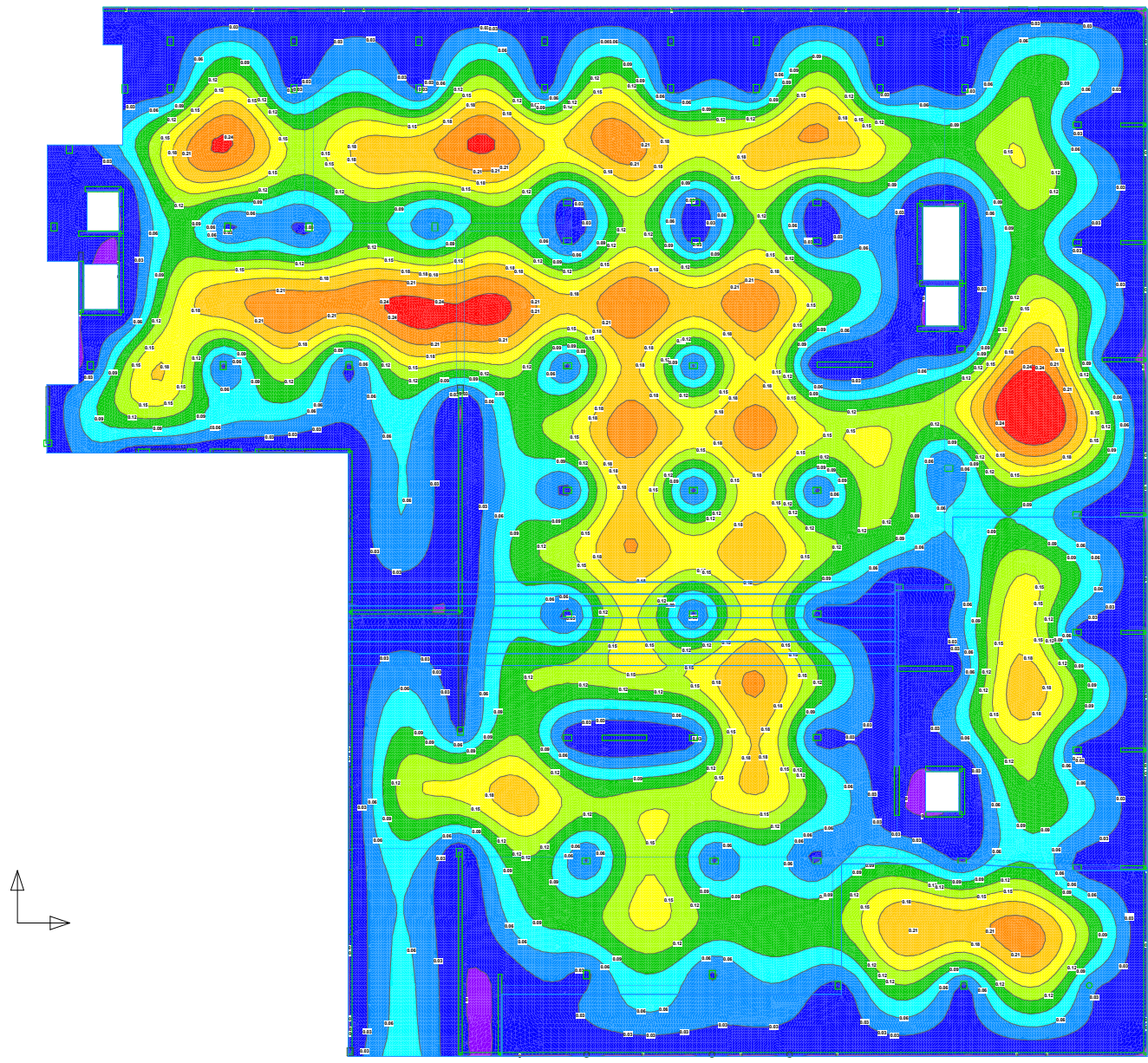
Service LC: D + Lr: Max Deflection Plan

Service LC: D + Lr: User Lines, User Beams, User Dimensions.
Structure: Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only.
Scale = 1/400
Service LC: D + Lr - Vertical Deflection Plot (Maximum Values)
Min Value = -0.007325 inches @ (15,43,127.8) Max Value = 0.2863 inches @ (224.6,116.7)



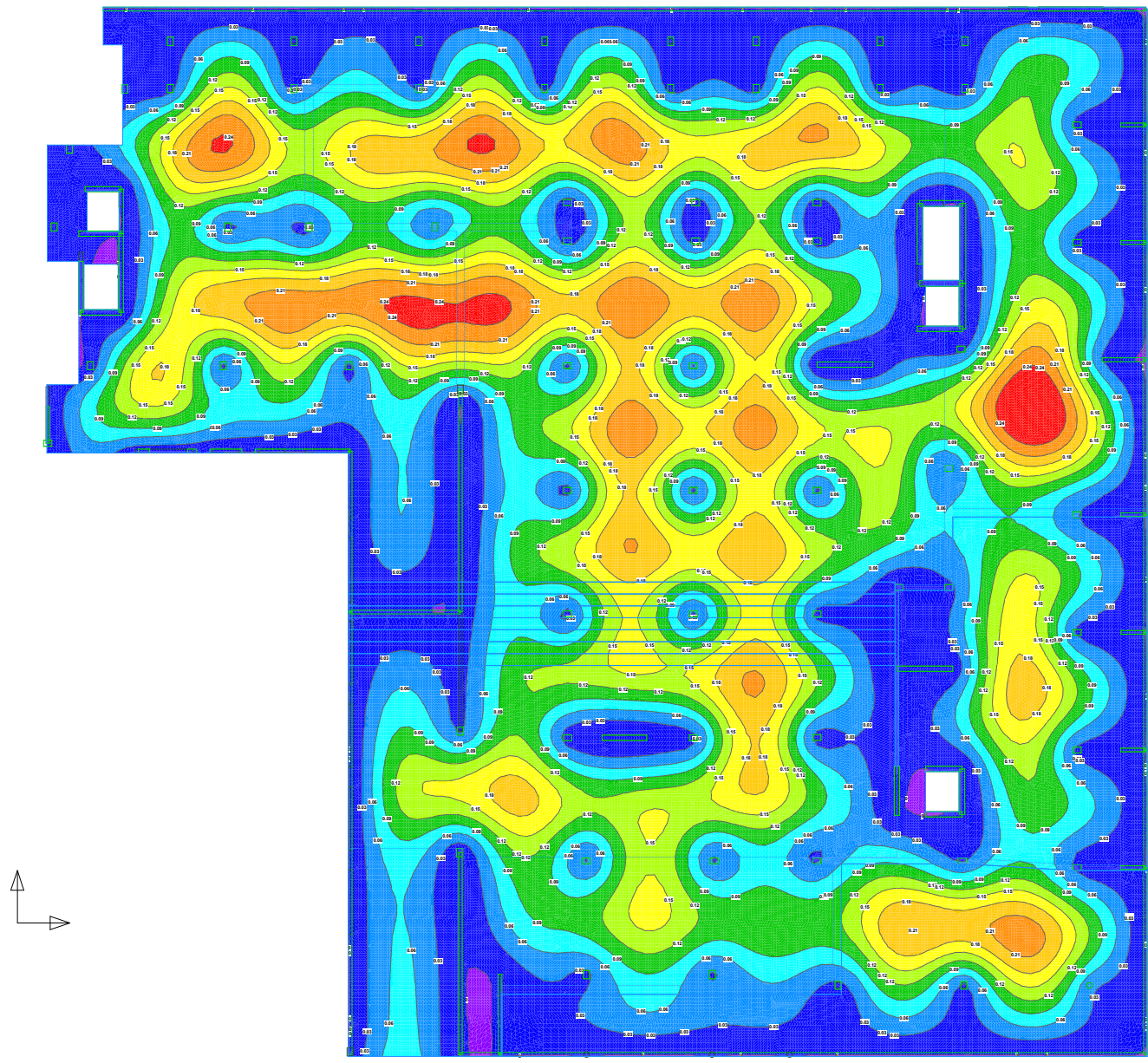
Service LC: D + Lr: Min Deflection Plan

Service LC: D + Lr: User Lines, User Beams, User Dimensions.
Display: Wall Elements Hidden, Slab Elements Active, Wall Element Outline Only, Column Elements Hidden, Column Elements Active, Slab Elements, Slab Element Outline Only.
Scale = 1/400
Service LC: D + Lr - Vertical Deflection Plot (Minimum Values)
Min Value = -0.007325 inches @ (15,43,127.8) Max Value = 0.2863 inches @ (224.6,116.7)



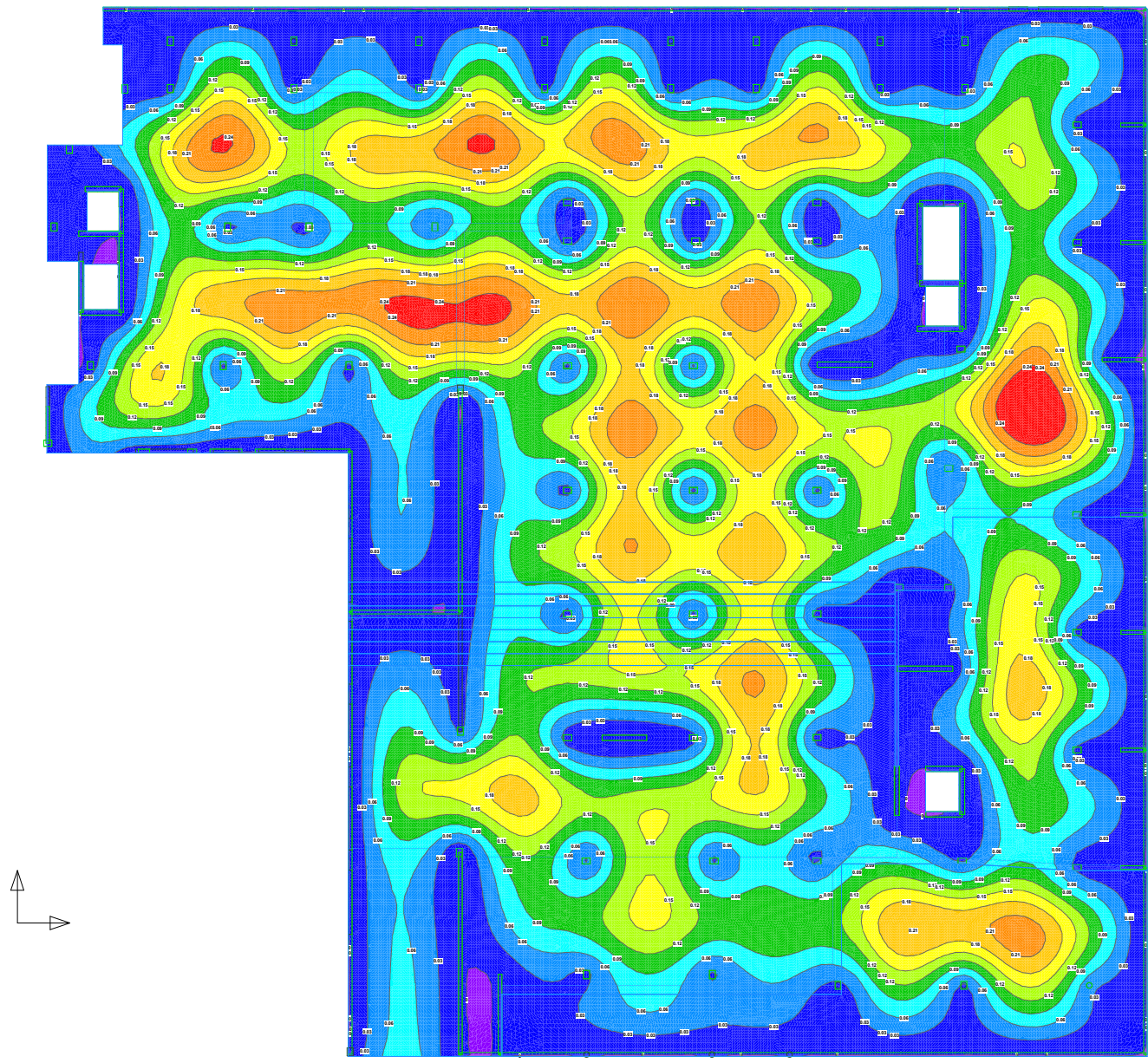
Service LC: D + S: Max Deflection Plan

Service LC: D + S: User Defined, User Defined, User Defined
Element: Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only
Scale = 1/400
Service LC: D + S: Vertical Deflection Plot (Maximum Values)
Min Value = -0.007325 inches @ (15,83,127.8) Max Value = 0.2863 inches @ (228.6,116.7)



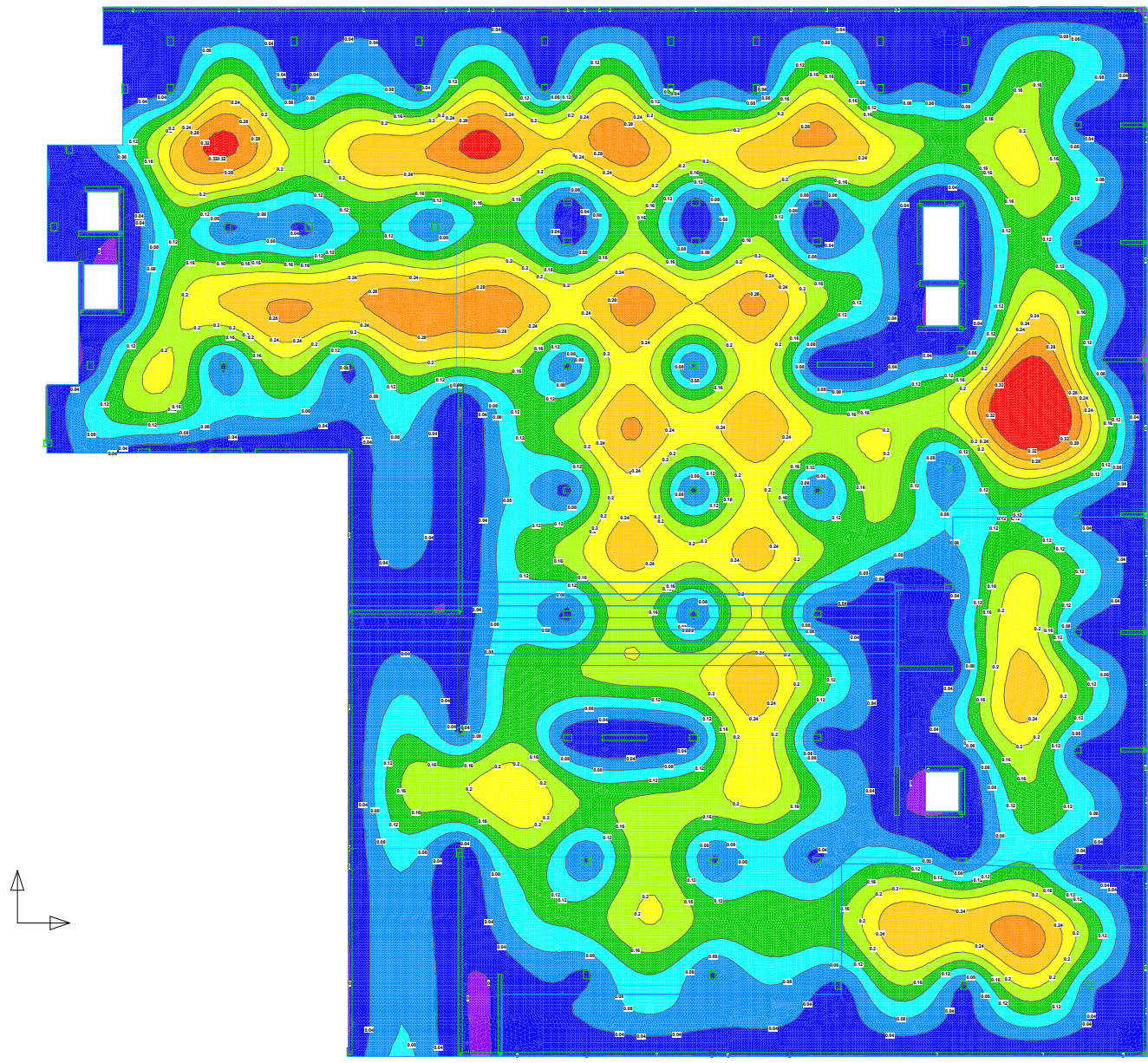
Service LC: D + S: Min Deflection Plan

Service LC: D + S: User Defined, User Defined, User Defined
Display: Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only
Scale = 1:400
Service LC: D + S - Vertical Deflection Plot (Minimum Values)
Min Value = -0.007325 inches @ (15,43,127.8) Max Value = 0.2863 inches @ (224.6,116.7)



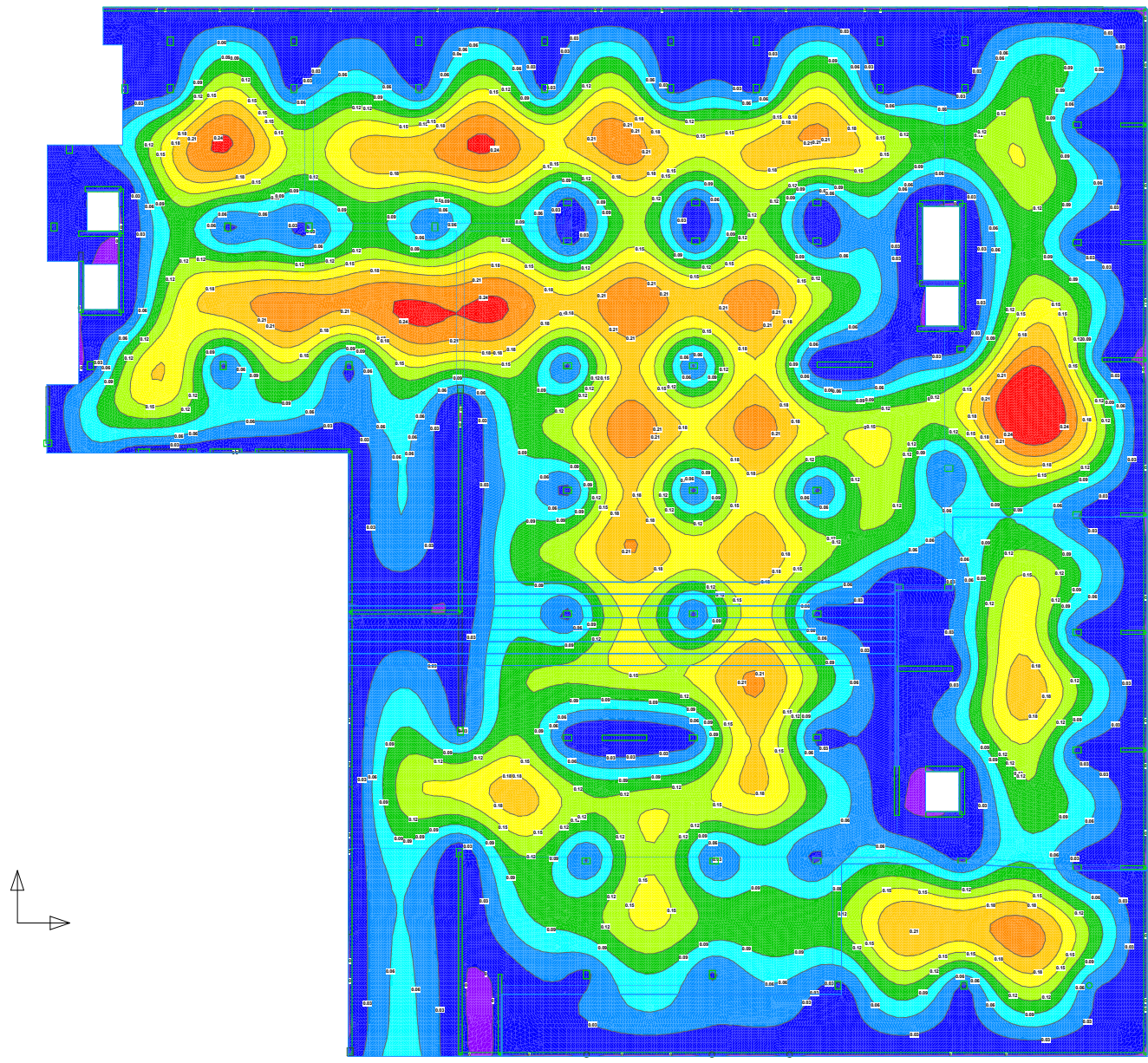
Service LC: D + 0.75L + 0.75Lr: Max Deflection Plan

Service LC: D + 0.75L + 0.75Lr: Max Deflection Plan
Min Value = -0.00462 inches @ (15,83,127.8) Max Value = 5.4876 inches @ (228.5,116.7)



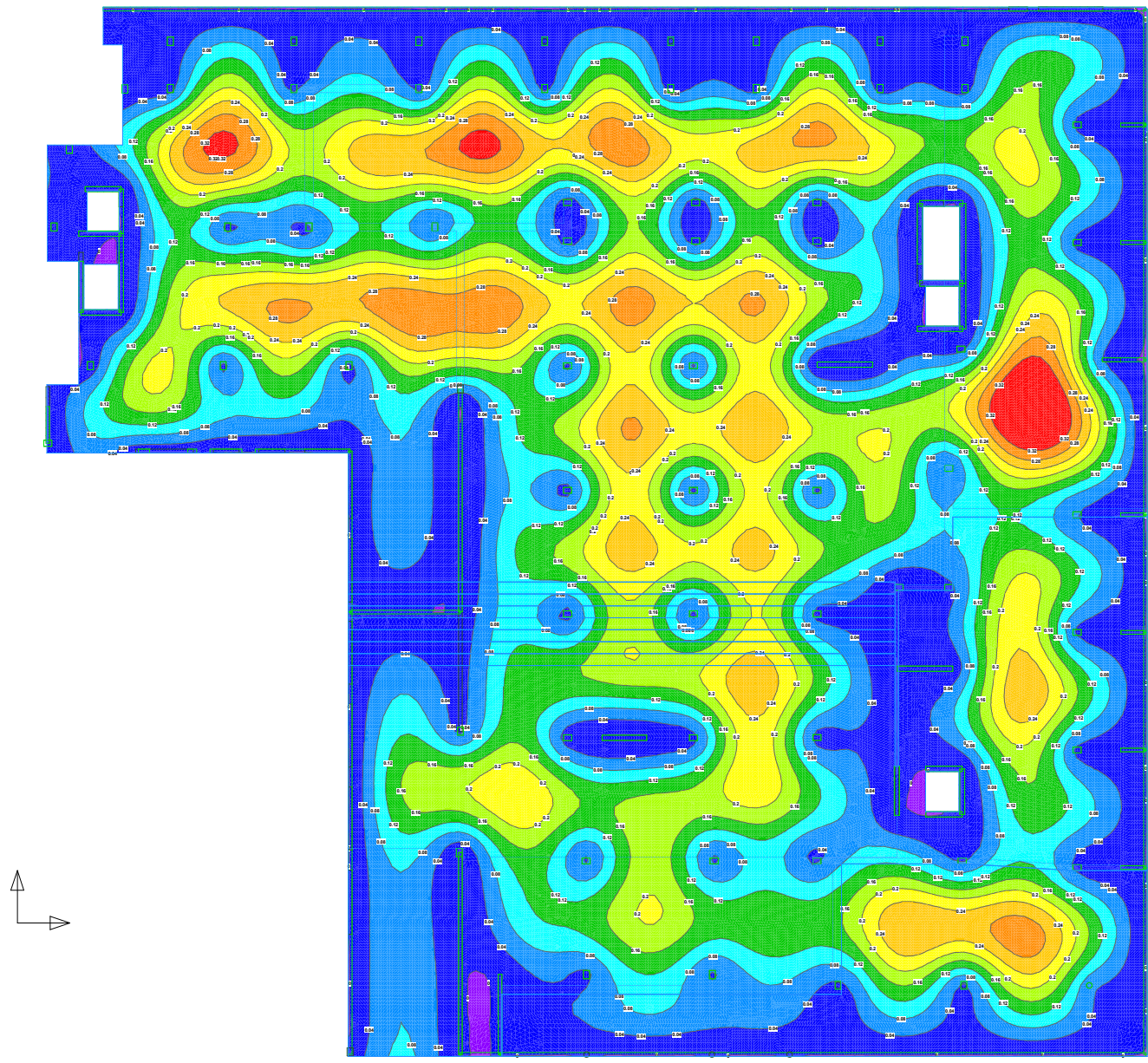
Service LC: D + 0.75L + 0.75Lr: Min Deflection Plan

Service LC: D + 0.75L + 0.75Lr: Min Deflection Plan
Min Value = -0.000198 inches @ (15,43,127.8) Max Value = 0.2863 inches @ (228.6,16.7)



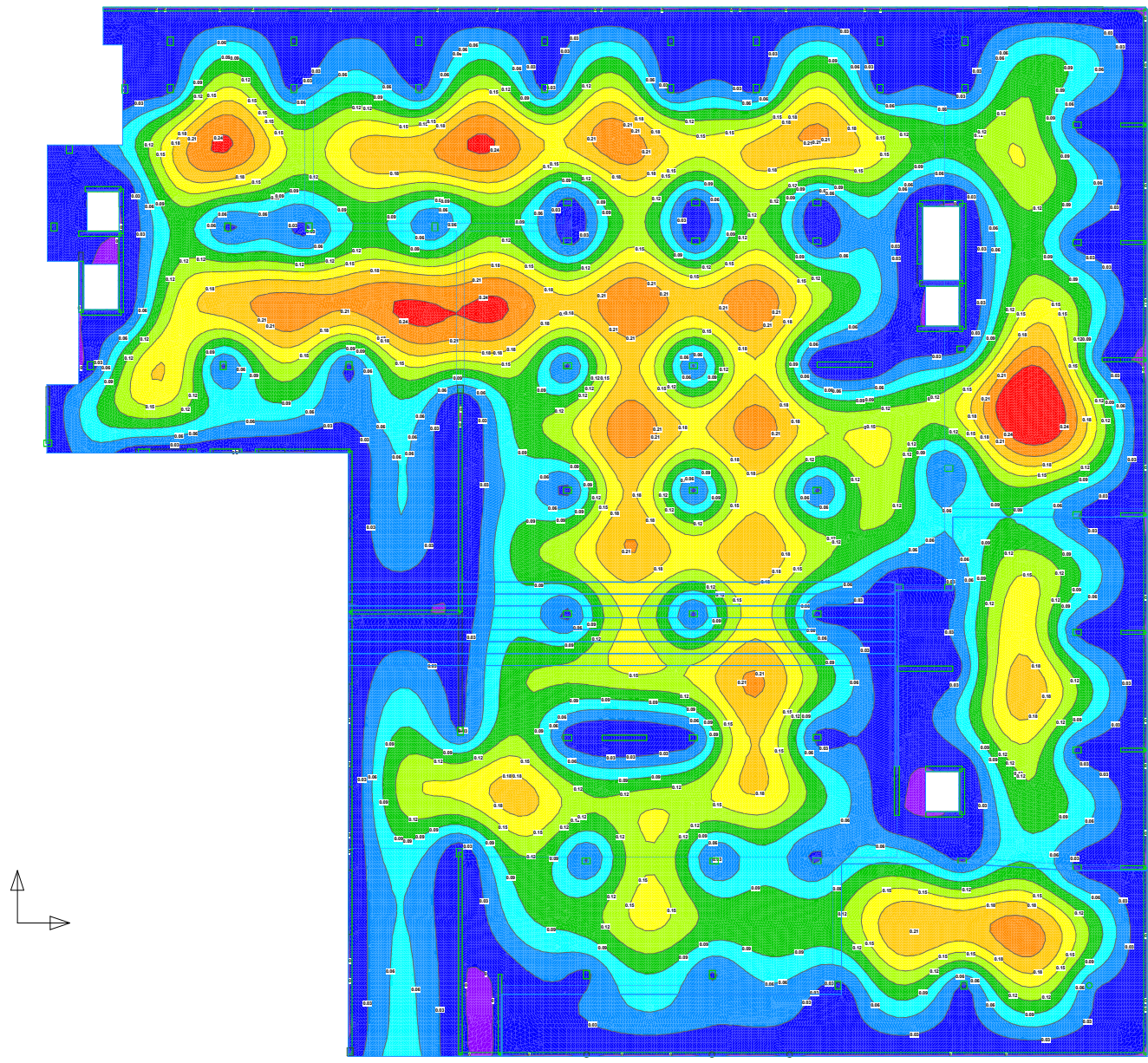
Service LC: D + 0.75L + 0.75S: Max Deflection Plan

Service LC: D + 0.75L + 0.75S: Max Deflection Plan
Min Value = -0.00462 inches @ (15,83,127.8) Max Value = 5.4876 inches @ (228.6,116.7)



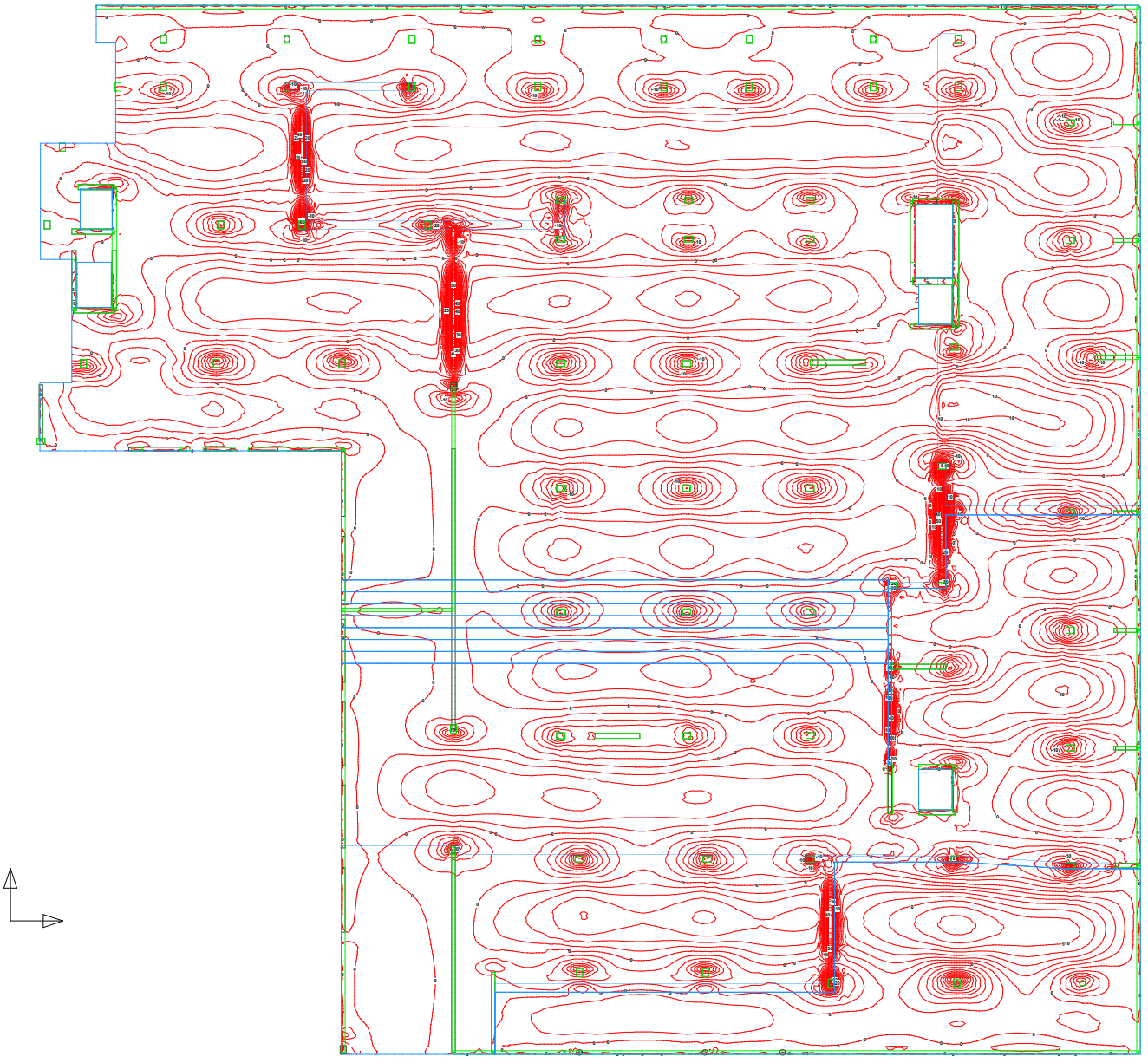
Service LC: D + 0.75L + 0.75S: Min Deflection Plan

Service LC: D + 0.75L + 0.75S: User Limit, User Notice, User Dimension,
Dimension, Wall Element Center, Wall Element Above, Wall Element Outline Only, Column Element Below, Column Element Above, Slab Element, Slab Element Outline Only,
Scale = 1/400
Service LC: D + 0.75L + 0.75S: Vertical Deflection Plot (Minimum Values)
Min Value = -0.000198 inches @ (15, 83, 127.8) Max Value = 0.2863 inches @ (228.5, 116.7)



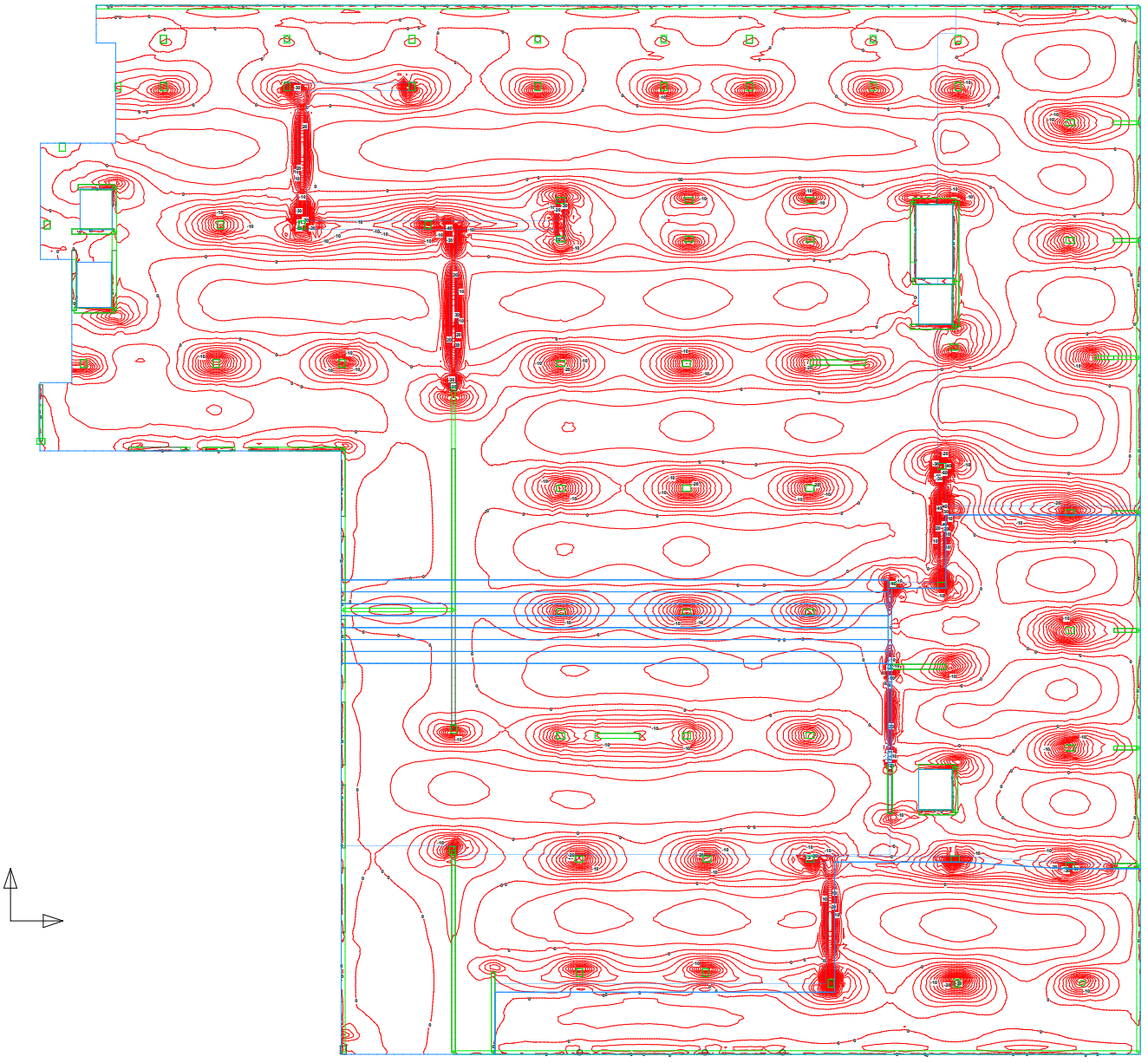
Factored LC: 1.4D: Max Mx Plan

Factored LC: 1.4D: User Lines, User Beams, User Dimensions.
Element: Max Elements Below, Min Elements Above, Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1/8"=1'-0"
Factored LC: 1.4D: Bending Moment Plot (Minimum Values) (X-Axis Direction)
Data Contour = 2 Kips
Min Value = -62.88 Kips @ (55, 1.157, 2) Max Value = 74.36 Kips @ (58, 78, 127, 3)



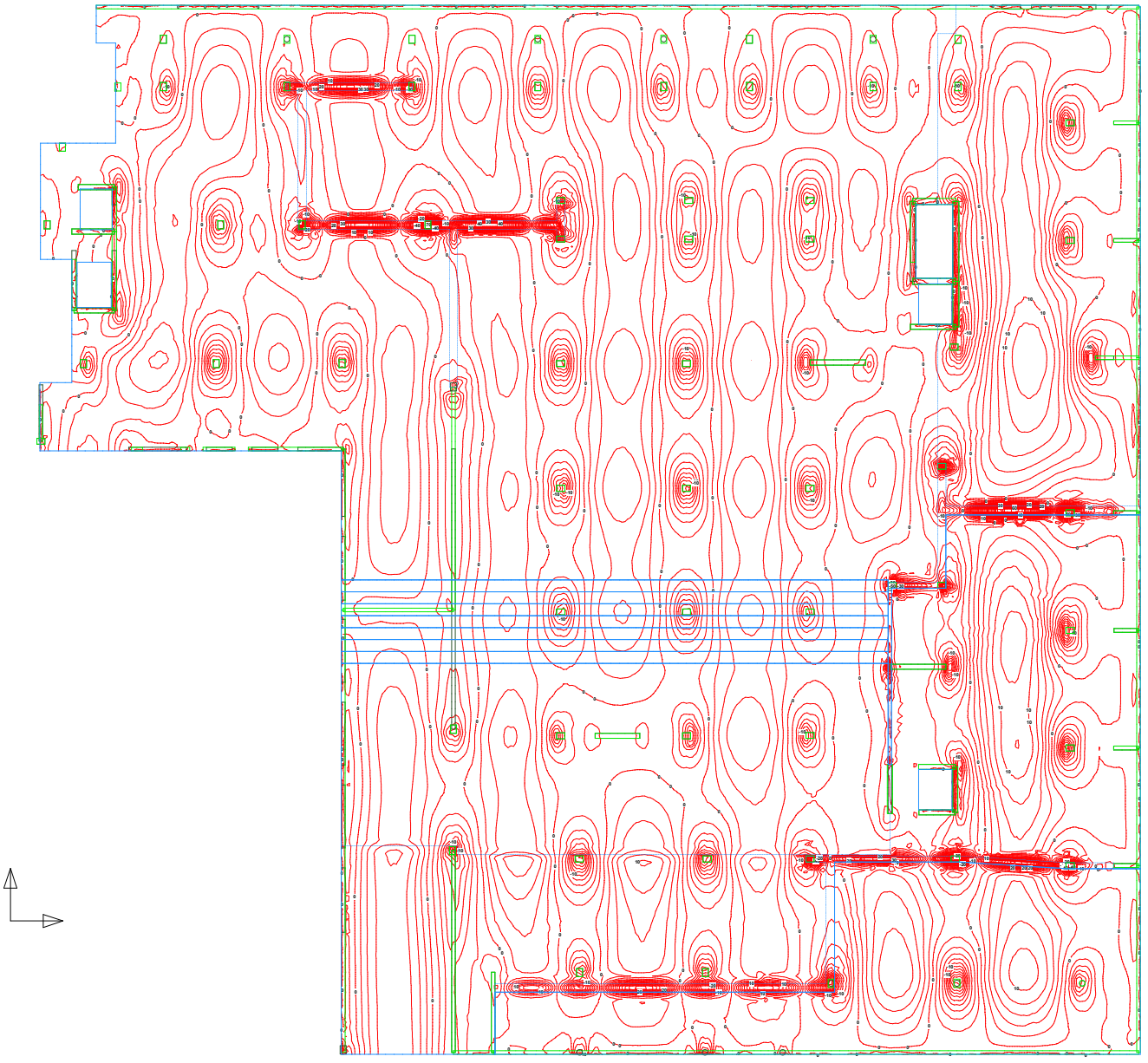
Factored LC: 1.4D: Min Mx Plan

Factored LC: 1.4D: User Lines, User Beams, User Dimensions.
Element: Min Elements Below, Max Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only.
Scale = 1/400
Factored LC: 1.4D: Bending Moment Plot (Minimum Values) (X-Axis Direction)
Data Contour = 2.0 Kip
Min Value = -0.15 Kip @ (55, 1.07, 0) Max Value = 0.81 Kip @ (58, 78, 127, 0)



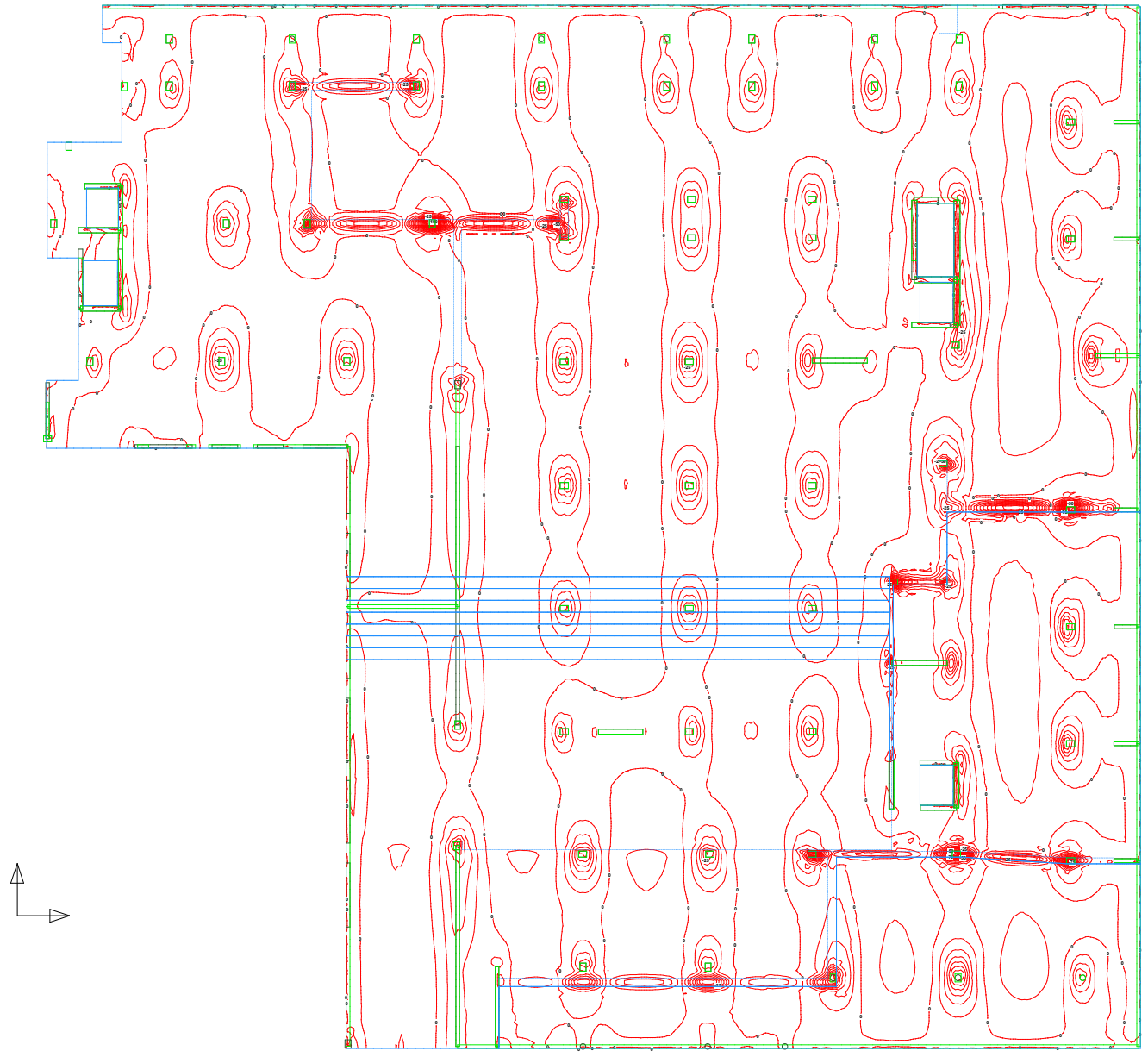
Factored LC: 1.4D: Max My Plan

Factored LC: 1.4D: User Lines, User Beams, User Dimensions.
Element: Max Elements Below, Min Elements Above, Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1/40;
Factored LC: 1.4D: Bending Moment (kN-m/ft) (7-Axis Direction)
Data Contour = 2.0kN
Min Value = -12.15 kN-m @ (215.3, 12.96) Max Value = 15.95 kN-m @ (225.2, 12.45)



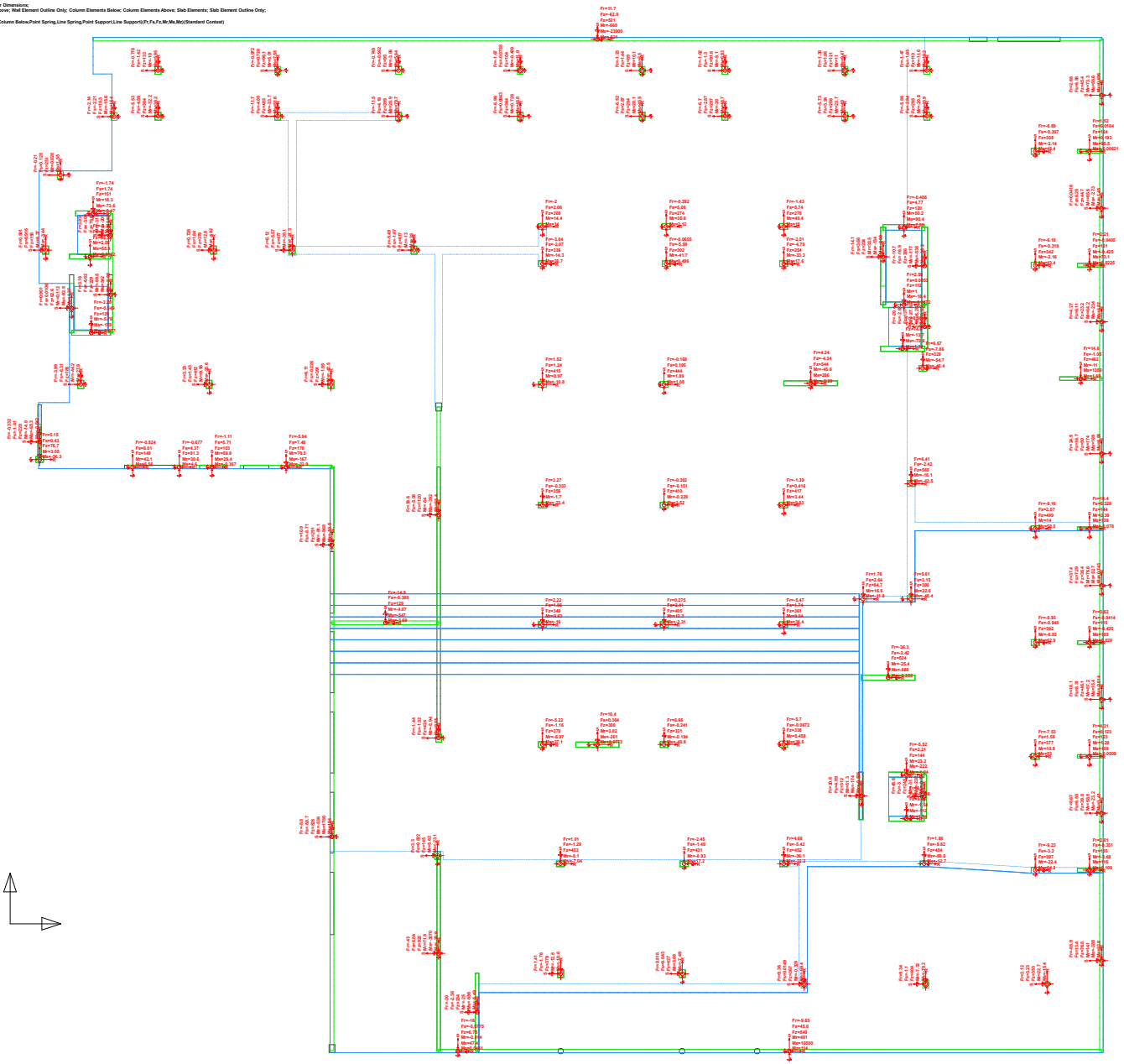
Factored LC: 1.4D: Min My Plan

Factored LC: 1.4D: User Lines, User Beams, User Dimensions.
Element: Min Element Value, Min Element Area, Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only.
Scale = 1/400
Factored LC: 1.4D: Bending Moment (Min (Minimum Value)) (Y Axis Direction)
Data Contour = 1 Page
Min Value = -117.2 Kips @ (213.3, 13.96) Max Value = 51.26 Kips @ (232.22, 45)



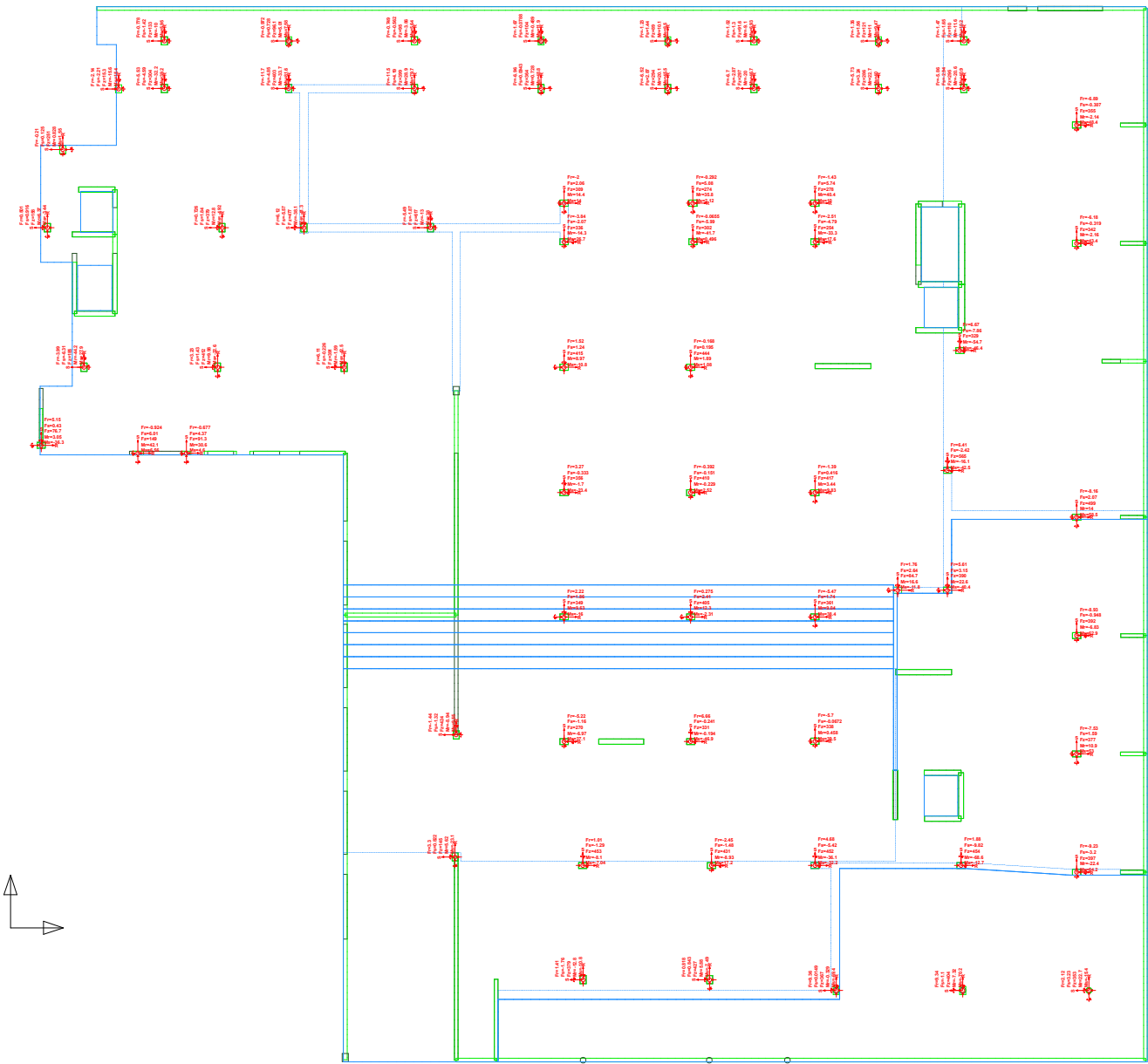
Factored LC: 1.4D: Std Reactions Plan

Factored LC: 1.4D: User Lines, User Nodes, User Dimensions
Element: Wall Elements Below, Std Elements Above, Wall Element Outline Only, Column Elements Below, Std Elements Above, Std Element Outline Only
Scale = 1/400
Factored LC: 1.4D: Reaction Plan (Wall Below, Column Below, Point Spring, Line Spring, Point Support, Line Support) (P1, P2, P3, M1, M2, M3) (Standard Content)



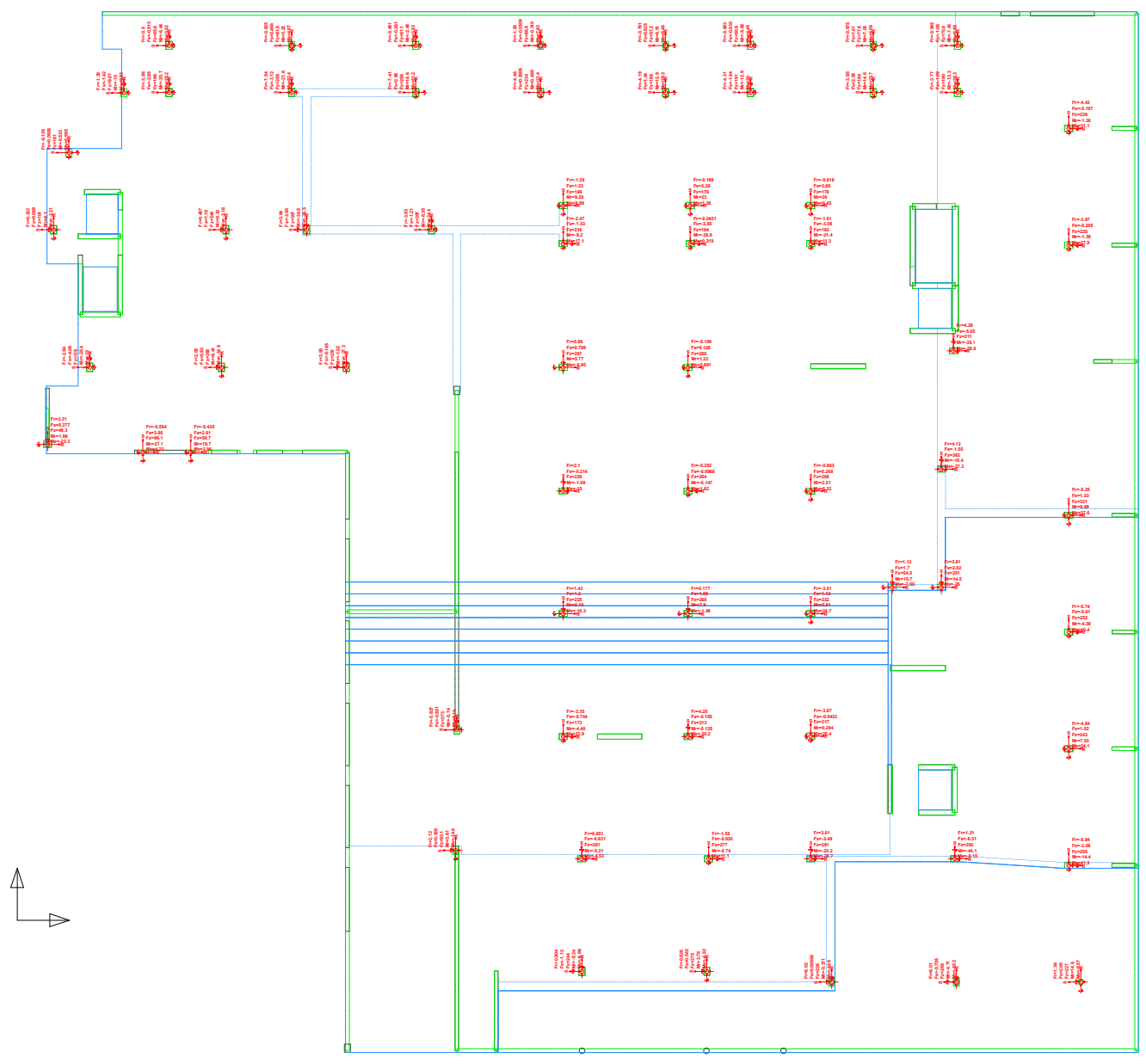
Factored LC: 1.4D: Max Reactions Plan

Factored LC: 1.4D: User Lines, User Nodes, User Dimensions.
Element: Wall Elements Below, Slab Elements Above, Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements, Slab Element Outline Only;
Scale = 1/400
Factored LC: 1.4D - Reaction Plan (Column Labels: F/F, P, M, M₂, M₃, Max Fy, Corner)



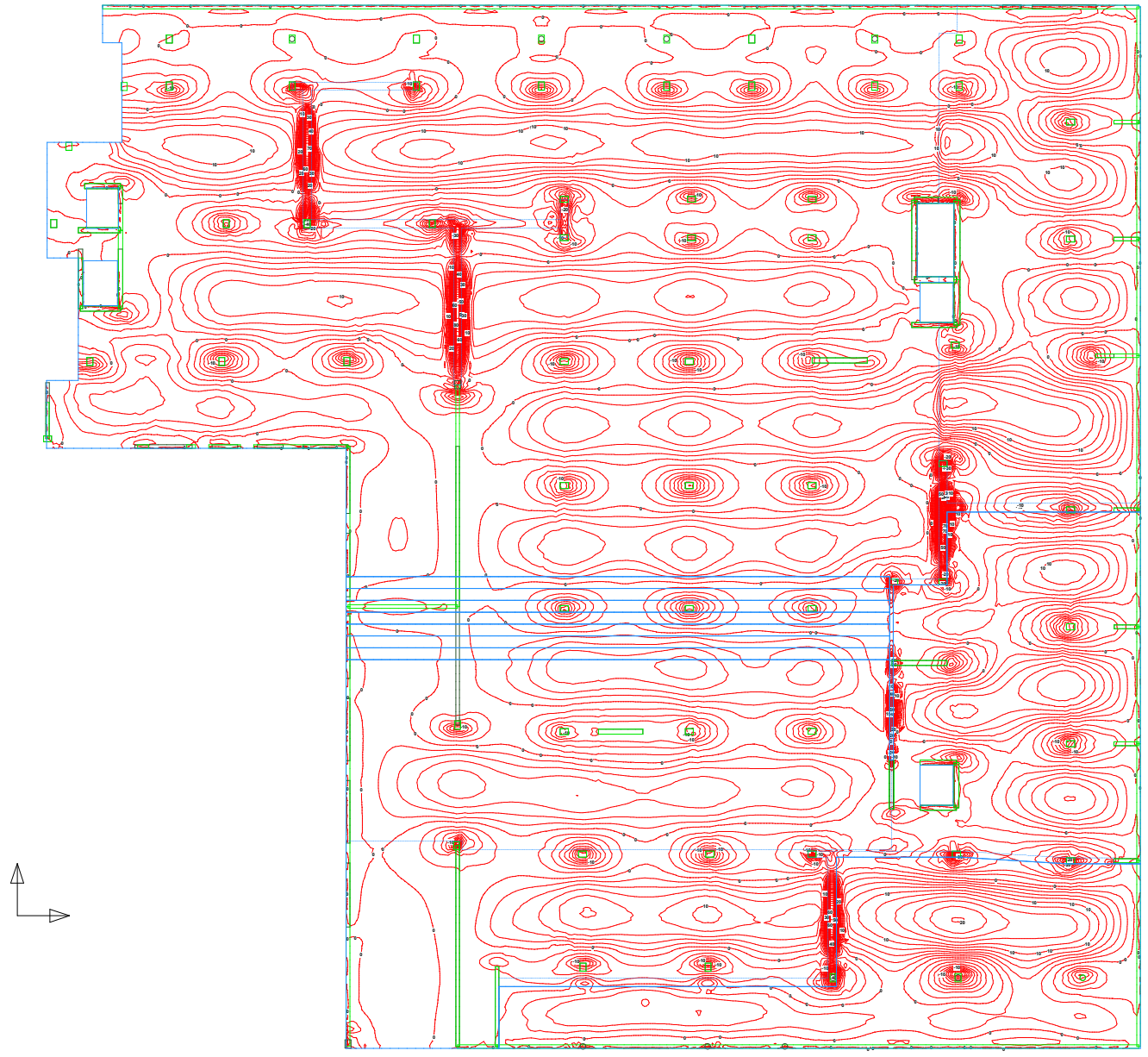
Factored LC: 1.4D: Min Reactions Plan

Factored LC: 1.4D: User Lines, User Nodes, User Dimensions.
Element: Wall Elements Below, Slab Elements Above, Wall Element Outline Only; Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only;
Scale = 1/400
Factored LC: 1.4D - Reaction Plan (Column Below/F/F, P/F, M/M, M/M, Min/F) Contour



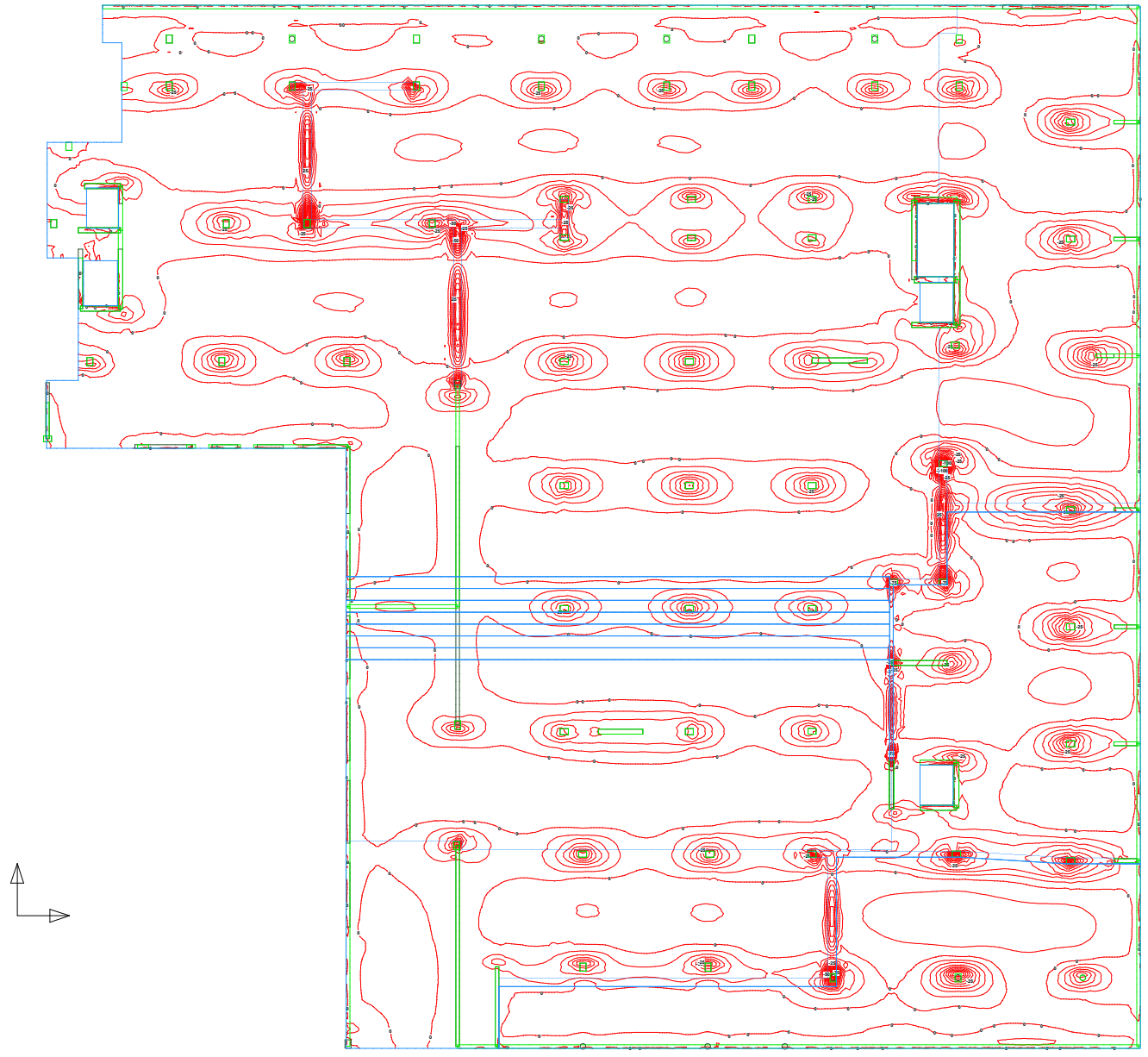
Factored LC: 1.2D + 1.6L + 0.5Lr: Max Mx Plan

Factored LC: 1.2D + 1.6L + 0.5Lr - User Lines, User Walls, User Dimensions
Element: Max Elements Below, Min Elements Above, Wall Elements Outline Only, Column Elements Below, Slab Elements Above, Slab Elements, Slab Element Outline Only
Scale: 1/4" = 1'-0"
Factored LC: 1.2D + 1.6L + 0.5Lr - Bending Moment Plot Maximum Values (X-Axis Direction)
Data Contour = 2 Kips
Min Value = -61.88 Kips @ (65,7,107.0) Max Value = 64.66 Kips @ (210,2,50.0)



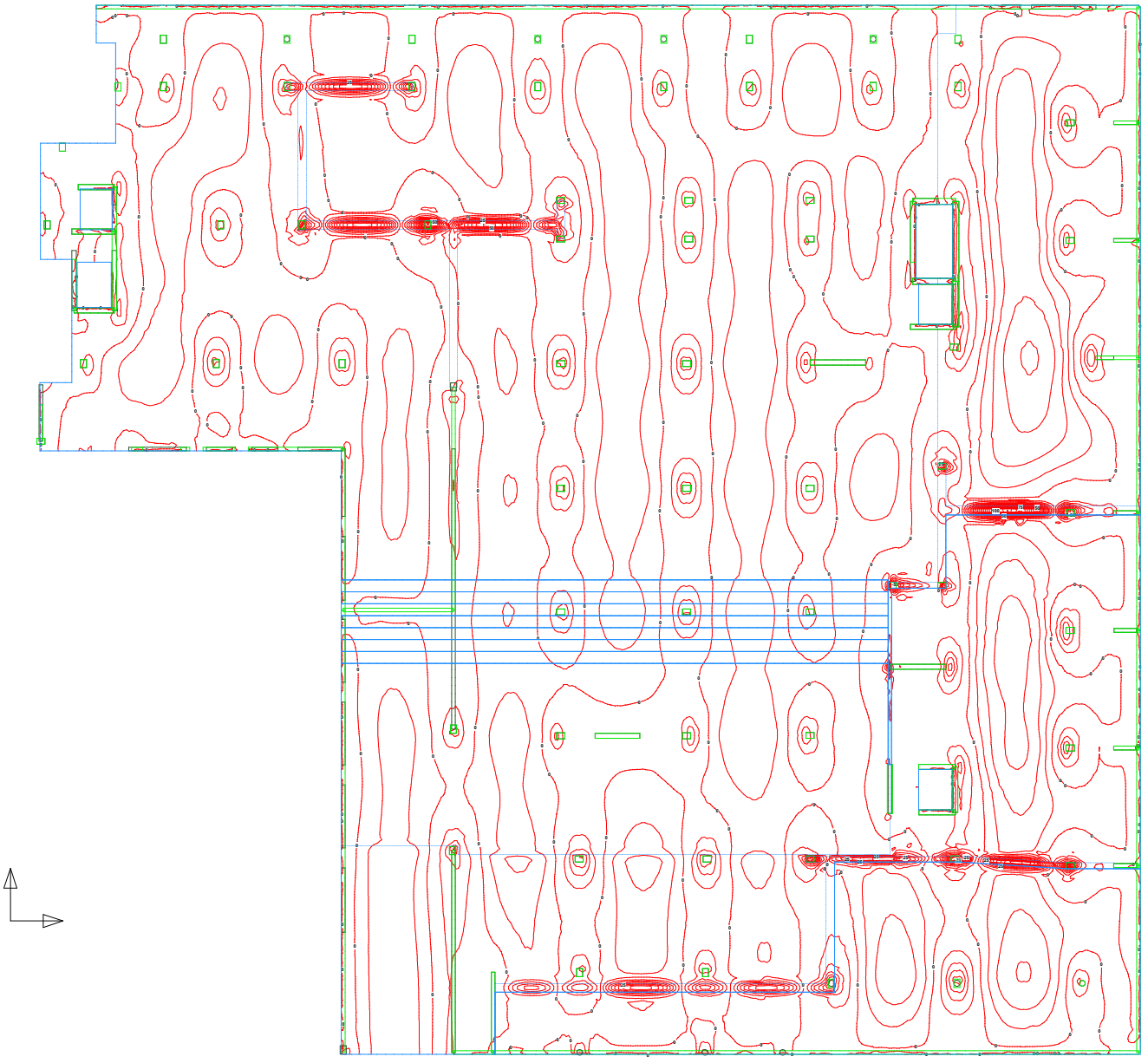
Factored LC: 1.2D + 1.6L + 0.5Lr: Min Mx Plan

Factored LC: 1.2D + 1.6L + 0.5Lr - User Lines, User Nodes, User Dimensions
Element: Min Elements Below, Max Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only
Scale = 1/400
Factored LC: 1.2D + 1.6L + 0.5Lr - Bending Moment Plot (Minimum Values) (X-Axis Direction)
Data Contour = 2 Alpha
Min Value = -102.7 Edge @ (216.2, 922.6) Max Value = 45.69 Edge @ (216.2, 92.32)



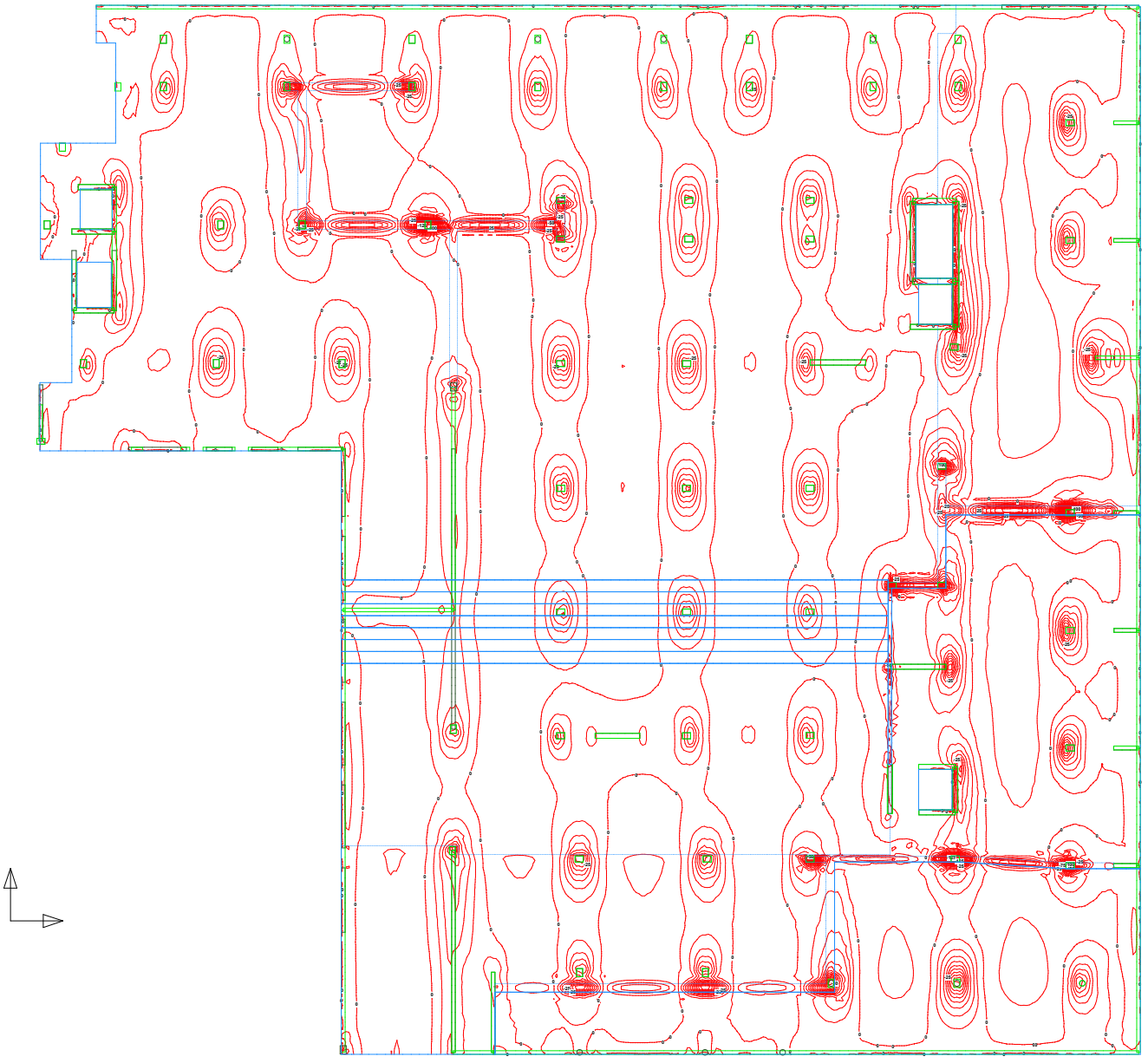
Factored LC: 1.2D + 1.6L + 0.5Lr: Max My Plan

Factored LC: 1.2D + 1.6L + 0.5Lr - User Lines, User Walls, User Dimensions
Element: Max Elements Below, Min Elements Above, Wall Elements Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only
Scale: 1/4"=1'-0"
Factored LC: 1.2D + 1.6L + 0.5Lr - Bending Moment Plot (Maximum Values) (Y-Axis Direction)
Data Contour = 2.0 Kips
Min Value = -12.27 Kips @ (215.3, 12.96) Max Value = 128.8 Kips @ (225.2, 32.45)



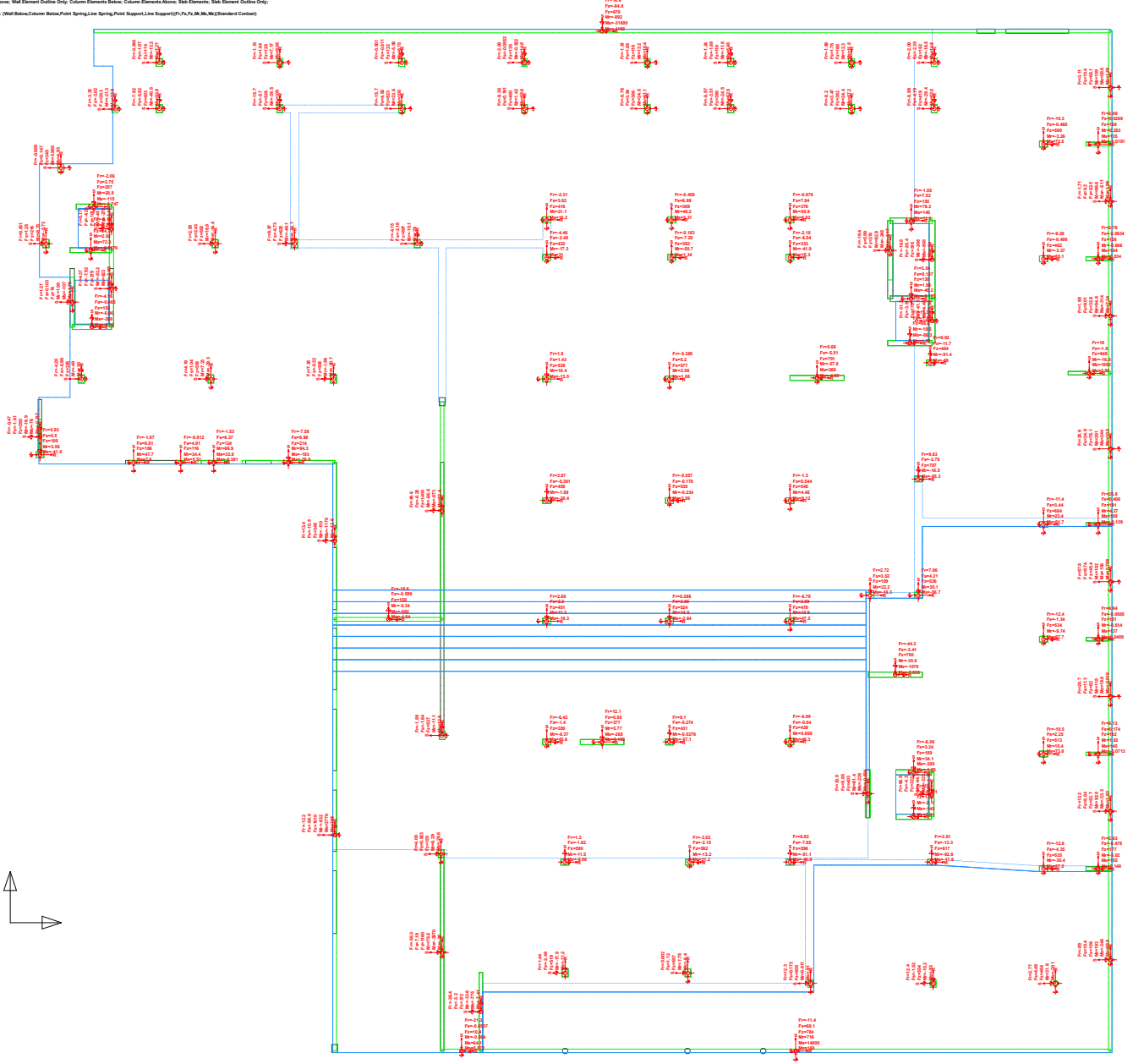
Factored LC: 1.2D + 1.6L + 0.5Lr: Min My Plan

Factored LC: 1.2D + 1.6L + 0.5Lr - User Lines, User Nodes, User Dimensions
Element: Min Elements Below, Max Elements Above, Wall Elements Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only
Scale = 1/400
Factored LC: 1.2D + 1.6L + 0.5Lr - Bending Moment Plot (Minimum Values) (Y-Axis Direction)
Data Contour = 2 Edge
Min Value = -163.7 Edge @ (215.3, 12.96) Max Value = 15.26 Edge @ (225.2, 32.45)



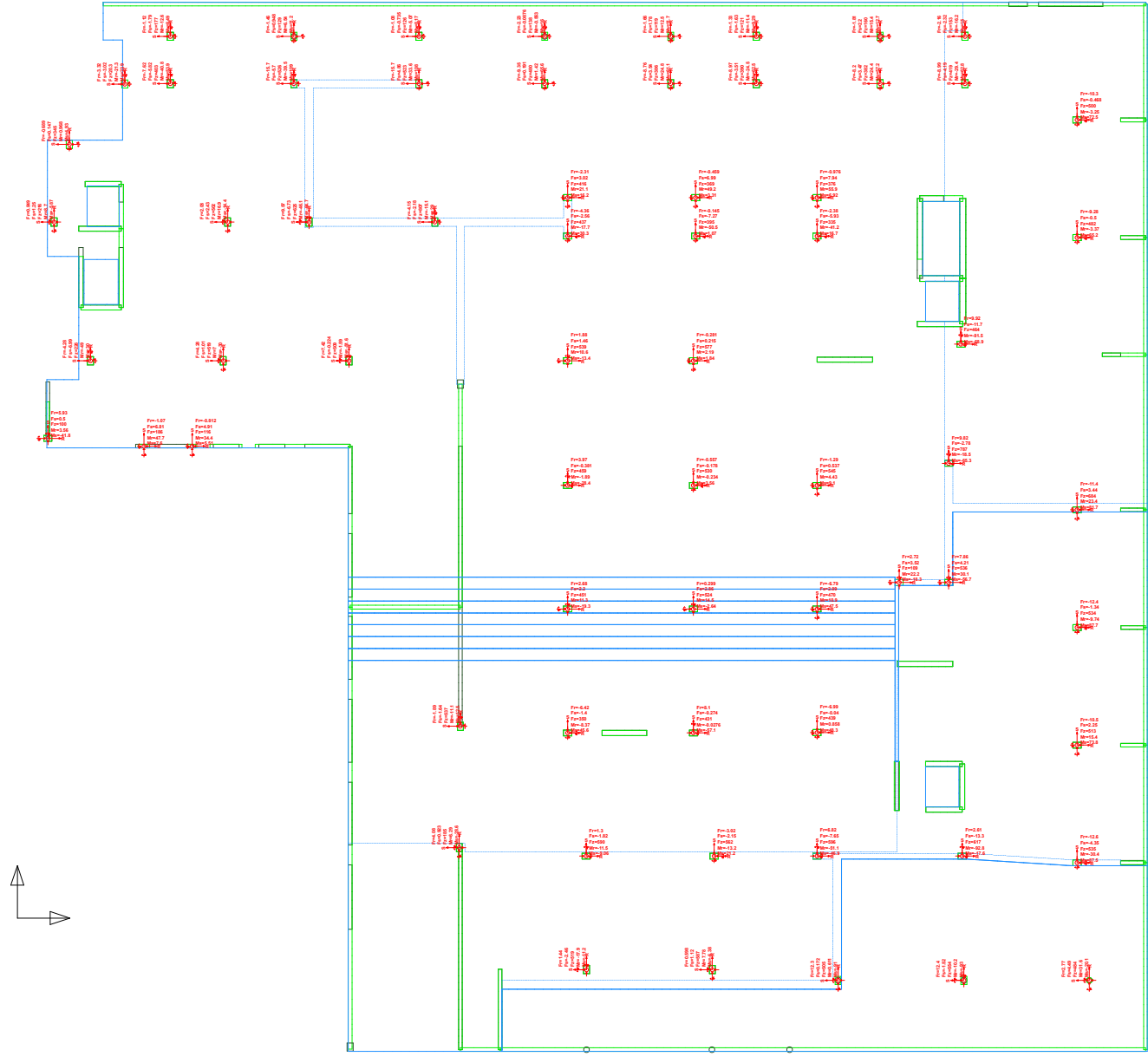
Factored LC: 1.2D + 1.6L + 0.5Lr: Std Reactions Plan

Factored LC: 1.2D + 1.6L + 0.5Lr: User Lines, User Notes, User Dimensions;
Element: Wall Elements Below; Std Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Std Elements; Std Element Outline Only;
Scale: 1/4" = 1'-0";
Factored LC: 1.2D + 1.6L + 0.5Lr: Reaction Plan; (Shell, Beam, Column, Below, Point, Spring, Line, Support, Line, Support) (P, F, T, M, Mo, My, Standard Content)



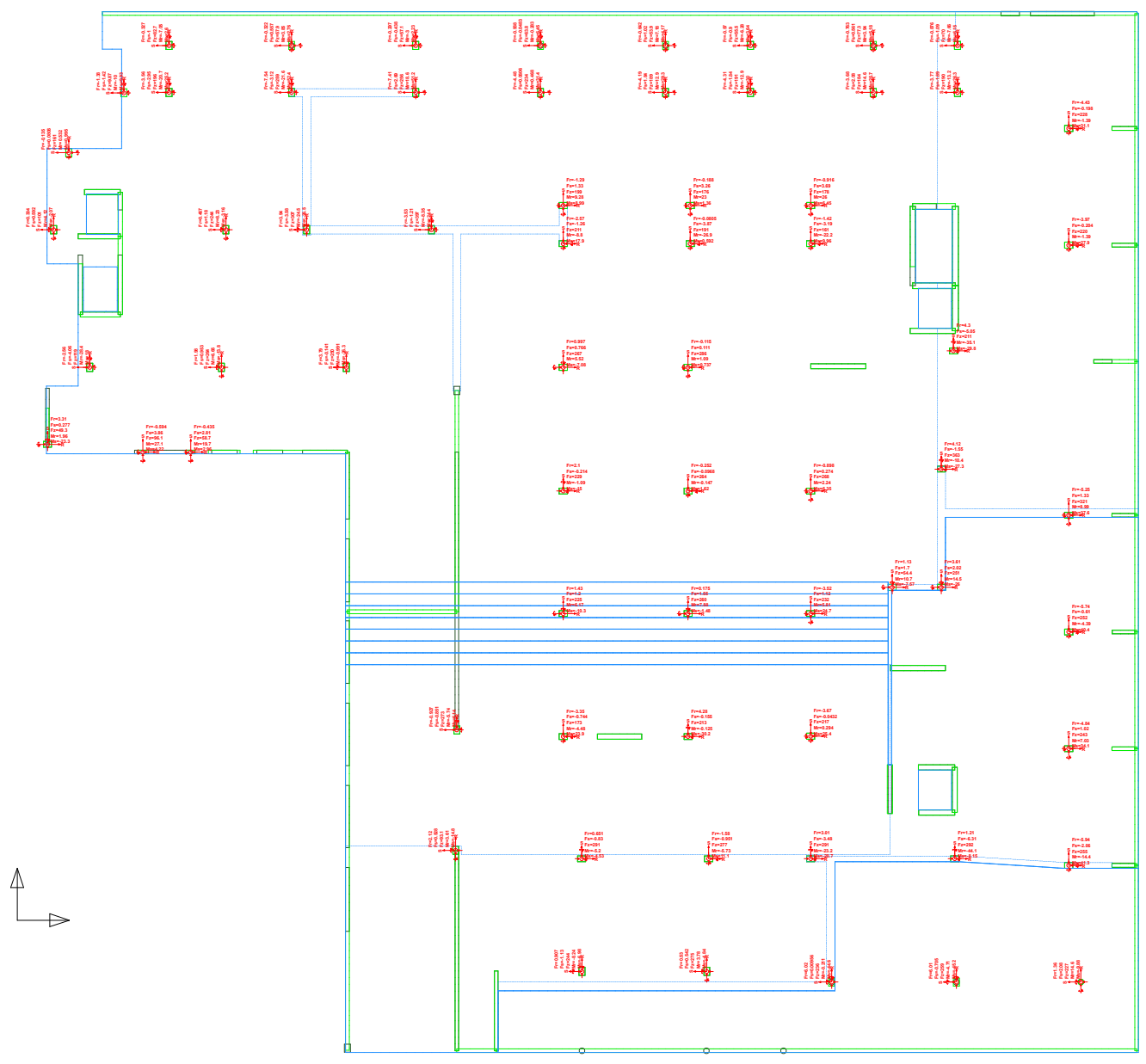
Factored LC: 1.2D + 1.6L + 0.5Lr: Max Reactions Plan

Factored LC: 1.2D + 1.6L + 0.5Lr: User Notes: User Dimensions:
Element: Max Elements Below: Max Elements Above: Wall Element Outline Only: Column Elements Below: Column Elements Above: Slab Elements: Slab Element Outline Only:
Scale: 1/4" = 1'-0"
Factored LC: 1.2D + 1.6L + 0.5Lr - Reaction Plot: (Columns Below)/P, F, M, N, Mx, My/(Max Fx Corner)



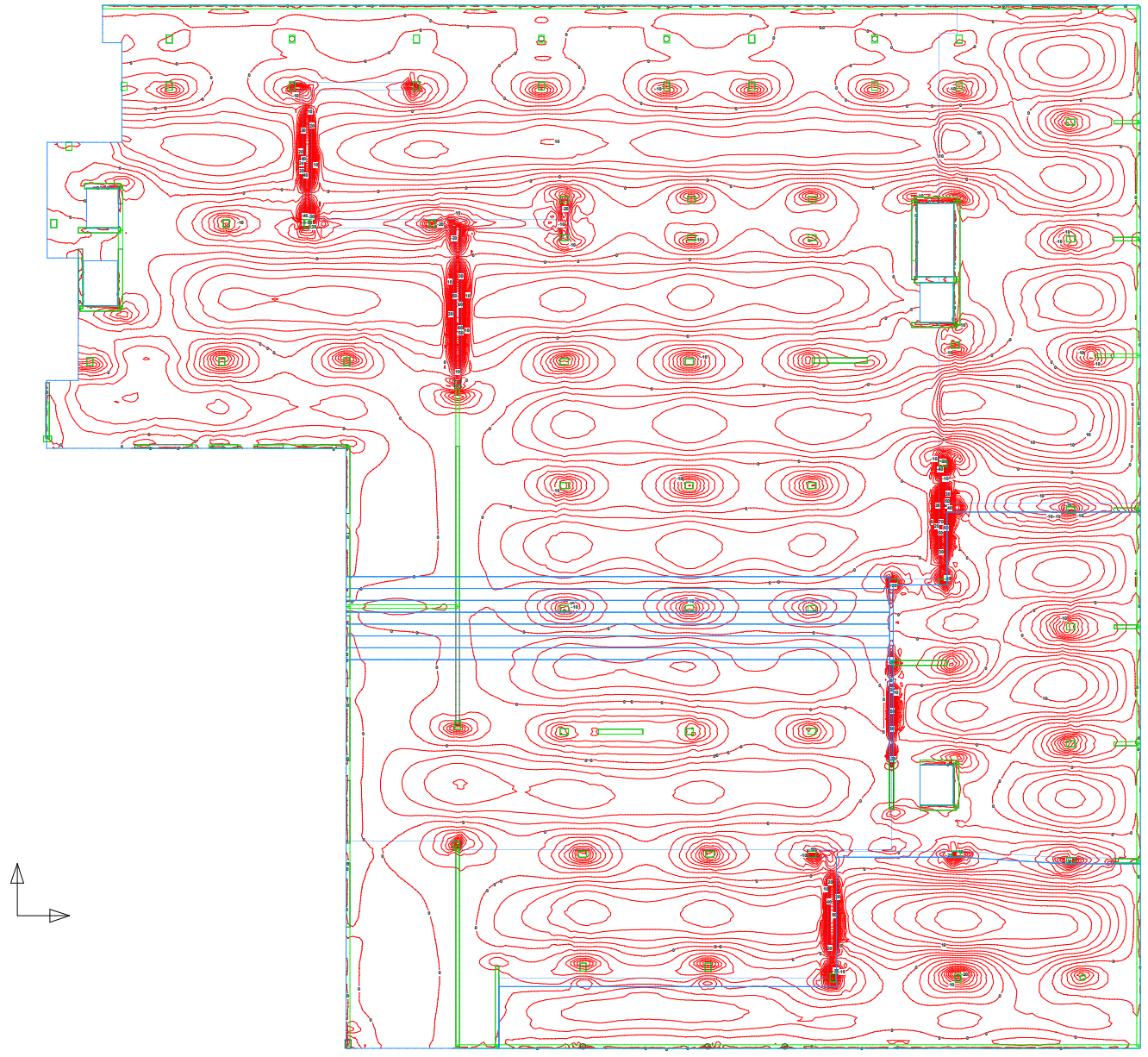
Factored LC: 1.2D + 1.6L + 0.5Lr: Min Reactions Plan

Factored LC: 1.2D + 1.6L + 0.5Lr: User Notes: User Dimensions:
Element: Min Elements Below; Max Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale: 1/4" = 1'-0"
Factored LC: 1.2D + 1.6L + 0.5Lr - Reaction Plot: (Column Below)/F1,F2,F3,M1,M2,M3/M4/M5/F4 Corner



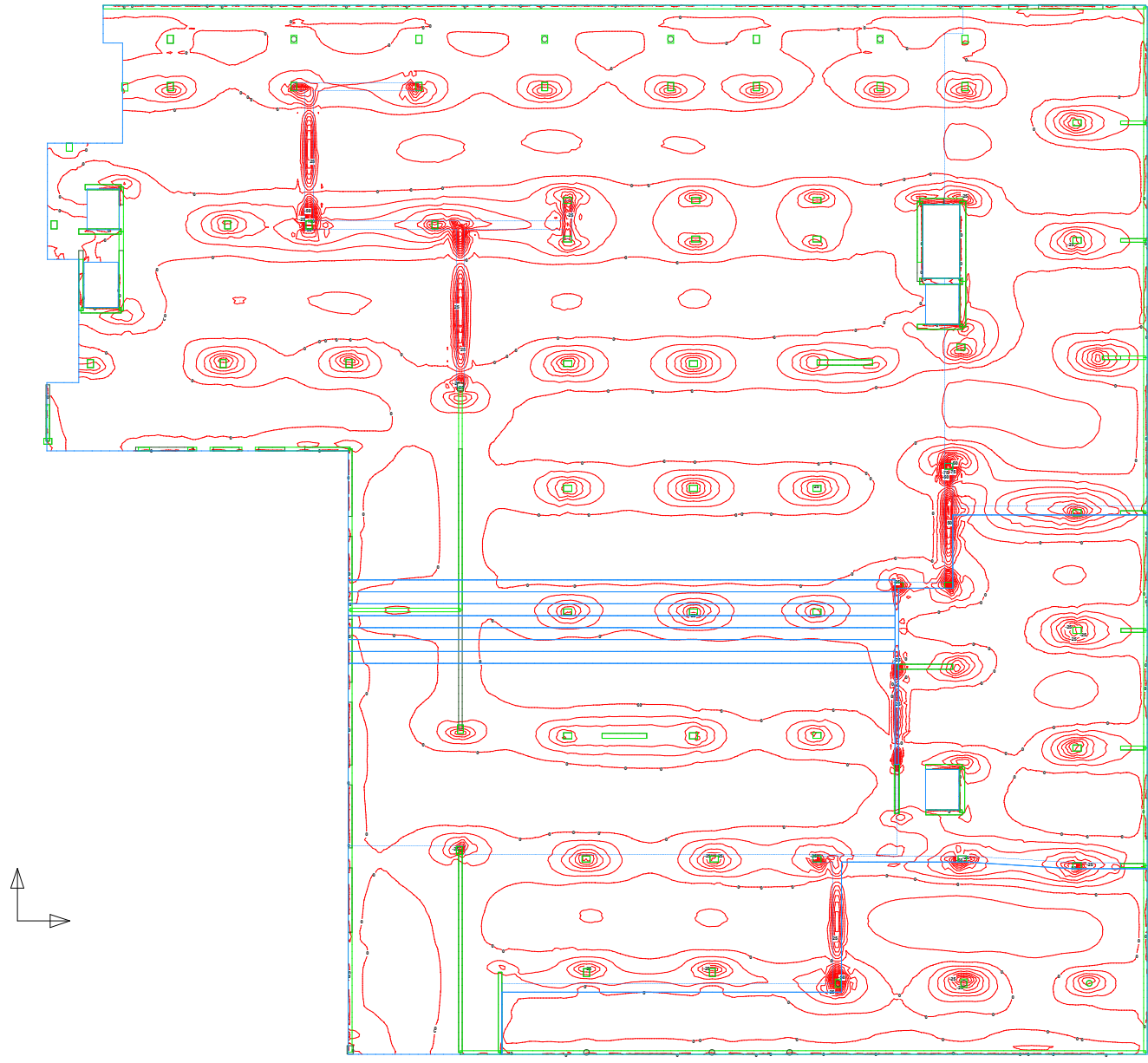
Factored LC: 1.2D + f1L + 1.6Lr: Max Mx Plan

Factored LC: 1.2D + f1L + 1.6Lr - Load Lines: User Define, User Dimension
Element: Max Elements Below: Max Elements Above: Wall Element Outline Only; Column Elements Below: Column Elements Above: Slab Element Outline Only
Scale = 1/400
Factored LC: 1.2D + f1L + 1.6Lr - Bending Moment Plan (Maximum Values) (X-Axis Direction)
Data Contour = 2 Kips
Min Value = -62.88 Kips @ (65,1,107.0) Max Value = 23.77 Kips @ (210,2,50.0)



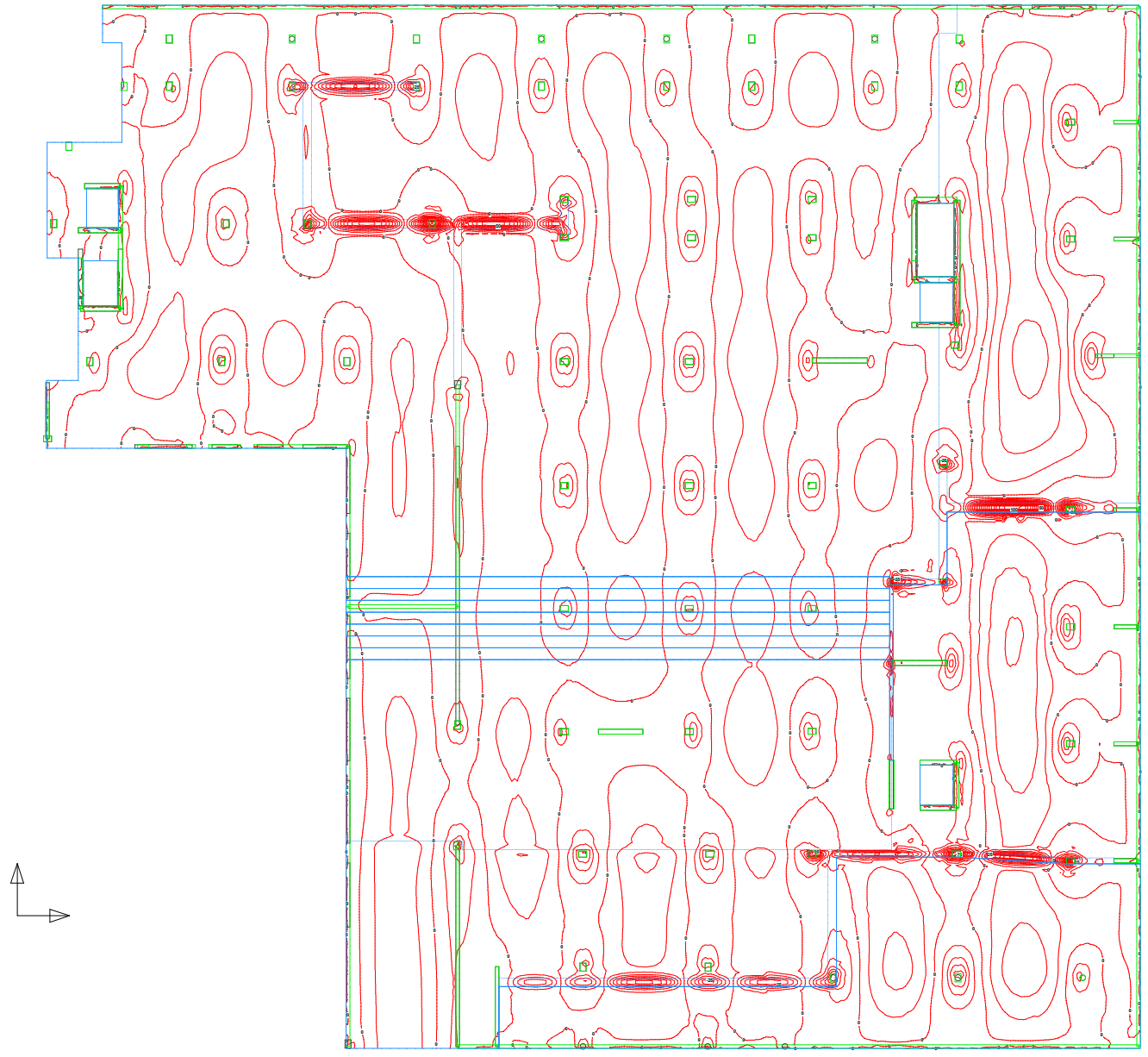
Factored LC: 1.2D + f1L + 1.6Lr: Min Mx Plan

Factored LC: 1.2D + f1L + 1.6Lr: User Define, User Dimension
Element: Min Elements Below, Min Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only
Scale = 1/400
Factored LC: 1.2D + f1L + 1.6Lr: Bending Moment Plot (Minimum Values) (X-Axis Direction)
Data Contour = 2.0 Kips
Min Value = -114.2 Kips @ (214.2, 102.8) Max Value = 47.31 Kips @ (99.79, 135.6)



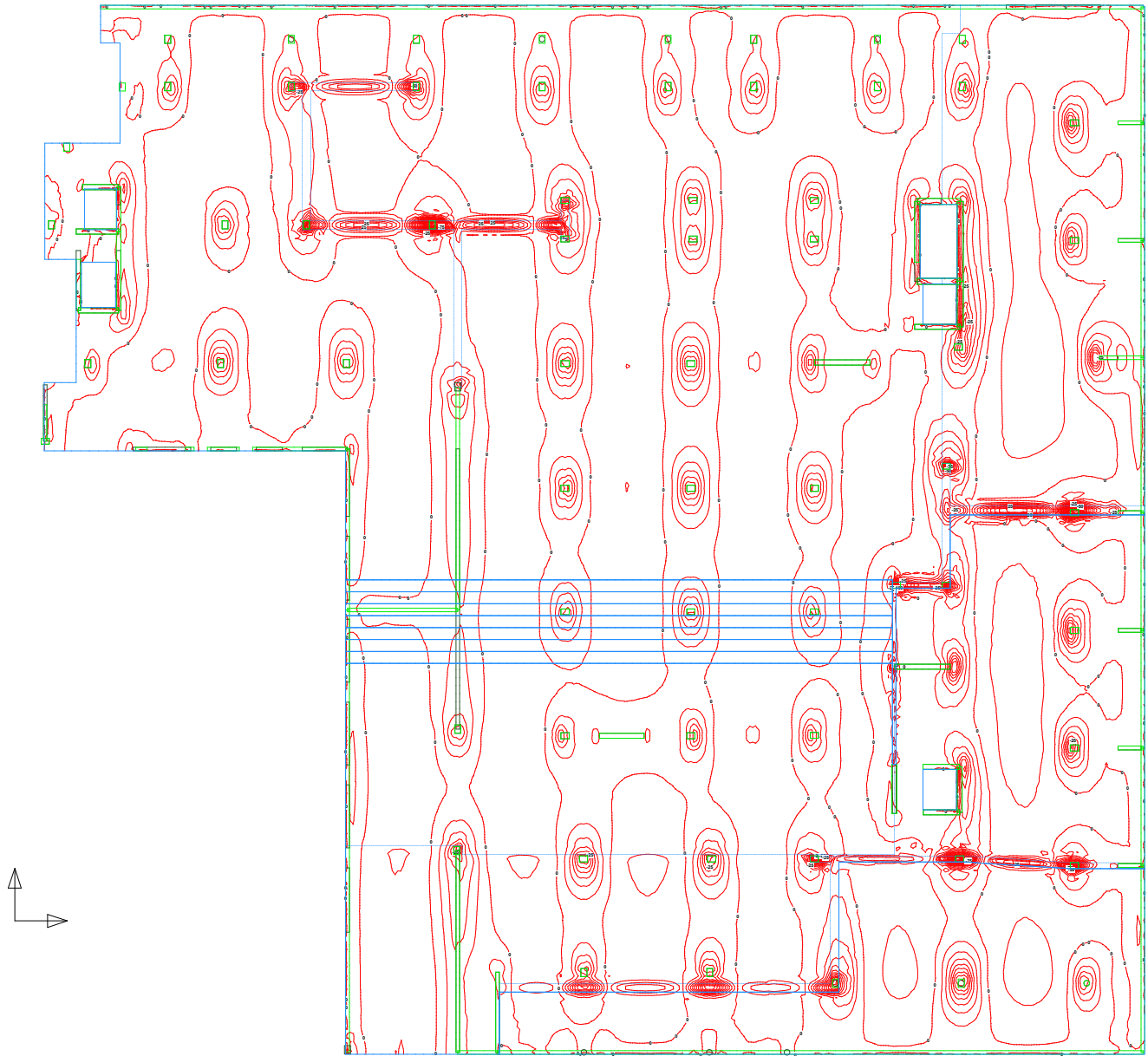
Factored LC: 1.2D + f1L + 1.6Lr: Max My Plan

Factored LC: 1.2D + f1L + 1.6Lr - Load Lines: User Define, User Dimension
Element: Max Elements Below, Max Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Element, Slab Element Outline Only
Scale = 1/400
Factored LC: 1.2D + f1L + 1.6Lr - Bending Moment Plot (Maximum Values) (Y-Axis Direction)
Data Contour = 2.0 Kips
Min Value = -12.88 Kips @ (215.3, 12.96) Max Value = 155.1 Kips @ (225.2, 32.45)



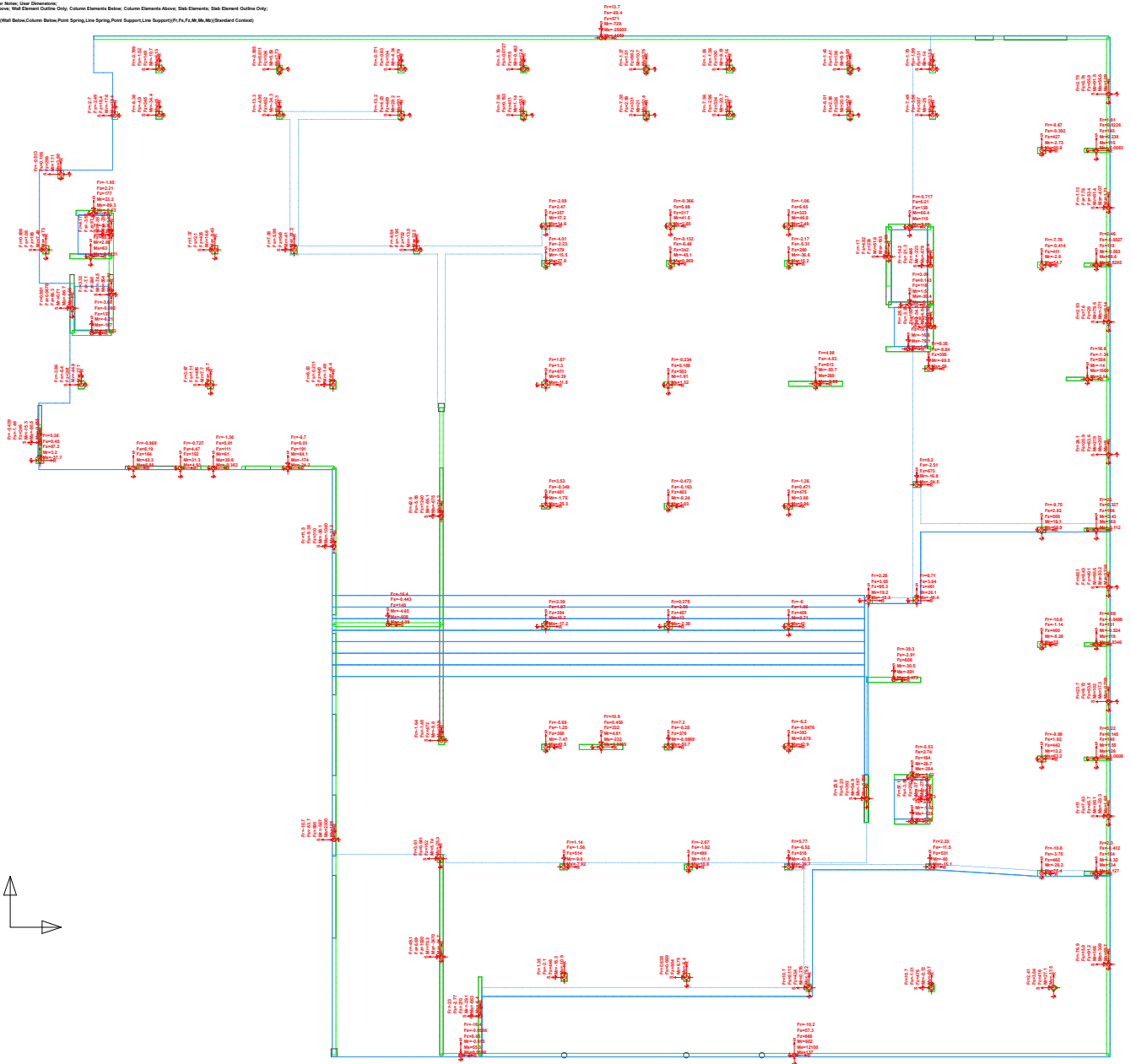
Factored LC: 1.2D + f1L + 1.6Lr: Min My Plan

Factored LC: 1.2D + f1L + 1.6Lr: User Lines, User Nodes, User Dimensions.
Element: Min Elements Below; Max Elements Above; Wall Elements Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale: 1:100
Factored LC: 1.2D + f1L + 1.6Lr: Bending Moment Plot (Minimum Values) (Y-Axis Direction)
Data Contour: 4 Kips
Min Value: -10 Kips @ (213,1,13.88) Max Value: 58.28 Kips @ (225,232,46)



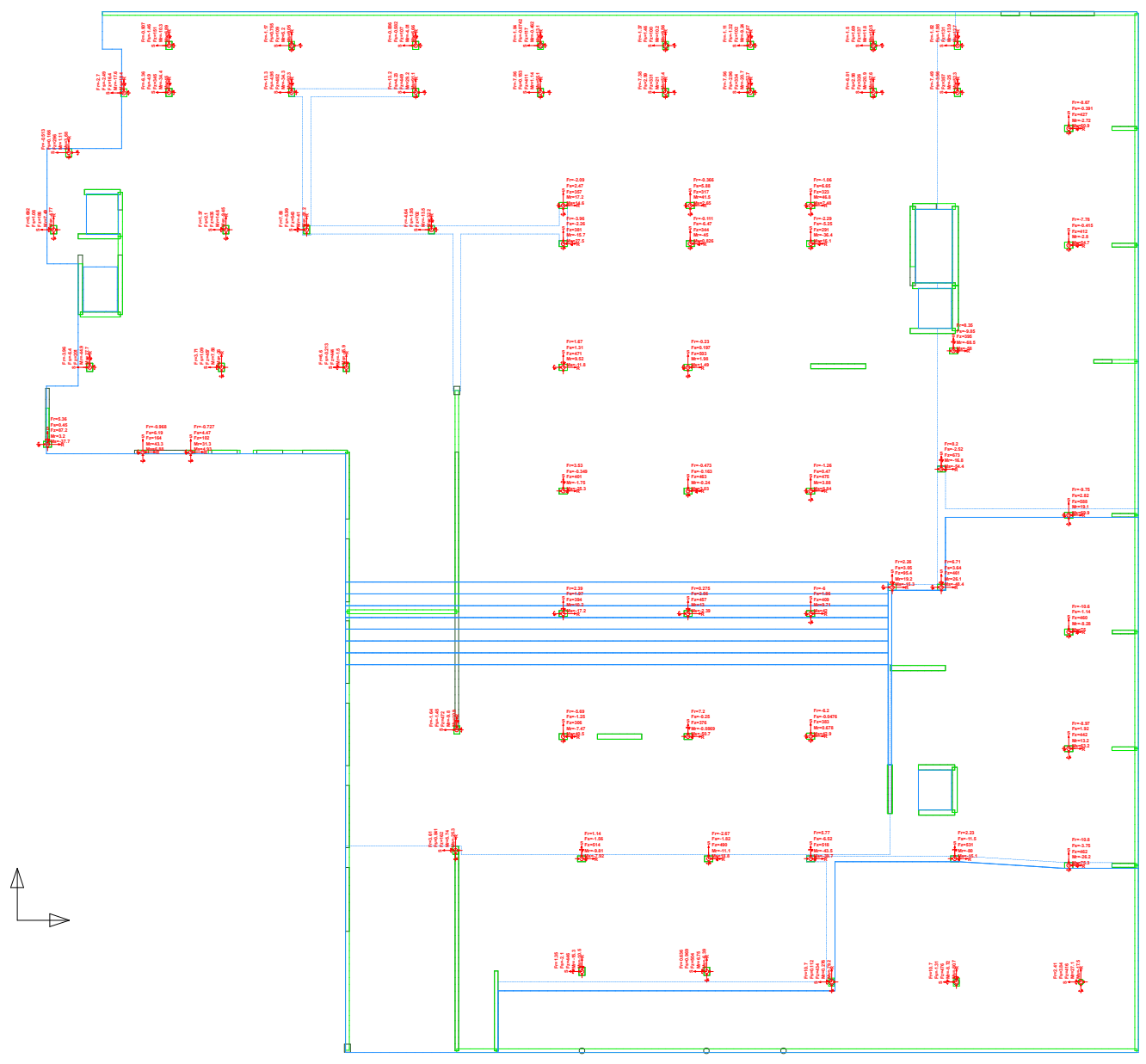
Factored LC: 1.2D + f1L + 1.6Lr: Std Reactions Plan

Factored LC: 1.2D + f1L + 1.6Lr: User Name: User Dimension:
 Element: Std Elements: Beam, Std Elements: Column, Wall, Slab, Outline: Only, Column Elements: Beam, Std Elements: Slab, Slab Element: Outline Only
 Scale: 1:100
 Factored LC: 1.2D + f1L + 1.6Lr: Reaction Plan: (000 Below Column Below Point Spring, Line Spring, Point Support, Line Support) (F1, F2, M1, M2) (Standard Content)



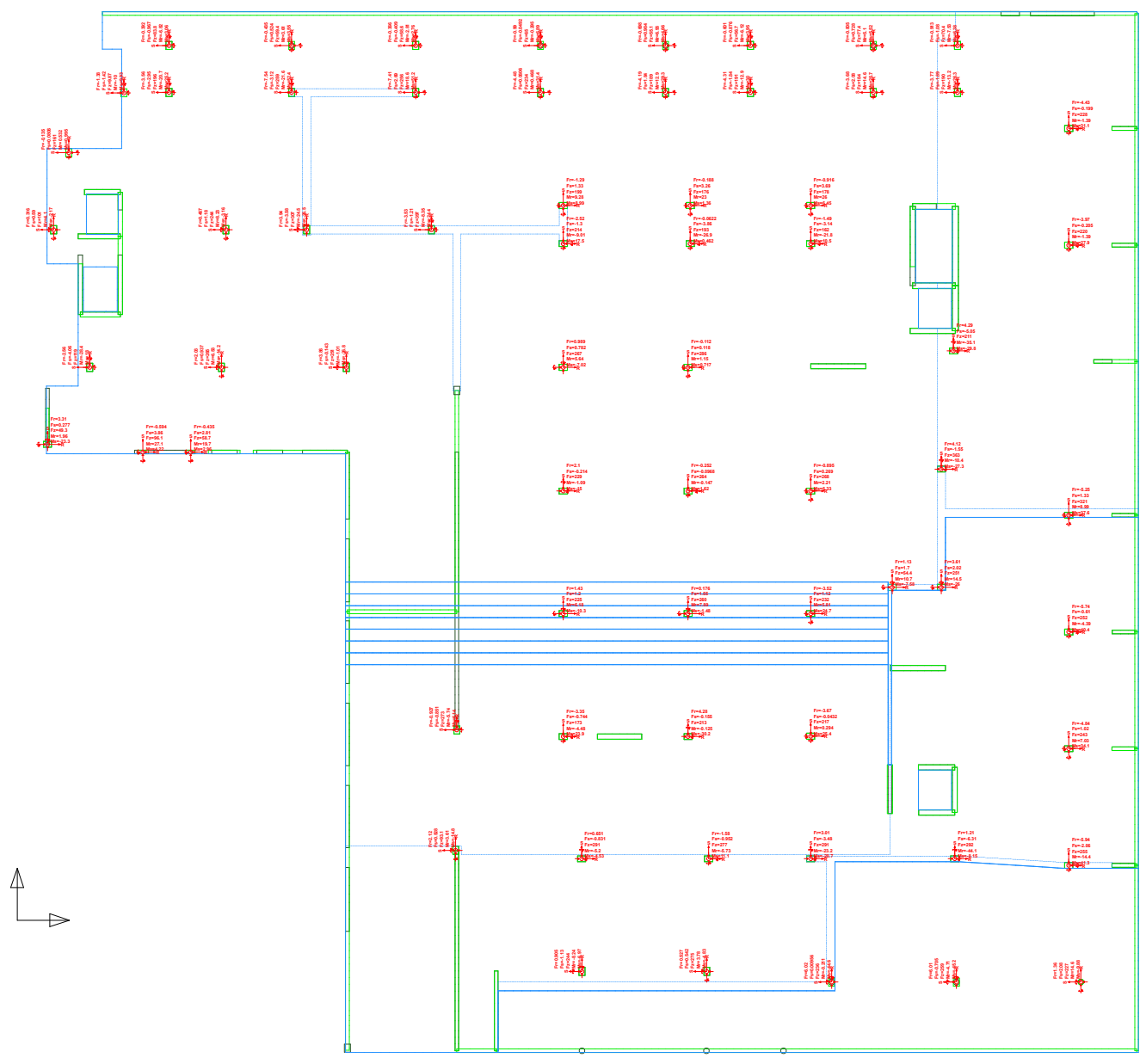
Factored LC: 1.2D + f1L + 1.6Lr: Max Reactions Plan

Factored LC: 1.2D + f1L + 1.6Lr: User Name: User Dimension:
Element: Max Elements Below: Max Elements Above: Wall Element Outline Only: Column Elements Below: Column Elements Above: Slab Elements: Slab Element Outline Only:
Scale: 1/400
Factored LC: 1.2D + f1L + 1.6Lr - Reaction Plan (Column Below) (F, P, L, M, Mo, No) (Max Fx Count)



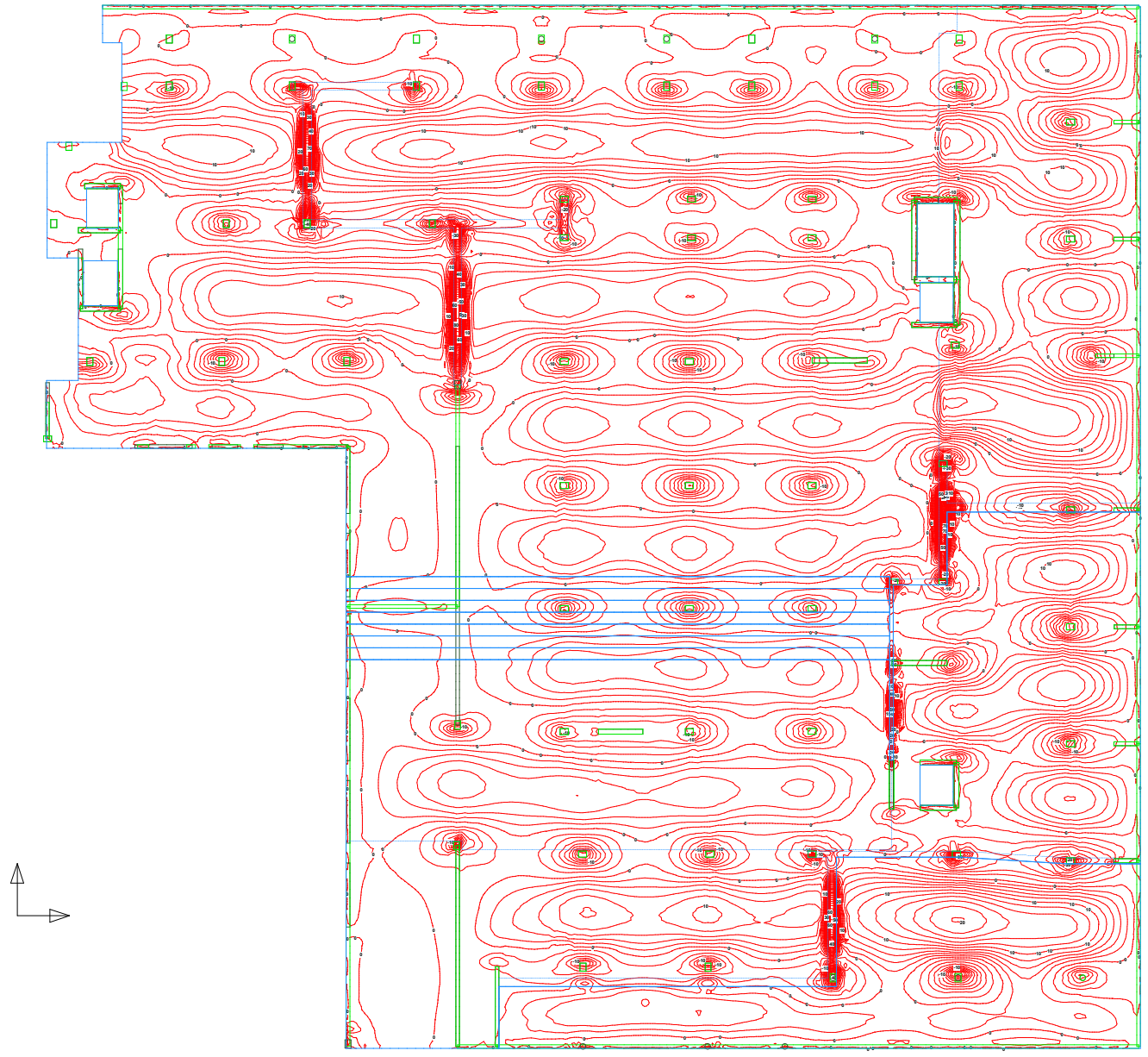
Factored LC: 1.2D + f1L + 1.6Lr: Min Reactions Plan

Factored LC: 1.2D + f1L + 1.6Lr: User Notes: User Drawings:
Element: Min Elements Below, Max Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only;
Scale: 1/4" = 1'-0";
Factored LC: 1.2D + f1L + 1.6Lr: Reaction Plan (Column Below/F, Fx/Fy, Mx/Mz, My/Mz) Min Fx Corner



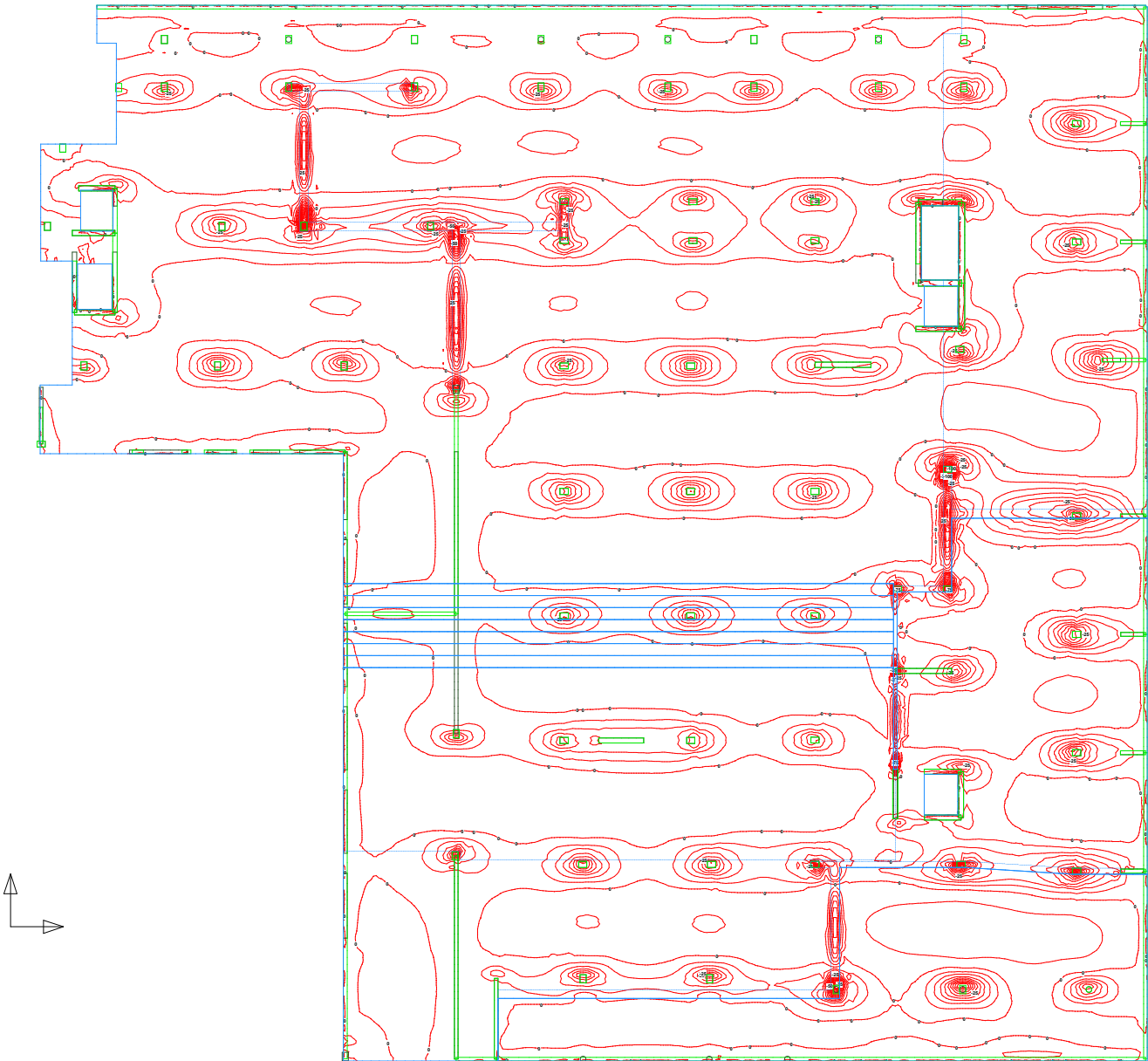
Factored LC: 1.2D + 1.6L + 0.5S: Max Mx Plan

Factored LC: 1.2D + 1.6L + 0.5S - User Links, User Nodes, User Dimensions
Element: Max Elements Below: Wall Elements Above: Wall Elements Outline Only; Column Elements Below: Column Elements Above: Slab Elements, Slab Element Outline Only;
Scale = 1/400
Factored LC: 1.2D + 1.6L + 0.5S - Bending Moment Plot (Maximum Values) (X-Axis Direction)
Data Contour = 2.0 Kips
Max Value = 42.08 Kips @ (65,7,107.0) Min Value = 94.66 Kips @ (210,2,50.0)



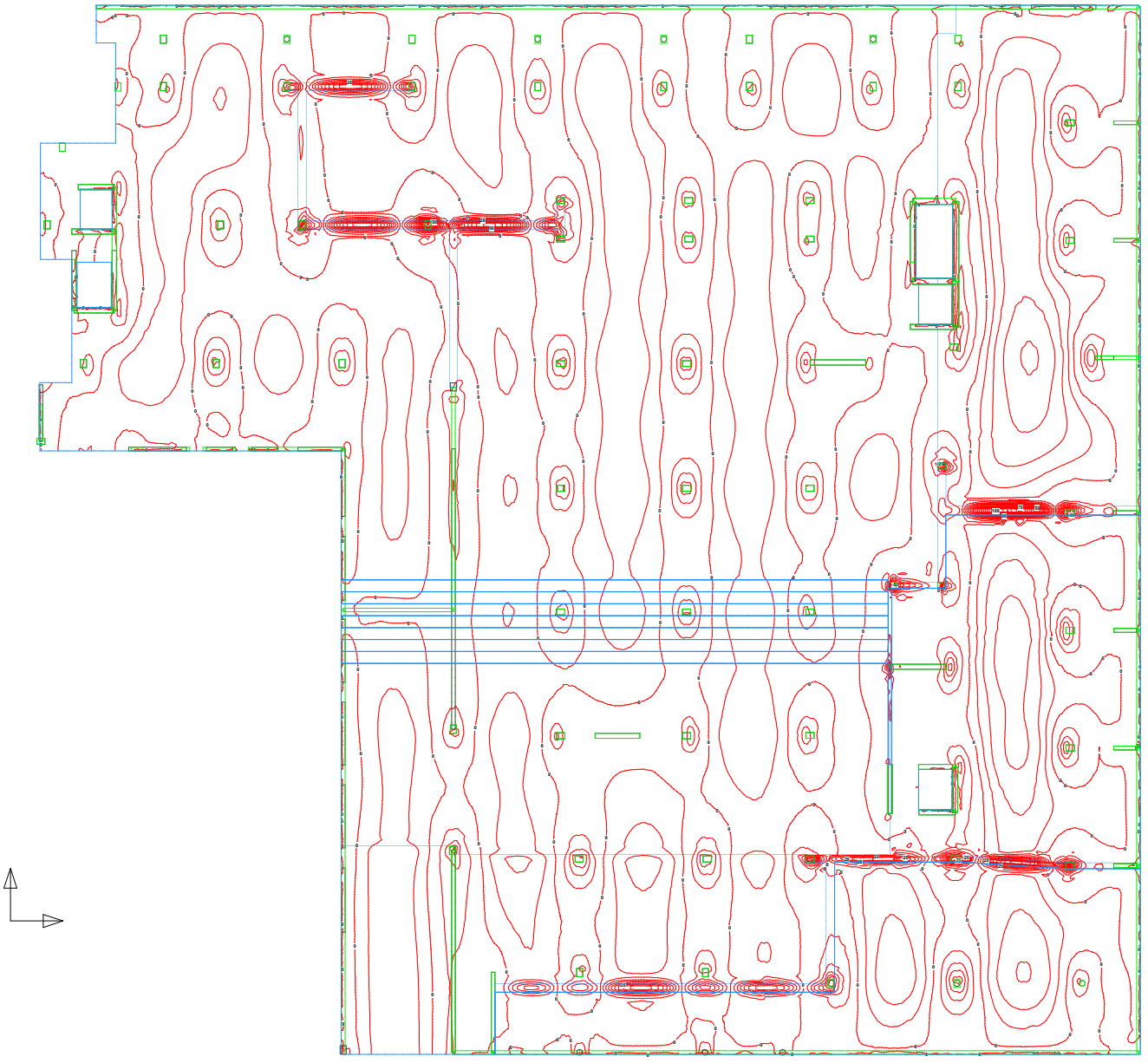
Factored LC: 1.2D + 1.6L + 0.5S: Min Mx Plan

Factored LC: 1.2D + 1.6L + 0.5S - User Links, User Nodes, User Dimensions
Element: Min Elements Below; Max Elements Above; Wall Element Outline Only; Column Elements Below; Core Elements Above; Slab Elements; Slab Element Outline Only
Scale = 1/400
Factored LC: 1.2D + 1.6L + 0.5S - Bending Moment Plot (Minimum Values) (X-Axis Direction)
Data Contour = 2 Edge
Min Value = -102.7 Edge @ (216.2,162.6) Max Value = 45.69 Edge @ (216.2,162.6)



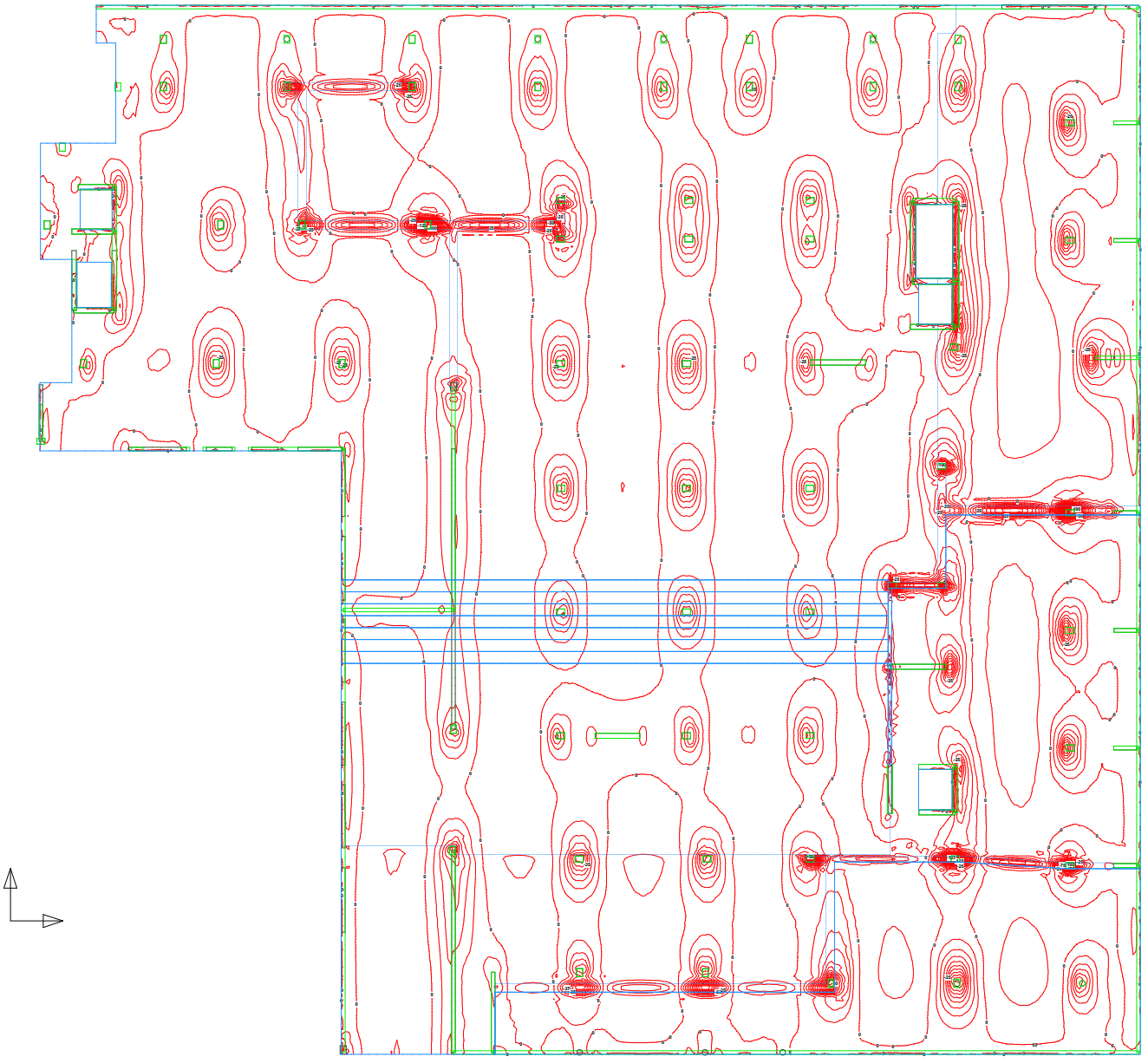
Factored LC: 1.2D + 1.6L + 0.5S: Max My Plan

Factored LC: 1.2D + 1.6L + 0.5S. User Lines, User Notes, User Dimensions.
Element: Max Element Value: Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale: 1/400
Factored LC: 1.2D + 1.6L + 0.5S - Bending Moment Plot (Maximum Values) (Y-Axis Direction)
Data Contour = 2.0kips
Min Value = -12.27 kips @ (215.3, 12.96) Max Value = 128.8 kips @ (225.2, 22.45)



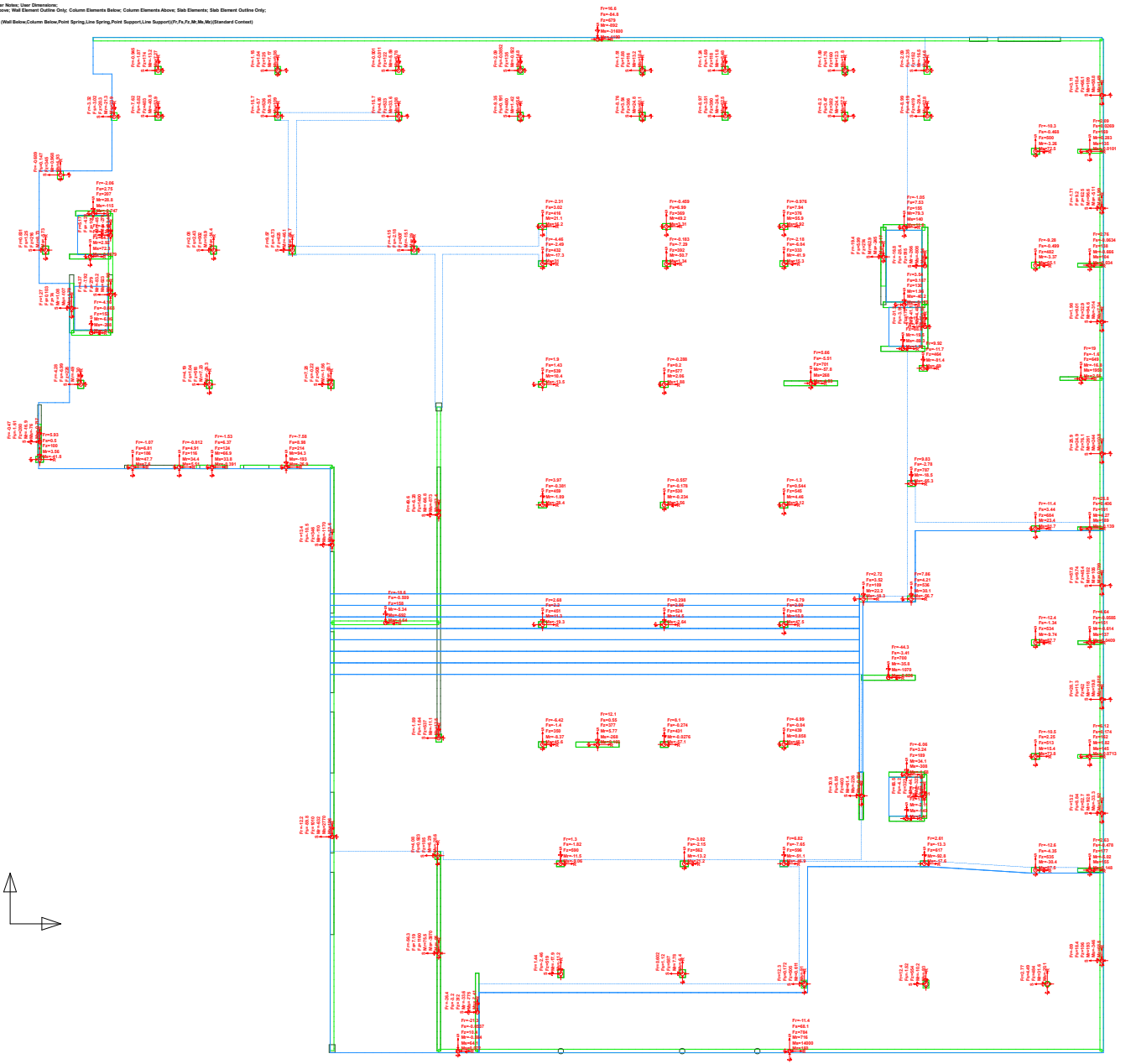
Factored LC: 1.2D + 1.6L + 0.5S: Min My Plan

Factored LC: 1.2D + 1.6L + 0.5S - User Links, User Nodes, User Dimensions
Element: Min Elements Below; Max Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only
Scale = 1/400
Factored LC: 1.2D + 1.6L + 0.5S - Bending Moment Plot (Minimum Values) (Y-Axis Direction)
Data Contour = 7 Edge
Min Value = -102.7 Edge @ (215.3, 12.96) Max Value = 12.26 Edge @ (225.2, 22.45)



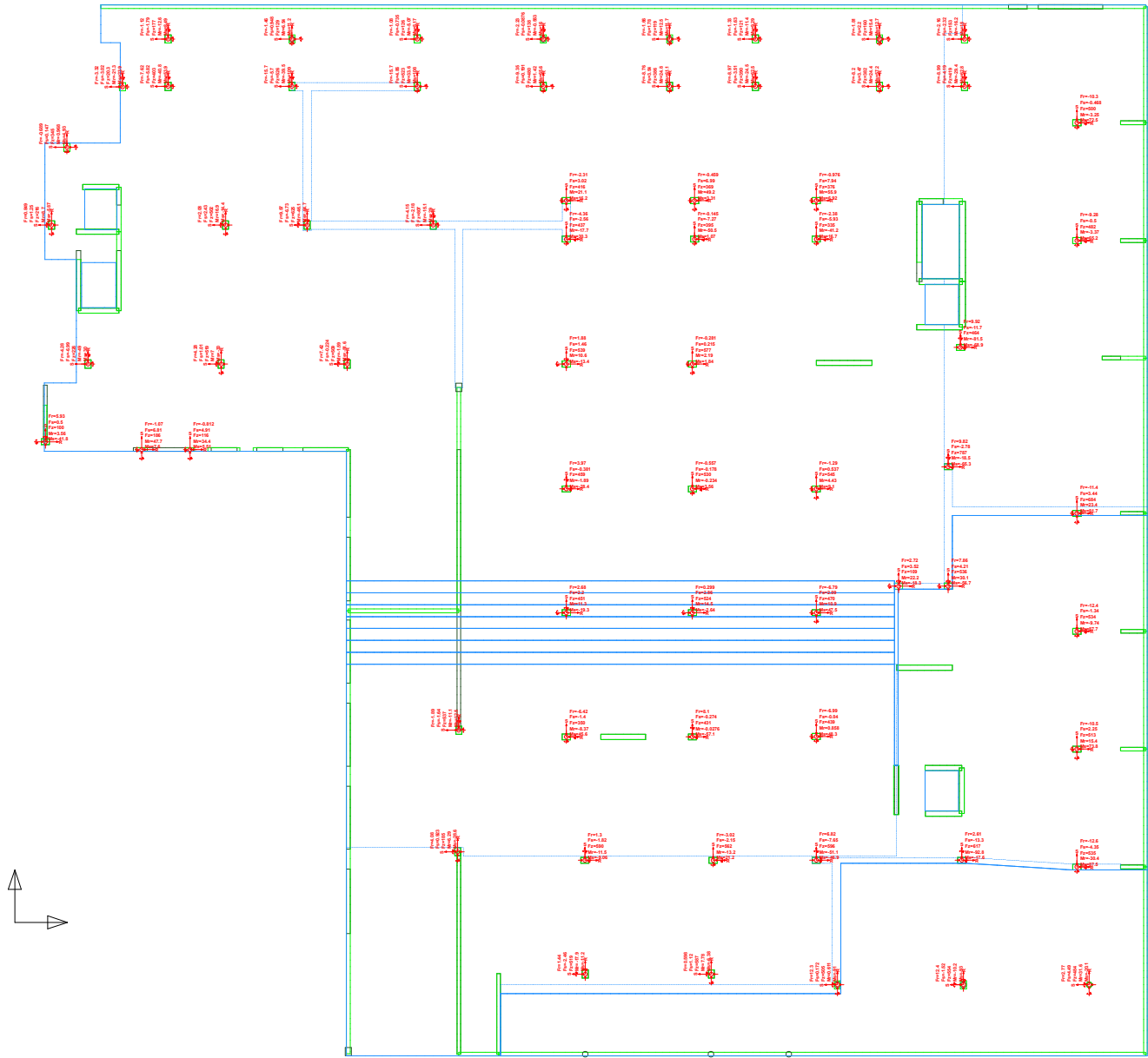
Factored LC: 1.2D + 1.6L + 0.5S: Std Reactions Plan

Factored LC: 1.2D + 1.6L + 0.5S: User Links, User Nodes, User Dimensions
Element: Wall Elements Below; Std Elements Above; Wall Element Outline Only; Column Elements Below; Std Elements Above; Std Element Outline Only;
Scale = 1/400
Factored LC: 1.2D + 1.6L + 0.5S: Reaction Plan (Std Below/Column Below/Point Spring/Line Spring/Point Support/Line Support/CF,FL,FR,MR,ML/Standard Connect)



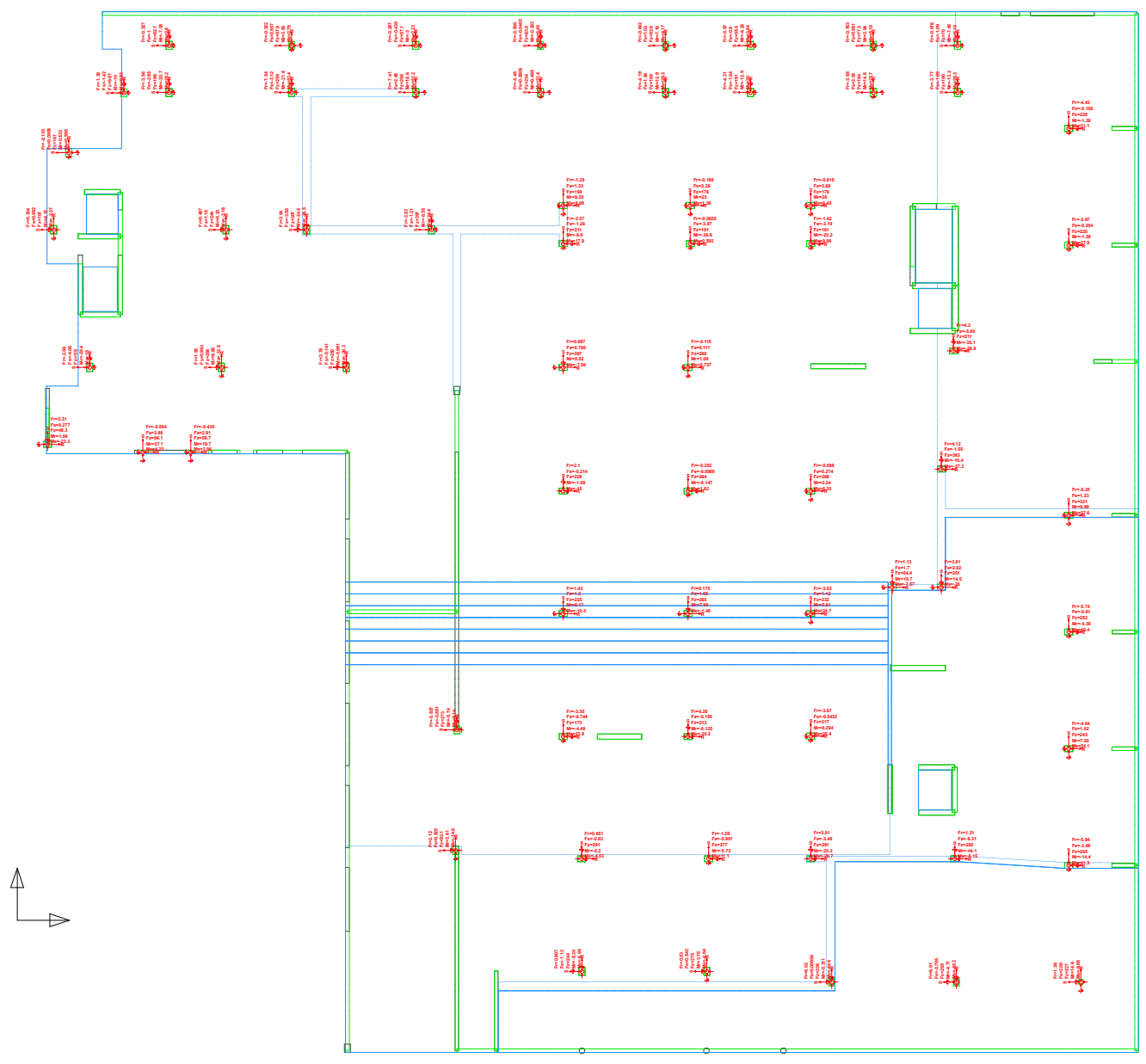
Factored LC: 1.2D + 1.6L + 0.5S: Max Reactions Plan

Factored LC: 1.2D + 1.6L + 0.5S - User Links, User Notes, User Dimensions
Element: Wall Elements Below, Wall Elements Above, Wall Elements Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Elements Outline Only
Scale = 1/400
Factored LC: 1.2D + 1.6L + 0.5S - Reaction Plot (Column Behavior) (F, P, M, Max, Min) (Max Fx Count)



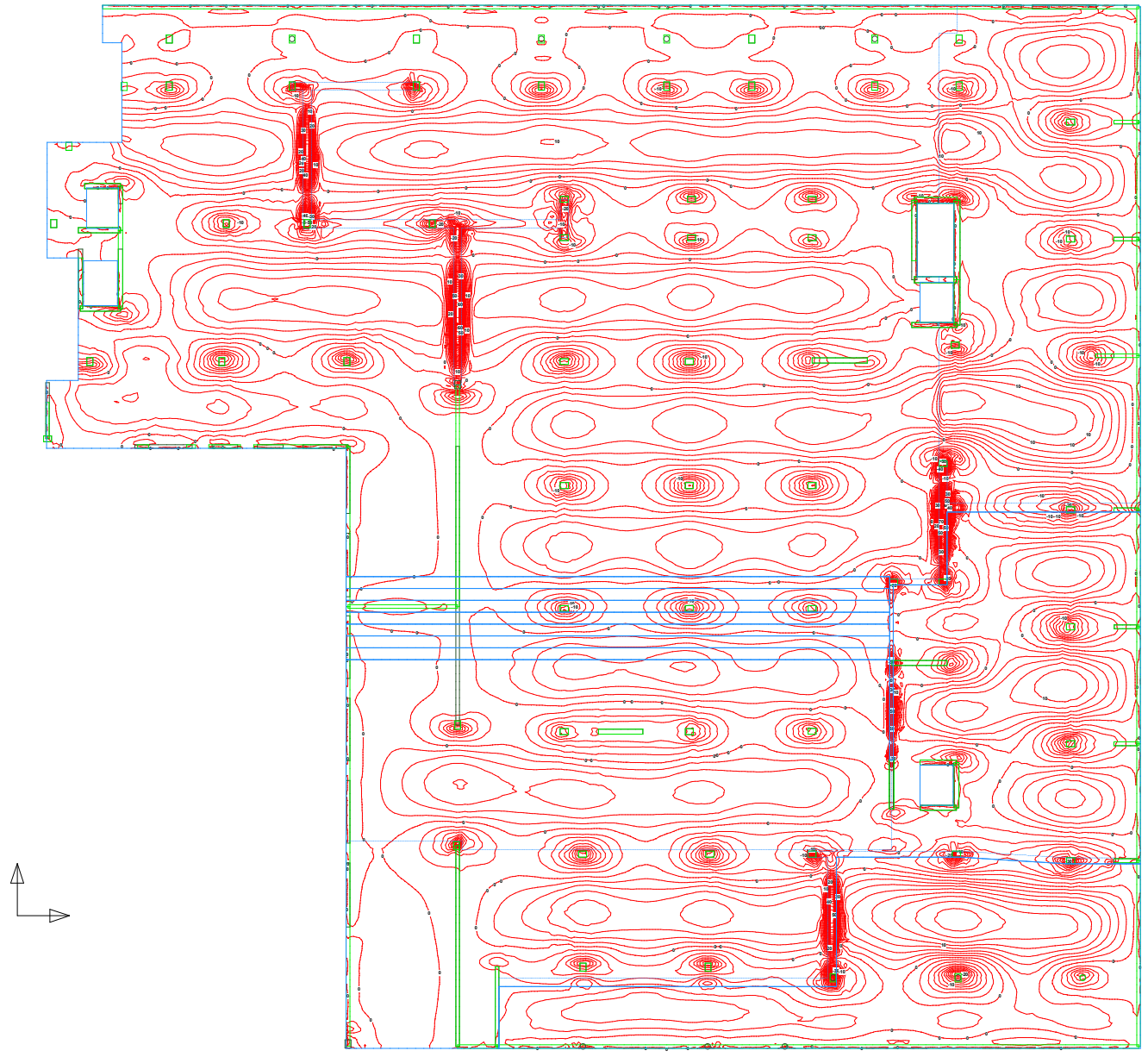
Factored LC: 1.2D + 1.6L + 0.5S: Min Reactions Plan

Factored LC: 1.2D + 1.6L + 0.5S. User Links, User Nodes, User Dimensions.
Element: Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only.
Scale = 1/400
Factored LC: 1.2D + 1.6L + 0.5S - Reaction Plot (Column Behavior) (F1,F2,F3,M1,M2,M3)(Min Fx Corner)



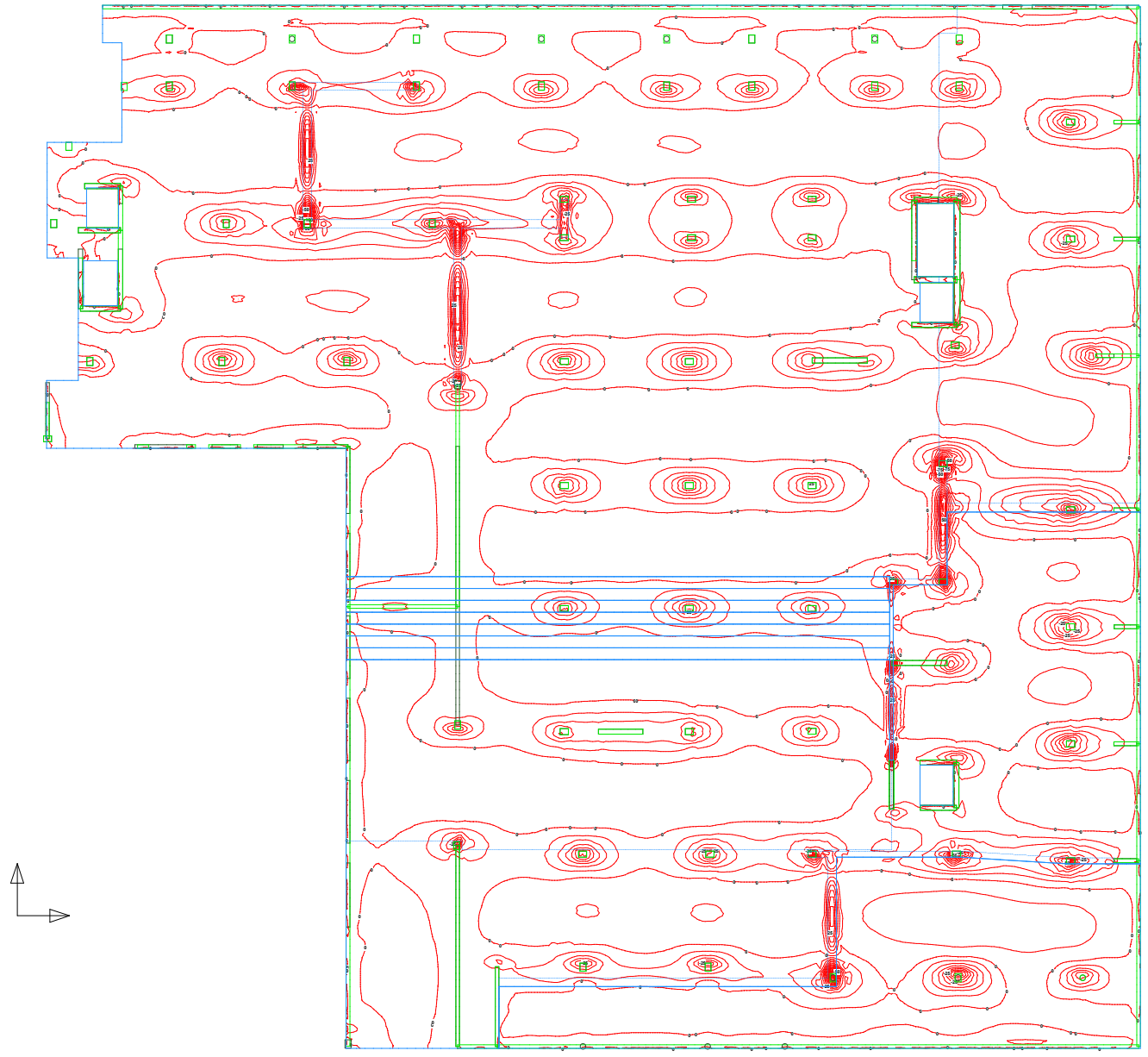
Factored LC: 1.2D + f1L + 1.6S: Max Mx Plan

Factored LC: 1.2D + f1L + 1.6S: Max Mx Plan
Element: Max Elements Below: Max Elements Above: Wall Elements Outline Only; Column Elements Below: Column Elements Above: Slab Elements: Slab Element Outline Only;
Scale: 1:100
Factored LC: 1.2D + f1L + 1.6S: Bending Moment Plus (Maximum Values) (X-Axis Direction)
Max Contour = 2.0 Kip
Min Value = -0.188 Kip @ (05,1,107,0) Max Value = 0.177 Kip @ (210,2,0,0)



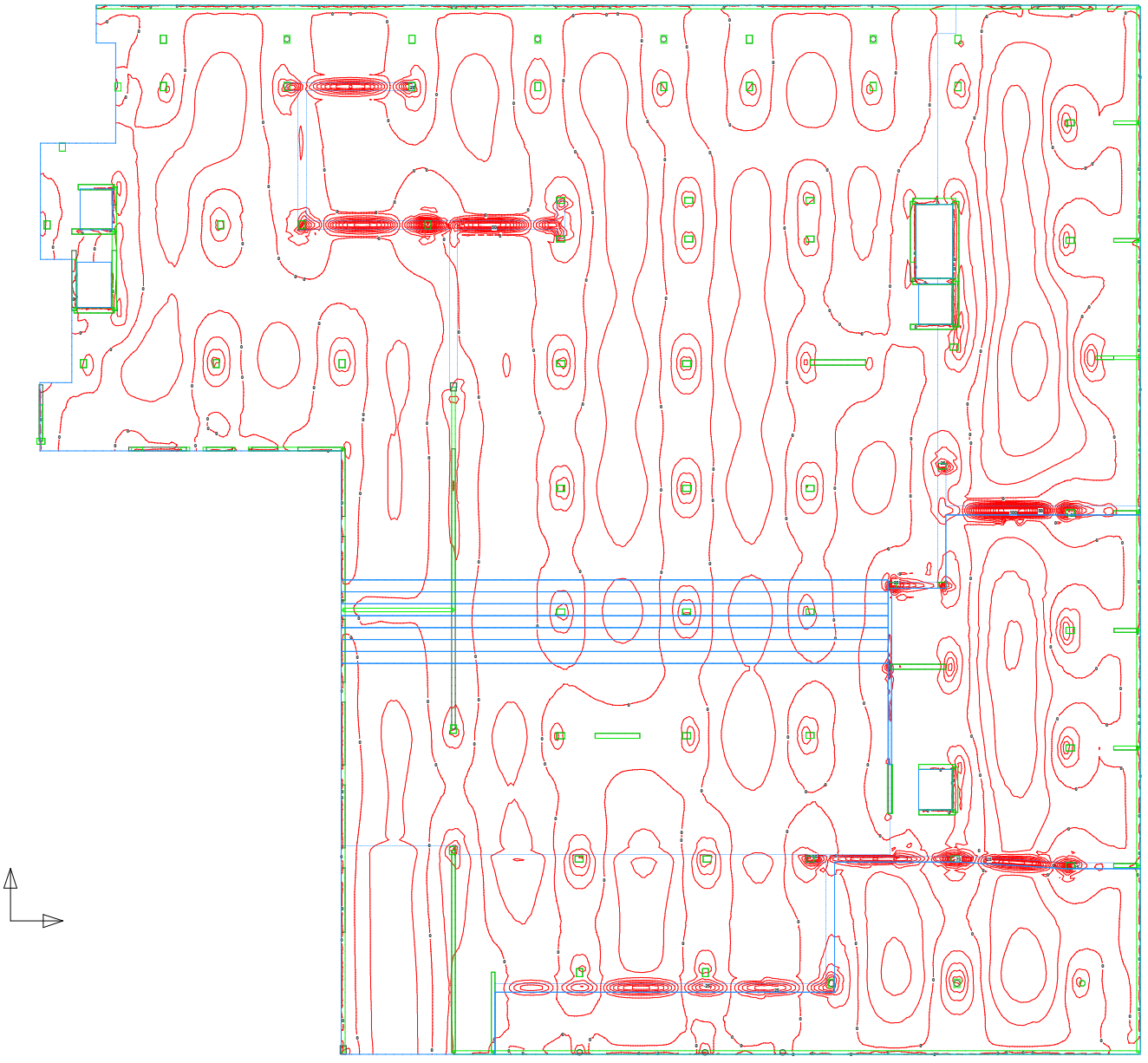
Factored LC: 1.2D + f1L + 1.6S: Min Mx Plan

Factored LC: 1.2D + f1L + 1.6S: Min Mx Plan
Element: Min Elements Below: Min Elements Above: Wall Element Outline Only; Column Elements Below: Column Elements Above: Slab Elements: Slab Element Outline Only;
Scale = 1/400
Factored LC: 1.2D + f1L + 1.6S: Bending Moment Plus (Minimum Values) (X-Axis Direction)
Data Contour = 2.0 Kips
Min Value = -114.2 Kips @ (214.2, 112.8) Max Value = 47.31 Kips @ (89.78, 135.6)



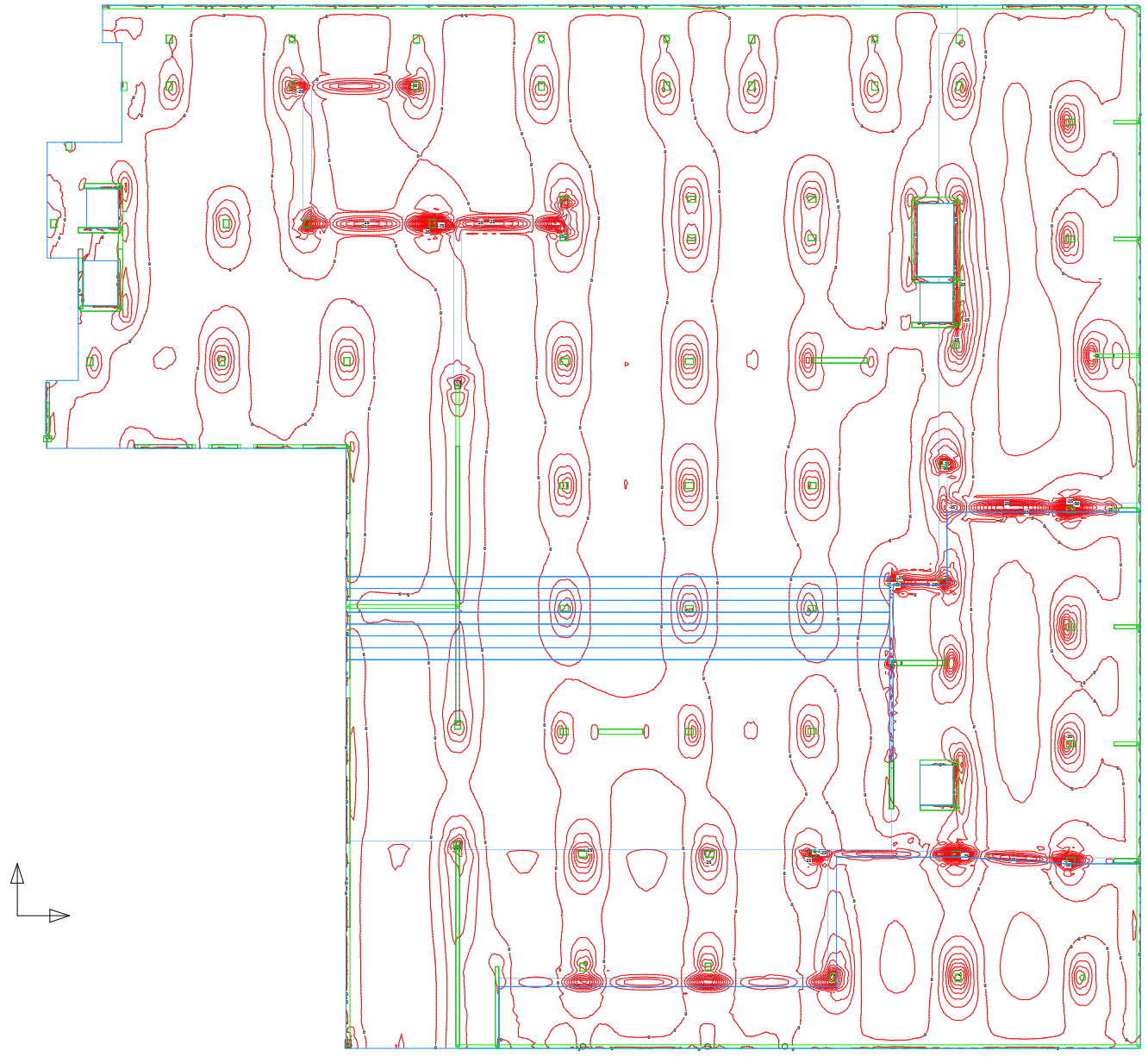
Factored LC: 1.2D + f1L + 1.6S: Max My Plan

Factored LC: 1.2D + f1L + 1.6S: Max My Plan
Element: Max Elements Below: Max Elements Above: Wall Element Outline Only; Column Elements Below: Column Elements Above: Slab Elements: Slab Element Outline Only;
Scale: 1/400
Factored LC: 1.2D + f1L + 1.6S: Bending Moment Plus (Maximum Values) (Y-Axis Direction)
Data Contour = 5 Kips
Min Value = -12.88 Kips @ (215.3, 12.96) Max Value = 155.1 Kips @ (225.2, 32.45)



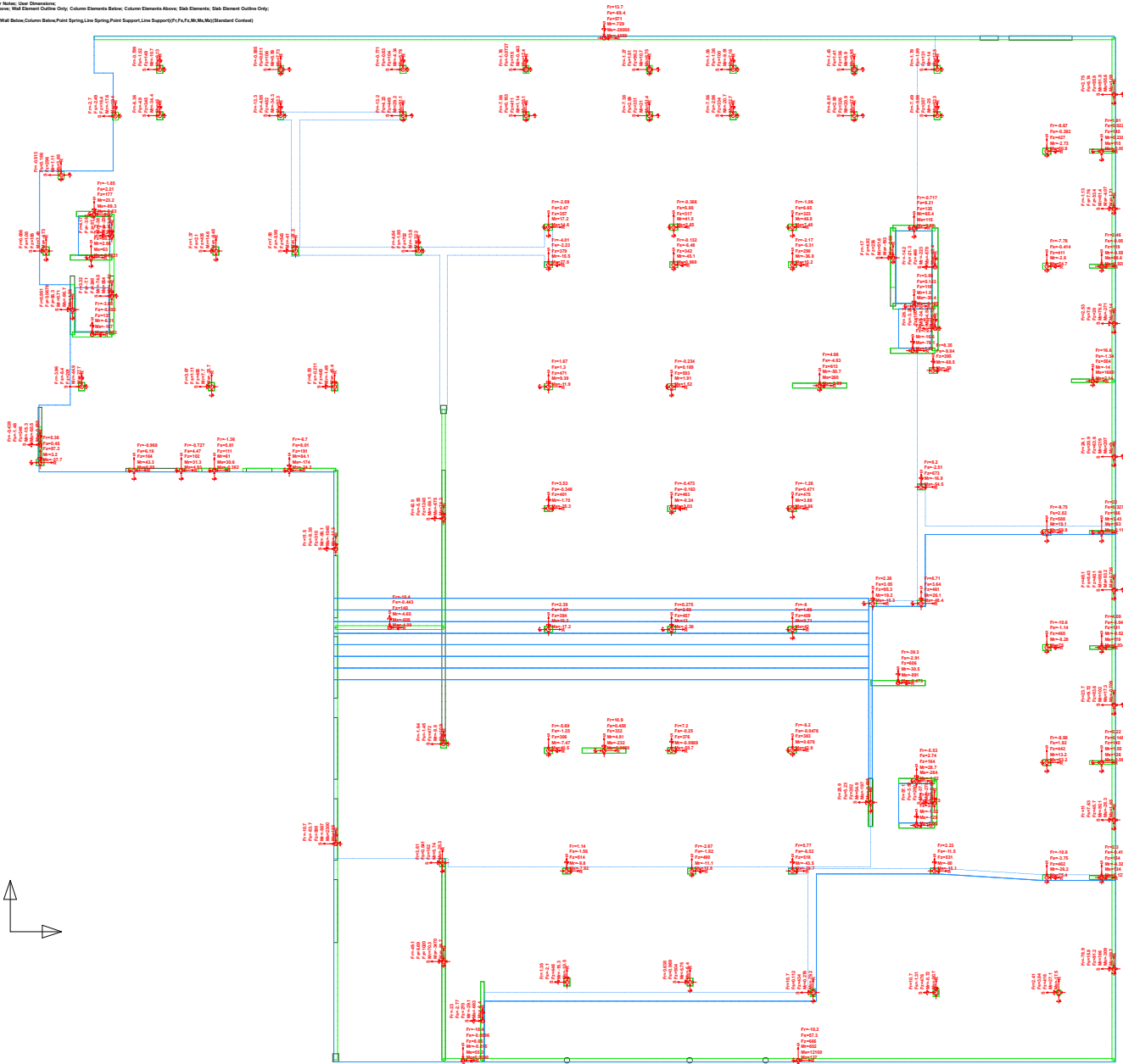
Factored LC: 1.2D + f1L + 1.6S: Min My Plan

Factored LC: 1.2D + f1L + 1.6S: Min My Plan
Element: Min Elements Below: Min Elements Above: Wall Elements Outline Only; Column Elements Below: Column Elements Above: Slab Elements: Slab Element Outline Only;
Scale: 1/400
Factored LC: 1.2D + f1L + 1.6S: Bending Moment Plus (Minimum Values) (Y-Axis Direction)
Max Contour = 8 Kips
Min Value = -10 Kips @ (213.1,13.8) Min Value = 8.28 Kips @ (225.2,32.4)



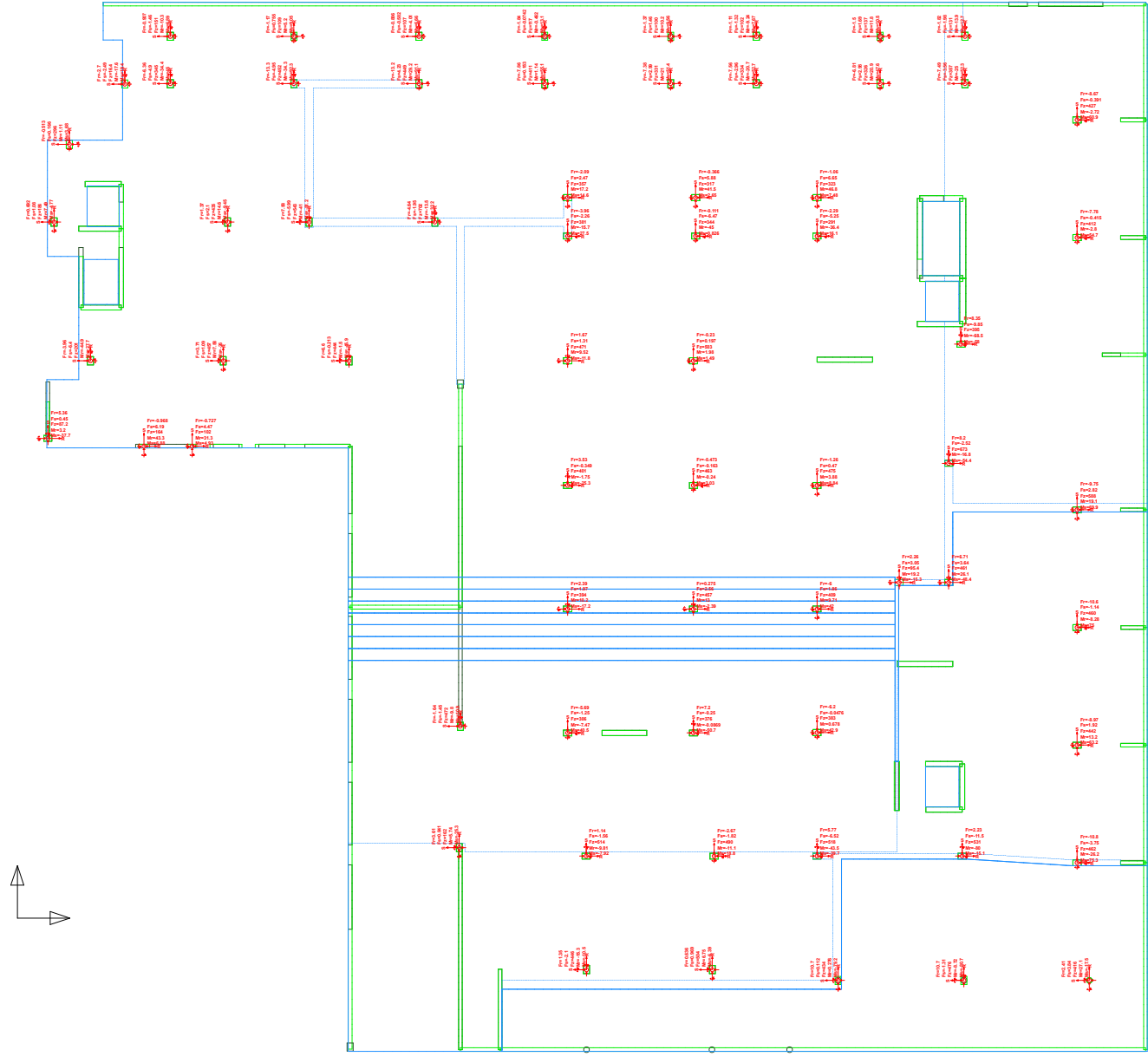
Factored LC: 1.2D + f1L + 1.6S: Std Reactions Plan

Factored LC: 1.2D + f1L + 1.6S: User Lines, User Notes, User Dimensions
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Wall Element Outline Only; Scale: 1/4" = 1'-0"; Reaction Plan; (Wall Below, Column Below, Point Spring, Line Spring, Point Support, Line Support) (P, F, A, M, N, S, R) (Standard Content)



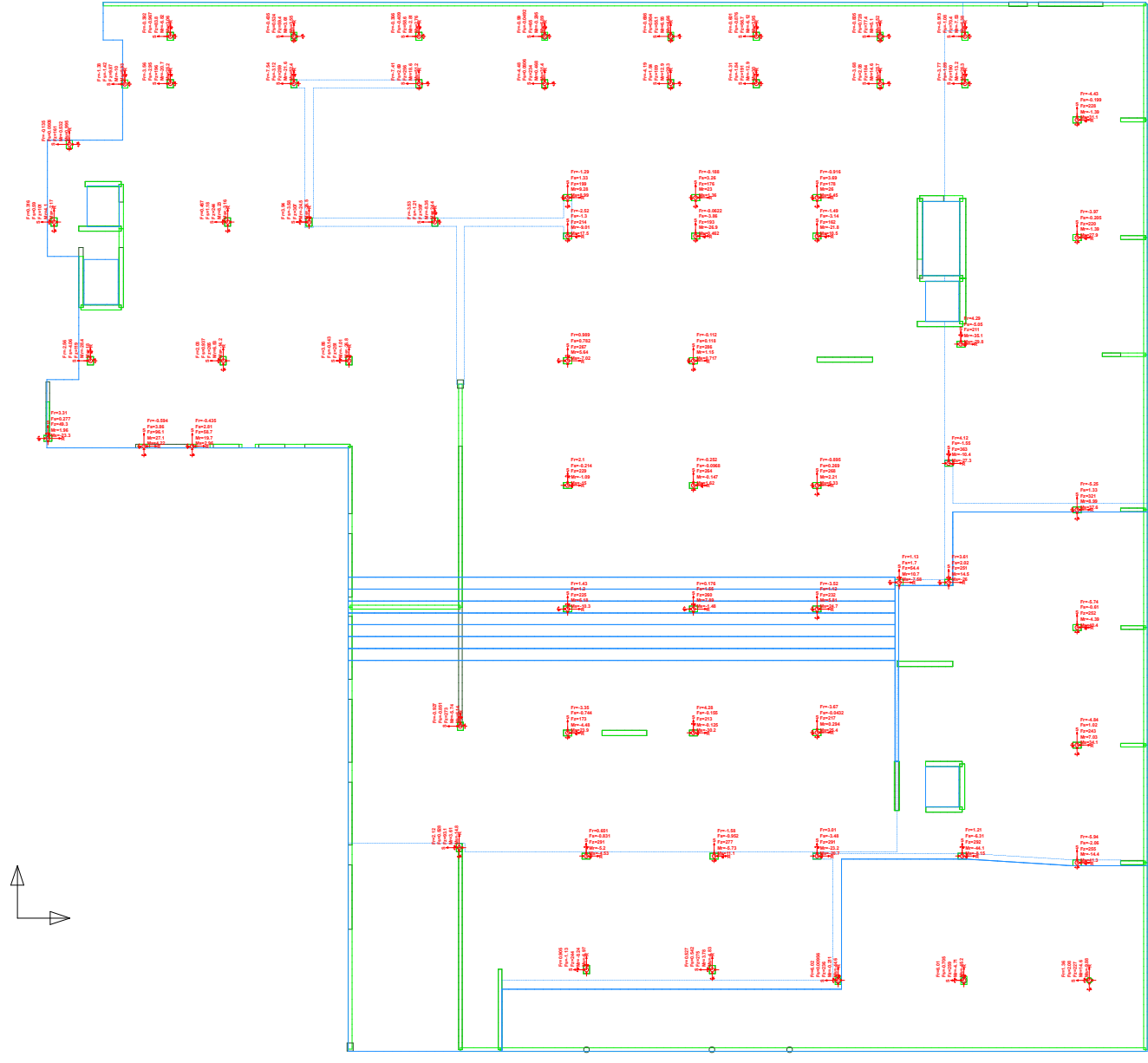
Factored LC: 1.2D + f1L + 1.6S: Max Reactions Plan

Factored LC: 1.2D + f1L + 1.6S: Max Reactions Plan
Element: Max Elements Below; Max Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1/400
Factored LC: 1.2D + f1L + 1.6S: Reaction Plan (Column Below/F/F, F/M, M/M, Max/F, Corner)



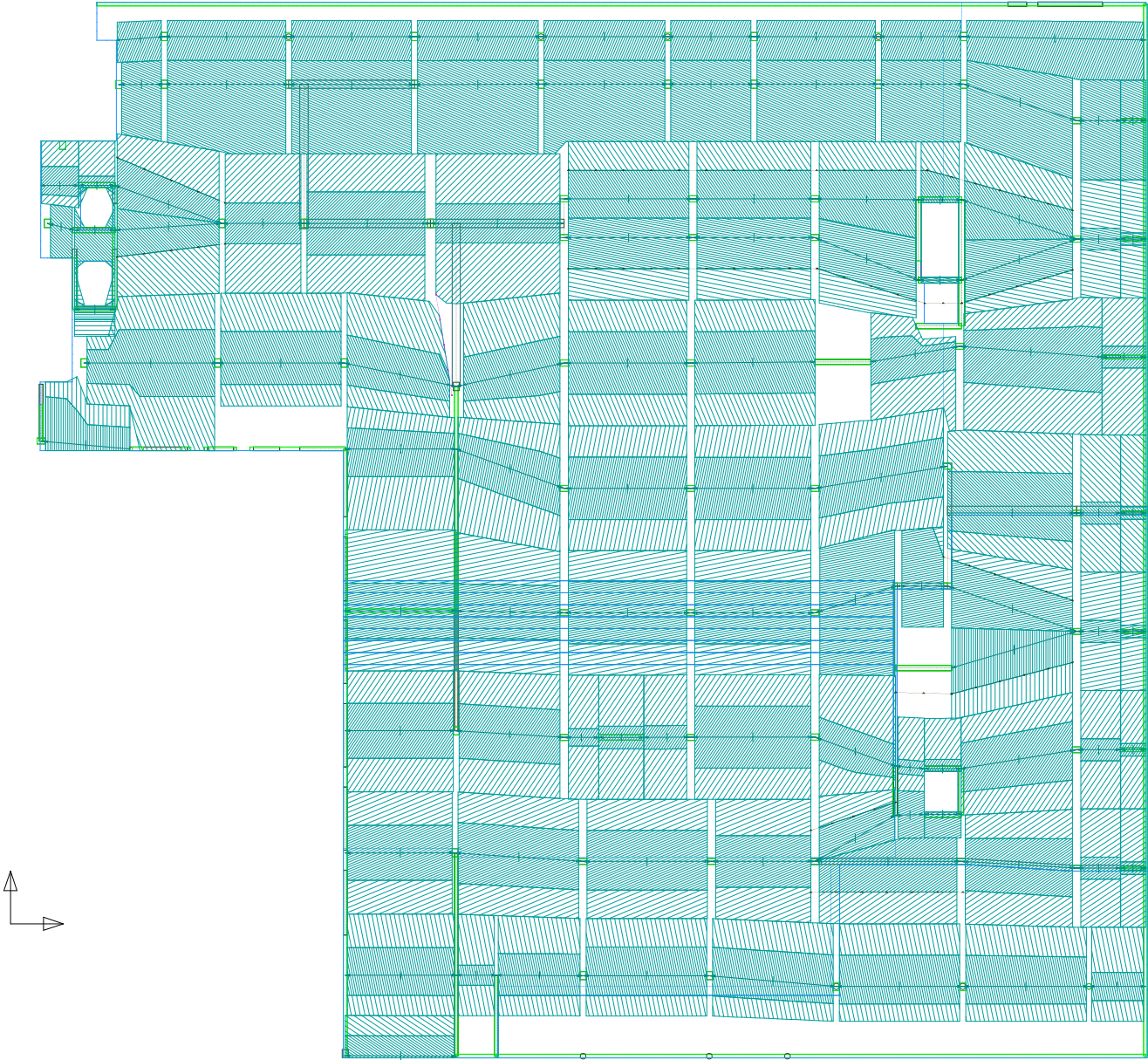
Factored LC: 1.2D + f1L + 1.6S: Min Reactions Plan

Factored LC: 1.2D + f1L + 1.6S: User Notes, User Drawings
Element: Min Elements Below, Max Elements Above, Wall Element Outline Only; Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only;
Scale: 1/4"=1'-0"
Factored LC: 1.2D + f1L + 1.6S: Reaction Plan (Column Below)(F, P, M, A, M, M)(Min F) Contain



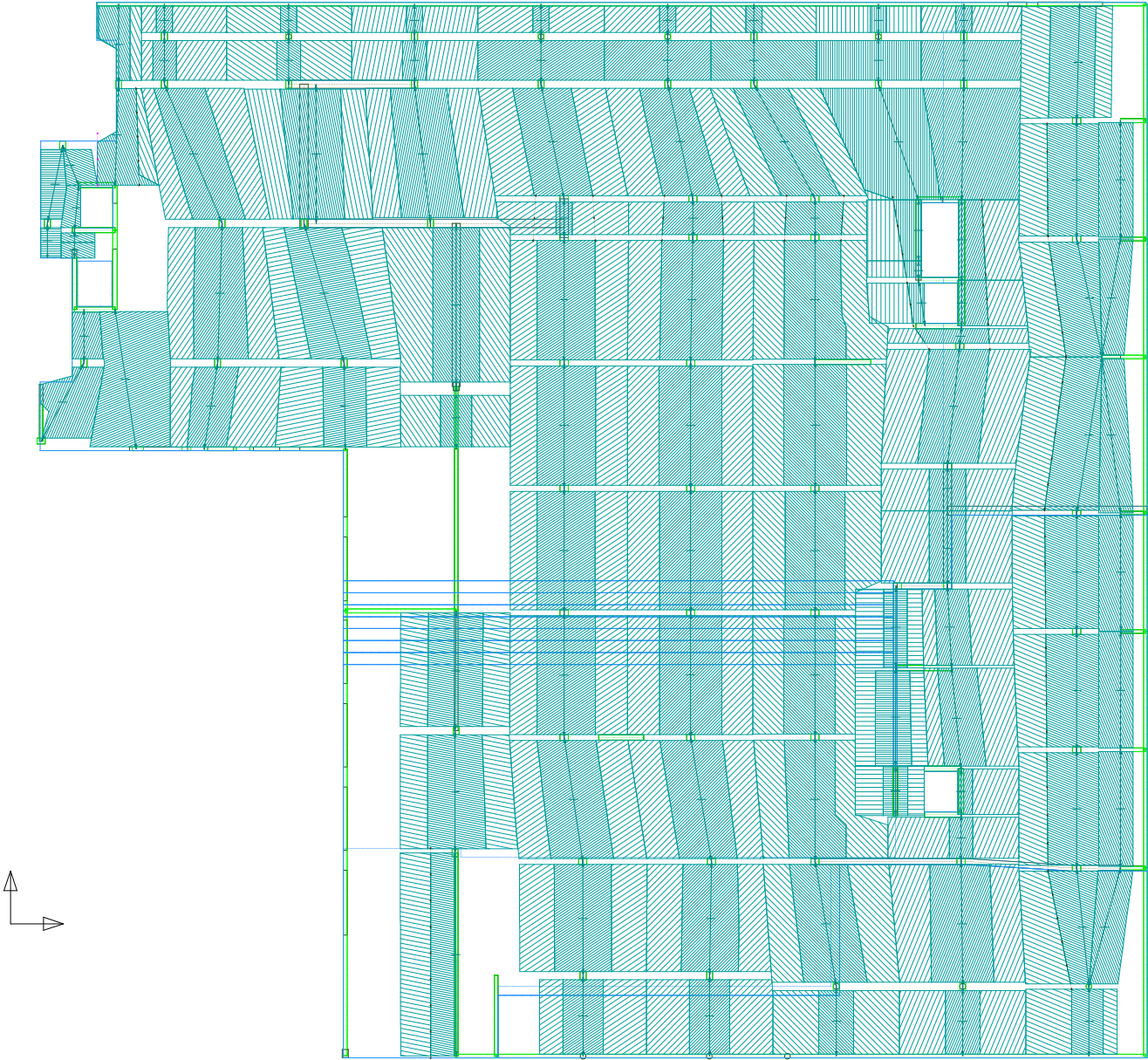
Design Strip: Latitude Design Spans Plan

Design Strip: Latitude Span Boundaries, Latitude DSs, Latitude DSCs, Latitude Strip Boundaries, Latitude DSs, SSS Hatching, Latitude Deflection Checks, User Notes, User Lines, User Dimensions
Break Strip: Slabs, Walls Above, Walls Below
Layers: Wall Elements Above, Wall Elements Below, Wall Element Outline Only, Column Elements Above, Column Elements Below, Slab Elements, Slab Element Outline Only
Scale: 1/4" = 1'-0"



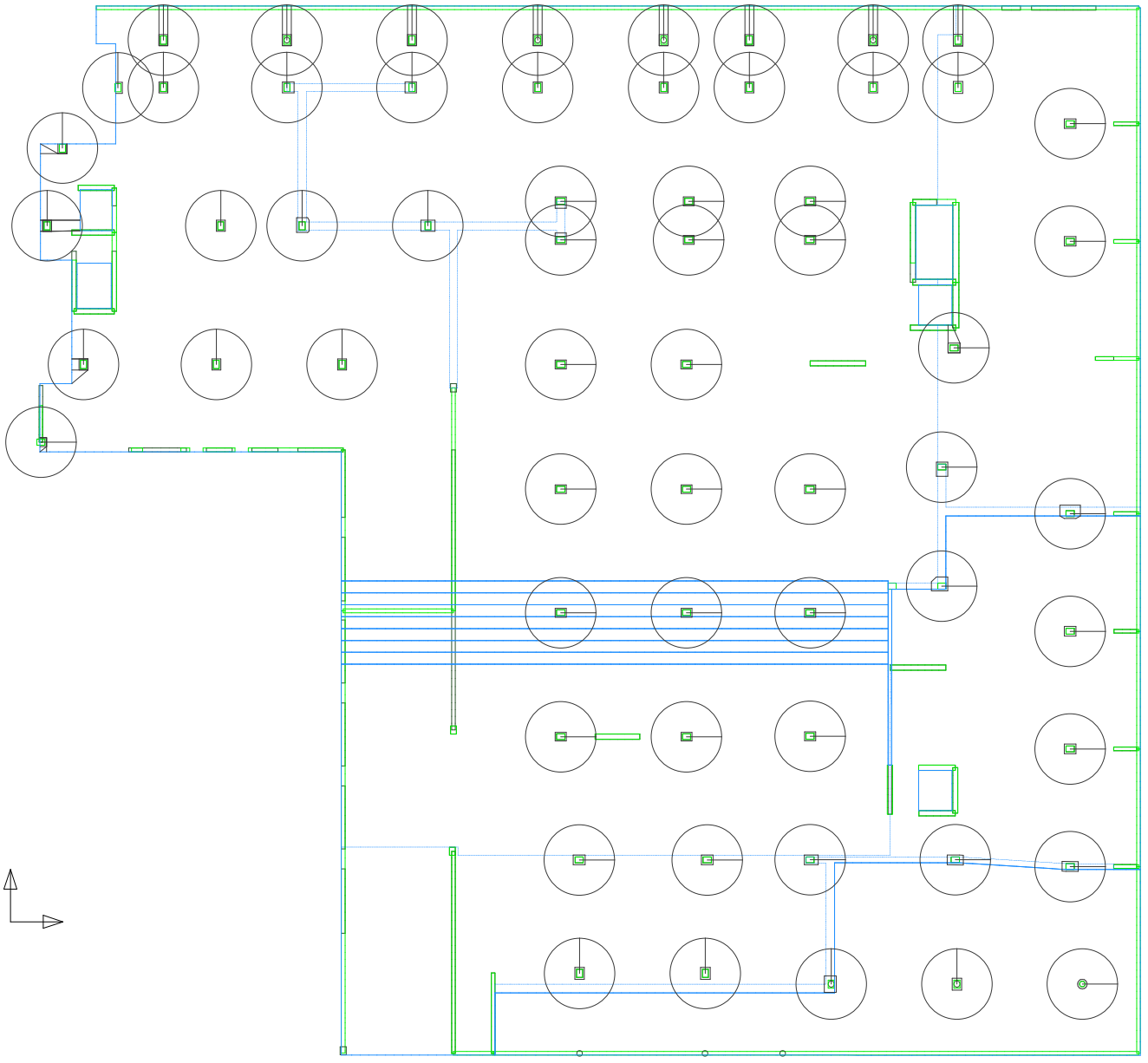
Design Strip: Longitude Design Spans Plan

Design Strip: Longitude Span Boundaries: Longitude SSa; Longitude DSa; Longitude Strip Boundaries: Longitude SSb; SSS Hatching; Longitude Deflection Checks; User Notes; User Lines; User Dimensions;
Sheet View: Name: Web Series;
Status: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only;
Scale: 1/4"=1'-0"



Design Strip: Punching Checks Plan

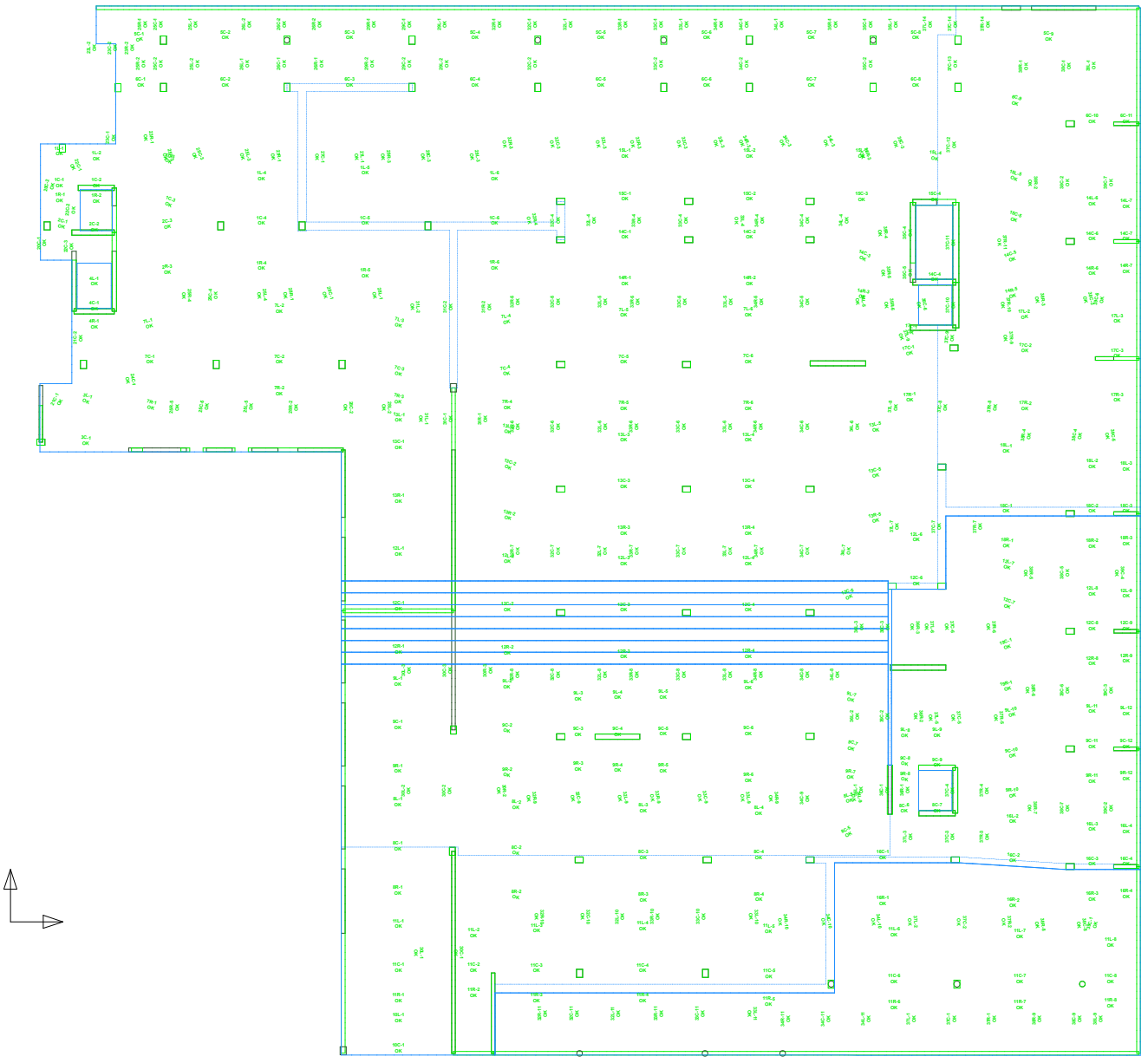
Design Strip: User Lines: User Notes: User Dimensions: Punching Checks: Punching Check Sections:
Elements: Wall Elements Below: Wall Elements Above: Wall Elements Outline Only: Column Elements Below: Column Elements Above: Slab Elements: Slab Element Outline Only:
Scale = 1/48



User Minimum Design: Status Plan

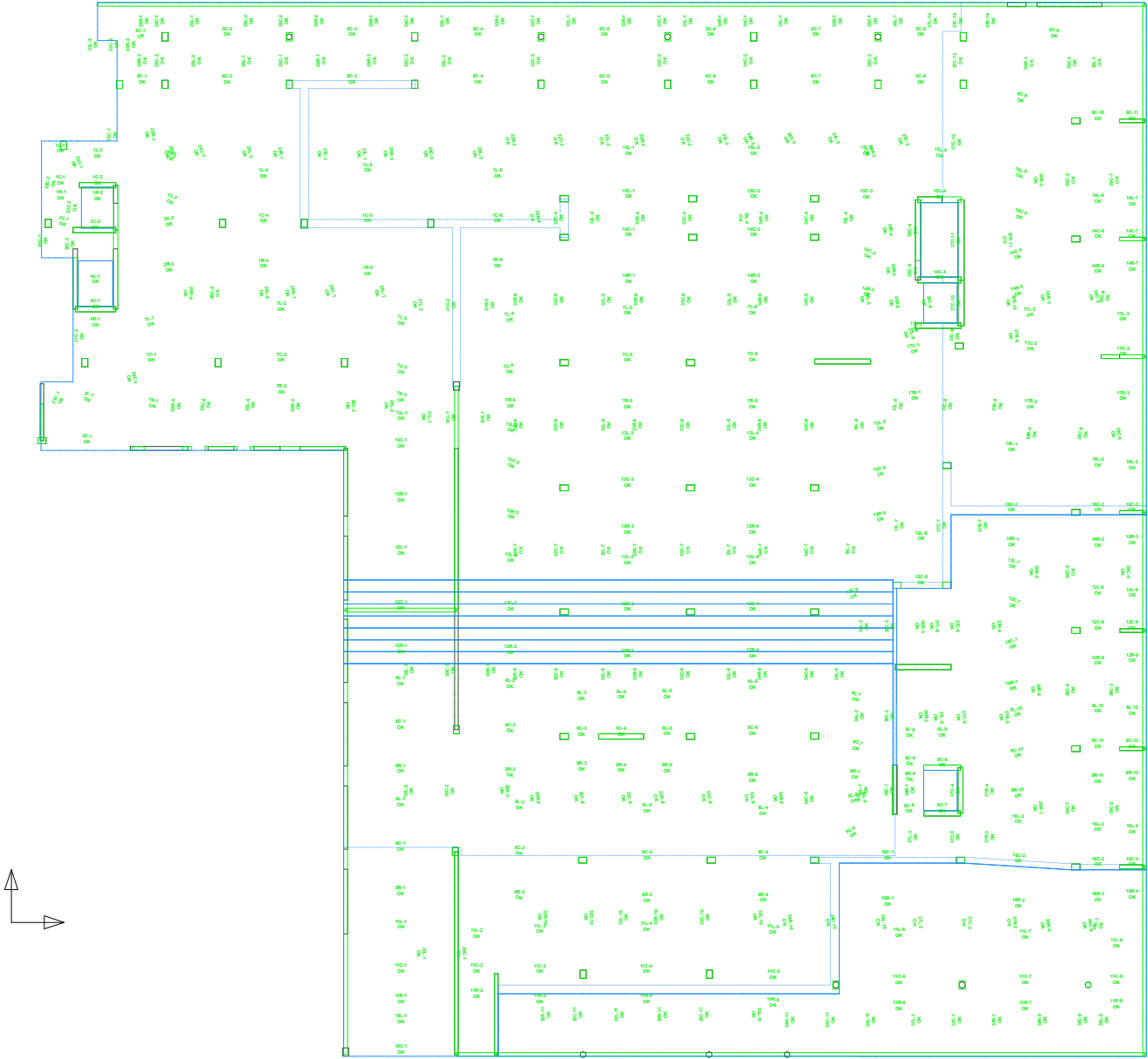
User Minimum Design: User Lines, User Notes, User Dimensions, Labeled Span Design, Longitudinal Span Design, Span Design Number, Span Design Status, Labeled OS Design, Longitudinal OS Design, OS Design Number, OS Design Status, OS Design, PC Design Number, PC Design Status, PC Design

Scale = 1/4" = 1'-0"



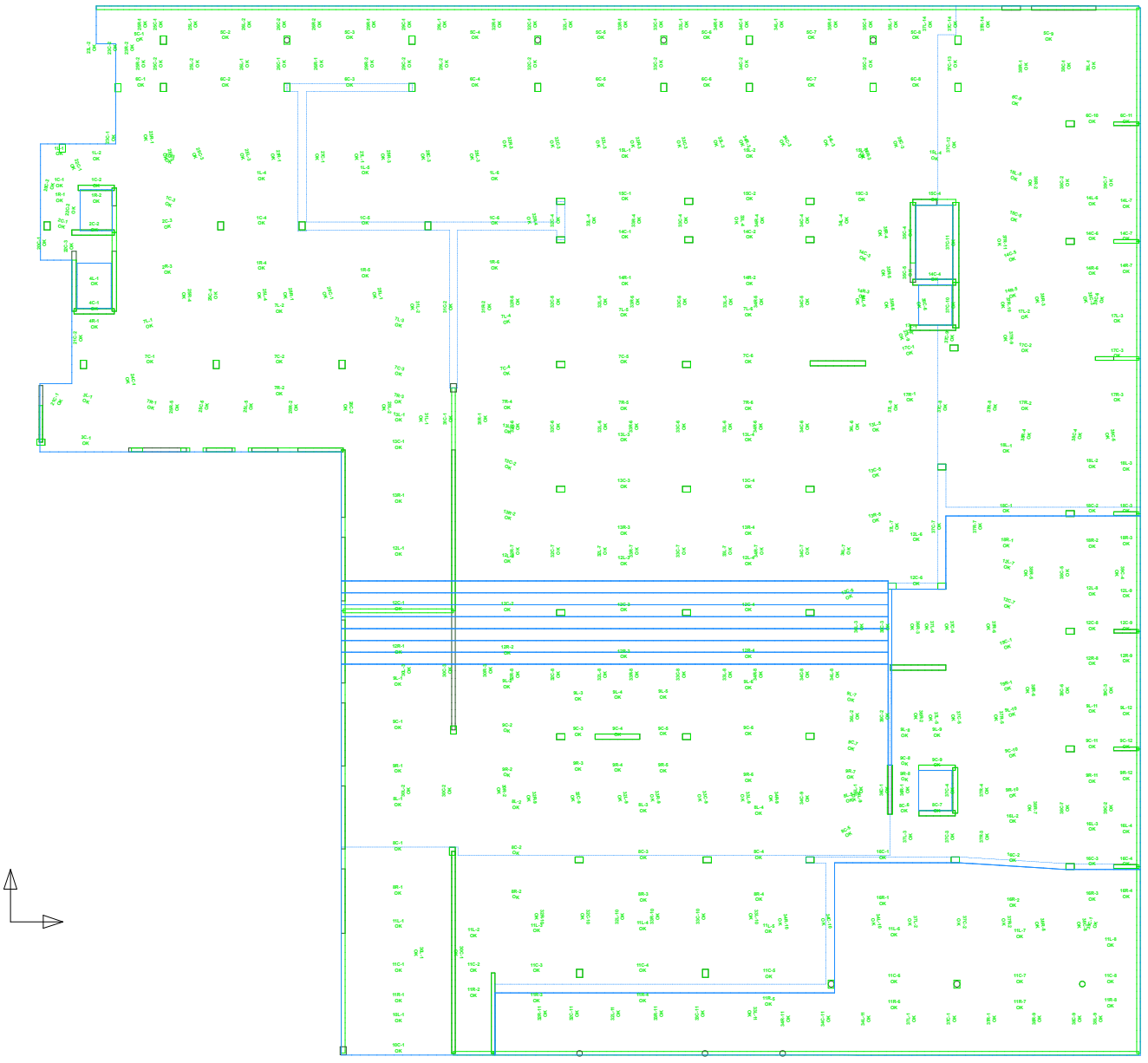
Initial Service Design: Status Plan

Initial Service Design: User Lines, User Names, User Dimensions, Labeled Span Design, Longitude Span Design, Span Design Number, Span Design Status, Labeled OS Design, Longitude OS Design, OS Design Number, OS Design Status, PC Design, PC Design Number, PC Design Status.
 Element: Wall Elements Above, Wall Elements Below, Wall Element Outline Only, Column Elements Above, Column Elements Below, Door Elements, Wall Element, Outline Only.
 Scale = 1/4" = 1'



Service Design: Status Plan

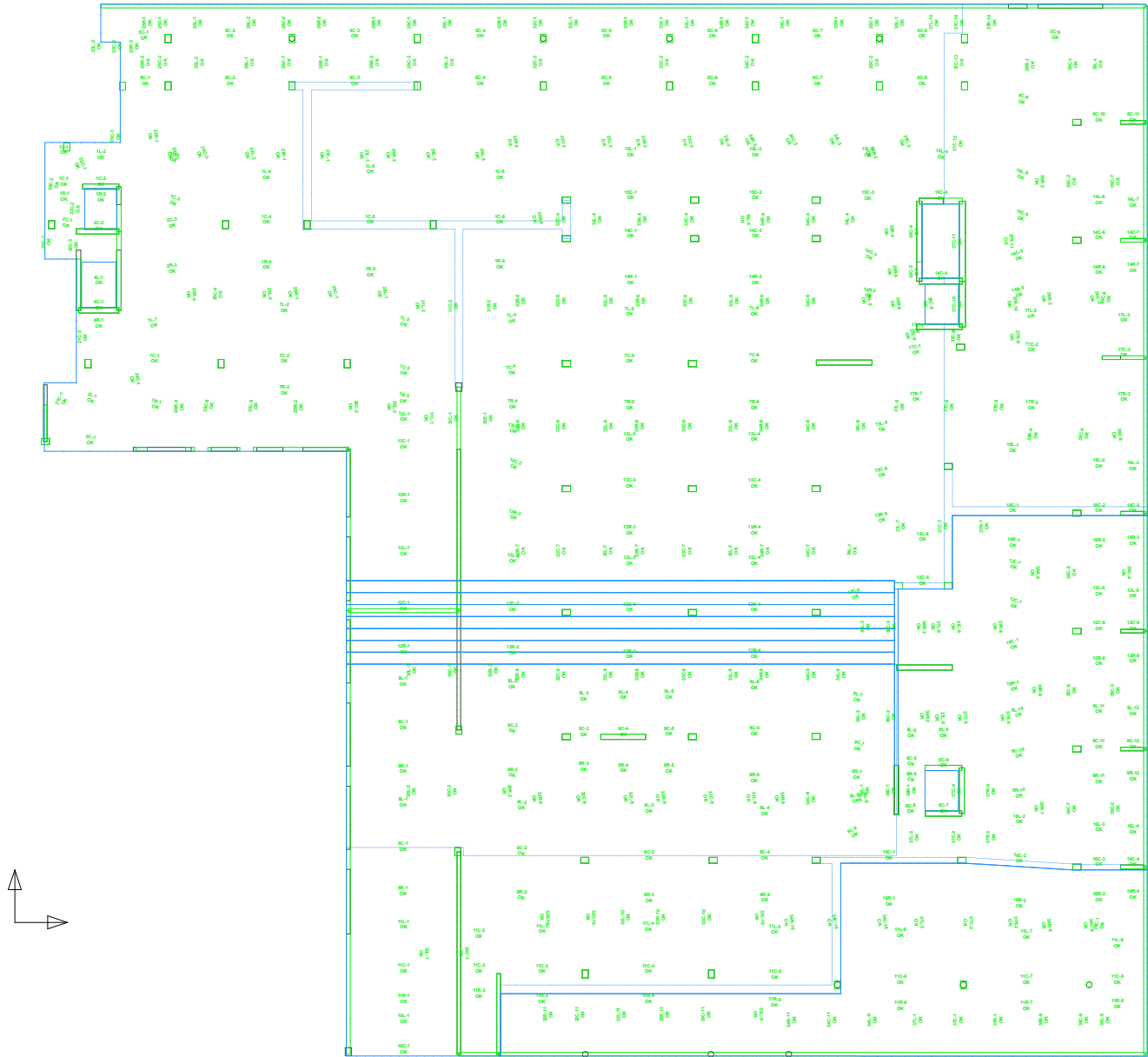
Service Design: User Lines, User Notes, User Dimensions, Latitude Span Design, Longitude Span Design, Span Design Number, Span Design Status, Latitude OS Design, Longitude OS Design, OS Design Number, OS Design Status, PC Design, PC Design Number, PC Design Status.
Shaded Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Wall Element, Span Element, Outline Only.
Scale = 1/4" = 1'-0"



Sustained Service Design: Status Plan

Standard Service Design: User Lines, User Notes, User Dimensions, Latchside Span Design, Latchside Span Design, Span Design Numbers, Span Design Status, Latchside OS Design, Latchside OS Design, OS Design Numbers, OS Design Status, PC Design, PC Design Numbers, PC Design Status, Element, Wall Elements, Window, Wall Elements Above, Wall Elements Outside Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element, Outside Only.

Scale = 1/4" = 1'-0"

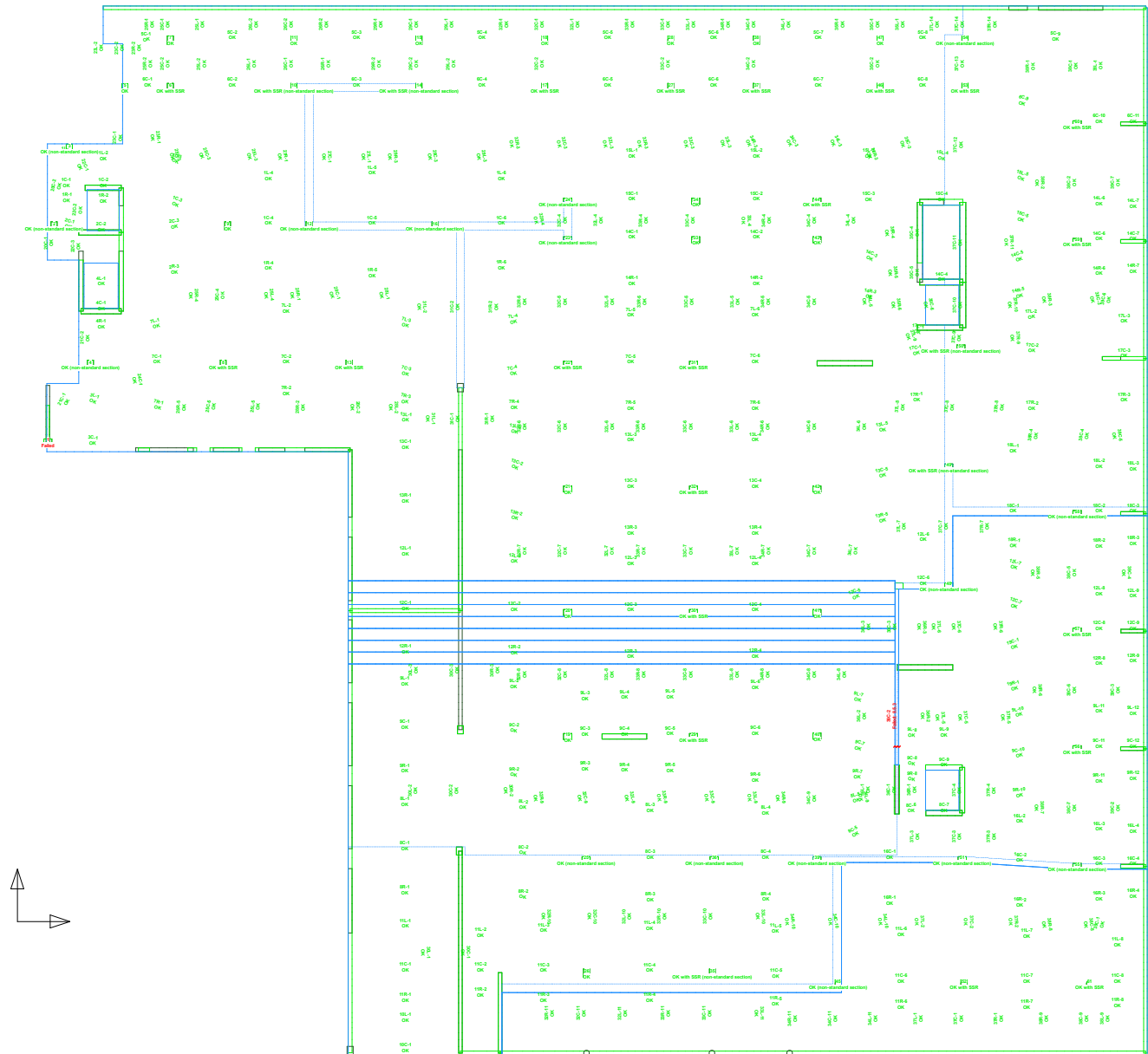


Strength Design: Status Plan

Strength Design: Clear Lines, Clear Notation, Clear Dimensions, Latitude Span Design, Longitude Span Design, Span Design Number, Span Design Status, Latitude DS Design, Longitude DS Design, DS Design Number, DS Design Status, PC Design Number, PC Design Status

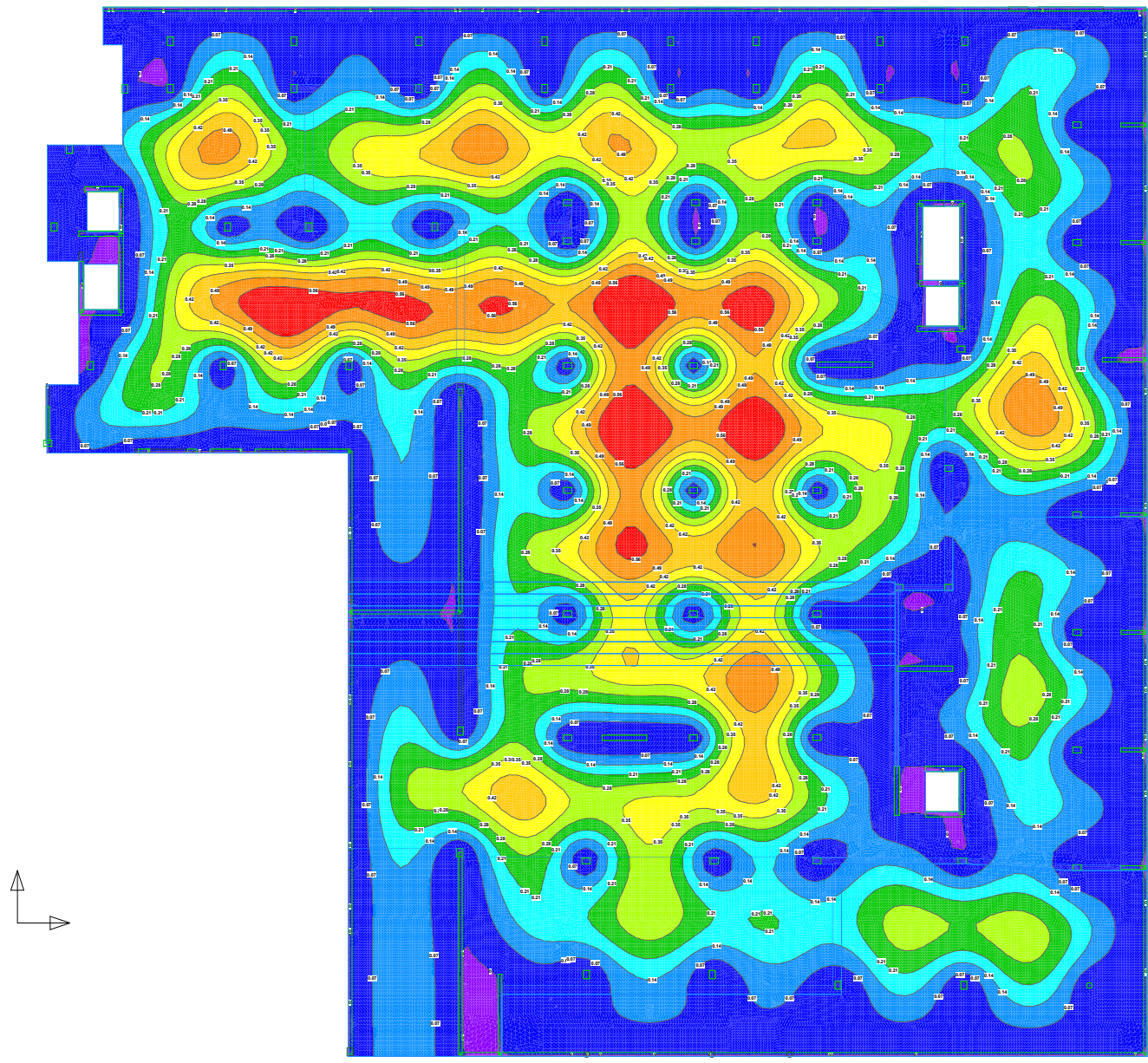
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Scale = 1/4" = 1'-0"



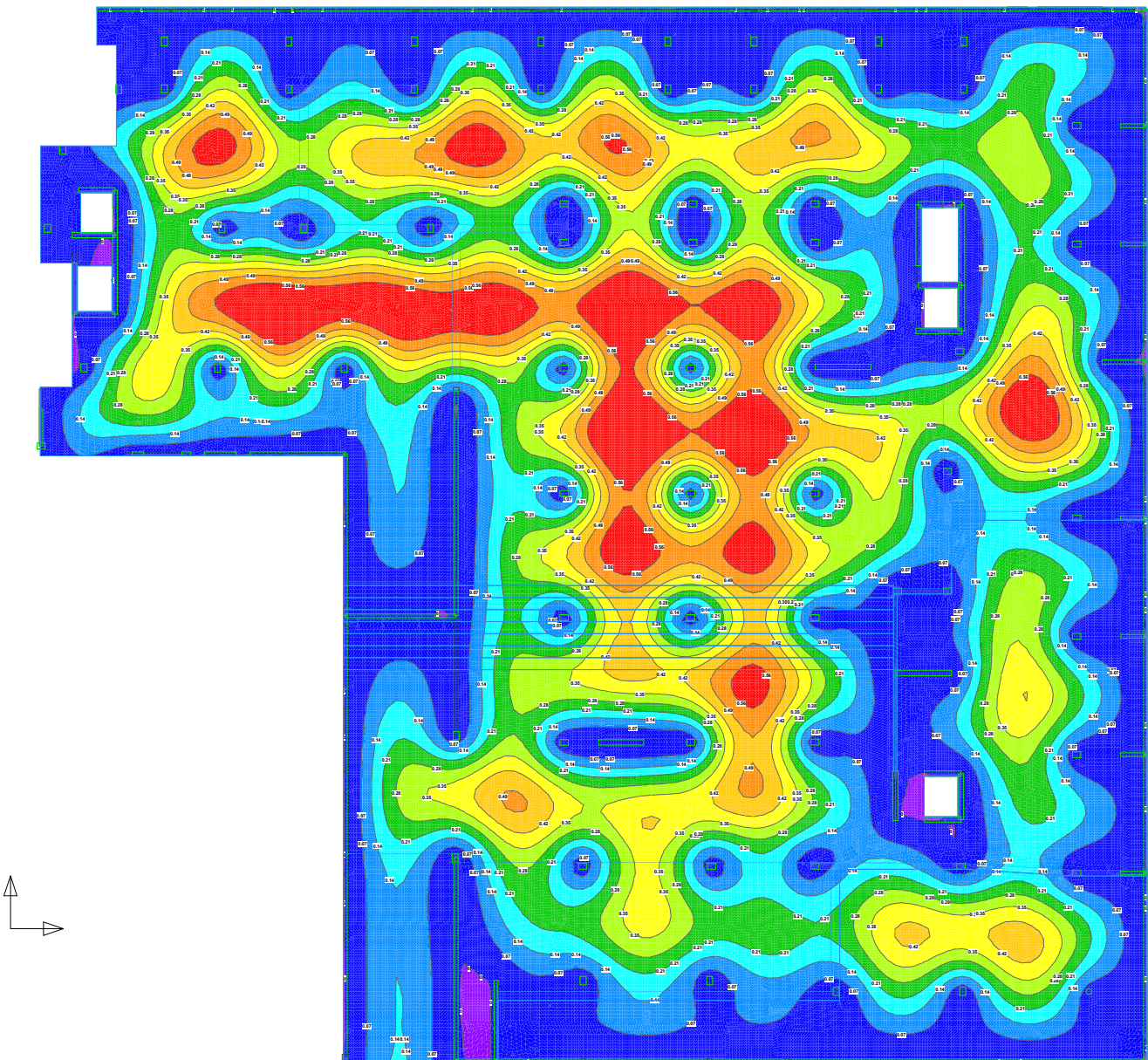
Construction Loads: Std Deflection Plan

Construction Loads: User Lines, User Nodes, User Dimensions.
Element: Wall Elements Below, Slab Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only.
Scale = 1/400
Construction Loads - Vertical Deflection Plot
Min Value = -0.0286 inches @ (13,51,127.0) Max Value = 0.6803 inches @ (130,1,115.0)



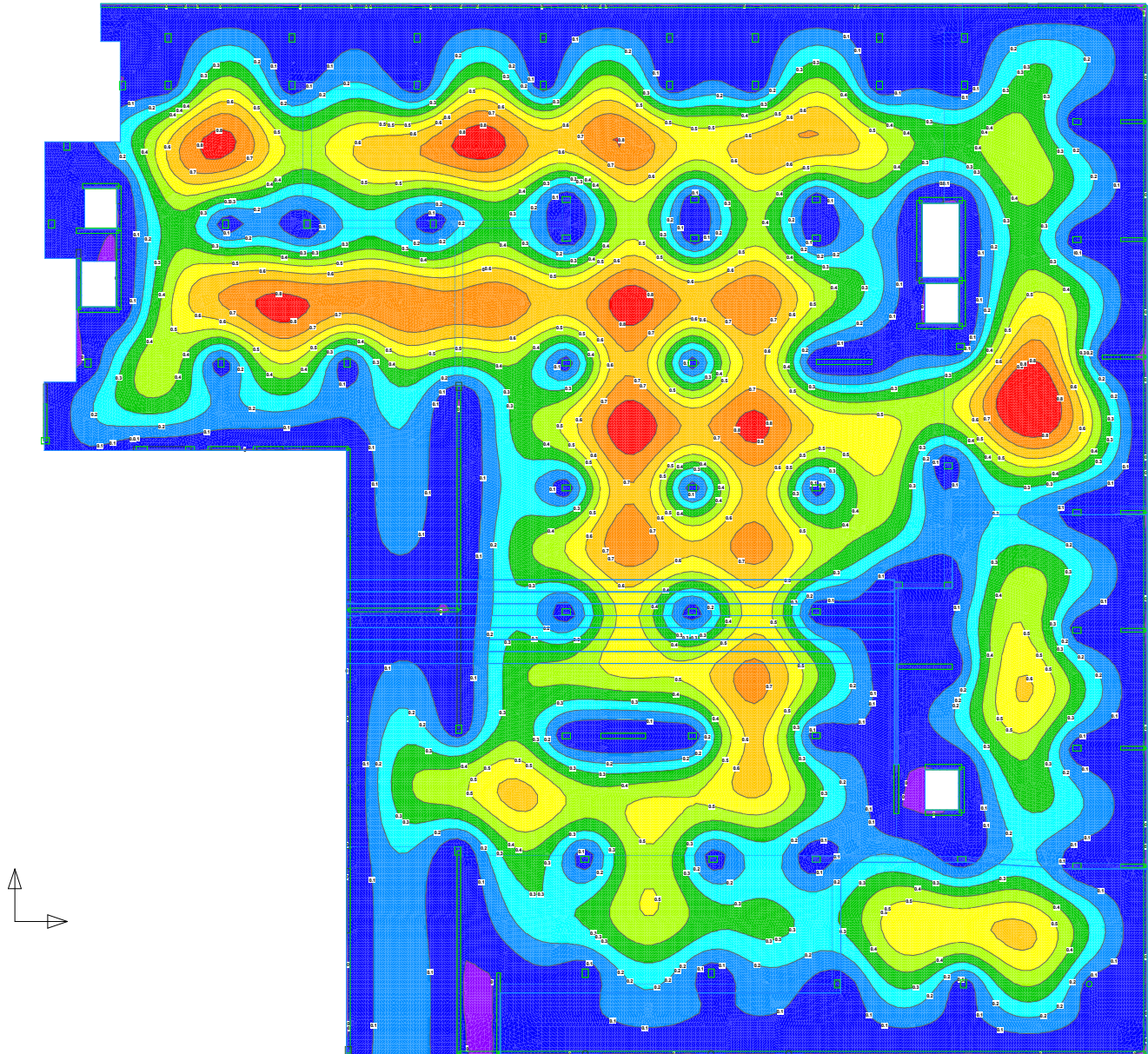
Nonstructural Element Attach: Std Deflection Plan

Nonstructural Element Attach: Clear Lines, Clear Notes, Clear Dimensions.
Display: Wall Elements Below, Std Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Std Elements, Std Element Outline Only.
Scale = 1/4" = 1'-0"
Nonstructural Element Attach - Vertical Deflection Plot
Min Value = -0.0168 inches @ (13,51,127.0) Max Value = 0.7169 inches @ (138,1,115.0)



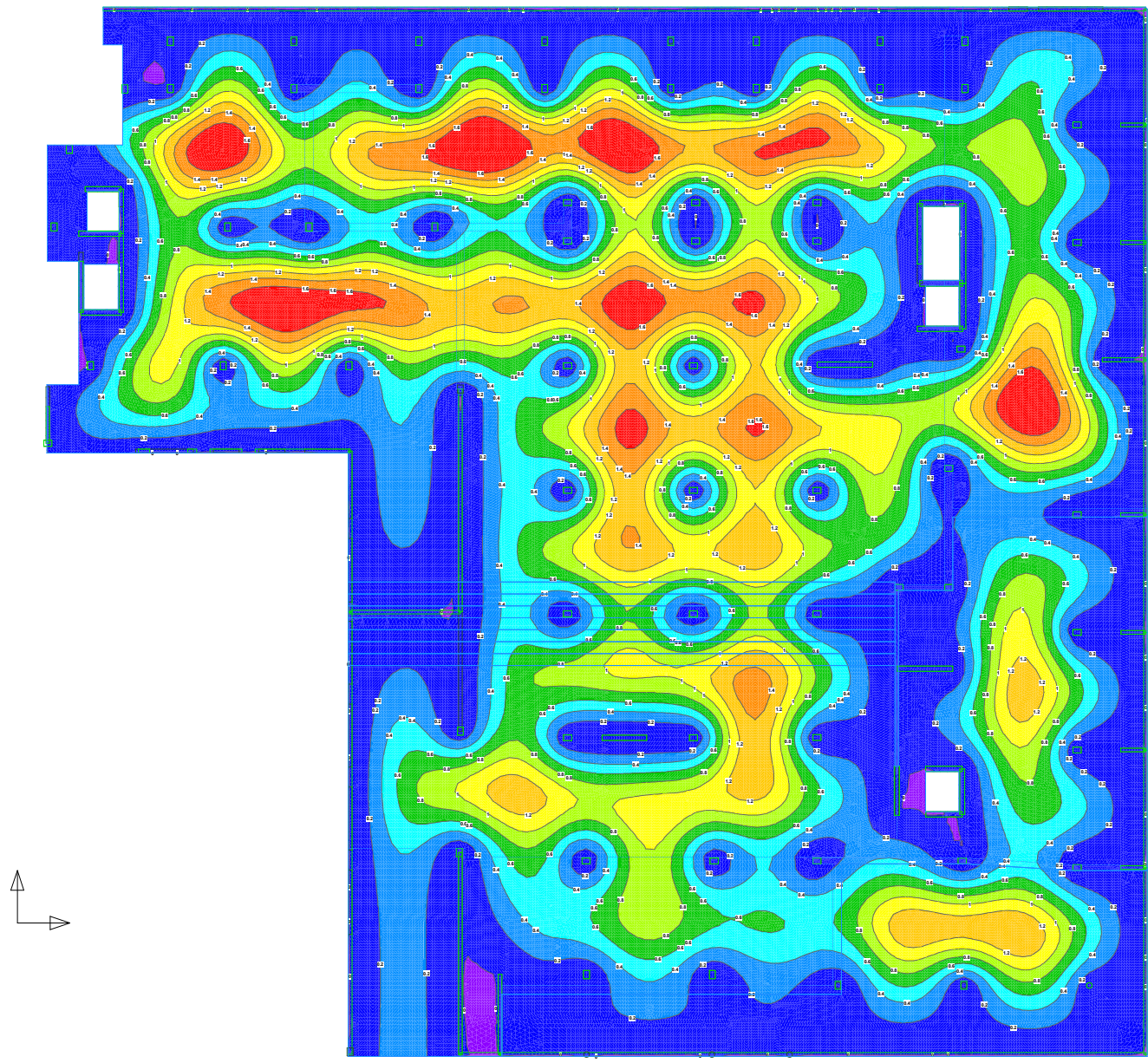
Immediate Live Load: Std Deflection Plan

Standard Live Load: User Lines, User Nodes, User Dimensions
Element: Wall Elements Below, Std Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Std Elements, Std Element Outline Only
Scale = 1.00
Standard Live Load - Vertical Deflection Plot
Min Value = -0.01864 inches @ (13,51,127.0) Max Value = 0.5416 inches @ (226.6,116.7)



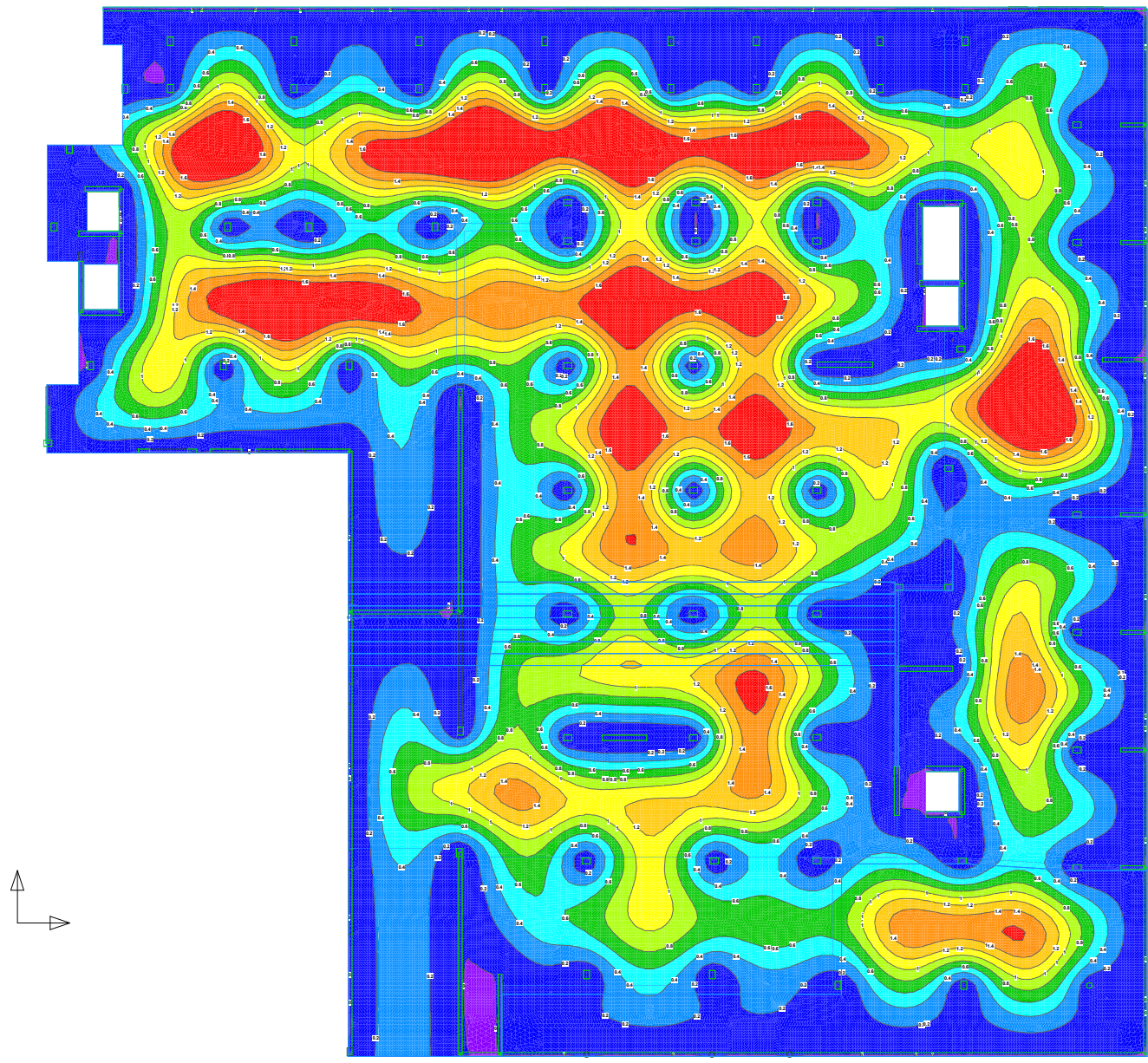
Sustained Loads: Std Deflection Plan

Standard Load: Clear Load, Clear Height, Clear Dimension.
Element: Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only.
Scale = 1/8" = 1'-0"
Sustained Loads - Vertical Deflection Plot
Min Value = -0.0587 inches @ (15.51,127.0) Max Value = 1.503 inches @ (105.6,174.0)



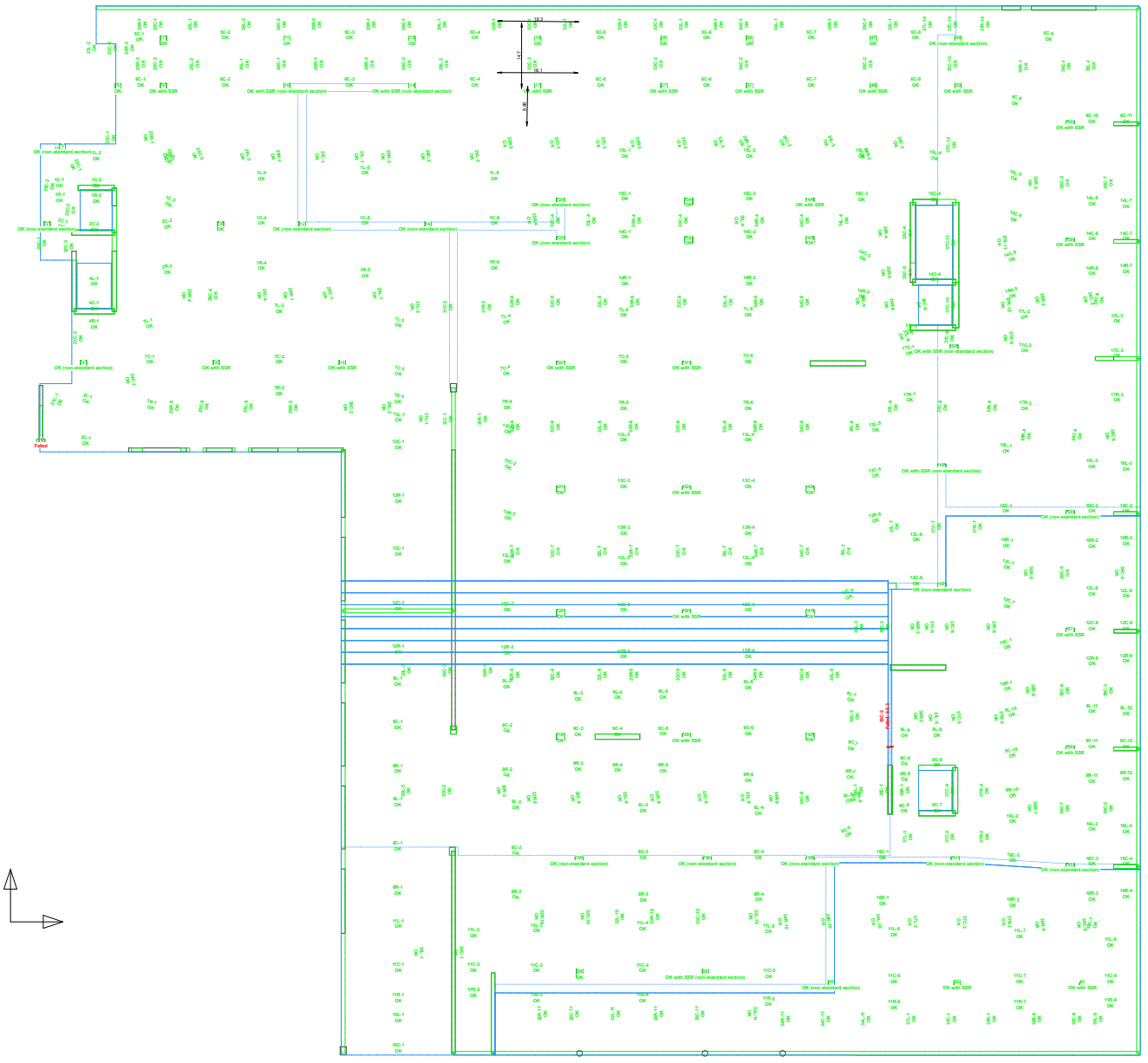
Sustained + Immediate Live Loads: Std Deflection Plan

Standard + Immediate Live Loads: User Lines, User Nodes, User Dimensions
Standard + Immediate Live Loads: Std Elements Above, Wall Elements Outline Only, Column Elements Below, Column Elements Above, Std Elements, Std Element Outline Only
Scale = 1/40
Standard + Immediate Live Loads - Vertical Deflection Plot
Min Value = -0.0568 inches @ (13,51,125.0) Max Value = 2.327 inches @ (105,4,174.0)



Design Status: Status Plan

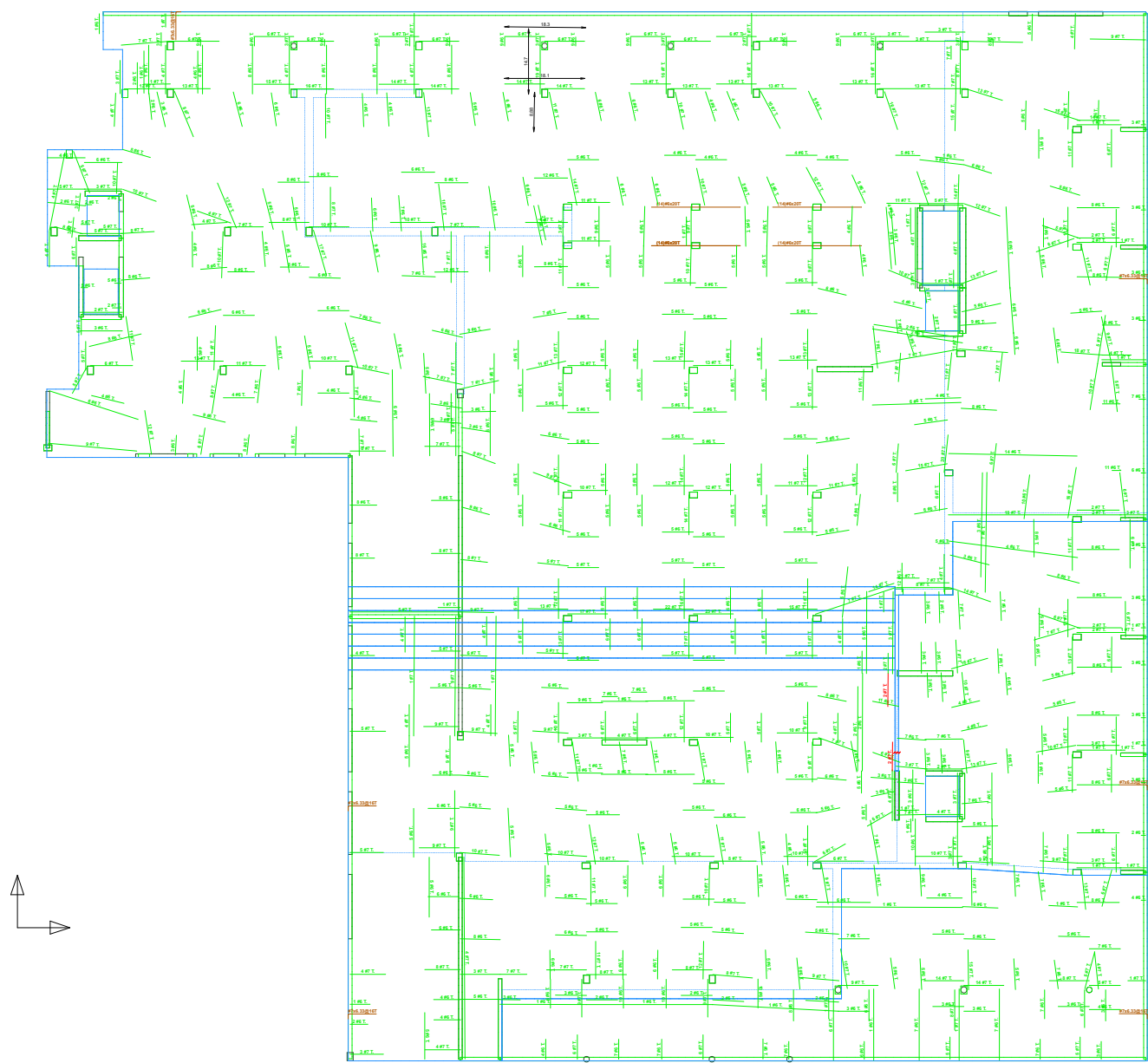
Design Status: User Lines, User Notes, User Comments, Lateral Span Design, Longitudinal Span Design, Span Design Number, Span Design Status, Lateral DS Design, Longitudinal DS Design, DS Design Number, DS Design Status, PC Design, PC Design Number, PC Design Status, Lateral Span Segment Deflection Check, Longitudinal Span Segment Deflection Check, Span Segment Deflection Check Status, Lateral Deflection Check, Longitudinal Deflection Check, Deflection Check Status.
Shaded: Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only.
Scale = 1/4" = 1'-0"



Design Status: Top Reinforcement Plan

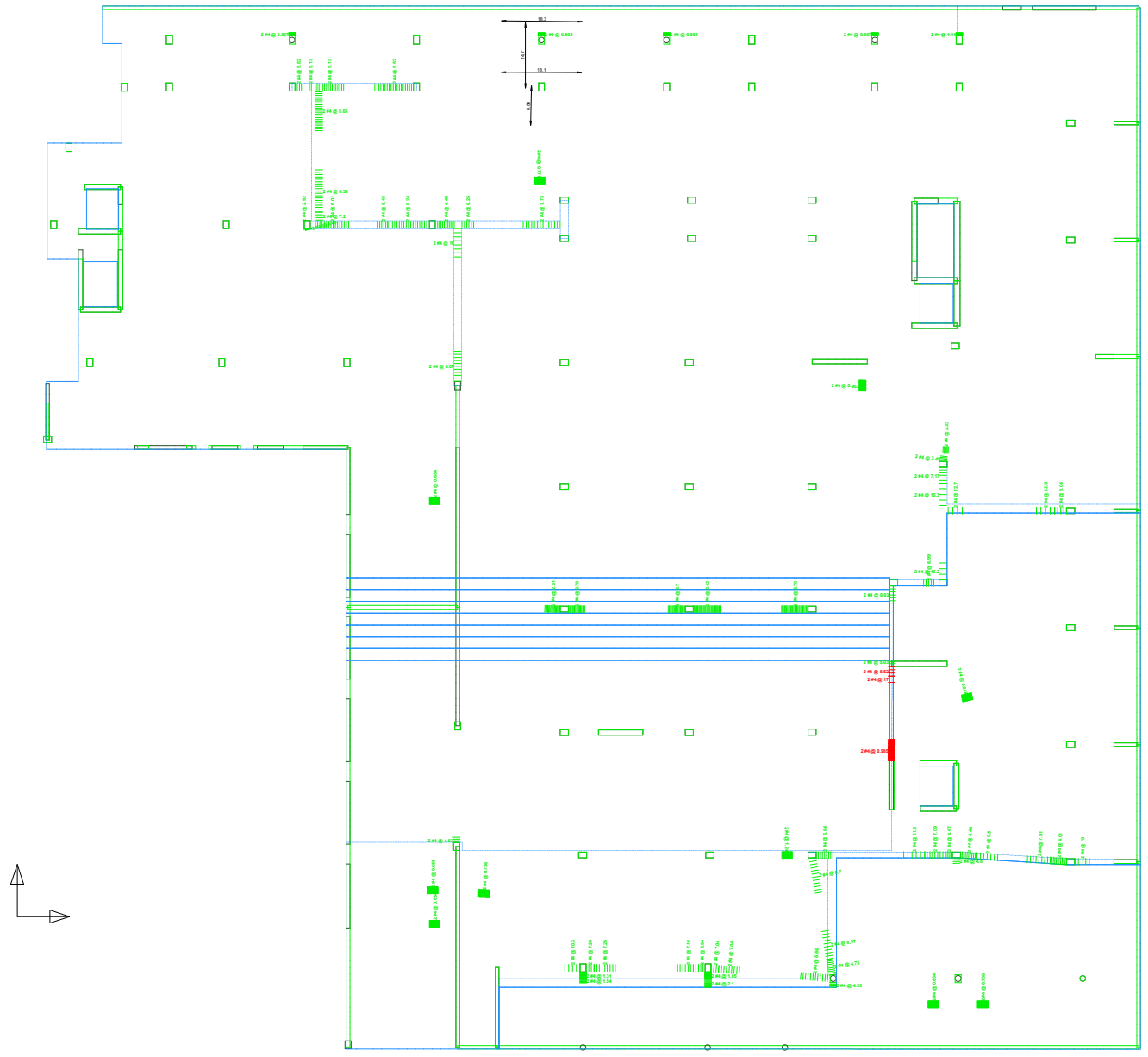
Design Status: User Lines, User Notes, User Comments, Latticed Span Design, Longitud Span Design, Span Design Top Bars, Span Design Bar Descriptions, Latticed CS Design, Longitud CS Design, CS Design Top Bars, Slab Design, Wall Elements Design, Wall Elements Notes, Wall Elements Center Only, Column Elements Design, Column Elements Notes, Slab Elements, Slab Elements Center Only, Reinforcement: Top Face Concentrated Reinf., Both Face Concentrated Reinf., Auto Face Concentrated Reinf., Concentrated Reinf., Descriptions: Top Face Distributed Reinf., Both Face Distributed Reinf., Auto Face Distributed Reinf., Distributed Reinf., Descriptions: Latticed User Concentrated Reinf., Longitud User Concentrated Reinf., Latticed User Distributed Reinf., Longitud User Distributed Reinf.

Scale: 1/4"=1'-0"



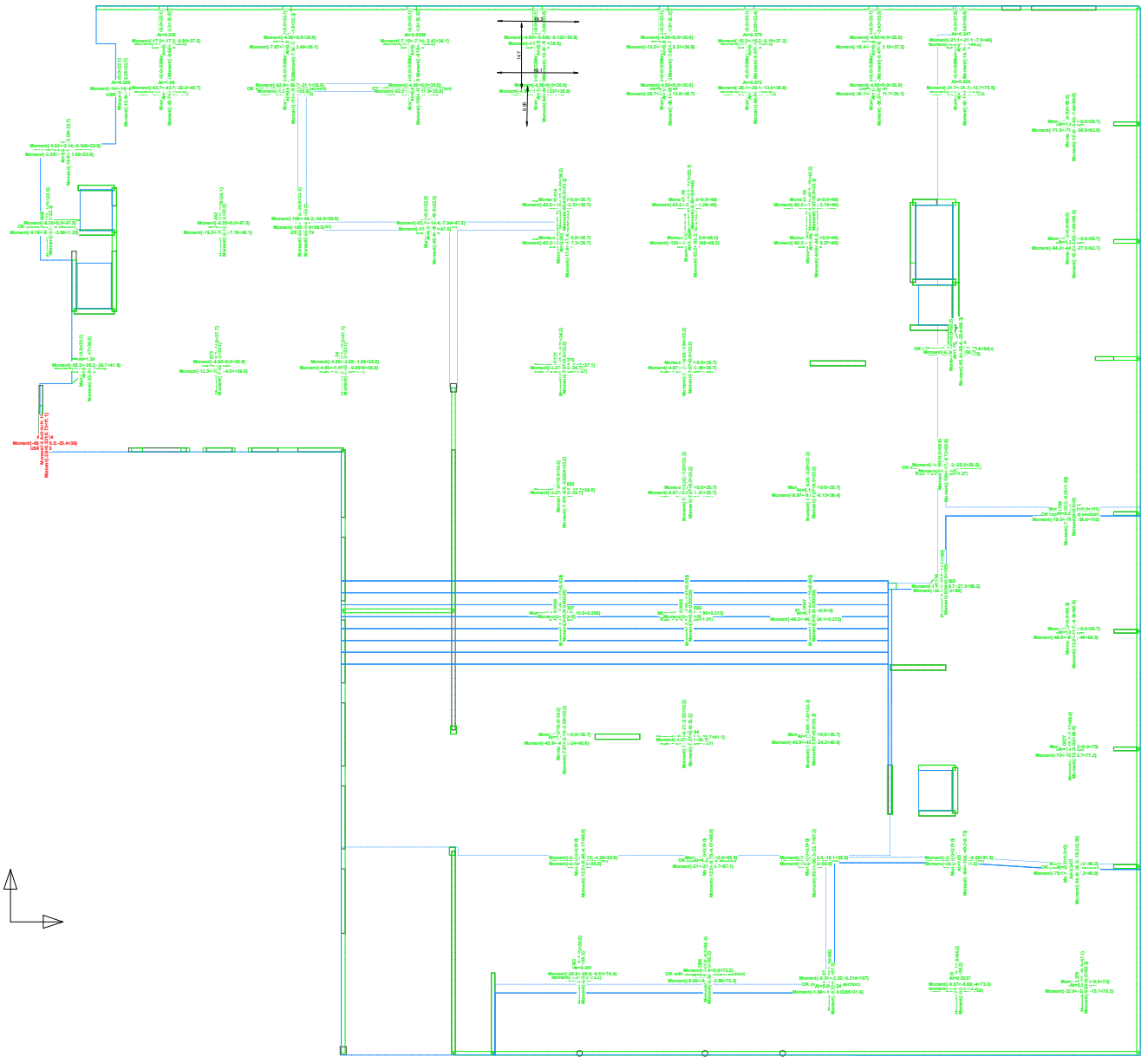
Design Status: Shear Reinforcement Plan

Design Status: User Lines, User Notes, User Comments, Lethal Span Design, Longitud Span Design, Span Design Shear Bars, Span Design Bar Descriptions, Lethal OS Design, Longitud OS Design, OS Design Numbers, OS Design Shear Bars, OS Design Bar Descriptions, Wall Elements Above, Wall Elements Below, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only, Scale = 1/432



Design Status: Punching Shear Status Plan

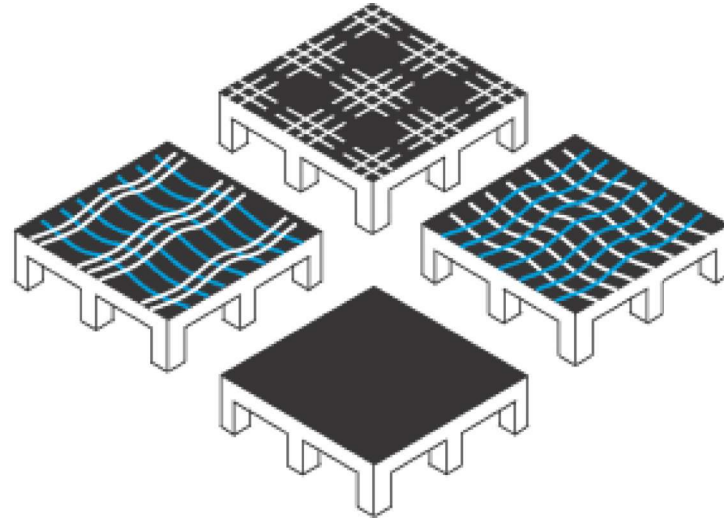
Design Status: User Lines, User Notes, User Dimensions, PC Design, PC Design Member, PC Design Status, PC Design Stress Ratio, PC Design Section, PC Design Feasural Section, PC Design Feasural Section Design, PC Design Feasural Section Analysis, OK, Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Wall Connects, Sash Element, Outline Only, Scale = 1/48



MERCER ISLAND MIXED USE

LEVEL 2 - PT TRANSFER SLAB

PCS STRUCTURAL SOLUTIONS



Level 2 - 10.3.2023 AED.cpt

10/12/2023

Seattle, WA

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Post-tensioned Slab Design Criteria

Code

ACI 318-14

Materials

Concrete $f'c = 5,500$ psi @ 28 days, $f'ci = 3,000$ psi

Reinforcing Steel $f_y = 60,000$ psi

Analysis

Gravity loads on elevated slabs were considered according to the Design Criteria in the General Notes of the structural drawings including structure self-weight added to the noted superimposed dead load. Strength design was performed using the governing load combination $1.2DL + 1.6LL$. Strength design was performed using the load combination $1.2DL + 1.6LL$. Unfactored service loads were used to calculate long-term cracked deflection under dead load conditions and a long term cracked deflection under dead load and live load. Unbalanced live load was considered for the worst case conditions.

The building was modeled in RAM Structural System with post-tensioned slabs designed in the Finite Element computer software program RAM Concept. Design used $\frac{1}{2}$ " unbonded tendons with $f_{pu} = 270$ ksi (final effective tension force per tendon = 26.8 kips). The cover requirements for the PT tendons are $\frac{3}{4}$ " at all bays for a "restrained" condition,

Average slab pre-compression P/A values were limited to minimum of 125 psi and a maximum of 305 psi. Stress limitations were as follows:

| | <u>Initial Stress</u> | <u>Sustained Stress</u> | <u>Total Stress</u> |
|----------------------|-----------------------|-------------------------|---------------------|
| Tension Stresses | | | |
| Top Fiber | $3 \sqrt{f'c}$ | $6 \sqrt{f'c}$ | $6 \sqrt{f'c}$ |
| Bottom Fiber | $3 \sqrt{f'c}$ | $6 \sqrt{f'c}$ | $6 \sqrt{f'c}$ |
| Compression Stresses | $.6 f_{ci}$ | $.45 f'c$ | $.6 f'c$ |

Both ASTM E119 Table X3.1 and ANSI / UL 263 Appendix C define all Concrete cast-in-place slab bays as "restrained".

See specific text noted below:

ASTM E119:

TABLE X3.1 Construction Classification, Restrained and Unrestrained

| | |
|---|--------------|
| I. Wall bearing: | |
| Single span and simply supported end spans of multiple bays: ^A | |
| (1) Open-web steel joists or steel beams, supporting concrete slab, precast units, or metal decking | unrestrained |
| (2) Concrete slabs, precast units, or metal decking | unrestrained |
| Interior spans of multiple bays: | |
| (1) Open-web steel joists, steel beams or metal decking, supporting continuous concrete slab | restrained |
| (2) Open-web steel joists or steel beams, supporting precast units or metal decking | unrestrained |
| (3) Cast-in-place concrete slab systems | restrained |
| (4) Precast concrete where the potential thermal expansion is resisted by adjacent construction ^B | restrained |
| II. Steel framing: | |
| (1) Steel beams welded, riveted, or bolted to the framing members | restrained |
| (2) All types of cast-in-place floor and roof systems (such as beam-and-slabs, flat slabs, pan joists, and waffle slabs) where the floor or roof system is secured to the framing members | restrained |
| (3) All types of prefabricated floor or roof systems where the structural members are secured to the framing members and the potential thermal expansion of the floor or roof system is resisted by the framing system or the adjoining floor or roof construction ^B | restrained |
| III. Concrete framing: | |
| (1) Beams securely fastened to the framing members | restrained |
| (2) All types of cast-in-place floor or roof systems (such as beam-and-slabs, flat slabs, pan joists, and waffle slabs) where the floor system is cast with the framing members | restrained |
| (3) Interior and exterior spans of precast systems with cast-in-place joints resulting in restraint equivalent to that which would exist in condition III (1) | restrained |
| (4) All types of prefabricated floor or roof systems where the structural members are secured to such systems and the potential thermal expansion of the floor or roof systems is resisted by the framing system or the adjoining floor or roof construction ^B | restrained |
| IV. Wood construction: | |
| All types | unrestrained |

APPENDIX C

Nonmandatory Guide for Determining Conditions of Restraint for Floor and Roof Assemblies and for Individual Beams

C1.1 Revisions adopted in 1970 introduced the concept of fire endurance classifications based on two conditions of support: restrained and unrestrained. As a result, specimens are fire tested to derive these two classifications.

C1.2 In fire tests, a restrained condition, as used in this standard, is one in which expansion at the supports of a load-carrying element resulting from the effects of the fire is resisted by forces external to the element. An unrestrained condition is one in which the load-carrying element is free to expand and rotate at its supports.

C1.3 This guide is based on knowledge currently available and classifies all constructions as either restrained or unrestrained. This classification will enable the architect, engineer, or building official to correlate the fire endurance classification, based on conditions of restraint, with the construction type under consideration. While it has been shown that certain conditions of restraint will improve fire endurance, methodologies for establishing the presence of sufficient restraint in actual constructions have not been standardized.

C1.4 For the purpose of this Guide, restraint in buildings is defined as follows:

Floor and roof assemblies and individual beams in buildings shall be considered restrained when the surrounding or supporting structure is capable of resisting substantial thermal expansion throughout the range of anticipated elevated temperatures. Constructions not complying with this definition are assumed to be free to rotate and expand and shall therefore be considered as unrestrained.

C1.5 The definition in C1.4 requires the exercise of engineering judgment to determine what constitutes restraint to "substantial thermal expansion." Restraint may be provided by the lateral stiffness of supports for floor and roof assemblies and intermediate beams forming part of the assembly. In order to develop restraint, connections must adequately transfer thermal thrusts to such supports. The rigidity of adjoining panels or structures should be considered in assessing the capability of a structure to resist thermal expansion. Continuity, such as that occurring in beams acting continuously over more than two supports, will induce rotational restraint which will usually add to the fire resistance of structural members. In Table C1.1 only the common types of constructions are listed. Having these examples in mind, as well as the philosophy expressed in the preamble, the user should be able to rationalize the less common types of construction.

C1.6 The foregoing methods of determining the presence or absence of restraint, according to the type and detail of construction, represent only one procedure for establishing dual fire endurance classifications. This procedure alone does not represent all restrained and unrestrained construction conditions.

**Table C1.1
Considerations of restraint for common construction**

| | | |
|------|---|--------------|
| I. | Wall Bearing: | |
| A. | Single span and simply supported end spans of multiple bays. ^a | |
| 1. | Open-web steel joists or steel beams supporting concrete slab, precast units, or metal decking. | Unrestrained |
| 2. | Concrete slabs, precast units, or metal decking. | Unrestrained |
| B. | Interior spans of multiple bays. | |
| 1. | Open-web steel joists, steel beams, or metal decking supporting continuous concrete slab. | Restrained |
| 2. | Open-web steel joists or steel beams, supporting precast units or metal decking. | Unrestrained |
| 3. | Cast-in-place concrete slab systems | Restrained |
| 4. | Precast concrete where the potential thermal expansion is resisted by adjacent construction ^b | Restrained |
| II. | Steel Framing: | |
| A. | Steel beams welded, riveted, or bolted to the framing members | Restrained |
| B. | All types of cast-in-place floor and roof systems (such as beam-and-slabs, flat slabs, pan joists, and waffle slabs) where the floor or roof system is secured to the framing members | Restrained |
| C. | All types of prefabricated floor or roof systems where the structural members are secured to the framing members and the potential thermal expansion of the floor or roof system is resisted by the framing system or the adjoining floor or roof construction ^b | Restrained |
| III. | Concrete Framing: | |
| A. | Beams securely fastened to the framing members. | Restrained |
| B. | All types of cast-in-place floor or roof systems, such as beam-and-slabs, flat slabs, pan joists, and waffle slabs, where the floor system is cast with the framing members. | Restrained |
| C. | Interior and exterior spans of precast systems with cast-in-place joints resulting in restraint equivalent to that which would exist in Condition III, item A | Restrained |
| D. | All types of prefabricated floor or roof systems where the structural members are secured to such systems and the potential thermal expansion of the floor or roof system is resisted by the framing system or the adjoining floor or roof construction ^b | Restrained |
| IV. | Wood Construction: | |
| A. | All types. | Unrestrained |

^a Floor and roof systems can be considered restrained if they are tied into walls with or without tie beams, and the walls are designed and detailed to resist thermal thrust from the floor or roof system.

^b For example, resistance to potential thermal expansion is considered to be achieved if:

1. Continuous structural concrete topping is used.
2. The space between the ends of precast units or between the ends of units and the vertical face of supports is filled with concrete or mortar.
3. The space between the ends of precast units and the vertical faces of supports or between the ends of solid or hollow core slab units does not exceed 0.25 percent of the length for normal-weight concrete members or 0.1 percent of the length for structural light-weight concrete members.

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Units

Geometry Unit:

Plan Dimensions: feet
Angles: degrees

Slab Thickness: inches
Elevations: inches

Support Dimensions: inches
Support Height: feet

Loading and Reaction Unit

Point Force: Kips
- Report As Zero: 0 Kips
Point Moment: kip-ft
- Report As Zero: 0 kip-ft

Line Force: kips/ft
- Report As Zero: 0 kips/ft
Line Moment: Kips
- Report As Zero: 0 Kips

Area Force: psf
- Report As Zero: 0 psf
Area Moment: #/foot
- Report As Zero: 0 #/foot

Spring and Stiffness Unit

Point Force Spring: kips/in
Point Moment Spring: k-ft/°

Line Force Spring: ksi
Line Moment Spring: k/°

Area Force Spring: pci
Area Moment Spring: k/ft°

Slab Analysis Unit:

Force: Kips
- Report As Zero: 0 Kips
Force Per Width: kips/ft
- Report As Zero: 0 kips/ft

Moment: kip-ft
- Report As Zero: 0 kip-ft
Moment Per Width: Kips
- Report As Zero: 0 Kips

Concrete Stress: psi
- Report As Zero: 0 psi
Deflection: inches
- Report As Zero: 0 inches

Materials Units:

Concrete Volume: yd³
Tendon Force: Kips
Reinforcing Stress: ksi

Reinforcing Area: in²
Tendon Force Per Width: kips/ft
PT Weight: pounds

Reinforcement Weight: tons
Tendon Profile: inches
Cover: inches

Units (2)

Miscellaneous Unit

Floor Area: ft²

Density: pcf

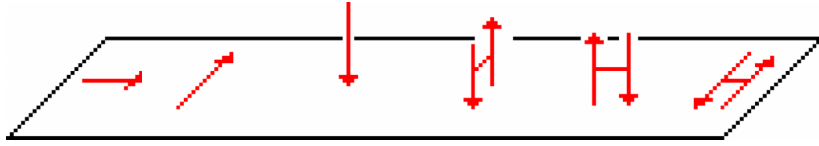
Elongations: inches

Tendon Angles (for friction): radians

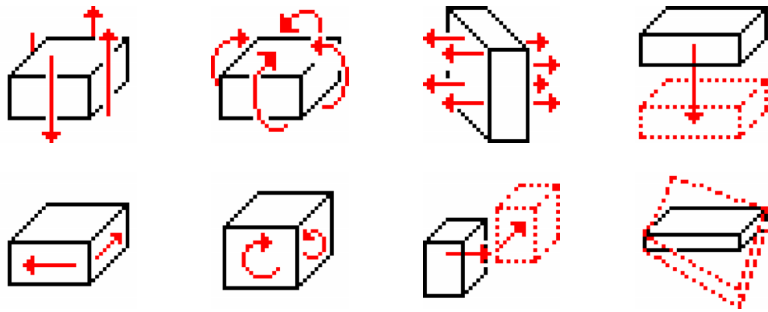
Temperature Change: °F

Signs

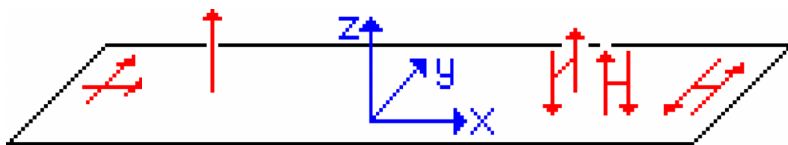
Positive Loads



Positive Analysis



Positive Reactions



Materials

Concrete Mix

| Mix Name | Density (pcf) | Density For Loads (pcf) | f_{ci} (psi) | f_c (psi) | f_{cui} (psi) | f_{cu} (psi) | Poissons Ratio | Thermal Exp Coeff | E_c Calc | User E_{ci} (psi) | User E_c (psi) |
|--------------|---------------|-------------------------|----------------|-------------|-----------------|----------------|----------------|-------------------|------------|---------------------|------------------|
| 3000 psi | 150 | 150 | 3000 | 3000 | 3725 | 3725 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 4000 psi | 150 | 150 | 3000 | 4000 | 3725 | 4975 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 5000 psi | 150 | 150 | 3000 | 5000 | 3725 | 6399 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 6000 psi | 150 | 150 | 3000 | 6000 | 3725 | 7450 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 5000 psi (2) | 145 | 150 | 3750 | 5000 | 4558 | 6399 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 4000 psi (2) | 145 | 150 | 3000 | 4000 | 3725 | 4975 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 6000 psi (2) | 145 | 150 | 4500 | 6000 | 5590 | 7450 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |

PT Systems

| System Name | Type | A_{ps} (in ²) | E_{ps} (ksi) | f_{se} (ksi) | f_{py} (ksi) | f_{pu} (ksi) | Duct Width (inches) | Strands Per Duct | Min Radius (feet) |
|---------------|----------|-----------------------------|----------------|----------------|----------------|----------------|---------------------|------------------|-------------------|
| 1/2" Unbonded | unbonded | 0.153 | 28000 | 175 | 243 | 270 | 0.5 | 1 | 6 |
| 1/2" Bonded | bonded | 0.153 | 28000 | 160 | 243 | 270 | 3 | 4 | 6 |
| 0.6" Unbonded | unbonded | 0.217 | 28000 | 175 | 243 | 270 | 0.6 | 1 | 8 |
| 0.6" Bonded | bonded | 0.217 | 28000 | 160 | 243 | 270 | 4 | 4 | 8 |

PT Stressing Parameters

| System Name | Jacking Stress (ksi) | Seating Loss (inches) | Anchor Friction | Wobble Friction (1/feet) | Angular Friction (1/radians) | Long-Term Losses (ksi) |
|---------------|----------------------|-----------------------|-----------------|--------------------------|------------------------------|------------------------|
| 1/2" Unbonded | 216 | 0.25 | 0 | 0.0014 | 0.07 | 22 |
| 1/2" Bonded | 216 | 0.25 | 0.02 | 0.001 | 0.2 | 22 |
| 0.6" Unbonded | 216 | 0.25 | 0 | 0.0014 | 0.07 | 22 |
| 0.6" Bonded | 216 | 0.25 | 0.02 | 0.001 | 0.2 | 22 |

Materials (2)

Reinforcing Bars

| <i>Bar Name</i> | <i>As (in²)</i> | <i>Es (ksi)</i> | <i>Fy (ksi)</i> | <i>Coating</i> | <i>Straight Ld/Db</i> | <i>90 Hook Ld/Db</i> | <i>180 Hook Ld/Db</i> |
|-----------------|----------------------------|-----------------|-----------------|----------------|-----------------------|----------------------|-----------------------|
| #3 | 0.11 | 29000 | 60 | None | Code | Code | Code |
| #4 | 0.2 | 29000 | 60 | None | Code | Code | Code |
| #5 | 0.31 | 29000 | 60 | None | Code | Code | Code |
| #6 | 0.44 | 29000 | 60 | None | Code | Code | Code |
| #7 | 0.6 | 29000 | 60 | None | Code | Code | Code |
| #8 | 0.79 | 29000 | 60 | None | Code | Code | Code |
| #9 | 1 | 29000 | 60 | None | Code | Code | Code |
| #10 | 1.27 | 29000 | 60 | None | Code | Code | Code |
| #11 | 1.56 | 29000 | 60 | None | Code | Code | Code |

SSR Systems

| <i>SSR System Name</i> | <i>Stud Area (in²)</i> | <i>Head Area (in²)</i> | <i>Min Clear Head Spacing (inches)</i> | <i>Specified Stud Spacing (inches)</i> | <i>Fy (ksi)</i> | <i>Stud Spacing Rounding Increment (inches)</i> | <i>Min Studs Per Rail</i> | <i>System Type</i> |
|--------------------------|-----------------------------------|-----------------------------------|--|--|-----------------|---|---------------------------|--------------------|
| 3/8" SSR | 0.11 | 1.11 | 0.5 | None | 50 | 0.25 | 2 | Rail |
| 1/2" SSR | 0.196 | 1.96 | 0.5 | None | 50 | 0.25 | 2 | Rail |
| 5/8" SSR | 0.307 | 3.07 | 0.5 | None | 50 | 0.25 | 2 | Rail |
| 3/4" SSR | 0.442 | 4.42 | 0.5 | None | 50 | 0.25 | 2 | Rail |
| Ancon Shearfix Auto-Size | 0.217 | 1.096 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 10 mm | 0.1217 | 1.096 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 12 mm | 0.1753 | 1.578 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 14 mm | 0.2386 | 2.147 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 16 mm | 0.3116 | 2.805 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 20 mm | 0.4869 | 4.383 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 24 mm | 0.7012 | 6.311 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |

Loadings

| <i>Loading Name</i> | <i>Type</i> | <i>Analysis</i> | <i>On-Pattern Factor</i> | <i>Off-Pattern Factor</i> |
|----------------------------------|-------------------------------|-----------------|--------------------------|---------------------------|
| Self-Dead Loading | Self-Weight | Normal | 1 | 1 |
| Balance Loading | Balance | Normal | 1 | 1 |
| Balanced Load (transfer) | Balance (transfer) | Normal | 1 | 1 |
| Hyperstatic Loading | Hyperstatic | Hyperstatic | 1 | 1 |
| Construction Dead Load | Stressing Dead | Normal | 1 | 1 |
| Dead Load | Dead | Normal | 1 | 1 |
| Dead Load (transfer) | Dead (transfer) | Normal | 1 | 1 |
| Live Load Reducible | Live (Reducible) | Normal | 1 | 0 |
| Live Load Reducible (transfer) | Live (Reducible) (transfer) | Normal | 1 | 0 |
| Live Load Unreducible | Live (Unreducible) | Normal | 1 | 0 |
| Partition Load | Live (Unreducible) | Normal | 1 | 0 |
| Live Load Unreducible (transfer) | Live (Unreducible) (transfer) | Normal | 1 | 0 |
| Live Load Storage | Live (Storage) | Normal | 1 | 0 |
| Live Load Storage (transfer) | Live (Storage) (transfer) | Normal | 1 | 0 |
| Live Load Roof | Live (Roof) | Normal | 1 | 0 |
| Live Load Roof (transfer) | Live (Roof) (transfer) | Normal | 1 | 0 |

Load Combinations

All Dead LC

Active Design Criteria: <none>

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Dead Load | 1 | 1 |
| Dead Load (transfer) | 1 | 1 |

Dead + Balance LC

Active Design Criteria: <none>

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|--------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Balanced Load (transfer) | 1 | 1 |
| Dead Load | 1 | 1 |
| Dead Load (transfer) | 1 | 1 |

Initial Service LC

Active Design Criteria: Initial Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1.13 | 1.13 |
| Construction Dead Load | 1 | 1 |

Load Combinations (2)

Service LC: D + L

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Balanced Load (transfer) | 1 | 1 |
| Dead Load | 1 | 1 |
| Dead Load (transfer) | 1 | 1 |
| Live Load Reducible | 1 | 0 |
| Live Load Reducible (transfer) | 1 | 0 |
| Live Load Unreducible | 1 | 0 |
| Partition Load | 1 | 0 |
| Live Load Unreducible (transfer) | 1 | 0 |
| Live Load Storage | 1 | 0 |
| Live Load Storage (transfer) | 1 | 0 |

Service LC: D + Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|---------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Balanced Load (transfer) | 1 | 1 |
| Dead Load | 1 | 1 |
| Dead Load (transfer) | 1 | 1 |
| Live Load Roof | 1 | 0 |
| Live Load Roof (transfer) | 1 | 0 |

Service LC: D + S

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|--------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Balanced Load (transfer) | 1 | 1 |
| Dead Load | 1 | 1 |
| Dead Load (transfer) | 1 | 1 |

Load Combinations (3)

Service LC: D + 0.75L + 0.75Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Balanced Load (transfer) | 1 | 1 |
| Dead Load | 1 | 1 |
| Dead Load (transfer) | 1 | 1 |
| Live Load Reducible | 0.75 | 0 |
| Live Load Reducible (transfer) | 0.75 | 0 |
| Live Load Unreducible | 0.75 | 0 |
| Partition Load | 0.75 | 0 |
| Live Load Unreducible (transfer) | 0.75 | 0 |
| Live Load Storage | 0.75 | 0 |
| Live Load Storage (transfer) | 0.75 | 0 |
| Live Load Roof | 0.75 | 0 |
| Live Load Roof (transfer) | 0.75 | 0 |

Service LC: D + 0.75L + 0.75S

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Balanced Load (transfer) | 1 | 1 |
| Dead Load | 1 | 1 |
| Dead Load (transfer) | 1 | 1 |
| Live Load Reducible | 0.75 | 0 |
| Live Load Reducible (transfer) | 0.75 | 0 |
| Live Load Unreducible | 0.75 | 0 |
| Partition Load | 0.75 | 0 |
| Live Load Unreducible (transfer) | 0.75 | 0 |
| Live Load Storage | 0.75 | 0 |
| Live Load Storage (transfer) | 0.75 | 0 |

Load Combinations (4)

Sustained Service LC

Active Design Criteria: Sustained Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Balanced Load (transfer) | 1 | 1 |
| Dead Load | 1 | 1 |
| Dead Load (transfer) | 1 | 1 |
| Live Load Reducible | 0.5 | 0.5 |
| Live Load Reducible (transfer) | 0.5 | 0.5 |
| Live Load Unreducible | 0.5 | 0.5 |
| Partition Load | 0.5 | 0.5 |
| Live Load Unreducible (transfer) | 0.5 | 0.5 |
| Live Load Storage | 1 | 1 |
| Live Load Storage (transfer) | 1 | 1 |
| Live Load Roof | 0.5 | 0.5 |
| Live Load Roof (transfer) | 0.5 | 0.5 |

Factored LC: 1.4D

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1.4 | 0.9 |
| Hyperstatic Loading | 1 | 1 |
| Dead Load | 1.4 | 0.9 |
| Dead Load (transfer) | 1.4 | 0.9 |

Load Combinations (5)

Factored LC: 1.2D + 1.6L + 0.5Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1.2 | 0.9 |
| Hyperstatic Loading | 1 | 1 |
| Dead Load | 1.2 | 0.9 |
| Dead Load (transfer) | 1.2 | 0.9 |
| Live Load Reducible | 1.6 | 0 |
| Live Load Reducible (transfer) | 1.6 | 0 |
| Live Load Unreducible | 1.6 | 0 |
| Partition Load | 1.6 | 0 |
| Live Load Unreducible (transfer) | 1.6 | 0 |
| Live Load Storage | 1.6 | 0 |
| Live Load Storage (transfer) | 1.6 | 0 |
| Live Load Roof | 0.5 | 0 |
| Live Load Roof (transfer) | 0.5 | 0 |

Factored LC: 1.2D + f1L + 1.6Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1.2 | 0.9 |
| Hyperstatic Loading | 1 | 1 |
| Dead Load | 1.2 | 0.9 |
| Dead Load (transfer) | 1.2 | 0.9 |
| Live Load Reducible | 0.5 | 0 |
| Live Load Reducible (transfer) | 0.5 | 0 |
| Live Load Unreducible | 1 | 0 |
| Partition Load | 1 | 0 |
| Live Load Unreducible (transfer) | 1 | 0 |
| Live Load Storage | 1 | 0 |
| Live Load Storage (transfer) | 1 | 0 |
| Live Load Roof | 1.6 | 0 |
| Live Load Roof (transfer) | 1.6 | 0 |

Load Combinations (6)

Factored LC: 1.2D + 1.6L + 0.5S

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1.2 | 0.9 |
| Hyperstatic Loading | 1 | 1 |
| Dead Load | 1.2 | 0.9 |
| Dead Load (transfer) | 1.2 | 0.9 |
| Live Load Reducible | 1.6 | 0 |
| Live Load Reducible (transfer) | 1.6 | 0 |
| Live Load Unreducible | 1.6 | 0 |
| Partition Load | 1.6 | 0 |
| Live Load Unreducible (transfer) | 1.6 | 0 |
| Live Load Storage | 1.6 | 0 |
| Live Load Storage (transfer) | 1.6 | 0 |

Factored LC: 1.2D + f1L + 1.6S

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1.2 | 0.9 |
| Hyperstatic Loading | 1 | 1 |
| Dead Load | 1.2 | 0.9 |
| Dead Load (transfer) | 1.2 | 0.9 |
| Live Load Reducible | 0.5 | 0 |
| Live Load Reducible (transfer) | 0.5 | 0 |
| Live Load Unreducible | 1 | 0 |
| Partition Load | 1 | 0 |
| Live Load Unreducible (transfer) | 1 | 0 |
| Live Load Storage | 1 | 0 |
| Live Load Storage (transfer) | 1 | 0 |

Design Rules

Code Minimum Desig

318-14 Min. Reinforcement

User Minimum Desig

Specified Min. Reinforcement

Initial Service Desig

318-14 Initial Service Design

Service Design

318-14 Service Design

Include detailed section analysis

Sustained Service Desig

318-14 Sustained Service Design

Strength Design

318-14 Strength Design

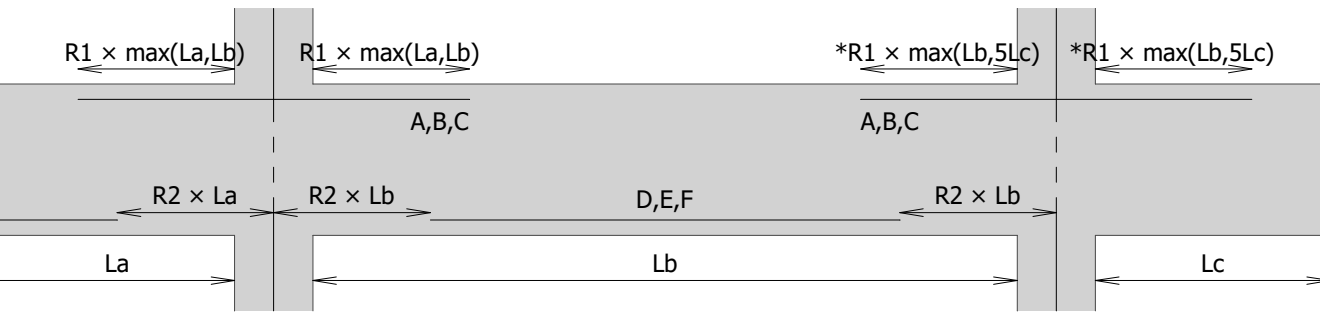
Punching Shear Design

Ductility Desig

318-14 Ductility Design

Detailing Rules

Custom Span Detailing Rules



| Rule Name | A Fraction | A R1 | B Fraction | B R1 | C Fraction | C R1 | D Fraction | D R2 | E Fraction | E R2 | F Fraction | F R2 |
|-----------|------------|------|------------|------|------------|------|------------|------|------------|------|------------|------|
| None | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

"A", "B" and "C", are support reinforcement sets, based on the peak reinforcement in the support zone.

"D", "E" and "F", are span reinforcement sets, based on the peak reinforcement in the span zone.

"*R1" is never taken as greater than 0.2 when multiplied by Lc (or Lcc).

"Fraction" is the ratio of set reinforcement to peak reinforcement. It is always in the 0.0 to 1.0 range.

Load History

| <i>Load History Step Name</i> | <i>Load Combination</i> | <i>Duration (days)</i> | <i>Total Age (days)</i> |
|-------------------------------|-------------------------|----------------------------|-----------------------------|
| Maximum Short Term Load | Service LC: D + L | 30 | 33 |
| Sustained Load | Sustained Service LC | 5000 | 5033 |
| Final Instantaneous Load | Service LC: D + L | 0 | 5033 |

Tendon Parameters Groups

Banded Tendon Polyline Groups

| <i>Group</i> | <i>PT</i> | <i>I.P.</i> | <i>Eff. Force</i> | <i>Number of</i> | <i>Min Force</i> | <i>Max Force</i> | <i>Force Incr.</i> | <i>Min</i> | <i>Max</i> | <i>Strands</i> | |
|--------------|---------------|--------------|-------------------|------------------|------------------|------------------|--------------------|---------------|----------------|----------------|------------------|
| <i>Name</i> | <i>System</i> | <i>Ratio</i> | <i>(Kips)</i> | <i>Strands</i> | <i>Optimize</i> | <i>(Kips)</i> | <i>(Kips)</i> | <i>(Kips)</i> | <i>Strands</i> | <i>Strands</i> | <i>Increment</i> |

Distributed Tendon Quadrilateral Groups

| <i>Group</i> | <i>PT</i> | <i>I.P.</i> | <i>Spacing</i> | <i>Eff. Force</i> | <i># Strands</i> | <i>Min Force</i> | <i>Max Force</i> | <i>Force Incr.</i> | <i>Min Strands</i> | <i>Max Strand</i> | <i>Strands Inc</i> | |
|--------------|---------------|--------------|----------------|-------------------|------------------|------------------|------------------|--------------------|--------------------|-------------------|--------------------|-----------------|
| <i>Name</i> | <i>System</i> | <i>Ratio</i> | <i>(feet)</i> | <i>(kips/ft)</i> | <i>(1/feet)</i> | <i>Optimize</i> | <i>(kips/ft)</i> | <i>(kips/ft)</i> | <i>(kips/ft)</i> | <i>(1/feet)</i> | <i>(1/feet)</i> | <i>(1/feet)</i> |

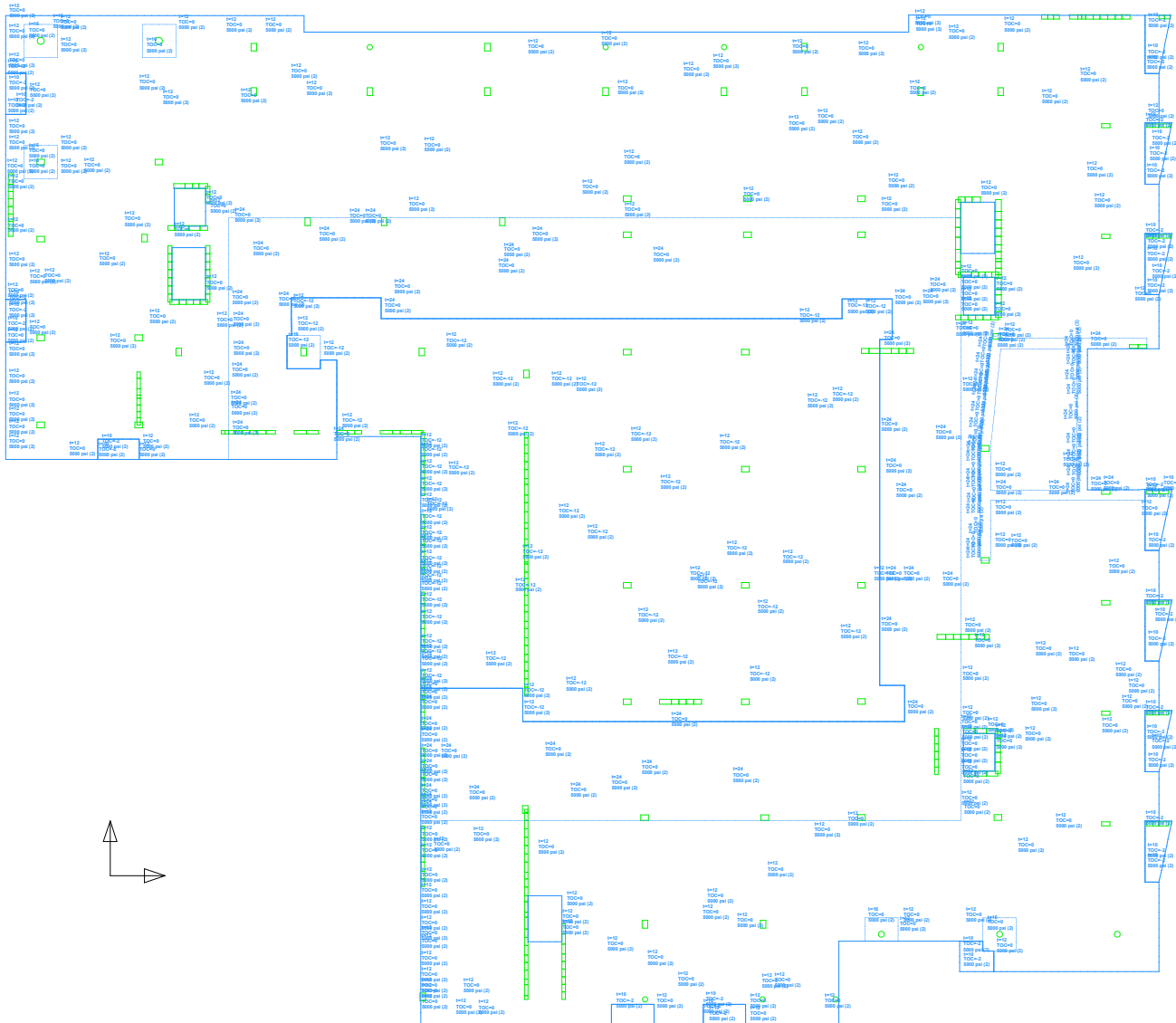
Profile Polyline Groups

| <i>Group</i> | <i>Elevation</i> | <i>Elevation</i> | <i>Min Elevation</i> | <i>Max Elevation</i> | <i>Elevation Incr.</i> | |
|--------------|------------------|------------------|----------------------|----------------------|------------------------|-----------------|
| <i>Name</i> | <i>Reference</i> | <i>(inches)</i> | <i>Optimize</i> | <i>(inches)</i> | <i>(inches)</i> | <i>(inches)</i> |

Element: Slab Summary Plan

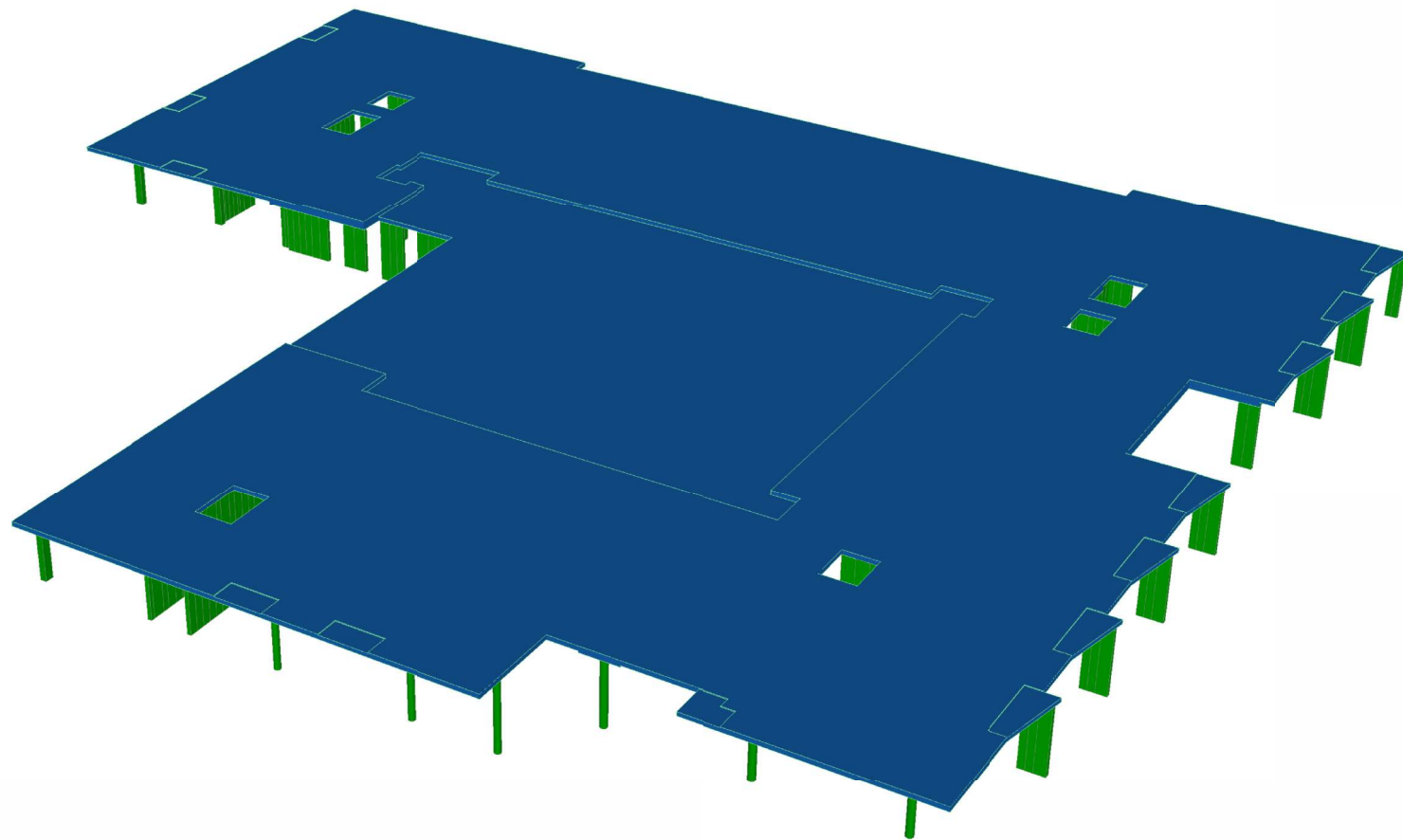
Element: User Lines, User Names, User Dimensions, Wall Elements Below, Wall Elements Above, Column Elements Below, Column Elements Above, Point Sprigs, Point Spring Name, Line Sprig, Line Sprig Name, Dbl Element, Dbl Element Outline Only, Slab Element Thicknesses, Dbl Element Elevations, Dbl Element Concrete Mark;

Size: 1/32



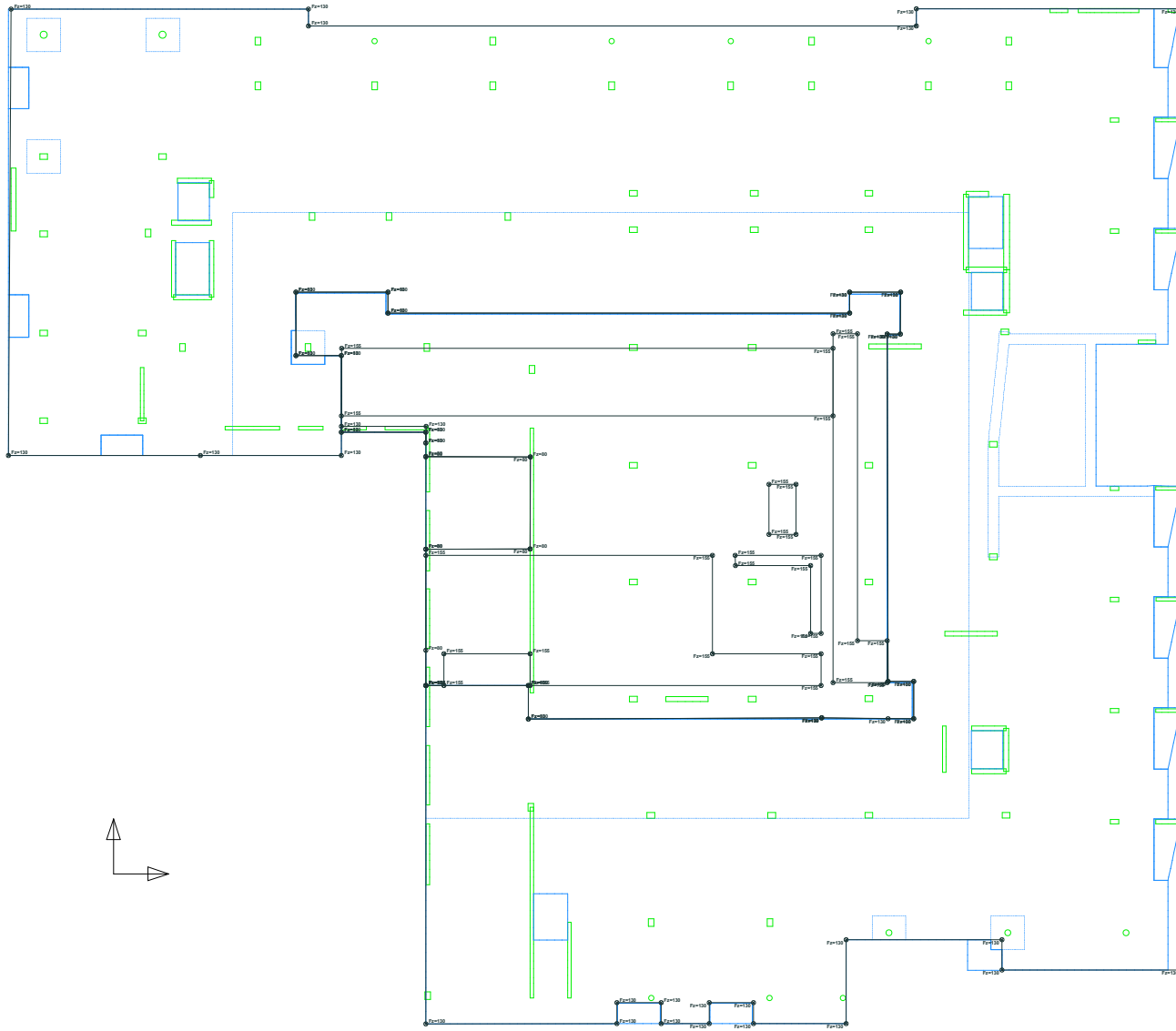
Element: Structure Summary Perspective

Wall Elements Below; Wall Elements Above; Column Elements Below; Column Elements Above; Slab Elements;



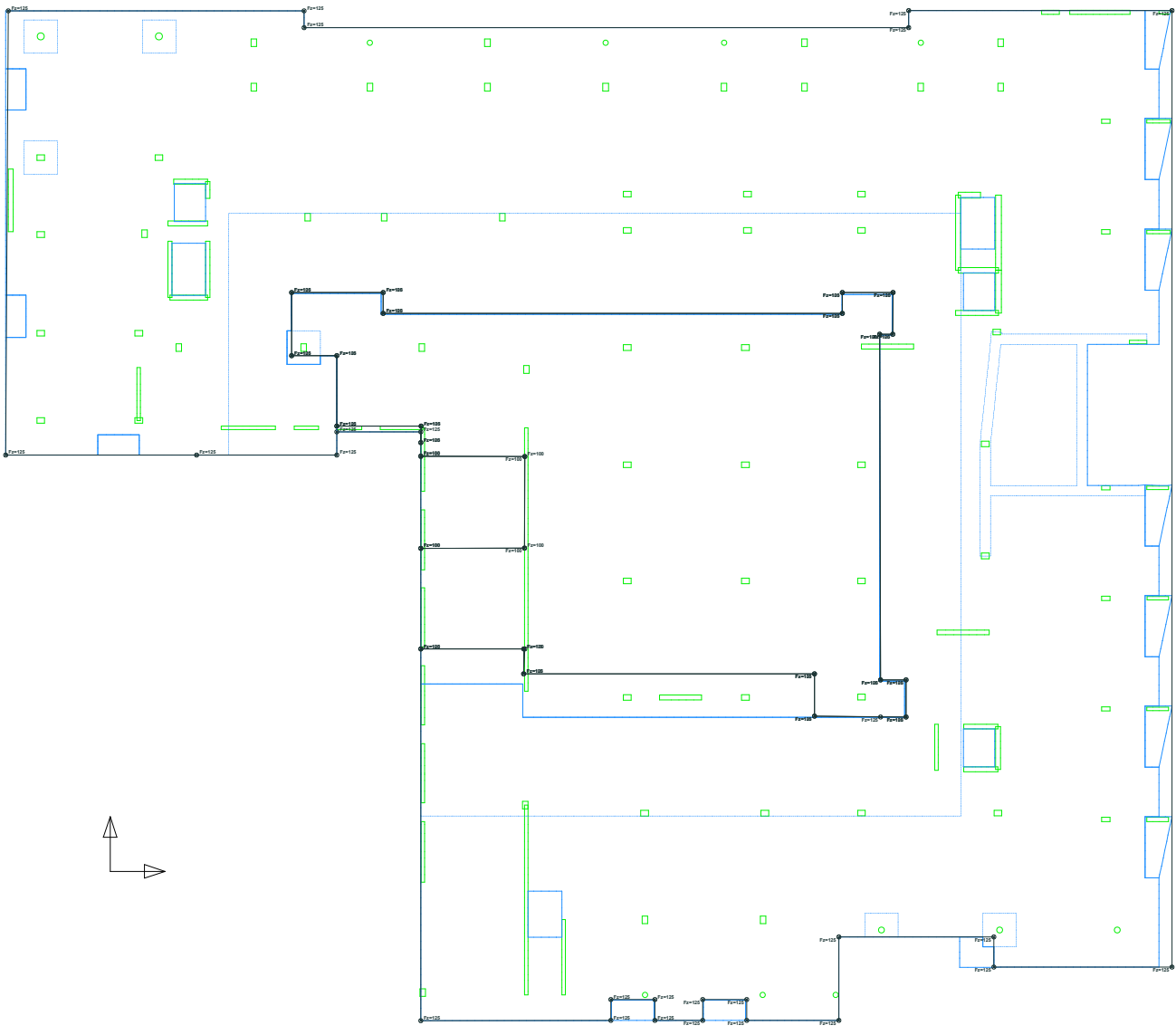
Dead Load: All Loads Plan

Dead Load: Point Loads, Point Load Name, Point Load Value, Line Loads, Line Load Name, Line Load Value, Area Loads, Area Load Name, Area Load Value, User Name, User Lines, User Dimensions,
Shaded: Wall Elements Above, Wall Elements Below, Wall Element Outline Only, Column Elements Above, Column Elements Below, Slab Elements, Slab Element Outline Only,
Scale = 1/32



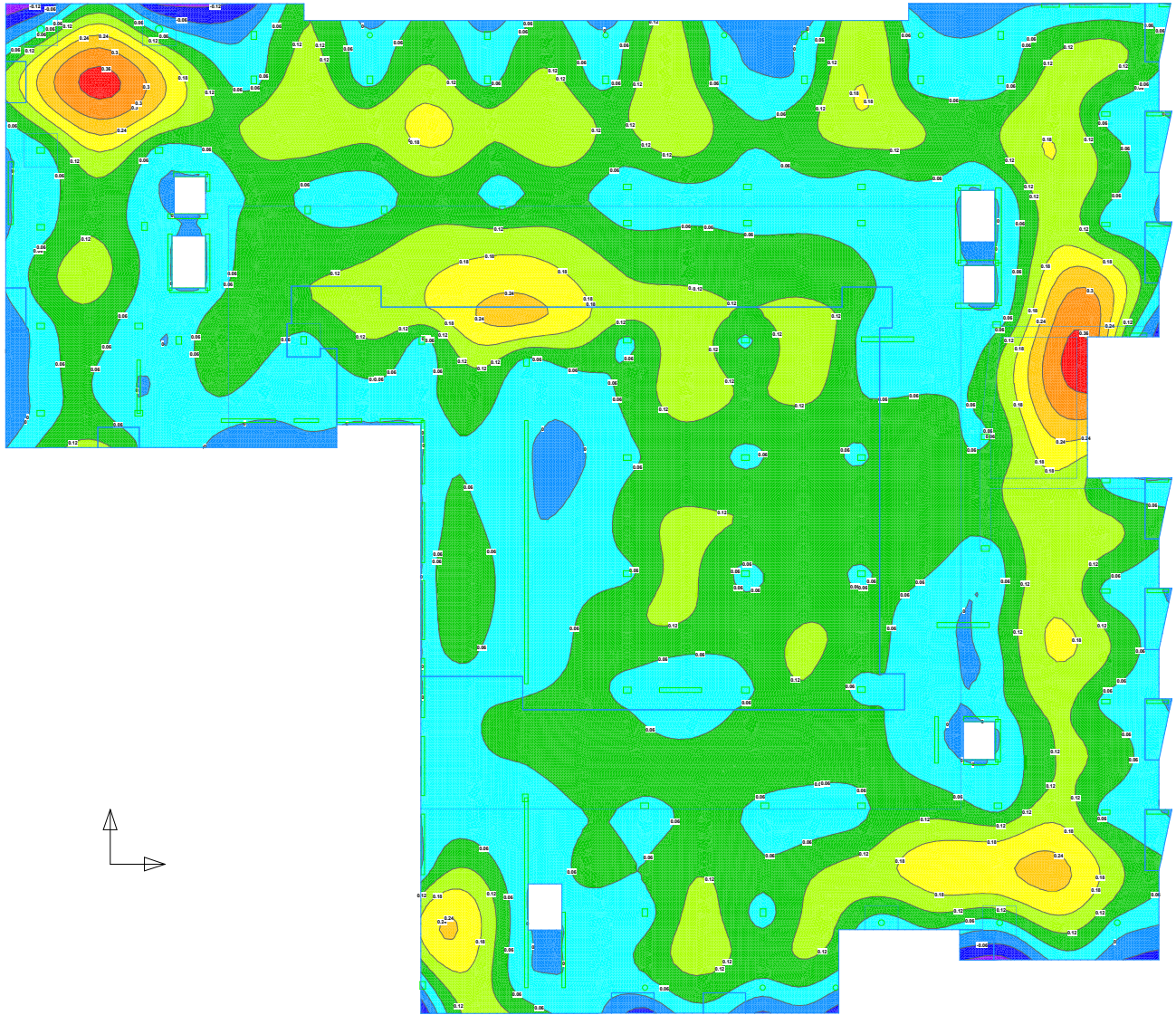
Live Load Unreducible: All Loads Plan

Live Load Unreducible: Clear Lines; User Notes; User Dimension; Point Loads; Point Load Issue; Point Load Value; Line Loads; Line Load Issue; Line Load Value; Area Loads; Area Load Issue; Area Load Value;
Shaded: Wall Elements Below; Wall Elements Above; Wall Elements Outside Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1/32



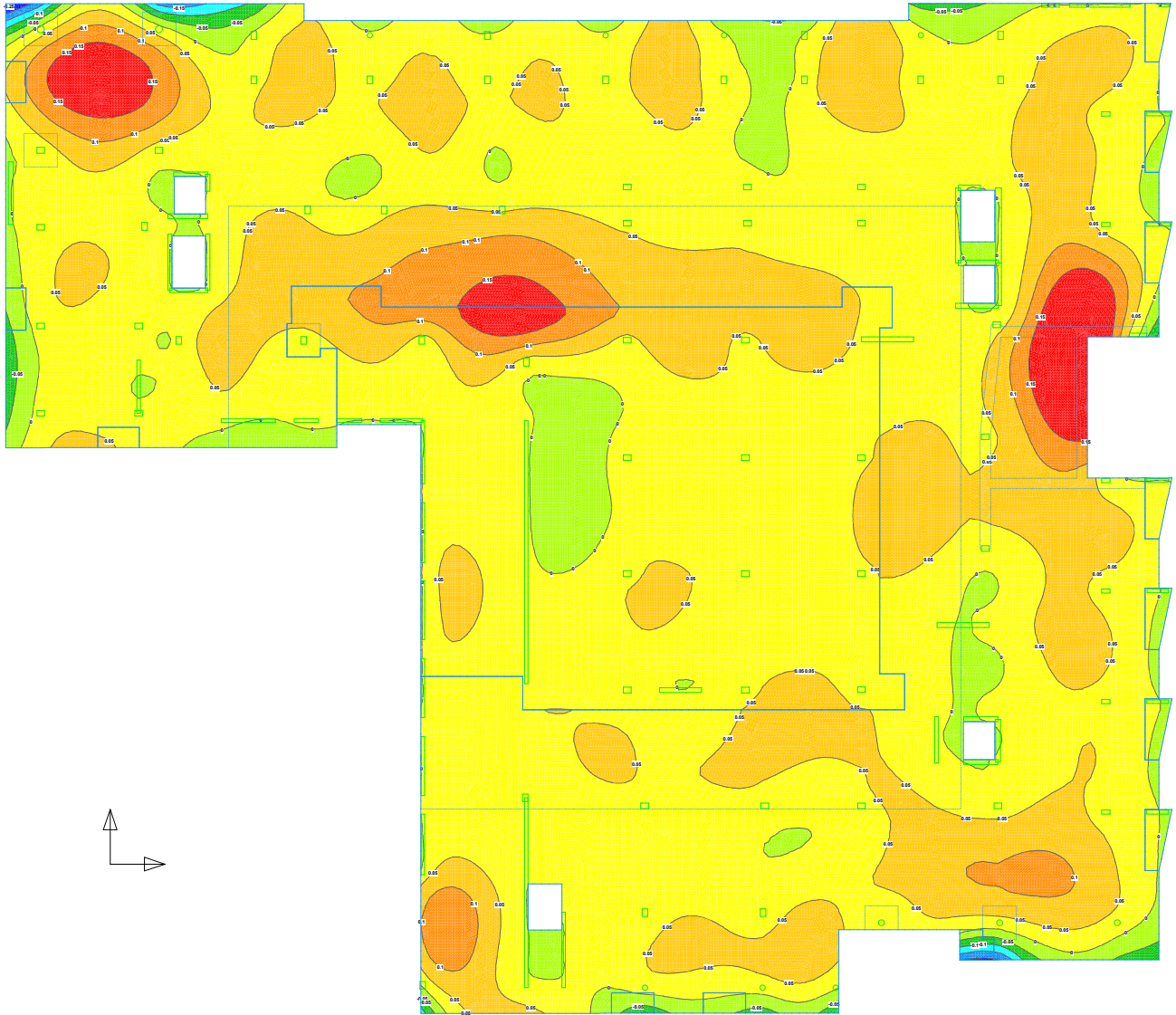
Service LC: D + L: Max Deflection Plan

Service LC: D + L: User Lines, User Deflec, User Drawings
Element: Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only
Scale = 1/200
Service LC: D + L: Vertical Deflection Plot (Maximum Values)
Min Value = -0.1794 inches @ (125,65,206.2) Max Value = 0.3918 inches @ (234,119.2)



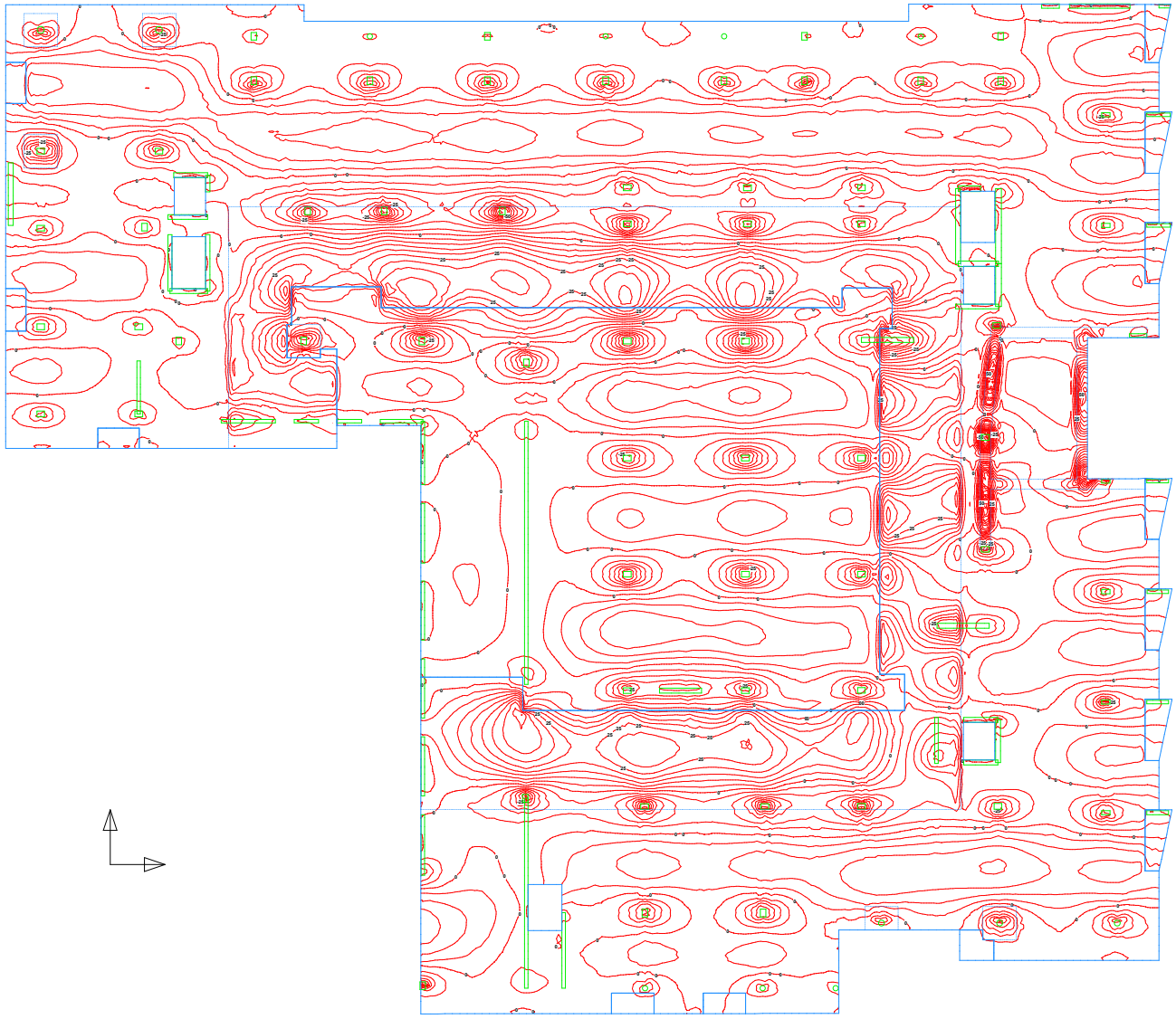
Service LC: D + L: Min Deflection Plan

Service LC: D + L: User Lines, User Deflex, User Dimensions
Element: Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only
Scale: 1/32"
Service LC: D + L - Vertical Deflection Plot (Minimum Values)
Min Value = -0.2763 inches @ (125.95,286.2) Max Value = 0.2691 inches @ (234.3,171.8)



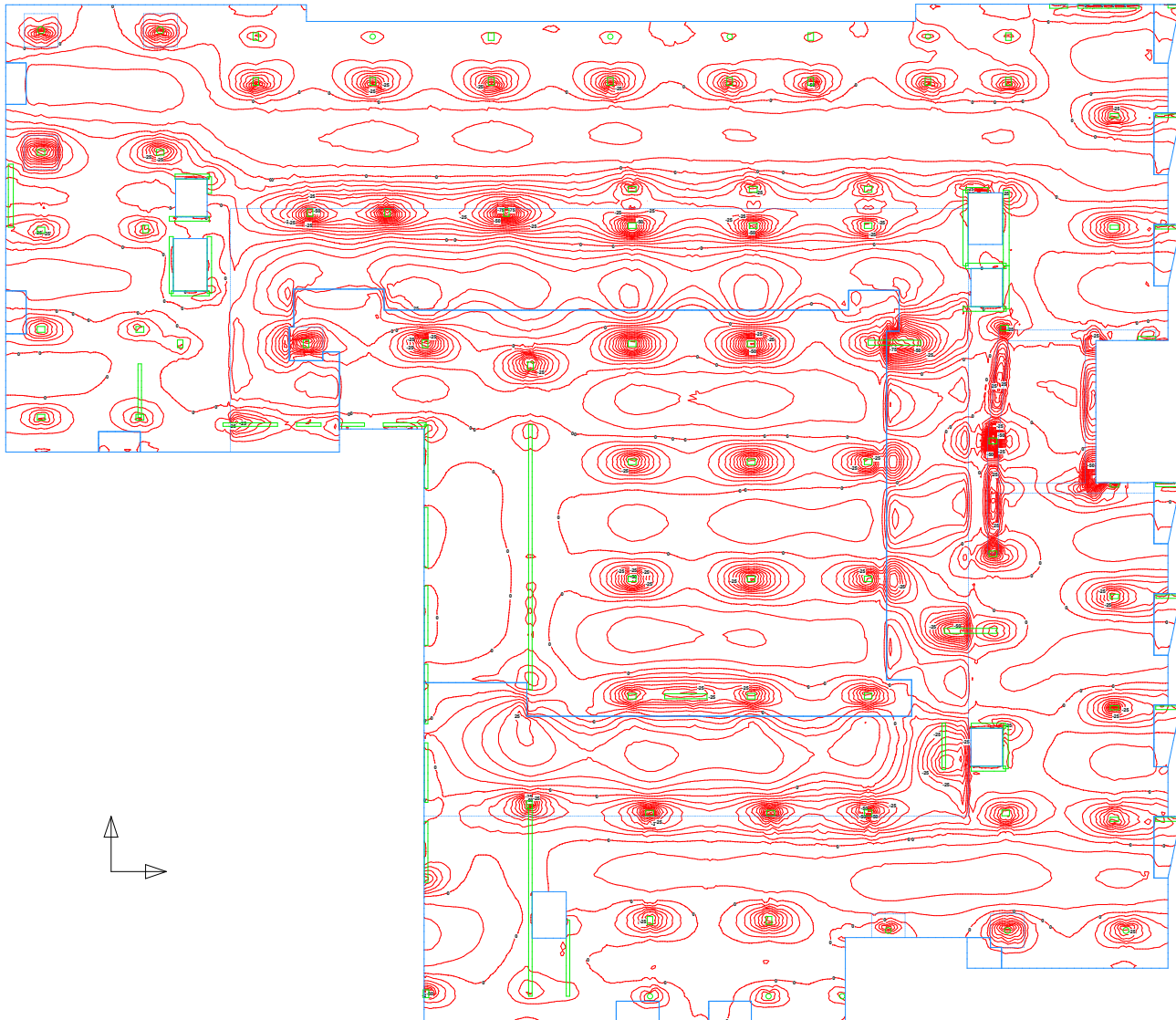
Factored LC: 1.4D: Max Mx Plan

Factored LC: 1.4D: User Lines, User Beams, User Dimensions
Element: Max Elements Below, Max Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only
Scale = 1/32
Factored LC: 1.4D: Bending Moment Plot (Maximum Moment) (X-Axis Direction)
One Direction = 1 Edge
Min Value = 64.22 Kip @ (218.4,162.6) Max Value = 47.29 Kip @ (218.4,88.6)



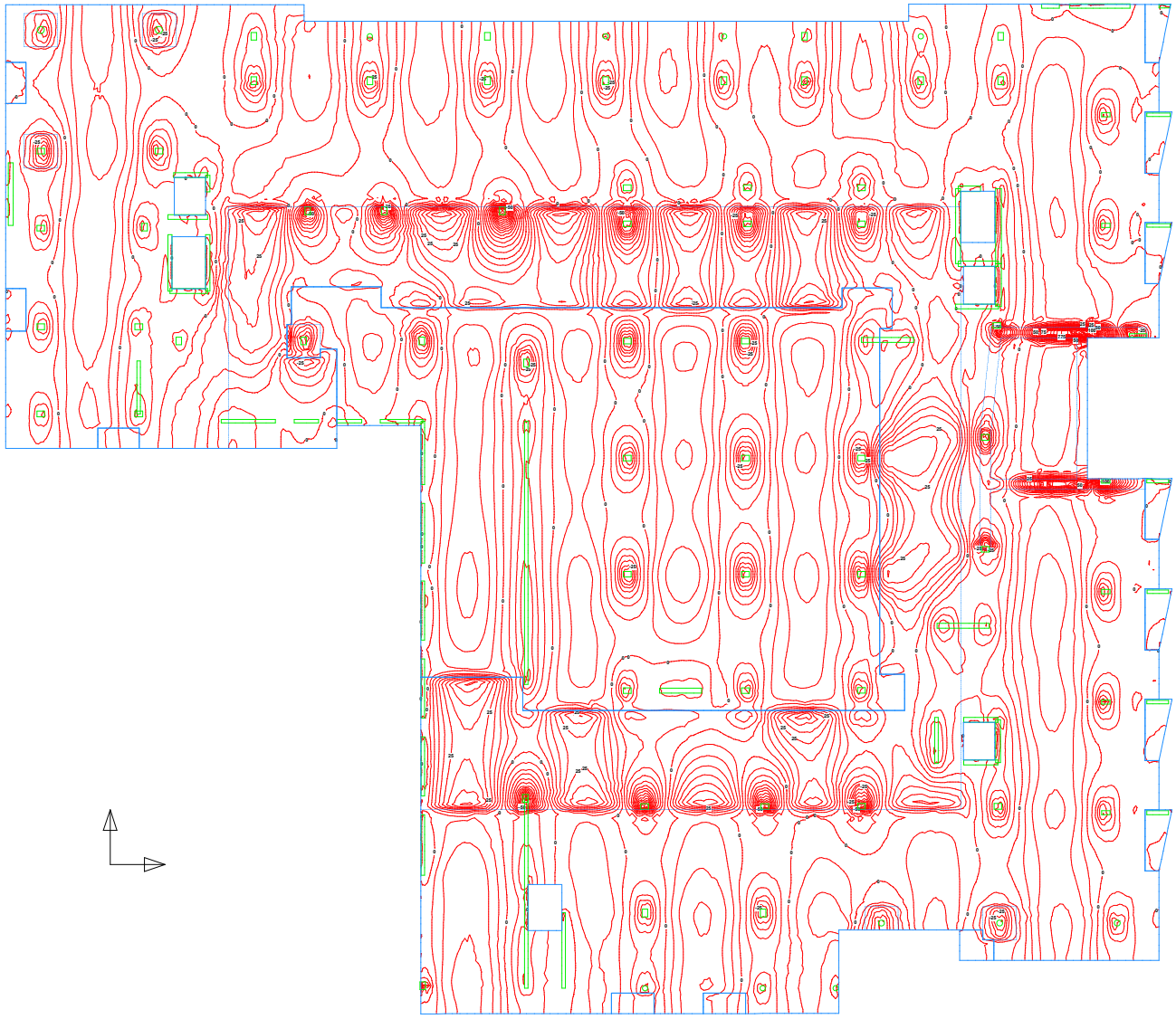
Factored LC: 1.4D: Min Mx Plan

Factored LC: 1.4D: User Lines, User Beams, User Dimensions.
Element: Min Elements Below, Min Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only.
Scale = 1/32
Factored LC: 1.4D: Bending Moment Plus (Minimum Value) (X-Axis Direction)
Min Moment = -2.00k
Min Value = -146.2 Kip @ (216.4,162.6) Max Value = 43.26 Kip @ (216.4,88.6)



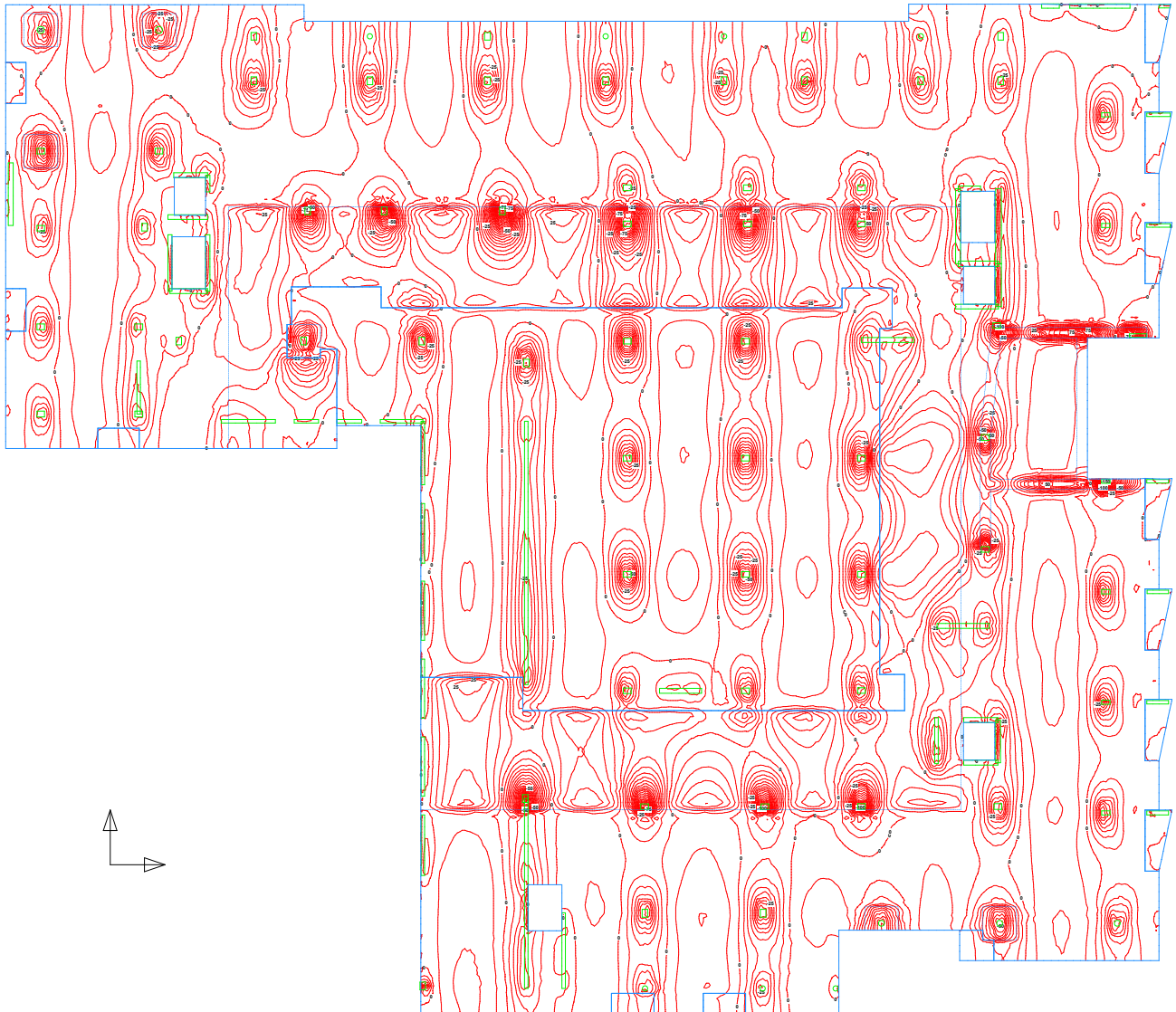
Factored LC: 1.4D: Max My Plan

Factored LC: 1.4D: User Lines, User Defms, User Dimensions
Element: Max Elements Below, Min Elements Above, Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1/32
Factored LC: 1.4D: Bending Moment Plot (Maximum Values) (Y-Axis Direction)
One Direction = 2 Edge
Min Value = -105.4 Kip @ (277.8,32.23) Max Value = 139.3 Kip @ (255.4,126.9)



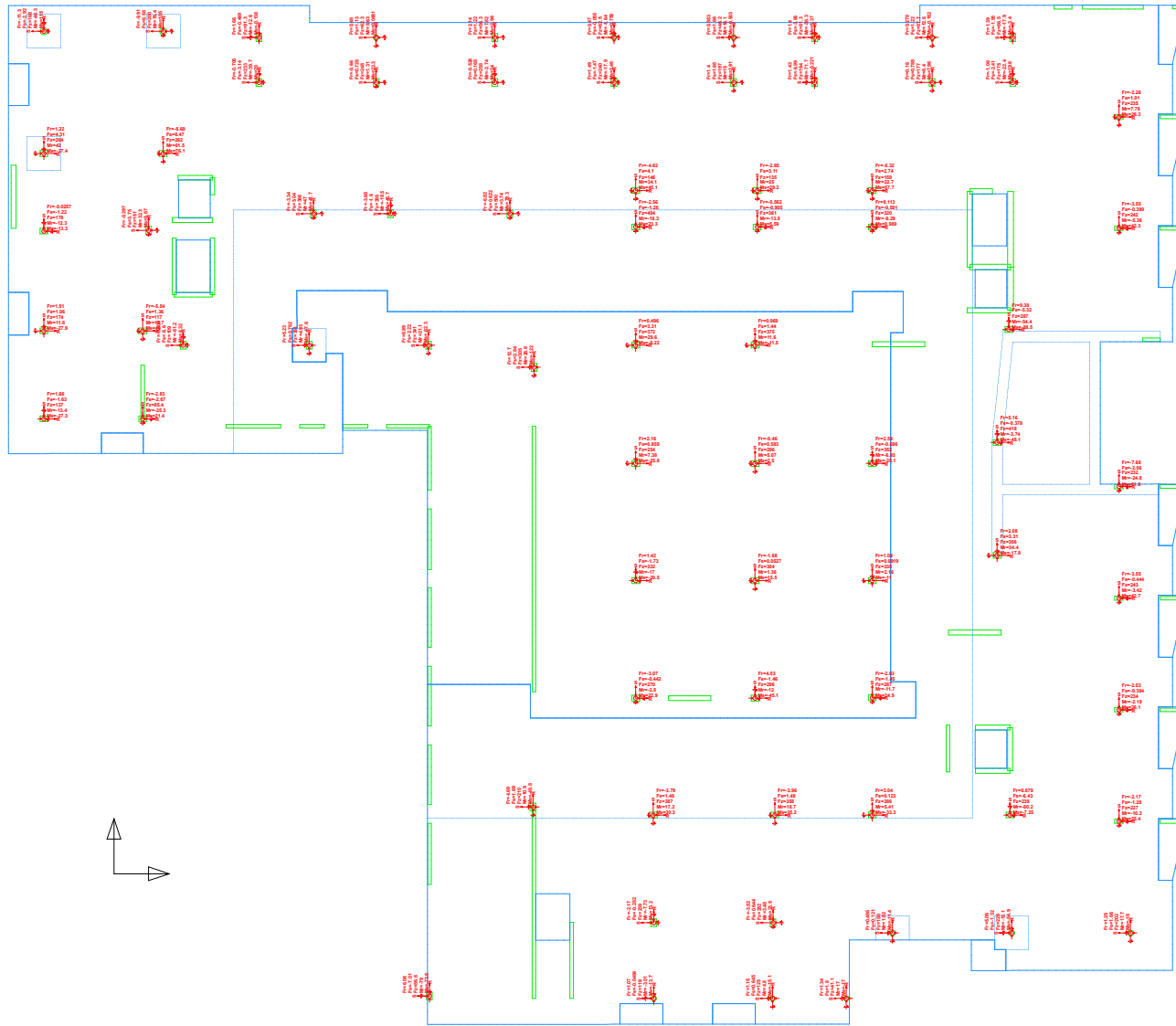
Factored LC: 1.4D: Min My Plan

Factored LC: 1.4D: User Lines, User Define, User Dimensions.
Element: Min Elements Below, Min Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only.
Scale = 1/32
Unit Conversion = 0.001
Factored LC: 1.4D: Bending Moment Plot (Minimum Values) (Y Axis Direction)
Min Value = -176.2 Kip @ (277.8, 82.23) Max Value = 83.54 Kip @ (255.4, 126.5)



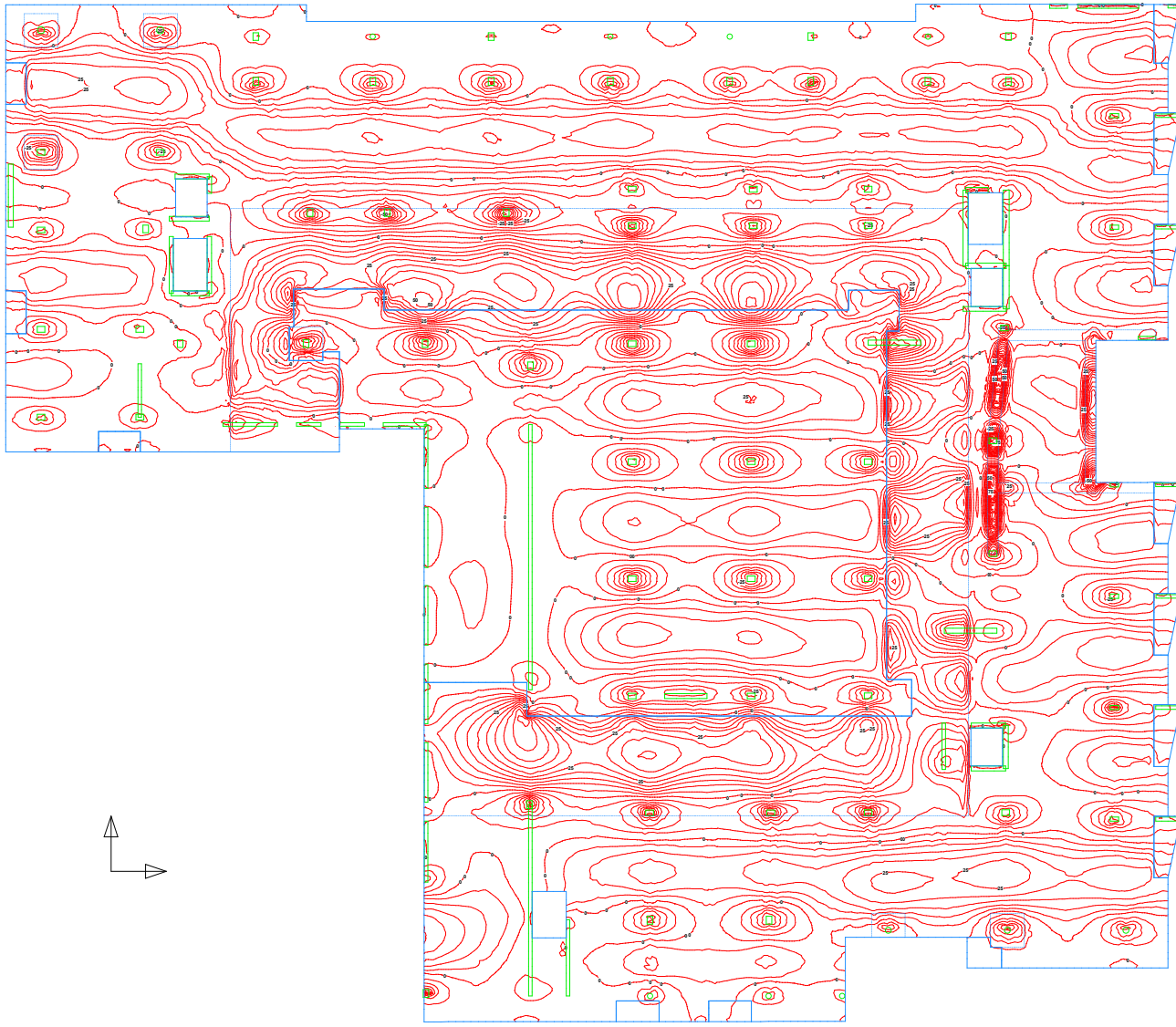
Factored LC: 1.4D: Max Reactions Plan

Factored LC: 1.4D: User Lines, User Notes, User Dimensions
Element: Wall Elements Below, Wall Elements Above, Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Element Outline Only;
Scale = 1/32
Factored LC: 1.4D: Reaction Plot (Column Below/F/F,M/M,Max/Fx Corner)



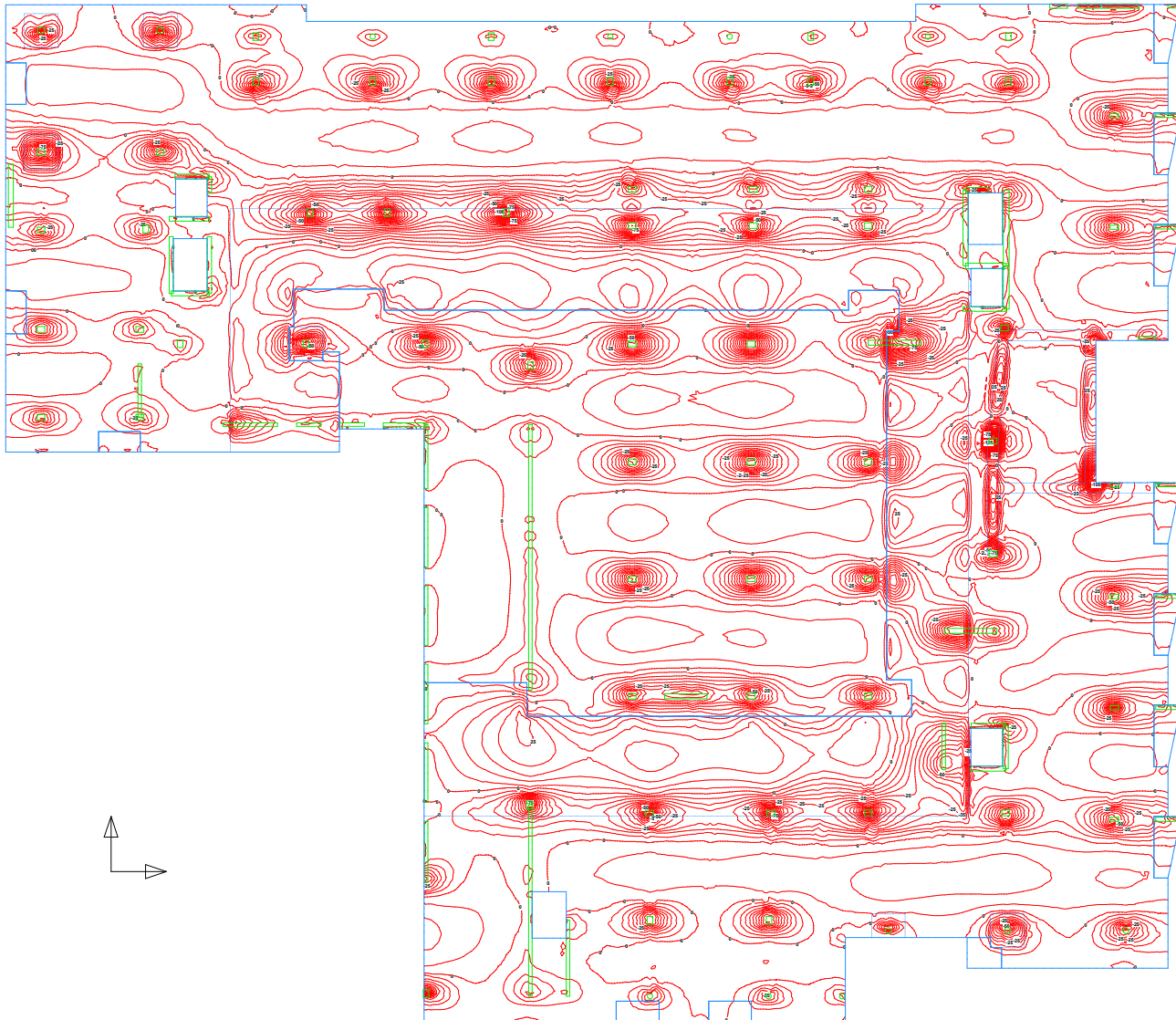
Factored LC: 1.2D + 1.6L + 0.5Lr: Max Mx Plan

Factored LC: 1.2D + 1.6L + 0.5Lr: User Notes: User Dimensions:
Element: Max Elements Below: Max Elements Above: Max Elements Outline Only: Column Elements Below: Column Elements Above: Slab Elements: Slab Element Outline Only:
Scale: 1/32
Factored LC: 1.2D + 1.6L + 0.5Lr - Bending Moment Plot (Maximum Values) (X-Axis Direction)
Min Moment = 0.00 kNm
Max Moment = 64.22 kNm @ (218.4,162.4) Max Value = 61.20 kNm @ (218.4,88.6)



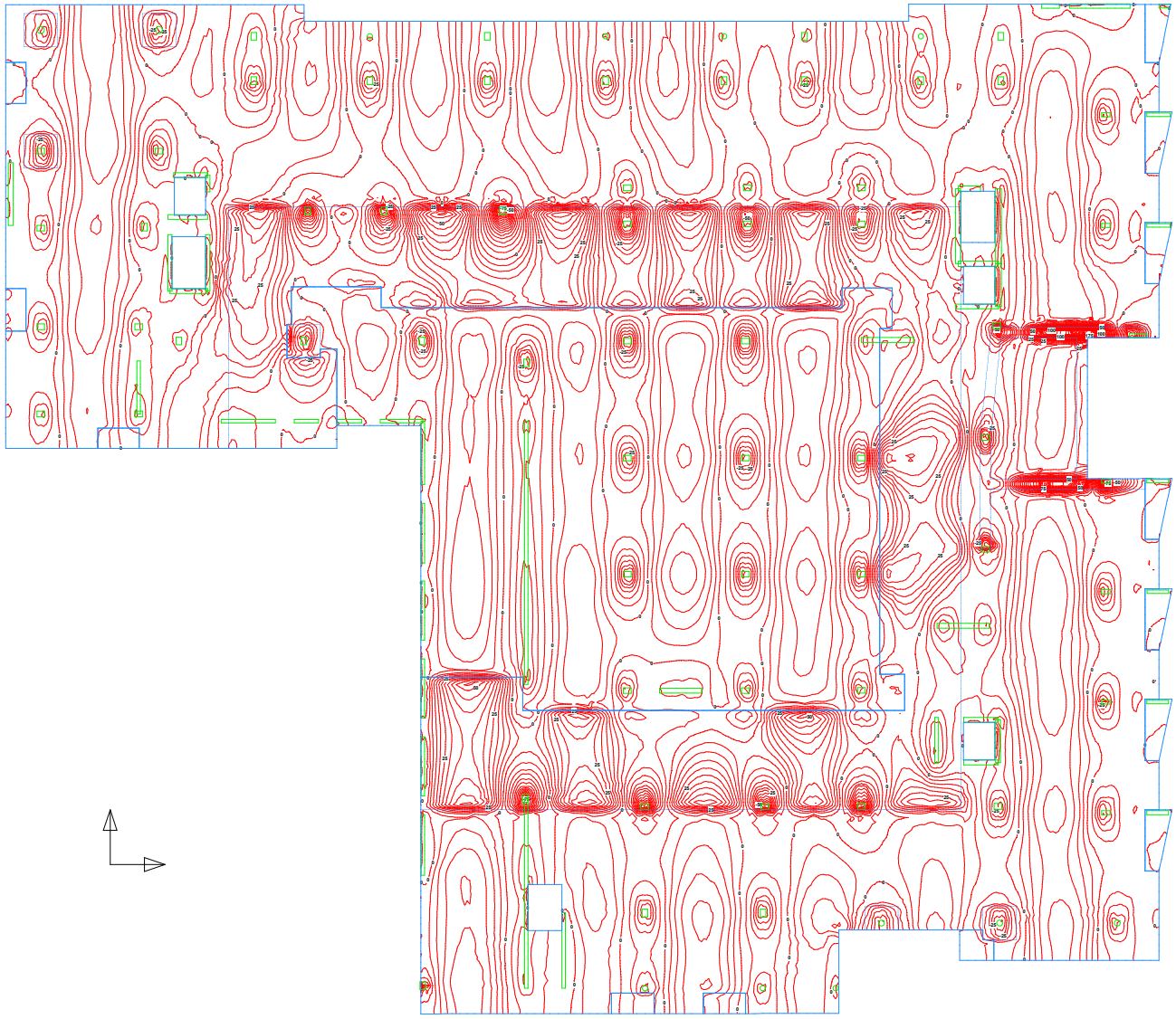
Factored LC: 1.2D + 1.6L + 0.5Lr: Min Mx Plan

Factored LC: 1.2D + 1.6L + 0.5Lr: User Notes: User Dimension:
Element: Min Element Below: Max Element Above: Wall Element Outline Only: Column Elements Below: Column Elements Above: Slab Elements: Slab Element Outline Only:
Scale = 1/32
Factored LC: 1.2D + 1.6L + 0.5Lr: Bending Moment Plot (Minimum Values) (X-Axis Direction)
Min Moment = -2.00k
Min Value = -157.4 Kip-ft @ (216.4,162.6) Max Value = 43.26 Kip-ft @ (216.4,88.6)



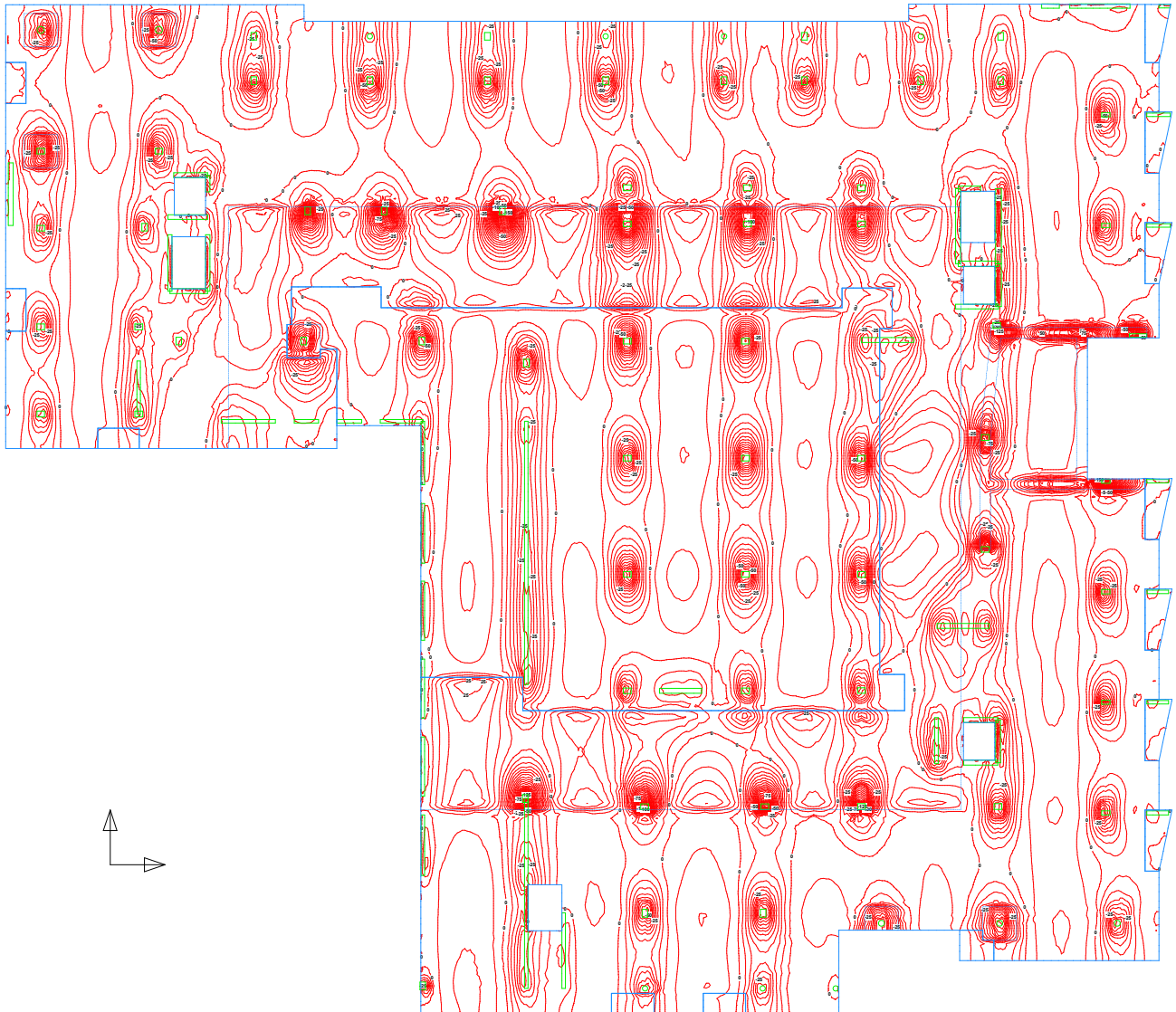
Factored LC: 1.2D + 1.6L + 0.5Lr: Max My Plan

Factored LC: 1.2D + 1.6L + 0.5Lr - User Lines, User Notes, User Dimensions;
Element: Max Element Value; Max Element Above; Max Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1/32;
Factored LC: 1.2D + 1.6L + 0.5Lr - Bending Moment Plot (Maximum Values) (Y-Axis Direction)
Min Value = 0 Kip-ft
Max Value = 153.4 Kip-ft @ (277.8, 32.2) Max Value = 153.2 Kip-ft @ (255.4, 156.5)



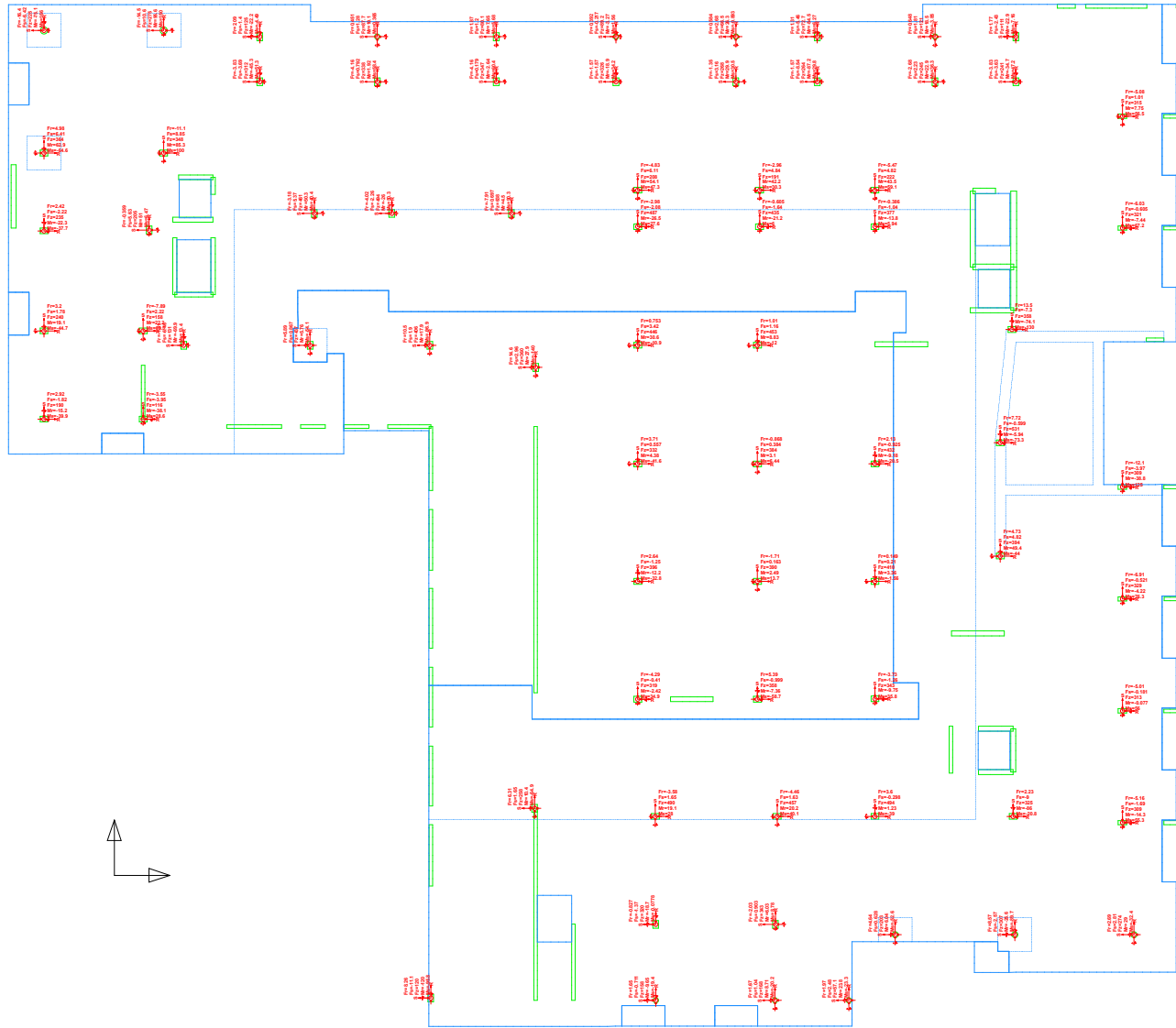
Factored LC: 1.2D + 1.6L + 0.5Lr: Min My Plan

Factored LC: 1.2D + 1.6L + 0.5Lr: User Notes: User Dimension:
Element: Min Element Below; Max Element Above; Wall Element Outline Only; Column Element Below; Column Element Above; Slab Element; Slab Element Outline Only;
Scale = 1/32
Factored LC: 1.2D + 1.6L + 0.5Lr - Bending Moment Plot (Minimum Values) (Y-Axis Direction)
One Direction = 2 Edge
Min Value = 127.3 Kip @ (277.8, 82.23) Max Value = 43.54 Kip @ (235.4, 134.9)



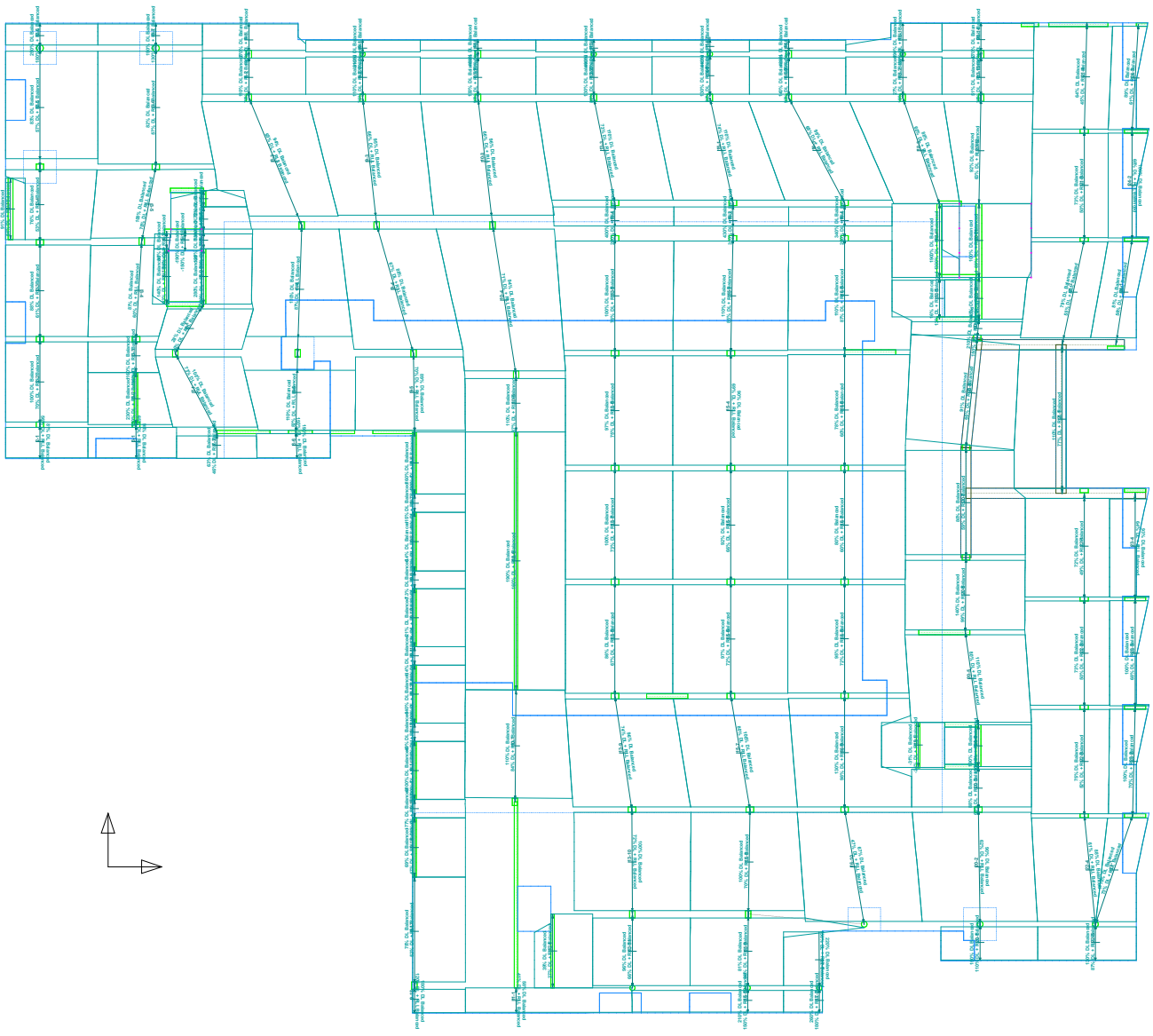
Factored LC: 1.2D + 1.6L + 0.5Lr: Max Reactions Plan

Factored LC: 1.2D + 1.6L + 0.5Lr - User Notes: User Dimension:
Element: Wall Elements Below; Slab Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale: 1/320
Factored LC: 1.2D + 1.6L + 0.5Lr - Reaction Plot: (Column Below)(F1,F2,M,N,M2)(Max Fx Contour)



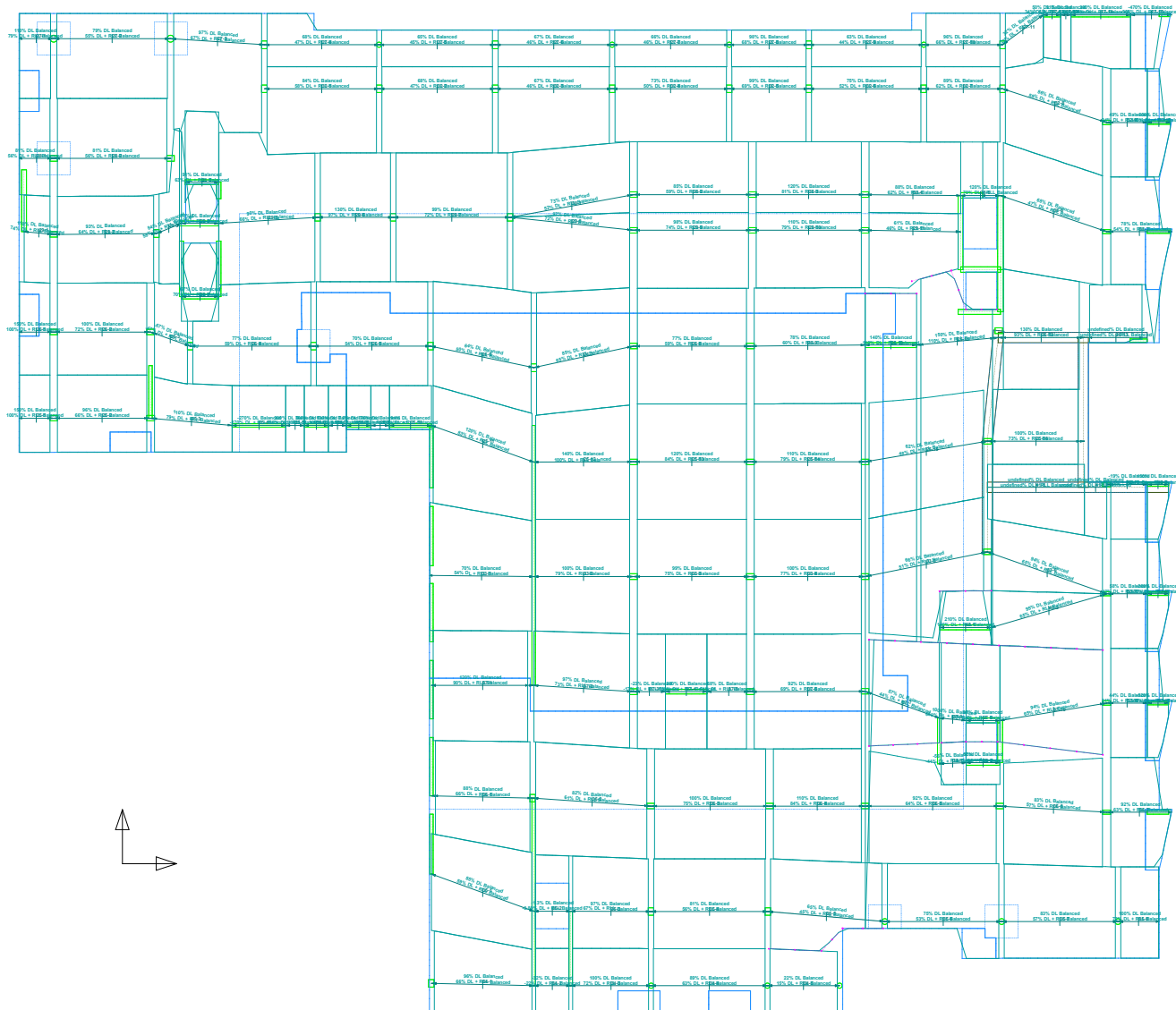
Design Strip: Latitude Design Spans Plan

Design Strip: Latitude Span Boundaries, Latitude S/S, S/S Number, Latitude D/S, Latitude Strip Boundaries, Latitude S/Ss, S/S Elevation Percentage, Latitude Deflection Checks, User Notes, User Lines, User Dimensions,
Block User Name, Strip Above Wall Below, Column Below,
Span: Wall Elements Above, Wall Elements Below, Wall Element Outline Only, Column Elements Above, Column Elements Below, Slab Elements, Slab Element Outline Only,
Scale: 1/8" = 1'-0"



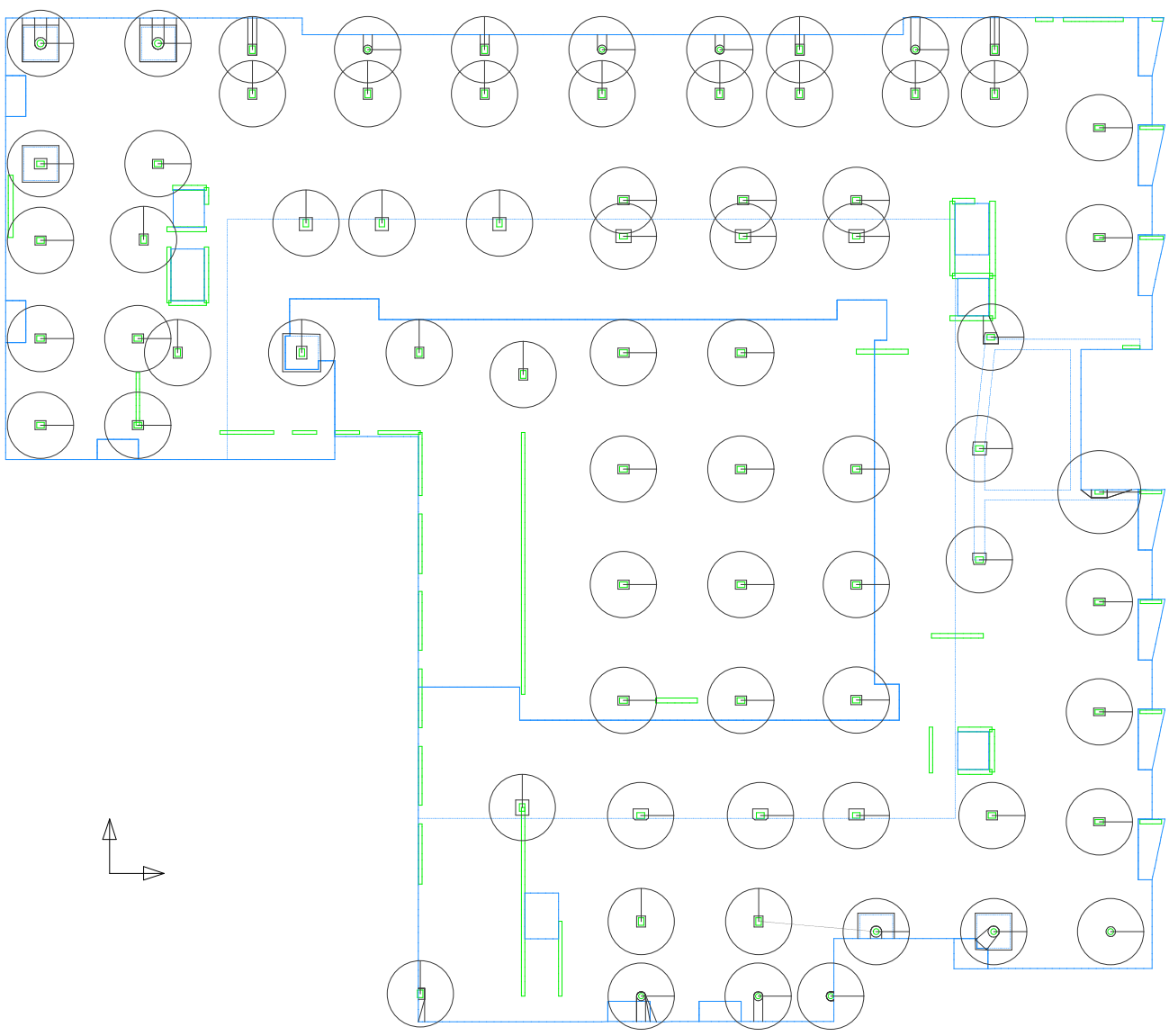
Design Strip: Longitude Design Spans Plan

Design Strip: Longitude Span Boundaries, Longitude S54, S55 Numbers; Longitude D54; Longitude Strip Boundaries; Longitude S55 Balance Percentages; Lengths Deflection, User Notes, User Lines, User Dimensions;
Sheet Title Name, Web Above, Web Below, Column Below;
Span: Wall Elements Above, Wall Elements Below, Wall Element Outline Only; Column Elements Above; Column Elements Below; SAb Elements; SAb Element Outline Only;
Scale: 1/16"



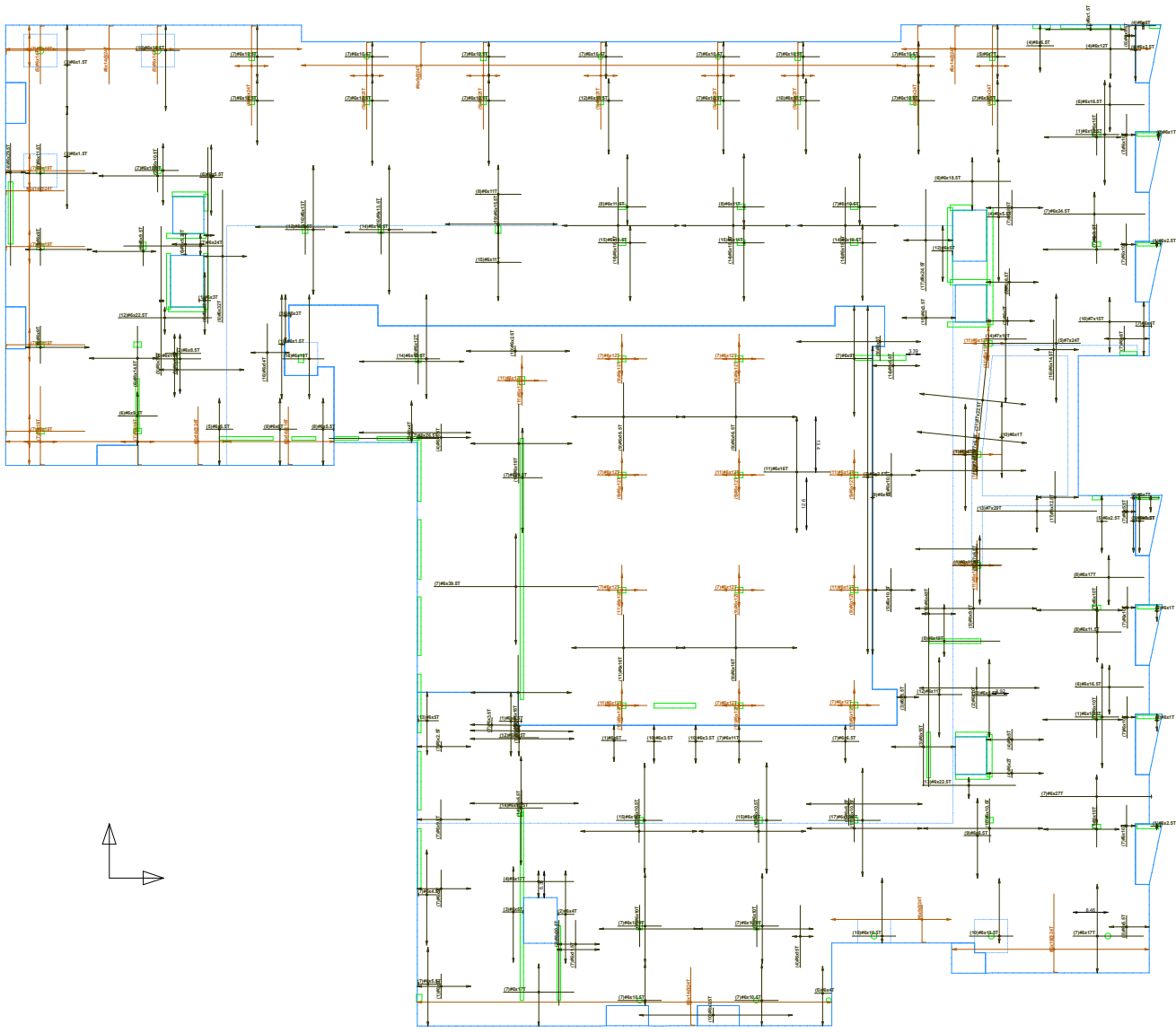
Design Strip: Punching Checks Plan

Design Strip: User Lines: User Notes: User Dimensions: Punching Checks: Punching Check Sections:
Shower: Wall Elements Below: Wall Elements Above: Wall Elements Outline Only: Column Elements Below: Column Elements Above: Slab Elements: Slab Element Outline Only:
Scale = 1/32



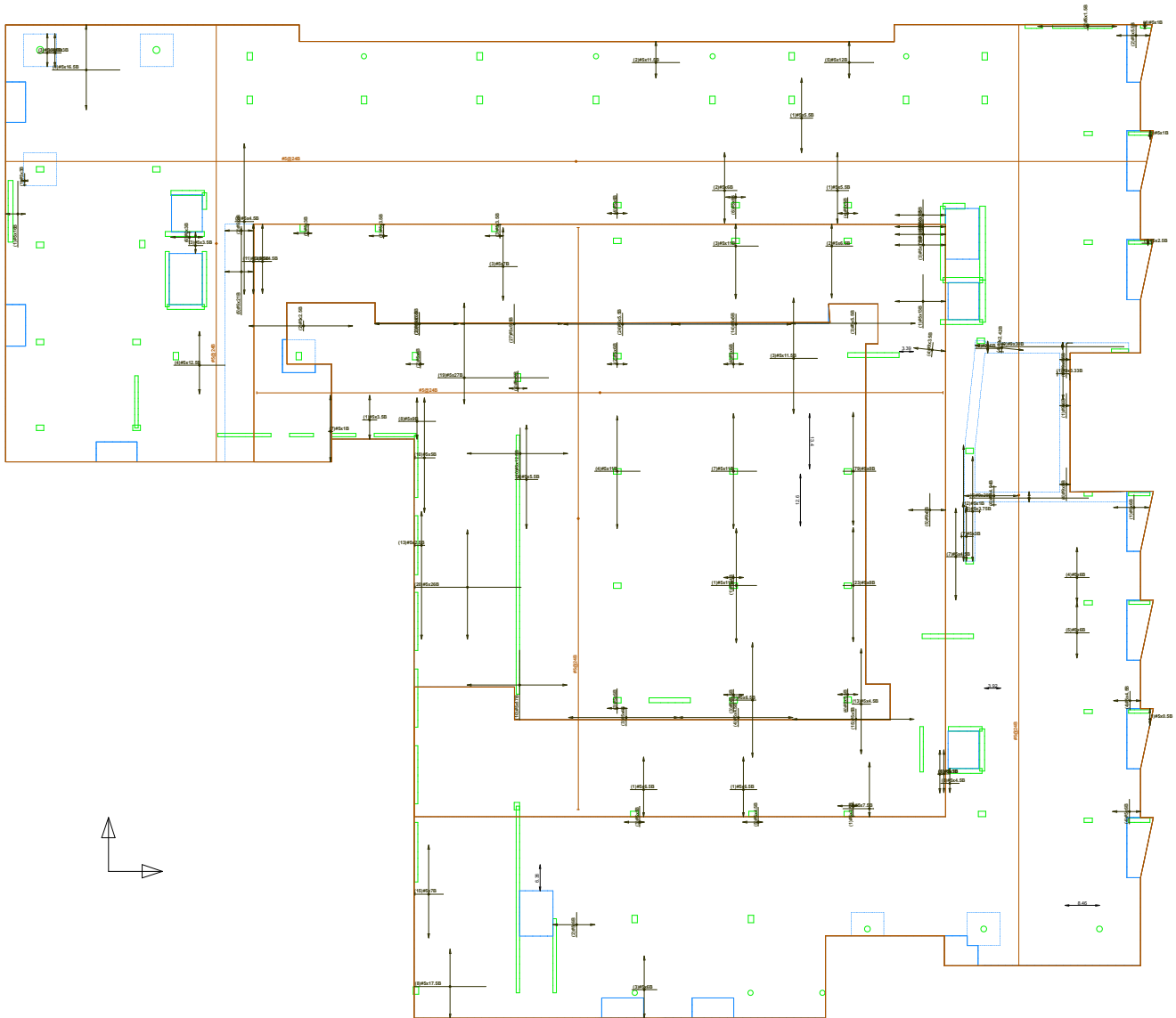
Reinforcement: Top Bars Plan

Reinforcement: User Lines, User Notes, User Dimensions, Lathings User Concentrated Reinf., Lathings Program Concentrated Reinf., Lathings User Distributed Reinf., Lathings Program Distributed Reinf., Longitud User Concentrated Reinf., Longitud Program Concentrated Reinf., Longitud User Distributed Reinf., Longitud Program Distributed Reinf., Top Face Concentrated Reinf., Both Face Concentrated Reinf., Top Face Distributed Reinf., Both Face Distributed Reinf., Concentrated Reinf. Description, Concentrated Reinf. Extent, Distributed Reinf. Description, Distributed Reinf. Extent, Shear Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only, Scale = 1/32



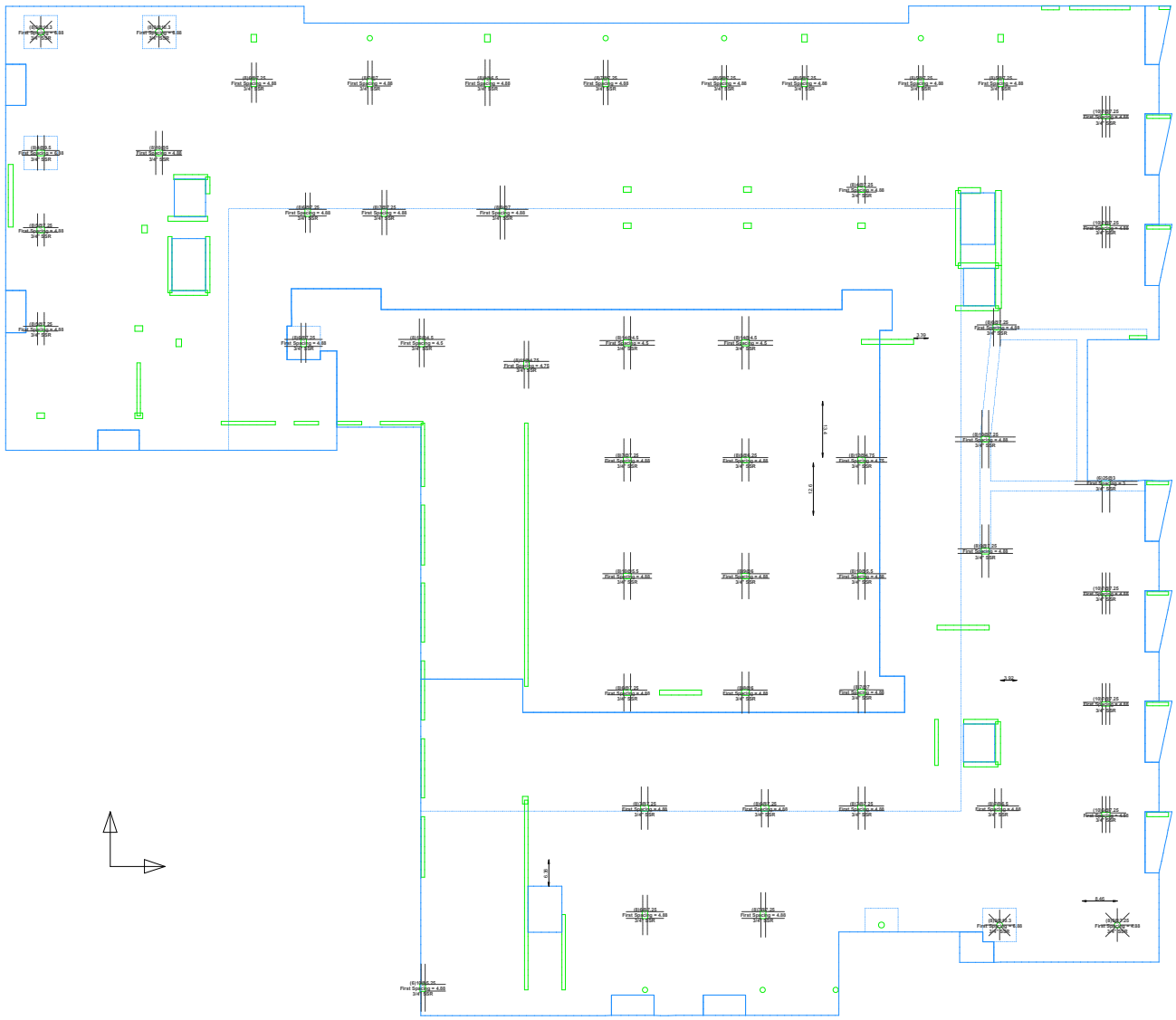
Reinforcement: Bottom Bars Plan

Reinforcement: User Lines, User Notes, User Dimensions, Latticbe User Concentrated Reinf., Latticbe Program Concentrated Reinf., Latticbe User Distributed Reinf., Latticbe Program Distributed Reinf., Longitude User Concentrated Reinf., Longitude Program Concentrated Reinf., Longitude User Distributed Reinf., Longitude Program Distributed Reinf., Bottom Face Concentrated Reinf., Both Face Concentrated Reinf., Bottom Face Distributed Reinf., Both Face Distributed Reinf., Concentrated Reinf. Description, Concentrated Reinf. Extent, Distributed Reinf. Description, Distributed Reinf. Extent, Shear, Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only, Scale = 1/32



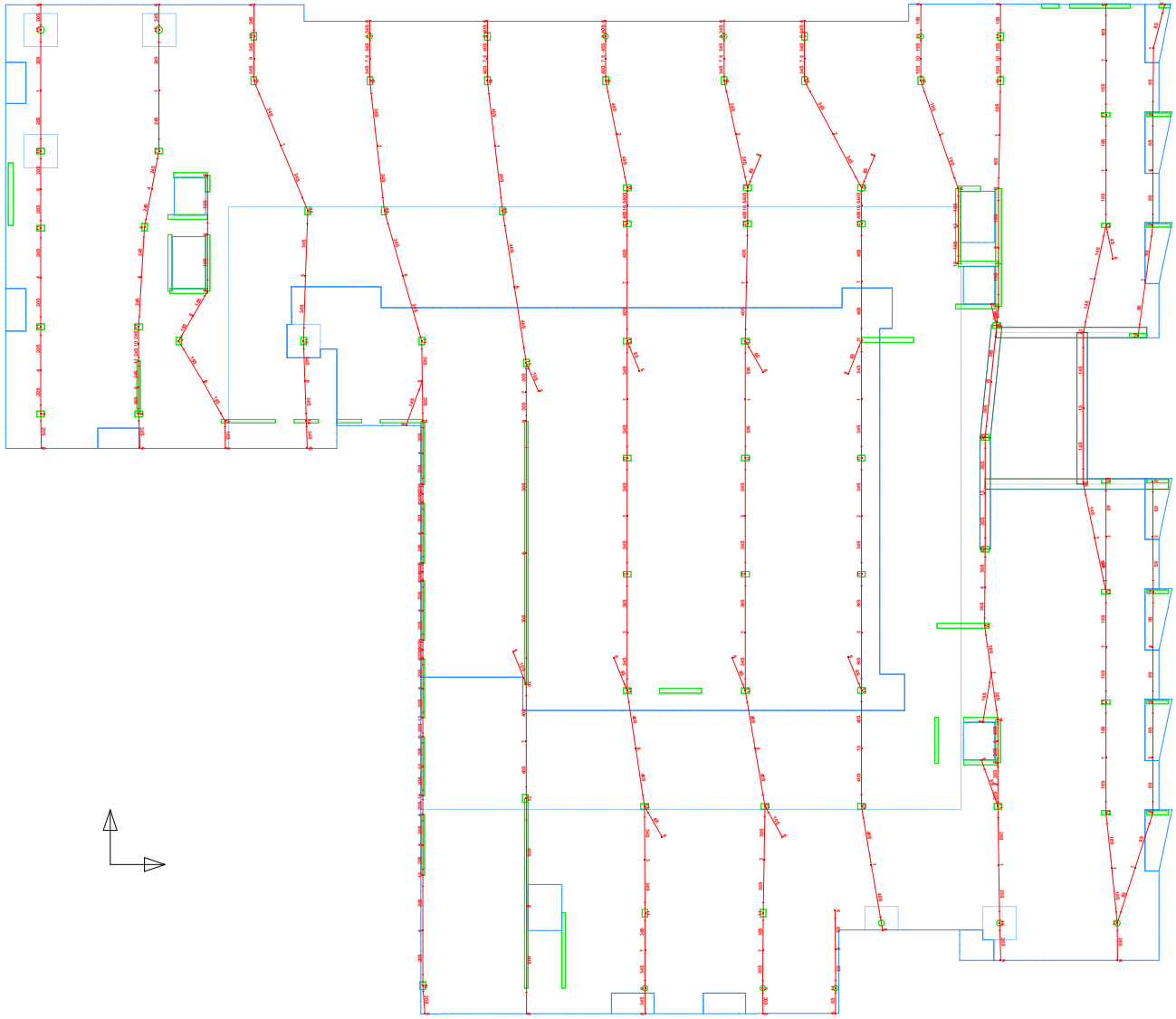
Reinforcement: SSR Plan

Reinforcement: User Lines, User Notes, User Dimensions, Program SSR Callouts, SSR Callout Details, Program SSR Rate.
Shadows: Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only.
Scale = 1/32'



Manual Latitude Tendon: Standard Plan

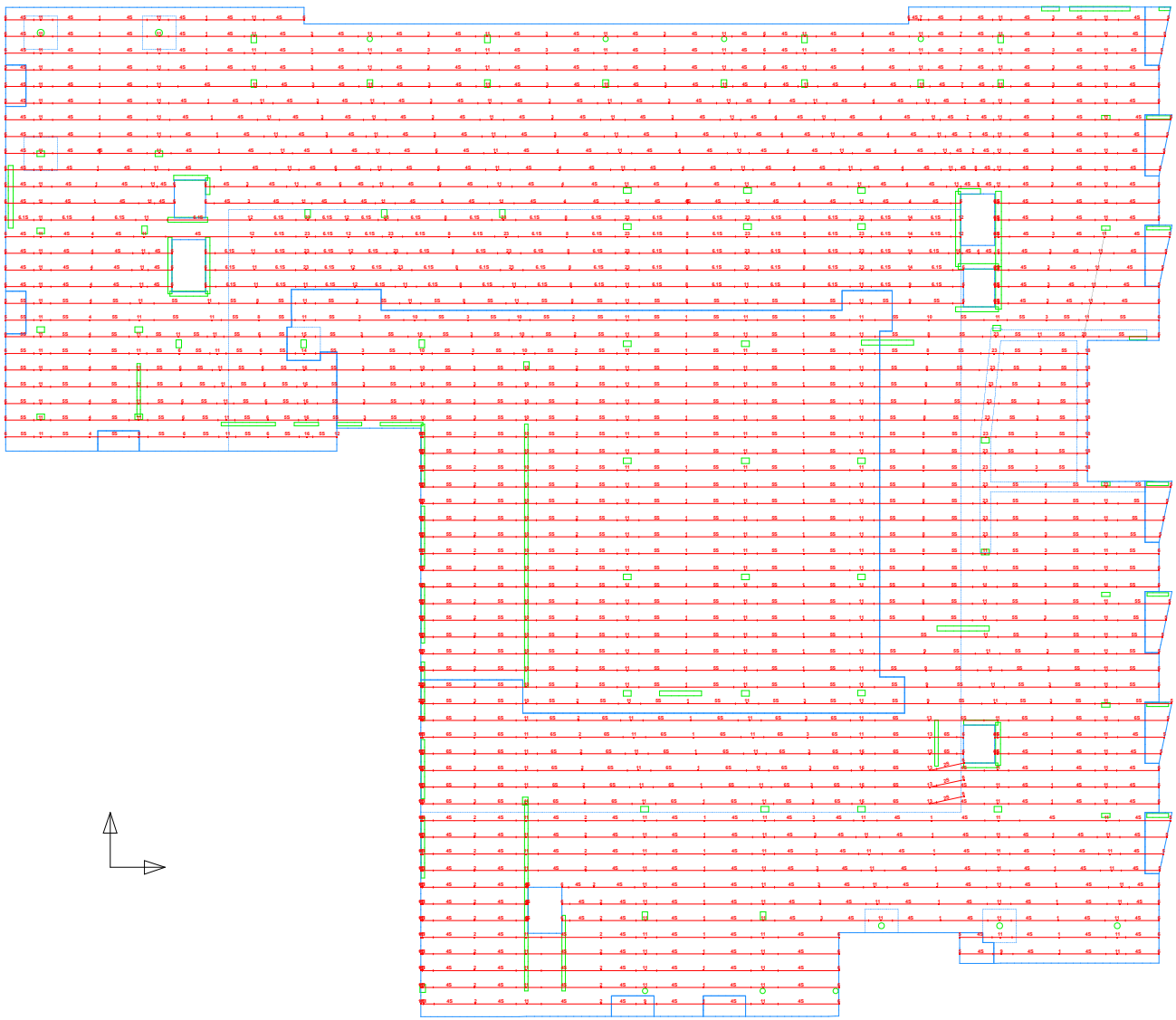
Manual Latitude Tendon: Tendon, Run Strands, Tendon Infection Ratio, Jack, Tendon Points, Profile Values, User Notes, User Lines, User Dimensions
Block Type: Slab, Wall, Beam, Column, Section
Element: Wall Element Above, Wall Element Below, Wall Element Outline Only, Column Element Above, Column Element Below, Slab Element, Slab Element Outline Only
Latitude Tendon Parameters: Tendon Profile, Spacing, Tendon Orientation, Distributed Tendon Quantities, Distributed Tendon Description, Distributed Tendon Overlay Area, Profile Points, Profile Elevation Values, Profile Notes, Jack Point, Legend
Legend: Tendon Parameters: Tendon Profile Polyline



Manual Longitude Tendon: Standard Plan

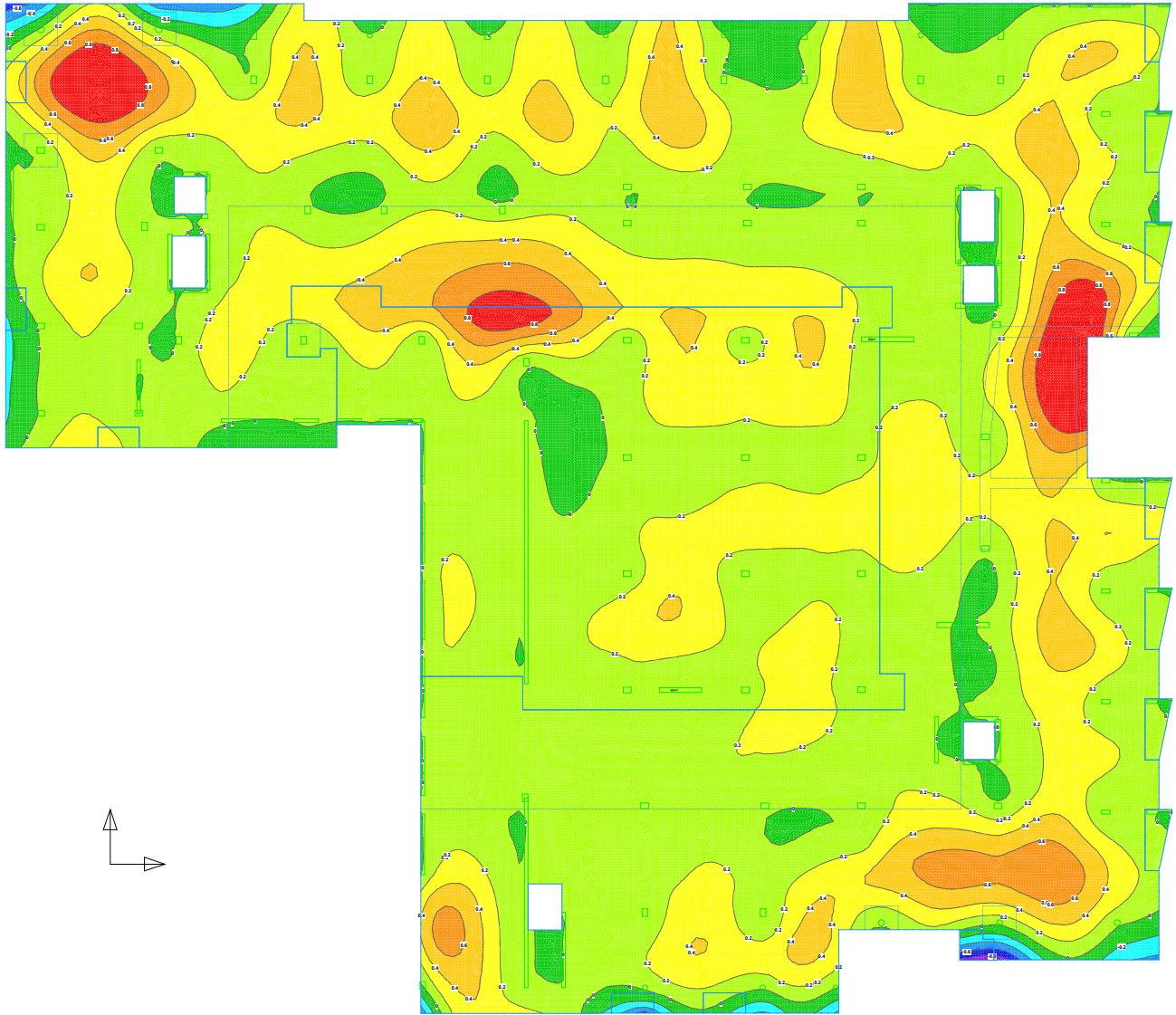
Manual Longitude Tendon: Tendon, Run Strands, Tendon Infection Ratio, Jack, Tendon Profile, Profile Values, Clear Height, Clear Lines, User Comments.
Strands: 100 Strands Above, 100 Strands Below, Wall Element Outline Only, Column Element Area, Column Element Area, Slab Element, Slab Element Outline Only.
Longitude Tendon Parameters: Standard Tendon, Standard Tendon Description, Distributed Tendon Quadrilateral, Distributed Tendon Description, Distributed Tendon Overlap Areas, Profile Points, Profile Elevation Values, Profile Nodes, Jack Region.
Distributed Longitude Tendon: Standard.

1 of 1



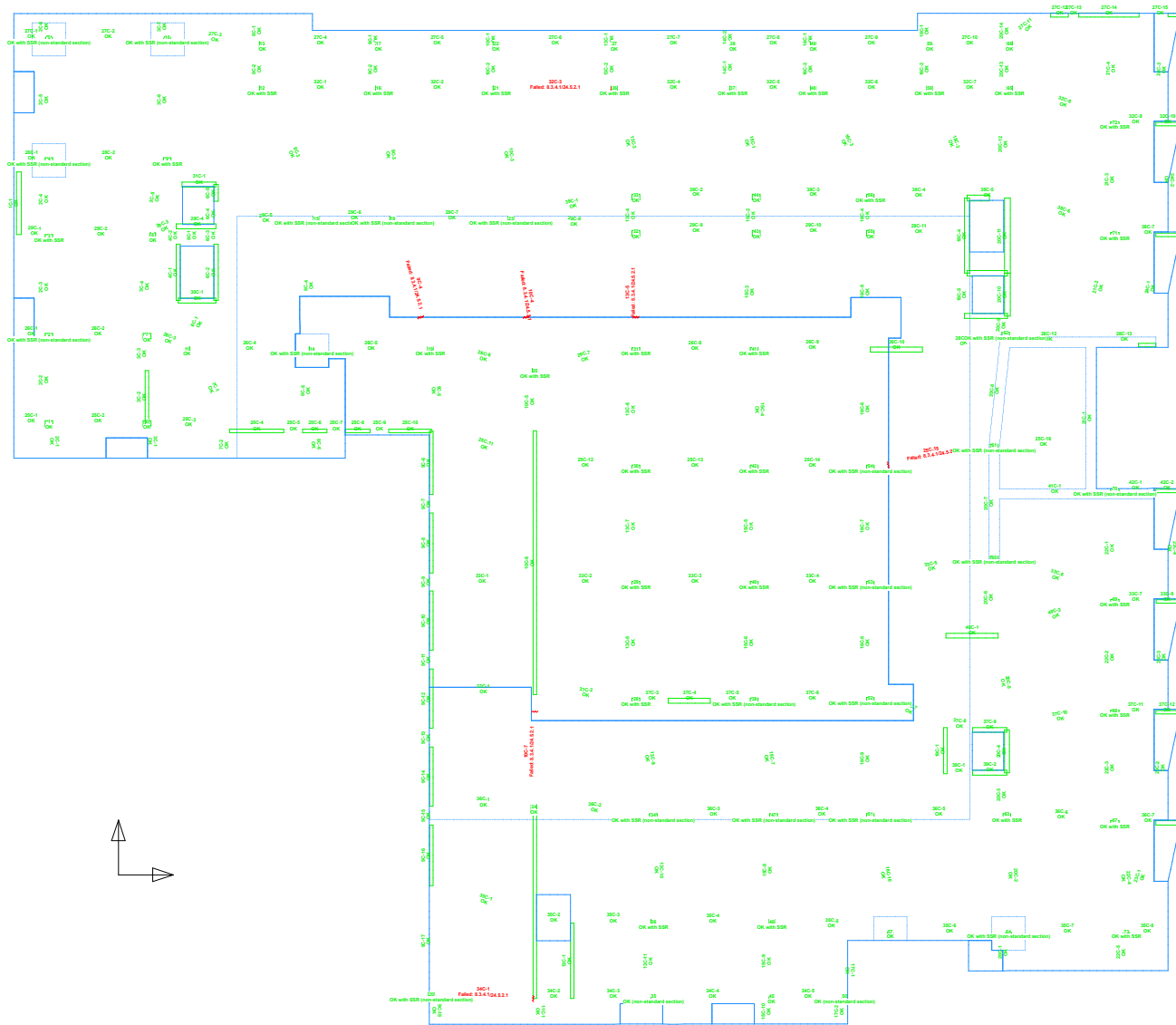
Sustained Load: Std Deflection Plan

Standard Load: User Load, User Model, User Dimensions
Element: Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only
Scale = 1/320
Standard Load - Vertical Deflection Plot
Min Value = 0.0427 inches @ (211.8, 0) Max Value = 1.221 inches @ (214.3, 119.3)



Design Status: Status Plan

Design Status: User Lines, User Notes, User Comments, Lattitude Span Design, Longitude Span Design, Span Design Number, Span Design Status, Lattitude DS Design, Longitude DS Design, DS Design Number, DS Design Status, FC Design Number, FC Design Status, Lattitude Span Segment Deflection Check, Longitude Span Segment Deflection Check, Span Segment Deflection Check Status, Lattitude Deflection Check, Longitude Deflection Check, Deflection Check Status, Shear, Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only, Scale = 1/32

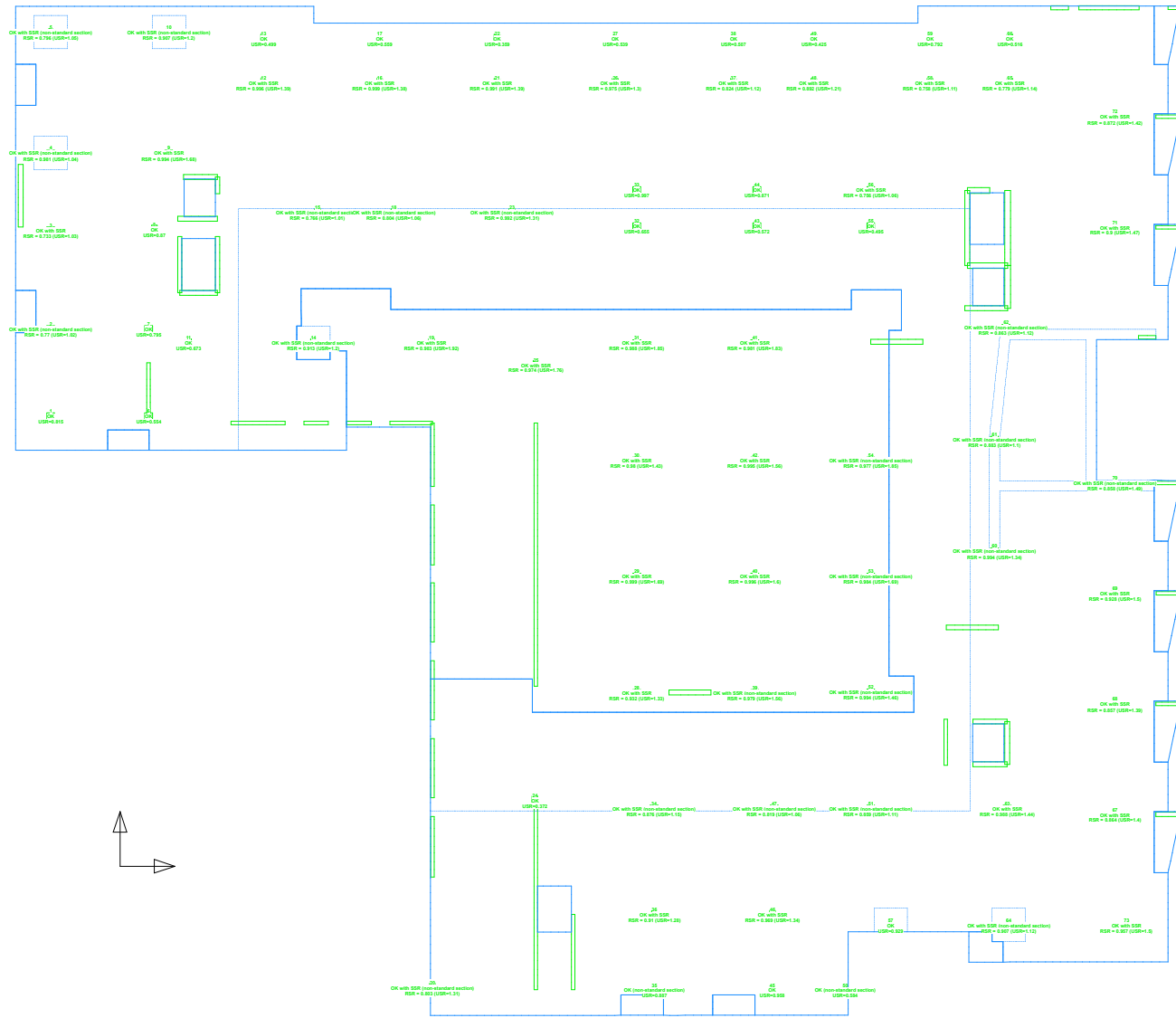


Design Status: Punching Shear Status Plan

Design Status: PC Design; PC Design Number: PC Design Status; PC Design Status Ratio; PC Design Finalized Section Design; PC Design Finalized Section Analysis; User Notes; User Lines; User Dimensions

Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only

Scale = 1/32



JORDAHL® EXPERT Punching shear - Design

Position: SR-1 16x22

1. Input information

| | | | | | |
|---------------------------|-----------------------------|---|-------|--------|--------------|
| Column type | Rectangular interior column | | | | |
| Column dimension | c_x / c_y | = | 22 | in | / 16 in |
| Slab type | Elevated concrete slab | | | | |
| Slab thickness | h | = | 12 | in | |
| Concrete cover top/bottom | c_o / c_u | = | 0.75 | in | / 0.75 in |
| Effective depth | d_x / d_y | = | 10.5 | in | / 10.5 in |
| Concrete strength | 5000 psi | | | | |
| Density | Normal weight concrete | | | | |
| Prestress | f_{pc} | = | 125 | psi | |
| Punching shear load | V_u | = | 446.2 | kip | |
| Unbalanced moment | M_{ux} / M_{uy} | = | 31 | kip-ft | / -11 kip-ft |
| Seismic loading | Yes | | | | |

2. Output information (ACI 318-14)

2.1 Inner Critical Section (d/2 outside of column face)

2.1.1 Common Properties

| | | | | |
|----------------------------|-------|---|------|-----------------|
| Area | A_c | = | 1239 | in ² |
| Critical section perimeter | b_0 | = | 118 | in |

2.1.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $1.524 \cdot 10^5$ | in ⁴ | / $2.070 \cdot 10^5$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.1.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 0 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $2.070 \cdot 10^5$ | in ⁴ | / $1.524 \cdot 10^5$ in ⁴ |
| Principal axis rotation | θ | = | 90.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.4247 | | / 0.3758 |
| Unbalanced moment | M_{u1} / M_{u2} | = | -11 | kip-ft | / -31 kip-ft |

2.1.4 Stresses

| | | | | | |
|-----------------------------------|------------------|---|--------|-----|-------------|
| Maximum shear stress | v_u | = | 376.7 | psi | |
| | x / y | = | -16.25 | in | / -13.25 in |
| Shear resistance (concrete only) | ϕv_c | = | 212.1 | psi | |
| Shear resistance (with studrails) | ϕv_n | = | 381 | psi | |
| Shear resistance (upper limit) | $\phi v_{n,max}$ | = | 424.3 | psi | |

2.2 Outer Critical Section (d/2 outside of reinforced zone)

2.2.1 Common Properties

| | | | | |
|----------------------------|-------|---|--------|-----------------|
| Area | A_c | = | 4539.2 | in ² |
| Critical section perimeter | b_0 | = | 432.3 | in |

2.2.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $9.475 \cdot 10^6$ | in ⁴ | / $9.933 \cdot 10^6$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.2.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 0 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $9.933 \cdot 10^6$ | in ⁴ | / $9.475 \cdot 10^6$ in ⁴ |
| Principal axis rotation | θ | = | 90.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.4050 | | / 0.3950 |
| Unbalanced moment | M_{u1} / M_{u2} | = | -11 | kip-ft | / -31 kip-ft |

2.2.4 Stresses

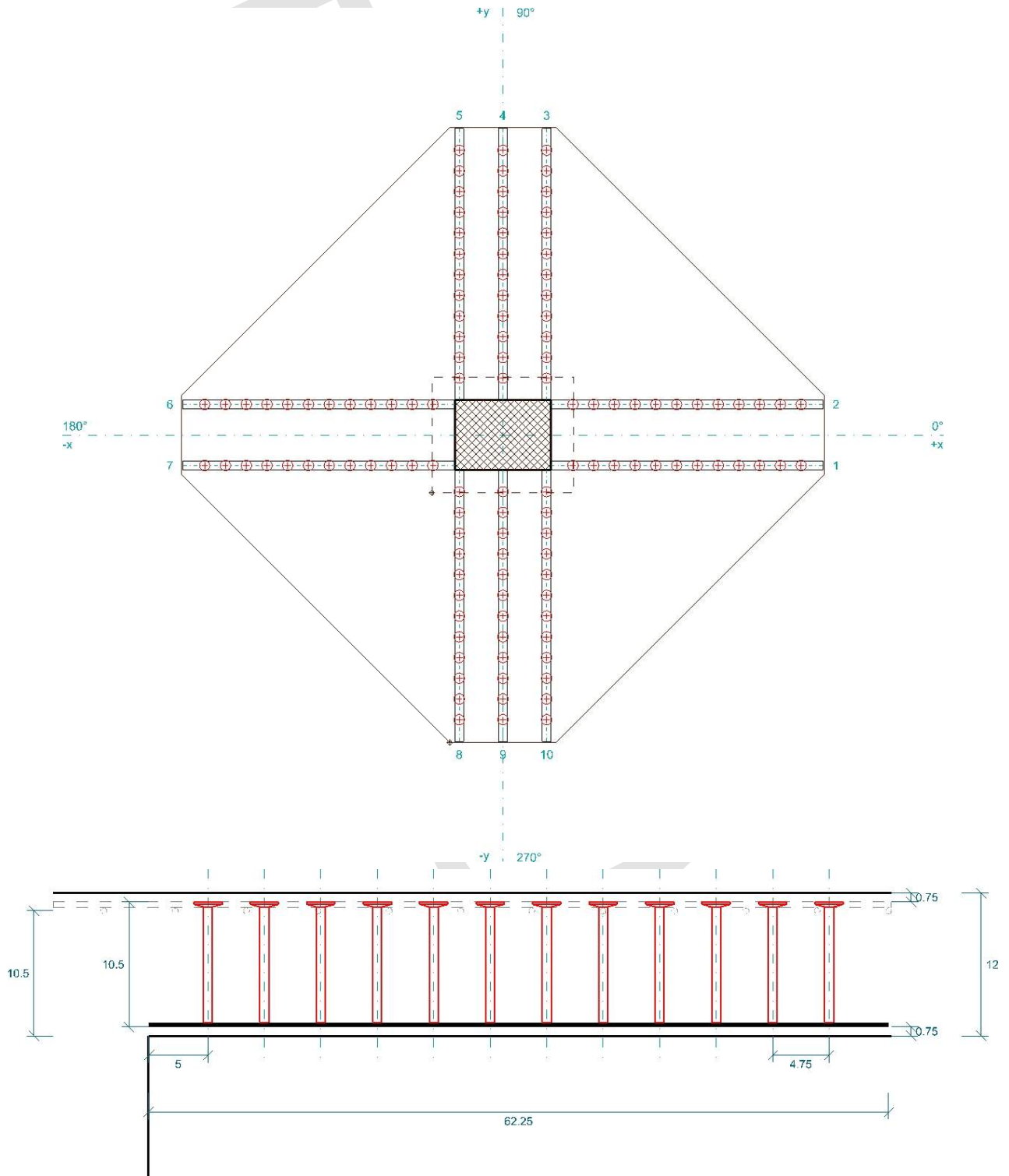
| | | | | | |
|----------------------|------------|---|---------|-----|------------|
| Maximum shear stress | v_u | = | 99.5 | psi | |
| | x / y | = | -12.175 | in | / -70.5 in |
| Shear resistance | ϕv_c | = | 106.1 | psi | |

3. Elements

| | | | |
|--------------------------------|-----------|---|----------------|
| Number of studrails per column | | = | 10 |
| Number of studs per studrail | | = | 12 |
| Stud diameter | D | = | 0.75 in |
| Stud spacing | S / S_0 | = | 4.75 in / 5 in |
| Overall height of studrail | OAH | = | 10.5 in |
| Overall length of studrail | OAL | = | 62.25 in |

4. Note

- The design against punching shear failure is based on the rules of ACI 318-14.
- This calculation is based on product specific properties of DECON® Studrails®. Changes, even to similar products, are only possible with new calculations.
- All data have to be checked with the given edge boundaries and the feasibility. DECON assumes no liability for the input data of the user.



JORDAHL® EXPERT Punching shear - Design

Position: SR-1 16x22 (Edge Condition)

1. Input information

| | | | | | |
|---------------------------|-------------------------|---|-------|--------|--------------|
| Column type | Rectangular edge column | | | | |
| Column dimension | c_x / c_y | = | 16 | in | / 22 in |
| Edge | r_b | = | 30 | in | |
| Slab type | Elevated concrete slab | | | | |
| Slab thickness | h | = | 12 | in | |
| Concrete cover top/bottom | c_o / c_u | = | 0.75 | in | / 0.75 in |
| Effective depth | d_x / d_y | = | 10.5 | in | / 10.5 in |
| Concrete strength | 5000 psi | | | | |
| Density | Normal weight concrete | | | | |
| Prestress | f_{pc} | = | 125 | psi | |
| Punching shear load | V_u | = | 72.7 | kip | |
| Unbalanced moment | M_{ux} / M_{uy} | = | -54.5 | kip-ft | / 6.3 kip-ft |
| Seismic loading | Yes | | | | |

2. Output information (ACI 318-14)

2.1 Inner Critical Section (d/2 outside of column face)

2.1.1 Common Properties

| | | | | |
|----------------------------|-------|---|-------|-----------------|
| Area | A_c | = | 960.8 | in ² |
| Critical section perimeter | b_o | = | 91.5 | in |

2.1.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / -4.706 in |
| Section moment of inertia | I_x / I_y | = | $1.123 \cdot 10^5$ | in ⁴ | / $1.361 \cdot 10^5$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.1.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 4.706 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $1.361 \cdot 10^5$ | in ⁴ | / $1.123 \cdot 10^5$ in ⁴ |
| Principal axis rotation | θ | = | 90.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.3758 | | / 0.4031 |
| Unbalanced moment | M_{u1} / M_{u2} | = | 6.3 | kip-ft | / 54.5 kip-ft |

2.1.4 Stresses

| | | | | | |
|-----------------------------------|------------------|---|-------|-----|------------|
| Maximum shear stress | v_u | = | 153.4 | psi | |
| | x / y | = | 13.25 | in | / 16.25 in |
| Shear resistance (concrete only) | ϕv_c | = | 212.1 | psi | |
| Shear resistance (with studrails) | ϕv_n | = | 312.8 | psi | |
| Shear resistance (upper limit) | $\phi v_{n,max}$ | = | 424.3 | psi | |

2.2 Outer Critical Section (d/2 outside of reinforced zone)

2.2.1 Common Properties

| | | | | |
|----------------------------|-------|---|--------|-----------------|
| Area | A_c | = | 2714.8 | in ² |
| Critical section perimeter | b_0 | = | 258.6 | in |

2.2.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / -16.848 in |
| Section moment of inertia | I_x / I_y | = | $2.474 \cdot 10^6$ | in ⁴ | / $5.348 \cdot 10^6$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.2.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 16.848 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $5.348 \cdot 10^6$ | in ⁴ | / $2.474 \cdot 10^6$ in ⁴ |
| Principal axis rotation | θ | = | 90.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.4141 | | / 0.3563 |
| Unbalanced moment | M_{u1} / M_{u2} | = | 6.3 | kip-ft | / 54.5 kip-ft |

2.2.4 Stresses

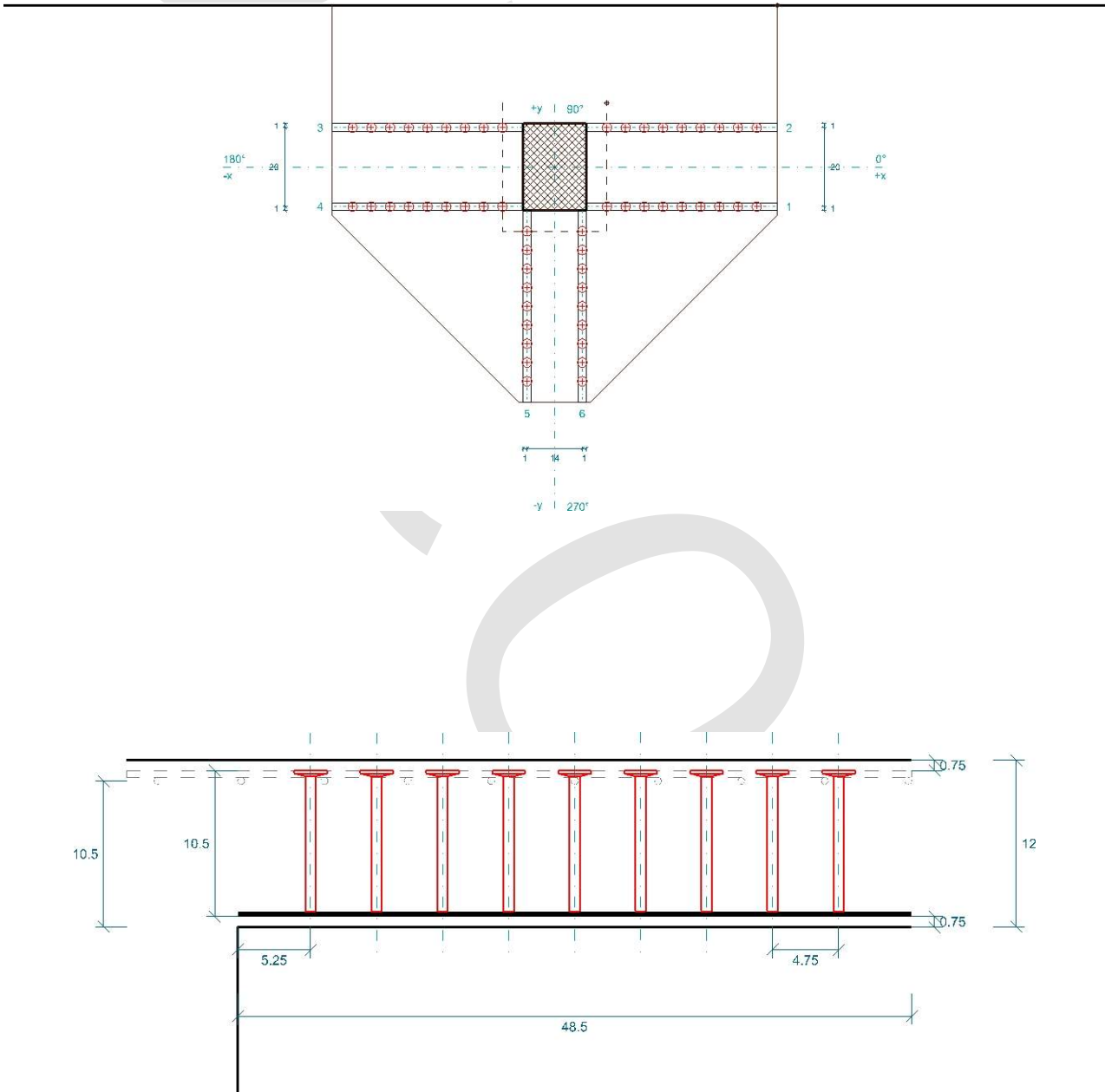
| | | | | | |
|----------------------|------------|---|-------|-----|---------|
| Maximum shear stress | v_u | = | 42.8 | psi | |
| | x / y | = | 56.5 | in | / 41 in |
| Shear resistance | ϕv_c | = | 106.1 | psi | |

3. Elements

| | | | |
|--------------------------------|-----------|---|-------------------|
| Number of studrails per column | | = | 6 |
| Number of studs per studrail | | = | 9 |
| Stud diameter | D | = | 0.75 in |
| Stud spacing | S / S_0 | = | 4.75 in / 5.25 in |
| Overall height of studrail | OAH | = | 10.5 in |
| Overall length of studrail | OAL | = | 48.5 in |

4. Note

- The design against punching shear failure is based on the rules of ACI 318-14.
- This calculation is based on product specific properties of DECON® Studrails®. Changes, even to similar products, are only possible with new calculations.
- All data have to be checked with the given edge boundaries and the feasibility. DECON assumes no liability for the input data of the user.



JORDAHL® EXPERT Punching shear - Design

Position: SR-1 12x24

1. Input information

| | | | | |
|---------------------------|-----------------------------|--------|---------------|--------|
| Column type | Rectangular interior column | | | |
| Column dimension | c_x / c_y | = 24 | in / 12 | in |
| Slab type | Elevated concrete slab | | | |
| Slab thickness | h | = 12 | in | |
| Concrete cover top/bottom | c_o / c_u | = 0.75 | in / 0.75 | in |
| Effective depth | d_x / d_y | = 10.5 | in / 10.5 | in |
| Concrete strength | 5000 psi | | | |
| Density | Normal weight concrete | | | |
| Prestress | f_{pc} | = 125 | psi | |
| Punching shear load | V_u | = 329 | kip | |
| Unbalanced moment | M_{ux} / M_{uy} | = -4.2 | kip-ft / 76.3 | kip-ft |
| Seismic loading | Yes | | | |

2. Output information (ACI 318-14)

2.1 Inner Critical Section (d/2 outside of column face)

2.1.1 Common Properties

| | | | |
|----------------------------|-------|--------|-----------------|
| Area | A_c | = 1197 | in ² |
| Critical section perimeter | b_0 | = 114 | in |

2.1.2 Natural Axis Properties

| | | | | |
|----------------------------|-------------|----------------------|--------------------------------------|-----------------|
| Centroid coordinate | e_x / e_y | = 0 | in / 0 | in |
| Section moment of inertia | I_x / I_y | = $1.116 \cdot 10^5$ | in ⁴ / $2.125 \cdot 10^5$ | in ⁴ |
| Section product of inertia | I_{xy} | = 0 | in ⁴ | |

2.1.3 Principal Axis Properties

| | | | | |
|---------------------------|-----------------------|----------------------|--------------------------------------|-----------------|
| Centroid coordinate | e_1 / e_2 | = 0 | in / 0 | in |
| Section moment of inertia | I_1 / I_2 | = $2.125 \cdot 10^5$ | in ⁴ / $1.116 \cdot 10^5$ | in ⁴ |
| Principal axis rotation | θ | = 90.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = 0.4522 | / 0.3500 | |
| Unbalanced moment | M_{u1} / M_{u2} | = 76.3 | kip-ft / 4.2 | kip-ft |

2.1.4 Stresses

| | | | | | |
|-----------------------------------|------------------|---|-------|-----|------------|
| Maximum shear stress | v_u | = | 310.2 | psi | |
| | x / y | = | 17.25 | in | / 11.25 in |
| Shear resistance (concrete only) | ϕv_c | = | 212.1 | psi | |
| Shear resistance (with studrails) | ϕv_n | = | 321.8 | psi | |
| Shear resistance (upper limit) | $\phi v_{n,max}$ | = | 424.3 | psi | |

2.2 Outer Critical Section (d/2 outside of reinforced zone)

2.2.1 Common Properties

| | | | | |
|----------------------------|-------|---|--------|-----------------|
| Area | A_c | = | 3683.6 | in ² |
| Critical section perimeter | b_0 | = | 350.8 | in |

2.2.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $4.921 \cdot 10^6$ | in ⁴ | / $5.557 \cdot 10^6$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.2.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 0 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $5.557 \cdot 10^6$ | in ⁴ | / $4.921 \cdot 10^6$ in ⁴ |
| Principal axis rotation | θ | = | 90.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.4125 | | / 0.3876 |
| Unbalanced moment | M_{u1} / M_{u2} | = | 76.3 | kip-ft | / 4.2 kip-ft |

2.2.4 Stresses

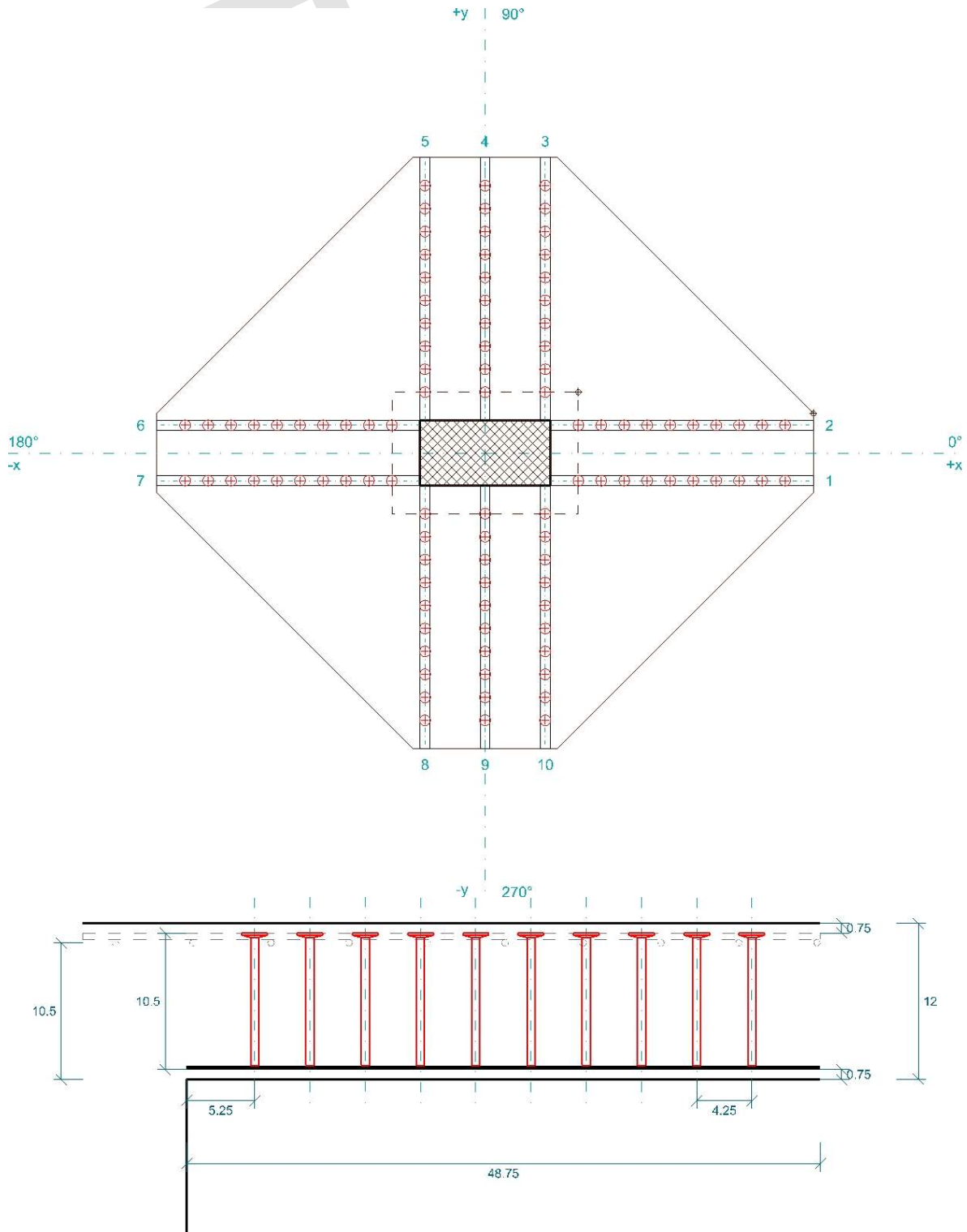
| | | | | | |
|----------------------|------------|---|-------|-----|----------|
| Maximum shear stress | v_u | = | 93.5 | psi | |
| | x / y | = | 60.75 | in | / 7.3 in |
| Shear resistance | ϕv_c | = | 106.1 | psi | |

3. Elements

| | | | |
|--------------------------------|-----------|---|-------------------|
| Number of studrails per column | | = | 10 |
| Number of studs per studrail | | = | 10 |
| Stud diameter | D | = | 0.625 in |
| Stud spacing | S / S_0 | = | 4.25 in / 5.25 in |
| Overall height of studrail | OAH | = | 10.5 in |
| Overall length of studrail | OAL | = | 48.75 in |

4. Note

- The design against punching shear failure is based on the rules of ACI 318-14.
- This calculation is based on product specific properties of DECON® Studrails®. Changes, even to similar products, are only possible with new calculations.
- All data have to be checked with the given edge boundaries and the feasibility. DECON assumes no liability for the input data of the user.



JORDAHL® EXPERT Punching shear - Design

Position: SR-2 16"Ø

1. Input information

| | | | | | |
|---------------------------|--------------------------|---|------|--------|-------------|
| Column type | Circular interior column | | | | |
| Diameter | d_{st} | = | 16 | in | |
| Slab type | Elevated concrete slab | | | | |
| Slab thickness | h | = | 12 | in | |
| Concrete cover top/bottom | c_o / c_u | = | 0.75 | in | / 0.75 in |
| Effective depth | d_x / d_y | = | 10.5 | in | / 10.5 in |
| Concrete strength | 5000 psi | | | | |
| Density | Normal weight concrete | | | | |
| Prestress | f_{pc} | = | 125 | psi | |
| Punching shear load | V_u | = | 274 | kip | |
| Unbalanced moment | M_{ux} / M_{uy} | = | 32.4 | kip-ft | / 29 kip-ft |
| Seismic loading | Yes | | | | |

2. Output information (ACI 318-14)

2.1 Inner Critical Section (d/2 outside of column face)

2.1.1 Common Properties

| | | | | | |
|----------------------------|-------|---|-------|-----------------|--|
| Area | A_c | = | 874.1 | in ² | |
| Critical section perimeter | b_0 | = | 83.3 | in | |

2.1.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $7.673 \cdot 10^4$ | in ⁴ | / $7.673 \cdot 10^4$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.1.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 0 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $7.673 \cdot 10^4$ | in ⁴ | / $7.673 \cdot 10^4$ in ⁴ |
| Principal axis rotation | θ | = | 0.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.4000 | | / 0.4000 |
| Unbalanced moment | M_{u1} / M_{u2} | = | 32.4 | kip-ft | / 29 kip-ft |

2.1.4 Stresses

| | | | | | |
|-----------------------------------|------------------|---|-------|-----|-------------|
| Maximum shear stress | v_u | = | 349.5 | psi | |
| | x / y | = | 8.837 | in | / -9.873 in |
| Shear resistance (concrete only) | ϕv_c | = | 212.1 | psi | |
| Shear resistance (with studrails) | ϕv_n | = | 421.4 | psi | |
| Shear resistance (upper limit) | $\phi v_{n,max}$ | = | 424.3 | psi | |

2.2 Outer Critical Section (d/2 outside of reinforced zone)

2.2.1 Common Properties

| | | | | |
|----------------------------|-------|---|------|-----------------|
| Area | A_c | = | 3370 | in ² |
| Critical section perimeter | b_0 | = | 321 | in |

2.2.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $3.933 \cdot 10^6$ | in ⁴ | / $3.933 \cdot 10^6$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.2.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 0 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $3.933 \cdot 10^6$ | in ⁴ | / $3.933 \cdot 10^6$ in ⁴ |
| Principal axis rotation | θ | = | 0.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.4000 | | / 0.4000 |
| Unbalanced moment | M_{u1} / M_{u2} | = | 32.4 | kip-ft | / 29 kip-ft |

2.2.4 Stresses

| | | | | | |
|----------------------|------------|---|-------|-----|--------------|
| Maximum shear stress | v_u | = | 83.7 | psi | |
| | x / y | = | 6.831 | in | / -53.907 in |
| Shear resistance | ϕv_c | = | 106.1 | psi | |

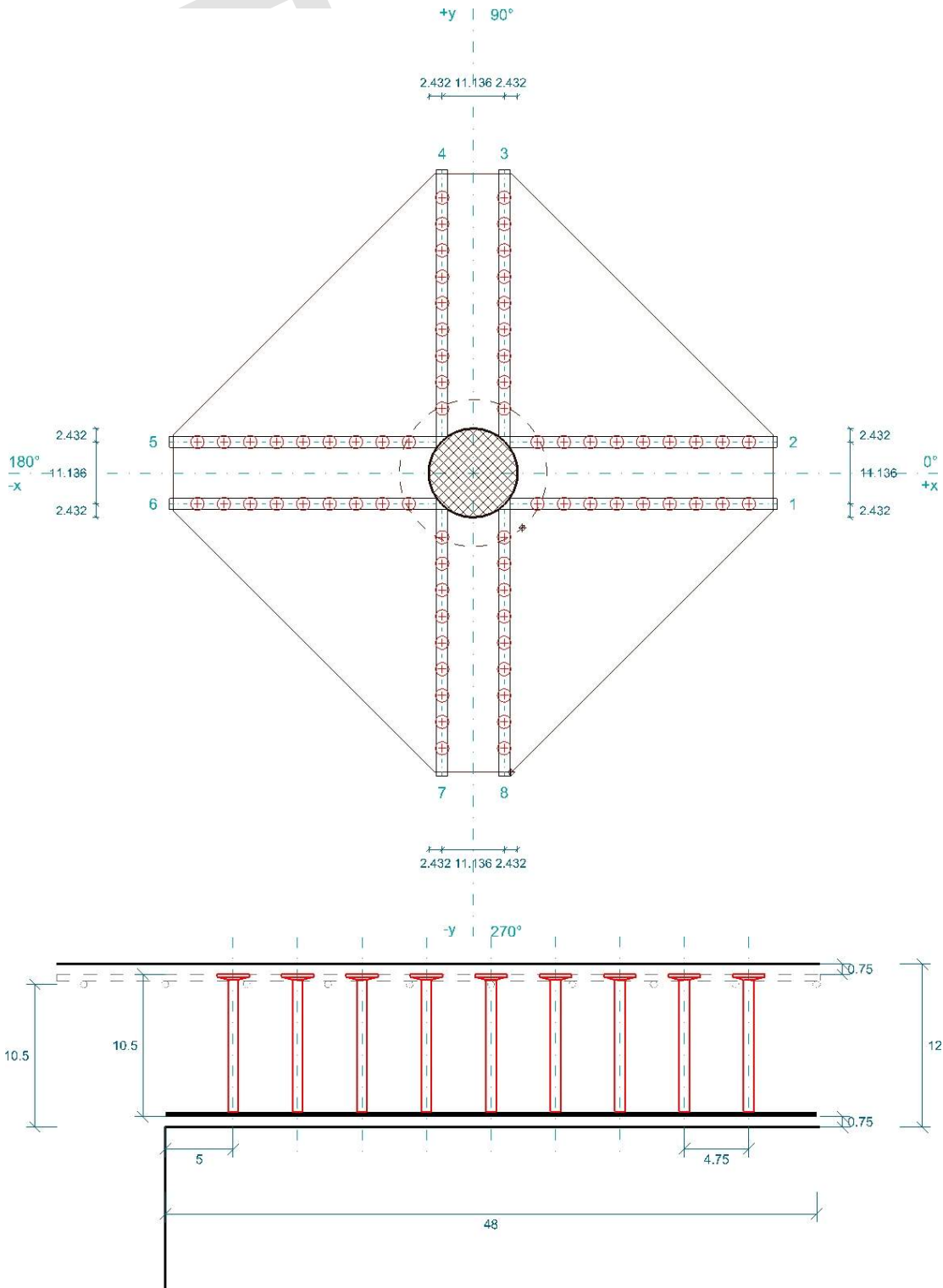
3. Elements

| | | | |
|--------------------------------|-----------|---|----------------|
| Number of studrails per column | | = | 8 |
| Number of studs per studrail | | = | 9 |
| Stud diameter | D | = | 0.75 in |
| Stud spacing | S / S_0 | = | 4.75 in / 5 in |
| Overall height of studrail | OAH | = | 10.5 in |
| Overall length of studrail | OAL | = | 48 in |

4. Note

- The design against punching shear failure is based on the rules of ACI 318-14.
- This calculation is based on product specific properties of DECON® Studrails®. Changes, even to similar products, are only possible with new calculations.
- All data have to be checked with the given edge boundaries and the feasibility. DECON assumes no liability for the input data of the user.

Date: October 10, 2023



JORDAHL® EXPERT Punching shear - Design

Position: SR-2 16"Ø (Edge Condition)

1. Input information

| | | | | | |
|---------------------------|------------------------|---|------|--------|---------------|
| Column type | Circular edge column | | | | |
| Diameter | d_{st} | = | 16 | in | |
| Edge | r_a | = | 0 | in | |
| Slab type | Elevated concrete slab | | | | |
| Slab thickness | h | = | 12 | in | |
| Concrete cover top/bottom | c_o / c_u | = | 0.75 | in | / 0.75 in |
| Effective depth | d_x / d_y | = | 10.5 | in | / 10.5 in |
| Concrete strength | 5000 psi | | | | |
| Density | Normal weight concrete | | | | |
| Prestress | f_{pc} | = | 125 | psi | |
| Punching shear load | V_u | = | 57.1 | kip | |
| Unbalanced moment | M_{ux} / M_{uy} | = | 23.3 | kip-ft | / 23.8 kip-ft |
| Seismic loading | Yes | | | | |

2. Output information (ACI 318-14)

2.1 Inner Critical Section (d/2 outside of column face)

2.1.1 Common Properties

| | | | | |
|----------------------------|-------|---|-------|-----------------|
| Area | A_c | = | 605.1 | in ² |
| Critical section perimeter | b_o | = | 57.6 | in |

2.1.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | -4.983 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $6.786 \cdot 10^4$ | in ⁴ | / $2.693 \cdot 10^4$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.1.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 4.983 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $6.786 \cdot 10^4$ | in ⁴ | / $2.693 \cdot 10^4$ in ⁴ |
| Principal axis rotation | θ | = | 0.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.4268 | | / 0.3409 |
| Unbalanced moment | M_{u1} / M_{u2} | = | 23.3 | kip-ft | / 23.8 kip-ft |

2.1.4 Stresses

| | | | | | |
|-----------------------------------|------------------|---|-------|-----|-------------|
| Maximum shear stress | v_u | = | 211.4 | psi | |
| | x / y | = | 8 | in | / -13.25 in |
| Shear resistance (concrete only) | ϕv_c | = | 212.1 | psi | |
| Shear resistance (with studrails) | ϕv_n | = | 450 | psi | |
| Shear resistance (upper limit) | $\phi v_{n,max}$ | = | 424.3 | psi | |

2.2 Outer Critical Section (d/2 outside of reinforced zone)

2.2.1 Common Properties

| | | | | |
|----------------------------|-------|---|-------|-----------------|
| Area | A_c | = | 1853 | in ² |
| Critical section perimeter | b_0 | = | 176.5 | in |

2.2.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | -26.989 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $2.455 \cdot 10^6$ | in ⁴ | / $6.206 \cdot 10^5$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.2.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 26.989 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $2.455 \cdot 10^6$ | in ⁴ | / $6.206 \cdot 10^5$ in ⁴ |
| Principal axis rotation | θ | = | 0.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.4680 | | / 0.2897 |
| Unbalanced moment | M_{u1} / M_{u2} | = | 23.3 | kip-ft | / 23.8 kip-ft |

2.2.4 Stresses

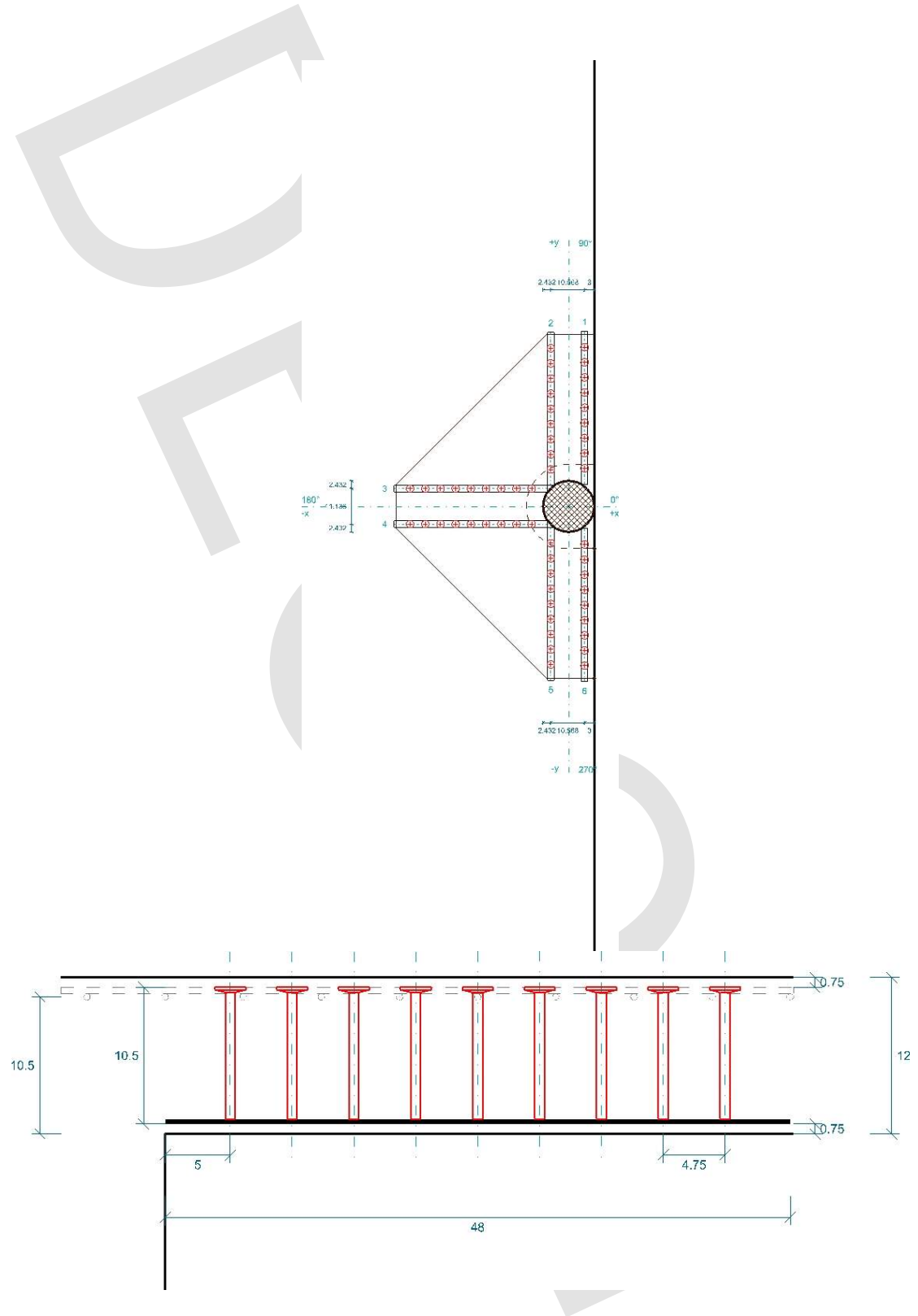
| | | | | | |
|----------------------|------------|---|-------|-----|--------------|
| Maximum shear stress | v_u | = | 63.5 | psi | |
| | x / y | = | 8 | in | / -53.907 in |
| Shear resistance | ϕv_c | = | 106.1 | psi | |

3. Elements

| | | | |
|--------------------------------|-----------|---|----------------|
| Number of studrails per column | | = | 6 |
| Number of studs per studrail | | = | 9 |
| Stud diameter | D | = | 0.75 in |
| Stud spacing | S / S_0 | = | 4.75 in / 5 in |
| Overall height of studrail | OAH | = | 10.5 in |
| Overall length of studrail | OAL | = | 48 in |

4. Note

- The design against punching shear failure is based on the rules of ACI 318-14.
- This calculation is based on product specific properties of DECON® Studrails®. Changes, even to similar products, are only possible with new calculations.
- All data have to be checked with the given edge boundaries and the feasibility. DECON assumes no liability for the input data of the user.



JORDAHL® EXPERT Punching shear - Design

Position: SR-1 16x22

1. Input information

| | | | | | |
|---------------------------|-----------------------------|---|--------|--------|-----------------|
| Column type | Rectangular interior column | | | | |
| Column dimension | c_x / c_y | = | 22 | in | / 16 in |
| Slab type | Elevated concrete slab | | | | |
| Slab thickness | h | = | 12 | in | |
| Concrete cover top/bottom | c_o / c_u | = | 0.75 | in | / 0.75 in |
| Effective depth | d_x / d_y | = | 10.5 | in | / 10.5 in |
| Concrete strength | 5000 psi | | | | |
| Density | Normal weight concrete | | | | |
| Prestress | f_{pc} | = | 0 | psi | |
| Punching shear load | V_u | = | 163 | kip | |
| Unbalanced moment | M_{ux} / M_{uy} | = | -120.6 | kip-ft | / -111.1 kip-ft |
| Seismic loading | Yes | | | | |

2. Output information (ACI 318-14)

2.1 Inner Critical Section (d/2 outside of column face)

2.1.1 Common Properties

| | | | | |
|----------------------------|-------|---|------|-----------------|
| Area | A_c | = | 1239 | in ² |
| Critical section perimeter | b_0 | = | 118 | in |

2.1.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $1.524 \cdot 10^5$ | in ⁴ | / $2.070 \cdot 10^5$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.1.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 0 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $2.070 \cdot 10^5$ | in ⁴ | / $1.524 \cdot 10^5$ in ⁴ |
| Principal axis rotation | θ | = | 90.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.4247 | | / 0.3758 |
| Unbalanced moment | M_{u1} / M_{u2} | = | -111.1 | kip-ft | / 120.6 kip-ft |

2.1.4 Stresses

| | | | | | |
|-----------------------------------|------------------|---|--------|-----|------------|
| Maximum shear stress | v_u | = | 223.3 | psi | |
| | x / y | = | -16.25 | in | / 13.25 in |
| Shear resistance (concrete only) | ϕv_c | = | 212.1 | psi | |
| Shear resistance (with studrails) | ϕv_n | = | 288.9 | psi | |
| Shear resistance (upper limit) | $\phi v_{n,max}$ | = | 424.3 | psi | |

2.2 Outer Critical Section (d/2 outside of reinforced zone)

2.2.1 Common Properties

| | | | | |
|----------------------------|-------|---|--------|-----------------|
| Area | A_c | = | 3710.7 | in ² |
| Critical section perimeter | b_0 | = | 353.4 | in |

2.2.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $5.215 \cdot 10^6$ | in ⁴ | / $5.543 \cdot 10^6$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.2.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 0 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $5.543 \cdot 10^6$ | in ⁴ | / $5.215 \cdot 10^6$ in ⁴ |
| Principal axis rotation | θ | = | 90.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.4062 | | / 0.3938 |
| Unbalanced moment | M_{u1} / M_{u2} | = | -111.1 | kip-ft | / 120.6 kip-ft |

2.2.4 Stresses

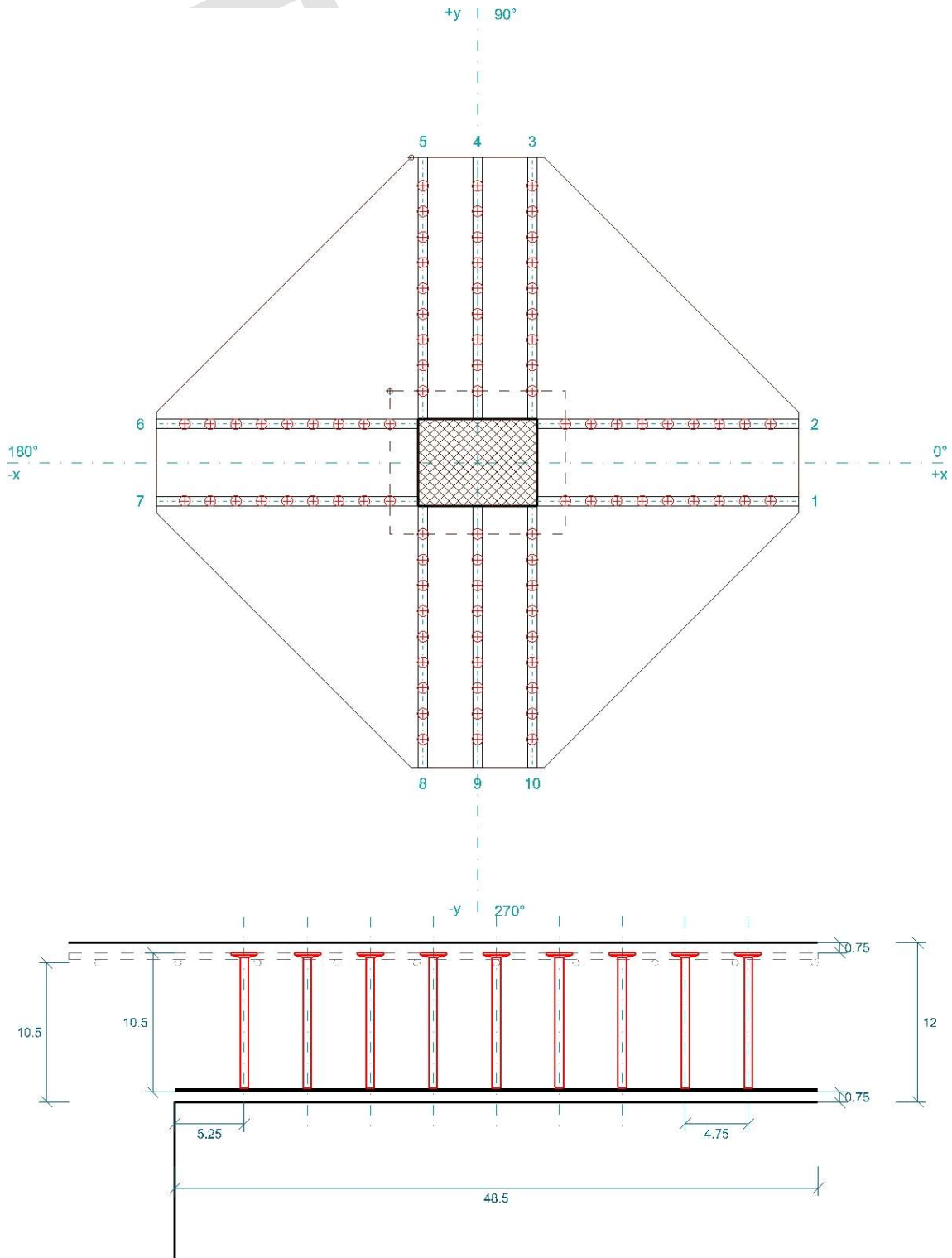
| | | | | | |
|----------------------|------------|---|-------|-----|-----------|
| Maximum shear stress | v_u | = | 51.3 | psi | |
| | x / y | = | -12.3 | in | / 56.5 in |
| Shear resistance | ϕv_c | = | 106.1 | psi | |

3. Elements

| | | | |
|--------------------------------|-----------|---|-------------------|
| Number of studrails per column | | = | 10 |
| Number of studs per studrail | | = | 9 |
| Stud diameter | D | = | 0.625 in |
| Stud spacing | S / S_0 | = | 4.75 in / 5.25 in |
| Overall height of studrail | OAH | = | 10.5 in |
| Overall length of studrail | OAL | = | 48.5 in |

4. Note

- The design against punching shear failure is based on the rules of ACI 318-14.
- This calculation is based on product specific properties of DECON® Studrails®. Changes, even to similar products, are only possible with new calculations.
- All data have to be checked with the given edge boundaries and the feasibility. DECON assumes no liability for the input data of the user.



JORDAHL® EXPERT Punching shear - Design

Position: SR-1 12x24

1. Input information

| | | | | | |
|---------------------------|-----------------------------|---|-------|--------|----------------|
| Column type | Rectangular interior column | | | | |
| Column dimension | c_x / c_y | = | 24 | in | / 12 in |
| Slab type | Elevated concrete slab | | | | |
| Slab thickness | h | = | 12 | in | |
| Concrete cover top/bottom | c_o / c_u | = | 0.75 | in | / 0.75 in |
| Effective depth | d_x / d_y | = | 10.5 | in | / 10.5 in |
| Concrete strength | 5000 psi | | | | |
| Density | Normal weight concrete | | | | |
| Prestress | f_{pc} | = | 0 | psi | |
| Punching shear load | V_u | = | 229.1 | kip | |
| Unbalanced moment | M_{ux} / M_{uy} | = | -18.7 | kip-ft | / 144.5 kip-ft |
| Seismic loading | Yes | | | | |

2. Output information (ACI 318-14)

2.1 Inner Critical Section (d/2 outside of column face)

2.1.1 Common Properties

| | | | | |
|----------------------------|-------|---|------|-----------------|
| Area | A_c | = | 1197 | in ² |
| Critical section perimeter | b_0 | = | 114 | in |

2.1.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $1.116 \cdot 10^5$ | in ⁴ | / $2.125 \cdot 10^5$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.1.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 0 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $2.125 \cdot 10^5$ | in ⁴ | / $1.116 \cdot 10^5$ in ⁴ |
| Principal axis rotation | θ | = | 90.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.4522 | | / 0.3500 |
| Unbalanced moment | M_{u1} / M_{u2} | = | 144.5 | kip-ft | / 18.7 kip-ft |

2.1.4 Stresses

| | | | | | |
|-----------------------------------|------------------|---|-------|-----|------------|
| Maximum shear stress | v_u | = | 263 | psi | |
| | x / y | = | 17.25 | in | / 11.25 in |
| Shear resistance (concrete only) | ϕv_c | = | 212.1 | psi | |
| Shear resistance (with studrails) | ϕv_n | = | 296.3 | psi | |
| Shear resistance (upper limit) | $\phi v_{n,max}$ | = | 424.3 | psi | |

2.2 Outer Critical Section (d/2 outside of reinforced zone)

2.2.1 Common Properties

| | | | | |
|----------------------------|-------|---|--------|-----------------|
| Area | A_c | = | 3668.7 | in ² |
| Critical section perimeter | b_0 | = | 349.4 | in |

2.2.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $4.862 \cdot 10^6$ | in ⁴ | / $5.493 \cdot 10^6$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.2.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 0 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $5.493 \cdot 10^6$ | in ⁴ | / $4.862 \cdot 10^6$ in ⁴ |
| Principal axis rotation | θ | = | 90.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.4126 | | / 0.3875 |
| Unbalanced moment | M_{u1} / M_{u2} | = | 144.5 | kip-ft | / 18.7 kip-ft |

2.2.4 Stresses

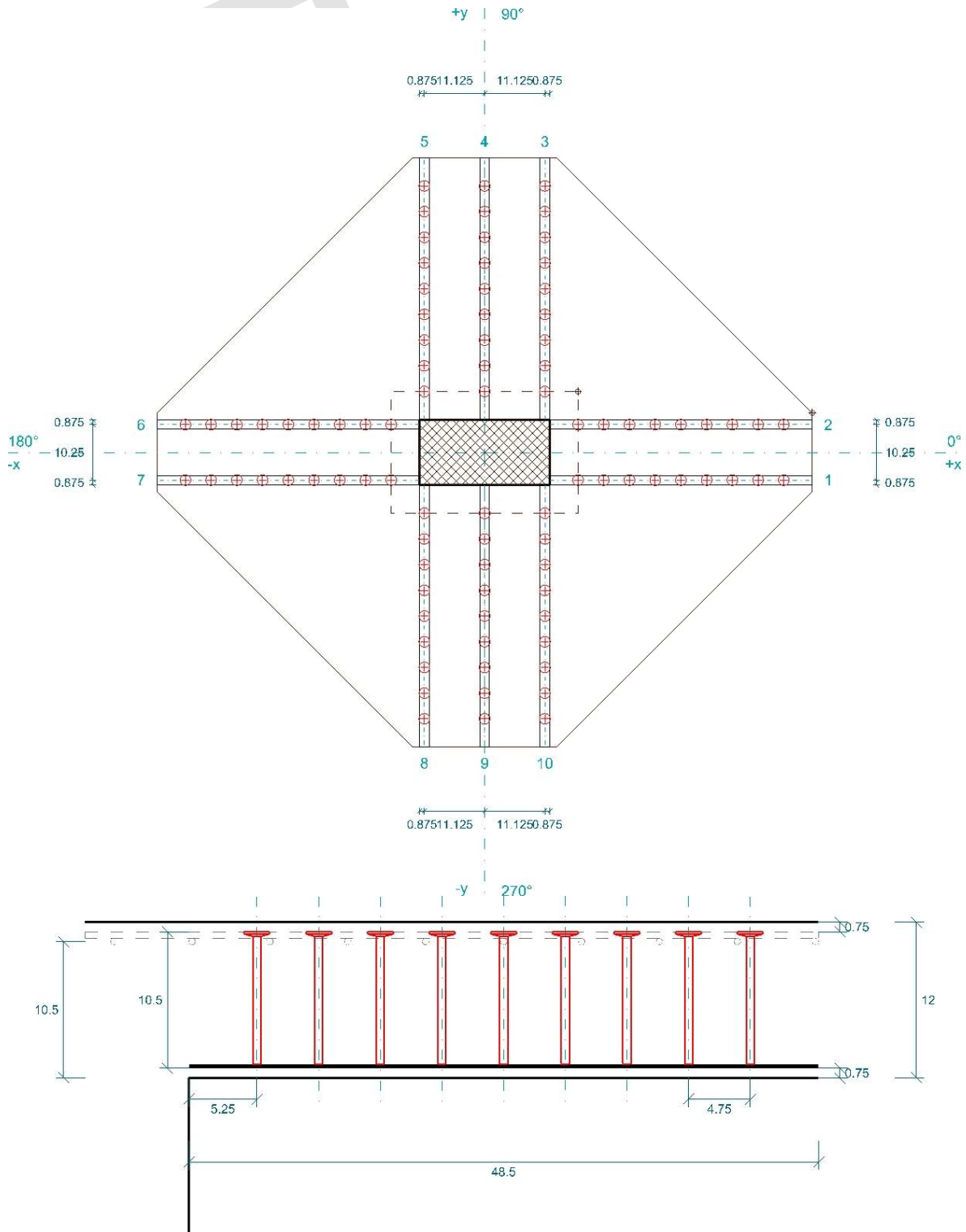
| | | | | | |
|----------------------|------------|---|-------|-----|----------|
| Maximum shear stress | v_u | = | 70.5 | psi | |
| | x / y | = | 60.5 | in | / 7.3 in |
| Shear resistance | ϕv_c | = | 106.1 | psi | |

3. Elements

| | | | |
|--------------------------------|-----------|---|-------------------|
| Number of studrails per column | | = | 10 |
| Number of studs per studrail | | = | 9 |
| Stud diameter | D | = | 0.625 in |
| Stud spacing | S / S_0 | = | 4.75 in / 5.25 in |
| Overall height of studrail | OAH | = | 10.5 in |
| Overall length of studrail | OAL | = | 48.5 in |

4. Note

- The design against punching shear failure is based on the rules of ACI 318-14.
- This calculation is based on product specific properties of DECON® Studrails®. Changes, even to similar products, are only possible with new calculations.
- All data have to be checked with the given edge boundaries and the feasibility. DECON assumes no liability for the input data of the user.



JORDAHL® EXPERT Punching shear - Design

Position: SR-2 16"Ø

1. Input information

| | | | | | |
|---------------------------|--------------------------|---|-------|--------|-----------------|
| Column type | Circular interior column | | | | |
| Diameter | d_{st} | = | 16 | in | |
| Slab type | Elevated concrete slab | | | | |
| Slab thickness | h | = | 12 | in | |
| Concrete cover top/bottom | c_o / c_u | = | 0.75 | in | / 0.75 in |
| Effective depth | d_x / d_y | = | 10.5 | in | / 10.5 in |
| Concrete strength | 5000 psi | | | | |
| Density | Normal weight concrete | | | | |
| Prestress | f_{pc} | = | 0 | psi | |
| Punching shear load | V_u | = | 264 | kip | |
| Unbalanced moment | M_{ux} / M_{uy} | = | -12.1 | kip-ft | / -119.9 kip-ft |
| Seismic loading | Yes | | | | |

2. Output information (ACI 318-14)

2.1 Inner Critical Section (d/2 outside of column face)

2.1.1 Common Properties

| | | | | | |
|----------------------------|-------|---|-------|-----------------|--|
| Area | A_c | = | 874.1 | in ² | |
| Critical section perimeter | b_o | = | 83.3 | in | |

2.1.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $7.673 \cdot 10^4$ | in ⁴ | / $7.673 \cdot 10^4$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.1.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 0 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $7.673 \cdot 10^4$ | in ⁴ | / $7.673 \cdot 10^4$ in ⁴ |
| Principal axis rotation | θ | = | 0.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.4000 | | / 0.4000 |
| Unbalanced moment | M_{u1} / M_{u2} | = | -12.1 | kip-ft | / -119.9 kip-ft |

2.1.4 Stresses

| | | | | | |
|-----------------------------------|------------------|---|---------|-----|-----------|
| Maximum shear stress | v_u | = | 401.9 | psi | |
| | x / y | = | -13.183 | in | / 1.33 in |
| Shear resistance (concrete only) | ϕv_c | = | 212.1 | psi | |
| Shear resistance (with studrails) | ϕv_n | = | 421.4 | psi | |
| Shear resistance (upper limit) | $\phi v_{n,max}$ | = | 424.3 | psi | |

2.2 Outer Critical Section (d/2 outside of reinforced zone)

2.2.1 Common Properties

| | | | | |
|----------------------------|-------|---|------|-----------------|
| Area | A_c | = | 3370 | in ² |
| Critical section perimeter | b_0 | = | 321 | in |

2.2.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $3.933 \cdot 10^6$ | in ⁴ | / $3.933 \cdot 10^6$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.2.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 0 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $3.933 \cdot 10^6$ | in ⁴ | / $3.933 \cdot 10^6$ in ⁴ |
| Principal axis rotation | θ | = | 0.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.4000 | | / 0.4000 |
| Unbalanced moment | M_{u1} / M_{u2} | = | -12.1 | kip-ft | / -119.9 kip-ft |

2.2.4 Stresses

| | | | | | |
|----------------------|------------|---|---------|-----|------------|
| Maximum shear stress | v_u | = | 86.3 | psi | |
| | x / y | = | -53.907 | in | / 6.831 in |
| Shear resistance | ϕv_c | = | 106.1 | psi | |

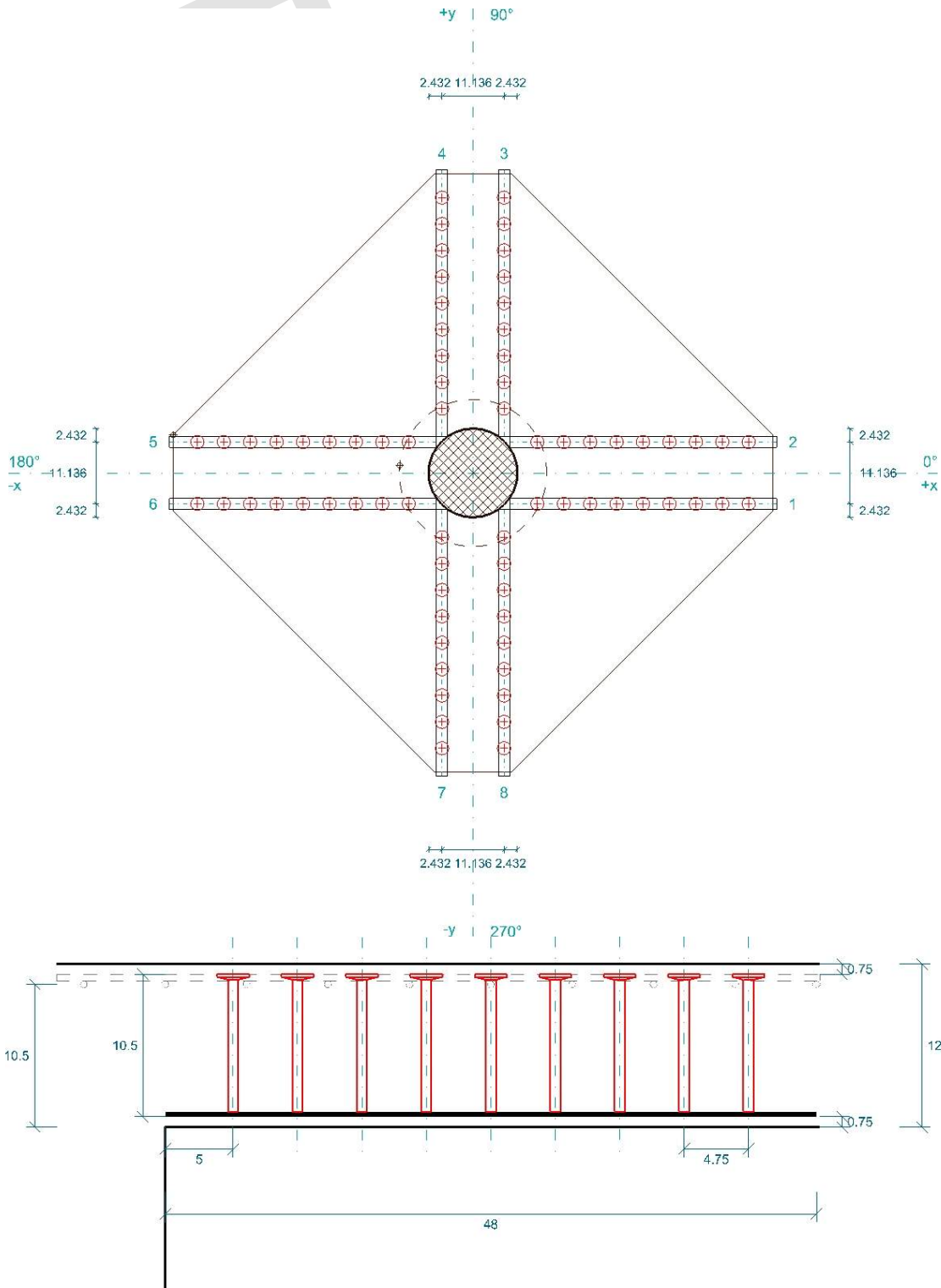
3. Elements

| | | | |
|--------------------------------|-----------|---|----------------|
| Number of studrails per column | | = | 8 |
| Number of studs per studrail | | = | 9 |
| Stud diameter | D | = | 0.75 in |
| Stud spacing | S / S_0 | = | 4.75 in / 5 in |
| Overall height of studrail | OAH | = | 10.5 in |
| Overall length of studrail | OAL | = | 48 in |

4. Note

- The design against punching shear failure is based on the rules of ACI 318-14.
- This calculation is based on product specific properties of DECON® Studrails®. Changes, even to similar products, are only possible with new calculations.
- All data have to be checked with the given edge boundaries and the feasibility. DECON assumes no liability for the input data of the user.

Date: October 10, 2023



JORDAHL® EXPERT Punching shear - Design

Position: SR-3 16x22

1. Input information

| | | | | |
|---------------------------|-----------------------------|--------|----------------|--------|
| Column type | Rectangular interior column | | | |
| Column dimension | c_x / c_y | = 16 | in / 22 | in |
| Slab type | Elevated concrete slab | | | |
| Slab thickness | h | = 10 | in | |
| Concrete cover top/bottom | c_o / c_u | = 0.75 | in / 0.75 | in |
| Effective depth | d_x / d_y | = 8.5 | in / 8.5 | in |
| Concrete strength | 5000 psi | | | |
| Density | Normal weight concrete | | | |
| Prestress | f_{pc} | = 0 | psi | |
| Punching shear load | V_u | = 182 | kip | |
| Unbalanced moment | M_{ux} / M_{uy} | = 12.5 | kip-ft / -49.2 | kip-ft |
| Seismic loading | Yes | | | |

2. Output information (ACI 318-14)

2.1 Inner Critical Section (d/2 outside of column face)

2.1.1 Common Properties

| | | | |
|----------------------------|-------|-------|-----------------|
| Area | A_c | = 935 | in ² |
| Critical section perimeter | b_0 | = 110 | in |

2.1.2 Natural Axis Properties

| | | | | |
|----------------------------|-------------|----------------------|--------------------------------------|-----------------|
| Centroid coordinate | e_x / e_y | = 0 | in / 0 | in |
| Section moment of inertia | I_x / I_y | = $1.371 \cdot 10^5$ | in ⁴ / $9.864 \cdot 10^4$ | in ⁴ |
| Section product of inertia | I_{xy} | = 0 | in ⁴ | |

2.1.3 Principal Axis Properties

| | | | | |
|---------------------------|-----------------------|----------------------|--------------------------------------|-----------------|
| Centroid coordinate | e_1 / e_2 | = 0 | in / 0 | in |
| Section moment of inertia | I_1 / I_2 | = $1.371 \cdot 10^5$ | in ⁴ / $9.864 \cdot 10^4$ | in ⁴ |
| Principal axis rotation | θ | = 0.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = 0.4266 | / 0.3740 | |
| Unbalanced moment | M_{u1} / M_{u2} | = 12.5 | kip-ft / -49.2 | kip-ft |

2.1.4 Stresses

| | | | | | |
|-----------------------------------|------------------|---|--------|-----|-------------|
| Maximum shear stress | v_u | = | 229.2 | psi | |
| | x / y | = | -12.25 | in | / -15.25 in |
| Shear resistance (concrete only) | ϕv_c | = | 212.1 | psi | |
| Shear resistance (with studrails) | ϕv_n | = | 304.1 | psi | |
| Shear resistance (upper limit) | $\phi v_{n,max}$ | = | 424.3 | psi | |

2.2 Outer Critical Section (d/2 outside of reinforced zone)

2.2.1 Common Properties

| | | | | |
|----------------------------|-------|---|--------|-----------------|
| Area | A_c | = | 2671.1 | in ² |
| Critical section perimeter | b_0 | = | 314.2 | in |

2.2.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $3.185 \cdot 10^6$ | in ⁴ | / $2.970 \cdot 10^6$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.2.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 0 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $3.185 \cdot 10^6$ | in ⁴ | / $2.970 \cdot 10^6$ in ⁴ |
| Principal axis rotation | θ | = | 0.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.4070 | | / 0.3930 |
| Unbalanced moment | M_{u1} / M_{u2} | = | 12.5 | kip-ft | / -49.2 kip-ft |

2.2.4 Stresses

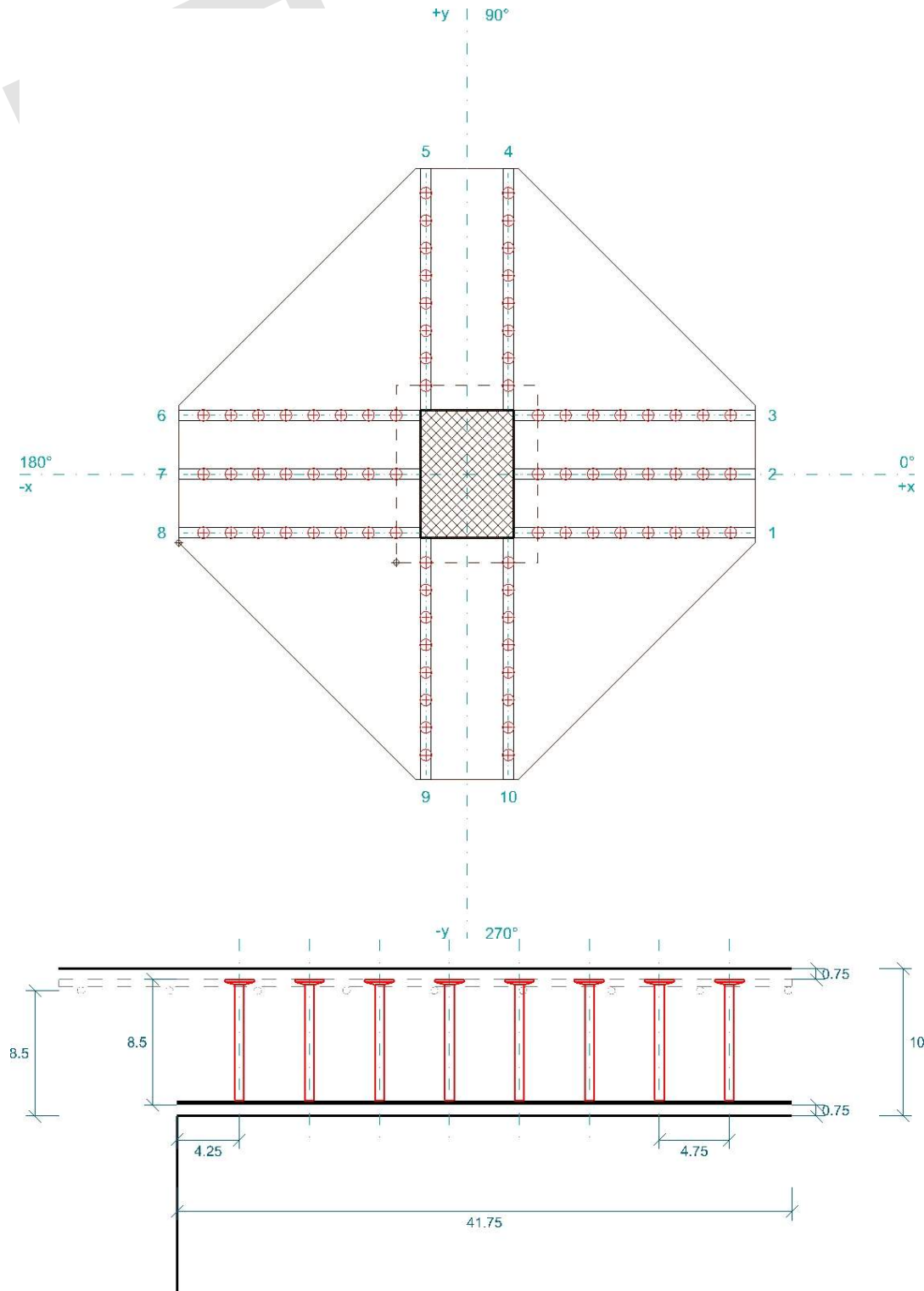
| | | | | | |
|----------------------|------------|---|--------|-----|--------------|
| Maximum shear stress | v_u | = | 72.3 | psi | |
| | x / y | = | -49.75 | in | / -11.885 in |
| Shear resistance | ϕv_c | = | 106.1 | psi | |

3. Elements

| | | | |
|--------------------------------|-----------|---|-------------------|
| Number of studrails per column | | = | 10 |
| Number of studs per studrail | | = | 8 |
| Stud diameter | D | = | 0.625 in |
| Stud spacing | S / S_0 | = | 4.75 in / 4.25 in |
| Overall height of studrail | OAH | = | 8.5 in |
| Overall length of studrail | OAL | = | 41.75 in |

4. Note

- The design against punching shear failure is based on the rules of ACI 318-14.
- This calculation is based on product specific properties of DECON® Studrails®. Changes, even to similar products, are only possible with new calculations.
- All data have to be checked with the given edge boundaries and the feasibility. DECON assumes no liability for the input data of the user.



CONCRETE LATERAL

Lateral Design Criteria

Code

ASCE 7-10

Analysis

A “two-stage” analysis per ASCE 7-10 Section 12.2.3.2 was used for the building lateral analysis. The equivalent lateral force (ELF) procedure was used, lumping the seismic mass of the wood building above the lower concrete portion of the building on the concrete podium slab.

For the lower, concrete portion of the structure, a “bearing wall system” consisting of “Special Reinforced Concrete Shear Walls” was used for the primary lateral force-resisting system corresponding to an R-factor of 5, a C_d -value of 5 and an Ω -factor of 2.5. The lateral force resisting system consists of horizontal concrete cast-in-place (rigid) diaphragms and concrete cast-in-place special reinforced concrete shear walls for vertical elements.

A RAM Structural System model was created to capture torsional demands and provide the design for the corresponding lateral resisting elements. RAM Concept was utilized for the design of the mat foundation and analysis of the diaphragms was done by hand, both using output from the RAM Structural System model.



Project: MERCER ISLAND

Job Number: 19-028

Sheet: _____ of _____

Name: AK

Originating Office: Seattle

Date: 10/12/23

DESIGN CRITERIA - SEISMIC

ASCE 7-10 SECTION 12.8 - EQUIVALENT LATERAL FORCE PROCEDURE

| | | | |
|--|--------|------------------|----------|
| OCCUPANCY CATEGORY: | I & II | LATITUDE: | 47.585 |
| SITE CLASS: | D | LONGITUDE: | -122.234 |
| IMPORTANCE FACTOR (I _E): | 1 | S _S = | 1.380 |
| STRUCTURAL SYSTEM (R): | 5 | S ₁ = | 0.531 |
| OVERSTRENGTH FACTOR (Ω ₀): | 3 | F _a = | 1.000 |
| | | F _v = | 1.500 |

ASCE 7-10 SECTION 11.4 SEISMIC GROUND MOTION VALUES

Section 11.4.3 - Adjusted Maximum Considered Earthquake Spectral Response Acceleration Parameters

$$S_{MS} = F_a * S_S = 1.380 \quad S_{M1} = F_v * S_1 = 0.797$$

Section 11.4.4 - Design Spectral Response Acceleration Parameters

$$S_{DS} = 2/3 * S_{MS} = 0.920 \quad S_{D1} = 2/3 * S_{M1} = 0.531$$

ASCE 7-10 SECTION 11.6 - SEISMIC DESIGN CATEGORY - SECTION 12.8.2 - PERIOD DETERMINATION

| ASCE 7-10 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 |
| >= 0.50g | D | D | D |
| D | | | |

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.

| ASCE 7-10 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 |
| >= 0.20g | D | D | D |
| D | | | |

| PERIOD DETERMINATION: | |
|--|-------|
| C _t = | 0.02 |
| h _n = | 26 FT |
| x = | 0.75 |
| T _a = C _t *h _n ^x = | 0.227 |

ASCE 7-10 SECTION 12.8.1.1 - SEISMIC RESPONSE COEFFICIENT

GENERAL EQUATION: $C_S = S_{DS}/(R/I) = 0.184$ <--CONTROLS EQ. 12.8-2

MAXIMUM: $C_S = S_{D1}/(T*(R/I)) = 0.468$ EQ. 12.8-3

MINIMUM: $C_S = 0.044 * S_{DS} * I > 0.01 = 0.040$ EQ. 12.8-5

For structures located where S₁ > 0.6g
 $C_S = 0.5 * S_1 / (R/I) = 0.000$ EQ. 12.8-6

ASCE 7-10 SECTION 12.8.1 - SEISMIC BASE SHEAR

$V = C_S * W = \mathbf{0.184 * W}$

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



Project: MIMU Job Number: 19-028

Sheet: of Name: JDJ

Originating Office: Seattle Date: 10/12/23

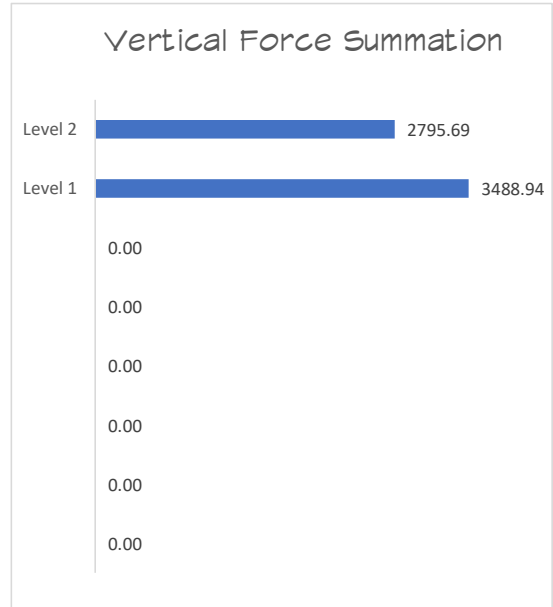
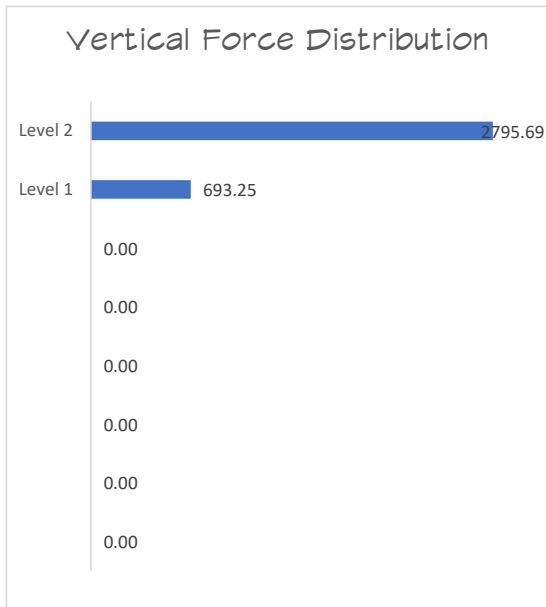
VERTICAL DISTRIBUTION OF SEISMIC FORCES ASCE 7-16 SEC. 12.8.3

CODE: IBC 2018, ASCE 7-16

LOCATION: MERCER ISLAND, WA

T = 0.28 Sec. ASCE 7-16 Sec. 12.8.2
 k = 1 ASCE 7-16 Sec. 12.8.3
 Base Shear, V = 3489 k
 # OF Floors = 3

| LEVEL | h_x (ft) | Floor Weight (k) | Wh_n^k (k-ft) | C_{vx} | F_x (k) | ΣF_x (k) |
|----------|---------------|---------------------|--------------------|--------------|----------------|---------------------|
| Level 2 | <u>25.5</u> | <u>15335</u> | <u>391042.5</u> | <u>0.801</u> | <u>2795.69</u> | <u>2795.69</u> |
| Level 1 | <u>10.5</u> | <u>9235</u> | <u>96967.5</u> | <u>0.199</u> | <u>693.25</u> | <u>3488.94</u> |
| Σ | | <u>24570</u> | <u>488010</u> | | | |





Project: MIMU Job Number: 19-028

Sheet: of Name: JDJ

Originating Office: Seattle Date: 10/12/23

DIAPHRAGM DESIGN FORCES ASCE 7-16 SEC. 12.10.1.1

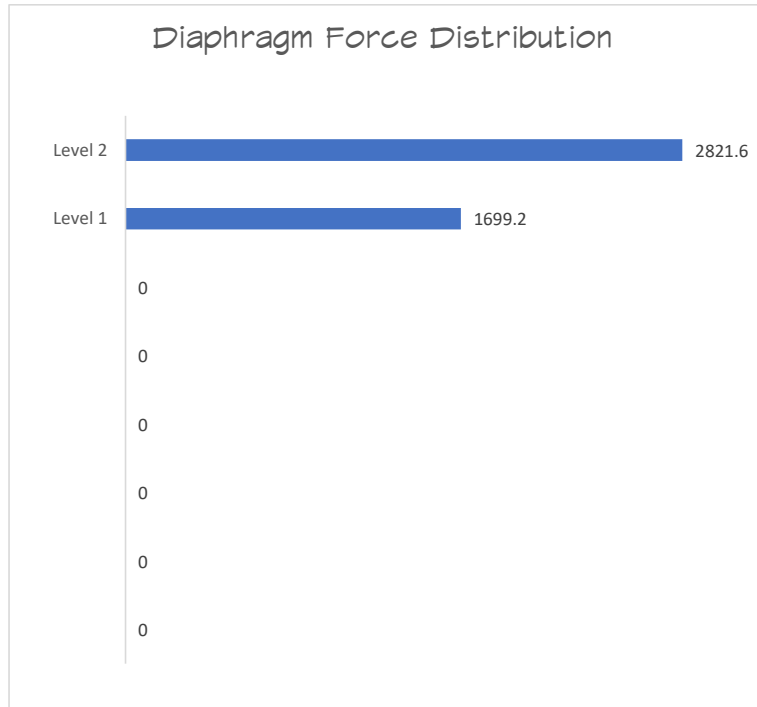
CODE: IBC 2018, ASCE 7-16

LOCATION: MERCER ISLAND, WA

$S_{DS} = 0.920$ ASCE 7-16 Sec. 11.4.5
 $I_e = 1.0$ ASCE 7-16 Table 1.5-2

| LEVEL | ΣF_x (k) | W_{px} (k-ft) | ΣW_i (k) | F_{px} (k) | F_{pxMIN} (k) | F_{pxMax} (k) |
|---------|---------------------|--------------------|---------------------|-----------------|--------------------|--------------------|
| Level 2 | 2795.69 | 15335 | 15335 | 2795.7 | 2821.6 | 5643.3 |
| Level 1 | 3488.94 | 9235 | 24570 | 1311.4 | 1699.2 | 3398.5 |

| LEVEL | F_{px} control (k) |
|---------|-------------------------|
| Level 2 | 2821.6 |
| Level 1 | 1699.2 |





Criteria, Mass and Exposure Data

RAM Frame 23.00.00.92



DataBase: MIMU - Revised Design_v2.0

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CRITERIA:

Rigid End Zones: Ignore Effects
 Member Force Output: At Face of Joint
 P-Delta: Yes Scale Factor: 1.00
 Ground Level: Base
 Mesh Criteria :
 Max. Distance Between Nodes on Mesh Line (ft) : 4.00
 Merge Node Tolerance (in) : 0.0100
 Geometry Tolerance (in) : 0.0050
 Walls Out-of-plane Stiffness Included in Analysis.
 Rotational Fixities Released at Wall Foundation Nodes.
 Sign considered for Dynamic Load Case Results.
 Rigid Links Included at Fixed Beam-to-Wall Locations
 Eigenvalue Analysis : Eigen Vectors (Subspace Iteration)

DIAPHRAGM DATA:

| Story | Diaph # | Diaph Type |
|--------|---------|------------|
| Second | 1 | Rigid |
| First | 1 | Rigid |

Disconnect Internal Nodes of Beams: Yes
 Disconnect Nodes outside Slab Boundary: Yes

Semirigid Diaphragm Parameters:

Use Slab Edges for Exterior Boundary
 Calculate Diaphragm Mass
 Hard Node Density Factor: 1.00

STORY MASS DATA:

Includes Self Mass of:

Beams
 Columns (Half mass of columns above and below)
 Walls (Half mass of walls above and below)
 Slabs/Deck

Calculated Values:

| Story | Diaph # | Weight kips | Mass k-s2/ft | MMI ft-k-s2 | Xm ft | Ym ft | EccX ft | EccY ft |
|--------|---------|----------------|-----------------|----------------|----------|----------|------------|------------|
| Second | 1 | 15322.39 | 475.85 | 4712370 | 134.96 | 99.88 | 25.44 | 12.10 |
| First | 1 | 9220.96 | 286.37 | 2748166 | 153.18 | 93.14 | 22.56 | 11.82 |
| | None | 65.19 | 2.02 | 1360 | -16.83 | 157.58 | -- | -- |

| Story | Diaph # | Combine |
|--------|---------|---------|
| Second | 1 | None |
| First | 1 | None |
| | None | 1-First |

Combined/Merged Values: 505



Criteria, Mass and Exposure Data

RAM Frame 23.00.00.92

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DataBase: MIMU - Revised Design_v2.0

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| Story | Diaph # | Weight kips | Mass k-s2/ft | MMI ft-k-s2 | Xm ft | Ym ft | EccX ft | EccY ft |
|--------|---------|----------------|-----------------|----------------|----------|----------|------------|------------|
| Second | 1 | 15322.4 | 475.85 | 4712369 | 134.96 | 99.88 | 25.44 | 12.10 |
| First | 1 | 9286.2 | 288.39 | 2815972 | 151.98 | 93.59 | 22.56 | 11.82 |

Distributed Mass Values for Pseudo-Flexible or Meshed Diaphragms:

| Story | Diaph # | Total Weight kips | Total Mass k-s2/ft |
|--------|---------|----------------------|-----------------------|
| Second | 1 | 15326.05 | 475.964 |
| First | 1 | 9223.54 | 286.445 |

WIND EXPOSURE DATA:

Calculated Values:

| Story | Diaph # | Building Extents (ft) | | | | Expose | Parapet ft |
|--------|---------|-----------------------|--------|--------|--------|--------|---------------|
| | | Min X | Max X | Min Y | Max Y | | |
| Second | 1 | -25.05 | 254.54 | -35.80 | 206.29 | Full | 0.00 |
| First | 1 | 6.62 | 254.54 | -30.05 | 206.28 | Full | 0.00 |

STORY GRAVITY LOADS DATA:

Includes Weight of:

- Beams
- Columns
- Walls
- Slabs/Deck

Live Load Reduction (Calculated)

Reducible : 60.00 %
Storage : 0.00 %

Calculated Values:

| Story | Diaph # | Dead kips | Xc ft | Yc ft | Live kips | Xc ft | Yc ft |
|--------|---------|--------------|----------|----------|--------------|----------|----------|
| Second | 1 | 16180.97 | 134.57 | 99.74 | 6169.78 | 136.42 | 100.76 |
| First | 1 | 9469.23 | 154.66 | 93.40 | 2985.16 | 169.61 | 85.47 |
| | None | 53.68 | -16.83 | 157.58 | 0.00 | 0.00 | 0.00 |

| Story | Diaph # | Snow kips | Xc ft | Yc ft | Combine |
|--------|---------|--------------|----------|----------|---------|
| Second | 1 | 0.00 | 0.00 | 0.00 | None |
| First | 1 | 0.00 | 0.00 | 0.00 | None |
| | None | 0.00 | 0.00 | 0.00 | 1-First |

User Specified Values:

| Story | Diaph # | Dead kips | Xc ft | Yc ft | Live kips | Xc ft | Yc ft |
|--------|---------|--------------|----------|----------|--------------|----------|----------|
| Second | 1 | 16180.97 | 134.57 | 99.74 | 6169.78 | 136.42 | 100.76 |



Criteria, Mass and Exposure Data

RAM Frame 23.00.00.92

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DataBase: MIMU - Revised Design_v2.0

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| Story | Diaph # | Dead | Xc | Yc | Live | Xc | Yc |
|--------------|----------------|-------------|-----------|-----------|-------------|-----------|-----------|
| First | 1 | 9522.91 | 153.69 | 93.77 | 2985.16 | 169.61 | 85.47 |

| Story | Diaph # | Snow | Xc | Yc |
|--------------|----------------|-------------|-----------|-----------|
| | | kips | ft | ft |
| Second | 1 | 0.0 | 0.00 | 0.00 |
| First | 1 | 0.0 | 0.00 | 0.00 |



Loads and Applied Forces

RAM Frame 23.00.00.92



DataBase: MIMU - Revised Design_v2.0

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LOAD CASE: EQ

Seismic ASCE 7-16 Equivalent Lateral Force
 Importance Factor: 1.00 TL: 6.00 s
 Site Class D: Stiff Soil
 Ss: 1.380 g S1: 0.531 g
 Use Specified: SDs: 0.920 g SD1: 0.531 g
 Use Specified Seismic Design Category: D
 Provisions for: Force
 Ground Level: Base

| Dir | Eccent | R | Ta Equation | | | Building Period-T | |
|-----|---------|-------|---------------------|----------|-------------|-------------------|-------|
| X | + And - | 5.00 | Std,Ct=0.020,x=0.75 | | | Calculated | |
| Y | + And - | 5.00 | Std,Ct=0.020,x=0.75 | | | Calculated | |
| Dir | Ta | Cu | T | T - used | Cs Eq12.8-2 | Cs - used | k |
| X | 0.227 | 1.400 | 0.539 | 0.318 | 0.184 | 0.184 | 1.000 |
| | | | | | | | |
| Dir | Ta | Cu | T | T - used | Cs Eq12.8-2 | Cs - used | k |
| Y | 0.227 | 1.400 | 0.275 | 0.275 | 0.184 | 0.184 | 1.000 |

Exception 2 per Section 11.4.8 is applied for site class D with S1 > 0.2

Total Building Weight (kips) = 24608.54

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_X_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 3623.68 | 0.00 | 134.96 | 111.99 |
| First | 1 | 10.50 | 904.29 | 0.00 | 151.98 | 105.41 |

APPLIED STORY FORCES

Type: EQ_ASCE716_X_+E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|------------|------------|
| Second | 25.50 | 3623.68 | 0.00 |
| First | 10.50 | 904.29 | 0.00 |
| | | 4527.97 | 0.00 |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_X_-E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|-------|---------|----------|------------|------------|---------|---------|
| | | 508 | | | | |



Loads and Applied Forces

RAM Frame 23.00.00.92

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DataBase: MIMU - Revised Design_v2.0

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| | | | | | | |
|--------|---|-------|---------|------|--------|-------|
| Second | 1 | 25.50 | 3623.68 | 0.00 | 134.96 | 87.78 |
| First | 1 | 10.50 | 904.29 | 0.00 | 151.98 | 81.77 |

APPLIED STORY FORCES

Type: EQ_ASCE716_X_-E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|------------|------------|
| Second | 25.50 | 3623.68 | 0.00 |
| First | 10.50 | 904.29 | 0.00 |
| | | 4527.97 | 0.00 |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_Y_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 0.00 | 3623.68 | 160.41 | 99.88 |
| First | 1 | 10.50 | 0.00 | 904.29 | 174.54 | 93.59 |

APPLIED STORY FORCES

Type: EQ_ASCE716_Y_+E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|------------|------------|
| Second | 25.50 | 0.00 | 3623.68 |
| First | 10.50 | 0.00 | 904.29 |
| | | 0.00 | 4527.97 |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_Y_-E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 0.00 | 3623.68 | 109.52 | 99.88 |
| First | 1 | 10.50 | 0.00 | 904.29 | 129.42 | 93.59 |

APPLIED STORY FORCES

Type: EQ_ASCE716_Y_-E_F

| Level | Ht ft | Fx kips | Fy kips |
|-------|----------|------------|------------|
| | | 0.00 | 4527.97 |



Loads and Applied Forces

RAM Frame 23.00.00.92

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DataBase: MIMU - Revised Design_v2.0

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| | | | |
|--------|-------|------|---------|
| Second | 25.50 | 0.00 | 3623.68 |
| First | 10.50 | 0.00 | 904.29 |
| | | 0.00 | 4527.97 |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_X_+E_0.3Y_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 3623.68 | 1087.10 | 160.41 | 111.99 |
| First | 1 | 10.50 | 904.29 | 271.29 | 174.54 | 105.41 |

APPLIED STORY FORCES

Type: EQ_ASCE716_X_+E_0.3Y_+E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|------------|------------|
| Second | 25.50 | 3623.68 | 1087.10 |
| First | 10.50 | 904.29 | 271.29 |
| | | 4527.97 | 1358.39 |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_X_+E_-0.3Y_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 3623.68 | -1087.10 | 160.41 | 111.99 |
| First | 1 | 10.50 | 904.29 | -271.29 | 174.54 | 105.41 |

APPLIED STORY FORCES

Type: EQ_ASCE716_X_+E_-0.3Y_+E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|------------|------------|
| Second | 25.50 | 3623.68 | -1087.10 |
| First | 10.50 | 904.29 | -271.29 |
| | | 4527.97 | -1358.39 |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_-X_+E_0.3Y_+E_F



Loads and Applied Forces

RAM Frame 23.00.00.92

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DataBase: MIMU - Revised Design_v2.0

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| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | -3623.68 | 1087.10 | 160.41 | 111.99 |
| First | 1 | 10.50 | -904.29 | 271.29 | 174.54 | 105.41 |

APPLIED STORY FORCES

Type: EQ_ASCE716_-X_+E_0.3Y_+E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|-----------------|----------------|
| Second | 25.50 | -3623.68 | 1087.10 |
| First | 10.50 | -904.29 | 271.29 |
| | | <u>-4527.97</u> | <u>1358.39</u> |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_-X_+E_-0.3Y_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | -3623.68 | -1087.10 | 160.41 | 111.99 |
| First | 1 | 10.50 | -904.29 | -271.29 | 174.54 | 105.41 |

APPLIED STORY FORCES

Type: EQ_ASCE716_-X_+E_-0.3Y_+E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|-----------------|-----------------|
| Second | 25.50 | -3623.68 | -1087.10 |
| First | 10.50 | -904.29 | -271.29 |
| | | <u>-4527.97</u> | <u>-1358.39</u> |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_0.3X_+E_Y_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 1087.10 | 3623.68 | 160.41 | 111.99 |
| First | 1 | 10.50 | 271.29 | 904.29 | 174.54 | 105.41 |

APPLIED STORY FORCES

Type: EQ_ASCE716_0.3X_+E_Y_+E_F



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| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|----------------|----------------|
| Second | 25.50 | 1087.10 | 3623.68 |
| First | 10.50 | 271.29 | 904.29 |
| | | <u>1358.39</u> | <u>4527.97</u> |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_0.3X_+E_-Y_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 1087.10 | -3623.68 | 160.41 | 111.99 |
| First | 1 | 10.50 | 271.29 | -904.29 | 174.54 | 105.41 |

APPLIED STORY FORCES

Type: EQ_ASCE716_0.3X_+E_-Y_+E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|----------------|-----------------|
| Second | 25.50 | 1087.10 | -3623.68 |
| First | 10.50 | 271.29 | -904.29 |
| | | <u>1358.39</u> | <u>-4527.97</u> |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_-0.3X_+E_-Y_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | -1087.10 | 3623.68 | 160.41 | 111.99 |
| First | 1 | 10.50 | -271.29 | 904.29 | 174.54 | 105.41 |

APPLIED STORY FORCES

Type: EQ_ASCE716_-0.3X_+E_-Y_+E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|-----------------|----------------|
| Second | 25.50 | -1087.10 | 3623.68 |
| First | 10.50 | -271.29 | 904.29 |
| | | <u>-1358.39</u> | <u>4527.97</u> |



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APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_-0.3X_+E_-Y_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | -1087.10 | -3623.68 | 160.41 | 111.99 |
| First | 1 | 10.50 | -271.29 | -904.29 | 174.54 | 105.41 |

APPLIED STORY FORCES

Type: EQ_ASCE716_-0.3X_+E_-Y_+E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|-----------------|-----------------|
| Second | 25.50 | -1087.10 | -3623.68 |
| First | 10.50 | -271.29 | -904.29 |
| | | <u>-1358.39</u> | <u>-4527.97</u> |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_X_+E_0.3Y_-E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 3623.68 | 1087.10 | 109.52 | 111.99 |
| First | 1 | 10.50 | 904.29 | 271.29 | 129.42 | 105.41 |

APPLIED STORY FORCES

Type: EQ_ASCE716_X_+E_0.3Y_-E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|----------------|----------------|
| Second | 25.50 | 3623.68 | 1087.10 |
| First | 10.50 | 904.29 | 271.29 |
| | | <u>4527.97</u> | <u>1358.39</u> |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_X_+E_-0.3Y_-E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 3623.68 | -1087.10 | 109.52 | 111.99 |
| First | 1 | 10.50 | 904.29 | -271.29 | 129.42 | 105.41 |



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APPLIED STORY FORCES

Type: EQ_ASCE716_X_+E_-0.3Y_-E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|------------|------------|
| Second | 25.50 | 3623.68 | -1087.10 |
| First | 10.50 | 904.29 | -271.29 |
| | | 4527.97 | -1358.39 |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_-X_+E_0.3Y_-E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | -3623.68 | 1087.10 | 109.52 | 111.99 |
| First | 1 | 10.50 | -904.29 | 271.29 | 129.42 | 105.41 |

APPLIED STORY FORCES

Type: EQ_ASCE716_-X_+E_0.3Y_-E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|------------|------------|
| Second | 25.50 | -3623.68 | 1087.10 |
| First | 10.50 | -904.29 | 271.29 |
| | | -4527.97 | 1358.39 |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_-X_+E_-0.3Y_-E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | -3623.68 | -1087.10 | 109.52 | 111.99 |
| First | 1 | 10.50 | -904.29 | -271.29 | 129.42 | 105.41 |

APPLIED STORY FORCES

Type: EQ_ASCE716_-X_+E_-0.3Y_-E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|------------|------------|
| Second | 25.50 | -3623.68 | -1087.10 |
| First | 10.50 | -904.29 | -271.29 |
| | | -4527.97 | -1358.39 |



Loads and Applied Forces

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_0.3X_+E_Y_-E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 1087.10 | 3623.68 | 109.52 | 111.99 |
| First | 1 | 10.50 | 271.29 | 904.29 | 129.42 | 105.41 |

APPLIED STORY FORCES

Type: EQ_ASCE716_0.3X_+E_Y_-E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|------------|------------|
| Second | 25.50 | 1087.10 | 3623.68 |
| First | 10.50 | 271.29 | 904.29 |
| | | 1358.39 | 4527.97 |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_0.3X_+E_-Y_-E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 1087.10 | -3623.68 | 109.52 | 111.99 |
| First | 1 | 10.50 | 271.29 | -904.29 | 129.42 | 105.41 |

APPLIED STORY FORCES

Type: EQ_ASCE716_0.3X_+E_-Y_-E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|------------|------------|
| Second | 25.50 | 1087.10 | -3623.68 |
| First | 10.50 | 271.29 | -904.29 |
| | | 1358.39 | -4527.97 |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_-0.3X_+E_Y_-E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | -1087.10 | 3623.68 | 109.52 | 111.99 |
| First | 1 | 10.50 | -271.29 | 904.29 | 129.42 | 105.41 |



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APPLIED STORY FORCES

Type: EQ_ASCE716_-0.3X_+E_Y_-E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|-----------------|----------------|
| Second | 25.50 | -1087.10 | 3623.68 |
| First | 10.50 | -271.29 | 904.29 |
| | | <u>-1358.39</u> | <u>4527.97</u> |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_-0.3X_+E_-Y_-E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | -1087.10 | -3623.68 | 109.52 | 111.99 |
| First | 1 | 10.50 | -271.29 | -904.29 | 129.42 | 105.41 |

APPLIED STORY FORCES

Type: EQ_ASCE716_-0.3X_+E_-Y_-E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|-----------------|-----------------|
| Second | 25.50 | -1087.10 | -3623.68 |
| First | 10.50 | -271.29 | -904.29 |
| | | <u>-1358.39</u> | <u>-4527.97</u> |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_X_-E_0.3Y_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 3623.68 | 1087.10 | 160.41 | 87.78 |
| First | 1 | 10.50 | 904.29 | 271.29 | 174.54 | 81.77 |

APPLIED STORY FORCES

Type: EQ_ASCE716_X_-E_0.3Y_+E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|----------------|----------------|
| Second | 25.50 | 3623.68 | 1087.10 |
| First | 10.50 | 904.29 | 271.29 |
| | | <u>4527.97</u> | <u>1358.39</u> |



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APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_X_-E_-0.3Y_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 3623.68 | -1087.10 | 160.41 | 87.78 |
| First | 1 | 10.50 | 904.29 | -271.29 | 174.54 | 81.77 |

APPLIED STORY FORCES

Type: EQ_ASCE716_X_-E_-0.3Y_+E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|----------------|-----------------|
| Second | 25.50 | 3623.68 | -1087.10 |
| First | 10.50 | 904.29 | -271.29 |
| | | <u>4527.97</u> | <u>-1358.39</u> |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_-X_-E_0.3Y_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | -3623.68 | 1087.10 | 160.41 | 87.78 |
| First | 1 | 10.50 | -904.29 | 271.29 | 174.54 | 81.77 |

APPLIED STORY FORCES

Type: EQ_ASCE716_-X_-E_0.3Y_+E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|-----------------|----------------|
| Second | 25.50 | -3623.68 | 1087.10 |
| First | 10.50 | -904.29 | 271.29 |
| | | <u>-4527.97</u> | <u>1358.39</u> |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_-X_-E_-0.3Y_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | -3623.68 | -1087.10 | 160.41 | 87.78 |
| First | 1 | 10.50 | -904.29 | -271.29 | 174.54 | 81.77 |



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APPLIED STORY FORCES

Type: EQ_ASCE716_-X_-E_-0.3Y_+E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|-----------------|-----------------|
| Second | 25.50 | -3623.68 | -1087.10 |
| First | 10.50 | -904.29 | -271.29 |
| | | <u>-4527.97</u> | <u>-1358.39</u> |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_0.3X_-E_Y_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 1087.10 | 3623.68 | 160.41 | 87.78 |
| First | 1 | 10.50 | 271.29 | 904.29 | 174.54 | 81.77 |

APPLIED STORY FORCES

Type: EQ_ASCE716_0.3X_-E_Y_+E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|----------------|----------------|
| Second | 25.50 | 1087.10 | 3623.68 |
| First | 10.50 | 271.29 | 904.29 |
| | | <u>1358.39</u> | <u>4527.97</u> |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_0.3X_-E_-Y_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 1087.10 | -3623.68 | 160.41 | 87.78 |
| First | 1 | 10.50 | 271.29 | -904.29 | 174.54 | 81.77 |

APPLIED STORY FORCES

Type: EQ_ASCE716_0.3X_-E_-Y_+E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|----------------|-----------------|
| Second | 25.50 | 1087.10 | -3623.68 |
| First | 10.50 | 271.29 | -904.29 |
| | | <u>1358.39</u> | <u>-4527.97</u> |



Loads and Applied Forces

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_-0.3X_-E_Y_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | -1087.10 | 3623.68 | 160.41 | 87.78 |
| First | 1 | 10.50 | -271.29 | 904.29 | 174.54 | 81.77 |

APPLIED STORY FORCES

Type: EQ_ASCE716_-0.3X_-E_Y_+E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|------------|------------|
| Second | 25.50 | -1087.10 | 3623.68 |
| First | 10.50 | -271.29 | 904.29 |
| | | -1358.39 | 4527.97 |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_-0.3X_-E_-Y_+E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | -1087.10 | -3623.68 | 160.41 | 87.78 |
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APPLIED STORY FORCES

Type: EQ_ASCE716_-0.3X_-E_-Y_+E_F

| Level | Ht ft | Fx kips | Fy kips |
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| | | -1358.39 | -4527.97 |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_X_-E_0.3Y_-E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 3623.68 | 1087.10 | 109.52 | 87.78 |
| First | 1 | 10.50 | 904.29 | 271.29 | 129.42 | 81.77 |



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APPLIED STORY FORCES

Type: EQ_ASCE716_X_-E_0.3Y_-E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|------------|------------|
| Second | 25.50 | 3623.68 | 1087.10 |
| First | 10.50 | 904.29 | 271.29 |
| | | 4527.97 | 1358.39 |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_X_-E_-0.3Y_-E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 3623.68 | -1087.10 | 109.52 | 87.78 |
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| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|------------|------------|
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Type: EQ_ASCE716_-X_-E_0.3Y_-E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
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| Level | Ht ft | Fx kips | Fy kips |
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| Second | 25.50 | -3623.68 | 1087.10 |
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Loads and Applied Forces

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_-X_-E_-0.3Y_-E_F

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|--------|---------|----------|------------|------------|---------|---------|
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APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_0.3X_-E_Y_-E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 1087.10 | 3623.68 | 109.52 | 87.78 |
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| Level | Ht ft | Fx kips | Fy kips |
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APPLIED DIAPHRAGM FORCES

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| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | 1087.10 | -3623.68 | 109.52 | 87.78 |
| First | 1 | 10.50 | 271.29 | -904.29 | 129.42 | 81.77 |



Loads and Applied Forces

APPLIED STORY FORCES

Type: EQ_ASCE716_0.3X_-E_-Y_-E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|----------------|-----------------|
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| | | <u>1358.39</u> | <u>-4527.97</u> |

APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_-0.3X_-E_Y_-E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | -1087.10 | 3623.68 | 109.52 | 87.78 |
| First | 1 | 10.50 | -271.29 | 904.29 | 129.42 | 81.77 |

APPLIED STORY FORCES

Type: EQ_ASCE716_-0.3X_-E_Y_-E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|-----------------|----------------|
| Second | 25.50 | -1087.10 | 3623.68 |
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APPLIED DIAPHRAGM FORCES

Type: EQ_ASCE716_-0.3X_-E_-Y_-E_F

| Level | Diaph.# | Ht ft | Fx kips | Fy kips | X ft | Y ft |
|--------|---------|----------|------------|------------|---------|---------|
| Second | 1 | 25.50 | -1087.10 | -3623.68 | 109.52 | 87.78 |
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Type: EQ_ASCE716_-0.3X_-E_-Y_-E_F

| Level | Ht ft | Fx kips | Fy kips |
|--------|----------|-----------------|-----------------|
| Second | 25.50 | -1087.10 | -3623.68 |
| First | 10.50 | -271.29 | -904.29 |
| | | <u>-1358.39</u> | <u>-4527.97</u> |



Building Story Shears

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CRITERIA:

Rigid End Zones: Ignore Effects
 Member Force Output: At Face of Joint
 P-Delta: Yes Scale Factor: 1.00
 Ground Level: Base
 Mesh Criteria :
 Max. Distance Between Nodes on Mesh Line (ft) : 4.00
 Merge Node Tolerance (in) : 0.0100
 Geometry Tolerance (in) : 0.0050
 Walls Out-of-plane Stiffness Included in Analysis.
 Rotational Fixities Released at Wall Foundation Nodes.
 Sign considered for Dynamic Load Case Results.
 Rigid Links Included at Fixed Beam-to-Wall Locations
 Eigenvalue Analysis : Eigen Vectors (Subspace Iteration)

| Load Case: D | DeadLoad | RAMUSER | | |
|--------------|----------|----------|-----------------|-----------------|
| Level | | Diaph. # | Shear-X kips | Shear-Y kips |
| Second | | 1 | 1.17 | 0.34 |
| First | | 1 | 7.10 | -5.49 |
| First | | None | -7.18 | 5.57 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 1.17 | 1.17 | 0.34 | 0.34 |
| First | -0.07 | -1.24 | 0.08 | -0.26 |

| Load Case: Lp | PosLiveLoad | RAMUSER | | |
|---------------|-------------|----------|-----------------|-----------------|
| Level | | Diaph. # | Shear-X kips | Shear-Y kips |
| Second | | 1 | 0.54 | 0.14 |
| First | | 1 | 3.62 | -2.43 |
| First | | None | -3.65 | 2.47 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 0.54 | 0.54 | 0.14 | 0.14 |
| First | -0.04 | -0.57 | 0.03 | -0.10 |

| Load Case: O1 | H | RAMUSERNODAL_O | | |
|---------------|---|----------------|-----------------|-----------------|
| Level | | Diaph. # | Shear-X kips | Shear-Y kips |
| Second | | 1 | 523-0.15 | 0.00 |



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| | | | |
|-------|------|---------|---------|
| First | 1 | -361.30 | -290.36 |
| First | None | -0.00 | -0.09 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -0.15 | -0.15 | 0.00 | 0.00 |
| First | -361.30 | -361.16 | -290.45 | -290.46 |

Load Case: E1 E RAMUSERNODAL_S

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -0.06 | 0.00 |
| First | 1 | -131.86 | -106.41 |
| First | None | -0.00 | -0.06 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -0.06 | -0.06 | 0.00 | 0.00 |
| First | -131.86 | -131.80 | -106.47 | -106.47 |

Load Case: E2 EQ EQ_ASCE716_X_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 3677.97 | 0.63 |
| First | 1 | 4532.44 | 0.58 |
| First | None | 0.00 | -0.54 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 3677.97 | 3677.97 | 0.63 | 0.63 |
| First | 4532.44 | 854.48 | 0.03 | -0.60 |

Load Case: E3 EQ EQ_ASCE716_X_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 3679.03 | 1.68 |
| First | 1 | 4532.55 | 34.52 |
| First | None | 0.00 | -34.52 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|-------|-----------------|------------------|-----------------|------------------|
| | 524 | | | |



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| | | | | |
|--------|---------|---------|-------|-------|
| Second | 3679.03 | 3679.03 | 1.68 | 1.68 |
| First | 4532.55 | 853.51 | -0.01 | -1.69 |

Load Case: E4 EQ EQ_ASCE716_Y_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 2.25 | 3639.65 |
| First | 1 | 0.16 | 4539.68 |
| First | None | -0.00 | -8.92 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 2.25 | 2.25 | 3639.65 | 3639.65 |
| First | 0.16 | -2.09 | 4530.76 | 891.11 |

Load Case: E5 EQ EQ_ASCE716_Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 0.01 | 3637.44 |
| First | 1 | -0.05 | 4468.37 |
| First | None | 0.00 | 62.47 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 0.01 | 0.01 | 3637.44 | 3637.44 |
| First | -0.05 | -0.06 | 4530.84 | 893.40 |

Load Case: E6 EQ EQ_ASCE716_X_+E_0.3Y_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 3678.64 | 1092.53 |
| First | 1 | 4532.49 | 1362.48 |
| First | None | 0.00 | -3.22 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 3678.64 | 3678.64 | 1092.53 | 1092.53 |
| First | 4532.49 | 853.85 | 1359.26 | 266.73 |

Load Case: E7 EQ EQ_ASCE716_X_+E_-0.3Y_+E_F

| Level | Diaph. # | Shear-X 525 kips | Shear-Y kips |
|-------|----------|---------------------|-----------------|
|-------|----------|---------------------|-----------------|



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| | | | |
|--------|------|---------|----------|
| Second | 1 | 3677.29 | -1091.26 |
| First | 1 | 4532.40 | -1361.33 |
| First | None | 0.00 | 2.13 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 3677.29 | 3677.29 | -1091.26 | -1091.26 |
| First | 4532.40 | 855.11 | -1359.19 | -267.93 |

Load Case: E8 EQ EQ_ASCE716_-X_+E_0.3Y_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -3677.29 | 1091.26 |
| First | 1 | -4532.40 | 1361.33 |
| First | None | -0.00 | -2.13 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -3677.29 | -3677.29 | 1091.26 | 1091.26 |
| First | -4532.40 | -855.11 | 1359.19 | 267.93 |

Load Case: E9 EQ EQ_ASCE716_-X_+E_-0.3Y_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -3678.64 | -1092.53 |
| First | 1 | -4532.49 | -1362.48 |
| First | None | -0.00 | 3.22 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -3678.64 | -3678.64 | -1092.53 | -1092.53 |
| First | -4532.49 | -853.85 | -1359.26 | -266.73 |

Load Case: E10 EQ EQ_ASCE716_0.3X_+E_Y_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 1105.64 | 3639.84 |
| First | 1 | 1359.89 | 4539.85 |
| First | None | 0.00 | -9.08 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 1105.64 | 1105.64 | 3639.84 | 3639.84 |
| First | 1359.89 | 1359.89 | 4539.85 | 4539.85 |



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| | kips | kips | kips | kips |
|--------|---------|---------|---------|---------|
| Second | 1105.64 | 1105.64 | 3639.84 | 3639.84 |
| First | 1359.89 | 254.26 | 4530.77 | 890.93 |

Load Case: E11 EQ EQ_ASCE716_0.3X_+E_-Y_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 1101.14 | -3639.46 |
| First | 1 | 1359.57 | -4539.50 |
| First | None | 0.00 | 8.76 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 1101.14 | 1101.14 | -3639.46 | -3639.46 |
| First | 1359.57 | 258.43 | -4530.75 | -891.29 |

Load Case: E12 EQ EQ_ASCE716_-0.3X_+E_Y_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -1101.14 | 3639.46 |
| First | 1 | -1359.57 | 4539.50 |
| First | None | -0.00 | -8.76 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -1101.14 | -1101.14 | 3639.46 | 3639.46 |
| First | -1359.57 | -258.43 | 4530.75 | 891.29 |

Load Case: E13 EQ EQ_ASCE716_-0.3X_+E_-Y_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -1105.64 | -3639.84 |
| First | 1 | -1359.89 | -4539.85 |
| First | None | -0.00 | 9.08 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -1105.64 | -1105.64 | -3639.84 | -3639.84 |
| First | -1359.89 | -254.26 | -4530.77 | -890.93 |



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Load Case: E14 EQ EQ_ASCE716_X_+E_0.3Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 3677.97 | 1091.87 |
| First | 1 | 4532.43 | 1341.09 |
| First | None | 0.00 | 18.20 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 3677.97 | 3677.97 | 1091.87 | 1091.87 |
| First | 4532.43 | 854.46 | 1359.29 | 267.42 |

Load Case: E15 EQ EQ_ASCE716_X_+E_-0.3Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 3677.96 | -1090.60 |
| First | 1 | 4532.46 | -1339.93 |
| First | None | 0.00 | -19.28 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 3677.96 | 3677.96 | -1090.60 | -1090.60 |
| First | 4532.46 | 854.50 | -1359.22 | -268.62 |

Load Case: E16 EQ EQ_ASCE716_-X_+E_0.3Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -3677.96 | 1090.60 |
| First | 1 | -4532.46 | 1339.93 |
| First | None | -0.00 | 19.28 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -3677.96 | -3677.96 | 1090.60 | 1090.60 |
| First | -4532.46 | -854.50 | 1359.22 | 268.62 |

Load Case: E17 EQ EQ_ASCE716_-X_+E_-0.3Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -3677.97 | -1091.87 |
| First | 1 | -4532.43 | -1341.09 |
| First | None | 528-0.00 | -18.20 |



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Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -3677.97 | -3677.97 | -1091.87 | -1091.87 |
| First | -4532.43 | -854.46 | -1359.29 | -267.42 |

Load Case: E18 EQ EQ_ASCE716_0.3X_+E_Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 1103.40 | 3637.63 |
| First | 1 | 1359.68 | 4468.54 |
| First | None | 0.00 | 62.31 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 1103.40 | 1103.40 | 3637.63 | 3637.63 |
| First | 1359.68 | 256.28 | 4530.85 | 893.22 |

Load Case: E19 EQ EQ_ASCE716_0.3X_+E_-Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 1103.38 | -3637.25 |
| First | 1 | 1359.79 | -4468.20 |
| First | None | -0.00 | -62.63 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 1103.38 | 1103.38 | -3637.25 | -3637.25 |
| First | 1359.79 | 256.41 | -4530.83 | -893.58 |

Load Case: E20 EQ EQ_ASCE716_-0.3X_+E_Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -1103.38 | 3637.25 |
| First | 1 | -1359.79 | 4468.20 |
| First | None | 0.00 | 62.63 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -1103.38 | -1103.38 | 3637.25 | 3637.25 |
| First | -1359.79 | -256.41 | 4530.83 | 893.58 |



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Load Case: E21 EQ EQ_ASCE716_-0.3X_+E_-Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -1103.40 | -3637.63 |
| First | 1 | -1359.68 | -4468.54 |
| First | None | -0.00 | -62.31 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -1103.40 | -1103.40 | -3637.63 | -3637.63 |
| First | -1359.68 | -256.28 | -4530.85 | -893.22 |

Load Case: E22 EQ EQ_ASCE716_X_-E_0.3Y_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 3679.71 | 1093.58 |
| First | 1 | 4532.60 | 1396.42 |
| First | None | 0.00 | -37.20 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 3679.71 | 3679.71 | 1093.58 | 1093.58 |
| First | 4532.60 | 852.89 | 1359.22 | 265.64 |

Load Case: E23 EQ EQ_ASCE716_X_-E_-0.3Y_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 3678.36 | -1090.21 |
| First | 1 | 4532.50 | -1327.39 |
| First | None | 0.00 | -31.85 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 3678.36 | 3678.36 | -1090.21 | -1090.21 |
| First | 4532.50 | 854.14 | -1359.23 | -269.02 |

Load Case: E24 EQ EQ_ASCE716_-X_-E_0.3Y_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -3678.36 | 1090.21 |
| First | 1 | -4532.50 | 1327.39 |
| First | None | 530-0.00 | 31.85 |



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Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -3678.36 | -3678.36 | 1090.21 | 1090.21 |
| First | -4532.50 | -854.14 | 1359.23 | 269.02 |

Load Case: E25 EQ EQ_ASCE716_-X_-E_-0.3Y_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -3679.71 | -1093.58 |
| First | 1 | -4532.60 | -1396.42 |
| First | None | -0.00 | 37.20 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -3679.71 | -3679.71 | -1093.58 | -1093.58 |
| First | -4532.60 | -852.89 | -1359.22 | -265.64 |

Load Case: E26 EQ EQ_ASCE716_0.3X_-E_Y_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 1105.96 | 3640.15 |
| First | 1 | 1359.92 | 4550.03 |
| First | None | 0.00 | -19.28 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 1105.96 | 1105.96 | 3640.15 | 3640.15 |
| First | 1359.92 | 253.97 | 4530.75 | 890.60 |

Load Case: E27 EQ EQ_ASCE716_0.3X_-E_-Y_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 1101.46 | -3639.14 |
| First | 1 | 1359.60 | -4529.32 |
| First | None | 0.00 | -1.44 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 1101.46 | 1101.46 | -3639.14 | -3639.14 |
| First | 1359.60 | 258.14 | -4530.76 | -891.62 |



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Load Case: E28 EQ EQ_ASCE716_-0.3X_-E_Y_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -1101.46 | 3639.14 |
| First | 1 | -1359.60 | 4529.32 |
| First | None | -0.00 | 1.44 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -1101.46 | -1101.46 | 3639.14 | 3639.14 |
| First | -1359.60 | -258.14 | 4530.76 | 891.62 |

Load Case: E29 EQ EQ_ASCE716_-0.3X_-E_-Y_+E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -1105.96 | -3640.15 |
| First | 1 | -1359.92 | -4550.03 |
| First | None | -0.00 | 19.28 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -1105.96 | -1105.96 | -3640.15 | -3640.15 |
| First | -1359.92 | -253.97 | -4530.75 | -890.60 |

Load Case: E30 EQ EQ_ASCE716_X_-E_0.3Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 3679.04 | 1092.92 |
| First | 1 | 4532.53 | 1375.03 |
| First | None | 0.00 | -15.78 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 3679.04 | 3679.04 | 1092.92 | 1092.92 |
| First | 4532.53 | 853.50 | 1359.25 | 266.33 |

Load Case: E31 EQ EQ_ASCE716_X_-E_-0.3Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 3679.03 | -1089.55 |
| First | 1 | 4532.57 | -1305.99 |
| First | None | 532 0.00 | -53.26 |



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Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 3679.03 | 3679.03 | -1089.55 | -1089.55 |
| First | 4532.57 | 853.54 | -1359.26 | -269.71 |

Load Case: E32 EQ EQ_ASCE716_-X_-E_0.3Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -3679.03 | 1089.55 |
| First | 1 | -4532.57 | 1305.99 |
| First | None | -0.00 | 53.26 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -3679.03 | -3679.03 | 1089.55 | 1089.55 |
| First | -4532.57 | -853.54 | 1359.26 | 269.71 |

Load Case: E33 EQ EQ_ASCE716_-X_-E_-0.3Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -3679.04 | -1092.92 |
| First | 1 | -4532.53 | -1375.03 |
| First | None | -0.00 | 15.78 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -3679.04 | -3679.04 | -1092.92 | -1092.92 |
| First | -4532.53 | -853.50 | -1359.25 | -266.33 |

Load Case: E34 EQ EQ_ASCE716_0.3X_-E_Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 1103.72 | 3637.95 |
| First | 1 | 1359.71 | 4478.73 |
| First | None | 0.00 | 52.11 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 1103.72 | 1103.72 | 3637.95 | 3637.95 |
| First | 1359.71 | 255.99 | 4530.84 | 892.89 |



Building Story Shears

RAM Frame 23.00.00.92

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DataBase: MIMU - Revised Design_v2.0

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Load Case: E35 EQ EQ_ASCE716_0.3X_-E_-Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | 1103.70 | -3636.94 |
| First | 1 | 1359.82 | -4458.02 |
| First | None | -0.00 | -72.83 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | 1103.70 | 1103.70 | -3636.94 | -3636.94 |
| First | 1359.82 | 256.12 | -4530.84 | -893.90 |

Load Case: E36 EQ EQ_ASCE716_-0.3X_-E_Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -1103.70 | 3636.94 |
| First | 1 | -1359.82 | 4458.02 |
| First | None | 0.00 | 72.83 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -1103.70 | -1103.70 | 3636.94 | 3636.94 |
| First | -1359.82 | -256.12 | 4530.84 | 893.90 |

Load Case: E37 EQ EQ_ASCE716_-0.3X_-E_-Y_-E_F

| Level | Diaph. # | Shear-X kips | Shear-Y kips |
|--------|----------|-----------------|-----------------|
| Second | 1 | -1103.72 | -3637.95 |
| First | 1 | -1359.71 | -4478.73 |
| First | None | -0.00 | -52.11 |

Summary - Total Story Shears

| Level | Shear-X kips | Change-X kips | Shear-Y kips | Change-Y kips |
|--------|-----------------|------------------|-----------------|------------------|
| Second | -1103.72 | -1103.72 | -3637.95 | -3637.95 |
| First | -1359.71 | -255.99 | -4530.84 | -892.89 |



Bentley

Drift

RAM Structural System 23.00.00.92
DataBase: MIMU - Revised Design_v2
Building Code: IBC Alt

10/10/23 12:57:37
Steel Code: IBC Alt

CRITERIA:

Rigid End Zones: Ignore Effects
Member Force Output: At Face of Joint
P-Delta: Yes Scale Factor: 1.00
Ground Level: Base

LOAD CASE DEFINITIONS:

E38 EQ-TOR EQ_ASCE716_X_+E_F
E39 EQ-TOR EQ_ASCE716_X_-E_F
E40 EQ-TOR EQ_ASCE716_Y_+E_F
E41 EQ-TOR EQ_ASCE716_Y_-E_F

RESULTS:

Location (ft): (31.000, 200.000)

| Story | LdC | Displacement | | Story Drift | | Drift Ratio | |
|--------|-----|--------------|---------|-------------|---------|-------------|--------|
| | | X in | Y in | X in | Y in | X | Y |
| Second | E38 | 0.6544 | 0.0012 | 0.6323 | 0.0018 | 0.0035 | 0.0000 |
| | E39 | 0.5720 | -0.0860 | 0.5514 | -0.0829 | 0.0031 | 0.0005 |
| | E40 | -0.0841 | 0.0870 | -0.0853 | 0.0719 | 0.0005 | 0.0004 |
| | E41 | 0.0112 | 0.1875 | 0.0081 | 0.1697 | 0.0000 | 0.0009 |
| First | E38 | 0.0222 | -0.0006 | 0.0222 | -0.0006 | 0.0002 | 0.0000 |
| | E39 | 0.0206 | -0.0031 | 0.0206 | -0.0031 | 0.0002 | 0.0000 |
| | E40 | 0.0012 | 0.0151 | 0.0012 | 0.0151 | 0.0000 | 0.0001 |
| | E41 | 0.0030 | 0.0179 | 0.0030 | 0.0179 | 0.0000 | 0.0001 |

Location (ft): (250.000, 200.000)

| Story | LdC | Displacement | | Story Drift | | Drift Ratio | |
|--------|-----|--------------|---------|-------------|---------|-------------|--------|
| | | X in | Y in | X in | Y in | X | Y |
| Second | E38 | 0.6544 | 0.0147 | 0.6323 | 0.0137 | 0.0035 | 0.0001 |
| | E39 | 0.5720 | 0.1364 | 0.5514 | 0.1334 | 0.0031 | 0.0007 |
| | E40 | -0.0841 | 0.3170 | -0.0853 | 0.3033 | 0.0005 | 0.0017 |
| | E41 | 0.0112 | 0.1765 | 0.0081 | 0.1651 | 0.0000 | 0.0009 |
| First | E38 | 0.0222 | 0.0010 | 0.0222 | 0.0010 | 0.0002 | 0.0000 |
| | E39 | 0.0206 | 0.0030 | 0.0206 | 0.0030 | 0.0002 | 0.0000 |
| | E40 | 0.0012 | 0.0137 | 0.0012 | 0.0137 | 0.0000 | 0.0001 |
| | E41 | 0.0030 | 0.0114 | 0.0030 | 0.0114 | 0.0000 | 0.0001 |



Drift

RAM Structural System 23.00.00.92
 DataBase: MIMU - Revised Design_v2
 Building Code: IBC Alt

Page 2/2
 10/10/23 12:57:37
 Steel Code: IBC Alt

Location (ft): (80.000, -25.000)

| Story | LdC | Displacement | | Story Drift | | Drift Ratio | |
|--------|-----|--------------|---------|-------------|---------|-------------|--------|
| | | X in | Y in | X in | Y in | X | Y |
| Second | E38 | 0.6683 | 0.0042 | 0.6445 | 0.0045 | 0.0036 | 0.0000 |
| | E39 | 0.8004 | -0.0362 | 0.7736 | -0.0345 | 0.0043 | 0.0002 |
| | E40 | 0.1522 | 0.1384 | 0.1525 | 0.1237 | 0.0008 | 0.0007 |
| | E41 | -0.0002 | 0.1851 | 0.0035 | 0.1686 | 0.0000 | 0.0009 |
| First | E38 | 0.0238 | -0.0003 | 0.0238 | -0.0003 | 0.0002 | 0.0000 |
| | E39 | 0.0268 | -0.0017 | 0.0268 | -0.0017 | 0.0002 | 0.0000 |
| | E40 | -0.0002 | 0.0148 | -0.0002 | 0.0148 | 0.0000 | 0.0001 |
| | E41 | -0.0037 | 0.0164 | -0.0037 | 0.0164 | 0.0000 | 0.0001 |

Location (ft): (250.000, -25.000)

| Story | LdC | Displacement | | Story Drift | | Drift Ratio | |
|--------|-----|--------------|---------|-------------|---------|-------------|--------|
| | | X in | Y in | X in | Y in | X | Y |
| Second | E38 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | E39 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | E40 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | E41 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| First | E38 | 0.0238 | 0.0010 | 0.0238 | 0.0010 | 0.0002 | 0.0000 |
| | E39 | 0.0268 | 0.0030 | 0.0268 | 0.0030 | 0.0002 | 0.0000 |
| | E40 | -0.0002 | 0.0137 | -0.0002 | 0.0137 | 0.0000 | 0.0001 |
| | E41 | -0.0037 | 0.0114 | -0.0037 | 0.0114 | 0.0000 | 0.0001 |

TORSIONAL IRREGULARITY DATA:

X-Axis:

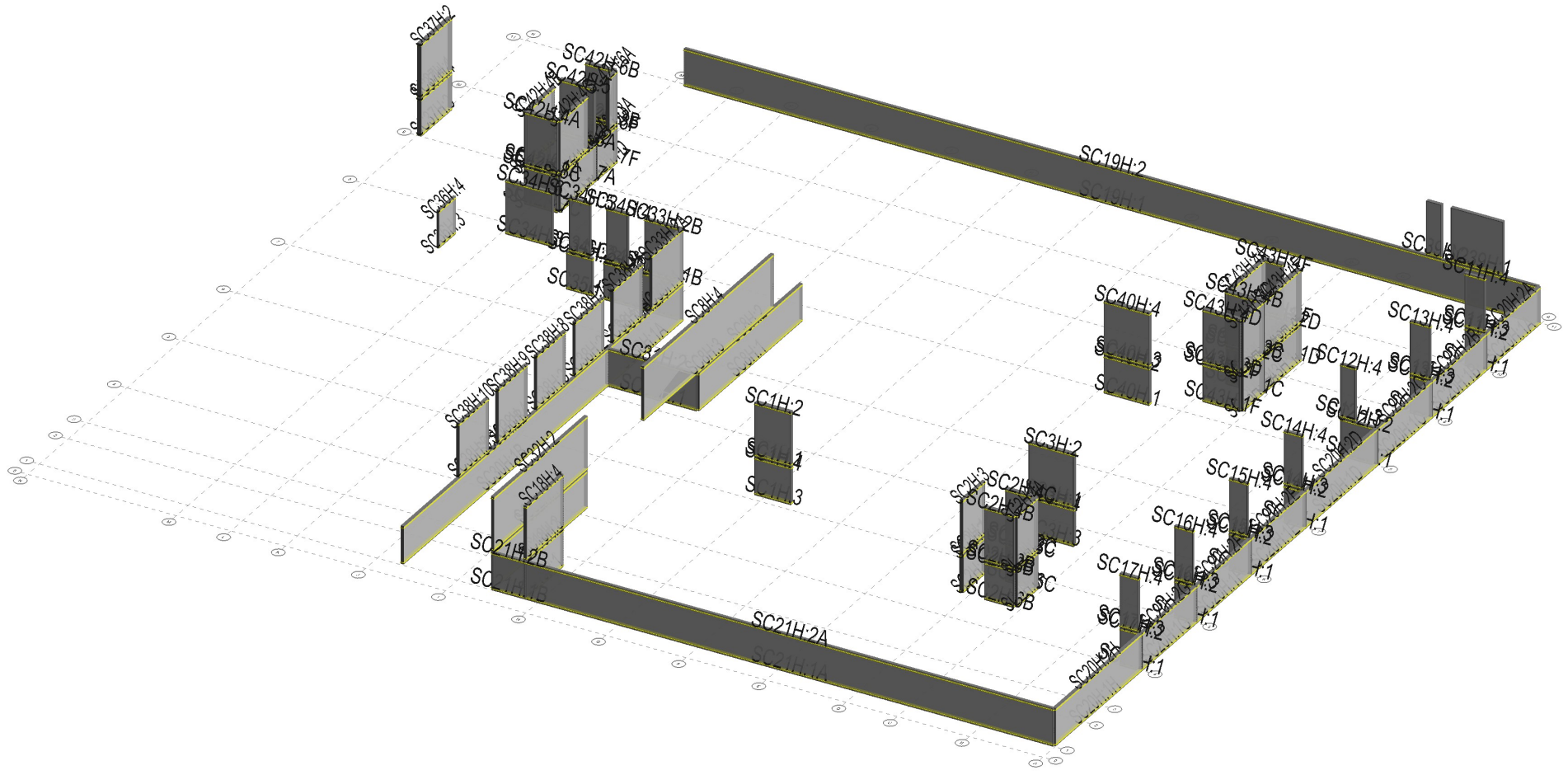
| Story | LdC | Drift in | Coord ft | Drift in | Coord ft | Max/Min | Max/Ave |
|--------|-----|-------------|----------------|-------------|----------------|---------|---------|
| Second | E39 | 0.7736 | (80.00 -25.00) | 0.5514 | (31.00 200.00) | 1.403 | 1.168 |
| First | E39 | 0.0268 | (80.00 -25.00) | 0.0206 | (31.00 200.00) | 1.303 | 1.132 |

Y-Axis:

| Story | LdC | Drift in | Coord ft | Drift in | Coord ft | Max/Min | Max/Ave |
|--------|-----|-------------|----------------|-------------|-----------------|---------|---------|
| Second | E40 | 0.0719 | (31.00 200.00) | 0.3033 | (250.00 200.00) | 4.218 | 1.617* |
| First | E41 | 0.0179 | (31.00 200.00) | 0.0114 | (250.00 200.00) | 1.574 | 1.223 |

1.617 > 1.4 - Extreme Torsional Irregularity, Eccentricity Amplified by $(1.617 / 1.2)^2 = 1.8 = 9.1\%$

CONCRETE WALL SECTION CUT MAP



CONCRETE WALLS

Concrete Wall Design Criteria

Code

ACI 318-14

Materials

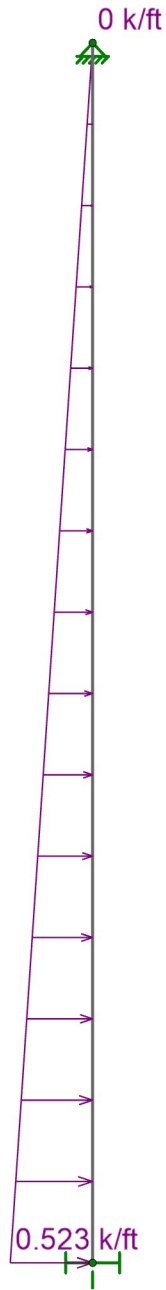
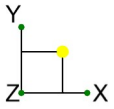
Basement walls: Concrete $f'c = 4,000$ psi at 28 days
Shear walls: Concrete $f'c = 6,000$ psi at 56 days
Reinforcing Steel $f_y = 60,000$ psi

Analysis

The basement walls were designed to resist the horizontal loads applied via the soil as provided in the geotechnical report labelled "Mercer Island Mixed Use Design 2885 78th Ave SE, Mercer Island, Washington" dated June 2023, File No: 0202744-111, and prepared by Haley Aldrich and vertical loads due to the self weight of the building, superimposed dead loads and live loads (including any appropriate surcharge and hydrostatic pressure).

Concrete shear walls were designed using the computer software analysis program RAM Structural System. Basement walls were designed using RAM Structural System and checked in RISA with the surcharge load.

BASEMENT WALL DESIGN



Loads: BLC 1, EARTH PRESSURE



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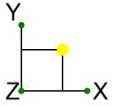
jjesse

SK-4

Oct 20, 2023 at 02:42 PM

Wall.r3d

BASEMENT WALL DESIGN



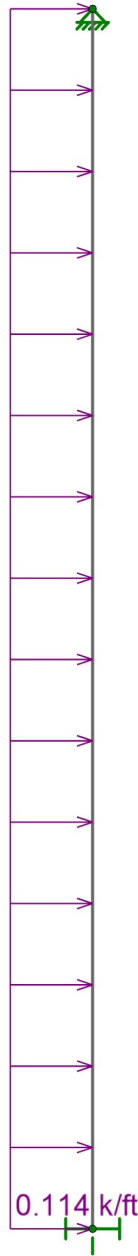
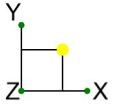
Loads: BLC 2, HYDRO



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jjesse

SK-5
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Wall.r3d

BASEMENT WALL DESIGN



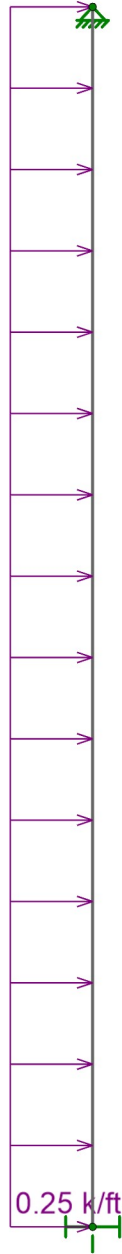
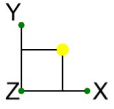
Loads: BLC 3, EQ



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jjesse

SK-6
Oct 20, 2023 at 02:42 PM
Wall.r3d

BASEMENT WALL DESIGN



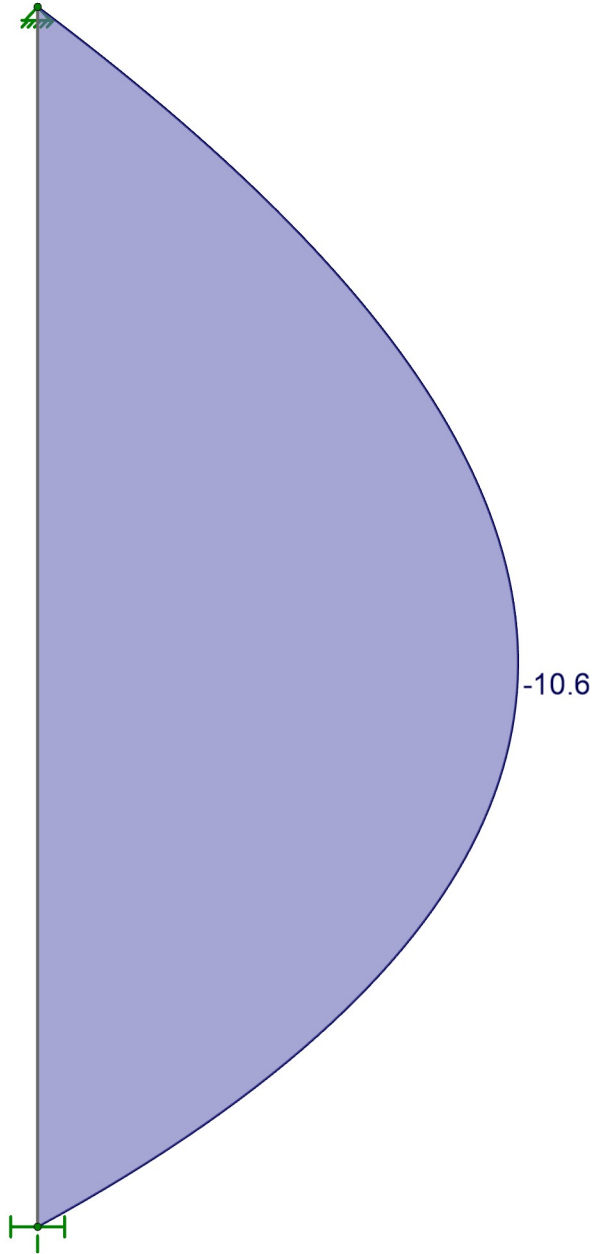
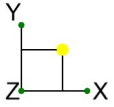
Loads: BLC 4, LL SURCHAGE



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jjesse

SK-7
Oct 20, 2023 at 02:42 PM
Wall.r3d

BASEMENT WALL DESIGN



Member z Bending Moments (kip-ft) (Enveloped)



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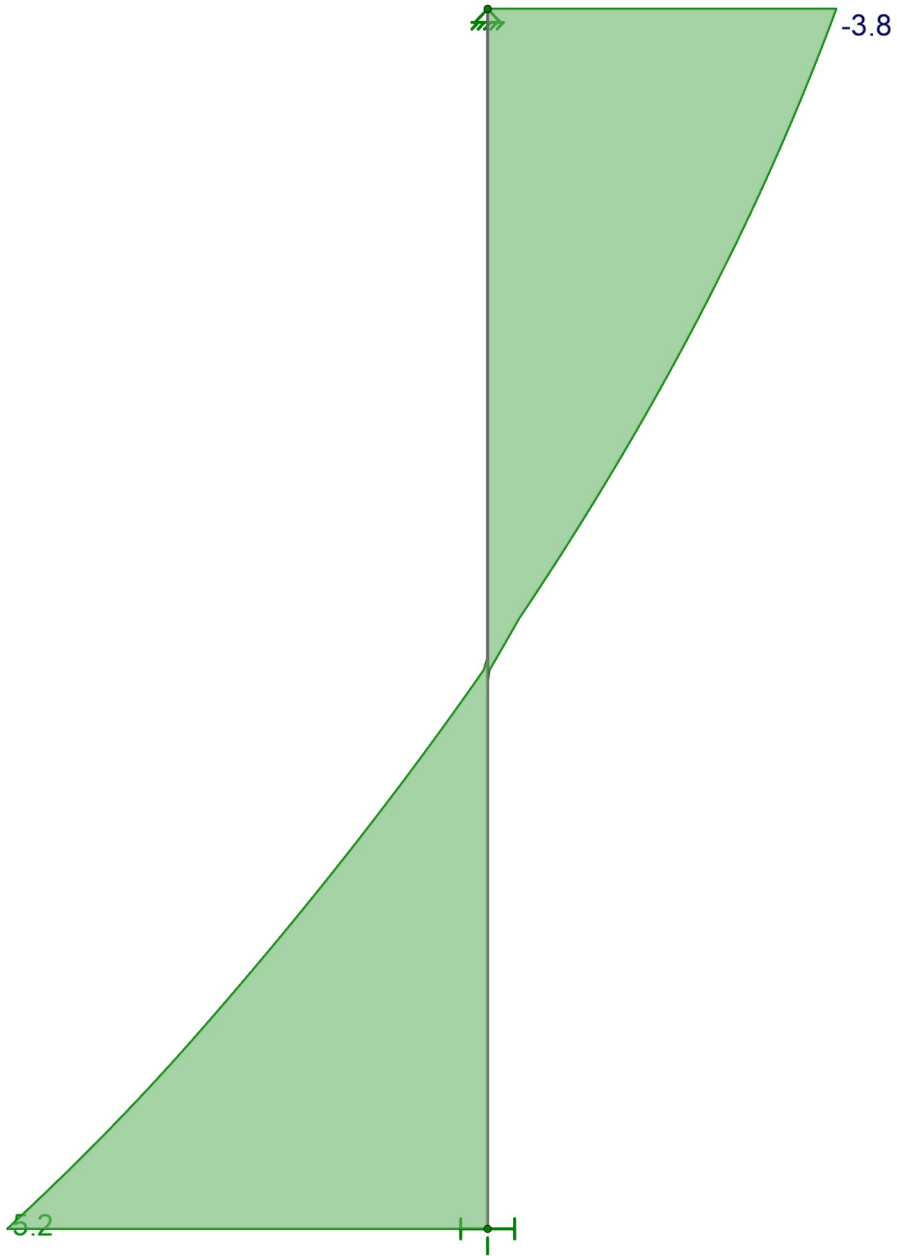
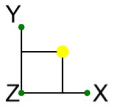
jjesse

SK-2

Oct 20, 2023 at 02:41 PM

Wall.r3d

BASEMENT WALL DESIGN



Member y Shear Forces (kips) (Enveloped)



<Licensed Company>
 jjesse

SK-3
 Oct 20, 2023 at 02:42 PM
 Wall.r3d

BASEMENT WALL DESIGN

Project

Reinforced Concrete Section (ACI 318-14)

PCS / ENG / Oct 20, 2023

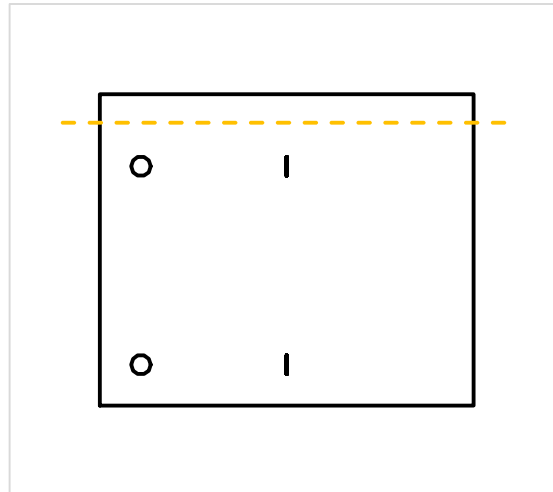
DESIGN OK!

Description: Basement wall concrete section analysis.

Properties

| | | | |
|-----------------|------|--------|--|
| Moment, Mu | 10.6 | kip-ft | USE 1 LAYER (1) #5 TOP & 1 LAYER (1) #5 BOT |
| Shear, Vu | 5 | kips | |
| Axial Load (+C) | 0 | kips | |

| | | |
|--------------|-------|-----|
| Width | 12 | in |
| Height | 10 | in |
| Length | 9.5 | ft |
| Member Type | Wall | |
| f'_c | 5000 | psi |
| β_1 | 0.8 | - |
| f_y | 60 | ksi |
| E_s | 29000 | ksi |
| Bottom Cover | 1 | in |
| Top Cover | 2 | in |
| Side Cover | 1 | in |



Flexure

| | Bar Size | Count | Depth | Bar Area | Layer A | d | db | Horz. Clr | |
|------------------|----------|-------|-------|----------|---------|------|------|-----------|------|
| Top Layer, As' | #5 | 1 | auto | 0.31 | 0.3 | 2.31 | 0.63 | 11.38 | -OK- |
| As1' | #5 | 0 | auto | 0.31 | 0.0 | 3.94 | 0.63 | INF | |
| As1' | #5 | 0 | auto | 0.31 | 0.0 | 7.06 | 0.63 | INF | |
| Bottom Layer, As | #5 | 1 | auto | 0.31 | 0.3 | 8.69 | 0.63 | 11.38 | -OK- |

| | | |
|----------------|--------|--------|
| s_{max} | 18.0 | -OK- |
| d | 8.7 | in |
| c | 0.91 | in |
| Tensile Strain | 0.0256 | - |
| ϕ | 0.90 | - |
| M_n | 16 | kip-ft |
| ϕM_n | 14 | kip-ft |
| DCR | 74% | -OK- |

Strain Compatibility

| Layer | d (in) | ϵ | σ (ksi) | A (in ²) | P (k) | M (k-in) |
|-------------------|--------|------------|----------------|----------------------|-------|----------|
| Comp Block | 0.4 | 0.003 | 4.25 | 9 | 37 | - |
| A _s ' | 2.3 | -0.005 | -60.0 | 0 | -19 | 36 |
| A _{s2} ' | 3.9 | -0.010 | -60.0 | 0 | 0 | 0 |
| A _{s2} | 7.1 | -0.020 | -60.0 | 0 | 0 | 0 |
| A _s | 8.7 | -0.026 | -60.0 | 0 | -19 | 155 |
| Axial Force | 5.00 | - | - | - | 0 | 0 |
| Σ : | | | | | 0 | 191 |

BASEMENT WALL DESIGN

Out-of-Plane Shear

| | | | | | | |
|--------------|-------|----------|-------------|------|------|----------------------|
| Shear Reinf | No | Yes/No | ϕ | 0.75 | - | |
| f_{yt} | 60 | ksi | λ_s | 1.0 | - | |
| Stirrup Size | #4 | - | V_c | 8 | kips | $1.15vfc$ |
| Spacing | 6 | in | V_s | 0 | kips | $0.00vfc$ |
| Max Spacing | 4.34 | -OK- | $V_{s,req}$ | 0 | kips | $0.00vfc$ |
| Legs | 4 | - | V_c+V_s | 8 | kips | $1.15vfc$ - CONTROLS |
| Av/s | 0.133 | sq.in/in | $V_{n,max}$ | 67 | kips | $9.15vfc$ |
| | | | V_n | 8 | kips | $1.15vfc$ |
| | | | ϕV_n | 6 | kips | $0.86vfc$ |
| | | | DCR | 82% | -OK- | |



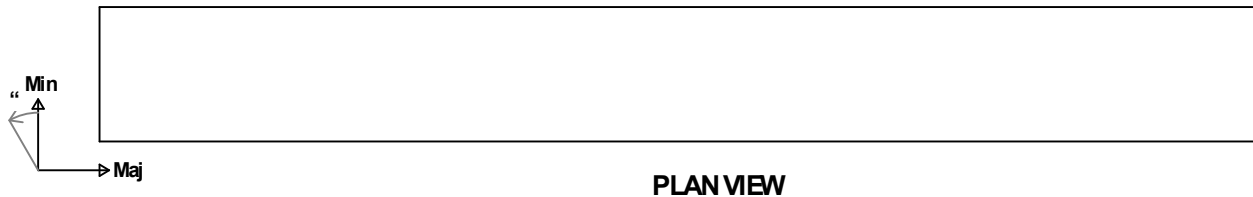
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

10/10/23 13:58:48

Section Cut ID: SC1H:1 (Horizontal) (Hinge)
Story: Second
Ag = 1693 in² Imaj = 2064772 in⁴ Imin = 27660 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 1
Wall Type: Cast-In-Place
Design Status: **PASS**

SC1H:1



Axial/Flexural Results:

Interaction: 0.609 **OK**
Beta = 360.0 deg CCW from Major axis
Pu = 123.05 kips phiPn = 201.97 kips
Mu = 4391.50 kip-ft phiMn = 7207.86 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC1H:1:
Length = 10.08 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = 302.29 kip phiVn = 633.66 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC1H:1:
Length = 10.08 ft
Effective depth = 11.94 in
Vu = -9.54 kip phiVn = 145.40 kip **OK**
Controlling Load Combo: 1.384 D + 1.300 E29 (LC 105)
Code Ref: 22.5



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Reinforcement Checks:

S.B.E. Check: **User-defined boundaries satisfy SBE requirements for all load combos**

Worst case is load combo 3 :

$c_{max} = 2.24$ ft $c = 0.60$ ft (18.10.6.2) **OK**

Segment SC1H:1:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.606% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.716% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



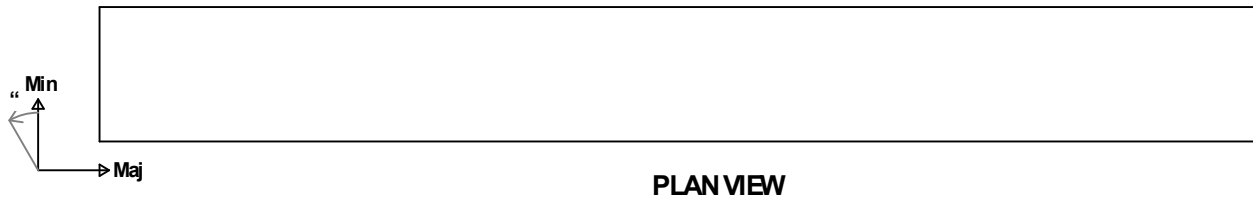
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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10/10/23 13:58:48

Section Cut ID: SC1H:2 (Horizontal) (Hinge)
Story: Second
Ag = 1693 in² Imaj = 2064772 in⁴ Imin = 27660 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 1
Wall Type: Cast-In-Place
Design Status: **PASS**

SC1H:2



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.082 **OK**
Beta = 18.9 deg CCW from Major axis
Pu = 237.85 kips phiPn = 2900.78 kips
Mu = 235.56 kip-ft phiMn = 2872.82 kip-ft
Controlling Load Combo: 1.384 D + 1.300 E22 (LC 98)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC1H:2:
Length = 10.08 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = 302.29 kip phiVn = 633.66 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC1H:2:
Length = 10.08 ft
Effective depth = 11.94 in
Vu = -9.54 kip phiVn = 145.40 kip **OK**
Controlling Load Combo: 1.384 D + 1.300 E29 (LC 105)
Code Ref: 22.5



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Reinforcement Checks:

S.B.E. Check: **User-defined boundaries satisfy SBE requirements for all load combos**

Worst case is load combo 3 :

$c_{max} = 2.24$ ft $c = 0.31$ ft (18.10.6.2) **OK**

Segment SC1H:2:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.606% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.716% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



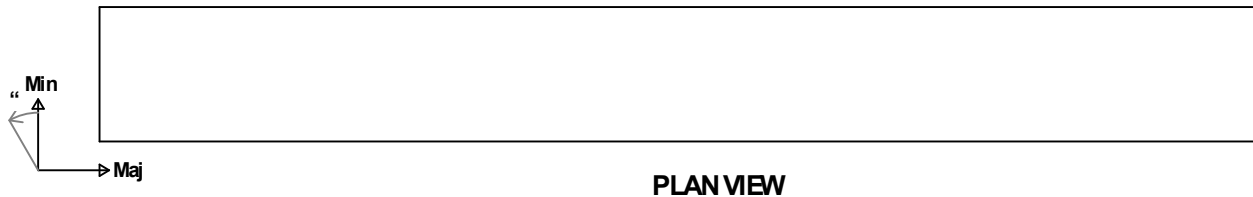
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC1H:3 (Horizontal) (Hinge)
Story: First
Ag = 1693 in² Imaj = 2064772 in⁴ Imin = 27660 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 1
Wall Type: Cast-In-Place
Design Status: **PASS**

SC1H:3



Axial/Flexural Results:

Interaction: 0.091 **OK**
Beta = 0.0 deg CCW from Major axis
Pu = 378.10 kips phiPn = 4166.06 kips
Mu = 734.49 kip-ft phiMn = 8092.90 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC1H:3:
Length = 10.08 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = -392.47 kip phiVn = 633.66 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC1H:3:
Length = 10.08 ft
Effective depth = 11.94 in
Vu = 4.32 kip phiVn = 145.40 kip **OK**
Controlling Load Combo: 1.384 D + 1.300 E29 (LC 105)
Code Ref: 22.5



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Reinforcement Checks:

S.B.E. Check: **User-defined boundaries satisfy SBE requirements for all load combos**

Worst case is load combo 3 :

$c_{max} = 2.24$ ft $c = 1.23$ ft (18.10.6.2) **OK**

Segment SC1H:3:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.606% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.716% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



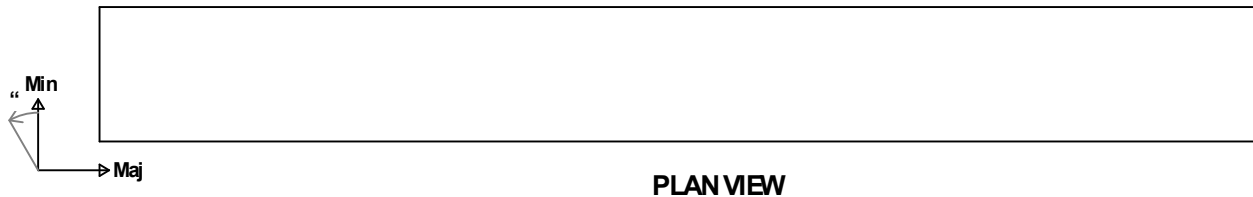
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC1H:4 (Horizontal) (Hinge)
Story: First
Ag = 1693 in² Imaj = 2064772 in⁴ Imin = 27660 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 1
Wall Type: Cast-In-Place
Design Status: **PASS**

SC1H:4



Axial/Flexural Results:

Interaction: 0.575 **OK**
Beta = 0.1 deg CCW from Major axis
Pu = 177.50 kips phiPn = 308.58 kips
Mu = 4371.02 kip-ft phiMn = 7598.88 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC1H:4:
Length = 10.08 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = -392.47 kip phiVn = 633.66 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC1H:4:
Length = 10.08 ft
Effective depth = 11.94 in
Vu = 4.32 kip phiVn = 145.40 kip **OK**
Controlling Load Combo: 1.384 D + 1.300 E29 (LC 105)
Code Ref: 22.5



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Reinforcement Checks:

S.B.E. Check: **User-defined boundaries satisfy SBE requirements for all load combos**

Worst case is load combo 3 :

$c_{max} = 2.24 \text{ ft}$ $c = 1.13 \text{ ft}$ (18.10.6.2) **OK**

Segment SC1H:4:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.606% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.716% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC2H:1 (Horizontal)
Story: Second
Ag = 1328 in2 Imaj = 1949496 in4 Imin = 11063 in4
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 2
Wall Type: Cast-In-Place
Design Status: **PASS**

SC2H:1



Axial/Flexural Results:

Interaction: 0.934 **OK**
Beta = 358.6 deg CCW from Major axis
Pu = 103.52 kips phiPn = 110.82 kips
Mu = 2100.93 kip-ft phiMn = 2249.26 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E29 + 1.0E1 + 1.6O1 (LC 341)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC2H:1:
Length = 11.06 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@15" oc Horiz Bar Pat: #4@18" oc
Vu = 173.56 kip phiVn = 246.63 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E29 + 1.0E1 + 1.6O1 (LC 263)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC2H:1:
Length = 11.06 ft
Effective depth = 8.44 in
Vu = -12.43 kip phiVn = 112.80 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 22.5

Reinforcement Checks:

Segment SC2H:1:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.462%556(1.6.1) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Max Vert Bar Spacing Limit: 18.00 in Actual: 15.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 14.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.218% Actual: 0.409% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK



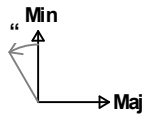
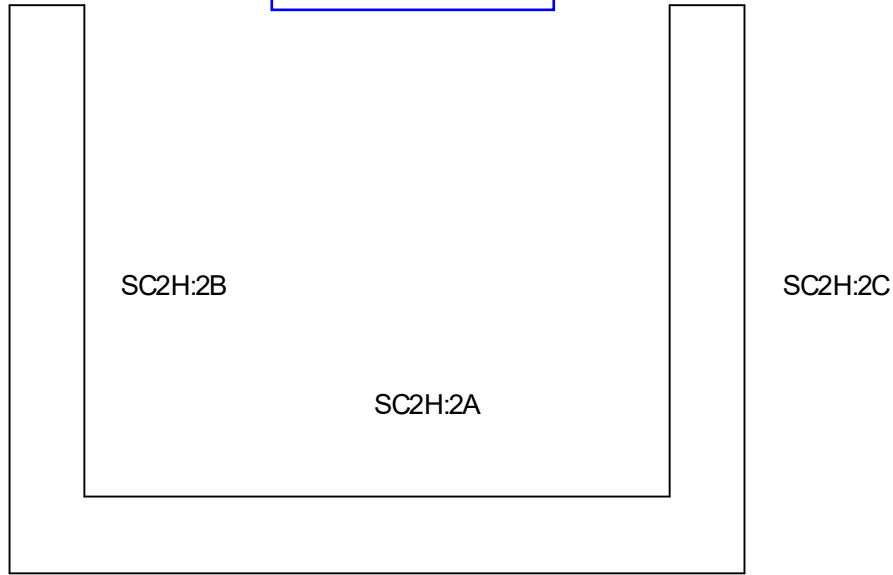
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC2H:2 (Horizontal) (Hinge)
Story: Second
Ag = 4482 in² Imaj = 12740896 in⁴ Imin = 4881963 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 2
Wall Type: Cast-In-Place
Design Status: **FAILS**

See notes on next page.



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.659 **OK**
Beta = 293.6 deg CCW from Major axis
Pu = 138.12 kips phiPn = 209.52 kips
Mu = 9953.46 kip-ft phiMn = 15098.67 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC2H:2A:
Length = 10.25 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = -517.31 kip phiVn = 650.24 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E26 + 1.0E1 + 1.6O1 (LC 260)
Code Ref: 11.5.4.4

Segment SC2H:2B:
Length = 8.21 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = 389.24 kip phiVn = 558 452.85 kip **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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In-Plane Shear Results:

Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.5.4.4

Segment SC2H:2C:

Length = 8.22 ft Thick = 14.00 in $f_c = 6000$ psi $f_y = 60$ ksi

Vert Bar Pat: Horiz Bar Pat:

$V_u = 268.69$ kip $\phi V_n = 492.10$ kip OK

Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)

Code Ref: 11.5.4.4

Wall-out-of plane shear strength assumed to be 0, perpendicular walls have adequate capacity for 6.7k and 1.23k shears, OK

Out-of-Plane Shear Results:

Segment SC2H:2A:

Length = 10.25 ft
Effective depth = 11.94 in

$V_u = 6.69$ kip $\phi V_n = 0.00$ kip NG

Controlling Load Combo: 1.384 D + 1.300 E25 + 1.0E1 + 1.6O1 (LC 236)

Code Ref: 22.5

Strength of Segment : Strength of Segment SC2H:2A per 22.5 is inadequate for LC 236

Segment SC2H:2B:

Length = 8.21 ft
Effective depth = 11.94 in

$V_u = 1.23$ kip $\phi V_n = 0.00$ kip NG

Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)

Code Ref: 22.5

Strength of Segment : Strength of Segment SC2H:2B per 22.5 is inadequate for LC 24

Segment SC2H:2C:

Length = 8.22 ft
Effective depth = 11.94 in

$V_u = -1.20$ kip $\phi V_n = 41.61$ kip OK

Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)

Code Ref: 22.5

Reinforcement Checks:

S.B.E. Check: User-defined boundaries satisfy SBE requirements for all load combos

Worst case is load combo 3 :

$c_{max} = 2.28$ ft $c = 2.34$ ft (18.10.6.2) OK

Segment SC2H:2A:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.968% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.00 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 1.052% Actual: 5.247% (18.10.4.3) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK
Segment SC2H:2B:
Thickness : 14.00 in
Min Vert Reinf Ratio: 0.150% Actual: 1.968% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.00 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 1.052% Actual: 1.247% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK
Segment SC2H:2C:
Thickness : 14.00 in
Min Vert Reinf Ratio: 0.150% Actual: 1.968% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.00 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 1.052% Actual: 1.247% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC2H:3 (Horizontal)
Story: Second
Ag = 1328 in2 Imaj = 1949496 in4 Imin = 11063 in4
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 2
Wall Type: Cast-In-Place
Design Status: **PASS**

SC2H:3



Axial/Flexural Results:

Interaction: 0.168 **OK**
Beta = 167.5 deg CCW from Major axis
Pu = 264.59 kips phiPn = 1574.05 kips
Mu = 343.21 kip-ft phiMn = 2041.79 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC2H:3:
Length = 11.06 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@15" oc Horiz Bar Pat: #4@18" oc
Vu = 173.56 kip phiVn = 246.63 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E29 + 1.0E1 + 1.6O1 (LC 263)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC2H:3:
Length = 11.06 ft
Effective depth = 8.44 in
Vu = -12.43 kip phiVn = 112.80 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 22.5

Reinforcement Checks:

Segment SC2H:3:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.462%**56(11.6.1) OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Max Vert Bar Spacing Limit: 18.00 in Actual: 15.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 14.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.218% Actual: 0.409% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK

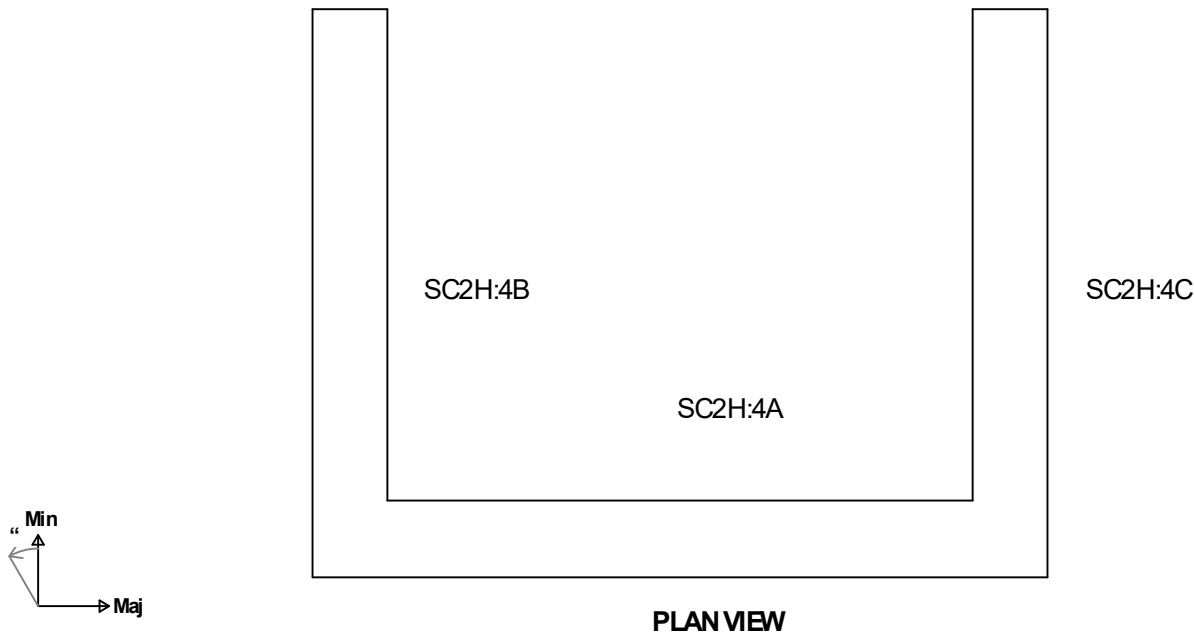


Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC2H:4 (Horizontal) (Hinge)
Story: Second
Ag = 4482 in² Imaj = 12740896 in⁴ Imin = 4881963 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 2
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.035 **OK**
Beta = 313.0 deg CCW from Major axis
Pu = 294.23 kips phiPn = 8524.95 kips
Mu = 1282.45 kip-ft phiMn = 37157.93 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC2H:4A:

Length = 10.25 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = -517.47 kip phiVn = 867.01 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E26 + 1.0E1 + 1.6O1 (LC 260)
Code Ref: 18.10.4.5

Segment SC2H:4B:

Length = 8.21 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = 390.55 kip phiVn = 563 546.13 kip **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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In-Plane Shear Results:

Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.5.4.4

Segment SC2H:4C:

Length = 8.22 ft Thick = 14.00 in $f_c = 6000$ psi $f_y = 60$ ksi

Vert Bar Pat: Horiz Bar Pat:

$V_u = 270.09$ kip $\phi V_n = 556.05$ kip OK

Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)

Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC2H:4A:

Length = 10.25 ft

Effective depth = 11.94 in

$V_u = 4.00$ kip $\phi V_n = 136.77$ kip OK

Controlling Load Combo: 0.716 D - 1.300 E22 + 1.0E1 + 1.6O1 (LC 286)

Code Ref: 22.5

Segment SC2H:4B:

Length = 8.21 ft

Effective depth = 11.94 in

$V_u = 1.69$ kip $\phi V_n = 99.75$ kip OK

Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)

Code Ref: 22.5

Segment SC2H:4C:

Length = 8.22 ft

Effective depth = 11.94 in

$V_u = -1.97$ kip $\phi V_n = 112.63$ kip OK

Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)

Code Ref: 22.5

Reinforcement Checks:

S.B.E. Check: User-defined boundaries satisfy SBE requirements for all load combos

Worst case is load combo 3 :

$c_{max} = 2.28$ ft $c = 1.57$ ft (18.10.6.2) OK

Segment SC2H:4A:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.968% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.00 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 1.052% Actual: 1.247% (18.10.4.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Segment SC2H:4B:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.968% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.00 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 1.052% Actual: 1.247% (18.10.4.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC2H:4C:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.968% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.00 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 1.052% Actual: 1.247% (18.10.4.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC2H:5 (Horizontal)
Story: First
Ag = 1859 in2 Imaj = 2729294 in4 Imin = 30356 in4
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 2
Wall Type: Cast-In-Place
Design Status: **PASS**

SC2H:5



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.079 **OK**
Beta = 5.1 deg CCW from Major axis
Pu = 402.92 kips phiPn = 5086.39 kips
Mu = 24.59 kip-ft phiMn = 310.48 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC2H:5:
Length = 11.06 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@18" oc Horiz Bar Pat: #4@15" oc
Vu = -157.89 kip phiVn = 322.69 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E29 + 1.0E1 + 1.6O1 (LC 263)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC2H:5:
Length = 11.06 ft
Effective depth = 12.44 in
Vu = -11.06 kip phiVn = 166.28 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E22 + 1.0E1 + 1.6O1 (LC 256)
Code Ref: 22.5



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Reinforcement Checks:

Segment SC2H:5:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.297% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 18.00 in (11.7.2.1) **OK**

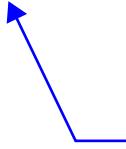
Min Vert Bar Spacing Limit: 1.00 in Actual: 17.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.187% Actual: 0.243% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.243% (18.10.2.1) **NG**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Web reinforcing
increased to #5 @
12" = 0.37% - **OK**

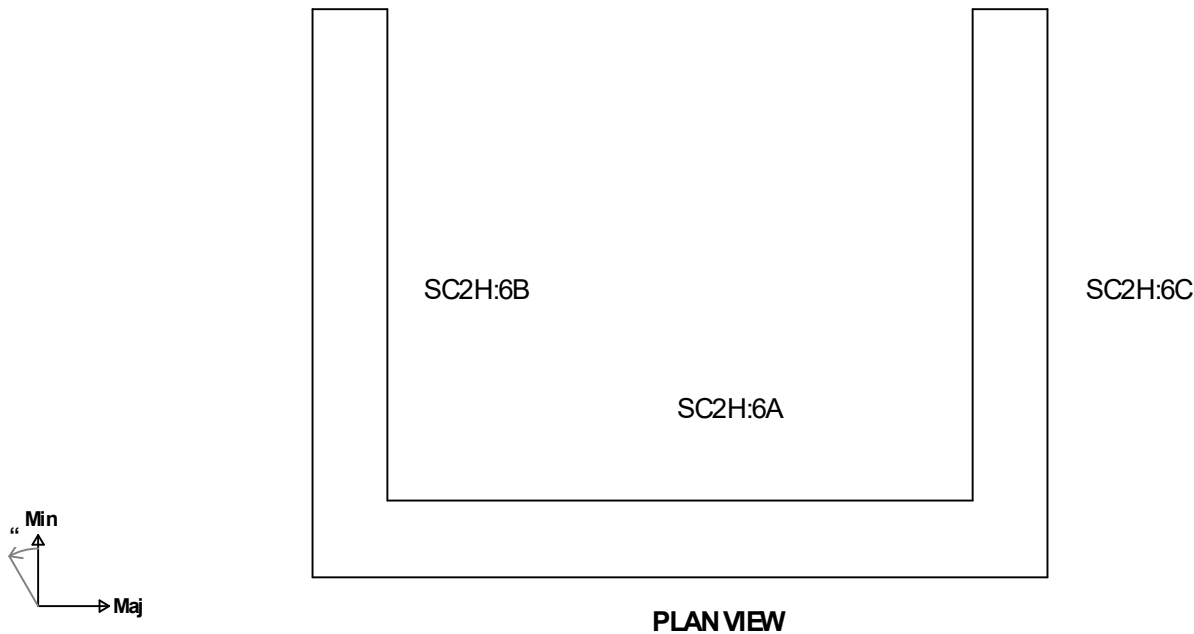


Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC2H:6 (Horizontal) (Hinge)
Story: First
Ag = 4482 in² Imaj = 12740896 in⁴ Imin = 4881963 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 2
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.187 **OK**
Beta = 317.1 deg CCW from Major axis
Pu = 239.21 kips phiPn = 1280.13 kips
Mu = 4310.87 kip-ft phiMn = 23069.66 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC2H:6A:

Length = 10.25 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = 175.38 kip phiVn = 680.71 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E29 (LC 179)
Code Ref: 11.5.4.4

Segment SC2H:6B:

Length = 8.21 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = -354.49 kip phiVn = 496.89 kip **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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In-Plane Shear Results:

Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 11.5.4.4

Segment SC2H:6C:

Length = 8.22 ft Thick = 14.00 in $f_c = 6000$ psi $f_y = 60$ ksi

Vert Bar Pat: Horiz Bar Pat:

$V_u = -318.72$ kip $\phi V_n = 556.05$ kip **OK**

Controlling Load Combo: 1.384 D + 1.300 E31 (LC 107)

Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC2H:6A:

Length = 10.25 ft

Effective depth = 11.94 in

$V_u = -2.16$ kip $\phi V_n = 71.23$ kip **OK**

Controlling Load Combo: 0.716 D - 1.300 E22 + 1.0E1 + 1.6O1 (LC 286)

Code Ref: 22.5

Segment SC2H:6B:

Length = 8.21 ft

Effective depth = 11.94 in

$V_u = -0.66$ kip $\phi V_n = 28.52$ kip **OK**

Controlling Load Combo: 0.716 D + 1.300 E26 (LC 176)

Code Ref: 22.5

Segment SC2H:6C:

Length = 8.22 ft

Effective depth = 11.94 in

$V_u = 0.40$ kip $\phi V_n = 58.42$ kip **OK**

Controlling Load Combo: 0.716 D + 1.300 E11 (LC 161)

Code Ref: 22.5

Reinforcement Checks:

S.B.E. Check: **User-defined boundaries satisfy SBE requirements for all load combos**

Worst case is load combo 3 :

$c_{max} = 2.28$ ft $c = 1.87$ ft (18.10.6.2) **OK**

Segment SC2H:6A:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.968% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.00 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 1.052% Actual: 1.247% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Segment SC2H:6B:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.968% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.00 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 1.052% Actual: 1.247% (18.10.4.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC2H:6C:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.968% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.00 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 1.052% Actual: 1.247% (18.10.4.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC2H:7 (Horizontal)
Story: First
Ag = 1859 in2 Imaj = 2729294 in4 Imin = 30356 in4
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 2
Wall Type: Cast-In-Place
Design Status: **PASS**

SC2H:7



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.750 **OK**
Beta = 359.6 deg CCW from Major axis
Pu = 162.83 kips phiPn = 216.96 kips
Mu = 2025.64 kip-ft phiMn = 2699.05 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E29 + 1.0E1 + 1.6O1 (LC 341)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC2H:7:
Length = 11.06 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@18" oc Horiz Bar Pat: #4@15" oc
Vu = -157.89 kip phiVn = 322.69 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E29 + 1.0E1 + 1.6O1 (LC 263)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC2H:7:
Length = 11.06 ft
Effective depth = 12.44 in
Vu = -11.06 kip phiVn = 166.28 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E22 + 1.0E1 + 1.6O1 (LC 256)
Code Ref: 22.5



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Reinforcement Checks:

Segment SC2H:7:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.297% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 18.00 in (11.7.2.1) **OK**

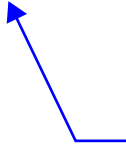
Min Vert Bar Spacing Limit: 1.00 in Actual: 17.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.187% Actual: 0.243% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.243% (18.10.2.1) **NG**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Web reinforcing
increased to #5 @
12" = 0.37% - **OK**



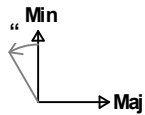
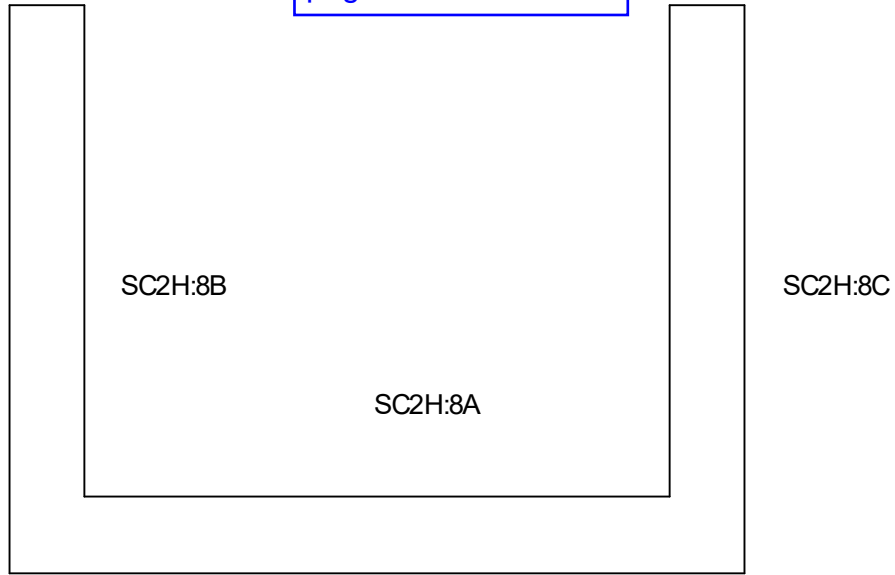
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC2H:8 (Horizontal) (Hinge)
Story: First
Ag = 4482 in² Imaj = 12740896 in⁴ Imin = 4881963 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 2
Wall Type: Cast-In-Place
Design Status: **FAILS**

See notes on next page.



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.654 **OK**
Beta = 294.7 deg CCW from Major axis
Pu = 239.21 kips phiPn = 365.77 kips
Mu = 10214.36 kip-ft phiMn = 15618.46 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC2H:8A:

Length = 10.25 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = 175.31 kip phiVn = 647.71 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E29 (LC 179)
Code Ref: 11.5.4.4

Segment SC2H:8B:

Length = 8.21 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = -350.42 kip phiVn = 452.85 kip **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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In-Plane Shear Results:

Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 11.5.4.4

Segment SC2H:8C:

Length = 8.22 ft Thick = 14.00 in $f_c = 6000$ psi $f_y = 60$ ksi

Vert Bar Pat: Horiz Bar Pat:

$V_u = -308.64$ kip $\phi V_n = 516.10$ kip

Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)

Code Ref: 11.5.4.4

Wall-out-of plane shear strength assumed to be 0, perpendicular walls have adequate capacity for 0.6k and 1.21k shears, **OK**

Out-of-Plane Shear Results:

Segment SC2H:8A:

Length = 10.25 ft
Effective depth = 11.94 in

$V_u = 0.60$ kip $\phi V_n = 0.00$ kip

Controlling Load Combo: 0.716 D + 1.300 E25 (LC 175)

Code Ref: 22.5

Strength of Segment : Strength of Segment SC2H:8A per 22.5 is inadequate for LC 175

NG

Segment SC2H:8B:

Length = 8.21 ft
Effective depth = 11.94 in

$V_u = 1.21$ kip $\phi V_n = 0.00$ kip

Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)

Code Ref: 22.5

Strength of Segment : Strength of Segment SC2H:8B per 22.5 is inadequate for LC 24

NG

Segment SC2H:8C:

Length = 8.22 ft
Effective depth = 11.94 in

$V_u = -1.66$ kip $\phi V_n = 42.41$ kip

Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)

Code Ref: 22.5

OK

Reinforcement Checks:

S.B.E. Check: User-defined boundaries satisfy SBE requirements for all load combos

Worst case is load combo 3 :

$c_{max} = 2.28$ ft $c = 1.92$ ft (18.10.6.2) **OK**

Segment SC2H:8A:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.968% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.00 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 1.052% Actual: 5.747% (18.10.4.3) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK
Segment SC2H:8B:
Thickness : 14.00 in
Min Vert Reinf Ratio: 0.150% Actual: 1.968% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.00 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 1.052% Actual: 1.247% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK
Segment SC2H:8C:
Thickness : 14.00 in
Min Vert Reinf Ratio: 0.150% Actual: 1.968% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.00 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 1.052% Actual: 1.247% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC3H:1 (Horizontal) (Hinge)
Story: Second
Ag = 2100 in² Imaj = 3937500 in⁴ Imin = 34300 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 3
Wall Type: Cast-In-Place
Design Status: **PASS**

SC3H:1



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.609 **OK**
Beta = 180.1 deg CCW from Major axis
Pu = 173.42 kips phiPn = 284.94 kips
Mu = 7185.77 kip-ft phiMn = 11807.17 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E22 + 1.0E1 + 1.6O1 (LC 286)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC3H:1:
Length = 12.50 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = -532.38 kip phiVn = 785.79 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E22 + 1.0E1 + 1.6O1 (LC 256)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC3H:1:
Length = 12.50 ft
Effective depth = 11.94 in
Vu = 14.54 kip phiVn = 180.31 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E26 (LC 28)
Code Ref: 22.5

Reinforcement Checks:

S.B.E. Check: **User-defined boundaries satisfy SBE requirements for all load combos**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Worst case is load combo 3 :

$c_{max} = 2.78$ ft $c = 0.50$ ft (18.10.6.2) **OK**

Segment SC3H:1:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.713% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.701% Actual: 1.190% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 1.190% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC3H:2 (Horizontal) (Hinge)
Story: Second
Ag = 2100 in² Imaj = 3937500 in⁴ Imin = 34300 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 3
Wall Type: Cast-In-Place
Design Status: **PASS**

SC3H:2



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.090 **OK**
Beta = 350.0 deg CCW from Major axis
Pu = 438.42 kips phiPn = 4893.99 kips
Mu = 467.45 kip-ft phiMn = 5218.00 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC3H:2:
Length = 12.50 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = -532.38 kip phiVn = 785.79 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E22 + 1.0E1 + 1.6O1 (LC 256)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC3H:2:
Length = 12.50 ft
Effective depth = 11.94 in
Vu = 14.54 kip phiVn = 180.31 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E26 (LC 28)
Code Ref: 22.5

Reinforcement Checks:

S.B.E. Check: **User-defined boundaries satisfy SBE requirements for all load combos**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Worst case is load combo 3 :

$c_{max} = 2.78$ ft $c = 0.62$ ft (18.10.6.2) **OK**

Segment SC3H:2:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.713% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.701% Actual: 1.190% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 1.190% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC3H:3 (Horizontal) (Hinge)
Story: First
Ag = 2100 in² Imaj = 3937500 in⁴ Imin = 34300 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 3
Wall Type: Cast-In-Place
Design Status: **PASS**

SC3H:3



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.161 **OK**
Beta = 360.0 deg CCW from Major axis
Pu = 608.46 kips phiPn = 3767.79 kips
Mu = 2340.90 kip-ft phiMn = 14495.74 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC3H:3:
Length = 12.50 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = -537.25 kip phiVn = 785.79 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC3H:3:
Length = 12.50 ft
Effective depth = 11.94 in
Vu = 10.90 kip phiVn = 180.32 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E29 (LC 31)
Code Ref: 22.5

Reinforcement Checks:

S.B.E. Check: **User-defined boundaries satisfy SBE requirements for all load combos**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Worst case is load combo 3 :

$c_{max} = 2.78$ ft $c = 1.42$ ft (18.10.6.2) **OK**

Segment SC3H:3:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.410% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.716% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC3H:4 (Horizontal) (Hinge)
Story: First
Ag = 2100 in² Imaj = 3937500 in⁴ Imin = 34300 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 3
Wall Type: Cast-In-Place
Design Status: **PASS**

SC3H:4



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.668 **OK**
Beta = 0.1 deg CCW from Major axis
Pu = 275.13 kips phiPn = 411.93 kips
Mu = 7227.03 kip-ft phiMn = 10820.34 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC3H:4:
Length = 12.50 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = -537.25 kip phiVn = 785.79 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC3H:4:
Length = 12.50 ft
Effective depth = 11.94 in
Vu = 10.90 kip phiVn = 180.32 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E29 (LC 31)
Code Ref: 22.5

Reinforcement Checks:

S.B.E. Check: **User-defined boundaries satisfy SBE requirements for all load combos**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Worst case is load combo 3 :

$c_{max} = 2.78$ ft $c = 0.76$ ft (18.10.6.2) **OK**

Segment SC3H:4:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.410% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.716% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC8H:1 (Horizontal)
Story: First
Ag = 6030 in² Imaj = 182713523 in⁴ Imin = 50250 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 8
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.144 **OK**
Beta = 0.0 deg CCW from Major axis
Pu = 1828.58 kips phiPn = 12668.29 kips
Mu = 12730.25 kip-ft phiMn = 88194.42 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E36 (LC 38)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC8H:1:
Length = 50.25 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = -914.17 kip phiVn = 1355.96 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E18 + 1.0E1 + 1.6O1 (LC 252)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC8H:1:
Length = 50.25 ft
Effective depth = 8.31 in
Vu = 13.07 kip phiVn = 460.82 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 22.5

Reinforcement Checks:

Segment SC8H:1:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.519% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC8H:2 (Horizontal)
Story: First
Ag = 6030 in² Imaj = 182713523 in⁴ Imin = 50250 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 8
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.145 **OK**
Beta = 357.3 deg CCW from Major axis
Pu = 1602.31 kips phiPn = 11041.37 kips
Mu = 4111.79 kip-ft phiMn = 28333.97 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E17 (LC 56)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC8H:2:
Length = 50.25 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = -920.11 kip phiVn = 1355.96 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E18 + 1.0E1 + 1.6O1 (LC 252)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC8H:2:
Length = 50.25 ft
Effective depth = 8.31 in
Vu = 34.35 kip phiVn = 460.82 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 22.5

Reinforcement Checks:

Segment SC8H:2:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.519% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

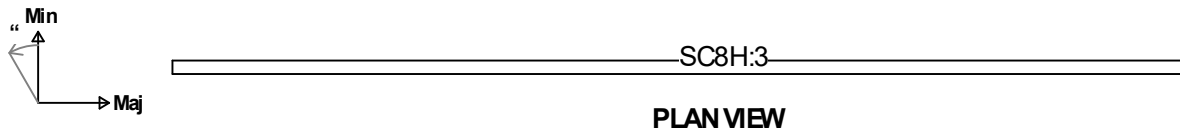


Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC8H:3 (Horizontal)
Story: Second
Ag = 7571 in² Imaj = 361676085 in⁴ Imin = 63094 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 8
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.166 **OK**
Beta = 1.5 deg CCW from Major axis
Pu = 477.51 kips phiPn = 2875.52 kips
Mu = 7590.35 kip-ft phiMn = 45708.38 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E32 + 1.0E1 + 1.6O1 (LC 423)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC8H:3:
Length = 63.09 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = 1487.76 kip phiVn = 1702.54 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E35 + 1.0E1 + 1.6O1 (LC 336)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC8H:3:
Length = 63.09 ft
Effective depth = 8.31 in
Vu = 8.71 kip phiVn = 578.56 kip **OK**
Controlling Load Combo: 1.384 D + 1.300 E25 + 1.0E1 + 1.6O1 (LC 236)
Code Ref: 22.5

Reinforcement Checks:

Segment SC8H:3:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.519% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

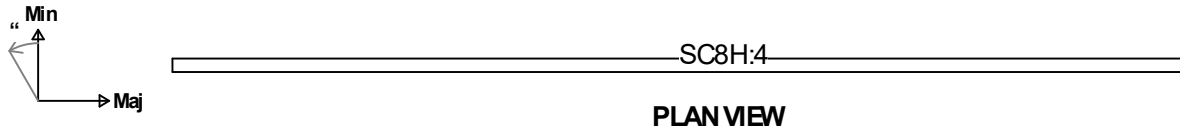


Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC8H:4 (Horizontal)
Story: Second
Ag = 7571 in² Imaj = 361676085 in⁴ Imin = 63094 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 8
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.055 **OK**
Beta = 0.9 deg CCW from Major axis
Pu = 962.86 kips phiPn = 17475.84 kips
Mu = 3054.08 kip-ft phiMn = 55431.51 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC8H:4:
Length = 63.09 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = 1467.86 kip phiVn = 1702.54 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E35 + 1.0E1 + 1.6O1 (LC 336)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC8H:4:
Length = 63.09 ft
Effective depth = 8.31 in
Vu = -15.69 kip phiVn = 578.57 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 22.5

Reinforcement Checks:

Segment SC8H:4:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.519% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 0.511% (18.10.2.1) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



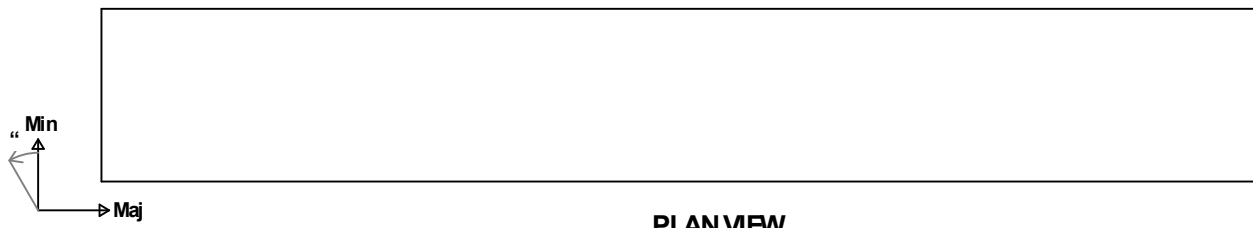
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC11H:1 (Horizontal)
Story: First
Ag = 670 in² Imaj = 250636 in⁴ Imin = 5583 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 11
Wall Type: Cast-In-Place
Design Status: **PASS**

SC11H:1



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.318 **OK**
Beta = 0.1 deg CCW from Major axis
Pu = -59.72 kips phiPn = -187.58 kips
Mu = 94.66 kip-ft phiMn = 297.32 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E14 (LC 164)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC11H:1:
Length = 5.58 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = -48.76 kip phiVn = 132.91 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E7 + 1.0E1 + 1.6O1 (LC 285)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC11H:1:
Length = 5.58 ft
Effective depth = 8.44 in
Vu = 0.22 kip phiVn = 42.70 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E14 (LC 164)
Code Ref: 22.5

Reinforcement Checks:

Segment SC11H:1:
Thickness : 10.00 in



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
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Min Vert Reinf Ratio: 0.003% Actual: 0.824% (11.6.2 (a)) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



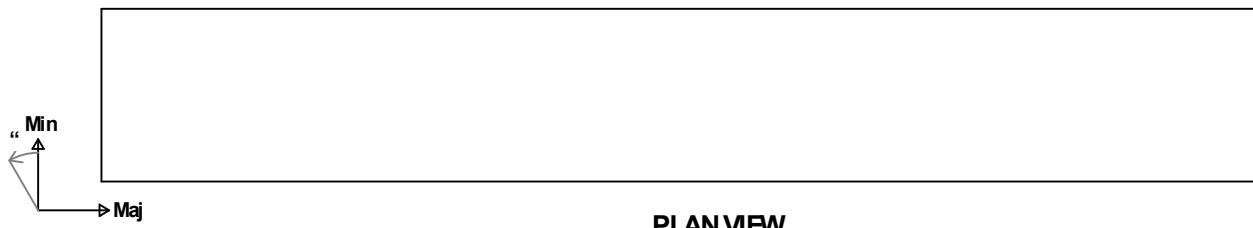
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC11H:2 (Horizontal)
Story: First
Ag = 670 in² Imaj = 250636 in⁴ Imin = 5583 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 11
Wall Type: Cast-In-Place
Design Status: **PASS**

SC11H:2



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.466 **OK**
Beta = 359.3 deg CCW from Major axis
Pu = -36.68 kips phiPn = -78.66 kips
Mu = 266.92 kip-ft phiMn = 572.46 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E7 + 1.0E1 + 1.6O1 (LC 285)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC11H:2:
Length = 5.58 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 75.24 kip phiVn = 175.60 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E7 + 1.0E1 + 1.6O1 (LC 351)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC11H:2:
Length = 5.58 ft
Effective depth = 8.44 in
Vu = 1.15 kip phiVn = 46.28 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E7 + 1.0E1 + 1.6O1 (LC 285)
Code Ref: 22.5

Reinforcement Checks:

Segment SC11H:2:
Thickness : 10.00 in



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Vert Reinf Ratio: 0.120% Actual: 0.824% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC11H:3 (Horizontal)
Story: Second
Ag = 670 in² Imaj = 250636 in⁴ Imin = 5583 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 11
Wall Type: Cast-In-Place
Design Status: **PASS**

SC11H:3



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.685 **OK**
Beta = 359.2 deg CCW from Major axis
Pu = 57.83 kips phiPn = 84.47 kips
Mu = 598.96 kip-ft phiMn = 874.81 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC11H:3:
Length = 5.58 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 48.13 kip phiVn = 181.48 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E7 (LC 9)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC11H:3:
Length = 5.58 ft
Effective depth = 7.69 in
Vu = -3.50 kip phiVn = 51.87 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E29 (LC 31)
Code Ref: 22.5

Reinforcement Checks:

Segment SC11H:3:
Thickness : 10.00 in



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Vert Reinf Ratio: 0.120% Actual: 0.733% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



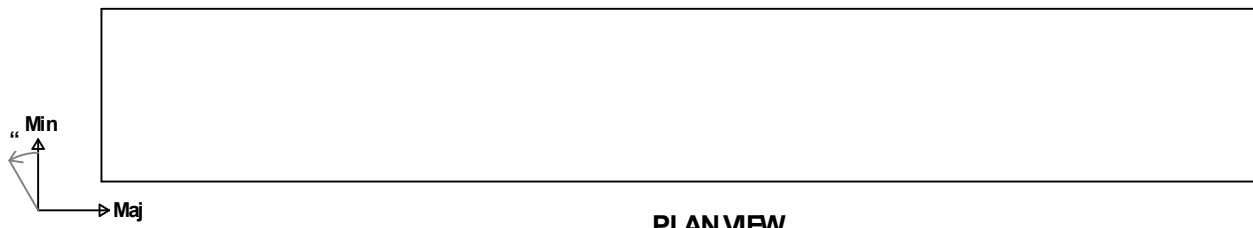
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC11H:4 (Horizontal)
Story: Second
Ag = 670 in² I_{maj} = 250636 in⁴ I_{min} = 5583 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 11
Wall Type: Cast-In-Place
Design Status: **PASS**

SC11H:4



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.126 **OK**
Beta = 160.3 deg CCW from Major axis
Pu = 147.55 kips phiPn = 1170.67 kips
Mu = 78.59 kip-ft phiMn = 623.51 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC11H:4:
Length = 5.58 ft Thick = 10.00 in f_c = 6000 psi f_y = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 48.13 kip phiVn = 181.48 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E7 (LC 9)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC11H:4:
Length = 5.58 ft
Effective depth = 7.69 in
Vu = -3.50 kip phiVn = 51.87 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E29 (LC 31)
Code Ref: 22.5

Reinforcement Checks:

Segment SC11H:4:
Thickness : 10.00 in



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Vert Reinf Ratio: 0.120% Actual: 0.733% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC12H:1 (Horizontal)
Story: First
Ag = 1170 in2 Imaj = 1334678 in4 Imin = 9750 in4
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 12
Wall Type: Cast-In-Place
Design Status: **PASS**

SC12H:1



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.219 **OK**
Beta = 180.0 deg CCW from Major axis
Pu = 554.48 kips phiPn = 2530.82 kips
Mu = 759.66 kip-ft phiMn = 3467.32 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E17 + 1.0E1 + 1.6O1 (LC 246)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC12H:1:
Length = 9.75 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 234.44 kip phiVn = 245.32 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC12H:1:
Length = 9.75 ft
Effective depth = 8.44 in
Vu = 0.52 kip phiVn = 90.76 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E18 (LC 20)
Code Ref: 22.5

Reinforcement Checks:

Segment SC12H:1:
Thickness : 10.00 in



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Vert Reinf Ratio: 0.004% Actual: 0.734% (11.6.2 (a)) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.682% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC12H:2 (Horizontal)
Story: First
Ag = 1170 in2 Imaj = 1334678 in4 Imin = 9750 in4
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 12
Wall Type: Cast-In-Place
Design Status: **PASS**

SC12H:2



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.420 **OK**
Beta = 180.4 deg CCW from Major axis
Pu = 652.52 kips phiPn = 1553.60 kips
Mu = 2000.65 kip-ft phiMn = 4763.41 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC12H:2:
Length = 9.75 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 227.38 kip phiVn = 245.32 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC12H:2:
Length = 9.75 ft
Effective depth = 8.44 in
Vu = 4.04 kip phiVn = 90.77 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E26 + 1.0E1 + 1.6O1 (LC 260)
Code Ref: 22.5

Reinforcement Checks:

Segment SC12H:2:
Thickness : 10.00 in



Section Cut Design Summary

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Min Vert Reinf Ratio: 0.004% Actual: 0.734% (11.6.2 (a)) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.682% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



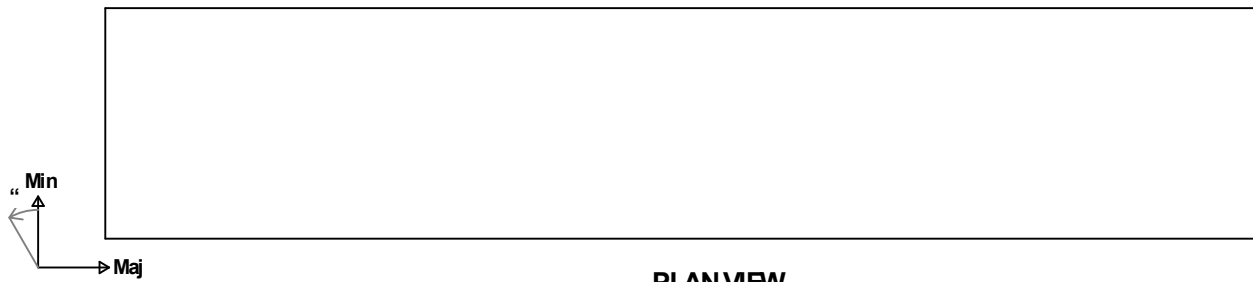
Section Cut Design Summary

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Section Cut ID: SC12H:3 (Horizontal)
Story: Second
Ag = 500 in² Imaj = 104167 in⁴ Imin = 4167 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 12
Wall Type: Cast-In-Place
Design Status: **PASS**

SC12H:3



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.543 **OK**
Beta = 4.9 deg CCW from Major axis
Pu = 347.06 kips phiPn = 638.98 kips
Mu = 491.72 kip-ft phiMn = 905.30 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC12H:3:
Length = 4.17 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 56.83 kip phiVn = 108.35 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC12H:3:
Length = 4.17 ft
Effective depth = 7.69 in
Vu = 8.36 kip phiVn = 38.72 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 22.5



Section Cut Design Summary

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Reinforcement Checks:

Segment SC12H:3:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.003% Actual: 0.859% (11.6.2 (a)) **OK**

Max Vert Bar Spacing Limit: 16.67 in Actual: 9.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.682% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



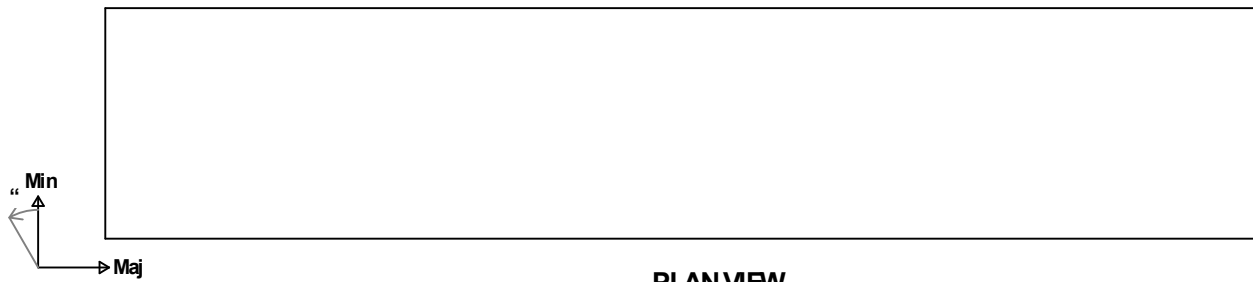
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Section Cut ID: SC12H:4 (Horizontal)
Story: Second
Ag = 500 in² Imaj = 104167 in⁴ Imin = 4167 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 12
Wall Type: Cast-In-Place
Design Status: **PASS**

SC12H:4



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.677 **OK**
Beta = 188.7 deg CCW from Major axis
Pu = 409.91 kips phiPn = 605.84 kips
Mu = 494.53 kip-ft phiMn = 730.91 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC12H:4:
Length = 4.17 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 56.83 kip phiVn = 108.35 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC12H:4:
Length = 4.17 ft
Effective depth = 7.69 in
Vu = 8.36 kip phiVn = 38.72 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 22.5



Section Cut Design Summary

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Reinforcement Checks:

Segment SC12H:4:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.003% Actual: 0.859% (11.6.2 (a)) **OK**

Max Vert Bar Spacing Limit: 16.67 in Actual: 9.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.682% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



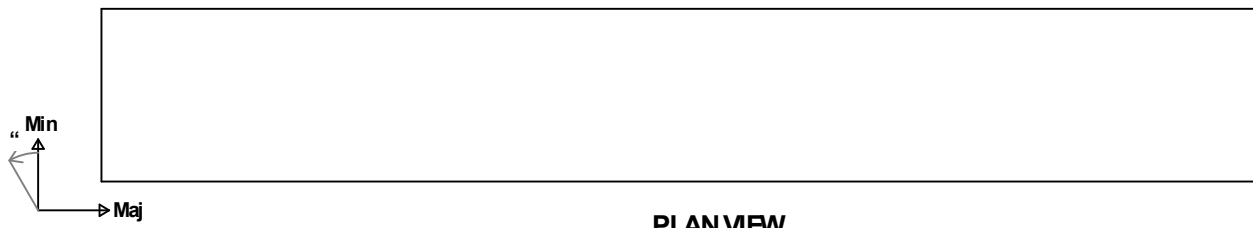
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC13H:1 (Horizontal)
Story: First
Ag = 670 in² Imaj = 250636 in⁴ Imin = 5583 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 13
Wall Type: Cast-In-Place
Design Status: **PASS**

SC13H:1



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.156 **OK**
Beta = 180.2 deg CCW from Major axis
Pu = -105.28 kips phiPn = -675.33 kips
Mu = 36.91 kip-ft phiMn = 236.78 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E7 + 1.0E1 + 1.6O1 (LC 285)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC13H:1:
Length = 5.58 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #8@9" oc Horiz Bar Pat: #5@9" oc
Vu = -142.68 kip phiVn = 176.30 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E7 + 1.0E1 + 1.6O1 (LC 285)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC13H:1:
Length = 5.58 ft
Effective depth = 8.13 in
Vu = 0.21 kip phiVn = 33.21 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E14 (LC 164)
Code Ref: 22.5

Reinforcement Checks:

Segment SC13H:1:
Thickness : 10.00 in



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Vert Reinf Ratio: 0.150% Actual: 2.110% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.00 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.682% Actual: 1.745% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 1.745% (18.10.2.1) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



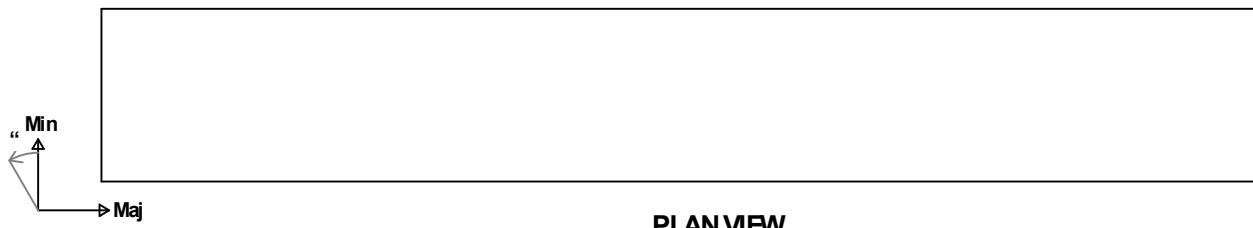
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC13H:2 (Horizontal)
Story: First
Ag = 670 in² Imaj = 250636 in⁴ Imin = 5583 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 13
Wall Type: Cast-In-Place
Design Status: **PASS**

SC13H:2



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.694 **OK**
Beta = 359.9 deg CCW from Major axis
Pu = -198.30 kips phiPn = -285.79 kips
Mu = 825.21 kip-ft phiMn = 1189.29 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC13H:2:
Length = 5.58 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #8@9" oc Horiz Bar Pat: #5@9" oc
Vu = -117.59 kip phiVn = 162.62 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC13H:2:
Length = 5.58 ft
Effective depth = 8.13 in
Vu = 0.50 kip phiVn = 20.14 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E7 + 1.0E1 + 1.6O1 (LC 285)
Code Ref: 22.5

Reinforcement Checks:

Segment SC13H:2:
Thickness : 10.00 in



Section Cut Design Summary

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Min Vert Reinf Ratio: 0.150% Actual: 2.110% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.00 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.682% Actual: 1.745% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 1.745% (18.10.2.1) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



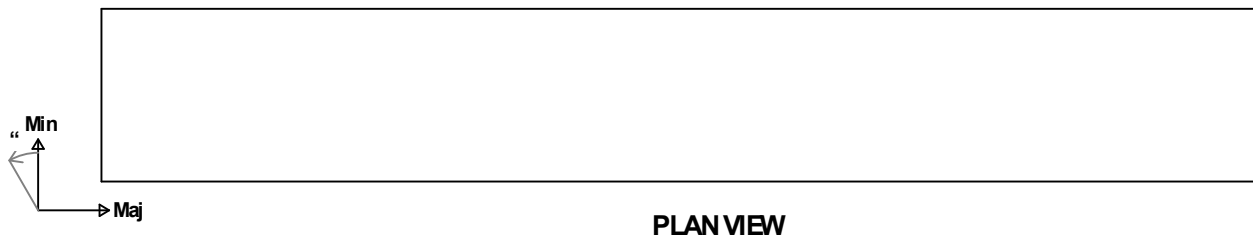
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RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC13H:3 (Horizontal)
Story: Second
Ag = 670 in² Imaj = 250636 in⁴ Imin = 5583 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 13
Wall Type: Cast-In-Place
Design Status: **PASS**

SC13H:3



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.858 **OK**
Beta = 359.9 deg CCW from Major axis
Pu = 47.18 kips phiPn = 55.00 kips
Mu = 1610.70 kip-ft phiMn = 1877.48 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC13H:3:
Length = 5.58 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #8@9" oc Horiz Bar Pat: #5@9" oc
Vu = 127.08 kip phiVn = 245.61 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E7 (LC 9)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC13H:3:
Length = 5.58 ft
Effective depth = 8.13 in
Vu = -0.85 kip phiVn = 54.82 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E29 (LC 31)
Code Ref: 22.5

Reinforcement Checks:

Segment SC13H:3:
Thickness : 10.00 in



Section Cut Design Summary

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Min Vert Reinf Ratio: 0.150% Actual: 2.110% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.00 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.682% Actual: 1.745% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 1.745% (18.10.2.1) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



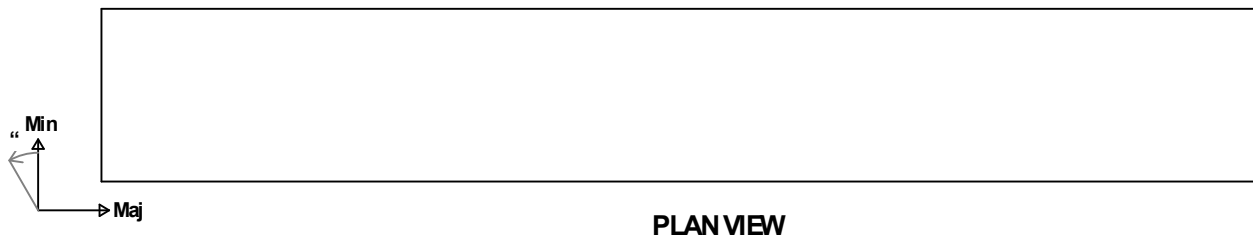
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Section Cut ID: SC13H:4 (Horizontal)
Story: Second
Ag = 670 in² Imaj = 250636 in⁴ Imin = 5583 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 13
Wall Type: Cast-In-Place
Design Status: **PASS**

SC13H:4



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.091 **OK**
Beta = 179.1 deg CCW from Major axis
Pu = 103.68 kips phiPn = 1145.46 kips
Mu = 191.55 kip-ft phiMn = 2116.19 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E7 + 1.0E1 + 1.6O1 (LC 351)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC13H:4:
Length = 5.58 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #8@9" oc Horiz Bar Pat: #5@9" oc
Vu = 127.08 kip phiVn = 245.61 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E7 (LC 9)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC13H:4:
Length = 5.58 ft
Effective depth = 8.13 in
Vu = -0.85 kip phiVn = 54.82 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E29 (LC 31)
Code Ref: 22.5

Reinforcement Checks:

Segment SC13H:4:
Thickness : 10.00 in



Section Cut Design Summary

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Min Vert Reinf Ratio: 0.150% Actual: 2.110% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.00 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.682% Actual: 1.745% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 1.745% (18.10.2.1) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC14H:1 (Horizontal)
Story: First
Ag = 670 in² Imaj = 250636 in⁴ Imin = 5583 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 14
Wall Type: Cast-In-Place
Design Status: **PASS**

SC14H:1



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.325 **OK**
Beta = 0.1 deg CCW from Major axis
Pu = -57.06 kips phiPn = -175.78 kips
Mu = 106.29 kip-ft phiMn = 327.41 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC14H:1:
Length = 5.58 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 38.75 kip phiVn = 140.48 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC14H:1:
Length = 5.58 ft
Effective depth = 8.44 in
Vu = 0.48 kip phiVn = 43.11 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 22.5

Reinforcement Checks:

Segment SC14H:1:
Thickness : 10.00 in



Section Cut Design Summary

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Min Vert Reinf Ratio: 0.003% Actual: 0.824% (11.6.2 (a)) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



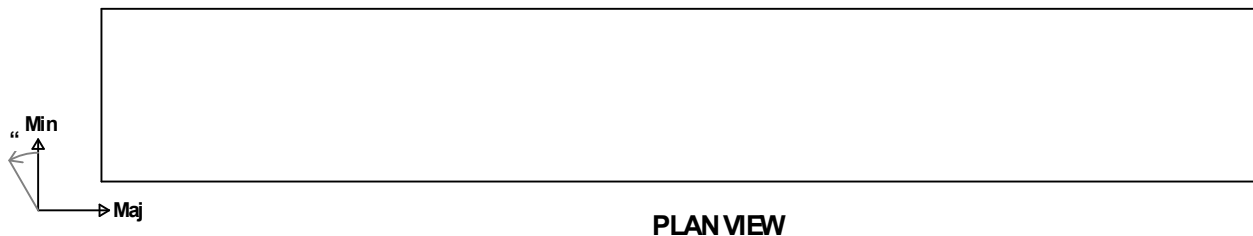
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC14H:2 (Horizontal)
Story: First
Ag = 670 in² I_{maj} = 250636 in⁴ I_{min} = 5583 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 14
Wall Type: Cast-In-Place
Design Status: **PASS**

SC14H:2



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.362 **OK**
Beta = 1.5 deg CCW from Major axis
Pu = 2.27 kips phiPn = 6.28 kips
Mu = 275.29 kip-ft phiMn = 761.37 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E25 + 1.0E1 + 1.6O1 (LC 337)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC14H:2:
Length = 5.58 ft Thick = 10.00 in f_c = 5000 psi f_y = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 59.99 kip phiVn = 175.60 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E22 + 1.0E1 + 1.6O1 (LC 256)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC14H:2:
Length = 5.58 ft
Effective depth = 8.44 in
Vu = 6.30 kip phiVn = 51.97 kip **OK**
Controlling Load Combo: 1.384 D + 1.300 E29 (LC 105)
Code Ref: 22.5

Reinforcement Checks:

Segment SC14H:2:
Thickness : 10.00 in



Section Cut Design Summary

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Min Vert Reinf Ratio: 0.120% Actual: 0.824% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC14H:3 (Horizontal)
Story: Second
Ag = 618 in² Imaj = 197038 in⁴ Imin = 5153 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 14
Wall Type: Cast-In-Place
Design Status: **PASS**

SC14H:3



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.597 **OK**
Beta = 359.8 deg CCW from Major axis
Pu = 55.72 kips phiPn = 93.32 kips
Mu = 490.90 kip-ft phiMn = 822.21 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC14H:3:
Length = 5.15 ft Thick = 10.00 in f_c = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 43.18 kip phiVn = 167.49 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC14H:3:
Length = 5.15 ft
Effective depth = 7.69 in
Vu = -7.54 kip phiVn = 47.87 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 22.5

Reinforcement Checks:

Segment SC14H:3:



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.794% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) OK

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
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Section Cut ID: SC14H:4 (Horizontal)
Story: Second
Ag = 618 in² Imaj = 197038 in⁴ Imin = 5153 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 14
Wall Type: Cast-In-Place
Design Status: **PASS**

SC14H:4



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.367 **OK**
Beta = 146.0 deg CCW from Major axis
Pu = 142.50 kips phiPn = 388.14 kips
Mu = 129.79 kip-ft phiMn = 353.52 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC14H:4:
Length = 5.15 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 43.18 kip phiVn = 167.49 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC14H:4:
Length = 5.15 ft
Effective depth = 7.69 in
Vu = -7.54 kip phiVn = 47.87 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 22.5

Reinforcement Checks:

Segment SC14H:4:



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Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.794% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) OK

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



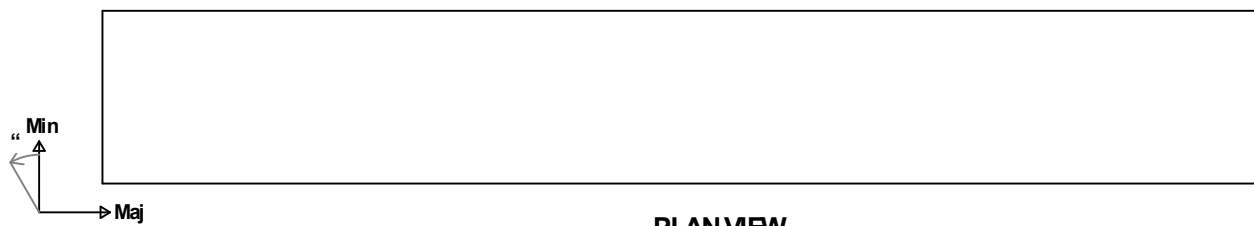
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC15H:1 (Horizontal)
Story: First
Ag = 670 in² Imaj = 250636 in⁴ Imin = 5583 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 15
Wall Type: Cast-In-Place
Design Status: **PASS**

SC15H:1



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.349 **OK**
Beta = 360.0 deg CCW from Major axis
Pu = -62.32 kips phiPn = -178.56 kips
Mu = 111.86 kip-ft phiMn = 320.51 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC15H:1:
Length = 5.58 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = -35.72 kip phiVn = 131.93 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E25 + 1.0E1 + 1.6O1 (LC 337)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC15H:1:
Length = 5.58 ft
Effective depth = 8.44 in
Vu = 0.42 kip phiVn = 42.29 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 22.5

Reinforcement Checks:

Segment SC15H:1:
Thickness : 10.00 in



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Min Vert Reinf Ratio: 0.003% Actual: 0.824% (11.6.2 (a)) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



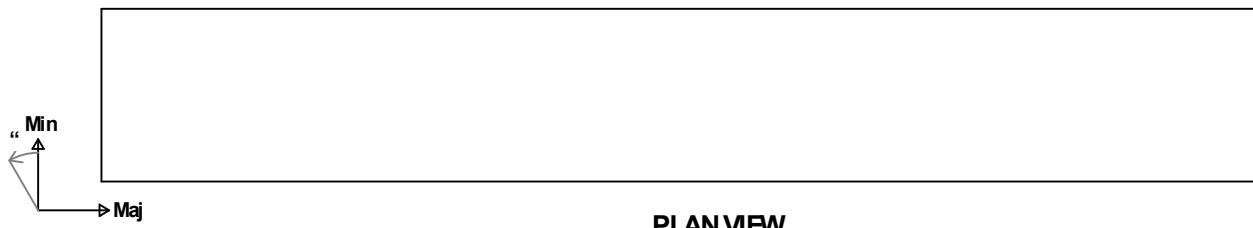
Section Cut Design Summary

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Section Cut ID: SC15H:2 (Horizontal)
Story: First
Ag = 670 in² Imaj = 250636 in⁴ Imin = 5583 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 15
Wall Type: Cast-In-Place
Design Status: **PASS**

SC15H:2



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.392 **OK**
Beta = 1.8 deg CCW from Major axis
Pu = -1.19 kips phiPn = -3.05 kips
Mu = 289.69 kip-ft phiMn = 738.91 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E25 + 1.0E1 + 1.6O1 (LC 337)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC15H:2:
Length = 5.58 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 62.43 kip phiVn = 175.60 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E22 + 1.0E1 + 1.6O1 (LC 256)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC15H:2:
Length = 5.58 ft
Effective depth = 8.44 in
Vu = -5.77 kip phiVn = 51.97 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E29 + 1.0E1 + 1.6O1 (LC 263)
Code Ref: 22.5

Reinforcement Checks:

Segment SC15H:2:
Thickness : 10.00 in



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Min Vert Reinf Ratio: 0.120% Actual: 0.824% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



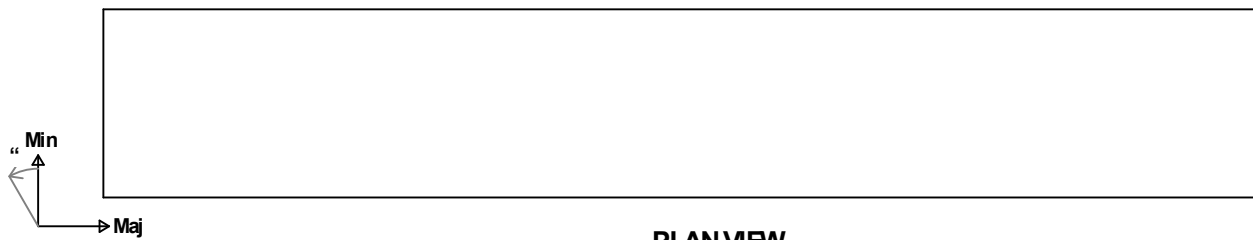
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC15H:3 (Horizontal)
Story: Second
Ag = 614 in² Imaj = 193172 in⁴ Imin = 5119 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 15
Wall Type: Cast-In-Place
Design Status: **PASS**

SC15H:3



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.665 **OK**
Beta = 1.5 deg CCW from Major axis
Pu = 44.25 kips phiPn = 66.56 kips
Mu = 504.98 kip-ft phiMn = 759.65 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC15H:3:
Length = 5.12 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 40.87 kip phiVn = 166.39 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear Results:

Segment SC15H:3:
Length = 5.12 ft
Effective depth = 7.69 in
Vu = 2.77 kip phiVn = 47.56 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E26 (LC 28)
Code Ref: 22.5

Reinforcement Checks:

Segment SC15H:3:



Section Cut Design Summary

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Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.799% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) OK

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



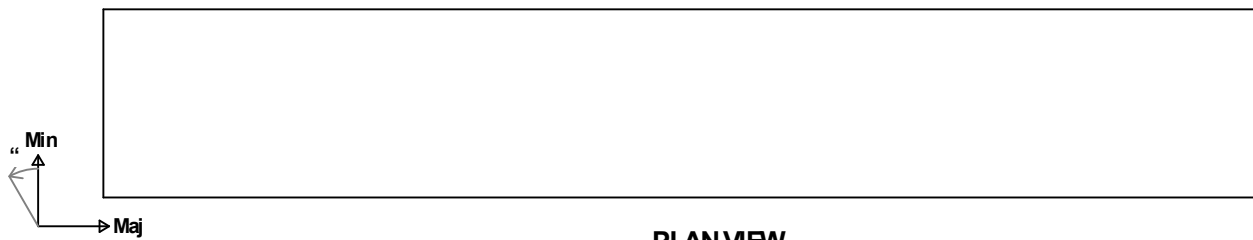
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
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Section Cut ID: SC15H:4 (Horizontal)
Story: Second
Ag = 614 in² Imaj = 193172 in⁴ Imin = 5119 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 15
Wall Type: Cast-In-Place
Design Status: **PASS**

SC15H:4



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.098 **OK**
Beta = 196.6 deg CCW from Major axis
Pu = 111.77 kips phiPn = 1144.11 kips
Mu = 63.10 kip-ft phiMn = 645.91 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC15H:4:
Length = 5.12 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 40.87 kip phiVn = 166.39 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear Results:

Segment SC15H:4:
Length = 5.12 ft
Effective depth = 7.69 in
Vu = 2.77 kip phiVn = 47.56 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E26 (LC 28)
Code Ref: 22.5

Reinforcement Checks:

Segment SC15H:4:



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Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.799% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) OK

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



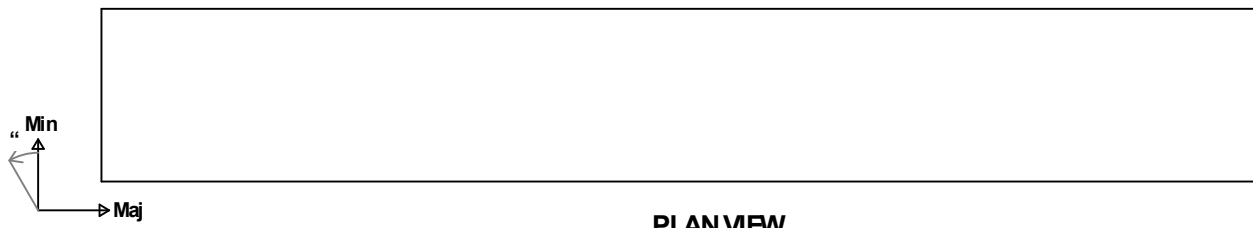
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC16H:1 (Horizontal)
Story: First
Ag = 670 in² Imaj = 250636 in⁴ Imin = 5583 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 16
Wall Type: Cast-In-Place
Design Status: **PASS**

SC16H:1



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.358 **OK**
Beta = 360.0 deg CCW from Major axis
Pu = -63.82 kips phiPn = -178.43 kips
Mu = 114.71 kip-ft phiMn = 320.73 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC16H:1:
Length = 5.58 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = -37.54 kip phiVn = 131.77 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E25 + 1.0E1 + 1.6O1 (LC 337)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC16H:1:
Length = 5.58 ft
Effective depth = 8.44 in
Vu = 0.43 kip phiVn = 42.14 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 22.5

Reinforcement Checks:

Segment SC16H:1:
Thickness : 10.00 in



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Vert Reinf Ratio: 0.003% Actual: 0.824% (11.6.2 (a)) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



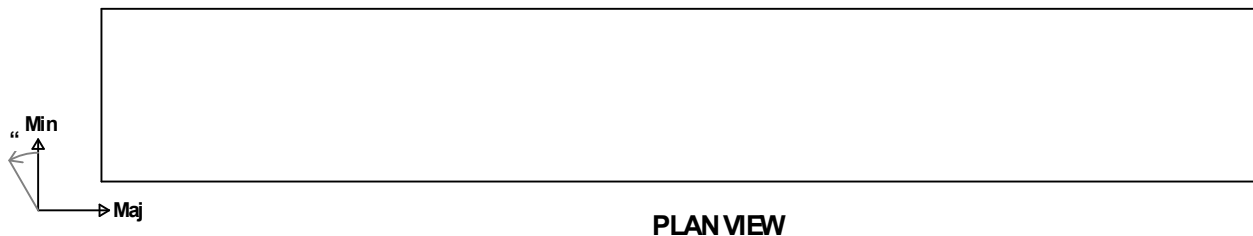
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC16H:2 (Horizontal)
Story: First
Ag = 670 in² Imaj = 250636 in⁴ Imin = 5583 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 16
Wall Type: Cast-In-Place
Design Status: **PASS**

SC16H:2



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.420 **OK**
Beta = 1.6 deg CCW from Major axis
Pu = -3.69 kips phiPn = -8.79 kips
Mu = 305.67 kip-ft phiMn = 727.59 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E25 + 1.0E1 + 1.6O1 (LC 337)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC16H:2:
Length = 5.58 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 66.89 kip phiVn = 175.60 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E22 + 1.0E1 + 1.6O1 (LC 256)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC16H:2:
Length = 5.58 ft
Effective depth = 8.44 in
Vu = -5.43 kip phiVn = 51.97 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E29 + 1.0E1 + 1.6O1 (LC 263)
Code Ref: 22.5

Reinforcement Checks:

Segment SC16H:2:
Thickness : 10.00 in



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Min Vert Reinf Ratio: 0.120% Actual: 0.824% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



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Section Cut ID: SC16H:3 (Horizontal)
Story: Second
Ag = 618 in² Imaj = 197040 in⁴ Imin = 5153 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 16
Wall Type: Cast-In-Place
Design Status: **PASS**

SC16H:3



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.700 **OK**
Beta = 1.0 deg CCW from Major axis
Pu = 49.41 kips phiPn = 70.63 kips
Mu = 544.68 kip-ft phiMn = 778.64 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC16H:3:
Length = 5.15 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 45.35 kip phiVn = 167.49 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear Results:

Segment SC16H:3:
Length = 5.15 ft
Effective depth = 7.69 in
Vu = -1.33 kip phiVn = 47.87 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E29 (LC 31)
Code Ref: 22.5

Reinforcement Checks:

Segment SC16H:3:



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Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.794% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) OK

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC16H:4 (Horizontal)
Story: Second
Ag = 618 in² Imaj = 197040 in⁴ Imin = 5153 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 16
Wall Type: Cast-In-Place
Design Status: **PASS**

SC16H:4



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.077 **OK**
Beta = 177.9 deg CCW from Major axis
Pu = 125.49 kips phiPn = 1626.42 kips
Mu = 81.66 kip-ft phiMn = 1058.34 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC16H:4:
Length = 5.15 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 45.35 kip phiVn = 167.49 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC16H:4:
Length = 5.15 ft
Effective depth = 7.69 in
Vu = -1.33 kip phiVn = 47.87 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E29 (LC 31)
Code Ref: 22.5

Reinforcement Checks:

Segment SC16H:4:



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.794% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) OK

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC17H:1 (Horizontal)
Story: First
Ag = 670 in² Imaj = 250636 in⁴ Imin = 5583 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 17
Wall Type: Cast-In-Place
Design Status: **PASS**

SC17H:1



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.372 **OK**
Beta = 360.0 deg CCW from Major axis
Pu = -68.93 kips phiPn = -185.35 kips
Mu = 112.68 kip-ft phiMn = 303.00 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC17H:1:
Length = 5.58 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = -46.30 kip phiVn = 131.02 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E25 + 1.0E1 + 1.6O1 (LC 337)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC17H:1:
Length = 5.58 ft
Effective depth = 8.44 in
Vu = 0.41 kip phiVn = 41.40 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 22.5

Reinforcement Checks:

Segment SC17H:1:
Thickness : 10.00 in



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Vert Reinf Ratio: 0.003% Actual: 0.824% (11.6.2 (a)) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



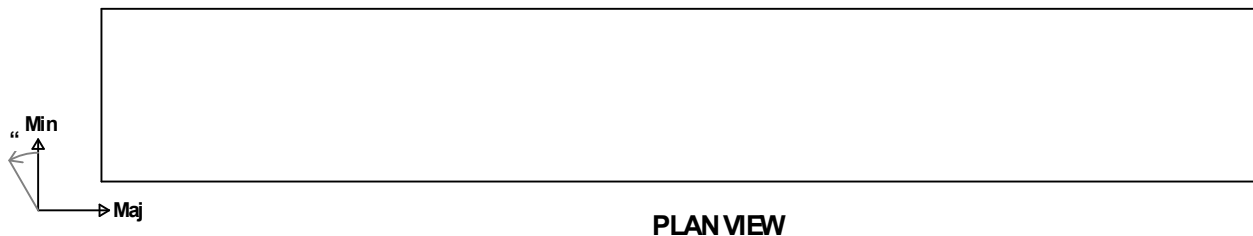
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
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Section Cut ID: SC17H:2 (Horizontal)
Story: First
Ag = 670 in² Imaj = 250636 in⁴ Imin = 5583 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 17
Wall Type: Cast-In-Place
Design Status: **PASS**

SC17H:2



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.555 **OK**
Beta = 1.9 deg CCW from Major axis
Pu = -9.03 kips phiPn = -16.27 kips
Mu = 392.84 kip-ft phiMn = 708.10 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E25 + 1.0E1 + 1.6O1 (LC 337)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC17H:2:
Length = 5.58 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 78.92 kip phiVn = 175.60 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E22 + 1.0E1 + 1.6O1 (LC 256)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC17H:2:
Length = 5.58 ft
Effective depth = 8.44 in
Vu = -8.90 kip phiVn = 51.97 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E26 (LC 28)
Code Ref: 22.5

Reinforcement Checks:

Segment SC17H:2:
Thickness : 10.00 in



Section Cut Design Summary

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Min Vert Reinf Ratio: 0.120% Actual: 0.824% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.436% Actual: 0.682% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



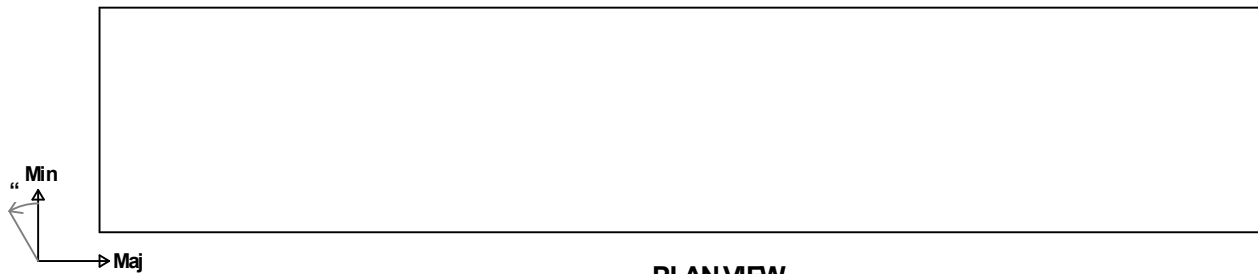
Section Cut Design Summary

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Section Cut ID: SC17H:3 (Horizontal)
Story: Second
Ag = 742 in² Imaj = 236448 in⁴ Imin = 8904 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 17
Wall Type: Cast-In-Place
Design Status: **PASS**

SC17H:3



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.853 **OK**
Beta = 1.9 deg CCW from Major axis
Pu = 58.98 kips phiPn = 69.14 kips
Mu = 671.47 kip-ft phiMn = 787.11 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC17H:3:
Length = 5.15 ft Thick = 12.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 54.78 kip phiVn = 179.95 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear Results:

Segment SC17H:3:
Length = 5.15 ft
Effective depth = 10.44 in
Vu = 5.47 kip phiVn = 65.00 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E26 (LC 28)
Code Ref: 22.5



Section Cut Design Summary

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Reinforcement Checks:

Segment SC17H:3:

Thickness : 12.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.662% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.364% Actual: 0.568% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



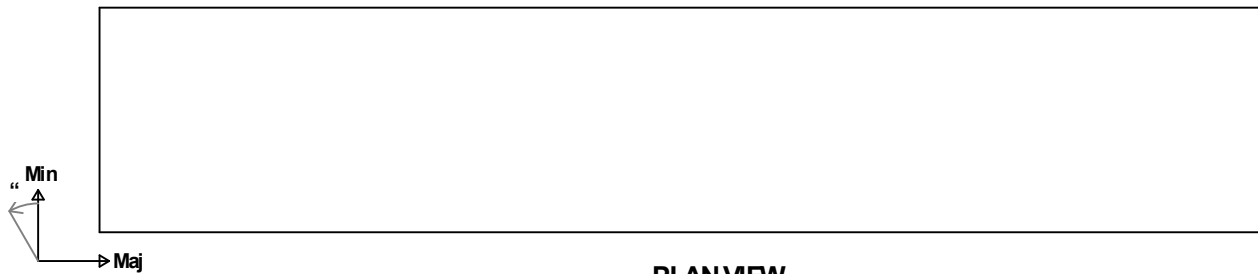
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Section Cut ID: SC17H:4 (Horizontal)
Story: Second
Ag = 742 in² Imaj = 236448 in⁴ Imin = 8904 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 17
Wall Type: Cast-In-Place
Design Status: **PASS**

SC17H:4



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.138 **OK**
Beta = 206.8 deg CCW from Major axis
Pu = 149.72 kips phiPn = 1082.35 kips
Mu = 93.79 kip-ft phiMn = 678.05 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC17H:4:
Length = 5.15 ft Thick = 12.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@9" oc Horiz Bar Pat: #4@9" oc
Vu = 54.78 kip phiVn = 179.95 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear Results:

Segment SC17H:4:
Length = 5.15 ft
Effective depth = 10.44 in
Vu = 5.47 kip phiVn = 65.00 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E26 (LC 28)
Code Ref: 22.5



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Reinforcement Checks:

Segment SC17H:4:

Thickness : 12.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.662% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 8.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.364% Actual: 0.568% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



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Section Cut ID: SC18H:1 (Horizontal)
Story: First
Ag = 2170 in2 Imaj = 8515261 in4 Imin = 18083 in4
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 18
Wall Type: Cast-In-Place
Design Status: **PASS**

SC18H:1



Axial/Flexural Results:

Interaction: 0.560 **OK**
Beta = 180.1 deg CCW from Major axis
Pu = -48.63 kips phiPn = -86.76 kips
Mu = 1674.36 kip-ft phiMn = 2987.33 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E36 + 1.0E1 + 1.6O1 (LC 418)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC18H:1:
Length = 18.08 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@18" oc Horiz Bar Pat: #4@18" oc
Vu = -95.04 kip phiVn = 300.48 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E35 (LC 185)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC18H:1:
Length = 18.08 ft
Effective depth = 8.44 in
Vu = 1.88 kip phiVn = 160.76 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E36 + 1.0E1 + 1.6O1 (LC 418)
Code Ref: 22.5

Reinforcement Checks:

Segment SC18H:1:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.368% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 18.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 1.648 in (25.2.1) **OK**



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Min Longit Reinf Ratio Limit: 0.218% Actual: 0.341% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC18H:2 (Horizontal)
Story: First
Ag = 2170 in2 Imaj = 8515261 in4 Imin = 18083 in4
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 18
Wall Type: Cast-In-Place
Design Status: **PASS**

SC18H:2



Axial/Flexural Results:

Interaction: 0.348 **OK**
Beta = 181.2 deg CCW from Major axis
Pu = 62.19 kips phiPn = 178.88 kips
Mu = 1705.81 kip-ft phiMn = 4906.41 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E36 + 1.0E1 + 1.6O1 (LC 418)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC18H:2:
Length = 18.08 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@18" oc Horiz Bar Pat: #4@18" oc
Vu = -145.74 kip phiVn = 384.11 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E36 + 1.0E1 + 1.6O1 (LC 356)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC18H:2:
Length = 18.08 ft
Effective depth = 8.44 in
Vu = 18.14 kip phiVn = 168.32 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 22.5

Reinforcement Checks:

Segment SC18H:2:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.368% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 18.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 1.750 in (25.2.1) **OK**



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Min Longit Reinf Ratio Limit: 0.218% Actual: 0.341% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC18H:3 (Horizontal)
Story: Second
Ag = 2170 in2 Imaj = 8515261 in4 Imin = 18083 in4
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 18
Wall Type: Cast-In-Place
Design Status: **PASS**

SC18H:3



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.575 **OK**
Beta = 168.2 deg CCW from Major axis
Pu = 89.02 kips phiPn = 154.93 kips
Mu = 575.80 kip-ft phiMn = 1002.13 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E22 + 1.0E1 + 1.6O1 (LC 286)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC18H:3:
Length = 18.08 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@18" oc Horiz Bar Pat: #4@18" oc
Vu = -189.73 kip phiVn = 384.11 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC18H:3:
Length = 18.08 ft
Effective depth = 8.44 in
Vu = 14.93 kip phiVn = 168.31 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E22 + 1.0E1 + 1.6O1 (LC 256)
Code Ref: 22.5

Reinforcement Checks:

Segment SC18H:3:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.368% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 18.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 1.652 in (25.2.1) **OK**



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Min Longit Reinf Ratio Limit: 0.218% Actual: 0.341% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

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Section Cut ID: SC18H:4 (Horizontal)
Story: Second
Ag = 2170 in² Imaj = 8515261 in⁴ Imin = 18083 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 18
Wall Type: Cast-In-Place
Design Status: **PASS**

SC18H:4



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.146 **OK**
Beta = 334.3 deg CCW from Major axis
Pu = 213.39 kips phiPn = 1465.52 kips
Mu = 195.88 kip-ft phiMn = 1345.26 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC18H:4:
Length = 18.08 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@18" oc Horiz Bar Pat: #4@18" oc
Vu = -189.73 kip phiVn = 384.11 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC18H:4:
Length = 18.08 ft
Effective depth = 8.44 in
Vu = 14.93 kip phiVn = 168.31 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E22 + 1.0E1 + 1.6O1 (LC 256)
Code Ref: 22.5

Reinforcement Checks:

Segment SC18H:4:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.368% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 18.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 1.654 in (25.2.1) **OK**



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Min Longit Reinf Ratio Limit: 0.218% Actual: 0.341% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**

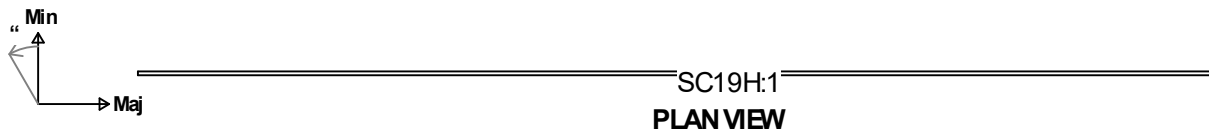


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Section Cut ID: SC19H:1 (Horizontal)
Story: First
Ag = 28174 in² Imaj = 18635981095 in⁴ Imin = 234781 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 19
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.291 **OK**
Beta = 0.4 deg CCW from Major axis
Pu = 378.60 kips phiPn = 1302.33 kips
Mu = 56370.30 kip-ft phiMn = 193903.95 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E17 + 1.0E1 + 1.6O1 (LC 241)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC19H:1:
Length = 234.78 ft Thick = 10.00 in fc = 4000 psi fy = 60 ksi
Vert Bar Pat: #5@18" oc Horiz Bar Pat: #5@18" oc
Vu = -5327.74 kip phiVn = 6061.98 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E17 + 1.0E1 + 1.6O1 (LC 246)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC19H:1:
Length = 234.78 ft
Effective depth = 7.56 in
Vu = -998.41 kip phiVn = 1751.81 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E1 + 1.0E1 + 1.6O1 (LC 279)
Code Ref: 22.5

Reinforcement Checks:

Segment SC19H:1:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.344% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 18.00 in (11.7.2.1) **OK**



Section Cut Design Summary

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Min Vert Bar Spacing Limit: 1.00 in Actual: 17.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.341% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.341% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

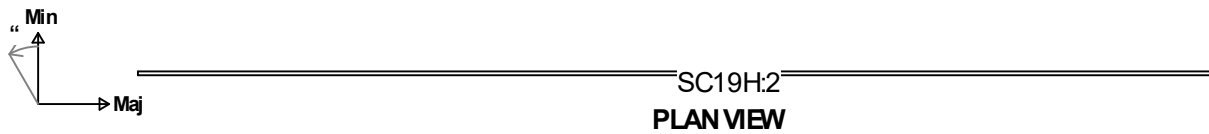


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RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC19H:2 (Horizontal)
Story: First
Ag = 28174 in² Imaj = 18635981095 in⁴ Imin = 234781 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 19
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.169 **OK**
Beta = 359.0 deg CCW from Major axis
Pu = 1051.05 kips phiPn = 6204.64 kips
Mu = 33719.82 kip-ft phiMn = 199057.75 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC19H:2:
Length = 234.78 ft Thick = 10.00 in fc = 4000 psi fy = 60 ksi
Vert Bar Pat: #5@18" oc Horiz Bar Pat: #5@18" oc
Vu = -5301.39 kip phiVn = 6061.98 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E17 + 1.0E1 + 1.6O1 (LC 246)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC19H:2:
Length = 234.78 ft
Effective depth = 7.56 in
Vu = 867.30 kip phiVn = 1751.83 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E1 + 1.0E1 + 1.6O1 (LC 414)
Code Ref: 22.5

Reinforcement Checks:

Segment SC19H:2:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.344% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 18.00 in (11.7.2.1) **OK**



Section Cut Design Summary

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Min Vert Bar Spacing Limit: 1.00 in Actual: 17.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.341% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.341% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC20H:1 (Horizontal)
Story: First
Ag = 28260 in² Imaj = 18807679980 in⁴ Imin = 235500 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 20
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.145 **OK**
Beta = 181.0 deg CCW from Major axis
Pu = -282.90 kips phiPn = -1944.66 kips
Mu = 17438.82 kip-ft phiMn = 119876.94 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E14 + 1.0E1 + 1.6O1 (LC 238)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC20H:1A:
Length = 26.09 ft Thick = 10.00 in fc = 4000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = -349.20 kip phiVn = 532.13 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E26 + 1.0E1 + 1.6O1 (LC 338)
Code Ref: 11.5.4.4

Segment SC20H:1B:
Length = 26.50 ft Thick = 10.00 in fc = 4000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = 398.48 kip phiVn = 684.22 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E26 (LC 28)
Code Ref: 18.10.4.1

Segment SC20H:1C:
Length = 26.41 ft Thick = 10.00 in fc = 4000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = 397.26 kip phiVn = 681.84 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E26 (LC 28)
Code Ref: 18.10.4.1

Segment SC20H:1D: 660



Section Cut Design Summary

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In-Plane Shear Results:

| | | | |
|-------------------------|--|-------------------------|----------------|
| Length = 34.93 ft | Thick = 10.00 in | $f_c = 4000$ psi | $f_y = 60$ ksi |
| Vert Bar Pat: #5@12" oc | Horiz Bar Pat: #5@18" oc | | |
| $V_u =$ | 525.49 kip | $\phi V_n = 901.76$ kip | OK |
| Controlling Load Combo: | 1.384 D + 0.500 Lp + 1.300 E26 (LC 28) | | |
| Code Ref: | 18.10.4.1 | | |

Segment SC20H:1E:

| | | | |
|-------------------------|--|-------------------------|----------------|
| Length = 26.50 ft | Thick = 10.00 in | $f_c = 4000$ psi | $f_y = 60$ ksi |
| Vert Bar Pat: #5@12" oc | Horiz Bar Pat: #5@18" oc | | |
| $V_u =$ | 396.81 kip | $\phi V_n = 684.22$ kip | OK |
| Controlling Load Combo: | 1.384 D + 0.500 Lp + 1.300 E26 (LC 28) | | |
| Code Ref: | 18.10.4.1 | | |

Segment SC20H:1F:

| | | | |
|-------------------------|--|-------------------------|----------------|
| Length = 26.50 ft | Thick = 10.00 in | $f_c = 4000$ psi | $f_y = 60$ ksi |
| Vert Bar Pat: #5@12" oc | Horiz Bar Pat: #5@18" oc | | |
| $V_u =$ | 398.94 kip | $\phi V_n = 684.22$ kip | OK |
| Controlling Load Combo: | 1.384 D + 0.500 Lp + 1.300 E26 (LC 28) | | |
| Code Ref: | 18.10.4.1 | | |

Segment SC20H:1G:

| | | | |
|-------------------------|--|-------------------------|----------------|
| Length = 26.50 ft | Thick = 10.00 in | $f_c = 4000$ psi | $f_y = 60$ ksi |
| Vert Bar Pat: #5@12" oc | Horiz Bar Pat: #5@18" oc | | |
| $V_u =$ | 399.67 kip | $\phi V_n = 684.22$ kip | OK |
| Controlling Load Combo: | 1.384 D + 0.500 Lp + 1.300 E26 (LC 28) | | |
| Code Ref: | 18.10.4.1 | | |

Segment SC20H:1H:

| | | | |
|-------------------------|--|-------------------------|----------------|
| Length = 42.07 ft | Thick = 10.00 in | $f_c = 4000$ psi | $f_y = 60$ ksi |
| Vert Bar Pat: #5@12" oc | Horiz Bar Pat: #5@18" oc | | |
| $V_u =$ | 545.88 kip | $\phi V_n = 868.22$ kip | OK |
| Controlling Load Combo: | 0.716 D + 1.300 E12 + 1.0E1 + 1.6O1 (LC 229) | | |
| Code Ref: | 11.5.4.4 | | |

Out-of-Plane Shear

Results:

Segment SC20H:1A:

| | | | |
|-------------------------|--|-------------------------|----|
| Length = | 26.09 ft | | |
| Effective depth = | 7.56 in | | |
| $V_u =$ | 62.28 kip | $\phi V_n = 177.57$ kip | OK |
| Controlling Load Combo: | 0.716 D - 1.300 E14 + 1.0E1 + 1.6O1 (LC 238) | | |
| Code Ref: | 22.5 | | |

Segment SC20H:1B:

| | |
|----------|----------|
| Length = | 26.50 ft |
|----------|----------|



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Out-of-Plane Shear

Results:

Effective depth = 7.56 in
Vu = 76.63 kip phiVn = 197.73 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E1 + 1.0E1 + 1.6O1 (LC 279)
Code Ref: 22.5

Segment SC20H:1C:

Length = 26.41 ft
Effective depth = 7.56 in
Vu = 75.23 kip phiVn = 197.04 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E1 + 1.0E1 + 1.6O1 (LC 279)
Code Ref: 22.5

Segment SC20H:1D:

Length = 34.93 ft
Effective depth = 7.56 in
Vu = 107.86 kip phiVn = 260.60 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E1 + 1.0E1 + 1.6O1 (LC 279)
Code Ref: 22.5

Segment SC20H:1E:

Length = 26.50 ft
Effective depth = 7.56 in
Vu = 76.43 kip phiVn = 197.73 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E1 + 1.0E1 + 1.6O1 (LC 279)
Code Ref: 22.5

Segment SC20H:1F:

Length = 26.50 ft
Effective depth = 7.56 in
Vu = 76.25 kip phiVn = 197.73 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E1 + 1.0E1 + 1.6O1 (LC 279)
Code Ref: 22.5

Segment SC20H:1G:

Length = 26.50 ft
Effective depth = 7.56 in
Vu = 76.30 kip phiVn = 197.73 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E1 + 1.0E1 + 1.6O1 (LC 279)
Code Ref: 22.5

Segment SC20H:1H:

Length = 42.07 ft
Effective depth = 7.56 in
Vu = 143.63 kip phiVn = 313.94 kip **OK**



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Out-of-Plane Shear

Results:

Controlling Load Combo: 0.716 D + 1.300 E1 + 1.0E1 + 1.6O1 (LC 279)
Code Ref: 22.5

Reinforcement Checks:

Segment SC20H:1A:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.515% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**

Segment SC20H:1B:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.515% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**

Segment SC20H:1C:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.515% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**

Segment SC20H:1D:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.515% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**

Segment SC20H:1E:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.515% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**



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Segment SC20H:1F:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.515% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) OK

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK

Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK

Segment SC20H:1G:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.515% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) OK

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK

Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK

Segment SC20H:1H:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.515% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) OK

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK

Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK



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Section Cut ID: SC20H:2 (Horizontal)
Story: First
Ag = 28260 in² Imaj = 18807679980 in⁴ Imin = 235500 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 20
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.257 **OK**
Beta = 177.6 deg CCW from Major axis
Pu = 411.97 kips phiPn = 1604.70 kips
Mu = 17834.68 kip-ft phiMn = 69469.07 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E8 (LC 10)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC20H:2A:
Length = 26.09 ft Thick = 10.00 in fc = 4000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = 392.76 kip phiVn = 673.69 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E29 + 1.0E1 + 1.6O1 (LC 263)
Code Ref: 18.10.4.1

Segment SC20H:2B:
Length = 26.50 ft Thick = 10.00 in fc = 4000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = 350.80 kip phiVn = 546.53 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E12 (LC 162)
Code Ref: 11.5.4.4

Segment SC20H:2C:
Length = 26.41 ft Thick = 10.00 in fc = 4000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = 375.82 kip phiVn = 545.16 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E12 (LC 162)
Code Ref: 11.5.4.4

Segment SC20H:2D: 665



Section Cut Design Summary

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In-Plane Shear Results:

| | | | |
|-------------------------|--|-------------------------|----------------|
| Length = 34.93 ft | Thick = 10.00 in | $f_c = 4000$ psi | $f_y = 60$ ksi |
| Vert Bar Pat: #5@12" oc | Horiz Bar Pat: #5@18" oc | | |
| $V_u =$ | 535.94 kip | $\phi V_n = 901.76$ kip | OK |
| Controlling Load Combo: | 1.384 D + 0.500 Lp + 1.300 E26 (LC 28) | | |
| Code Ref: | 18.10.4.1 | | |

Segment SC20H:2E:

| | | | |
|-------------------------|--|-------------------------|----------------|
| Length = 26.50 ft | Thick = 10.00 in | $f_c = 4000$ psi | $f_y = 60$ ksi |
| Vert Bar Pat: #5@12" oc | Horiz Bar Pat: #5@18" oc | | |
| $V_u =$ | 402.91 kip | $\phi V_n = 684.22$ kip | OK |
| Controlling Load Combo: | 1.384 D + 0.500 Lp + 1.300 E26 (LC 28) | | |
| Code Ref: | 18.10.4.1 | | |

Segment SC20H:2F:

| | | | |
|-------------------------|--|-------------------------|----------------|
| Length = 26.50 ft | Thick = 10.00 in | $f_c = 4000$ psi | $f_y = 60$ ksi |
| Vert Bar Pat: #5@12" oc | Horiz Bar Pat: #5@18" oc | | |
| $V_u =$ | 406.64 kip | $\phi V_n = 684.22$ kip | OK |
| Controlling Load Combo: | 1.384 D + 0.500 Lp + 1.300 E26 (LC 28) | | |
| Code Ref: | 18.10.4.1 | | |

Segment SC20H:2G:

| | | | |
|-------------------------|--|-------------------------|----------------|
| Length = 26.50 ft | Thick = 10.00 in | $f_c = 4000$ psi | $f_y = 60$ ksi |
| Vert Bar Pat: #5@12" oc | Horiz Bar Pat: #5@18" oc | | |
| $V_u =$ | 410.07 kip | $\phi V_n = 684.22$ kip | OK |
| Controlling Load Combo: | 1.384 D + 0.500 Lp + 1.300 E26 (LC 28) | | |
| Code Ref: | 18.10.4.1 | | |

Segment SC20H:2H:

| | | | |
|-------------------------|--|--------------------------|----------------|
| Length = 42.07 ft | Thick = 10.00 in | $f_c = 4000$ psi | $f_y = 60$ ksi |
| Vert Bar Pat: #5@12" oc | Horiz Bar Pat: #5@18" oc | | |
| $V_u =$ | -610.24 kip | $\phi V_n = 1086.35$ kip | OK |
| Controlling Load Combo: | 0.716 D - 1.300 E26 + 1.0E1 + 1.6O1 (LC 338) | | |
| Code Ref: | 18.10.4.1 | | |

Out-of-Plane Shear Results:

Segment SC20H:2A:

| | | | |
|-------------------------|--|-------------------------|----|
| Length = | 26.09 ft | | |
| Effective depth = | 7.56 in | | |
| $V_u =$ | -65.31 kip | $\phi V_n = 194.69$ kip | OK |
| Controlling Load Combo: | 1.384 D + 0.500 Lp + 1.300 E1 + 1.0E1 + 1.6O1 (LC 414) | | |
| Code Ref: | 22.5 | | |

Segment SC20H:2B:

| | |
|----------|----------|
| Length = | 26.50 ft |
|----------|----------|



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Out-of-Plane Shear

Results:

Effective depth = 7.56 in
Vu = -67.40 kip phiVn = 197.73 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E1 + 1.0E1 + 1.6O1 (LC 414)
Code Ref: 22.5

Segment SC20H:2C:

Length = 26.41 ft
Effective depth = 7.56 in
Vu = -65.84 kip phiVn = 197.04 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E1 + 1.0E1 + 1.6O1 (LC 414)
Code Ref: 22.5

Segment SC20H:2D:

Length = 34.93 ft
Effective depth = 7.56 in
Vu = -114.44 kip phiVn = 260.60 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E1 + 1.0E1 + 1.6O1 (LC 414)
Code Ref: 22.5

Segment SC20H:2E:

Length = 26.50 ft
Effective depth = 7.56 in
Vu = -69.49 kip phiVn = 197.73 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E1 + 1.0E1 + 1.6O1 (LC 414)
Code Ref: 22.5

Segment SC20H:2F:

Length = 26.50 ft
Effective depth = 7.56 in
Vu = -69.23 kip phiVn = 197.73 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E1 + 1.0E1 + 1.6O1 (LC 414)
Code Ref: 22.5

Segment SC20H:2G:

Length = 26.50 ft
Effective depth = 7.56 in
Vu = -69.65 kip phiVn = 197.73 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E1 + 1.0E1 + 1.6O1 (LC 414)
Code Ref: 22.5

Segment SC20H:2H:

Length = 42.07 ft
Effective depth = 7.56 in
Vu = -126.73 kip phiVn = 313.94 kip **OK**
667



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Out-of-Plane Shear

Results:

Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E1 + 1.0E1 + 1.6O1 (LC 414)
Code Ref: 22.5

Reinforcement Checks:

Segment SC20H:2A:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.515% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC20H:2B:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.515% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC20H:2C:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.515% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC20H:2D:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.515% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC20H:2E:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.515% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



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Segment SC20H:2F:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.515% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC20H:2G:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.515% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC20H:2H:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.515% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

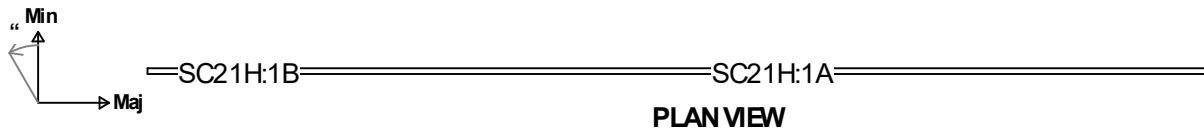


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Section Cut ID: SC21H:1 (Horizontal)
Story: First
Ag = 18520 in² Imaj = 5293485173 in⁴ Imin = 154333 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 21
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.132 **OK**
Beta = 358.6 deg CCW from Major axis
Pu = 125.29 kips phiPn = 947.79 kips
Mu = 11262.54 kip-ft phiMn = 85195.33 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E21 + 1.0E1 + 1.6O1 (LC 269)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC21H:1A:
Length = 145.38 ft Thick = 10.00 in fc = 4000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@15" oc
Vu = -3852.54 kip phiVn = 4217.38 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E31 + 1.0E1 + 1.6O1 (LC 332)
Code Ref: 18.10.4.1

Segment SC21H:1B:
Length = 8.96 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@15" oc
Vu = 159.02 kip phiVn = 206.55 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E25 + 1.0E1 + 1.6O1 (LC 337)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC21H:1A:
Length = 145.38 ft
Effective depth = 7.56 in
Vu = 589.98 kip phiVn = 1084.71 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E1 + 1.0E1 + 1.6O1 (LC 279)
Code Ref: 22.5



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Out-of-Plane Shear

Results:

Segment SC21H:1B:

Length = 8.96 ft
Effective depth = 7.56 in
 $V_u = 10.97$ kip $\phi V_n = 53.25$ kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E21 + 1.0E1 + 1.6O1 (LC 269)
Code Ref: 22.5

Reinforcement Checks:

Segment SC21H:1A:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.517% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.409% Actual: 0.511% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.511% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC21H:1B:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.517% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.409% Actual: 0.511% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.511% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

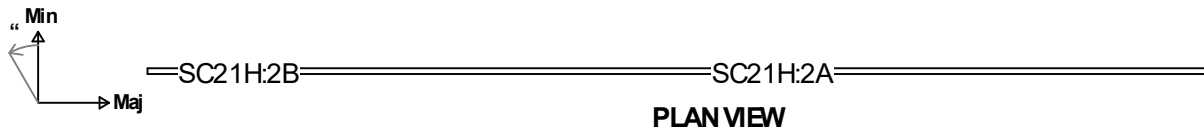


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Section Cut ID: SC21H:2 (Horizontal)
Story: First
Ag = 18520 in² Imaj = 5293485173 in⁴ Imin = 154333 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 21
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.208 **OK**
Beta = 177.2 deg CCW from Major axis
Pu = 1049.94 kips phiPn = 5042.27 kips
Mu = 12647.67 kip-ft phiMn = 60739.67 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC21H:2A:
Length = 145.38 ft Thick = 10.00 in fc = 4000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@15" oc
Vu = -3869.25 kip phiVn = 4217.38 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E32 (LC 34)
Code Ref: 18.10.4.1

Segment SC21H:2B:
Length = 8.96 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@15" oc
Vu = -185.61 kip phiVn = 216.00 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E31 + 1.0E1 + 1.6O1 (LC 343)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC21H:2A:
Length = 145.38 ft
Effective depth = 7.56 in
Vu = -525.08 kip phiVn = 1084.73 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E1 + 1.0E1 + 1.6O1 (LC 414)
Code Ref: 22.5



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Out-of-Plane Shear

Results:

Segment SC21H:2B:

Length = 8.96 ft
Effective depth = 7.56 in
Vu = -3.36 kip phiVn = 67.12 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E21 + 1.0E1 + 1.6O1 (LC 269)
Code Ref: 22.5

Reinforcement Checks:

Segment SC21H:2A:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.517% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.409% Actual: 0.511% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.511% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC21H:2B:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.517% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.409% Actual: 0.511% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.511% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

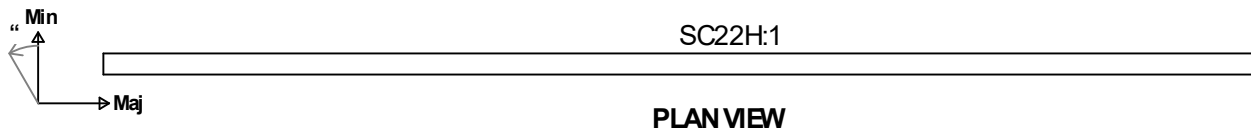


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Section Cut ID: SC22H:1 (Horizontal)
Story: First
Ag = 5460 in² Imaj = 135642780 in⁴ Imin = 45500 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 22
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.353 **OK**
Beta = 180.0 deg CCW from Major axis
Pu = 278.93 kips phiPn = 791.27 kips
Mu = 16890.49 kip-ft phiMn = 47914.68 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E36 + 1.0E1 + 1.6O1 (LC 418)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC22H:1:
Length = 45.50 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = -888.27 kip phiVn = 1227.78 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E36 + 1.0E1 + 1.6O1 (LC 356)
Code Ref: 18.10.4.1

Out-of-Plane Shear Results:

Segment SC22H:1:
Length = 45.50 ft
Effective depth = 8.31 in
Vu = -16.89 kip phiVn = 417.25 kip **OK**
Controlling Load Combo: 1.384 D + 1.300 E25 (LC 101)
Code Ref: 22.5

Reinforcement Checks:

Segment SC22H:1:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.528% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**



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Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 0.511% (18.10.2.1) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

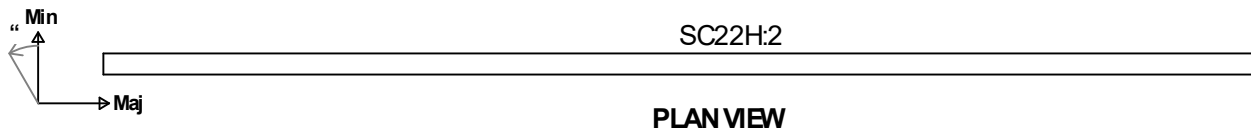


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Section Cut ID: SC22H:2 (Horizontal)
Story: First
Ag = 5460 in² Imaj = 135642780 in⁴ Imin = 45500 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 22
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.209 **OK**
Beta = 0.3 deg CCW from Major axis
Pu = 536.02 kips phiPn = 2564.26 kips
Mu = 13571.31 kip-ft phiMn = 64922.96 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E35 + 1.0E1 + 1.6O1 (LC 417)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC22H:2:
Length = 45.50 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = -907.56 kip phiVn = 1227.78 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E36 + 1.0E1 + 1.6O1 (LC 356)
Code Ref: 18.10.4.1

Out-of-Plane Shear Results:

Segment SC22H:2:
Length = 45.50 ft
Effective depth = 8.31 in
Vu = -34.21 kip phiVn = 417.24 kip **OK**
Controlling Load Combo: 1.384 D + 1.300 E25 + 1.0E1 + 1.6O1 (LC 236)
Code Ref: 22.5

Reinforcement Checks:

Segment SC22H:2:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.528% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**



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Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 0.511% (18.10.2.1) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

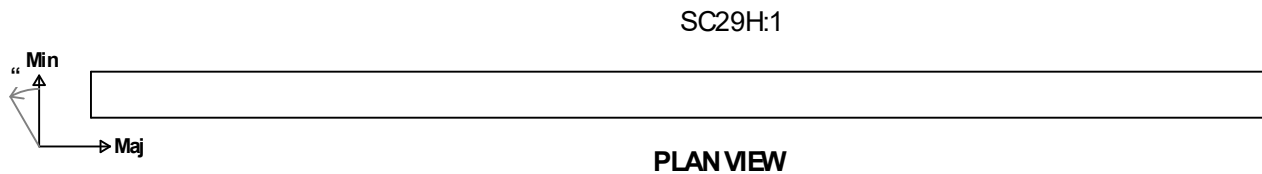


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Section Cut ID: SC29H:1 (Horizontal)
Story: First
Ag = 2562 in² Imaj = 14020536 in⁴ Imin = 21353 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 29
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.949 **OK**
Beta = 360.0 deg CCW from Major axis
Pu = -443.38 kips phiPn = -467.40 kips
Mu = 2526.32 kip-ft phiMn = 2663.17 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC29H:1:
Length = 21.35 ft Thick = 10.00 in fc = 4000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@12" oc
Vu = 257.50 kip phiVn = 519.04 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E32 + 1.0E1 + 1.6O1 (LC 344)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC29H:1:
Length = 21.35 ft
Effective depth = 7.56 in
Vu = -1.96 kip phiVn = 104.22 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E32 + 1.0E1 + 1.6O1 (LC 344)
Code Ref: 22.5

Reinforcement Checks:

Segment SC29H:1:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.527% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.511% Actual: 0.781% (18.10.4.3) **OK**



Section Cut Design Summary

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Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.511% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**

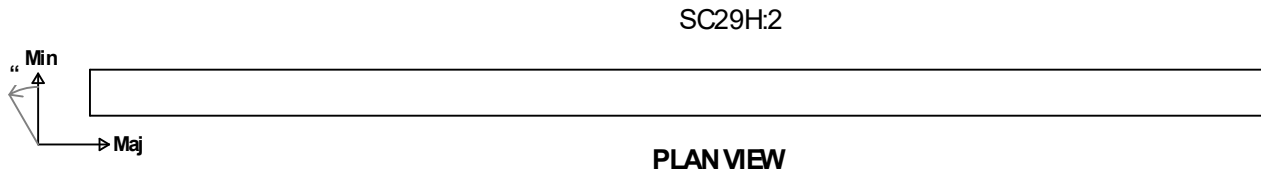


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Section Cut ID: SC29H:2 (Horizontal)
Story: First
Ag = 2562 in2 Imaj = 14020536 in4 Imin = 21353 in4
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 29
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.627 **OK**
Beta = 9.0 deg CCW from Major axis
Pu = -447.66 kips phiPn = -713.96 kips
Mu = 67.97 kip-ft phiMn = 108.41 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E32 (LC 219)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC29H:2:
Length = 21.35 ft Thick = 10.00 in fc = 4000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@12" oc
Vu = 262.91 kip phiVn = 518.44 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC29H:2:
Length = 21.35 ft
Effective depth = 7.56 in
Vu = -2.77 kip phiVn = 103.66 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)
Code Ref: 22.5

Reinforcement Checks:

Segment SC29H:2:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.527% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.511% Actual: 0.511% (18.10.4.3) **OK**



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Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 0.511% (18.10.2.1) OK
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK

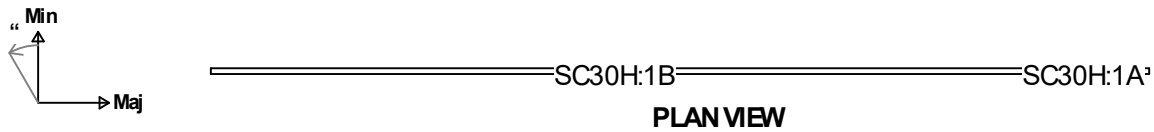


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Section Cut ID: SC30H:1 (Horizontal)
Story: First
Ag = 16302 in² Imaj = 3610473730 in⁴ Imin = 135852 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 30
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.202 **OK**
Beta = 179.6 deg CCW from Major axis
Pu = 464.11 kips phiPn = 2299.03 kips
Mu = 30268.29 kip-ft phiMn = 149937.31 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E17 + 1.0E1 + 1.6O1 (LC 274)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC30H:1A:
Length = 36.26 ft Thick = 10.00 in fc = 4000 psi fy = 60 ksi
Vert Bar Pat: #5@18" oc Horiz Bar Pat: #5@18" oc
Vu = -595.15 kip phiVn = 936.23 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E36 + 1.0E1 + 1.6O1 (LC 418)
Code Ref: 18.10.4.1

Segment SC30H:1B:
Length = 99.59 ft Thick = 10.00 in fc = 4000 psi fy = 60 ksi
Vert Bar Pat: #5@18" oc Horiz Bar Pat: #5@18" oc
Vu = 1680.71 kip phiVn = 2571.44 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E36 (LC 38)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC30H:1A:
Length = 36.26 ft
Effective depth = 7.56 in
Vu = -101.11 kip phiVn = 240.97 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E22 + 1.0E1 + 1.6O1 (LC 286)
Code Ref: 22.5



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Out-of-Plane Shear

Results:

Segment SC30H:1B:

Length = 99.59 ft

Effective depth = 7.56 in

$V_u = -385.60$ kip $\phi V_n = 743.11$ kip **OK**

Controlling Load Combo: 0.716 D + 1.300 E1 + 1.0E1 + 1.6O1 (LC 279)

Code Ref: 22.5

Reinforcement Checks:

Segment SC30H:1A:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.346% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 18.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 17.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.341% Actual: 0.341% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.341% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC30H:1B:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.346% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 18.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 17.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.341% Actual: 0.341% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.341% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

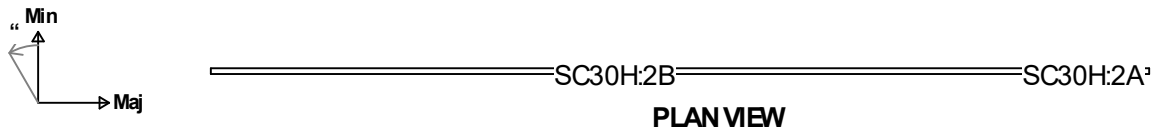


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Section Cut ID: SC30H:2 (Horizontal)
Story: First
Ag = 16302 in² Imaj = 3610473730 in⁴ Imin = 135852 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 30
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.392 **OK**
Beta = 358.8 deg CCW from Major axis
Pu = 1246.00 kips phiPn = 3176.41 kips
Mu = 31090.50 kip-ft phiMn = 79258.52 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E25 + 1.0E1 + 1.6O1 (LC 337)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC30H:2A:
Length = 36.26 ft Thick = 10.00 in fc = 4000 psi fy = 60 ksi
Vert Bar Pat: #5@18" oc Horiz Bar Pat: #5@18" oc
Vu = 574.19 kip phiVn = 736.70 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E36 (LC 186)
Code Ref: 11.5.4.4

Segment SC30H:2B:
Length = 99.59 ft Thick = 10.00 in fc = 4000 psi fy = 60 ksi
Vert Bar Pat: #5@18" oc Horiz Bar Pat: #5@18" oc
Vu = 1700.93 kip phiVn = 2571.44 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E36 (LC 38)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC30H:2A:
Length = 36.26 ft
Effective depth = 7.56 in
Vu = 116.98 kip phiVn = 270.57 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E1 + 1.0E1 + 1.6O1 (LC 414)
Code Ref: 22.5



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Out-of-Plane Shear

Results:

Segment SC30H:2B:

Length = 99.59 ft
Effective depth = 7.56 in
Vu = 380.70 kip phiVn = 743.13 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E1 + 1.0E1 + 1.6O1 (LC 414)
Code Ref: 22.5

Reinforcement Checks:

Segment SC30H:2A:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.346% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 18.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 17.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.341% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.341% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC30H:2B:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.346% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 18.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 17.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.341% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.341% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

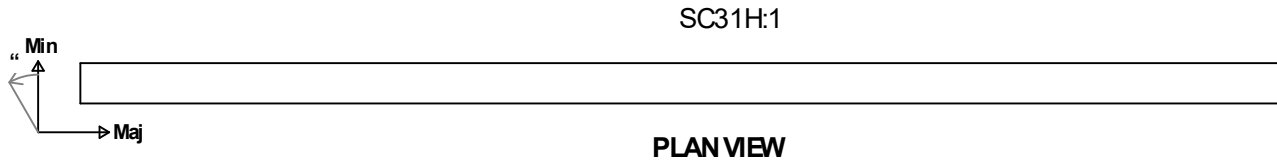


Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Design Code: ACI 318-14

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Section Cut ID: SC31H:1 (Horizontal)
Story: First
Ag = 2980 in² Imaj = 22052993 in⁴ Imin = 24833 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 31
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.068 **OK**
Beta = 360.0 deg CCW from Major axis
Pu = 263.64 kips phiPn = 3866.16 kips
Mu = 2121.99 kip-ft phiMn = 31117.93 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E32 + 1.0E1 + 1.6O1 (LC 333)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC31H:1:
Length = 24.83 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = -448.00 kip phiVn = 670.11 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E25 (LC 27)
Code Ref: 18.10.4.1

Out-of-Plane Shear Results:

Segment SC31H:1:
Length = 24.83 ft
Effective depth = 8.31 in
Vu = -2.21 kip phiVn = 227.72 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E36 + 1.0E1 + 1.6O1 (LC 356)
Code Ref: 22.5

Reinforcement Checks:

Segment SC31H:1:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.535% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.851% (18.10.4.3) **OK**



Section Cut Design Summary

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Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.511% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

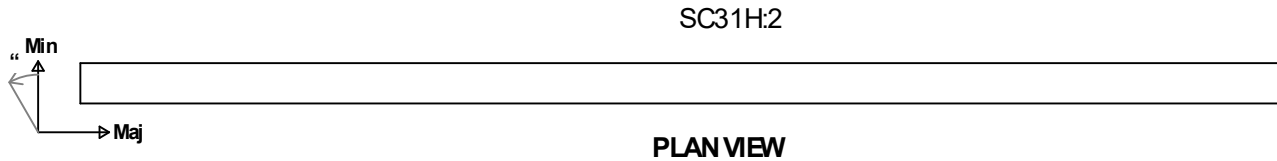


Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC31H:2 (Horizontal)
Story: First
Ag = 2980 in2 Imaj = 22052993 in4 Imin = 24833 in4
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 31
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.047 **OK**
Beta = 359.2 deg CCW from Major axis
Pu = 174.26 kips phiPn = 3681.88 kips
Mu = 1076.66 kip-ft phiMn = 22748.43 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E17 + 1.0E1 + 1.6O1 (LC 246)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC31H:2:
Length = 24.83 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = -506.54 kip phiVn = 670.11 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E22 + 1.0E1 + 1.6O1 (LC 256)
Code Ref: 18.10.4.1

Out-of-Plane Shear Results:

Segment SC31H:2:
Length = 24.83 ft
Effective depth = 8.31 in
Vu = 6.61 kip phiVn = 227.71 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E14 (LC 16)
Code Ref: 22.5

Reinforcement Checks:

Segment SC31H:2:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.535% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.831% (18.10.4.3) **OK**



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Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 0.511% (18.10.2.1) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

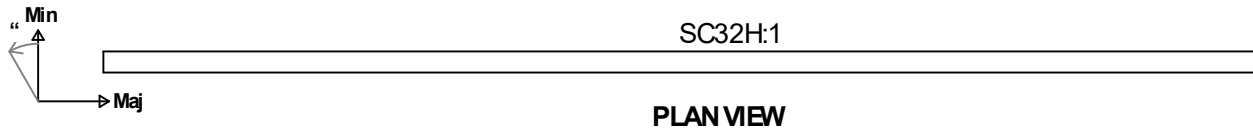


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Design Code: ACI 318-14

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Section Cut ID: SC32H:1 (Horizontal)
Story: Second
Ag = 5460 in² Imaj = 135642780 in⁴ Imin = 45500 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 32
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.410 **OK**
Beta = 182.8 deg CCW from Major axis
Pu = 290.39 kips phiPn = 707.82 kips
Mu = 5388.43 kip-ft phiMn = 13134.23 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E32 (LC 219)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC32H:1:
Length = 45.50 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = 921.95 kip phiVn = 1227.78 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E35 + 1.0E1 + 1.6O1 (LC 336)
Code Ref: 18.10.4.1

Out-of-Plane Shear Results:

Segment SC32H:1:
Length = 45.50 ft
Effective depth = 8.31 in
Vu = -38.60 kip phiVn = 417.23 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 22.5

Reinforcement Checks:

Segment SC32H:1:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.528% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**



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Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

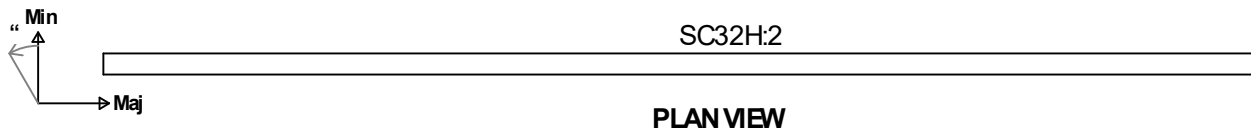


Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Design Code: ACI 318-14

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Section Cut ID: SC32H:2 (Horizontal)
Story: Second
Ag = 5460 in² Imaj = 135642780 in⁴ Imin = 45500 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 32
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.131 **OK**
Beta = 170.0 deg CCW from Major axis
Pu = 719.51 kips phiPn = 5472.23 kips
Mu = 1387.60 kip-ft phiMn = 10553.40 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC32H:2:
Length = 45.50 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = 921.96 kip phiVn = 1227.78 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E35 + 1.0E1 + 1.60I (LC 336)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC32H:2:
Length = 45.50 ft
Effective depth = 8.31 in
Vu = -38.60 kip phiVn = 417.23 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 22.5

Reinforcement Checks:

Segment SC32H:2:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.528% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.511% (18.10.4.3) **OK**



Section Cut Design Summary

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Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

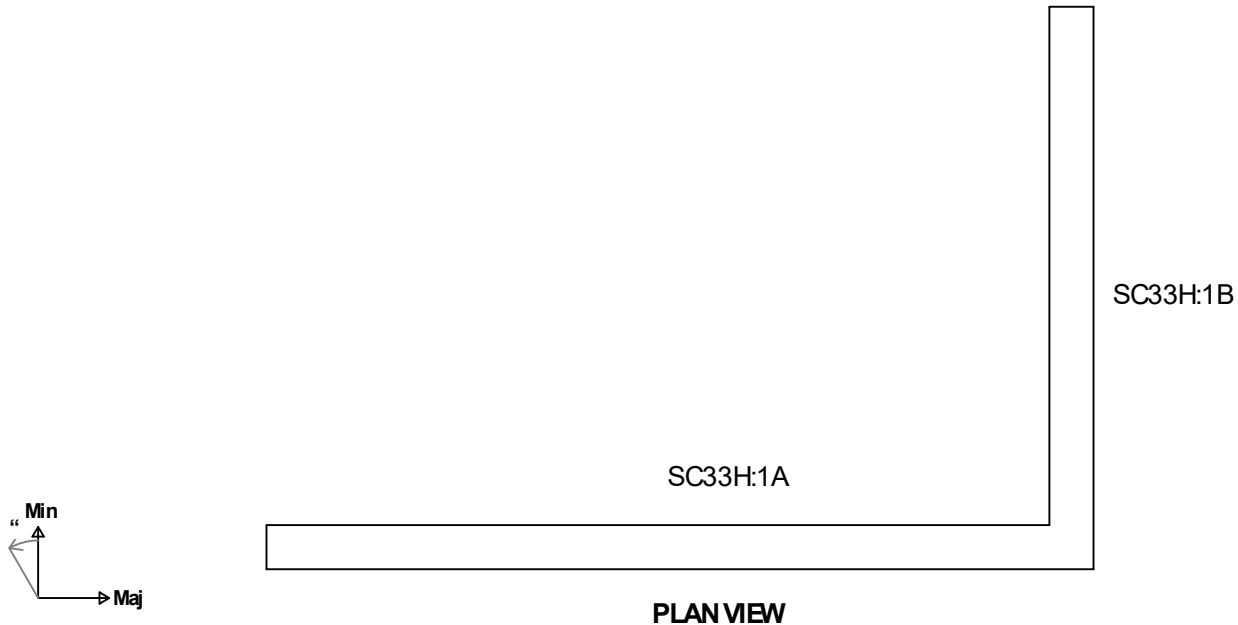


Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Design Code: ACI 318-14

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Section Cut ID: SC33H:1 (Horizontal)
Story: Second
Ag = 3042 in² Imaj = 11127882 in⁴ Imin = 4257238 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 33
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.955 **OK**
Beta = 231.6 deg CCW from Major axis
Pu = 126.35 kips phiPn = 132.25 kips
Mu = 6834.48 kip-ft phiMn = 7153.67 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E31 + 1.0E1 + 1.6O1 (LC 422)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC33H:1A:
Length = 15.18 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #7@9" oc Horiz Bar Pat: #5@12" oc
Vu = 270.36 kip phiVn = 365.00 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E31 + 1.0E1 + 1.6O1 (LC 343)
Code Ref: 11.5.4.4

Segment SC33H:1B:
Length = 10.17 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@6" oc Horiz Bar Pat: #6@9" oc
Vu = 356.55 kip phiVn = 395.75 kip **OK**



Section Cut Design Summary

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In-Plane Shear Results:

Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC33H:1A:

Length = 15.18 ft
Effective depth = 7.44 in
Vu = 17.62 kip phiVn = 69.39 kip OK
Controlling Load Combo: 0.716 D + 1.300 E32 (LC 182)
Code Ref: 22.5

Segment SC33H:1B:

Length = 10.17 ft
Effective depth = 6.88 in
Vu = -8.10 kip phiVn = 18.85 kip OK
Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)
Code Ref: 22.5

Reinforcement Checks:

Segment SC33H:1A:

Thickness : 10.00 in
Min Vert Reinf Ratio: 0.150% Actual: 1.451% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.13 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.511% Actual: 1.336% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 1.336% (18.10.2.1) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC33H:1B:

Thickness : 10.00 in
Min Vert Reinf Ratio: 0.150% Actual: 1.451% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 6.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 5.25 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.982% Actual: 1.473% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 1.336% (18.10.2.1) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

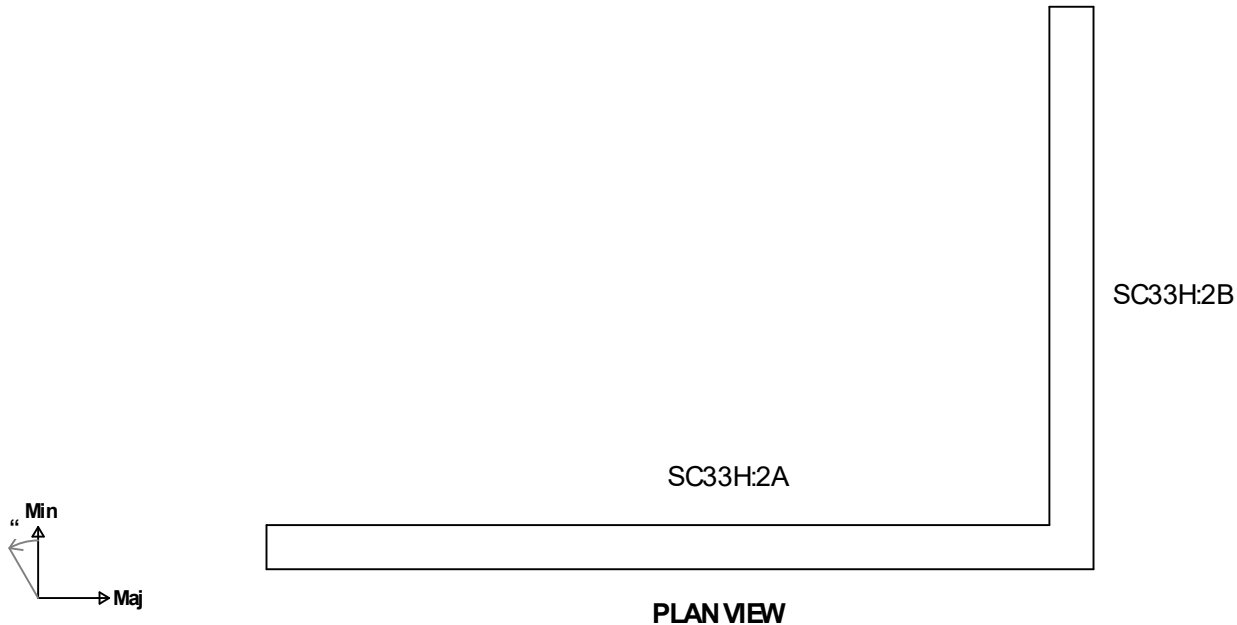


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RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC33H:2 (Horizontal)
Story: Second
Ag = 3042 in² Imaj = 11127882 in⁴ Imin = 4257238 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 33
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.045 **OK**
Beta = 317.5 deg CCW from Major axis
Pu = 263.65 kips phiPn = 5816.99 kips
Mu = 589.75 kip-ft phiMn = 13011.87 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E17 + 1.0E1 + 1.6O1 (LC 251)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC33H:2A:
Length = 15.18 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #7@9" oc Horiz Bar Pat: #5@12" oc
Vu = 280.81 kip phiVn = 435.94 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E31 + 1.0E1 + 1.6O1 (LC 343)
Code Ref: 11.5.4.4

Segment SC33H:2B:
Length = 10.17 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@6" oc Horiz Bar Pat: #6@9" oc
Vu = 367.74 kip phiVn = 467.63 kip **OK**
696



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In-Plane Shear Results:

Controlling Load Combo: 0.716 D - 1.300 E32 + 1.0E1 + 1.6O1 (LC 344)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC33H:2A:

Length = 15.18 ft
Effective depth = 7.44 in
Vu = 43.36 kip phiVn = 136.45 kip OK
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E32 (LC 34)
Code Ref: 22.5

Segment SC33H:2B:

Length = 10.17 ft
Effective depth = 6.88 in
Vu = -31.12 kip phiVn = 84.49 kip OK
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E32 + 1.0E1 + 1.6O1 (LC 333)
Code Ref: 22.5

Reinforcement Checks:

Segment SC33H:2A:

Thickness : 10.00 in
Min Vert Reinf Ratio: 0.150% Actual: 1.451% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 9.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 8.13 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.511% Actual: 1.336% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 1.336% (18.10.2.1) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC33H:2B:

Thickness : 10.00 in
Min Vert Reinf Ratio: 0.150% Actual: 1.451% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 6.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 5.25 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.982% Actual: 1.473% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 1.336% (18.10.2.1) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



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Section Cut ID: SC34H:1 (Horizontal)
Story: Second
Ag = 710 in² Imaj = 297743 in⁴ Imin = 5913 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 34
Wall Type: Cast-In-Place
Design Status: **PASS**

SC34H:1



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.980 **OK**
Beta = 358.1 deg CCW from Major axis
Pu = 41.52 kips phiPn = 42.38 kips
Mu = 732.68 kip-ft phiMn = 747.91 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC34H:1:
Length = 5.91 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@12" oc
Vu = 56.95 kip phiVn = 212.96 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC34H:1:
Length = 5.91 ft
Effective depth = 7.56 in
Vu = -9.00 kip phiVn = 54.04 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 22.5

Reinforcement Checks:

Segment SC34H:1:
Thickness : 10.00 in



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Min Vert Reinf Ratio: 0.120% Actual: 0.605% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.511% Actual: 0.511% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 0.511% (18.10.2.1) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



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Section Cut ID: SC34H:2 (Horizontal)
Story: Second
Ag = 700 in² Imaj = 285344 in⁴ Imin = 5830 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 34
Wall Type: Cast-In-Place
Design Status: **PASS**

SC34H:2



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.821 **OK**
Beta = 357.6 deg CCW from Major axis
Pu = 42.28 kips phiPn = 51.50 kips
Mu = 482.60 kip-ft phiMn = 587.76 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC34H:2:
Length = 5.83 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@18" oc Horiz Bar Pat: #5@12" oc
Vu = 36.88 kip phiVn = 209.96 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC34H:2:
Length = 5.83 ft
Effective depth = 7.56 in
Vu = -6.57 kip phiVn = 53.28 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 22.5

Reinforcement Checks:

Segment SC34H:2:
Thickness : 10.00 in



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Vert Reinf Ratio: 0.120% Actual: 0.439% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 18.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 17.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.511% Actual: 0.341% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Design Code: ACI 318-14

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Section Cut ID: SC34H:3 (Horizontal)
Story: Second
Ag = 1560 in² Imaj = 3163680 in⁴ Imin = 13000 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 34
Wall Type: Cast-In-Place
Design Status: **PASS**

SC34H:3



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.896 **OK**
Beta = 359.3 deg CCW from Major axis
Pu = 108.08 kips phiPn = 120.64 kips
Mu = 4122.56 kip-ft phiMn = 4601.63 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC34H:3:
Length = 13.00 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@12" oc Horiz Bar Pat: #5@12" oc
Vu = 317.90 kip phiVn = 468.18 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC34H:3:
Length = 13.00 ft
Effective depth = 7.50 in
Vu = -16.31 kip phiVn = 117.83 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 22.5

Reinforcement Checks:

Segment SC34H:3:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.150% Actual: 0.793% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: ~~10~~20 in (11.7.2.1) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Vert Bar Spacing Limit: 1.00 in Actual: 11.25 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.511% Actual: 0.736% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.736% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



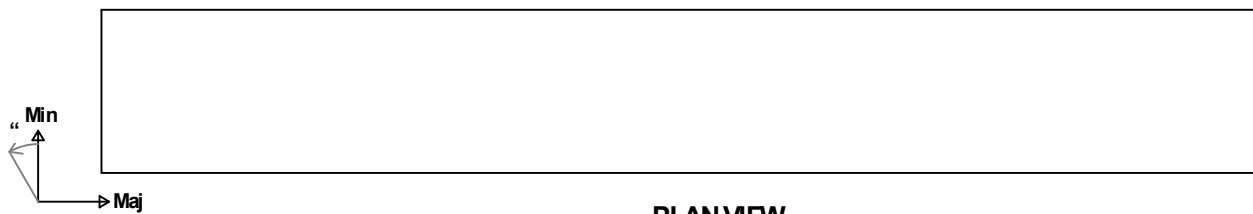
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
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Section Cut ID: SC34H:4 (Horizontal)
Story: Second
Ag = 710 in² Imaj = 297743 in⁴ Imin = 5913 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 34
Wall Type: Cast-In-Place
Design Status: **PASS**

SC34H:4



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.603 **OK**
Beta = 134.7 deg CCW from Major axis
Pu = 89.43 kips phiPn = 148.32 kips
Mu = 104.70 kip-ft phiMn = 173.65 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC34H:4:
Length = 5.91 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@12" oc
Vu = 56.95 kip phiVn = 212.96 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear Results:

Segment SC34H:4:
Length = 5.91 ft
Effective depth = 7.56 in
Vu = -9.00 kip phiVn = 54.04 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 22.5

Reinforcement Checks:

Segment SC34H:4:
Thickness : 10.00 in



Section Cut Design Summary

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Min Vert Reinf Ratio: 0.120% Actual: 0.605% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.511% Actual: 0.511% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.511% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC34H:5 (Horizontal)
Story: Second
Ag = 700 in² Imaj = 285344 in⁴ Imin = 5830 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 34
Wall Type: Cast-In-Place
Design Status: **PASS**

SC34H:5



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.342 **OK**
Beta = 137.6 deg CCW from Major axis
Pu = 89.38 kips phiPn = 261.01 kips
Mu = 70.56 kip-ft phiMn = 206.05 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E31 + 1.0E1 + 1.6O1 (LC 332)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC34H:5:
Length = 5.83 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@18" oc Horiz Bar Pat: #5@12" oc
Vu = 36.88 kip phiVn = 209.96 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC34H:5:
Length = 5.83 ft
Effective depth = 7.56 in
Vu = -6.57 kip phiVn = 53.28 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 22.5

Reinforcement Checks:

Segment SC34H:5:
Thickness : 10.00 in



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Vert Reinf Ratio: 0.120% Actual: 0.439% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 18.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 17.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.511% Actual: 0.341% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
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Section Cut ID: SC34H:6 (Horizontal)
Story: Second
Ag = 1560 in² Imaj = 3163680 in⁴ Imin = 13000 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 34
Wall Type: Cast-In-Place
Design Status: **PASS**

SC34H:6



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.279 **OK**
Beta = 166.2 deg CCW from Major axis
Pu = 258.20 kips phiPn = 925.12 kips
Mu = 511.25 kip-ft phiMn = 1831.75 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC34H:6:
Length = 13.00 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@12" oc Horiz Bar Pat: #5@12" oc
Vu = 317.90 kip phiVn = 468.18 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC34H:6:
Length = 13.00 ft
Effective depth = 7.50 in
Vu = -16.31 kip phiVn = 117.83 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 22.5

Reinforcement Checks:

Segment SC34H:6:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.150% Actual: 0.793% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: ~~18.00~~ in (11.7.2.1) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Vert Bar Spacing Limit: 1.00 in Actual: 11.25 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.511% Actual: 0.736% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 0.736% (18.10.2.1) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC35H:1 (Horizontal)
Story: First
Ag = 867 in² Imaj = 542860 in⁴ Imin = 7224 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 35
Wall Type: Cast-In-Place
Design Status: **PASS**

SC35H:1



Axial/Flexural Results:

Interaction: 0.059 **OK**
Beta = 163.5 deg CCW from Major axis
Pu = 120.87 kips phiPn = 2058.10 kips
Mu = 4.11 kip-ft phiMn = 69.93 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC35H:1:
Length = 7.22 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@12" oc
Vu = -46.94 kip phiVn = 252.56 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E25 + 1.0E1 + 1.6O1 (LC 259)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC35H:1:
Length = 7.22 ft
Effective depth = 7.56 in
Vu = -3.01 kip phiVn = 60.27 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E35 + 1.0E1 + 1.6O1 (LC 336)
Code Ref: 22.5



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Reinforcement Checks:

Segment SC35H:1:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.566% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.511% Actual: 0.511% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC35H:2 (Horizontal)
Story: First
Ag = 867 in² Imaj = 542860 in⁴ Imin = 7224 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 35
Wall Type: Cast-In-Place
Design Status: **PASS**

SC35H:2



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.344 **OK**
Beta = 1.1 deg CCW from Major axis
Pu = 56.29 kips phiPn = 163.58 kips
Mu = 471.03 kip-ft phiMn = 1368.80 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC35H:2:
Length = 7.22 ft Thick = 10.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@12" oc
Vu = -46.94 kip phiVn = 252.56 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E25 + 1.0E1 + 1.6O1 (LC 259)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC35H:2:
Length = 7.22 ft
Effective depth = 7.56 in
Vu = -3.01 kip phiVn = 60.27 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E35 + 1.0E1 + 1.6O1 (LC 336)
Code Ref: 22.5



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Reinforcement Checks:

Segment SC35H:2:

Thickness : 10.00 in

Min Vert Reinf Ratio: 0.120% Actual: 0.566% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.511% Actual: 0.511% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**



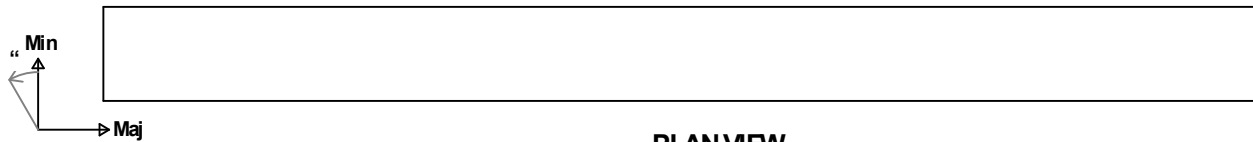
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
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Section Cut ID: SC36H:3 (Horizontal)
Story: First
Ag = 790 in² Imaj = 642389 in⁴ Imin = 4214 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 36
Wall Type: Cast-In-Place
Design Status: **PASS**

SC36H:3



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.033 **OK**
Beta = 180.3 deg CCW from Major axis
Pu = 40.54 kips phiPn = 1245.80 kips
Mu = 81.56 kip-ft phiMn = 2506.22 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E36 + 1.0E1 + 1.6O1 (LC 356)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC36H:3:
Length = 8.23 ft Thick = 8.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = 11.44 kip phiVn = 203.95 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E36 (LC 38)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC36H:3:
Length = 8.23 ft
Effective depth = 5.56 in
Vu = 0.97 kip phiVn = 50.51 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 22.5

Reinforcement Checks:

Segment SC36H:3:
Thickness : 8.00 in



Section Cut Design Summary

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Min Vert Reinf Ratio: 0.120% Actual: 0.699% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.426% Actual: 0.639% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC36H:4 (Horizontal)
Story: First
Ag = 790 in² Imaj = 642389 in⁴ Imin = 4214 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 36
Wall Type: Cast-In-Place
Design Status: **PASS**

SC36H:4



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.236 **OK**
Beta = 238.0 deg CCW from Major axis
Pu = 38.23 kips phiPn = 161.71 kips
Mu = 31.95 kip-ft phiMn = 135.12 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC36H:4
Length = 8.23 ft Thick = 8.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #5@18" oc
Vu = 9.62 kip phiVn = 203.95 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E36 (LC 38)
Code Ref: 18.10.4.1

Out-of-Plane Shear Results:

Segment SC36H:4
Length = 8.23 ft
Effective depth = 5.56 in
Vu = 6.96 kip phiVn = 50.51 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 22.5

Reinforcement Checks:

Segment SC36H:4
Thickness : 8.00 in



Section Cut Design Summary

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Min Vert Reinf Ratio: 0.120% Actual: 0.699% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.426% Actual: 0.639% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK

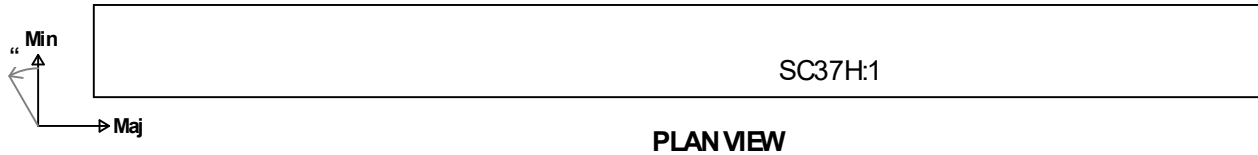


Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC37H:1 (Horizontal) (Hinge)
Story: Second
Ag = 2520 in2 Imaj = 6804000 in4 Imin = 41160 in4
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 37
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.338 **OK**
Beta = 179.9 deg CCW from Major axis
Pu = 22.93 kips phiPn = 67.81 kips
Mu = 1430.95 kip-ft phiMn = 4231.99 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E36 + 1.0E1 + 1.6O1 (LC 418)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC37H:1:
Length = 15.00 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #4@12" oc
Vu = 96.05 kip phiVn = 483.49 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E36 (LC 38)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC37H:1:
Length = 15.00 ft
Effective depth = 11.69 in
Vu = -0.51 kip phiVn = 211.84 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E1 (LC 3)
Code Ref: 22.5

Reinforcement Checks:

S.B.E. Check: **User-defined boundaries satisfy SBE requirements for all load combos**
Worst case is load combo 3 :
cmax = 3.33 ft c = 0.87 ft (18.10.6.2) **OK**

Segment SC37H:1:
Thickness : 14.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.390% (11.6.1) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.234% Actual: 0.365% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK

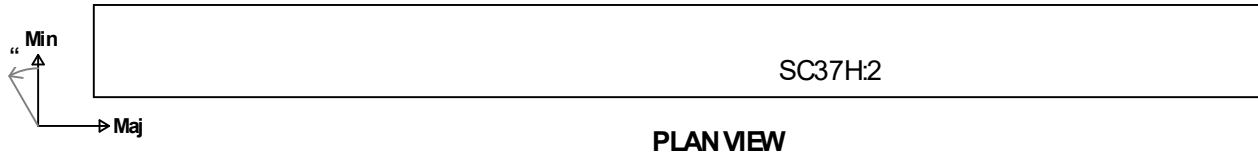


Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC37H:2 (Horizontal)
Story: Second
Ag = 2520 in² Imaj = 6804000 in⁴ Imin = 41160 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 37
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.019 **OK**
Beta = 176.0 deg CCW from Major axis
Pu = 31.13 kips phiPn = 1639.03 kips
Mu = 176.74 kip-ft phiMn = 9304.49 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC37H:2:
Length = 15.00 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #4@12" oc
Vu = 96.05 kip phiVn = 483.49 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E36 (LC 38)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC37H:2:
Length = 15.00 ft
Effective depth = 11.69 in
Vu = -0.51 kip phiVn = 211.84 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E1 (LC 3)
Code Ref: 22.5

Reinforcement Checks:

Segment SC37H:2:
Thickness : 14.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.390% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.234% Actual: 0.365% (18.10.4.3) **OK**



Section Cut Design Summary

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Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**

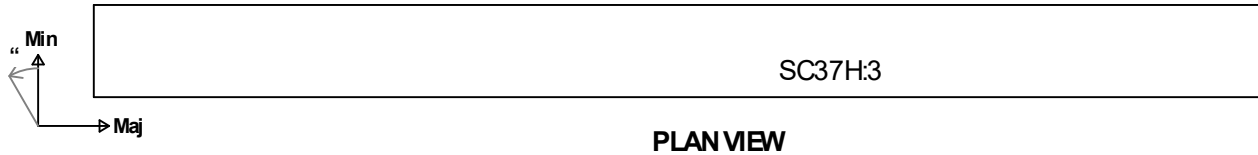


Section Cut Design Summary

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Section Cut ID: SC37H:3 (Horizontal)
Story: First
Ag = 2520 in² Imaj = 6804000 in⁴ Imin = 41160 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 37
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.567 **OK**
Beta = 180.0 deg CCW from Major axis
Pu = 42.66 kips phiPn = 75.29 kips
Mu = 2420.69 kip-ft phiMn = 4272.22 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E36 + 1.0E1 + 1.6O1 (LC 418)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC37H:3:
Length = 15.00 ft Thick = 14.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #4@12" oc
Vu = 96.05 kip phiVn = 461.38 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E36 (LC 38)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC37H:3:
Length = 15.00 ft
Effective depth = 11.69 in
Vu = -0.51 kip phiVn = 193.39 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E1 (LC 3)
Code Ref: 22.5

Reinforcement Checks:

Segment SC37H:3:
Thickness : 14.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.390% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.234% Actual: 0.365% (18.10.4.3) **OK**



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RAM Concrete Wall 23.00.00.92
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Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**

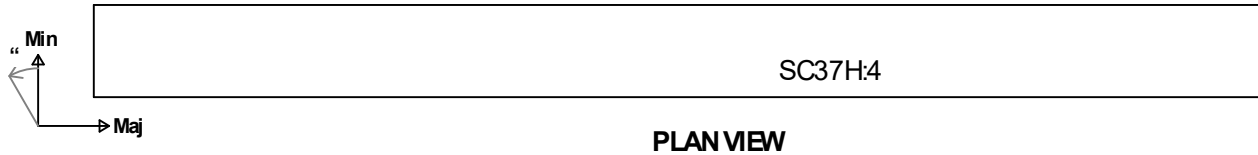


Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
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Section Cut ID: SC37H:4 (Horizontal)
Story: First
Ag = 2520 in² Imaj = 6804000 in⁴ Imin = 41160 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 37
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.329 **OK**
Beta = 179.9 deg CCW from Major axis
Pu = 42.66 kips phiPn = 129.75 kips
Mu = 1525.21 kip-ft phiMn = 4638.49 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E36 + 1.0E1 + 1.6O1 (LC 418)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC37H:4:
Length = 15.00 ft Thick = 14.00 in fc = 5000 psi fy = 60 ksi
Vert Bar Pat: #5@12" oc Horiz Bar Pat: #4@12" oc
Vu = 96.05 kip phiVn = 461.38 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E36 (LC 38)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC37H:4:
Length = 15.00 ft
Effective depth = 11.69 in
Vu = -0.51 kip phiVn = 193.39 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E1 (LC 3)
Code Ref: 22.5

Reinforcement Checks:

Segment SC37H:4:
Thickness : 14.00 in
Min Vert Reinf Ratio: 0.120% Actual: 0.390% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.38 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.234% Actual: 0.365% (18.10.4.3) **OK**



Section Cut Design Summary

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Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC38H:1 (Horizontal)
Story: Second
Ag = 1720 in2 Imaj = 4237415 in4 Imin = 14330 in4
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 38
Wall Type: Cast-In-Place
Design Status: **PASS**

SC38H:1



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.468 **OK**
Beta = 8.2 deg CCW from Major axis
Pu = 119.13 kips phiPn = 254.64 kips
Mu = 1004.85 kip-ft phiMn = 2147.94 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E32 (LC 34)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC38H:1:
Length = 14.33 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@12" oc Horiz Bar Pat: #5@18" oc
Vu = -150.21 kip phiVn = 401.77 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC38H:1:
Length = 14.33 ft
Effective depth = 7.50 in
Vu = 21.76 kip phiVn = 129.87 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E25 (LC 27)
Code Ref: 22.5

Reinforcement Checks:

Segment SC38H:1:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.150% Actual: 0.771% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Vert Bar Spacing Limit: 1.00 in Actual: 11.25 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.736% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK



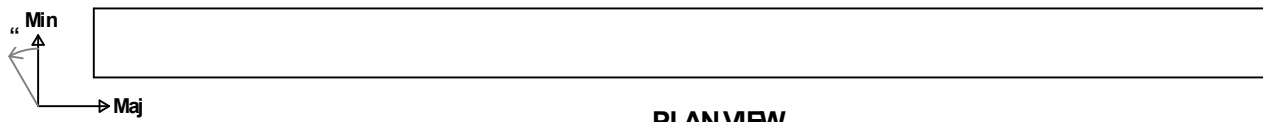
Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
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Section Cut ID: SC38H:2 (Horizontal)
Story: Second
Ag = 1700 in2 Imaj = 4097057 in4 Imin = 14170 in4
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 38
Wall Type: Cast-In-Place
Design Status: **PASS**

SC38H:2



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.494 **OK**
Beta = 9.7 deg CCW from Major axis
Pu = 150.38 kips phiPn = 304.53 kips
Mu = 951.17 kip-ft phiMn = 1926.22 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E32 (LC 34)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC38H:2:
Length = 14.17 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@12" oc Horiz Bar Pat: #5@18" oc
Vu = -143.09 kip phiVn = 397.29 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 18.10.4.1

Out-of-Plane Shear Results:

Segment SC38H:2:
Length = 14.17 ft
Effective depth = 7.50 in
Vu = 26.32 kip phiVn = 128.43 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E25 (LC 27)
Code Ref: 22.5

Reinforcement Checks:

Segment SC38H:2:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.150% Actual: 0.779% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Design Code: ACI 318-14

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Min Vert Bar Spacing Limit: 1.00 in Actual: 11.25 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.736% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC38H:3 (Horizontal)
Story: Second
Ag = 1700 in2 Imaj = 4097057 in4 Imin = 14170 in4
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 38
Wall Type: Cast-In-Place
Design Status: **PASS**

SC38H:3



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.605 **OK**
Beta = 11.5 deg CCW from Major axis
Pu = 144.83 kips phiPn = 239.42 kips
Mu = 973.18 kip-ft phiMn = 1608.80 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E32 (LC 34)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC38H:3:
Length = 14.17 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@12" oc Horiz Bar Pat: #5@18" oc
Vu = -147.93 kip phiVn = 397.29 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC38H:3:
Length = 14.17 ft
Effective depth = 7.50 in
Vu = 30.39 kip phiVn = 128.43 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E25 (LC 27)
Code Ref: 22.5

Reinforcement Checks:

Segment SC38H:3:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.150% Actual: 0.779% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
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Min Vert Bar Spacing Limit: 1.00 in Actual: 11.25 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.736% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC38H:4 (Horizontal)
Story: Second
Ag = 1700 in2 Imaj = 4097057 in4 Imin = 14170 in4
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 38
Wall Type: Cast-In-Place
Design Status: **PASS**

SC38H:4



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.621 **OK**
Beta = 11.7 deg CCW from Major axis
Pu = 139.42 kips phiPn = 224.45 kips
Mu = 970.96 kip-ft phiMn = 1563.12 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E32 (LC 34)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC38H:4:
Length = 14.17 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@12" oc Horiz Bar Pat: #5@18" oc
Vu = -149.40 kip phiVn = 397.29 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC38H:4:
Length = 14.17 ft
Effective depth = 7.50 in
Vu = 30.26 kip phiVn = 128.42 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E25 (LC 27)
Code Ref: 22.5

Reinforcement Checks:

Segment SC38H:4:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.150% Actual: 0.779% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Vert Bar Spacing Limit: 1.00 in Actual: 11.25 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.736% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC38H:5 (Horizontal)
Story: Second
Ag = 1740 in² Imaj = 4390020 in⁴ Imin = 14500 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 38
Wall Type: Cast-In-Place
Design Status: **PASS**

SC38H:5



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.541 **OK**
Beta = 11.1 deg CCW from Major axis
Pu = 180.88 kips phiPn = 334.33 kips
Mu = 995.10 kip-ft phiMn = 1839.27 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E32 (LC 34)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC38H:5:
Length = 14.50 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@12" oc Horiz Bar Pat: #5@18" oc
Vu = 179.07 kip phiVn = 406.54 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E35 + 1.0E1 + 1.6O1 (LC 336)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC38H:5:
Length = 14.50 ft
Effective depth = 7.50 in
Vu = 28.51 kip phiVn = 131.42 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E25 (LC 27)
Code Ref: 22.5

Reinforcement Checks:

Segment SC38H:5:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.150% Actual: 0.812% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Vert Bar Spacing Limit: 1.00 in Actual: 11.25 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.736% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
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Section Cut ID: SC38H:6 (Horizontal)
Story: Second
Ag = 1720 in2 Imaj = 4237415 in4 Imin = 14330 in4
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 38
Wall Type: Cast-In-Place
Design Status: **PASS**

SC38H:6



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.599 **OK**
Beta = 267.2 deg CCW from Major axis
Pu = 128.12 kips phiPn = 213.73 kips
Mu = 187.35 kip-ft phiMn = 312.54 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC38H:6:
Length = 14.33 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@12" oc Horiz Bar Pat: #5@18" oc
Vu = -150.21 kip phiVn = 401.77 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC38H:6:
Length = 14.33 ft
Effective depth = 7.50 in
Vu = 21.76 kip phiVn = 129.87 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E25 (LC 27)
Code Ref: 22.5

Reinforcement Checks:

Segment SC38H:6:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.150% Actual: 0.771% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Min Vert Bar Spacing Limit: 1.00 in Actual: 11.25 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.736% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
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Section Cut ID: SC38H:7 (Horizontal)
Story: Second
Ag = 1700 in2 Imaj = 4097057 in4 Imin = 14170 in4
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 38
Wall Type: Cast-In-Place
Design Status: **PASS**

SC38H:7



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.735 **OK**
Beta = 266.9 deg CCW from Major axis
Pu = 154.68 kips phiPn = 210.43 kips
Mu = 228.54 kip-ft phiMn = 310.92 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC38H:7:
Length = 14.17 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@12" oc Horiz Bar Pat: #5@18" oc
Vu = -143.09 kip phiVn = 397.29 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 18.10.4.1

Out-of-Plane Shear Results:

Segment SC38H:7:
Length = 14.17 ft
Effective depth = 7.50 in
Vu = 26.32 kip phiVn = 128.43 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E25 (LC 27)
Code Ref: 22.5

Reinforcement Checks:

Segment SC38H:7:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.150% Actual: 0.779% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
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Min Vert Bar Spacing Limit: 1.00 in Actual: 11.25 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.736% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC38H:8 (Horizontal)
Story: Second
Ag = 1700 in2 Imaj = 4097057 in4 Imin = 14170 in4
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 38
Wall Type: Cast-In-Place
Design Status: **PASS**

SC38H:8



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.888 **OK**
Beta = 272.2 deg CCW from Major axis
Pu = 155.12 kips phiPn = 174.68 kips
Mu = 266.10 kip-ft phiMn = 299.65 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC38H:8:
Length = 14.17 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@12" oc Horiz Bar Pat: #5@18" oc
Vu = -147.93 kip phiVn = 397.29 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 18.10.4.1

Out-of-Plane Shear Results:

Segment SC38H:8:
Length = 14.17 ft
Effective depth = 7.50 in
Vu = 30.39 kip phiVn = 128.43 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E25 (LC 27)
Code Ref: 22.5

Reinforcement Checks:

Segment SC38H:8:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.150% Actual: 0.779% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
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Min Vert Bar Spacing Limit: 1.00 in Actual: 11.25 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.736% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

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Section Cut ID: SC38H:9 (Horizontal)
Story: Second
Ag = 1700 in2 Imaj = 4097057 in4 Imin = 14170 in4
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 38
Wall Type: Cast-In-Place
Design Status: **PASS**

SC38H:9



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.908 **OK**
Beta = 284.5 deg CCW from Major axis
Pu = 154.15 kips phiPn = 169.83 kips
Mu = 277.93 kip-ft phiMn = 306.20 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC38H:9:
Length = 14.17 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@12" oc Horiz Bar Pat: #5@18" oc
Vu = -149.40 kip phiVn = 397.29 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC38H:9:
Length = 14.17 ft
Effective depth = 7.50 in
Vu = 30.26 kip phiVn = 128.42 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E25 (LC 27)
Code Ref: 22.5

Reinforcement Checks:

Segment SC38H:9:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.150% Actual: 0.779% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 14.2 in (11.7.2.1) **OK**



Section Cut Design Summary

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Min Vert Bar Spacing Limit: 1.00 in Actual: 11.25 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.736% (18.10.4.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC38H:10 (Horizontal)
Story: Second
Ag = 1740 in² Imaj = 4390020 in⁴ Imin = 14500 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 38
Wall Type: Cast-In-Place
Design Status: **PASS**

SC38H:10



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.762 **OK**
Beta = 203.6 deg CCW from Major axis
Pu = 203.19 kips phiPn = 266.80 kips
Mu = 613.31 kip-ft phiMn = 805.31 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC38H:10:
Length = 14.50 ft Thick = 10.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@12" oc Horiz Bar Pat: #5@18" oc
Vu = 179.07 kip phiVn = 406.54 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E35 + 1.0E1 + 1.6O1 (LC 336)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC38H:10:
Length = 14.50 ft
Effective depth = 7.50 in
Vu = 28.51 kip phiVn = 131.42 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E25 (LC 27)
Code Ref: 22.5

Reinforcement Checks:

Segment SC38H:10:
Thickness : 10.00 in
Min Vert Reinf Ratio: 0.150% Actual: 0.812% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**



Section Cut Design Summary

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Min Vert Bar Spacing Limit: 1.00 in Actual: 11.25 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.341% Actual: 0.736% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC39H:1 (Horizontal) (Hinge)
Story: Second
Ag = 2080 in² Imaj = 5211460 in⁴ Imin = 24966 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 39
Wall Type: Cast-In-Place
Design Status: **PASS**

SC39H:1



Axial/Flexural Results:

Interaction: 0.740 **OK**
Beta = 0.5 deg CCW from Major axis
Pu = 86.16 kips phiPn = 116.44 kips
Mu = 8365.20 kip-ft phiMn = 11305.16 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC39H:1:
Length = 14.45 ft Thick = 12.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = -604.35 kip phiVn = 873.32 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E7 + 1.0E1 + 1.6O1 (LC 351)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC39H:1:
Length = 14.45 ft
Effective depth = 8.75 in
Vu = 43.55 kip phiVn = 152.77 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 22.5

Reinforcement Checks:

S.B.E. Check: **User-defined boundaries satisfy SBE requirements for all load combos**
Worst case is load combo 3 :
cmax = 3.21 ft $\frac{c}{d} = 0.20$ ft (18.10.6.2) **OK**



Section Cut Design Summary

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Segment SC39H:1:

Thickness : 12.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.510% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.00 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 0.818% Actual: 1.091% (18.10.4.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK

Min web reinforcement ratio: 0.250% Actual: 1.091% (18.10.2.1) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC39H:2 (Horizontal) (Hinge)
Story: Second
Ag = 608 in² Imaj = 130202 in⁴ Imin = 7299 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 39
Wall Type: Cast-In-Place
Design Status: **PASS**

SC39H:2



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.426 **OK**
Beta = 2.9 deg CCW from Major axis
Pu = 24.74 kips phiPn = 58.12 kips
Mu = 369.21 kip-ft phiMn = 867.48 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC39H:2:
Length = 4.22 ft Thick = 12.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = 27.56 kip phiVn = 306.23 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E7 (LC 9)
Code Ref: 18.10.4.5

Out-of-Plane Shear

Results:

Segment SC39H:2:
Length = 4.22 ft
Effective depth = 9.50 in
Vu = 10.67 kip phiVn = 48.49 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 22.5



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Reinforcement Checks:

S.B.E. Check: **User-defined boundaries satisfy SBE requirements for all load combos**

Worst case is load combo 3 :

$c_{max} = 0.94$ ft $c = 0.18$ ft (18.10.6.2) **OK**

Segment SC39H:2:

Thickness : 12.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.307% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 16.89 in Actual: 6.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 5.25 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 1.704% Actual: 1.227% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Section Cut ID: SC40H:1 (Horizontal) (Hinge)
Story: First
Ag = 2100 in² Imaj = 3937500 in⁴ Imin = 34300 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 40
Wall Type: Cast-In-Place
Design Status: **PASS**

SC40H:1



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.123 **OK**
Beta = 180.0 deg CCW from Major axis
Pu = 652.92 kips phiPn = 5288.47 kips
Mu = 1445.14 kip-ft phiMn = 11705.14 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E17 + 1.0E1 + 1.6O1 (LC 246)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC40H:1:
Length = 12.50 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = 270.04 kip phiVn = 785.79 kip **OK**
Controlling Load Combo: 1.384 D + 1.300 E8 (LC 84)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC40H:1:
Length = 12.50 ft
Effective depth = 11.94 in
Vu = 6.03 kip phiVn = 180.32 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E29 (LC 31)
Code Ref: 22.5

Reinforcement Checks:

S.B.E. Check: **User-defined boundaries satisfy SBE requirements for all load combos**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Worst case is load combo 3 :

$c_{max} = 2.78$ ft $c = 2.20$ ft (18.10.6.2) **OK**

Segment SC40H:1:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.410% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.716% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
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Section Cut ID: SC40H:2 (Horizontal) (Hinge)
Story: First
Ag = 2100 in² Imaj = 3937500 in⁴ Imin = 34300 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 40
Wall Type: Cast-In-Place
Design Status: **PASS**

SC40H:2



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.294 **OK**
Beta = 179.8 deg CCW from Major axis
Pu = 301.01 kips phiPn = 1024.33 kips
Mu = 3957.98 kip-ft phiMn = 13468.88 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E8 + 1.0E1 + 1.6O1 (LC 225)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC40H:2:
Length = 12.50 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = 270.04 kip phiVn = 785.79 kip **OK**
Controlling Load Combo: 1.384 D + 1.300 E8 (LC 84)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC40H:2:
Length = 12.50 ft
Effective depth = 11.94 in
Vu = 6.03 kip phiVn = 180.32 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E29 (LC 31)
Code Ref: 22.5

Reinforcement Checks:

S.B.E. Check: **User-defined boundaries satisfy SBE requirements for all load combos**



Section Cut Design Summary

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Worst case is load combo 3 :

$c_{max} = 2.78$ ft $c = 1.73$ ft (18.10.6.2) **OK**

Segment SC40H:2:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.410% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.716% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

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Section Cut ID: SC40H:3 (Horizontal) (Hinge)
Story: Second
Ag = 2100 in² Imaj = 3937500 in⁴ Imin = 34300 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 40
Wall Type: Cast-In-Place
Design Status: **PASS**

SC40H:3



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.350 **OK**
Beta = 0.5 deg CCW from Major axis
Pu = 200.16 kips phiPn = 571.60 kips
Mu = 4027.15 kip-ft phiMn = 11500.17 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E14 (LC 164)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC40H:3:
Length = 12.50 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = 348.09 kip phiVn = 785.79 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E7 (LC 9)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC40H:3:
Length = 12.50 ft
Effective depth = 11.94 in
Vu = 14.63 kip phiVn = 180.31 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E29 + 1.0E1 + 1.6O1 (LC 263)
Code Ref: 22.5

Reinforcement Checks:

S.B.E. Check: **User-defined boundaries satisfy SBE requirements for all load combos**



Section Cut Design Summary

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Worst case is load combo 3 :

$c_{max} = 2.78$ ft $c = 0.59$ ft (18.10.6.2) **OK**

Segment SC40H:3:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.410% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.716% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

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Section Cut ID: SC40H:4 (Horizontal) (Hinge)
Story: Second
Ag = 2100 in² Imaj = 3937500 in⁴ Imin = 34300 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 40
Wall Type: Cast-In-Place
Design Status: **PASS**

SC40H:4



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.123 **OK**
Beta = 186.2 deg CCW from Major axis
Pu = 497.03 kips phiPn = 4053.24 kips
Mu = 914.37 kip-ft phiMn = 7456.61 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC40H:4
Length = 12.50 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: Horiz Bar Pat:
Vu = 348.09 kip phiVn = 785.79 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E7 (LC 9)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC40H:4
Length = 12.50 ft
Effective depth = 11.94 in
Vu = 14.63 kip phiVn = 180.31 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E29 + 1.0E1 + 1.6O1 (LC 263)
Code Ref: 22.5

Reinforcement Checks:

S.B.E. Check: **User-defined boundaries satisfy SBE requirements for all load combos**



Section Cut Design Summary

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Worst case is load combo 3 :

$c_{max} = 2.78$ ft $c = 0.72$ ft (18.10.6.2) **OK**

Segment SC40H:4:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.410% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.716% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



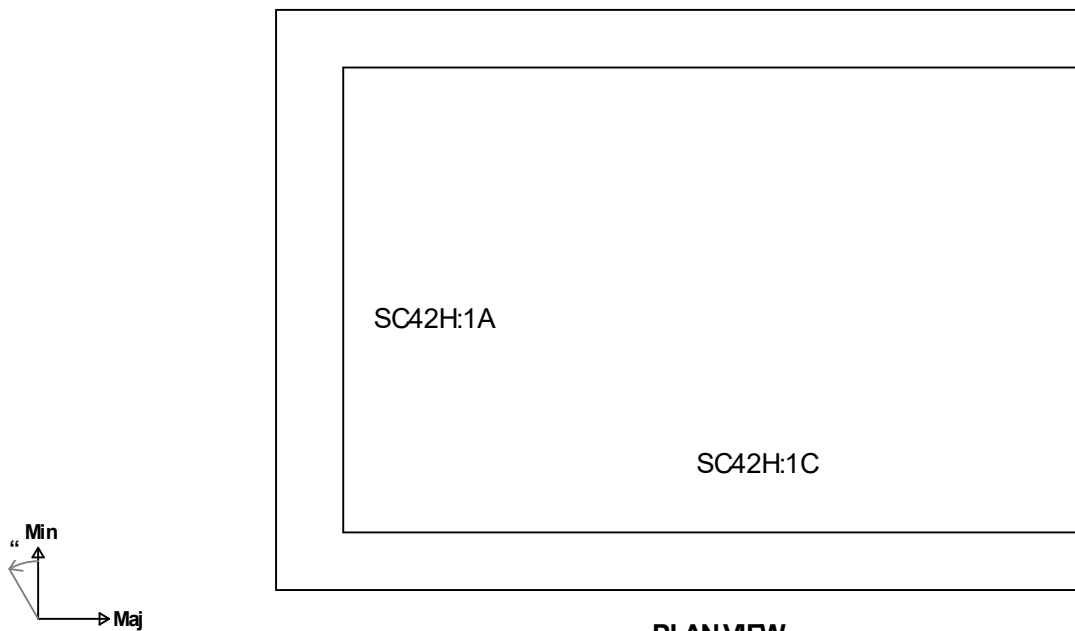
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Section Cut ID: SC42H:1 (Horizontal)
Story: Second
Ag = 5411 in² Imaj = 15774521 in⁴ Imin = 13097380 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 42
Wall Type: Cast-In-Place
Design Status: **PASS**

SC42H:1B



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.468 **OK**
Beta = 273.6 deg CCW from Major axis
Pu = 159.34 kips phiPn = 340.46 kips
Mu = 6401.29 kip-ft phiMn = 13677.67 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC42H:1A:
Length = 9.06 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
Vu = -392.54 kip phiVn = 448.91 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E31 + 1.0E1 + 1.6O1 (LC 332)
Code Ref: 11.5.4.4

Segment SC42H:1B:

Length = 13.50 ft Thick = 12.00 in ~~758~~ 6000 psi fy = 60 ksi



Section Cut Design Summary

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In-Plane Shear Results:

Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
Vu = -239.34 kip phiVn = 574.01 kip OK
Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)
Code Ref: 11.5.4.4

Segment SC42H:1C:

Length = 13.50 ft Thick = 12.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
Vu = -256.47 kip phiVn = 577.81 kip OK
Controlling Load Combo: 0.716 D - 1.300 E14 + 1.0E1 + 1.6O1 (LC 238)
Code Ref: 11.5.4.4

Out-of-Plane Shear

Results:

Segment SC42H:1A:

Length = 9.06 ft
Effective depth = 12.06 in
Vu = 18.37 kip phiVn = 98.07 kip OK
Controlling Load Combo: 0.716 D - 1.300 E35 + 1.0E1 + 1.6O1 (LC 417)
Code Ref: 22.5

Segment SC42H:1B:

Length = 13.50 ft
Effective depth = 10.06 in
Vu = -18.94 kip phiVn = 81.55 kip OK
Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)
Code Ref: 22.5

Segment SC42H:1C:

Length = 13.50 ft
Effective depth = 10.06 in
Vu = 33.53 kip phiVn = 85.53 kip OK
Controlling Load Combo: 0.716 D - 1.300 E14 + 1.0E1 + 1.6O1 (LC 238)
Code Ref: 22.5

Reinforcement Checks:

Segment SC42H:1A:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.867% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 0.716% (18.10.2.1) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



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Segment SC42H:1B:

Thickness : 12.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.867% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.818% Actual: 0.835% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.716% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC42H:1C:

Thickness : 12.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.867% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.818% Actual: 0.835% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.716% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



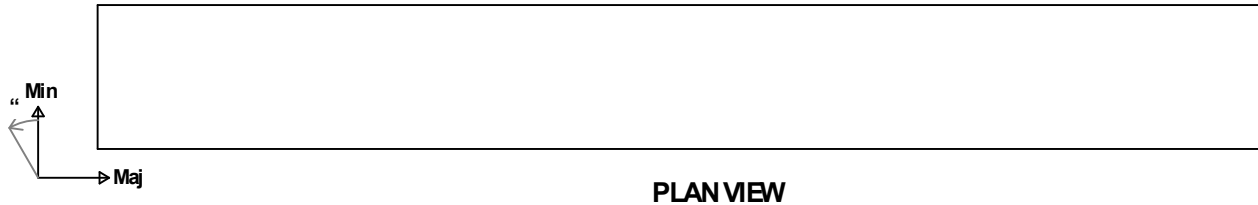
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Section Cut ID: SC42H:2 (Horizontal)
Story: Second
Ag = 1606 in² Imaj = 1762807 in⁴ Imin = 26240 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 42
Wall Type: Cast-In-Place
Design Status: **PASS**

SC42H:2



Axial/Flexural Results:

Interaction: 0.971 **OK**
Beta = 360.0 deg CCW from Major axis
Pu = 24.45 kips phiPn = 25.18 kips
Mu = 2394.87 kip-ft phiMn = 2466.61 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC42H:2:
Length = 9.56 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@12" oc Horiz Bar Pat: #5@9" oc
Vu = -182.98 kip phiVn = 466.88 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E7 + 1.0E1 + 1.6O1 (LC 351)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC42H:2:
Length = 9.56 ft
Effective depth = 12.25 in
Vu = -4.43 kip phiVn = 141.55 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 22.5



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Reinforcement Checks:

Segment SC42H:2:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.605% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.25 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.487% Actual: 0.526% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.526% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**



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Section Cut ID: SC42H:3 (Horizontal)
Story: Second
Ag = 1943 in² Imaj = 2075197 in⁴ Imin = 370464 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 42
Wall Type: Cast-In-Place
Design Status: **PASS**

SC42H:3B



SC42H:3A

PLAN VIEW

Axial/Flexural Results:

Interaction: 0.748 **OK**
Beta = 346.1 deg CCW from Major axis
Pu = 61.95 kips phiPn = 82.87 kips
Mu = 2328.37 kip-ft phiMn = 3114.64 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC42H:3A:
Length = 4.00 ft Thick = 12.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
Vu = -53.05 kip phiVn = 241.78 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E31 (LC 33)
Code Ref: 18.10.4.1

Segment SC42H:3B:

Length = 8.14 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc



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In-Plane Shear Results:

$V_u =$ -198.80 kip $\phi V_n =$ 511.42 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E7 + 1.0E1 + 1.6O1 (LC 351)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC42H:3A:

Length = 4.00 ft
Effective depth = 10.06 in
 $V_u =$ 1.04 kip $\phi V_n =$ 13.17 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E31 + 1.0E1 + 1.6O1 (LC 343)
Code Ref: 22.5

Segment SC42H:3B:

Length = 8.14 ft
Effective depth = 12.06 in
 $V_u =$ -0.43 kip $\phi V_n =$ 83.90 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)
Code Ref: 22.5

Reinforcement Checks:

Segment SC42H:3A:

Thickness : 12.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.929% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 16.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.818% Actual: 0.835% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.835% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC42H:3B:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.929% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.835% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

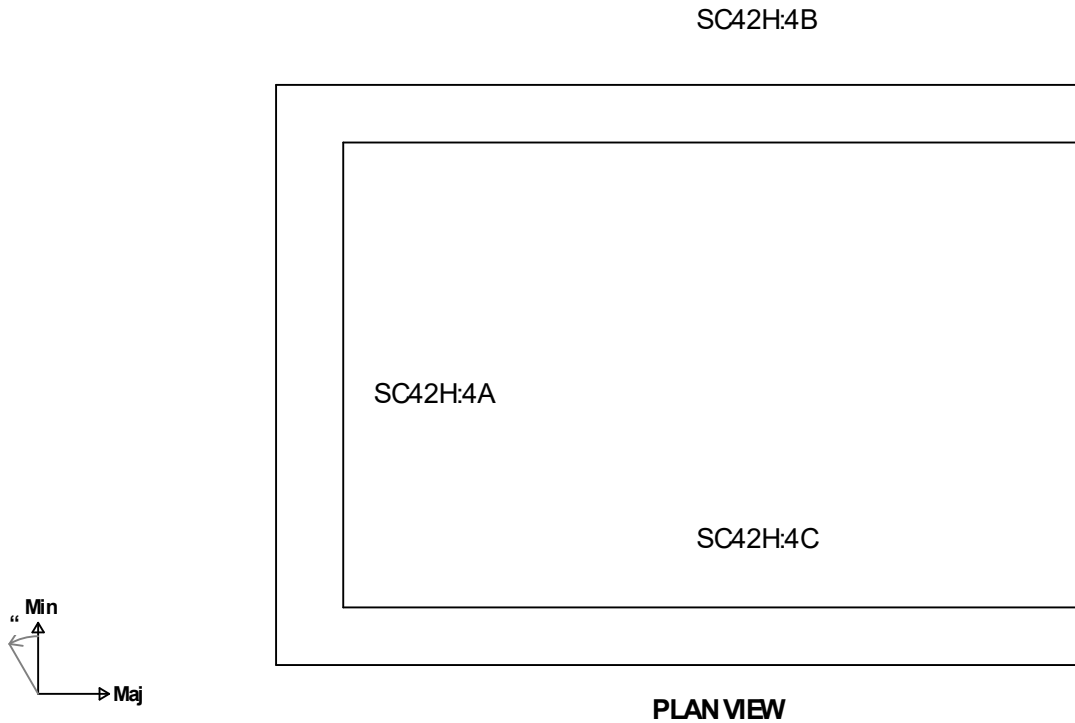


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Section Cut ID: SC42H:4 (Horizontal)
Story: Second
Ag = 5411 in² Imaj = 15774521 in⁴ Imin = 13097380 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 42
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.031 **OK**
Beta = 251.9 deg CCW from Major axis
Pu = 368.17 kips phiPn = 11953.20 kips
Mu = 1104.94 kip-ft phiMn = 35874.09 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC42H:4A:
Length = 9.06 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
Vu = -443.48 kip phiVn = 569.70 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E17 + 1.0E1 + 1.6O1 (LC 246)
Code Ref: 18.10.4.1

Segment SC42H:4B:

Length = 13.50 ft Thick = 12.00 in ~~765~~ 6000 psi fy = 60 ksi



Section Cut Design Summary

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In-Plane Shear Results:

Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
Vu = -243.33 kip phiVn = 646.57 kip OK
Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)
Code Ref: 11.5.4.4

Segment SC42H:4C:

Length = 13.50 ft Thick = 12.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
Vu = -267.65 kip phiVn = 816.02 kip OK
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E17 + 1.0E1 + 1.6O1 (LC 246)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC42H:4A:

Length = 9.06 ft
Effective depth = 12.06 in
Vu = 25.36 kip phiVn = 132.10 kip OK
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E35 + 1.0E1 + 1.6O1 (LC 336)
Code Ref: 22.5

Segment SC42H:4B:

Length = 13.50 ft
Effective depth = 10.06 in
Vu = -34.57 kip phiVn = 164.15 kip OK
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E31 (LC 33)
Code Ref: 22.5

Segment SC42H:4C:

Length = 13.50 ft
Effective depth = 10.06 in
Vu = 68.33 kip phiVn = 164.16 kip OK
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 22.5

Reinforcement Checks:

Segment SC42H:4A:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.867% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min web reinforcement ratio: 0.250% Actual: 0.716% (18.10.2.1) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



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Segment SC42H:4B:

Thickness : 12.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.867% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 0.818% Actual: 0.835% (18.10.4.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK

Min web reinforcement ratio: 0.250% Actual: 0.716% (18.10.2.1) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC42H:4C:

Thickness : 12.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.867% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 0.818% Actual: 0.835% (18.10.4.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK

Min web reinforcement ratio: 0.250% Actual: 0.716% (18.10.2.1) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



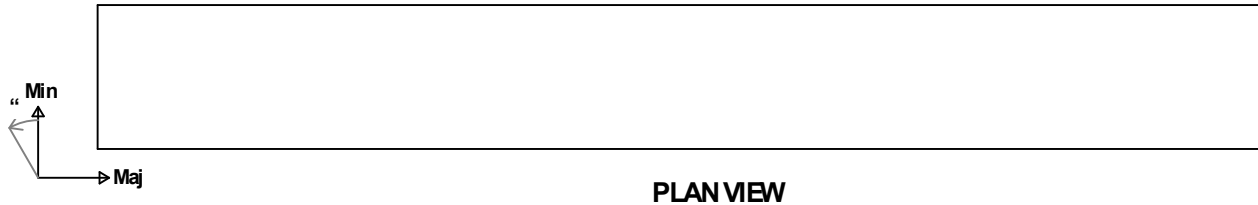
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Section Cut ID: SC42H:5 (Horizontal)
Story: Second
Ag = 1606 in² Imaj = 1762807 in⁴ Imin = 26240 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 42
Wall Type: Cast-In-Place
Design Status: **PASS**

SC42H:5



Axial/Flexural Results:

Interaction: 0.075 **OK**
Beta = 1.7 deg CCW from Major axis
Pu = 49.26 kips phiPn = 652.76 kips
Mu = 356.47 kip-ft phiMn = 4723.38 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E7 (LC 9)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC42H:5:
Length = 9.56 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@12" oc Horiz Bar Pat: #5@9" oc
Vu = -182.98 kip phiVn = 466.88 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E7 + 1.0E1 + 1.6O1 (LC 351)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC42H:5:
Length = 9.56 ft
Effective depth = 12.25 in
Vu = -4.43 kip phiVn = 141.55 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 22.5



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Reinforcement Checks:

Segment SC42H:5:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.605% (11.6.1) **OK**

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.25 in (25.2.1) **OK**

Min Longit Reinf Ratio Limit: 0.487% Actual: 0.526% (18.10.4.3) **OK**

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**

Min web reinforcement ratio: 0.250% Actual: 0.526% (18.10.2.1) **OK**

Min Number of Reinf Curtains: 1 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

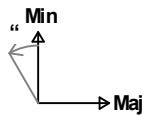
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Section Cut ID: SC42H:6 (Horizontal)
Story: Second
Ag = 1943 in² Imaj = 2075197 in⁴ Imin = 370464 in⁴
Major Axis Orientation: 0.00 degrees (CCW from global X-axis)
Wall Design Group: 42
Wall Type: Cast-In-Place
Design Status: **PASS**

SC42H:6B

SC42H:6A



PLAN VIEW

Axial/Flexural Results:

Interaction: 0.126 **OK**
Beta = 8.2 deg CCW from Major axis
Pu = 144.60 kips phiPn = 1149.70 kips
Mu = 670.82 kip-ft phiMn = 5333.61 kip-ft
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC42H:6A:
Length = 4.00 ft Thick = 12.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
Vu = -50.76 kip phiVn = 241.78 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E31 (LC 33)
Code Ref: 18.10.4.1

Segment SC42H:6B:

Length = 8.14 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc



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In-Plane Shear Results:

$V_u = -197.29$ kip $\phi V_n = 511.42$ kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E7 + 1.0E1 + 1.6O1 (LC 351)
Code Ref: 18.10.4.1

Out-of-Plane Shear

Results:

Segment SC42H:6A:

Length = 4.00 ft
Effective depth = 10.06 in
 $V_u = 3.45$ kip $\phi V_n = 48.64$ kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 22.5

Segment SC42H:6B:

Length = 8.14 ft
Effective depth = 12.06 in
 $V_u = -3.47$ kip $\phi V_n = 118.58$ kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 22.5

Reinforcement Checks:

Segment SC42H:6A:

Thickness : 12.00 in
Min Vert Reinf Ratio: 0.150% Actual: 0.929% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 16.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.818% Actual: 0.835% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.835% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC42H:6B:

Thickness : 14.00 in
Min Vert Reinf Ratio: 0.150% Actual: 0.929% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.835% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

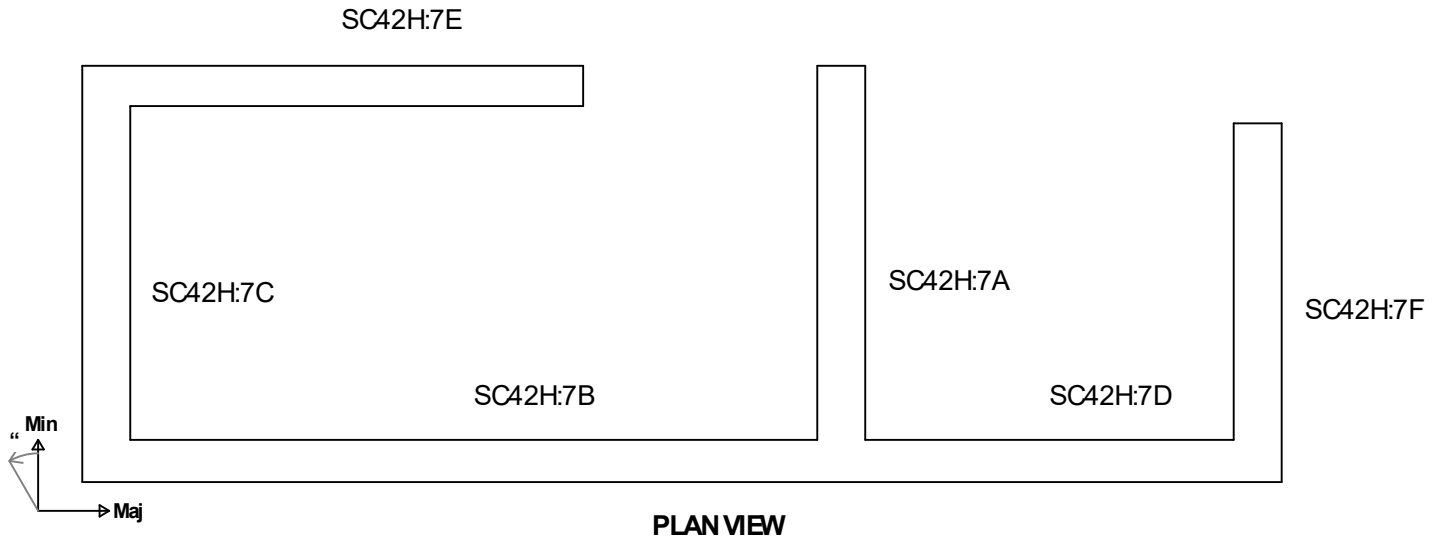


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Section Cut ID: SC42H:7 (Horizontal)
Story: First
Ag = 10068 in² Imaj = 138018968 in⁴ Imin = 19476029 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 42
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.323 **OK**
Beta = 266.2 deg CCW from Major axis
Pu = 428.02 kips phiPn = 1323.57 kips
Mu = 6739.27 kip-ft phiMn = 20839.70 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC42H:7A:
Length = 9.56 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@12" oc Horiz Bar Pat: #5@9" oc
Vu = -147.40 kip phiVn = 368.24 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E8 + 1.0E1 + 1.6O1 (LC 352)
Code Ref: 11.5.4.4

Segment SC42H:7B:
Length = 17.75 ft Thick = 12.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
Vu = 83.45 kip phiVn = 1072.92 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E26 (LC 28)
Code Ref: 18.10.4.1



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In-Plane Shear Results:

Segment SC42H:7C:

Length = 9.06 ft Thick = 14.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
 $V_u = -168.12$ kip $\phi V_n = 455.22$ kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E17 + 1.0E1 + 1.6O1 (LC 241)
Code Ref: 11.5.4.4

Segment SC42H:7D:

Length = 10.03 ft Thick = 12.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
 $V_u = -64.66$ kip $\phi V_n = 477.06$ kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E18 + 1.0E1 + 1.6O1 (LC 242)
Code Ref: 11.5.4.4

Segment SC42H:7E:

Length = 11.50 ft Thick = 12.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
 $V_u = 75.42$ kip $\phi V_n = 542.84$ kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 11.5.4.4

Segment SC42H:7F:

Length = 8.14 ft Thick = 14.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
 $V_u = -157.68$ kip $\phi V_n = 406.66$ kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E8 + 1.0E1 + 1.6O1 (LC 352)
Code Ref: 11.5.4.4

Out-of-Plane Shear Results:

Segment SC42H:7A:

Length = 9.56 ft
Effective depth = 11.50 in
 $V_u = -0.16$ kip $\phi V_n = 118.09$ kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)
Code Ref: 22.5

Segment SC42H:7B:

Length = 17.75 ft
Effective depth = 8.81 in
 $V_u = -12.43$ kip $\phi V_n = 123.81$ kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E14 + 1.0E1 + 1.6O1 (LC 238)
Code Ref: 22.5

Segment SC42H:7C:



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Out-of-Plane Shear

Results:

Length = 9.06 ft
Effective depth = 10.81 in
Vu = -4.98 kip phiVn = 94.83 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E36 (LC 186)
Code Ref: 22.5

Segment SC42H:7D:

Length = 10.03 ft
Effective depth = 8.81 in
Vu = -10.38 kip phiVn = 81.14 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E14 + 1.0E1 + 1.6O1 (LC 238)
Code Ref: 22.5

Segment SC42H:7E:

Length = 11.50 ft
Effective depth = 8.81 in
Vu = 9.58 kip phiVn = 57.12 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)
Code Ref: 22.5

Segment SC42H:7F:

Length = 8.14 ft
Effective depth = 10.81 in
Vu = 2.21 kip phiVn = 91.13 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E32 + 1.0E1 + 1.6O1 (LC 344)
Code Ref: 22.5

Reinforcement Checks:

Segment SC42H:7A:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.816% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.25 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.487% Actual: 0.526% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min web reinforcement ratio: 0.250% Actual: 0.526% (18.10.2.1) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC42H:7B:

Thickness : 12.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.816% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.818% Actual: 0.835% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**



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Min web reinforcement ratio: 0.250% Actual: 0.526% (18.10.2.1) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC42H:7C:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.816% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK

Min web reinforcement ratio: 0.250% Actual: 0.526% (18.10.2.1) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC42H:7D:

Thickness : 12.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.816% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 0.818% Actual: 0.835% (18.10.4.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK

Min web reinforcement ratio: 0.250% Actual: 0.526% (18.10.2.1) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC42H:7E:

Thickness : 12.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.816% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 0.818% Actual: 0.835% (18.10.4.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK

Min web reinforcement ratio: 0.250% Actual: 0.526% (18.10.2.1) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC42H:7F:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.816% (11.6.1) OK

Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK

Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) OK

Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) OK

Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK

Min web reinforcement ratio: 0.250% Actual: 0.526% (18.10.2.1) OK

Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK



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Section Cut ID: SC42H:8 (Horizontal)
Story: First
Ag = 10068 in² Imaj = 138018968 in⁴ Imin = 19476029 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 42
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.614 **OK**
Beta = 268.1 deg CCW from Major axis
Pu = 428.02 kips phiPn = 696.70 kips
Mu = 11411.28 kip-ft phiMn = 18574.30 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC42H:8A:
Length = 9.56 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #6@12" oc Horiz Bar Pat: #5@9" oc
Vu = -136.98 kip phiVn = 357.22 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E7 + 1.0E1 + 1.6O1 (LC 285)
Code Ref: 11.5.4.4

Segment SC42H:8B:
Length = 17.75 ft Thick = 12.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
Vu = 99.36 kip phiVn = 1072.92 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E26 (LC 28)
Code Ref: 18.10.4.1



Section Cut Design Summary

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In-Plane Shear Results:

Segment SC42H:8C:

Length = 9.06 ft Thick = 14.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
 $V_u = -130.40$ kip $\phi V_n = 453.73$ kip OK
Controlling Load Combo: 0.716 D - 1.300 E17 + 1.0E1 + 1.6O1 (LC 241)
Code Ref: 11.5.4.4

Segment SC42H:8D:

Length = 10.03 ft Thick = 12.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
 $V_u = -54.42$ kip $\phi V_n = 483.58$ kip OK
Controlling Load Combo: 0.716 D - 1.300 E18 + 1.0E1 + 1.6O1 (LC 242)
Code Ref: 11.5.4.4

Segment SC42H:8E:

Length = 11.50 ft Thick = 12.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
 $V_u = 67.14$ kip $\phi V_n = 533.95$ kip OK
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E35 (LC 37)
Code Ref: 11.5.4.4

Segment SC42H:8F:

Length = 8.14 ft Thick = 14.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #7@12" oc Horiz Bar Pat: #6@9" oc
 $V_u = -146.93$ kip $\phi V_n = 380.07$ kip OK
Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)
Code Ref: 11.5.4.4

Out-of-Plane Shear Results:

Segment SC42H:8A:

Length = 9.56 ft
Effective depth = 11.50 in
 $V_u = 7.19$ kip $\phi V_n = 117.75$ kip OK
Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)
Code Ref: 22.5

Segment SC42H:8B:

Length = 17.75 ft
Effective depth = 8.81 in
 $V_u = -9.85$ kip $\phi V_n = 110.83$ kip OK
Controlling Load Combo: 0.716 D - 1.300 E14 + 1.0E1 + 1.6O1 (LC 238)
Code Ref: 22.5

Segment SC42H:8C:



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Out-of-Plane Shear

Results:

Length = 9.06 ft
Effective depth = 10.81 in
Vu = -8.52 kip phiVn = 88.34 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E35 + 1.0E1 + 1.6O1 (LC 417)
Code Ref: 22.5

Segment SC42H:8D:

Length = 10.03 ft
Effective depth = 8.81 in
Vu = 45.94 kip phiVn = 78.47 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E7 + 1.0E1 + 1.6O1 (LC 351)
Code Ref: 22.5

Segment SC42H:8E:

Length = 11.50 ft
Effective depth = 8.81 in
Vu = 20.69 kip phiVn = 44.05 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E31 (LC 181)
Code Ref: 22.5

Segment SC42H:8F:

Length = 8.14 ft
Effective depth = 10.81 in
Vu = -7.83 kip phiVn = 78.24 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)
Code Ref: 22.5

Reinforcement Checks:

Segment SC42H:8A:

Thickness : 14.00 in
Min Vert Reinf Ratio: 0.150% Actual: 0.816% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.25 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.487% Actual: 0.526% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC42H:8B:

Thickness : 12.00 in
Min Vert Reinf Ratio: 0.150% Actual: 0.816% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.818% Actual: 0.835% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



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Segment SC42H:8C:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.816% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC42H:8D:

Thickness : 12.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.816% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.818% Actual: 0.835% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC42H:8E:

Thickness : 12.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.816% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.818% Actual: 0.835% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC42H:8F:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 0.816% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 11.13 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.701% Actual: 0.716% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

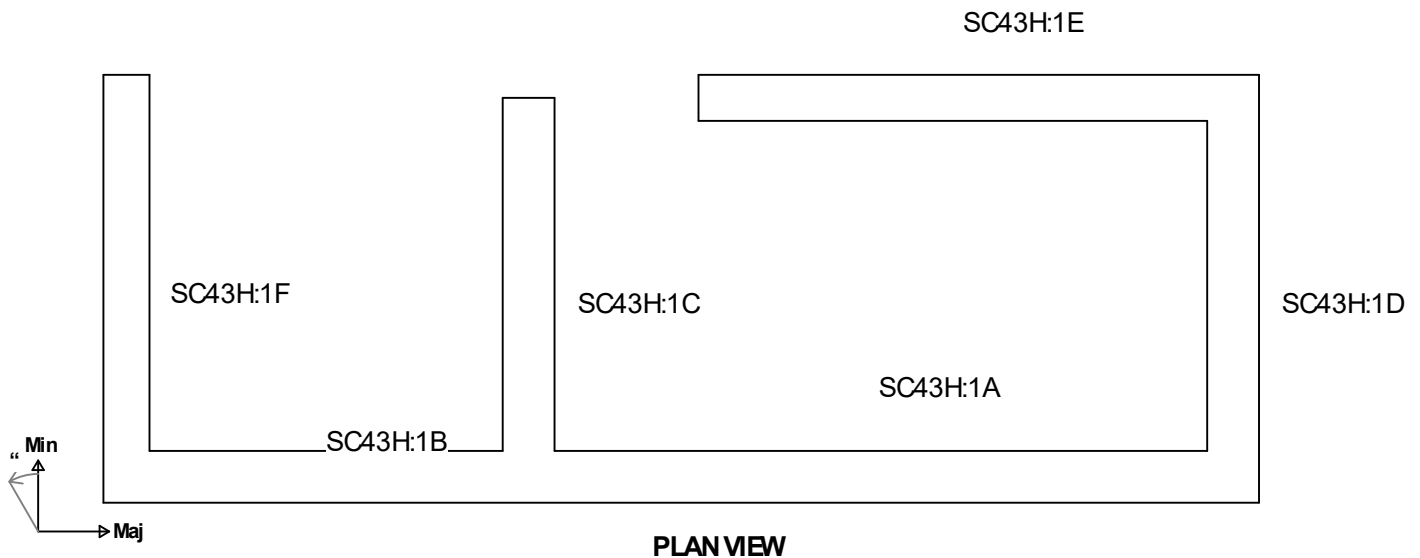


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Section Cut ID: SC43H:1 (Horizontal)
Story: First
Ag = 13027 in² Imaj = 180195406 in⁴ Imin = 30070107 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 43
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.215 **OK**
Beta = 298.2 deg CCW from Major axis
Pu = 616.09 kips phiPn = 2872.03 kips
Mu = 10799.70 kip-ft phiMn = 50345.12 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E14 (LC 164)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC43H:1A:
Length = 18.00 ft Thick = 16.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
Vu = -107.34 kip phiVn = 1173.35 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E7 + 1.0E1 + 1.6O1 (LC 351)
Code Ref: 11.5.4.4

Segment SC43H:1B:
Length = 10.25 ft Thick = 16.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
Vu = -65.83 kip phiVn = 644.99 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E29 + 1.0E1 + 1.6O1 (LC 263)
Code Ref: 11.5.4.4 780



Section Cut Design Summary

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In-Plane Shear Results:

Segment SC43H:1C:

Length = 9.67 ft Thick = 16.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
 $V_u = -230.18$ kip $\phi V_n = 608.56$ kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E25 + 1.0E1 + 1.6O1 (LC 259)
Code Ref: 11.5.4.4

Segment SC43H:1D:

Length = 9.67 ft Thick = 16.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
 $V_u = -74.45$ kip $\phi V_n = 791.42$ kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E25 + 1.0E1 + 1.6O1 (LC 259)
Code Ref: 18.10.4.1

Segment SC43H:1E:

Length = 13.67 ft Thick = 14.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
 $V_u = -135.00$ kip $\phi V_n = 837.79$ kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E25 + 1.0E1 + 1.6O1 (LC 259)
Code Ref: 11.5.4.4

Segment SC43H:1F:

Length = 10.25 ft Thick = 14.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #6@6" oc Horiz Bar Pat: #7@9" oc
 $V_u = -229.41$ kip $\phi V_n = 645.13$ kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E8 + 1.0E1 + 1.6O1 (LC 352)
Code Ref: 11.5.4.4

Out-of-Plane Shear Results:

Segment SC43H:1A:

Length = 18.00 ft
Effective depth = 12.56 in
 $V_u = -8.68$ kip $\phi V_n = 176.82$ kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E22 + 1.0E1 + 1.6O1 (LC 286)
Code Ref: 22.5

Segment SC43H:1B:

Length = 10.25 ft
Effective depth = 12.56 in
 $V_u = -10.04$ kip $\phi V_n = 80.65$ kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E8 + 1.0E1 + 1.6O1 (LC 225)
Code Ref: 22.5

Segment SC43H:1C:



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Out-of-Plane Shear

Results:

Length = 9.67 ft
Effective depth = 13.81 in
Vu = -4.25 kip phiVn = 115.09 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E26 (LC 176)
Code Ref: 22.5

Segment SC43H:1D:

Length = 9.67 ft
Effective depth = 13.81 in
Vu = 0.74 kip phiVn = 86.42 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E26 + 1.0E1 + 1.6O1 (LC 338)
Code Ref: 22.5

Segment SC43H:1E:

Length = 13.67 ft
Effective depth = 11.81 in
Vu = 4.22 kip phiVn = 101.25 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)
Code Ref: 22.5

Segment SC43H:1F:

Length = 10.25 ft
Effective depth = 12.00 in
Vu = -1.38 kip phiVn = 57.77 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E26 (LC 176)
Code Ref: 22.5

Reinforcement Checks:

Segment SC43H:1A:

Thickness : 16.00 in
Min Vert Reinf Ratio: 0.150% Actual: 1.148% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.835% Actual: 1.041% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC43H:1B:

Thickness : 16.00 in
Min Vert Reinf Ratio: 0.150% Actual: 1.148% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.835% Actual: 1.041% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



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Segment SC43H:1C:

Thickness : 16.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.148% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.835% Actual: 1.041% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC43H:1D:

Thickness : 16.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.148% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.835% Actual: 1.041% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC43H:1E:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.148% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.954% Actual: 1.190% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC43H:1F:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.148% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 6.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 5.25 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.954% Actual: 1.052% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

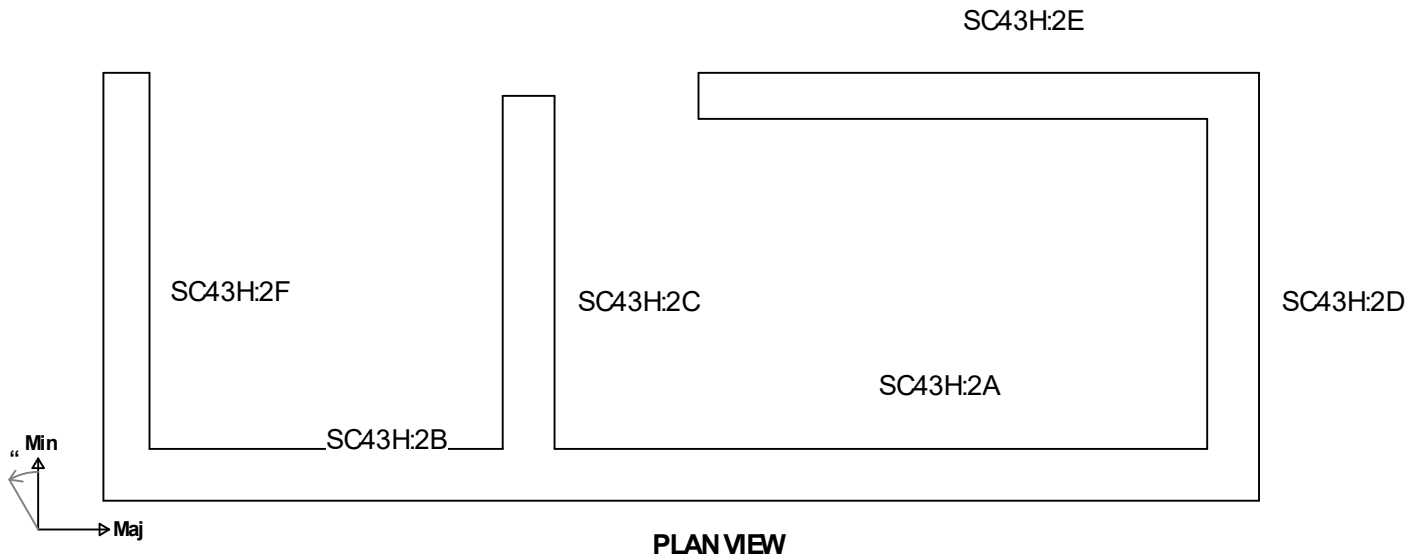


Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC43H:2 (Horizontal)
Story: First
Ag = 13027 in² Imaj = 180195406 in⁴ Imin = 30070107 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 43
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.354 **OK**
Beta = 291.9 deg CCW from Major axis
Pu = 616.10 kips phiPn = 1741.63 kips
Mu = 15473.43 kip-ft phiMn = 43741.42 kip-ft
Controlling Load Combo: 0.716 D + 1.300 E14 (LC 164)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC43H:2A:
Length = 18.00 ft Thick = 16.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
Vu = -96.75 kip phiVn = 1473.68 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E11 + 1.0E1 + 1.6O1 (LC 355)
Code Ref: 18.10.4.1

Segment SC43H:2B:
Length = 10.25 ft Thick = 16.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
Vu = -36.62 kip phiVn = 583.19 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E12 + 1.0E1 + 1.6O1 (LC 229)
Code Ref: 11.5.4.4 784



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Design Code: ACI 318-14

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In-Plane Shear Results:

Segment SC43H:2C:

Length = 9.67 ft Thick = 16.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
 $V_u = -188.95$ kip $\phi V_n = 573.08$ kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E25 + 1.0E1 + 1.6O1 (LC 337)
Code Ref: 11.5.4.4

Segment SC43H:2D:

Length = 9.67 ft Thick = 16.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
 $V_u = 31.28$ kip $\phi V_n = 585.25$ kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E25 (LC 175)
Code Ref: 11.5.4.4

Segment SC43H:2E:

Length = 13.67 ft Thick = 14.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
 $V_u = -121.11$ kip $\phi V_n = 800.11$ kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E25 + 1.0E1 + 1.6O1 (LC 337)
Code Ref: 11.5.4.4

Segment SC43H:2F:

Length = 10.25 ft Thick = 14.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #6@6" oc Horiz Bar Pat: #7@9" oc
 $V_u = -204.32$ kip $\phi V_n = 616.81$ kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E7 + 1.0E1 + 1.6O1 (LC 285)
Code Ref: 11.5.4.4

Out-of-Plane Shear Results:

Segment SC43H:2A:

Length = 18.00 ft
Effective depth = 12.56 in
 $V_u = -13.80$ kip $\phi V_n = 164.61$ kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E22 + 1.0E1 + 1.6O1 (LC 286)
Code Ref: 22.5

Segment SC43H:2B:

Length = 10.25 ft
Effective depth = 12.56 in
 $V_u = -17.23$ kip $\phi V_n = 49.80$ kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E8 + 1.0E1 + 1.6O1 (LC 225)
Code Ref: 22.5

Segment SC43H:2C:



Section Cut Design Summary

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Out-of-Plane Shear

Results:

Length = 9.67 ft
Effective depth = 13.81 in
Vu = -8.03 kip phiVn = 96.32 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 22.5

Segment SC43H:2D:

Length = 9.67 ft
Effective depth = 13.81 in
Vu = -31.14 kip phiVn = 113.55 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E26 + 1.0E1 + 1.6O1 (LC 260)
Code Ref: 22.5

Segment SC43H:2E:

Length = 13.67 ft
Effective depth = 11.81 in
Vu = 9.61 kip phiVn = 84.62 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)
Code Ref: 22.5

Segment SC43H:2F:

Length = 10.25 ft
Effective depth = 12.00 in
Vu = -2.45 kip phiVn = 43.79 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 22.5

Reinforcement Checks:

Segment SC43H:2A:

Thickness : 16.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.148% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.835% Actual: 1.041% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC43H:2B:

Thickness : 16.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.148% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.835% Actual: 1.041% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Segment SC43H:2C:

Thickness : 16.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.148% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.835% Actual: 1.041% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC43H:2D:

Thickness : 16.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.148% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.835% Actual: 1.041% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC43H:2E:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.148% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.954% Actual: 1.190% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC43H:2F:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.148% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 6.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.00 in Actual: 5.25 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.954% Actual: 1.052% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

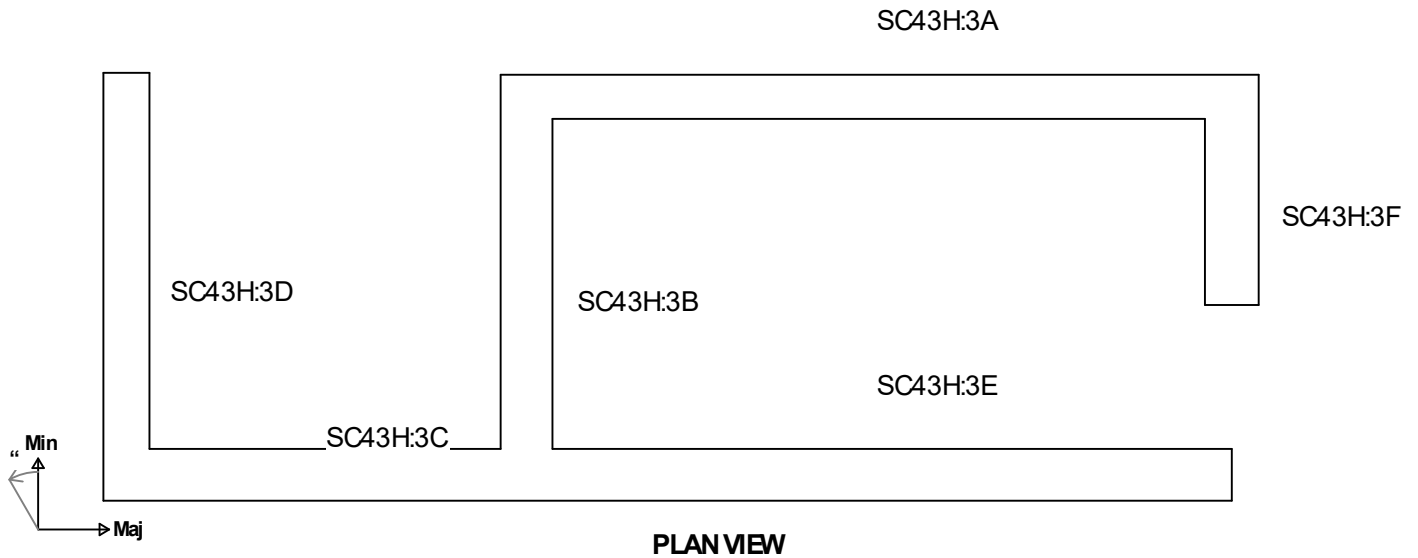


Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC43H:3 (Horizontal)
Story: Second
Ag = 12922 in² Imaj = 158166066 in⁴ Imin = 32908072 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 43
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.317 **OK**
Beta = 248.1 deg CCW from Major axis
Pu = 372.12 kips phiPn = 1174.92 kips
Mu = 15390.71 kip-ft phiMn = 48594.50 kip-ft
Controlling Load Combo: 0.716 D - 1.300 E8 (LC 195)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC43H:3A:
Length = 18.00 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
Vu = -681.96 kip phiVn = 1090.86 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E11 (LC 161)
Code Ref: 11.5.4.4

Segment SC43H:3B:
Length = 9.67 ft Thick = 16.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
Vu = 597.81 kip phiVn = 624.91 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E7 (LC 157)
Code Ref: 11.5.4.4 **788**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Design Code: ACI 318-14

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In-Plane Shear Results:

Segment SC43H:3C:

Length = 10.25 ft Thick = 16.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
 $V_u = 537.83$ kip $\phi V_n = 635.29$ kip OK
Controlling Load Combo: 0.716 D + 1.300 E26 (LC 176)
Code Ref: 11.5.4.4

Segment SC43H:3D:

Length = 10.25 ft Thick = 14.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
 $V_u = 373.49$ kip $\phi V_n = 566.48$ kip OK
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 11.5.4.4

Segment SC43H:3E:

Length = 18.00 ft Thick = 16.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
 $V_u = -855.57$ kip $\phi V_n = 1100.42$ kip OK
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E26 + 1.0E1 + 1.6O1 (LC 260)
Code Ref: 11.5.4.4

Segment SC43H:3F:

Length = 5.33 ft Thick = 16.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
 $V_u = 124.78$ kip $\phi V_n = 436.37$ kip OK
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 18.10.4.1

Out-of-Plane Shear Results:

Segment SC43H:3A:

Length = 18.00 ft
Effective depth = 11.81 in
 $V_u = -37.19$ kip $\phi V_n = 147.10$ kip OK
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E7 (LC 9)
Code Ref: 22.5

Segment SC43H:3B:

Length = 9.67 ft
Effective depth = 13.81 in
 $V_u = 21.76$ kip $\phi V_n = 117.35$ kip OK
Controlling Load Combo: 0.716 D + 1.300 E26 (LC 176)
Code Ref: 22.5

Segment SC43H:3C:



Section Cut Design Summary

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Out-of-Plane Shear

Results:

Length = 10.25 ft
Effective depth = 13.81 in
Vu = 55.08 kip phiVn = 63.52 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E7 + 1.0E1 + 1.6O1 (LC 351)
Code Ref: 22.5

Segment SC43H:3D:

Length = 10.25 ft
Effective depth = 11.81 in
Vu = 6.02 kip phiVn = 50.84 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E22 (LC 172)
Code Ref: 22.5

Segment SC43H:3E:

Length = 18.00 ft
Effective depth = 13.81 in
Vu = 38.20 kip phiVn = 175.75 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E22 + 1.0E1 + 1.6O1 (LC 286)
Code Ref: 22.5

Segment SC43H:3F:

Length = 5.33 ft
Effective depth = 13.81 in
Vu = -15.99 kip phiVn = 40.04 kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E26 + 1.0E1 + 1.6O1 (LC 338)
Code Ref: 22.5

Reinforcement Checks:

Segment SC43H:3A:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.191% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.954% Actual: 1.190% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC43H:3B:

Thickness : 16.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.191% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.835% Actual: 1.041% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
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Segment SC43H:3C:

Thickness : 16.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.191% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.835% Actual: 1.041% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC43H:3D:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.191% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.954% Actual: 1.190% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC43H:3E:

Thickness : 16.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.191% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.835% Actual: 1.041% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC43H:3F:

Thickness : 16.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.191% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.835% Actual: 1.041% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

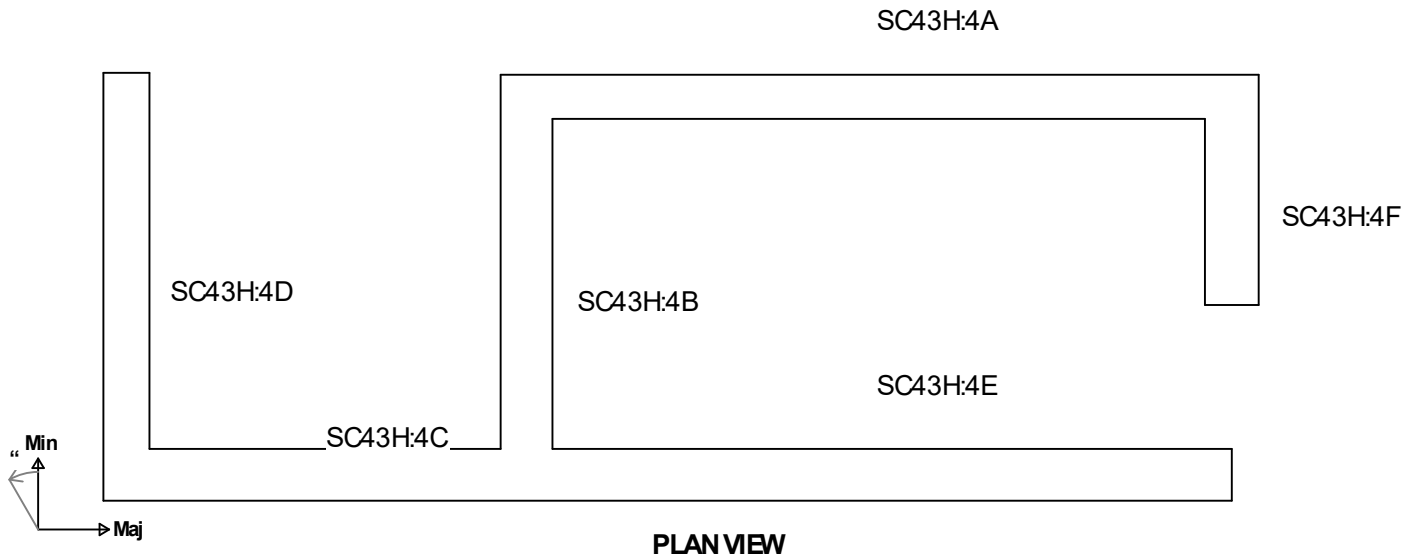


Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Section Cut ID: SC43H:4 (Horizontal)
Story: Second
Ag = 12922 in² Imaj = 158166066 in⁴ Imin = 32908072 in⁴
Major Axis Orientation: 90.00 degrees (CCW from global X-axis)
Wall Design Group: 43
Wall Type: Cast-In-Place
Design Status: **PASS**



Axial/Flexural Results:

Interaction: 0.026 **OK**
Beta = 348.6 deg CCW from Major axis
Pu = 791.09 kips phiPn = 30231.88 kips
Mu = 3725.22 kip-ft phiMn = 142361.64 kip-ft
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 11.4.2.1

In-Plane Shear Results:

Segment SC43H:4A:
Length = 18.00 ft Thick = 14.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
Vu = 718.46 kip phiVn = 1430.18 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E11 + 1.0E1 + 1.6O1 (LC 355)
Code Ref: 18.10.4.1

Segment SC43H:4B:
Length = 9.67 ft Thick = 16.00 in fc = 6000 psi fy = 60 ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
Vu = 567.59 kip phiVn = 632.42 kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E14 (LC 164)
Code Ref: 11.5.4.4 792



Section Cut Design Summary

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In-Plane Shear Results:

Segment SC43H:4C:

Length = 10.25 ft Thick = 16.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
 $V_u = 483.77$ kip $\phi V_n = 667.91$ kip **OK**
Controlling Load Combo: 0.716 D + 1.300 E12 (LC 162)
Code Ref: 11.5.4.4

Segment SC43H:4D:

Length = 10.25 ft Thick = 14.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
 $V_u = 402.71$ kip $\phi V_n = 643.35$ kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 11.5.4.4

Segment SC43H:4E:

Length = 18.00 ft Thick = 16.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
 $V_u = -875.06$ kip $\phi V_n = 1473.68$ kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E26 + 1.0E1 + 1.6O1 (LC 260)
Code Ref: 18.10.4.1

Segment SC43H:4F:

Length = 5.33 ft Thick = 16.00 in $f_c = 6000$ psi $f_y = 60$ ksi
Vert Bar Pat: #9@12" oc Horiz Bar Pat: #7@9" oc
 $V_u = -93.19$ kip $\phi V_n = 346.85$ kip **OK**
Controlling Load Combo: 0.716 D - 1.300 E22 + 1.0E1 + 1.6O1 (LC 286)
Code Ref: 11.5.4.4

Out-of-Plane Shear Results:

Segment SC43H:4A:

Length = 18.00 ft
Effective depth = 11.81 in
 $V_u = -61.70$ kip $\phi V_n = 256.91$ kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp (LC 2)
Code Ref: 22.5

Segment SC43H:4B:

Length = 9.67 ft
Effective depth = 13.81 in
 $V_u = 12.08$ kip $\phi V_n = 158.52$ kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp - 1.300 E29 + 1.0E1 + 1.6O1 (LC 263)
Code Ref: 22.5

Segment SC43H:4C:



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

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Out-of-Plane Shear

Results:

Length = 10.25 ft
Effective depth = 13.81 in
Vu = 88.11 kip phiVn = 171.07 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 22.5

Segment SC43H:4D:

Length = 10.25 ft
Effective depth = 11.81 in
Vu = 9.74 kip phiVn = 137.49 kip **OK**
Controlling Load Combo: 1.384 D + 0.500 Lp + 1.300 E22 (LC 24)
Code Ref: 22.5

Segment SC43H:4E:

Length = 18.00 ft
Effective depth = 13.81 in
Vu = 77.63 kip phiVn = 300.41 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 22.5

Segment SC43H:4F:

Length = 5.33 ft
Effective depth = 13.81 in
Vu = -46.36 kip phiVn = 88.95 kip **OK**
Controlling Load Combo: 1.200 D + 1.600 Lp + 1.0E1 + 1.6O1 (LC 413)
Code Ref: 22.5

Reinforcement Checks:

Segment SC43H:4A:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.191% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.954% Actual: 1.190% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**

Segment SC43H:4B:

Thickness : 16.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.191% (11.6.1) **OK**
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) **OK**
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) **OK**
Min Longit Reinf Ratio Limit: 0.835% Actual: 1.041% (18.10.4.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) **OK**
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) **OK**



Section Cut Design Summary

RAM Concrete Wall 23.00.00.92
Database: MIMU - Revised Design_v2.0
Design Code: ACI 318-14

Page 248/248
10/10/23 13:58:48

Segment SC43H:4C:

Thickness : 16.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.191% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.835% Actual: 1.041% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC43H:4D:

Thickness : 14.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.191% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.954% Actual: 1.190% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

Segment SC43H:4E:

Thickness : 16.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.191% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.835% Actual: 1.041% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

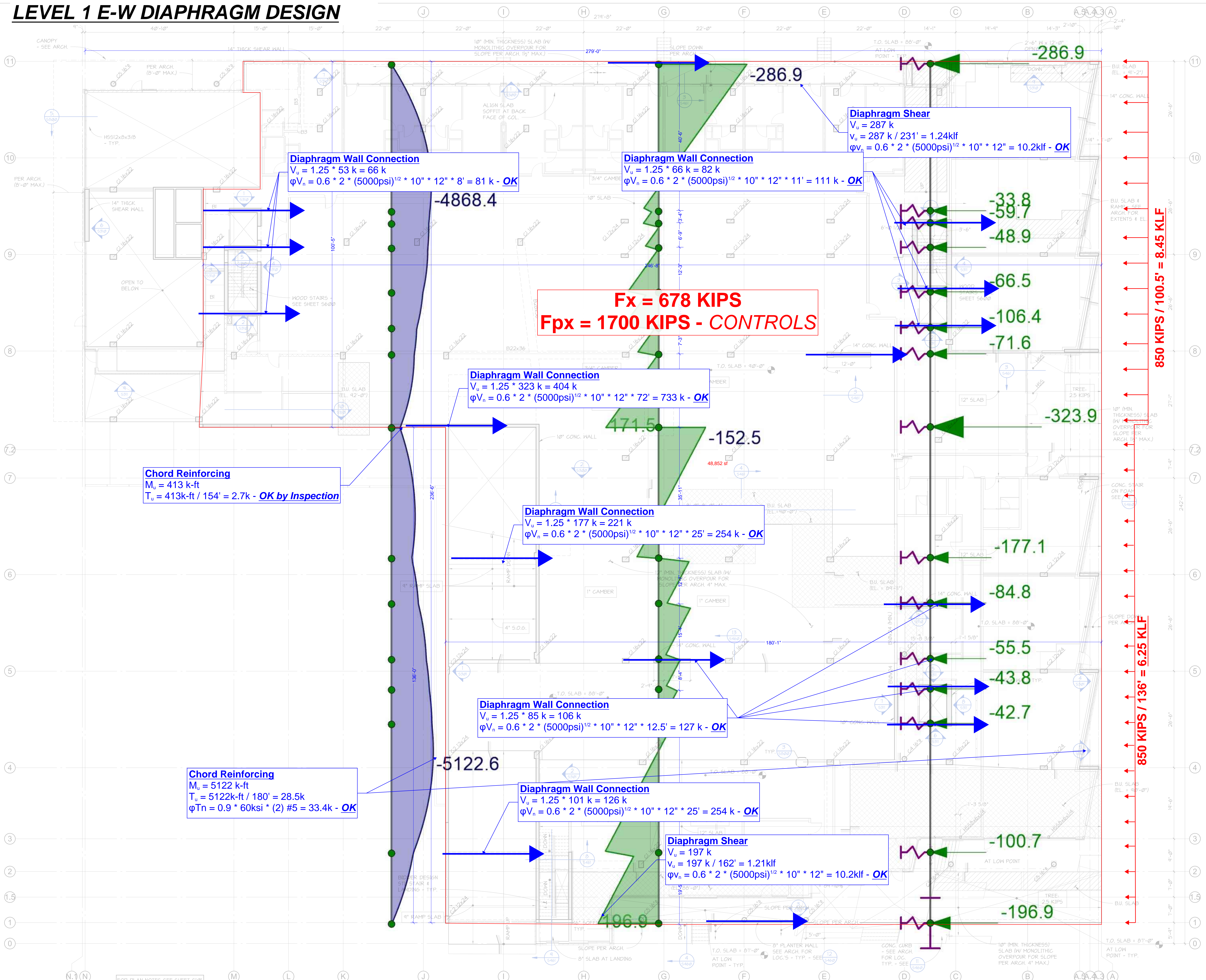
Segment SC43H:4F:

Thickness : 16.00 in

Min Vert Reinf Ratio: 0.150% Actual: 1.191% (11.6.1) OK
Max Vert Bar Spacing Limit: 18.00 in Actual: 12.00 in (11.7.2.1) OK
Min Vert Bar Spacing Limit: 1.13 in Actual: 10.87 in (25.2.1) OK
Min Longit Reinf Ratio Limit: 0.835% Actual: 1.041% (18.10.4.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (11.7.2.3) OK
Min Number of Reinf Curtains: 2 Actual: 2 (18.10.2.2) OK

CONCRETE DIAPHRAGM

LEVEL 1 E-W DIAPHRAGM DESIGN



Diaphragm Wall Connection
 $V_u = 1.25 * 53 \text{ k} = 66 \text{ k}$
 $\phi V_n = 0.6 * 2 * (5000\text{psi})^{1/2} * 10" * 12" * 8' = 81 \text{ k} - \text{OK}$

Diaphragm Wall Connection
 $V_u = 1.25 * 66 \text{ k} = 82 \text{ k}$
 $\phi V_n = 0.6 * 2 * (5000\text{psi})^{1/2} * 10" * 12" * 11' = 111 \text{ k} - \text{OK}$

Diaphragm Shear
 $V_u = 287 \text{ k}$
 $V_u = 287 \text{ k} / 231' = 1.24 \text{ klf}$
 $\phi V_n = 0.6 * 2 * (5000\text{psi})^{1/2} * 10" * 12" = 10.2 \text{ klf} - \text{OK}$

$F_x = 678 \text{ KIPS}$
 $F_{px} = 1700 \text{ KIPS} - \text{CONTROLS}$

Diaphragm Wall Connection
 $V_u = 1.25 * 323 \text{ k} = 404 \text{ k}$
 $\phi V_n = 0.6 * 2 * (5000\text{psi})^{1/2} * 10" * 12" * 72' = 733 \text{ k} - \text{OK}$

Chord Reinforcing
 $M_u = 413 \text{ k-ft}$
 $T_u = 413 \text{ k-ft} / 154' = 2.7 \text{ k} - \text{OK by Inspection}$

Diaphragm Wall Connection
 $V_u = 1.25 * 177 \text{ k} = 221 \text{ k}$
 $\phi V_n = 0.6 * 2 * (5000\text{psi})^{1/2} * 10" * 12" * 25' = 254 \text{ k} - \text{OK}$

Diaphragm Wall Connection
 $V_u = 1.25 * 85 \text{ k} = 106 \text{ k}$
 $\phi V_n = 0.6 * 2 * (5000\text{psi})^{1/2} * 10" * 12" * 12.5' = 127 \text{ k} - \text{OK}$

Chord Reinforcing
 $M_u = 5122 \text{ k-ft}$
 $T_u = 5122 \text{ k-ft} / 180' = 28.5 \text{ k}$
 $\phi T_n = 0.9 * 60 \text{ksi} * (2) \#5 = 33.4 \text{ k} - \text{OK}$

Diaphragm Wall Connection
 $V_u = 1.25 * 101 \text{ k} = 126 \text{ k}$
 $\phi V_n = 0.6 * 2 * (5000\text{psi})^{1/2} * 10" * 12" * 25' = 254 \text{ k} - \text{OK}$

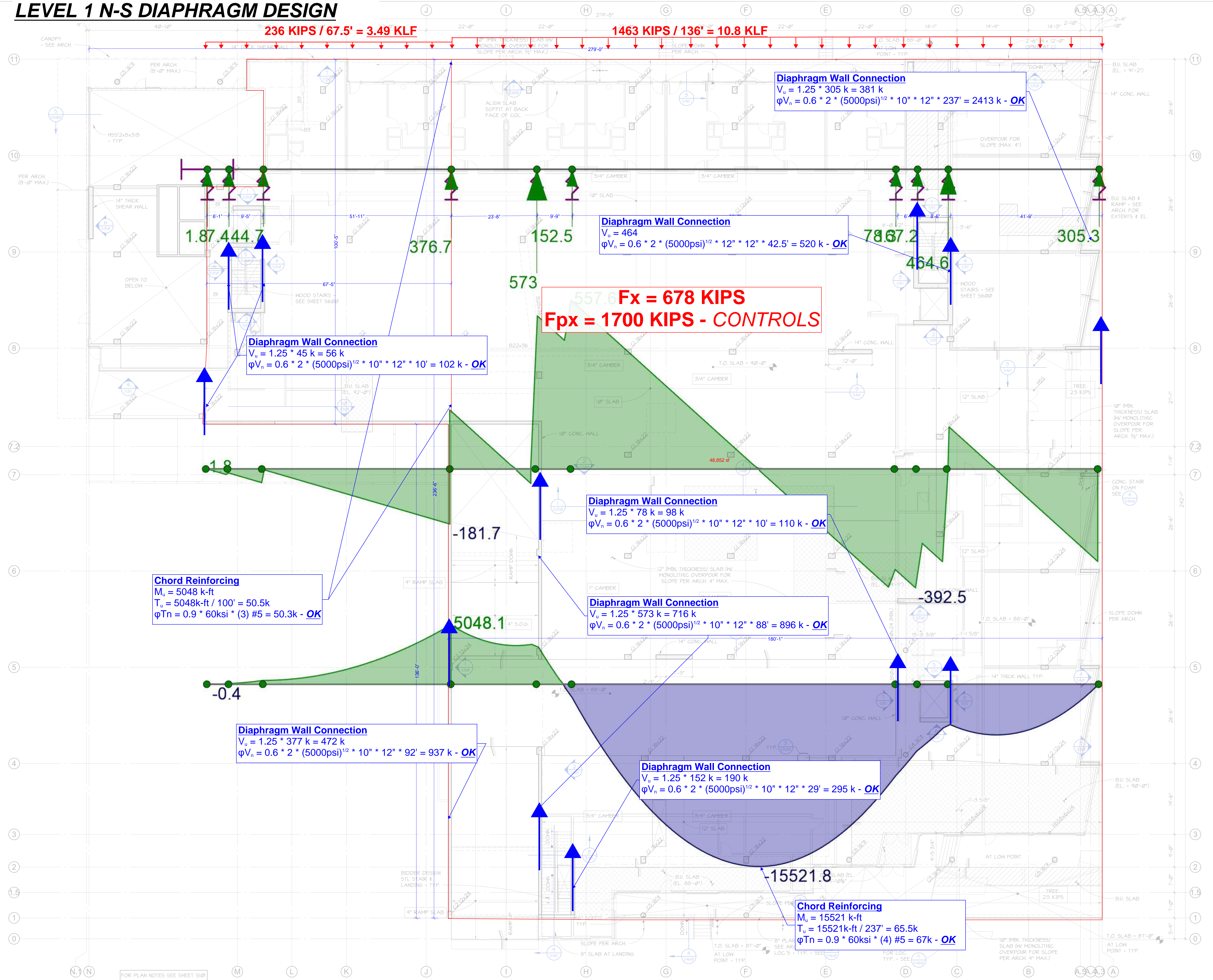
Diaphragm Shear
 $V_u = 197 \text{ k}$
 $V_u = 197 \text{ k} / 162' = 1.21 \text{ klf}$
 $\phi V_n = 0.6 * 2 * (5000\text{psi})^{1/2} * 10" * 12" = 10.2 \text{ klf} - \text{OK}$

850 KIPS / 100.5' = 8.45 KLF

850 KIPS / 136' = 6.25 KLF

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LEVEL 1 N-S DIAPHRAGM DESIGN



Diaphragm Wall Connection
 $V_u = 1.25 * 45 \text{ k} = 56 \text{ k}$
 $\phi V_n = 0.6 * 2 * (5000\text{psi})^{1/2} * 10'' * 12'' * 10' = 102 \text{ k} - \text{OK}$

Diaphragm Wall Connection
 $V_u = 464$
 $\phi V_n = 0.6 * 2 * (5000\text{psi})^{1/2} * 12'' * 12'' * 42.5' = 520 \text{ k} - \text{OK}$

Diaphragm Wall Connection
 $V_u = 1.25 * 305 \text{ k} = 381 \text{ k}$
 $\phi V_n = 0.6 * 2 * (5000\text{psi})^{1/2} * 10'' * 12'' * 237' = 2413 \text{ k} - \text{OK}$

$F_x = 678 \text{ KIPS}$
 $F_{px} = 1700 \text{ KIPS} - \text{CONTROLS}$

Diaphragm Wall Connection
 $V_u = 1.25 * 78 \text{ k} = 98 \text{ k}$
 $\phi V_n = 0.6 * 2 * (5000\text{psi})^{1/2} * 10'' * 12'' * 10' = 110 \text{ k} - \text{OK}$

Diaphragm Wall Connection
 $V_u = 1.25 * 573 \text{ k} = 716 \text{ k}$
 $\phi V_n = 0.6 * 2 * (5000\text{psi})^{1/2} * 10'' * 12'' * 88' = 896 \text{ k} - \text{OK}$

Chord Reinforcing
 $M_u = 5048 \text{ k-ft}$
 $T_u = 5048 \text{ k-ft} / 100' = 50.5 \text{ k}$
 $\phi T_n = 0.9 * 60 \text{ksi} * (3) \#5 = 50.3 \text{ k} - \text{OK}$

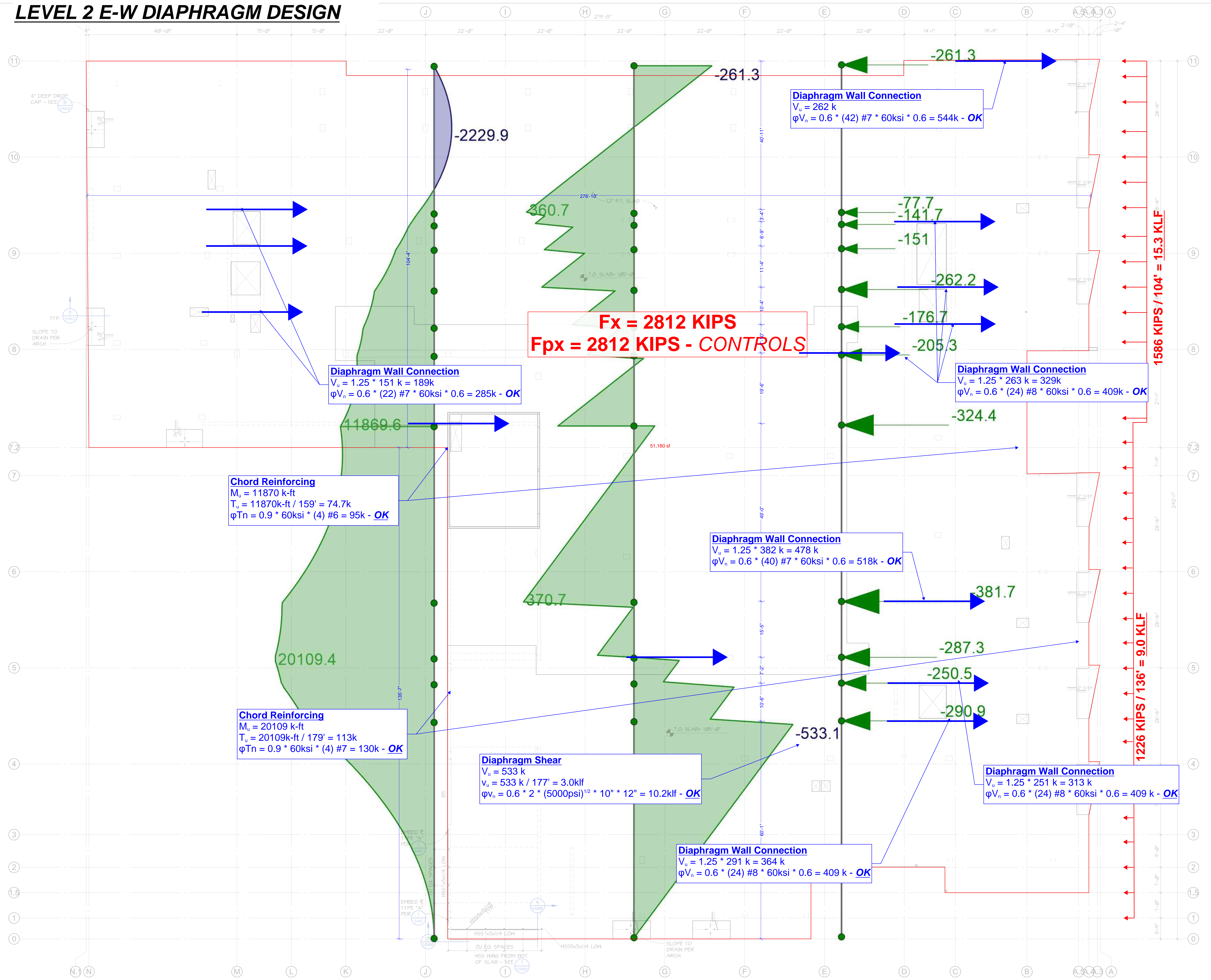
Diaphragm Wall Connection
 $V_u = 1.25 * 377 \text{ k} = 472 \text{ k}$
 $\phi V_n = 0.6 * 2 * (5000\text{psi})^{1/2} * 10'' * 12'' * 92' = 937 \text{ k} - \text{OK}$

Diaphragm Wall Connection
 $V_u = 1.25 * 152 \text{ k} = 190 \text{ k}$
 $\phi V_n = 0.6 * 2 * (5000\text{psi})^{1/2} * 10'' * 12'' * 29' = 295 \text{ k} - \text{OK}$

Chord Reinforcing
 $M_u = 15521 \text{ k-ft}$
 $T_u = 15521 \text{ k-ft} / 237' = 65.5 \text{ k}$
 $\phi T_n = 0.9 * 60 \text{ksi} * (4) \#5 = 67 \text{ k} - \text{OK}$

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LEVEL 2 E-W DIAPHRAGM DESIGN

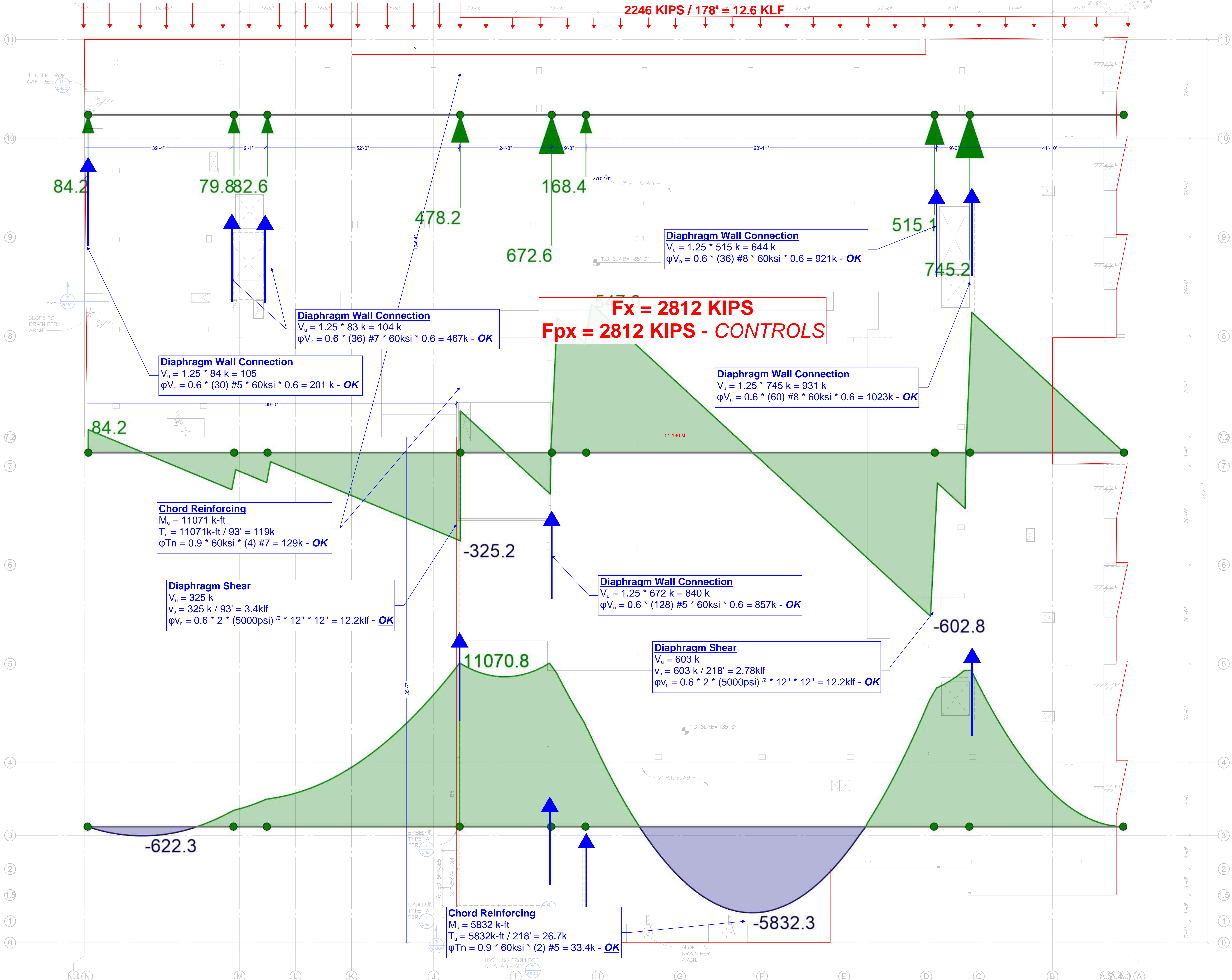


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LEVEL 2 N-S DIAPHRAGM DESIGN

565 KIPS / 99' = 5.7 KLF

2246 KIPS / 178' = 12.6 KLF



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MAT FOUNDATION

Foundation Design Criteria

Code

ACI 318-14

Materials

Concrete $f'c = 5,000$ psi, Mat
Reinforcing Steel $f_y = 60,000$ psi

Analysis

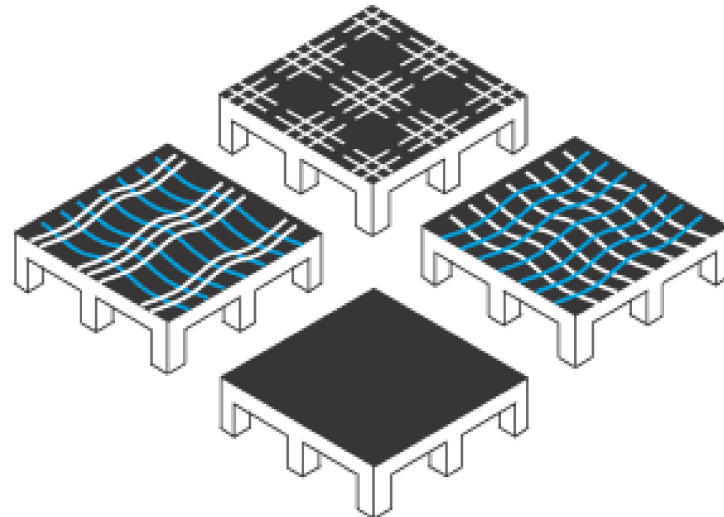
The foundation support was designed in accordance with the recommendations and values within the geotechnical report labelled "Mercer Island Mixed Use Design 2885 78th Ave SE, Mercer Island, Washington" dated June 2023, File No: 0202744-111, and prepared by Haley Aldrich.

For rammed aggregate pier information, see letter from Geopier Northwest, "Design Submittal – Geopier Soil Reinforcement REVISED", dated October 13, 2023.

Bearing pressures at the mat (Level P1 and at Detention Vault) were determined using RAM Structural System and service loads. Reinforcing was designed using RAM Concept and ultimate loads in accordance with ACI 318-14 and the allowable soil bearing values in the geotechnical report.

Load combinations included hydrostatic pressure with both full detention vault tank and empty tank as well as no hydrostatic pressure with both full tank and empty tank for soil bearing checks including seismic forces within standard load combinations. Enveloped results for all load combinations were considered for strength design.

Mat Foundation Design



Mat Foundation.cpt
10/12/2023

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8.4

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Units

Geometry Unit:

Plan Dimensions: feet
Angles: degrees

Slab Thickness: inches
Elevations: inches

Support Dimensions: inches
Support Height: feet

Loading and Reaction Unit

Point Force: Kips
- Report As Zero: 0 Kips
Point Moment: kip-ft
- Report As Zero: 0 kip-ft

Line Force: kips/ft
- Report As Zero: 0 kips/ft
Line Moment: Kips
- Report As Zero: 0 Kips

Area Force: psf
- Report As Zero: 0 psf
Area Moment: #/foot
- Report As Zero: 0 #/foot

Spring and Stiffness Unit:

Point Force Spring: kips/in
Point Moment Spring: k-ft/°

Line Force Spring: ksi
Line Moment Spring: k/°

Area Force Spring: pci
Area Moment Spring: k/ft°

Slab Analysis Unit:

Force: Kips
- Report As Zero: 0 Kips
Force Per Width: kips/ft
- Report As Zero: 0 kips/ft

Moment: kip-ft
- Report As Zero: 0 kip-ft
Moment Per Width: Kips
- Report As Zero: 0 Kips

Concrete Stress: psi
- Report As Zero: 0 psi
Deflection: inches
- Report As Zero: 0 inches

Materials Units

Concrete Volume: yd³
Tendon Force: Kips
Reinforcing Stress: ksi

Reinforcing Area: in²
Tendon Force Per Width: kips/ft
PT Weight: pounds

Reinforcement Weight: tons
Tendon Profile: inches
Cover: inches

Units (2)

Miscellaneous Unit

Floor Area: ft²

Tendon Angles (for friction): radians

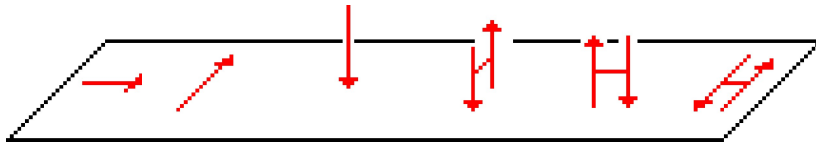
Density: pcf

Temperature Change: °F

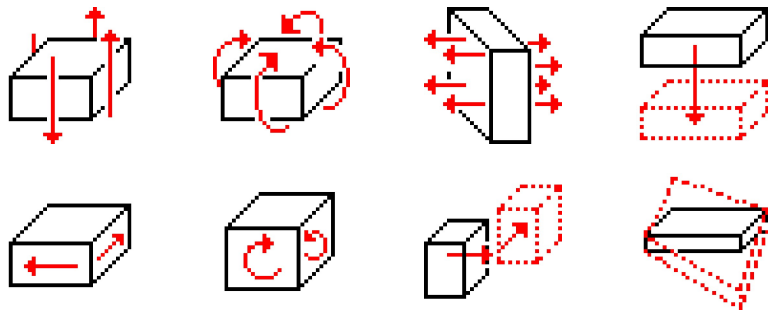
Elongations: inches

Signs

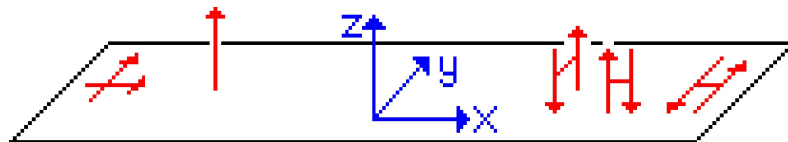
Positive Loads



Positive Analysis



Positive Reactions



Materials

Concrete Mix

| Mix Name | Density (pcf) | Density For Loads (pcf) | f_{ci} (psi) | f_c (psi) | f_{cui} (psi) | f_{cu} (psi) | Poissons Ratio | Thermal Exp Coeff | Ec Calc | User E_{ci} (psi) | User E_c (psi) |
|--------------|---------------|-------------------------|----------------|-------------|-----------------|----------------|----------------|-------------------|---------|---------------------|------------------|
| 3000 psi | 150 | 150 | 3000 | 3000 | 3725 | 3725 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 4000 psi | 150 | 150 | 3000 | 4000 | 3725 | 4975 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 5000 psi | 150 | 150 | 3000 | 5000 | 3725 | 6399 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 6000 psi | 150 | 150 | 3000 | 6000 | 3725 | 7450 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 5000 psi (2) | 145 | 150 | 3750 | 5000 | 4558 | 6399 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 4000 psi (2) | 145 | 150 | 3000 | 4000 | 3725 | 4975 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 6000 psi (2) | 145 | 150 | 4500 | 6000 | 5590 | 7450 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |

PT Systems

| System Name | Type | A_{ps} (in ²) | E_{ps} (ksi) | f_{se} (ksi) | f_{py} (ksi) | f_{pu} (ksi) | Duct Width (inches) | Strands Per Duct | Min Radius (feet) |
|---------------|----------|-----------------------------|----------------|----------------|----------------|----------------|---------------------|------------------|-------------------|
| 1/2" Unbonded | unbonded | 0.153 | 28000 | 175 | 243 | 270 | 0.5 | 1 | 6 |
| 1/2" Bonded | bonded | 0.153 | 28000 | 160 | 243 | 270 | 3 | 4 | 6 |
| 0.6" Unbonded | unbonded | 0.217 | 28000 | 175 | 243 | 270 | 0.6 | 1 | 8 |
| 0.6" Bonded | bonded | 0.217 | 28000 | 160 | 243 | 270 | 4 | 4 | 8 |

PT Stressing Parameters

| System Name | Jacking Stress (ksi) | Seating Loss (inches) | Anchor Friction | Wobble Friction (1/feet) | Angular Friction (1/radians) | Long-Term Losses (ksi) |
|---------------|----------------------|-----------------------|-----------------|--------------------------|------------------------------|------------------------|
| 1/2" Unbonded | 216 | 0.25 | 0 | 0.0014 | 0.07 | 22 |
| 1/2" Bonded | 216 | 0.25 | 0.02 | 0.001 | 0.2 | 22 |
| 0.6" Unbonded | 216 | 0.25 | 0 | 0.0014 | 0.07 | 22 |
| 0.6" Bonded | 216 | 0.25 | 0.02 | 0.001 | 0.2 | 22 |

Materials (2)

Reinforcing Bars

| <i>Bar Name</i> | <i>As (in²)</i> | <i>Es (ksi)</i> | <i>Fy (ksi)</i> | <i>Coating</i> | <i>Straight Ld/Db</i> | <i>90 Hook Ld/Db</i> | <i>180 Hook Ld/Db</i> |
|-----------------|----------------------------|-----------------|-----------------|----------------|-----------------------|----------------------|-----------------------|
| #3 | 0.11 | 29000 | 60 | None | Code | Code | Code |
| #4 | 0.2 | 29000 | 60 | None | Code | Code | Code |
| #5 | 0.31 | 29000 | 60 | None | Code | Code | Code |
| #6 | 0.44 | 29000 | 60 | None | Code | Code | Code |
| #7 | 0.6 | 29000 | 60 | None | Code | Code | Code |
| #8 | 0.79 | 29000 | 60 | None | Code | Code | Code |
| #9 | 1 | 29000 | 60 | None | Code | Code | Code |
| #10 | 1.27 | 29000 | 60 | None | Code | Code | Code |
| #11 | 1.56 | 29000 | 60 | None | Code | Code | Code |

SSR Systems

| <i>SSR System Name</i> | <i>Stud Area (in²)</i> | <i>Head Area (in²)</i> | <i>Min Clear Head Spacing (inches)</i> | <i>Specified Stud Spacing (inches)</i> | <i>Fy (ksi)</i> | <i>Stud Spacing Rounding Increment (inches)</i> | <i>Min Studs Per Rail</i> | <i>System Type</i> |
|------------------------------|-----------------------------------|-----------------------------------|--|--|-----------------|---|---------------------------|--------------------|
| 3/8" SSR | 0.11 | 1.11 | 0.5 | None | 50 | 0.25 | 2 | Rail |
| 1/2" SSR | 0.196 | 1.96 | 0.5 | None | 50 | 0.25 | 2 | Rail |
| 5/8" SSR | 0.307 | 3.07 | 0.5 | None | 50 | 0.25 | 2 | Rail |
| 3/4" SSR | 0.442 | 4.42 | 0.5 | None | 50 | 0.25 | 2 | Rail |
| Ancon Shearfix Auto-Size 217 | 0.1217 | 1.096 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 10 mm | 0.1217 | 1.096 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 12 mm | 0.1753 | 1.578 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 14 mm | 0.2386 | 2.147 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 16 mm | 0.3116 | 2.805 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 20 mm | 0.4869 | 4.383 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 24 mm | 0.7012 | 6.311 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |

Loadings

| <i>Loading Name</i> | <i>Type</i> | <i>Analysis</i> | <i>On-Pattern Factor</i> | <i>Off-Pattern Factor</i> |
|----------------------------------|--------------------------------|-----------------|--------------------------|---------------------------|
| Self-Dead Loading | Self-Weight | Normal | 1 | 1 |
| Balance Loading | Balance | Normal | 1 | 1 |
| Balanced Load (transfer) | Balance (transfer) | Normal | 1 | 1 |
| Hyperstatic Loading | Hyperstatic | Hyperstatic | 1 | 1 |
| Construction Dead Load | Stressing Dead | Normal | 1 | 1 |
| Dead Load | Dead | Normal | 1 | 1 |
| Dentention Vault Water | Dead | Normal | 1 | 1 |
| Dead Load (transfer) | Dead (transfer) | Normal | 1 | 1 |
| Live Load Reducible | Live (Reducible) | Normal | 1 | 0 |
| Live Load Reducible (transfer) | Live (Reducible) (transfer) | Normal | 1 | 0 |
| Live Load Unreducible | Live (Unreducible) | Normal | 1 | 0 |
| Partition Load | Live (Unreducible) | Normal | 1 | 0 |
| Live Load Unreducible (transfer) | Live (Unreducible) (transfer) | Normal | 1 | 0 |
| Live Load Storage | Live (Storage) | Normal | 1 | 0 |
| Live Load Storage (transfer) | Live (Storage) (transfer) | Normal | 1 | 0 |
| Live Load Roof | Live (Roof) | Normal | 1 | 0 |
| Live Load Roof (transfer) | Live (Roof) (transfer) | Normal | 1 | 0 |
| Hydrostatic | Other | Normal | 1 | 0 |
| EQ(EQ_ASCE716_X_+E_F) | Ultimate Seismic 1 (transfer) | Normal | 1 | 1 |
| H | Ultimate Seismic 1 (transfer) | Normal | 1 | 1 |
| E | Ultimate Seismic 2 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_X_-E_F) | Ultimate Seismic 2 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_Y_+E_F) | Ultimate Seismic 3 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_Y_-E_F) | Ultimate Seismic 4 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_X_+E_0.3Y_+E_F) | Ultimate Seismic 5 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_X_+E_-0.3Y_+E_F) | Ultimate Seismic 6 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_-X_+E_0.3Y_+E_F) | Ultimate Seismic 7 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_-X_+E_-0.3Y_+E_F) | Ultimate Seismic 8 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_0.3X_+E_Y_+E_F) | Ultimate Seismic 9 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_0.3X_+E_-Y_+E_F) | Ultimate Seismic 10 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_-0.3X_+E_Y_+E_F) | Ultimate Seismic 11 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_-0.3X_+E_-Y_+E_F) | Ultimate Seismic 12 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_X_+E_0.3Y_-E_F) | Ultimate Seismic 13 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_X_+E_-0.3Y_-E_F) | Ultimate Seismic 14 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_-X_+E_0.3Y_-E_F) | Ultimate Seismic 15 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_-X_+E_-0.3Y_-E_F) | Ultimate Seismic 16 (transfer) | Normal | 1 | 1 |

Loadings (2)

| | | | | |
|---------------------------------|--------------------------------|--------|---|---|
| EQ(EQ_ASCE716_0.3X_+E_Y_-E_F) | Ultimate Seismic 17 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_0.3X_+E_-Y_-E_F) | Ultimate Seismic 18 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_-0.3X_+E_Y_-E_F) | Ultimate Seismic 19 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_-0.3X_+E_-Y_-E_F) | Ultimate Seismic 20 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_X_-E_0.3Y_+E_F) | Ultimate Seismic 21 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_X_-E_-0.3Y_+E_F) | Ultimate Seismic 22 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_-X_-E_0.3Y_+E_F) | Ultimate Seismic 23 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_-X_-E_-0.3Y_+E_F) | Ultimate Seismic 24 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_0.3X_-E_Y_+E_F) | Ultimate Seismic 25 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_0.3X_-E_-Y_+E_F) | Ultimate Seismic 26 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_-0.3X_-E_Y_+E_F) | Ultimate Seismic 27 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_-0.3X_-E_-Y_+E_F) | Ultimate Seismic 28 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_X_-E_0.3Y_-E_F) | Ultimate Seismic 29 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_X_-E_-0.3Y_-E_F) | Ultimate Seismic 30 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_-X_-E_0.3Y_-E_F) | Ultimate Seismic 31 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_-X_-E_-0.3Y_-E_F) | Ultimate Seismic 32 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_0.3X_-E_Y_-E_F) | Ultimate Seismic 33 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_0.3X_-E_-Y_-E_F) | Ultimate Seismic 34 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_-0.3X_-E_Y_-E_F) | Ultimate Seismic 35 (transfer) | Normal | 1 | 1 |
| EQ(EQ_ASCE716_-0.3X_-E_-Y_-E_F) | Ultimate Seismic 36 (transfer) | Normal | 1 | 1 |
| EQ_tor_check(EQ_ASCE716_X_+E_F) | Ultimate Seismic 37 (transfer) | Normal | 1 | 1 |
| EQ_tor_check(EQ_ASCE716_X_-E_F) | Ultimate Seismic 38 (transfer) | Normal | 1 | 1 |
| EQ_tor_check(EQ_ASCE716_Y_+E_F) | Ultimate Seismic 39 (transfer) | Normal | 1 | 1 |
| EQ_tor_check(EQ_ASCE716_Y_-E_F) | Ultimate Seismic 40 (transfer) | Normal | 1 | 1 |

Load Combinations

All Dead LC

Active Design Criteria: <none>

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|------------------------|------------------------|
| Self-Dead Loading | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Dentention Vault Water | 1 |

Dead + Balance LC

Active Design Criteria: <none>

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|--------------------------|------------------------|
| Self-Dead Loading | 1 |
| Balance Loading | 1 |
| Balanced Load (transfer) | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Dentention Vault Water | 1 |

Initial Service LC

Active Design Criteria: Initial Service Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|------------------------|------------------------|
| Self-Dead Loading | 1 |
| Balance Loading | 1.13 |
| Construction Dead Load | 1 |

Load Combinations (2)

Service LC: D + L

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design, Soil Bearing Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1 |
| Balance Loading | 1 |
| Balanced Load (transfer) | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Live Load Reducible | 1 |
| Live Load Reducible (transfer) | 1 |
| Live Load Unreducible | 1 |
| Partition Load | 1 |
| Live Load Unreducible (transfer) | 1 |
| Live Load Storage | 1 |
| Live Load Storage (transfer) | 1 |

Service LC: D

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design, Soil Bearing Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|--------------------------|------------------------|
| Self-Dead Loading | 1 |
| Balance Loading | 1 |
| Balanced Load (transfer) | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |

Load Combinations (3)

Service LC: D + Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design, Soil Bearing Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|---------------------------|------------------------|
| Self-Dead Loading | 1 |
| Balance Loading | 1 |
| Balanced Load (transfer) | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Live Load Roof | 1 |
| Live Load Roof (transfer) | 1 |
| Dentention Vault Water | 1 |

Service LC: D + S

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design, Soil Bearing Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|--------------------------|------------------------|
| Self-Dead Loading | 1 |
| Balance Loading | 1 |
| Balanced Load (transfer) | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |

Load Combinations (4)

Service LC: D + 0.75L + 0.75Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design, Soil Bearing Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1 |
| Balance Loading | 1 |
| Balanced Load (transfer) | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Live Load Reducible | 0.75 |
| Live Load Reducible (transfer) | 0.75 |
| Live Load Unreducible | 0.75 |
| Partition Load | 0.75 |
| Live Load Unreducible (transfer) | 0.75 |
| Live Load Storage | 0.75 |
| Live Load Storage (transfer) | 0.75 |
| Live Load Roof | 0.75 |
| Live Load Roof (transfer) | 0.75 |
| Dentention Vault Water | 1 |

Service LC: D + 0.75L + 0.75S

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design, Soil Bearing Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1 |
| Balance Loading | 1 |
| Balanced Load (transfer) | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Live Load Reducible | 0.75 |
| Live Load Reducible (transfer) | 0.75 |
| Live Load Unreducible | 0.75 |
| Partition Load | 0.75 |
| Live Load Unreducible (transfer) | 0.75 |
| Live Load Storage | 0.75 |
| Live Load Storage (transfer) | 0.75 |

Load Combinations (5)

Service Seismic LC: D + 0.7E

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: 0.7

| <i>Loading</i> | <i>Standard Factor</i> |
|--------------------------|------------------------|
| Self-Dead Loading | 1 |
| Balance Loading | 1 |
| Balanced Load (transfer) | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |

Service Seismic LC: D - 0.7E

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: -0.7

| <i>Loading</i> | <i>Standard Factor</i> |
|--------------------------|------------------------|
| Self-Dead Loading | 1 |
| Balance Loading | 1 |
| Balanced Load (transfer) | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |

Load Combinations (6)

Service Seismic LC: $D + 0.75L + 0.75S + 0.525E$

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: 0.525

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1 |
| Balance Loading | 1 |
| Balanced Load (transfer) | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Live Load Reducible | 0.75 |
| Live Load Reducible (transfer) | 0.75 |
| Live Load Unreducible | 0.75 |
| Partition Load | 0.75 |
| Live Load Unreducible (transfer) | 0.75 |
| Live Load Storage | 0.75 |
| Live Load Storage (transfer) | 0.75 |
| Dentention Vault Water | 1 |

Service Seismic LC: $D + 0.75L + 0.75S - 0.525E$

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: -0.525

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1 |
| Balance Loading | 1 |
| Balanced Load (transfer) | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Live Load Reducible | 0.75 |
| Live Load Reducible (transfer) | 0.75 |
| Live Load Unreducible | 0.75 |
| Partition Load | 0.75 |
| Live Load Unreducible (transfer) | 0.75 |
| Live Load Storage | 0.75 |
| Live Load Storage (transfer) | 0.75 |
| Dentention Vault Water | 1 |

Load Combinations (7)

Service Seismic LC: 0.6D + 0.7E

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: 0.7

| <i>Loading</i> | <i>Standard Factor</i> |
|--------------------------|------------------------|
| Self-Dead Loading | 0.6 |
| Balance Loading | 1 |
| Balanced Load (transfer) | 1 |
| Dead Load | 0.6 |
| Dead Load (transfer) | 0.6 |

Service Seismic LC: 0.6D - 0.7E

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: -0.7

| <i>Loading</i> | <i>Standard Factor</i> |
|--------------------------|------------------------|
| Self-Dead Loading | 0.6 |
| Balance Loading | 1 |
| Balanced Load (transfer) | 1 |
| Dead Load | 0.6 |
| Dead Load (transfer) | 0.6 |

Load Combinations (8)

Sustained Service LC

Active Design Criteria: Sustained Service Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1 |
| Balance Loading | 1 |
| Balanced Load (transfer) | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Live Load Reducible | 0.5 |
| Live Load Reducible (transfer) | 0.5 |
| Live Load Unreducible | 0.5 |
| Partition Load | 0.5 |
| Live Load Unreducible (transfer) | 0.5 |
| Live Load Storage | 1 |
| Live Load Storage (transfer) | 1 |
| Live Load Roof | 0.5 |
| Live Load Roof (transfer) | 0.5 |

Factored LC: 1.4D

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading | 1.4 |
| Hyperstatic Loading | 1 |
| Dead Load | 1.4 |
| Dead Load (transfer) | 1.4 |
| Hydrostatic | 1.4 |

Load Combinations (9)

Factored LC: 0.9D

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading | 0.9 |
| Hyperstatic Loading | 1 |
| Dead Load | 0.9 |
| Dead Load (transfer) | 0.9 |

Factored LC: 1.2D + 1.6L + 0.5Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1.2 |
| Hyperstatic Loading | 1 |
| Dead Load | 1.2 |
| Dead Load (transfer) | 1.2 |
| Live Load Reducible | 1.6 |
| Live Load Reducible (transfer) | 1.6 |
| Live Load Unreducible | 1.6 |
| Partition Load | 1.6 |
| Live Load Unreducible (transfer) | 1.6 |
| Live Load Storage | 1.6 |
| Live Load Storage (transfer) | 1.6 |
| Live Load Roof | 0.5 |
| Live Load Roof (transfer) | 0.5 |
| Dentention Vault Water | 1.2 |

Load Combinations (10)

Factored LC: 1.2D + 1.6L + 0.5S

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1.2 |
| Hyperstatic Loading | 1 |
| Dead Load | 1.2 |
| Dead Load (transfer) | 1.2 |
| Live Load Reducible | 1.6 |
| Live Load Reducible (transfer) | 1.6 |
| Live Load Unreducible | 1.6 |
| Partition Load | 1.6 |
| Live Load Unreducible (transfer) | 1.6 |
| Live Load Storage | 1.6 |
| Live Load Storage (transfer) | 1.6 |
| Dentention Vault Water | 1.2 |

Factored LC: 0.9D + 1.6L + 0.5Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 0.9 |
| Hyperstatic Loading | 1 |
| Dead Load | 0.9 |
| Dead Load (transfer) | 0.9 |
| Live Load Reducible | 1.6 |
| Live Load Reducible (transfer) | 1.6 |
| Live Load Unreducible | 1.6 |
| Partition Load | 1.6 |
| Live Load Unreducible (transfer) | 1.6 |
| Live Load Storage | 1.6 |
| Live Load Storage (transfer) | 1.6 |
| Live Load Roof | 0.5 |
| Live Load Roof (transfer) | 0.5 |

Load Combinations (11)

Factored LC: 0.9D + 1.6L + 0.5S

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 0.9 |
| Hyperstatic Loading | 1 |
| Dead Load | 0.9 |
| Dead Load (transfer) | 0.9 |
| Live Load Reducible | 1.6 |
| Live Load Reducible (transfer) | 1.6 |
| Live Load Unreducible | 1.6 |
| Partition Load | 1.6 |
| Live Load Unreducible (transfer) | 1.6 |
| Live Load Storage | 1.6 |
| Live Load Storage (transfer) | 1.6 |

Factored LC: 1.2D + f1L + 1.6Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1.2 |
| Hyperstatic Loading | 1 |
| Dead Load | 1.2 |
| Dead Load (transfer) | 1.2 |
| Live Load Reducible | 0.5 |
| Live Load Reducible (transfer) | 0.5 |
| Live Load Unreducible | 1 |
| Partition Load | 1 |
| Live Load Unreducible (transfer) | 1 |
| Live Load Storage | 1 |
| Live Load Storage (transfer) | 1 |
| Live Load Roof | 1.6 |
| Live Load Roof (transfer) | 1.6 |
| Dentention Vault Water | 1.2 |

Load Combinations (12)

Factored LC: 1.2D + f1L + 1.6S

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1.2 |
| Hyperstatic Loading | 1 |
| Dead Load | 1.2 |
| Dead Load (transfer) | 1.2 |
| Live Load Reducible | 0.5 |
| Live Load Reducible (transfer) | 0.5 |
| Live Load Unreducible | 1 |
| Partition Load | 1 |
| Live Load Unreducible (transfer) | 1 |
| Live Load Storage | 1 |
| Live Load Storage (transfer) | 1 |
| Dentention Vault Water | 1.2 |

Factored LC: 0.9D + f1L + 1.6Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 0.9 |
| Hyperstatic Loading | 1 |
| Dead Load | 0.9 |
| Dead Load (transfer) | 0.9 |
| Live Load Reducible | 0.5 |
| Live Load Reducible (transfer) | 0.5 |
| Live Load Unreducible | 1 |
| Partition Load | 1 |
| Live Load Unreducible (transfer) | 1 |
| Live Load Storage | 1 |
| Live Load Storage (transfer) | 1 |
| Live Load Roof | 1.6 |
| Live Load Roof (transfer) | 1.6 |

Load Combinations (13)

Factored LC: 0.9D + f1L + 1.6S

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 0.9 |
| Hyperstatic Loading | 1 |
| Dead Load | 0.9 |
| Dead Load (transfer) | 0.9 |
| Live Load Reducible | 0.5 |
| Live Load Reducible (transfer) | 0.5 |
| Live Load Unreducible | 1 |
| Partition Load | 1 |
| Live Load Unreducible (transfer) | 1 |
| Live Load Storage | 1 |
| Live Load Storage (transfer) | 1 |

Factored Seismic LC: 1.2D + f1L + f2S + E

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: 1

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1.2 |
| Hyperstatic Loading | 1 |
| Dead Load | 1.2 |
| Dead Load (transfer) | 1.2 |
| Live Load Reducible | 0.5 |
| Live Load Reducible (transfer) | 0.5 |
| Live Load Unreducible | 1 |
| Partition Load | 1 |
| Live Load Unreducible (transfer) | 1 |
| Live Load Storage | 1 |
| Live Load Storage (transfer) | 1 |
| Dentention Vault Water | 1.2 |

Load Combinations (14)

Factored Seismic LC: 1.2D + f1L + f2S - E

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: -1

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1.2 |
| Hyperstatic Loading | 1 |
| Dead Load | 1.2 |
| Dead Load (transfer) | 1.2 |
| Live Load Reducible | 0.5 |
| Live Load Reducible (transfer) | 0.5 |
| Live Load Unreducible | 1 |
| Partition Load | 1 |
| Live Load Unreducible (transfer) | 1 |
| Live Load Storage | 1 |
| Live Load Storage (transfer) | 1 |
| Dentention Vault Water | 1.2 |

Factored Seismic LC: 0.9D + E

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: 1

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading | 0.9 |
| Hyperstatic Loading | 1 |
| Dead Load | 0.9 |
| Dead Load (transfer) | 0.9 |

Factored Seismic LC: 0.9D - E

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: -1

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading | 0.9 |
| Hyperstatic Loading | 1 |
| Dead Load | 0.9 |
| Dead Load (transfer) | 0.9 |

Load Combinations (15)

All Dead LC + H

Active Design Criteria: <none>

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| H | 1 |

Dead + Balance LC + H

Active Design Criteria: <none>

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|--------------------------|------------------------|
| Self-Dead Loading | 1 |
| Balance Loading | 1 |
| Balanced Load (transfer) | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| H | 1 |

Initial Service LC + H

Active Design Criteria: Initial Service Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|------------------------|------------------------|
| Self-Dead Loading | 1 |
| Balance Loading | 1.13 |
| Construction Dead Load | 1 |
| H | 1 |

Load Combinations (16)

Service LC: D + L + H

Active Design Criteria: Code Minimum Design, User Minimum Design, Service Design, Soil Bearing Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Live Load Reducible | 1 |
| Live Load Reducible (transfer) | 1 |
| Live Load Unreducible | 1 |
| Partition Load | 1 |
| Live Load Unreducible (transfer) | 1 |
| Live Load Storage | 1 |
| Live Load Storage (transfer) | 1 |
| H | 1 |

Service LC: D + H

Active Design Criteria: Code Minimum Design, User Minimum Design, Service Design, Soil Bearing Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| H | 1 |

Service LC: D + Lr + H

Active Design Criteria: Code Minimum Design, User Minimum Design, Service Design, Soil Bearing Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|---------------------------|------------------------|
| Self-Dead Loading | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Live Load Roof | 1 |
| Live Load Roof (transfer) | 1 |
| H | 1 |

Load Combinations (17)

Service LC: D + S + H

Active Design Criteria: Code Minimum Design, User Minimum Design, Service Design, Soil Bearing Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| H | 1 |

Service LC: D + 0.75L + 0.75Lr + H

Active Design Criteria: Code Minimum Design, User Minimum Design, Service Design, Soil Bearing Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Live Load Reducible | 0.75 |
| Live Load Reducible (transfer) | 0.75 |
| Live Load Unreducible | 0.75 |
| Partition Load | 0.75 |
| Live Load Unreducible (transfer) | 0.75 |
| Live Load Storage | 0.75 |
| Live Load Storage (transfer) | 0.75 |
| Live Load Roof | 0.75 |
| Live Load Roof (transfer) | 0.75 |
| H | 1 |

Load Combinations (18)

Service LC: D + 0.75L + 0.75S + H

Active Design Criteria: Code Minimum Design, User Minimum Design, Service Design, Soil Bearing Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Live Load Reducible | 0.75 |
| Live Load Reducible (transfer) | 0.75 |
| Live Load Unreducible | 0.75 |
| Partition Load | 0.75 |
| Live Load Unreducible (transfer) | 0.75 |
| Live Load Storage | 0.75 |
| Live Load Storage (transfer) | 0.75 |
| H | 1 |

Service Seismic LC: D + 0.7E + H

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: 0.7

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Hydrostatic | 1 |

Service Seismic LC: D - 0.7E + H

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: -0.7

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Hydrostatic | 1 |

Load Combinations (19)

Service Seismic LC: $D + 0.75L + 0.75S + 0.525E + H$

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: 0.525

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Live Load Reducible | 0.75 |
| Live Load Reducible (transfer) | 0.75 |
| Live Load Unreducible | 0.75 |
| Partition Load | 0.75 |
| Live Load Unreducible (transfer) | 0.75 |
| Live Load Storage | 0.75 |
| Live Load Storage (transfer) | 0.75 |
| Hydrostatic | 1 |

Service Seismic LC: $D + 0.75L + 0.75S - 0.525E + H$

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: -0.525

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Live Load Reducible | 0.75 |
| Live Load Reducible (transfer) | 0.75 |
| Live Load Unreducible | 0.75 |
| Partition Load | 0.75 |
| Live Load Unreducible (transfer) | 0.75 |
| Live Load Storage | 0.75 |
| Live Load Storage (transfer) | 0.75 |
| Hydrostatic | 1 |

Load Combinations (20)

Service Seismic LC: 0.6D + 0.7E + H

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: 0.7

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading | 0.6 |
| Dead Load | 0.6 |
| Dead Load (transfer) | 0.6 |
| Hydrostatic | 1 |

Service Seismic LC: 0.6D - 0.7E + H

Active Design Criteria: Soil Bearing Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: -0.7

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading | 0.6 |
| Dead Load | 0.6 |
| Dead Load (transfer) | 0.6 |
| Hydrostatic | 1 |

Sustained Service LC + H

Active Design Criteria: Sustained Service Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1 |
| Dead Load | 1 |
| Dead Load (transfer) | 1 |
| Live Load Reducible | 0.5 |
| Live Load Reducible (transfer) | 0.5 |
| Live Load Unreducible | 0.5 |
| Partition Load | 0.5 |
| Live Load Unreducible (transfer) | 0.5 |
| Live Load Storage | 1 |
| Live Load Storage (transfer) | 1 |
| Live Load Roof | 0.5 |
| Live Load Roof (transfer) | 0.5 |
| Hydrostatic | 1 |

Load Combinations (21)

Factored LC: 1.4D + 1.6H

Active Design Criteria: Code Minimum Design, User Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading | 1.4 |
| Dead Load | 1.4 |
| Dead Load (transfer) | 1.4 |
| Hydrostatic | 1.6 |

Factored LC: 0.9D + 1.6H

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|-----------------------|------------------------|
| Self-Dead Loading | 0.9 |
| Dead Load | 0.9 |
| Dead Load (transfer) | 0.9 |
| Detention Vault Water | 1.6 |

Factored LC: 1.2D + 1.6L + 0.5Lr + 1.6H

Active Design Criteria: Code Minimum Design, User Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1.2 |
| Dead Load | 1.2 |
| Dead Load (transfer) | 1.2 |
| Live Load Reducible | 1.6 |
| Live Load Reducible (transfer) | 1.6 |
| Live Load Unreducible | 1.6 |
| Partition Load | 1.6 |
| Live Load Unreducible (transfer) | 1.6 |
| Live Load Storage | 1.6 |
| Live Load Storage (transfer) | 1.6 |
| Live Load Roof | 0.5 |
| Live Load Roof (transfer) | 0.5 |
| Hydrostatic | 1.5 |

Load Combinations (22)

Factored LC: 1.2D + 1.6L + 0.5S + 1.6H

Active Design Criteria: Code Minimum Design, User Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1.2 |
| Dead Load | 1.2 |
| Dead Load (transfer) | 1.2 |
| Live Load Reducible | 1.6 |
| Live Load Reducible (transfer) | 1.6 |
| Live Load Unreducible | 1.6 |
| Partition Load | 1.6 |
| Live Load Unreducible (transfer) | 1.6 |
| Live Load Storage | 1.6 |
| Live Load Storage (transfer) | 1.6 |
| Hydrostatic | 1.6 |

Factored LC: 0.9D + 1.6L + 0.5Lr + 1.6H

Active Design Criteria: Code Minimum Design, User Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 0.9 |
| Dead Load | 0.9 |
| Dead Load (transfer) | 0.9 |
| Live Load Reducible | 1.6 |
| Live Load Reducible (transfer) | 1.6 |
| Live Load Unreducible | 1.6 |
| Partition Load | 1.6 |
| Live Load Unreducible (transfer) | 1.6 |
| Live Load Storage | 1.6 |
| Live Load Storage (transfer) | 1.6 |
| Live Load Roof | 0.5 |
| Live Load Roof (transfer) | 0.5 |
| Hydrostatic | 1.6 |

Load Combinations (23)

Factored LC: 0.9D + 1.6L + 0.5S + 1.6H

Active Design Criteria: Code Minimum Design, User Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 0.9 |
| Dead Load | 0.9 |
| Dead Load (transfer) | 0.9 |
| Live Load Reducible | 1.6 |
| Live Load Reducible (transfer) | 1.6 |
| Live Load Unreducible | 1.6 |
| Partition Load | 1.6 |
| Live Load Unreducible (transfer) | 1.6 |
| Live Load Storage | 1.6 |
| Live Load Storage (transfer) | 1.6 |
| H | 1.6 |

Factored LC: 1.2D + f1L + 1.6Lr + 1.6H

Active Design Criteria: Code Minimum Design, User Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1.2 |
| Dead Load | 1.2 |
| Dead Load (transfer) | 1.2 |
| Live Load Reducible | 1 |
| Live Load Reducible (transfer) | 1 |
| Live Load Unreducible | 1 |
| Partition Load | 1 |
| Live Load Unreducible (transfer) | 1 |
| Live Load Storage | 1 |
| Live Load Storage (transfer) | 1 |
| Live Load Roof | 1.6 |
| Live Load Roof (transfer) | 1.6 |
| H | 1.6 |

Load Combinations (24)

Factored LC: 1.2D + f1L + 1.6S + 1.6H

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1.2 |
| Dead Load | 1.2 |
| Dead Load (transfer) | 1.2 |
| Live Load Reducible | 1 |
| Live Load Reducible (transfer) | 1 |
| Live Load Unreducible | 1 |
| Partition Load | 1 |
| Live Load Unreducible (transfer) | 1 |
| Live Load Storage | 1 |
| Live Load Storage (transfer) | 1 |
| Live Load Roof | 1.6 |
| Live Load Roof (transfer) | 1.6 |
| Hydrostatic | 1.6 |

Factored LC: 0.9D + f1L + 1.6Lr + 1.6H

Active Design Criteria: Code Minimum Design, User Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 0.9 |
| Dead Load | 0.9 |
| Dead Load (transfer) | 0.9 |
| Live Load Reducible | 1 |
| Live Load Reducible (transfer) | 1 |
| Live Load Unreducible | 1 |
| Partition Load | 1 |
| Live Load Unreducible (transfer) | 1 |
| Live Load Storage | 1 |
| Live Load Storage (transfer) | 1 |
| Live Load Roof | 1.6 |
| Live Load Roof (transfer) | 1.6 |
| Hydrostatic | 1.6 |

Load Combinations (25)

Factored LC: 0.9D + f1L + 1.6S + 1.6H

Active Design Criteria: Code Minimum Design, User Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 0.9 |
| Dead Load | 0.9 |
| Dead Load (transfer) | 0.9 |
| Live Load Reducible | 1.6 |
| Live Load Reducible (transfer) | 1.6 |
| Live Load Unreducible | 1.6 |
| Partition Load | 1.6 |
| Live Load Unreducible (transfer) | 1.6 |
| Live Load Storage | 1.6 |
| Live Load Storage (transfer) | 1.6 |
| Hydrostatic | 1.6 |

Factored Seismic LC: 1.2D + f1L + f2S + E + 1.6H

Active Design Criteria: Code Minimum Design, User Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: 1

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1.2 |
| Dead Load | 1.2 |
| Dead Load (transfer) | 1.2 |
| Live Load Reducible | 0.5 |
| Live Load Reducible (transfer) | 0.5 |
| Live Load Unreducible | 1 |
| Partition Load | 1 |
| Live Load Unreducible (transfer) | 1 |
| Live Load Storage | 1 |
| Live Load Storage (transfer) | 1 |
| Hydrostatic | 1.6 |

Load Combinations (26)

Factored Seismic LC: 1.2D + f1L + f2S - E + 1.6H

Active Design Criteria: Code Minimum Design, User Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: -1

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------------------|------------------------|
| Self-Dead Loading | 1.2 |
| Dead Load | 1.2 |
| Dead Load (transfer) | 1.2 |
| Live Load Reducible | 0.5 |
| Live Load Reducible (transfer) | 0.5 |
| Live Load Unreducible | 1 |
| Partition Load | 1 |
| Live Load Unreducible (transfer) | 1 |
| Live Load Storage | 1 |
| Live Load Storage (transfer) | 1 |
| Hydrostatic | 1.6 |

Factored Seismic LC: 0.9D + E + 1.6H

Active Design Criteria: Code Minimum Design, User Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: 1

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading | 0.9 |
| Dead Load | 0.9 |
| Dead Load (transfer) | 0.9 |
| Hydrostatic | 1.6 |

Factored Seismic LC: 0.9D - E + 1.6H

Active Design Criteria: Code Minimum Design, User Minimum Design, Strength Design, Ductility Design

Analysis: Zero-Tension

Key Lateral Loading: Seismic-Ultimate Standard Factor: -1

| <i>Loading</i> | <i>Standard Factor</i> |
|----------------------|------------------------|
| Self-Dead Loading | 0.9 |
| Dead Load | 0.9 |
| Dead Load (transfer) | 0.9 |
| Hydrostatic | 1.6 |

Design Rules

Code Minimum Design

318-14 Min. Reinforcement

User Minimum Design

Specified Min. Reinforcement

Initial Service Design

318-14 Initial Service Design

Service Design

318-14 Service Design

Include detailed section analysis

Sustained Service Design

318-14 Sustained Service Design

Strength Design

318-14 Strength Design

Punching Shear Design

Ductility Design

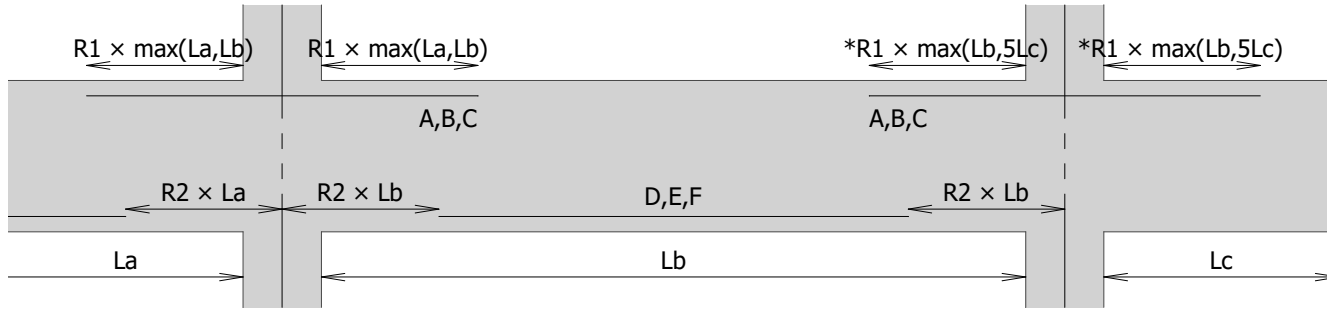
318-14 Ductility Design

Soil Bearing Design

None

Detailing Rules

Custom Span Detailing Rules



| Rule | A | A | B | B | C | C | D | D | E | E | F | F |
|------|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|
| Name | Fraction | R1 | Fraction | R1 | Fraction | R1 | Fraction | R2 | Fraction | R2 | Fraction | R2 |
| None | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

"A", "B" and "C", are support reinforcement sets, based on the peak reinforcement in the support zone.

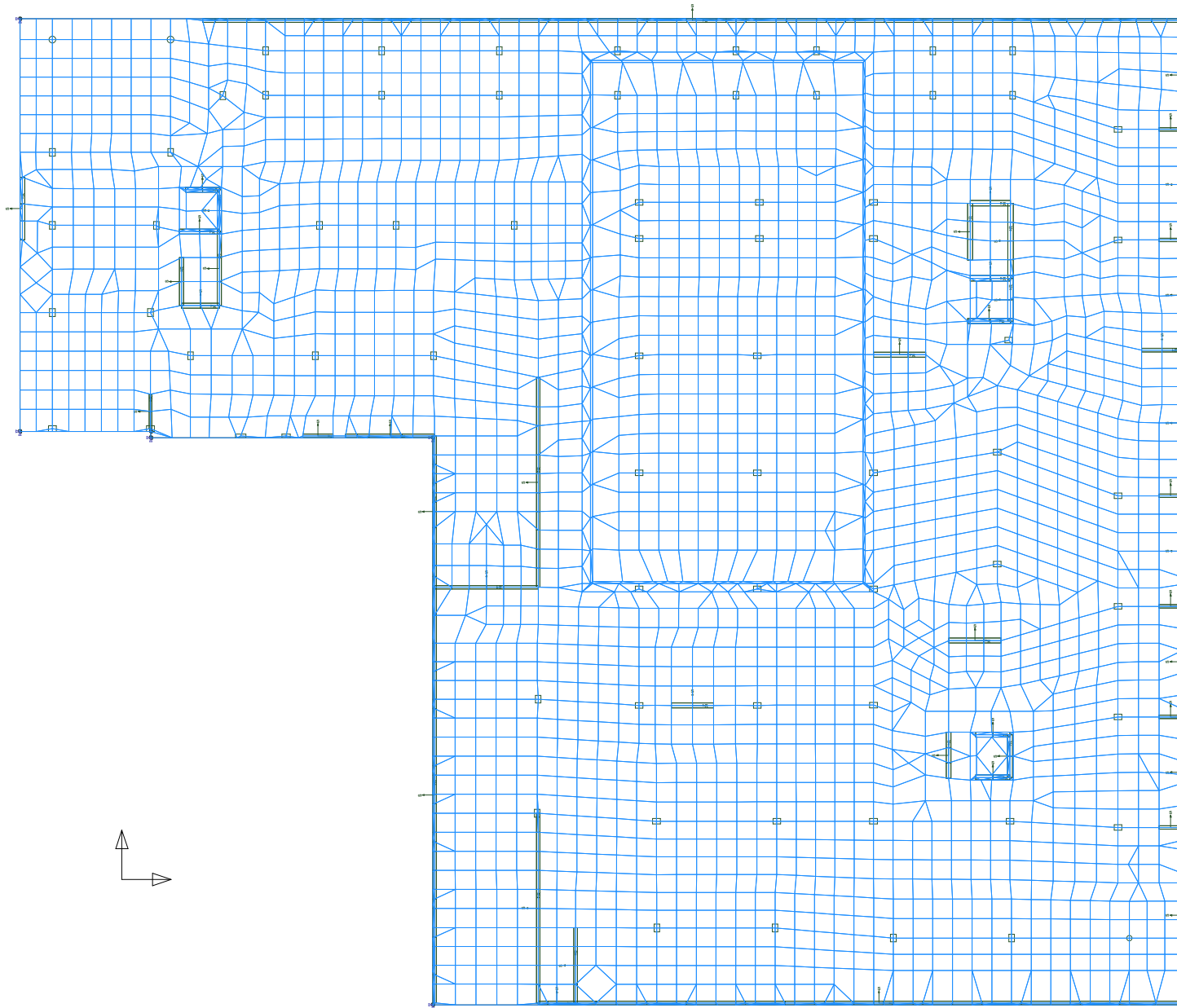
"D", "E" and "F", are span reinforcement sets, based on the peak reinforcement in the span zone.

"*R1" is never taken as greater than 0.2 when multiplied by Lc (or Lcc).

"Fraction" is the ratio of set reinforcement to peak reinforcement. It is always in the 0.0 to 1.0 range.

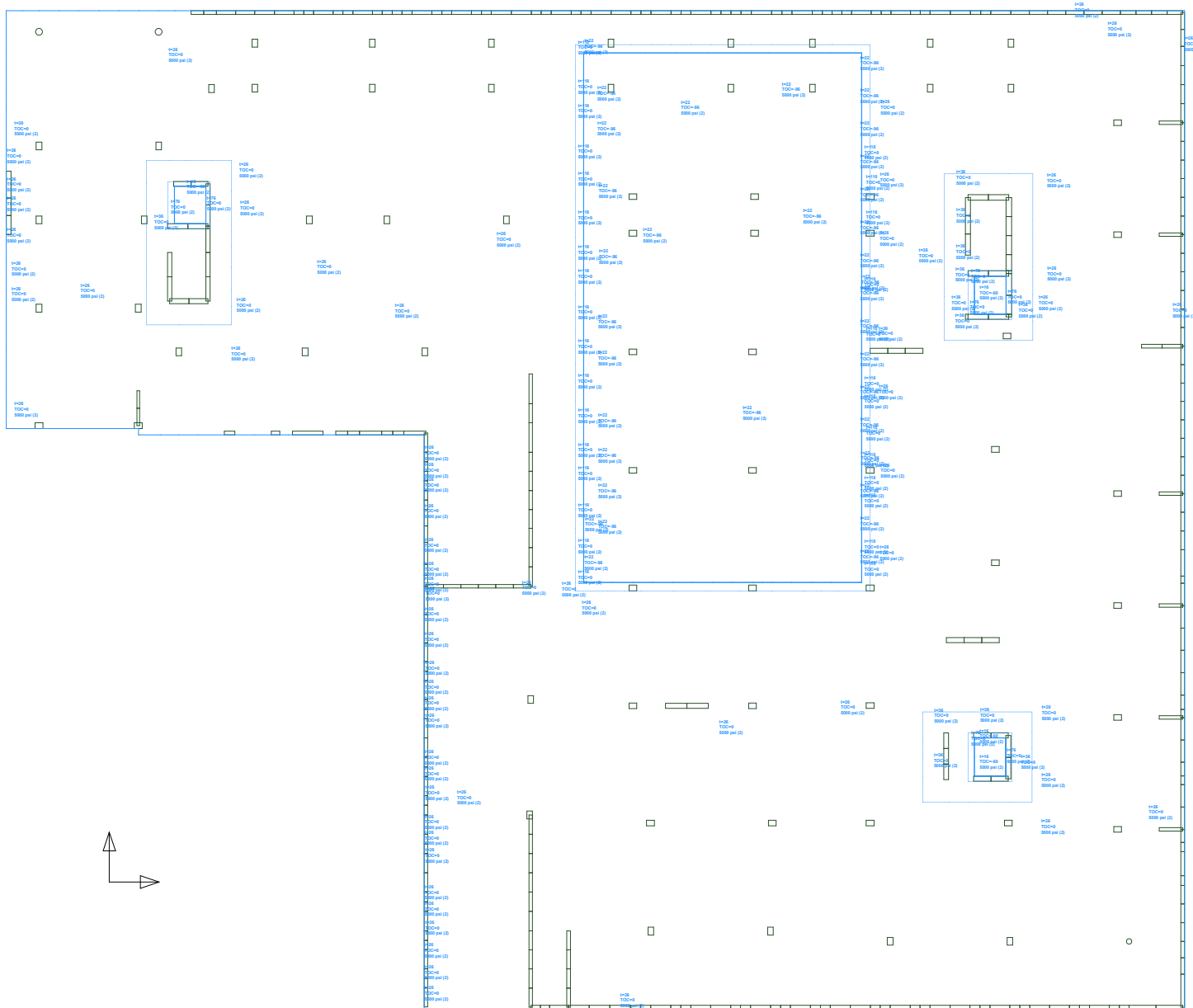
Element: Standard Plan

Element: User Lines; User Notes; User Dimensions; Wall Elements Below; Wall Elements Above; Wall Element Groups Below; Wall Element Groups Above; Wall Element Group Area; Column Elements Below; Column Elements Above; Slab Elements; Point Springs; Point Spring Icons; Line Springs; Line Spring Icons; Area Springs; Area Spring Icons; Point Supports; Point Support Icons; Line Supports; Line Support Icons;
Scale = 1/400



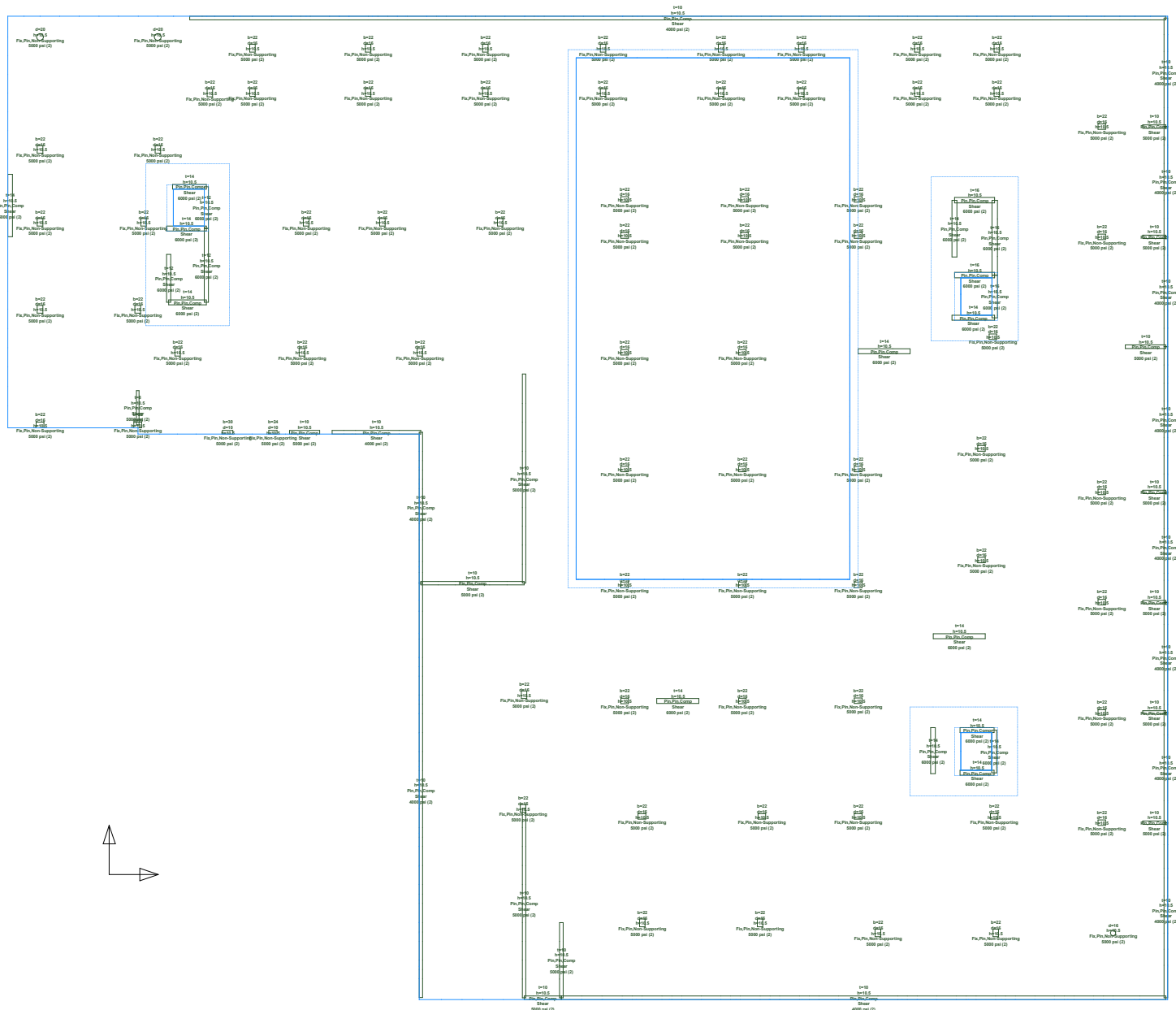
Element: Slab Summary Plan

Element: User Lines; User Notes; User Dimensions; Wall Elements Below; Wall Elements Above; Column Elements Below; Column Elements Above; Point Springs; Point Spring Icons; Line Springs; Line Spring Icons; Slab Element; Slab Element Outline Only; Slab Element Thickness; Slab Element Elevations; Slab Element Concrete Models;
Scale: 1:400



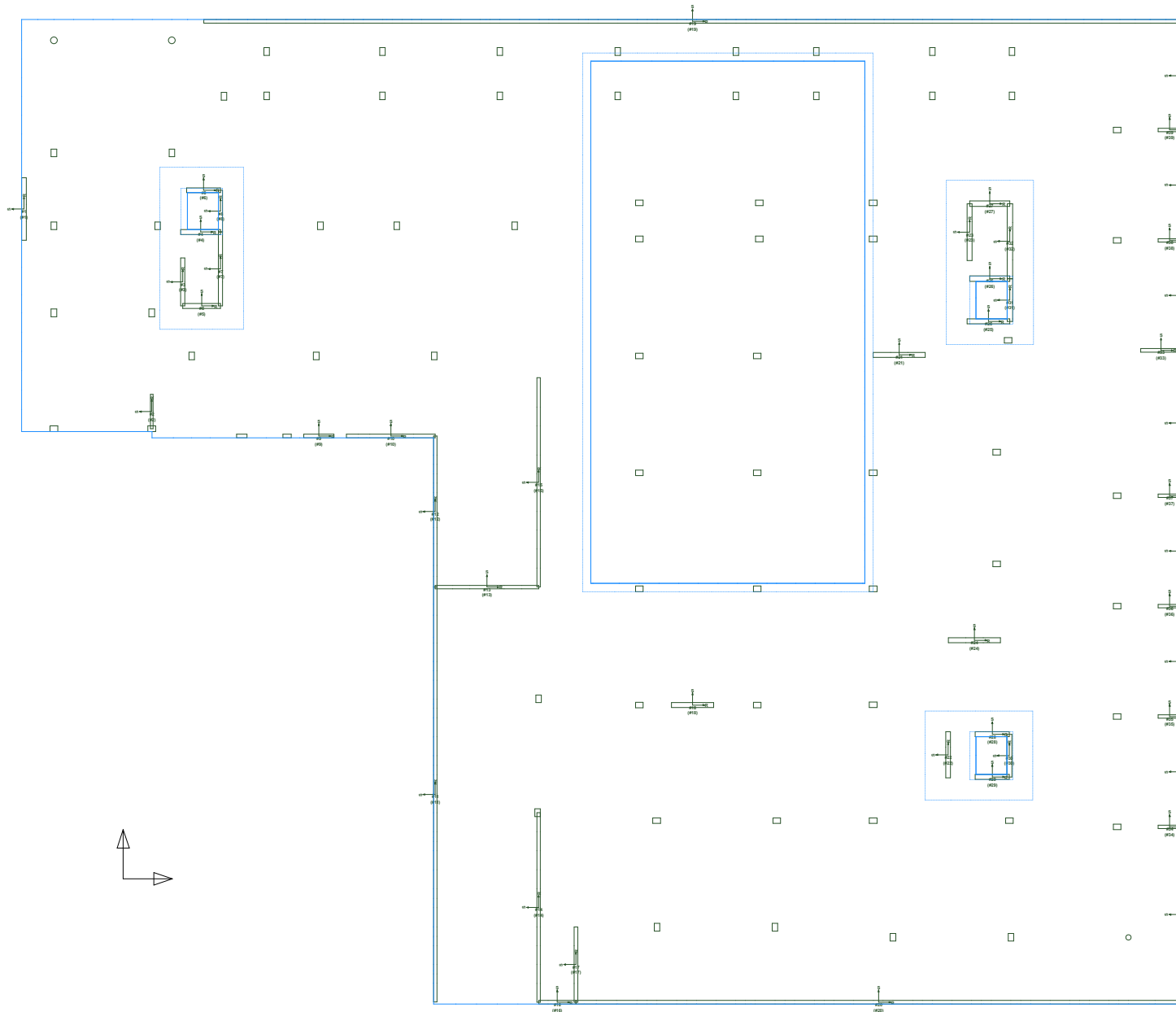
Element: Supports Above Slab Summary Plan

Element: User Lines; User Notes; User Dimensions; Wall Elements Above; Wall Element Thicknesses; Wall Element Heights; Wall Element Party; Wall Element Shear Party; Wall Element Concrete Models; Wall Element Outline Only; Column Elements Above; Column Element Dimensions; Column Element Heights; Column Element Party; Column Element Concrete Models; Slab Elements; Slab Element Outline Only; Scale: 1:400



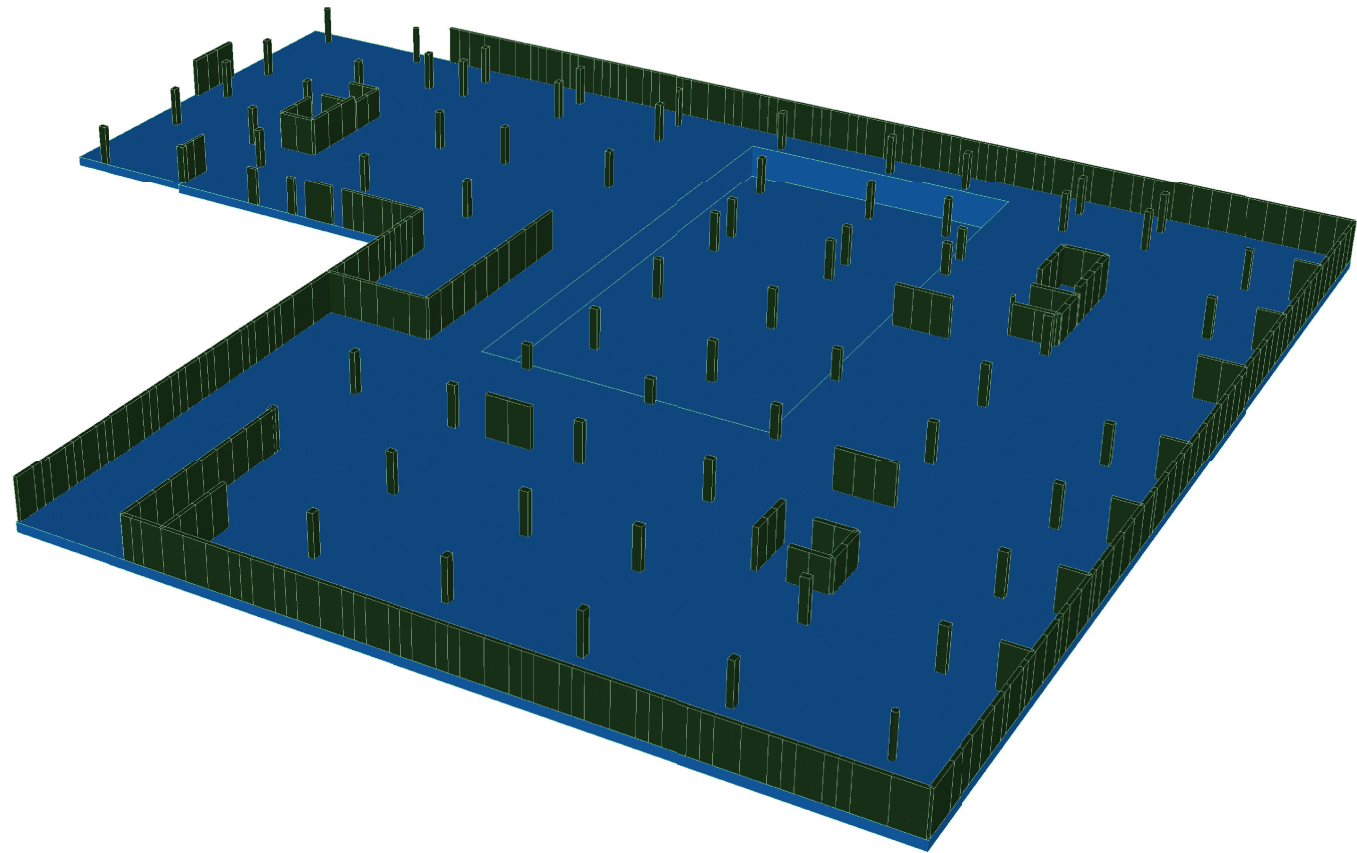
Element: Wall Group Above Slab Summary Plan

Element: Wall Element Group Above, Wall Element Group Numbers, Wall Element Group Names, Wall Element Group Area, Column Elements Above, Slab Elements, Slab Element Outline Only, Scale = 1/4"=1'-0"



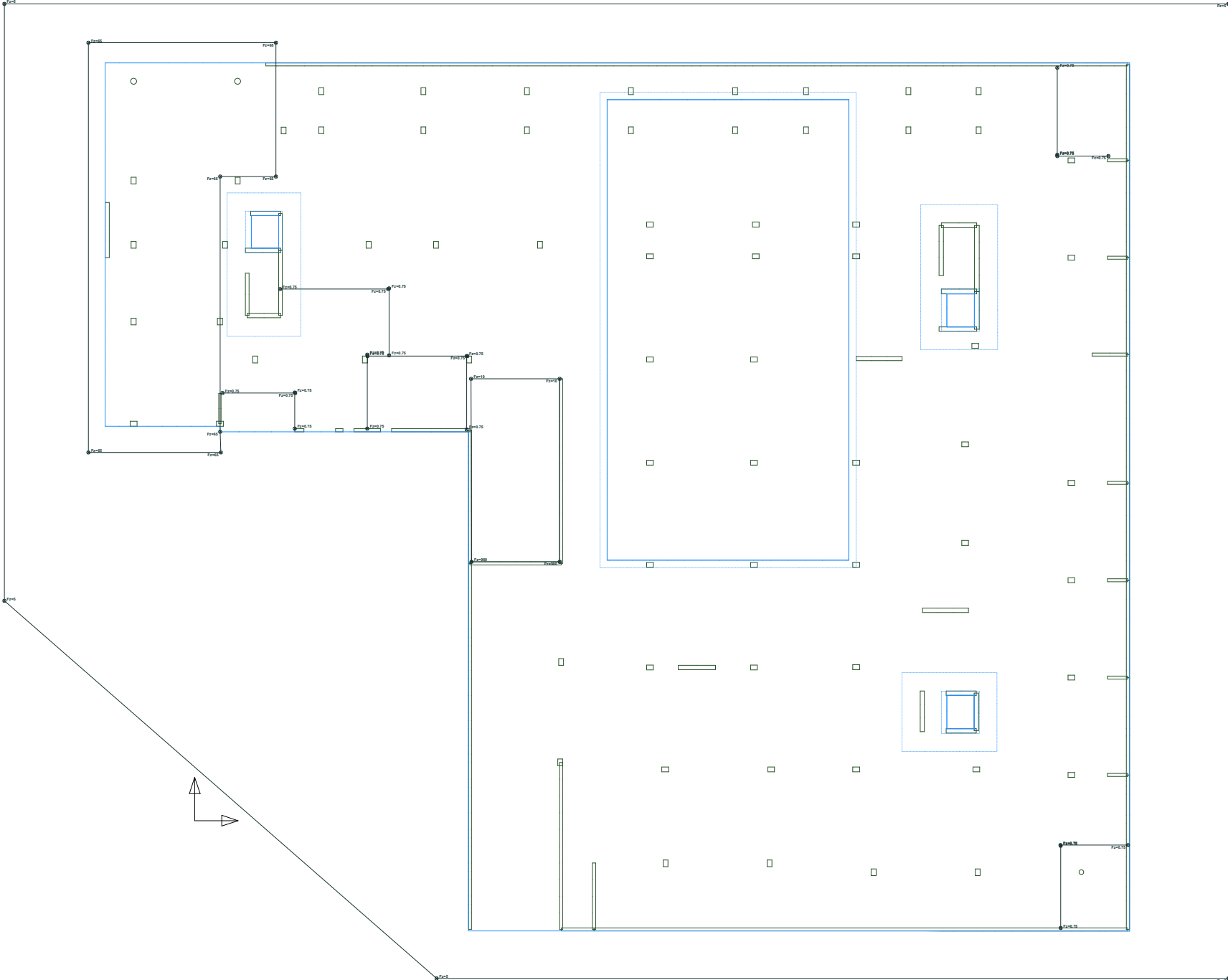
Element: Structure Summary Perspective

Wall Elements Below; Wall Elements Above; Column Elements Below; Column Elements Above; Slab Elements;



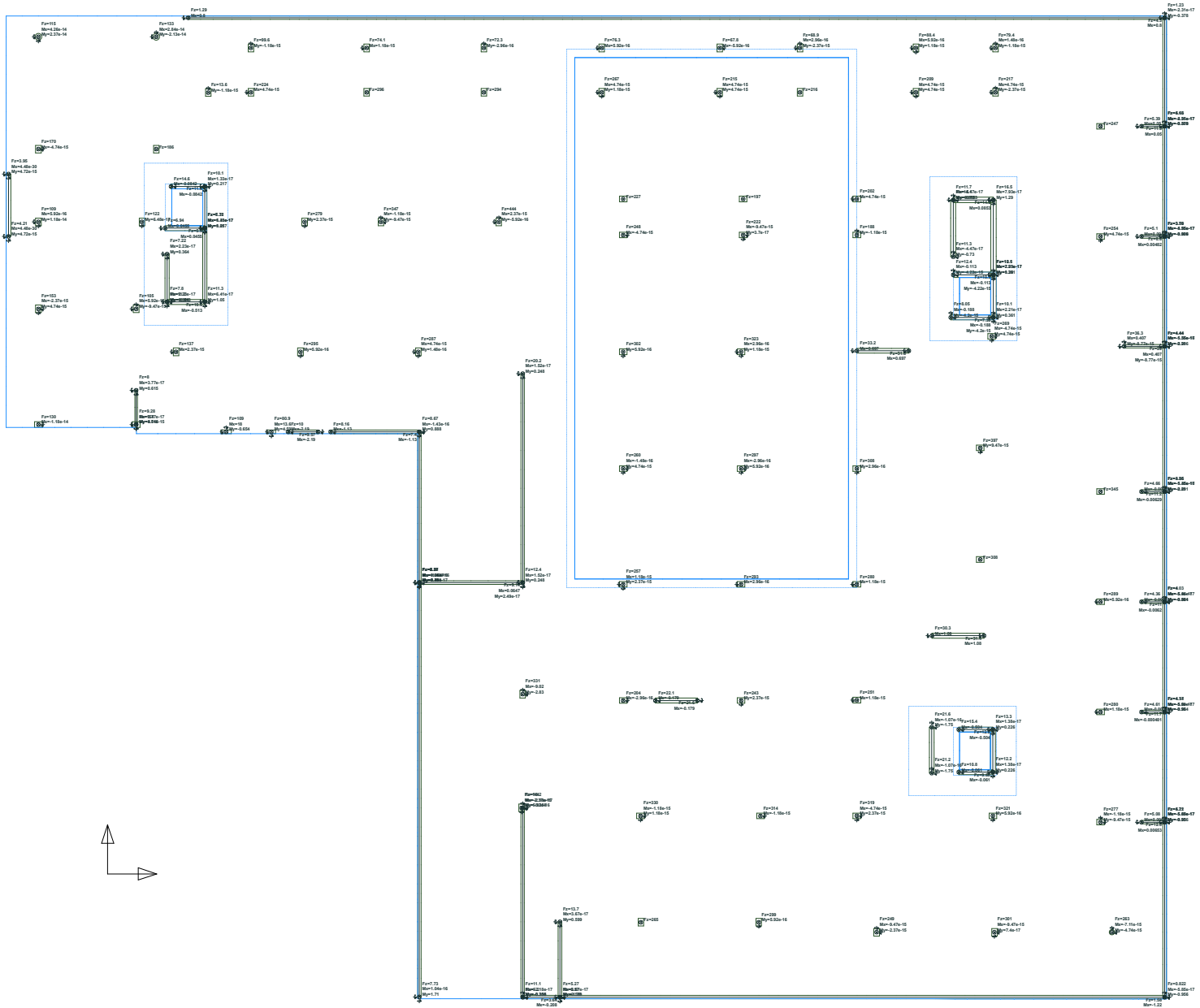
Dead Load: All Loads Plan

Dead Load: User Notes: User Dimensions: Point Loads: Point Load Form: Point Load Values: Line Loads: Line Load Form: Line Load Values: Area Loads: Area Load Form: Area Load Values: Column: Wall Elements Below: Wall Elements Above: Wall Element Outline Only: Column Element Below: Column Element Above: Slab Elements: Slab Element Outline Only: Scale = 1/8" = 1'-0"



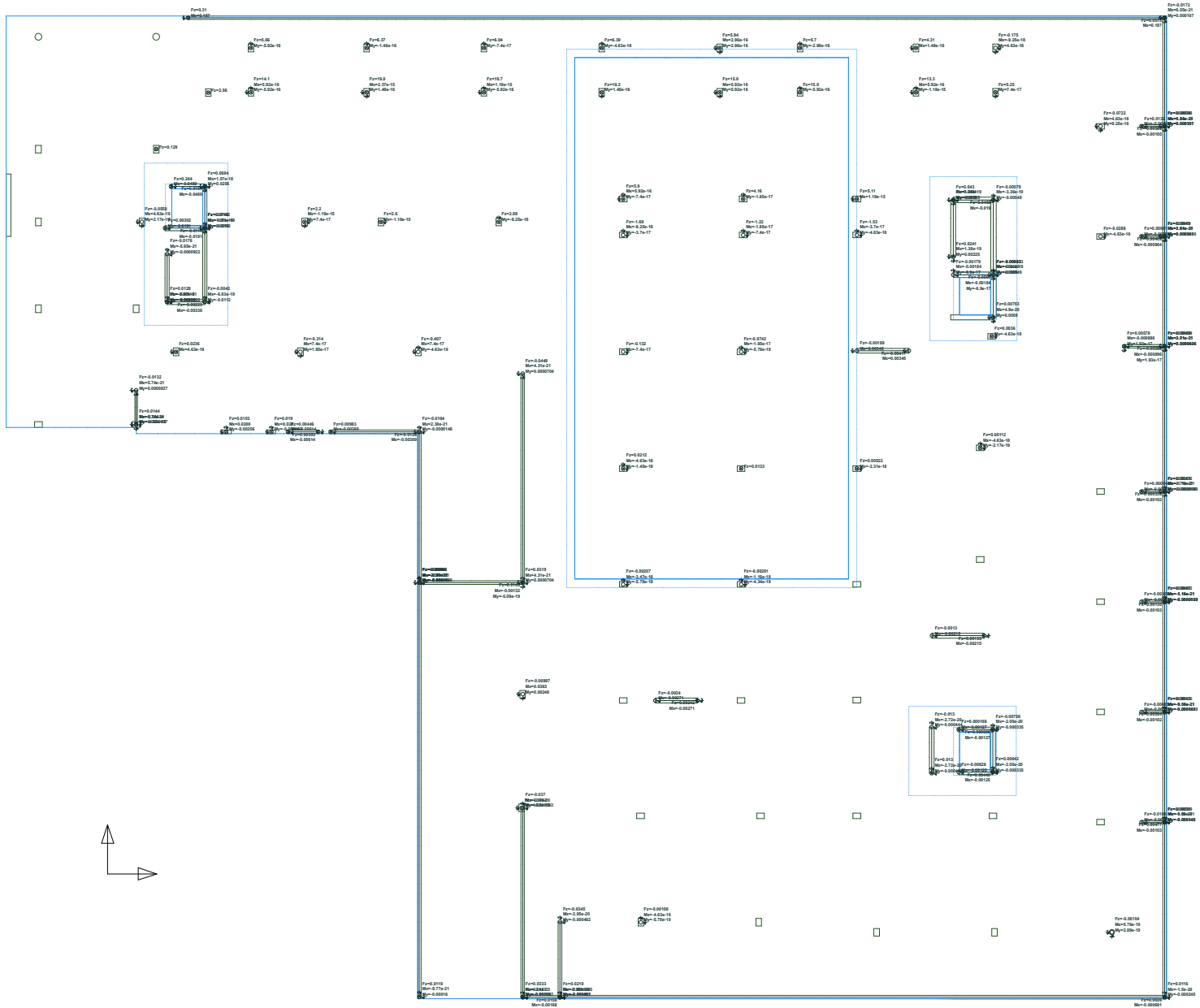
Dead Load (transfer): All Loads Plan

Dead Load (transfer): User Loads, User Moments, User Dimensions, Point Loads, Point Load X-axis, Point Load Y-axis, Line Loads, Line Load X-axis, Line Load Y-axis, Area Loads, Area Load X-axis, Area Load Y-axis, Element, Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only
Scale = 1:400



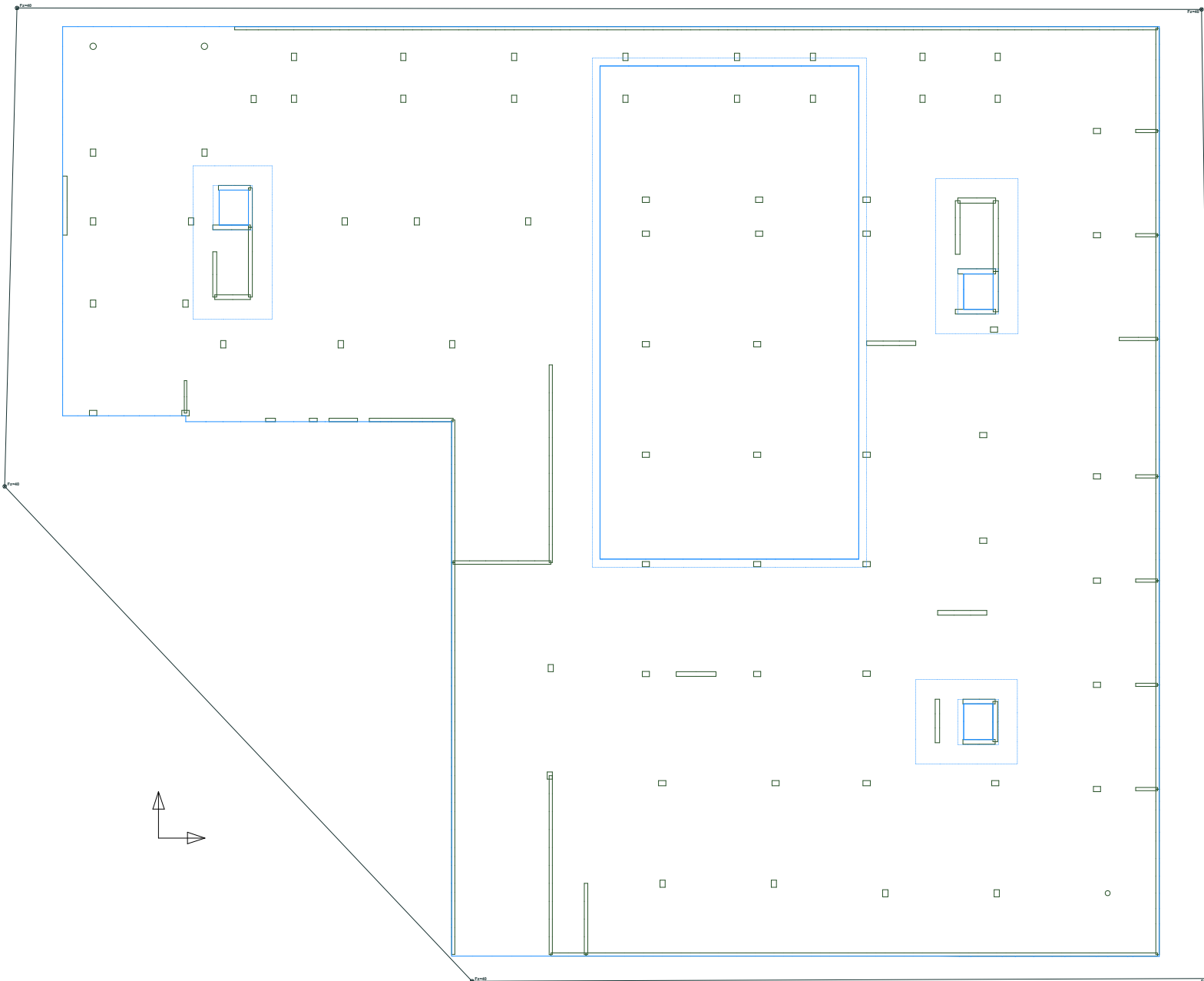
Live Load Reducible (transfer): All Loads Plan

Live Load Reducible (transfer): All Loads, User Name, User Dimension, Point Load, Point Load Name, Point Load Value, Line Load, Line Load Name, Line Load Value, Area Load, Area Load Name, Area Load Value, Element, Wall Elements Above, Wall Elements Below, Wall Element Center Only, Column Elements Above, Column Elements Below, Column Element Center Only, Scale = 1:400



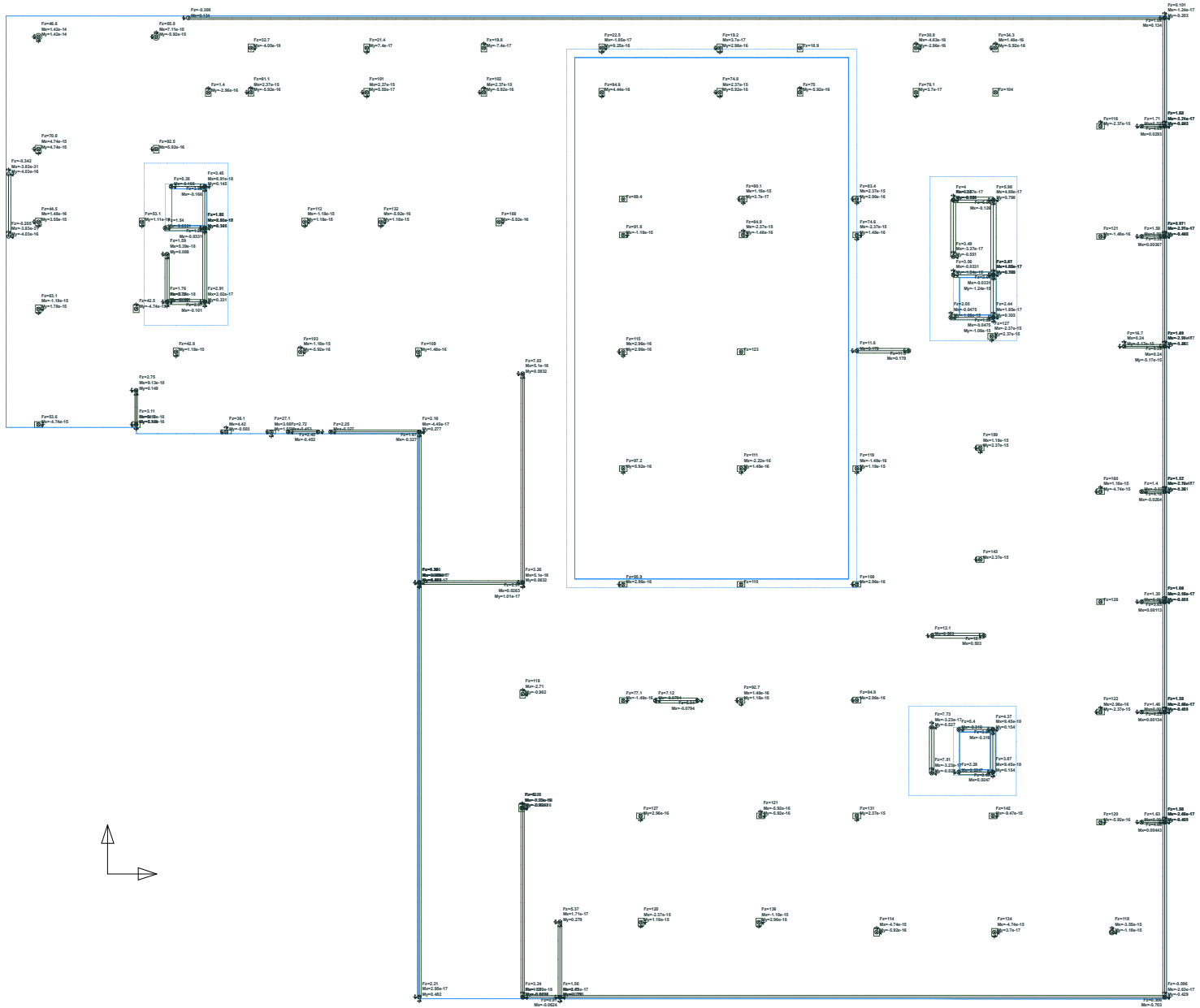
Live Load Unreducible: All Loads Plan

Live Load Unreducible: User Lines, User Notes, User Dimensions, Point Loads, Point Load Sums, Point Load Values, Line Loads, Line Load Sums, Line Load Values, Area Loads, Area Load Sums, Area Load Values, Element, Wall Elements Above, Wall Elements Below, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only
Scale = 1:400



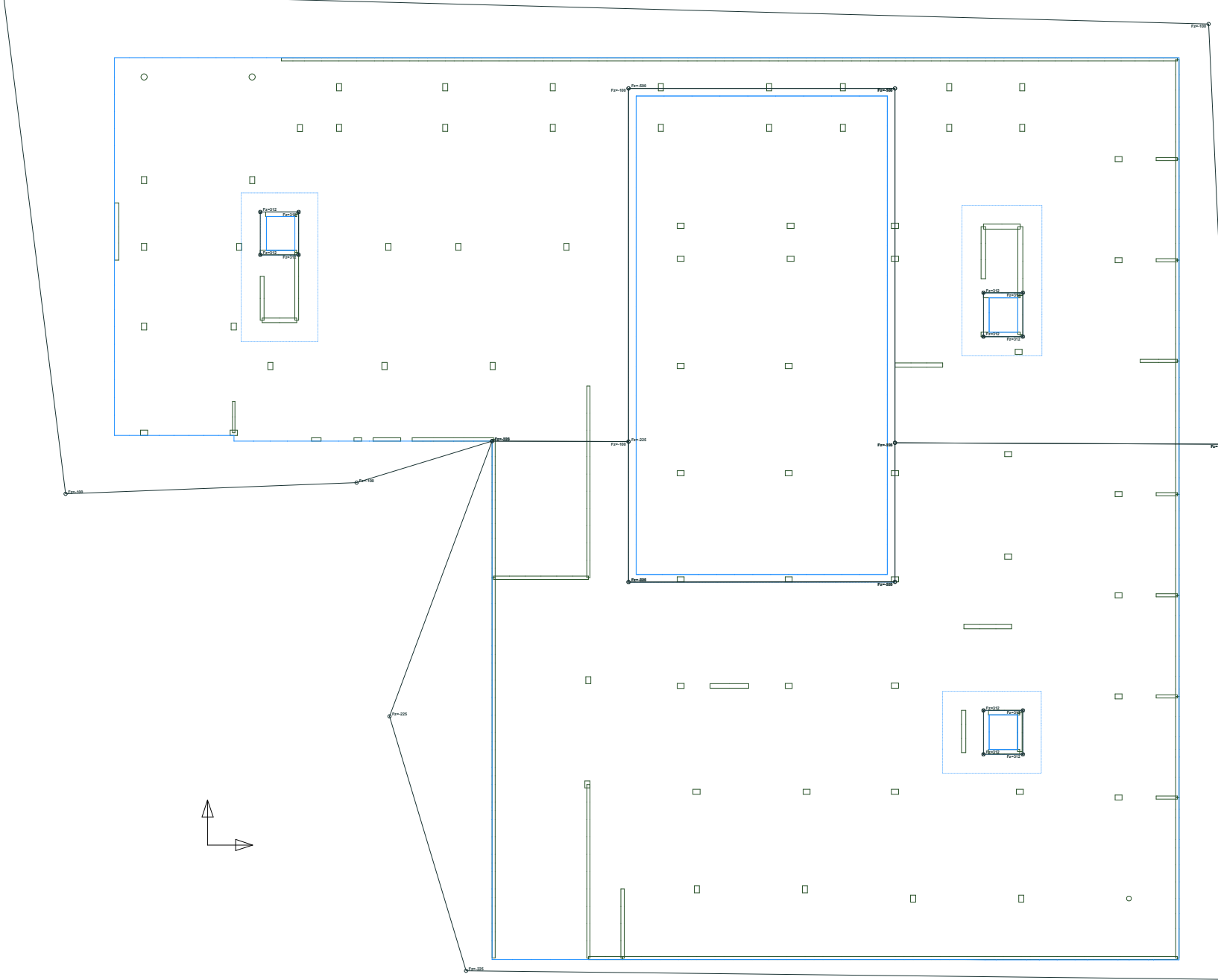
Live Load Unreducible (transfer): All Loads Plan

Live Load Unreducible (transfer): All Loads Plan
 User Lines: User Notes, User Dimensions, Point Loads, Point Load Name, Point Load Value, Line Loads, Line Load Name, Line Load Value, Area Loads, Area Load Name, Area Load Value,
 Element: Wall Elements Above, Wall Elements Below, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only
 Scale = 1:400



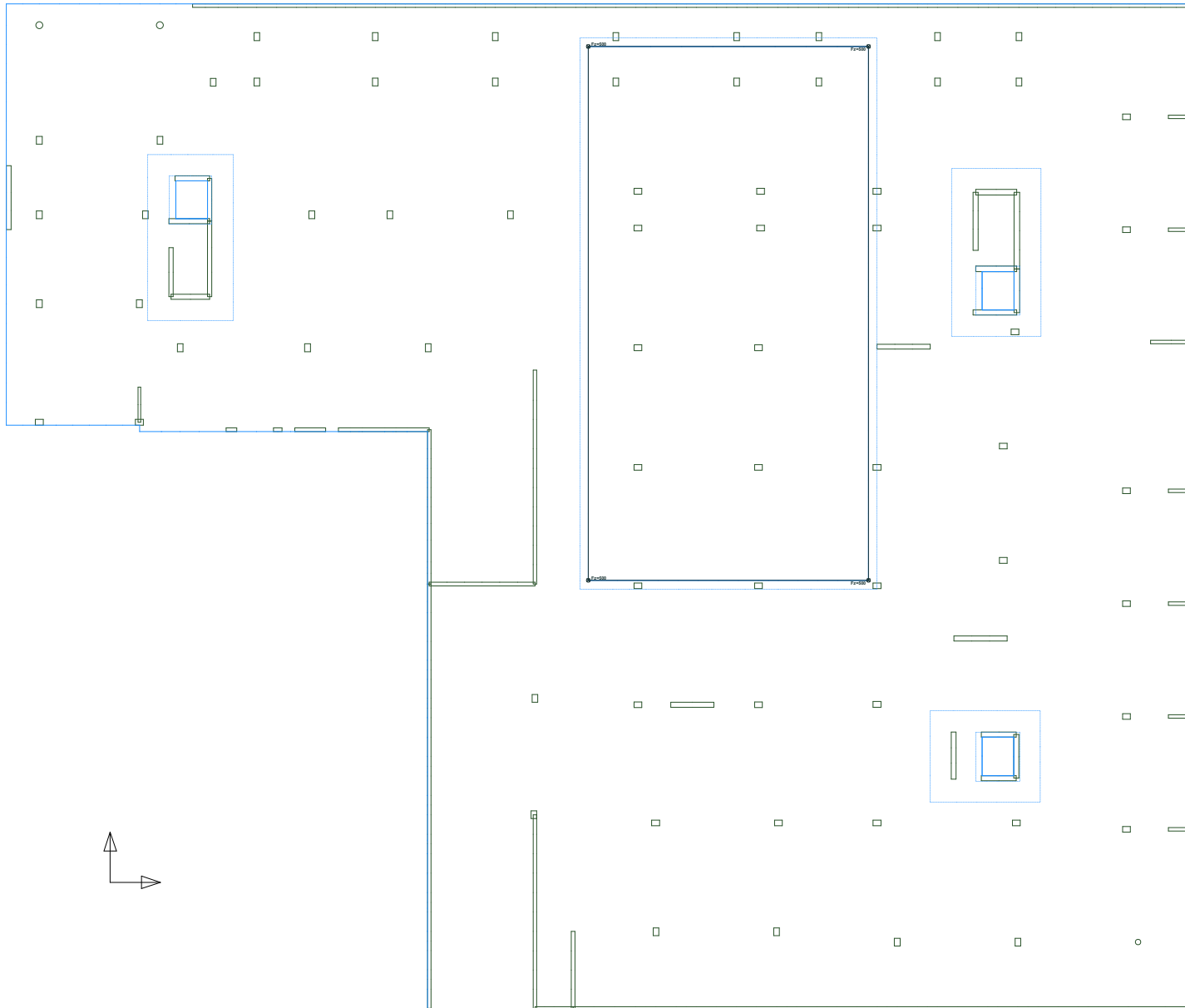
Hydrostatic: All Loads Plan

Hydrostatic: Clear Lines, Clear Notes, Clear Dimensions, Point Loads, Point Load Icons, Line Loads, Line Load Icons, Line Load Values, Area Loads, Area Load Icons, Area Load Values, Elements, Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Columns, Element Below, Columns Elements Above, Wall Elements, Wall Element Outline Only, 2023-10-12



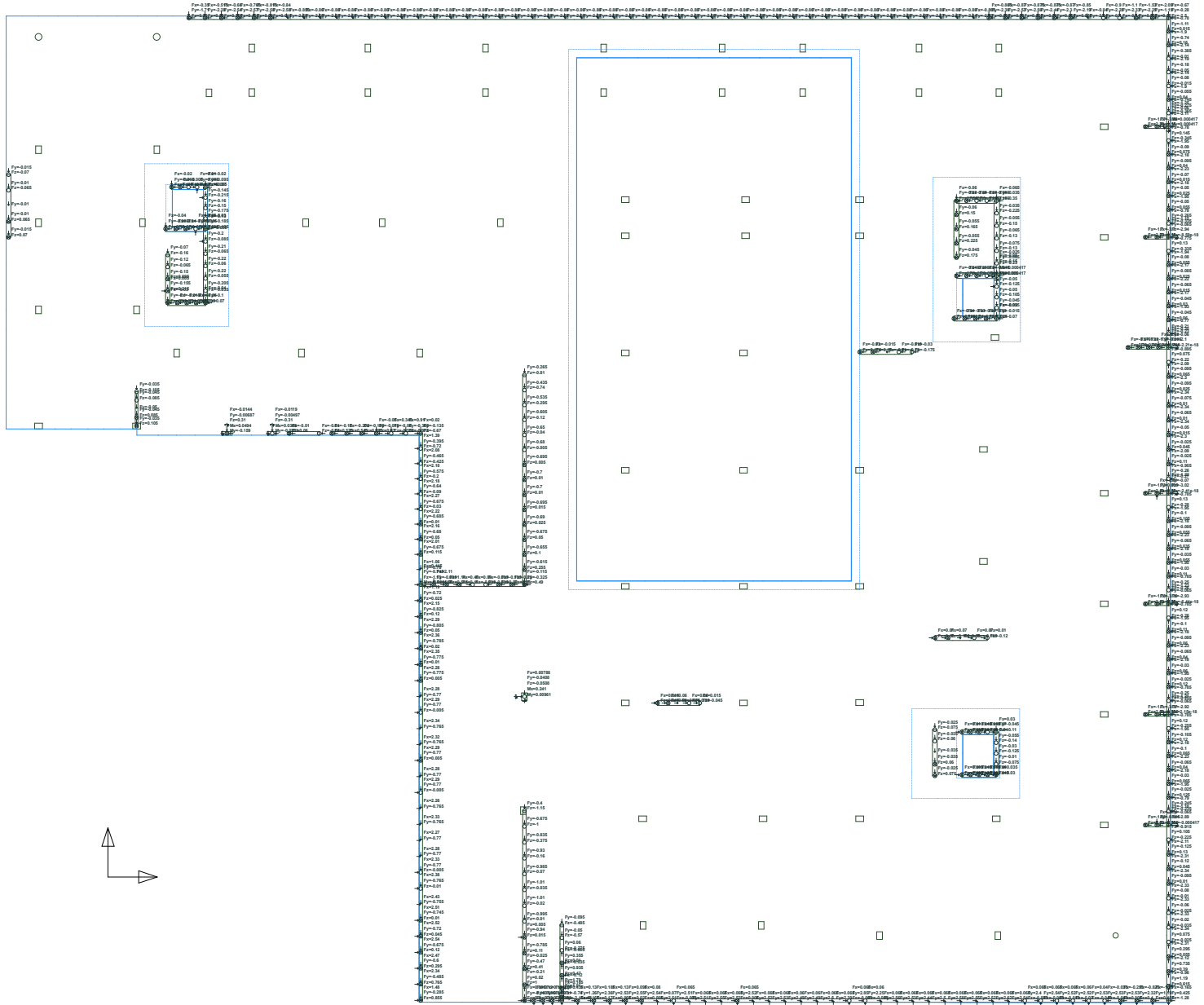
Dentention Vault Water: All Loads Plan

Dentention Vault Water: User: Lines, User: Notes, User: Dimensions, Point Loads, Point Load Icons, Point Load Values, Line Loads, Line Load Icons, Line Load Values, Area Loads, Area Load Icons, Area Load Values, Element, Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Wall Elements, Wall Element Outline Only, Scale = 1:400



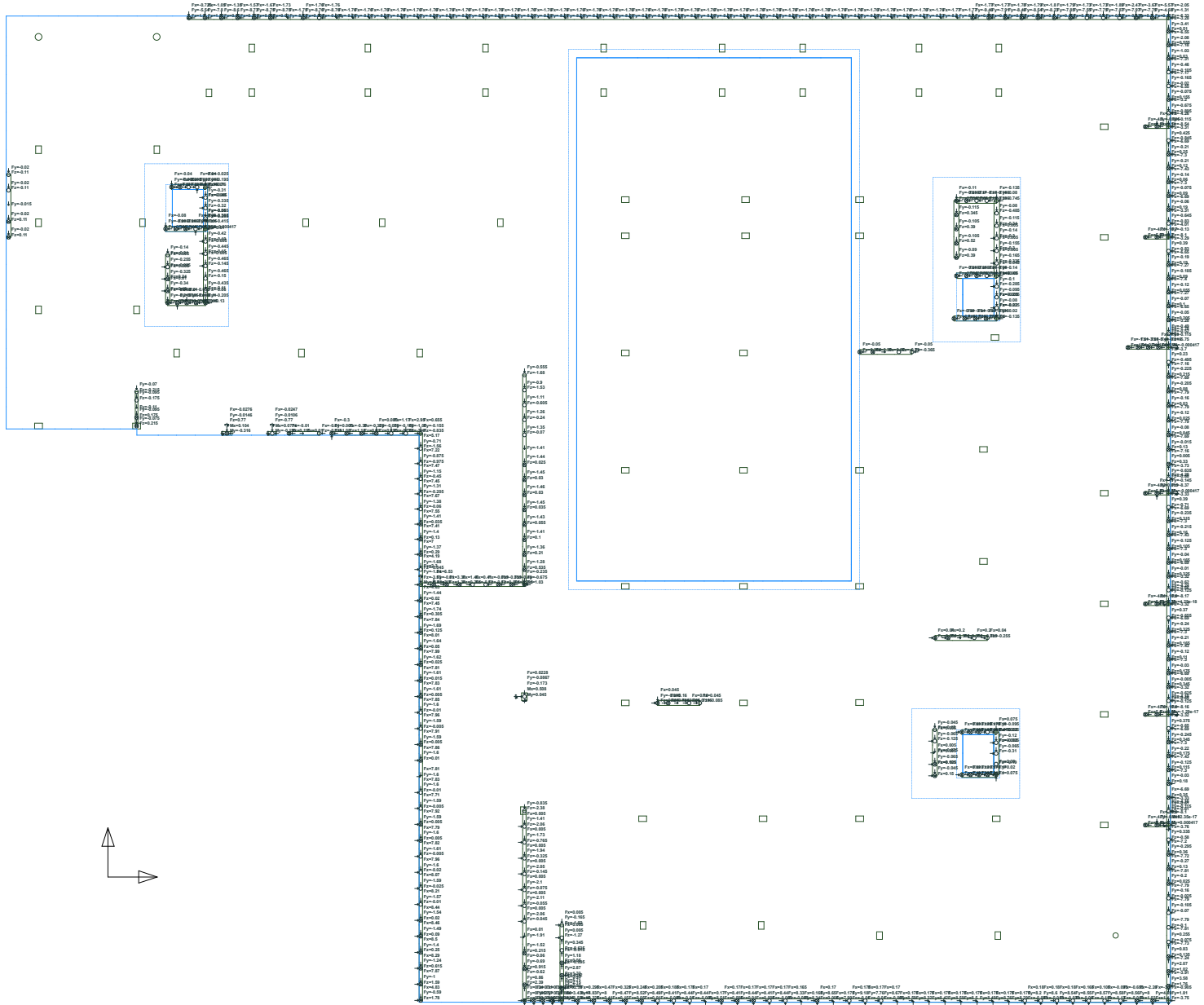
E: All Loads Plan

E: User Lines: User Name: User Dimensions: Point Loads Point Load Icons: Point Load Values: Line Loads: Line Load Icons: Line Load Values: Area Loads: Area Load Icons: Area Load Values:
Elements: Wall Elements Below: Wall Elements Above: Wall Elements Outside Only: Column Elements Below: Column Elements Above: Deck Elements: Deck Element Outside Only:
Scale = 1:400



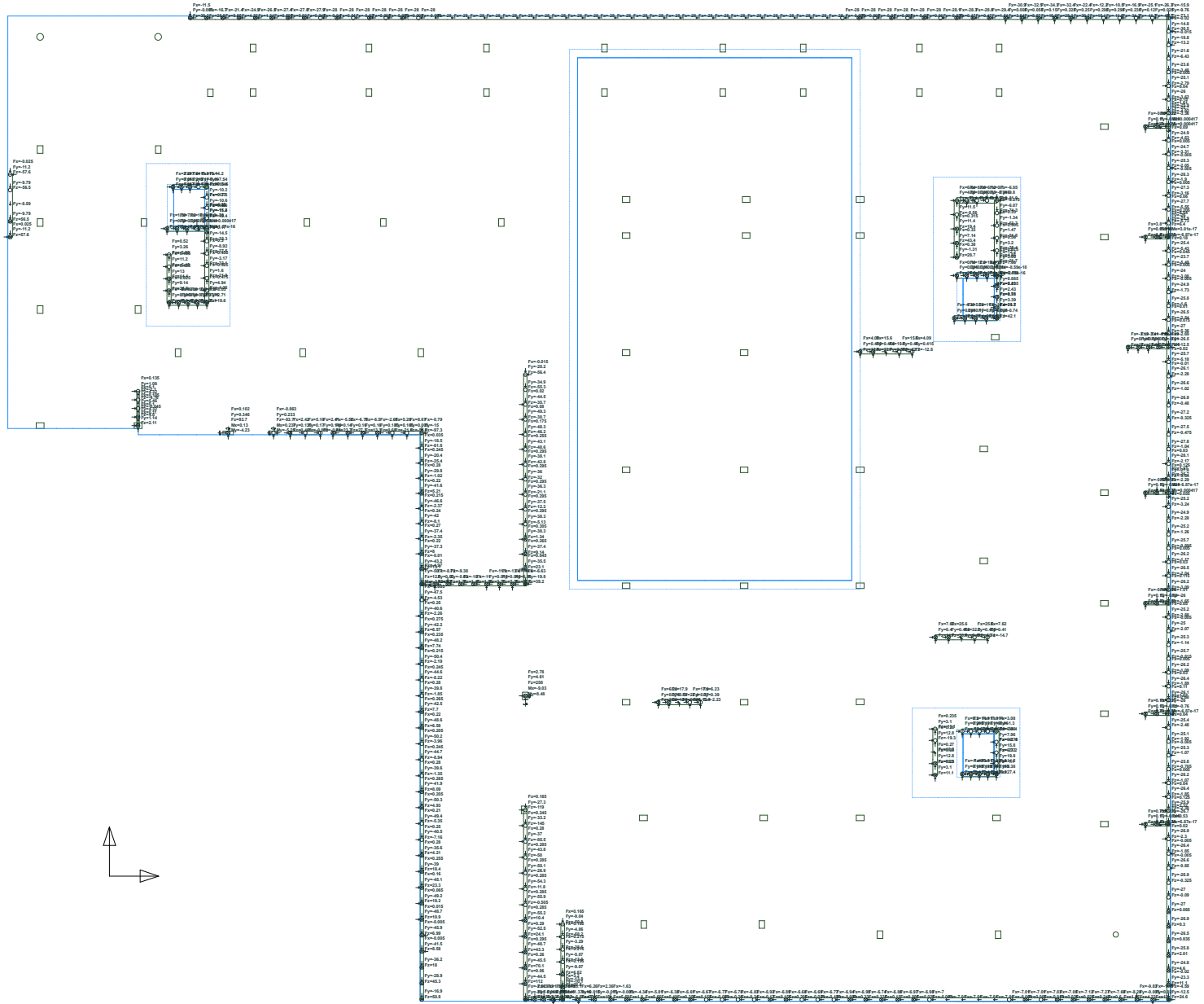
H: All Loads Plan

H: User Lines: User Notes: User Dimensions: Point Loads: Point Load Icons: Point Load Values: Line Loads: Line Load Icons: Line Load Values: Area Loads: Area Load Icons: Area Load Values:
Clipboard: Wall Elements Below: Wall Elements Above: Wall Element Outline Only: Column Elements Below: Column Elements Above: Slab Elements: Slab Element Outline Only:
Scale = 1:400



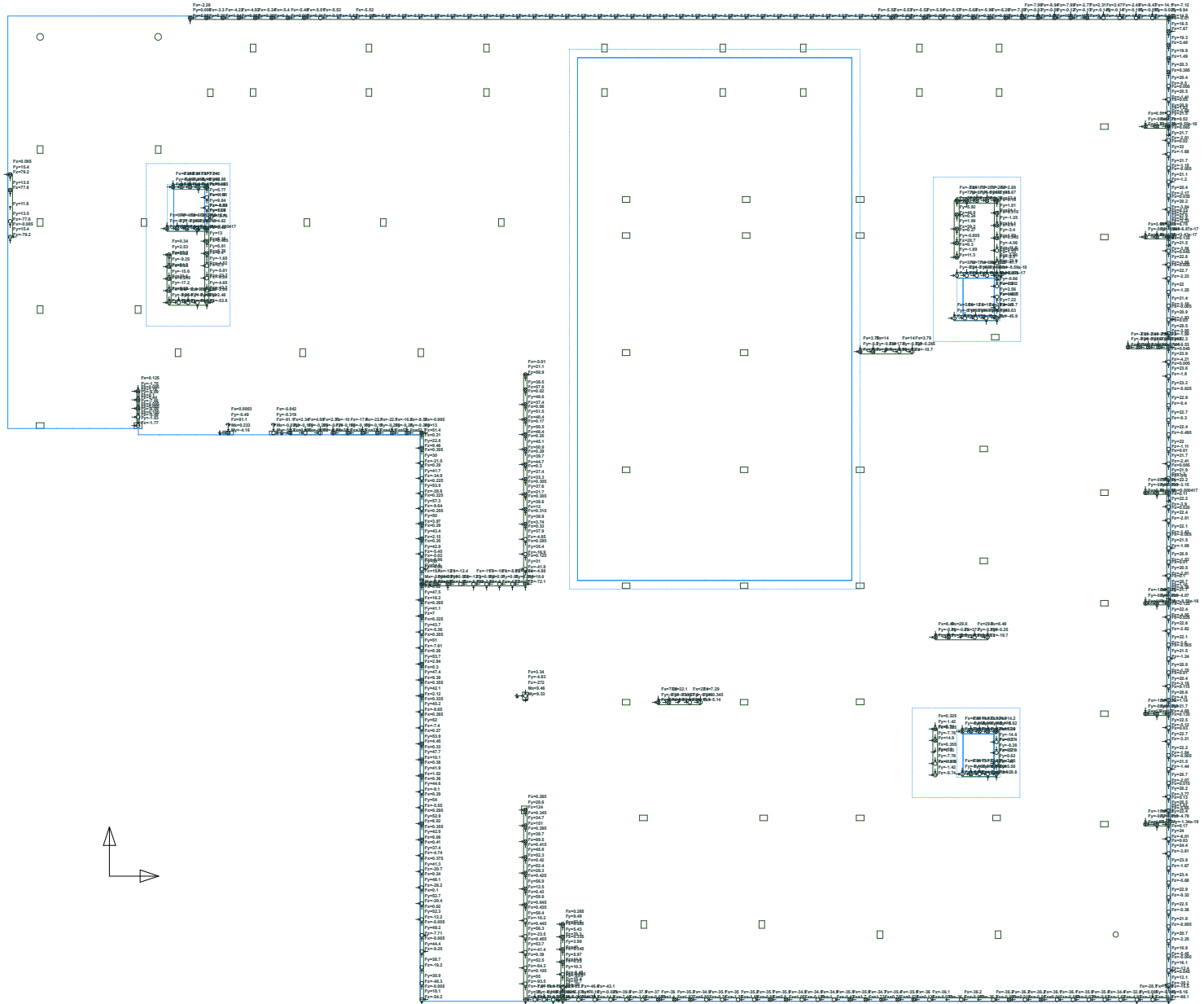
EQ(EQ_ASCE716_-0.3X_-E_-Y_-E_F): All Loads Plan

EQ(EQ_ASCE716_-0.3X_-E_-Y_-E_F): User Lines, User Area, User Dimension, Point Load, Point Load Form, Point Load Icon, Line Load, Line Load Form, Line Load Icon, Area Load, Area Load Form, Area Load Icon.
 Element: Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Element, Slab Element Outline Only.
 Scale = 1:400



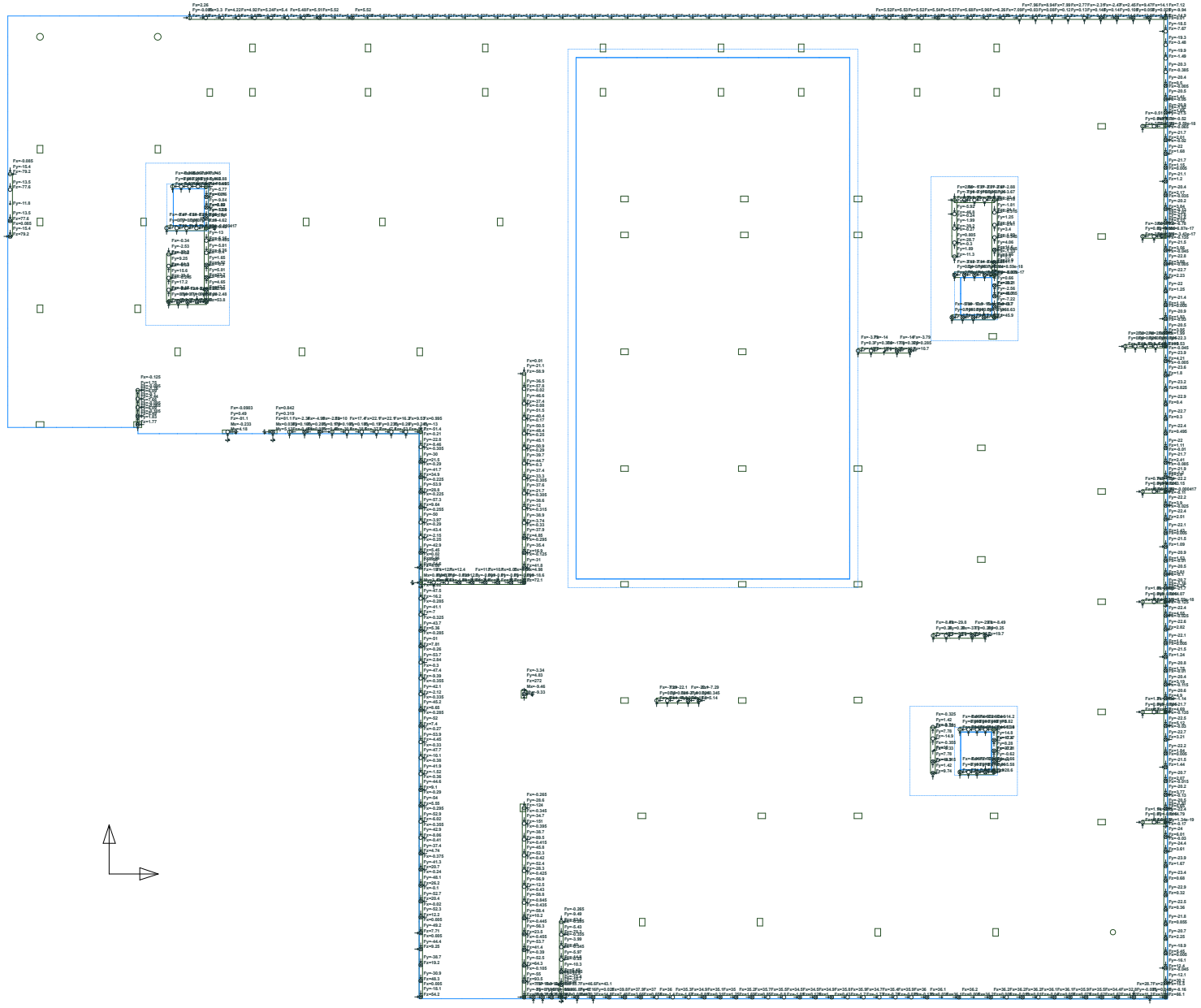
EQ(EQ_ASCE716_-0.3X_-E_Y_-E_F): All Loads Plan

EQEQ_ASCE716_-0.3X_-E_Y_-E_F User: Linan User: Admin User: Dimension: Point Load Point Load Item: Point Load Value: Line Load Value: Area Load Value: Area Load Item: Area Load Value: Dimension: Mat Element Below: Mat Element Above: Mat Element Below: Column Element Below: Column Element Above: Mat Element: Side Element Outline Only: Scale = 1:400



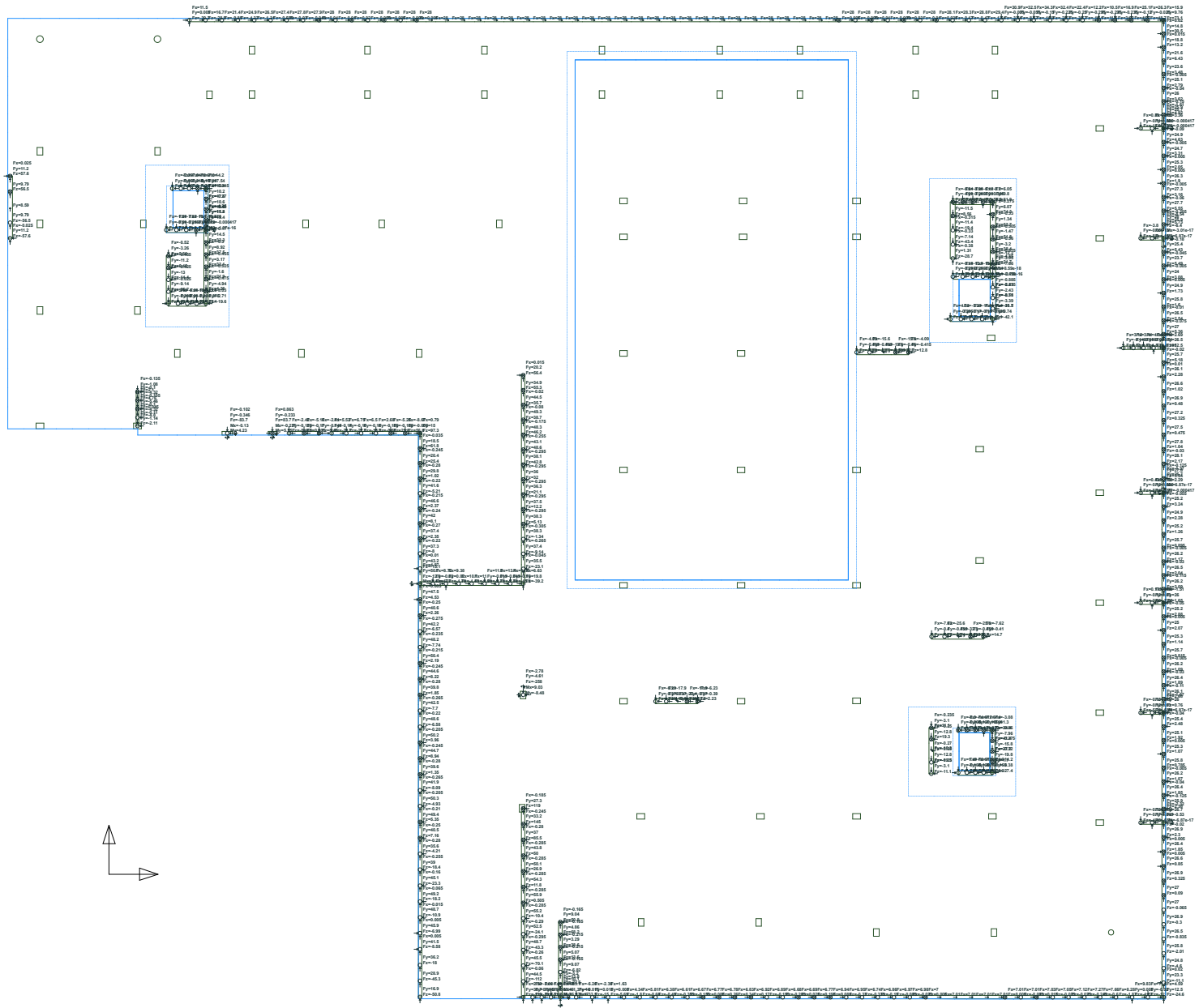
EQ(EQ_ASCE716_0.3X_-E_-Y_-E_F): All Loads Plan

EQ(EQ_ASCE716_0.3X_-E_-Y_-E_F) User: Lina, User Agency: User Dimension, Point Load, Point Load from, Point Load Value, Line Load, Line Load from, Line Load Value, Area Load, Area Load from, Area Load Value, Element, Shell Element Below, Shell Element Above, Shell Element Outline Only, Column Element Below, Column Element Above, Shell Element, Shell Element Outline Only, Scale = 1:400



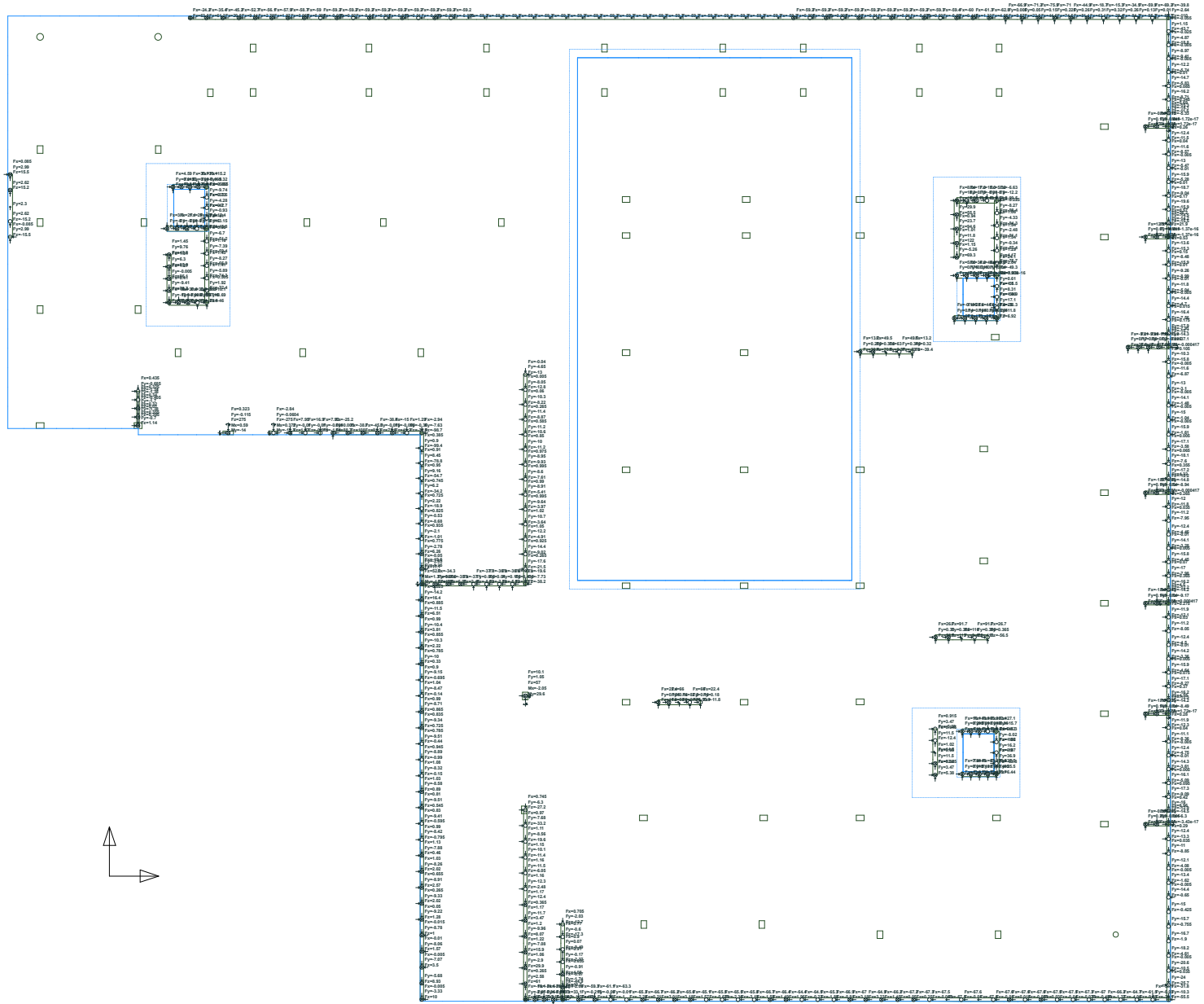
EQ(EQ_ASCE716_0.3X_-E_Y_-E_F): All Loads Plan

EQ(EQ_ASCE716_0.3X_-E_Y_-E_F) User: User Name, User Dimension, Point Load, Point Load from, Point Load Value, Line Load, Line Load from, Area Load, Area Load from, Area Load Value, Column, Wall Element Below, Wall Element Above, Wall Element Outline Only, Column Element Below, Column Element Above, Wall Element, Wall Element Outline Only
Scale = 1:400



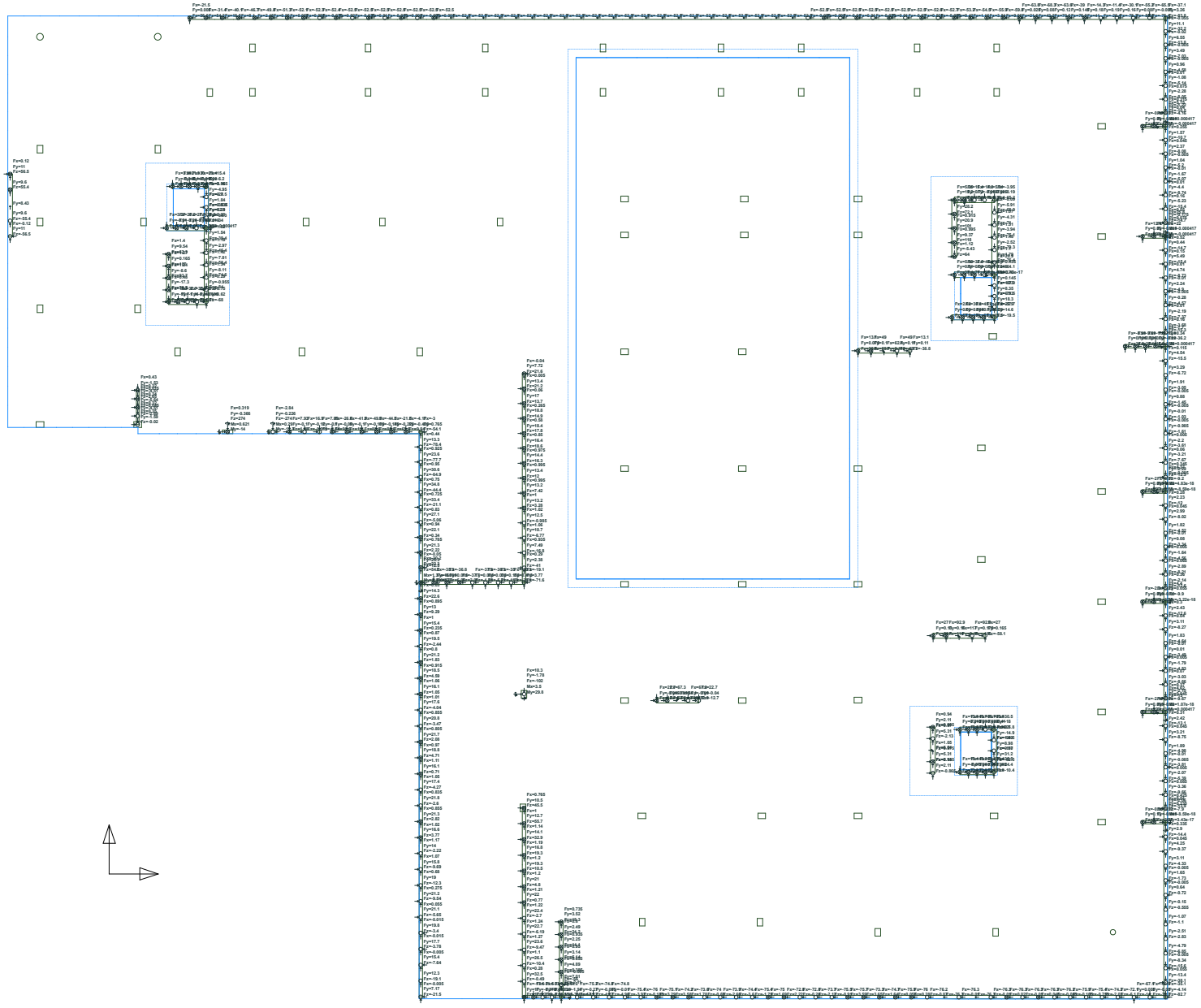
EQ(EQ_ASCE716_-X_-E_-0.3Y_-E_F): All Loads Plan

EQ(EQ_ASCE716_-X_-E_-0.3Y_-E_F): User Lines, User Areas, User Dimensions, Point Loads, Point Load Icons, Point Load Values, Line Loads, Line Load Icons, Line Load Values, Area Loads, Area Load Icons, Area Load Values, Element, Shell Elements Below, Wall Elements Above, Wall Elements Outside Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Elements Outside Only
Scale = 1:400



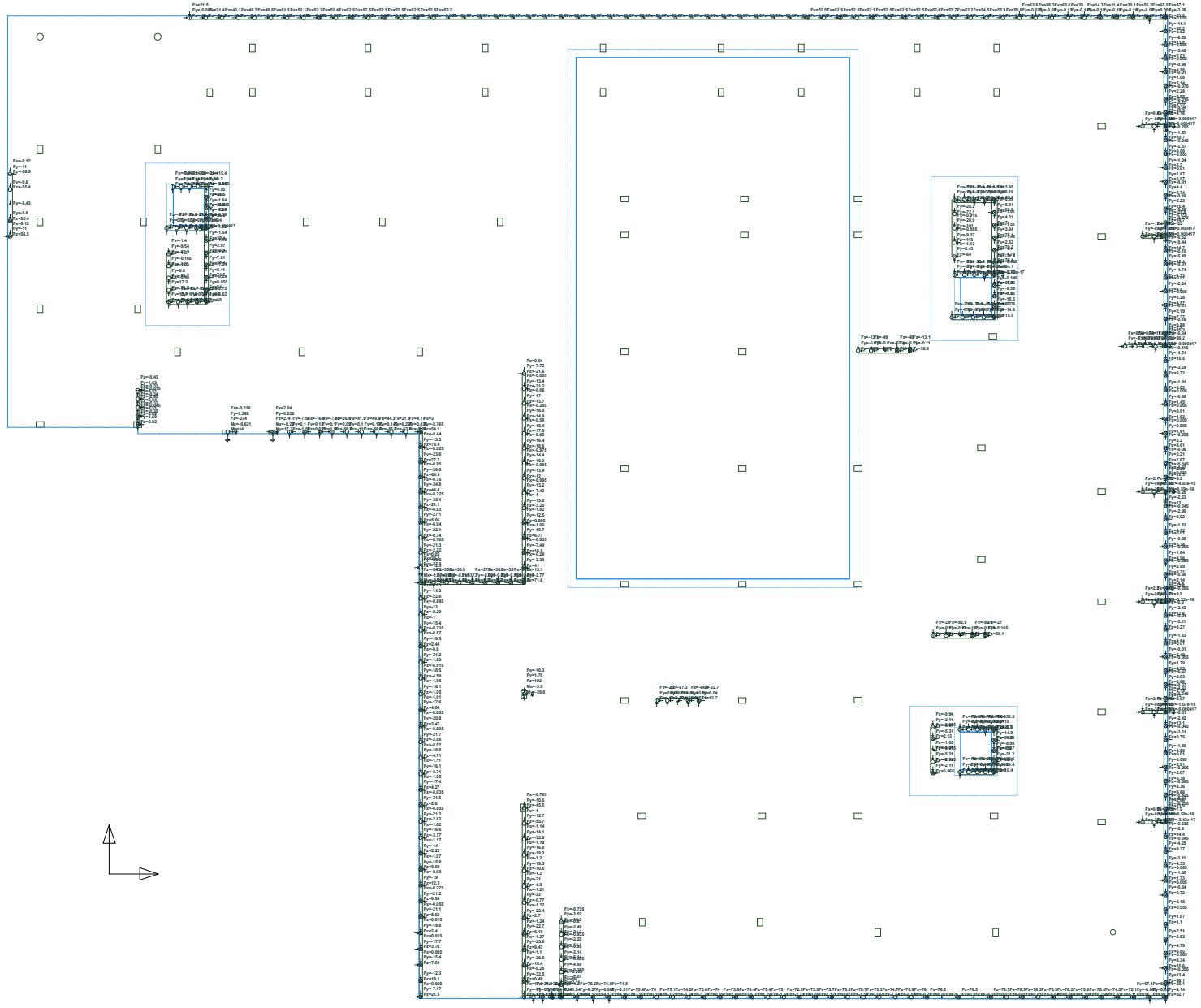
EQ(EQ_ASCE716_-X_-E_0.3Y_-E_F): All Loads Plan

EQ(EQ_ASCE716_-X_-E_0.3Y_-E_F) User: Lina, User Agency: User Dimension: Point Load, Point Load from, Point Load Value, Line Load, Line Load from, Line Load Value, Area Load, Area Load from, Area Load Value, Element: Wall Element Below, Wall Element Above, Wall Element Outer Only, Column Element Below, Column Element Above, Slab Element, Slab Element Outer Only, Scale = 1:400



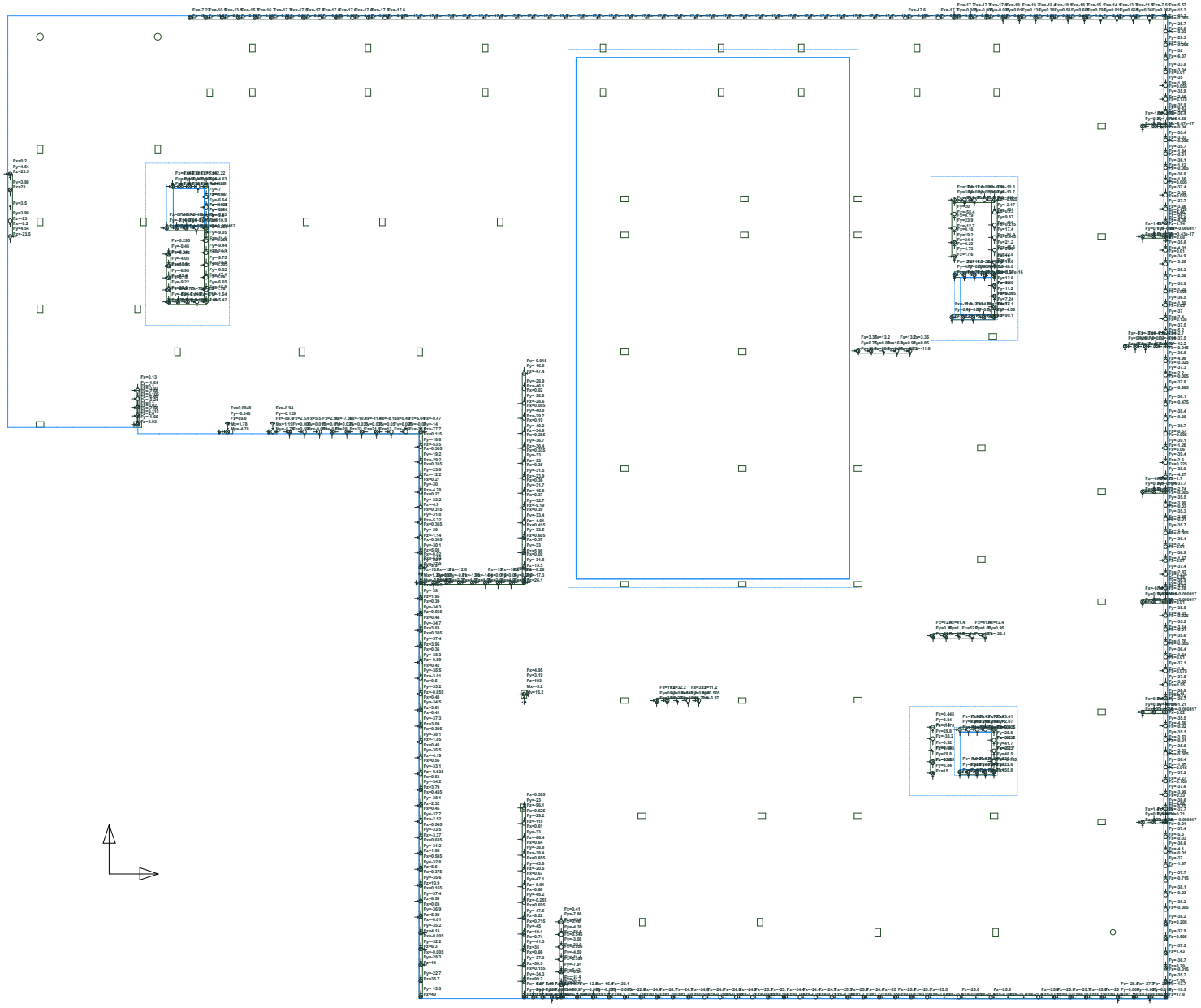
EQ(EQ_ASCE716_X_-E_-0.3Y_-E_F): All Loads Plan

EQ(EQ_ASCE716_X_-E_-0.3Y_-E_F) User: Lina, User Agency: User Dimension, Point Load, Point Load Name, Point Load Value, Line Load, Line Load Name, Line Load Value, Area Load, Area Load Name, Area Load Value.
Display: Show Elements Below, Hide Elements Above, Hide Elements Outline Only, Column Elements Below, Column Elements Above, Hide Elements, Hide Elements Outline Only.
Scale = 1:400



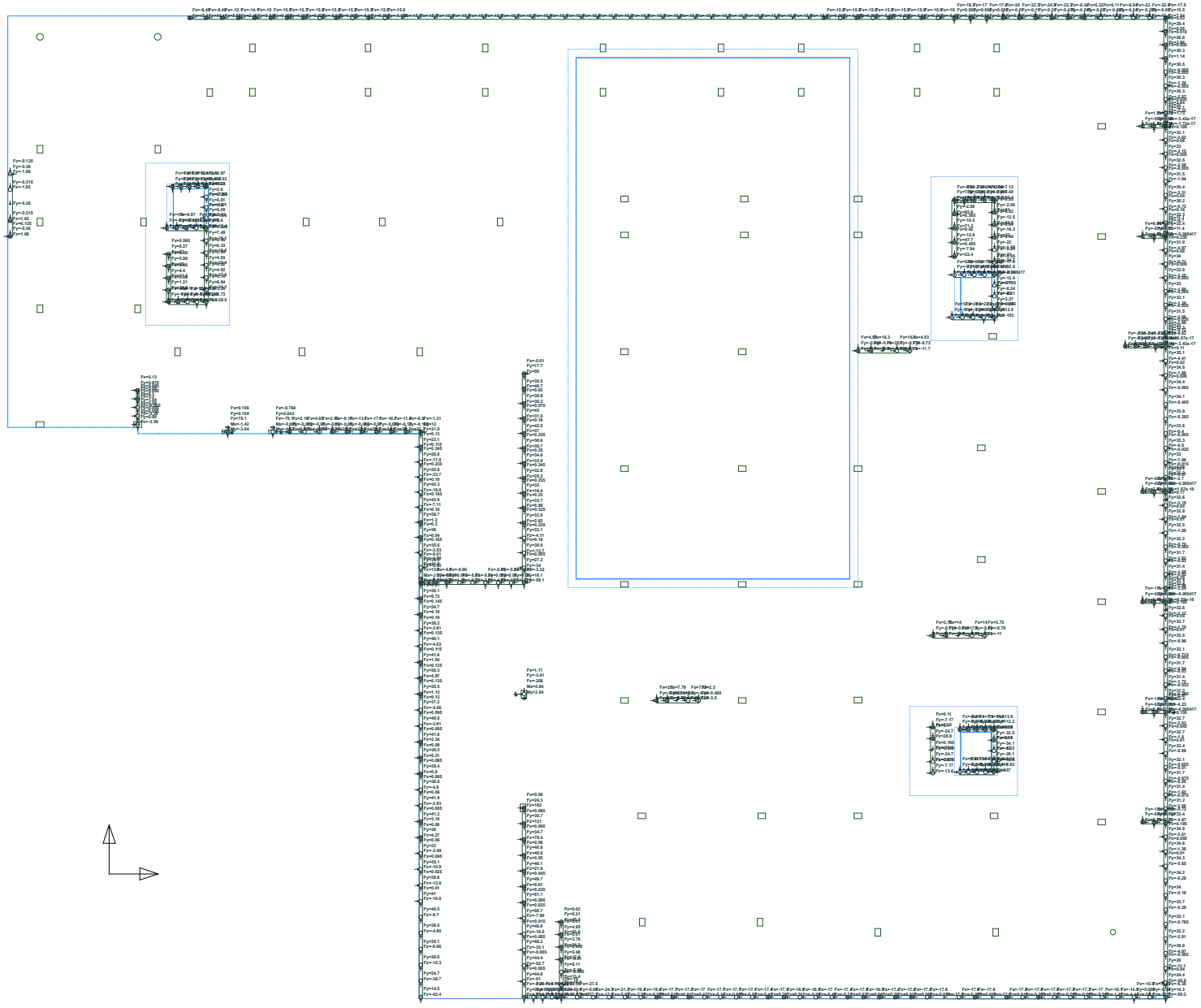
EQ(EQ_ASCE716_-0.3X_-E_-Y_+E_F): All Loads Plan

EQEQ_ASCE716_-0.3X_-E_-Y_+E_F: User Lines, User Areas, User Dimensions, Point Loads, Point Load Icons, Point Load Values, Line Loads, Line Load Icons, Line Load Values, Area Loads, Area Load Icons, Area Load Values.
Elements: Wall Elements Below, Wall Elements Above, Wall Elements Outside Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Elements Outside Only.
Scale = 1:400



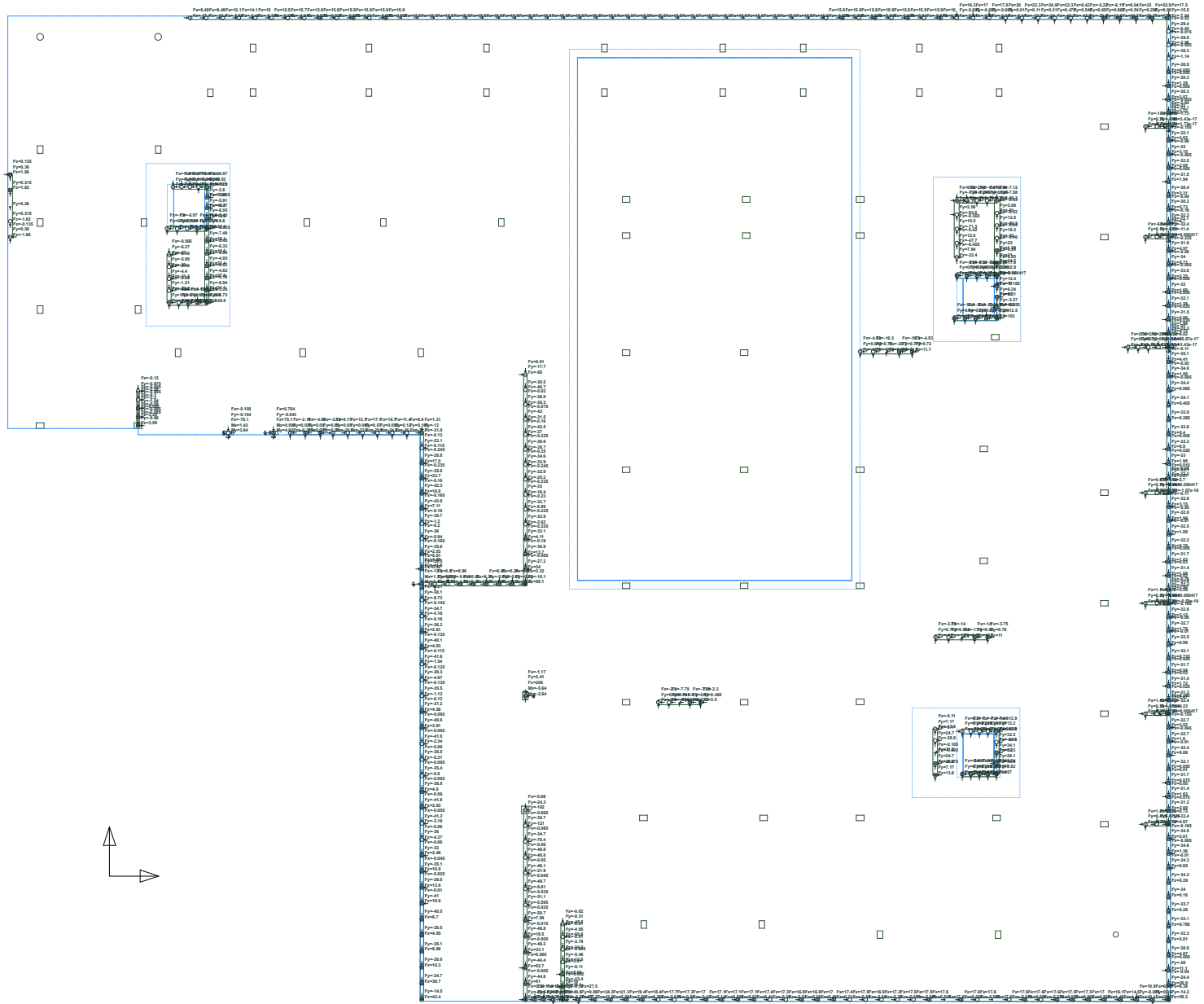
EQ(EQ_ASCE716_-0.3X_-E_Y_+E_F): All Loads Plan

EQEQ_ASCE716_-0.3X_-E_Y_+E_F: User Lines, User Areas, User Dimensions; Point Loads, Point Load Items, Point Load Items; Line Loads, Line Load Items; Area Loads, Area Load Items; Area Load Values; Element, Shell Elements Section; Wall Elements Above; Wall Elements Outside Only; Column Elements Below; Column Elements Above; Shell Elements; Shell Elements Outside Only; Scale = 1:400



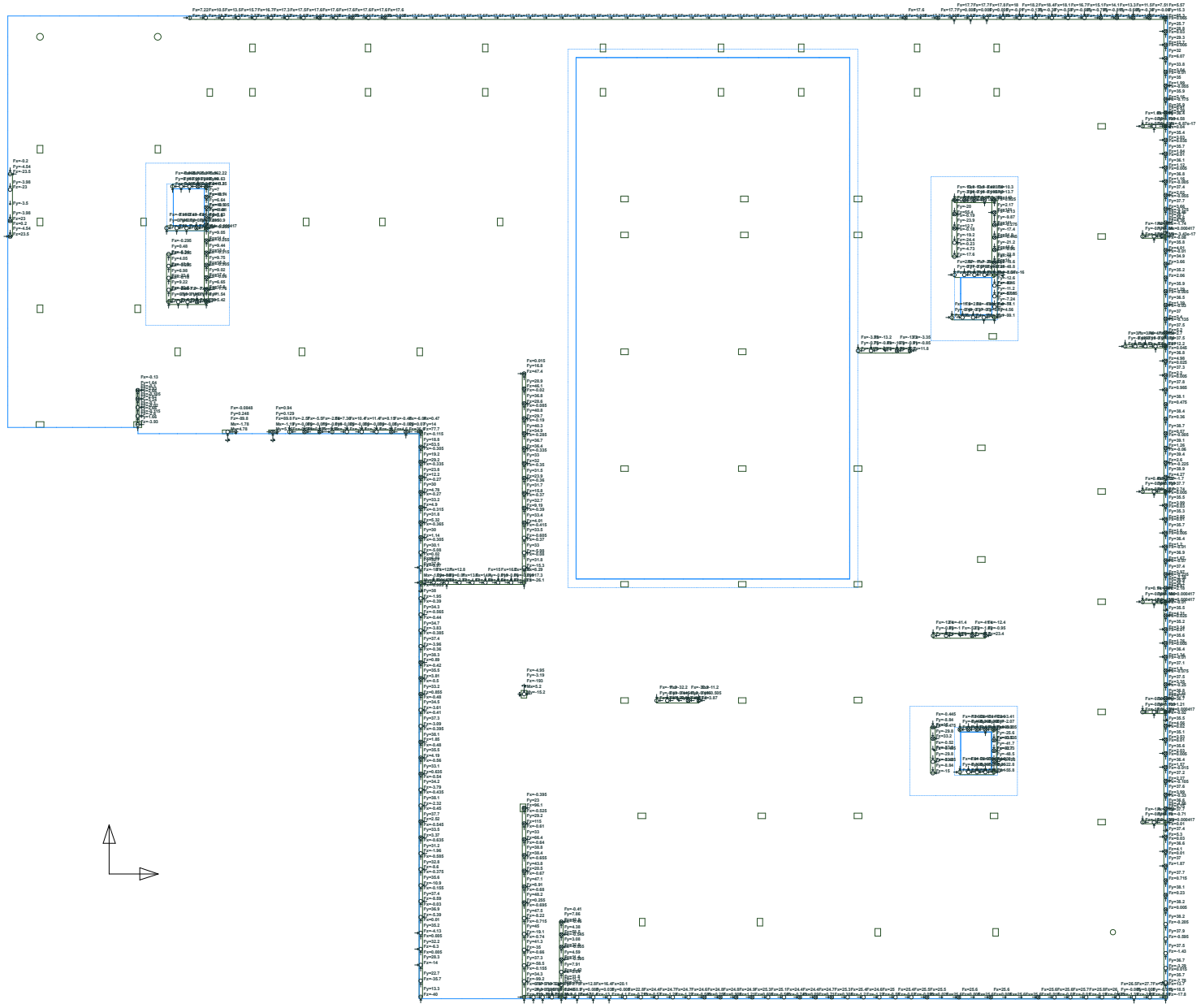
EQ(EQ_ASC716_0.3X_-E_-Y_+E_F): All Loads Plan

EQ(EQ_ASC716_0.3X_-E_-Y_+E_F): User Lines, User Areas, User Dimensions, Point Loads, Point Load Icons, Point Load Values, Line Loads, Line Load Icons, Line Load Values, Area Loads, Area Load Icons, Area Load Values.
 Element: Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Wall Element Outline Only.
 Scale = 1.000



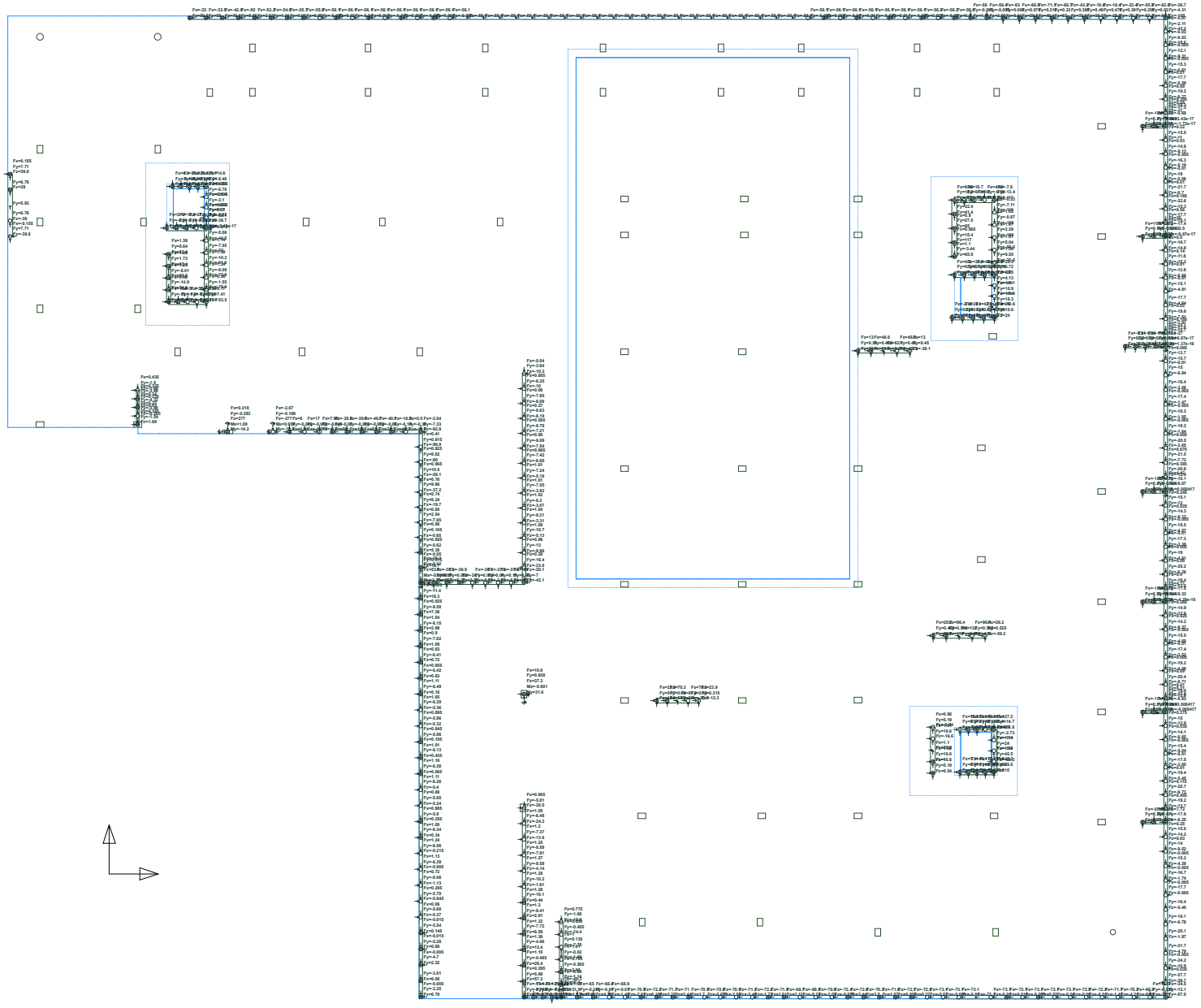
EQ(EQ_ASCE716_0.3X_-E_Y_+E_F): All Loads Plan

EQ(EQ_ASCE716_0.3X_-E_Y_+E_F) User: Lines, User: Areas, User: Dimensions, Point: Loads, Point: Load Sums, Point: Load Values, Line: Loads, Line: Load Sums, Line: Load Values, Area: Loads, Area: Load Sums, Area: Load Values, Element: Shell Elements Below, Shell Elements Above, Wall Elements Outside Only, Column Elements Below, Column Elements Above, Wall Elements, Shell Elements, Shell Elements Outside Only
Scale = 1:400



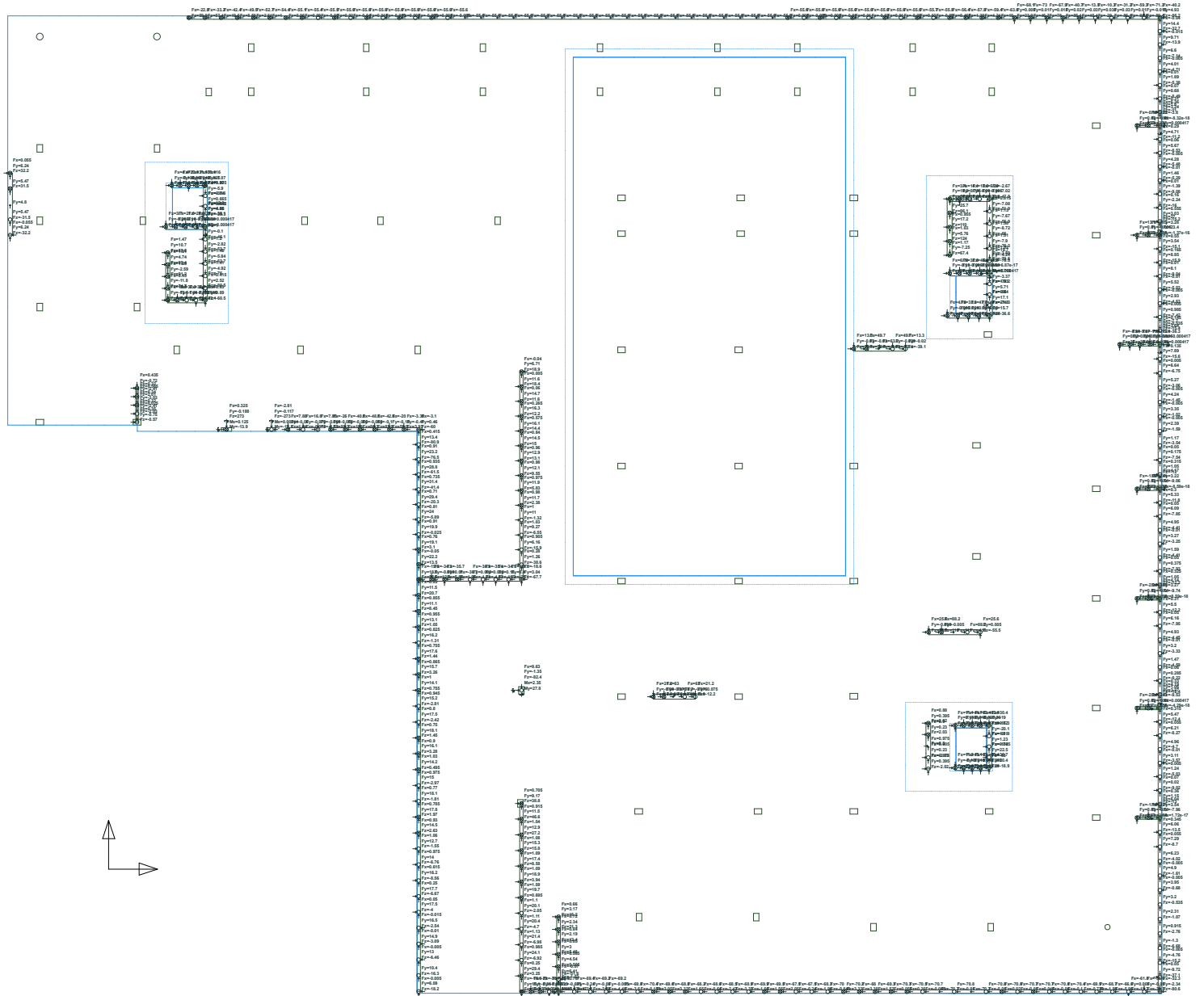
EQ(EQ_ASCE716_-X_-E_-0.3Y_+E_F): All Loads Plan

EQEQ_ASCE716_-X_-E_-0.3Y_+E_F: User Lines, User Areas, User Dimensions, Point Loads, Point Load Icons, Point Load Values, Line Loads, Line Load Icons, Line Load Values, Area Loads, Area Load Icons, Area Load Values, Elements: Wall Elements Below, Wall Elements Above, Wall Elements Center, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only
Scale = 1:400



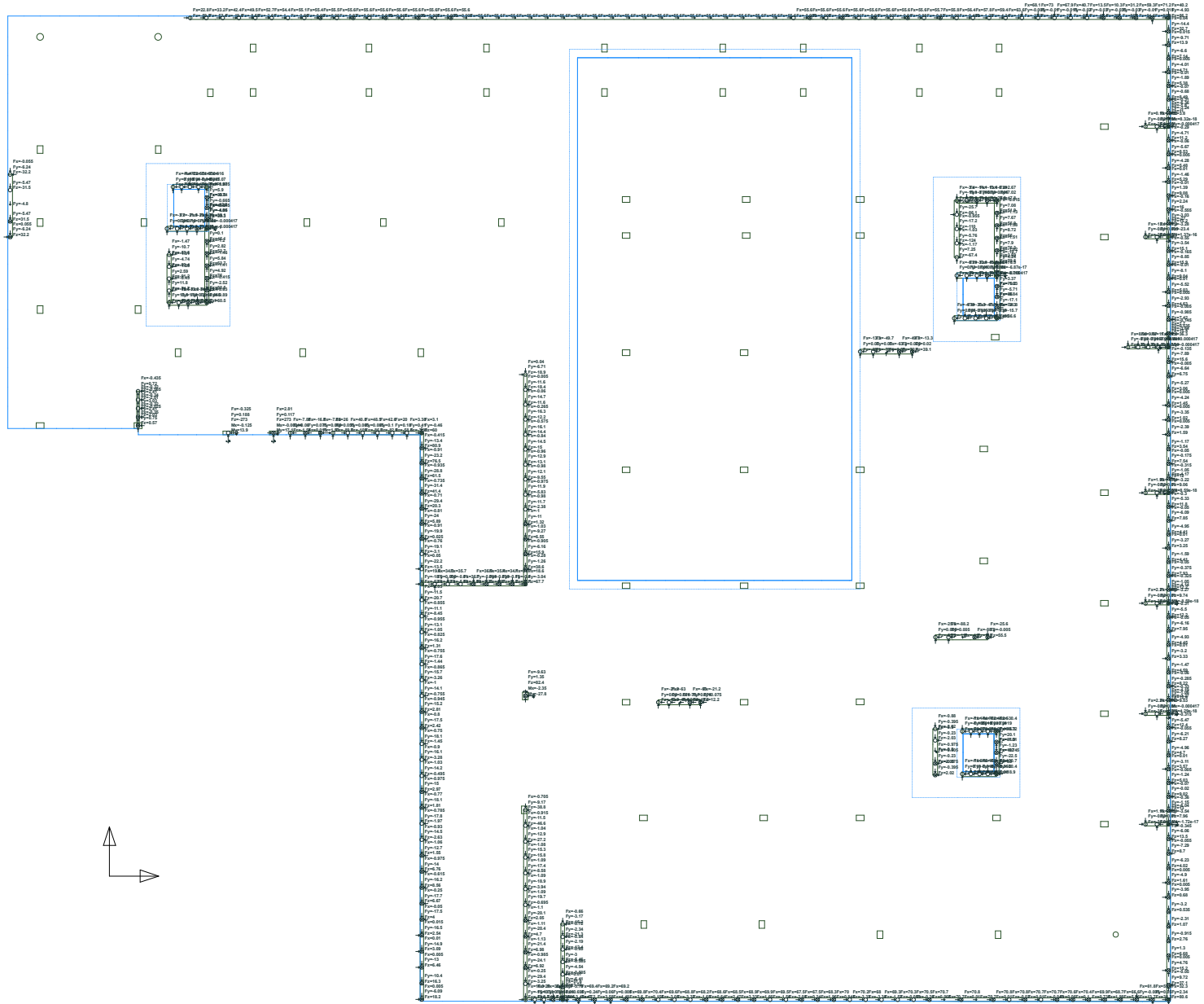
EQ(EQ_ASCE716_-X_-E_0.3Y_+E_F): All Loads Plan

EQ(EQ_ASCE716_-X_-E_0.3Y_+E_F): User Load, User Area, User Dimension; Point Load, Point Load Item, Line Load, Line Load Item, Area Load, Area Load Item, Area Load Dimension; Mat Element Below, Mat Element Above, Mat Element Outline Only; Column Element Below, Column Element Above, Column Element Outline Only; Scale = 1.00



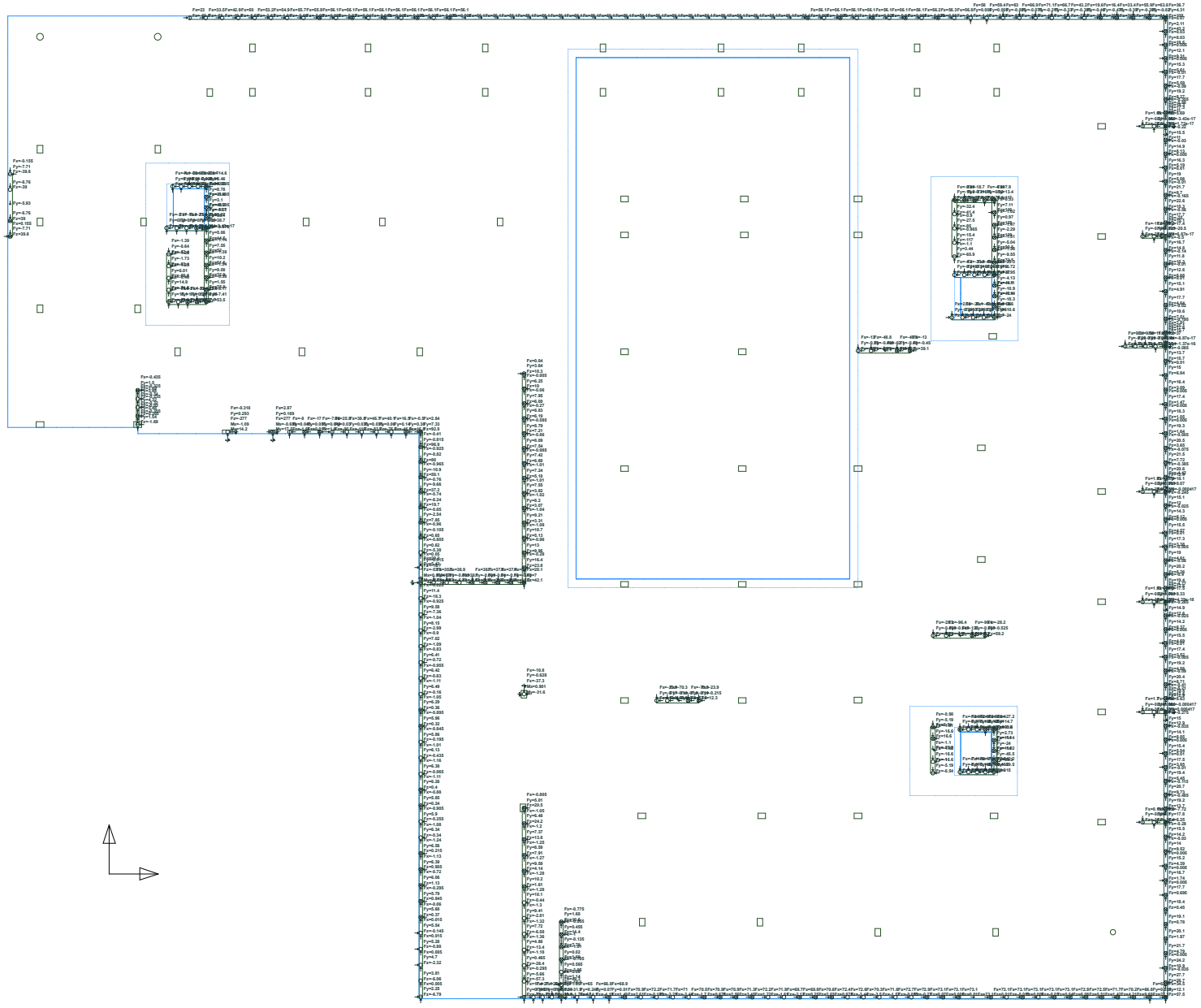
EQ(EQ_ASCE716_X_-E_-0.3Y_+E_F): All Loads Plan

EQ(EQ_ASCE716_X_-E_-0.3Y_+E_F) User Lines, User Areas, User Dimensions; Point Loads, Point Load Icons, Point Load Values; Line Loads, Line Load Icons, Line Load Values; Area Loads, Area Load Icons, Area Load Values.
 Elements: Shell Elements Below, Wall Elements Above, Wall Element Outline Only; Columns: Elements Below, Column Elements Above, Wall Elements, Wall Element Outline Only.
 Scale = 1:400



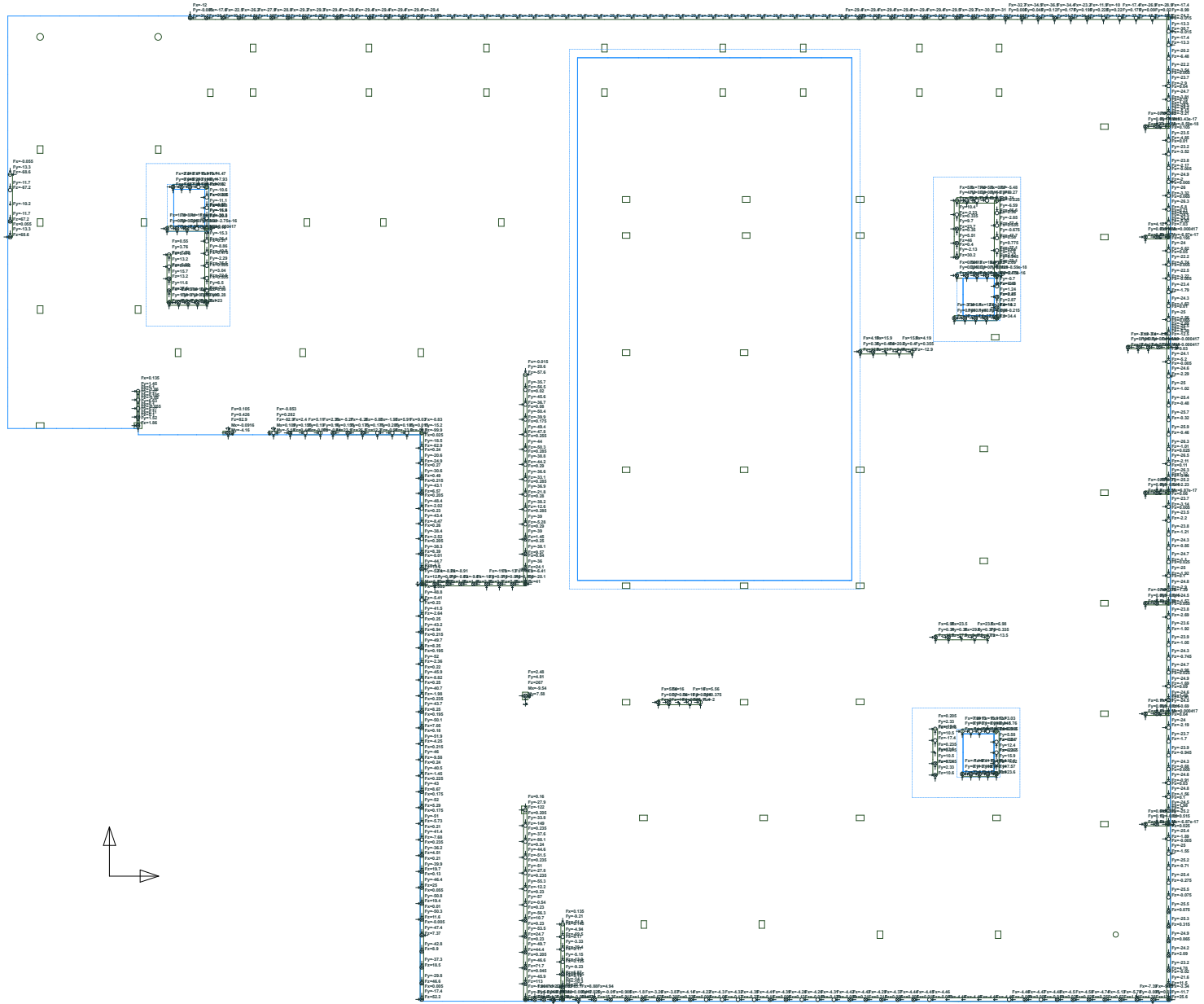
EQ(EQ_ASCE716_X_-E_0.3Y_+E_F): All Loads Plan

EQ(EQ_ASCE716_X_-E_0.3Y_+E_F) User Lines: User Areas, User Dimensions, Point Loads, Point Load Icons, Point Load Values, Line Loads, Line Load Icons, Line Load Values, Area Loads, Area Load Icons, Area Load Values.
Elements: Shell Elements Below, Shell Elements Above, Shell Elements Outline Only, Column Elements Below, Column Elements Above, Shell Elements, Shell Elements Outline Only.
Scale = 1:400



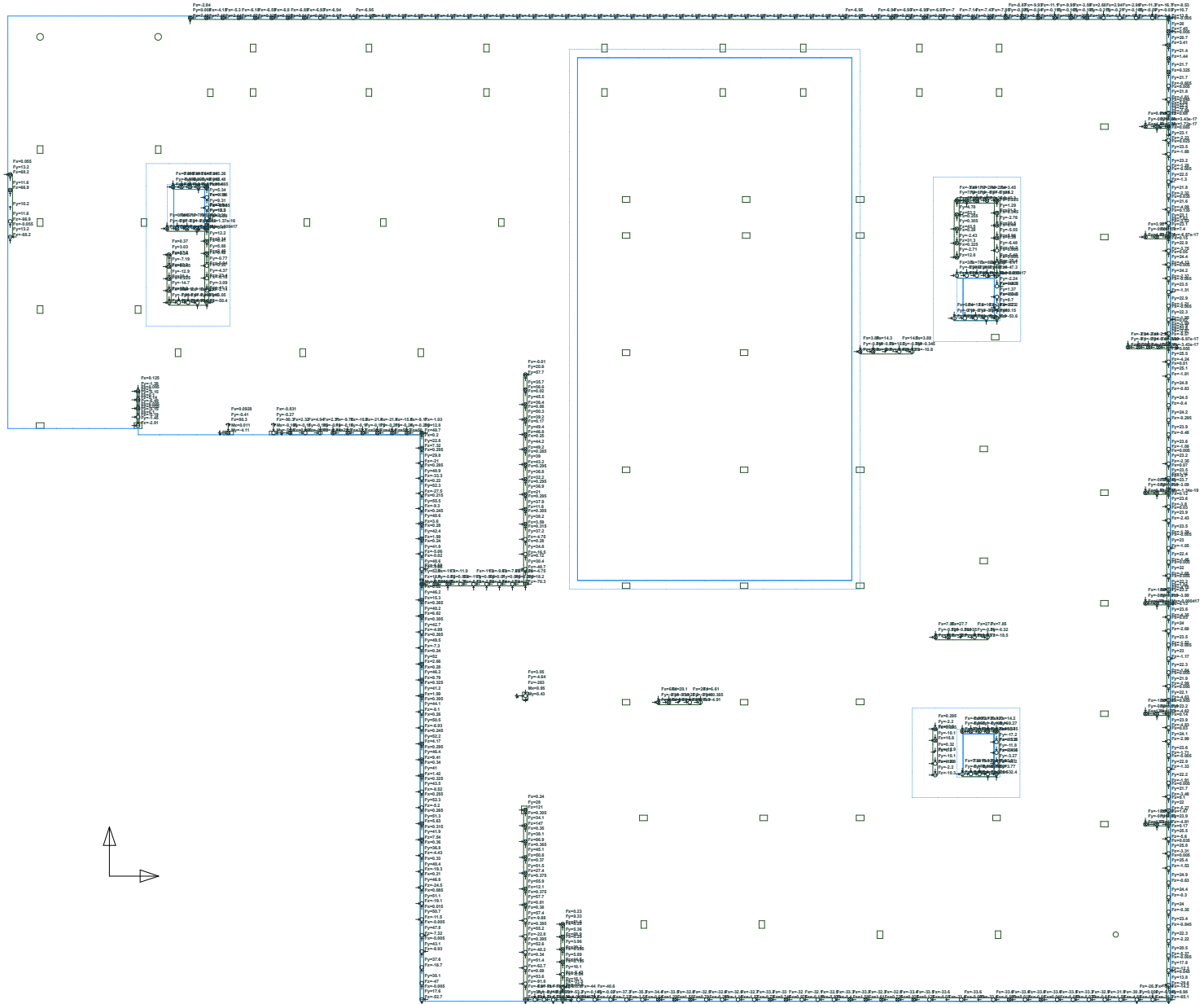
EQ(EQ_ASCE716_-0.3X_+E_-Y_-E_F): All Loads Plan

EQEQ_ASCE716_-0.3X_+E_-Y_-E_F: User Lines, User Areas, User Dimensions, Point Loads, Point Load Icons, Point Load Values, Line Loads, Line Load Icons, Line Load Values, Area Loads, Area Load Icons, Area Load Values.
Elements: Wall Elements Below, Wall Elements Above, Wall Elements Outside Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Elements Outside Only.
Scale = 1:400



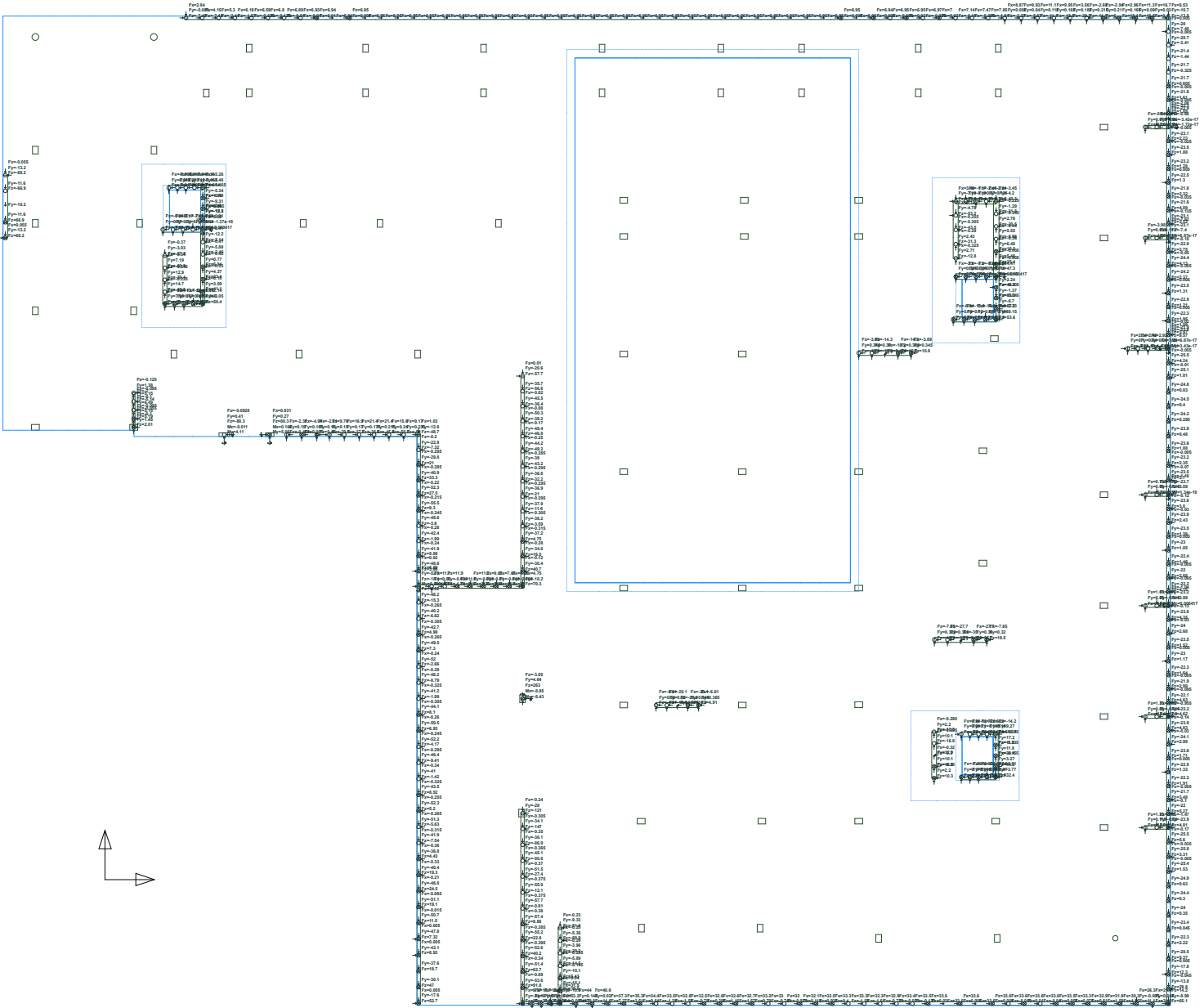
EQ(EQ_ASCE716_-0.3X_+E_Y_-E_F): All Loads Plan

EQEQ_ASCE716_-0.3X_+E_Y_-E_F; User: User; Title: User Dimension: Point Load; Point Load; Point Load; Line Load; Line Load; Line Load; Area Load; Area Load; Area Load;
Element: Mat Element; Mat Element; Mat Element; Column Element; Column Element; Column Element; Column Element; Column Element; Column Element; Column Element;
Scale = 1:400



EQ(EQ_ASCE716_0.3X_+E_-Y_-E_F): All Loads Plan

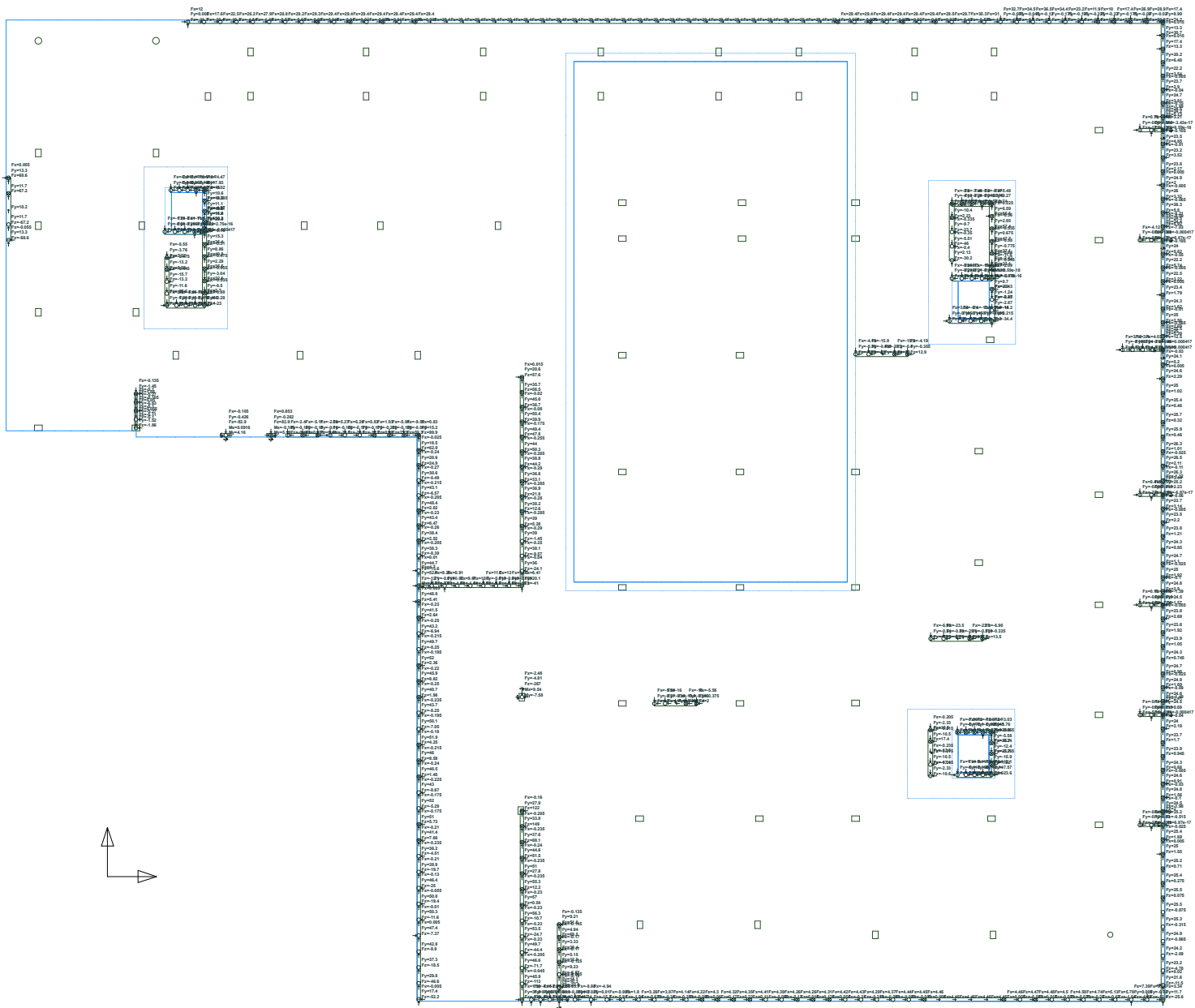
EQ(EQ_ASCE716_0.3X_+E_-Y_-E_F) User: User, User Name: User, Dimension: Point Load, Point Load, Point Load Value, Line Load, Line Load Value, Line Load Value, Area Load, Area Load Value, Area Load Value
Element: Wall Elements Above, Wall Elements Below, Column Elements Above, Column Elements Below, Slab Elements, Slab Element Outline Only
Scale = 1:400



EQ(EQ_ASCE716_0.3X_+E_Y_-E_F): All Loads Plan

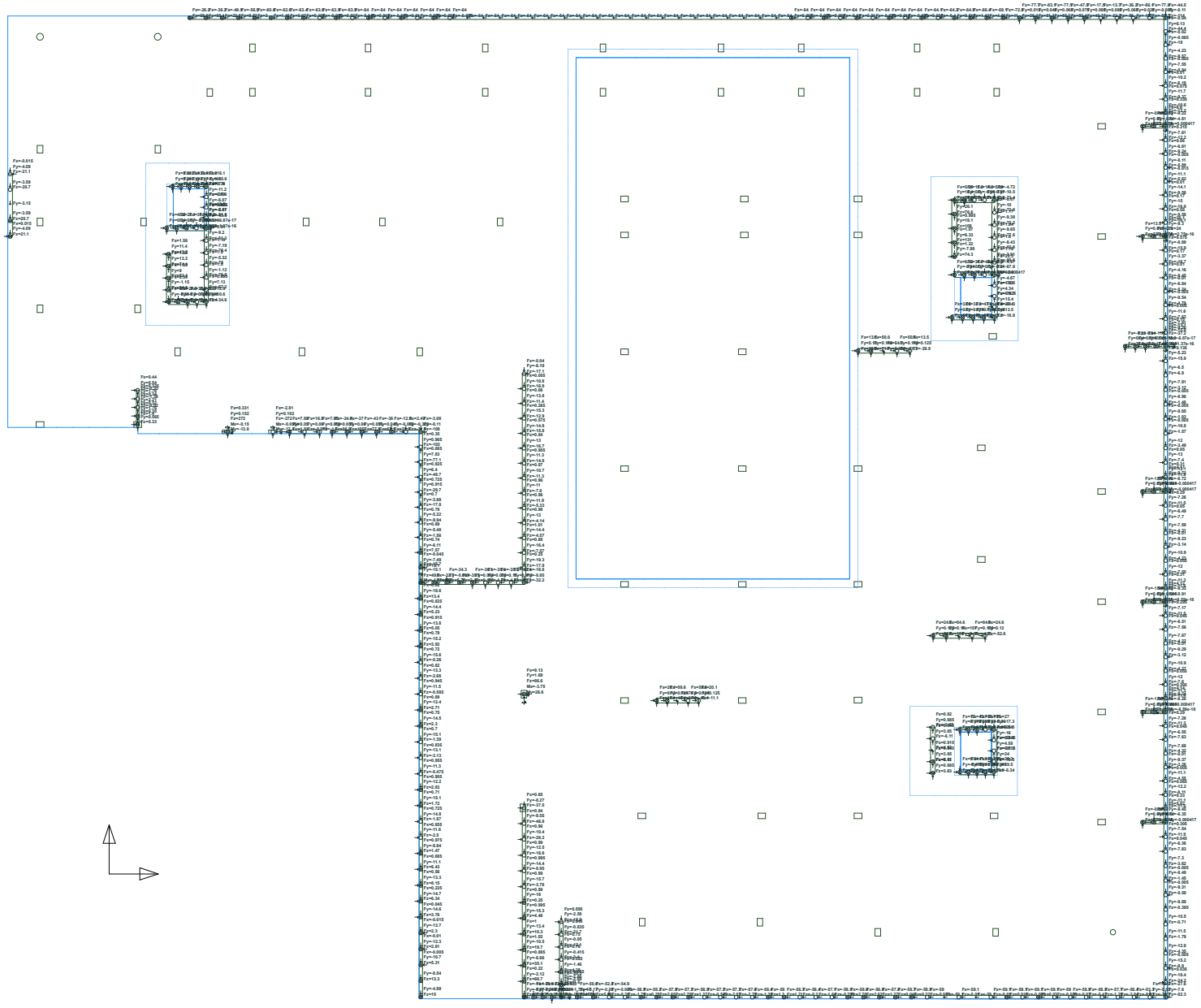
EQ(EQ_ASCE716_0.3X_+E_Y_-E_F)
Display: Shell Elements Below, Wall Elements Above, Wall Elements Outside Only, Column Elements Below, Column Elements Above, Wall Elements, Area Load Below, Area Load Values, Line Load Values, Point Load Values, Point Load Below, Point Load Above, Point Load Values, Line Load Values, Line Load Below, Line Load Above, Line Load Values, Area Load Values, Area Load Below, Area Load Above, Area Load Values

Scale = 1:400



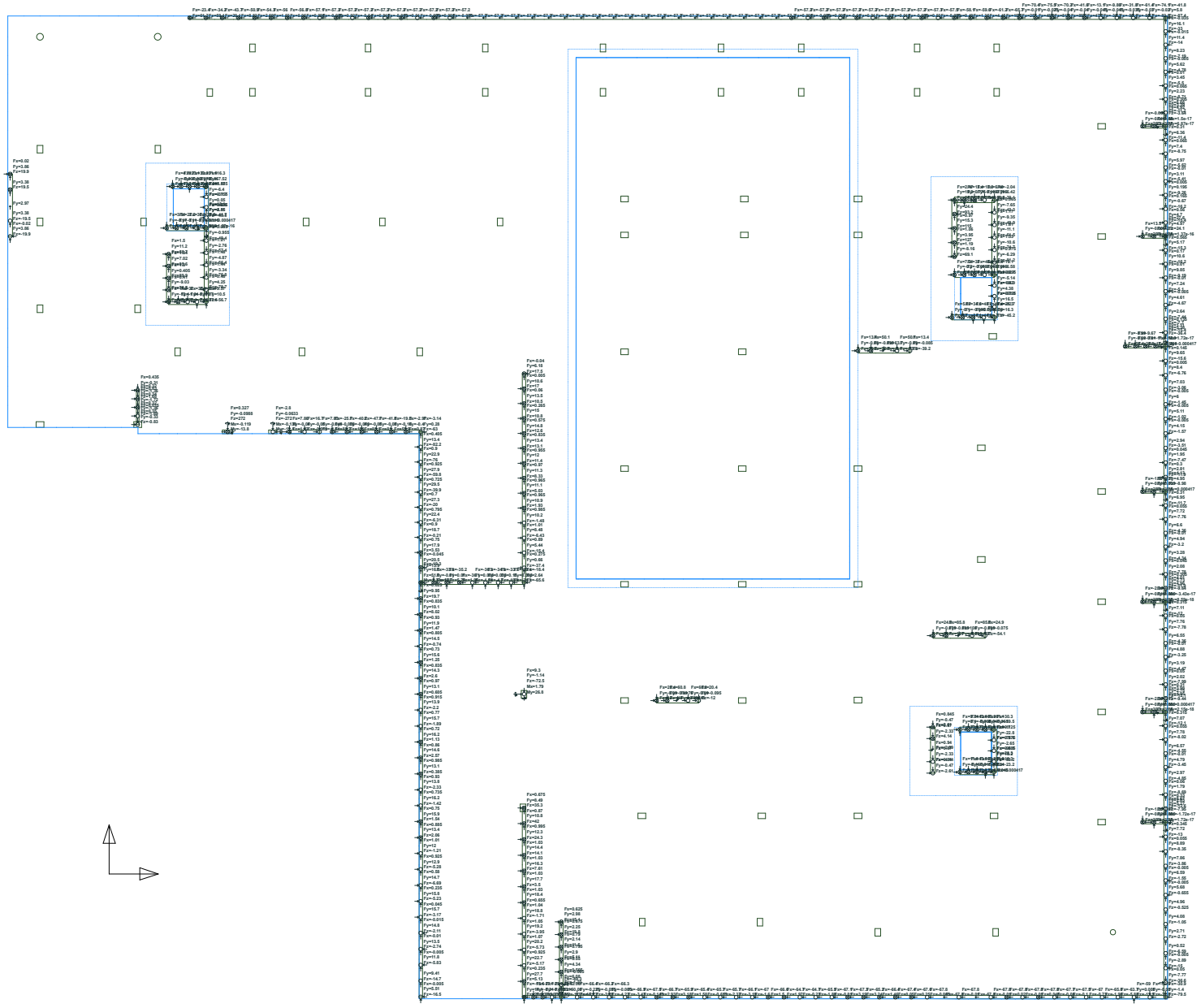
EQ(EQ_ASCE716_-X_+E_-0.3Y_-E_F): All Loads Plan

EQ(EQ_ASCE716_-X_+E_-0.3Y_-E_F) User: Lines, User Area: User Dimensions, Point Loads, Point Load Item, Point Load Value, Line Loads, Line Load Item, Line Load Value, Area Loads, Area Load Item, Area Load Value.
 Element: Wall Elements Below, Wall Elements Above, Wall Elements Outside Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Elements Outside Only.
 Scale = 1:400



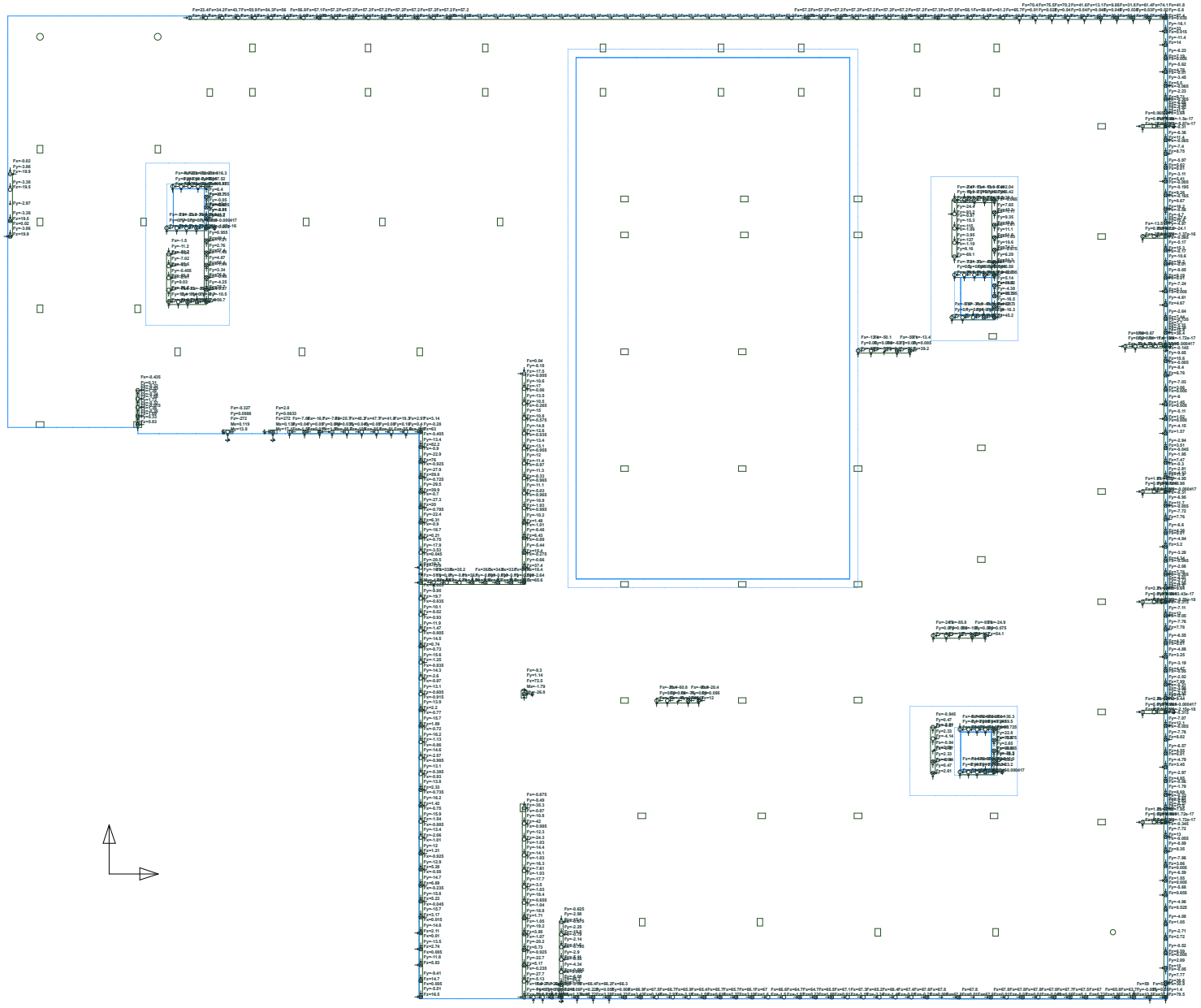
EQ(EQ_ASCE716_-X_+E_0.3Y_-E_F): All Loads Plan

EQ(EQ_ASCE716_-X_+E_0.3Y_-E_F) User: Lines, User: Area, User: Dimension, Point: Load, Point: Load Value, Line: Load, Line: Load Value, Area: Load, Area: Load Value, Dimension: Wall: Element Above, Wall: Element Below, Column: Element Above, Column: Element Below, Slab: Element, Slab: Element Outline Only, Scale = 1:400



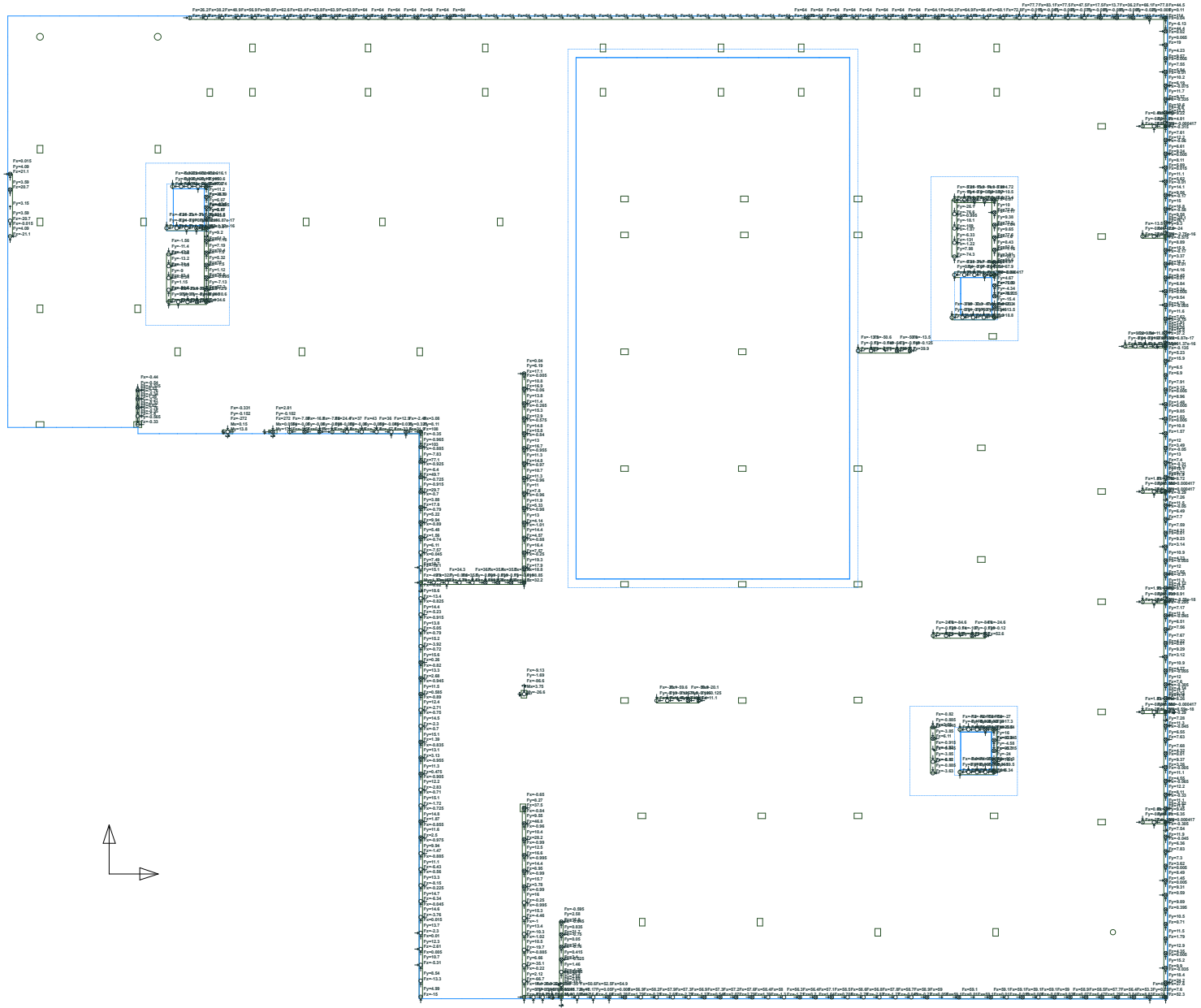
EQ(EQ_ASCE716_X_+E_-0.3Y_-E_F): All Loads Plan

EQ(EQ_ASCE716_X_+E_-0.3Y_-E_F) User: Lina, User: Admin, User: Dimension, Point Load, Point Load from, Point Load Values, Line Loads, Line Load from, Line Load Values, Area Loads, Area Load from, Area Load Values, Element, Shell Elements, Slab, Wall Elements Above, Wall Elements Outside Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Elements Outside Only, Scale = 1:400



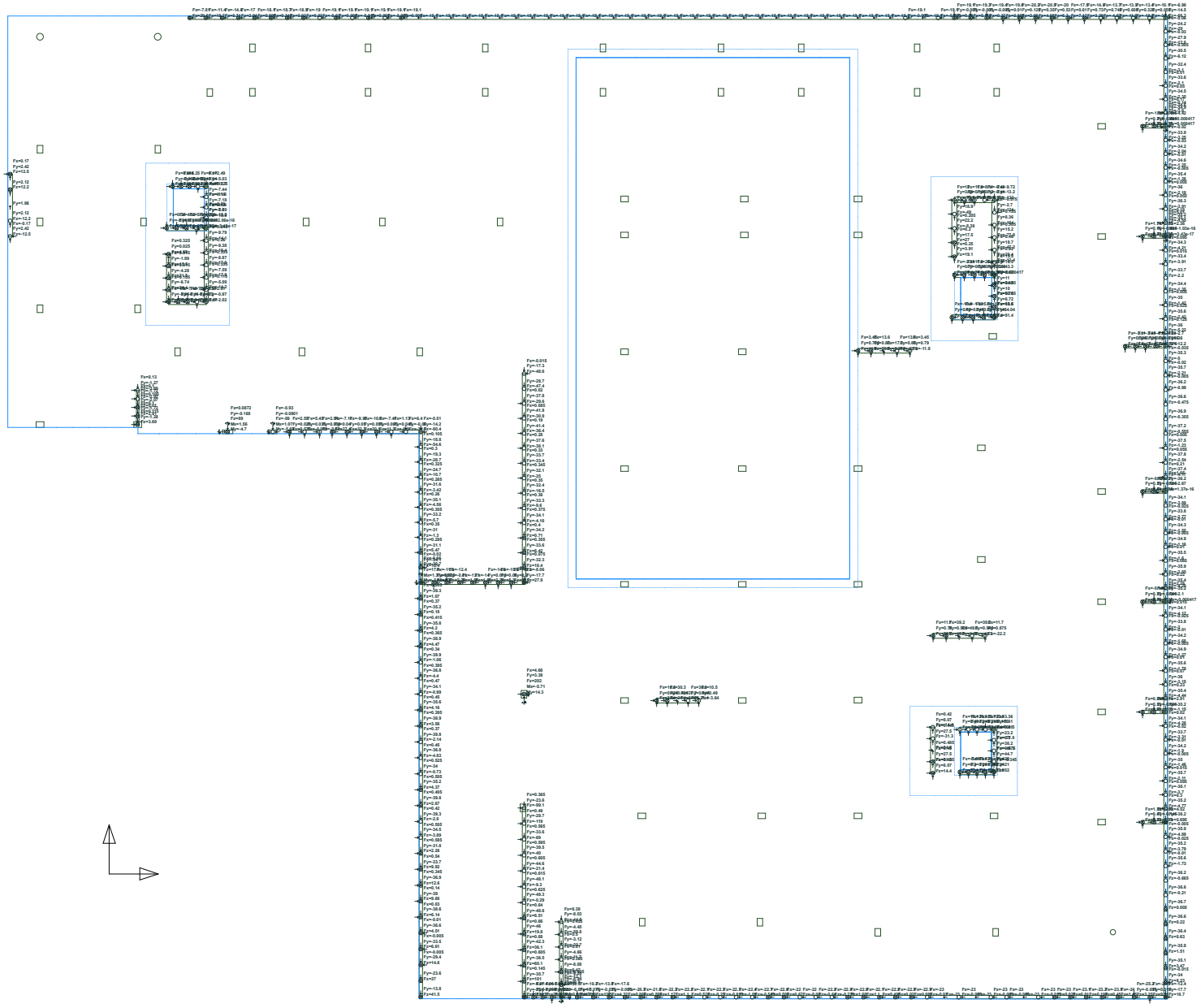
EQ(EQ_ASCE716_X_+E_0.3Y_-E_F): All Loads Plan

EQ(EQ_ASCE716_X_+E_0.3Y_-E_F) User Lines: User Areas, User Dimensions, Point Loads, Point Load Icons, Point Load Values, Line Loads, Line Load Icons, Line Load Values, Area Loads, Area Load Icons, Area Load Values, Element, Shell Element Icon, Shell Element Above, Shell Element Below, Column Element Icon, Column Element Above, Shell Element, Shell Element Outline Only, Scale = 1:400



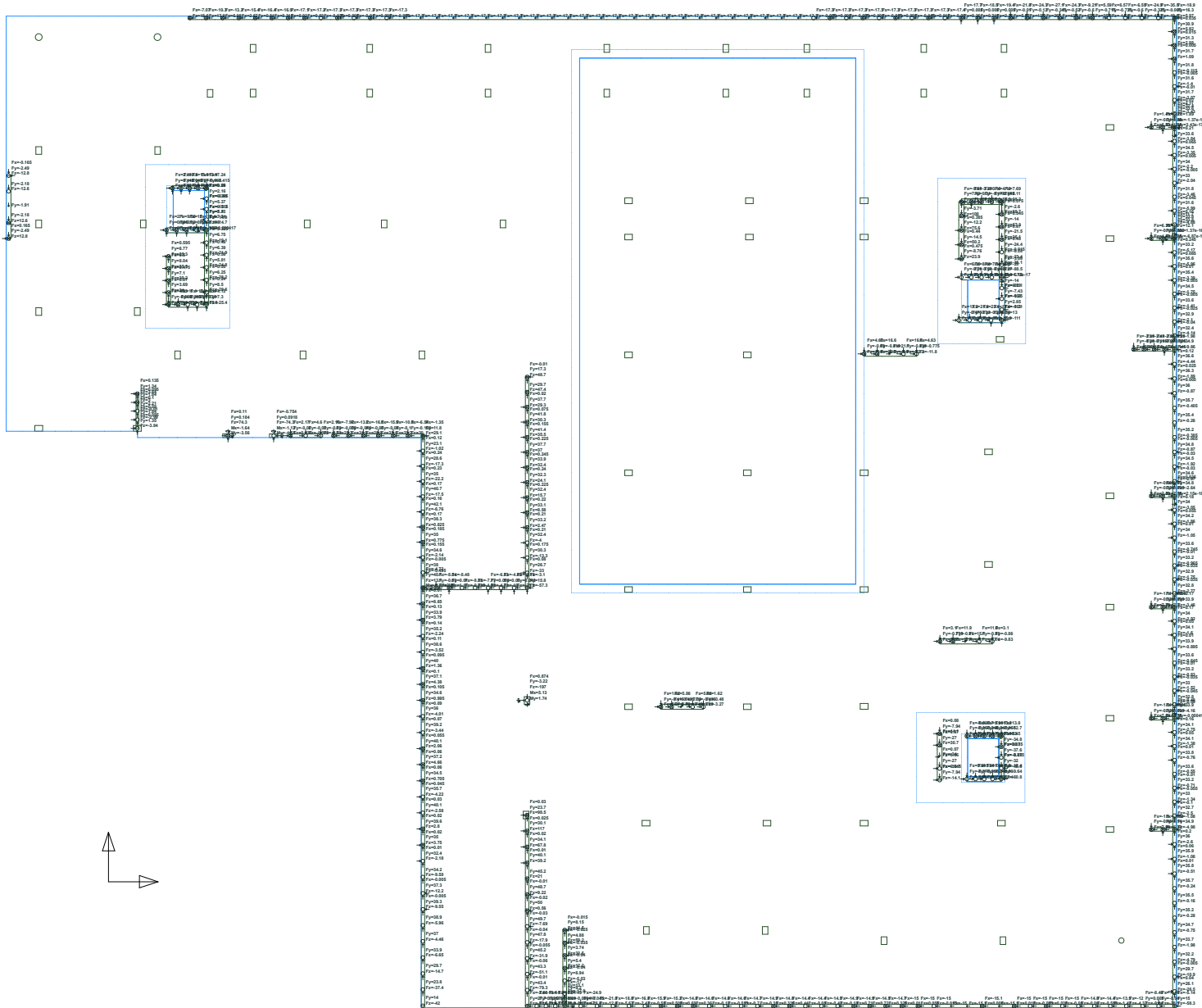
EQ(EQ_ASCE716_-0.3X_+E_-Y_+E_F): All Loads Plan

EQ(EQ_ASCE716_-0.3X_+E_-Y_+E_F) User Lines: User Notes: User Dimensions: Point Loads: Point Load Icons: Point Load Values: Line Loads: Line Load Icons: Line Load Values: Area Loads: Area Load Icons: Area Load Values: Elements: Wall Elements Below: Wall Elements Above: Wall Elements Outline Only: Column Elements Below: Column Elements Above: Wall Elements: Wall Elements Outline Only: Scale = 1:400



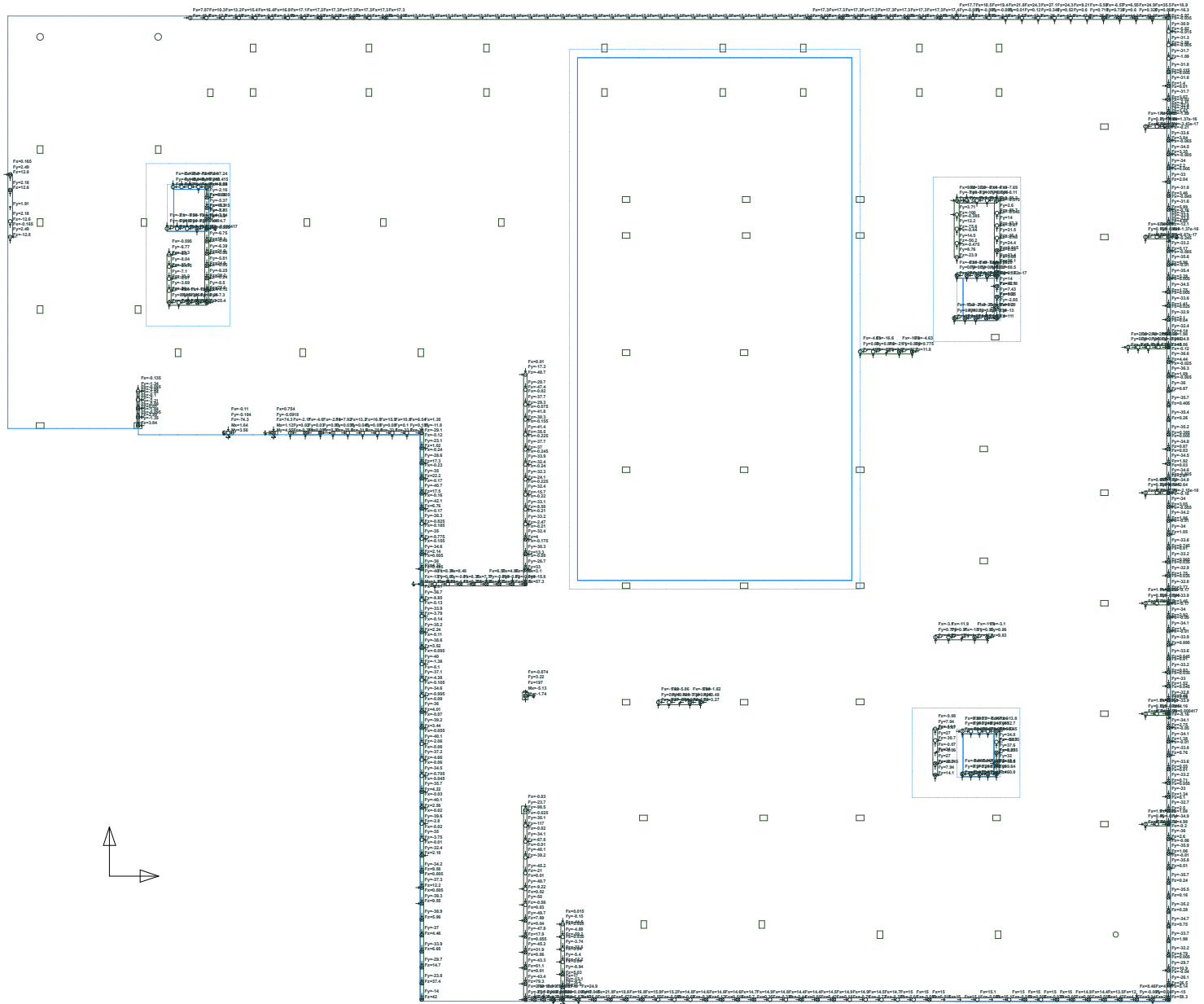
EQ(EQ_ASCE716_-0.3X_+E_Y_+E_F): All Loads Plan

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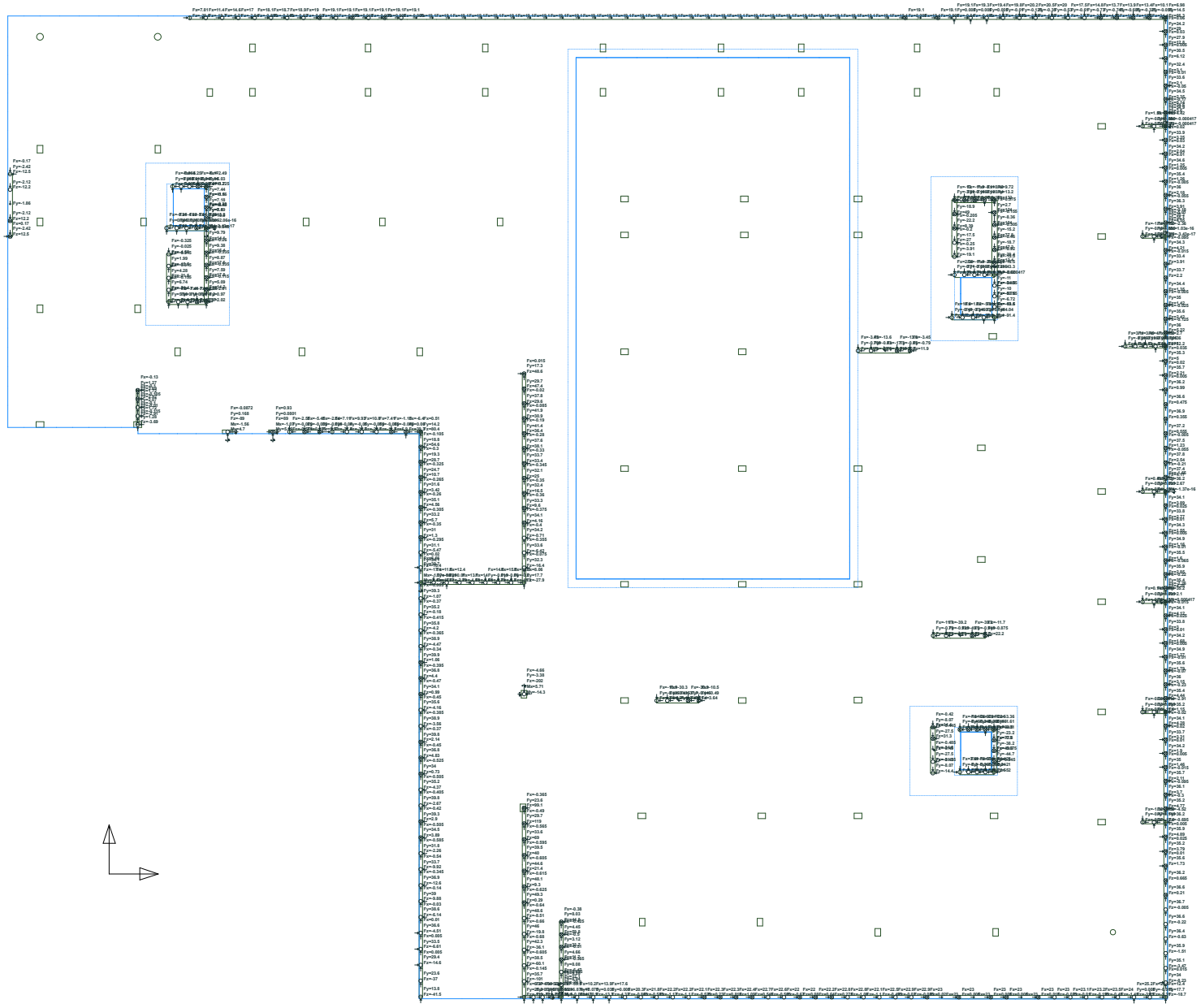
EQ(EQ_ASCE716_0.3X_+E_-Y_+E_F): All Loads Plan

EQ(EQ_ASCE716_0.3X_+E_-Y_+E_F): All Loads Plan
 Element: Wall Elements Below, Wall Elements Above, Wall Element Center Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Center Only
 Scale = 1/400



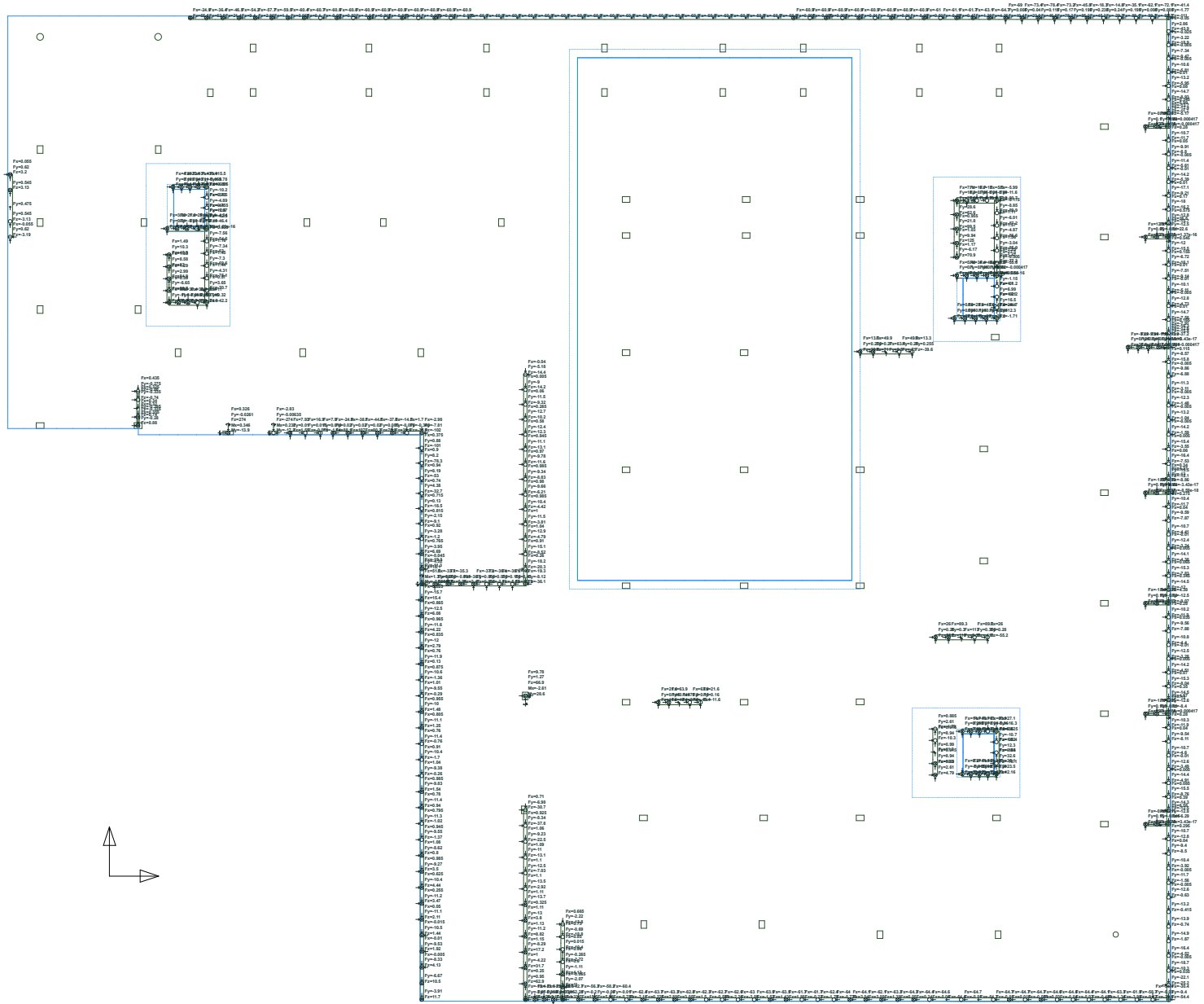
EQ(EQ_ASCE716_0.3X_+E_Y_+E_F): All Loads Plan

EQ(EQ_ASCE716_0.3X_+E_Y_+E_F) User: Linan, User Agency: User Dimension: Point Load, Point Load Isop, Point Load Values, Line Load, Line Load Isop, Line Load Values, Area Load, Area Load Isop, Area Load Values
Element: Shell Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Deck Elements, Deck Element Outline Only
Scale = 1:400



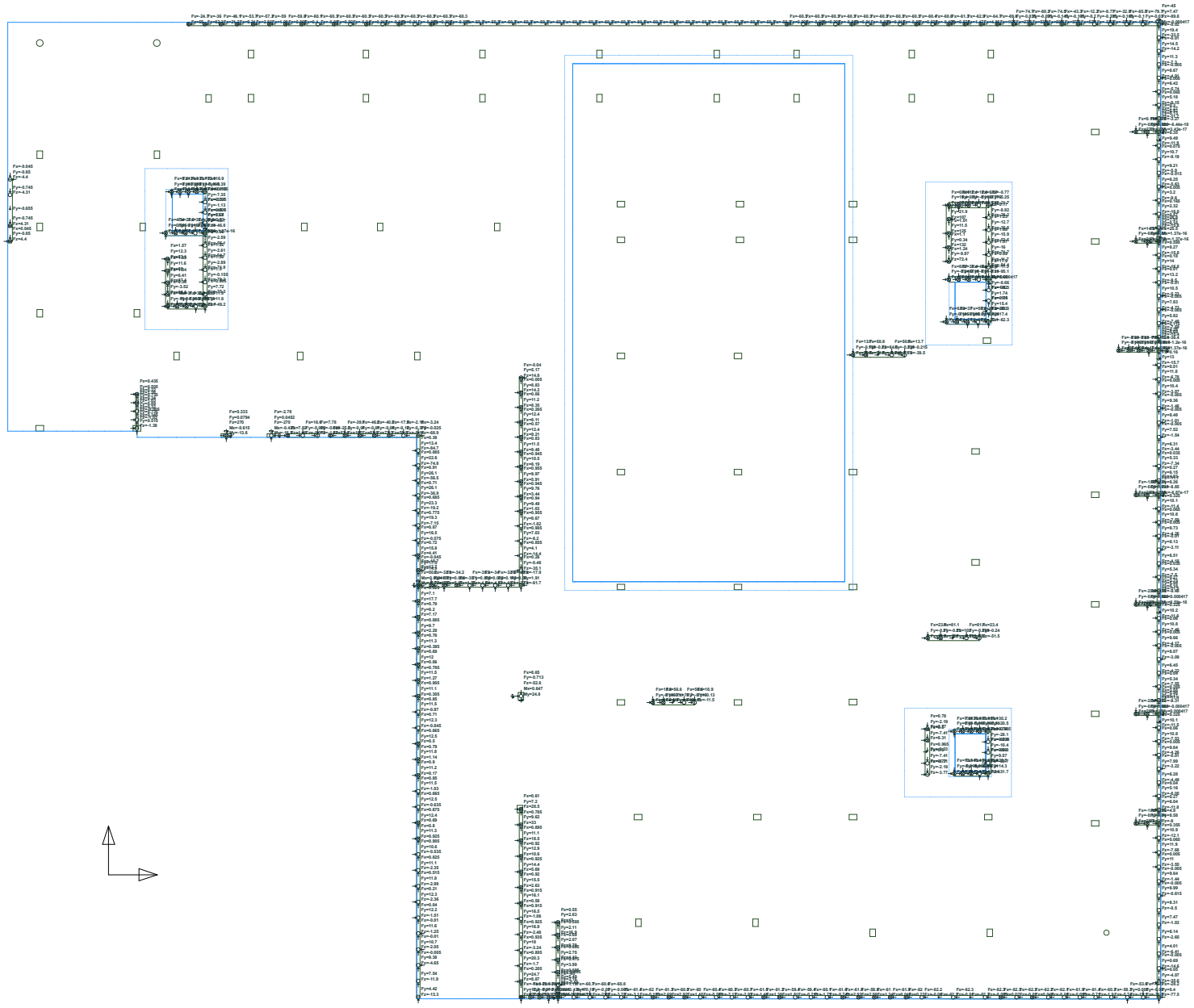
EQ(EQ_ASCE716_-X_+E_-0.3Y_+E_F): All Loads Plan

EQ(EQ_ASCE716_-X_+E_-0.3Y_+E_F) User Lines, User Notes, User Dimensions, Point Loads, Point Load Icons, Point Load Values, Line Loads, Line Load Icons, Line Load Values, Area Loads, Area Load Icons, Area Load Values, Elements: Wall Elements Below, Wall Elements Above, Wall Elements Outside Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Elements Outside Only
Scale = 1:400



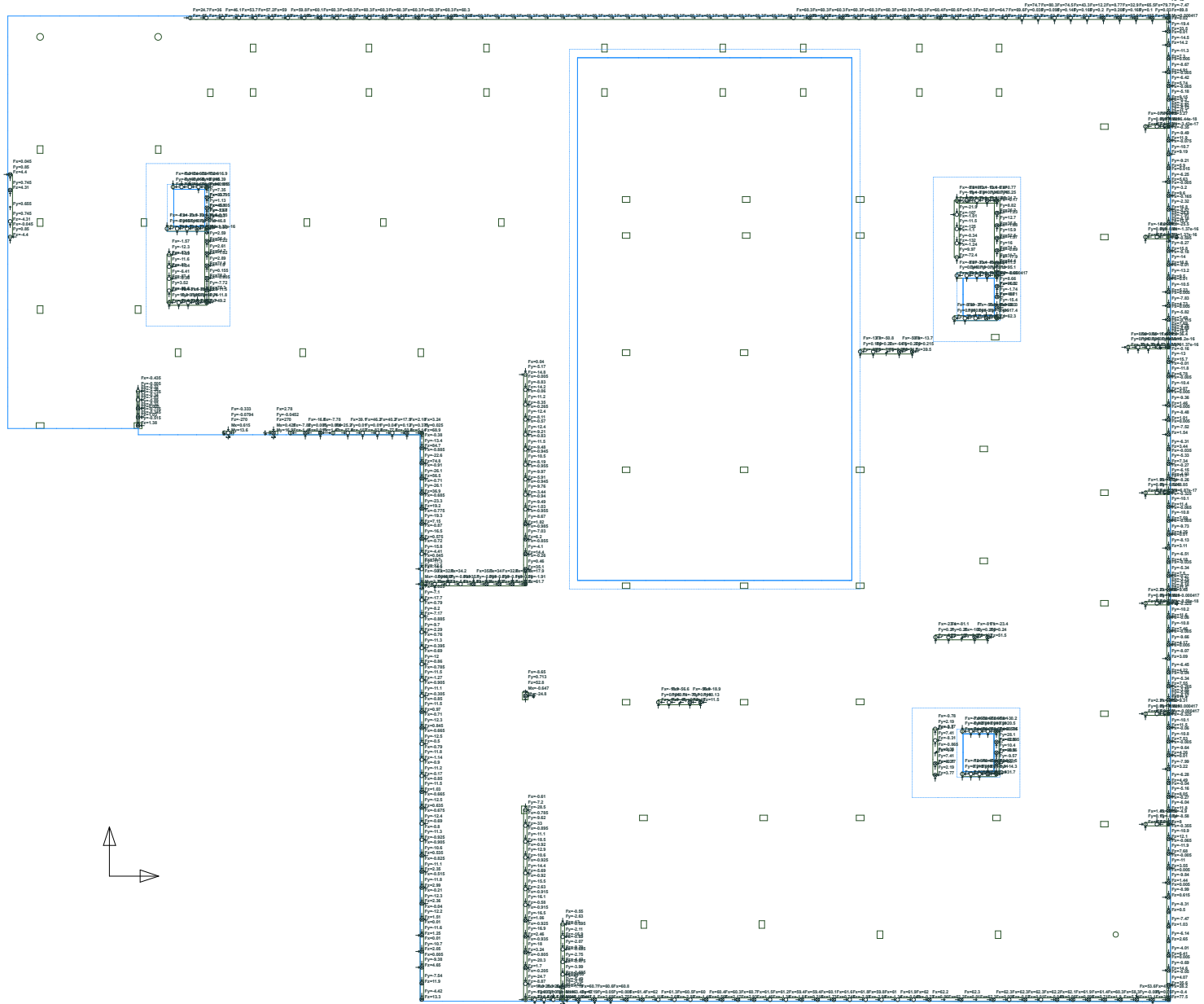
EQ(EQ_ASCE716_-X_+E_0.3Y_+E_F): All Loads Plan

EQEQ_ASCE716_-X_+E_0.3Y_+E_F: Data Lines: User Name, User Dimension, Point Load, Point Load Icon, Point Load Value, Line Load, Line Load Icon, Line Load Value, Area Load, Area Load Icon, Area Load Value.
Elements: Wall Elements Above, Wall Elements Below, Wall Elements Outside Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Elements Outside Only.
Scale = 1:400



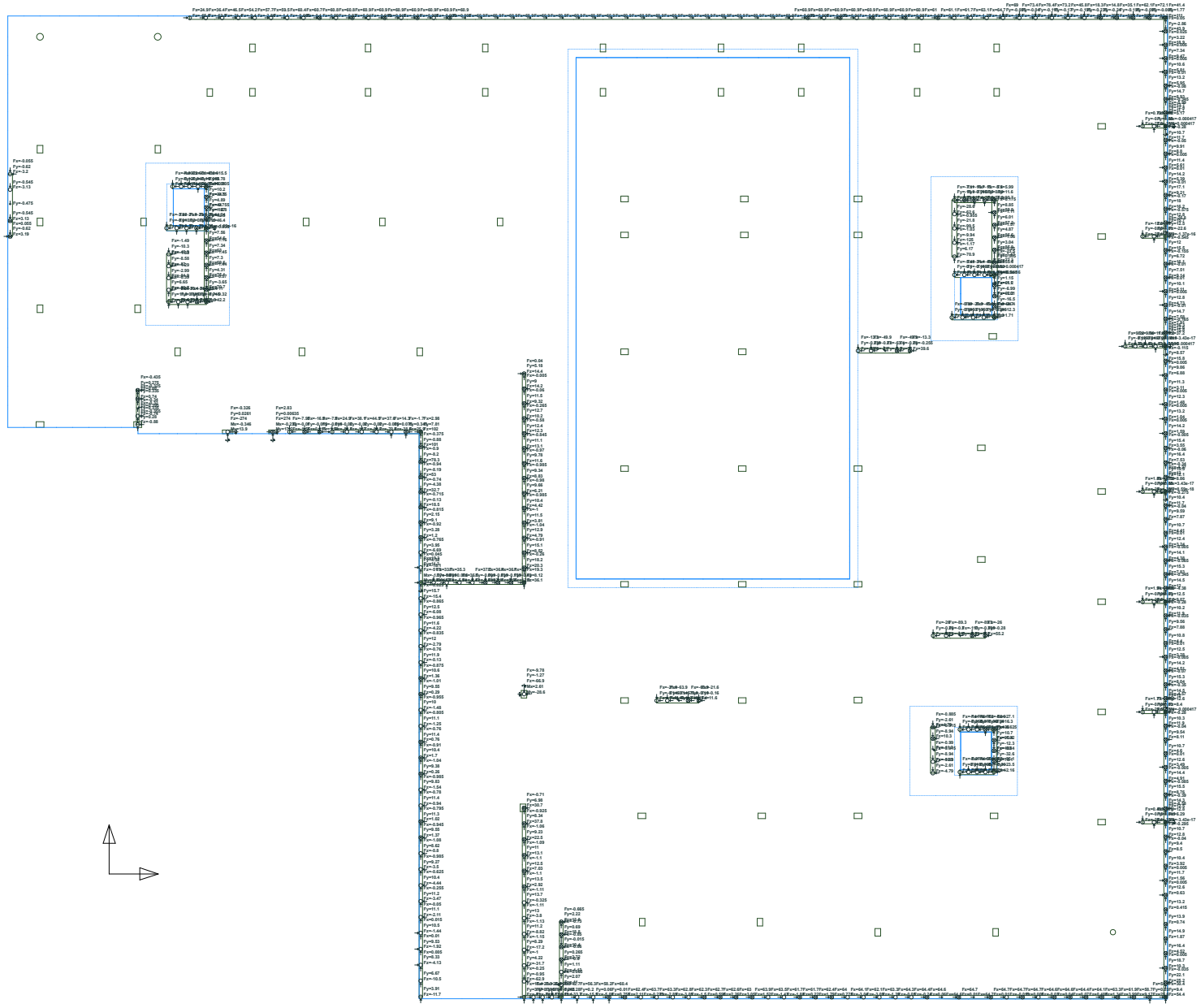
EQ(EQ_ASCE716_X_+E_-0.3Y_+E_F): All Loads Plan

EQ(EQ_ASCE716_X_+E_-0.3Y_+E_F): All Loads Plan. User Dimension: Point Load, Point Load, Point Load Value, Line Load, Line Load Value, Area Load, Area Load Value. Element: Shell Element Below, Wall Element Above, Wall Element Below, Column Element Below, Column Element Above, Wall Element Below, Wall Element Above, Wall Element Below, Wall Element Above. Scale = 1:400



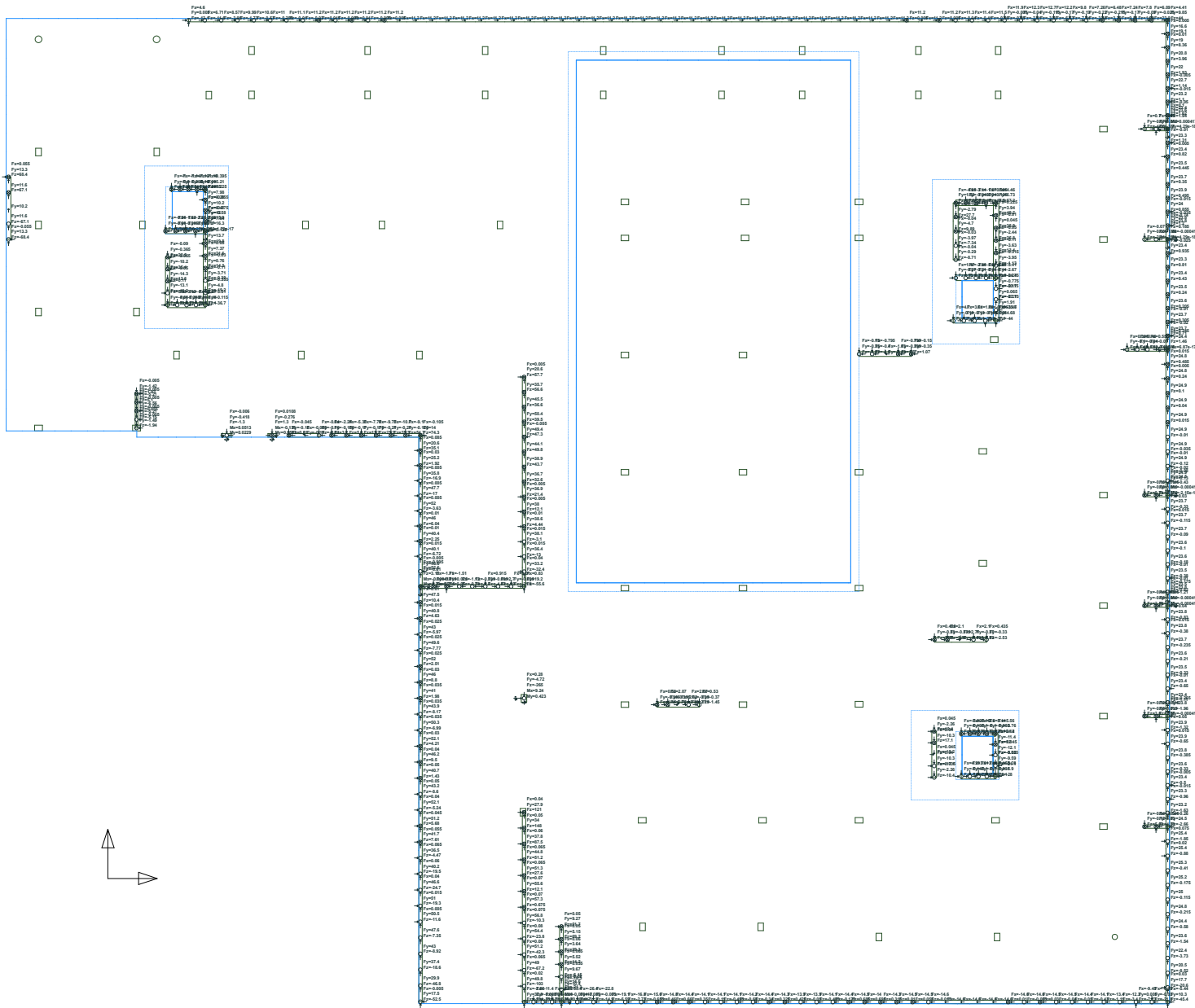
EQ(EQ_ASCE716_X_+E_0.3Y_+E_F): All Loads Plan

EQ(EQ_ASCE716_X_+E_0.3Y_+E_F) User: Lina, User Agency: User Dimension: Point Load, Point Load Icon, Point Load Values, Line Load, Line Load Icon, Line Load Values, Area Load, Area Load Icon, Area Load Values, Element: Wall Elements Below, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Wall Element, Wall Element Outline Only, Scale = 1:400



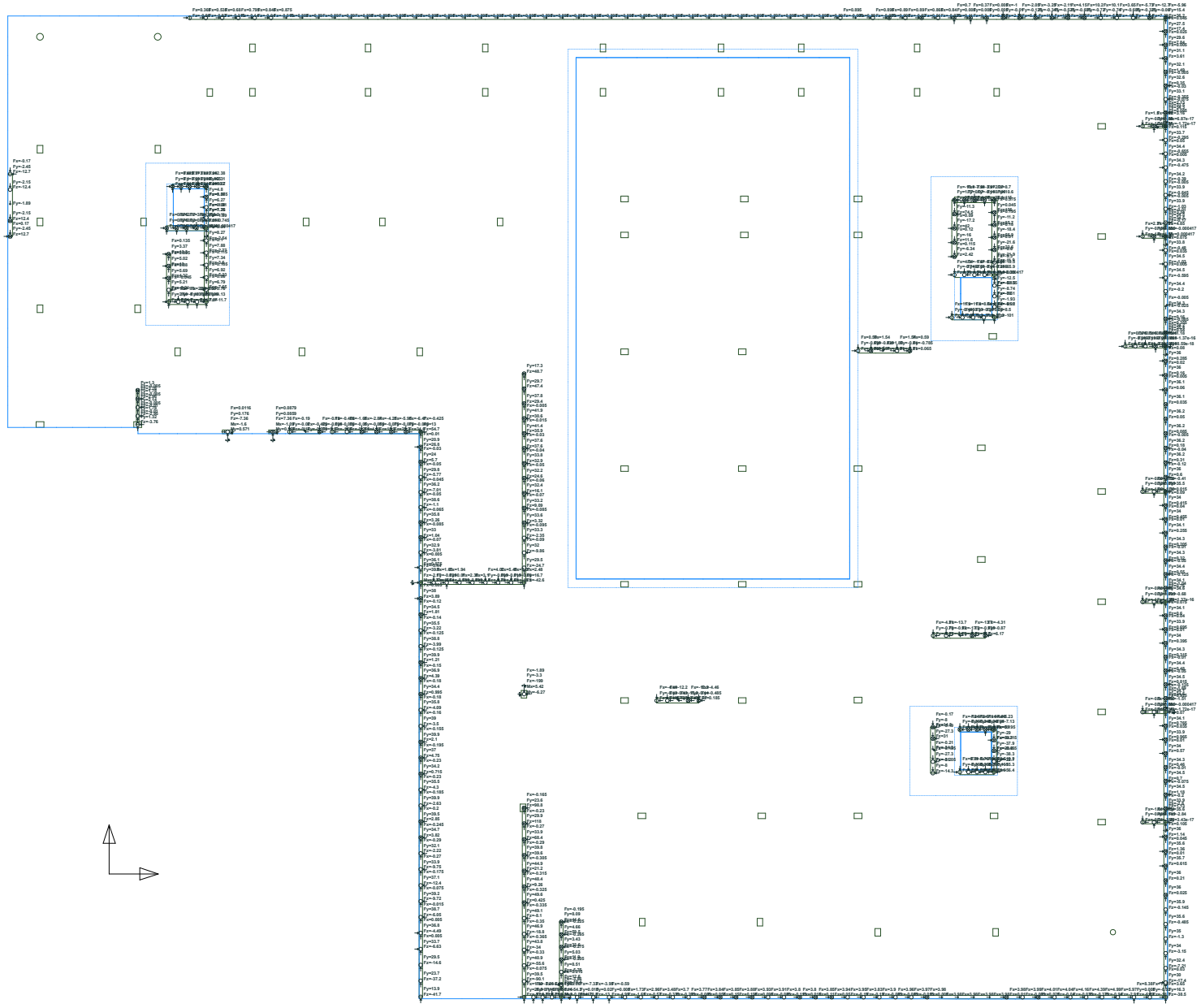
EQ(EQ_ASCE716_Y_-E_F): All Loads Plan

EQEQ_ASCE716_Y_-E_F User: User Name; User Dimension; Point Load; Point Load Name; Line Load; Line Load Name; Area Load; Area Load Name; Area Load Value; Element; Wall Element Above; Wall Element Below; Column Element Above; Column Element Below; Column Element Value; Column Element Value Only; Scale = 1:400



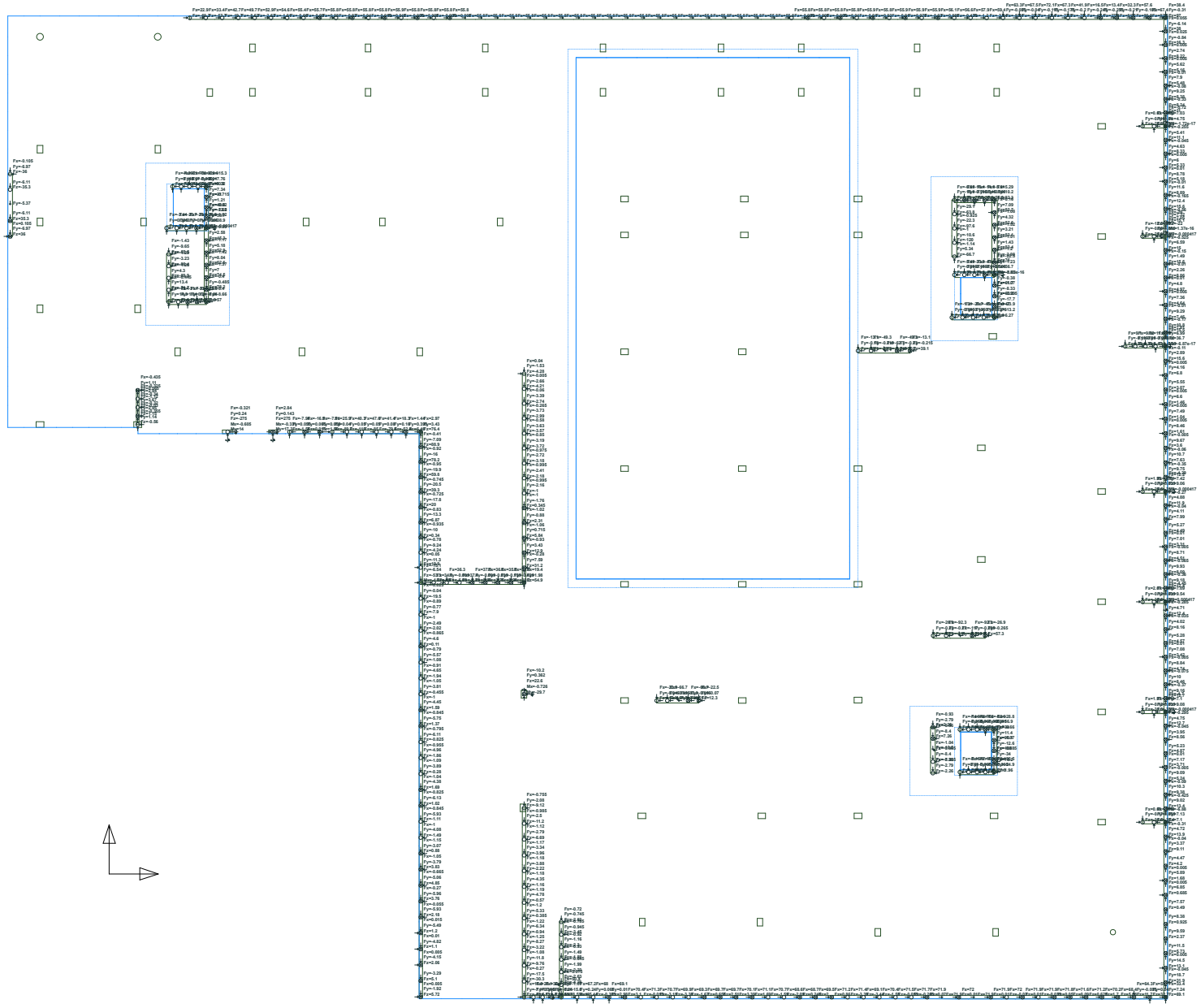
EQ(EQ_ASCE716_Y_+E_F): All Loads Plan

EQEQ_ASCE716_Y_+E_F User Name: User Name; User Dimension: Point Load; Point Load Score; Point Load Value; Line Load; Line Load Score; Line Load Value; Area Load; Area Load Score; Area Load Value; Element; Shell Element; Slab; Wall Element; Column; Column Above; Column; Column Below; Slab Element; Slab Element Above; Slab Element; Slab Element Below; Scale = 1.000



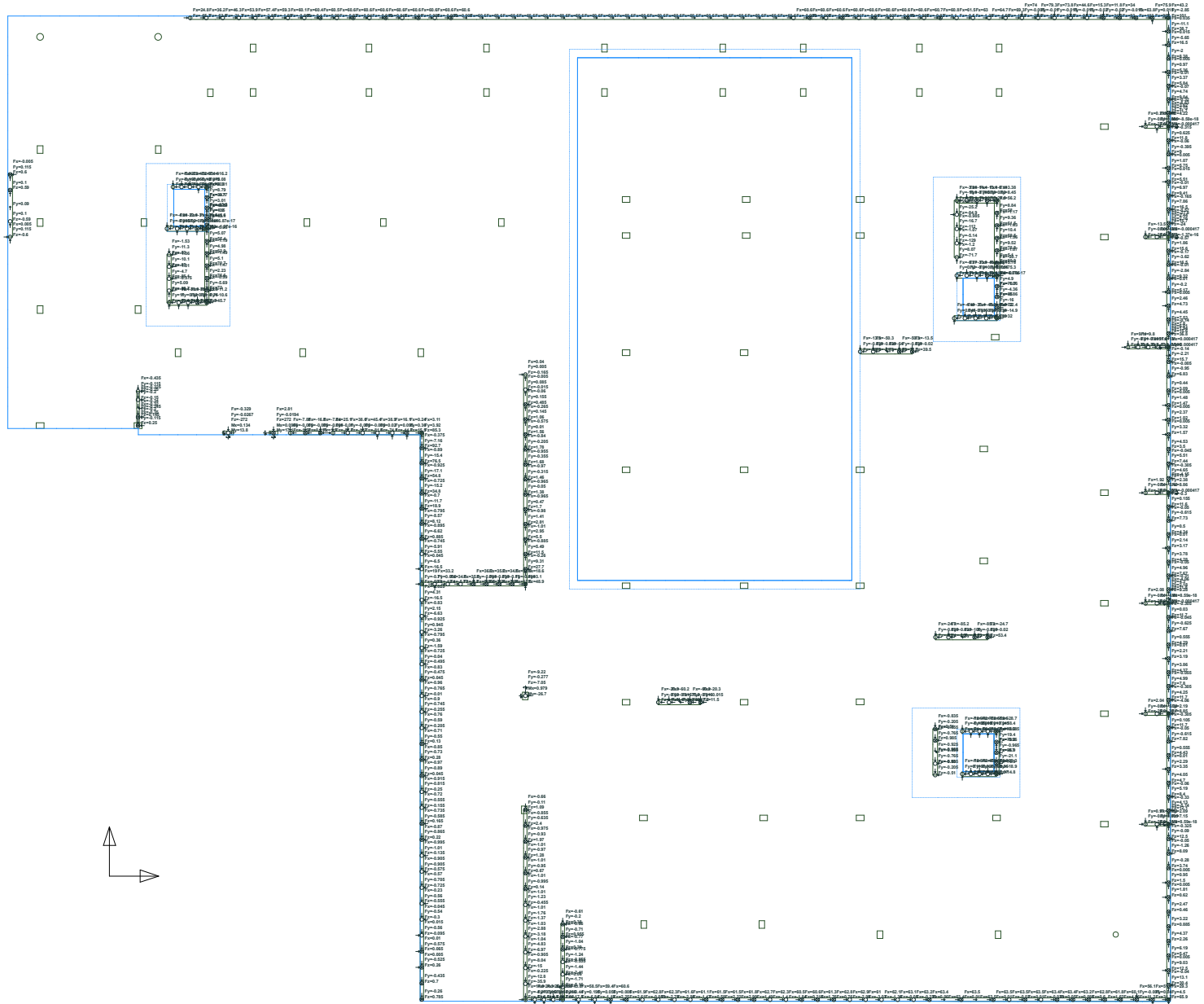
EQ(EQ_ASCE716_X_-E_F): All Loads Plan

EQEQ_ASCE716_X_-E_F User: User Name; User Dimensions; Point Loads; Point Load Name; Line Loads; Line Load Name; Area Loads; Area Load Name; Area Load Name; Element; Wall Elements Above; Wall Elements Below; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only; Scale = 1:400



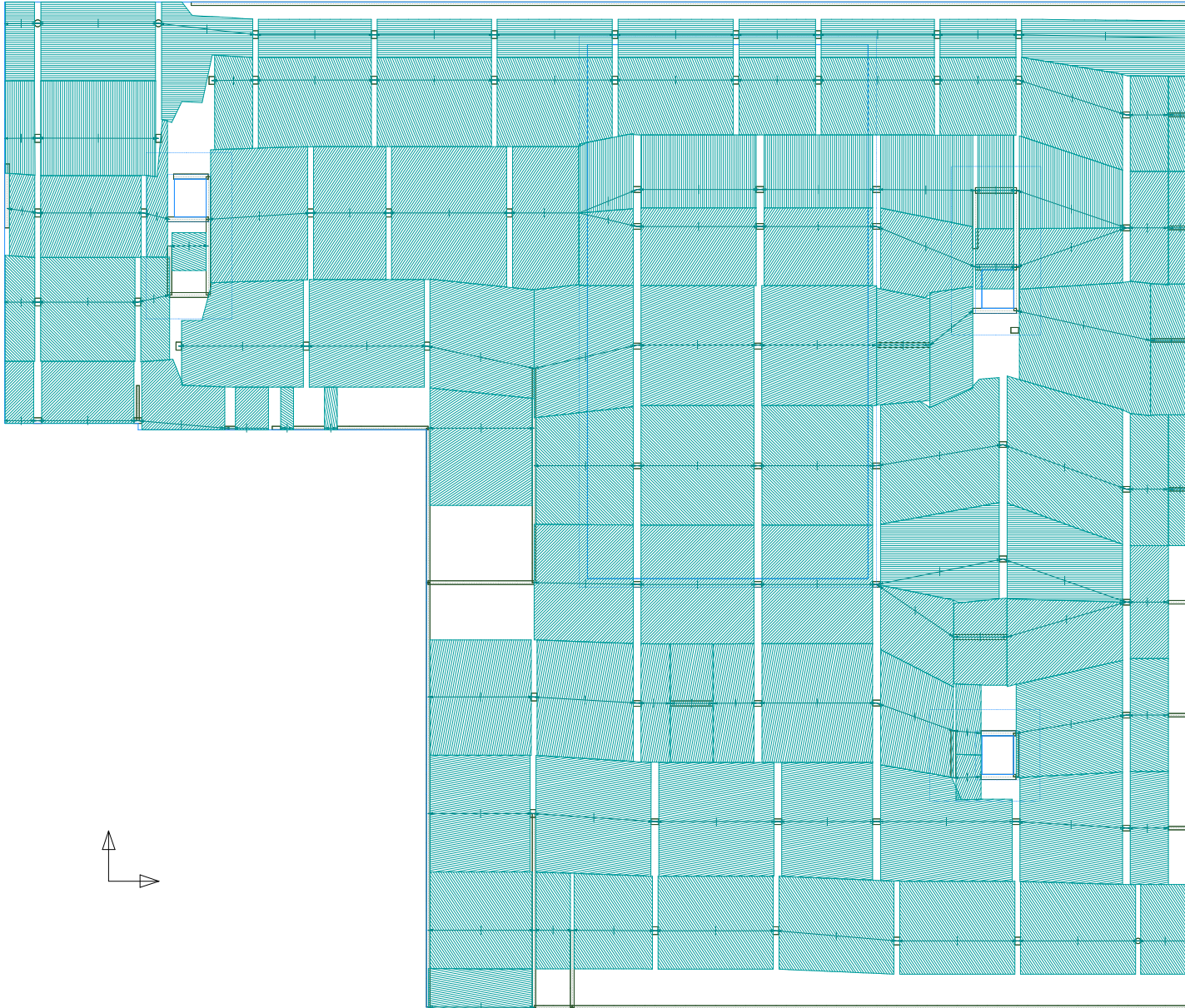
EQ(EQ_ASCE716_X_+E_F): All Loads Plan

EQEQ_ASCE716_X_+E_F: User Name: User Name; User Dimensions: Point Loads: Point Load Name; Line Loads: Line Load Name; Area Loads: Area Load Name; Area Load Name; Element: Wall Elements Below; Wall Elements Above; Wall Elements Outside Only; Column Elements Below; Column Elements Above; Deck Elements; Deck Elements Outside Only; Scale = 1:400



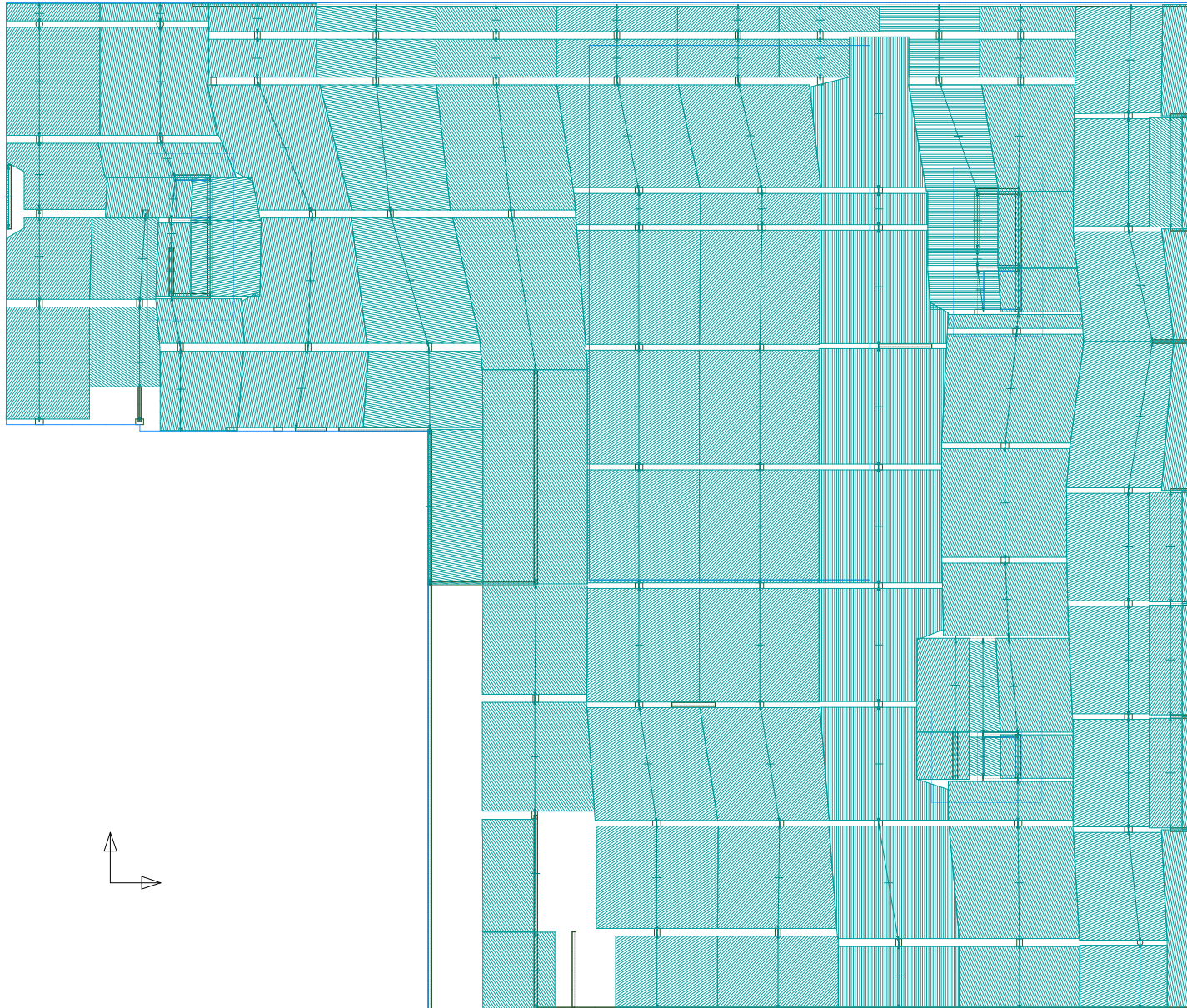
Design Strip: Latitude Design Spans Plan

Design Strip: Latitude Span Boundaries, Latitude Size, Latitude Strip Boundaries, Latitude Size, S/S Hatching, Latitude Deflection Checks, User Notes, User Lines, User Dimensions;
Wall Top: Wall Above, Wall Below, Column Above;
Element: Wall Elements Above, Wall Elements Below, Wall Element Outline Only, Column Elements Above, Column Elements Below, Slab Element, Slab Element Outline Only;
Scale: 1/4" = 1'-0"



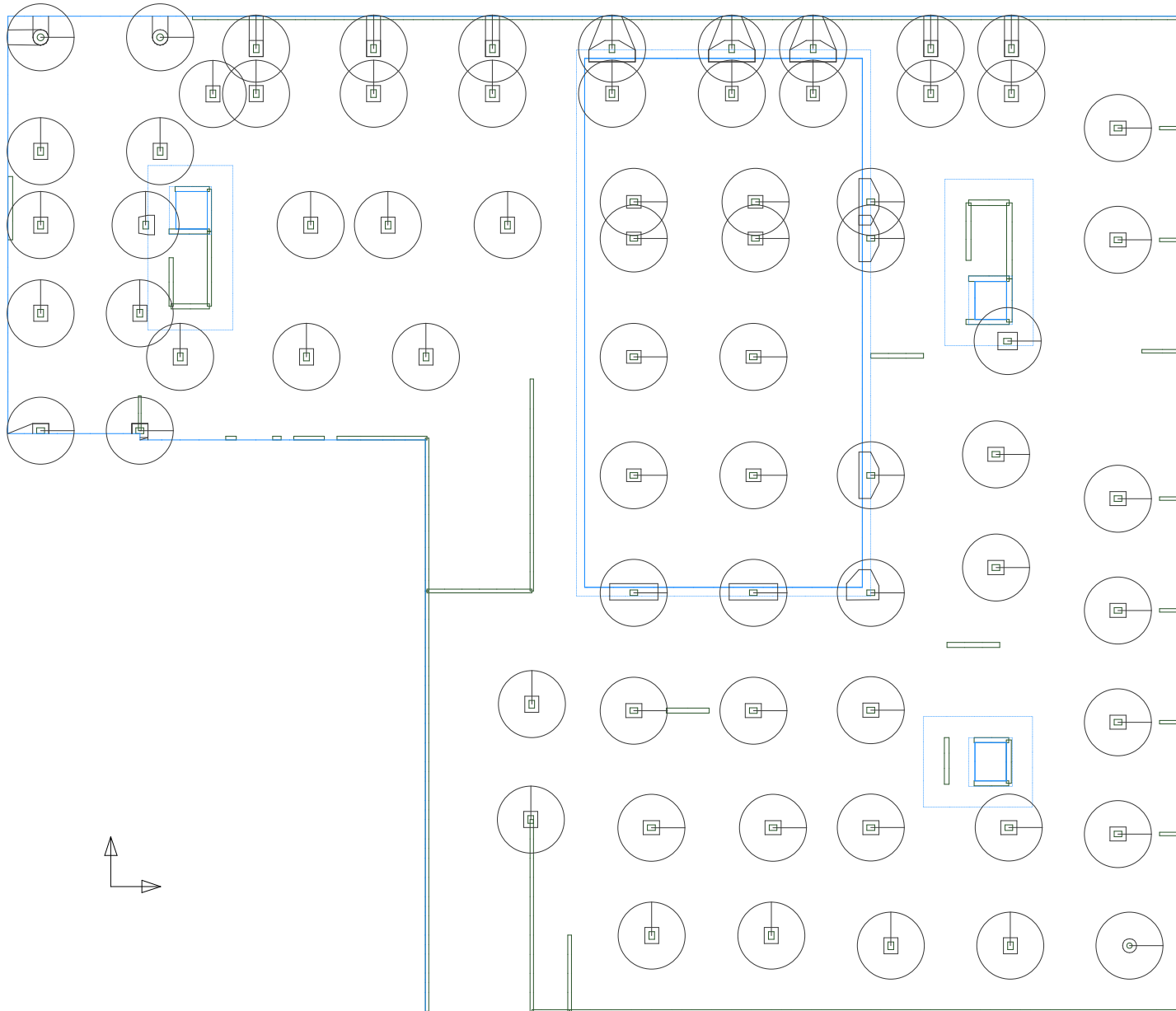
Design Strip: Longitude Design Spans Plan

Design Strip: Longitude Span Boundaries, Longitude SSt; Longitude SSt; Longitude SSt; SSt Matching; Longitude Deflection Checks; User Notes; User Lines; User Dimensions;
Wall Foot: Slabs; Walls Above;
Column: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Element Above; Column Element Below; Slab Element; Slab Element Outline Only;
Scale: 1/4"=1'-0"



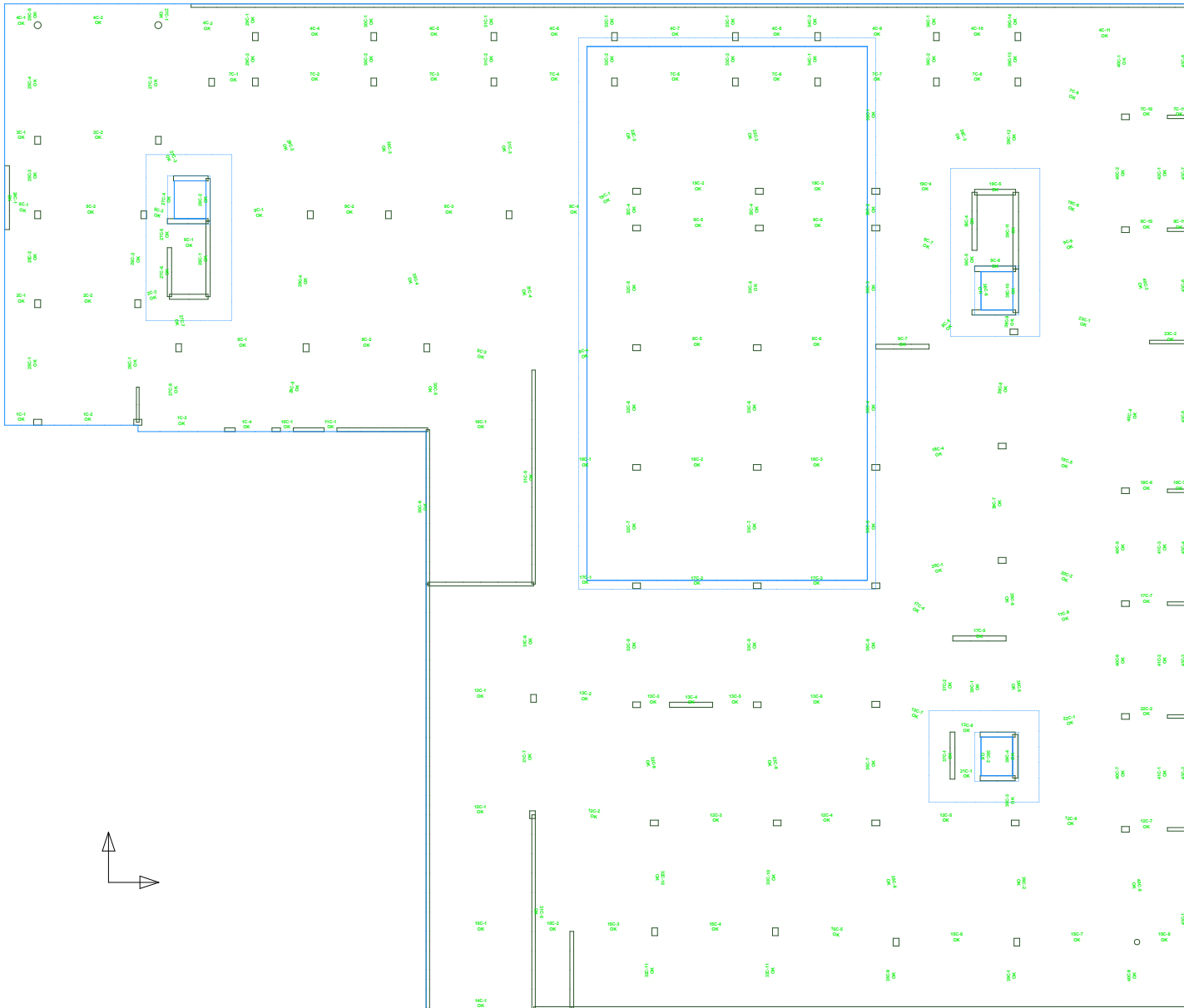
Design Strip: Punching Checks Plan

Design Strip: User Lines, User Notes, User Dimensions, Punching Checks, Punching Check Sections.
Elements: Wall Elements Above, Wall Elements Below, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Element Outline Only.
Scale = 1:400



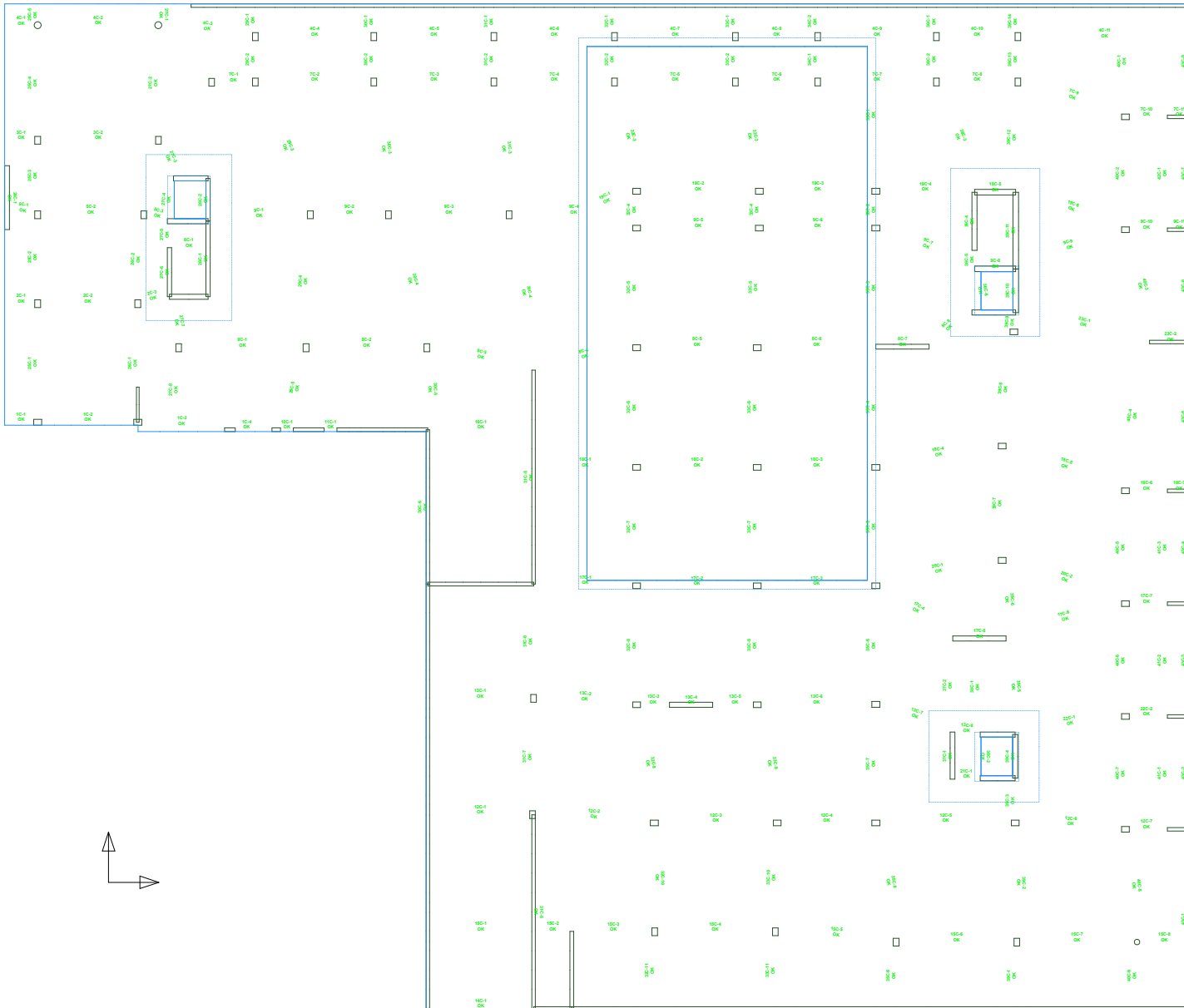
User Minimum Design: Status Plan

User Minimum Design: User Lines, User Notes, User Dimensions, Labeled Span Design, Longhole Span Design, Span Design Number, Span Design Status, Labeled DS Design, Labeled DS Design Number, DS Design Status, PC Design, PC Design Number, PC Design Status, Design, Wall Elements Above, Wall Elements Below, Wall Element Outline Only, Column Elements Below, Column Elements Above, Box Elements, Box Element Outline Only, Scale = 1:400



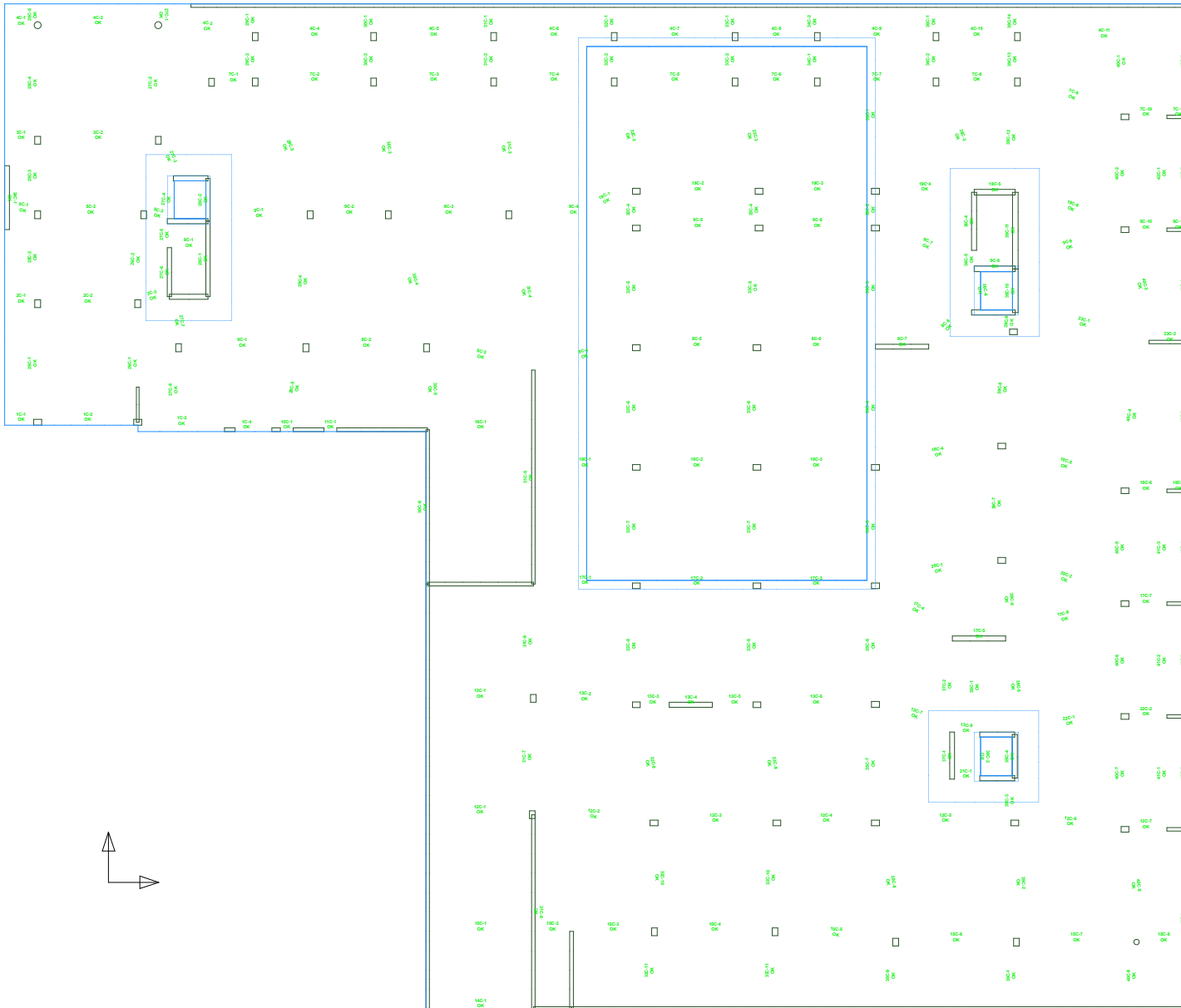
Service Design: Status Plan

Service Design: User Lines, User Notes, User Dimensions, Latitude, Span Design, Longitude, Span Design, Span Design Status, Latitude, DS Design, Longitude, DS Design, DS Design Number, DS Design Status, PC Design, PC Design Number, PC Design Status, Design, Wall Elements Above, Wall Elements Below, Wall Element Outline Only, Column Elements Below, Column Elements Above, Wall Elements, Wall Element Outline Only, Scale = 1:400



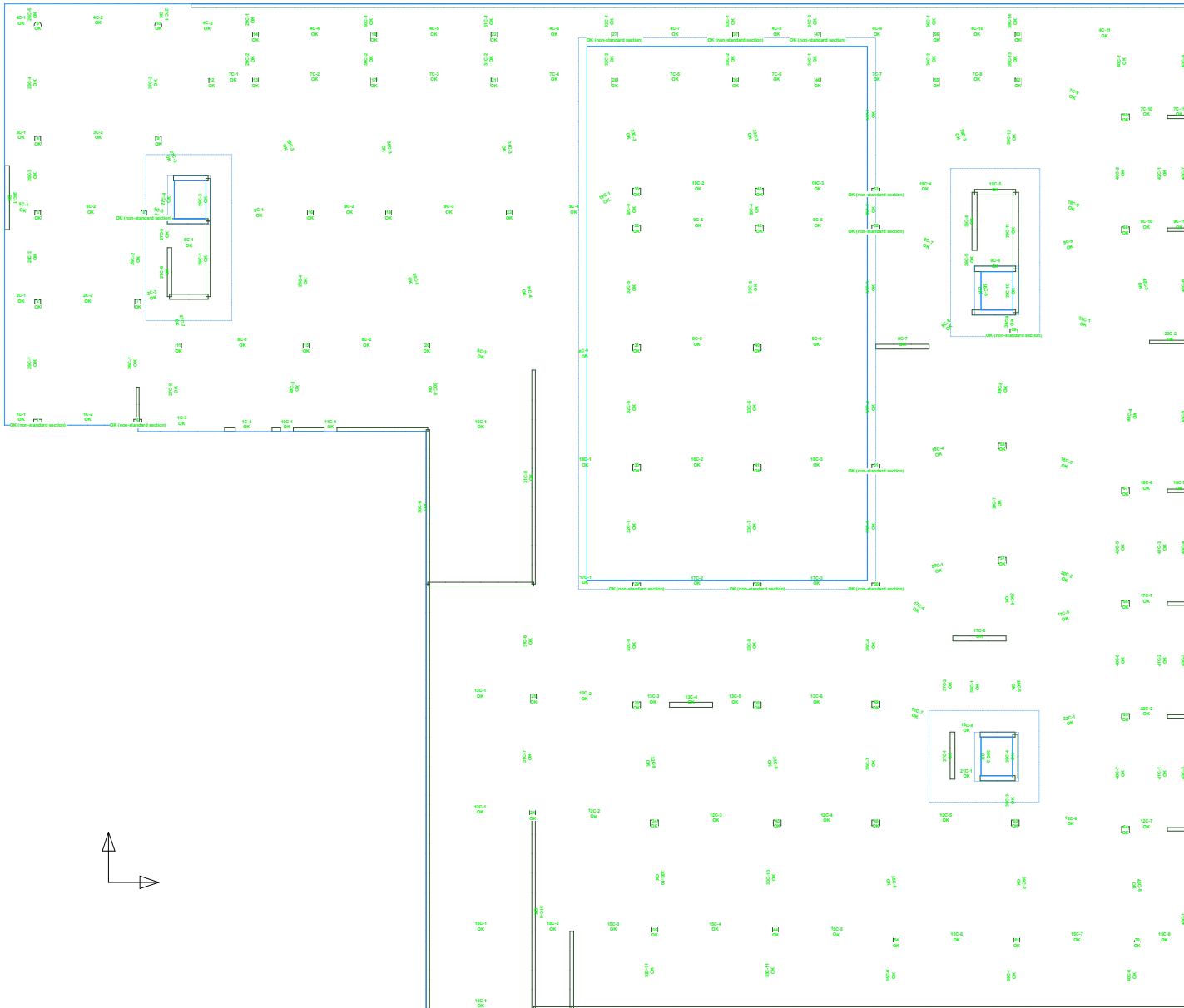
Sustained Service Design: Status Plan

Sustained Service Design: User Lines, User Notes, User Dimensions, Latitude Span Design, Longitude Span Design, Span Design Number, Span Design Status, Latitude DS Design, Longitude DS Design, DS Design Number, DS Design Status, PC Design Number, PC Design Status, Element Wall Elements Above, Wall Elements Outline Only, Column Elements Below, Column Elements Above, Slab Elements, Slab Elements Outline Only
Scale = 1:400



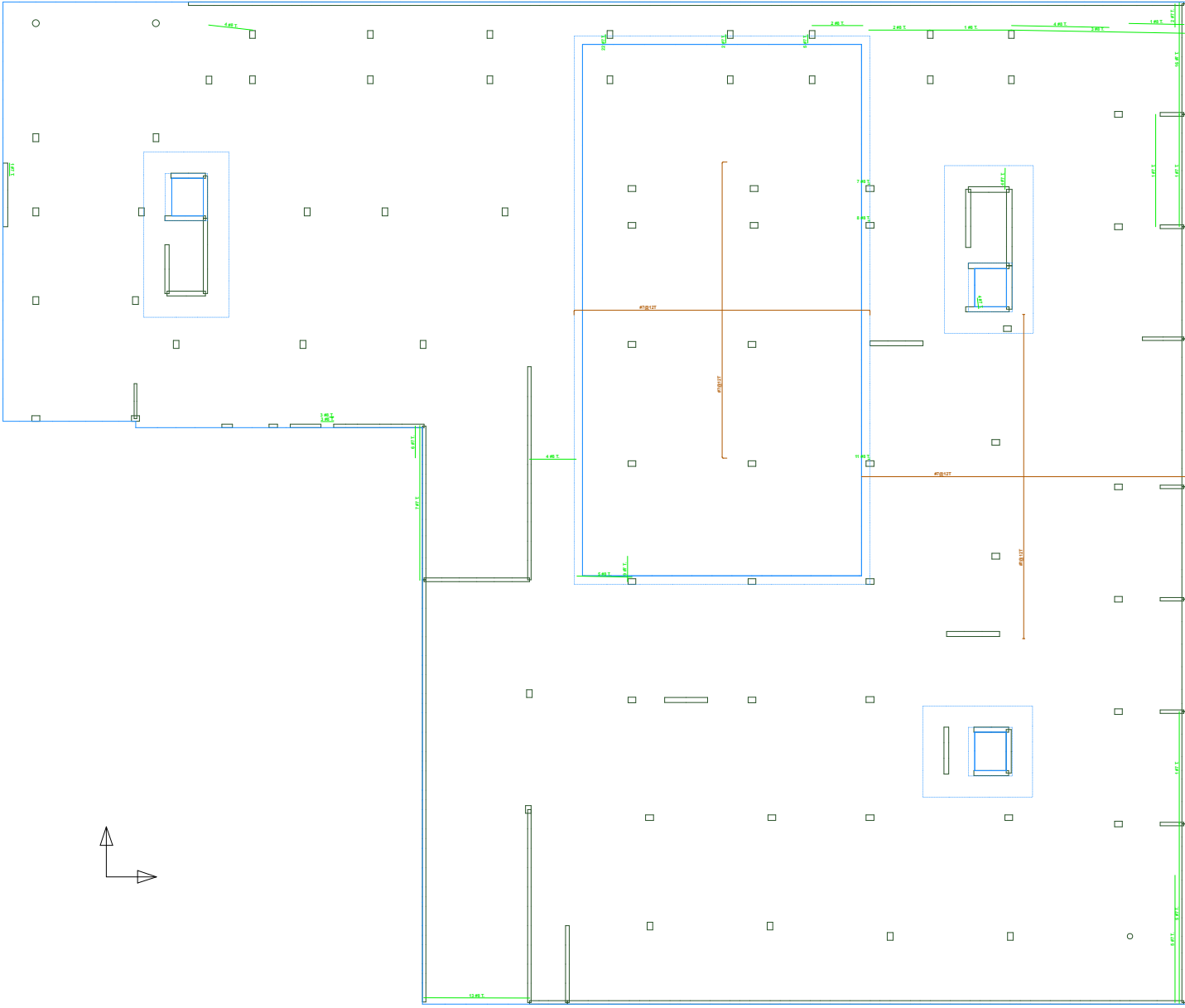
Strength Design: Status Plan

Strength Design: User Name: User Name; User Dimension: L: Lattice Span Design; Longitude Span Design; Span Design Number; User Design Status: L: Lattice DS Design; Longitude DS Design; DS Design Number; DS Design Status; PC Design; PC Design Number; PC Design Status; Design: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; DS Element; DS Element Outline Only; Scale = 1:400



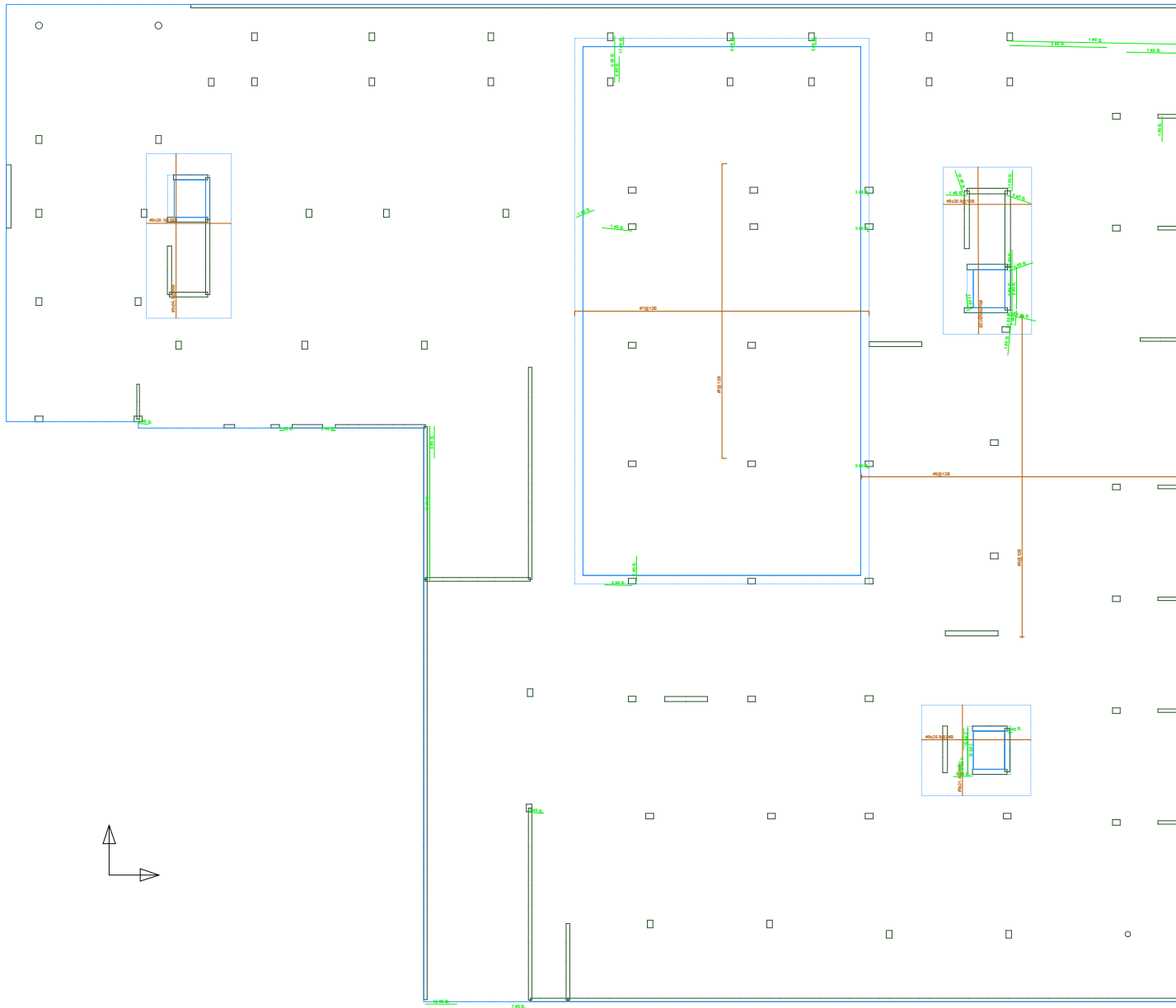
Strength Design: Top Reinforcement Plan

Strength Design: User Name: User Name; User Dimension: Latitude Span Design; Longitude Span Design; Span Design Top Bar; Span Design Bar Description; Latitude DS Design; Longitude DS Design; DS Design Top Bar; Design: Wall Concrete Area; Mat Concrete Area; Wall Concrete Outline Only; Column Reinforcement; Column Reinforcement Above; DS Design; Side Element Outline Only; Reinforcement: Top Face Concentrated Reinf.; Both Face Concentrated Reinf.; Auto Face Concentrated Reinf.; Concentrated Reinf. Description; Top Face Distributed Reinf.; Both Face Distributed Reinf.; Auto Face Distributed Reinf.; Distributed Reinf. Description; Latitude User Concentrated Reinf.; Longitude User Concentrated Reinf.; Latitude User Distributed Reinf.; Longitude User Distributed Reinf.; Scale: 1/8"=1'-0"



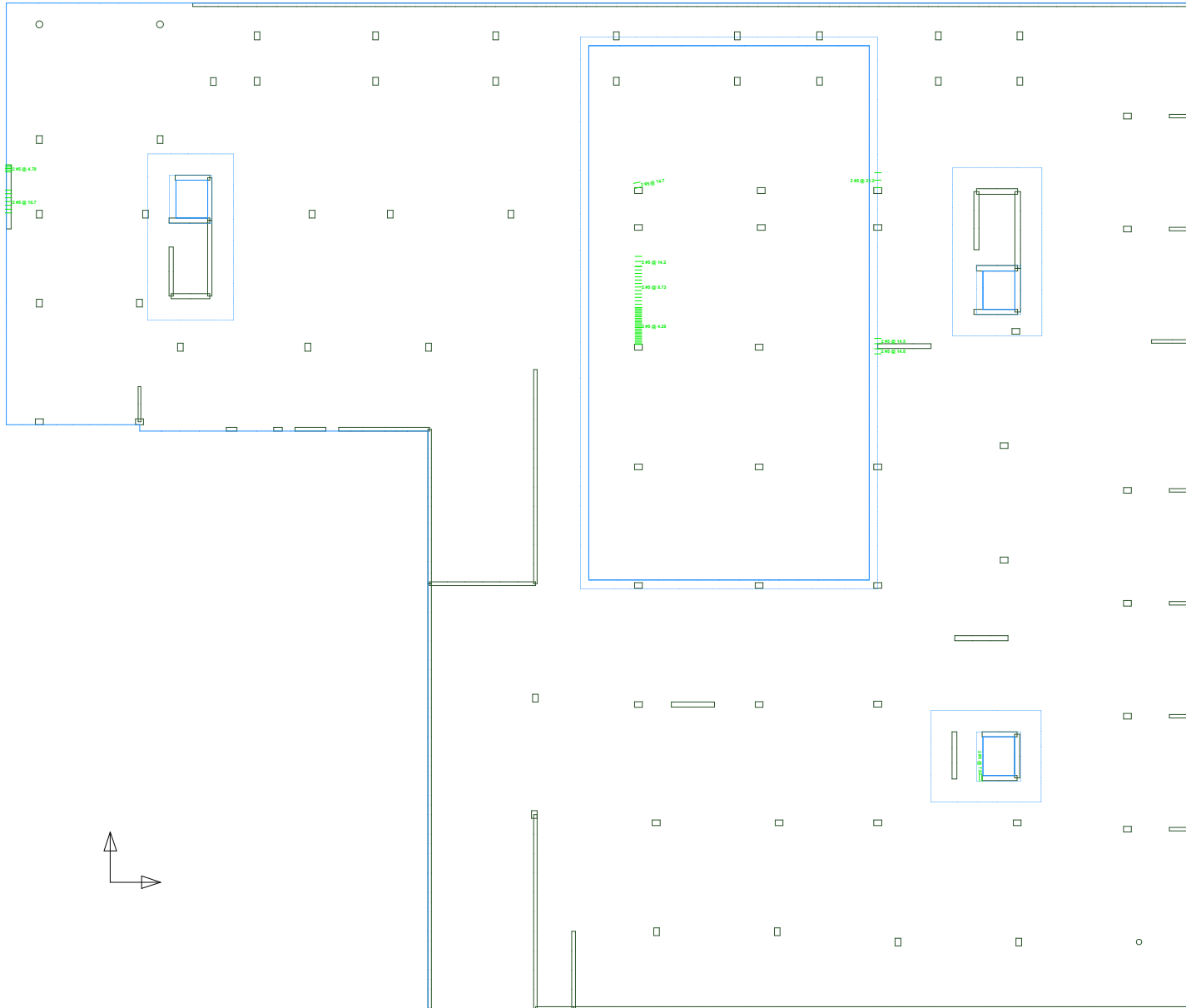
Strength Design: Bottom Reinforcement Plan

Strength Design: User Lines, User Notes, User Dimensions, Lattitude Span Design, Longitude Span Design, Span Design Bottom Bars, Span Design Bar Descriptions, Lattitude DS Design, Longitude DS Design, DS Design Bottom Bars, Channel Wall Elements Above, Wall Elements Above, Wall Elements Outside Only, Columns Elements Below, Columns Elements Above, Wall Elements, Side Elements Outside Only, Reinforcement: Bottom Face Concentrated Reinf., Both Faces Concentrated Reinf., Axis Face Concentrated Reinf., Concentrated Reinf. Description, Bottom Face Distributed Reinf., Both Faces Distributed Reinf., Axis Face Distributed Reinf., Distributed Reinf. Description, Lattitude User Concentrated Reinf., Longitude User Concentrated Reinf., Lattitude User Distributed Reinf., Longitude User Distributed Reinf., Scale: 1/8"=1'-0"



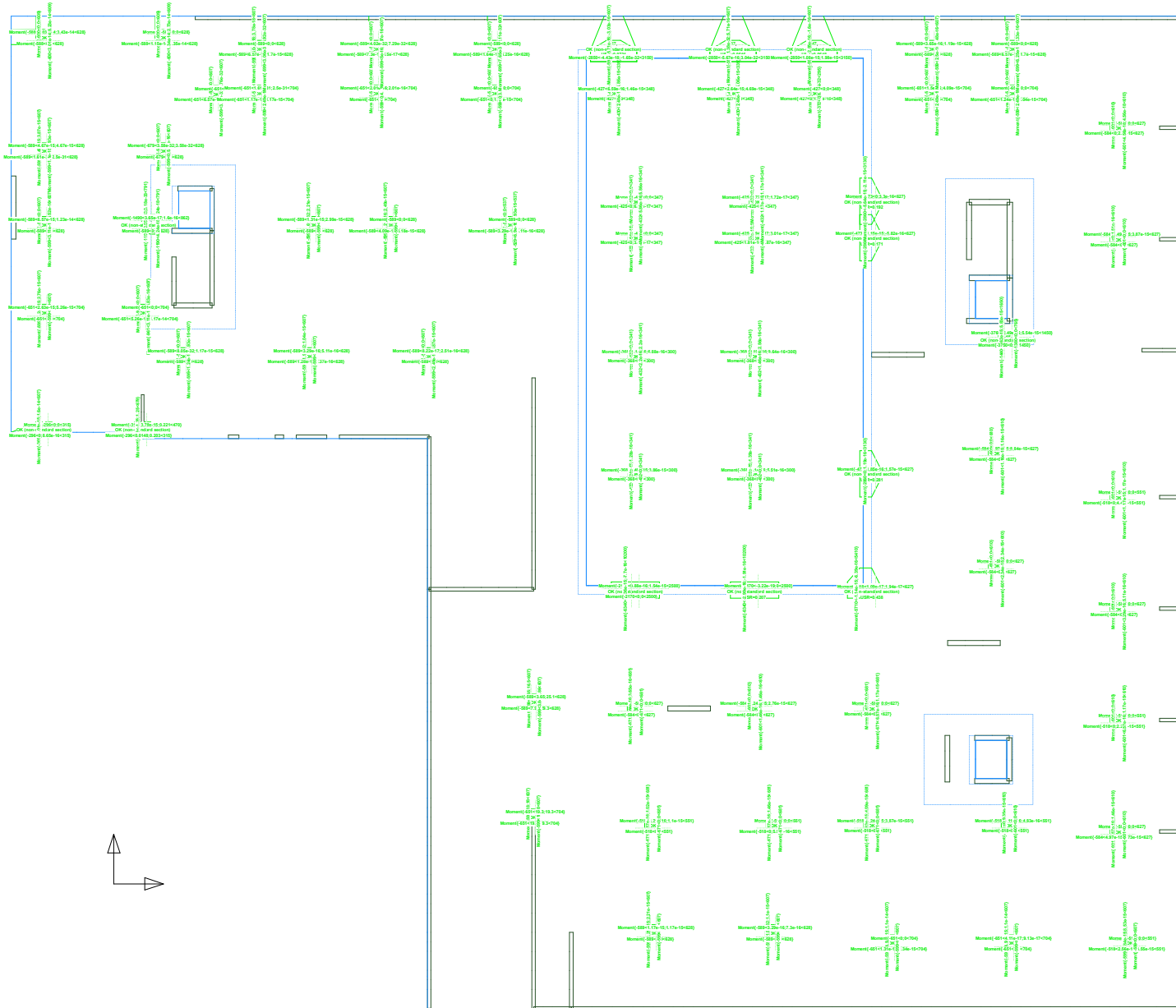
Strength Design: Shear Reinforcement Plan

Strength Design: User Lines, User Notes, User Dimensions, Lattice Span Design, Longitud Span Design, Span Design Shear Bars, Span Design Bar Descriptions, Lattice OS Design, Longitud OS Design, OS Design Number, OS Design Shear Bars, Column Wall Elements Above, Wall Elements Above, Wall Element Outline Only, Column Elements Below, Column Elements Above, Wall Elements, Side Element Outline Only, Scale = 1:400



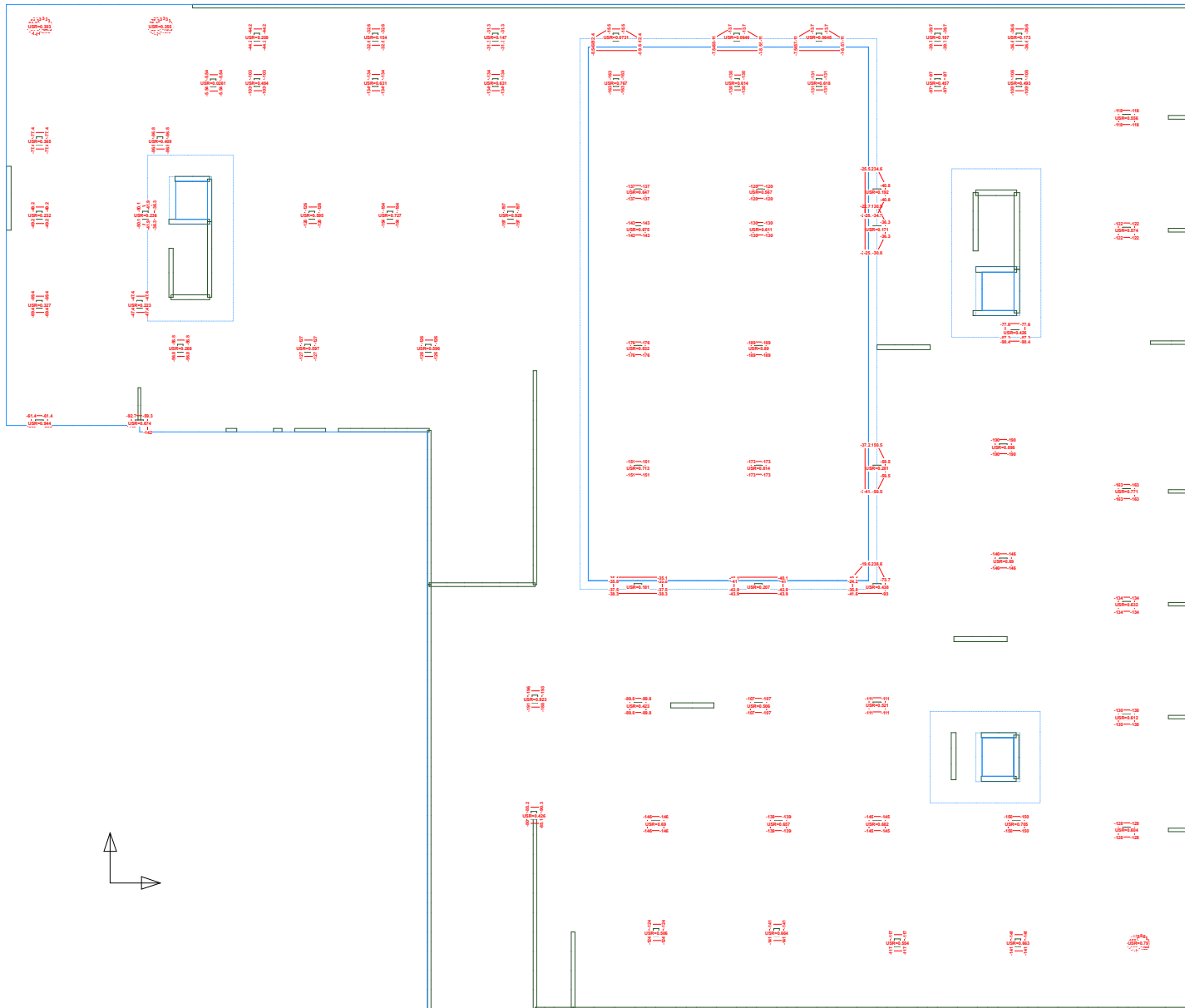
Strength Design: Punching Shear Status Plan

Strength Design: User Name: User Name; User Dimension: PC Design; PC Design Number: PC Design Status; PC Design Status: PC Design Status; PC Design Section: PC Design Section; PC Design Section Design: PC Design Section Design; PC Design Section Analysis: PC Design Section Analysis; Element: Wall Elements Above; Wall Elements Above; Wall Elements Below; Column Elements Below; Column Elements Below; Column Elements Above; Column Elements Above; Scale: 1:400



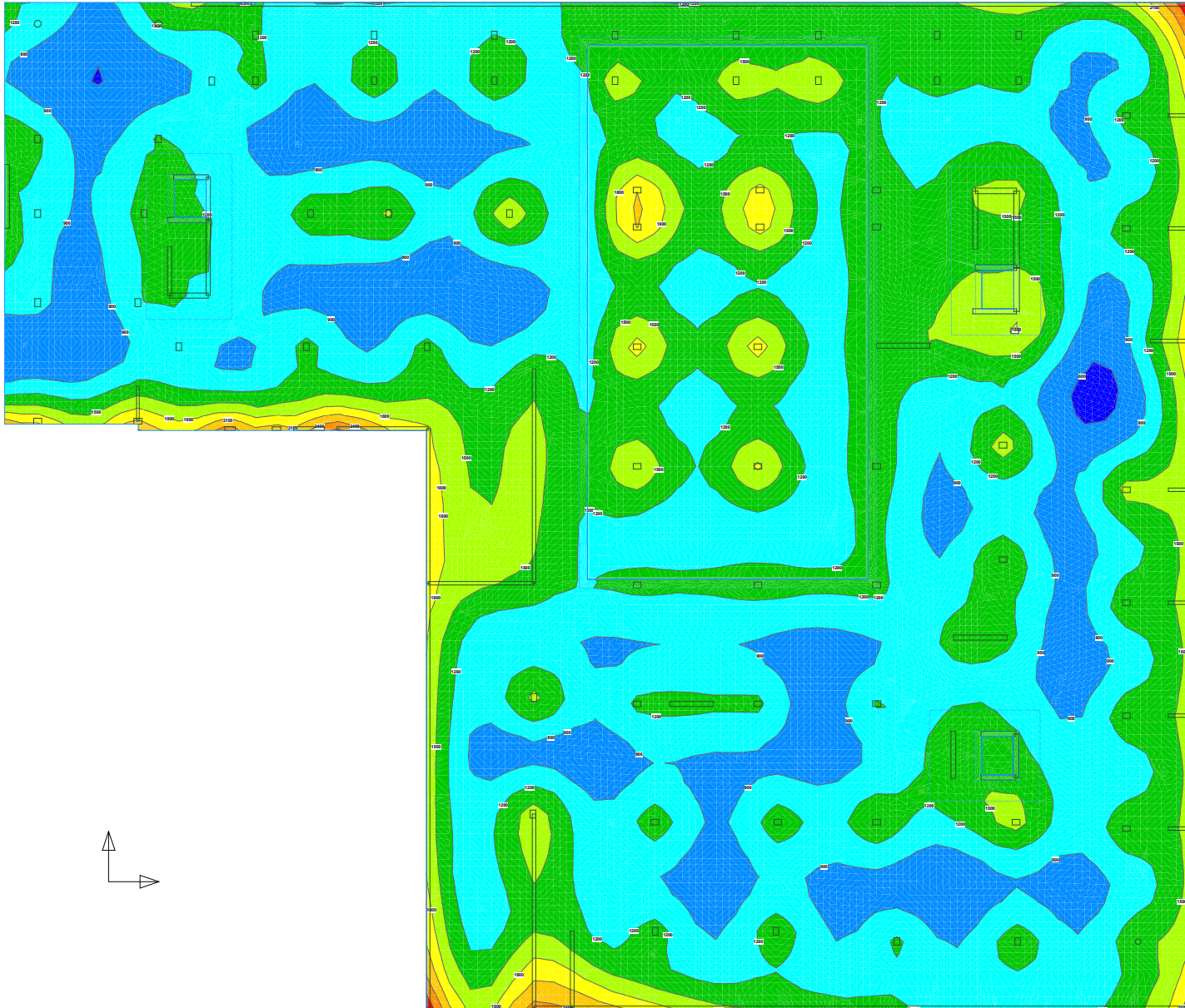
Strength Design: Punching Shear Stress Plan

Strength Design: User: Linn, User Notes: User Dimension: FC Design: SRP
 Element: Wall Elements Above: Wall Elements Below: Wall Elements Outline Only: Column Elements Above: Slab Elements: Slab Elements Outline Only:
 Scale = 1:400
 Strength Design - Punching Plot (Stress, Stress Ratio) (Standard Sections 1-1, Cutoff Sections 1-1) (Max SR Contour)



Soil Bearing Design: Max Soil Bearing Pressure Plan

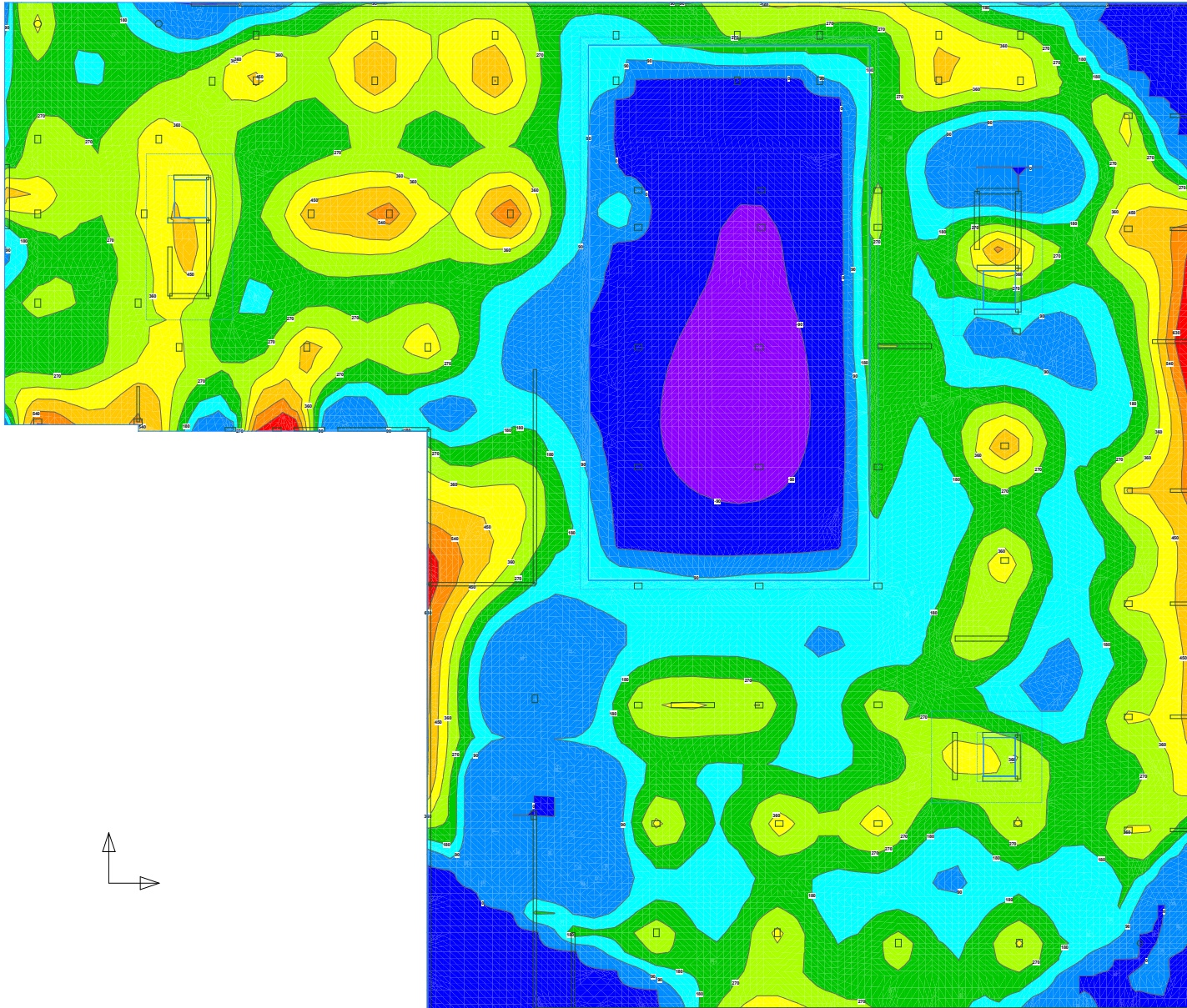
Soil Bearing Design User Lines: User Notes, User Dimensions, Latitude Span Design, Longitude Span Design, Latitude OS Design, Longitude OS Design, PC Design
Display: Soil Elements Above, Mat Elements Above, Wall Elements, Column Only, Column Elements Below, Column Elements Above, Wall Elements, Soil Element Outline Only
Scale = 1.48E
Soil Bearing Design - Area Spring Vertical Reactions Plot (Maximum Values)
Min Value = 0 psf @ (11.43,206.3) Max Value = 2100 psf @ (254.5,206.3)



Soil Bearing Design: Max Soil Bearing Pressure Plan (2)

Soil Bearing Design: Min Soil Bearing Pressure Plan

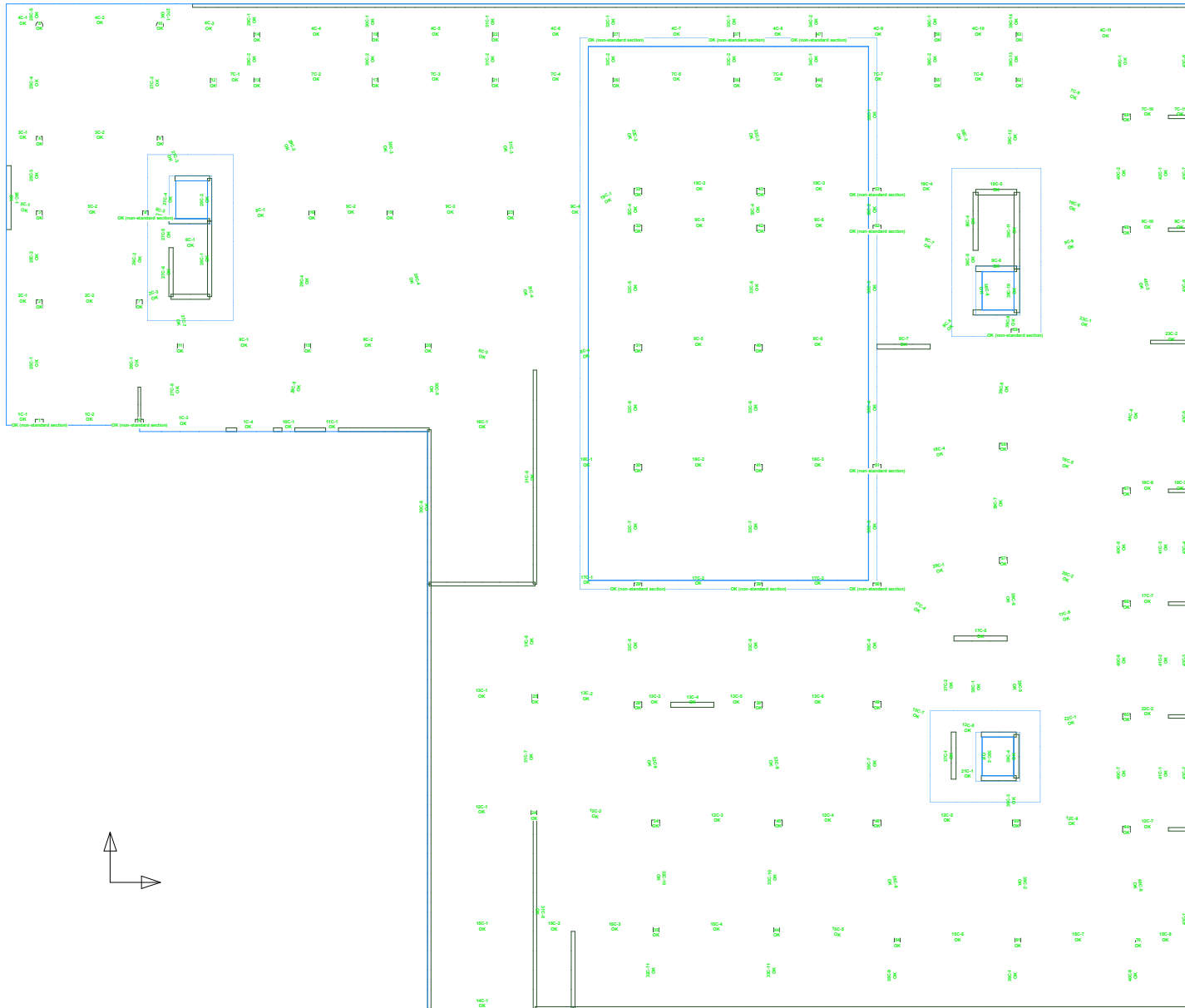
Soil Bearing Design User Notes: User Dimension, User Dimension, Latitude Span Design, Longitude Span Design, Latitude OS Design, Longitude OS Design, PC Design
Display: Soil Element Above, Mat Element Above, Wall Element, Column Only, Column Element Below, Column Element Above, Wall Element, Soil Element Outline Only
Scale = 1.000
Soil Bearing Design - Area Spring Vertical Reactions Plot (Minimum Values)
Min Value = -146.7 psf @ (147.3,111.6) Max Value = 807.8 psf @ (42.38,105.8)



Soil Bearing Design: Min Soil Bearing Pressure Plan (2)

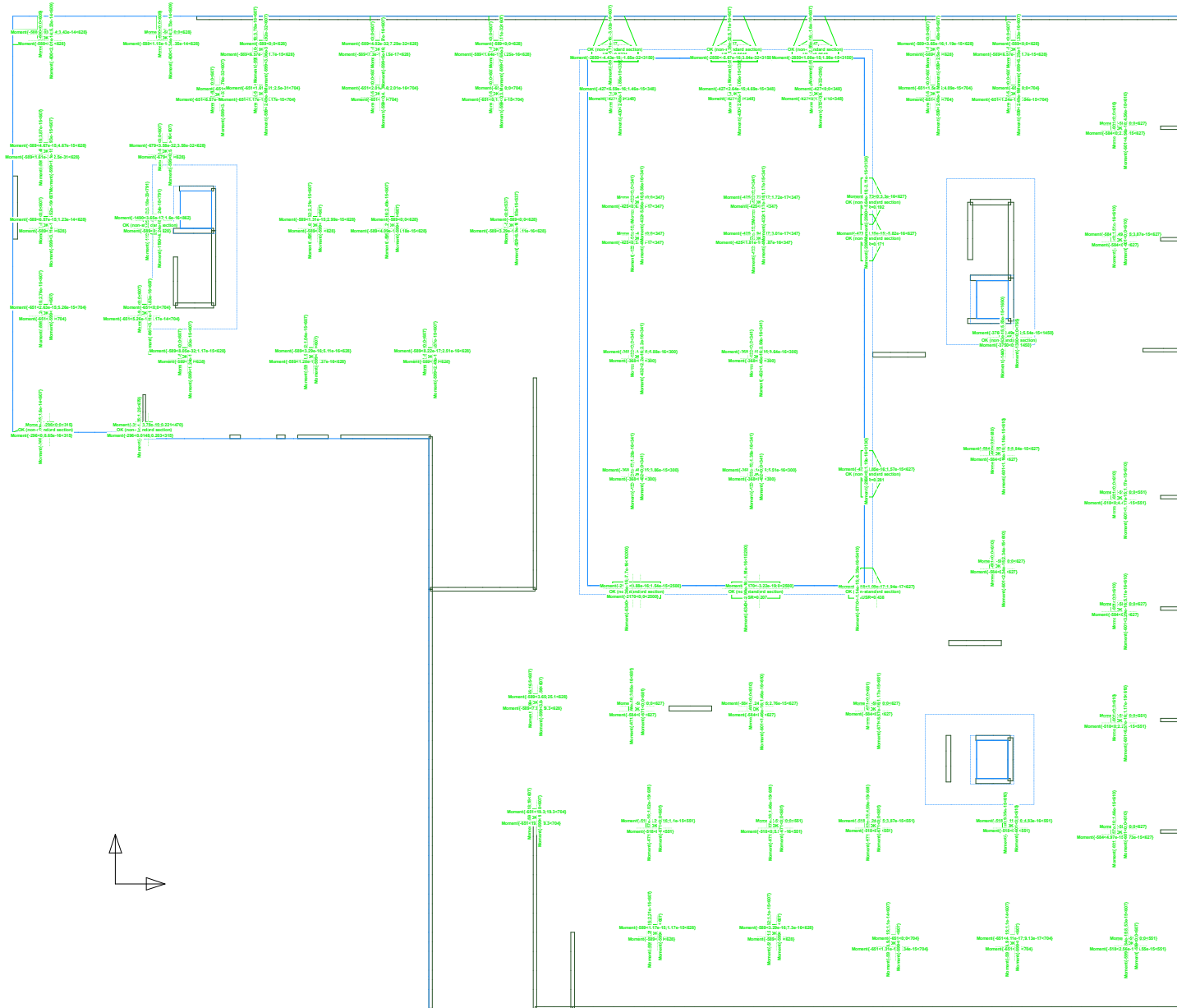
Design Status: Status Plan

Design Status: User Lines; User Notes; User Dimensions; Latitude Span Design; Longitude Span Design; Span Design Numbers; Span Design Status; Latitude DS Design; Longitude DS Design; DS Design Status; DS Design Numbers; PC Design Numbers; PC Design Status; Latitude Span Segment Deflection Checks; Longitude Span Segment Deflection Checks; Span Segment Deflection Check Status; Latitude Deflection Checks; Longitude Deflection Checks; Deflection Check Status;
 Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only
 Scale = 1:400



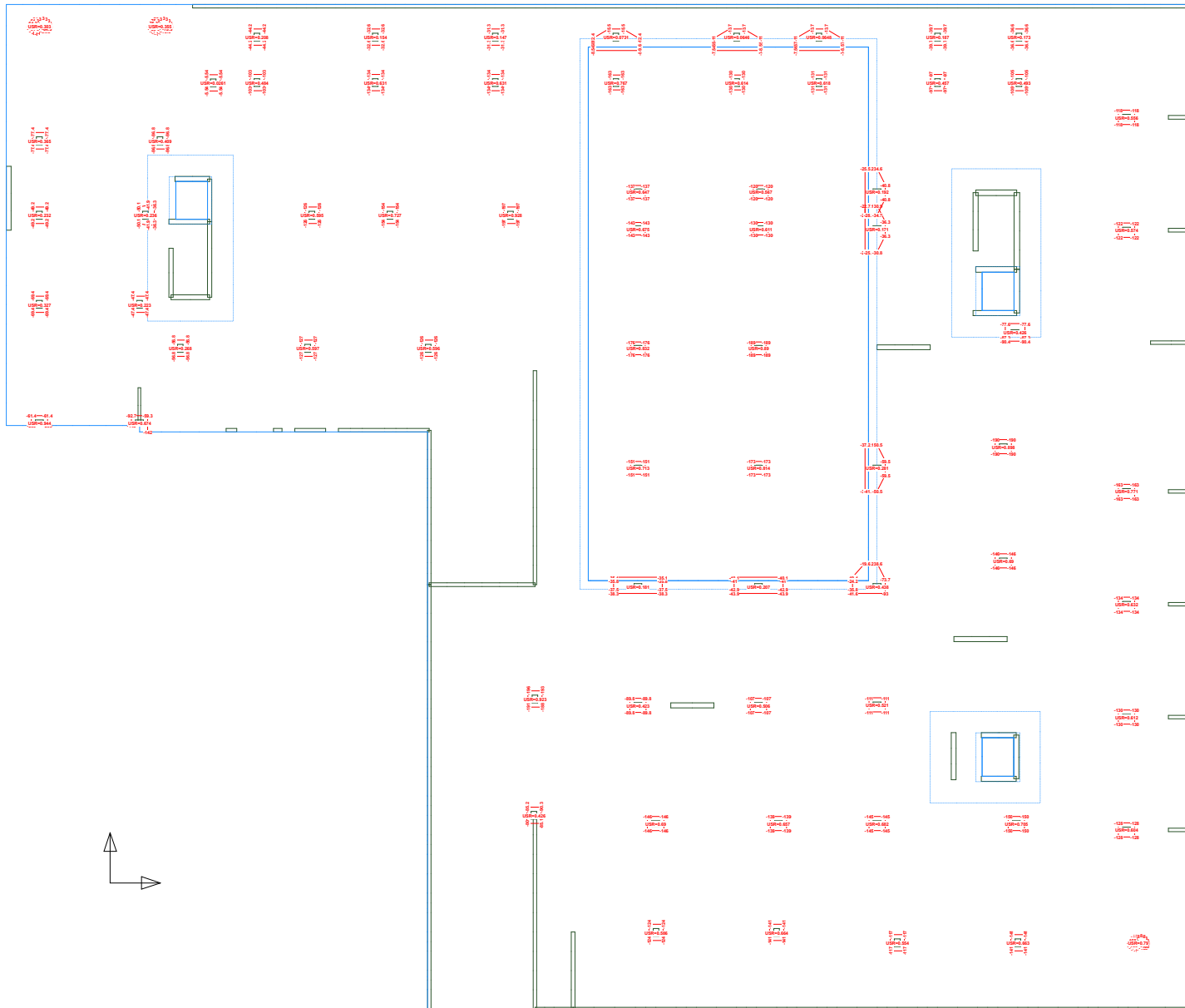
Design Status: Punching Shear Status Plan

Design Status: User Limit, User Notes, User Dimensions, PC Design, PC Design Number, PC Design Status, PC Design Stress Ratio, PC Design Section, PC Design Flexural Section, PC Design Flexural Section Design, PC Design Flexural Section Analysis, Element, Wall Elements Above, Wall Elements Below, Wall Element Outline Only, Column Elements Below, Column Elements Above, Slab Element, Slab Element Outline Only, Scale = 1:400



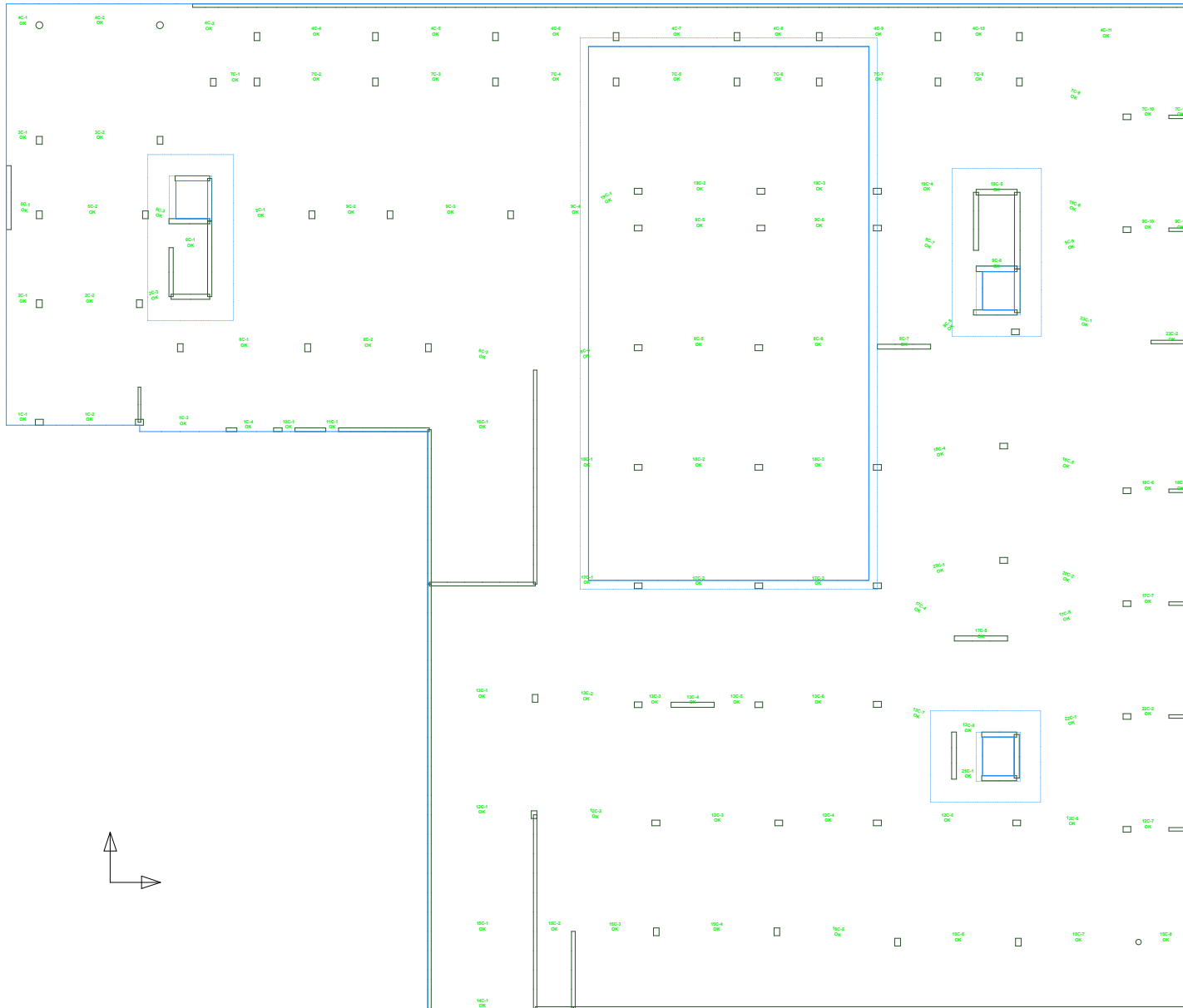
Design Status: Punching Shear Stress Plan

Design Status: User Load, User Note, User Dimension, PC Design, SR;
 Element: Wall Element Above, Wall Element Below, Wall Element Outer Only, Column Element Above, Slab Element, Slab Element Outer Only;
 Scale = 1:400
 Design Status - Punching Plot: (Stress, Stress Ratio) Standard Section 1-1, Cut-off Section 1-1 (Max SR Contour)



Design Status: Latitude Status Plan

Design Status: User Lines; User Notes; User Dimensions; Latitude Span Design; Span Design Numbers; Span Design Status; Latitude D5 Design; D5 Design Numbers; D5 Design Status; Latitude Span Segment Deflection Checks; Span Segment Deflection Check Status; Latitude Deflection Checks; Deflection Check Status; Element; Wall Elements Above; Wall Elements Below; Wall Elements Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Elements Outline Only; Scale = 1:400



Responsible:

 Construction project: MIMU
 Construction member: Mat

Date: October 09, 2023

JORDAHL® EXPERT Punching shear - Design

Position: NW Blade Wall

1. Input information

| | | | | | |
|---------------------------|-------------------------|--------|--------|-------|--------|
| Column type | Rectangular edge column | | | | |
| Column dimension | c_x / c_y | = 14 | in | / 170 | in |
| Edge | r_a | = 2 | in | | |
| Slab type | Foundation slab | | | | |
| Foundation depth | h | = 26 | in | | |
| Concrete cover top/bottom | c_o / c_u | = 1 | in | / 3 | in |
| Effective depth | d_x / d_y | = 22 | in | / 22 | in |
| Concrete strength | 5000 psi | | | | |
| Density | Normal concrete | | | | |
| Prestress | f_{pc} | = 0 | psi | | |
| Punching shear load | V_u | = 84 | kip | | |
| Unbalanced moment | M_{ux} / M_{uy} | = 2468 | kip-ft | / 0 | kip-ft |
| Soil pressure | σ_u | = 15 | psi | | |
| Reinforcement diameter | ϕ_x / ϕ_y | = #8 | | / #8 | |
| Distances | s_x / s_y | = 12 | in | / 12 | in |

2. Output information (ACI 318-14)

2.1 Inner Critical Section (d/2 outside of column face)

2.1.1 Common Properties

| | | | | | |
|----------------------------|-------|--------|-----------------|--|--|
| Area | A_c | = 5412 | in ² | | |
| Critical section perimeter | b_0 | = 246 | in | | |

2.1.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|----------------------|-----------------|----------------------|-----------------|
| Centroid coordinate | e_x / e_y | = 15.037 | in | / 0 | in |
| Section moment of inertia | I_x / I_y | = $2.392 \cdot 10^7$ | in ⁴ | / $2.412 \cdot 10^5$ | in ⁴ |
| Section product of inertia | I_{xy} | = 0 | in ⁴ | | |

2.1.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|----------------------|-----------------|----------------------|-----------------|
| Centroid coordinate | e_1 / e_2 | = -15.037 | in | / 0 | in |
| Section moment of inertia | I_1 / I_2 | = $2.392 \cdot 10^7$ | in ⁴ | / $2.412 \cdot 10^5$ | in ⁴ |
| Principal axis rotation | θ | = 0.0 | ° | | |
| Moment fraction | γ_1 / γ_2 | = 0.6400 | | / 0.0000 | |
| Unbalanced moment | M_{u1} / M_{u2} | = 2468 | kip-ft | / 0 | kip-ft |

Responsible:

Construction project: MIMU
Construction member: Mat

Date: October 09, 2023

2.1.4 Stresses

Maximum shear stresses v_u = 77.2 psi
 x / y = -9 in / -96 in
Shear resistance (concrete only) ϕv_c = 123.5 psi

Punching shear reinforcement is not required.

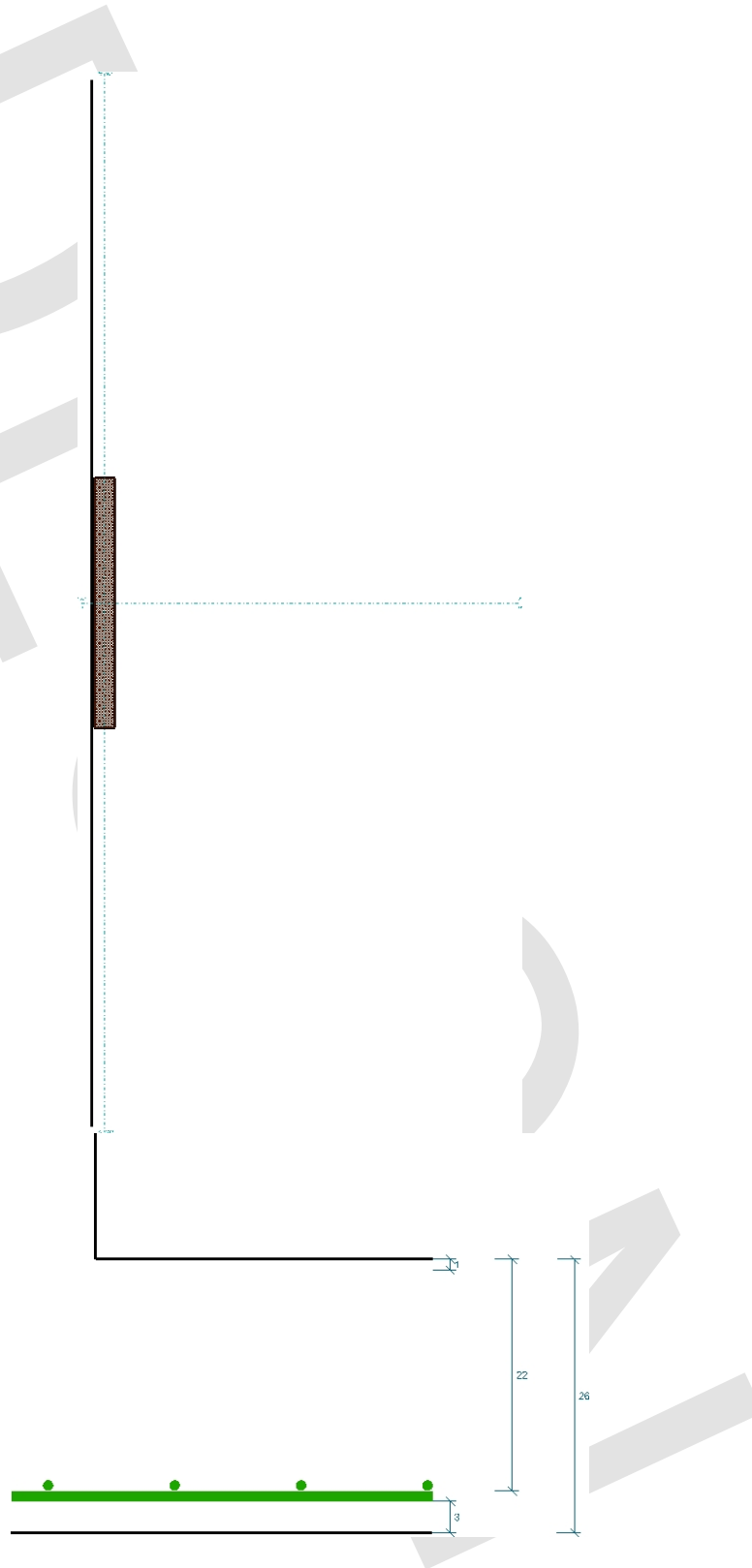
3. Note

- The design against punching shear failure is based on the rules of ACI 318-14.
- This calculation is based on product specific properties of DECON® Studrails®. Changes, even to similar products, are only possible with new calculations.
- All data have to be checked with the given edge boundaries and the feasibility. DECON assumes no liability for the input data of the user.

Responsible:

Construction project: MIMU
Construction member: Mat

Date: October 09, 2023



Responsible:

 Construction project: MIMU
 Construction member: Mat

Date: October 09, 2023

JORDAHL® EXPERT Punching shear - Design

Position: NW Core

1. Input information

| | | | | | |
|---------------------------|-----------------------------|---|------|--------|---------------|
| Column type | Rectangular internal column | | | | |
| Column dimension | c_x / c_y | = | 124 | in | / 352 in |
| Slab type | Foundation slab | | | | |
| Foundation depth | h | = | 36 | in | |
| Concrete cover top/bottom | c_o / c_u | = | 1 | in | / 3 in |
| Effective depth | d_x / d_y | = | 32 | in | / 32 in |
| Concrete strength | 5000 psi | | | | |
| Density | Normal concrete | | | | |
| Prestress | f_{pc} | = | 0 | psi | |
| Punching shear load | V_u | = | 989 | kip | |
| Unbalanced moment | M_{ux} / M_{uy} | = | 5363 | kip-ft | / 6867 kip-ft |
| Seismic loading | Yes | | | | |
| Soil pressure | σ_u | = | 15 | psi | |
| Reinforcement diameter | ϕ_x / ϕ_y | = | #8 | | / #8 |
| Distances | s_x / s_y | = | 12 | in | / 12 in |

2. Output information (ACI 318-14)

2.1 Inner Critical Section (d/2 outside of column face)

2.1.1 Common Properties

| | | | | |
|----------------------------|-------|---|-------|-----------------|
| Area | A_c | = | 34560 | in ² |
| Critical section perimeter | b_o | = | 1080 | in |

2.1.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $6.700 \cdot 10^8$ | in ⁴ | / $1.698 \cdot 10^8$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.1.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 0 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $6.700 \cdot 10^8$ | in ⁴ | / $1.698 \cdot 10^8$ in ⁴ |
| Principal axis rotation | θ | = | 0.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.5112 | | / 0.2982 |
| Unbalanced moment | M_{u1} / M_{u2} | = | 5363 | kip-ft | / 6867 kip-ft |

Responsible:

 Construction project: MIMU
 Construction member: Mat

Date: October 09, 2023

2.1.4 Stresses

Maximum shear stresses v_u = 23.3 psi
 x / y = 78 in / -192 in
 Shear resistance (concrete only) ϕv_c = 168.9 psi

Punching shear reinforcement is not required.

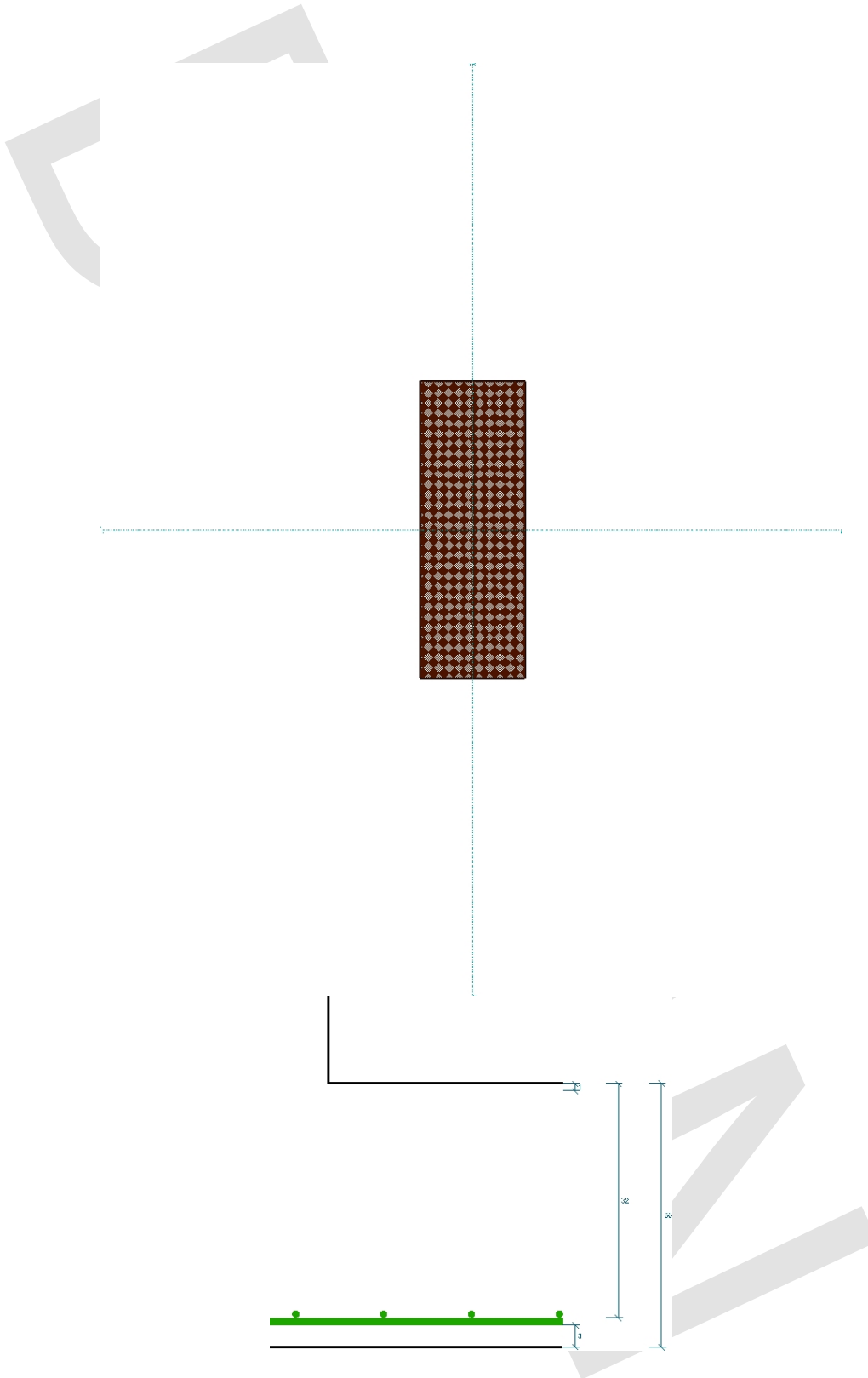
3. Note

- The design against punching shear failure is based on the rules of ACI 318-14.
- This calculation is based on product specific properties of DECON® Studrails®. Changes, even to similar products, are only possible with new calculations.
- All data have to be checked with the given edge boundaries and the feasibility. DECON assumes no liability for the input data of the user.

Responsible:

Construction project: MIMU
Construction member: Mat

Date: October 09, 2023



Responsible:

 Construction project: MIMU
 Construction member: Mat

Date: October 09, 2023

JORDAHL® EXPERT Punching shear - Design

Position: NE Core

1. Input information

| | | | | | |
|---------------------------|-----------------------------|---|-------|--------|---------------|
| Column type | Rectangular internal column | | | | |
| Column dimension | c_x / c_y | = | 124 | in | / 352 in |
| Slab type | Foundation slab | | | | |
| Foundation depth | h | = | 36 | in | |
| Concrete cover top/bottom | c_o / c_u | = | 1 | in | / 3 in |
| Effective depth | d_x / d_y | = | 32 | in | / 32 in |
| Concrete strength | 5000 psi | | | | |
| Density | Normal concrete | | | | |
| Prestress | f_{pc} | = | 0 | psi | |
| Punching shear load | V_u | = | 1324 | kip | |
| Unbalanced moment | M_{ux} / M_{uy} | = | 30223 | kip-ft | / 1125 kip-ft |
| Seismic loading | Yes | | | | |
| Soil pressure | σ_u | = | 15 | psi | |

2. Output information (ACI 318-14)

2.1 Inner Critical Section (d/2 outside of column face)

2.1.1 Common Properties

| | | | | |
|----------------------------|-------|---|-------|-----------------|
| Area | A_c | = | 34560 | in ² |
| Critical section perimeter | b_o | = | 1080 | in |

2.1.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $6.700 \cdot 10^8$ | in ⁴ | / $1.698 \cdot 10^8$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.1.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 0 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $6.700 \cdot 10^8$ | in ⁴ | / $1.698 \cdot 10^8$ in ⁴ |
| Principal axis rotation | θ | = | 0.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.5112 | | / 0.2982 |
| Unbalanced moment | M_{u1} / M_{u2} | = | 30223 | kip-ft | / 1125 kip-ft |

Responsible:

 Construction project: MIMU
 Construction member: Mat

Date: October 09, 2023

2.1.4 Stresses

Maximum shear stresses v_u = 67.3 psi
 x / y = 78 in / -192 in
 Shear resistance (concrete only) ϕv_c = 168.9 psi

Punching shear reinforcement is not required.

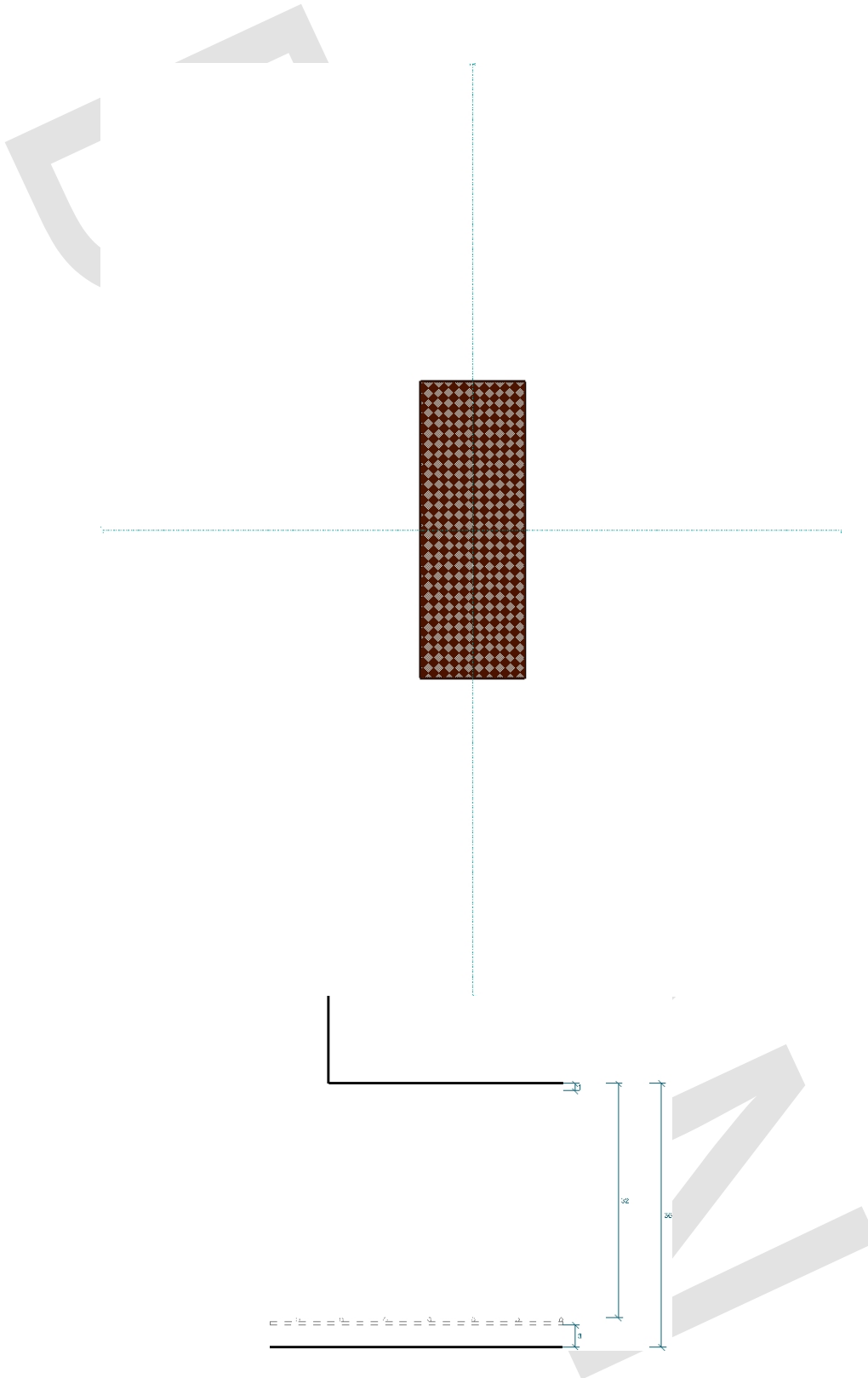
3. Note

- The design against punching shear failure is based on the rules of ACI 318-14.
- This calculation is based on product specific properties of DECON® Studrails®. Changes, even to similar products, are only possible with new calculations.
- All data have to be checked with the given edge boundaries and the feasibility. DECON assumes no liability for the input data of the user.

Responsible:

Construction project: MIMU
Construction member: Mat

Date: October 09, 2023



Responsible:

 Construction project: MIMU
 Construction member: Mat

Date: October 09, 2023

JORDAHL® EXPERT Punching shear - Design

Position: SE Core

1. Input information

| | | | | | |
|---------------------------|-----------------------------|--------|--------|---|-------------|
| Column type | Rectangular internal column | | | | |
| Column dimension | c_x / c_y | = 188 | in | / | 138 in |
| Slab type | Foundation slab | | | | |
| Foundation depth | h | = 36 | in | | |
| Concrete cover top/bottom | c_o / c_u | = 1 | in | / | 3 in |
| Effective depth | d_x / d_y | = 32 | in | / | 32 in |
| Concrete strength | 5000 psi | | | | |
| Density | Normal concrete | | | | |
| Prestress | f_{pc} | = 0 | psi | | |
| Punching shear load | V_u | = 565 | kip | | |
| Unbalanced moment | M_{ux} / M_{uy} | = 5758 | kip-ft | / | 2976 kip-ft |
| Seismic loading | Yes | | | | |
| Soil pressure | σ_u | = 15 | psi | | |

2. Output information (ACI 318-14)

2.1 Inner Critical Section (d/2 outside of column face)

2.1.1 Common Properties

| | | | | | |
|----------------------------|-------|---------|-----------------|--|--|
| Area | A_c | = 24960 | in ² | | |
| Critical section perimeter | b_o | = 780 | in | | |

2.1.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|----------------------|-----------------|---|------------------------------------|
| Centroid coordinate | e_x / e_y | = 0 | in | / | 0 in |
| Section moment of inertia | I_x / I_y | = $1.279 \cdot 10^8$ | in ⁴ | / | $1.884 \cdot 10^8$ in ⁴ |
| Section product of inertia | I_{xy} | = 0 | in ⁴ | | |

2.1.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|----------------------|-----------------|---|------------------------------------|
| Centroid coordinate | e_1 / e_2 | = 0 | in | / | 0 in |
| Section moment of inertia | I_1 / I_2 | = $1.884 \cdot 10^8$ | in ⁴ | / | $1.279 \cdot 10^8$ in ⁴ |
| Principal axis rotation | θ | = 90.0 | ° | | |
| Moment fraction | γ_1 / γ_2 | = 0.4313 | | | |
| Unbalanced moment | M_{u1} / M_{u2} | = 2976 | kip-ft | / | -5758 kip-ft |

Responsible:

Construction project: MIMU
Construction member: Mat

Date: October 09, 2023

2.1.4 Stresses

Maximum shear stresses v_u = 26.1 psi
 x / y = 110 in / -85 in
Shear resistance (concrete only) ϕv_c = 193.1 psi

Punching shear reinforcement is not required.

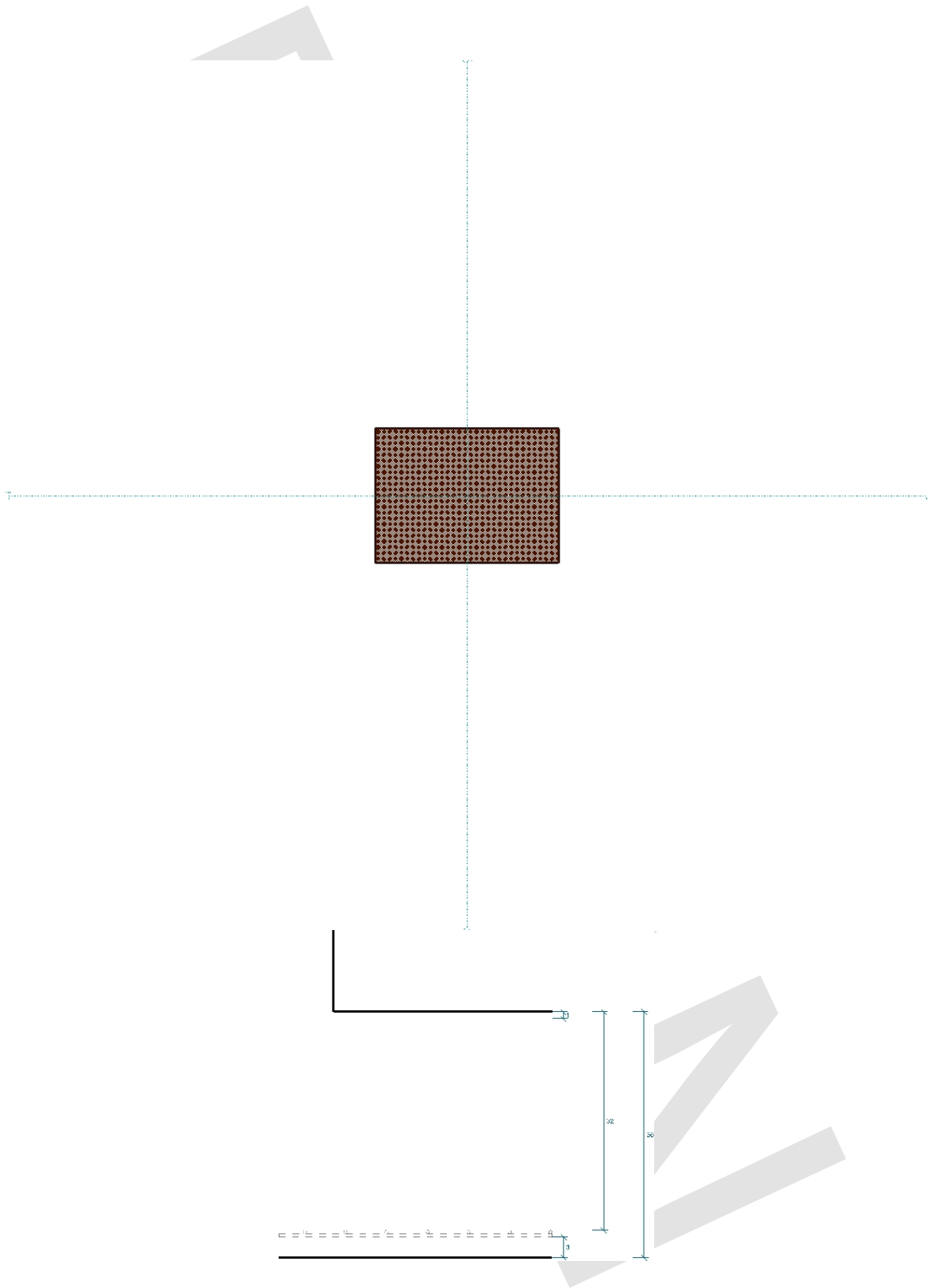
3. Note

- The design against punching shear failure is based on the rules of ACI 318-14.
- This calculation is based on product specific properties of DECON® Studrails®. Changes, even to similar products, are only possible with new calculations.
- All data have to be checked with the given edge boundaries and the feasibility. DECON assumes no liability for the input data of the user.

Responsible:

Construction project: MIMU
Construction member: Mat

Date: October 09, 2023



Responsible:

 Construction project: MIMU
 Construction member: Mat

Date: October 09, 2023

JORDAHL® EXPERT Punching shear - Design

Position: NE Blade Wall

1. Input information

| | | | | | |
|---------------------------|-----------------------------|---|-----|--------|---------------|
| Column type | Rectangular internal column | | | | |
| Column dimension | c_x / c_y | = | 148 | in | / 14 in |
| Slab type | Foundation slab | | | | |
| Foundation depth | h | = | 26 | in | |
| Concrete cover top/bottom | c_o / c_u | = | 1 | in | / 3 in |
| Effective depth | d_x / d_y | = | 22 | in | / 22 in |
| Concrete strength | 5000 psi | | | | |
| Density | Normal concrete | | | | |
| Prestress | f_{pc} | = | 0 | psi | |
| Punching shear load | V_u | = | 653 | kip | |
| Unbalanced moment | M_{ux} / M_{uy} | = | 0 | kip-ft | / 1445 kip-ft |
| Soil pressure | σ_u | = | 15 | psi | |

2. Output information (ACI 318-14)

2.1 Inner Critical Section (d/2 outside of column face)

2.1.1 Common Properties

| | | | | |
|----------------------------|-------|---|------|-----------------|
| Area | A_c | = | 9064 | in ² |
| Critical section perimeter | b_0 | = | 412 | in |

2.1.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $2.595 \cdot 10^6$ | in ⁴ | / $2.946 \cdot 10^7$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.1.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 0 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $2.946 \cdot 10^7$ | in ⁴ | / $2.595 \cdot 10^6$ in ⁴ |
| Principal axis rotation | θ | = | 90.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.5916 | | / 0.2348 |
| Unbalanced moment | M_{u1} / M_{u2} | = | 1445 | kip-ft | / 0 kip-ft |

Responsible:

 Construction project: MIMU
 Construction member: Mat

Date: October 09, 2023

2.1.4 Stresses

Maximum shear stresses v_u = 91.5 psi
 x / y = 85 in / 0 in
 Shear resistance (concrete only) ϕv_c = 126.1 psi

Punching shear reinforcement is not required.

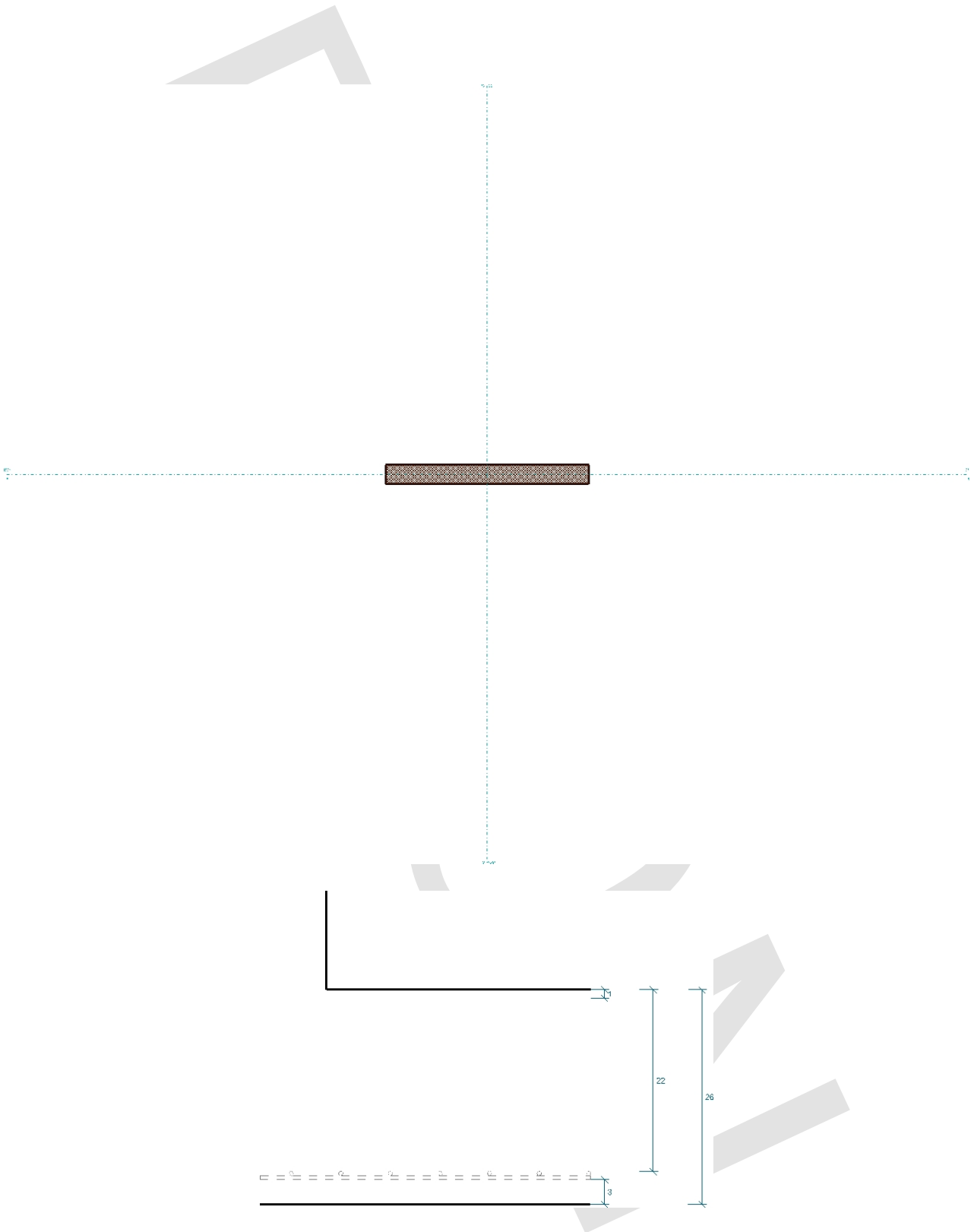
3. Note

- The design against punching shear failure is based on the rules of ACI 318-14.
- This calculation is based on product specific properties of DECON® Studrails®. Changes, even to similar products, are only possible with new calculations.
- All data have to be checked with the given edge boundaries and the feasibility. DECON assumes no liability for the input data of the user.

Responsible:

Construction project: MIMU
Construction member: Mat

Date: October 09, 2023



Responsible:

 Construction project: MIMU
 Construction member: Mat

Date: October 09, 2023

JORDAHL® EXPERT Punching shear - Design

Position: SW Blade Wall

1. Input information

| | | | | | |
|---------------------------|-----------------------------|---|-----|--------|--------------|
| Column type | Rectangular internal column | | | | |
| Column dimension | c_x / c_y | = | 120 | in | / 14 in |
| Slab type | Foundation slab | | | | |
| Foundation depth | h | = | 26 | in | |
| Concrete cover top/bottom | c_o / c_u | = | 1 | in | / 3 in |
| Effective depth | d_x / d_y | = | 22 | in | / 22 in |
| Concrete strength | 5000 psi | | | | |
| Density | Normal concrete | | | | |
| Prestress | f_{pc} | = | 0 | psi | |
| Punching shear load | V_u | = | 408 | kip | |
| Unbalanced moment | M_{ux} / M_{uy} | = | 0 | kip-ft | / 735 kip-ft |
| Soil pressure | σ_u | = | 15 | psi | |

2. Output information (ACI 318-14)

2.1 Inner Critical Section (d/2 outside of column face)

2.1.1 Common Properties

| | | | | |
|----------------------------|-------|---|------|-----------------|
| Area | A_c | = | 7832 | in ² |
| Critical section perimeter | b_o | = | 356 | in |

2.1.2 Natural Axis Properties

| | | | | | |
|----------------------------|-------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_x / e_y | = | 0 | in | / 0 in |
| Section moment of inertia | I_x / I_y | = | $2.195 \cdot 10^6$ | in ⁴ | / $1.848 \cdot 10^7$ in ⁴ |
| Section product of inertia | I_{xy} | = | 0 | in ⁴ | |

2.1.3 Principal Axis Properties

| | | | | | |
|---------------------------|-----------------------|---|--------------------|-----------------|--------------------------------------|
| Centroid coordinate | e_1 / e_2 | = | 0 | in | / 0 in |
| Section moment of inertia | I_1 / I_2 | = | $1.848 \cdot 10^7$ | in ⁴ | / $2.195 \cdot 10^6$ in ⁴ |
| Principal axis rotation | θ | = | 90.0 | ° | |
| Moment fraction | γ_1 / γ_2 | = | 0.5697 | | / 0.2513 |
| Unbalanced moment | M_{u1} / M_{u2} | = | 735 | kip-ft | / 0 kip-ft |

Responsible:

 Construction project: MIMU
 Construction member: Mat

Date: October 09, 2023

2.1.4 Stresses

Maximum shear stresses v_u = 61.6 psi
 x / y = 71 in / 18 in
 Shear resistance (concrete only) ϕv_c = 130.8 psi

Punching shear reinforcement is not required.

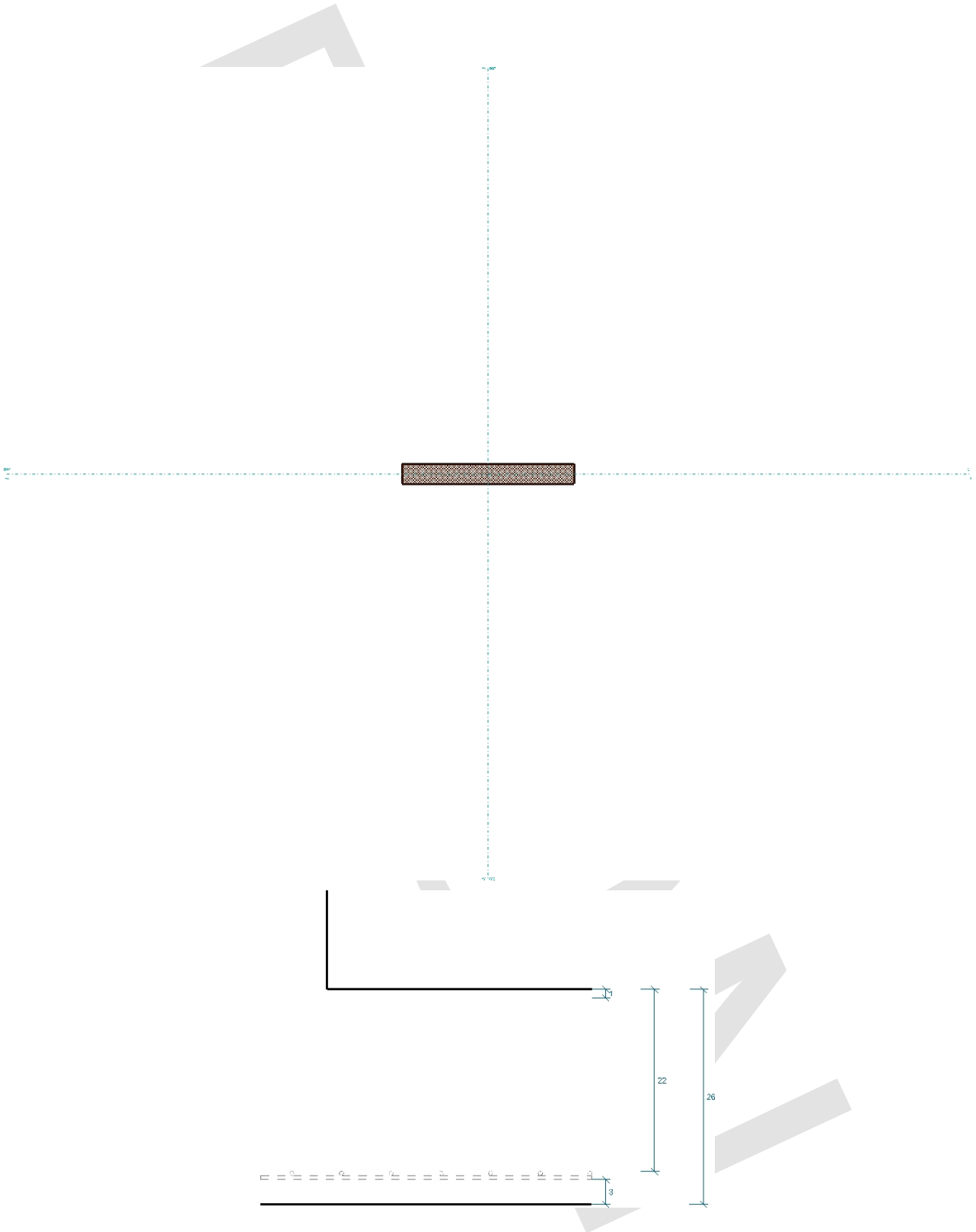
3. Note

- The design against punching shear failure is based on the rules of ACI 318-14.
- This calculation is based on product specific properties of DECON® Studrails®. Changes, even to similar products, are only possible with new calculations.
- All data have to be checked with the given edge boundaries and the feasibility. DECON assumes no liability for the input data of the user.

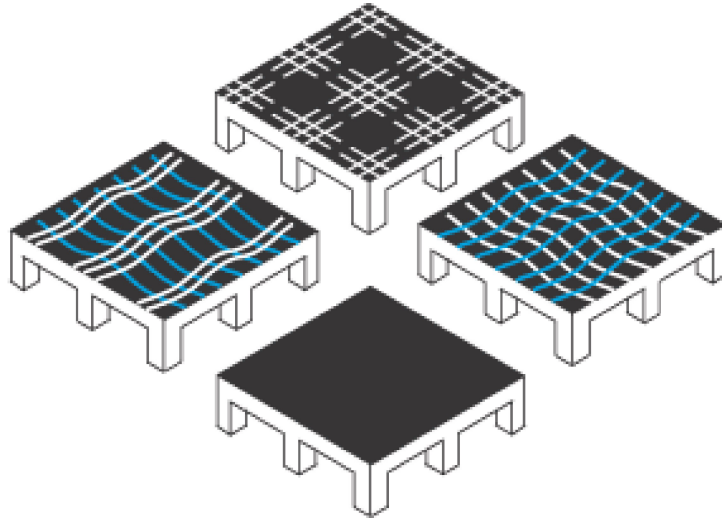
Responsible:

Construction project: MIMU
Construction member: Mat

Date: October 09, 2023



Detention Vault Lid



Vault Lid.cpt
10/12/2023

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8.4

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Units

Geometry Unit:

Plan Dimensions: feet
Angles: degrees

Slab Thickness: inches
Elevations: inches

Support Dimensions: inches
Support Height: feet

Loading and Reaction Unit

Point Force: Kips
- Report As Zero: 0 Kips
Point Moment: kip-ft
- Report As Zero: 0 kip-ft

Line Force: kips/ft
- Report As Zero: 0 kips/ft
Line Moment: Kips
- Report As Zero: 0 Kips

Area Force: psf
- Report As Zero: 0 psf
Area Moment: #/foot
- Report As Zero: 0 #/foot

Spring and Stiffness Unit:

Point Force Spring: kips/in
Point Moment Spring: k-ft/°

Line Force Spring: ksi
Line Moment Spring: k/°

Area Force Spring: pci
Area Moment Spring: k/ft°

Slab Analysis Unit:

Force: Kips
- Report As Zero: 0 Kips
Force Per Width: kips/ft
- Report As Zero: 0 kips/ft

Moment: kip-ft
- Report As Zero: 0 kip-ft
Moment Per Width: Kips
- Report As Zero: 0 Kips

Concrete Stress: psi
- Report As Zero: 0 psi
Deflection: inches
- Report As Zero: 0 inches

Materials Units

Concrete Volume: yd³
Tendon Force: Kips
Reinforcing Stress: ksi

Reinforcing Area: in²
Tendon Force Per Width: kips/ft
PT Weight: pounds

Reinforcement Weight: tons
Tendon Profile: inches
Cover: inches

Miscellaneous Unit

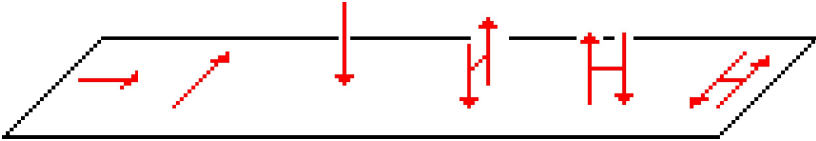
Floor Area: ft²
Tendon Angles (for friction): radians

Density: pcf
Temperature Change: °F

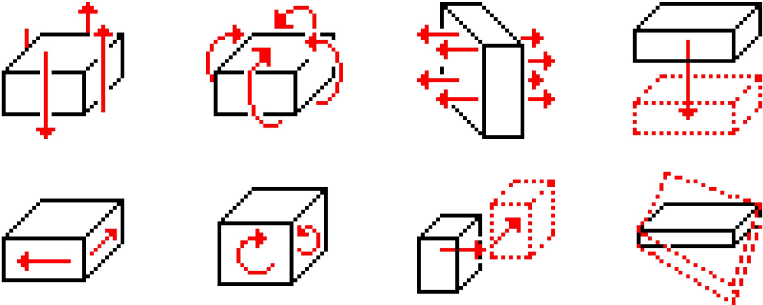
Elongations: inches

Signs

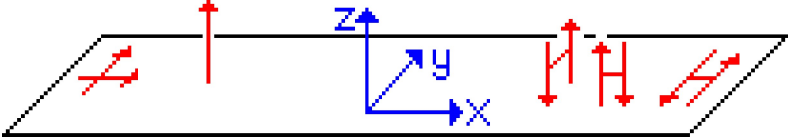
Positive Loads



Positive Analysis



Positive Reactions



Materials

Concrete Mix

| Mix Name | Density (pcf) | Density For Loads (pcf) | fci (psi) | fc (psi) | fcui (psi) | fcu (psi) | Poissons Ratio | Thermal Exp Coeff | Ec Calc | User Eci (psi) | User Ec (psi) |
|----------|---------------|-------------------------|-----------|----------|------------|-----------|----------------|-------------------|---------|----------------|---------------|
| 3000 psi | 150 | 150 | 3000 | 3000 | 3725 | 3725 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 4000 psi | 150 | 150 | 3000 | 4000 | 3725 | 4975 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 5000 psi | 150 | 150 | 3000 | 5000 | 3725 | 6399 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |
| 6000 psi | 150 | 150 | 3000 | 6000 | 3725 | 7450 | 0.2 | 5.556e-6 | Code | 2500000 | 3000000 |

PT Systems

| System Name | Type | Aps (in ²) | Eps (ksi) | fse (ksi) | fpv (ksi) | fpv (ksi) | Duct Width (inches) | Strands Per Duct | Min Radius (feet) |
|---------------|----------|------------------------|-----------|-----------|-----------|-----------|---------------------|------------------|-------------------|
| 1/2" Unbonded | unbonded | 0.153 | 28000 | 175 | 243 | 270 | 0.5 | 1 | 6 |
| 1/2" Bonded | bonded | 0.153 | 28000 | 160 | 243 | 270 | 3 | 4 | 6 |
| 0.6" Unbonded | unbonded | 0.217 | 28000 | 175 | 243 | 270 | 0.6 | 1 | 8 |
| 0.6" Bonded | bonded | 0.217 | 28000 | 160 | 243 | 270 | 4 | 4 | 8 |

PT Stressing Parameters

| System Name | Jacking Stress (ksi) | Seating Loss (inches) | Anchor Friction | Wobble Friction (1/feet) | Angular Friction (1/radians) | Long-Term Losses (ksi) |
|---------------|----------------------|-----------------------|-----------------|--------------------------|------------------------------|------------------------|
| 1/2" Unbonded | 216 | 0.25 | 0 | 0.0014 | 0.07 | 22 |
| 1/2" Bonded | 216 | 0.25 | 0.02 | 0.001 | 0.2 | 22 |
| 0.6" Unbonded | 216 | 0.25 | 0 | 0.0014 | 0.07 | 22 |
| 0.6" Bonded | 216 | 0.25 | 0.02 | 0.001 | 0.2 | 22 |

Reinforcing Bars

| Bar Name | As (in ²) | Es (ksi) | Fy (ksi) | Coating | Straight Ld/Db | 90 Hook Ld/Db | 180 Hook Ld/Db |
|----------|-----------------------|----------|----------|---------|----------------|---------------|----------------|
| #3 | 0.11 | 29000 | 60 | None | Code | Code | Code |
| #4 | 0.2 | 29000 | 60 | None | Code | Code | Code |
| #5 | 0.31 | 29000 | 60 | None | Code | Code | Code |
| #6 | 0.44 | 29000 | 60 | None | Code | Code | Code |
| #7 | 0.6 | 29000 | 60 | None | Code | Code | Code |
| #8 | 0.79 | 29000 | 60 | None | Code | Code | Code |
| #9 | 1 | 29000 | 60 | None | Code | Code | Code |
| #10 | 1.27 | 29000 | 60 | None | Code | Code | Code |
| #11 | 1.56 | 29000 | 60 | None | Code | Code | Code |

Materials (2)

SSR Systems

| <i>SSR System Name</i> | <i>Stud Area (in²)</i> | <i>Head Area (in²)</i> | <i>Min Clear Head Spacing (inches)</i> | <i>Specified Stud Spacing (inches)</i> | <i>Fy (ksi)</i> | <i>Stud Spacing Rounding Increment (inches)</i> | <i>Min Studs Per Rail</i> | <i>System Type</i> |
|--------------------------|-----------------------------------|-----------------------------------|--|--|-----------------|---|---------------------------|--------------------|
| 3/4" SSR | 0.442 | 4.42 | 0.5 | 4 | 50 | 0.5 | 2 | Rail |
| Ancon Shearfix Auto-Size | 0.1217 | 1.096 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 10 mm | 0.1217 | 1.096 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 12 mm | 0.1753 | 1.578 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 14 mm | 0.2386 | 2.147 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 16 mm | 0.3116 | 2.805 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 20 mm | 0.4869 | 4.383 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |
| Ancon Shearfix 24 mm | 0.7012 | 6.311 | 0.5906 | None | 72.52 | 0.03937 | 2 | Rail |

Loadings

| <i>Loading Name</i> | <i>Type</i> | <i>Analysis</i> | <i>On-Pattern Factor</i> | <i>Off-Pattern Factor</i> |
|---|--------------------|-----------------|--------------------------|---------------------------|
| Self-Dead Loading | Self-Weight | Normal | 1 | 1 |
| Balance Loading | Balance | Normal | 1 | 1 |
| Hyperstatic Loading | Hyperstatic | Hyperstatic | 1 | 1 |
| Temporary Construction (At Stressing) Loading | Stressing Dead | Normal | 1 | 1 |
| Other Dead Loading | Dead | Normal | 1 | 1 |
| Live (Reducible) Loading | Live (Reducible) | Normal | 1 | 0 |
| Live (Unreducible) Loading | Live (Unreducible) | Normal | 1 | 0 |
| Live (Storage) Loading | Live (Storage) | Normal | 1 | 0 |
| Live (Parking) Loading | Live (Parking) | Normal | 1 | 0 |
| Live (Roof) Loading | Live (Roof) | Normal | 1 | 0 |
| Snow Loading | Snow | Normal | 1 | 1 |

Load Combinations

All Dead LC

Active Design Criteria: <none>

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|--------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Other Dead Loading | 1 | 1 |

Dead + Balance LC

Active Design Criteria: <none>

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|--------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Other Dead Loading | 1 | 1 |

Initial Service LC

Active Design Criteria: Initial Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|---|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1.13 | 1.13 |
| Temporary Construction (At Stressing) Loading | 1 | 1 |

Service LC: D + L

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Other Dead Loading | 1 | 1 |
| Live (Reducible) Loading | 1 | 0 |
| Live (Unreducible) Loading | 1 | 0 |
| Live (Storage) Loading | 1 | 0 |
| Live (Parking) Loading | 1 | 0 |

Service LC: D + Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|---------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Other Dead Loading | 1 | 1 |
| Live (Roof) Loading | 1 | 0 |

Load Combinations (2)

Service LC: D + S

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|--------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Other Dead Loading | 1 | 1 |
| Snow Loading | 1 | 0 |

Service LC: D + 0.75L + 0.75Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Other Dead Loading | 1 | 1 |
| Live (Reducible) Loading | 0.75 | 0 |
| Live (Unreducible) Loading | 0.75 | 0 |
| Live (Storage) Loading | 0.75 | 0 |
| Live (Parking) Loading | 0.75 | 0 |
| Live (Roof) Loading | 0.75 | 0 |

Service LC: D + 0.75L + 0.75S

Active Design Criteria: User Minimum Design, Code Minimum Design, Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Other Dead Loading | 1 | 1 |
| Live (Reducible) Loading | 0.75 | 0 |
| Live (Unreducible) Loading | 0.75 | 0 |
| Live (Storage) Loading | 0.75 | 0 |
| Live (Parking) Loading | 0.75 | 0 |
| Snow Loading | 0.75 | 0 |

Sustained Service LC

Active Design Criteria: Sustained Service Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1 | 1 |
| Balance Loading | 1 | 1 |
| Other Dead Loading | 1 | 1 |
| Live (Reducible) Loading | 0.5 | 0.5 |
| Live (Unreducible) Loading | 0.5 | 0.5 |
| Live (Storage) Loading | 1 | 1 |
| Live (Parking) Loading | 0.5 | 0.5 |
| Live (Roof) Loading | 0.5 | 0.5 |

Load Combinations (3)

Factored LC: 1.4D

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|---------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1.4 | 0.9 |
| Hyperstatic Loading | 1 | 1 |
| Other Dead Loading | 1.4 | 0.9 |

Factored LC: 1.2D + 1.6L + 0.5Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1.2 | 0.9 |
| Hyperstatic Loading | 1 | 1 |
| Other Dead Loading | 1.2 | 0.9 |
| Live (Reducible) Loading | 1.6 | 0 |
| Live (Unreducible) Loading | 1.6 | 0 |
| Live (Storage) Loading | 1.6 | 0 |
| Live (Parking) Loading | 1.6 | 0 |
| Live (Roof) Loading | 0.5 | 0 |

Factored LC: 1.2D + f1L + 1.6Lr

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1.2 | 0.9 |
| Hyperstatic Loading | 1 | 1 |
| Other Dead Loading | 1.2 | 0.9 |
| Live (Reducible) Loading | 0.5 | 0 |
| Live (Unreducible) Loading | 1 | 0 |
| Live (Storage) Loading | 1 | 0 |
| Live (Parking) Loading | 1 | 0 |
| Live (Roof) Loading | 1.6 | 0 |

Factored LC: 1.2D + 1.6L + 0.5S

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1.2 | 0.9 |
| Hyperstatic Loading | 1 | 1 |
| Other Dead Loading | 1.2 | 0.9 |
| Live (Reducible) Loading | 1.6 | 0 |
| Live (Unreducible) Loading | 1.6 | 0 |
| Live (Storage) Loading | 1.6 | 0 |
| Live (Parking) Loading | 1.6 | 0 |
| Snow Loading | 0.5 | 0 |

Load Combinations (4)

Factored LC: 1.2D + f1L + 1.6S

Active Design Criteria: User Minimum Design, Code Minimum Design, Strength Design, Ductility Design

Analysis: Linear

| <i>Loading</i> | <i>Standard Factor</i> | <i>Alt. Envelope Factor</i> |
|----------------------------|------------------------|-----------------------------|
| Self-Dead Loading | 1.2 | 0.9 |
| Hyperstatic Loading | 1 | 1 |
| Other Dead Loading | 1.2 | 0.9 |
| Live (Reducible) Loading | 0.5 | 0 |
| Live (Unreducible) Loading | 1 | 0 |
| Live (Storage) Loading | 1 | 0 |
| Live (Parking) Loading | 1 | 0 |
| Snow Loading | 1.6 | 0 |

Design Rules

Code Minimum Desig

318-14 Min. Reinforcement

User Minimum Desig

Specified Min. Reinforcement

Initial Service Desig

318-14 Initial Service Design

Service Design

318-14 Service Design

Include detailed section analysis

Sustained Service Desig

318-14 Sustained Service Design

Strength Design

318-14 Strength Design

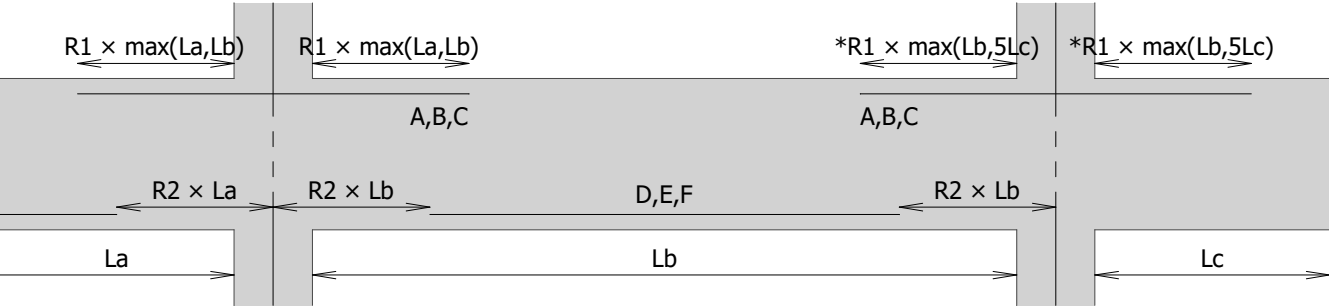
Punching Shear Design

Ductility Desig

318-14 Ductility Design

Detailing Rules

Custom Span Detailing Rules



| Rule | A | A | B | B | C | C | D | D | E | E | F | F |
|------|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|
| Name | Fraction | R1 | Fraction | R1 | Fraction | R1 | Fraction | R2 | Fraction | R2 | Fraction | R2 |
| None | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

"A", "B" and "C", are support reinforcement sets, based on the peak reinforcement in the support zone.
 "D", "E" and "F", are span reinforcement sets, based on the peak reinforcement in the span zone.
 "**R1" is never taken as greater than 0.2 when multiplied by L_c (or L_{cc}).
 "Fraction" is the ratio of set reinforcement to peak reinforcement. It is always in the 0.0 to 1.0 range.

Load History

| <i>Load History Step Name</i> | <i>Load Combination</i> | <i>Duration (days)</i> | <i>Total Age (days)</i> |
|-------------------------------|-------------------------|----------------------------|-----------------------------|
| Maximum Short Term Load | Service LC: D + L | 30 | 33 |
| Sustained Load | Sustained Service LC | 5000 | 5033 |
| Final Instantaneous Load | Service LC: D + L | 0 | 5033 |

Tendon Parameters Groups

Banded Tendon Polyline Groups

| <i>Group Name</i> | <i>PT System</i> | <i>I.P. Ratio</i> | <i>Eff. Force (Kips)</i> | <i>Number of Strands</i> | <i>Optimize</i> | <i>Min Force (Kips)</i> | <i>Max Force (Kips)</i> | <i>Force Incr. (Kips)</i> | <i>Min Strands</i> | <i>Max Strands</i> | <i>Strands Increment</i> |
|-------------------|------------------|-------------------|--------------------------|--------------------------|-----------------|-------------------------|-------------------------|---------------------------|--------------------|--------------------|--------------------------|
|-------------------|------------------|-------------------|--------------------------|--------------------------|-----------------|-------------------------|-------------------------|---------------------------|--------------------|--------------------|--------------------------|

Distributed Tendon Quadrilateral Groups

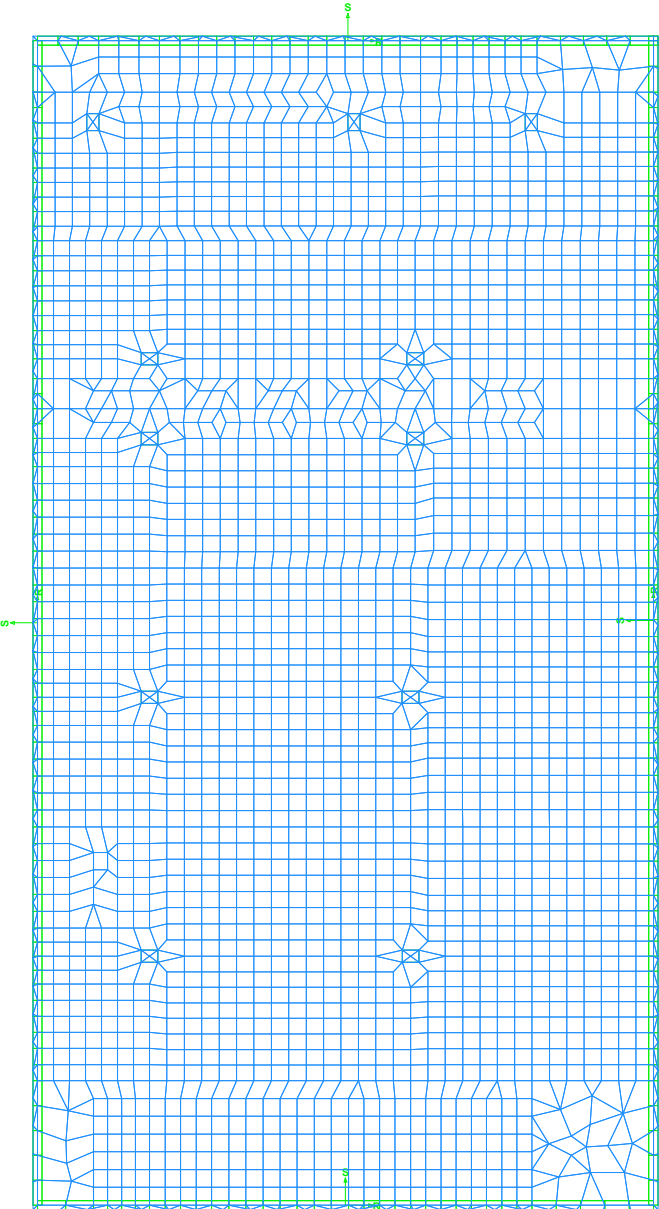
| <i>Group Name</i> | <i>PT System</i> | <i>I.P. Ratio</i> | <i>Spacing (feet)</i> | <i>Eff. Force (kips/ft)</i> | <i># Strands (1/feet)</i> | <i>Optimize</i> | <i>Min Force (kips/ft)</i> | <i>Max Force (kips/ft)</i> | <i>Force Incr. (kips/ft)</i> | <i>Min Strands (1/feet)</i> | <i>Max Strand (1/feet)</i> | <i>Strands Ir (1/feet)</i> |
|-------------------|------------------|-------------------|-----------------------|-----------------------------|---------------------------|-----------------|----------------------------|----------------------------|------------------------------|-----------------------------|----------------------------|----------------------------|
|-------------------|------------------|-------------------|-----------------------|-----------------------------|---------------------------|-----------------|----------------------------|----------------------------|------------------------------|-----------------------------|----------------------------|----------------------------|

Profile Polyline Groups

| <i>Group Name</i> | <i>Elevation Reference</i> | <i>Elevation (inches)</i> | <i>Optimize</i> | <i>Min Elevation (inches)</i> | <i>Max Elevation (inches)</i> | <i>Elevation Incr. (inches)</i> |
|-------------------|----------------------------|---------------------------|-----------------|-------------------------------|-------------------------------|---------------------------------|
|-------------------|----------------------------|---------------------------|-----------------|-------------------------------|-------------------------------|---------------------------------|

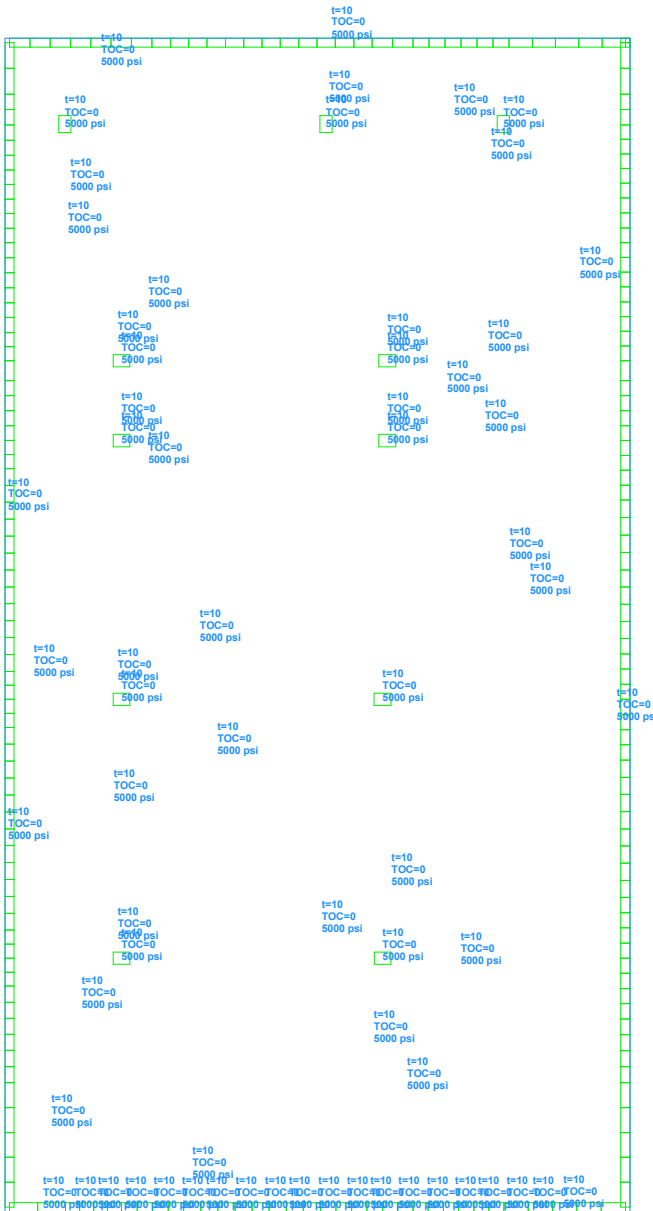
Element: Standard Plan

Element: User Lines; User Notes; User Dimensions; Wall Elements Below; Wall Elements Above; Wall Element Groups Below; Wall Element Groups Above; Wall Element Group Axes; Column Elements Below; Column Elements Above; Slab Elements; Point Springs; Point Spring Icons; Line Springs; Line S
Scale = 1:250



Element: Slab Summary Plan

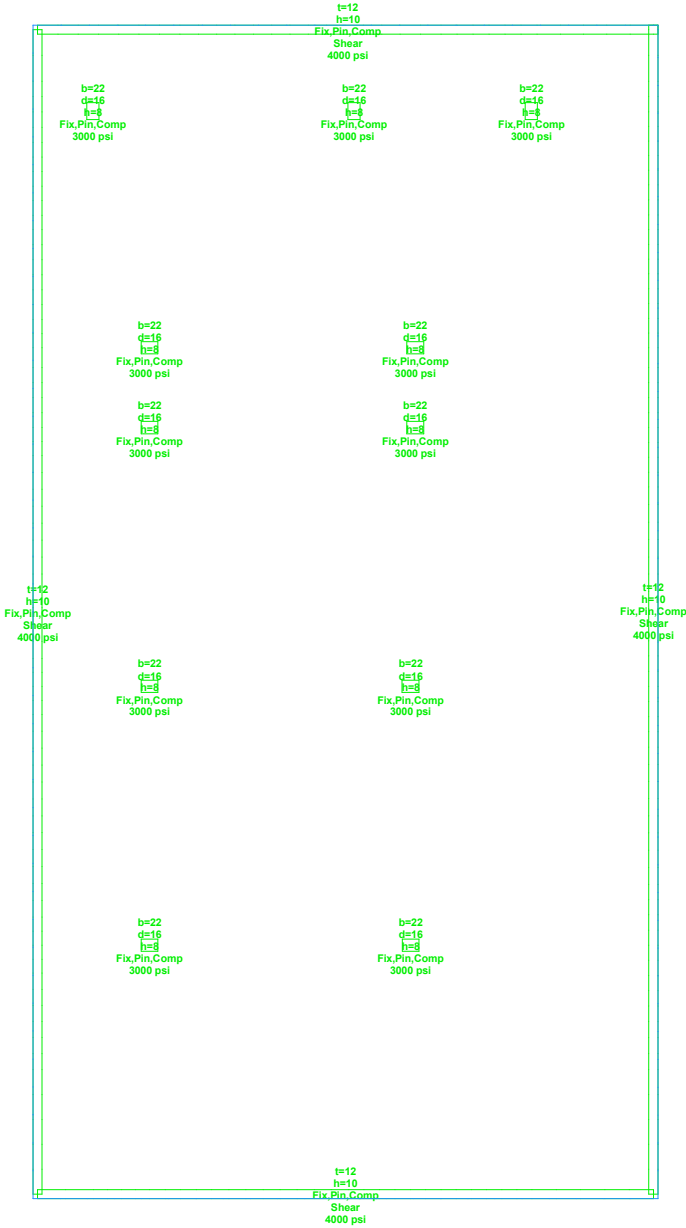
Element: User Lines; User Notes; User Dimensions; Wall Elements Below; Wall Elements Above; Column Elements Below; Column Elements Above; Point Springs; Point Spring Icons; Line Springs; Line Spring Icons; Slab Elements; Slab Element Outline Only; Slab Element Thicknesses; Slab Element Ele
Scale = 1:250



Element: Supports Below Slab Summary Plan

Element: User Lines; User Notes; User Dimensions; Wall Elements Below; Wall Element Thicknesses; Wall Element Heights; Wall Element Fixity; Wall Element Shear Fixity; Wall Element Concrete Models; Wall Element Outline Only; Column Elements Below; Column Element Dimensions; Column Element

Scale = 1:250

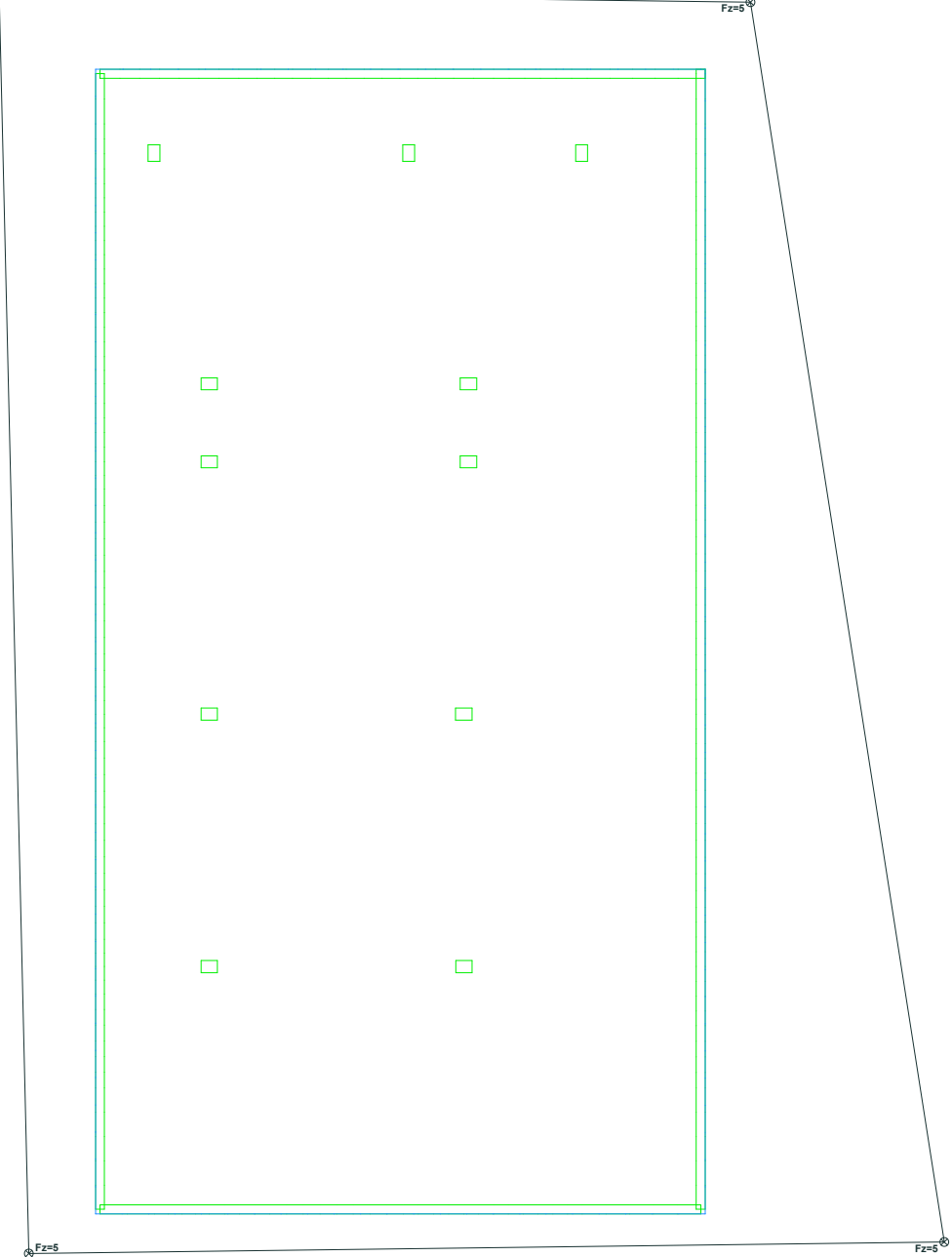


Other Dead Loading: All Loads Plan

Other Dead Loading: User Lines; User Notes; User Dimensions; Point Loads; Point Load Icons; Point Load Values; Line Loads; Line Load Icons; Line Load Values; Area Loads; Area Load Icons; Area Load Values;

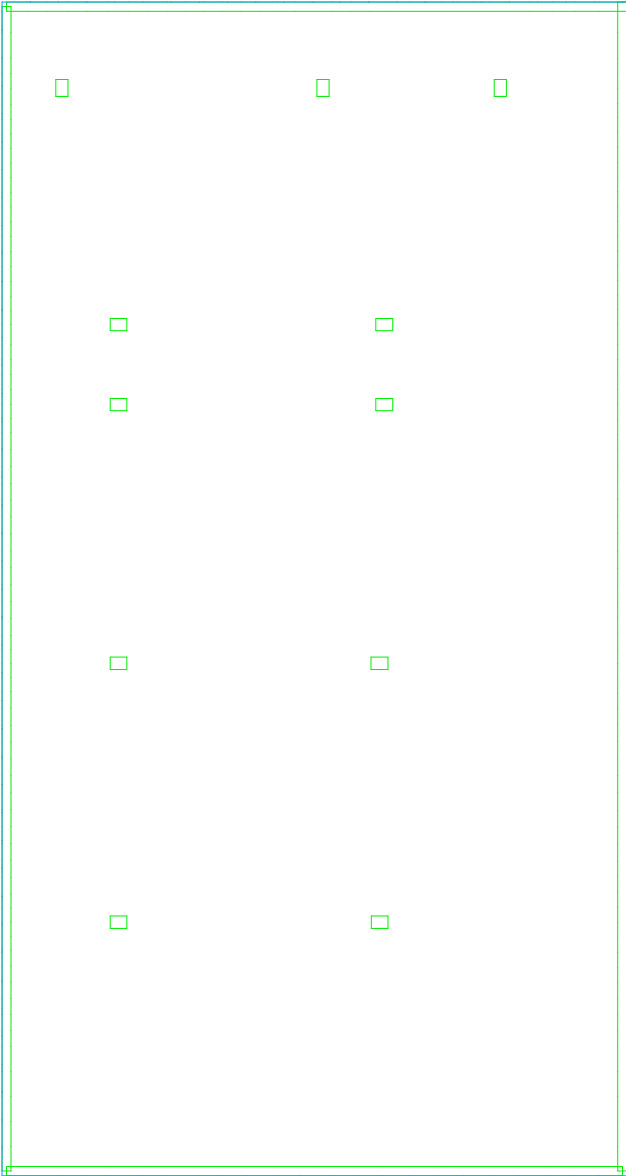
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;

Scale = 1:250



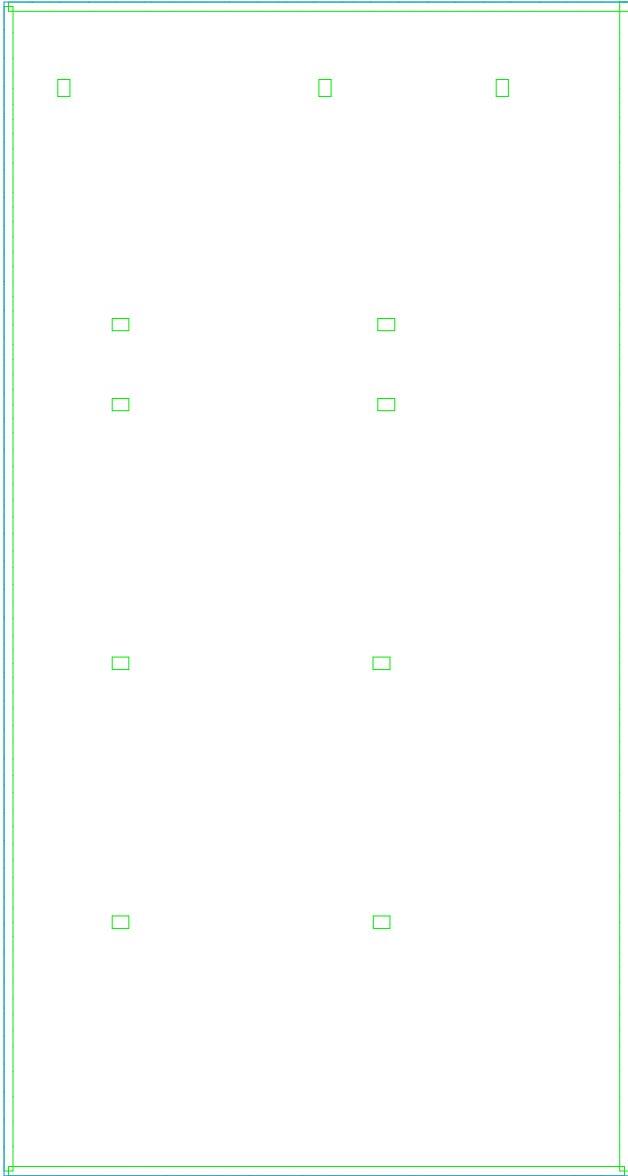
Live (Reducible) Loading: All Loads Plan

Live (Reducible) Loading: User Lines; User Notes; User Dimensions; Point Loads; Point Load Icons; Point Load Values; Line Loads; Line Load Icons; Line Load Values; Area Loads; Area Load Icons; Area Load Values;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250



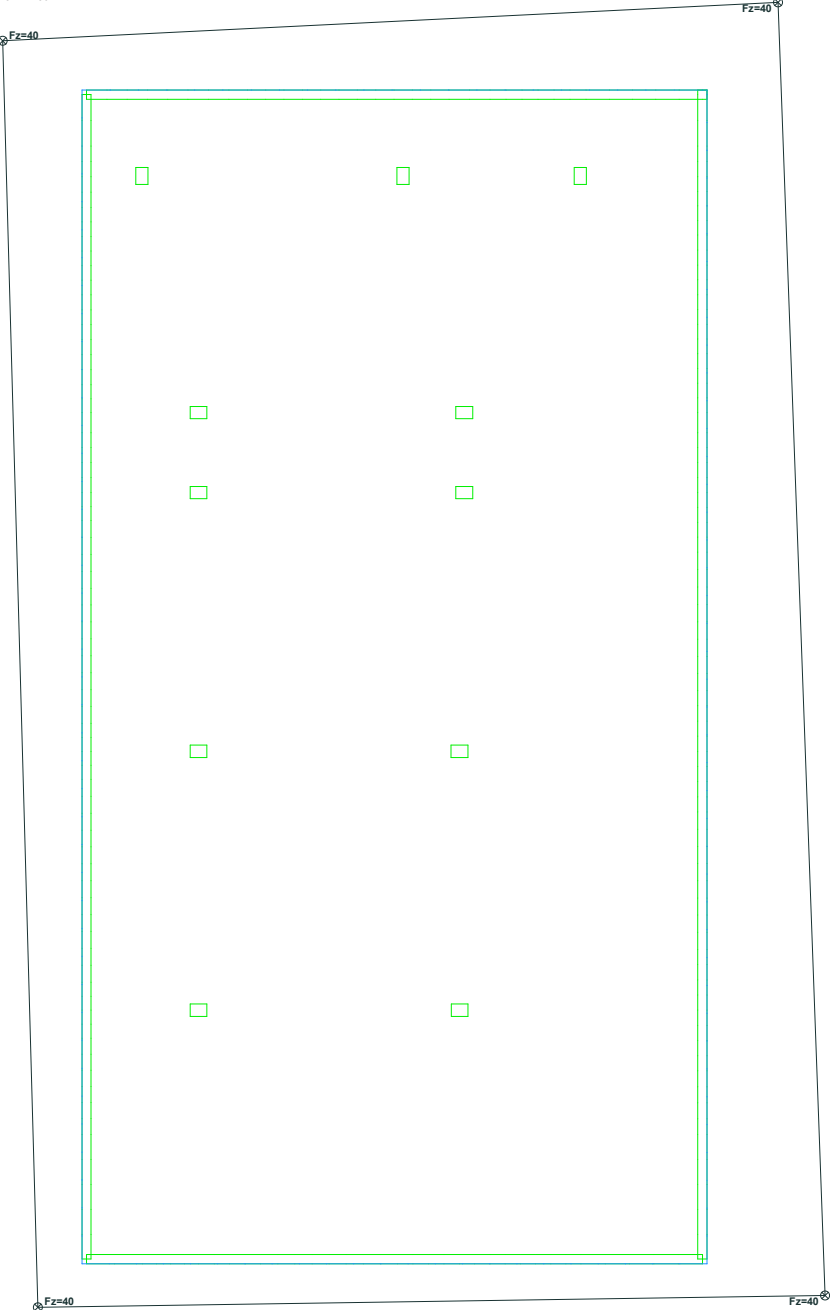
Live (Unreducible) Loading: All Loads Plan

Live (Unreducible) Loading: User Lines; User Notes; User Dimensions; Point Loads; Point Load Icons; Point Load Values; Line Loads; Line Load Icons; Line Load Values; Area Loads; Area Load Icons; Area Load Values;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250



Live (Parking) Loading: All Loads Plan

Live (Parking) Loading: User Lines; User Notes; User Dimensions; Point Loads; Point Load Icons; Point Load Values; Line Loads; Line Load Icons; Line Load Values; Area Loads; Area Load Icons; Area Load Values;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250

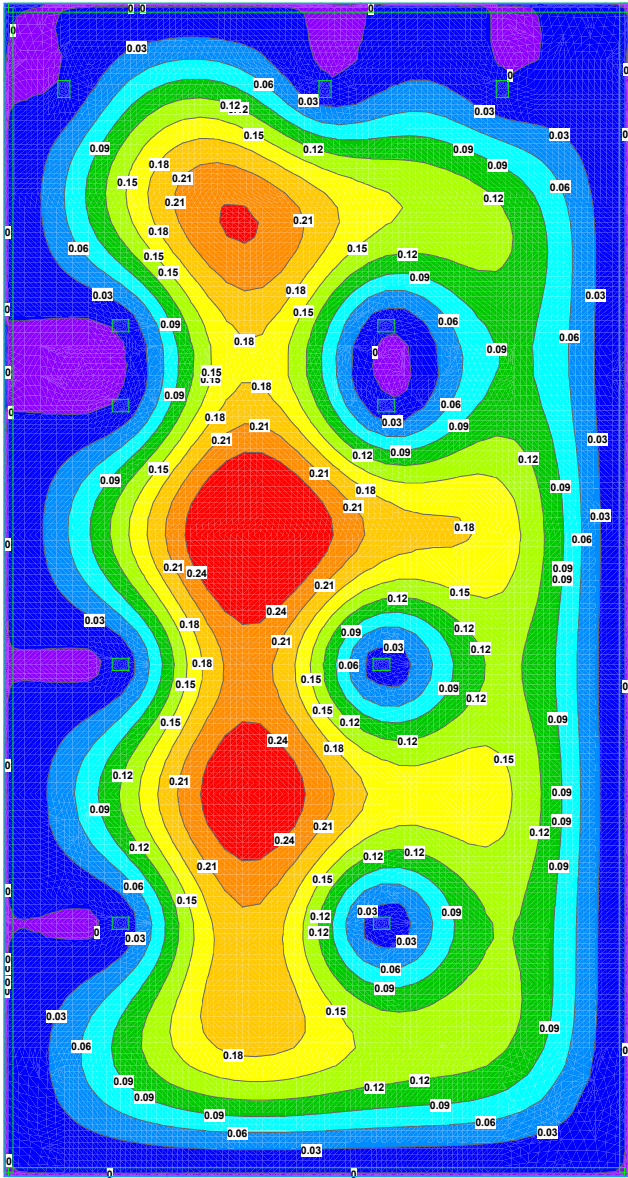


Service LC: D + L: Max Deflection Plan

Service LC: D + L: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Service LC: D + L - Vertical Deflection Plot (Maximum Values)

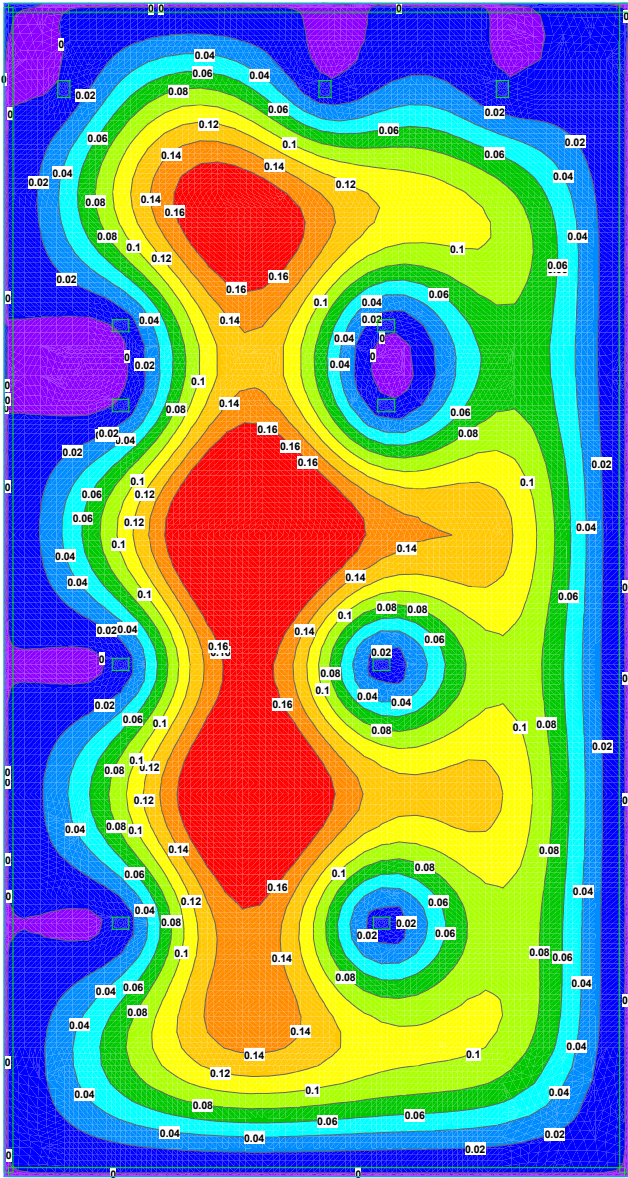
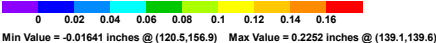


Min Value = -0.01255 inches @ (120.5,156.9) Max Value = 0.2945 inches @ (139.1,139.6)



Service LC: D + L: Min Deflection Plan

Service LC: D + L: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Service LC: D + L - Vertical Deflection Plot (Minimum Values)

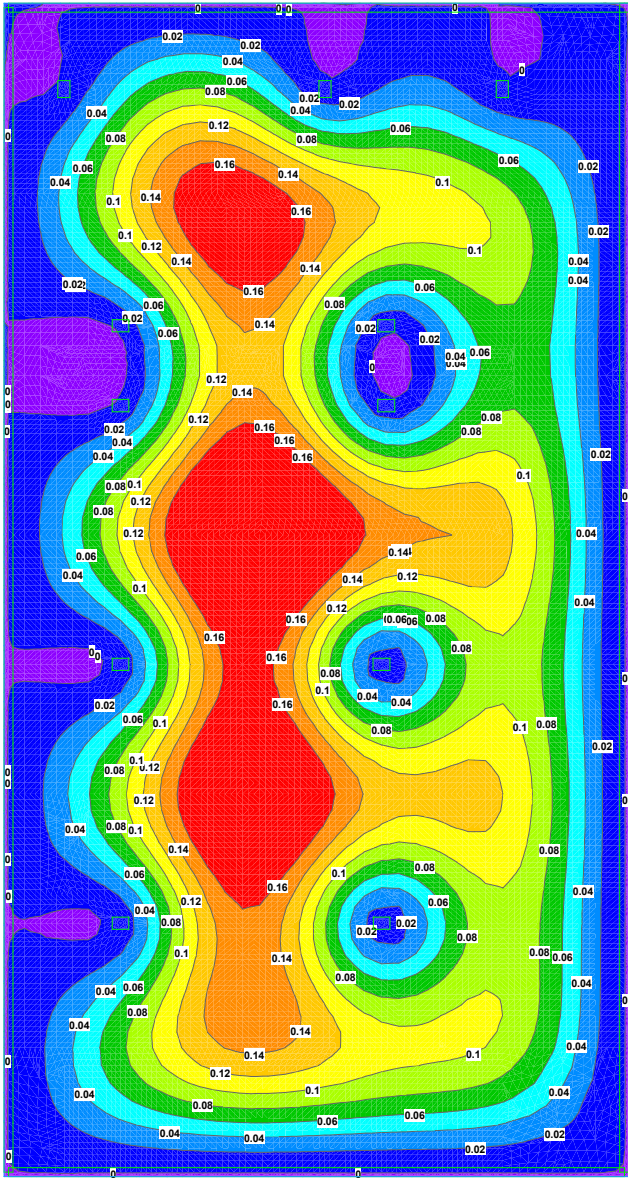


Service LC: D + Lr: Max Deflection Plan

Service LC: D + Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Service LC: D + Lr - Vertical Deflection Plot (Maximum Values)



Min Value = -0.01255 inches @ (120.5,156.9) Max Value = 0.2252 inches @ (139.1,139.6)

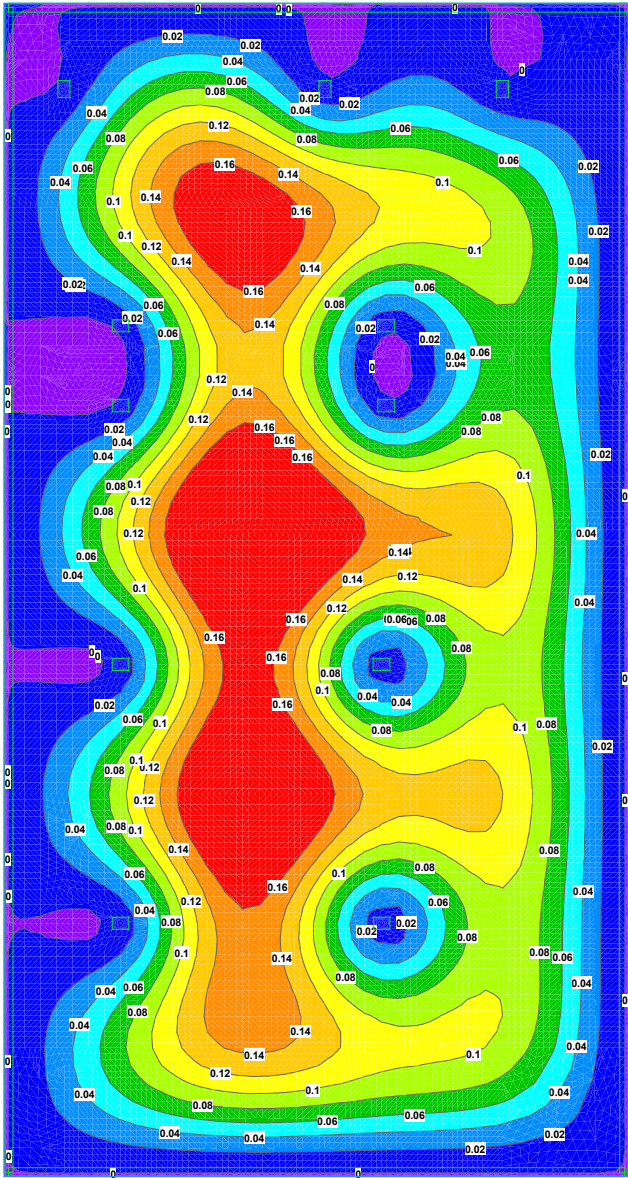


Service LC: D + Lr: Min Deflection Plan

Service LC: D + Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Service LC: D + Lr - Vertical Deflection Plot (Minimum Values)



Min Value = -0.01255 inches @ (120.5,156.9) Max Value = 0.2252 inches @ (139.1,139.6)

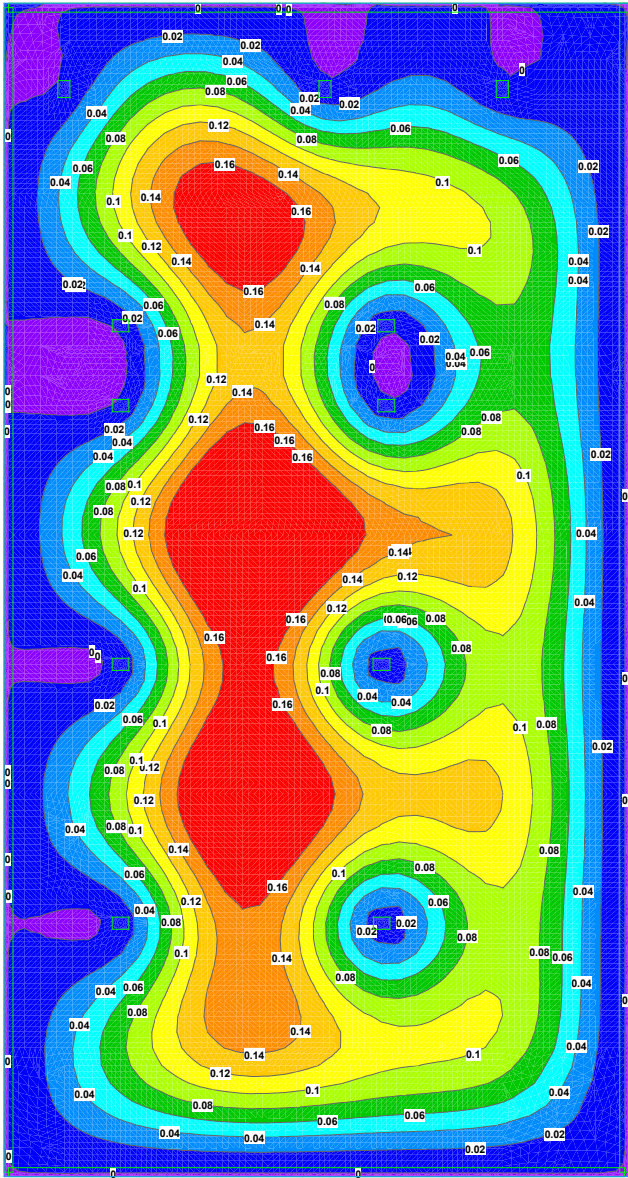


Service LC: D + S: Max Deflection Plan

Service LC: D + S: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Service LC: D + S - Vertical Deflection Plot (Maximum Values)



Min Value = -0.01255 inches @ (120.5,156.9) Max Value = 0.2252 inches @ (139.1,139.6)

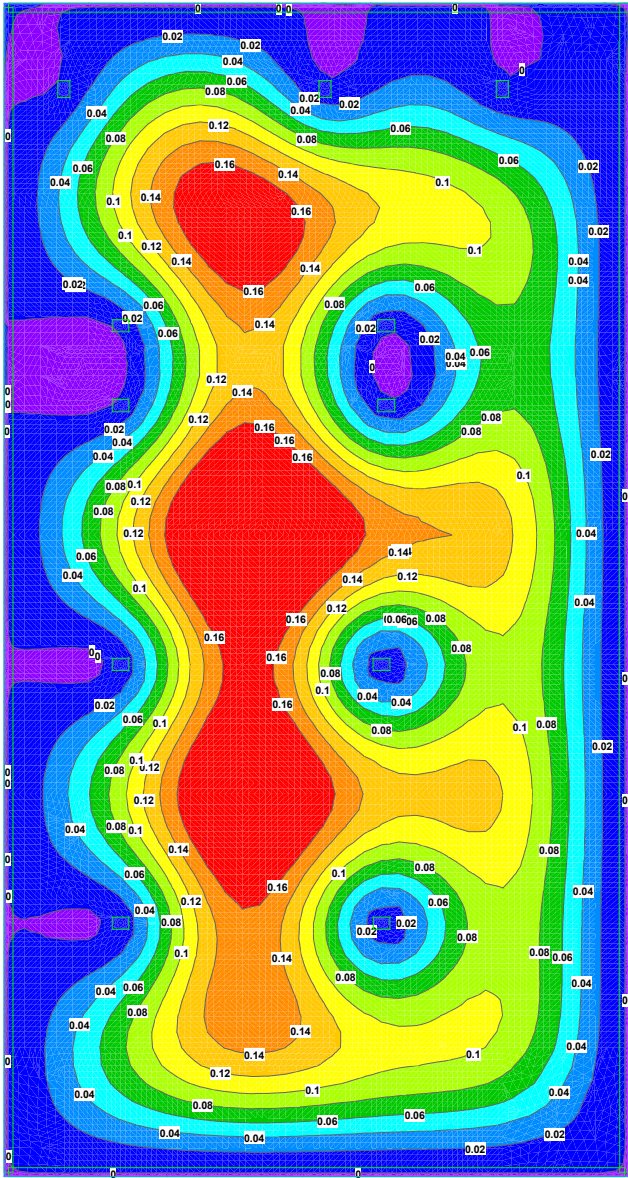


Service LC: D + S: Min Deflection Plan

Service LC: D + S: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Service LC: D + S - Vertical Deflection Plot (Minimum Values)



Min Value = -0.01255 inches @ (120.5,156.9) Max Value = 0.2252 inches @ (139.1,139.6)

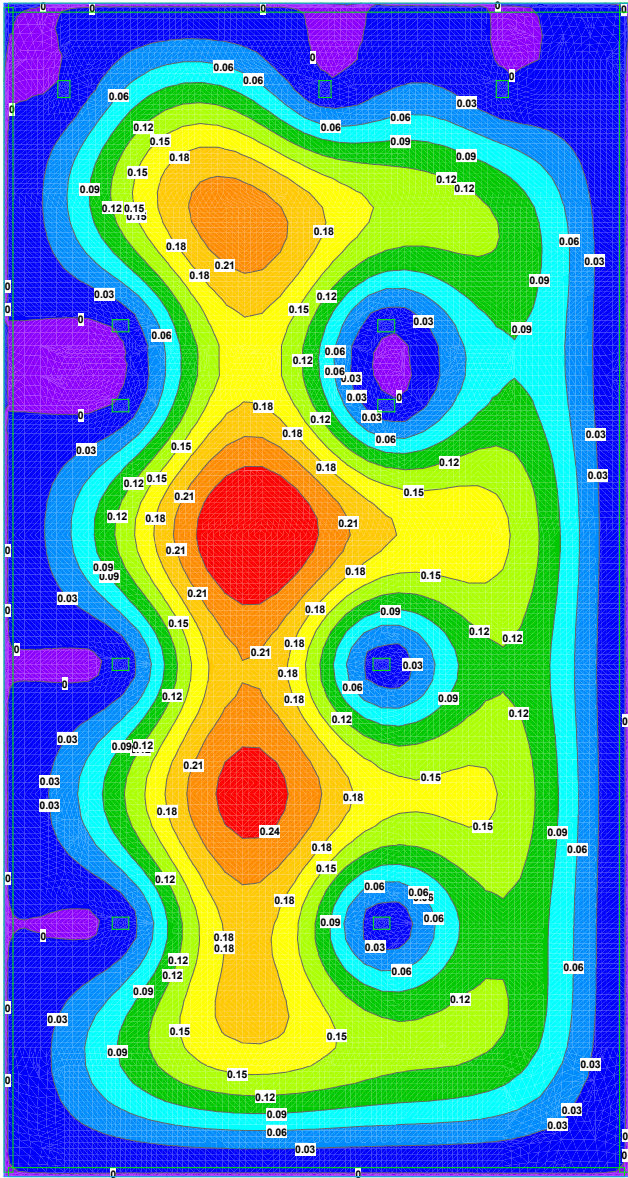


Service LC: D + 0.75L + 0.75Lr: Max Deflection Plan

Service LC: D + 0.75L + 0.75Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Service LC: D + 0.75L + 0.75Lr - Vertical Deflection Plot (Maximum Values)



Min Value = -0.01255 inches @ (120.5,156.9) Max Value = 0.2772 inches @ (139.1,139.6)

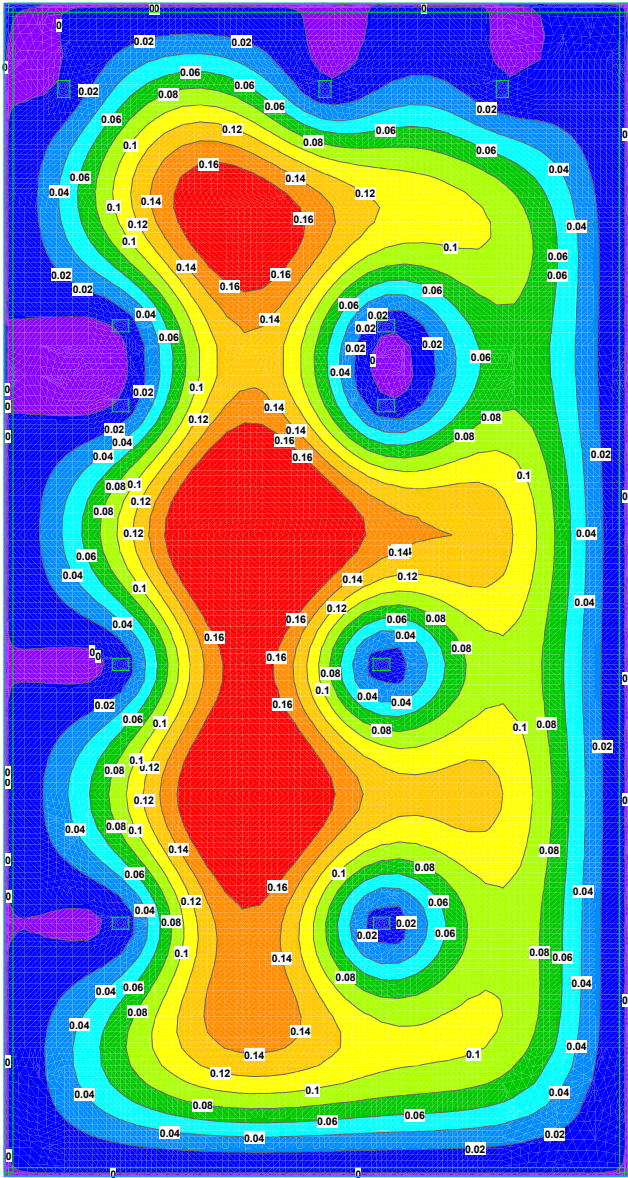


Service LC: D + 0.75L + 0.75Lr: Min Deflection Plan

Service LC: D + 0.75L + 0.75Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Service LC: D + 0.75L + 0.75Lr - Vertical Deflection Plot (Minimum Values)



Min Value = -0.01544 inches @ (120.5,156.9) Max Value = 0.2252 inches @ (139.1,139.6)

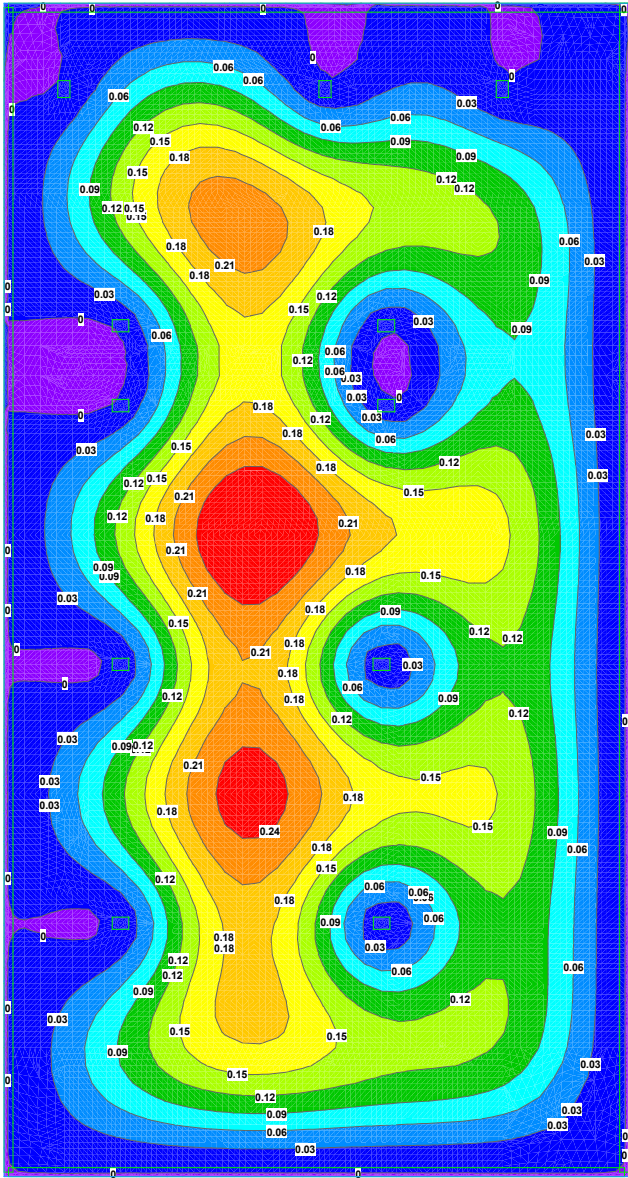


Service LC: D + 0.75L + 0.75S: Max Deflection Plan

Service LC: D + 0.75L + 0.75S: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Service LC: D + 0.75L + 0.75S - Vertical Deflection Plot (Maximum Values)



Min Value = -0.01255 inches @ (120.5,156.9) Max Value = 0.2772 inches @ (139.1,139.6)

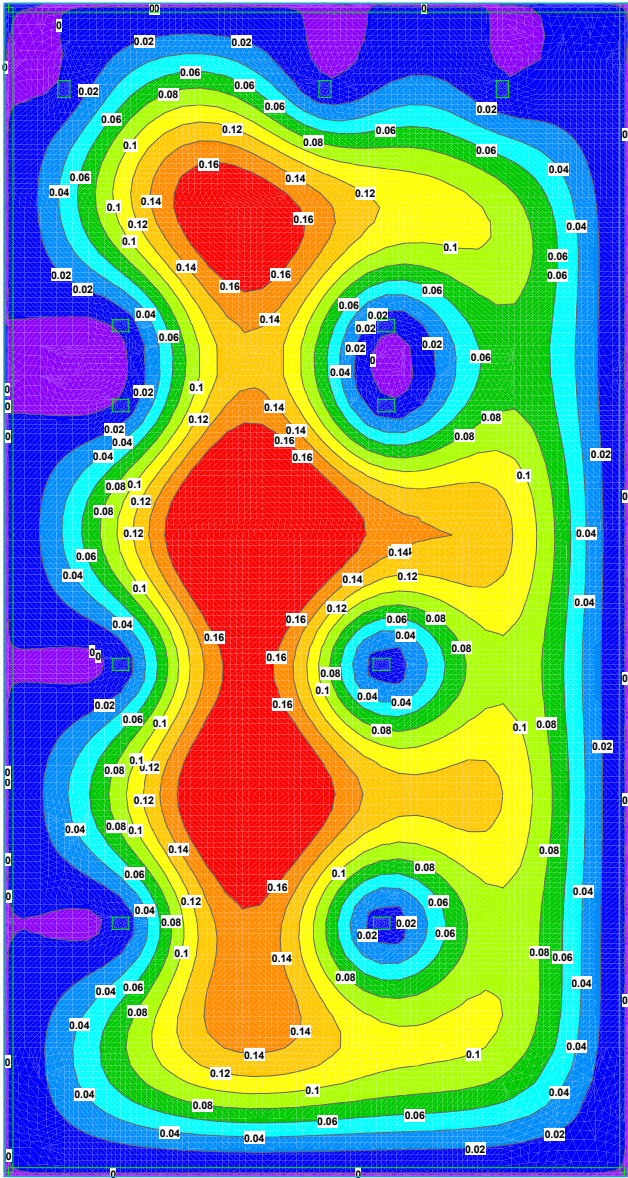


Service LC: D + 0.75L + 0.75S: Min Deflection Plan

Service LC: D + 0.75L + 0.75S: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Service LC: D + 0.75L + 0.75S - Vertical Deflection Plot (Minimum Values)

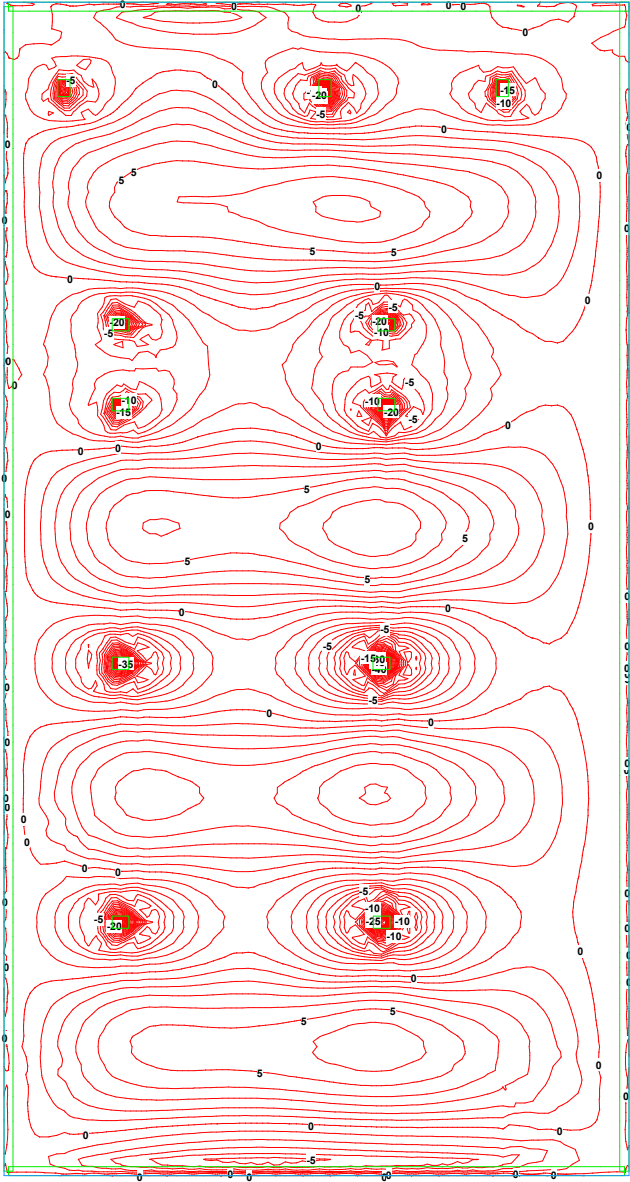


Min Value = -0.01544 inches @ (120.5,156.9) Max Value = 0.2252 inches @ (139.1,139.6)



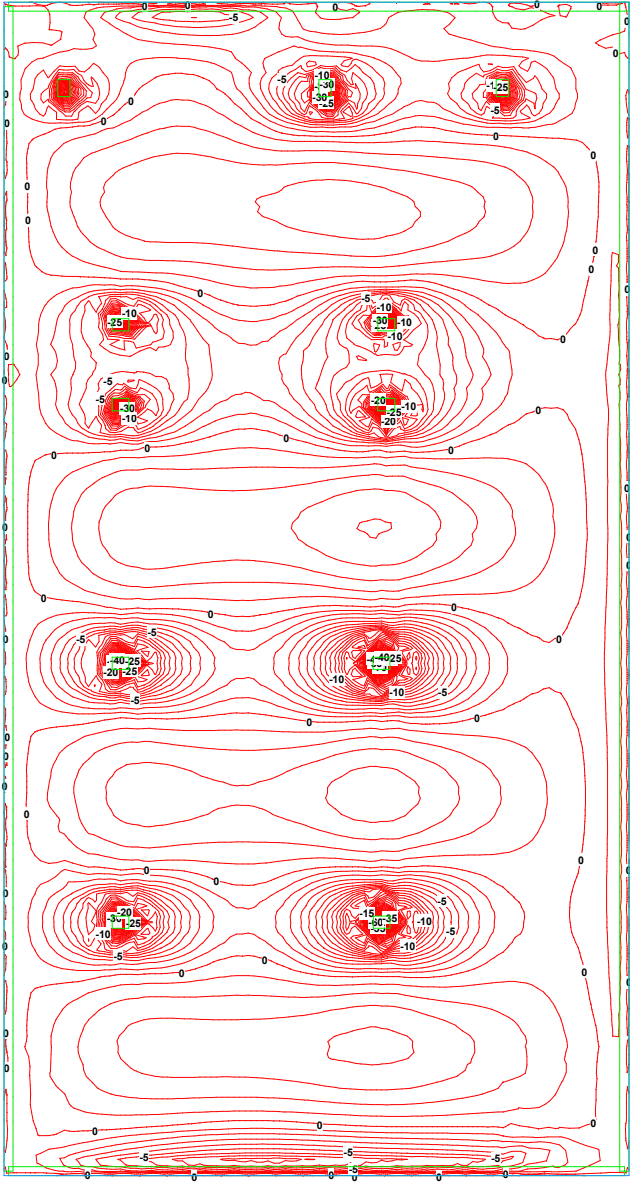
Factored LC: 1.4D: Max Mx Plan

Factored LC: 1.4D: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.4D - Bending Moment Plot (Maximum Values) (X-Axis Direction)
One Contour = 1 Kips
Min Value = -45.18 Kips @ (151.8,125.9) Max Value = 7.858 Kips @ (150.6,140.5)



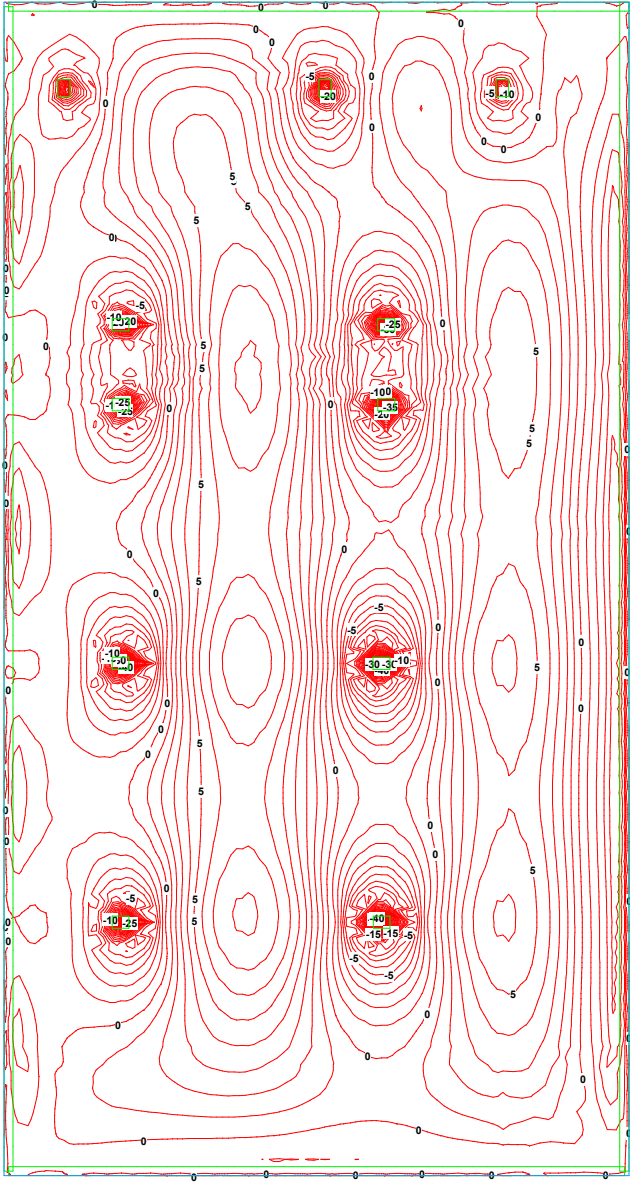
Factored LC: 1.4D: Min Mx Plan

Factored LC: 1.4D: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.4D - Bending Moment Plot (Minimum Values) (X-Axis Direction)
One Contour = 1 Kips
Min Value = -70.28 Kips @ (151.8,125.9) Max Value = 5.052 Kips @ (150.6,140.5)



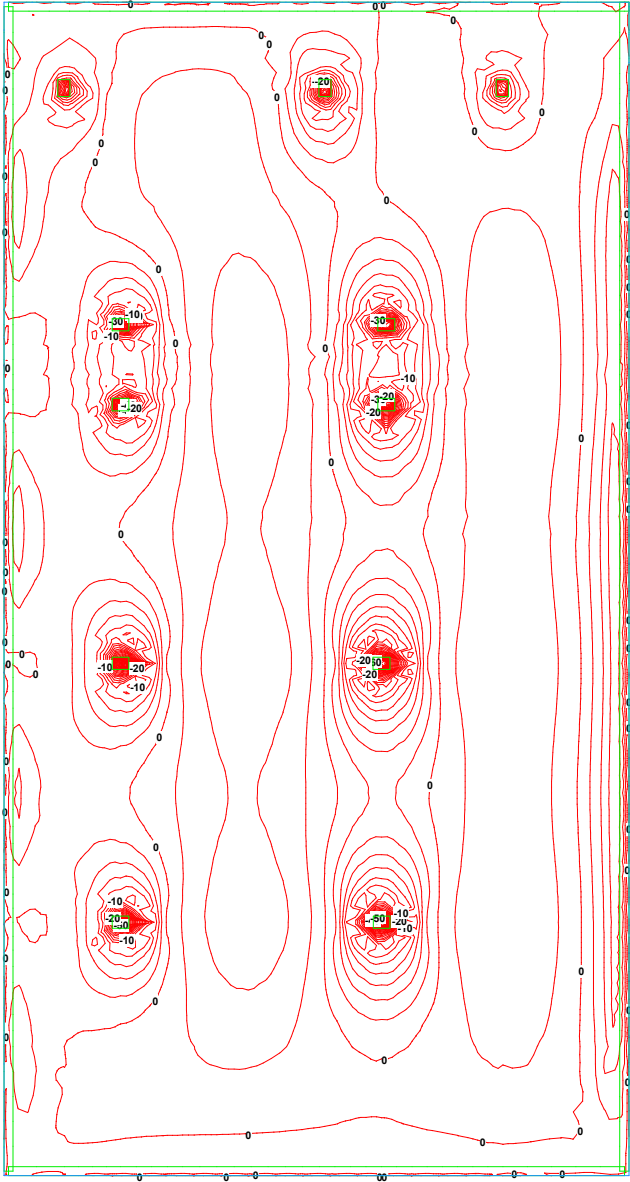
Factored LC: 1.4D: Max My Plan

Factored LC: 1.4D: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.4D - Bending Moment Plot (Maximum Values) (Y-Axis Direction)
One Contour = 1 Kips
Min Value = -51.25 Kips @ (151.8,125.9) Max Value = 8.709 Kips @ (138.1,125.5)



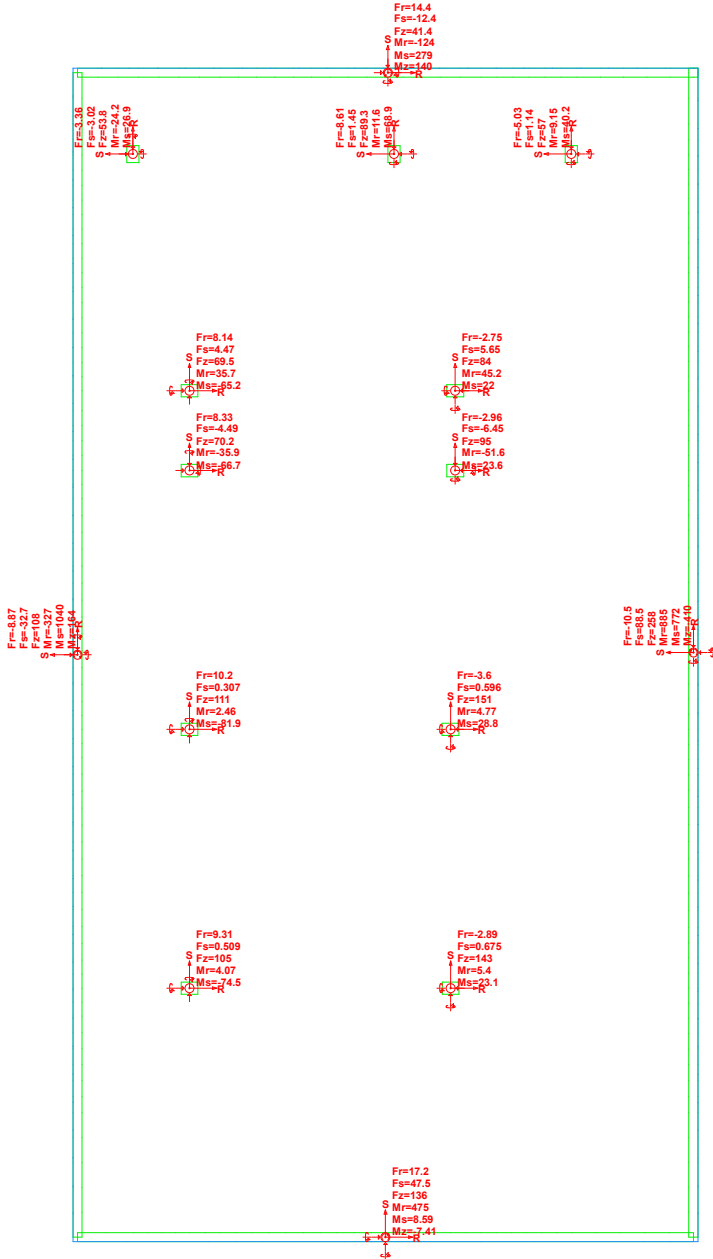
Factored LC: 1.4D: Min My Plan

Factored LC: 1.4D: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.4D - Bending Moment Plot (Minimum Values) (Y-Axis Direction)
One Contour = 2 Kips
Min Value = -79.73 Kips @ (151.8,125.9) Max Value = 5.599 Kips @ (138.1,125.5)



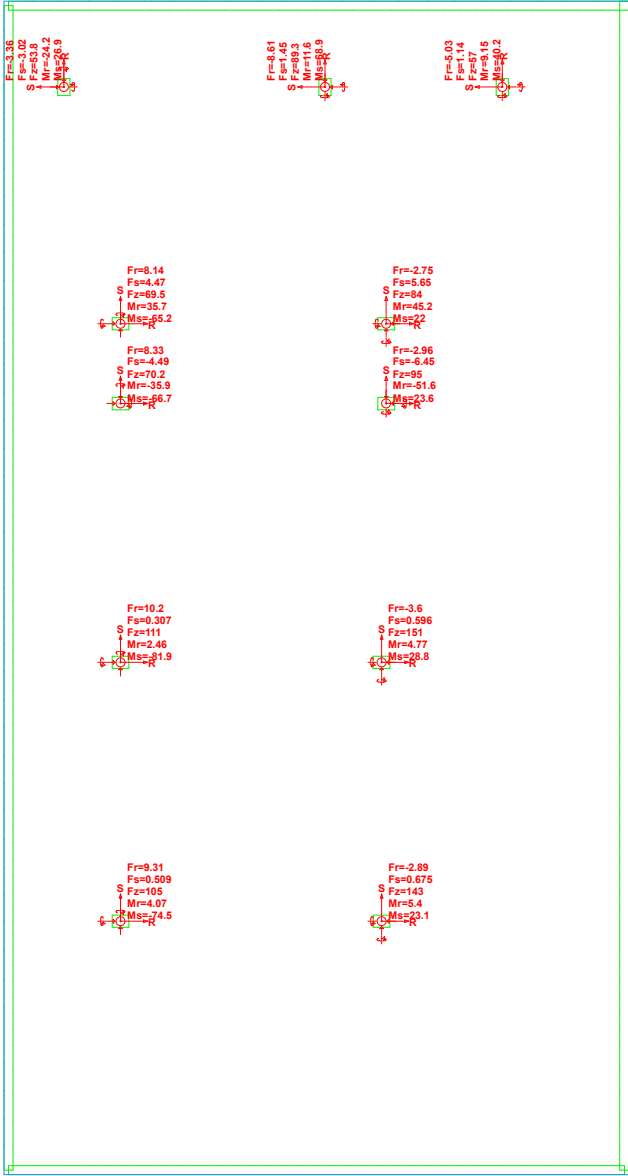
Factored LC: 1.4D: Std Reactions Plan

Factored LC: 1.4D: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.4D - Reaction Plot: (Wall Below,Column Below,Point Spring,Line Spring,Line Support)(Fr,Fs,Fz,Mr,Ms,Mz)(Standard Context)



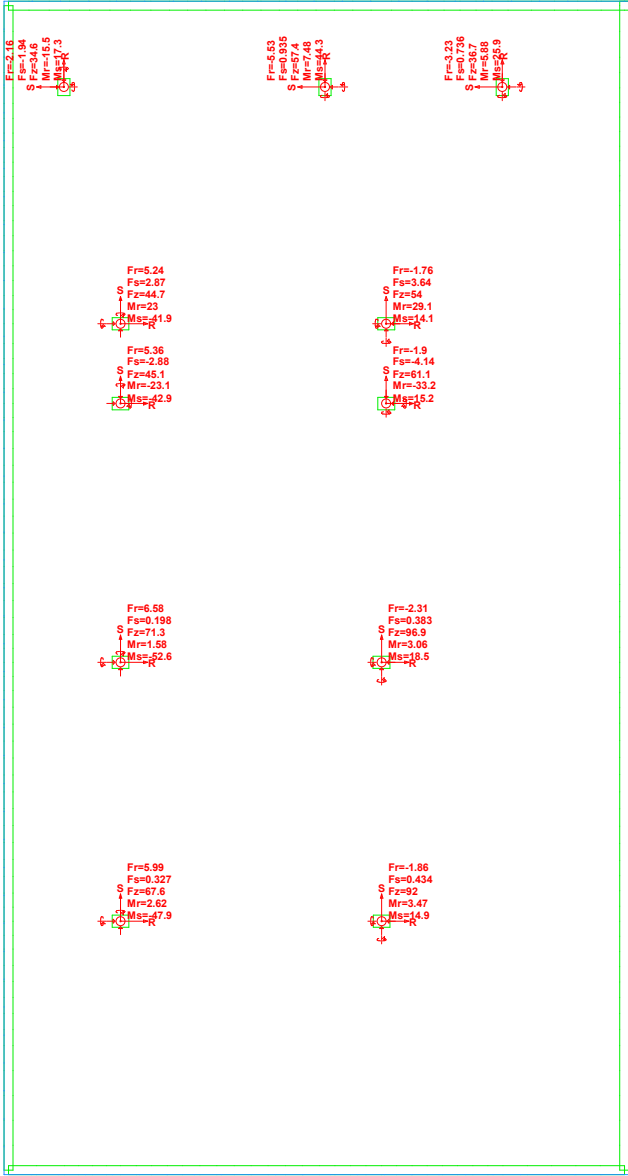
Factored LC: 1.4D: Max Reactions Plan

Factored LC: 1.4D: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.4D - Reaction Plot: (Column Below)(Fr,Fs,Fz,Mr,Ms,Mz)(Max Fz Context)



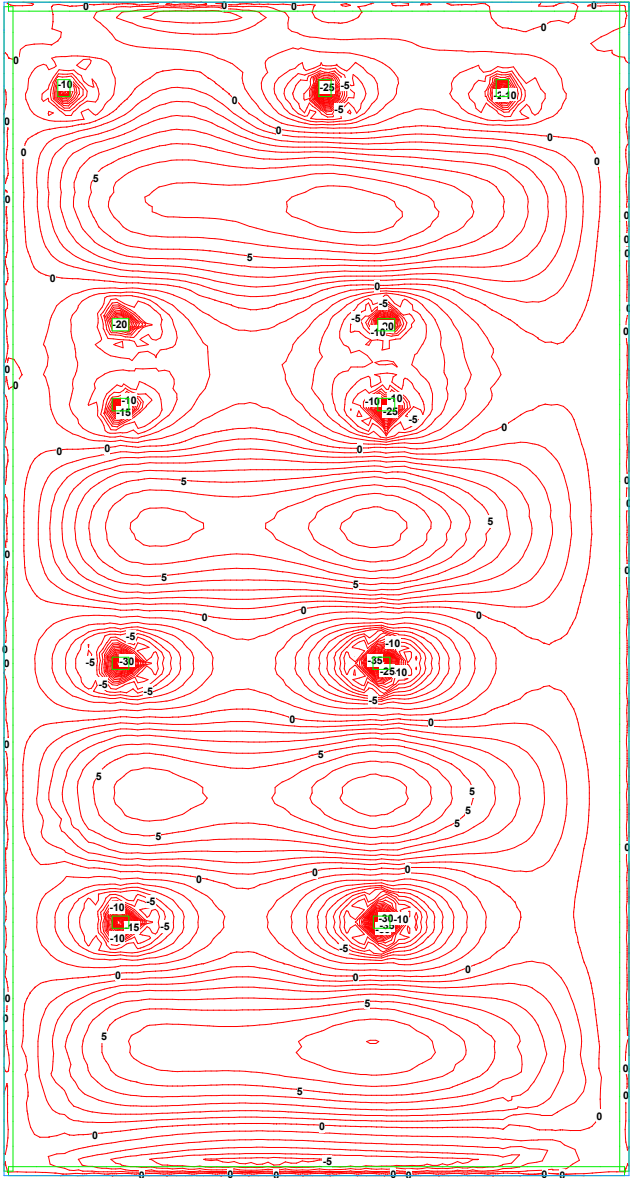
Factored LC: 1.4D: Min Reactions Plan

Factored LC: 1.4D: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.4D - Reaction Plot: (Column Below)(Fr,Fs,Fz,Mr,Ms,Mz)(Min Fz Context)



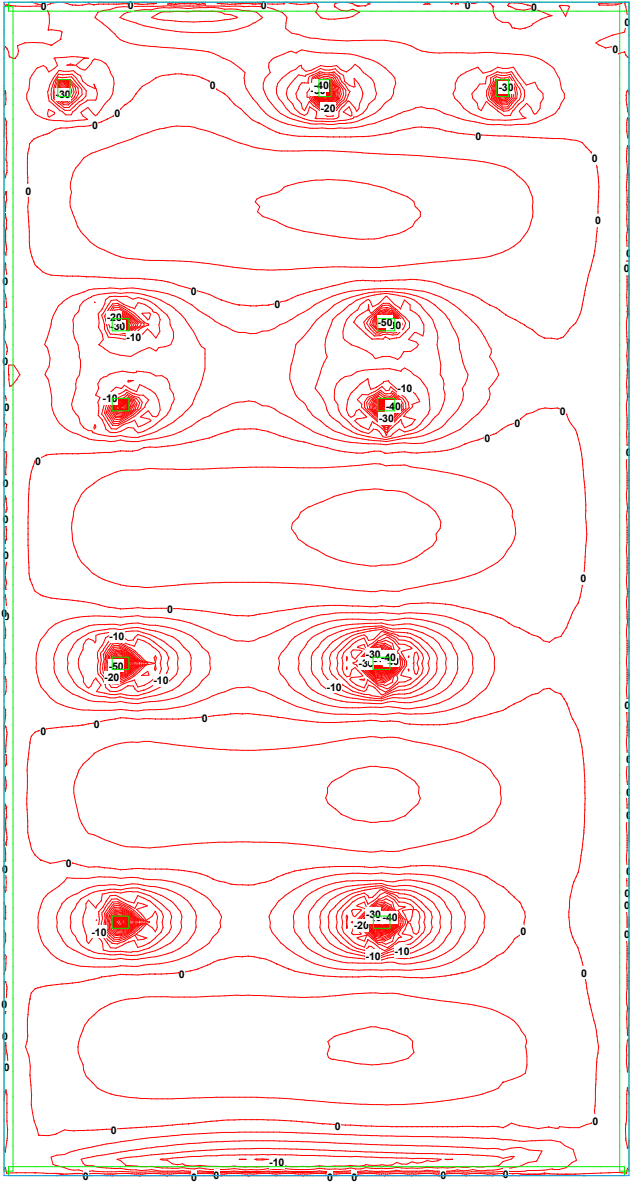
Factored LC: 1.2D + 1.6L + 0.5Lr: Max Mx Plan

Factored LC: 1.2D + 1.6L + 0.5Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.2D + 1.6L + 0.5Lr - Bending Moment Plot (Maximum Values) (X-Axis Direction)
One Contour = 1 Kips
Min Value = -45.18 Kips @ (151.8,125.9) Max Value = 9.499 Kips @ (150.6,140.5)



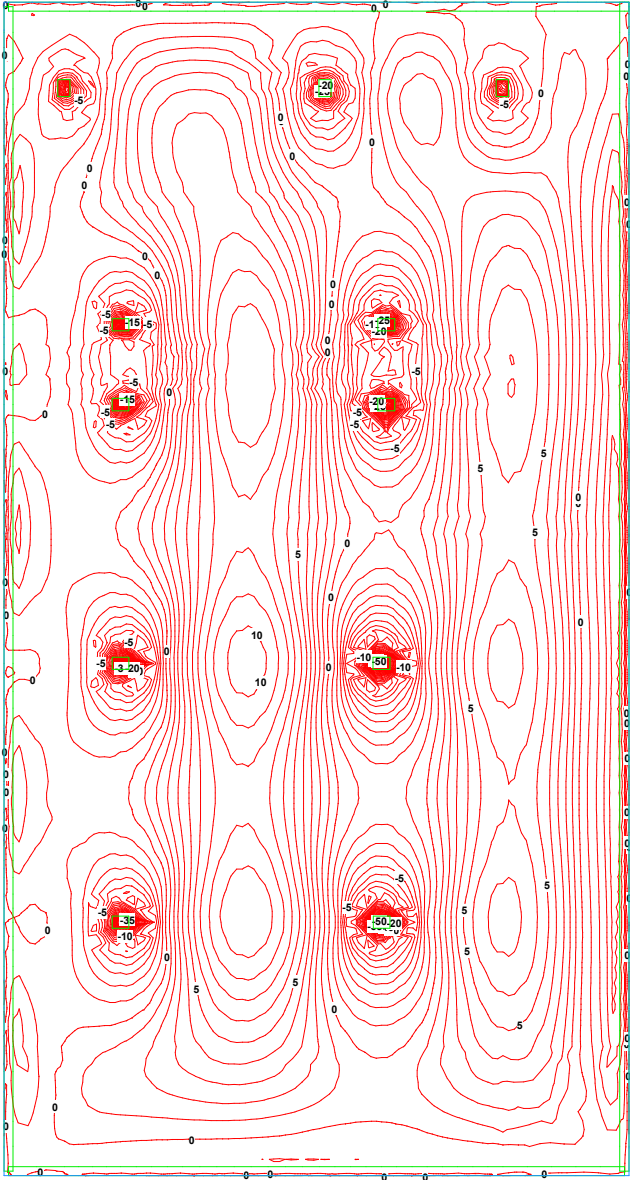
Factored LC: 1.2D + 1.6L + 0.5Lr: Min Mx Plan

Factored LC: 1.2D + 1.6L + 0.5Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.2D + 1.6L + 0.5Lr - Bending Moment Plot (Minimum Values) (X-Axis Direction)
One Contour = 2 Kips
Min Value = -84.95 Kips @ (151.8,125.9) Max Value = 5.052 Kips @ (150.6,140.5)



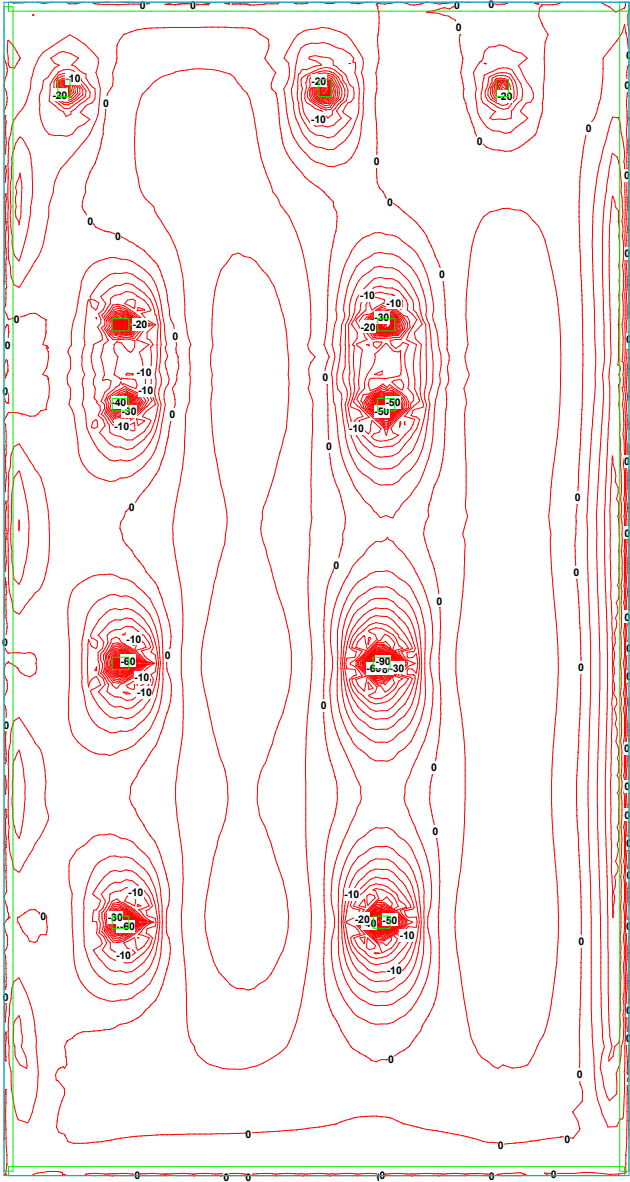
Factored LC: 1.2D + 1.6L + 0.5Lr: Max My Plan

Factored LC: 1.2D + 1.6L + 0.5Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.2D + 1.6L + 0.5Lr - Bending Moment Plot (Maximum Values) (Y-Axis Direction)
One Contour = 1 Kips
Min Value = -51.25 Kips @ (151.8,125.9) Max Value = 10.53 Kips @ (138.1,125.5)



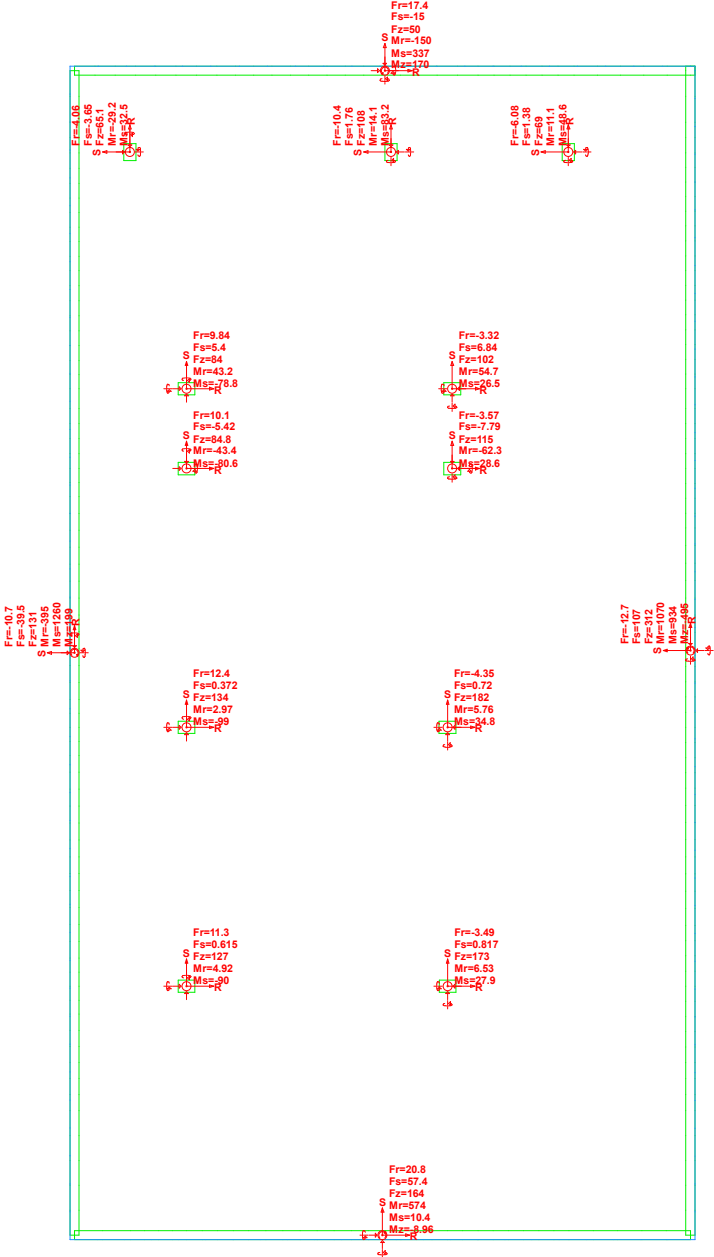
Factored LC: 1.2D + 1.6L + 0.5Lr: Min My Plan

Factored LC: 1.2D + 1.6L + 0.5Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.2D + 1.6L + 0.5Lr - Bending Moment Plot (Minimum Values) (Y-Axis Direction)
One Contour = 2 Kips
Min Value = -96.37 Kips @ (151.8,125.9) Max Value = 5.599 Kips @ (138.1,125.5)



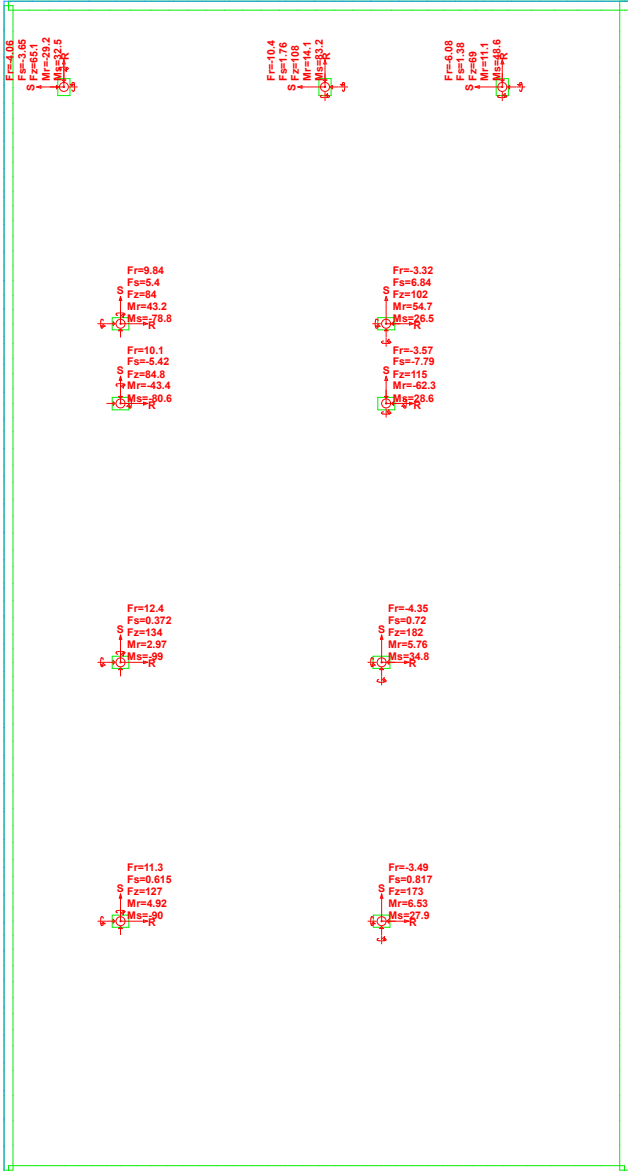
Factored LC: 1.2D + 1.6L + 0.5Lr: Std Reactions Plan

Factored LC: 1.2D + 1.6L + 0.5Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.2D + 1.6L + 0.5Lr - Reaction Plot: (Wall Below,Column Below,Point Spring,Line Spring,Point Support,Line Support)(Fr,Fs,Fz,Mr,Mz)(Standard Context)



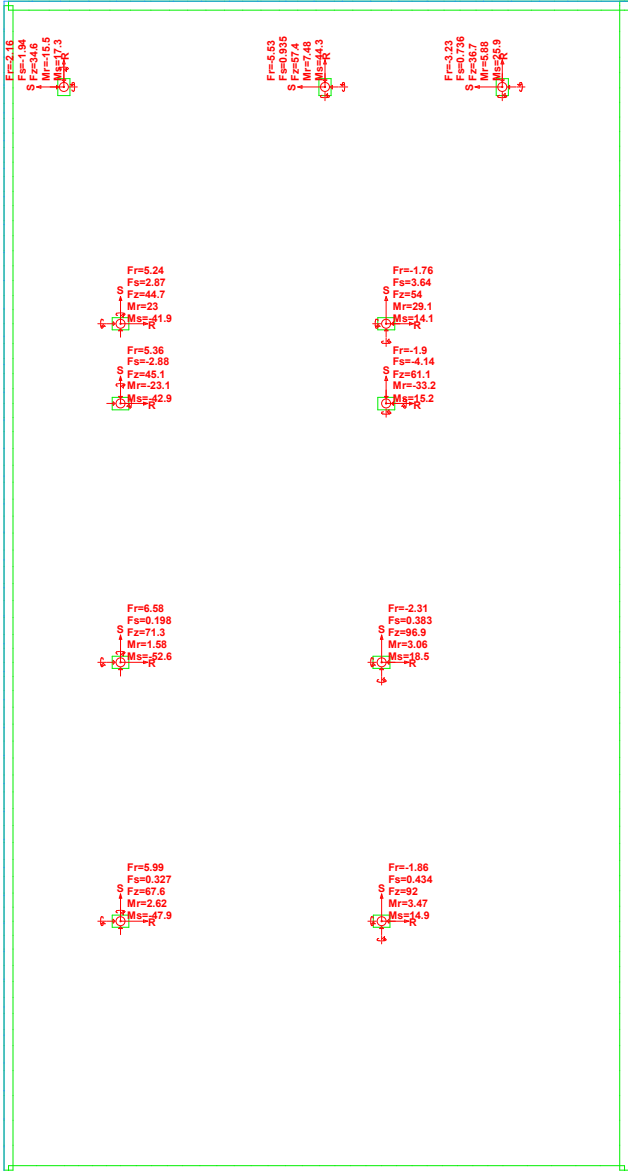
Factored LC: 1.2D + 1.6L + 0.5Lr: Max Reactions Plan

Factored LC: 1.2D + 1.6L + 0.5Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.2D + 1.6L + 0.5Lr - Reaction Plot: (Column Below)(Fr,Fs,Fz,Mr,Ms,Mz)(Max Fz Context)



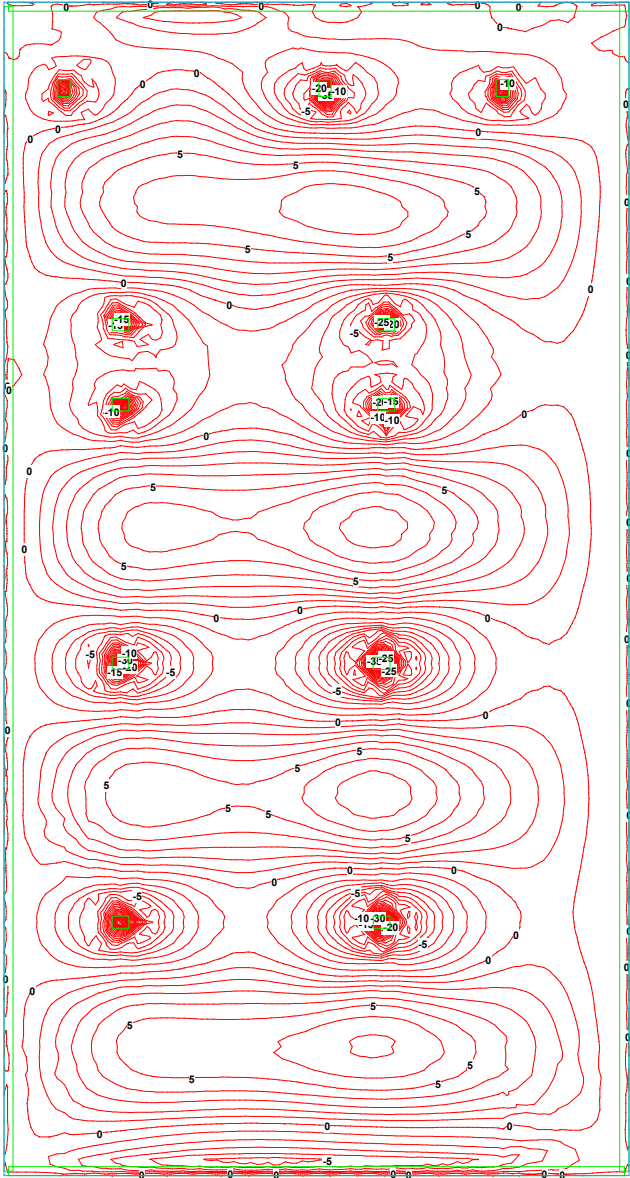
Factored LC: 1.2D + 1.6L + 0.5Lr: Min Reactions Plan

Factored LC: 1.2D + 1.6L + 0.5Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.2D + 1.6L + 0.5Lr - Reaction Plot: (Column Below)(Fr,Fs,Fz,Mr,Ms,Mz)(Min Fz Context)



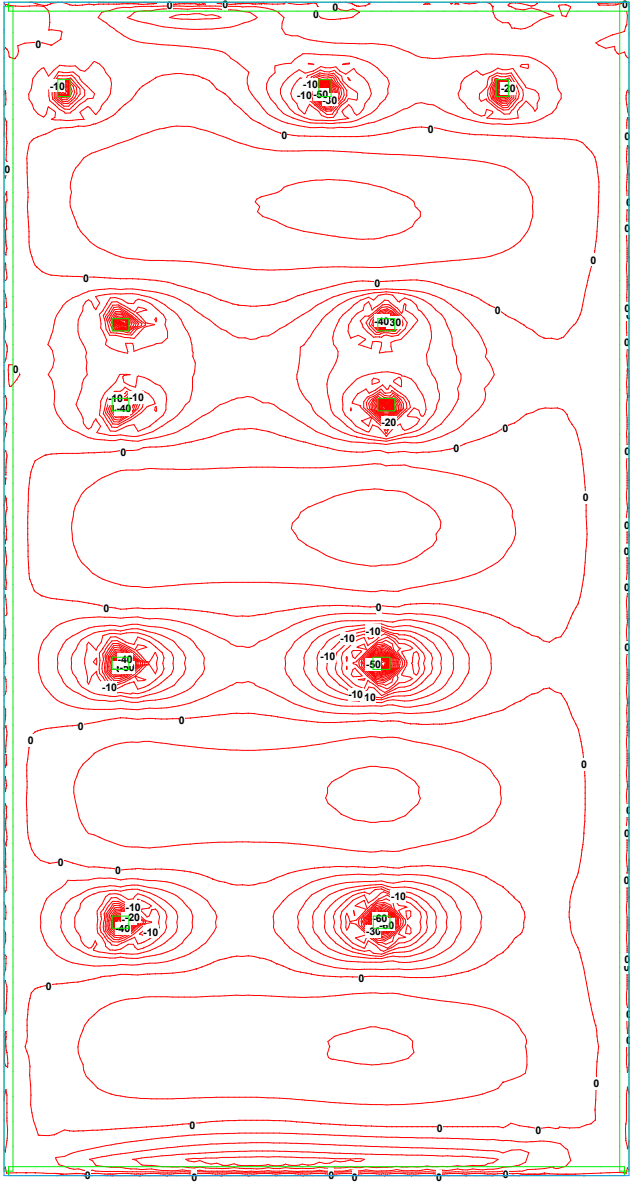
Factored LC: 1.2D + f1L + 1.6Lr: Max Mx Plan

Factored LC: 1.2D + f1L + 1.6Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.2D + f1L + 1.6Lr - Bending Moment Plot (Maximum Values) (X-Axis Direction)
One Contour = 1 Kips
Min Value = -45.18 Kips @ (151.8,125.9) Max Value = 8.463 Kips @ (150.6,140.5)



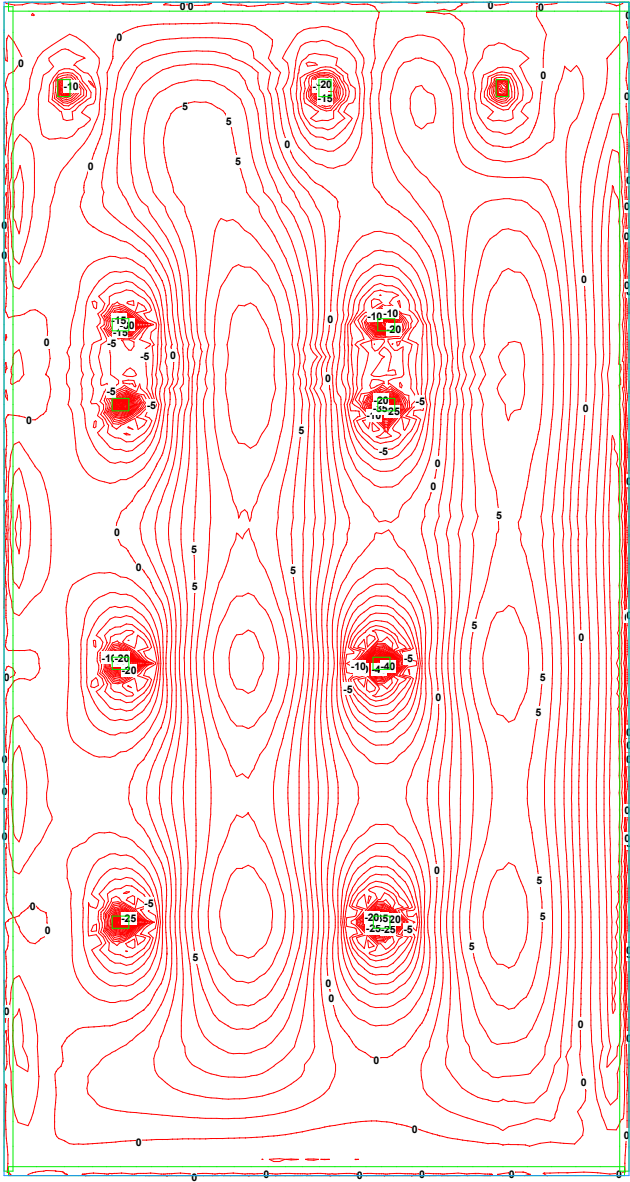
Factored LC: 1.2D + f1L + 1.6Lr: Min Mx Plan

Factored LC: 1.2D + f1L + 1.6Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1.250
Factored LC: 1.2D + f1L + 1.6Lr - Bending Moment Plot (Minimum Values) (X-Axis Direction)
One Contour = 2 Kips
Min Value = -75.68 Kips @ (151.8,125.9) Max Value = 5.052 Kips @ (150.6,140.5)



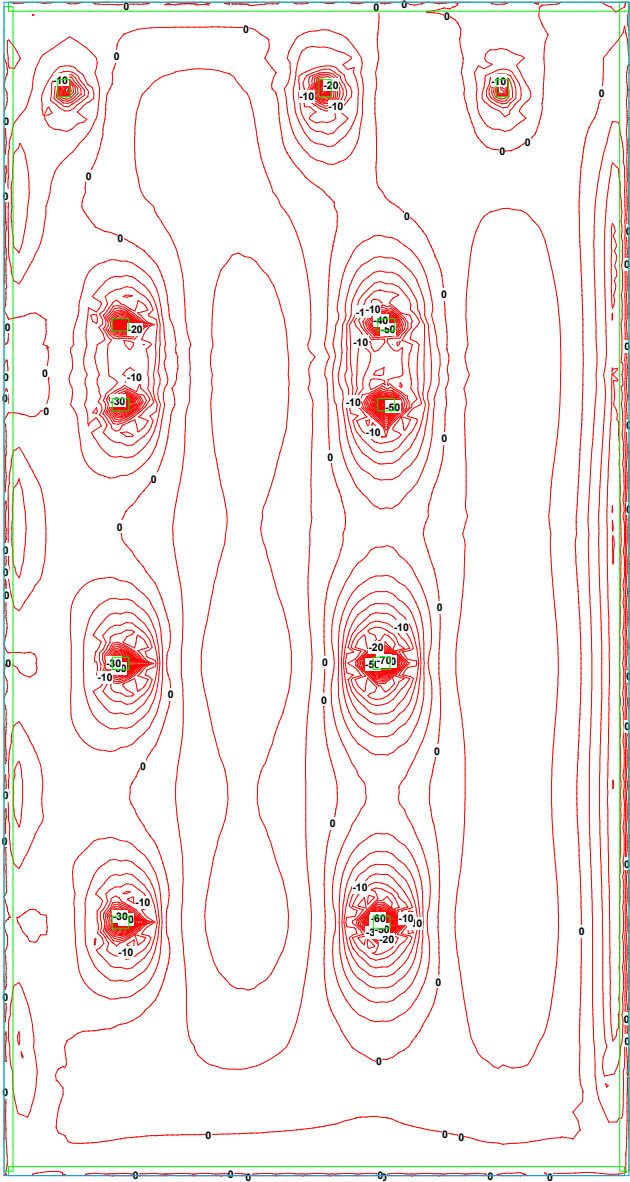
Factored LC: 1.2D + f1L + 1.6Lr: Max My Plan

Factored LC: 1.2D + f1L + 1.6Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.2D + f1L + 1.6Lr - Bending Moment Plot (Maximum Values) (Y-Axis Direction)
One Contour = 1 Kips
Min Value = -51.25 Kips @ (151.8,125.9) Max Value = 9.379 Kips @ (138.1,125.5)



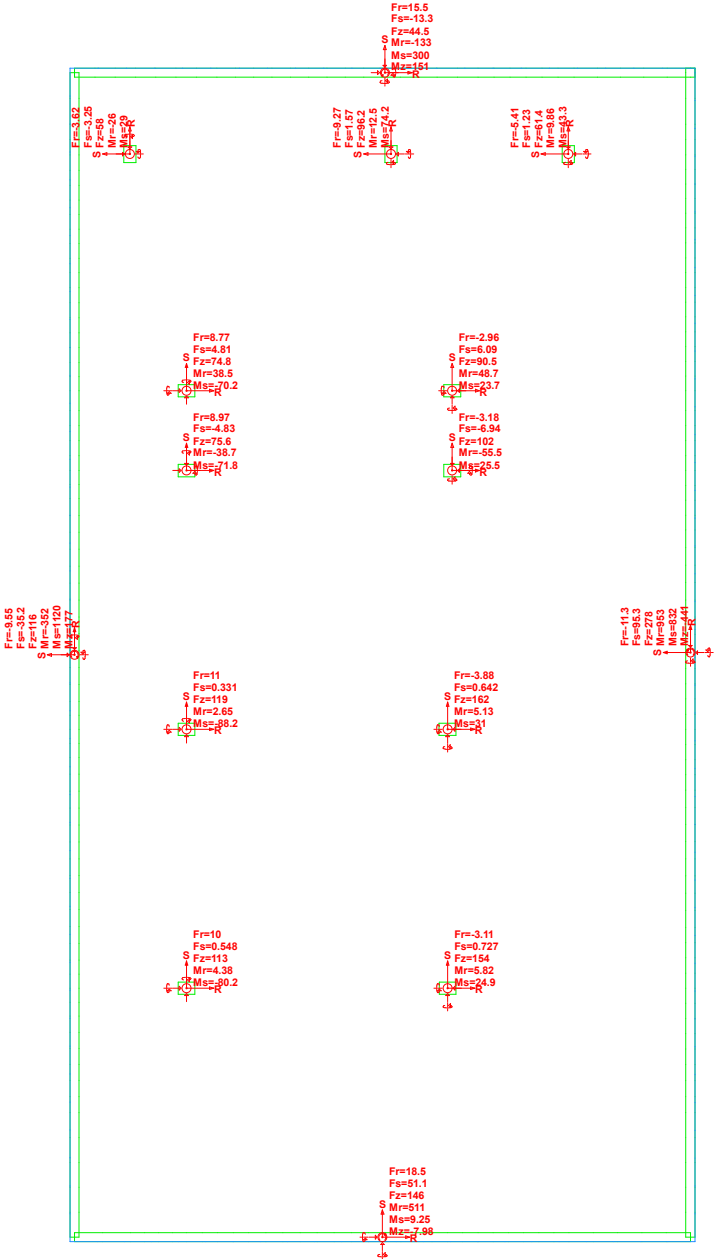
Factored LC: 1.2D + f1L + 1.6Lr: Min My Plan

Factored LC: 1.2D + f1L + 1.6Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.2D + f1L + 1.6Lr - Bending Moment Plot (Minimum Values) (Y-Axis Direction)
One Contour = 2 Kips
Min Value = -85.86 Kips @ (151.8,125.9) Max Value = 5.599 Kips @ (138.1,125.5)



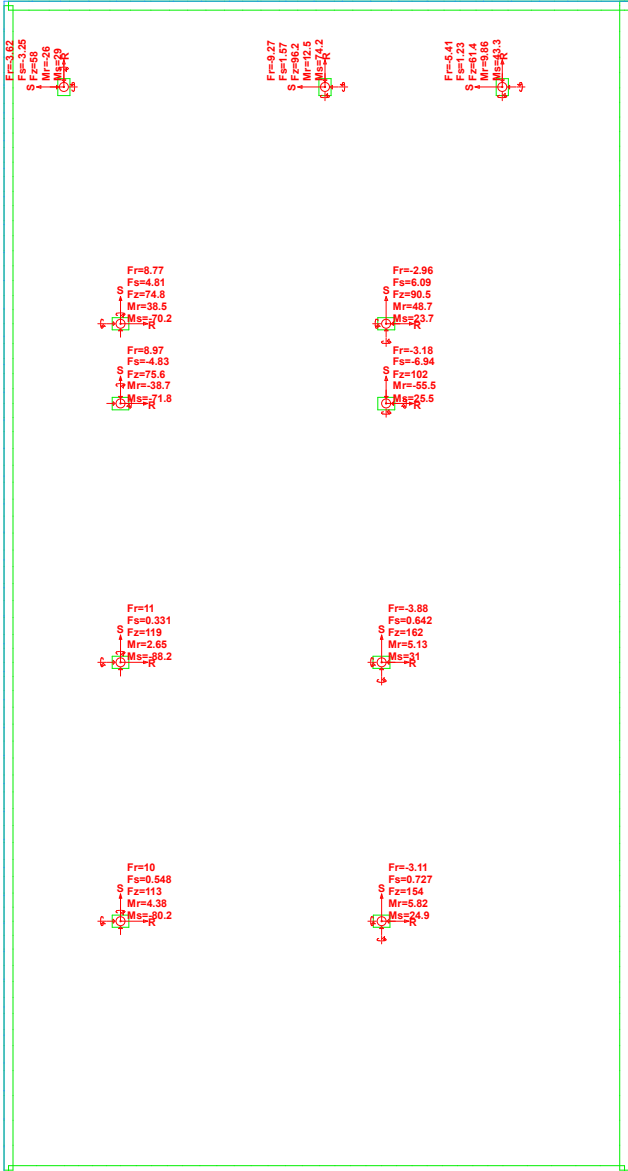
Factored LC: 1.2D + f1L + 1.6Lr: Std Reactions Plan

Factored LC: 1.2D + f1L + 1.6Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.2D + f1L + 1.6Lr - Reaction Plot: (Wall Below,Column Below,Point Spring,Line Spring,Point Support,Line Support)(Fr,Fs,Fz,Mr,Ms,Mz)(Standard Context)



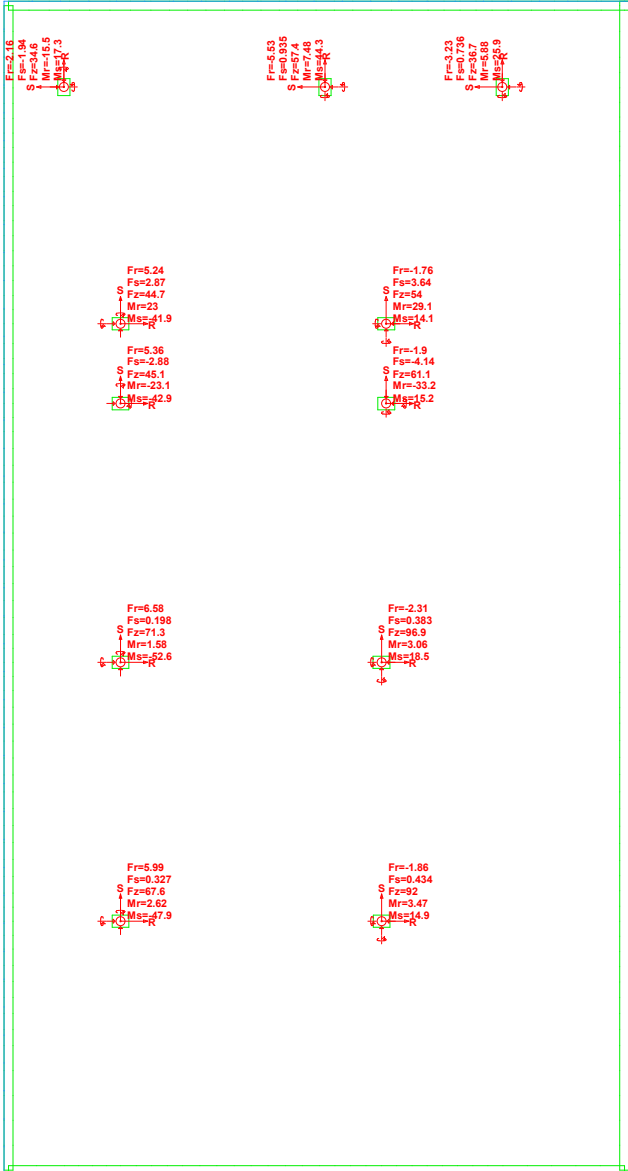
Factored LC: 1.2D + f1L + 1.6Lr: Max Reactions Plan

Factored LC: 1.2D + f1L + 1.6Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
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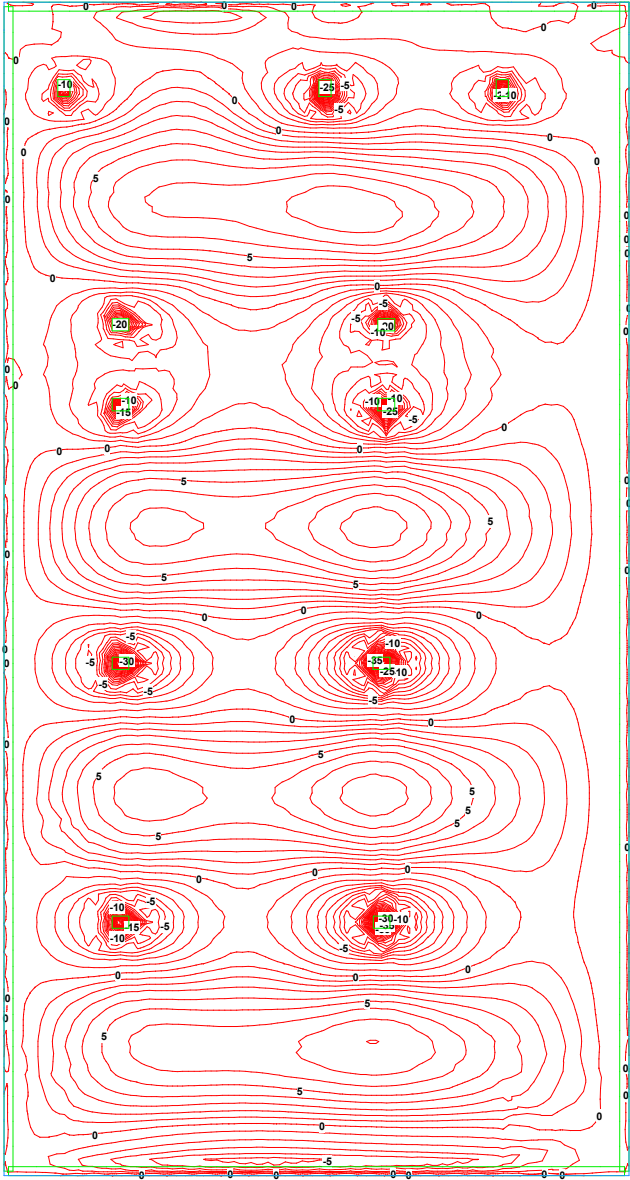
Factored LC: 1.2D + f1L + 1.6Lr: Min Reactions Plan

Factored LC: 1.2D + f1L + 1.6Lr: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
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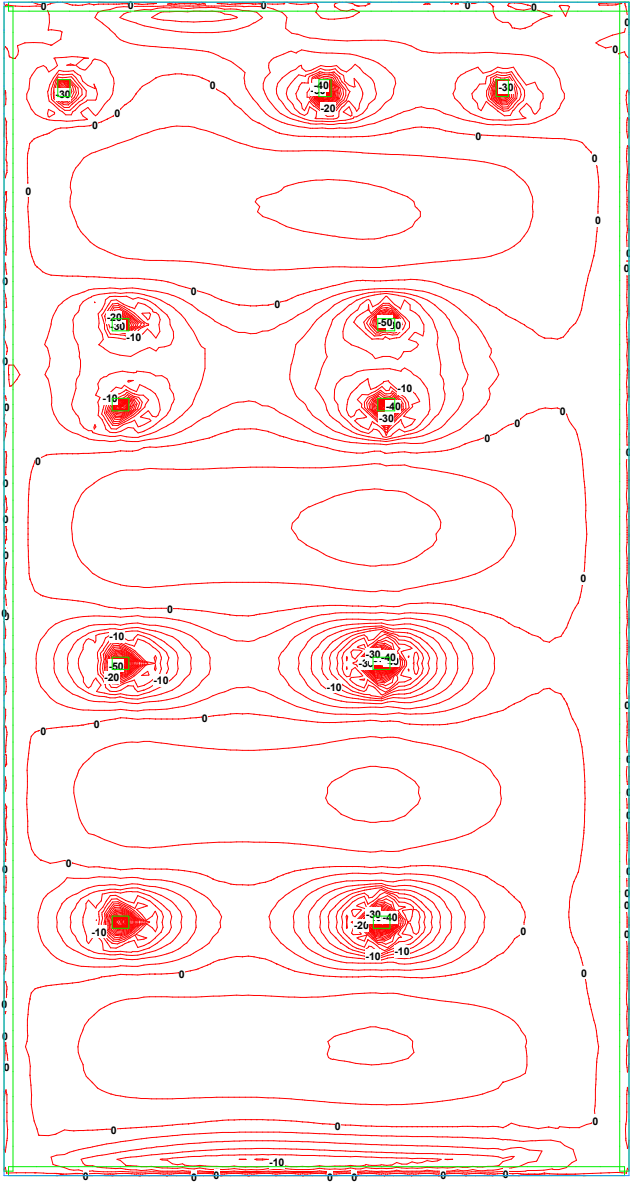
Factored LC: 1.2D + 1.6L + 0.5S: Max Mx Plan

Factored LC: 1.2D + 1.6L + 0.5S: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.2D + 1.6L + 0.5S - Bending Moment Plot (Maximum Values) (X-Axis Direction)
One Contour = 1 Kips
Min Value = -45.18 Kips @ (151.8,125.9) Max Value = 9.499 Kips @ (150.6,140.5)



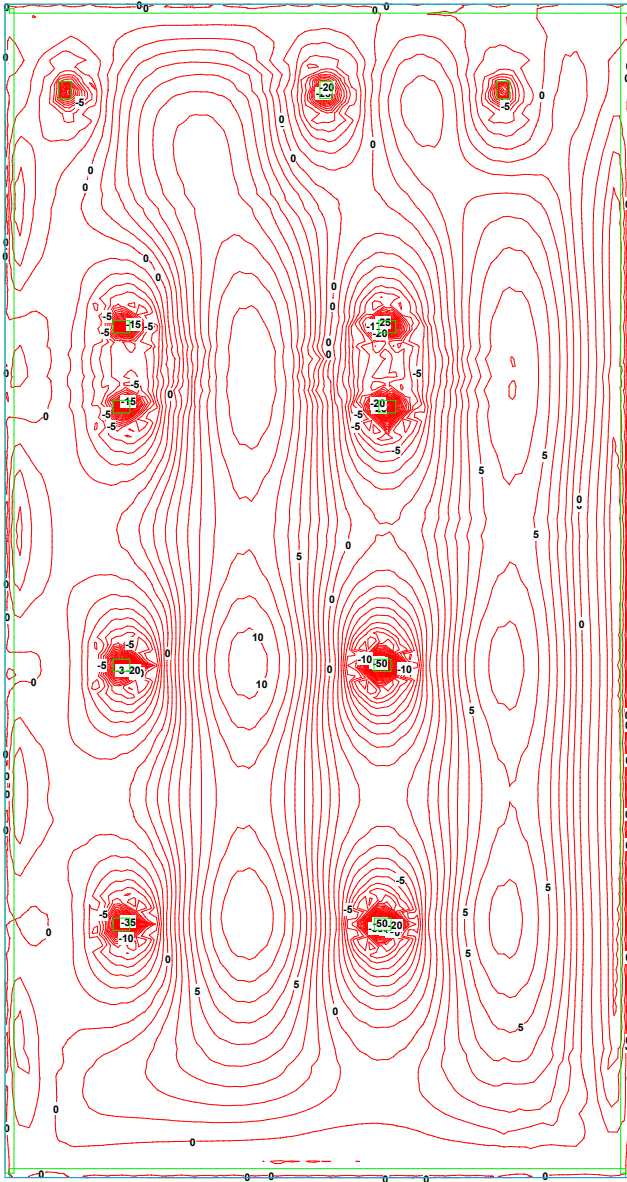
Factored LC: 1.2D + 1.6L + 0.5S: Min Mx Plan

Factored LC: 1.2D + 1.6L + 0.5S: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.2D + 1.6L + 0.5S - Bending Moment Plot (Minimum Values) (X-Axis Direction)
One Contour = 2 Kips
Min Value = -84.95 Kips @ (151.8,125.9) Max Value = 5.052 Kips @ (150.6,140.5)



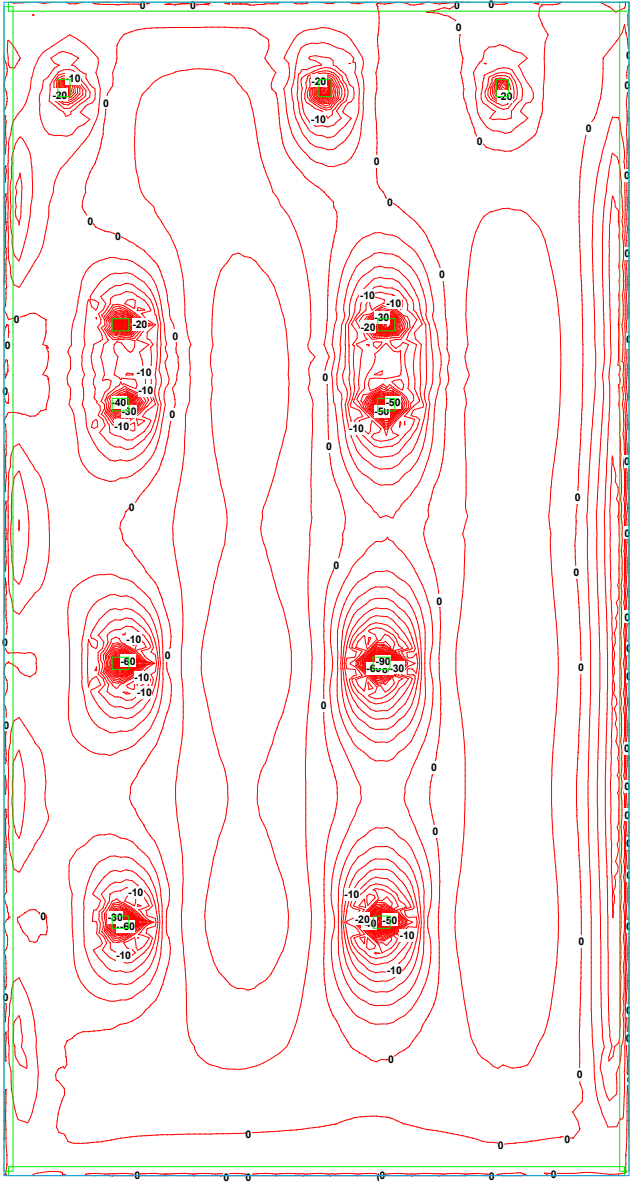
Factored LC: 1.2D + 1.6L + 0.5S: Max My Plan

Factored LC: 1.2D + 1.6L + 0.5S: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.2D + 1.6L + 0.5S - Bending Moment Plot (Maximum Values) (Y-Axis Direction)
 One Contour = 1 Kips
 Min Value = -51.25 Kips @ (151.8,125.9) Max Value = 10.53 Kips @ (138.1,125.5)



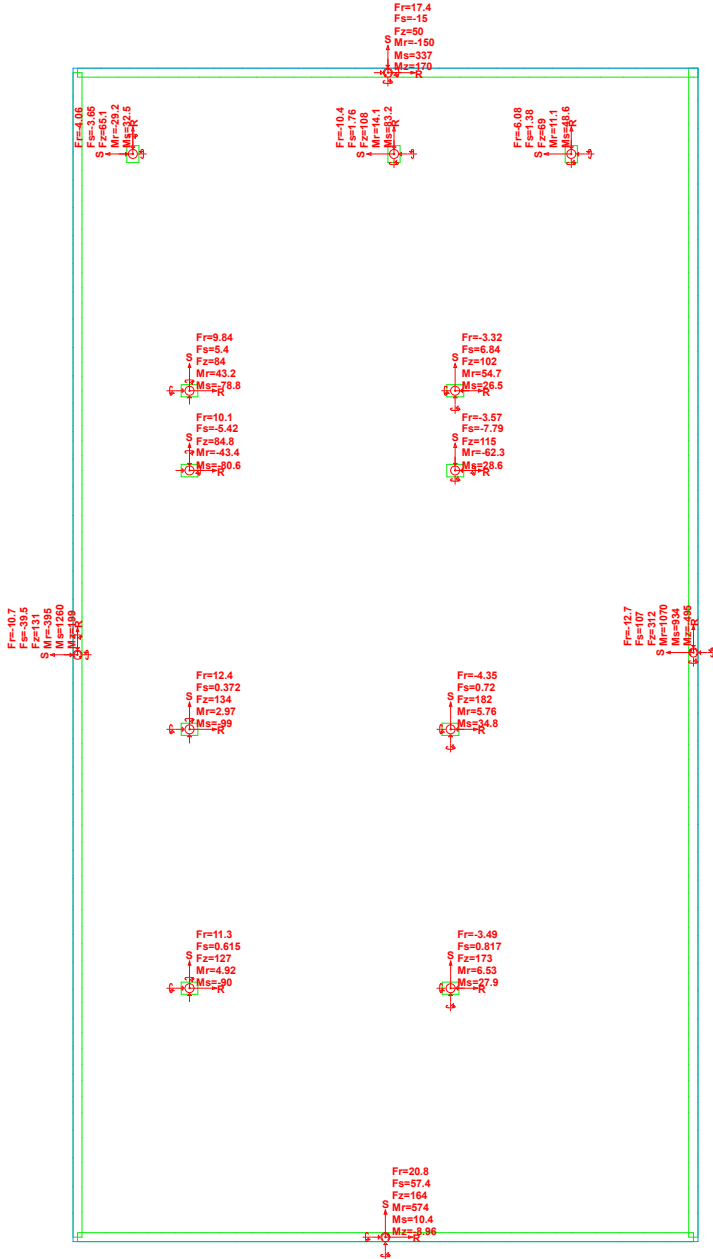
Factored LC: 1.2D + 1.6L + 0.5S: Min My Plan

Factored LC: 1.2D + 1.6L + 0.5S: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.2D + 1.6L + 0.5S - Bending Moment Plot (Minimum Values) (Y-Axis Direction)
One Contour = 2 Kips
Min Value = -96.37 Kips @ (151.8,125.9) Max Value = 5.599 Kips @ (138.1,125.5)



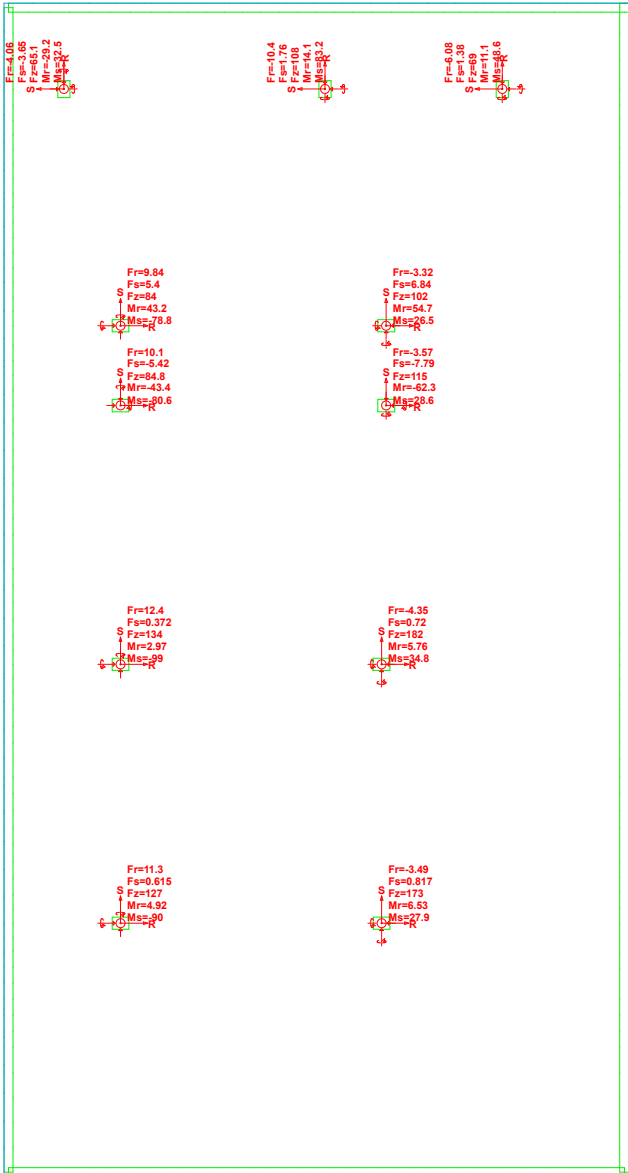
Factored LC: 1.2D + 1.6L + 0.5S: Std Reactions Plan

Factored LC: 1.2D + 1.6L + 0.5S: User Lines; User Notes; User Dimensions;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250
 Factored LC: 1.2D + 1.6L + 0.5S - Reaction Plot: (Wall Below,Column Below,Point Spring,Line Spring,Point Support,Line Support)(Fr,Fs,Fz,Mr,Ms,Mz)(Standard Context)



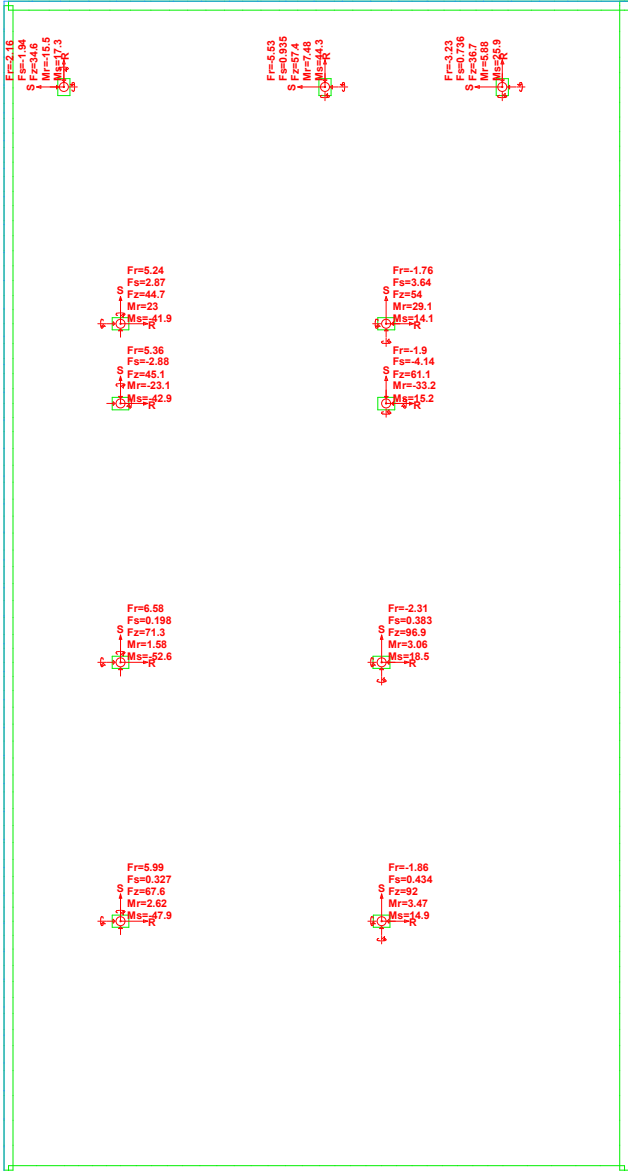
Factored LC: 1.2D + 1.6L + 0.5S: Max Reactions Plan

Factored LC: 1.2D + 1.6L + 0.5S: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
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Factored LC: 1.2D + 1.6L + 0.5S - Reaction Plot: (Column Below)(Fr,Fs,Fz,Mr,Ms,Mz)(Max Fz Context)



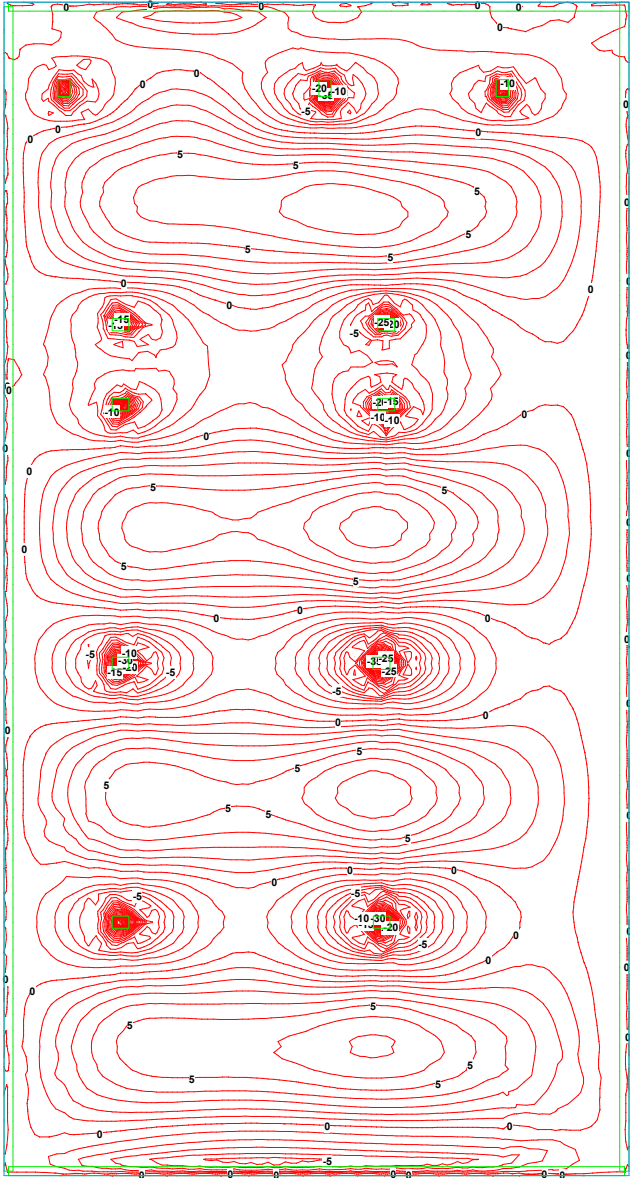
Factored LC: 1.2D + 1.6L + 0.5S: Min Reactions Plan

Factored LC: 1.2D + 1.6L + 0.5S: User Lines; User Notes; User Dimensions;
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Factored LC: 1.2D + 1.6L + 0.5S - Reaction Plot: (Column Below)(Fr,Fs,Fz,Mr,Ms,Mz)(Min Fz Context)



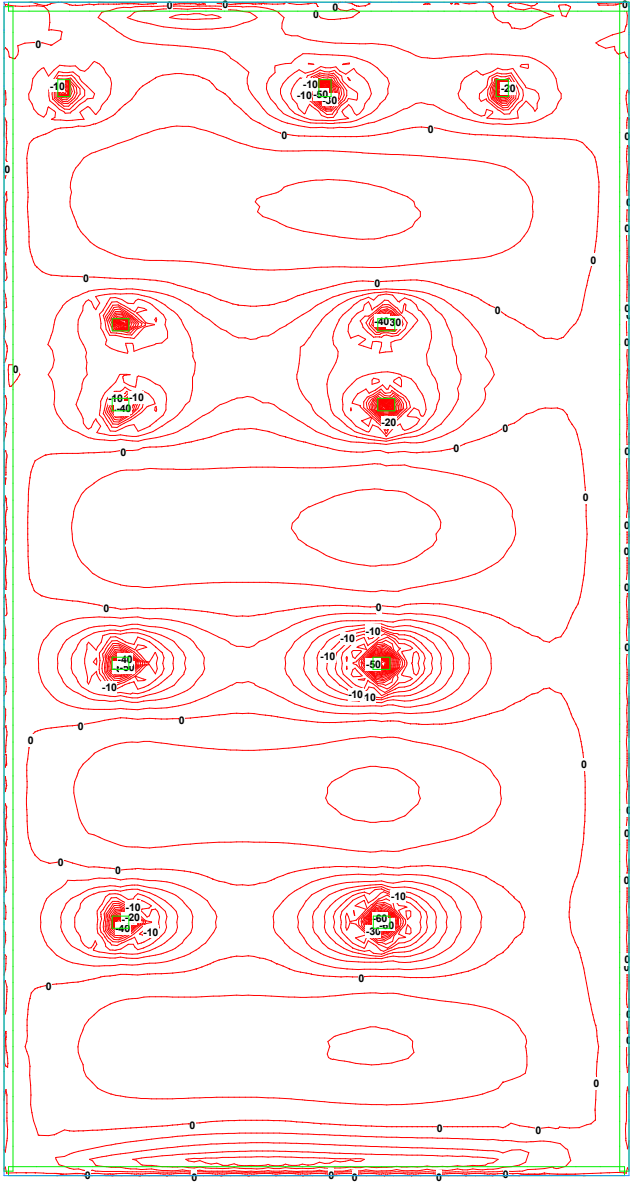
Factored LC: 1.2D + f1L + 1.6S: Max Mx Plan

Factored LC: 1.2D + f1L + 1.6S: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1.250
Factored LC: 1.2D + f1L + 1.6S - Bending Moment Plot (Maximum Values) (X- Axis Direction)
One Contour = 1 Kips
Min Value = -45.18 Kips @ (151.8,125.9) Max Value = 8.463 Kips @ (150.6,140.5)



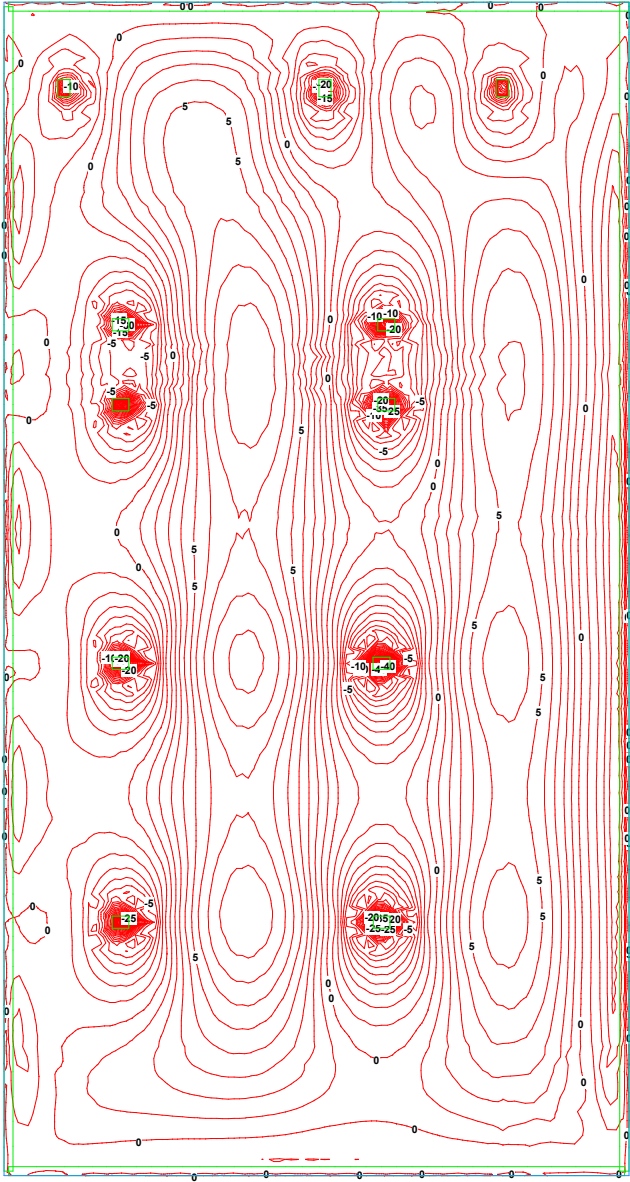
Factored LC: 1.2D + f1L + 1.6S: Min Mx Plan

Factored LC: 1.2D + f1L + 1.6S: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1.250
Factored LC: 1.2D + f1L + 1.6S - Bending Moment Plot (Minimum Values) (X-Axis Direction)
One Contour = 2 Kips
Min Value = -75.68 Kips @ (151.8,125.9) Max Value = 5.052 Kips @ (150.6,140.5)



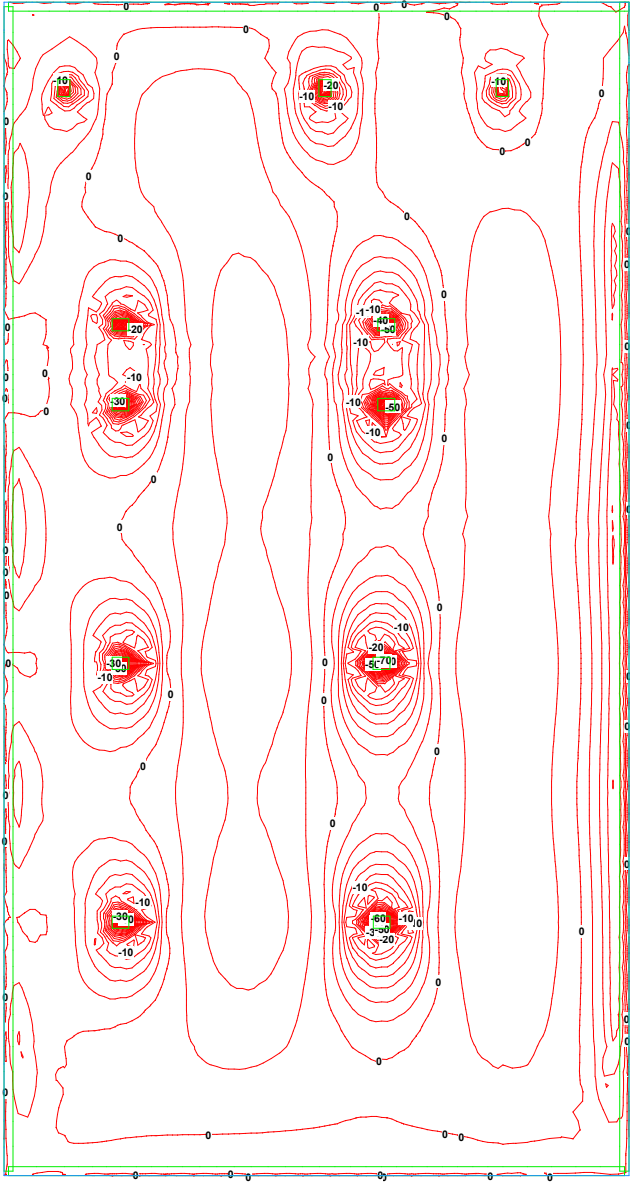
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Factored LC: 1.2D + f1L + 1.6S: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.2D + f1L + 1.6S - Bending Moment Plot (Maximum Values) (Y-Axis Direction)
One Contour = 1 Kips
Min Value = -51.25 Kips @ (151.8,125.9) Max Value = 9.379 Kips @ (138.1,125.5)



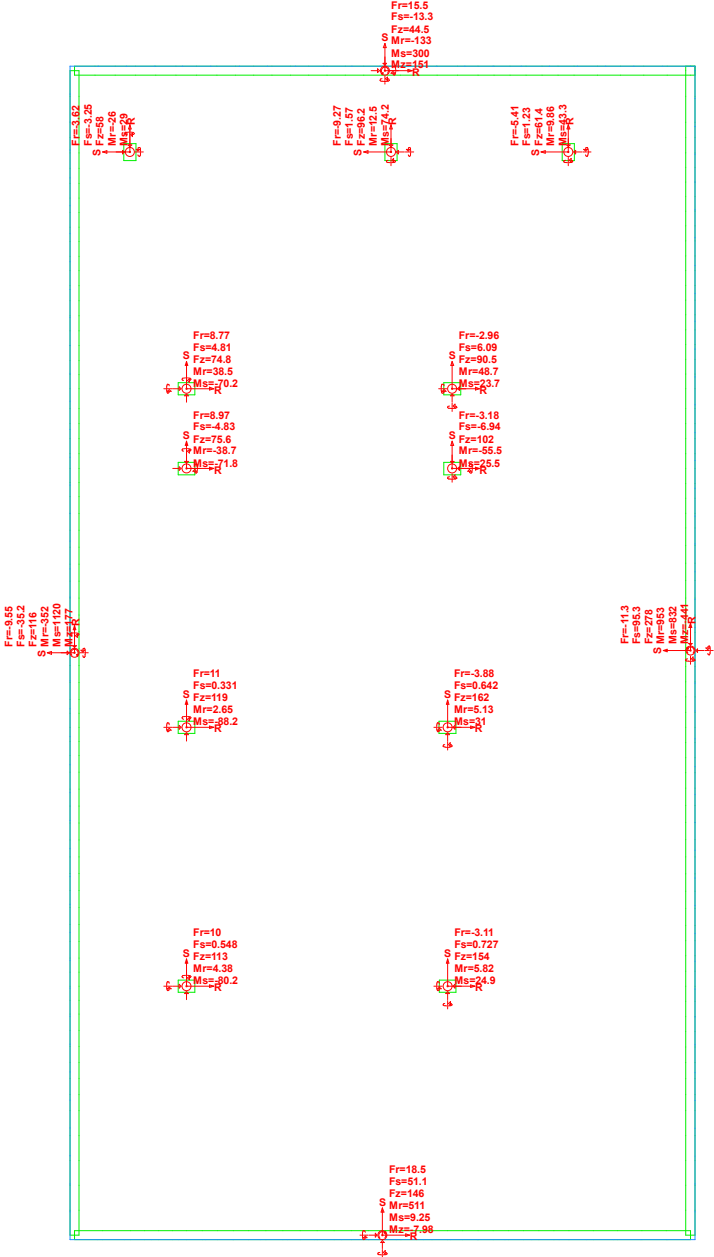
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Factored LC: 1.2D + f1L + 1.6S: User Lines; User Notes; User Dimensions;
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Scale = 1.250
Factored LC: 1.2D + f1L + 1.6S - Bending Moment Plot (Minimum Values) (Y-Axis Direction)
One Contour = 2 Kips
Min Value = -85.86 Kips @ (151.8,125.9) Max Value = 5.599 Kips @ (138.1,125.5)



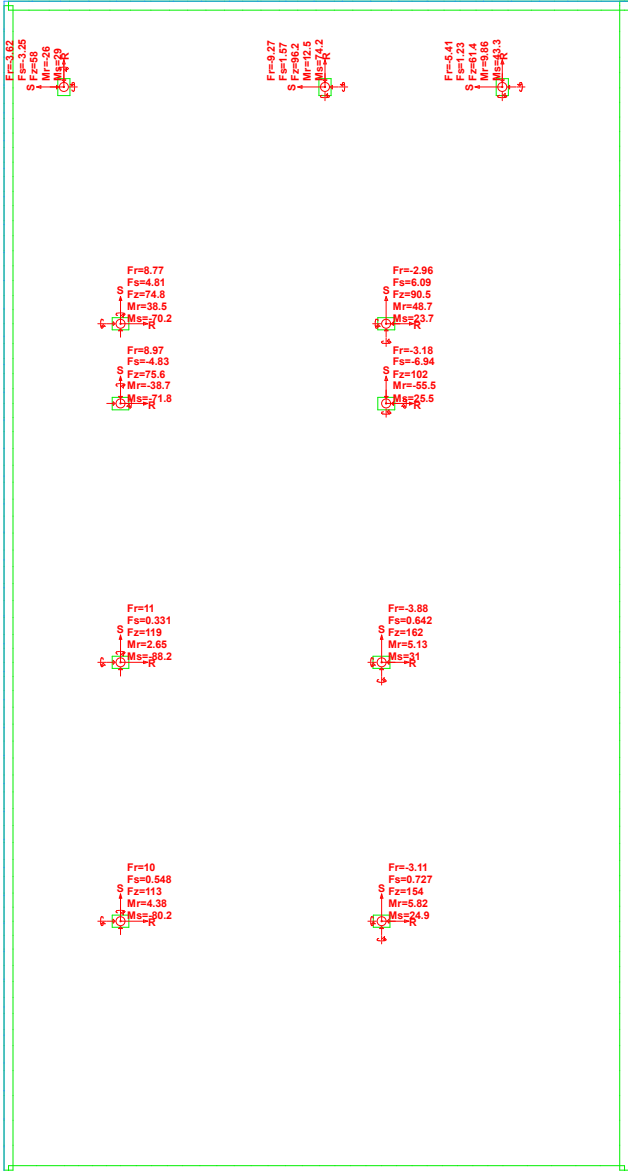
Factored LC: 1.2D + f1L + 1.6S: Std Reactions Plan

Factored LC: 1.2D + f1L + 1.6S: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Factored LC: 1.2D + f1L + 1.6S - Reaction Plot: (Wall Below,Column Below,Point Spring,Line Spring,Point Support,Line Support)(Fr,Fs,Fz,Mr,Ms,Mz)(Standard Context)



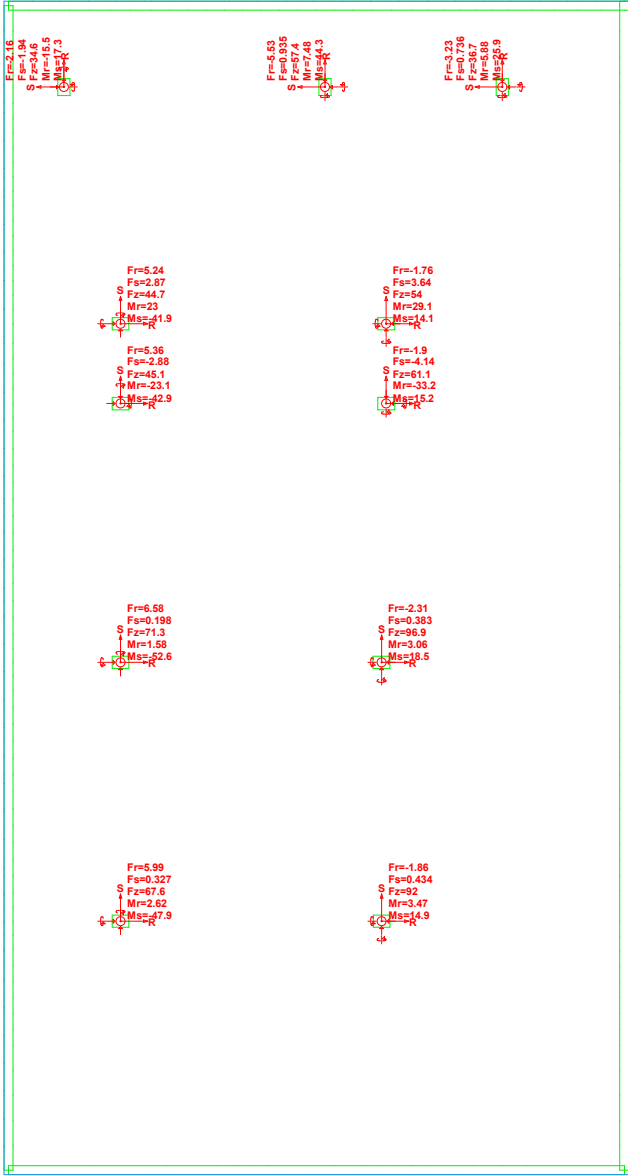
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Factored LC: 1.2D + f1L + 1.6S - User Lines; User Notes; User Dimensions;
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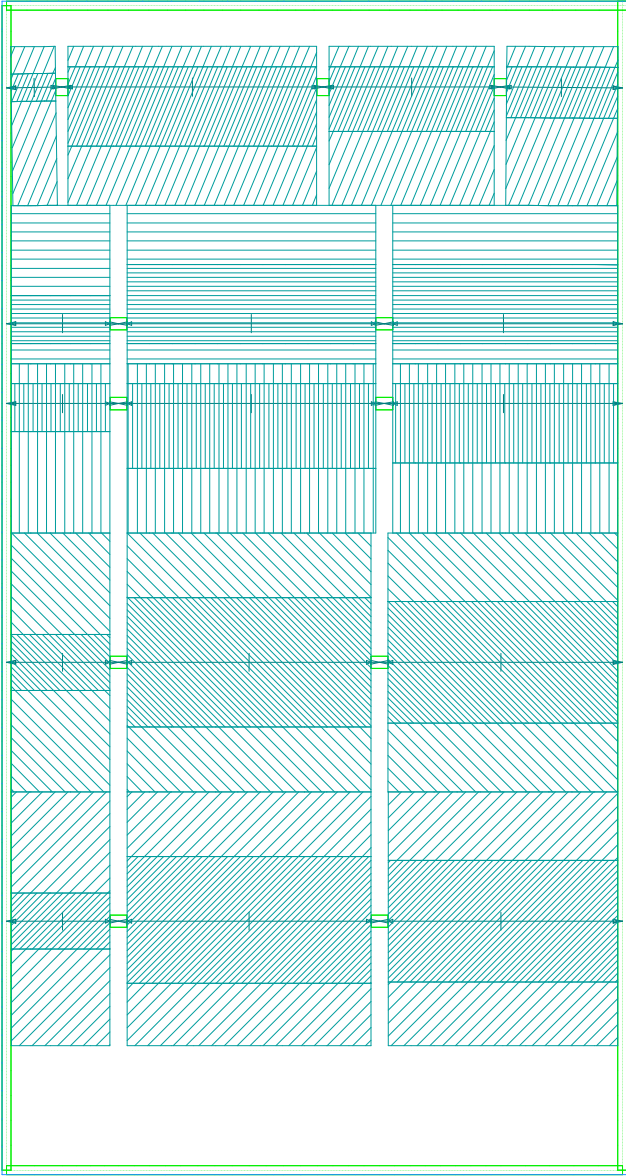
Factored LC: 1.2D + f1L + 1.6S: Min Reactions Plan

Factored LC: 1.2D + f1L + 1.6S: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
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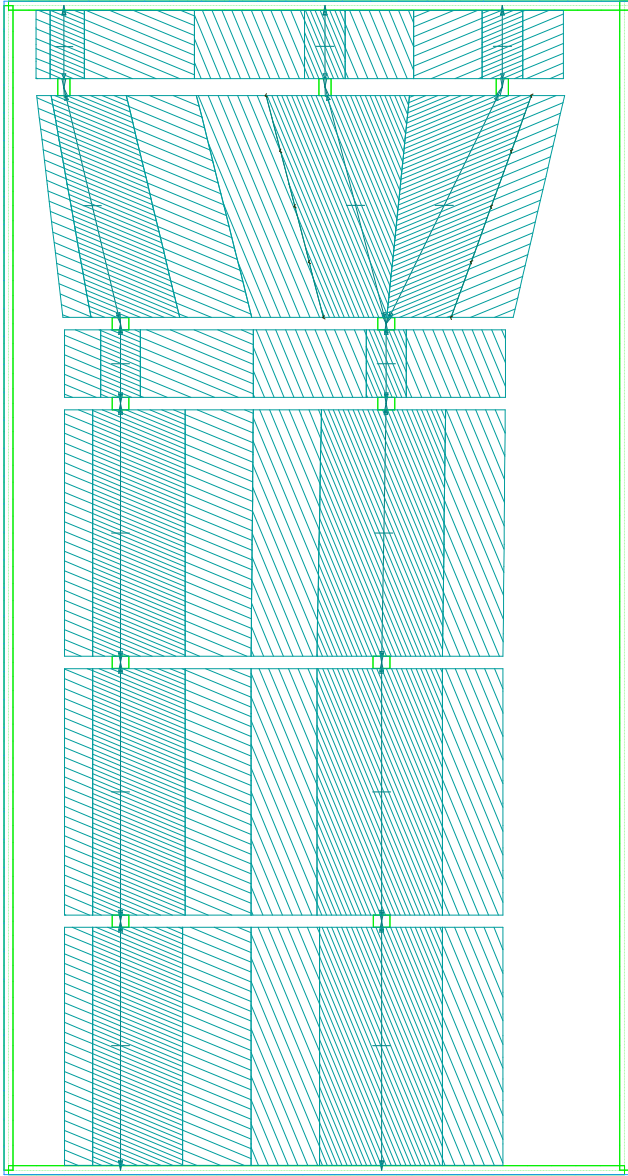
Design Strip: Latitude Design Spans Plan

Design Strip: Latitude Span Boundaries; Latitude SSS; Latitude DSs; Latitude Strip Boundaries; Latitude SSSs; SSS Hatching; Latitude Deflection Checks; User Notes; User Lines; User Dimensions;
Mesh Input: Walls Below; Columns Below;
Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only;
Scale = 1:250



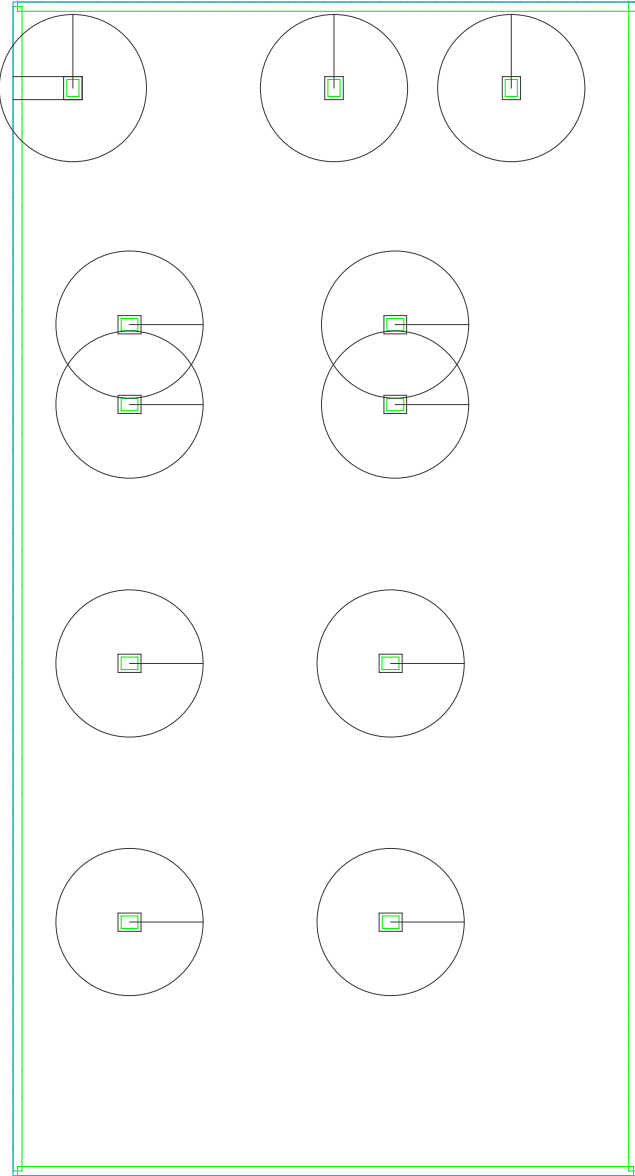
Design Strip: Longitude Design Spans Plan

Design Strip: Longitude Span Boundaries; Longitude SSs; Longitude DSs; Longitude Strip Boundaries; Longitude SSSs; SSS Hatching; Longitude Deflection Checks; User Notes; User Lines; User Dimensions;
Mesh Input: Walls Below; Columns Below;
Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only;
Scale = 1:250



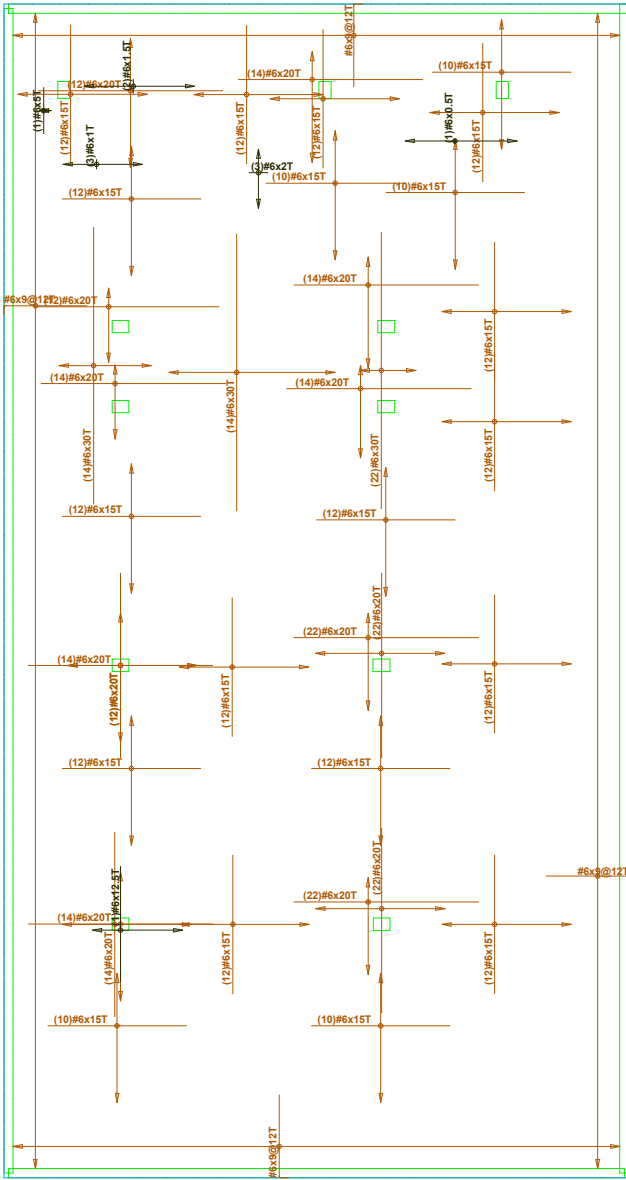
Design Strip: Punching Checks Plan

Design Strip: User Lines; User Notes; User Dimensions; Punching Checks; Punching Check Sections;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250



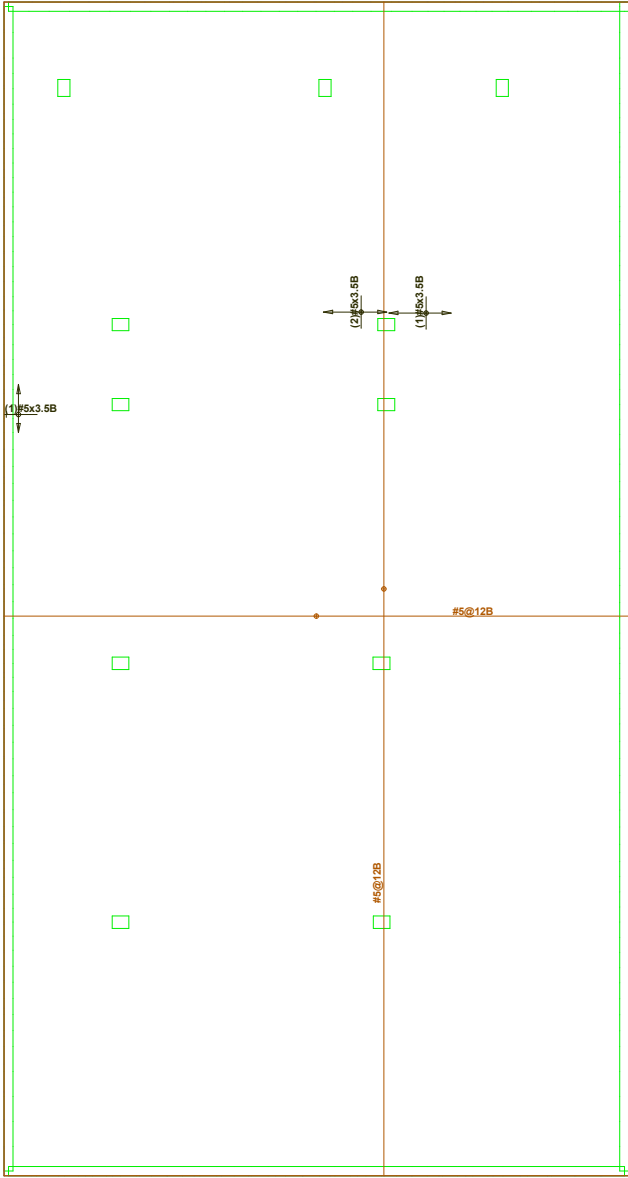
Reinforcement: Top Bars Plan

Reinforcement: User Lines; User Notes; User Dimensions; Latitude User Concentrated Reinf.; Latitude Program Concentrated Reinf.; Latitude User Distributed Reinf.; Latitude Program Distributed Reinf.; Longitude User Concentrated Reinf.; Longitude Program Concentrated Reinf.; Longitude User Distributed Reinf.; Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250



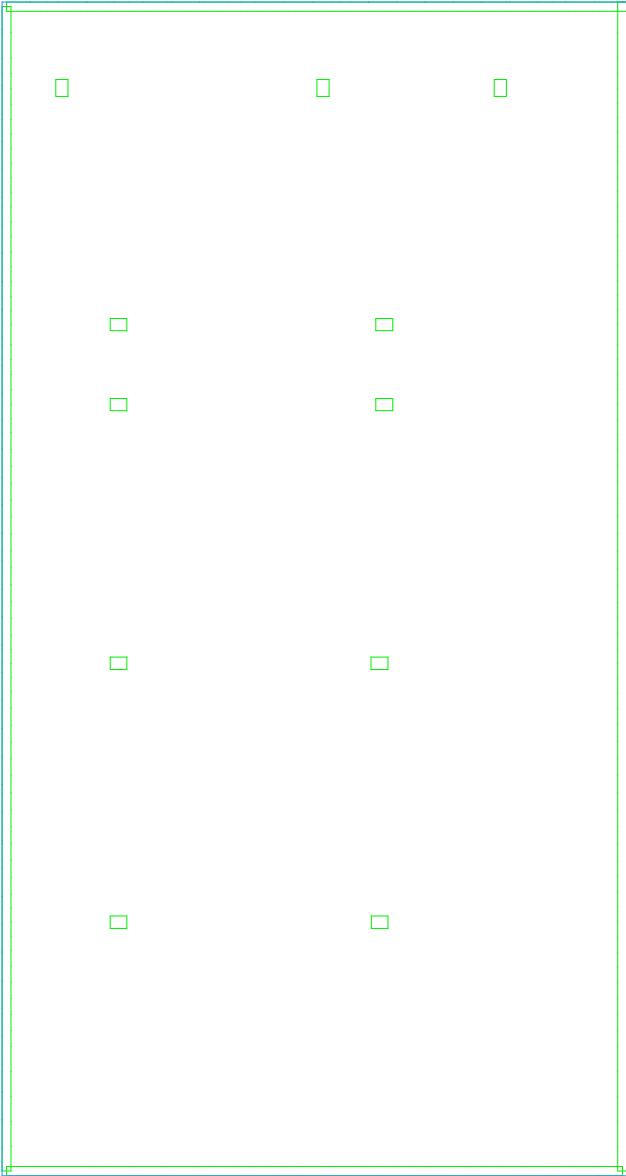
Reinforcement: Bottom Bars Plan

Reinforcement: User Lines; User Notes; User Dimensions; Latitude User Concentrated Reinf.; Latitude Program Concentrated Reinf.; Latitude User Distributed Reinf.; Latitude Program Distributed Reinf.; Longitude User Concentrated Reinf.; Longitude Program Concentrated Reinf.; Longitude User Distributed Reinf.; Longitude Program Distributed Reinf.; Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
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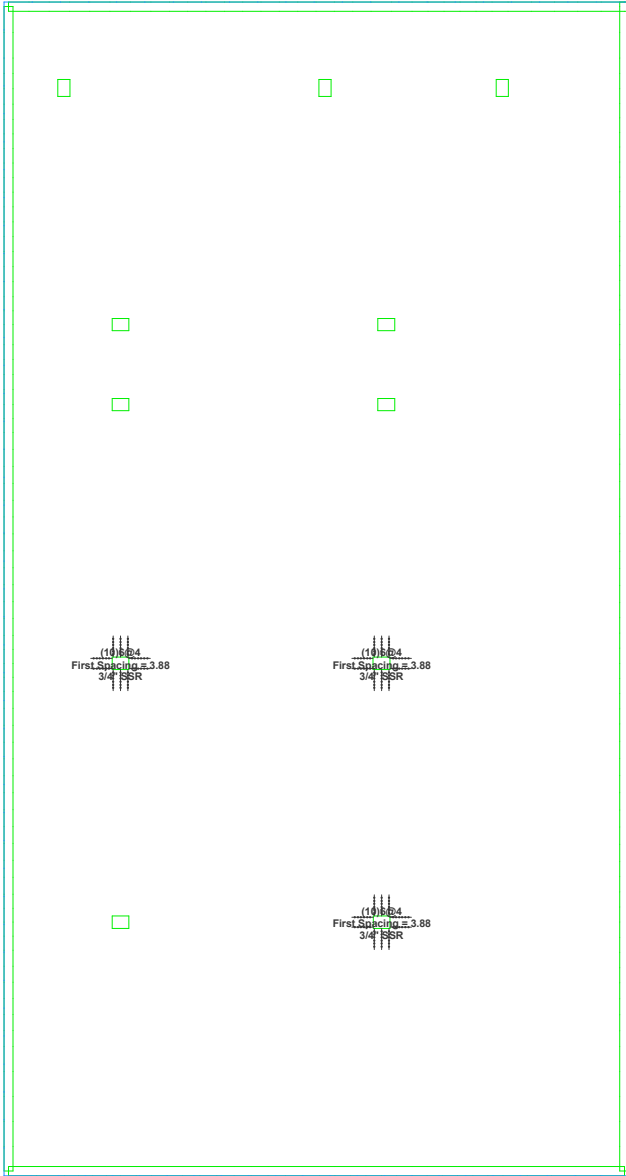
Reinforcement: Shear Bars Plan

Reinforcement: User Lines; User Notes; User Dimensions; Latitude User Transverse Reinf.; Latitude Program Transverse Reinf.; Latitude User Individual Transverse Bars; Latitude Program Individual Transverse Bars; Longitude User Transverse Reinf.; Longitude Program Transverse Reinf.; Longitude User Element; Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250



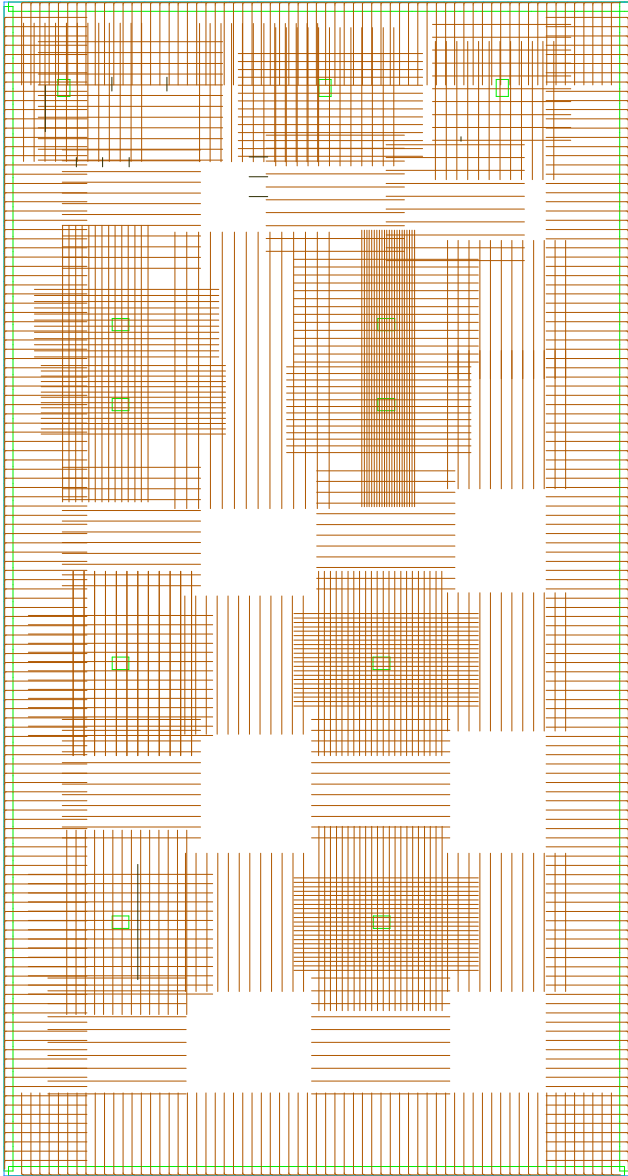
Reinforcement: SSR Plan

Reinforcement: User Lines; User Notes; User Dimensions; Program SSR Callouts; SSR Callout Details; Program SSR Ralls;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250



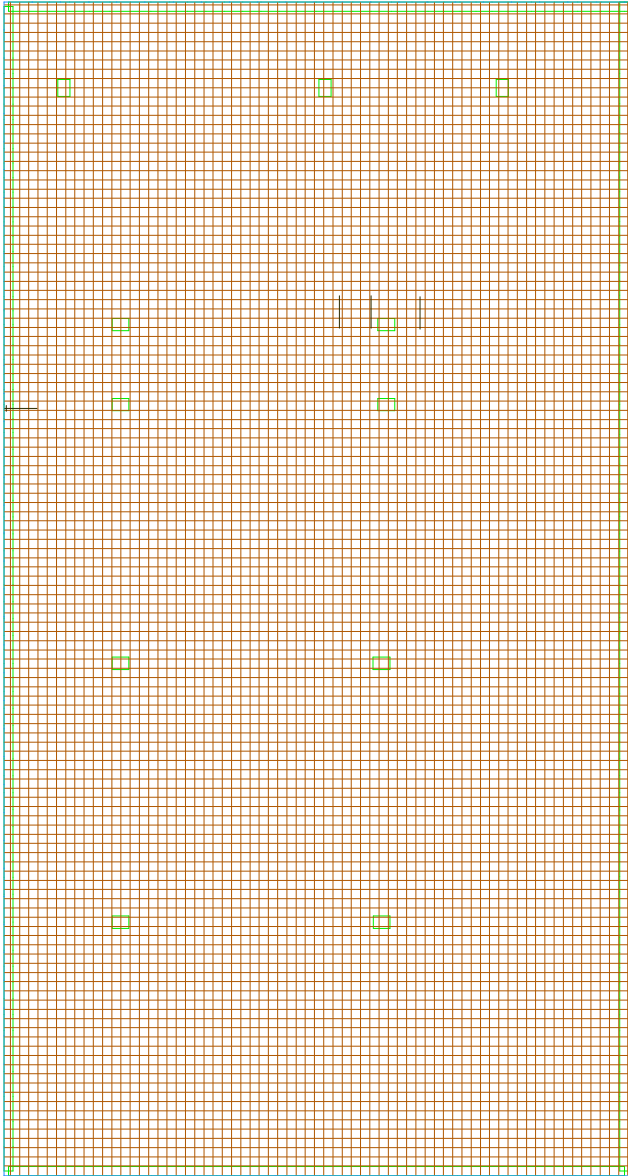
Reinforcement: Individual Top Bars Plan

Reinforcement: User Lines; User Notes; User Dimensions; Longitude User Individual Bars; Longitude Program Individual Bars; Latitude User Individual Bars; Latitude Program Individual Bars; Top Face Individual Bars; Both Faces Individual Bars;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250



Reinforcement: Individual Bottom Bars Plan

Reinforcement: User Lines; User Notes; User Dimensions; Longitude User Individual Bars; Longitude Program Individual Bars; Latitude User Individual Bars; Latitude Program Individual Bars; Bottom Face Individual Bars; Both Faces Individual Bars;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250



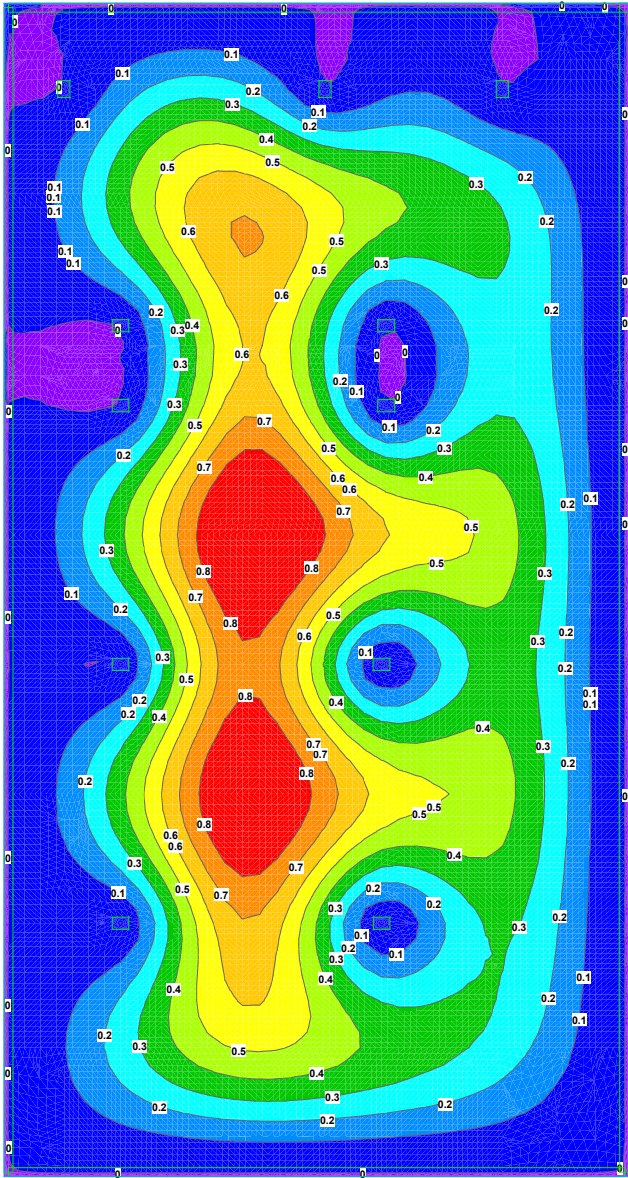
Maximum Short Term Load: Std Deflection Plan

Maximum Short Term Load: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250

Maximum Short Term Load - Vertical Deflection Plot



Min Value = -0.02826 inches @ (121.8,158.8) Max Value = 0.98 inches @ (139.1,139.6)



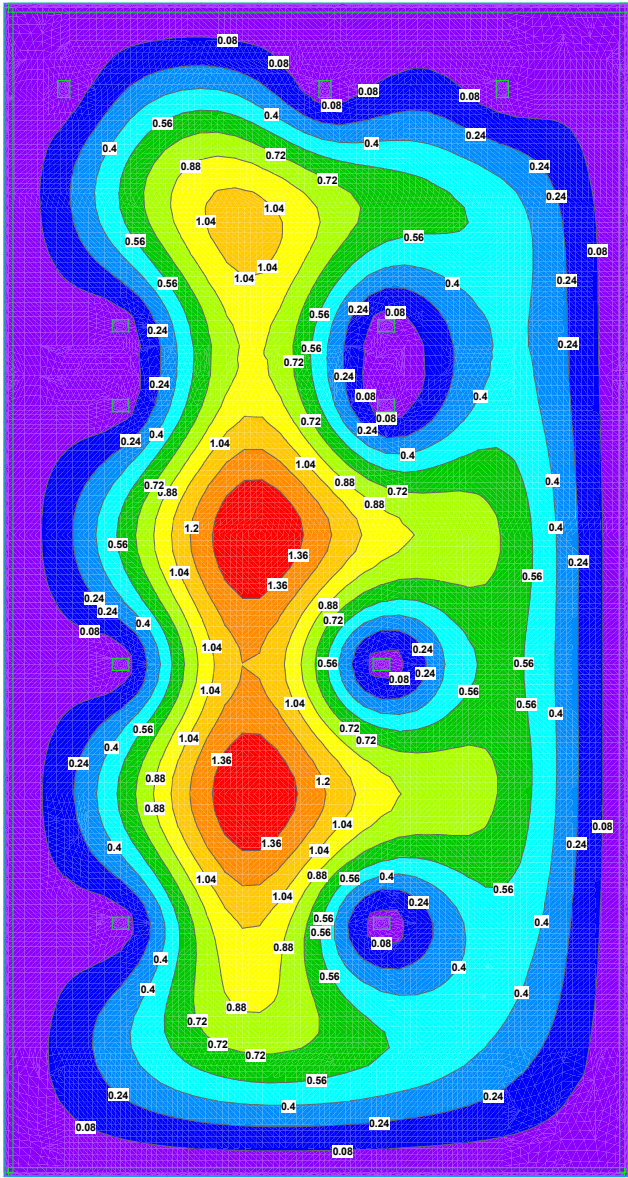
Sustained Load: Std Deflection Plan

Sustained Load: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250

Sustained Load - Vertical Deflection Plot



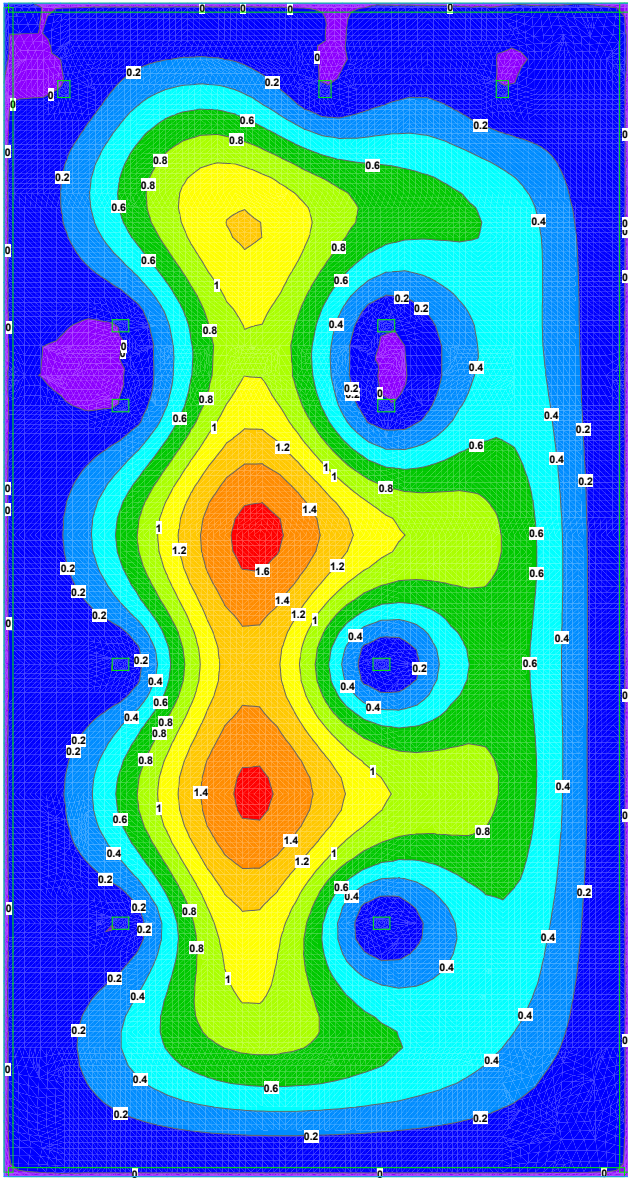
Min Value = -0.0367 inches @ (121.8,158.8) Max Value = 1.516 inches @ (139.1,139.6)



Final Instantaneous Load: Std Deflection Plan

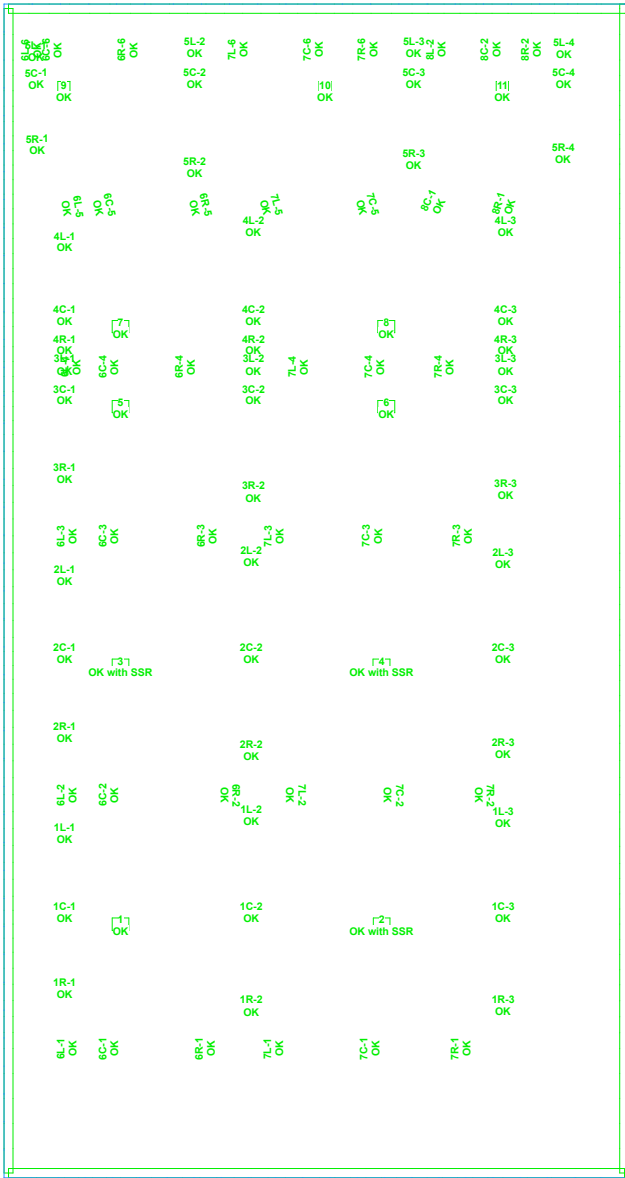
Final Instantaneous Load: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250

Final Instantaneous Load - Vertical Deflection Plot
Min Value = -0.04012 inches @ (121.8,158.8) Max Value = 1.665 inches @ (139.1,139.6)



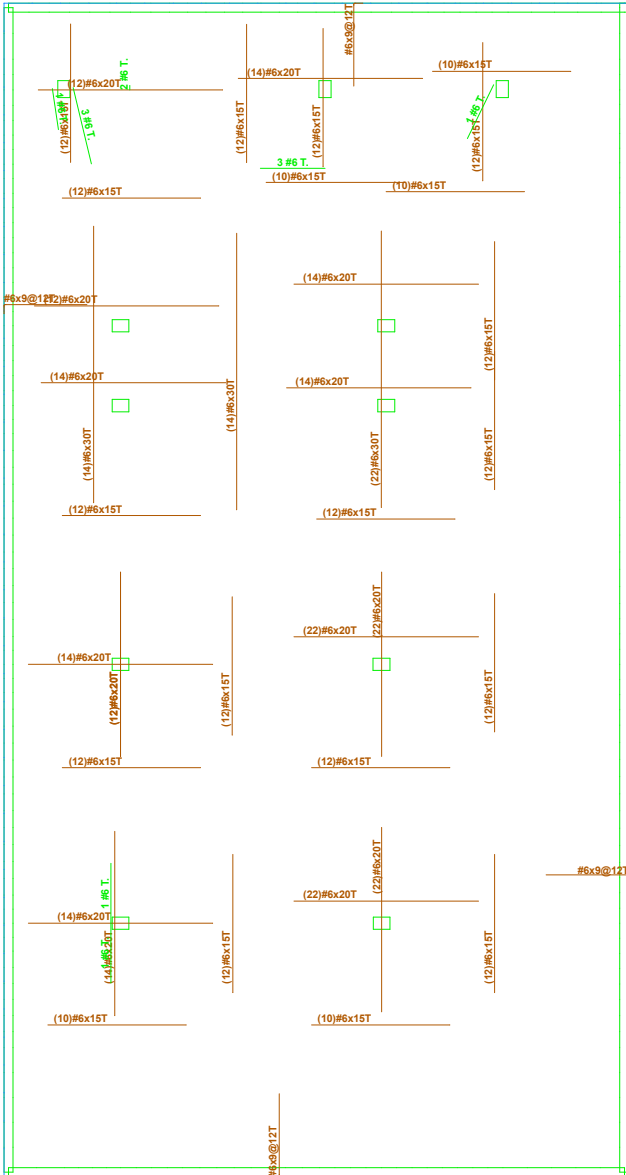
Design Status: Status Plan

Design Status: User Lines; User Notes; User Dimensions; Latitude Span Designs; Longitude Span Designs; Span Design Numbers; Span Design Status; Latitude DS Designs; Longitude DS Designs; DS Design Numbers; DS Design Status; PC Designs; PC Design Numbers; PC Design Status; Latitude Span Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250



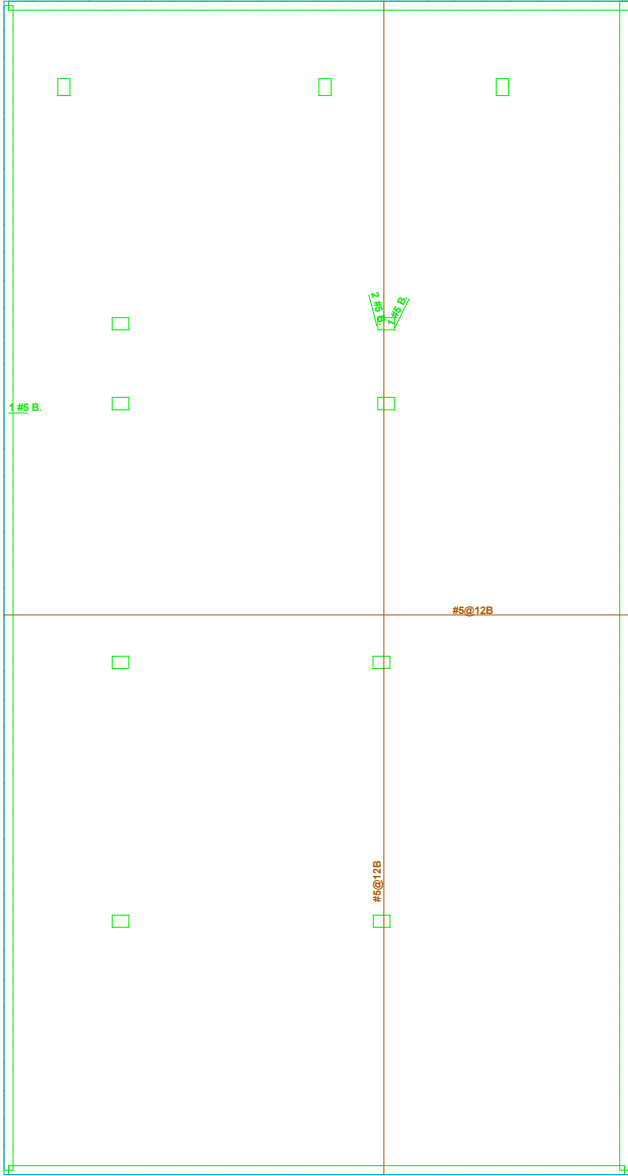
Design Status: Top Reinforcement Plan

Design Status: User Lines; User Notes; User Dimensions; Latitude Span Designs; Longitude Span Designs; Span Design Top Bars; Span Design Bar Descriptions; Latitude DS Designs; Longitude DS Designs; DS Design Top Bars;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Reinforcement: Top Face Concentrated Reinf.; Both Faces Concentrated Reinf.; Auto Face Concentrated Reinf.; Concentrated Reinf. Descriptions; Top Face Distributed Reinf.; Both Faces Distributed Reinf.; Auto Face Distributed Reinf.; Distributed Reinf. Descriptions; Latitude User Concentrated Reinf.; L
 Scale = 1:250



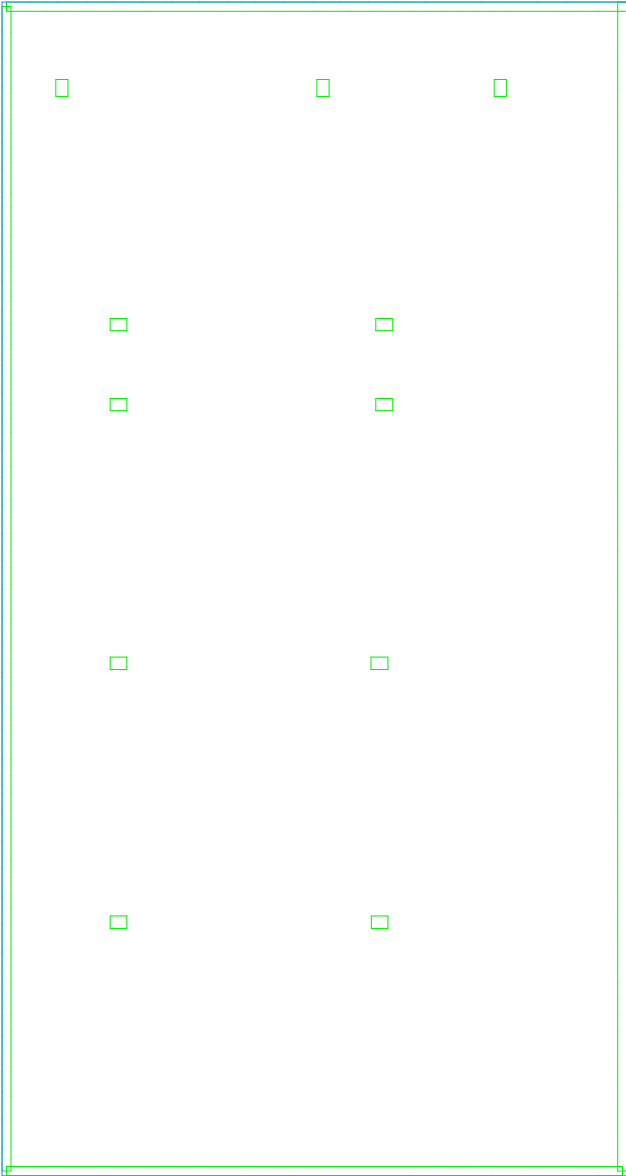
Design Status: Bottom Reinforcement Plan

Design Status: User Lines; User Notes; User Dimensions; Latitude Span Designs; Longitude Span Designs; Span Design Bottom Bars; Span Design Bar Descriptions; Latitude DS Designs; Longitude DS Designs; DS Design Bottom Bars;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Reinforcement: Bottom Face Concentrated Reinf.; Both Faces Concentrated Reinf.; Auto Face Concentrated Reinf.; Concentrated Reinf. Descriptions; Bottom Face Distributed Reinf.; Both Faces Distributed Reinf.; Auto Face Distributed Reinf.; Distributed Reinf. Descriptions; Latitude User Concentrated R
Scale = 1:250



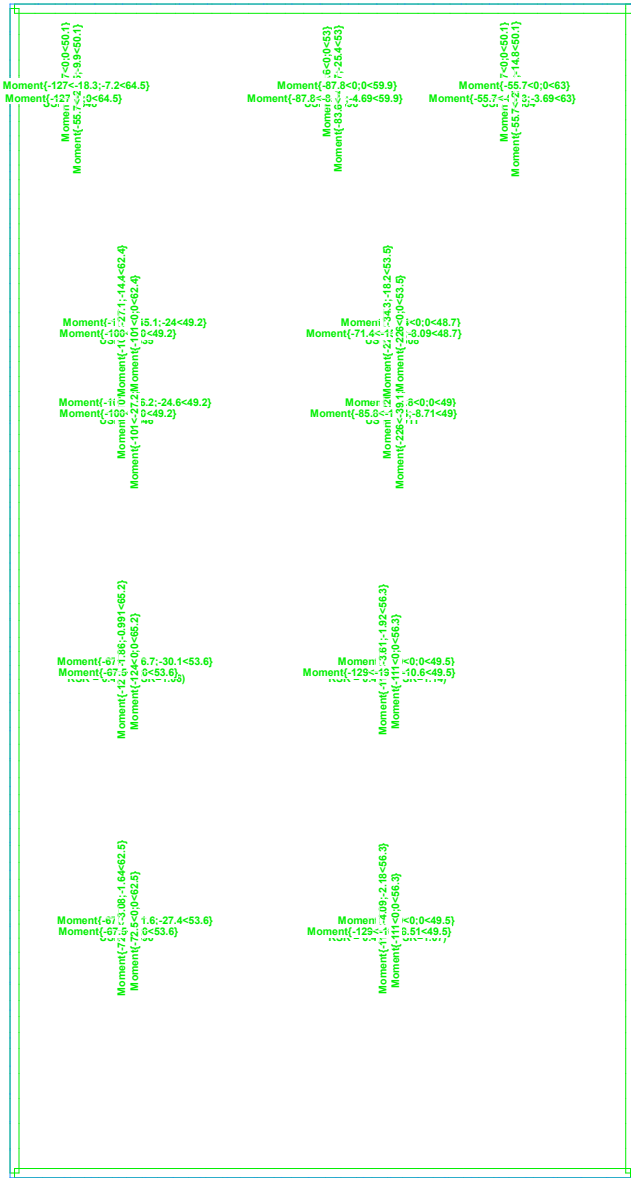
Design Status: Shear Reinforcement Plan

Design Status: User Lines; User Notes; User Dimensions; Latitude Span Designs; Longitude Span Designs; Span Design Shear Bars; Span Design Bar Descriptions; Latitude DS Designs; Longitude DS Designs; DS Design Numbers; DS Design Shear Bars;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250



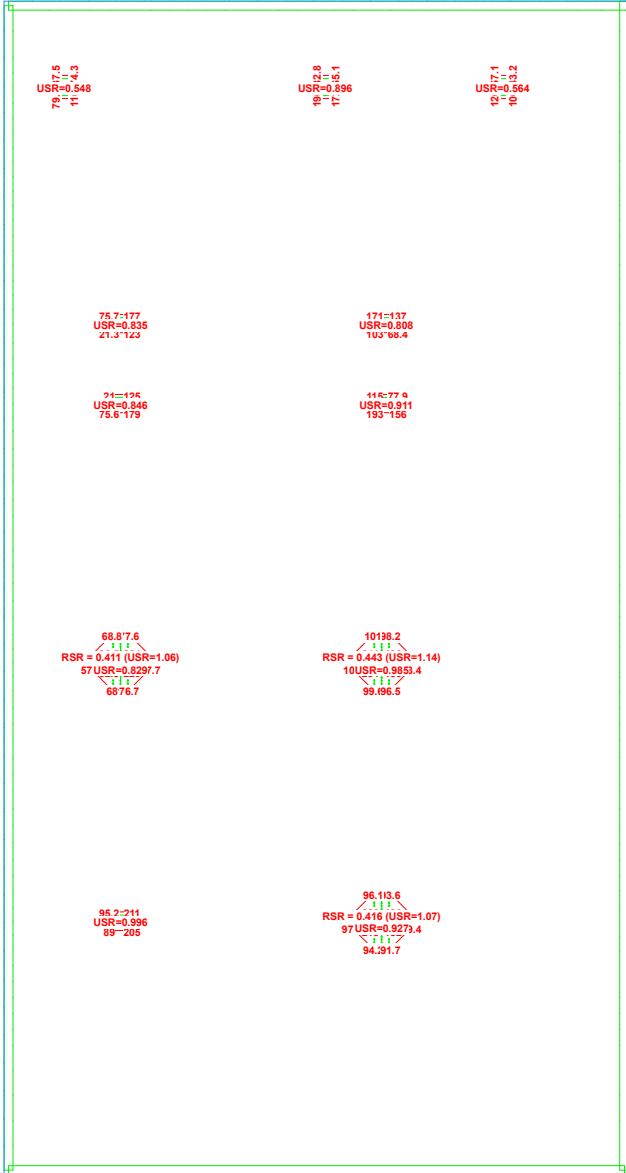
Design Status: Punching Shear Status Plan

Design Status: User Lines; User Notes; User Dimensions; PC Designs; PC Design Numbers; PC Design Status; PC Design Stress Ratios; PC Design Sections; PC Design Flexural Sections; PC Design Flexural Section Design; PC Design Flexural Section Analysis;
 Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
 Scale = 1:250



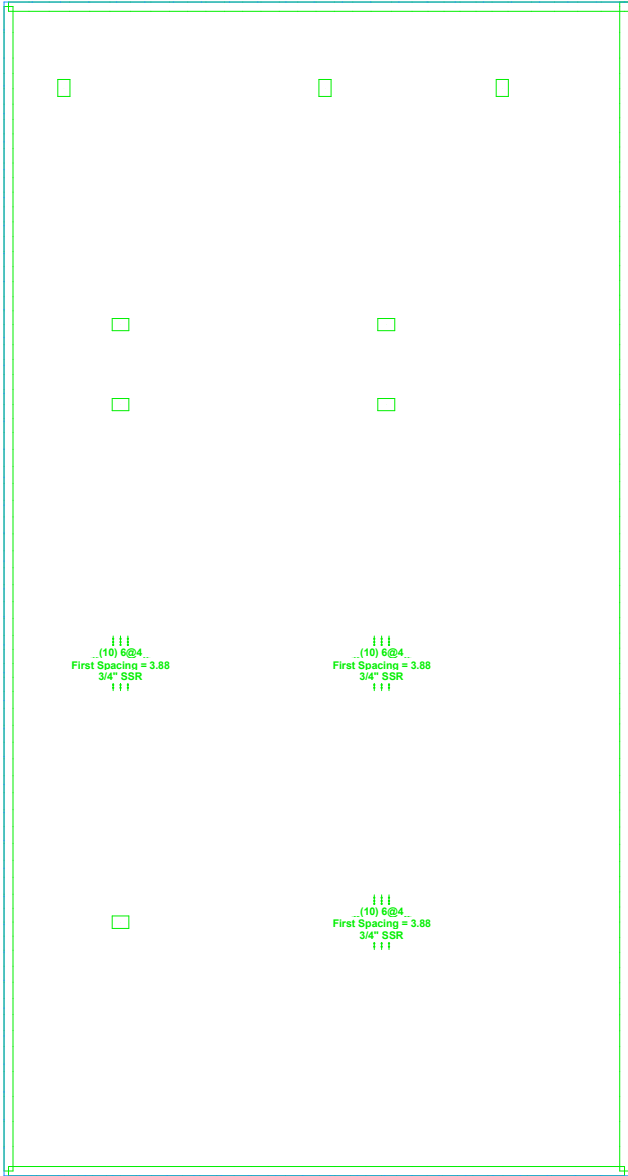
Design Status: Punching Shear Stress Plan

Design Status: User Lines; User Notes; User Dimensions; PC Designs; SSR;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250
Design Status - Punching Plot: (Stresses, Stress Ratio)(Standard Sections 1-1, Cutoff Sections 1-1)(Max SR Context)

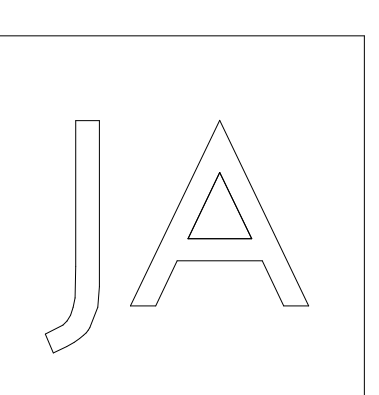


Design Status: SSR Plan

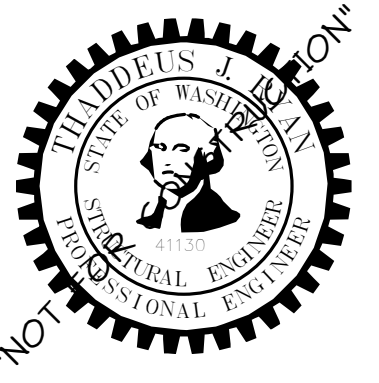
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Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:250



WOOD GRAVITY



Johnston Architects, LLC
3131 Western Ave
Suite 510
Seattle, WA 98121
T 206.523.6150
F 206.523.9392



PCS
Structural Solutions
Seattle | Tacoma | Portland
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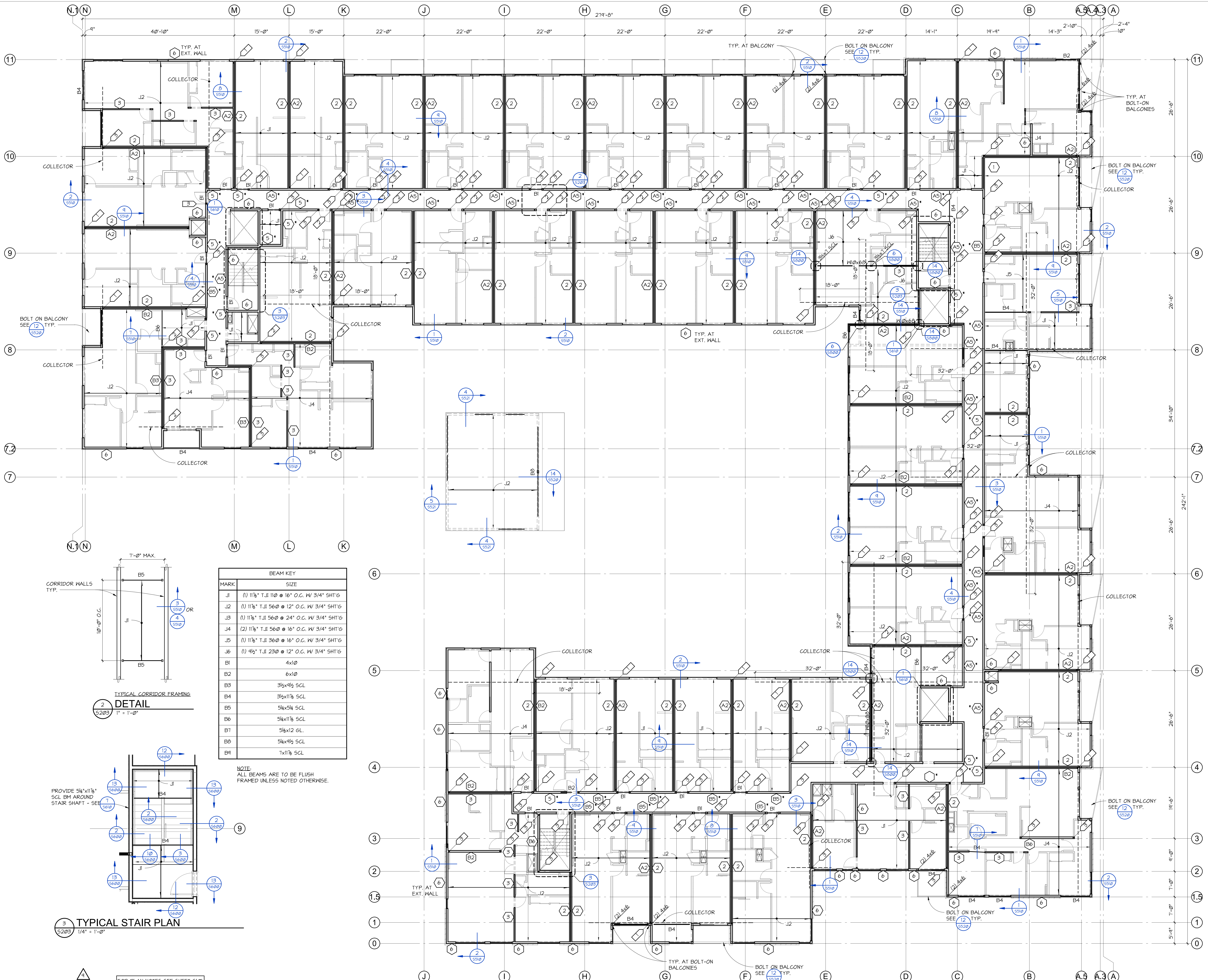
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|------------|-------------------------|
| 08/23/2021 | PERMIT CORRECTIONS |
| 09/30/2021 | BUILDING PERMIT CORR #1 |
| 3/28/2022 | BUILDING PERMIT CORR #2 |
| 12/12/2022 | BUILDING PERMIT CORR #3 |
| 10/13/2023 | BUILDING PERMIT CORR #4 |

| Date | Description |
|----------|--------------|
| 01/22/21 | PERMIT SET |
| 09/01/21 | PROGRESS SET |
| 10/25/21 | GMP SET |

SHEET TITLE
**LEVEL 3 FLOOR
FRAMING PLAN**

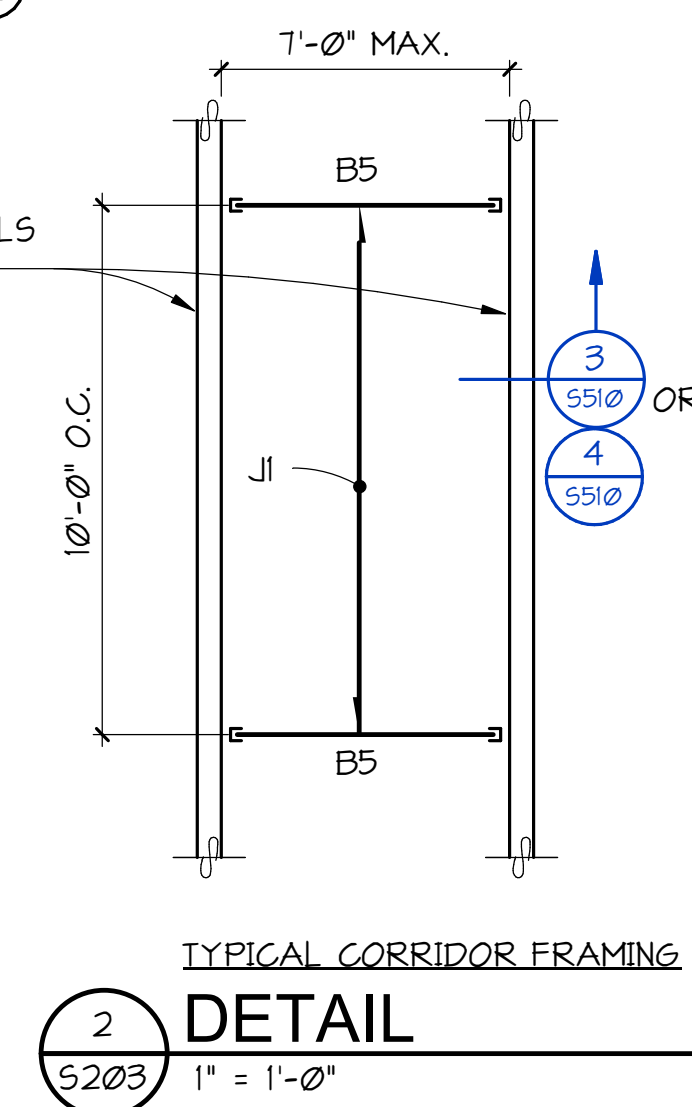
SHEET NO.
S203

Drawn: DEH
Checked: KR

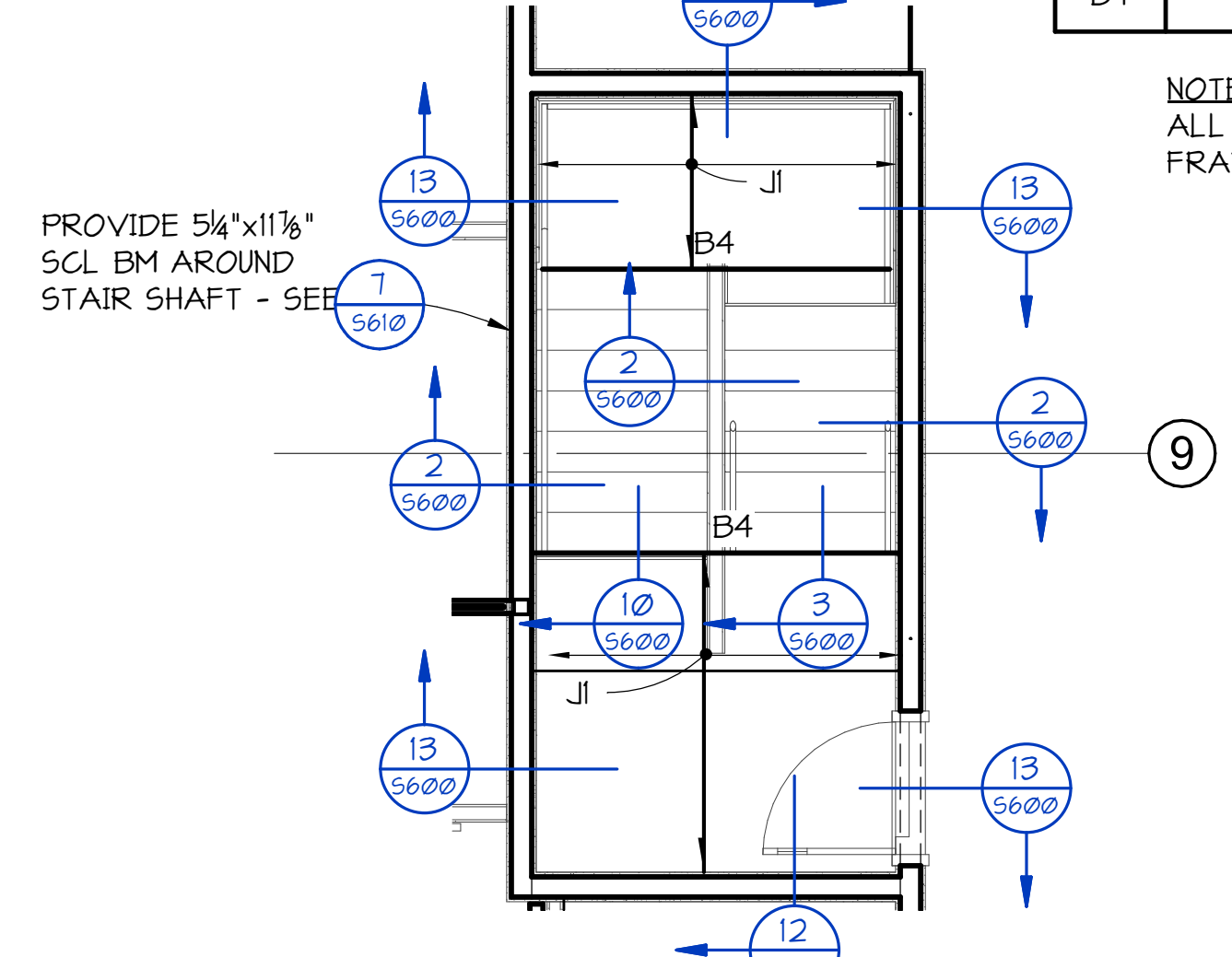


| BEAM KEY | |
|----------|---|
| MARK | SIZE |
| J1 | (1) 11 1/8" T.J.I 11 @ 16" O.C. W/ 3/4" SHT'G |
| J2 | (1) 11 1/8" T.J.I 5 @ 12" O.C. W/ 3/4" SHT'G |
| J3 | (1) 11 1/8" T.J.I 5 @ 24" O.C. W/ 3/4" SHT'G |
| J4 | (2) 11 1/8" T.J.I 5 @ 16" O.C. W/ 3/4" SHT'G |
| J5 | (1) 11 1/8" T.J.I 3 @ 16" O.C. W/ 3/4" SHT'G |
| J6 | (1) 4 1/2" T.J.I 23 @ 12" O.C. W/ 3/4" SHT'G |
| B1 | 4x10 |
| B2 | 6x10 |
| B3 | 3 1/2 x 9 1/2 SCL |
| B4 | 3 1/2 x 11 1/2 SCL |
| B5 | 5 1/2 x 5 1/2 SCL |
| B6 | 5 1/2 x 11 1/2 SCL |
| B7 | 5 1/2 x 12 GL. |
| B8 | 5 1/2 x 9 1/2 SCL |
| B9 | 7 x 11 1/2 SCL |

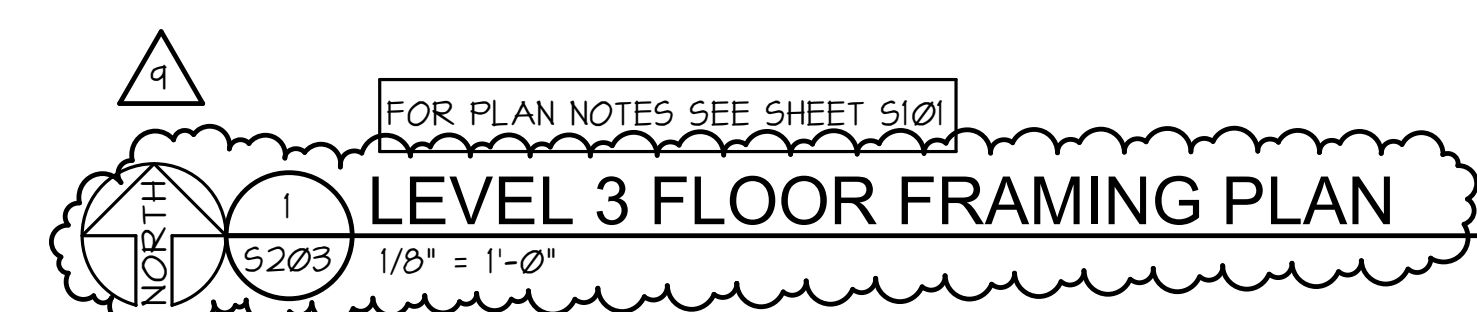
NOTE:
ALL BEAMS ARE TO BE FLUSH
FRAMED UNLESS NOTED OTHERWISE.



2 TYPICAL CORRIDOR FRAMING
DETAIL
5/20/23 1" = 1'-0"



3 TYPICAL STAIR PLAN
5/20/23 1/4" = 1'-0"



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 P:\Draw\10112023\10112023\MERCER ISLAND APARTMENTS\HYCROFT\B019 (CENTRAL)_Rev001.rvt
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| Level | | | |
|-------------------------|---------|---|----------|
| Member Name | Results | Current Solution | Comments |
| J1 | Passed | 1 piece(s) 11 7/8" TJI® 110 @ 16" OC | |
| J2 | Passed | 1 piece(s) 11 7/8" TJI® 560 @ 12" OC | |
| J2 @ Lofts | Passed | 1 piece(s) 11 7/8" TJI® 560 @ 12" OC | |
| J3 | Passed | 2 piece(s) 11 7/8" TJI® 560 @ 16" OC | |
| J4 | Passed | 2 piece(s) 11 7/8" TJI® 560 @ 16" OC | |
| J5 | Passed | 1 piece(s) 11 7/8" TJI® 360 @ 16" OC | |
| J6 | Passed | 1 piece(s) 9 1/2" TJI® 210 @ 16" OC | |
| J6 - Above Fitness Room | Passed | 1 piece(s) 9 1/2" TJI® 230 @ 12" OC | |
| Res. Storage Joists | Passed | 1 piece(s) 11 7/8" TJI® 110 @ 16" OC | |
| RF J1 | Passed | 1 piece(s) 11 7/8" TJI® 110 @ 16" OC | |
| RF FLAT J2 w/ PV | Passed | 1 piece(s) 11 7/8" TJI® 560 @ 24" OC | |
| RF J2 SLOPED | Passed | 1 piece(s) 11 7/8" TJI® 560 @ 16" OC | |
| RF J3 | Passed | 1 piece(s) 11 7/8" TJI® 560 @ 24" OC | |
| RF J4 | Passed | 1 piece(s) 11 7/8" TJI® 560 @ 24" OC | |
| RF J7 | Passed | 2 piece(s) 9 1/2" TJI® 230 @ 12" OC | |
| Rim 1 | Passed | 1 piece(s) 1 1/2" x 11 7/8" 1.5E TimberStrand® LSL | |
| Rim 2 | Passed | 1 piece(s) 3 1/2" x 11 7/8" 2.0E Parallam® PSL | |
| Rim 3 | Passed | 1 piece(s) 1 1/2" x 11 7/8" 1.5E TimberStrand® LSL | |
| B3 | Passed | 1 piece(s) 3 1/2" x 9 1/2" 2.0E Parallam® PSL | |
| B4 | Passed | 1 piece(s) 3 1/2" x 11 7/8" 2.0E Parallam® PSL | |
| Pavilion RF Joist | Passed | 1 piece(s) 11 7/8" TJI® 560 @ 12" OC | |
| Pavilion Col. | Passed | 1 piece(s) 6 x 8 DF No.1 | |
| Pavilion Cant. Joist | Passed | 1 piece(s) 1 3/4" x 7 1/4" 1.55E TimberStrand® LSL @ 12" OC | |
| Pavilion East Face BMs | Passed | 1 piece(s) 5 1/4" x 9 1/2" 2.0E Parallam® PSL | |
| B9 - Unit 328, 428 | Passed | 1 piece(s) 7" x 11 7/8" 2.0E Parallam® PSL | |
| B9 - L3/L4 Col. | Passed | 1 piece(s) 3 1/2" x 7" 1.8E Parallam® PSL | |

| | |
|---|-----------|
| ForteWEB Software Operator Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | Job Notes |
|---|-----------|



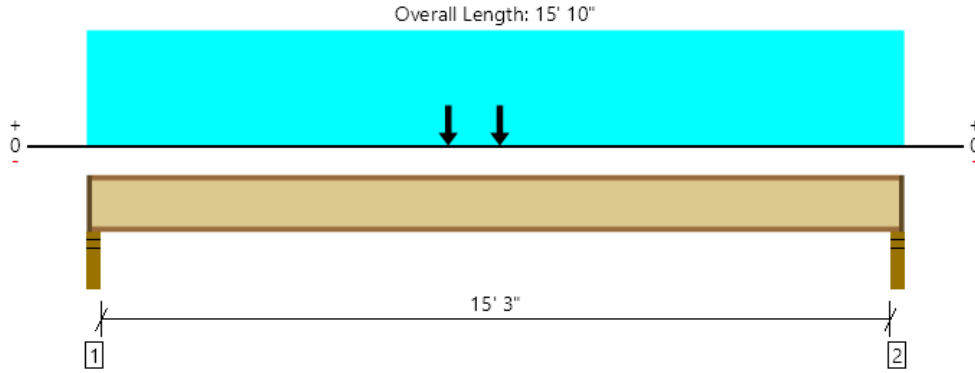
1202

10/12/2023 5:05:03 PM UTC

ForteWEB v3.6

File Name: Gravity Updates

Level, J1
1 piece(s) 11 7/8" TJI @ 110 @ 16" OC



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|----------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 772 @ 2 1/2" | 1041 (2.25") | Passed (74%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 756 @ 3 1/2" | 1560 | Passed (48%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 3224 @ 7' 11 11/16" | 3160 | Passed (102%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.230 @ 7' 11" | 0.385 | Passed (L/803) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.456 @ 7' 10 11/16" | 0.771 | Passed (L/406) | -- | 1.0 D + 1.0 L (All Spans) |
| TJ-Pro™ Rating | 50 | 45 | Passed | -- | -- |

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling, Pour Flooring Overlay.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------------|----------|------------------|
| | Total | Available | Required | Dead | Floor Live | Factored | |
| 1 - Stud wall - DF | 3.50" | 2.25" | 1.75" | 359 | 422 | 781 | 1 1/4" Rim Board |
| 2 - Stud wall - DF | 3.50" | 2.25" | 1.75" | 349 | 422 | 771 | 1 1/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 3' o/c | |
| Bottom Edge (Lu) | 15' 8" o/c | |

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

| Vertical Loads | Location | Spacing | Dead (0.90) | Floor Live (1.00) | Comments |
|-------------------|--------------|---------|-------------|-------------------|--------------|
| 1 - Uniform (PSF) | 0 to 15' 10" | 16" | 25.0 | 40.0 | Default Load |
| 2 - Point (lb) | 7' | N/A | 90 | - | |
| 3 - Point (lb) | 8' | N/A | 90 | - | |

Weyerhaeuser Notes

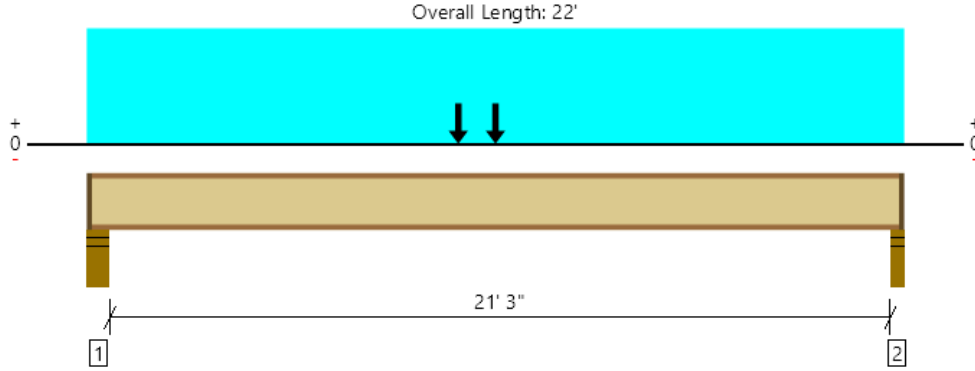
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

| ForteWEB Software Operator | Job Notes |
|---|-----------|
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, J2
1 piece(s) 11 7/8" TJI @ 560 @ 12" OC



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 788 @ 21' 9 1/2" | 1396 (2.25") | Passed (56%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 786 @ 5 1/2" | 2050 | Passed (38%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 4645 @ 11' | 9500 | Passed (49%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.304 @ 11' 1" | 0.535 | Passed (L/844) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.599 @ 11' | 1.071 | Passed (L/429) | -- | 1.0 D + 1.0 L (All Spans) |
| TJ-Pro™ Rating | 45 | 45 | Passed | -- | -- |

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling, Pour Flooring Overlay.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------------|----------|------------------|
| | Total | Available | Required | Dead | Floor Live | Factored | |
| 1 - Stud wall - DF | 5.50" | 4.25" | 1.75" | 372 | 443 | 815 | 1 1/4" Rim Board |
| 2 - Stud wall - DF | 3.50" | 2.25" | 1.75" | 358 | 437 | 795 | 1 1/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 8' 2" o/c | |
| Bottom Edge (Lu) | 21' 10" o/c | |

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

| Vertical Loads | Location | Spacing | Dead (0.90) | Floor Live (1.00) | Comments |
|-------------------|----------|---------|-------------|-------------------|--------------|
| 1 - Uniform (PSF) | 0 to 22' | 12" | 25.0 | 40.0 | Default Load |
| 2 - Point (lb) | 10' | N/A | 90 | - | |
| 3 - Point (lb) | 11' | N/A | 90 | - | |

Weyerhaeuser Notes

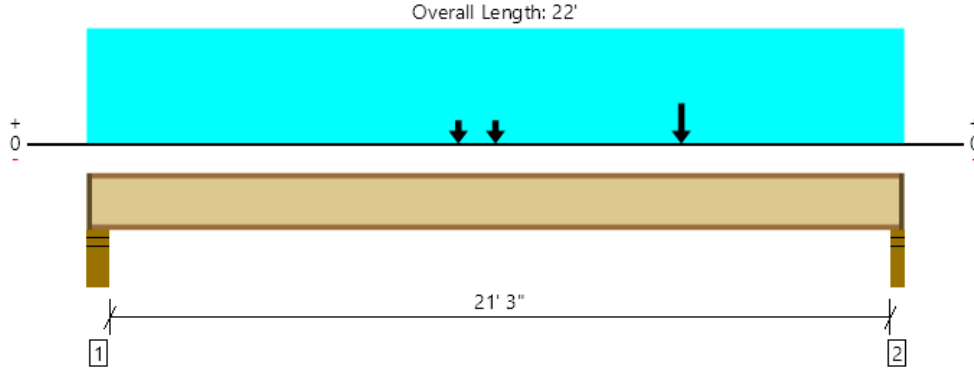
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| ForteWEB Software Operator | Job Notes |
|---|-----------|
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, J2 @ Lofts
 1 piece(s) 11 7/8" TJI @ 560 @ 12" OC



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|----------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 978 @ 21' 9 1/2" | 1396 (2.25") | Passed (70%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 965 @ 21' 8 1/2" | 2050 | Passed (47%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 5392 @ 11' | 9500 | Passed (57%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.350 @ 11' 2 13/16" | 0.535 | Passed (L/734) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.706 @ 11' 2 3/4" | 1.071 | Passed (L/364) | -- | 1.0 D + 1.0 L (All Spans) |
| TJ-Pro™ Rating | 45 | 45 | Passed | -- | -- |

System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling, Pour Flooring Overlay.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------------|----------|------------------|
| | Total | Available | Required | Dead | Floor Live | Factored | |
| 1 - Stud wall - DF | 5.50" | 4.25" | 1.75" | 413 | 473 | 886 | 1 1/4" Rim Board |
| 2 - Stud wall - DF | 3.50" | 2.25" | 1.75" | 467 | 517 | 984 | 1 1/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 7' 6" o/c | |
| Bottom Edge (Lu) | 21' 10" o/c | |

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

| Vertical Loads | Location | Spacing | Dead (0.90) | Floor Live (1.00) | Comments |
|-------------------|----------|---------|-------------|-------------------|--------------|
| 1 - Uniform (PSF) | 0 to 22' | 12" | 25.0 | 40.0 | Default Load |
| 2 - Point (PLF) | 16' | 12" | 150.0 | 110.0 | |
| 3 - Point (lb) | 10' | N/A | 90 | - | |
| 4 - Point (lb) | 11' | N/A | 90 | - | |

Weyerhaeuser Notes

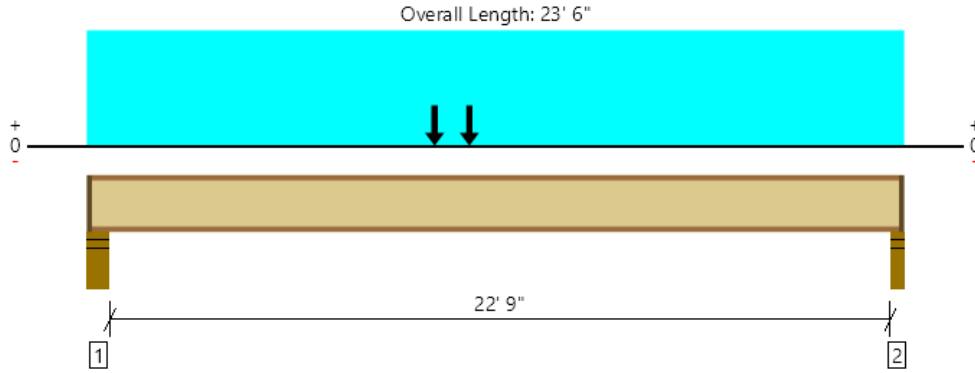
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

| ForteWEB Software Operator | Job Notes |
|---|-----------|
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, J3
2 piece(s) 11 7/8" TJI @ 560 @ 16" OC



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|--------------------|--------------|-----------------|------|-----------------------------|
| Member Reaction (lbs) | 1082 @ 23' 3 1/2" | 2793 (2.25") | Passed (39%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 1086 @ 5 1/2" | 4100 | Passed (26%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 6637 @ 11' | 19000 | Passed (35%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.269 @ 11' 10" | 0.573 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.500 @ 11' 9 3/8" | 1.146 | Passed (L/550) | -- | 1.0 D + 1.0 L (All Spans) |
| TJ-Pro™ Rating | 47 | 45 | Passed | -- | -- |

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling, Pour Flooring Overlay.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------------|----------|------------------|
| | Total | Available | Required | Dead | Floor Live | Factored | |
| 1 - Stud wall - DF | 5.50" | 4.25" | 1.75" | 495 | 631 | 1126 | 1 1/4" Rim Board |
| 2 - Stud wall - DF | 3.50" | 2.25" | 1.75" | 468 | 622 | 1091 | 1 1/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 9' 9" o/c | |
| Bottom Edge (Lu) | 23' 4" o/c | |

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

| Vertical Loads | Location | Spacing | Dead (0.90) | Floor Live (1.00) | Comments |
|-------------------|-------------|---------|-------------|-------------------|--------------|
| 1 - Uniform (PSF) | 0 to 23' 6" | 16" | 25.0 | 40.0 | Default Load |
| 2 - Point (lb) | 10' | N/A | 90 | - | |
| 3 - Point (lb) | 11' | N/A | 90 | - | |

Weyerhaeuser Notes

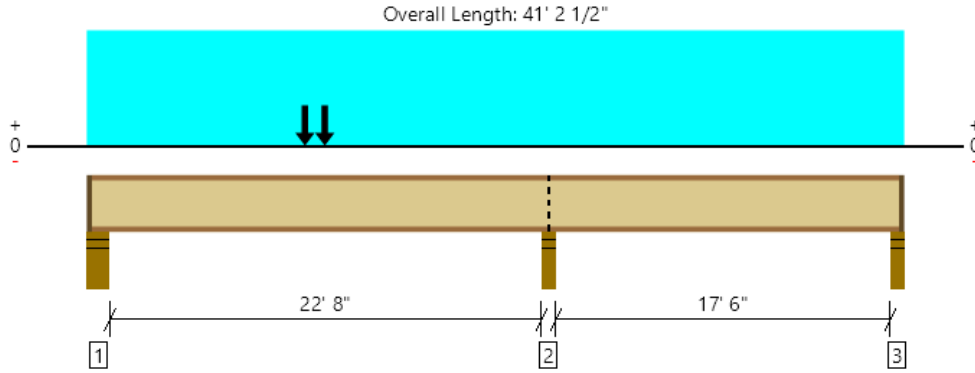
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| ForteWEB Software Operator | Job Notes |
|---|-----------|
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, J4
2 piece(s) 11 7/8" TJI @ 560 @ 16" OC



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|--------------------|--------------|-----------------|------|-----------------------------|
| Member Reaction (lbs) | 2360 @ 23' 3 1/4" | 6000 (3.50") | Passed (39%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 1236 @ 23' 1 1/2" | 4510 | Passed (27%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | -5117 @ 23' 3 1/4" | 19000 | Passed (27%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.187 @ 11' 1" | 0.572 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.328 @ 11' | 1.145 | Passed (L/838) | -- | 1.0 D + 1.0 L (All Spans) |
| TJ-Pro™ Rating | 48 | 45 | Passed | -- | -- |

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling, Pour Flooring Overlay.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------------|----------|------------------|
| | Total | Available | Required | Dead | Floor Live | Factored | |
| 1 - Stud wall - DF | 5.50" | 4.25" | 1.75" | 389 | 545/-34 | 934 | 1 1/4" Rim Board |
| 2 - Stud wall - DF | 3.50" | 3.50" | 3.50" | 988 | 1372 | 2360 | Blocking |
| 3 - Stud wall - DF | 3.50" | 2.25" | 1.75" | 176 | 432/-106 | 609 | 1 1/4" Rim Board |

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 11' 9" o/c | |
| Bottom Edge (Lu) | 11' 2" o/c | |

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

| Vertical Loads | Location | Spacing | Dead (0.90) | Floor Live (1.00) | Comments |
|-------------------|-----------------|---------|-------------|-------------------|--------------|
| 1 - Uniform (PSF) | 0 to 41' 2 1/2" | 16" | 25.0 | 40.0 | Default Load |
| 2 - Point (lb) | 11' | N/A | 90 | - | |
| 3 - Point (lb) | 12' | N/A | 90 | - | |

Weyerhaeuser Notes

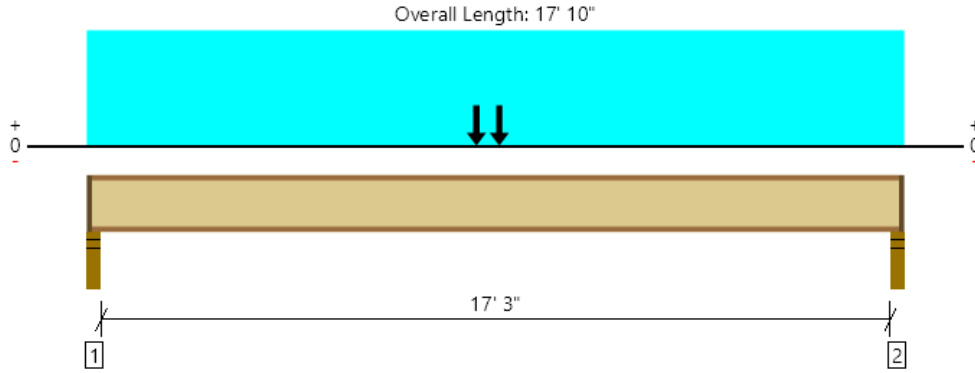
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

| | |
|---|-----------|
| ForteWEB Software Operator | Job Notes |
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, J5
1 piece(s) 11 7/8" TJI @ 360 @ 16" OC



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|--------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 855 @ 2 1/2" | 1202 (2.25") | Passed (71%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 839 @ 3 1/2" | 1705 | Passed (49%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 4047 @ 8' 11 1/4" | 6180 | Passed (65%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.259 @ 8' 11" | 0.435 | Passed (L/808) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.503 @ 8' 10 7/8" | 0.871 | Passed (L/416) | -- | 1.0 D + 1.0 L (All Spans) |
| TJ-Pro™ Rating | 48 | 45 | Passed | -- | -- |

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling, Pour Flooring Overlay.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------------|----------|------------------|
| | Total | Available | Required | Dead | Floor Live | Factored | |
| 1 - Stud wall - DF | 3.50" | 2.25" | 1.75" | 389 | 476 | 865 | 1 1/4" Rim Board |
| 2 - Stud wall - DF | 3.50" | 2.25" | 1.75" | 385 | 476 | 861 | 1 1/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 4' 7" o/c | |
| Bottom Edge (Lu) | 17' 8" o/c | |

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

| Vertical Loads | Location | Spacing | Dead (0.90) | Floor Live (1.00) | Comments |
|-------------------|--------------|---------|-------------|-------------------|--------------|
| 1 - Uniform (PSF) | 0 to 17' 10" | 16" | 25.0 | 40.0 | Default Load |
| 2 - Point (lb) | 8' 6" | N/A | 90 | - | |
| 3 - Point (lb) | 9' | N/A | 90 | - | |

Weyerhaeuser Notes

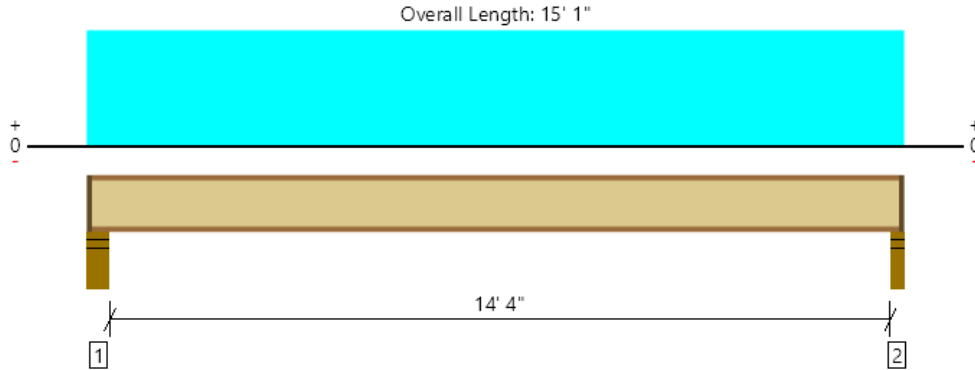
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

| ForteWEB Software Operator | Job Notes |
|---|-----------|
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, J6
1 piece(s) 9 1/2" TJI® 210 @ 16" OC



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 637 @ 14' 10 1/2" | 1134 (2.25") | Passed (56%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 621 @ 5 1/2" | 1330 | Passed (47%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 2278 @ 7' 7 1/2" | 3000 | Passed (76%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.259 @ 7' 7 1/2" | 0.363 | Passed (L/671) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.421 @ 7' 7 1/2" | 0.725 | Passed (L/413) | -- | 1.0 D + 1.0 L (All Spans) |
| TJ-Pro™ Rating | 46 | 45 | Passed | -- | -- |

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling, Pour Flooring Overlay.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------------|----------|------------------|
| | Total | Available | Required | Dead | Floor Live | Factored | |
| 1 - Stud wall - DF | 5.50" | 4.25" | 1.75" | 254 | 407 | 661 | 1 1/4" Rim Board |
| 2 - Stud wall - DF | 3.50" | 2.25" | 1.75" | 249 | 398 | 646 | 1 1/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 4' 2" o/c | |
| Bottom Edge (Lu) | 14' 11" o/c | |

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

| Vertical Load | Location | Spacing | Dead (0.90) | Floor Live (1.00) | Comments |
|-------------------|-------------|---------|-------------|-------------------|--------------|
| 1 - Uniform (PSF) | 0 to 15' 1" | 16" | 25.0 | 40.0 | Default Load |

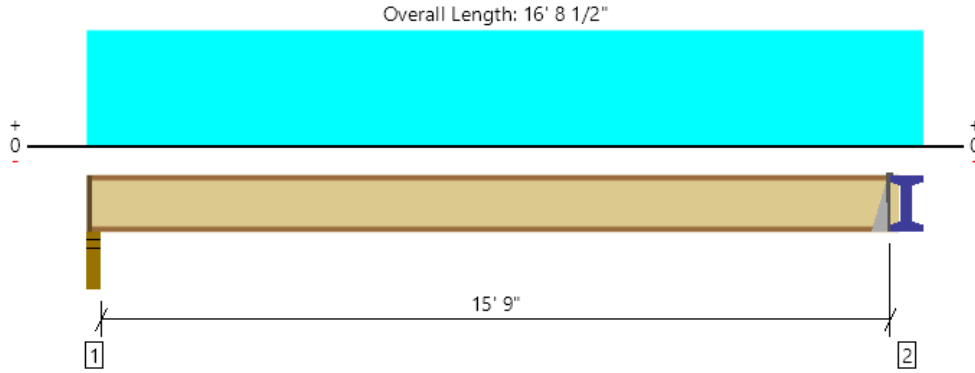
| Member Notes |
|--------------|
| At Lofts |

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

| ForteWEB Software Operator | Job Notes |
|---|-----------|
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, J6 - Above Fitness Room
1 piece(s) 9 1/2" TJI® 230 @ 12" OC



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 515 @ 16' 1/2" | 1060 (1.75") | Passed (49%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 515 @ 16' 1/2" | 1330 | Passed (39%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 2037 @ 8' 1 1/2" | 3330 | Passed (61%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.259 @ 8' 1 1/2" | 0.396 | Passed (L/734) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.421 @ 8' 1 1/2" | 0.792 | Passed (L/452) | -- | 1.0 D + 1.0 L (All Spans) |
| TJ-Pro™ Rating | 45 | 45 | Passed | -- | -- |

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling, Pour Flooring Overlay.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|---------------------|----------------|---------------------|------------------------|-------------------------|------------|----------|-----------------------|
| | Total | Available | Required | Dead | Floor Live | Factored | |
| 1 - Stud wall - DF | 3.50" | 2.25" | 1.75" | 203 | 325 | 528 | 1 1/4" Rim Board |
| 2 - Hanger on steel | 8.00" | Hanger ¹ | 1.75" / - ² | 215 | 343 | 558 | See note ¹ |

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.
- ² Required Bearing Length / Required Bearing Length with Web Stiffeners

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 5' 3" o/c | |
| Bottom Edge (Lu) | 15' 11" o/c | |

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

Connector: Simpson Strong-Tie

| Support | Model | Seat Length | Top Fasteners | Face Fasteners | Member Fasteners | Accessories |
|----------------------|---------------------|-------------|---------------|----------------|------------------|-------------|
| 2 - Top Mount Hanger | Connector not found | N/A | N/A | N/A | N/A | |

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

| Vertical Load | Location | Spacing | Dead (0.90) | Floor Live (1.00) | Comments |
|-------------------|-----------------|---------|-------------|-------------------|--------------|
| 1 - Uniform (PSF) | 0 to 16' 8 1/2" | 12" | 25.0 | 40.0 | Default Load |

Weyerhaeuser Notes

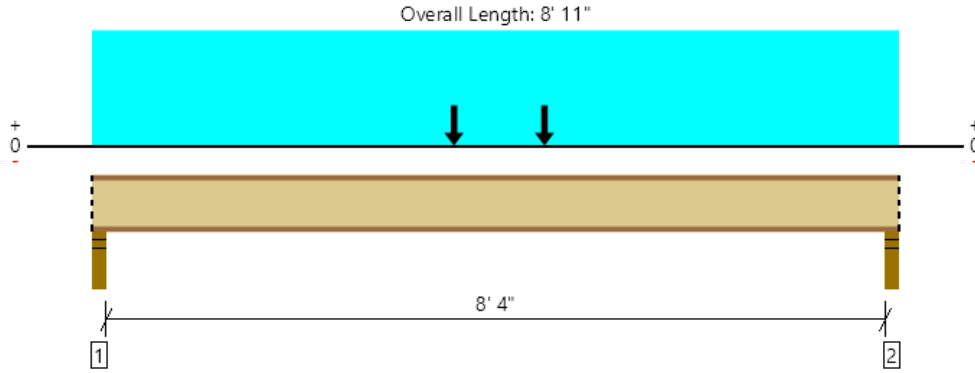
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

| ForteWEB Software Operator | Job Notes |
|---|-----------|
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, Res. Storage Joists
 1 piece(s) 11 7/8" TJI @ 110 @ 16" OC



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|-----------------|------|-----------------------------|
| Member Reaction (lbs) | 983 @ 8' 8 1/2" | 1375 (3.50") | Passed (71%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 924 @ 8' 7 1/2" | 1560 | Passed (59%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 2144 @ 4' 5 7/16" | 3160 | Passed (68%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.085 @ 4' 5 1/2" | 0.213 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.120 @ 4' 5 1/2" | 0.425 | Passed (L/849) | -- | 1.0 D + 1.0 L (All Spans) |
| TJ-Pro™ Rating | 68 | 45 | Passed | -- | -- |

System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling, Pour Flooring Overlay.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------------|----------|-------------|
| | Total | Available | Required | Dead | Floor Live | Factored | |
| 1 - Stud wall - DF | 3.50" | 3.50" | 2.02" | 238 | 743 | 981 | Blocking |
| 2 - Stud wall - DF | 3.50" | 3.50" | 2.03" | 239 | 743 | 983 | Blocking |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 3' 10" o/c | |
| Bottom Edge (Lu) | 8' 11" o/c | |

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

| Vertical Loads | Location | Spacing | Dead (0.90) | Floor Live (1.00) | Comments |
|-------------------|-------------|---------|-------------|-------------------|--------------|
| 1 - Uniform (PSF) | 0 to 8' 11" | 16" | 25.0 | 125.0 | Default Load |
| 2 - Point (lb) | 4' | N/A | 90 | - | |
| 3 - Point (lb) | 5' | N/A | 90 | - | |

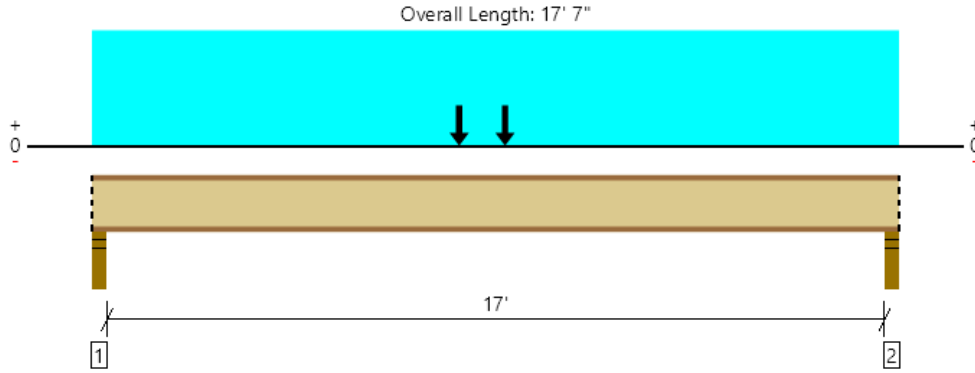
| Member Notes |
|-------------------------------|
| Joists at Residential Storage |

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| ForteWEB Software Operator | Job Notes |
|---|-----------|
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, RF J1
 1 piece(s) 11 7/8" TJI @ 110 @ 16" OC



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 714 @ 2 1/2" | 1581 (3.50") | Passed (45%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Shear (lbs) | 694 @ 3 1/2" | 1794 | Passed (39%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Moment (Ft-lbs) | 3331 @ 8' 10" | 3634 | Passed (92%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Live Load Defl. (in) | 0.319 @ 8' 9 1/2" | 0.572 | Passed (L/645) | -- | 1.0 D + 1.0 S (All Spans) |
| Total Load Defl. (in) | 0.699 @ 8' 9 1/4" | 0.858 | Passed (L/295) | -- | 1.0 D + 1.0 S (All Spans) |

System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------|----------|-------------|
| | Total | Available | Required | Dead | Snow | Factored | |
| 1 - Stud wall - DF | 3.50" | 3.50" | 1.75" | 363 | 352 | 714 | Blocking |
| 2 - Stud wall - DF | 3.50" | 3.50" | 1.75" | 357 | 352 | 708 | Blocking |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 3' o/c | |
| Bottom Edge (Lu) | 17' 7" o/c | |

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

| Vertical Loads | Location | Spacing | Dead (0.90) | Snow (1.15) | Comments |
|-------------------|-------------|---------|-------------|-------------|--------------|
| 1 - Uniform (PSF) | 0 to 17' 7" | 16" | 23.0 | 30.0 | Default Load |
| 2 - Point (lb) | 8' | N/A | 90 | - | |
| 3 - Point (lb) | 9' | N/A | 90 | - | |

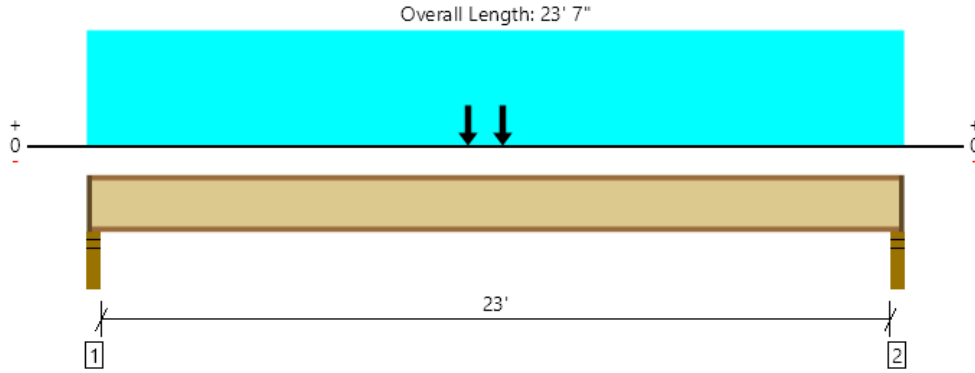
| Member Notes |
|--------------|
| 16.75' SPAN |

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

| ForteWEB Software Operator | Job Notes |
|---|-----------|
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, RF FLAT J2 w/ PV
1 piece(s) 11 7/8" TJI @ 560 @ 24" OC



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|---------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 1214 @ 2 1/2" | 1606 (2.25") | Passed (76%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Shear (lbs) | 1196 @ 3 1/2" | 2358 | Passed (51%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Moment (Ft-lbs) | 7438 @ 11' 9 13/16" | 10925 | Passed (68%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Live Load Defl. (in) | 0.561 @ 11' 9 1/2" | 1.158 | Passed (L/495) | -- | 1.0 D + 1.0 S (All Spans) |
| Total Load Defl. (in) | 1.219 @ 11' 9 3/8" | 1.544 | Passed (L/228) | -- | 1.0 D + 1.0 S (All Spans) |

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

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

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------|----------|------------------|
| | Total | Available | Required | Dead | Snow | Factored | |
| 1 - Stud wall - DF | 3.50" | 2.25" | 1.75" | 635 | 590 | 1224 | 1 1/4" Rim Board |
| 2 - Stud wall - DF | 3.50" | 2.25" | 1.75" | 630 | 590 | 1220 | 1 1/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 6' 4" o/c | |
| Bottom Edge (Lu) | 23' 5" o/c | |

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

| Vertical Loads | Location | Spacing | Dead (0.90) | Snow (1.15) | Comments |
|-------------------|-------------|---------|-------------|-------------|--------------|
| 1 - Uniform (PSF) | 0 to 23' 7" | 24" | 23.0 | 25.0 | Default Load |
| 2 - Point (lb) | 11' | N/A | 90 | - | |
| 3 - Point (lb) | 12' | N/A | 90 | - | |

Member Notes

23' SPAN

Weyerhaeuser Notes

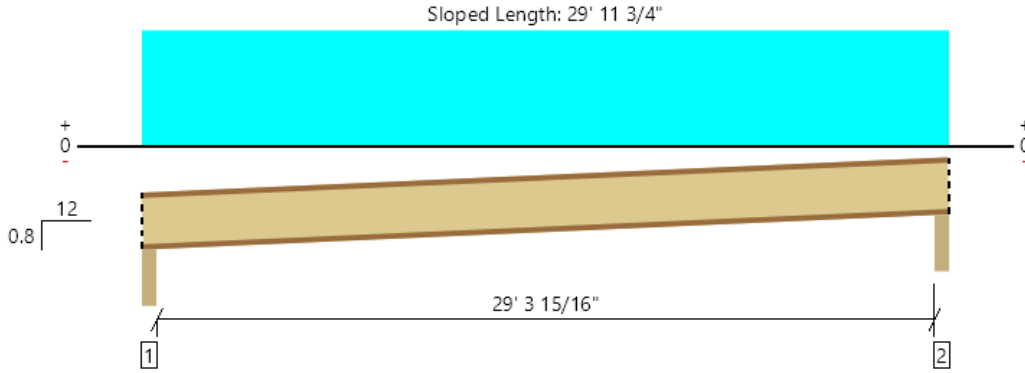
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

| | |
|---|-----------|
| ForteWEB Software Operator | Job Notes |
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, RF J2 SLOPED
1 piece(s) 11 7/8" TJI ® 560 @ 16" OC



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

Member Length : 30' 9/16"

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|---------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 958 @ 2 1/2" | 1984 (3.50") | Passed (48%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Shear (lbs) | 940 @ 3 1/2" | 2358 | Passed (40%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Moment (Ft-lbs) | 6968 @ 14' 11 1/2" | 10925 | Passed (64%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Live Load Defl. (in) | 0.952 @ 14' 11 1/2" | 1.478 | Passed (L/372) | -- | 1.0 D + 1.0 S (All Spans) |
| Total Load Defl. (in) | 1.831 @ 14' 11 1/2" | 1.971 | Passed (L/194) | -- | 1.0 D + 1.0 S (All Spans) |

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0.8/12

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

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|------------------------|----------------|-----------|----------|-------------------------|------|----------|-------------|
| | Total | Available | Required | Dead | Snow | Factored | |
| 1 - Beveled Plate - DF | 3.50" | 3.50" | 1.75" | 460 | 499 | 958 | Blocking |
| 2 - Beveled Plate - DF | 3.50" | 3.50" | 1.75" | 460 | 499 | 958 | Blocking |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 6' 7" o/c | |
| Bottom Edge (Lu) | 30' o/c | |

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

| Vertical Load | Location | Spacing | Dead (0.90) | Snow (1.15) | Comments |
|-------------------|--------------------|---------|-------------|-------------|--------------|
| 1 - Uniform (PSF) | 0 to 29' 10 15/16" | 16" | 23.0 | 25.0 | Default Load |

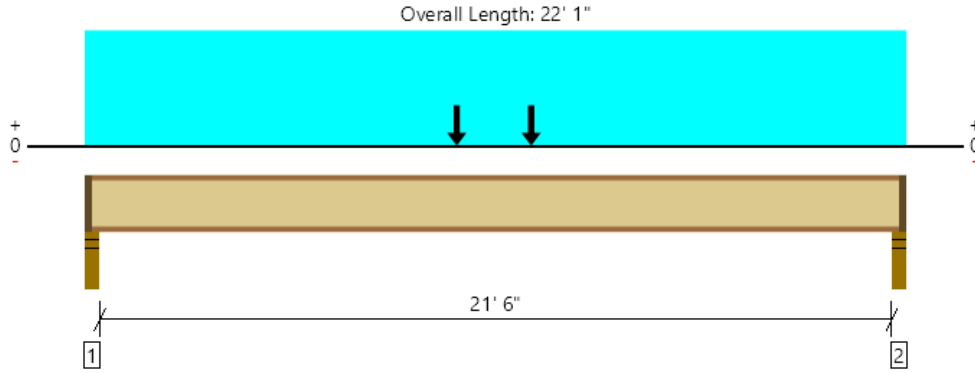
| Member Notes |
|--------------|
| 29.33' SPAN |

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| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, RF J3
1 piece(s) 11 7/8" TJI @ 560 @ 24" OC



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 1245 @ 2 1/2" | 1455 (1.75") | Passed (86%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Shear (lbs) | 1230 @ 3 1/2" | 2358 | Passed (52%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Moment (Ft-lbs) | 7105 @ 11' 9/16" | 10925 | Passed (65%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Live Load Defl. (in) | 0.522 @ 11' 1/2" | 0.722 | Passed (L/498) | -- | 1.0 D + 1.0 S (All Spans) |
| Total Load Defl. (in) | 1.038 @ 11' 1/2" | 1.083 | Passed (L/250) | -- | 1.0 D + 1.0 S (All Spans) |

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------|----------|------------------|
| | Total | Available | Required | Dead | Snow | Factored | |
| 1 - Stud wall - DF | 3.50" | 1.75" | 1.75" | 598 | 663 | 1261 | 1 3/4" Rim Board |
| 2 - Stud wall - DF | 3.50" | 1.75" | 1.75" | 598 | 663 | 1260 | 1 3/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 6' 6" o/c | |
| Bottom Edge (Lu) | 21' 10" o/c | |

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

| Vertical Loads | Location | Spacing | Dead (0.90) | Snow (1.15) | Comments |
|-------------------|-------------|---------|-------------|-------------|--------------|
| 1 - Uniform (PSF) | 0 to 22' 1" | 24" | 23.0 | 30.0 | Default Load |
| 2 - Point (lb) | 10' | N/A | 90 | - | |
| 3 - Point (lb) | 12' | N/A | 90 | - | |

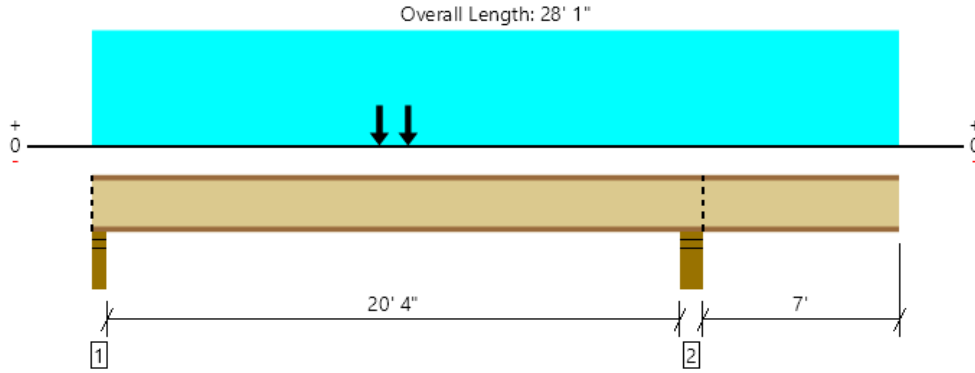
| Member Notes |
|--------------|
| 16.75' SPAN |

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| ForteWEB Software Operator | Job Notes |
|---|-----------|
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, RF J4
 1 piece(s) 11 7/8" TJI @ 560 @ 24" OC



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|----------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 1110 @ 2 1/2" | 1984 (3.50") | Passed (56%) | 1.15 | 1.0 D + 1.0 S (Alt Spans) |
| Shear (lbs) | 1227 @ 20' 7 1/2" | 2358 | Passed (52%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Moment (Ft-lbs) | 5575 @ 10' | 10925 | Passed (51%) | 1.15 | 1.0 D + 1.0 S (Alt Spans) |
| Live Load Defl. (in) | 0.378 @ 10' 3 1/2" | 0.688 | Passed (L/655) | -- | 1.0 D + 1.0 S (Alt Spans) |
| Total Load Defl. (in) | 0.728 @ 10' 2 11/16" | 1.032 | Passed (L/340) | -- | 1.0 D + 1.0 S (Alt Spans) |

System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Upward deflection on right cantilever exceeds 0.4".

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------|----------|-------------|
| | Total | Available | Required | Dead | Snow | Factored | |
| 1 - Stud wall - DF | 3.50" | 3.50" | 1.75" | 516 | 594 | 1110 | Blocking |
| 2 - Stud wall - DF | 5.50" | 5.50" | 3.50" | 955 | 1129 | 2084 | Blocking |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 7' 5" o/c | |
| Bottom Edge (Lu) | 10' 9" o/c | |

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

| Vertical Loads | Location | Spacing | Dead (0.90) | Snow (1.15) | Comments |
|-------------------|-------------|---------|-------------|-------------|--------------|
| 1 - Uniform (PSF) | 0 to 28' 1" | 24" | 23.0 | 30.0 | Default Load |
| 2 - Point (lb) | 10' | N/A | 90 | - | |
| 3 - Point (lb) | 11' | N/A | 90 | - | |

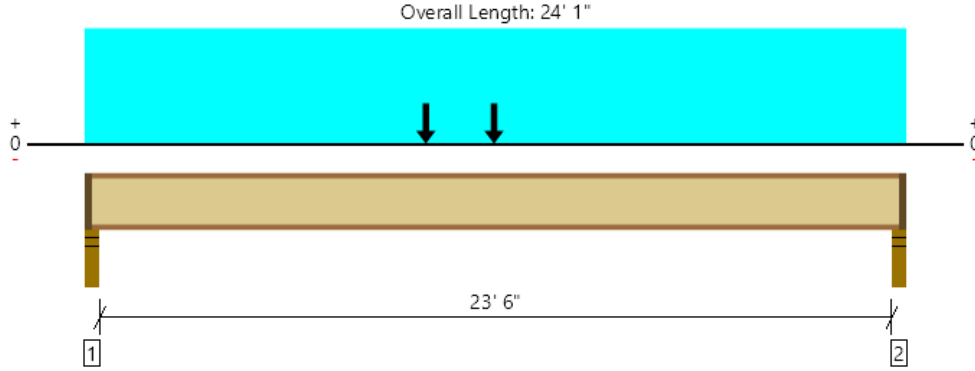
| Member Notes |
|---------------|
| 7' cantilever |

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| | |
|---|-----------|
| ForteWEB Software Operator | Job Notes |
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, RF J7
2 piece(s) 9 1/2" TJI® 230 @ 12" OC



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|---------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 728 @ 2 1/2" | 2438 (1.75") | Passed (30%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Shear (lbs) | 721 @ 3 1/2" | 3059 | Passed (24%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Moment (Ft-lbs) | 4685 @ 12' | 7659 | Passed (61%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Live Load Defl. (in) | 0.538 @ 12' 1/2" | 0.789 | Passed (L/528) | -- | 1.0 D + 1.0 S (All Spans) |
| Total Load Defl. (in) | 1.165 @ 11' 11 3/4" | 1.183 | Passed (L/244) | -- | 1.0 D + 1.0 S (All Spans) |

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------|----------|------------------|
| | Total | Available | Required | Dead | Snow | Factored | |
| 1 - Stud wall - DF | 3.50" | 1.75" | 1.75" | 375 | 361 | 736 | 1 3/4" Rim Board |
| 2 - Stud wall - DF | 3.50" | 1.75" | 1.75" | 359 | 361 | 720 | 1 3/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 4' 10" o/c | |
| Bottom Edge (Lu) | 23' 10" o/c | |

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

| Vertical Loads | Location | Spacing | Dead (0.90) | Snow (1.15) | Comments |
|-------------------|-------------|---------|-------------|-------------|--------------|
| 1 - Uniform (PSF) | 0 to 24' 1" | 12" | 23.0 | 30.0 | Default Load |
| 2 - Point (lb) | 10' | N/A | 90 | - | |
| 3 - Point (lb) | 12' | N/A | 90 | - | |

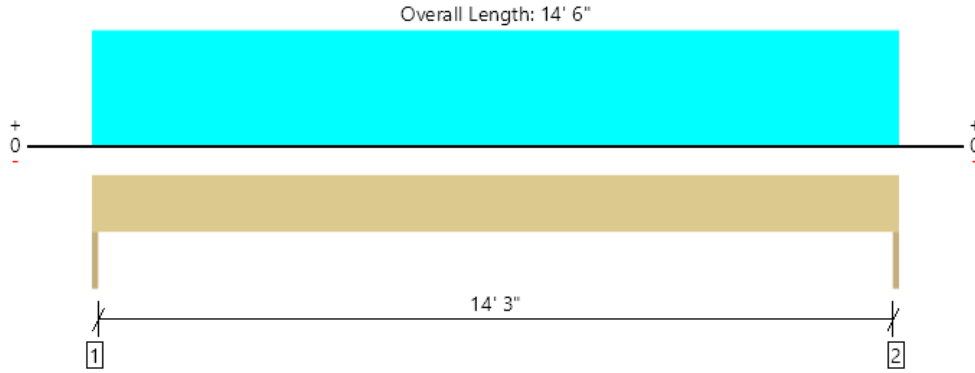
| Member Notes |
|--------------|
| 16.75' SPAN |

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Level, Rim 1
 1 piece(s) 1 1/2" x 11 7/8" 1.5E TimberStrand® LSL



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|-----------------|------|-----------------------------|
| Member Reaction (lbs) | 1308 @ 0 | 1406 (1.50") | Passed (93%) | -- | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 1107 @ 1' 1 3/8" | 3563 | Passed (31%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 4742 @ 7' 3" | 6616 | Passed (72%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.136 @ 7' 3" | 0.483 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.612 @ 7' 3" | 0.725 | Passed (L/284) | -- | 1.0 D + 1.0 L (All Spans) |

System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|----------------|----------------|-----------|----------|-------------------------|------------|----------|-------------|
| | Total | Available | Required | Dead | Floor Live | Factored | |
| 1 - Plate - DF | 1.50" | 1.50" | 1.50" | 1018 | 290 | 1308 | None |
| 2 - Plate - DF | 1.50" | 1.50" | 1.50" | 1018 | 290 | 1308 | None |

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 3' 10" o/c | |
| Bottom Edge (Lu) | 14' 6" o/c | |

•Maximum allowable bracing intervals based on applied load.

| Vertical Loads | Location | Tributary Width | Dead (0.90) | Floor Live (1.00) | Comments |
|-----------------------|-------------|-----------------|-------------|-------------------|--------------|
| 0 - Self Weight (PLF) | 0 to 14' 6" | N/A | 5.4 | -- | |
| 1 - Uniform (PSF) | 0 to 14' 6" | 1' | 25.0 | 40.0 | Default Load |
| 2 - Uniform (PLF) | 0 to 14' 6" | N/A | 110.0 | - | |

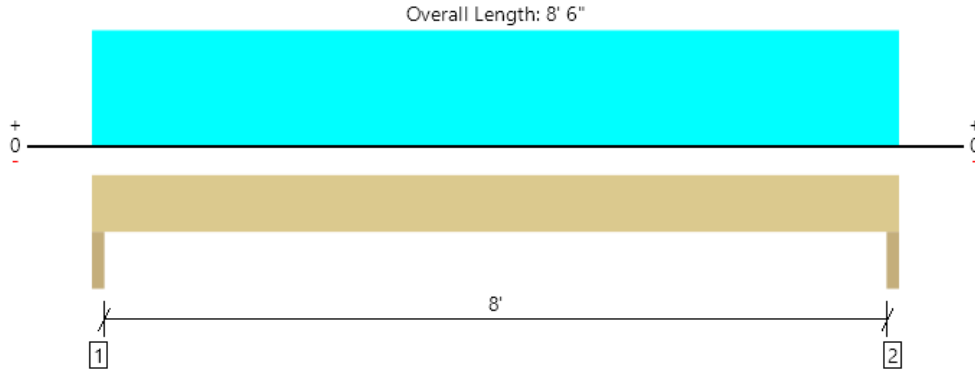
| Member Notes |
|--------------|
| Longest Span |

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| | |
|---|-----------|
| ForteWEB Software Operator | Job Notes |
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, Rim 2
 1 piece(s) 3 1/2" x 11 7/8" 2.0E Parallam® PSL



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|-----------------|------|-----------------------------|
| Member Reaction (lbs) | 3653 @ 1 1/2" | 6563 (3.00") | Passed (56%) | -- | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 2587 @ 1' 2 7/8" | 8035 | Passed (32%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 7312 @ 4' 3" | 19902 | Passed (37%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.059 @ 4' 3" | 0.275 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.112 @ 4' 3" | 0.412 | Passed (L/884) | -- | 1.0 D + 1.0 L (All Spans) |

System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|----------------|----------------|-----------|----------|-------------------------|------------|----------|-------------|
| | Total | Available | Required | Dead | Floor Live | Factored | |
| 1 - Plate - DF | 3.00" | 3.00" | 1.67" | 1726 | 1926 | 3653 | None |
| 2 - Plate - DF | 3.00" | 3.00" | 1.67" | 1726 | 1926 | 3653 | None |

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 8' 6" o/c | |
| Bottom Edge (Lu) | 8' 6" o/c | |

•Maximum allowable bracing intervals based on applied load.

| Vertical Loads | Location | Tributary Width | Dead (0.90) | Floor Live (1.00) | Comments |
|-----------------------|------------|-----------------|-------------|-------------------|--------------|
| 0 - Self Weight (PLF) | 0 to 8' 6" | N/A | 13.0 | -- | |
| 1 - Uniform (PSF) | 0 to 8' 6" | 11' 3 15/16" | 25.0 | 40.0 | Default Load |
| 2 - Uniform (PLF) | 0 to 8' 6" | N/A | 110.0 | - | |

| Member Notes |
|------------------------|
| Worst Case Load & Span |

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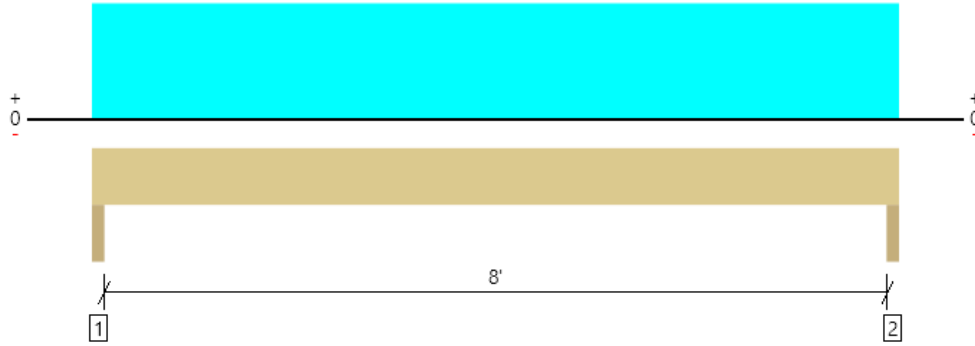
| | |
|---|-----------|
| ForteWEB Software Operator | Job Notes |
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, Rim 3

1 piece(s) 1 1/2" x 11 7/8" 1.5E TimberStrand® LSL

Overall Length: 8' 6"



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 2563 @ 1 1/2" | 2813 (3.00") | Passed (91%) | -- | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 1815 @ 1' 2 7/8" | 3563 | Passed (51%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 5130 @ 4' 3" | 6616 | Passed (78%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.122 @ 4' 3" | 0.275 | Passed (L/814) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.244 @ 4' 3" | 0.412 | Passed (L/405) | -- | 1.0 D + 1.0 L (All Spans) |

System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|----------------|----------------|-----------|----------|-------------------------|------------|----------|-------------|
| | Total | Available | Required | Dead | Floor Live | Factored | |
| 1 - Plate - DF | 3.00" | 3.00" | 2.73" | 1288 | 1275 | 2563 | None |
| 2 - Plate - DF | 3.00" | 3.00" | 2.73" | 1288 | 1275 | 2563 | None |

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 3' 5" o/c | |
| Bottom Edge (Lu) | 8' 6" o/c | |

•Maximum allowable bracing intervals based on applied load.

| Vertical Loads | Location | Tributary Width | Dead (0.90) | Floor Live (1.00) | Comments |
|-----------------------|------------|-----------------|-------------|-------------------|--------------|
| 0 - Self Weight (PLF) | 0 to 8' 6" | N/A | 5.4 | -- | |
| 1 - Uniform (PSF) | 0 to 8' 6" | 7' 6" | 25.0 | 40.0 | Default Load |
| 2 - Uniform (PLF) | 0 to 8' 6" | N/A | 110.0 | - | |

| Member Notes |
|----------------------------|
| J1 Joists Framing Into Rim |

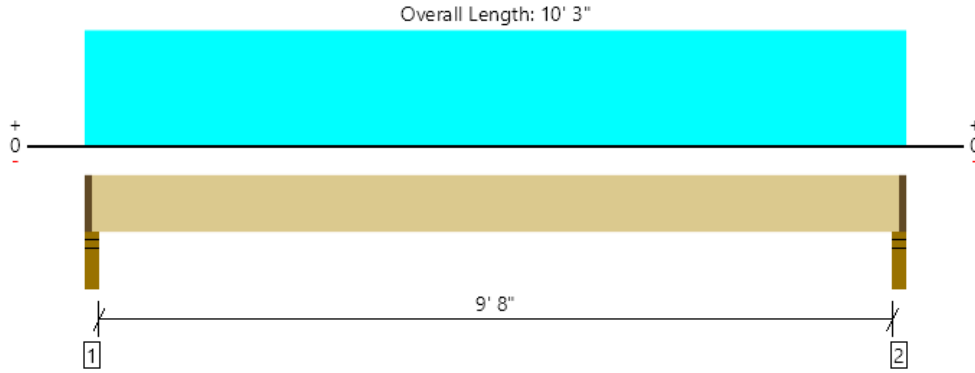
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| The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator |

| | |
|---|-----------|
| ForteWEB Software Operator | Job Notes |
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, B3

1 piece(s) 3 1/2" x 9 1/2" 2.0E Parallam® PSL



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|-----------------|------|-----------------------------|
| Member Reaction (lbs) | 807 @ 2" | 3828 (1.75") | Passed (21%) | -- | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 655 @ 1' 1" | 6428 | Passed (10%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 1992 @ 5' 1 1/2" | 13057 | Passed (15%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.045 @ 5' 1 1/2" | 0.248 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.077 @ 5' 1 1/2" | 0.496 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |

System : Floor
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------------|----------|------------------|
| | Total | Available | Required | Dead | Floor Live | Factored | |
| 1 - Stud wall - DF | 3.50" | 1.75" | 1.50" | 351 | 478 | 829 | 1 3/4" Rim Board |
| 2 - Stud wall - DF | 3.50" | 1.75" | 1.50" | 351 | 478 | 829 | 1 3/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 10' o/c | |
| Bottom Edge (Lu) | 10' o/c | |

- Maximum allowable bracing intervals based on applied load.

| Vertical Loads | Location (Side) | Tributary Width | Dead (0.90) | Floor Live (1.00) | Comments |
|-----------------------|----------------------|-----------------|-------------|-------------------|--------------|
| 0 - Self Weight (PLF) | 1 3/4" to 10' 1 1/4" | N/A | 10.4 | -- | |
| 1 - Uniform (PSF) | 0 to 10' 3" (Front) | 2' 4" | 25.0 | 40.0 | Default Load |

| Member Notes |
|---------------|
| Worst Case B4 |

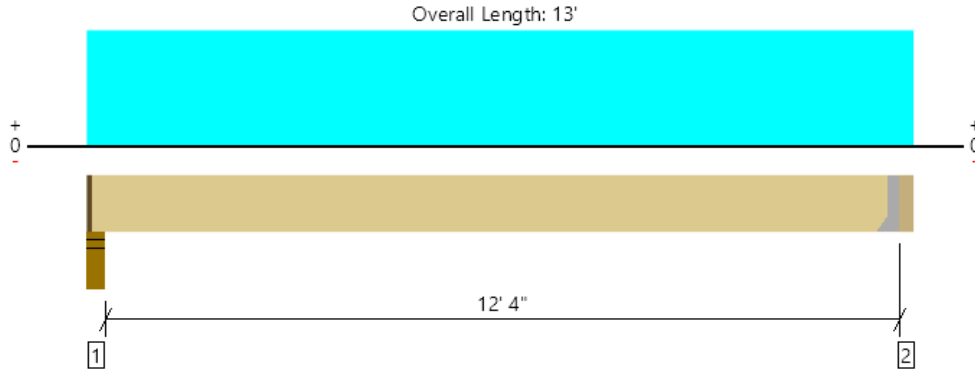
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| ForteWEB Software Operator | Job Notes |
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| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, B4

1 piece(s) 3 1/2" x 11 7/8" 2.0E Parallam® PSL



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 3573 @ 12' 8 1/2" | 3573 (1.63") | Passed (100%) | -- | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 3005 @ 11' 8 5/8" | 8035 | Passed (37%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 11128 @ 6' 5 3/4" | 19902 | Passed (56%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.210 @ 6' 5 3/4" | 0.311 | Passed (L/712) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.349 @ 6' 5 3/4" | 0.623 | Passed (L/428) | -- | 1.0 D + 1.0 L (All Spans) |

System : Floor
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|-------------------------------|----------------|---------------------|----------|-------------------------|------------|----------|-----------------------|
| | Total | Available | Required | Dead | Floor Live | Factored | |
| 1 - Stud wall - DF | 4.50" | 3.25" | 1.67" | 1480 | 2235 | 3715 | 1 1/4" Rim Board |
| 2 - Hanger on 11 7/8" DF beam | 3.50" | Hanger ¹ | 1.63" | 1487 | 2250 | 3736 | See note ¹ |

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 12' 7" o/c | |
| Bottom Edge (Lu) | 12' 7" o/c | |

•Maximum allowable bracing intervals based on applied load.

| Connector: Simpson Strong-Tie | | | | | | |
|-------------------------------|--------|-------------|---------------|----------------|------------------|-------------|
| Support | Model | Seat Length | Top Fasteners | Face Fasteners | Member Fasteners | Accessories |
| 2 - Face Mount Hanger | HHUS48 | 3.00" | N/A | 22-16d | 8-16d | |

• Refer to manufacturer notes and instructions for proper installation and use of all connectors.

| Vertical Loads | Location (Side) | Tributary Width | Dead (0.90) | Floor Live (1.00) | Comments |
|-----------------------|----------------------|-----------------|-------------|-------------------|--------------|
| 0 - Self Weight (PLF) | 1 1/4" to 12' 8 1/2" | N/A | 13.0 | -- | |
| 1 - Uniform (PSF) | 0 to 13' (Front) | 8' 7 1/2" | 25.0 | 40.0 | Default Load |

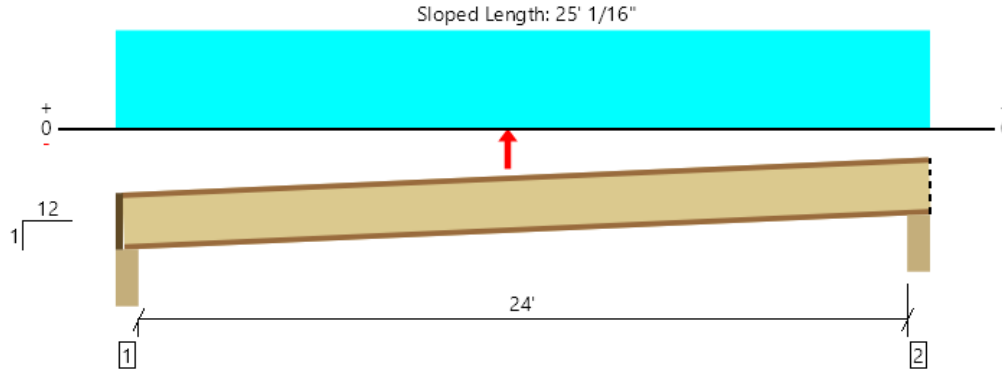
| Member Notes |
|---------------|
| Worst Case B4 |

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Level, Pavilion RF Joist
1 piece(s) 11 7/8" TJI @ 560 @ 12" OC



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

Member Length : 24' 11 1/4"

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|----------------------|--------------|-----------------|------|-----------------------------|
| Member Reaction (lbs) | 517 @ 24' 6 1/2" | 1984 (3.50") | Passed (26%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Shear (lbs) | 497 @ 24' 5 1/2" | 2358 | Passed (21%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Moment (Ft-lbs) | 2777 @ 13' 5 5/16" | 10925 | Passed (25%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Live Load Defl. (in) | 0.286 @ 12' 5 13/16" | 0.808 | Passed (L/999+) | -- | 1.0 D + 1.0 S (All Spans) |
| Total Load Defl. (in) | 0.516 @ 12' 5 13/16" | 1.213 | Passed (L/564) | -- | 1.0 D + 1.0 S (All Spans) |

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 1/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | | Accessories |
|------------------------|----------------|-----------|----------|-------------------------|-----------|------|----------|------------------|
| | Total | Available | Required | Dead | Roof Live | Snow | Factored | |
| 1 - Beveled Plate - DF | 5.50" | 3.75" | 1.75" | 229 | 228 | 285 | 514 | 1 3/4" Rim Board |
| 2 - Beveled Plate - DF | 5.50" | 5.50" | 1.75" | 230 | 229 | 287 | 517 | Blocking |

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 10' 9" o/c | |
| Bottom Edge (Lu) | 24' 10" o/c | |

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

| Vertical Loads | Location | Spacing | Dead (0.90) | Roof Live (non-snow: 1.25) | Snow (1.15) | Comments |
|-------------------|--------------|---------|-------------|----------------------------|-------------|--|
| 1 - Uniform (PSF) | 0 to 24' 11" | 12" | 20.0 | 20.0 | 25.0 | Default Load |
| 2 - Point (PLF) | 12' | 12" | -41.0 | -41.0 | -51.0 | Linked from: Pavilion Cant. Joist, Support 1 |

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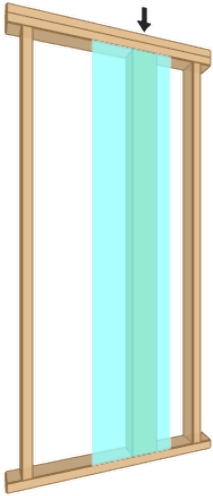


Level, Pavilion Col.
1 piece(s) 6 x 8 DF No.1

Wall Height: 13' 6"

Member Height: 13' 1 1/2"

Tributary Width: 1'



Drawing is Conceptual

| Design Results | Actual | Allowed | Result | LDF | Load: Combination |
|-------------------------|-----------------|---------|-----------------|------|----------------------------------|
| Slenderness | 21 | 50 | Passed (42%) | -- | -- |
| Compression (lbs) | 16320 | 31748 | Passed (51%) | 1.15 | 1.0 D + 1.0 S |
| Plate Bearing (lbs) | 16320 | 25781 | Passed (63%) | -- | 1.0 D + 1.0 S |
| Lateral Reaction (lbs) | 93 | -- | -- | 1.60 | 1.0 D + 0.6 W |
| Lateral Shear (lbs) | 85 | 7480 | Passed (1%) | 1.60 | 1.0 D + 0.6 W |
| Lateral Moment (ft-lbs) | 307 @ mid-span | 8193 | Passed (4%) | 1.60 | 1.0 D + 0.6 W |
| Total Deflection (in) | 0.07 @ mid-span | 1.31 | Passed (L/2211) | -- | 1.0 D + 0.45 W + 0.75 L + 0.75 S |
| Bending/Compression | 0.56 | 1 | Passed (56%) | 1.15 | 1.0 D + 1.0 S |

- Lateral deflection criteria: Wind (L/120)
- Input axial load eccentricity for this design is 10% of applicable member side dimension.
- Applicable calculations are based on NDS.

| Supports | Type | Material |
|----------|--------|-------------------|
| Top | Dbl 2X | Douglas Fir-Larch |
| Base | 2X | Douglas Fir-Larch |

System : Wall
Member Type : Column
Building Code : IBC 2015
Design Methodology : ASD

| Max Unbraced Length | Comments |
|---------------------|----------|
| 8' | |

| Lateral Connections | | | | |
|---------------------|-----------|----------------------------|----------|-------------------|
| Supports | Connector | Type/Model | Quantity | Connector Nailing |
| Top | Nails | 8d (0.113" x 2 1/2") (Toe) | 2 | N/A |
| Base | Nails | 8d (0.113" x 2 1/2") (Toe) | 2 | N/A |

- Nailed connection at the top of the member is assumed to be nailed through the bottom 2x plate prior to placement of the top 2x of the double top plate assembly.

| Vertical Load | Tributary Width | Dead (0.90) | Snow (1.15) | Comments |
|----------------|-----------------|-------------|-------------|--------------|
| 1 - Point (lb) | N/A | 8160 | 8160 | Default Load |

| Lateral Load | Location | Tributary Width | Wind (1.60) | Comments |
|-------------------|-------------|-----------------|-------------|----------|
| 1 - Uniform (PSF) | Full Length | 1' | 23.7 | |

- ASCE/SEI 7 Sec. 30.4: Exposure Category (B), Mean Roof Height (33'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (115), Risk Category(II), Effective Wind Area determined using full member span and trib. width.
- IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

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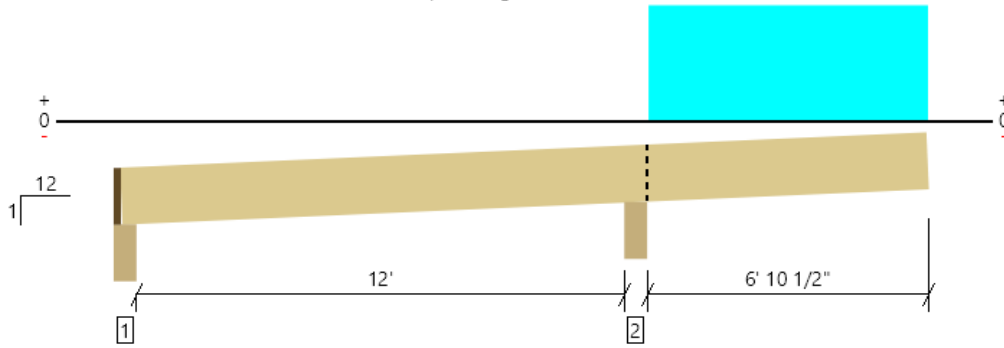
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Level, Pavilion Cant. Joist

1 piece(s) 1 3/4" x 7 1/4" 1.55E TimberStrand® LSL @ 12" OC

Sloped Length: 19' 10 5/16"



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

Member Length : 19' 9 3/16"

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|--------------------|--------------|-----------------|------|-----------------------------|
| Member Reaction (lbs) | 398 @ 12' 8 1/4" | 6036 (5.50") | Passed (7%) | -- | 1.0 D + 1.0 S (All Spans) |
| Shear (lbs) | 283 @ 13' 6 1/4" | 3015 | Passed (9%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Moment (Ft-lbs) | -1135 @ 12' 8 1/4" | 3721 | Passed (31%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Live Load Defl. (in) | 0.539 @ 19' 9 1/2" | 0.713 | Passed (2L/318) | -- | 1.0 D + 1.0 S (All Spans) |
| Total Load Defl. (in) | 0.972 @ 19' 9 1/2" | 0.951 | Passed (2L/176) | -- | 1.0 D + 1.0 S (All Spans) |

System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD
 Member Pitch : 1/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Right cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 4% increase in the moment capacity has been added to account for repetitive member usage.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | | Accessories |
|------------------------|----------------|-----------|----------|-------------------------|-----------|------|----------|------------------|
| | Total | Available | Required | Dead | Roof Live | Snow | Factored | |
| 1 - Beveled Plate - DF | 5.50" | 3.75" | 1.50" | -41 | -41 | -51 | -92 | 1 3/4" Rim Board |
| 2 - Beveled Plate - DF | 5.50" | 5.50" | 1.50" | 177 | 177 | 221 | 398 | Blocking |

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 19' 9" o/c | |
| Bottom Edge (Lu) | 19' 9" o/c | |

- Maximum allowable bracing intervals based on applied load.

| Vertical Load | Location (Side) | Spacing | Dead (0.90) | Roof Live (non-snow: 1.25) | Snow (1.15) | Comments |
|-------------------|-------------------|---------|-------------|----------------------------|-------------|--------------|
| 1 - Uniform (PSF) | 13' to 19' 9 1/2" | 12" | 20.0 | 20.0 | 25.0 | Default Load |

Weyerhaeuser Notes

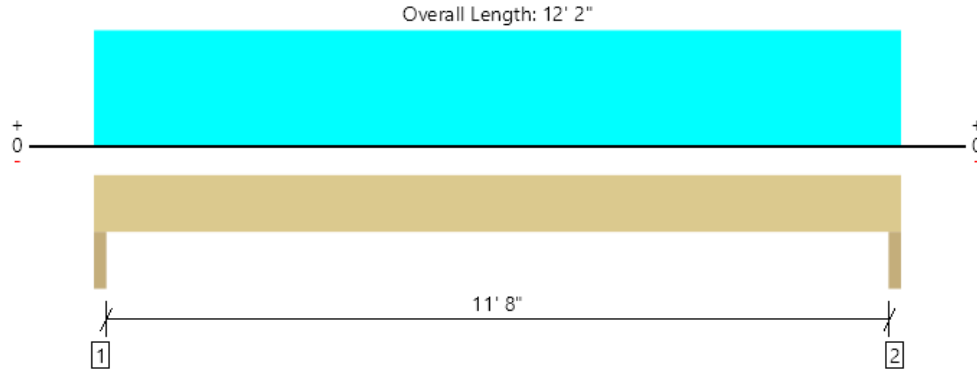
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Level, Pavilion East Face BMs
 1 piece(s) 5 1/4" x 9 1/2" 2.0E Parallam® PSL



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 5661 @ 1' 1/2" | 9844 (3.00") | Passed (58%) | -- | 1.0 D + 1.0 S (All Spans) |
| Shear (lbs) | 4692 @ 1' 1/2" | 11089 | Passed (42%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Moment (Ft-lbs) | 16519 @ 6' 1" | 22523 | Passed (73%) | 1.15 | 1.0 D + 1.0 S (All Spans) |
| Live Load Defl. (in) | 0.328 @ 6' 1" | 0.397 | Passed (L/436) | -- | 1.0 D + 1.0 S (All Spans) |
| Total Load Defl. (in) | 0.601 @ 6' 1" | 0.596 | Passed (L/238) | -- | 1.0 D + 1.0 S (All Spans) |

System : Floor
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | | Accessories |
|-------------------|----------------|-----------|----------|-------------------------|-----------|------|----------|-------------|
| | Total | Available | Required | Dead | Roof Live | Snow | Factored | |
| 1 - Trimmer - SPF | 3.00" | 3.00" | 1.73" | 2571 | 2470 | 3090 | 5661 | None |
| 2 - Trimmer - DF | 3.00" | 3.00" | 1.73" | 2571 | 2470 | 3090 | 5661 | None |

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 12' 2" o/c | |
| Bottom Edge (Lu) | 12' 2" o/c | |

•Maximum allowable bracing intervals based on applied load.

| Vertical Loads | Location (Side) | Tributary Width | Dead (0.90) | Roof Live (non-snow: 1.25) | Snow (1.15) | Comments |
|-----------------------|-------------------|-----------------|-------------|----------------------------|-------------|--|
| 0 - Self Weight (PLF) | 0 to 12' 2" | N/A | 15.6 | -- | -- | |
| 1 - Uniform (PLF) | 0 to 12' 2" (Top) | N/A | 230.0 | 229.0 | 287.0 | Linked from: Pavilion RF Joist, Support 2 |
| 2 - Uniform (PLF) | 0 to 12' 2" (Top) | N/A | 177.0 | 177.0 | 221.0 | Linked from: Pavilion Cant. Joist, Support 2 |

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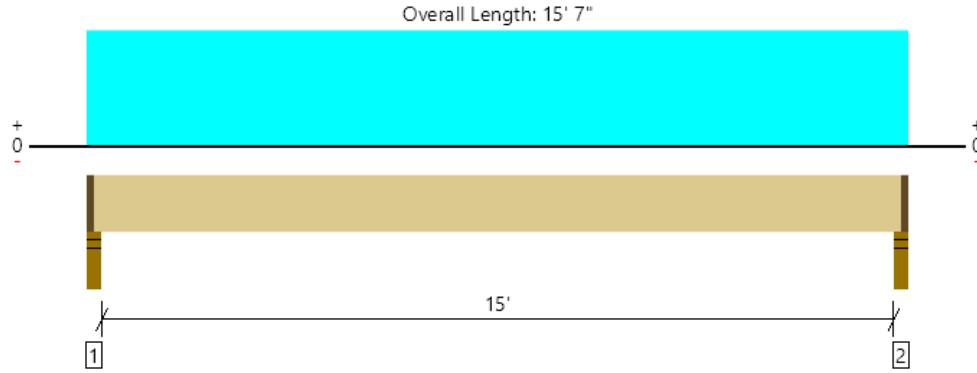
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

| | |
|---|-----------|
| ForteWEB Software Operator | Job Notes |
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, B9 - Unit 328, 428

1 piece(s) 7" x 11 7/8" 2.0E Parallam® PSL



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 6660 @ 2" | 7656 (1.75") | Passed (87%) | -- | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 5671 @ 1' 3 3/8" | 16071 | Passed (35%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 25321 @ 7' 9 1/2" | 39805 | Passed (64%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.345 @ 7' 9 1/2" | 0.381 | Passed (L/531) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.578 @ 7' 9 1/2" | 0.762 | Passed (L/317) | -- | 1.0 D + 1.0 L (All Spans) |

System : Floor
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Member should be side-loaded from both sides of the member or braced to prevent rotation.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------------|----------|------------------|
| | Total | Available | Required | Dead | Floor Live | Factored | |
| 1 - Stud wall - DF | 3.50" | 1.75" | 1.52" | 2731 | 4052 | 6783 | 1 3/4" Rim Board |
| 2 - Stud wall - DF | 3.50" | 1.75" | 1.52" | 2731 | 4052 | 6783 | 1 3/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 15' 4" o/c | |
| Bottom Edge (Lu) | 15' 4" o/c | |

•Maximum allowable bracing intervals based on applied load.

| Vertical Loads | Location (Side) | Tributary Width | Dead (0.90) | Floor Live (1.00) | Comments |
|-----------------------|----------------------|-----------------|-------------|-------------------|--------------|
| 0 - Self Weight (PLF) | 1 3/4" to 15' 5 1/4" | N/A | 26.0 | -- | |
| 1 - Uniform (PSF) | 0 to 15' 7" (Front) | 13' | 25.0 | 40.0 | Default Load |

Member Notes

Worst Case B4

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

| ForteWEB Software Operator | Job Notes |
|---|-----------|
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



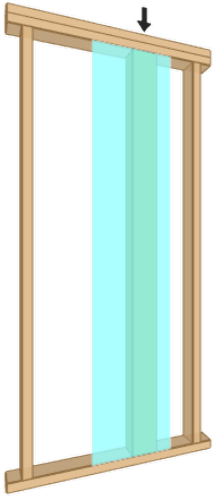
Level, B9 - L3/L4 Col.

1 piece(s) 3 1/2" x 7" 1.8E Parallam® PSL

Wall Height: 8' 6"

Member Height: 8' 1 1/2"

Tributary Width: 1'



Drawing is Conceptual

| Design Results | Actual | Allowed | Result | LDF | Load: Combination |
|-------------------------|-----------------|---------|-----------------|------|-------------------|
| Slenderness | 27 | 50 | Passed (55%) | -- | -- |
| Compression (lbs) | 13566 | 23093 | Passed (59%) | 1.00 | 1.0 D + 1.0 L |
| Plate Bearing (lbs) | 13566 | 15313 | Passed (89%) | -- | 1.0 D + 1.0 L |
| Lateral Reaction (lbs) | 62 | -- | -- | 1.60 | 1.0 D + 0.6 W |
| Lateral Shear (lbs) | 53 | 6011 | Passed (1%) | 1.60 | 1.0 D + 0.6 W |
| Lateral Moment (ft-lbs) | 125 @ mid-span | 9814 | Passed (1%) | 1.60 | 1.0 D + 0.6 W |
| Total Deflection (in) | 0.03 @ mid-span | 0.81 | Passed (L/3032) | -- | 1.0 D + 1.0 L |
| Bending/Compression | 0.49 | 1 | Passed (49%) | 1.00 | 1.0 D + 1.0 L |

- Lateral deflection criteria: Wind (L/120)
- Input axial load eccentricity for this design is 10% of applicable member side dimension.
- Applicable calculations are based on NDS.
- Bearing shall be on a metal plate or strap, or on other equivalently durable, rigid, homogeneous material with sufficient stiffness to distribute applied load.

| Supports | Type | Material |
|----------|--------|-------------------|
| Top | Dbl 2X | Douglas Fir-Larch |
| Base | 2X | Douglas Fir-Larch |

System : Wall
 Member Type : Column
 Building Code : IBC 2015
 Design Methodology : ASD

| Max Unbraced Length | Comments |
|---------------------|----------|
| 8' | |

| Lateral Connections | | | | |
|---------------------|-----------|----------------------------|----------|-------------------|
| Supports | Connector | Type/Model | Quantity | Connector Nailing |
| Top | Nails | 8d (0.113" x 2 1/2") (Toe) | 2 | N/A |
| Base | Nails | 8d (0.113" x 2 1/2") (Toe) | 2 | N/A |

- Nailed connection at the top of the member is assumed to be nailed through the bottom 2x plate prior to placement of the top 2x of the double top plate assembly.

| Vertical Load | Tributary Width | Dead (0.90) | Floor Live (1.00) | Comments |
|----------------|-----------------|-------------|-------------------|--------------|
| 1 - Point (lb) | N/A | 5462 | 8104 | Default Load |

| Lateral Load | Location | Tributary Width | Wind (1.60) | Comments |
|-------------------|-------------|-----------------|-------------|----------|
| 1 - Uniform (PSF) | Full Length | 1' | 25.3 | |

- ASCE/SEI 7 Sec. 30.4: Exposure Category (B), Mean Roof Height (33'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (115), Risk Category(II), Effective Wind Area determined using full member span and trib. width.
- IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

Weyerhaeuser Notes

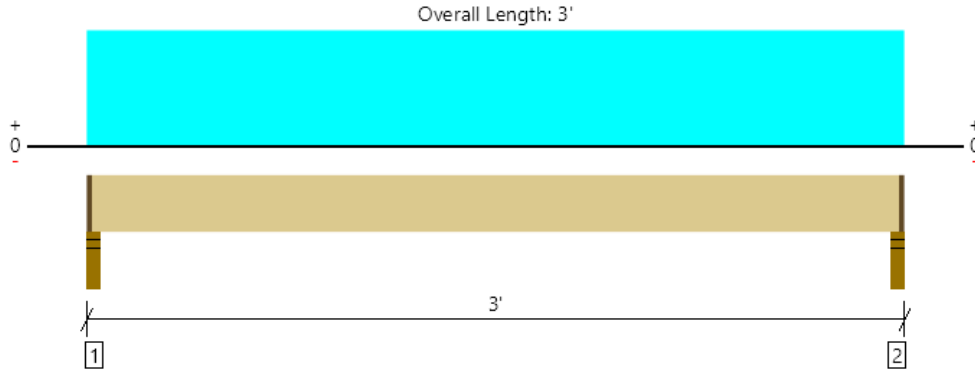
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| | |
|---|-----------|
| ForteWEB Software Operator | Job Notes |
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Floor, Typical Interior Header (B1)
1 piece(s) 4 x 10 Douglas Fir-Larch No. 1



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|-----------------|------|-----------------------------|
| Member Reaction (lbs) | 2007 @ 2" | 3347 (2.25") | Passed (60%) | -- | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 629 @ 1' 3/4" | 3885 | Passed (16%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 1278 @ 1' 6" | 4991 | Passed (26%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.003 @ 1' 6" | 0.067 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.004 @ 1' 6" | 0.089 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/360).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|---------------------|----------------|-----------|----------|-------------------------|------------|-------|------------------|
| | Total | Available | Required | Dead | Floor Live | Total | |
| 1 - Stud wall - SPF | 3.50" | 2.25" | 1.50" | 836 | 1320 | 2156 | 1 1/4" Rim Board |
| 2 - Stud wall - SPF | 3.50" | 2.25" | 1.50" | 836 | 1320 | 2156 | 1 1/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 2' 10" o/c | |
| Bottom Edge (Lu) | 2' 10" o/c | |

•Maximum allowable bracing intervals based on applied load.

| Vertical Loads | Location (Side) | Tributary Width | Dead (0.90) | Floor Live (1.00) | Comments |
|-----------------------|----------------------|-----------------|-------------|-------------------|--------------|
| 0 - Self Weight (PLF) | 1 1/4" to 2' 10 3/4" | N/A | 8.2 | -- | |
| 1 - Uniform (PLF) | 0 to 3' (Front) | N/A | 550.0 | 880.0 | Default Load |

Weyerhaeuser Notes

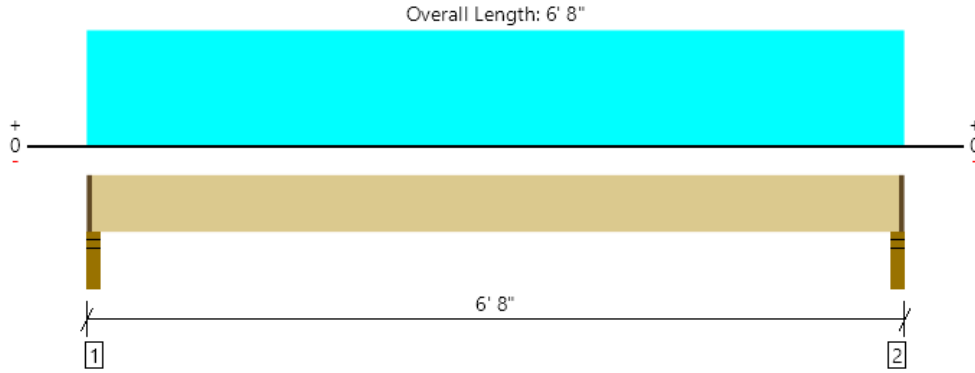
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| ForteWEB Software Operator | Job Notes |
|--|-----------|
| Alisha Khadka PCS Structural Solutions (409) 600-3170 alisha.khadka@katerra.com | |



Floor, Typical Exterior Header (B2)
1 piece(s) 6 x 10 Douglas Fir-Larch No. 1



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|-----------------|------|-----------------------------|
| Member Reaction (lbs) | 3996 @ 2" | 5259 (2.25") | Passed (76%) | -- | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 2784 @ 1' 1" | 5922 | Passed (47%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 6204 @ 3' 4" | 9307 | Passed (67%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.048 @ 3' 4" | 0.158 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.079 @ 3' 4" | 0.211 | Passed (L/960) | -- | 1.0 D + 1.0 L (All Spans) |

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/360).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|---------------------|----------------|-----------|----------|-------------------------|------------|-------|------------------|
| | Total | Available | Required | Dead | Floor Live | Total | |
| 1 - Stud wall - SPF | 3.50" | 2.25" | 1.71" | 1612 | 2511 | 4123 | 1 1/4" Rim Board |
| 2 - Stud wall - SPF | 3.50" | 2.25" | 1.71" | 1612 | 2511 | 4123 | 1 1/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 6' 6" o/c | |
| Bottom Edge (Lu) | 6' 6" o/c | |

•Maximum allowable bracing intervals based on applied load.

| Vertical Loads | Location (Side) | Tributary Width | Dead (0.90) | Floor Live (1.00) | Comments |
|-----------------------|---------------------|-----------------|-------------|-------------------|--------------|
| 0 - Self Weight (PLF) | 1 1/4" to 6' 6 3/4" | N/A | 13.2 | -- | |
| 1 - Uniform (PLF) | 0 to 6' 8" (Front) | N/A | 470.8 | 753.3 | Default Load |

Weyerhaeuser Notes

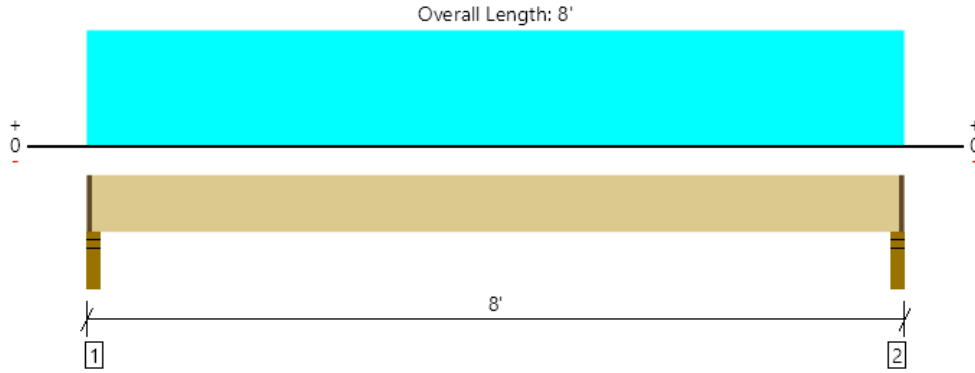
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| ForteWEB Software Operator | Job Notes |
|--|-----------|
| Alisha Khadka PCS Structural Solutions (409) 600-3170 alisha.khadka@katerra.com | |



Floor, Typical Exterior Header (B2)-13'-9"
1 piece(s) 6 x 10 Douglas Fir-Larch No. 1



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|-----------------|------|-----------------------------|
| Member Reaction (lbs) | 3597 @ 2" | 5259 (2.25") | Passed (68%) | -- | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 2693 @ 1' 1" | 5922 | Passed (45%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 6783 @ 4' | 9307 | Passed (73%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.077 @ 4' | 0.192 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.127 @ 4' | 0.256 | Passed (L/725) | -- | 1.0 D + 1.0 L (All Spans) |

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/360).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|---------------------|----------------|-----------|----------|-------------------------|------------|-------|------------------|
| | Total | Available | Required | Dead | Floor Live | Total | |
| 1 - Stud wall - SPF | 3.50" | 2.25" | 1.54" | 1452 | 2240 | 3692 | 1 1/4" Rim Board |
| 2 - Stud wall - SPF | 3.50" | 2.25" | 1.54" | 1452 | 2240 | 3692 | 1 1/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 7' 10" o/c | |
| Bottom Edge (Lu) | 7' 10" o/c | |

•Maximum allowable bracing intervals based on applied load.

| Vertical Loads | Location (Side) | Tributary Width | Dead (0.90) | Floor Live (1.00) | Comments |
|-----------------------|----------------------|-----------------|-------------|-------------------|--------------|
| 0 - Self Weight (PLF) | 1 1/4" to 7' 10 3/4" | N/A | 13.2 | -- | |
| 1 - Uniform (PLF) | 0 to 8' (Front) | N/A | 350.0 | 560.0 | Default Load |

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| | |
|--|-----------|
| ForteWEB Software Operator | Job Notes |
| Alisha Khadka PCS Structural Solutions (409) 600-3170 alisha.khadka@katerra.com | |





BUILT-UP COLUMNS

2015 NDS/2015 IBC

| | | | | |
|---------------|----------------|----------|---------|--------------------|
| Doug-Fir #2 | $F_b =$ | 900 psi | $C_r =$ | 1.15 for 3+ studs |
| or Hem-Fir #1 | $F_v =$ | 150 psi | $C_F =$ | 1.5 size - bending |
| | $F_c =$ | 1350 psi | $C_F =$ | 1.15 size - axial |
| | $F_{c\perp} =$ | 405 psi | $E =$ | 1.50E+06 psi |

| | | | | |
|---|-------------------------|------|-------|----------------------|
| $V_{allow} = A * F_v * C_D / 1.5$ | $V_{applied} (\#) =$ | 50 | $A =$ | 5.25 in ² |
| $M_{allow} = S * F_b * C_D * C_F * C_r$ | $M_{applied} (ft-\#) =$ | 100 | $S =$ | 3.06 in ³ |
| $P_{allow} = A * F_c * C_D * C_F * C_P$ | $P_{applied} (\#) =$ | 1500 | $I =$ | 5.36 in ⁴ |

2 X 4 ~ FLOOR (Cd = 1.0)

| 8'-0" | | 2x4 | (2) 2x4 | (3) 2x4 | (4) 2x4 |
|---------------|-------------------------|------|---------|---------|---------|
| $C_p = 0.348$ | $V_{allow} (\#) =$ | 525 | 1050 | 1575 | 2100 |
| | $M_{allow} (ft - \#) =$ | 345 | 689 | 1189 | 1585 |
| | $P_{allow} (\#) =$ | 2836 | 5673 | 8509 | 11346 |
| | Interaction = | 0.84 | 0.26 | 0.13 | 0.09 |
| | $P_{c,allow} (\#) =$ | 2126 | 4253 | 6379 | 8505 |
| 10'-0" | | 2x4 | (2) 2x4 | (3) 2x4 | (4) 2x4 |
| $C_p = 0.232$ | $V_{allow} (\#) =$ | 525 | 1050 | 1575 | 2100 |
| | $M_{allow} (ft - \#) =$ | 345 | 689 | 1189 | 1585 |
| | $P_{allow} (\#) =$ | 1891 | 3782 | 5673 | 7564 |
| | Interaction = | N.G. | 0.39 | 0.18 | 0.12 |
| | $P_{c,allow} (\#) =$ | 2126 | 4253 | 6379 | 8505 |
| 12'-0" | | 2x4 | (2) 2x4 | (3) 2x4 | (4) 2x4 |
| $C_p = 0.165$ | $V_{allow} (\#) =$ | 525 | 1050 | 1575 | 2100 |
| | $M_{allow} (ft - \#) =$ | 345 | 689 | 1189 | 1585 |
| | $P_{allow} (\#) =$ | 1345 | 2690 | 4035 | 5379 |
| | Interaction = | N.G. | 0.62 | 0.27 | 0.16 |
| | $P_{c,allow} (\#) =$ | 2126 | 4253 | 6379 | 8505 |

2 X 4 ~ ROOF (Cd = 1.15)

| 8'-0" | | 2x4 | (2) 2x4 | (3) 2x4 | (4) 2x4 |
|---------------|-------------------------|------|---------|---------|---------|
| $C_p = 0.308$ | $V_{allow} (\#) =$ | 604 | 1208 | 1811 | 2415 |
| | $M_{allow} (ft - \#) =$ | 396 | 792 | 1367 | 1823 |
| | $P_{allow} (\#) =$ | 2887 | 5774 | 8661 | 11548 |
| | Interaction = | 0.75 | 0.23 | 0.12 | 0.08 |
| | $P_{c,allow} (\#) =$ | 2126 | 4253 | 6379 | 8505 |
| 10'-0" | | 2x4 | (2) 2x4 | (3) 2x4 | (4) 2x4 |
| $C_p = 0.204$ | $V_{allow} (\#) =$ | 604 | 1208 | 1811 | 2415 |
| | $M_{allow} (ft - \#) =$ | 396 | 792 | 1367 | 1823 |
| | $P_{allow} (\#) =$ | 1912 | 3824 | 5736 | 7649 |
| | Interaction = | N.G. | 0.36 | 0.17 | 0.11 |
| | $P_{c,allow} (\#) =$ | 2126 | 4253 | 6379 | 8505 |
| 12'-0" | | 2x4 | (2) 2x4 | (3) 2x4 | (4) 2x4 |
| $C_p = 0.144$ | $V_{allow} (\#) =$ | 604 | 1208 | 1811 | 2415 |
| | $M_{allow} (ft - \#) =$ | 396 | 792 | 1367 | 1823 |
| | $P_{allow} (\#) =$ | 1350 | 2699 | 4049 | 5399 |
| | Interaction = | N.G. | 0.58 | 0.25 | 0.15 |
| | $P_{c,allow} (\#) =$ | 2126 | 4253 | 6379 | 8505 |



Project: MERCER ISLAND MIXED USE

Job Number: 19-028

Sheet: _____ of _____

Name: AED

Originating Office: Tacoma Seattle

Date: 09/29/21

BUILT-UP COLUMNS

2015 NDS/2015 IBC

Doug-Fir #2 $F_b = 900$ psi $C_r = 1.15$ for 3+ studs
 or Hem-Fir #1 $F_v = 150$ psi $C_F = 1.3$ size - bending
 $F_c = 1350$ psi $C_F = 1.1$ size - axial
 $F_{c\perp} = 405$ psi $E = 1.50E+06$ psi

$V_{allow} = A * F_v * C_D / 1.5$ $V_{applied} (\#) = 50$ $A = 8.25$ in²
 $M_{allow} = S * F_b * C_D * C_F * C_r$ $M_{applied} (ft-\#) = 100$ $S = 7.56$ in³
 $P_{allow} = A * F_c * C_D * C_F * C_P$ $P_{applied} (\#) = 1500$ $I = 20.80$ in⁴

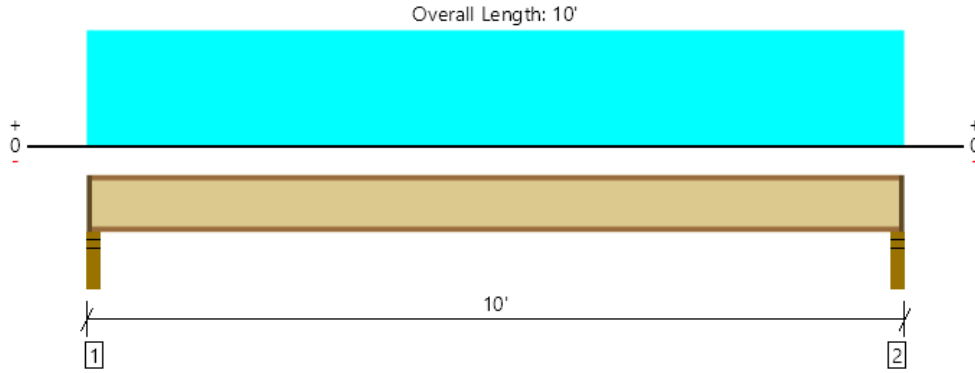
2 X 6 ~ FLOOR (Cd=1.0)

| 8'-0" | 2x6 | (2) 2x6 | (3) 2x6 | (4) 2x6 |
|---------------|--------------------------------|---------|---------|---------|
| $C_p = 0.639$ | $V_{allow} (\#) = 825$ | 1650 | 2475 | 3300 |
| | $M_{allow} (ft - \#) = 737$ | 1475 | 2544 | 3392 |
| | $P_{allow} (\#) = 8441$ | 16882 | 25323 | 33764 |
| | Interaction = 0.19 | 0.08 | 0.04 | 0.03 |
| | $P_{c\perp allow} (\#) = 3341$ | 6683 | 10024 | 13365 |
| 10'-0" | 2x6 | (2) 2x6 | (3) 2x6 | (4) 2x6 |
| $C_p = 0.522$ | $V_{allow} (\#) = 825$ | 1650 | 2475 | 3300 |
| | $M_{allow} (ft - \#) = 737$ | 1475 | 2544 | 3392 |
| | $P_{allow} (\#) = 6395$ | 12790 | 19185 | 25581 |
| | Interaction = 0.22 | 0.09 | 0.05 | 0.03 |
| | $P_{c\perp allow} (\#) = 3341$ | 6683 | 10024 | 13365 |
| 12'-0" | 2x6 | (2) 2x6 | (3) 2x6 | (4) 2x6 |
| $C_p = 0.392$ | $V_{allow} (\#) = 825$ | 1650 | 2475 | 3300 |
| | $M_{allow} (ft - \#) = 737$ | 1475 | 2544 | 3392 |
| | $P_{allow} (\#) = 4802$ | 9605 | 14407 | 19210 |
| | Interaction = 0.29 | 0.10 | 0.05 | 0.04 |
| | $P_{c\perp allow} (\#) = 3341$ | 6683 | 10024 | 13365 |

2 X 6 ~ ROOF (Cd = 1.15)

| 8'-0" | 2x6 | (2) 2x6 | (3) 2x6 | (4) 2x6 |
|---------------|--------------------------------|---------|---------|---------|
| $C_p = 0.639$ | $V_{allow} (\#) = 949$ | 1898 | 2846 | 3795 |
| | $M_{allow} (ft - \#) = 848$ | 1696 | 2925 | 3901 |
| | $P_{allow} (\#) = 9003$ | 18006 | 27008 | 36011 |
| | Interaction = 0.16 | 0.07 | 0.04 | 0.03 |
| | $P_{c\perp allow} (\#) = 3341$ | 6683 | 10024 | 13365 |
| 10'-0" | 2x6 | (2) 2x6 | (3) 2x6 | (4) 2x6 |
| $C_p = 0.47$ | $V_{allow} (\#) = 949$ | 1898 | 2846 | 3795 |
| | $M_{allow} (ft - \#) = 848$ | 1696 | 2925 | 3901 |
| | $P_{allow} (\#) = 6622$ | 13244 | 19865 | 26487 |
| | Interaction = 0.20 | 0.08 | 0.04 | 0.03 |
| | $P_{c\perp allow} (\#) = 3341$ | 6683 | 10024 | 13365 |
| 12'-0" | 2x6 | (2) 2x6 | (3) 2x6 | (4) 2x6 |
| $C_p = 0.347$ | $V_{allow} (\#) = 949$ | 1898 | 2846 | 3795 |
| | $M_{allow} (ft - \#) = 848$ | 1696 | 2925 | 3901 |
| | $P_{allow} (\#) = 4889$ | 9778 | 14667 | 19555 |
| | Interaction = 0.26 | 0.09 | 0.05 | 0.03 |
| | $P_{c\perp allow} (\#) = 3341$ | 6683 | 10024 | 13365 |

Floor, Typical Corridor Joists
1 piece(s) 11 7/8" TJI @ 110 @ 16" OC



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|-----------------|------|-----------------------------|
| Member Reaction (lbs) | 423 @ 2 1/2" | 1041 (2.25") | Passed (41%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 407 @ 3 1/2" | 1560 | Passed (26%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 992 @ 5' | 3160 | Passed (31%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.041 @ 5' | 0.240 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.067 @ 5' | 0.319 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |
| TJ-Pro™ Rating | 63 | 40 | Passed | -- | -- |

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/360).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|---------------------|----------------|-----------|----------|-------------------------|------------|-------|------------------|
| | Total | Available | Required | Dead | Floor Live | Total | |
| 1 - Stud wall - SPF | 3.50" | 2.25" | 1.75" | 166 | 266 | 432 | 1 1/4" Rim Board |
| 2 - Stud wall - SPF | 3.50" | 2.25" | 1.75" | 166 | 266 | 432 | 1 1/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 5' 9" o/c | |
| Bottom Edge (Lu) | 9' 10" o/c | |

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

| Vertical Load | Location (Side) | Spacing | Dead (0.90) | Floor Live (1.00) | Comments |
|-------------------|-----------------|---------|-------------|-------------------|--------------|
| 1 - Uniform (PLF) | 0 to 10' | N/A | 33.2 | 53.2 | Default Load |

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

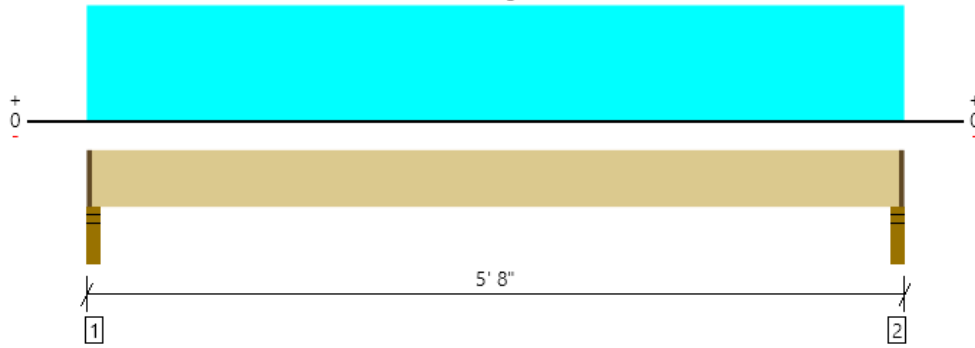
| ForteWEB Software Operator | Job Notes |
|--|-----------|
| Alisha Khadka PCS Structural Solutions (409) 600-3170 alisha.khadka@katerra.com | |



Floor, Typical Corridor Beam
 1 piece(s) 3 1/2" x 5 1/4" 1.8E Parallam® PSL

B5

Overall Length: 5' 8"



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 1790 @ 2" | 3347 (2.25") | Passed (53%) | -- | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 1380 @ 8 3/4" | 2818 | Passed (49%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 2331 @ 2' 10" | 3672 | Passed (64%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.106 @ 2' 10" | 0.133 | Passed (L/605) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.173 @ 2' 10" | 0.178 | Passed (L/369) | -- | 1.0 D + 1.0 L (All Spans) |

System : Floor
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/360).
- Allowed moment does not reflect the adjustment for the beam stability factor.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|---------------------|----------------|-----------|----------|-------------------------|------------|-------|------------------|
| | Total | Available | Required | Dead | Floor Live | Total | |
| 1 - Stud wall - SPF | 3.50" | 2.25" | 1.50" | 724 | 1133 | 1857 | 1 1/4" Rim Board |
| 2 - Stud wall - SPF | 3.50" | 2.25" | 1.50" | 724 | 1133 | 1857 | 1 1/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 5' 6" o/c | |
| Bottom Edge (Lu) | 5' 6" o/c | |

- Maximum allowable bracing intervals based on applied load.

| Vertical Loads | Location (Side) | Tributary Width | Dead (0.90) | Floor Live (1.00) | Comments |
|-----------------------|---------------------|-----------------|-------------|-------------------|--------------|
| 0 - Self Weight (PLF) | 1 1/4" to 5' 6 3/4" | N/A | 5.7 | -- | |
| 1 - Uniform (PLF) | 0 to 5' 8" (Front) | N/A | 250.0 | 400.0 | Default Load |

Weyerhaeuser Notes

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

| ForteWEB Software Operator | Job Notes |
|--|-----------|
| Alisha Khadka PCS Structural Solutions (409) 600-3170 alisha.khadka@katerra.com | |



STUD WALLS

| | DEAD | LIVE | SNOW |
|--------------|--------|---------|--------|
| ROOF: | 18 PSF | 25 PSF | 25 PSF |
| RESIDENTIAL: | 30 PSF | 40 PSF | 0 PSF |
| STAIRS: | 10 PSF | 100 PSF | 0 PSF |
| WALLS: | 9 PSF | 0 PSF | 0 PSF |

| LEVE | WALL | TRIB. WIDTH (ft) | DL (plf) | LLroof (plf) | SL (plf) | DL (lbs) | LL (lbs) | SL (lbs) |
|------|---------------|------------------|----------|--------------|----------|----------|----------|----------|
| 4 | A.1 | 1.83 | 42.09 | 45.75 | 45.75 | 55.98 | 60.85 | 60.85 |
| | 9.1 | 4.50 | 103.50 | 112.50 | 112.50 | 137.66 | 149.63 | 149.63 |
| | 4.3 | 10.83 | 249.09 | 270.75 | 270.75 | 331.29 | 360.10 | 360.10 |
| | C.2 | 12.33 | 283.59 | 308.25 | 308.25 | 377.17 | 409.97 | 409.97 |
| | Exterior | 14.00 | 322.00 | 350.00 | 350.00 | 428.26 | 465.50 | 465.50 |
| | O.1 | 16.17 | 371.91 | 404.25 | 404.25 | 494.64 | 537.65 | 537.65 |
| | J.1 | 18.92 | 435.16 | 473.00 | 473.00 | 578.76 | 629.09 | 629.09 |
| | Q.1/(4.2-2x6) | 22.00 | 506.00 | 550.00 | 550.00 | 672.98 | 731.50 | 731.50 |
| | 1.11 | 24.67 | 567.41 | 616.75 | 616.75 | 754.66 | 820.28 | 820.28 |

| LEVE | WALL | TRIB. WIDTH (ft) | DL (plf) | LLfloor (plf) | SL (plf) | DL (lbs) | LLfloor (lbs) | SL/LLroof |
|------|----------|------------------|----------|---------------|----------|----------|---------------|-----------|
| 3 | A.1 | 1.83 | 96.99 | 73.20 | 45.75 | 129.00 | 97.36 | 60.85 |
| | 9.1 | 4.50 | 238.5 | 180.00 | 112.50 | 317.21 | 239.40 | 149.63 |
| | 4.3 | 10.83 | 573.99 | 433.20 | 270.75 | 763.41 | 576.16 | 360.10 |
| | C.2 | 12.33 | 653.49 | 493.20 | 308.25 | 869.14 | 655.96 | 409.97 |
| | Exterior | 14.00 | 742 | 560.00 | 350.00 | 986.86 | 744.80 | 465.50 |
| | O.1 | 16.17 | 857.01 | 646.80 | 404.25 | 1139.82 | 860.24 | 537.65 |
| | J.1 | 18.92 | 1002.76 | 756.80 | 473.00 | 1333.67 | 1006.54 | 629.09 |
| | Q.1 | 22.00 | 1166 | 880.00 | 550.00 | 1550.78 | 1170.40 | 731.50 |
| | 1.11 | 24.67 | 1307.51 | 986.80 | 616.75 | 1738.99 | 1312.44 | 820.28 |

| LEVE | WALL | TRIB. WIDTH (ft) | DL (plf) | LLfloor (plf) | SL (plf) | DL (lbs) | LLfloor (lbs) | SL/LLroof |
|------|----------|------------------|----------|---------------|----------|----------|---------------|-----------|
| 2 | A.1 | 1.83 | 151.89 | 146.40 | 45.75 | 202.01 | 194.71 | 60.85 |
| | 9.1 | 4.50 | 373.5 | 360.00 | 112.50 | 496.76 | 478.80 | 149.63 |
| | 4.3 | 10.83 | 898.89 | 866.40 | 270.75 | 1195.52 | 1152.31 | 360.10 |
| | C.2 | 12.33 | 1023.39 | 986.40 | 308.25 | 1361.11 | 1311.91 | 409.97 |
| | Exterior | 14.00 | 1162 | 1120.00 | 350.00 | 1545.46 | 1489.60 | 465.50 |
| | O.1 | 16.17 | 1342.11 | 1293.60 | 404.25 | 1785.01 | 1720.49 | 537.65 |
| | J.1 | 18.92 | 1570.36 | 1513.60 | 473.00 | 2088.58 | 2013.09 | 629.09 |
| | Q.1 | 22.00 | 1826 | 1760.00 | 550.00 | 2428.58 | 2340.80 | 731.50 |
| | 1.11 | 24.67 | 2047.61 | 1973.60 | 616.75 | 2723.32 | 2624.89 | 820.28 |



STUD WALL DESIGN - A.1

2018 NDS/2018 IBC

WALL DATA

| | | | | | |
|---------------------|--------------|-----------------------|--------------|-----------------|---------|
| LUMBER TYPE: | DF#2 | APPLIED LOADS: | $P_{DEAD} =$ | 190 | LBS |
| $F_b =$ | 900 PSI | $W_{WIND} =$ | 8.0 PSF | $P_{LIVE} =$ | 195 LBS |
| $F_c =$ | 1350 PSI | $W_{SEISMIC} =$ | 5.0 PSF | $P_{SNOW} =$ | 61 LBS |
| $F_{cL} =$ | 625 PSI | | | $P_{WIND} =$ | 0 LBS |
| $E =$ | 1.60E+06 PSI | | | $P_{SEISMIC} =$ | 0 LBS |

| | | | | |
|--------------------|----------------------|-----------------------|------------------------|----------------------|
| STUD SIZE: | (1) 2x4 | MISCELLANEOUS: | HEIGHT = | 9.33 FT |
| $A_x =$ | 5.25 IN ² | | SPACING = | 16 IN |
| $S_x =$ | 3.06 IN ³ | | ECCENTRICITY = | 0.1 IN |
| $I_x =$ | 5.36 IN ⁴ | | $C_{F(Compression)} =$ | 1.15 (NDS 4.3.6) |
| $C_{F(BENDING)} =$ | 1.5 (NDS 4.3.6) | APPLY? | | |
| $F_{cE} =$ | 469.1 PSI | $C_{SYS(BENDING)} =$ | 1.50 | YES (SDPWS T3.1.1.1) |
| $C_b =$ | 1.25 (NDS 3.10.4) | $C_{F(BENDING)} =$ | 1.15 | YES (NDS 4.3.9) |

LOAD CASES - IBC 1605.3.1

| | | | |
|--------|---|--------|--|
| CASE 1 | DEAD + LIVE + 5 PSF LAT. | CASE 4 | DEAD + 0.45WIND + 0.75LIVE + 0.75SNOW |
| CASE 2 | DEAD + SNOW + 5 PSF LAT. | CASE 5 | DEAD + 0.60WIND |
| CASE 3 | DEAD + 0.75LIVE + 0.75SNOW + 5 PSF LAT. | CASE 6 | DEAD + 0.75SEISMIC |
| | | CASE 7 | DEAD + 0.53SEISMIC + 0.75LIVE + 0.75SNOW |

ALLOWABLE STRESSES - C_d PER NDS T3.2, C_p PER NDS 3.7.1, ASSUME $C_m, C_t, C_i, C_L = 1.0$

| CASE | C_D | F_c^* | F_{cE}/F_c^* | C_P | F_c' | F_b' | F_{cL} |
|-------|-------|---------|----------------|-------|--------|--------|----------|
| 1 | 1.00 | 1553 | 0.30 | 0.280 | 435 | 1553 | 781 |
| 2 & 3 | 1.15 | 1785 | 0.26 | 0.247 | 440 | 1785 | 781 |
| 4 & 5 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 3240 | 781 |
| 6 & 7 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 2484 | 781 |

APPLIED STRESSES - NDS CHAPTER 3 DESIGN EQUATIONS

| CASE | $P_{APPLIED}$ | F_c | $M_{LAT. LOAD}$ | $M_{ECC.}$ | M_{TOTAL} | f_b |
|------|---------------|-------|-----------------|------------|-------------|-------|
| 1 | 385 | 73 | 73 | 3 | 75 | 292 |
| 2 | 251 | 48 | 73 | 2 | 74 | 289 |
| 3 | 382 | 73 | 73 | 3 | 75 | 292 |
| 4 | 382 | 73 | 52 | 3 | 54 | 212 |
| 5 | 190 | 36 | 70 | 2 | 71 | 277 |
| 6 | 190 | 36 | 51 | 2 | 52 | 203 |
| 7 | 382 | 73 | 38 | 3 | 40 | 158 |

DESIGN CHECKS - COMBINED STRESS CHECK PER NDS EQN 3.9-3

| CASE | f_c/F_c' | f_b/F_b' | f_c/F_{cL} | Combined | f_c/F_{cE} | Deflection | L/? |
|------------|------------|------------|--------------|----------|--------------|------------|--------|
| 1 | 0.17 | 0.19 | 0.09 | 0.25 | 0.16 | 0.14 | L/822 |
| 2 | 0.11 | 0.16 | 0.06 | 0.19 | 0.10 | 0.13 | L/830 |
| 3 | 0.17 | 0.16 | 0.09 | 0.22 | 0.15 | 0.14 | L/822 |
| 4* | 0.16 | 0.07 | 0.09 | 0.10 | 0.15 | 0.05 | L/2422 |
| 5* | 0.08 | 0.09 | 0.05 | 0.10 | 0.08 | 0.06 | L/1859 |
| 6 | 0.08 | 0.08 | 0.05 | 0.09 | 0.08 | 0.09 | L/1184 |
| 7 | 0.16 | 0.06 | 0.09 | 0.10 | 0.15 | 0.07 | L/1515 |
| MAX. ----> | 0.17 | 0.19 | 0.09 | 0.25 | 0.16 | 0.14 | L/822 |
| | O.K. | O.K. | O.K. | O.K. | O.K. | | |

* Deflections reduced by 0.42 per IBC Table 1604.3 footnote F. Increase deflection by 1.4 for jambs supporting glass.

PLATE BENDING - *ALIGN STUDS WITH JOISTS WHERE POSSIBLE*

| | | | | | | |
|-----------------------|------------|-----------------|----------------------------|----------|----------|---|
| MISCELLANEOUS: | $C_{Fu} =$ | 1.1 (NDS 4.3.7) | ALLOWABLE STRESSES: | $F_v' =$ | 173 PSI | <div style="border: 1px solid black; padding: 5px; text-align: center;"> STUD REACTIONS (OUT - OF - PLANE) 50 LB </div> |
| | $F_v =$ | 150 PSI | | $F_b' =$ | 1708 PSI | |

| | | | | | | |
|----------------------------------|---------|-----------------------|--------------------------|------------------|----------|------------|
| DBL TOP PLATE PROPERTIES: | $A_x =$ | 10.50 IN ² | APPLIED STRESSES: | $f_v =$ | 24 PSI | <---- O.K. |
| | $S_x =$ | 2.63 IN ³ | | $f_b =$ | 382 PSI | <---- O.K. |
| | $I_x =$ | 1.97 IN ⁴ | | $\Delta_{MAX} =$ | 0.007 IN | |

STUD WALL DESIGN - 9.1

2018 NDS/2018 IBC

WALL DATA

| | | | | | | |
|---------------------|----------------------|---|-----------------------|------------------------|------------------|------------------|
| LUMBER TYPE: | DF#2 | ▼ | APPLIED LOADS: | $P_{DEAD} =$ | 467 | LBS |
| $F_b =$ | 900 PSI | | $W_{WIND} =$ | 8.0 PSF | $P_{LIVE} =$ | 479 LBS |
| $F_c =$ | 1350 PSI | | $W_{SEISMIC} =$ | 5.0 PSF | $P_{SNOW} =$ | 150 LBS |
| $F_{c \perp} =$ | 625 PSI | | | | $P_{WIND} =$ | 0 LBS |
| $E =$ | 1.60E+06 PSI | | | | $P_{SEISMIC} =$ | 0 LBS |
| STUD SIZE: | | | MISCELLANEOUS: | | HEIGHT = | |
| | (1) 2x4 | ▼ | | | 9.33 FT | |
| $A_x =$ | 5.25 IN ² | | | SPACING = | 16 IN | |
| $S_x =$ | 3.06 IN ³ | | | ECCENTRICITY = | 0.1 IN | |
| $I_x =$ | 5.36 IN ⁴ | | | $C_{F(Compression)} =$ | 1.15 (NDS 4.3.6) | |
| $C_{F(BENDING)} =$ | 1.5 (NDS 4.3.6) | | | APPLY? | | |
| $F_{cE} =$ | 469.1 PSI | | $C_{SYS(BENDING)} =$ | 1.50 | YES | (SDPWS T3.1.1.1) |
| $C_b =$ | 1.25 (NDS 3.10.4) | | $C_{F(BENDING)} =$ | 1.15 | YES | (NDS 4.3.9) |

LOAD CASES - IBC 1605.3.1

| | | | |
|--------|---|--------|--|
| CASE 1 | DEAD + LIVE + 5 PSF LAT. | CASE 4 | DEAD + 0.45WIND + 0.75LIVE + 0.75SNOW |
| CASE 2 | DEAD + SNOW + 5 PSF LAT. | CASE 5 | DEAD + 0.60WIND |
| CASE 3 | DEAD + 0.75LIVE + 0.75SNOW + 5 PSF LAT. | CASE 6 | DEAD + 0.75SEISMIC |
| | | CASE 7 | DEAD + 0.53SEISMIC + 0.75LIVE + 0.75SNOW |

ALLOWABLE STRESSES - C_d PER NDS T2.3.2, C_p PER NDS 3.7.1, ASSUME $C_m, C_t, C_i, C_L = 1.0$

| CASE | C_D | F_c^* | F_{cE}/F_c^* | C_p | F_c' | F_b' | $F_{c \perp}$ |
|-------|-------|---------|----------------|-------|--------|--------|---------------|
| 1 | 1.00 | 1553 | 0.30 | 0.280 | 435 | 1553 | 781 |
| 2 & 3 | 1.15 | 1785 | 0.26 | 0.247 | 440 | 1785 | 781 |
| 4 & 5 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 3240 | 781 |
| 6 & 7 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 2484 | 781 |

APPLIED STRESSES - NDS CHAPTER 3 DESIGN EQUATIONS

| CASE | $P_{APPLIED}$ | F_c | $M_{LAT. LOAD}$ | $M_{ECC.}$ | M_{TOTAL} | f_b |
|------|---------------|-------|-----------------|------------|-------------|-------|
| 1 | 946 | 180 | 73 | 8 | 77 | 304 |
| 2 | 616 | 117 | 73 | 5 | 76 | 297 |
| 3 | 938 | 179 | 73 | 8 | 77 | 303 |
| 4 | 938 | 179 | 52 | 8 | 57 | 224 |
| 5 | 467 | 89 | 70 | 4 | 72 | 282 |
| 6 | 467 | 89 | 51 | 4 | 53 | 208 |
| 7 | 938 | 179 | 38 | 8 | 43 | 170 |

DESIGN CHECKS - COMBINED STRESS CHECK PER NDS EQN 3.9-3

| CASE | f_c/F_c' | f_b/F_b' | $f_c/F_{c \perp}$ | Combined | f_c/F_{cE} | Deflection | L/? |
|------------|------------|------------|-------------------|----------|--------------|------------|--------|
| 1 | 0.41 | 0.20 | 0.23 | 0.49 | 0.38 | 0.14 | L/791 |
| 2 | 0.27 | 0.17 | 0.15 | 0.29 | 0.25 | 0.14 | L/809 |
| 3 | 0.41 | 0.17 | 0.23 | 0.44 | 0.38 | 0.14 | L/791 |
| 4* | 0.40 | 0.07 | 0.23 | 0.27 | 0.38 | 0.05 | L/2299 |
| 5* | 0.20 | 0.09 | 0.11 | 0.15 | 0.19 | 0.06 | L/1822 |
| 6 | 0.20 | 0.08 | 0.11 | 0.14 | 0.19 | 0.10 | L/1152 |
| 7 | 0.40 | 0.07 | 0.23 | 0.27 | 0.38 | 0.08 | L/1414 |
| MAX. ----> | 0.41 | 0.20 | 0.23 | 0.49 | 0.38 | 0.14 | L/791 |
| | O.K. | O.K. | O.K. | O.K. | O.K. | | |

* Deflections reduced by 0.42 per IBC Table 1604.3 footnote F. Increase deflection by 1.4 for jambs supporting glass.

PLATE BENDING - *ALIGN STUDS WITH JOISTS WHERE POSSIBLE*

| | | |
|-----------------------|----------------------------|-----------------------|
| MISCELLANEOUS: | ALLOWABLE STRESSES: | STUD REACTIONS |
| $C_{Fu} =$ | 1.1 (NDS 4.3.7) | $F_v' =$ |
| $F_v =$ | 150 PSI | $F_b' =$ |
| | | (OUT - OF - PLANE) |
| | | 50 LB |

| | | |
|----------------------------------|--------------------------|--------------------|
| DBL TOP PLATE PROPERTIES: | APPLIED STRESSES: | |
| $A_x =$ | 10.50 IN ² | $f_v =$ |
| $S_x =$ | 2.63 IN ³ | $f_b =$ |
| $I_x =$ | 1.97 IN ⁴ | $\Delta_{MAX} =$ |
| | | 59 PSI <---- O.K. |
| | | 939 PSI <---- O.K. |
| | | 0.017 IN |



STUD WALL DESIGN - 4.3

2018 NDS/2018 IBC

WALL DATA

| | | | | | | | |
|---------------------|------------|---------------------------------------|-----------------------|----------------------|--------------|-----------------|------------------|
| <u>LUMBER TYPE:</u> | | DF#2 <input type="button" value="v"/> | <u>APPLIED LOADS:</u> | | $P_{DEAD} =$ | 691 | LBS |
| $F_b =$ | 900 | PSI | $W_{WIND} =$ | 8.0 | PSF | $P_{LIVE} =$ | 576 LBS |
| $F_c =$ | 1350 | PSI | $W_{SEISMIC} =$ | 5.0 | PSF | $P_{SNOW} =$ | 360 LBS |
| $F_{cL} =$ | 625 | PSI | | | | $P_{WIND} =$ | 0 LBS |
| $E =$ | 1.60E+06 | PSI | | | | $P_{SEISMIC} =$ | 0 LBS |
| <u>STUD SIZE:</u> | | | <u>MISCELLANEOUS:</u> | HEIGHT = | 9.33 | FT | |
| $A_x =$ | (1) | 2x4 <input type="button" value="v"/> | | SPACING = | 16 | IN | |
| $S_x =$ | 5.25 | IN ² | | ECCENTRICITY = | 0.1 | IN | |
| $S_x =$ | 3.06 | IN ³ | | $C_F(COMPRESSION) =$ | 1.15 | (NDS 4.3.6) | |
| $I_x =$ | 5.36 | IN ⁴ | | APPLY? | | | |
| $C_{F(BENDING)} =$ | 1.5 | (NDS 4.3.6) | | $C_{SYS(BENDING)} =$ | 1.50 | YES | (SDPWS T3.1.1.1) |
| $F_{cE} =$ | 469.1 | PSI | | $C_{F(BENDING)} =$ | 1.15 | YES | (NDS 4.3.9) |
| $C_b =$ | 1.25 | (NDS 3.10.4) | | | | | |

LOAD CASES - IBC 1605.3.1

| | | | |
|--------|---|--------|--|
| CASE 1 | DEAD + LIVE + 5 PSF LAT. | CASE 4 | DEAD + 0.45WIND + 0.75LIVE + 0.75SNOW |
| CASE 2 | DEAD + SNOW + 5 PSF LAT. | CASE 5 | DEAD + 0.60WIND |
| CASE 3 | DEAD + 0.75LIVE + 0.75SNOW + 5 PSF LAT. | CASE 6 | DEAD + 0.75SEISMIC |
| | | CASE 7 | DEAD + 0.53SEISMIC + 0.75LIVE + 0.75SNOW |

ALLOWABLE STRESSES - C_d PER NDS T3.2, C_p PER NDS 3.7.1, ASSUME $C_m, C_t, C_i, C_L = 1.0$

| CASE | C_D | F_c^* | F_{cE}/F_c^* | C_p | F_c' | F_b' | F_{cL} |
|-------|-------|---------|----------------|-------|--------|--------|----------|
| 1 | 1.00 | 1553 | 0.30 | 0.280 | 435 | 1553 | 781 |
| 2 & 3 | 1.15 | 1785 | 0.26 | 0.247 | 440 | 1785 | 781 |
| 4 & 5 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 3240 | 781 |
| 6 & 7 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 2484 | 781 |

APPLIED STRESSES - NDS CHAPTER 3 DESIGN EQUATIONS

| CASE | $P_{APPLIED}$ | F_c | $M_{LAT. LOAD}$ | $M_{ECC.}$ | M_{TOTAL} | f_b |
|------|---------------|-------|-----------------|------------|-------------|-------|
| 1 | 1268 | 241 | 73 | 11 | 79 | 310 |
| 2 | 1051 | 200 | 73 | 9 | 78 | 306 |
| 3 | 1394 | 265 | 73 | 12 | 80 | 313 |
| 4 | 1394 | 265 | 52 | 12 | 59 | 233 |
| 5 | 691 | 132 | 70 | 6 | 73 | 287 |
| 6 | 691 | 132 | 51 | 6 | 54 | 213 |
| 7 | 1394 | 265 | 38 | 12 | 46 | 179 |

DESIGN CHECKS - COMBINED STRESS CHECK PER NDS EQN 3.9-3

| CASE | f_c/F_c' | f_b/F_b' | f_c/F_{cL} | Combined | f_c/F_{cE} | Deflection | L/? |
|------------|-------------|-------------|--------------|-------------|--------------|-------------|--------------|
| 1 | 0.55 | 0.20 | 0.31 | 0.72 | 0.51 | 0.14 | L/774 |
| 2 | 0.45 | 0.17 | 0.26 | 0.51 | 0.43 | 0.14 | L/785 |
| 3 | 0.60 | 0.18 | 0.34 | 0.77 | 0.57 | 0.15 | L/768 |
| 4* | 0.59 | 0.07 | 0.34 | 0.51 | 0.57 | 0.05 | L/2207 |
| 5* | 0.29 | 0.09 | 0.17 | 0.21 | 0.28 | 0.06 | L/1793 |
| 6 | 0.29 | 0.09 | 0.17 | 0.21 | 0.28 | 0.10 | L/1127 |
| 7 | 0.59 | 0.07 | 0.34 | 0.52 | 0.57 | 0.08 | L/1341 |
| MAX. ----> | 0.60 | 0.20 | 0.34 | 0.77 | 0.57 | 0.15 | L/768 |
| | O.K. | O.K. | O.K. | O.K. | O.K. | | |

* Deflections reduced by 0.42 per IBC Table 1604.3 footnote F. Increase deflection by 1.4 for jambs supporting glass.

PLATE BENDING - *ALIGN STUDS WITH JOISTS WHERE POSSIBLE*

| | | | | |
|-----------------------|-----------------|----------------------------|----------|---|
| <u>MISCELLANEOUS:</u> | | <u>ALLOWABLE STRESSES:</u> | | <u>STUD REACTIONS</u> (OUT - OF - PLANE) |
| $C_{Fu} =$ | 1.1 (NDS 4.3.7) | $F_v' =$ | 173 PSI | |
| $F_v =$ | 150 PSI | $F_b' =$ | 1708 PSI | 50 LB |

| | | | |
|----------------------------------|-----------------------|--------------------------|----------------------------|
| <u>DBL TOP PLATE PROPERTIES:</u> | | <u>APPLIED STRESSES:</u> | |
| $A_x =$ | 10.50 IN ² | $f_v =$ | 100 PSI <---- O.K. |
| $S_x =$ | 2.63 IN ³ | $f_b =$ | 1602 PSI <---- O.K. |
| $I_x =$ | 1.97 IN ⁴ | $\Delta_{MAX} =$ | 0.028 IN |



Project: Mercer Island

Job Number: 19-028

Sheet: 1 of

Name: AK

Originating Office: Seattle

Date: 11/13/20

STUD WALL DESIGN - C.2

2018 NDS/2018 IBC

WALL DATA

| | | | | |
|-----------------------------|-----------------|----------------------------------|----------------------------------|------------------|
| LUMBER TYPE: | DF#2 | APPLIED LOADS: | $P_{DEAD} = 1279$ | LBS |
| $F_b = 900$ | PSI | $W_{WIND} = 8.0$ | $P_{LIVE} = 1312$ | LBS |
| $F_c = 1350$ | PSI | $W_{SEISMIC} = 5.0$ | $P_{SNOW} = 410$ | LBS |
| $F_{c\perp} = 625$ | PSI | | $P_{WIND} = 0$ | LBS |
| $E = 1.60E+06$ | PSI | | $P_{SEISMIC} = 0$ | LBS |
| STUD SIZE: | (2) 2x4 | MISCELLANEOUS: | HEIGHT = 9.33 | FT |
| $A_x = 10.50$ | IN ² | | SPACING = 16 | IN |
| $S_x = 6.13$ | IN ³ | | ECCENTRICITY = 0.1 | IN |
| $I_x = 10.72$ | IN ⁴ | | $C_F(\text{COMPRESSION}) = 1.15$ | (NDS 4.3.6) |
| $C_F(\text{BENDING}) = 1.5$ | (NDS 4.3.6) | | APPLY? | |
| $F_{cE} = 469.1$ | PSI | $C_{SYS(\text{BENDING})} = 1.50$ | YES | (SDPWS T3.1.1.1) |
| $C_b = 1.13$ | (NDS 3.10.4) | $C_F(\text{BENDING}) = 1.15$ | YES | (NDS 4.3.9) |

LOAD CASES - IBC 1605.3.1

| | | | |
|--------|---|--------|--|
| CASE 1 | DEAD + LIVE + 5 PSF LAT. | CASE 4 | DEAD + 0.45WIND + 0.75LIVE + 0.75SNOW |
| CASE 2 | DEAD + SNOW + 5 PSF LAT. | CASE 5 | DEAD + 0.60WIND |
| CASE 3 | DEAD + 0.75LIVE + 0.75SNOW + 5 PSF LAT. | CASE 6 | DEAD + 0.75SEISMIC |
| | | CASE 7 | DEAD + 0.53SEISMIC + 0.75LIVE + 0.75SNOW |

ALLOWABLE STRESSES - C_d PER NDS T3.2.2, C_p PER NDS 3.7.1, ASSUME $C_m, C_t, C_i, C_L = 1.0$

| CASE | C_D | F_c^* | F_{cE}/F_c^* | C_P | F_c' | F_b' | $F_{c\perp}$ |
|-------|-------|---------|----------------|-------|--------|--------|--------------|
| 1 | 1.00 | 1553 | 0.30 | 0.280 | 435 | 1553 | 703 |
| 2 & 3 | 1.15 | 1785 | 0.26 | 0.247 | 440 | 1785 | 703 |
| 4 & 5 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 3240 | 703 |
| 6 & 7 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 2484 | 703 |

APPLIED STRESSES - NDS CHAPTER 3 DESIGN EQUATIONS

| CASE | $P_{APPLIED}$ | F_c | $M_{LAT. LOAD}$ | $M_{ECC.}$ | M_{TOTAL} | f_b |
|------|---------------|-------|-----------------|------------|-------------|-------|
| 1 | 2591 | 247 | 73 | 22 | 86 | 169 |
| 2 | 1689 | 161 | 73 | 14 | 81 | 159 |
| 3 | 2571 | 245 | 73 | 21 | 86 | 168 |
| 4 | 2571 | 245 | 52 | 21 | 66 | 129 |
| 5 | 1279 | 122 | 70 | 11 | 76 | 149 |
| 6 | 1279 | 122 | 51 | 11 | 57 | 113 |
| 7 | 2571 | 245 | 38 | 21 | 52 | 102 |

DESIGN CHECKS - COMBINED STRESS CHECK PER NDS EQN 3.9-3

| CASE | f_c/F_c' | f_b/F_b' | $f_c/F_{c\perp}$ | Combined | f_c/F_{cE} | Deflection | L/? |
|------------|------------|------------|------------------|----------|--------------|------------|--------|
| 1 | 0.57 | 0.11 | 0.35 | 0.55 | 0.53 | 0.08 | L/1424 |
| 2 | 0.37 | 0.09 | 0.23 | 0.27 | 0.34 | 0.07 | L/1507 |
| 3 | 0.56 | 0.09 | 0.35 | 0.51 | 0.52 | 0.08 | L/1426 |
| 4* | 0.54 | 0.04 | 0.35 | 0.38 | 0.52 | 0.03 | L/4002 |
| 5* | 0.27 | 0.05 | 0.17 | 0.14 | 0.26 | 0.03 | L/3442 |
| 6 | 0.27 | 0.05 | 0.17 | 0.13 | 0.26 | 0.05 | L/2133 |
| 7 | 0.54 | 0.04 | 0.35 | 0.38 | 0.52 | 0.05 | L/2364 |
| MAX. ----> | 0.57 | 0.11 | 0.35 | 0.55 | 0.53 | 0.08 | L/1424 |
| | O.K. | O.K. | O.K. | O.K. | O.K. | | |

* Deflections reduced by 0.42 per IBC Table 1604.3 footnote F. Increase deflection by 1.4 for jambs supporting glass.

PLATE BENDING - *ALIGN STUDS WITH JOISTS WHERE POSSIBLE*

| | | |
|----------------------------|----------------------------|---|
| MISCELLANEOUS: | ALLOWABLE STRESSES: | STUD REACTIONS (OUT - OF - PLANE) |
| $C_{Fu} = 1.1$ (NDS 4.3.7) | $F_v' = 173$ PSI | 50 LB |
| $F_v = 150$ PSI | $F_b' = 1708$ PSI | |

DBL TOP PLATE PROPERTIES:

| | |
|---------------|-----------------|
| $A_x = 10.50$ | IN ² |
| $S_x = 2.63$ | IN ³ |
| $I_x = 1.97$ | IN ⁴ |

APPLIED STRESSES:

| | | |
|------------------------|-----|-----------|
| $F_v = 161$ | PSI | <--- O.K. |
| $f_b = 2574$ | PSI | <--- N.G. |
| $\Delta_{MAX} = 0.046$ | IN | |

STUD WALL DESIGN - C.2

2018 NDS/2018 IBC

WALL DATA

| | | | | | | |
|---------------------------|----------------------|--|-----------------------------|-------------------------------|-------------------------|------------------|
| LUMBER TYPE: | DF#2 | | APPLIED LOADS: | P _{DEAD} = | 787 | LBS |
| F _b = | 900 PSI | | W _{WIND} = | 8.0 PSF | P _{LIVE} = | 656 LBS |
| F _c = | 1350 PSI | | W _{SEISMIC} = | 5.0 PSF | P _{SNOW} = | 110 LBS |
| F _{c⊥} = | 625 PSI | | | | P _{WIND} = | 0 LBS |
| E = | 1.60E+06 PSI | | | | P _{SEISMIC} = | 0 LBS |
| | | | | | | |
| STUD SIZE: | (1) 2x4 | | MISCELLANEOUS: | HEIGHT = | 9.33 FT | |
| A _x = | 5.25 IN ² | | | SPACING = | 16 IN | |
| S _x = | 3.06 IN ³ | | | ECCENTRICITY = | 0.1 IN | |
| I _x = | 5.36 IN ⁴ | | | C _{F(COMPRESSION)} = | 1.15 (NDS 4.3.6) | |
| C _{F(BENDING)} = | 1.5 (NDS 4.3.6) | | | APPLY? | | |
| F _{CE} = | 469.1 PSI | | C _{sys(BENDING)} = | 1.50 | YES | (SDPWS T3.1.1.1) |
| C _b = | 1.25 (NDS 3.10.4) | | C _{F(BENDING)} = | 1.15 | YES | (NDS 4.3.9) |

LOAD CASES - IBC 1605.3.1

| | | | |
|--------|---|--------|--|
| CASE 1 | DEAD + LIVE + 5 PSF LAT. | CASE 4 | DEAD + 0.45WIND + 0.75LIVE + 0.75SNOW |
| CASE 2 | DEAD + SNOW + 5 PSF LAT. | CASE 5 | DEAD + 0.60WIND |
| CASE 3 | DEAD + 0.75LIVE + 0.75SNOW + 5 PSF LAT. | CASE 6 | DEAD + 0.75SEISMIC |
| | | CASE 7 | DEAD + 0.53SEISMIC + 0.75LIVE + 0.75SNOW |

ALLOWABLE STRESSES - C_d PER NDS T3.2.2, C_p PER NDS 3.7.1, ASSUME C_m, C_t, C_i, C_L = 1.0

| CASE | C _D | F _c * | F _{CE} /F _c * | C _p | F _c ' | F _b ' | F _{c⊥} |
|-------|----------------|------------------|-----------------------------------|----------------|------------------|------------------|-----------------|
| 1 | 1.00 | 1553 | 0.30 | 0.280 | 435 | 1553 | 781 |
| 2 & 3 | 1.15 | 1785 | 0.26 | 0.247 | 440 | 1785 | 781 |
| 4 & 5 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 3240 | 781 |
| 6 & 7 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 2484 | 781 |

APPLIED STRESSES - NDS CHAPTER 3 DESIGN EQUATIONS

| CASE | P _{APPLIED} | F _c | M _{LAT. LOAD} | M _{ECC.} | M _{TOTAL} | f _b |
|------|----------------------|----------------|------------------------|-------------------|--------------------|----------------|
| 1 | 1443 | 275 | 73 | 12 | 80 | 314 |
| 2 | 897 | 171 | 73 | 7 | 77 | 303 |
| 3 | 1362 | 259 | 73 | 11 | 80 | 312 |
| 4 | 1362 | 259 | 52 | 11 | 59 | 232 |
| 5 | 787 | 150 | 70 | 7 | 74 | 289 |
| 6 | 787 | 150 | 51 | 7 | 55 | 215 |
| 7 | 1362 | 259 | 38 | 11 | 46 | 178 |

DESIGN CHECKS - COMBINED STRESS CHECK PER NDS EQN 3.9-3

| CASE | f _c /F _c ' | f _b /F _b ' | f _c /F _{c⊥} | Combined | f _c /F _{CE} | Deflection | L/? |
|------------|----------------------------------|----------------------------------|---------------------------------|-------------|---------------------------------|-------------|--------------|
| 1 | 0.63 | 0.20 | 0.35 | 0.89 | 0.59 | 0.15 | L/765 |
| 2 | 0.39 | 0.17 | 0.22 | 0.42 | 0.36 | 0.14 | L/794 |
| 3 | 0.59 | 0.17 | 0.33 | 0.74 | 0.55 | 0.15 | L/769 |
| 4* | 0.58 | 0.07 | 0.33 | 0.49 | 0.55 | 0.05 | L/2213 |
| 5* | 0.33 | 0.09 | 0.19 | 0.24 | 0.32 | 0.06 | L/1781 |
| 6 | 0.33 | 0.09 | 0.19 | 0.24 | 0.32 | 0.10 | L/1117 |
| 7 | 0.58 | 0.07 | 0.33 | 0.49 | 0.55 | 0.08 | L/1346 |
| MAX. ----> | 0.63 | 0.20 | 0.35 | 0.89 | 0.59 | 0.15 | L/765 |
| | O.K. | O.K. | O.K. | O.K. | O.K. | | |

* Deflections reduced by 0.42 per IBC Table 1604.3 footnote F. Increase deflection by 1.4 for jambs supporting glass.

PLATE BENDING - *ALIGN STUDS WITH JOISTS WHERE POSSIBLE*

| MISCELLANEOUS: | ALLOWABLE STRESSES: | <table border="1"> <tr><th>STUD REACTIONS (OUT - OF - PLANE)</th></tr> <tr><td>50 LB</td></tr> </table> | STUD REACTIONS (OUT - OF - PLANE) | 50 LB |
|--|-----------------------------|--|-----------------------------------|--------------|
| STUD REACTIONS (OUT - OF - PLANE) | | | | |
| 50 LB | | | | |
| C _{FU} = 1.1 (NDS 4.3.7) | F _V ' = 173 PSI | | | |
| F _V = 150 PSI | F _b ' = 1708 PSI | | | |
| | | | | |
| DBL TOP PLATE PROPERTIES: | APPLIED STRESSES: | | | |
| A _x = 10.50 IN ² | f _v = 85 PSI | ---- O.K. | | |
| S _x = 2.63 IN ³ | f _b = 1367 PSI | ---- O.K. | | |
| I _x = 1.97 IN ⁴ | Δ _{MAX} = 0.024 IN | | | |

STUD WALL DESIGN - C.2

2018 NDS/2018 IBC

WALL DATA

| | | | | | |
|--------------------|-----------------------|----------------------|------------------------|-----------------|------------------|
| LUMBER TYPE: | DF#2 | APPLIED LOADS: | P_{DEAD} = | 1545 | LBS |
| F_b = | 900 PSI | W_{WIND} = | 8.0 PSF | P_{LIVE} = | 1490 LBS |
| F_c = | 1350 PSI | $W_{SEISMIC}$ = | 5.0 PSF | P_{SNOW} = | 466 LBS |
| F_{cL} = | 625 PSI | | | P_{WIND} = | 0 LBS |
| E = | 1.60E+06 PSI | | | $P_{SEISMIC}$ = | 0 LBS |
| | | | | | |
| STUD SIZE: | (1) 2x6 | MISCELLANEOUS: | HEIGHT = | 9.33 | FT |
| A_x = | 8.25 IN ² | | SPACING = | 16 | IN |
| S_x = | 7.56 IN ³ | | ECCENTRICITY = | 0.1 | IN |
| I_x = | 20.80 IN ⁴ | | $C_{F(Compression)}$ = | 1.10 | (NDS 4.3.6) |
| $C_{F(BENDING)}$ = | 1.3 (NDS 4.3.6) | | APPLY? | | |
| F_{cE} = | 1158.4 PSI | $C_{SYS(BENDING)}$ = | 1.35 | YES | (SDPWS T3.1.1.1) |
| C_b = | 1.25 (NDS 3.10.4) | $C_{F(BENDING)}$ = | 1.15 | YES | (NDS 4.3.9) |

LOAD CASES - IBC 1605.3.1

| | | | |
|--------|---|--------|--|
| CASE 1 | DEAD + LIVE + 5 PSF LAT. | CASE 4 | DEAD + 0.45WIND + 0.75LIVE + 0.75SNOW |
| CASE 2 | DEAD + SNOW + 5 PSF LAT. | CASE 5 | DEAD + 0.60WIND |
| CASE 3 | DEAD + 0.75LIVE + 0.75SNOW + 5 PSF LAT. | CASE 6 | DEAD + 0.75SEISMIC |
| | | CASE 7 | DEAD + 0.53SEISMIC + 0.75LIVE + 0.75SNOW |

ALLOWABLE STRESSES - C_d PER NDS T3.2.2, C_p PER NDS 3.7.1, ASSUME $C_m, C_t, C_i, C_L = 1.0$

| CASE | C_D | F_c^* | F_{cE}/F_c^* | C_p | F_c' | F_b' | F_{cL} |
|-------|-------|---------|----------------|-------|--------|--------|----------|
| 1 | 1.00 | 1485 | 0.78 | 0.600 | 891 | 1346 | 781 |
| 2 & 3 | 1.15 | 1708 | 0.68 | 0.547 | 933 | 1547 | 781 |
| 4 & 5 | 1.60 | 2376 | 0.49 | 0.425 | 1009 | 2527 | 781 |
| 6 & 7 | 1.60 | 2376 | 0.49 | 0.425 | 1009 | 2153 | 781 |

APPLIED STRESSES - NDS CHAPTER 3 DESIGN EQUATIONS

| CASE | $P_{APPLIED}$ | F_c | $M_{LAT. LOAD}$ | $M_{ECC.}$ | M_{TOTAL} | f_b |
|------|---------------|-------|-----------------|------------|-------------|-------|
| 1 | 3035 | 368 | 73 | 25 | 88 | 140 |
| 2 | 2011 | 244 | 73 | 17 | 83 | 132 |
| 3 | 3012 | 365 | 73 | 25 | 88 | 140 |
| 4 | 3012 | 365 | 52 | 25 | 68 | 108 |
| 5 | 1545 | 187 | 70 | 13 | 78 | 123 |
| 6 | 1545 | 187 | 51 | 13 | 59 | 93 |
| 7 | 3012 | 365 | 38 | 25 | 54 | 86 |

DESIGN CHECKS - COMBINED STRESS CHECK PER NDS EQN 3.9-3

| CASE | f_c/F_c' | f_b/F_b' | f_c/F_{cL} | Combined | f_c/F_{cE} | Deflection | L/? |
|------------|------------|------------|--------------|----------|--------------|------------|--------|
| 1 | 0.41 | 0.10 | 0.47 | 0.32 | 0.32 | 0.04 | L/2691 |
| 2 | 0.26 | 0.09 | 0.31 | 0.18 | 0.21 | 0.04 | L/2864 |
| 3 | 0.39 | 0.09 | 0.47 | 0.29 | 0.32 | 0.04 | L/2695 |
| 4* | 0.36 | 0.04 | 0.47 | 0.19 | 0.32 | 0.02 | L/6752 |
| 5* | 0.19 | 0.05 | 0.24 | 0.09 | 0.16 | 0.02 | L/5902 |
| 6 | 0.19 | 0.04 | 0.24 | 0.09 | 0.16 | 0.03 | L/4042 |
| 7 | 0.36 | 0.04 | 0.47 | 0.19 | 0.32 | 0.03 | L/4392 |
| MAX. ----> | 0.41 | 0.10 | 0.47 | 0.32 | 0.32 | 0.04 | L/2691 |
| | O.K. | O.K. | O.K. | O.K. | O.K. | | |

* Deflections reduced by 0.42 per IBC Table 1604.3 footnote F. Increase deflection by 1.4 for jambs supporting glass.

PLATE BENDING - *ALIGN STUDS WITH JOISTS WHERE POSSIBLE*

| | | |
|-----------------------------|---------------------|--------------------------------------|
| MISCELLANEOUS: | ALLOWABLE STRESSES: | STUD REACTIONS (OUT - OF - PLANE) |
| C_{Fu} = 1.15 (NDS 4.3.7) | $F_v' = 173$ PSI | |
| $F_v = 150$ PSI | $F_b' = 1547$ PSI | 50 LB |

| | | |
|-------------------------------|---------------------------|-----------|
| DBL TOP PLATE PROPERTIES: | APPLIED STRESSES: | |
| $A_x = 16.50$ IN ² | $F_v = 122$ PSI | <--- O.K. |
| $S_x = 4.13$ IN ³ | $f_b = 1950$ PSI | <--- N.G. |
| $I_x = 3.09$ IN ⁴ | $\Delta_{MAX} = 0.035$ IN | |

STUD WALL DESIGN - 0.1 (Demising)

2018 NDS/2018 IBC

WALL DATA

| | | | | | |
|---------------------------|----------------------|-----------------------------|-------------------------------|------------------------|------------------|
| LUMBER TYPE: | DF#2 | APPLIED LOADS: | P _{DEAD} = | 839 | LBS |
| F _b = | 900 PSI | W _{WIND} = | 8.0 PSF | P _{LIVE} = | 860 LBS |
| F _c = | 1350 PSI | W _{SEISMIC} = | 5.0 PSF | P _{SNOW} = | 269 LBS |
| F _{cL} = | 625 PSI | | | P _{WIND} = | 0 LBS |
| E = | 1.60E+06 PSI | | | P _{SEISMIC} = | 0 LBS |
| STUD SIZE: | (1) 2x4 | MISCELLANEOUS: | HEIGHT = | 9.33 | FT |
| A _x = | 5.25 IN ² | | SPACING = | 16 | IN |
| S _x = | 3.06 IN ³ | | ECCENTRICITY = | 0.1 | IN |
| I _x = | 5.36 IN ⁴ | | C _{F(COMPRESSION)} = | 1.15 | (NDS 4.3.6) |
| C _{F(BENDING)} = | 1.5 (NDS 4.3.6) | | APPLY? | | |
| F _{CE} = | 469.1 PSI | C _{sys(BENDING)} = | 1.50 | YES | (SDPWS T3.1.1.1) |
| C _b = | 1.25 (NDS 3.10.4) | C _{F(BENDING)} = | 1.15 | YES | (NDS 4.3.9) |

LOAD CASES - IBC 1605.3.1

| | | | |
|--------|---|--------|--|
| CASE 1 | DEAD + LIVE + 5 PSF LAT. | CASE 4 | DEAD + 0.45WIND + 0.75LIVE + 0.75SNOW |
| CASE 2 | DEAD + SNOW + 5 PSF LAT. | CASE 5 | DEAD + 0.60WIND |
| CASE 3 | DEAD + 0.75LIVE + 0.75SNOW + 5 PSF LAT. | CASE 6 | DEAD + 0.75SEISMIC |
| | | CASE 7 | DEAD + 0.53SEISMIC + 0.75LIVE + 0.75SNOW |

ALLOWABLE STRESSES - C_d PER NDS T3.2, C_p PER NDS 3.7.1, ASSUME C_m, C_t, C_i, C_L = 1.0

| CASE | C _D | F _c * | F _{CE} /F _c * | C _P | F _c ' | F _b ' | F _{cL} |
|-------|----------------|------------------|-----------------------------------|----------------|------------------|------------------|-----------------|
| 1 | 1.00 | 1553 | 0.30 | 0.280 | 435 | 1553 | 781 |
| 2 & 3 | 1.15 | 1785 | 0.26 | 0.247 | 440 | 1785 | 781 |
| 4 & 5 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 3240 | 781 |
| 6 & 7 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 2484 | 781 |

APPLIED STRESSES - NDS CHAPTER 3 DESIGN EQUATIONS

| CASE | P _{APPLIED} | F _c | M _{LAT. LOAD} | M _{ECC.} | M _{TOTAL} | f _b |
|------|----------------------|----------------|------------------------|-------------------|--------------------|----------------|
| 1 | 1699 | 324 | 73 | 14 | 81 | 319 |
| 2 | 1108 | 211 | 73 | 9 | 78 | 307 |
| 3 | 1686 | 321 | 73 | 14 | 81 | 319 |
| 4 | 1686 | 321 | 52 | 14 | 61 | 239 |
| 5 | 839 | 160 | 70 | 7 | 74 | 290 |
| 6 | 839 | 160 | 51 | 7 | 55 | 216 |
| 7 | 1686 | 321 | 38 | 14 | 47 | 185 |

DESIGN CHECKS - COMBINED STRESS CHECK PER NDS EQN 3.9-3

| CASE | f _c /F _c ' | f _b /F _b ' | f _c /F _{cL} | Combined | f _c /F _{CE} | Deflection | L/? |
|------------|----------------------------------|----------------------------------|---------------------------------|----------|---------------------------------|------------|--------|
| 1 | 0.74 | 0.21 | 0.41 | 1.22 | 0.69 | 0.15 | L/753 |
| 2 | 0.48 | 0.17 | 0.27 | 0.54 | 0.45 | 0.14 | L/782 |
| 3 | 0.73 | 0.18 | 0.41 | 1.10 | 0.68 | 0.15 | L/753 |
| 4* | 0.71 | 0.07 | 0.41 | 0.74 | 0.68 | 0.05 | L/2152 |
| 5* | 0.36 | 0.09 | 0.20 | 0.26 | 0.34 | 0.06 | L/1774 |
| 6 | 0.36 | 0.09 | 0.20 | 0.26 | 0.34 | 0.10 | L/1111 |
| 7 | 0.71 | 0.07 | 0.41 | 0.75 | 0.68 | 0.09 | L/1297 |
| MAX. ----> | 0.74 | 0.21 | 0.41 | 1.22 | 0.69 | 0.15 | L/753 |
| | O.K. | O.K. | O.K. | N.G. | O.K. | | |

* Deflections reduced by 0.42 per IBC Table 1604.3 footnote F. Increase deflection by 1.4 for jambs supporting glass.

PLATE BENDING - *ALIGN STUDS WITH JOISTS WHERE POSSIBLE*

| | | | |
|-----------------------|-----------------|----------------------------|---------------------------|
| MISCELLANEOUS: | | ALLOWABLE STRESSES: | STUD REACTIONS |
| C _{FU} = | 1.1 (NDS 4.3.7) | F _V ' = | 173 PSI |
| F _V = | 150 PSI | F _b ' = | 1708 PSI |
| | | | (OUT - OF - PLANE) |
| | | | 50 LB |

DBL TOP PLATE PROPERTIES:

| | |
|------------------|-----------------------|
| A _x = | 10.50 IN ² |
| S _x = | 2.63 IN ³ |
| I _x = | 1.97 IN ⁴ |

APPLIED STRESSES:

| | | |
|--------------------|----------|-----------|
| f _V = | 105 PSI | <--- O.K. |
| f _b = | 1688 PSI | <--- O.K. |
| Δ _{MAX} = | 0.030 IN | |



Project: Mercer Island

Job Number: 19-028 NOTES:

Sheet: 1 of

Name: AK

Originating Office: Seattle

Date: 11/13/20

STUD WALL DESIGN - J.1 (Demising)

2018 NDS/2018 IBC

WALL DATA

| | | | | | | | | |
|---------------------|----------|-----------------|-----------------------|------|------------------------|------------------|----------------------|-----|
| LUMBER TYPE: | | DF#2 | APPLIED LOADS: | | $P_{DEAD} =$ | 981 | LBS | |
| $F_b =$ | 900 | PSI | $W_{WIND} =$ | 8.0 | PSF | $P_{LIVE} =$ | 1007 | LBS |
| $F_c =$ | 1350 | PSI | $W_{SEISMIC} =$ | 5.0 | PSF | $P_{SNOW} =$ | 315 | LBS |
| $F_{c\perp} =$ | 625 | PSI | | | | $P_{WIND} =$ | 0 | LBS |
| $E =$ | 1.60E+06 | PSI | | | | $P_{SEISMIC} =$ | 0 | LBS |
| STUD SIZE: | | (1) 2x4 | MISCELLANEOUS: | | HEIGHT = | 9.33 | FT | |
| $A_x =$ | 5.25 | IN ² | | | SPACING = | 16 | IN | |
| $S_x =$ | 3.06 | IN ³ | | | ECCENTRICITY = | 0.1 | IN | |
| $I_x =$ | 5.36 | IN ⁴ | | | $C_{F(COMPRESSION)} =$ | 1.15 | (NDS 4.3.6) | |
| $C_{F(BENDING)} =$ | 1.5 | (NDS 4.3.6) | | | APPLY? | | | |
| $F_{cE} =$ | 469.1 | PSI | $C_{SYS(BENDING)} =$ | 1.50 | YES | (SDPWS T3.1.1.1) | Is not applied w/ Cr | |
| $C_b =$ | 1.25 | (NDS 3.10.4) | $C_{r(BENDING)} =$ | 1.15 | YES | (NDS 4.3.9) | Is not applied w/ Cs | |

LOAD CASES - IBC 1605.3.1

| | | | |
|--------|---|--------|--|
| CASE 1 | DEAD + LIVE + 5 PSF LAT. | CASE 4 | DEAD + 0.45WIND + 0.75LIVE + 0.75SNOW |
| CASE 2 | DEAD + SNOW + 5 PSF LAT. | CASE 5 | DEAD + 0.60WIND |
| CASE 3 | DEAD + 0.75LIVE + 0.75SNOW + 5 PSF LAT. | CASE 6 | DEAD + 0.75SEISMIC |
| | | CASE 7 | DEAD + 0.53SEISMIC + 0.75LIVE + 0.75SNOW |

ALLOWABLE STRESSES - Cd PER NDS T2.3.2, Cp PER NDS 3.7.1, ASSUME Cm, Ct, Ci, CL = 1.0

| CASE | C _D | F _c * | F _{cE} /F _c * | C _P | F _c ' | F _b ' | F _{c⊥} |
|-------|----------------|------------------|-----------------------------------|----------------|------------------|------------------|-----------------|
| 1 | 1.00 | 1553 | 0.30 | 0.280 | 435 | 1553 | 781 |
| 2 & 3 | 1.15 | 1785 | 0.26 | 0.247 | 440 | 1785 | 781 |
| 4 & 5 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 3240 | 781 |
| 6 & 7 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 2484 | 781 |

APPLIED STRESSES - NDS CHAPTER 3 DESIGN EQUATIONS

| CASE | P _{APPLIED} | f _c | M _{LAT. LOAD} | M _{ECCL.} | M _{TOTAL} | f _b |
|------|----------------------|----------------|------------------------|--------------------|--------------------|----------------|
| 1 | 1988 | 379 | 73 | 17 | 83 | 325 |
| 2 | 1296 | 247 | 73 | 11 | 79 | 311 |
| 3 | 1972 | 376 | 73 | 16 | 83 | 324 |
| 4 | 1972 | 376 | 52 | 16 | 63 | 245 |
| 5 | 981 | 187 | 70 | 8 | 75 | 293 |
| 6 | 981 | 187 | 51 | 8 | 56 | 219 |
| 7 | 1972 | 376 | 38 | 16 | 49 | 191 |

DESIGN CHECKS - COMBINED STRESS CHECK PER NDS EQN 3.9-3

| CASE | f _c /F _c ' | f _b /F _b ' | f _c /F _{c⊥} | Combined | f _c /F _{cE} | Deflection | L/? |
|------------|----------------------------------|----------------------------------|---------------------------------|----------|---------------------------------|------------|--------|
| 1 | 0.87 | 0.21 | 0.48 | 1.84 | 0.81 | 0.15 | L/739 |
| 2 | 0.56 | 0.17 | 0.32 | 0.68 | 0.53 | 0.14 | L/773 |
| 3 | 0.85 | 0.18 | 0.48 | 1.64 | 0.80 | 0.15 | L/740 |
| 4* | 0.84 | 0.08 | 0.48 | 1.08 | 0.80 | 0.05 | L/2101 |
| 5* | 0.42 | 0.09 | 0.24 | 0.32 | 0.40 | 0.06 | L/1756 |
| 6 | 0.42 | 0.09 | 0.24 | 0.32 | 0.40 | 0.10 | L/1096 |
| 7 | 0.84 | 0.08 | 0.48 | 1.09 | 0.80 | 0.09 | L/1258 |
| MAX. ----> | 0.87 | 0.21 | 0.48 | 1.84 | 0.81 | 0.15 | L/739 |
| | O.K. | O.K. | O.K. | N.G. | O.K. | | |

* Deflections reduced by 0.42 per IBC Table 1604.3 footnote f. Increase deflection by 1.4 for jambs supporting glass.

PLATE BENDING - *ALIGN STUDS WITH JOISTS WHERE POSSIBLE*

| | | | | |
|-----------------------|-----------------|----------------------------|----------|--|
| MISCELLANEOUS: | | ALLOWABLE STRESSES: | | STUD REACTIONS (OUT - OF - PLANE) 50 LB |
| $C_{Fu} =$ | 1.1 (NDS 4.3.7) | $F_v' =$ | 173 PSI | |
| $F_v =$ | 150 PSI | $F_b' =$ | 1708 PSI | |

| | | | |
|----------------------------------|-------|--------------------------|----------------------------|
| DBL TOP PLATE PROPERTIES: | | APPLIED STRESSES: | |
| $A_x =$ | 10.50 | IN ² | $F_v =$ 123 PSI <--- O.K. |
| $S_x =$ | 2.63 | IN ³ | $F_b =$ 1975 PSI <--- N.G. |
| $I_x =$ | 1.97 | IN ⁴ | $\Delta_{MAX} =$ 0.035 IN |

STUD WALL DESIGN - J.1 (Demising)

2018 NDS/2018 IBC

WALL DATA

| LUMBER TYPE: | | DF#2 | APPLIED LOADS: | | P _{DEAD} = | 604 | LBS |
|----------------------------|----------|-----------------|------------------------------|------|--------------------------------|------------------|------------------------|
| F _b = | 900 | PSI | W _{WIND} = | 8.0 | P _{LIVE} = | 503 | LBS |
| F _c = | 1350 | PSI | W _{SEISMIC} = | 5.0 | P _{SNOW} = | 315 | LBS |
| F _{cL} = | 625 | PSI | | | P _{WIND} = | 0 | LBS |
| E = | 1.60E+06 | PSI | | | P _{SEISMIC} = | 0 | LBS |
| STUD SIZE: | | (1) 2x4 | MISCELLANEOUS: | | HEIGHT = | 9.33 | FT |
| A _x = | 5.25 | IN ² | | | SPACING = | 16 | IN |
| S _x = | 3.06 | IN ³ | | | ECCENTRICITY = | 0.1 | IN |
| I _x = | 5.36 | IN ⁴ | | | C _F (COMPRESSION) = | 1.15 | (NDS 4.3.6) |
| C _F (BENDING) = | 1.5 | (NDS 4.3.6) | | | | | APPLY? |
| F _{cE} = | 469.1 | PSI | C _{SYS} (BENDING) = | 1.50 | YES | (SDPWS T3.1.1.1) | Is not applied w/ Cr |
| C _b = | 1.25 | (NDS 3.10.4) | C _r (BENDING) = | 1.15 | YES | (NDS 4.3.9) | Is not applied w/ Csys |

LOAD CASES - IBC 1605.3.1

| | | | |
|--------|---|--------|--|
| CASE 1 | DEAD + LIVE + 5 PSF LAT. | CASE 4 | DEAD + 0.45WIND + 0.75LIVE + 0.75SNOW |
| CASE 2 | DEAD + SNOW + 5 PSF LAT. | CASE 5 | DEAD + 0.60WIND |
| CASE 3 | DEAD + 0.75LIVE + 0.75SNOW + 5 PSF LAT. | CASE 6 | DEAD + 0.75SEISMIC |
| | | CASE 7 | DEAD + 0.53SEISMIC + 0.75LIVE + 0.75SNOW |

ALLOWABLE STRESSES - C_d PER NDS T2.3.2, C_p PER NDS 3.7.1, ASSUME C_m, C_t, C_i, C_L = 1.0

| CASE | C _D | F _c * | F _{cE} /F _c * | C _F | F _{c'} | F _{b'} | F _{cL} |
|-------|----------------|------------------|-----------------------------------|----------------|-----------------|-----------------|-----------------|
| 1 | 1.00 | 1553 | 0.30 | 0.280 | 435 | 1553 | 781 |
| 2 & 3 | 1.15 | 1785 | 0.26 | 0.247 | 440 | 1785 | 781 |
| 4 & 5 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 3240 | 781 |
| 6 & 7 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 2484 | 781 |

APPLIED STRESSES - NDS CHAPTER 3 DESIGN EQUATIONS

| CASE | P _{APPLIED} | f _c | M _{LAT. LOAD} | M _{ECC.} | M _{TOTAL} | f _b |
|------|----------------------|----------------|------------------------|-------------------|--------------------|----------------|
| 1 | 1107 | 211 | 73 | 9 | 78 | 307 |
| 2 | 918 | 175 | 73 | 8 | 77 | 303 |
| 3 | 1217 | 232 | 73 | 10 | 79 | 309 |
| 4 | 1217 | 232 | 52 | 10 | 59 | 229 |
| 5 | 604 | 115 | 70 | 5 | 73 | 285 |
| 6 | 604 | 115 | 51 | 5 | 54 | 211 |
| 7 | 1217 | 232 | 38 | 10 | 45 | 175 |

DESIGN CHECKS - COMBINED STRESS CHECK PER NDS EQN 3.9-3

| CASE | f _c /F _{c'} | f _b /F _{b'} | f _c /F _{cL} | Combined | f _c /F _{cE} | Deflection | L/? |
|------------|---------------------------------|---------------------------------|---------------------------------|----------|---------------------------------|------------|--------|
| 1 | 0.48 | 0.20 | 0.27 | 0.59 | 0.45 | 0.14 | L/782 |
| 2 | 0.40 | 0.17 | 0.22 | 0.43 | 0.37 | 0.14 | L/792 |
| 3 | 0.53 | 0.17 | 0.30 | 0.62 | 0.49 | 0.14 | L/777 |
| 4* | 0.52 | 0.07 | 0.30 | 0.41 | 0.49 | 0.05 | L/2242 |
| 5* | 0.26 | 0.09 | 0.15 | 0.18 | 0.25 | 0.06 | L/1804 |
| 6 | 0.26 | 0.09 | 0.15 | 0.18 | 0.25 | 0.10 | L/1136 |
| 7 | 0.52 | 0.07 | 0.30 | 0.41 | 0.49 | 0.08 | L/1368 |
| MAX. ----> | 0.53 | 0.20 | 0.30 | 0.62 | 0.49 | 0.14 | L/777 |
| | O.K. | O.K. | O.K. | O.K. | O.K. | | |

* Deflections reduced by 0.42 per IBC Table 1604.3 footnote f. Increase deflection by 1.4 for jambs supporting glass.

PLATE BENDING - *ALIGN STUDS WITH JOISTS WHERE POSSIBLE*

| MISCELLANEOUS: | ALLOWABLE STRESSES: | STUD REACTIONS (OUT - OF - PLANE) |
|-----------------------------------|-----------------------------|--------------------------------------|
| C _{Fu} = 1.1 (NDS 4.3.7) | F _v ' = 173 PSI | 50 LB |
| F _v = 150 PSI | F _b ' = 1708 PSI | |

| DBL TOP PLATE PROPERTIES: | | APPLIED STRESSES: | |
|--|--|-----------------------------|-----------|
| A _x = 10.50 IN ² | | F _v = 87 PSI | <--- O.K. |
| S _x = 2.63 IN ³ | | f _b = 1400 PSI | <--- O.K. |
| I _x = 1.97 IN ⁴ | | Δ _{MAX} = 0.025 IN | |

STUD WALL DESIGN - Q.1 (Demising) 2018 NDS/2018 IBC

WALL DATA

| | | | | | |
|---------------------|----------------------|------------------|--------------------------------|--|--|
| LUMBER TYPE: | | DF#2 ▼ | APPLIED LOADS: | | $P_{DEAD} =$ 1141 LBS |
| $F_b =$ | 900 PSI | | $W_{WIND} =$ 8.0 PSF | $P_{LIVE} =$ 1120 LBS | |
| $F_c =$ | 1350 PSI | | $W_{SEISMIC} =$ 5.0 PSF | $P_{SNOW} =$ 366 LBS | |
| $F_{c\perp} =$ | 625 PSI | | | $P_{WIND} =$ 0 LBS | |
| $E =$ | 1.60E+06 PSI | | | $P_{SEISMIC} =$ 0 LBS | |
| STUD SIZE: | | (1) 2x4 ▼ | MISCELLANEOUS: | | HEIGHT = 9.33 FT |
| $A_x =$ | 5.25 IN ² | | | SPACING = 16 IN | |
| $S_x =$ | 3.06 IN ³ | | | ECCENTRICITY = 0.1 IN | |
| $I_x =$ | 5.36 IN ⁴ | | | C_F(COMPRESSION) = 1.15 (NDS 4.3.6) | |
| C_F (BENDING) = | 1.5 (NDS 4.3.6) | | | APPLY? | |
| $F_{cE} =$ | 469.1 PSI | | C_{SYS} (BENDING) = | 1.50 | YES (SDPWS T3.1.1.1) Is not applied w/ Cr |
| $C_b =$ | 1.25 (NDS 3.10.4) | | C_r (BENDING) = | 1.15 | YES (NDS 4.3.9) Is not applied w/ C_{SYS} |

LOAD CASES - IBC 1605.3.1

| | | | |
|--------|---|--------|--|
| CASE 1 | DEAD + LIVE + 5 PSF LAT. | CASE 4 | DEAD + 0.45WIND + 0.75LIVE + 0.75SNOW |
| CASE 2 | DEAD + SNOW + 5 PSF LAT. | CASE 5 | DEAD + 0.60WIND |
| CASE 3 | DEAD + 0.75LIVE + 0.75SNOW + 5 PSF LAT. | CASE 6 | DEAD + 0.75SEISMIC |
| | | CASE 7 | DEAD + 0.55SEISMIC + 0.75LIVE + 0.75SNOW |

ALLOWABLE STRESSES - C_d PER NDS T2.3.2, C_p PER NDS 3.7.1, ASSUME $C_m, C_t, C_i, C_L = 1.0$

| CASE | C_D | F_c^* | F_{cE}/F_c^* | C_P | F_c' | F_b' | $F_{c\perp}$ |
|-------|-------|---------|----------------|-------|--------|--------|--------------|
| 1 | 1.00 | 1553 | 0.30 | 0.280 | 435 | 1553 | 781 |
| 2 & 3 | 1.15 | 1785 | 0.26 | 0.247 | 440 | 1785 | 781 |
| 4 & 5 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 3240 | 781 |
| 6 & 7 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 2484 | 781 |

APPLIED STRESSES - NDS CHAPTER 3 DESIGN EQUATIONS

| CASE | $P_{APPLIED}$ | f_c | $M_{LAT. LOAD}$ | $M_{ECC.}$ | M_{TOTAL} | f_b |
|------|---------------|-------|-----------------|------------|-------------|-------|
| 1 | 2262 | 431 | 73 | 19 | 84 | 330 |
| 2 | 1507 | 287 | 73 | 13 | 80 | 315 |
| 3 | 2256 | 430 | 73 | 19 | 84 | 330 |
| 4 | 2256 | 430 | 52 | 19 | 64 | 251 |
| 5 | 1141 | 217 | 70 | 10 | 76 | 296 |
| 6 | 1141 | 217 | 51 | 10 | 57 | 222 |
| 7 | 2256 | 430 | 38 | 19 | 50 | 197 |

DESIGN CHECKS - COMBINED STRESS CHECK PER NDS EQN 3.9-3

| CASE | f_c/F_c' | f_b/F_b' | $f_c/F_{c\perp}$ | Combined | f_c/F_{cE} | Deflection | L/? |
|------------|-------------|-------------|------------------|-------------|--------------|-------------|--------------|
| 1 | 0.99 | 0.21 | 0.55 | 3.59 | 0.92 | 0.15 | L/727 |
| 2 | 0.65 | 0.18 | 0.37 | 0.88 | 0.61 | 0.15 | L/762 |
| 3 | 0.98 | 0.18 | 0.55 | 3.15 | 0.92 | 0.15 | L/727 |
| 4* | 0.96 | 0.08 | 0.55 | 1.84 | 0.92 | 0.05 | L/2052 |
| 5* | 0.48 | 0.09 | 0.28 | 0.40 | 0.46 | 0.06 | L/1737 |
| 6 | 0.48 | 0.09 | 0.28 | 0.40 | 0.46 | 0.10 | L/1080 |
| 7 | 0.96 | 0.08 | 0.55 | 1.86 | 0.92 | 0.09 | L/1221 |
| MAX. ----> | 0.99 | 0.21 | 0.55 | 3.59 | 0.92 | 0.15 | L/727 |
| | O.K. | O.K. | O.K. | N.G. | O.K. | | |

* Deflections reduced by 0.42 per IBC Table 1604.3 footnote F. Increase deflection by 1.4 for jambs supporting glass.

PLATE BENDING - *ALIGN STUDS WITH JOISTS WHERE POSSIBLE*

| | | |
|----------------------------|----------------------------|---|
| MISCELLANEOUS: | ALLOWABLE STRESSES: | STUD REACTIONS (OUT - OF - PLANE) 50 LB |
| $C_{Fu} =$ 1.1 (NDS 4.3.7) | $F_v' =$ 173 PSI | |
| $F_v =$ 150 PSI | $F_b' =$ 1708 PSI | |

| | | |
|----------------------------------|---------------------------|------------|
| DBL TOP PLATE PROPERTIES: | APPLIED STRESSES: | |
| $A_x =$ 10.50 IN ² | $F_v =$ 144 PSI | ----- O.K. |
| $S_x =$ 2.63 IN ³ | $f_b =$ 2296 PSI | ----- N.G. |
| $I_x =$ 1.97 IN ⁴ | $\Delta_{MAX} =$ 0.041 IN | |

STUD WALL DESIGN - Q.1 (Demising)

2018 NDS/2018 IBC

WALL DATA

| | | | | |
|-----------------------------|----------------------|-----------------------|----------------|--|
| LUMBER TYPE: DF#2 ▼ | | APPLIED LOADS: | | $P_{DEAD} =$ 702 LBS |
| $F_b =$ | 900 PSI | $W_{WIND} =$ | 8.0 PSF | $P_{LIVE} =$ 585 LBS |
| $F_c =$ | 1350 PSI | $W_{SEISMIC} =$ | 5.0 PSF | $P_{SNOW} =$ 366 LBS |
| $F_{c\perp} =$ | 625 PSI | | | $P_{WIND} =$ 0 LBS |
| $E =$ | 1.60E+06 PSI | | | $P_{SEISMIC} =$ 0 LBS |
| STUD SIZE: (1) 2x4 ▼ | | MISCELLANEOUS: | | $HEIGHT =$ 9.33 FT |
| $A_x =$ | 5.25 IN ² | | | $SPACING =$ 16 IN |
| $S_x =$ | 3.06 IN ³ | | | $ECCENTRICITY =$ 0.1 IN |
| $I_x =$ | 5.36 IN ⁴ | | | $C_{F(COMPRESSION)} =$ 1.15 (NDS 4.3.6) |
| $C_{F(BENDING)} =$ | 1.5 (NDS 4.3.6) | | | APPLY? |
| $F_{cE} =$ | 469.1 PSI | $C_{SYS(BENDING)} =$ | 1.50 | YES (SDPWS T3.1.1.1) Is not applied w/ Cr |
| $C_b =$ | 1.25 (NDS 3.10.4) | $C_{r(BENDING)} =$ | 1.15 | YES (NDS 4.3.9) Is not applied w/ Csys |

LOAD CASES - IBC 1605.3.1

| | | | |
|--------|---|--------|--|
| CASE 1 | DEAD + LIVE + 5 PSF LAT. | CASE 4 | DEAD + 0.45WIND + 0.75LIVE + 0.75SNOW |
| CASE 2 | DEAD + SNOW + 5 PSF LAT. | CASE 5 | DEAD + 0.60WIND |
| CASE 3 | DEAD + 0.75LIVE + 0.75SNOW + 5 PSF LAT. | CASE 6 | DEAD + 0.75SEISMIC |
| | | CASE 7 | DEAD + 0.53SEISMIC + 0.75LIVE + 0.75SNOW |

ALLOWABLE STRESSES - C_d PER NDS T2.3.2, C_p PER NDS 3.7.1, ASSUME $C_m, C_t, C_i, C_L = 1.0$

| CASE | C_D | F_c^* | F_{cE}/F_c^* | C_P | F_c' | F_b' | $F_{c\perp}$ |
|-------|-------|---------|----------------|-------|--------|--------|--------------|
| 1 | 1.00 | 1553 | 0.30 | 0.280 | 435 | 1553 | 781 |
| 2 & 3 | 1.15 | 1785 | 0.26 | 0.247 | 440 | 1785 | 781 |
| 4 & 5 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 3240 | 781 |
| 6 & 7 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 2484 | 781 |

APPLIED STRESSES - NDS CHAPTER 3 DESIGN EQUATIONS

| CASE | $P_{APPLIED}$ | f_c | $M_{LAT. LOAD}$ | $M_{ECC.}$ | M_{TOTAL} | f_b |
|------|---------------|-------|-----------------|------------|-------------|-------|
| 1 | 1287 | 245 | 73 | 11 | 79 | 311 |
| 2 | 1068 | 203 | 73 | 9 | 73 | 306 |
| 3 | 1415 | 270 | 73 | 12 | 80 | 313 |
| 4 | 1415 | 270 | 52 | 12 | 60 | 234 |
| 5 | 702 | 134 | 70 | 6 | 73 | 287 |
| 6 | 702 | 134 | 51 | 6 | 54 | 213 |
| 7 | 1415 | 270 | 38 | 12 | 46 | 180 |

DESIGN CHECKS - COMBINED STRESS CHECK PER NDS EQN 3.9-3

| CASE | f_c/F_c' | f_b/F_b' | $f_c/F_{c\perp}$ | Combined | f_c/F_{cE} | Deflection | L/? |
|------------|-------------|-------------|------------------|-------------|--------------|-------------|--------------|
| 1 | 0.56 | 0.20 | 0.31 | 0.74 | 0.52 | 0.14 | L/773 |
| 2 | 0.46 | 0.17 | 0.26 | 0.52 | 0.43 | 0.14 | L/784 |
| 3 | 0.61 | 0.18 | 0.35 | 0.79 | 0.57 | 0.15 | L/767 |
| 4* | 0.60 | 0.07 | 0.35 | 0.53 | 0.57 | 0.05 | L/2203 |
| 5* | 0.30 | 0.09 | 0.17 | 0.21 | 0.29 | 0.06 | L/1791 |
| 6 | 0.30 | 0.09 | 0.17 | 0.21 | 0.29 | 0.10 | L/1126 |
| 7 | 0.60 | 0.07 | 0.35 | 0.53 | 0.57 | 0.08 | L/1337 |
| MAX. ----> | 0.61 | 0.20 | 0.35 | 0.79 | 0.57 | 0.15 | L/767 |
| | O.K. | O.K. | O.K. | O.K. | O.K. | | |

* Deflections reduced by 0.42 per IBC Table 1604.3 footnote F. Increase deflection by 1.4 for jambs supporting glass.

PLATE BENDING - *ALIGN STUDS WITH JOISTS WHERE POSSIBLE*

MISCELLANEOUS:

$C_{Fu} =$ 1.1 (NDS 4.3.7)
 $F_v =$ **150** PSI

ALLOWABLE STRESSES:

$F_v' =$ 173 PSI
 $F_b' =$ 1708 PSI

STUD REACTIONS (OUT - OF - PLANE)

50 LB

DBL TOP PLATE PROPERTIES:

$A_x =$ 10.50 IN²
 $S_x =$ 2.63 IN³
 $I_x =$ 1.97 IN⁴

APPLIED STRESSES:

$F_v =$ **102** PSI <--- O.K.
 $f_b =$ **1627** PSI <--- O.K.
 $\Delta_{MAX} =$ **0.029** IN

STUD WALL DESIGN - 1.11 (Demising)

2018 NDS/2018 IBC

WALL DATA

| | | | | | | | | |
|----------------------------|----------|-----------------|------------------------------|------|--------------------------------|------------------------|------------------------|-----|
| LUMBER TYPE: | | DF#2 | APPLIED LOADS: | | P _{DEAD} = | 1280 | LBS | |
| F _b = | 900 | PSI | W _{WIND} = | 8.0 | PSF | P _{LIVE} = | 1312 | LBS |
| F _c = | 1350 | PSI | W _{SEISMIC} = | 5.0 | PSF | P _{SNOW} = | 410 | LBS |
| F _{c⊥} = | 625 | PSI | | | | P _{WIND} = | 0 | LBS |
| E = | 1.60E+06 | PSI | | | | P _{SEISMIC} = | 0 | LBS |
| STUD SIZE: | | (1) 2x4 | MISCELLANEOUS: | | HEIGHT = | 9.33 | FT | |
| A _x = | 5.25 | IN ² | | | SPACING = | 16 | IN | |
| S _x = | 3.06 | IN ³ | | | ECCENTRICITY = | 0.1 | IN | |
| I _x = | 5.36 | IN ⁴ | | | C _F (COMPRESSION) = | 1.15 | (NDS 4.3.6) | |
| C _F (BENDING) = | 1.5 | (NDS 4.3.6) | | | | APPLY? | | |
| F _{CE} = | 469.1 | PSI | C _{sys} (BENDING) = | 1.50 | YES | (SDPWS T3.1.1.1) | Is not applied w/ Cr | |
| C _b = | 1.25 | (NDS 3.10.4) | C _r (BENDING) = | 1.15 | YES | (NDS 4.3.9) | Is not applied w/ Csys | |

LOAD CASES - IBC 1605.3.1

| | | | |
|--------|---|--------|--|
| CASE 1 | DEAD + LIVE + 5 PSF LAT. | CASE 4 | DEAD + 0.45WIND + 0.75LIVE + 0.75SNOW |
| CASE 2 | DEAD + SNOW + 5 PSF LAT. | CASE 5 | DEAD + 0.60WIND |
| CASE 3 | DEAD + 0.75LIVE + 0.75SNOW + 5 PSF LAT. | CASE 6 | DEAD + 0.75SEISMIC |
| | | CASE 7 | DEAD + 0.55SEISMIC + 0.75LIVE + 0.75SNOW |

ALLOWABLE STRESSES - C_d PER NDS T2.3.2, C_p PER NDS 3.7.1, ASSUME C_m, C_t, C_i, C_L = 1.0

| CASE | C _d | F _c * | F _{CE} /F _c * | C _p | F _c ' | F _b ' | F _{c⊥} |
|-------|----------------|------------------|-----------------------------------|----------------|------------------|------------------|-----------------|
| 1 | 1.00 | 1553 | 0.30 | 0.280 | 435 | 1553 | 781 |
| 2 & 3 | 1.15 | 1785 | 0.26 | 0.247 | 440 | 1785 | 781 |
| 4 & 5 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 3240 | 781 |
| 6 & 7 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 2484 | 781 |

APPLIED STRESSES - NDS CHAPTER 3 DESIGN EQUATIONS

| CASE | P _{APPLIED} | f _c | M _{LAT. LOAD} | M _{ECC.} | M _{TOTAL} | f _b |
|------|----------------------|----------------|------------------------|-------------------|--------------------|----------------|
| 1 | 2592 | 494 | 73 | 22 | 86 | 337 |
| 2 | 1690 | 322 | 73 | 14 | 81 | 319 |
| 3 | 2572 | 490 | 73 | 21 | 86 | 337 |
| 4 | 2572 | 490 | 52 | 21 | 66 | 257 |
| 5 | 1280 | 244 | 70 | 11 | 76 | 299 |
| 6 | 1280 | 244 | 51 | 11 | 57 | 225 |
| 7 | 2572 | 490 | 38 | 21 | 52 | 203 |

DESIGN CHECKS - COMBINED STRESS CHECK PER NDS EQN 3.9-3

| CASE | f _c /F _c ' | f _b /F _b ' | f _c /F _{c⊥} | Combined | f _c /F _{CE} | Deflection | L/? |
|------------|----------------------------------|----------------------------------|---------------------------------|----------|---------------------------------|------------|--------|
| 1 | 1.13 | 0.22 | 0.63 | -2.85 | 1.05 | 0.16 | L/712 |
| 2 | 0.73 | 0.18 | 0.41 | 1.10 | 0.69 | 0.15 | L/753 |
| 3 | 1.11 | 0.19 | 0.63 | -3.03 | 1.04 | 0.16 | L/713 |
| 4* | 1.09 | 0.08 | 0.63 | -0.61 | 1.04 | 0.06 | L/2001 |
| 5* | 0.54 | 0.09 | 0.31 | 0.49 | 0.52 | 0.07 | L/1721 |
| 6 | 0.54 | 0.09 | 0.31 | 0.48 | 0.52 | 0.10 | L/1067 |
| 7 | 1.09 | 0.08 | 0.63 | -0.66 | 1.04 | 0.09 | L/1182 |
| MAX. ----> | 1.13 | 0.22 | 0.63 | 1.10 | 1.05 | 0.16 | L/712 |
| | N.G. | O.K. | O.K. | N.G. | N.G. | | |

* Deflections reduced by 0.42 per IBC Table 1604.3 footnote F. Increase deflection by 1.4 for jambs supporting glass.

PLATE BENDING - *ALIGN STUDS WITH JOISTS WHERE POSSIBLE*

| | | | | |
|----------------------------------|-----------------------|----------------------------|----------|--|
| MISCELLANEOUS: | | ALLOWABLE STRESSES: | | STUD REACTIONS (OUT - OF - PLANE) 50 LB |
| C _{Ft} = | 1.1 (NDS 4.3.7) | F _v ' = | 173 PSI | |
| F _v = | 150 PSI | F _b ' = | 1708 PSI | |
| DBL TOP PLATE PROPERTIES: | | APPLIED STRESSES: | | |
| A _x = | 10.50 IN ² | F _v = | 161 PSI | <--- O.K. |
| S _x = | 2.63 IN ³ | f _b = | 2575 PSI | <--- N.G. |
| I _x = | 1.97 IN ⁴ | Δ _{MAX} = | 0.046 IN | |

STUD WALL DESIGN - 1.11 (Demising)

2018 NDS/2018 IBC

WALL DATA

| | | | | | | | | |
|-------------------------|----------|-----------------|-----------------------------|------|-----------------------------|------------------|------------------------|-----|
| LUMBER TYPE: | | DF#2 | APPLIED LOADS: | | $P_{DEAD} =$ | 295 | LBS | |
| $F_b =$ | 900 | PSI | $W_{WIND} =$ | 8.0 | PSF | $P_{LIVE} =$ | 410 | LBS |
| $F_c =$ | 1350 | PSI | $W_{SEISMIC} =$ | 5.0 | PSF | $P_{SNOW} =$ | 410 | LBS |
| $F_{c\perp} =$ | 625 | PSI | | | | $P_{WIND} =$ | 0 | LBS |
| $E =$ | 1.60E+06 | PSI | | | | $P_{SEISMIC} =$ | 0 | LBS |
| STUD SIZE: | | (1) 2x4 | MISCELLANEOUS: | | HEIGHT = | 9.33 | FT | |
| $A_x =$ | 5.25 | IN ² | | | SPACING = | 16 | IN | |
| $S_x =$ | 3.06 | IN ³ | | | ECCENTRICITY = | 0.1 | IN | |
| $I_x =$ | 5.36 | IN ⁴ | | | $C_F(\text{COMPRESSION}) =$ | 1.15 | (NDS 4.3.6) | |
| $C_F(\text{BENDING}) =$ | 1.5 | (NDS 4.3.6) | | | APPLY? | | | |
| $F_{cE} =$ | 469.1 | PSI | $C_{SYS}(\text{BENDING}) =$ | 1.50 | YES | (SDPWS T3.1.1.1) | Is not applied w/ Cr | |
| $C_D =$ | 1.25 | (NDS 3.10.4) | $C_R(\text{BENDING}) =$ | 1.15 | YES | (NDS 4.3.9) | Is not applied w/ Csys | |

LOAD CASES - IBC 1605.3.1

| | | | |
|--------|---|--------|--|
| CASE 1 | DEAD + LIVE + 5 PSF LAT. | CASE 4 | DEAD + 0.45WIND + 0.75LIVE + 0.75SNOW |
| CASE 2 | DEAD + SNOW + 5 PSF LAT. | CASE 5 | DEAD + 0.60WIND |
| CASE 3 | DEAD + 0.75LIVE + 0.75SNOW + 5 PSF LAT. | CASE 6 | DEAD + 0.75SEISMIC |
| | | CASE 7 | DEAD + 0.53SEISMIC + 0.75LIVE + 0.75SNOW |

ALLOWABLE STRESSES - C_D PER NDS T2.3.2, C_P PER NDS 3.7.1, ASSUME $C_m, C_t, C_i, C_L = 1.0$

| CASE | C_D | F_c^* | F_{cE}/F_c^* | C_P | F_c' | F_b' | $F_{c\perp}$ |
|-------|-------|---------|----------------|-------|--------|--------|--------------|
| 1 | 1.00 | 1553 | 0.30 | 0.280 | 435 | 1553 | 781 |
| 2 & 3 | 1.15 | 1785 | 0.26 | 0.247 | 440 | 1785 | 781 |
| 4 & 5 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 3240 | 781 |
| 6 & 7 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 2484 | 781 |

APPLIED STRESSES - NDS CHAPTER 3 DESIGN EQUATIONS

| CASE | $P_{APPLIED}$ | f_c | $M_{LAT. LOAD}$ | $M_{ECC.}$ | M_{TOTAL} | f_b |
|------|---------------|-------|-----------------|------------|-------------|-------|
| 1 | 705 | 134 | 73 | 6 | 76 | 299 |
| 2 | 705 | 134 | 73 | 6 | 76 | 299 |
| 3 | 911 | 173 | 73 | 8 | 77 | 303 |
| 4 | 911 | 173 | 52 | 8 | 57 | 223 |
| 5 | 295 | 56 | 70 | 2 | 71 | 279 |
| 6 | 295 | 56 | 51 | 2 | 52 | 205 |
| 7 | 911 | 173 | 38 | 8 | 43 | 169 |

DESIGN CHECKS - COMBINED STRESS CHECK PER NDS EQN 3.9-3

| CASE | f_c/F_c' | f_b/F_b' | $f_c/F_{c\perp}$ | Combined | f_c/F_{cE} | Deflection | L/? |
|------------|------------|------------|------------------|----------|--------------|------------|--------|
| 1 | 0.31 | 0.19 | 0.17 | 0.36 | 0.29 | 0.14 | L/804 |
| 2 | 0.31 | 0.17 | 0.17 | 0.33 | 0.29 | 0.14 | L/804 |
| 3 | 0.39 | 0.17 | 0.22 | 0.42 | 0.37 | 0.14 | L/793 |
| 4* | 0.39 | 0.07 | 0.22 | 0.26 | 0.37 | 0.05 | L/2305 |
| 5* | 0.13 | 0.09 | 0.07 | 0.11 | 0.12 | 0.06 | L/1845 |
| 6 | 0.13 | 0.08 | 0.07 | 0.11 | 0.12 | 0.10 | L/1171 |
| 7 | 0.39 | 0.07 | 0.22 | 0.26 | 0.37 | 0.08 | L/1419 |
| MAX. ----> | 0.39 | 0.19 | 0.22 | 0.42 | 0.37 | 0.14 | L/793 |
| | O.K. | O.K. | O.K. | O.K. | O.K. | | |

* Deflections reduced by 0.42 per IBC Table 1604.3 footnote F. Increase deflection by 1.4 for jambs supporting glass.

PLATE BENDING - *ALIGN STUDS WITH JOISTS WHERE POSSIBLE*

| | | | | |
|----------------------------------|-----------------------|----------------------------|----------|--|
| MISCELLANEOUS: | | ALLOWABLE STRESSES: | | STUD REACTIONS (OUT - OF - PLANE) |
| $C_{Fu} =$ | 1.1 (NDS 4.3.7) | $F_v' =$ | 173 PSI | |
| $F_v =$ | 150 PSI | $F_b' =$ | 1708 PSI | 50 LB |
| DBL TOP PLATE PROPERTIES: | | APPLIED STRESSES: | | |
| $A_x =$ | 10.50 IN ² | $F_v =$ | 67 PSI | ---- O.K. |
| $S_x =$ | 2.63 IN ³ | $f_b =$ | 1075 PSI | ---- O.K. |
| $I_x =$ | 1.97 IN ⁴ | $\Delta_{MAX} =$ | 0.019 IN | |



Project: Mercer Island

Job Number: 19-028 NOTES:

Sheet: 1 of

Name: AK

Originating Office: Seattle

Date: 11/13/20

STUD WALL DESIGN - 1.11 (Demising)

2018 NDS/2018 IBC

WALL DATA

| | | |
|---------------------|--------------|--|
| LUMBER TYPE: | DF#2 | |
| F _b = | 900 PSI | |
| F _c = | 1350 PSI | |
| F _{c⊥} = | 625 PSI | |
| E = | 1.60E+06 PSI | |

| | | | |
|------------------------|---------------------|------------------------|---------|
| APPLIED LOADS: | P _{DEAD} = | 787 | LBS |
| W _{WIND} = | 8.0 PSF | P _{LIVE} = | 656 LBS |
| W _{SEISMIC} = | 5.0 PSF | P _{SNOW} = | 410 LBS |
| | | P _{WIND} = | 0 LBS |
| | | P _{SEISMIC} = | 0 LBS |

| | | |
|---------------------------|----------------------|--|
| STUD SIZE: | (1) 2x4 | |
| A _x = | 5.25 IN ² | |
| S _x = | 3.06 IN ³ | |
| I _x = | 5.36 IN ⁴ | |
| C _{F(BENDING)} = | 1.5 (NDS 4.3.6) | |
| F _{CE} = | 469.1 PSI | |
| C _D = | 1.25 (NDS 3.10.4) | |

| | | | |
|-----------------------|-----------------------------|------|--|
| MISCELLANEOUS: | HEIGHT = | 9.33 | FT |
| | SPACING = | 16 | IN |
| | ECCENTRICITY = | 0.1 | IN |
| | C _{F(COMPRESS)} = | 1.15 | (NDS 4.3.6) |
| | C _{SYS(BENDING)} = | 1.50 | YES (SDPMG T3.1.1.1) Is not applied w/ Cr |
| | C _{r(BENDING)} = | 1.15 | YES (NDS 4.3.9) Is not applied w/ Csys |

LOAD CASES - IBC 1605.3.1

| | | | |
|--------|---|--------|--|
| CASE 1 | DEAD + LIVE + 5 PSF LAT. | CASE 4 | DEAD + 0.45WIND + 0.75LIVE + 0.75SNOW |
| CASE 2 | DEAD + SNOW + 5 PSF LAT. | CASE 5 | DEAD + 0.60WIND |
| CASE 3 | DEAD + 0.75LIVE + 0.75SNOW + 5 PSF LAT. | CASE 6 | DEAD + 0.75SEISMIC |
| | | CASE 7 | DEAD + 0.53SEISMIC + 0.75LIVE + 0.75SNOW |

ALLOWABLE STRESSES - C_D PER NDS T2.3.2, C_p PER NDS 3.7.1, ASSUME C_m, C_t, C_i, C_L = 1.0

| CASE | C _D | F _c * | F _{CE} /F _c * | C _F | F _c ' | F _b ' | F _{c⊥} |
|-------|----------------|------------------|-----------------------------------|----------------|------------------|------------------|-----------------|
| 1 | 1.00 | 1553 | 0.30 | 0.280 | 435 | 1553 | 787 |
| 2 & 3 | 1.15 | 1785 | 0.26 | 0.247 | 440 | 1785 | 787 |
| 4 & 5 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 3240 | 787 |
| 6 & 7 | 1.60 | 2484 | 0.19 | 0.181 | 449 | 2484 | 787 |

APPLIED STRESSES - NDS CHAPTER 3 DESIGN EQUATIONS

| CASE | P _{APPLIED} | f _c | M _{LAT. LOAD} | M _{ECC.} | M _{TOTAL} | f _b |
|------|----------------------|----------------|------------------------|-------------------|--------------------|----------------|
| 1 | 1444 | 275 | 73 | 12 | 80 | 314 |
| 2 | 1198 | 228 | 73 | 10 | 79 | 309 |
| 3 | 1587 | 302 | 73 | 13 | 81 | 317 |
| 4 | 1587 | 302 | 52 | 13 | 60 | 237 |
| 5 | 787 | 150 | 70 | 7 | 74 | 289 |
| 6 | 787 | 150 | 51 | 7 | 55 | 215 |
| 7 | 1587 | 302 | 38 | 13 | 47 | 183 |

DESIGN CHECKS - COMBINED STRESS CHECK PER NDS EQN 3.9-3

| CASE | f _c /F _c ' | f _b /F _b ' | f _c /F _{c⊥} | Combined | f _c /F _{CE} | Deflection | L/? |
|------------|----------------------------------|----------------------------------|---------------------------------|-------------|---------------------------------|-------------|--------------|
| 1 | 0.63 | 0.20 | 0.35 | 0.89 | 0.59 | 0.15 | L/765 |
| 2 | 0.52 | 0.17 | 0.29 | 0.61 | 0.49 | 0.14 | L/778 |
| 3 | 0.69 | 0.18 | 0.39 | 0.97 | 0.64 | 0.15 | L/758 |
| 4* | 0.67 | 0.07 | 0.39 | 0.66 | 0.64 | 0.05 | L/2170 |
| 5* | 0.33 | 0.09 | 0.19 | 0.24 | 0.32 | 0.06 | L/1781 |
| 6 | 0.33 | 0.09 | 0.19 | 0.24 | 0.32 | 0.10 | L/1116 |
| 7 | 0.67 | 0.07 | 0.39 | 0.66 | 0.64 | 0.09 | L/1312 |
| MAX. ----> | 0.69 | 0.20 | 0.39 | 0.97 | 0.64 | 0.15 | L/758 |
| | O.K. | O.K. | O.K. | O.K. | O.K. | | |

* Deflections reduced by 0.42 per IBC Table 1604.3 footnote f. Increase deflection by 1.4 for jambs supporting glass.

PLATE BENDING - *ALIGN STUDS WITH JOISTS WHERE POSSIBLE*

MISCELLANEOUS:

| | |
|-------------------|-----------------|
| C _{FD} = | 1.1 (NDS 4.3.7) |
| F _v = | 150 PSI |

ALLOWABLE STRESSES:

| | |
|--------------------|----------|
| F _v ' = | 173 PSI |
| F _b ' = | 1708 PSI |

STUD REACTIONS (OUT - OF - PLANE)

50 LB

DBL TOP PLATE PROPERTIES:

| | |
|------------------|-----------------------|
| A _x = | 10.50 IN ² |
| S _x = | 2.63 IN ³ |
| I _x = | 1.97 IN ⁴ |

APPLIED STRESSES:

| | | |
|--------------------|----------|-----------|
| F _v = | 114 PSI | <--- O.K. |
| f _b = | 1825 PSI | <--- N.G. |
| Δ _{MAX} = | 0.032 IN | |



Project: MIMU Job Number: 19-028
 Sheet: _____ of _____ Name: AED
 Originating Office: Seattle Date: 09/11/23

STUD WALL DESIGN - PAVILION

2015 NDS/2015 IBC

WALL DATA

| | | | | | | | |
|---------------------|----------|-----------------|-----------------------------|-------------|-----------------------|------------------|-------------|
| LUMBER TYPE: | | DF#2 | APPLIED LOADS: | | $P_{DEAD} =$ | 541 | LB |
| $F_b =$ | 900 | PSI | (IBC 1605.3.2) ($\omega =$ | 1.0 | $P_{LIVE} =$ | 0 | LB |
| $F_c =$ | 1350 | PSI | $W_{WIND} =$ | 16.9 | $P_{SNOW} =$ | 676 | LB |
| $F_{c \perp} =$ | 625 | PSI | $\omega W_{WIND} =$ | 16.9 | $P_{WIND} =$ | 0 | LB |
| $E =$ | 1.60E+06 | PSI | $W_{SEISMIC} =$ | 5.0 | $P_{SEISMIC} =$ | 108 | LB |
| STUD SIZE: | | (1) 2x6 | MISCELLANEOUS: | | HEIGHT = | 13.5 | FT |
| $A_x =$ | 8.25 | IN ² | | | SPACING = | 16 | IN |
| $S_x =$ | 7.56 | IN ³ | | | ECCENTRICITY = | 0.1 | IN |
| $I_x =$ | 20.80 | IN ⁴ | | | C_F (COMPRESSION) = | 1.10 | (NDS 4.3.6) |
| C_F (BENDING) = | 1.3 | (NDS 4.3.6) | | | APPLY? | | |
| $F_{cE} =$ | 553.3 | PSI | C_{SYS} (BENDING) = | 1.35 | YES | (SDPWS T3.1.1.1) | |
| $C_b =$ | 1.25 | (NDS 3.10.4) | C_r (BENDING) = | 1.15 | YES | (NDS 4.3.9) | |

LOAD CASES - IBC 1605.3.1

| | | | |
|--------|---------------------------------|--------|-----------------------------------|
| CASE 1 | DEAD + LIVE + 5 PSF LAT. | CASE 4 | DEAD + LIVE + 0.6WIND + (1/2)SNOW |
| CASE 2 | DEAD + LIVE + SNOW + 5 PSF LAT. | CASE 5 | DEAD + LIVE + SNOW + 0.3WIND |
| CASE 3 | DEAD + LIVE + 0.6WIND | CASE 6 | DEAD + LIVE + SNOW + SEISMIC/1.4 |

ALLOWABLE STRESSES - C_d PER NDS T2.3.2, C_p PER NDS 3.7.1, ASSUME $C_m, C_t, C_i, C_L = 1.0$

| CASE | C_D | F_c^* | F_{cE}/F_c^* | C_F | F_c' | F_b' | $F_{c \perp}'$ |
|-----------|-------|---------|----------------|-------|--------|--------|----------------|
| 1 | 1.00 | 1485 | 0.37 | 0.338 | 502 | 1346 | 781 |
| 2 | 1.15 | 1708 | 0.32 | 0.299 | 510 | 1547 | 781 |
| 3, 4, & 5 | 1.60 | 2376 | 0.23 | 0.220 | 524 | 2527 | 781 |
| 6 | 1.60 | 2376 | 0.23 | 0.220 | 524 | 2153 | 781 |

APPLIED STRESSES - NDS CHAPTER 3 DESIGN EQUATIONS

| CASE | $P_{APPLIED}$ | F_c | $M_{LAT. LOAD}$ | $M_{ECC.}$ | M_{TOTAL} | F_b |
|------|---------------|-------|-----------------|------------|-------------|-------|
| 1 | 541.3 | 66 | 151.9 | 4.5 | 154.7 | 245 |
| 2 | 1217.0 | 148 | 151.9 | 10.1 | 158.2 | 251 |
| 3 | 541.3 | 66 | 308.0 | 4.5 | 310.8 | 493 |
| 4 | 879.1 | 107 | 308.0 | 7.3 | 312.6 | 496 |
| 5 | 1217.0 | 148 | 154.0 | 10.1 | 160.3 | 254 |
| 6 | 1294.3 | 157 | 108.5 | 10.8 | 115.2 | 183 |

DESIGN CHECKS - COMBINED STRESS CHECK PER NDS EQN 3.9-3

| CASE | f_c/F_c' | f_b/F_b' | $f_c/F_{c \perp}'$ | Combined | f_c/F_{cE} | Deflection | L/? |
|------------|-------------|-------------|--------------------|-------------|--------------|-------------|---------------|
| 1 | 0.13 | 0.18 | 0.08 | 0.22 | 0.12 | 0.15 | L/1062 |
| 2 | 0.29 | 0.16 | 0.19 | 0.30 | 0.27 | 0.16 | L/1039 |
| 3* | 0.13 | 0.20 | 0.08 | 0.24 | 0.12 | 0.16 | L/1016 |
| 4* | 0.20 | 0.20 | 0.14 | 0.28 | 0.19 | 0.16 | L/1008 |
| 5* | 0.28 | 0.10 | 0.19 | 0.22 | 0.27 | 0.08 | L/1944 |
| 6 | 0.30 | 0.08 | 0.20 | 0.21 | 0.28 | 0.11 | L/1426 |
| MAX. ----> | 0.30 | 0.20 | 0.20 | 0.30 | 0.28 | 0.16 | L/1008 |
| | O.K. | O.K. | O.K. | O.K. | O.K. | | |

* Deflections reduced by 0.42 per IBC Table 1604.3 footnote f. Increase deflection by 1.4 for jamba supporting glass.

PLATE BENDING - *ALIGN STUDS WITH JOISTS WHERE POSSIBLE*

| | | |
|----------------------------------|----------------------------------|---|
| MISCELLANEOUS: | ALLOWABLE STRESSES: | STUD REACTIONS (OUT - OF - PLANE) 152 LB |
| $C_{Fu} =$ 1.15 (NDS 4.3.7) | $F_v' =$ 173 PSI | |
| $F_v =$ 150 PSI | $F_b' =$ 1547 PSI | |
| DBL TOP PLATE PROPERTIES: | APPLIED STRESSES: | |
| $A_x =$ 16.50 IN ² | $F_v =$ 74 PSI | <--- O.K. |
| $S_x =$ 4.13 IN ³ | $F_b =$ 1180 PSI | <--- O.K. |
| $I_x =$ 3.09 IN ⁴ | $\Delta_{MAX} =$ 0.021 IN | |

GEOMETRY

| | | | |
|------------------------|---------------|----------------|-------------|
| Beam Designation | | W10X68 | |
| Span | Length | Support | Type |
| ① | 16.50 ft | ① | Pinned |
| ② | N.A. | ② | Pinned |
| ③ | N.A. | ③ | N.A. |
| ④ | N.A. | ④ | N.A. |
| ⑤ | N.A. | ⑤ | N.A. |
| | | ⑥ | N.A. |

PROPERTIES

| | | | |
|----------|------------------------|---------|-----------------------|
| Area .. | 19.9 in ² | Sx ... | 75.7 in ³ |
| Depth | 10.4 in | Zx ... | 85.3 in ³ |
| bf | 10.1 in | rx | 4.44 in |
| tw | 0.47 in | ly | 134.0 in ⁴ |
| tf | 0.77 in | Sy ... | 26.4 in ³ |
| k des . | 1.27 in | Zy ... | 40.1 in ³ |
| Ix | 394.0 in ⁴ | ry | 2.59 in |
| Cw | 3100.0 in ⁶ | J | 3.56 in ⁴ |

LRFD SUPPORT REACTIONS (kip)

| Load Comb. | △ | |
|-------------------|------|------|
| 1.4D | 28.0 | 19.4 |
| 1.2D+1.6L+0.5Lr | 51.7 | 35.8 |
| 1.2D+1.6L+0.5S | 54.4 | 37.7 |
| 1.2D+0.5L+1.6Lr | 32.7 | 22.6 |
| 1.2D+0.5L+1.6S | 41.3 | 28.6 |
| 1.2D+1.6Lr+0.5W | 24.0 | 16.6 |
| 1.2D+1.6S+0.5W | 32.7 | 22.6 |
| 1.2D+0.5L+0.5Lr+W | 32.7 | 22.6 |
| 1.2D+0.5L+0.5S+W | 35.4 | 24.5 |
| 1.2D+0.5L+0.2S+E | 33.8 | 23.4 |
| 0.9D+W | 18.0 | 12.5 |
| 0.9D+E | 18.0 | 12.5 |
| 1.2CD+1.6CL | 0.9 | 0.7 |

SLAB AND DECK

| | |
|--|----------|
| Overall Slab Thickness | 0.0 in |
| <i>Interior Beam. Beam Spacing = 5.0 ft</i> | |
| Effective Slab Width | 4.13 ft |
| Concrete Strength f _c | 3000 psi |
| Concrete Density | 150 pcf |
| Metal Deck Type | None |
| Deck Ribs Height hr | 0.0 in |
| Deck Ribs Avg. Width wr .. | 0.0 in |
| <i>No Metal Deck specified for this Beam</i> | |

DESIGN FOR SHEAR

| | |
|--|------------------------------|
| Shear Coefficient Cv | 1.00 |
| Maximum Shear Force V ... | 40.2 kip |
| Limit States | Nominal V_n |
| Shear Yielding | 146.6 kip |
| Shear Buckling | 146.6 kip |
| Nominal Strength V _n | 146.6 kip |
| Resistance Factor φ | 1.00 |
| Design Strength φV _n | 146.6 kip |
| V / φV _n Design Ratio | 0.27 OK |



FLEXURE (NON-COMPOSITE)

Lateral Bracing @3.00 ft (Top)

- Construction Loads

Max. Bending Moment M .. 2.6 k-ft
 L. T. Buckling Cb-factor 1.06

Limit States **Nominal Mn**

| | | | |
|----------------------------------|-------|------|----|
| Yielding | 355.4 | k-ft | ← |
| Lateral Torsional Buckling | 355.4 | k-ft | |
| Flange Local Buckling | N.A. | k-ft | |
| Web Local Buckling | N.A. | k-ft | |
| Nominal Strength Mn | 355.4 | k-ft | |
| Resistance Factor ϕ | 0.90 | | |
| Design Strength ϕMn | 319.9 | k-ft | |
| M / ϕMn Design Ratio | 0.01 | | OK |

- Final Loads

Max. Bending Moment M .. 149.7 k-ft
 L. T. Buckling Cb-factor 1.01

Limit States **Nominal Mn**

| | | | |
|----------------------------------|-------|------|----|
| Yielding | 355.4 | k-ft | ← |
| Lateral Torsional Buckling | 355.4 | k-ft | |
| Flange Local Buckling | N.A. | k-ft | |
| Web Local Buckling | N.A. | k-ft | |
| Nominal Strength Mn | 355.4 | k-ft | |
| Resistance Factor ϕ | 0.90 | | |
| Design Strength ϕMn | 319.9 | k-ft | |
| M / ϕMn Design Ratio | 0.47 | | OK |

LOCAL BUCKLING

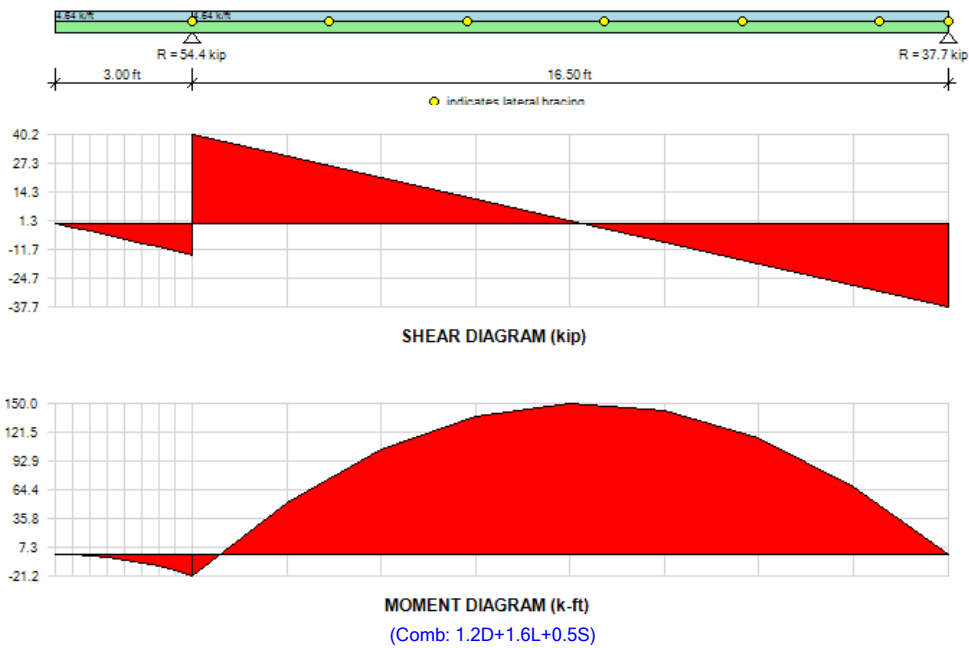
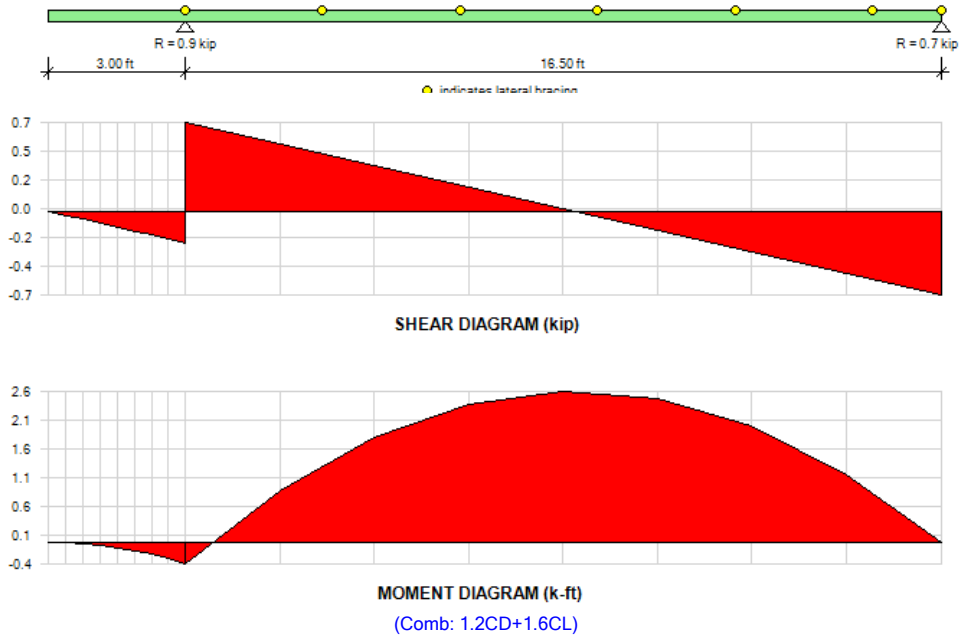
| | |
|------------------------------|-------------|
| Flanges in Flexure | Compact |
| Flanges in Compression | Non-compact |
| Web in Flexure | Compact |
| Web in Compression | Non-compact |

DEFLECTIONS

| | | | | | |
|----------------------------|---------------|-------------|-----------------|-------|----|
| Stiffness factor | 1.0 | | | | |
| Required Camber | 0.00 in | | | | |
| Long-term Deflection | N.A. | | | | |
| <u>Loading</u> | δ (in) | L/ δ | L/ δ Min | Ratio | |
| CL | 0.00 | 3600 | 180 | 0.05 | OK |
| CD+CL .. | 0.00 | 3600 | 120 | 0.03 | OK |
| L | -0.11 | 333 | 180 | 0.54 | OK |
| D+L | -0.23 | 154 | 120 | 0.78 | OK |

DESIGN CODES

| | |
|-------------------------|--------------|
| Steel Design | AISC 360-16 |
| Load Combinations | ASCE 7-10/16 |



| GEOMETRY | | PROPERTIES | | | |
|----------------------------|------------|------------|---------------------|---------|-----------------------|
| Column Designation | HSS4X4X1/4 | Weight | 12 lb/ft | Sx ... | 3.9 in ³ |
| Steel Yield Strength Fy | 46.0 ksi | Area | 3.4 in ² | Zx ... | 4.7 in ³ |
| Modulus of Elasticity Es | 29000 ksi | Depth | 4.0 in | rx | 1.52 in |
| Member Length L | 9.00 ft | Width | 4.00 in | ly | 7.8 in ⁴ |
| Effective Length Kx-factor | 1.00 | t nom | 0.25 in | Sy ... | 3.9 in ³ |
| Effective Length Ky-factor | 1.00 | t des | 0.23 in | Zy ... | 4.7 in ³ |
| Unbraced Length Lb | N.A. ft | lx | 7.8 in ⁴ | ry | 1.52 in |
| | | | | J | 12.80 in ⁴ |

UNFACTORED LOADS (Elastic Second-Order Analysis)

| | Dead | Live | RLive | Snow | Wind | Seismic | |
|---------------|------|------|-------|------|------|---------|------|
| Axial Force P | 8.2 | 8.1 | 0.0 | 2.5 | 0.0 | 0.0 | kip |
| Mx at Bottom | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | k-ft |
| Mx at Top | 0.7 | 0.7 | 0.0 | 0.4 | 0.0 | 0.0 | k-ft |
| My at Bottom | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | k-ft |
| My at Top | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | k-ft |

COLUMN STRENGTH

| Comb | Pr (kip) | Pc (kip) | Pr/Pc Ratio | Mrx (k-ft) | Mcx (k-ft) | Mrx/Mcx Ratio | Mry (k-ft) | Mcy (k-ft) | Mry/Mcy Ratio | H1-1a Ratio | H1-1b Ratio | |
|------|----------|----------|-------------|------------|------------|---------------|------------|------------|---------------|-------------|-------------|----|
| ① | 11.5 | 99.3 | 0.12 | 1.0 | 16.2 | 0.06 | 0.0 | 16.2 | 0.00 | N.A. | 0.12 | OK |
| ② | 22.8 | 99.3 | 0.23 | 2.0 | 16.2 | 0.12 | 0.0 | 16.2 | 0.00 | 0.34 | N.A. | OK |
| ③ | 24.1 | 99.3 | 0.24 | 2.2 | 16.2 | 0.13 | 0.0 | 16.2 | 0.00 | 0.36 | N.A. | OK |
| ④ | 13.9 | 99.3 | 0.14 | 1.2 | 16.2 | 0.07 | 0.0 | 16.2 | 0.00 | N.A. | 0.14 | OK |
| ⑤ | 17.9 | 99.3 | 0.18 | 1.8 | 16.2 | 0.11 | 0.0 | 16.2 | 0.00 | N.A. | 0.20 | OK |
| ⑥ | 9.8 | 99.3 | 0.10 | 0.8 | 16.2 | 0.05 | 0.0 | 16.2 | 0.00 | N.A. | 0.10 | OK |
| ⑦ | 13.8 | 99.3 | 0.14 | 1.5 | 16.2 | 0.09 | 0.0 | 16.2 | 0.00 | N.A. | 0.16 | OK |
| ⑧ | 13.9 | 99.3 | 0.14 | 1.2 | 16.2 | 0.07 | 0.0 | 16.2 | 0.00 | N.A. | 0.14 | OK |
| ⑨ | 15.1 | 99.3 | 0.15 | 1.4 | 16.2 | 0.09 | 0.0 | 16.2 | 0.00 | N.A. | 0.16 | OK |
| ⑩ | 14.4 | 99.3 | 0.14 | 1.3 | 16.2 | 0.08 | 0.0 | 16.2 | 0.00 | N.A. | 0.15 | OK |
| ⑪ | 7.4 | 99.3 | 0.07 | 0.6 | 16.2 | 0.04 | 0.0 | 16.2 | 0.00 | N.A. | 0.08 | OK |
| ⑫ | 7.4 | 99.3 | 0.07 | 0.6 | 16.2 | 0.04 | 0.0 | 16.2 | 0.00 | N.A. | 0.08 | OK |

COMPRESSION

| | |
|---------------------------------------|----------------|
| Slenderness Ratio $K_x L / r_x$ | 71.1 |
| Slenderness Ratio $K_y L / r_y$ | 71.1 |
| Max. Slenderness Ratio | 71.1 OK |

| Limit States | Nominal P_n |
|-----------------------------------|--------------------|
| Flexural Buckling | 110.4 kip ← |
| Torsional Buckling | N.A. kip |
| Flexural-Torsional Buckling | N.A. kip |
| Nominal Strength P_n | 110.4 kip |
| Resistance Factor ϕ | 0.90 |
| Design Strength ϕP_n | 99.3 kip |
| $P / \phi P_n$ Design Ratio | 0.24 OK |

BENDING ABOUT Y-Y

| Limit States | Nominal M_n |
|-----------------------------------|--------------------|
| Yielding | 18.0 k-ft ← |
| Lateral-Torsional Buckling | N.A. k-ft |
| Flange Local Buckling | N.A. k-ft |
| Web Local Buckling | N.A. k-ft |
| Nominal Strength M_n | 18.0 k-ft |
| Resistance Factor ϕ | 0.90 |
| Design Strength ϕM_n | 16.2 k-ft |
| $M / \phi M_n$ Design Ratio | 0.00 OK |

LOCAL BUCKLING

| | |
|----------------------------|-------------|
| Flanges in Flexure | Compact |
| Walls in Compression | Non-slender |
| Webs in Flexure | Compact |

BENDING ABOUT X-X

| | |
|------------------------------------|-----------|
| Moment at 1/4 point of L_b | N.A. k-ft |
| Moment at 1/2 point of L_b | N.A. k-ft |
| Moment at 3/4 point of L_b | N.A. k-ft |
| L. T. Buckling C_b -factor | N.A. |

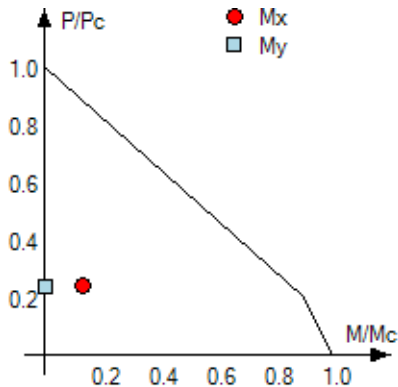
| Limit States | Nominal M_n |
|-----------------------------------|--------------------|
| Yielding | 18.0 k-ft ← |
| Lateral-Torsional Buckling | N.A. k-ft |
| Flange Local Buckling | N.A. k-ft |
| Web Local Buckling | N.A. k-ft |
| Nominal Strength M_n | 18.0 k-ft |
| Resistance Factor ϕ | 0.90 |
| Design Strength ϕM_n | 16.2 k-ft |
| $M / \phi M_n$ Design Ratio | 0.13 OK |

COMBINED FORCES

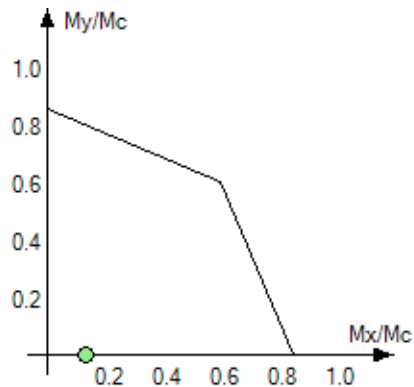
| | |
|-----------------------------|----------------|
| Combined Forces Ratio | 0.36 OK |
|-----------------------------|----------------|

DESIGN CODES

| | |
|-------------------------|--------------|
| Steel Design | AISC 360-16 |
| Load Combinations | ASCE 7-10/16 |



INTERACTION DIAGRAM



BIAXIAL BENDING DIAGRAM


GEOMETRY

| | | |
|--------------------------------------|---------------|---------------------|
| Beam Designation W10X88 | | |
| Span | Length | Support Type |
| ① | 23.25 ft | ① Pinned |
| ② | N.A. | ② Pinned |
| ③ | N.A. | ③ N.A. |
| ④ | N.A. | ④ N.A. |
| ⑤ | N.A. | ⑤ N.A. |
| | | ⑥ N.A. |

PROPERTIES

| | | | |
|----------|------------------------|---------|-----------------------|
| Area .. | 26.0 in ² | Sx ... | 98.5 in ³ |
| Depth | 10.8 in | Zx ... | 113.0 in ³ |
| bf | 10.3 in | rx | 4.54 in |
| tw | 0.61 in | ly | 179.0 in ⁴ |
| tf | 0.99 in | Sy ... | 34.8 in ³ |
| k des . | 1.49 in | Zy ... | 53.1 in ³ |
| Ix | 534.0 in ⁴ | ry | 2.63 in |
| Cw | 4330.0 in ⁶ | J | 7.53 in ⁴ |

LRFD SUPPORT REACTIONS (kip)

| | | |
|-------------------|---|------|
| Load Comb. |  | |
| 1.4D | 26.1 | 26.1 |
| 1.2D+1.6L+0.5Lr | 48.4 | 48.4 |
| 1.2D+1.6L+0.5S | 51.0 | 51.0 |
| 1.2D+0.5L+1.6Lr | 30.5 | 30.5 |
| 1.2D+0.5L+1.6S | 38.7 | 38.7 |
| 1.2D+1.6Lr+0.5W | 22.4 | 22.4 |
| 1.2D+1.6S+0.5W | 30.5 | 30.5 |
| 1.2D+0.5L+0.5Lr+W | 30.5 | 30.5 |
| 1.2D+0.5L+0.5S+W | 33.1 | 33.1 |
| 1.2D+0.5L+0.2S+E | 31.5 | 31.5 |
| 0.9D+W | 16.8 | 16.8 |
| 0.9D+E | 16.8 | 16.8 |
| 1.2CD+1.6CL | 1.2 | 1.2 |

SLAB AND DECK

| | |
|--|----------|
| Overall Slab Thickness | 0.0 in |
| <i>Interior Beam. Beam Spacing = 5.0 ft</i> | |
| Effective Slab Width | 5.00 ft |
| Concrete Strength f'c | 3000 psi |
| Concrete Density | 150 pcf |
| Metal Deck Type | None |
| Deck Ribs Height hr | 0.0 in |
| Deck Ribs Avg. Width wr .. | 0.0 in |
| <i>No Metal Deck specified for this Beam</i> | |

DESIGN FOR SHEAR

| | |
|----------------------------|----------------|
| Shear Coefficient Cv | 1.00 |
| Maximum Shear Force V ... | 51.0 kip |
| Limit States | |
| Shear Yielding | 196.0 kip |
| Shear Buckling | 196.0 kip |
| Nominal Vn | |
| Nominal Strength Vn | 196.0 kip |
| Resistance Factor φ | 1.00 |
| Design Strength φVn | 196.0 kip |
| V / φVn Design Ratio | 0.26 OK |



FLEXURE (NON-COMPOSITE)

Lateral Bracing @3.00 ft (Top)

- Construction Loads

Max. Bending Moment M .. 7.1 k-ft
L. T. Buckling Cb-factor 1.01

Limit States Nominal Mn

| | | | |
|----------------------------------|-------|------|----|
| Yielding | 470.8 | k-ft | ← |
| Lateral Torsional Buckling | 470.8 | k-ft | |
| Flange Local Buckling | N.A. | k-ft | |
| Web Local Buckling | N.A. | k-ft | |
| Nominal Strength Mn | 470.8 | k-ft | |
| Resistance Factor ϕ | 0.90 | | |
| Design Strength ϕ Mn | 423.8 | k-ft | |
| M / ϕ Mn Design Ratio | 0.02 | | OK |

- Final Loads

Max. Bending Moment M .. 296.2 k-ft
L. T. Buckling Cb-factor 1.01

Limit States Nominal Mn

| | | | |
|----------------------------------|-------|------|----|
| Yielding | 470.8 | k-ft | ← |
| Lateral Torsional Buckling | 470.8 | k-ft | |
| Flange Local Buckling | N.A. | k-ft | |
| Web Local Buckling | N.A. | k-ft | |
| Nominal Strength Mn | 470.8 | k-ft | |
| Resistance Factor ϕ | 0.90 | | |
| Design Strength ϕ Mn | 423.8 | k-ft | |
| M / ϕ Mn Design Ratio | 0.70 | | OK |

LOCAL BUCKLING

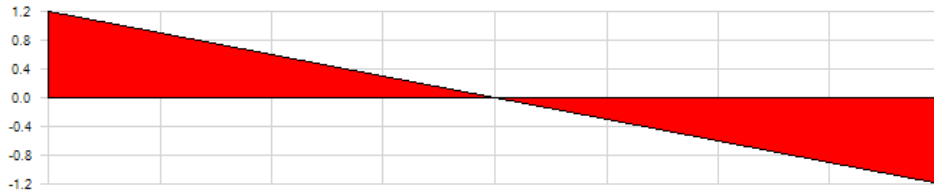
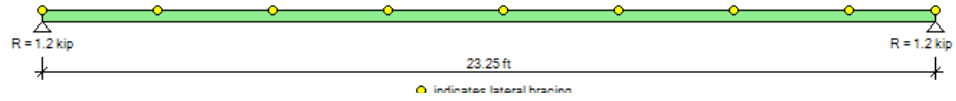
| | |
|------------------------------|-------------|
| Flanges in Flexure | Compact |
| Flanges in Compression | Non-compact |
| Web in Flexure | Compact |
| Web in Compression | Non-compact |

DEFLECTIONS

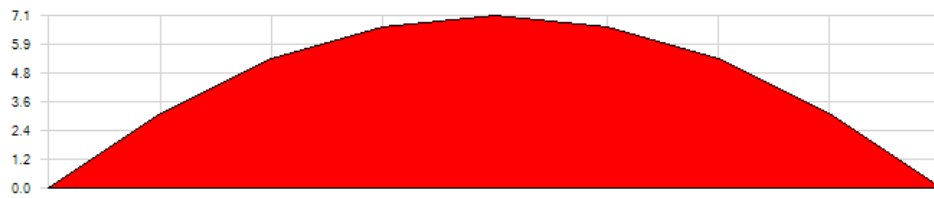
| | | | | | |
|----------------------------|---------------------------------|------------------------------|----------------------------------|--------------|----|
| Stiffness factor | 1.0 | | | | |
| Required Camber | 0.54 in | | | | |
| Long-term Deflection | N.A. | | | | |
| <u>Loading</u> | <u>δ (in)</u> | <u>L/δ</u> | <u>L/δ Min</u> | <u>Ratio</u> | |
| CL | 0.00 | 9999 | 360 | 0.04 | OK |
| CD+CL .. | -0.51 | 550 | 240 | 0.44 | OK |
| L | 0.59 | 469 | 360 | 0.77 | OK |
| D+L | 0.73 | 382 | 240 | 0.63 | OK |

DESIGN CODES

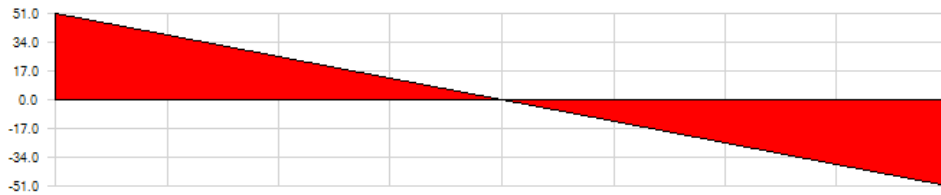
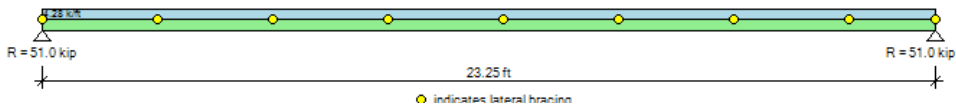
| | |
|-------------------------|--------------|
| Steel Design | AISC 360-16 |
| Load Combinations | ASCE 7-10/16 |



SHEAR DIAGRAM (kip)



MOMENT DIAGRAM (k-ft)
(Comb: 1.2CD+1.6CL)



SHEAR DIAGRAM (kip)



MOMENT DIAGRAM (k-ft)
(Comb: 1.2D+1.6L+0.5S)

GEOMETRY

| | |
|-----------------------------------|-----------|
| Column Designation | HSS5X5X16 |
| Steel Yield Strength F_y | 46.0 ksi |
| Modulus of Elasticity E_s | 29000 ksi |
| Member Length L | 9.00 ft |
| Effective Length Kx-factor | 1.00 |
| Effective Length Ky-factor | 1.00 |
| Unbraced Length L_b | N.A. ft |

PROPERTIES

| | | | |
|--------|----------------------|---------|-----------------------|
| Weight | 19 lb/ft | Sx ... | 7.6 in ³ |
| Area | 5.3 in ² | Zx ... | 9.2 in ³ |
| Depth | 5.0 in | rx | 1.90 in |
| Width | 5.00 in | ly | 19.0 in ⁴ |
| t nom | 0.31 in | Sy ... | 7.6 in ³ |
| t des | 0.29 in | Zy ... | 9.2 in ³ |
| lx | 19.0 in ⁴ | ry | 1.90 in |
| | | J | 31.20 in ⁴ |

LRFD FACTORED LOADS (2nd-Order Analysis)

| | |
|----------------------------|------------------------|
| Axial Force P | 26.1 kip |
| | Bottom Top |
| M_x due to Gravity | 0.0 13.1 k-ft |
| M_y due to Gravity | 0.0 3.3 k-ft |

LOCAL BUCKLING

| | |
|----------------------------|-------------|
| Flanges in Flexure | Compact |
| Walls in Compression | Non-slender |
| Webs in Flexure | Compact |

COMPRESSION

| | |
|---------------------------------------|---------|
| Slenderness Ratio $K_x L / r_x$ | 56.8 |
| Slenderness Ratio $K_y L / r_y$ | 56.8 |
| Max. Slenderness Ratio | 56.8 OK |

| Limit States | Nominal P_n |
|-----------------------------------|---------------|
| Flexural Buckling | 194.7 kip ← |
| Torsional Buckling | N.A. kip |
| Flexural-Torsional Buckling | N.A. kip |
| Nominal Strength P_n | 194.7 kip |
| Resistance Factor ϕ | 0.90 |
| Design Strength ϕP_n | 175.2 kip |
| $P / \phi P_n$ Design Ratio | 0.15 OK |

BENDING ABOUT X-X

| | |
|------------------------------------|-----------|
| Moment at 1/4 point of L_b | N.A. k-ft |
| Moment at 1/2 point of L_b | N.A. k-ft |
| Moment at 3/4 point of L_b | N.A. k-ft |
| L. T. Buckling C_b -factor | N.A. |

| Limit States | Nominal M_n |
|-----------------------------------|---------------|
| Yielding | 35.1 k-ft ← |
| Lateral-Torsional Buckling | N.A. k-ft |
| Flange Local Buckling | N.A. k-ft |
| Web Local Buckling | N.A. k-ft |
| Nominal Strength M_n | 35.1 k-ft |
| Resistance Factor ϕ | 0.90 |
| Design Strength ϕM_n | 31.6 k-ft |
| $M / \phi M_n$ Design Ratio | 0.41 OK |

BENDING ABOUT Y-Y

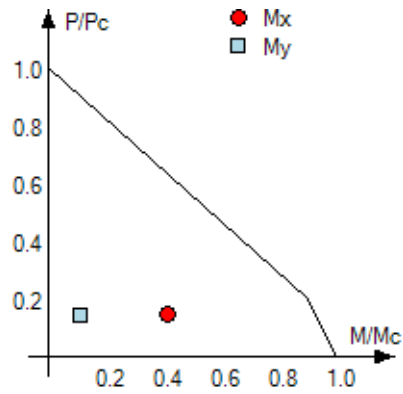
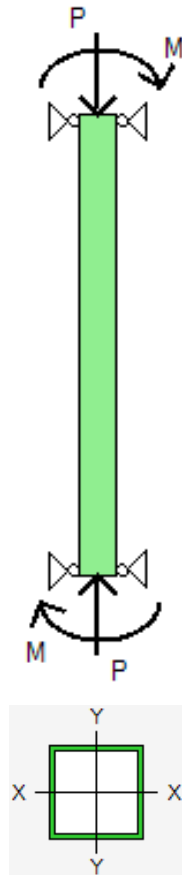
| Limit States | Nominal M_n |
|-----------------------------------|---------------|
| Yielding | 35.1 k-ft ← |
| Lateral-Torsional Buckling | N.A. k-ft |
| Flange Local Buckling | N.A. k-ft |
| Web Local Buckling | N.A. k-ft |
| Nominal Strength M_n | 35.1 k-ft |
| Resistance Factor ϕ | 0.90 |
| Design Strength ϕM_n | 31.6 k-ft |
| $M / \phi M_n$ Design Ratio | 0.10 OK |

COMBINED FORCES

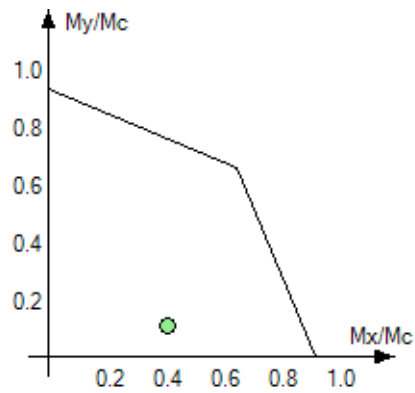
| | |
|-----------------------------|---------|
| Combined Forces Ratio | 0.59 OK |
|-----------------------------|---------|

DESIGN CODES

| | |
|-------------------------|--------------|
| Steel Design | AISC 360-16 |
| Load Combinations | Pre-combined |



INTERACTION DIAGRAM



BIAXIAL BENDING DIAGRAM

WOOD LATERAL

GENERAL - FLOOR PLAN NOTES

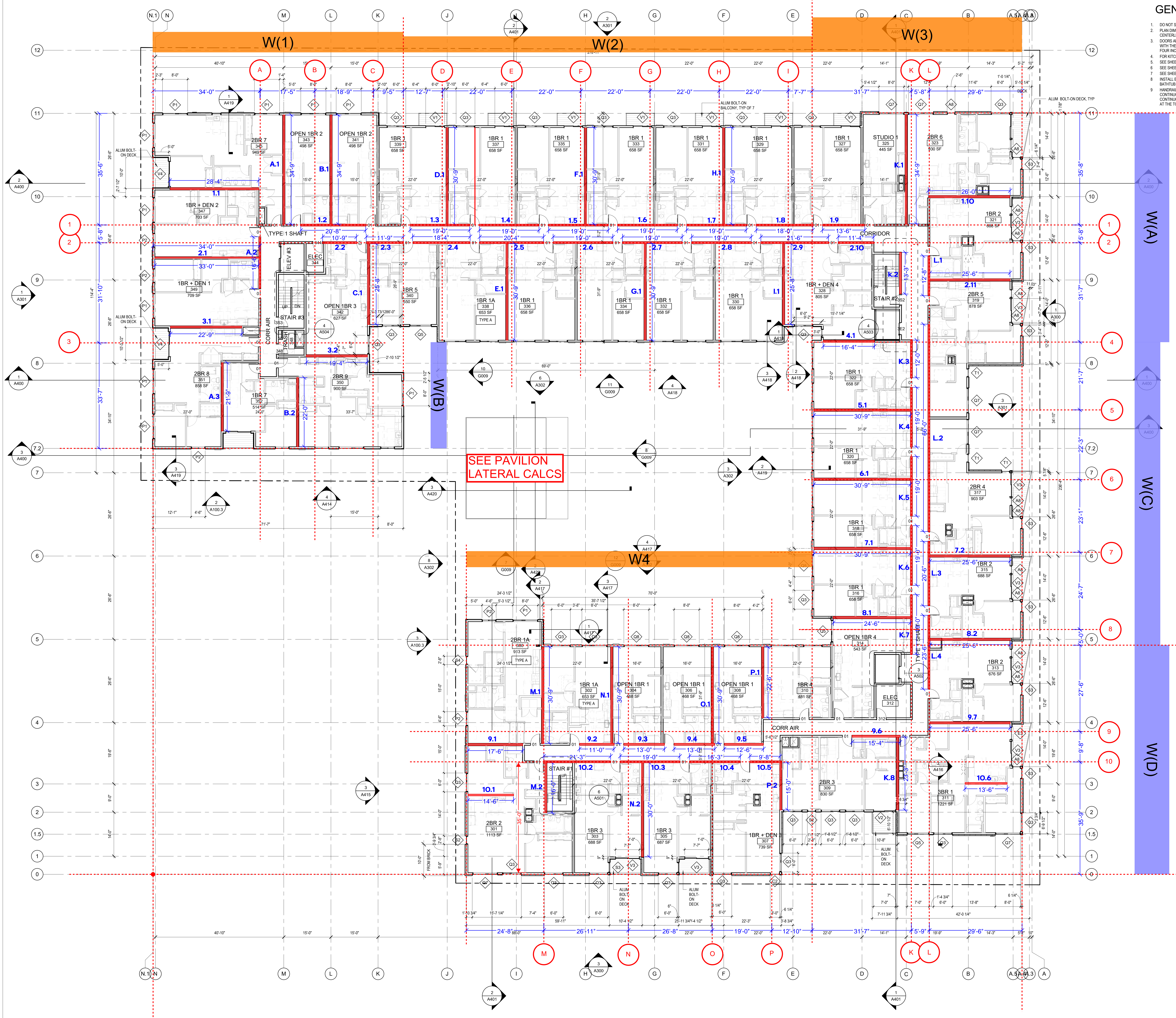
- DO NOT SCALE DRAWINGS
- PLAN DIMENSIONS ARE TO FACE OF STUD. FACE OF CONCRETE WALL, CENTERLINE OF COLUMN, OR CENTERLINE OF ROUND OPENINGS. SEE CONTACT ARCHITECT FOR CLARIFICATIONS.
- DOORS AND CASED OPENINGS INDICATED ADJACENT TO WALL INTERSECTIONS SHALL BE LOCATED WITH THE EDGE OF FINISH OPENING SIX INCHES FROM THE ADJACENT WALL AT THE EXTERIOR AND FOUR INCHES FROM THE ADJACENT WALL AT THE INTERIOR UNLESS OTHERWISE NOTED.
- FOR KITCHEN / BATH / WASHER DRYER FAN LOCATIONS, SEE MECHANICAL DWGS.
- SEE SHEET A802 FOR WINDOW SCHEDULE.
- SEE SHEET A803 FOR DOOR SCHEDULE.
- SEE SHEET A812 FOR WALL ASSEMBLIES.
- INSTALL BLOCKING FOR GRAB BARS IN ALL BATHROOM WALLS SURROUNDING WATER CLOSET, BATH TUB AND SHOWER. REF. A700-A704.
- HANDRAILS SHALL RETURN TO A WALL, GUARD OR THE WALKING SURFACE OR SHALL BE CONTINUOUS TO THE HANDRAIL, OR AN ADJACENT STAIR FLIGHT OR RAMP RUN, WHERE NOT CONTIGUOUS BETWEEN FLIGHTS, THE HANDRAILS SHALL EXTEND HORIZONTALLY NOT LESS THAN 12" AT THE TOP AND BOTTOM RISER (OR TOP AND BOTTOM OF RAMP) (IBC 1014.6)



Johnston Architects, LLC
3131 Western Ave
Suite 510
Seattle, WA 98121
P 206.523.6163
F 206.523.6362

Area Schedule (Unit Gross) - UNIT

| Unit Type | Count |
|-------------|-------|
| 1BR | 18 |
| 2BR | 27 |
| 2BR+L | 4 |
| 3BR | 3 |
| STUDIO | 24 |
| Grand total | 146 |



SEE PAVILION LATERAL CALCS

MERCER ISLAND MIXED USE
2845 87TH AVE SE
MERCER ISLAND, WA 98040

DRAWING ISSUE

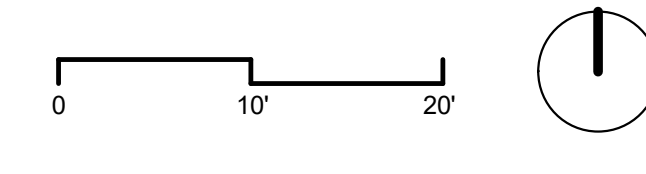
| Date | Description |
|------------|-------------------------|
| 12/24/2019 | LAND USE SET |
| 03/31/2020 | 50% CD |
| 06/26/2020 | LAND USE SET REV #1 |
| 12/04/2020 | LAND USE SET REV #2 |
| 01/25/2021 | BUILDING PERMIT 190% CD |
| 03/30/2021 | LAND USE SET REV #3 |
| 09/30/2021 | BUILDING PERMIT CORR #1 |
| 10/25/2021 | GMP SET |
| 03/25/2022 | BUILDING PERMIT CORR #2 |

SHEET TITLE
LEVEL 3 FLOOR PLAN

SHEET NO.
A203

Drawn
Checked

1 LEVEL 3
1" = 10'-0"



| | |
|----------------------|---------------|
| Project: | Mercer Island |
| Engineer: | AED |
| Date Updated: | 9/11/2023 |

| | |
|-------------------------------|-------|
| PARAPET HEIGHT (FT) | 3.5 |
| ROOF FLOOR AREA (SF) | 39368 |
| TYP. FLOOR AREA (SF) | 39368 |
| Exterior Walls w/ Veneer (FT) | 236 |
| Typ. Exterior Walls (FT) | 414 |

Load Summary

| Level | Weight (K) | Note |
|----------|------------|-------------|
| RF | 961.9 | |
| L4 | 1493.6 | |
| L3 | 1478.5 | |
| Σ | | 3934 |

Story Heights

| Level | Height (ft) | Elev (ft) |
|-------|-------------|-----------|
| Roof | 11.33 | 29.99 |
| L4 | 9.33 | 18.66 |
| L3 | 9.33 | 9.33 |

*SEISMIC BASE IS AT TRANSFER SLAB

Wood Floor, Wall, & Roof Weights

| Level | Description | SDL (PSF) | Area (SF) | SDL (LBS) | |
|----------------------------|--|------------------------|-----------------|------------------|------------------|
| RF | Typ. Roof | 18 | 39350 | 708300 | |
| | Mezzanine | 23 | 956 | 21988 | |
| | PV Ready | 5 | 4054 | 20270 | |
| | - | 0 | 0 | 0 | |
| | Exterior Walls W/ Veneer | 48 | 2163 | 0 | |
| | Interior Walls | 9 | 39368 | 177156 | |
| | Exterior Walls (No Veneer) | 9 | 3794 | 34148.79 | |
| | Roof Σ | | | 46523 | 750558 |
| | Wall Σ | | | 43162 | 211305 |
| | L4 | Typ. Residential Floor | 25 | 39350 | 983750 |
| - | | 0 | 0 | 0 | |
| - | | 0 | 0 | 0 | |
| - | | 0 | 0 | 0 | |
| Exterior Walls W/ Veneer | | 48 | 2438 | 117018.24 | |
| Interior Walls | | 9 | 39368 | 354312 | |
| Exterior Walls (No Veneer) | | 9 | 4277 | 38490 | |
| Floor Σ | | | 41787.88 | 1100768.2 | |
| Wall Σ | | | 43645 | 392802 | |
| L3 | | Typ. Residential Floor | 25 | 39350 | 983750 |
| | - | 0 | 0 | 0 | |
| | - | 0 | 0 | 0 | |
| | Exterior Walls W/ Veneer | 48 | 2202 | 105690.24 | |
| | Interior Walls | 9 | 39368 | 354312 | |
| | Exterior Walls (No Veneer) | 9 | 3863 | 34764 | |
| | Floor Σ | | | 41551.88 | 1089440.2 |
| | Wall Σ | | | 43231 | 389076 |
| | L2 - Transfer Slab (Not Included) | Typ. Residential Floor | 10 | 39350 | 393500 |
| | | - | 0 | 0 | 0 |
| - | | 0 | 0 | 0 | |
| - | | 0 | 0 | 0 | |
| Exterior Walls W/ Veneer | | 48 | 1101 | 52845.12 | |
| Interior Walls | | 9 | 39368 | 354312 | |
| Exterior Walls (No Veneer) | | 9 | 1931 | 17382 | |
| Floor Σ | | | 39350 | 393500 | |
| Wall Σ | | | 41299 | 371694 | |

LATERAL-WIND:

Worst-Case = North Elevation (Max Area)

BLDG. Length on North Elevation = 279.5'

$V_{ULT} = 110 \text{ mph}$, Exposure = B, $K_{ZF} = 1.3$

$$q_z = 0.00256 K_z (1.3) \overset{G}{(0.85)} (110^2)$$

$$q_z = 34.23 K_z$$

| LEVEL | K_z | (PSF) q_z | (SF) AREA | (K) V |
|-------------|-------|----------------|--------------|----------|
| ROOF (50') | 0.81 | 27.73 | 3167 | 87.82 |
| L4 (38.33') | 0.76 | 26.02 | 2608 | 67.86 |
| L3 (29') | 0.7 | 23.96 | 2608 | 62.49 |

$$\Sigma = 218.2 \text{ K}$$

$$V_{wind} = 218.2 \text{ K (LRFD)}$$

$$V_{wind} = 152.8 \text{ K (ASD)} < V_{SEISMIC} = 391 \text{ K}$$

0% SEISMIC CONTROLS

VERTICAL DISTRIBUTION OF SEISMIC FORCES (ASD)

| Level | h_x (ft) | $w_x(k)$ | $w_x h_x^k$ (k-ft) | $w_x h_x^k / \sum w_i h_i^k$ (%) | F_x (k) (ASD) | F_{tot} (k) (ASD) |
|-------|------------|----------|--------------------|----------------------------------|-----------------|---------------------|
| Roof | 29.99 | 961.9 | 28846.27 | 41% | 159.97 | 159.97 |
| 4 | 18.66 | 1493.6 | 27870.01 | 40% | 154.56 | 314.53 |
| 3 | 9.33 | 1478.5 | 13794.55 | 20% | 76.50 | 391.03 |

INPUTS
 OUTPUTS

Sum Σ 3933.9 70510.83

$k = 1$ (T < 0.5 Sec)
 $C_s = 0.142$ (ASD) 801.1
 1319.2
 $S_{DS} = 0.92$ 1316.1
 $I = 1$

MAX $F_{px}(k) = 0.4 S_{DS} I w_{px} = 0.368 * w_{px}$
 MIN $F_{px}(k) = 0.2 S_{DS} I w_{px} = 0.184 * w_{px}$

DIAPHRAGM DESIGN SEISMIC FORCES (ASD)

| Level | $w_{px}(k)$ | $\sum w_i(k)$ | $F_x(k)$ | $\sum F_i(k)$ | $\sum F_x / \sum w_{px}$ | Diaphragm Force | | | |
|-------|-------------|---------------|----------|---------------|--------------------------|-----------------|-------------------------|-----------------|-----------------|
| | | | | | | $F_{px}(k)$ | $\gamma = F_{px} / F_x$ | Max $F_{px}(k)$ | Min $F_{px}(k)$ |
| Roof | 961.8628 | 961.8628 | 159.97 | 159.97 | 0.184 | 176.98 | 1.11 | 247.78 | 123.89 |
| 4 | 1493.57 | 2455.433 | 154.56 | 314.53 | 0.184 | 274.82 | 1.78 | 384.74 | 192.37 |
| 3 | 1478.516 | 3933.948 | 76.50 | 391.03 | 0.184 | 272.05 | 3.56 | 380.87 | 190.43 |

Sum Σ 3933.948 391.03 ASD

PROJECT # 19028
 ENGR: AED
 DATE: 9/11/2023

| V (K) | 391.0 | ASD | |
|-------|--------------|----------------|-------------------------|
| E/W | | | |
| LABEL | % TOTAL MASS | TRIBUTARY (FT) | DISTRIBUTED SHEAR (KLF) |
| W(A) | 50% | 73 | 2.65 |
| W(B) | 7% | 34 | 0.75 |
| W(C) | 15% | 96.5 | 0.59 |
| W(D) | 30% | 72.34 | 1.59 |
| Σ | 100% | 276 | |

| V (K) | 391.0 | ASD | |
|-------|--------------|----------------|-------------------------|
| N/S | | | |
| LABEL | % TOTAL MASS | TRIBUTARY (FT) | DISTRIBUTED SHEAR (KLF) |
| W(1) | 21% | 80 | 1.03 |
| W(2) | 23% | 130 | 0.69 |
| W(3) | 36% | 67 | 2.10 |
| W(4) | 20% | 110 | 0.71 |
| Σ | 100% | 387 | |

| LVL 3 | | | | |
|-------|-------------------------|----------------|----------------------------------|----------|
| E/W | | | | |
| GRID | DISTRIBUTED SHEAR (KLF) | TRIBUTARY (FT) | AVAILABLE SHEAR WALL LENGTH (FT) | Vu (PLF) |
| 1 | 2.65 | 38.3 | 201.5 | 504.4 |
| 2 | 2.65 | 34.7 | 209.49 | 438.8 |
| 3 | 0.75 | 33.7 | 42.08 | 602.6 |
| 4 | 0.59 | 10.8 | 16.33 | 386.8 |
| 5 | 0.59 | 21.9 | 30.75 | 418.9 |
| 6 | 0.59 | 22.7 | 30.75 | 433.3 |
| 7 | 0.59 | 23.8 | 56.25 | 248.6 |
| 8 | 0.59 | 17.3 | 44.75 | 227.1 |
| 9 | 1.59 | 37.2 | 107.83 | 549.7 |
| 10 | 1.59 | 35.8 | 94.17 | 605.4 |
| | Σ | 276 | 834 | |

| LVL 3 | | | | |
|-------|-------------------------|----------------|----------------------------------|----------|
| N/S | | | | |
| GRID | DISTRIBUTED SHEAR (KLF) | TRIBUTARY (FT) | AVAILABLE SHEAR WALL LENGTH (FT) | Vu (PLF) |
| A | 1.03 | 42.75 | 73.0 | 601.1 |
| B | 1.03 | 27.5 | 57 | 497.4 |
| C | 0.69 | 11 | 25.67 | 295.9 |
| D | 0.69 | 22 | 30.75 | 494.0 |
| E | 0.69 | 22 | 31 | 494.0 |
| F | 0.69 | 22 | 30.75 | 494.0 |
| G | 0.69 | 22 | 30.75 | 494.0 |
| H | 0.69 | 22 | 30.75 | 494.0 |
| I | 0.69 | 14.75 | 30.75 | 331.2 |
| | | | | |
| K | 2.10 | 34.335 | 159.25 | 453.0 |
| L | 2.10 | 32.335 | 122.67 | 553.8 |

Note:
Values reported for results of rigid and flexible diaphragm envelope analysis

PROJECT # 19028
ENGR: AED
DATE: 9/11/2023

(ASD)

| | | |
|------|-----------------|----------|
| 460 | 15/32" (1) Side | 10d @ 4" |
| 600 | 15/32" (1) Side | 10d @ 3" |
| 920 | 15/32" (2) Side | 10d @ 4" |
| 1200 | 15/32" (2) Side | 10d @ 3" |

| LVL 2 | | | | | | | |
|---------|---------|-----------|-----------------|---------|---------|-----------|-----------------|
| E-W | | | | N-S | | | |
| F.tot = | 391.03 | kips | (ASD) | F.tot = | 391.03 | kips | (ASD) |
| GRID | v (plf) | Sheathing | Spacing | GRID | v (plf) | Sheathing | Spacing |
| 1 | 560 | 10d @ 3" | 15/32" (1) Side | A | 625 | 10d @ 3" | 15/32" (1) Side |
| 2 | 570 | 10d @ 3" | 15/32" (1) Side | B | 617 | 10d @ 3" | 15/32" (1) Side |
| 3 | 603 | 10d @ 3" | 15/32" (1) Side | C | 607 | 10d @ 3" | 15/32" (1) Side |
| 4 | 429 | 10d @ 4" | 15/32" (1) Side | D | 588 | 10d @ 3" | 15/32" (1) Side |
| 5 | 540 | 10d @ 3" | 15/32" (1) Side | E | 568 | 10d @ 3" | 15/32" (1) Side |
| 6 | 559 | 10d @ 3" | 15/32" (1) Side | F | 548 | 10d @ 3" | 15/32" (1) Side |
| 7 | 574 | 10d @ 3" | 15/32" (1) Side | G | 538 | 10d @ 3" | 15/32" (1) Side |
| 8 | 572 | 10d @ 3" | 15/32" (1) Side | H | 494 | 10d @ 3" | 15/32" (1) Side |
| 9 | 588 | 10d @ 3" | 15/32" (1) Side | I | 540 | 10d @ 3" | 15/32" (1) Side |
| 10 | 605 | 10d @ 3" | 15/32" (1) Side | K | 612 | 10d @ 3" | 15/32" (1) Side |
| | | | | L | 604 | 10d @ 3" | 15/32" (1) Side |
| | | | | M | 580 | 10d @ 3" | 15/32" (1) Side |
| | | | | N | 543 | 10d @ 3" | 15/32" (1) Side |
| | | | | O | 549 | 10d @ 3" | 15/32" (1) Side |
| | | | | P | 510 | 10d @ 3" | 15/32" (1) Side |

| LVL 3 | | | | | | | |
|---------|---------|-----------|-----------------|-------|---------|-----------|-----------------|
| E-W | | | | N-S | | | |
| F.tot = | 314.53 | kips | (ASD) | ratio | 1.24 | F.tot = | 314.53 |
| GRID | v (plf) | Sheathing | Spacing | GRID | v (plf) | Sheathing | Spacing |
| 1 | 450 | 10d @ 4" | 15/32" (1) Side | A | 503 | 10d @ 3" | 15/32" (1) Side |
| 2 | 459 | 10d @ 4" | 15/32" (1) Side | B | 496 | 10d @ 3" | 15/32" (1) Side |
| 3 | 485 | 10d @ 3" | 15/32" (1) Side | C | 488 | 10d @ 3" | 15/32" (1) Side |
| 4 | 345 | 10d @ 4" | 15/32" (1) Side | D | 473 | 10d @ 4" | 15/32" (1) Side |
| 5 | 435 | 10d @ 4" | 15/32" (1) Side | E | 457 | 10d @ 4" | 15/32" (1) Side |
| 6 | 450 | 10d @ 4" | 15/32" (1) Side | F | 441 | 10d @ 4" | 15/32" (1) Side |
| 7 | 462 | 10d @ 3" | 15/32" (1) Side | G | 433 | 10d @ 4" | 15/32" (1) Side |
| 8 | 460 | 10d @ 3" | 15/32" (1) Side | H | 397 | 10d @ 4" | 15/32" (1) Side |
| 9 | 473 | 10d @ 3" | 15/32" (1) Side | I | 434 | 10d @ 4" | 15/32" (1) Side |
| 10 | 487 | 10d @ 3" | 15/32" (1) Side | K | 492 | 10d @ 3" | 15/32" (1) Side |
| | | | | L | 486 | 10d @ 3" | 15/32" (1) Side |
| | | | | M | 467 | 10d @ 4" | 15/32" (1) Side |
| | | | | N | 437 | 10d @ 4" | 15/32" (1) Side |
| | | | | O | 442 | 10d @ 4" | 15/32" (1) Side |
| | | | | P | 410 | 10d @ 4" | 15/32" (1) Side |

| LVL 4 | | | | | | | |
|---------|---------|-----------|-----------------|-------|---------|-----------|-----------------|
| E-W | | | | N-S | | | |
| F.tot = | 159.97 | kips | (ASD) | ratio | 2.44 | F.tot = | 159.97 |
| GRID | v (plf) | Sheathing | Spacing | GRID | v (plf) | Sheathing | Spacing |
| 1 | 229 | 10d @ 4" | 15/32" (1) Side | A | 256 | 10d @ 4" | 15/32" (1) Side |
| 2 | 233 | 10d @ 4" | 15/32" (1) Side | B | 252 | 10d @ 4" | 15/32" (1) Side |
| 3 | 247 | 10d @ 4" | 15/32" (1) Side | C | 248 | 10d @ 4" | 15/32" (1) Side |
| 4 | 176 | 10d @ 4" | 15/32" (1) Side | D | 241 | 10d @ 4" | 15/32" (1) Side |
| 5 | 221 | 10d @ 4" | 15/32" (1) Side | E | 232 | 10d @ 4" | 15/32" (1) Side |
| 6 | 229 | 10d @ 4" | 15/32" (1) Side | F | 224 | 10d @ 4" | 15/32" (1) Side |
| 7 | 235 | 10d @ 4" | 15/32" (1) Side | G | 220 | 10d @ 4" | 15/32" (1) Side |
| 8 | 234 | 10d @ 4" | 15/32" (1) Side | H | 202 | 10d @ 4" | 15/32" (1) Side |
| 9 | 241 | 10d @ 4" | 15/32" (1) Side | I | 221 | 10d @ 4" | 15/32" (1) Side |
| 10 | 248 | 10d @ 4" | 15/32" (1) Side | K | 250 | 10d @ 4" | 15/32" (1) Side |
| | | | | L | 247 | 10d @ 4" | 15/32" (1) Side |
| | | | | M | 237 | 10d @ 4" | 15/32" (1) Side |
| | | | | N | 222 | 10d @ 4" | 15/32" (1) Side |
| | | | | O | 225 | 10d @ 4" | 15/32" (1) Side |
| | | | | P | 208 | 10d @ 4" | 15/32" (1) Side |

| | Wall | Length | RIGID | | FLEXIBLE | Difference | Capacity (plf) | DCR _{Rigid} | DCR _{Flexible} | Multiplier |
|------|-------|--------|-------|---------|----------|------------|----------------|----------------------|-------------------------|------------|
| | | | V (k) | v (plf) | v (plf) | | | | | |
| E/W | 1.1 | 28.33 | 15.81 | 558.1 | 504 | 11% | 600 | 0.93 | 0.84 | 1.11 |
| | 1.2 | 20.67 | 10.3 | 498.3 | 504 | -1% | 600 | 0.83 | 0.84 | N/A |
| | 1.3 | 19 | 9.1 | 478.9 | 504 | -5% | 600 | 0.80 | 0.84 | N/A |
| | 1.4 | 19 | 9.1 | 478.9 | 504 | -5% | 600 | 0.80 | 0.84 | N/A |
| | 1.5 | 19 | 9.1 | 478.9 | 504 | -5% | 600 | 0.80 | 0.84 | N/A |
| | 1.6 | 19 | 9.1 | 478.9 | 504 | -5% | 600 | 0.80 | 0.84 | N/A |
| | 1.7 | 19 | 9.1 | 478.9 | 504 | -5% | 600 | 0.80 | 0.84 | N/A |
| | 1.8 | 18 | 8.4 | 466.7 | 504 | -7% | 600 | 0.78 | 0.84 | N/A |
| | 1.9 | 13.5 | 5.23 | 387.4 | 504 | -23% | 600 | 0.65 | 0.84 | N/A |
| | 1.10 | 26 | 14.15 | 544.2 | 504 | 8% | 600 | 0.91 | 0.84 | 1.08 |
| | 2.1 | 33 | 18.77 | 568.8 | 439 | 30% | 600 | 0.95 | 0.73 | 1.30 |
| | 2.2 | 10.75 | 3.39 | 315.3 | 439 | -28% | 600 | 0.53 | 0.73 | N/A |
| | 2.3 | 11.75 | 4.03 | 343.0 | 439 | -22% | 600 | 0.57 | 0.73 | N/A |
| | 2.4 | 18.33 | 8.6 | 469.2 | 439 | 7% | 600 | 0.78 | 0.73 | 1.07 |
| | 2.5 | 20.33 | 10.02 | 492.9 | 439 | 12% | 600 | 0.82 | 0.73 | 1.12 |
| | 2.6 | 19 | 9.08 | 477.9 | 439 | 9% | 600 | 0.80 | 0.73 | 1.09 |
| | 2.7 | 19 | 9.08 | 477.9 | 439 | 9% | 600 | 0.80 | 0.73 | 1.09 |
| | 2.8 | 19 | 9.08 | 477.9 | 439 | 9% | 600 | 0.80 | 0.73 | 1.09 |
| | 2.9 | 21.5 | 10.85 | 504.7 | 439 | 15% | 600 | 0.84 | 0.73 | 1.15 |
| | 2.10 | 11.33 | 3.76 | 331.9 | 439 | -24% | 600 | 0.55 | 0.73 | N/A |
| | 2.11 | 25.5 | 13.55 | 531.4 | 439 | 21% | 600 | 0.89 | 0.73 | 1.21 |
| | 3.1 | 22.75 | 11.52 | 506.4 | 603 | -16% | 600 | 0.84 | 1.01 | N/A |
| | 3.2 | 19.33 | 9.09 | 470.3 | 603 | -22% | 600 | 0.78 | 1.01 | N/A |
| | 4.1 | 16.33 | 7.03 | 430.5 | 387 | 11% | 600 | 0.72 | 0.65 | 1.11 |
| | 5.1 | 30.75 | 16.67 | 542.1 | 419 | 29% | 600 | 0.90 | 0.70 | 1.29 |
| | 6.1 | 30.75 | 17.14 | 557.4 | 433 | 29% | 600 | 0.93 | 0.72 | 1.29 |
| | 7.1 | 30.75 | 17.72 | 576.3 | 249 | 131% | 600 | 0.96 | 0.42 | 2.31 |
| | 7.2 | 25.5 | 14.05 | 551.0 | 249 | 121% | 600 | 0.92 | 0.42 | 2.21 |
| | 8.1 | 24.5 | 13.72 | 560.0 | 227 | 147% | 600 | 0.93 | 0.38 | 2.47 |
| | 8.2 | 25.5 | 14.61 | 572.9 | 227 | 152% | 600 | 0.95 | 0.38 | 2.52 |
| 9.1 | 17.5 | 8.98 | 513.1 | 550 | -7% | 600 | 0.86 | 0.92 | N/A | |
| 9.2 | 11 | 3.97 | 360.9 | 550 | -34% | 600 | 0.60 | 0.92 | N/A | |
| 9.3 | 13 | 5.45 | 419.2 | 550 | -24% | 600 | 0.70 | 0.92 | N/A | |
| 9.4 | 13 | 5.45 | 419.2 | 550 | -24% | 600 | 0.70 | 0.92 | N/A | |
| 9.5 | 12.5 | 5.07 | 405.6 | 550 | -26% | 600 | 0.68 | 0.92 | N/A | |
| 9.6 | 15.33 | 7.23 | 471.6 | 550 | -14% | 600 | 0.79 | 0.92 | N/A | |
| 9.7 | 25.5 | 14.97 | 587.1 | 550 | 7% | 600 | 0.98 | 0.92 | 1.07 | |
| 10.1 | 14.5 | 6.75 | 465.5 | 605 | -23% | 600 | 0.78 | 1.01 | N/A | |
| 10.2 | 21.25 | 12.05 | 567.1 | 605 | -6% | 600 | 0.95 | 1.01 | N/A | |
| 10.3 | 19 | 10.25 | 539.5 | 605 | -11% | 600 | 0.90 | 1.01 | N/A | |
| 10.4 | 16.25 | 8.05 | 495.4 | 605 | -18% | 600 | 0.83 | 1.01 | N/A | |
| 10.5 | 9.67 | 3.08 | 318.5 | 605 | -47% | 600 | 0.53 | 1.01 | N/A | |
| 10.6 | 13.5 | 5.93 | 439.3 | 605 | -27% | 600 | 0.73 | 1.01 | N/A | |
| N/S | A.1 | 34.75 | 21.8 | 627.3 | 601 | 4% | 600 | 1.05 | 1.00 | 1.04 |
| | A.2 | 16.5 | 8.02 | 486.1 | 601 | -19% | 600 | 0.81 | 1.00 | N/A |
| | A.3 | 21.75 | 12.26 | 563.7 | 601 | -6% | 600 | 0.94 | 1.00 | N/A |
| | B.1 | 34.75 | 21.45 | 617.3 | 497 | 24% | 600 | 1.03 | 0.83 | 1.24 |
| | B.2 | 22 | 12.15 | 552.3 | 497 | 11% | 600 | 0.92 | 0.83 | 1.11 |
| | C.1 | 25.67 | 15.58 | 606.9 | 296 | 105% | 600 | 1.01 | 0.49 | 2.05 |
| | D.1 | 30.75 | 18.08 | 588.0 | 494 | 19% | 600 | 0.98 | 0.82 | 1.19 |
| | E.1 | 30.75 | 17.41 | 566.2 | 494 | 15% | 600 | 0.94 | 0.82 | 1.15 |
| | F.1 | 30.75 | 16.91 | 549.9 | 494 | 11% | 600 | 0.92 | 0.82 | 1.11 |
| | G.1 | 30.75 | 16.52 | 537.2 | 494 | 9% | 600 | 0.90 | 0.82 | 1.09 |
| | H.1 | 30.75 | 2.47 | 80.3 | 494 | -84% | 600 | 0.13 | 0.82 | N/A |
| | I.1 | 25.67 | 13.84 | 539.2 | 331 | 63% | 600 | 0.90 | 0.55 | 1.63 |
| | K.1 | 34.75 | 21.19 | 609.8 | 453 | 35% | 600 | 1.02 | 0.76 | 1.35 |
| | K.2 | 13.25 | 5.32 | 401.5 | 453 | -11% | 600 | 0.67 | 0.76 | N/A |
| | K.3 | 12 | 4.45 | 370.8 | 453 | -18% | 600 | 0.62 | 0.76 | N/A |
| | K.4 | 19 | 9.64 | 507.4 | 453 | 12% | 600 | 0.85 | 0.76 | 1.12 |
| | K.5 | 19 | 9.64 | 507.4 | 453 | 12% | 600 | 0.85 | 0.76 | 1.12 |
| | K.6 | 19 | 9.64 | 507.4 | 453 | 12% | 600 | 0.85 | 0.76 | 1.12 |
| | K.7 | 19 | 9.64 | 507.4 | 453 | 12% | 600 | 0.85 | 0.76 | 1.12 |
| | K.8 | 23.25 | 12.75 | 548.4 | 453 | 21% | 600 | 0.91 | 0.76 | 1.21 |
| | L.1 | 12.67 | 4.97 | 392.3 | 554 | -29% | 600 | 0.65 | 0.92 | N/A |
| | L.2 | 72 | 43.59 | 605.4 | 554 | 9% | 600 | 1.01 | 0.92 | 1.09 |
| | L.3 | 20.5 | 10.85 | 529.3 | 554 | -4% | 600 | 0.88 | 0.92 | N/A |
| | L.4 | 23.5 | 13.11 | 557.9 | 554 | 1% | 600 | 0.93 | 0.92 | 1.01 |
| | M.1 | 30.75 | 17.18 | 558.7 | 581 | -4% | 600 | 0.93 | 0.97 | N/A |
| | M.2 | 16 | 6.9 | 431.3 | 581 | -26% | 600 | 0.72 | 0.97 | N/A |
| | N.1 | 30.75 | 16.74 | 544.4 | 314 | 73% | 600 | 0.91 | 0.52 | 1.73 |
| | N.2 | 30 | 16.05 | 535.0 | 314 | 70% | 600 | 0.89 | 0.52 | 1.70 |
| | O.1 | 30.75 | 16.81 | 546.7 | 528 | 4% | 600 | 0.91 | 0.88 | 1.04 |
| | P.1 | 22.5 | 11.5 | 511.1 | 455 | 12% | 600 | 0.85 | 0.76 | 1.12 |
| P.2 | 15 | 6.27 | 418.0 | 455 | -8% | 600 | 0.70 | 0.76 | N/A | |

INDICATES CONTROLLING VALUE

| | | |
|------|-----------------|----------|
| 460 | 15/32" (1) Side | 10d @ 4" |
| 600 | 15/32" (1) Side | 10d @ 3" |
| 920 | 15/32" (2) Side | 10d @ 4" |
| 1200 | 15/32" (2) Side | 10d @ 3" |

Torsional Analysis of Rigid Diaphragm

Project File: Rigid Diaphragm Enercalc.ec6

LIC# : KW-06014122, Build:20.23.08.30

PCS STRUCTURAL SOLUTIONS

(c) ENERCALC INC 1983-2023

DESCRIPTION: Mercer Island - Diaphragm

General Information

IBC 2015, CBC 2016, ASCE 7-10

| | | | |
|---|---|--|------------|
| Applied Lateral Force in "X" Direction | 391.0 k | Center of Shear Application : | |
| Applied Lateral Force in "Y" Direction | 391.0 k | Distance from "X" datum point | 160.50 ft |
| | | Distance from "Y" datum point | 140.150 ft |
| Note: These loads are resolved into X & Y components when applied to the system of elements at angular increment | | Accidental Torsion values per ASCE 7-05 12.8.4.2 | |
| | | Ecc. as % of Maximum Dimension | 5.00 % |
| Load Orientation Angular Increment | 15.0 deg | Maximum Dimensions : | |
| Load Location Angular Increment | 15.0 deg | Along "X" Axis | 279.50 ft |
| | | Along "Y" Axis | 240.250 ft |
| Center of Rigidity Location (calculated) . . . | | | |
| "X" dist. from Datum | 161.017 ft | | |
| "Y" dist. from Datum | 144.802 ft | | |
| | Accidental Eccentricity +/- from "Y" Coord. of Center of Load Application : | | 13.975 ft |
| | Accidental Eccentricity +/- from "X" Coord. of Center of Load Application : | | 12.013 ft |

Wall Information

| Label | X Wall C.G. Location | Y Wall C.G. Location | Wall Angle CCW | Wall Fixity | Length | Height | Thickness | E - Bending | E - Shear |
|---|----------------------|----------------------|----------------|-------------|----------|---------|-----------|-------------|-------------|
| 1.1 | 19.6 ft | 218.2 ft | 0 deg | Fix-Pin | 28.33 ft | 9.33 ft | 3.5 in | 0.026 Mpsi | 0.0104 Mpsi |
| Wall Deflections (Stiffness) for 1.0 kip load : | | | | | | | | | |
| Along Wall "y" Dir | 1.2427E-002 in | | | | | | | | |
| Along Wall "x" Dir | 1.4824E+001 in | | | | | | | | |
| 1.10 | 259.8 ft | 215.75 ft | 0 deg | Fix-Pin | 26 ft | 9.33 ft | 3.5 in | 0.026 Mpsi | 0.0104 Mpsi |
| Wall Deflections (Stiffness) for 1.0 kip load : | | | | | | | | | |
| Along Wall "y" Dir | 1.3861E-002 in | | | | | | | | |
| Along Wall "x" Dir | 1.6152E+001 in | | | | | | | | |
| 1.2 | 57.33 ft | 206.67 ft | 0 deg | Fix-Pin | 20.67 ft | 9.33 ft | 3.5 in | 0.026 Mpsi | 0.0104 Mpsi |
| Wall Deflections (Stiffness) for 1.0 kip load : | | | | | | | | | |
| Along Wall "y" Dir | 1.8923E-002 in | | | | | | | | |
| Along Wall "x" Dir | 2.0317E+001 in | | | | | | | | |
| 1.3 | 91.33 ft | 206.67 ft | 0 deg | Fix-Pin | 19 ft | 9.33 ft | 3.5 in | 0.026 Mpsi | 0.0104 Mpsi |
| Wall Deflections (Stiffness) for 1.0 kip load : | | | | | | | | | |
| Along Wall "y" Dir | 2.1393E-002 in | | | | | | | | |
| Along Wall "x" Dir | 2.2103E+001 in | | | | | | | | |
| 1.4 | 113.33 ft | 206.67 ft | 0 deg | Fix-Pin | 19 ft | 9.33 ft | 3.5 in | 0.026 Mpsi | 0.0104 Mpsi |
| Wall Deflections (Stiffness) for 1.0 kip load : | | | | | | | | | |
| Along Wall "y" Dir | 2.1393E-002 in | | | | | | | | |
| Along Wall "x" Dir | 2.2103E+001 in | | | | | | | | |
| 1.5 | 135.4 ft | 206.67 ft | 0 deg | Fix-Pin | 19 ft | 9.33 ft | 3.5 in | 0.026 Mpsi | 0.0104 Mpsi |
| Wall Deflections (Stiffness) for 1.0 kip load : | | | | | | | | | |
| Along Wall "y" Dir | 2.1393E-002 in | | | | | | | | |
| Along Wall "x" Dir | 2.2103E+001 in | | | | | | | | |
| 1.6 | 157.33 ft | 206.67 ft | 0 deg | Fix-Pin | 19 ft | 9.33 ft | 3.5 in | 0.026 Mpsi | 0.0104 Mpsi |
| Wall Deflections (Stiffness) for 1.0 kip load : | | | | | | | | | |
| Along Wall "y" Dir | 2.1393E-002 in | | | | | | | | |
| Along Wall "x" Dir | 2.2103E+001 in | | | | | | | | |
| 1.7 | 179.33 ft | 206.67 ft | 0 deg | Fix-Pin | 19 ft | 9.33 ft | 3.5 in | 0.026 Mpsi | 0.0104 Mpsi |
| Wall Deflections (Stiffness) for 1.0 kip load : | | | | | | | | | |
| Along Wall "y" Dir | 2.1393E-002 in | | | | | | | | |
| Along Wall "x" Dir | 2.2103E+001 in | | | | | | | | |

Wall Information

Torsional Analysis of Rigid Diaphragm

Project File: Rigid Diaphragm Enercalc.ec6

LIC# : KW-06014122, Build:20.23.08.30

PCS STRUCTURAL SOLUTIONS

(c) ENERCALC INC 1983-2023

DESCRIPTION: Mercer Island - Diaphragm

| | | | | |
|---|----------------------|-----------|-------------|-------------|
| Label : 1.8 | X Wall C.G. Location | 201 ft | Length | 18 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 206.67 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 1.9 | X Wall C.G. Location | 219.75 ft | Length | 13.5 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 206.67 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 10.1 | X Wall C.G. Location | 107.5 ft | Length | 14.5 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 25.25 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 10.2 | X Wall C.G. Location | 135 ft | Length | 21.25 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 35.75 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 10.3 | X Wall C.G. Location | 159 ft | Length | 19 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 35.75 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 10.4 | X Wall C.G. Location | 178.75 ft | Length | 16.25 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 35.75 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 10.5 | X Wall C.G. Location | 195 ft | Length | 9.67 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 35.75 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 10.6 | X Wall C.G. Location | 265.25 ft | Length | 13.5 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 29 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 2.1 | X Wall C.G. Location | 17.33 ft | Length | 33 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 196.2 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 2.10 | X Wall C.G. Location | 223.75 ft | Length | 11.33 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 201 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 2.11 | X Wall C.G. Location | 260 ft | Length | 25.5 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 189.25 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 2.2 | X Wall C.G. Location | 59.5 ft | Length | 10.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 201 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |

Wall Information

Torsional Analysis of Rigid Diaphragm

Project File: Rigid Diaphragm Enercalc.ec6

LIC#: KW-06014122, Build:20.23.08.30

PCS STRUCTURAL SOLUTIONS

(c) ENERCALC INC 1983-2023

DESCRIPTION: Mercer Island - Diaphragm

| | | | | |
|---|----------------------|-----------|-------------|-------------|
| Label : 2.3 | X Wall C.G. Location | 73.75 ft | Length | 11.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 201 ft | Height | 9.33 ft |
| Along Wall "y" Dir 4.8184E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 3.5741E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 2.4 | X Wall C.G. Location | 91.75 ft | Length | 18.33 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 201 ft | Height | 9.33 ft |
| Along Wall "y" Dir 2.2577E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 2.2911E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 2.5 | X Wall C.G. Location | 114.25 ft | Length | 20.33 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 201 ft | Height | 9.33 ft |
| Along Wall "y" Dir 1.9378E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 2.0657E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 2.6 | X Wall C.G. Location | 137 ft | Length | 19 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 201 ft | Height | 9.33 ft |
| Along Wall "y" Dir 2.1393E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 2.2103E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 2.7 | X Wall C.G. Location | 159 ft | Length | 19 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 201 ft | Height | 9.33 ft |
| Along Wall "y" Dir 2.1393E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 2.2103E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 2.8 | X Wall C.G. Location | 181 ft | Length | 19 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 201 ft | Height | 9.33 ft |
| Along Wall "y" Dir 2.1393E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 2.2103E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 2.9 | X Wall C.G. Location | 204.25 ft | Length | 21.5 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 201 ft | Height | 9.33 ft |
| Along Wall "y" Dir 1.7898E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 1.9533E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 3.1 | X Wall C.G. Location | 17 ft | Length | 22.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 174.25 ft | Height | 9.33 ft |
| Along Wall "y" Dir 1.6552E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 1.8460E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 3.2 | X Wall C.G. Location | 58.5 ft | Length | 19.33 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 165 ft | Height | 9.33 ft |
| Along Wall "y" Dir 2.0855E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 2.1726E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 4.1 | X Wall C.G. Location | 221.5 ft | Length | 16.33 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 169.75 ft | Height | 9.33 ft |
| Along Wall "y" Dir 2.7033E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 2.5717E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 5.1 | X Wall C.G. Location | 225.75 ft | Length | 30.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 147.75 ft | Height | 9.33 ft |
| Along Wall "y" Dir 1.1230E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 1.3657E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 6.1 | X Wall C.G. Location | 225.75 ft | Length | 30.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 125.75 ft | Height | 9.33 ft |
| Along Wall "y" Dir 1.1230E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 1.3657E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |

Wall Information

Torsional Analysis of Rigid Diaphragm

Project File: Rigid Diaphragm Enercalc.ec6

LIC#: KW-06014122, Build:20.23.08.30

PCS STRUCTURAL SOLUTIONS

(c) ENERCALC INC 1983-2023

DESCRIPTION: Mercer Island - Diaphragm

| | | | | |
|---|----------------------|-----------|-------------|-------------|
| Label : 7.1 | X Wall C.G. Location | 225.75 ft | Length | 30.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 103.67 ft | Height | 9.33 ft |
| Along Wall "y" Dir 1.1230E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 1.3657E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 7.2 | X Wall C.G. Location | 260.1 ft | Length | 25.5 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 101.25 ft | Height | 9.33 ft |
| Along Wall "y" Dir 1.4215E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 1.6469E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 8.1 | X Wall C.G. Location | 228.75 ft | Length | 24.5 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 81.75 ft | Height | 9.33 ft |
| Along Wall "y" Dir 1.4982E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 1.7141E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 8.2 | X Wall C.G. Location | 260 ft | Length | 25.5 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 74.75 ft | Height | 9.33 ft |
| Along Wall "y" Dir 1.4215E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 1.6469E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 9.1 | X Wall C.G. Location | 109 ft | Length | 17.5 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 41.25 ft | Height | 9.33 ft |
| Along Wall "y" Dir 2.4237E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 2.3998E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 9.2 | X Wall C.G. Location | 141.25 ft | Length | 11 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 41.25 ft | Height | 9.33 ft |
| Along Wall "y" Dir 5.4784E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 3.8178E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 9.3 | X Wall C.G. Location | 156.33 ft | Length | 13 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 41.25 ft | Height | 9.33 ft |
| Along Wall "y" Dir 3.9909E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 3.2305E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 9.4 | X Wall C.G. Location | 172.33 ft | Length | 13 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 41.25 ft | Height | 9.33 ft |
| Along Wall "y" Dir 3.9909E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 3.2305E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 9.5 | X Wall C.G. Location | 188 ft | Length | 12.5 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 41.25 ft | Height | 9.33 ft |
| Along Wall "y" Dir 4.2885E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 3.3597E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 9.6 | X Wall C.G. Location | 230.25 ft | Length | 15.33 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 44 ft | Height | 9.33 ft |
| Along Wall "y" Dir 2.9973E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 2.7395E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : 9.7 | X Wall C.G. Location | 260 ft | Length | 25.25 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 48.25 ft | Height | 9.33 ft |
| Along Wall "y" Dir 1.4399E-002 in | Wall Angle CCW | 0 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 1.6632E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : A.1 | X Wall C.G. Location | 41.5 ft | Length | 34.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 224.33 ft | Height | 9.33 ft |
| Along Wall "y" Dir 9.7020E-003 in | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir 1.2085E+001 in | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |

Wall Information

Torsional Analysis of Rigid Diaphragm

Project File: Rigid Diaphragm Enercalc.ec6

LIC#: KW-06014122, Build:20.23.08.30

PCS STRUCTURAL SOLUTIONS

(c) ENERCALC INC 1983-2023

DESCRIPTION: Mercer Island - Diaphragm

| | | | | |
|---|----------------------|-----------|-------------|-------------|
| Label : A.2 | X Wall C.G. Location | 34 ft | Length | 16.5 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 194.67 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : A.3 | X Wall C.G. Location | 22 ft | Length | 21.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 152 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : B.1 | X Wall C.G. Location | 56.67 ft | Length | 34.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 224.33 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : B.2 | X Wall C.G. Location | 46 ft | Length | 22 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 147 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : C.1 | X Wall C.G. Location | 68.67 ft | Length | 25.67 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 187.75 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : D.1 | X Wall C.G. Location | 79.5 ft | Length | 30.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 222.25 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : E.1 | X Wall C.G. Location | 112.5 ft | Length | 30.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 185.33 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : F.1 | X Wall C.G. Location | 137.67 ft | Length | 30.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 222.25 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : G.1 | X Wall C.G. Location | 156.67 ft | Length | 30.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 185.33 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : H.1 | X Wall C.G. Location | 181.67 ft | Length | 30.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 222.25 ft | Height | 30.75 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : I.1 | X Wall C.G. Location | 200.67 ft | Length | 25.67 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 187.75 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : K.1 | X Wall C.G. Location | 239.5 ft | Length | 34.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 224.5 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |

Wall Information

Torsional Analysis of Rigid Diaphragm

Project File: Rigid Diaphragm Enercalc.ec6

LIC#: KW-06014122, Build:20.23.08.30

PCS STRUCTURAL SOLUTIONS

(c) ENERCALC INC 1983-2023

DESCRIPTION: Mercer Island - Diaphragm

| | | | | |
|---|----------------------|-----------|-------------|-------------|
| Label : K.2 | X Wall C.G. Location | 238 ft | Length | 13.25 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 191.33 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : K.3 | X Wall C.G. Location | 241.5 ft | Length | 12 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 164.25 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : K.4 | X Wall C.G. Location | 241.5 ft | Length | 19 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 145.5 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : K.5 | X Wall C.G. Location | 241.5 ft | Length | 19 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 123.5 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : K.6 | X Wall C.G. Location | 241.5 ft | Length | 19 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 101.5 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : K.7 | X Wall C.G. Location | 241.5 ft | Length | 19 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 79.5 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : K.8 | X Wall C.G. Location | 237 ft | Length | 23.25 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 32 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : L.1 | X Wall C.G. Location | 247 ft | Length | 12.67 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 190.5 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : L.2 | X Wall C.G. Location | 247 ft | Length | 66 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 145 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : L.3 | X Wall C.G. Location | 247 ft | Length | 20.5 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 95.75 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : L.4 | X Wall C.G. Location | 247 ft | Length | 23.5 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 70.75 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : M.1 | X Wall C.G. Location | 124 ft | Length | 30.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 57 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |

Wall Information

Torsional Analysis of Rigid Diaphragm

Project File: Rigid Diaphragm Enercalc.ec6

LIC#: KW-06014122, Build:20.23.08.30

PCS STRUCTURAL SOLUTIONS

(c) ENERCALC INC 1983-2023

DESCRIPTION: Mercer Island - Diaphragm

| | | | | |
|---|----------------------|-----------|-------------|-------------|
| Label : M.2 | X Wall C.G. Location | 125 ft | Length | 16 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 27.5 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : N.1 | X Wall C.G. Location | 146 ft | Length | 30.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 57 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : N.2 | X Wall C.G. Location | 155.75 ft | Length | 30 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 20.5 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : O.1 | X Wall C.G. Location | 178 ft | Length | 30.75 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 57 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : P.1 | X Wall C.G. Location | 194 ft | Length | 22.5 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 61 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |
| Label : P.2 | X Wall C.G. Location | 199.75 ft | Length | 15 ft |
| Wall Deflections (Stiffness) for 1.0 kip load : | Y Wall C.G. Location | 28 ft | Height | 9.33 ft |
| Along Wall "y" Dir | Wall Angle CCW | 90 deg | Thickness | 3.5 in |
| Along Wall "x" Dir | Wall Fixity | Fix-Pin | E - Bending | 0.026 Mpsi |
| | | | E - Shear | 0.0104 Mpsi |

ANALYSIS SUMMARY

Maximum shear forces applied to resisting elements. Eccentricity with respect to Center of Rigidity

| Resisting Element | Load Angle | Max Shear along Member Local "y-y" Axis | | | Max Shear along Member Local "x-x" Axis | | | |
|-------------------|------------|---|------------|-----------------|---|------------|------------|-----------------|
| | | X-Ecc (ft) | Y-Ecc (ft) | Shear Force (k) | Load Angle | X-Ecc (ft) | Y-Ecc (ft) | Shear Force (k) |
| 1.1 | 0 | 0.52 | 7.36 | 15.813 | 90 | -13.46 | -4.65 | 0.015 |
| 1.10 | 0 | 0.52 | 7.36 | 14.154 | 90 | 14.49 | -4.65 | 0.013 |
| 1.2 | 0 | 0.52 | 7.36 | 10.305 | 90 | -13.46 | -4.65 | 0.010 |
| 1.3 | 0 | 0.52 | 7.36 | 9.115 | 90 | -13.46 | -4.65 | 0.009 |
| 1.4 | 0 | 0.52 | 7.36 | 9.115 | 90 | -13.46 | -4.65 | 0.009 |
| 1.5 | 0 | 0.52 | 7.36 | 9.115 | 90 | -13.46 | -4.65 | 0.009 |
| 1.6 | 0 | 0.52 | 7.36 | 9.115 | 90 | -13.46 | -4.65 | 0.008 |
| 1.7 | 0 | 0.52 | 7.36 | 9.115 | 90 | 14.49 | -4.65 | 0.009 |
| 1.8 | 0 | 0.52 | 7.36 | 8.402 | 90 | 14.49 | -4.65 | 0.008 |
| 1.9 | 0 | 0.52 | 7.36 | 5.229 | 90 | 14.49 | -4.65 | 0.006 |
| 10.1 | 0 | 0.52 | -16.66 | 6.761 | 90 | -13.46 | -4.65 | 0.007 |
| 10.2 | 0 | 0.52 | -16.66 | 12.062 | 90 | -13.46 | -4.65 | 0.010 |
| 10.3 | 0 | 0.52 | -16.66 | 10.258 | 90 | -13.46 | -4.65 | 0.008 |
| 10.4 | 0 | 0.52 | -16.66 | 8.054 | 90 | 14.49 | -4.65 | 0.007 |
| 10.5 | 0 | 0.52 | -16.66 | 3.079 | 90 | 14.49 | -4.65 | 0.004 |
| 10.6 | 0 | 0.52 | -16.66 | 5.939 | 90 | 14.49 | -4.65 | 0.007 |
| 2.1 | 0 | 0.52 | 7.36 | 18.771 | 90 | -13.46 | -4.65 | 0.017 |
| 2.10 | 0 | 0.52 | 7.36 | 3.758 | 90 | 14.49 | -4.65 | 0.005 |
| 2.11 | 0 | 0.52 | 7.36 | 13.555 | 90 | 14.49 | -4.65 | 0.013 |
| 2.2 | 0 | 0.52 | 7.36 | 3.387 | 90 | -13.46 | -4.65 | 0.005 |
| 2.3 | 0 | 0.52 | 7.36 | 4.031 | 90 | -13.46 | -4.65 | 0.006 |
| 2.4 | 0 | 0.52 | 7.36 | 8.604 | 90 | -13.46 | -4.65 | 0.009 |
| 2.5 | 0 | 0.52 | 7.36 | 10.024 | 90 | -13.46 | -4.65 | 0.010 |
| 2.6 | 0 | 0.52 | 7.36 | 9.080 | 90 | -13.46 | -4.65 | 0.009 |
| 2.7 | 0 | 0.52 | 7.36 | 9.080 | 90 | -13.46 | -4.65 | 0.008 |

Torsional Analysis of Rigid Diaphragm

Project File: Rigid Diaphragm Enercalc.ec6

LIC# : KW-06014122, Build:20.23.08.30

PCS STRUCTURAL SOLUTIONS

(c) ENERCALC INC 1983-2023

DESCRIPTION: Mercer Island - Diaphragm

ANALYSIS SUMMARY

Maximum shear forces applied to resisting elements. Eccentricity with respect to Center of Rigidity

| Resisting Element | Load Angle | Max Shear along Member Local "y-y" Axis | | | Max Shear along Member Local "x-x" Axis | | | |
|-------------------|------------|---|------------|-----------------|---|------------|------------|-----------------|
| | | X-Ecc (ft) | Y-Ecc (ft) | Shear Force (k) | Load Angle | X-Ecc (ft) | Y-Ecc (ft) | Shear Force (k) |
| 2.8 | 0 | 0.52 | 7.36 | 9.080 | 90 | 14.49 | -4.65 | 0.009 |
| 2.9 | 0 | 0.52 | 7.36 | 10.853 | 90 | 14.49 | -4.65 | 0.010 |
| 3.1 | 0 | 0.52 | 7.36 | 11.522 | 90 | -13.46 | -4.65 | 0.012 |
| 3.2 | 0 | 0.52 | 7.36 | 9.086 | 90 | -13.46 | -4.65 | 0.010 |
| 4.1 | 0 | 0.52 | 7.36 | 7.032 | 90 | 14.49 | -4.65 | 0.008 |
| 5.1 | 0 | 0.52 | 7.36 | 16.669 | 90 | 14.49 | -4.65 | 0.015 |
| 6.1 | 0 | 0.52 | -16.66 | 17.142 | 90 | 14.49 | -4.65 | 0.015 |
| 7.1 | 0 | 0.52 | -16.66 | 17.731 | 90 | 14.49 | -4.65 | 0.015 |
| 7.2 | 0 | 0.52 | -16.66 | 14.059 | 90 | 14.49 | -4.65 | 0.013 |
| 8.1 | 0 | 0.52 | -16.66 | 13.729 | 90 | 14.49 | -4.65 | 0.012 |
| 8.2 | 0 | 0.52 | -16.66 | 14.617 | 90 | 14.49 | -4.65 | 0.013 |
| 9.1 | 0 | 0.52 | -16.66 | 8.987 | 90 | -13.46 | -4.65 | 0.008 |
| 9.2 | 0 | 0.52 | -16.66 | 3.976 | 90 | -13.46 | -4.65 | 0.005 |
| 9.3 | 0 | 0.52 | -16.66 | 5.458 | 90 | -13.46 | -4.65 | 0.006 |
| 9.4 | 0 | 0.52 | -16.66 | 5.458 | 90 | 14.49 | -4.65 | 0.006 |
| 9.5 | 0 | 0.52 | -16.66 | 5.079 | 90 | 14.49 | -4.65 | 0.006 |
| 9.6 | 0 | 0.52 | -16.66 | 7.240 | 90 | 14.49 | -4.65 | 0.007 |
| 9.7 | 0 | 0.52 | -16.66 | 14.981 | 90 | 14.49 | -4.65 | 0.013 |
| A.1 | 90 | -13.46 | -4.65 | 22.166 | 0 | 0.52 | 7.36 | 0.016 |
| A.2 | 90 | -13.46 | -4.65 | 8.157 | 0 | 0.52 | 7.36 | 0.008 |
| A.3 | 90 | -13.46 | -4.65 | 12.479 | 0 | 0.52 | 7.36 | 0.010 |
| B.1 | 90 | -13.46 | -4.65 | 21.788 | 0 | 0.52 | 7.36 | 0.016 |
| B.2 | 90 | -13.46 | -4.65 | 12.344 | 0 | 0.52 | 7.36 | 0.010 |
| C.1 | 90 | -13.46 | -4.65 | 14.794 | 0 | 0.52 | 7.36 | 0.012 |
| D.1 | 90 | -13.46 | -4.65 | 18.331 | 0 | 0.52 | 7.36 | 0.014 |
| E.1 | 90 | -13.46 | -4.65 | 17.621 | 0 | 0.52 | 7.36 | 0.014 |
| F.1 | 90 | -13.46 | -4.65 | 17.079 | 0 | 0.52 | 7.36 | 0.014 |
| G.1 | 90 | -13.46 | -4.65 | 16.670 | 0 | 0.52 | 7.36 | 0.014 |
| H.1 | 90 | 14.49 | -4.65 | 2.490 | 0 | 0.52 | 7.36 | 0.000 |
| I.1 | 90 | 14.49 | -4.65 | 13.942 | 0 | 0.52 | 7.36 | 0.012 |
| K.1 | 90 | 14.49 | -4.65 | 21.294 | 0 | 0.52 | 7.36 | 0.016 |
| K.2 | 90 | 14.49 | -4.65 | 5.347 | 0 | 0.52 | 7.36 | 0.006 |
| K.3 | 90 | 14.49 | -4.65 | 4.474 | 0 | 0.52 | 7.36 | 0.005 |
| K.4 | 90 | 14.49 | -4.65 | 9.681 | 0 | 0.52 | 7.36 | 0.008 |
| K.5 | 90 | 14.49 | -4.65 | 9.681 | 0 | 0.52 | -16.66 | 0.009 |
| K.6 | 90 | 14.49 | -4.65 | 9.681 | 0 | 0.52 | -16.66 | 0.009 |
| K.7 | 90 | 14.49 | -4.65 | 9.681 | 0 | 0.52 | -16.66 | 0.009 |
| K.8 | 90 | 14.49 | -4.65 | 12.815 | 0 | 0.52 | -16.66 | 0.012 |
| L.1 | 90 | 14.49 | -4.65 | 4.986 | 0 | 0.52 | 7.36 | 0.006 |
| L.2 | 90 | 14.49 | -4.65 | 43.588 | 0 | 0.52 | 7.36 | 0.029 |
| L.3 | 90 | 14.49 | -4.65 | 10.891 | 0 | 0.52 | -16.66 | 0.010 |
| L.4 | 90 | 14.49 | -4.65 | 13.166 | 0 | 0.52 | -16.66 | 0.012 |
| M.1 | 90 | -13.46 | -4.65 | 17.373 | 0 | 0.52 | -16.66 | 0.016 |
| M.2 | 90 | -13.46 | -4.65 | 6.975 | 0 | 0.52 | -16.66 | 0.008 |
| N.1 | 90 | -13.46 | -4.65 | 16.899 | 0 | 0.52 | -16.66 | 0.016 |
| N.2 | 90 | -13.46 | -4.65 | 16.193 | 0 | 0.52 | -16.66 | 0.016 |
| O.1 | 90 | 14.49 | -4.65 | 16.970 | 0 | 0.52 | -16.66 | 0.016 |
| P.1 | 90 | 14.49 | -4.65 | 11.589 | 0 | 0.52 | -16.66 | 0.011 |
| P.2 | 90 | 14.49 | -4.65 | 6.313 | 0 | 0.52 | -16.66 | 0.008 |

Torsional Analysis of Rigid Diaphragm

Project File: Rigid Diaphragm Enercalc.ec6






LIC# : KW-06014122, Build:20.23.08.30

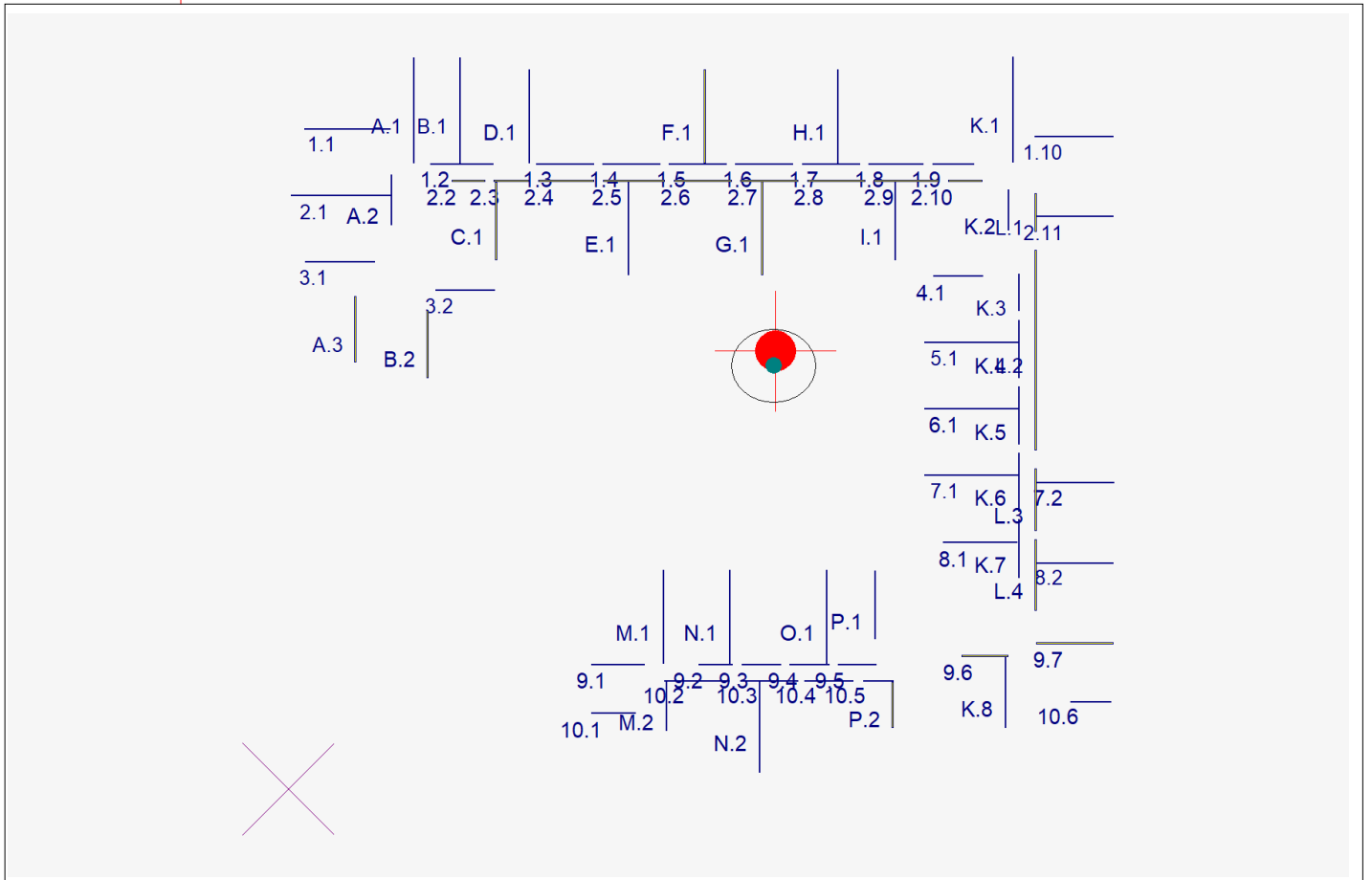
PCS STRUCTURAL SOLUTIONS

(c) ENERCALC INC 1983-2023

DESCRIPTION: Mercer Island - Diaphragm

Layout of Resisting Elements

Legend :  Defined Wall  Datum
 Center of Rigidity  Center of Mass  Accidental eccentricity application boundary



Project Title: Mercer Island
Engineer: AED
Project ID: 19028
Project Descr:

Torsional Analysis of Rigid Diaphragm

Project File: Rigid Diaphragm Enercalc.ec6

LIC# : KW-06014122, Build:20.23.08.30

PCS STRUCTURAL SOLUTIONS

(c) ENERCALC INC 1983-2023

DESCRIPTION: Mercer Island - Diaphragm

Analysis Notes

This program is designed to distribute an applied shear load to a set of resisting elements.

Each resisting element data entry specifies a deflection along a "major" and "minor" axis due to a 1,000 lb load. Each resisting element may be entered as a wall or a column (whereby the deflection is calculated), or as a generic resisting element with specified deflection. The deflections define the stiffness of each resisting element.

Each resisting element is defined at an (X,Y) location from a datum the user has previously defined. A counter-clockwise rotation of the element can be entered with respect to a traditional "+X" axis line.

A main "shear" load and an optional orthogonal shear load are specified for distribution to the system of resisting elements. In addition the maximum orthogonal dimensions of the structure and minimum accidental eccentricity percentage are specified.

From the entered loads the program calculates resultant force vectors for each angular orientation that is requested. The force is applied to the resisting elements in angular increments to generate a series of resulting direct and torsional shear loads on each element. This application of force is then repeated at angular intervals along an elliptical path defined by the minimum accidental eccentricity.

The end result is a table of direct shear and torsional shear values for each element from the iterated angles of load application and accidental eccentricity. These values are then searched to find the maximum major and minor axis shears applied to each resisting element.

Level 4 Loft Lateral Design ϕ $S_{DS} = 0.92$

Loft Area = 238 sf

Weight = (238 sf) (25 PSF + 10 PSF)
 Floor Walls

$W_p = 8330$ lbs

$F_p = \frac{0.4 a_p S_{DS} W_p}{\left(\frac{R_p}{F_p}\right)} \left(1 + 2 \frac{z}{h}\right)$ ASCE 13.3-1

$a_p = 2.5, R_p = 3.5, F_p = 1.0, z = 18.5', h = 28.5'$

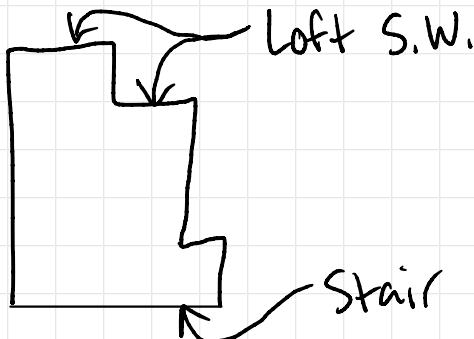
$F_p = \frac{0.4(2.5)(0.92)(8330)}{\left(\frac{3.5}{1}\right)} \left(1 + 2\left(\frac{18.5}{28.5}\right)\right)$

Very Conservative

$F_p = 5032$ lbs

OR $\approx 60\% \cdot W_p$

ASD \downarrow



$V_{\text{stair S.W.}} = \frac{5032}{2} = 2516 \times 0.7$

$V_{\text{stair S.W.}} = \frac{1761}{14.5'} = 121.5$ plf

Add to L4 in excel \uparrow

$$V_{\text{Loft S.W.}} = \frac{1761}{7.5' + 4.67'} = 145 \text{ plf} \quad \checkmark \text{ Wall Type A OK}$$

Add to L3
Excel ↑

Diaphragm positively attached at 2 sides to additionally brace loft - see 18+19 on S510

Level 4M Loft Design:

Loft Area = 167 sf

$$\text{Weight} = (167 \text{ sf}) \left(\underbrace{25 \text{ PSF}}_{\text{Floor}} + \underbrace{10 \text{ PSF}}_{\text{Walls}} \right)$$

$$W_p = 5845 \text{ lbs}$$

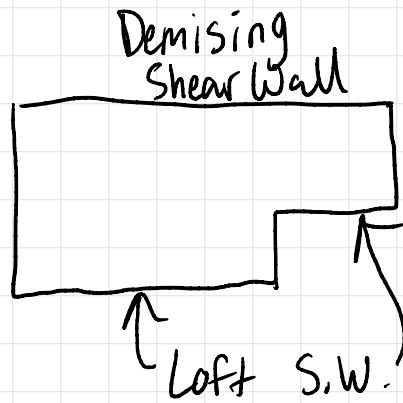
$$F_p = \frac{0.4 a_p S D S W_p}{\left(\frac{R_p}{F_p} \right)} \left(1 + 2 \frac{z}{h} \right) \quad \text{ASCE 13.3-1}$$

$$a_p = 2.5, \quad R_p = 3.5, \quad F_p = 1.0, \quad z = 18.5', \quad h = 28.5'$$

$$F_p = \frac{0.4(2.5)(0.92)(5845)}{\left(\frac{3.5}{1}\right)} \left(1 + 2\left(\frac{18.5}{28.5}\right)\right)$$

Very Conservative

$$F_p = 3531 \text{ lbs OR } \approx 60\% \cdot W_p$$



$$V_{\text{Demising S.W.}} = \frac{3531}{2} \times 0.7 = 1236 \#$$

ASD

$$V_{\text{Demising S.W.}} = \frac{1236}{30.5'} = 41 \text{ plf}$$

↖ Add to Excel Calc

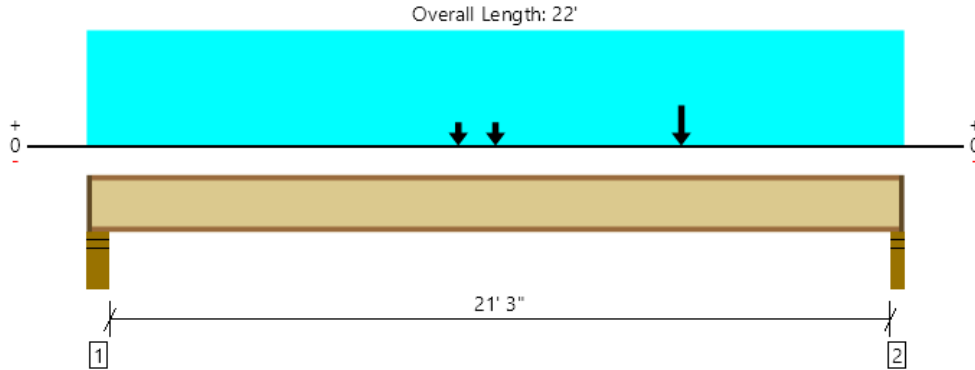
$$V_{\text{Loft S.W.}} = \frac{1236}{9.5' + 14.5'} = 52 \text{ plf } \checkmark$$

Wall Type A OK

Diaphragm Positively Attached - see 16+18 on S510

Add to L3 Excel Calc

Level, J2 @ Lofts
 1 piece(s) 11 7/8" TJI @ 560 @ 12" OC



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|----------------------|--------------|----------------|------|-----------------------------|
| Member Reaction (lbs) | 978 @ 21' 9 1/2" | 1396 (2.25") | Passed (70%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 965 @ 21' 8 1/2" | 2050 | Passed (47%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 5392 @ 11' | 9500 | Passed (57%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.350 @ 11' 2 13/16" | 0.535 | Passed (L/734) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.706 @ 11' 2 3/4" | 1.071 | Passed (L/364) | -- | 1.0 D + 1.0 L (All Spans) |
| TJ-Pro™ Rating | 45 | 45 | Passed | -- | -- |

System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 5/8" Gypsum ceiling, Pour Flooring Overlay.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------------|-------|------------------|
| | Total | Available | Required | Dead | Floor Live | Total | |
| 1 - Stud wall - DF | 5.50" | 4.25" | 1.75" | 413 | 473 | 886 | 1 1/4" Rim Board |
| 2 - Stud wall - DF | 3.50" | 2.25" | 1.75" | 467 | 517 | 984 | 1 1/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 7' 6" o/c | |
| Bottom Edge (Lu) | 21' 10" o/c | |

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

| Vertical Loads | Location | Spacing | Dead (0.90) | Floor Live (1.00) | Comments |
|-------------------|----------|---------|-------------|-------------------|--------------|
| 1 - Uniform (PSF) | 0 to 22' | 12" | 25.0 | 40.0 | Default Load |
| 2 - Point (PLF) | 16' | 12" | 150.0 | 110.0 | |
| 3 - Point (lb) | 10' | N/A | 90 | - | |
| 4 - Point (lb) | 11' | N/A | 90 | - | |

Weyerhaeuser Notes

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

| ForteWEB Software Operator | Job Notes |
|---|-----------|
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |





Project: Mercer Island Mixed Use

Job Number: 19028

Sheet: _____ of _____

Name: AED

Originating Office: Seattle

Date: 9/8/2023

MULTISTORY SHEARWALL DESIGN

ENTER ALL LOADS UNFACTORED

| | | | | |
|---------------|-------|-----|-------------|------|
| $C_s =$ | 0.142 | | Drift Limit | |
| $SDS =$ | 0.92 | | $D =$ | 0.02 |
| ROOF DL = | 18 | psf | $C_d =$ | 4.0 |
| FLOOR DL = | 25 | psf | | |
| WALL WT = | 9 | psf | | |
| FLOOR DEPTH = | 1 | ft | | |

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 |

CONT. ROD HOLDOWNS

| TYPE | T_{ALLOW} | GRADE |
|----------|-------------|-----------|
| 0.500 in | 4270 lbs | ASTM A307 |
| 0.625 in | 6675 lbs | ASTM A307 |
| 0.750 in | 9610 lbs | ASTM A307 |
| 0.875 in | 13080 lbs | ASTM A307 |
| 1.000 in | 17080 lbs | ASTM A307 |
| 1.125 in | 21620 lbs | ASTM A307 |
| 1.250 in | 26690 lbs | ASTM A307 |
| 1.500 in | 38495 lbs | ASTM A307 |
| 1.750 in | 52315 lbs | ASTM A307 |
| HDU-02 | 3075 lbs | 0.088 in |
| HDU-04 | 4565 lbs | 0.114 in |
| HDU-05 | 5645 lbs | 0.115 in |
| HDU-08 | 7870 lbs | 0.113 in |
| HDU-11 | 11175 lbs | 0.137 in |
| HDU-14 | 14445 lbs | 0.177 in |

SHEARWALL TYPES

| TYPE | V_{ALLOW} | G_a |
|------|-------------|------------|
| A | 460 plf | 15.00 k-in |
| B | 600 plf | 18.50 k-in |
| C | 920 plf | 30.00 k-in |
| D | 1200 plf | 37.00 k-in |

POST TYPES

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



Project: Mercer Island Mixed Use
 Sheet: _____ of _____
 Originating Office: Seattle

Job Number: 19028
 Name: AED
 Date: 09/08/23

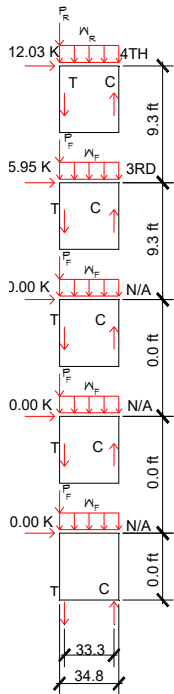
MULTISTORY SHEARWALL DESIGN - SUMMARY

| LABEL | STATUS | Tmax (K) | Vmax (plf) | D/C - (1) SIDED SW | SHEATHING | CONT. HOLDDOWN ROD DIAMETER | Cmax (K) |
|--------|--------|----------|------------|-----------------------|-----------|--------------------------------|----------|
| W(A.1) | OK | 9.6 | 625.4 | 104% | (1) SIDE | 0.750 | 13.4 |
| W(A.2) | OK | 12.2 | 625 | 104% | (1) SIDE | 0.875 | 13.4 |
| W(A.3) | OK | 5.5 | 625 | 104% | (1) SIDE | 0.625 | 13.4 |
| W(B.1) | OK | 3.3 | 617 | 103% | (1) SIDE | 0.500 | 13.2 |
| W(B.2) | OK | 8.8 | 617 | 103% | (1) SIDE | 0.750 | 13.2 |
| W(C.1) | OK | 7.4 | 607 | 101% | (1) SIDE | 0.750 | 13.0 |
| W(D.1) | OK | 0.6 | 588 | 98% | (1) SIDE | NONE | 12.6 |
| W(I.1) | OK | 4.2 | 540 | 90% | (1) SIDE | 0.500 | 11.6 |
| W(K.1) | OK | 3.3 | 612 | 102% | (1) SIDE | 0.500 | 13.1 |
| W(K.2) | OK | 12.2 | 612 | 102% | (1) SIDE | 0.875 | 13.1 |
| W(K.4) | OK | 10.7 | 612 | 102% | (1) SIDE | 0.875 | 13.1 |
| W(K.8) | OK | 8.2 | 612 | 102% | (1) SIDE | 0.750 | 13.1 |
| W(L.1) | OK | 12.2 | 604 | 101% | (1) SIDE | 0.875 | 12.9 |
| W(L.2) | OK | 0.0 | 604 | 101% | (1) SIDE | NONE | 12.9 |
| W(L.3) | OK | 9.8 | 604 | 101% | (1) SIDE | 0.875 | 12.9 |
| W(M.1) | OK | 0.4 | 581 | 97% | (1) SIDE | NONE | 12.4 |
| W(M.2) | OK | 10.4 | 581 | 97% | (1) SIDE | 0.875 | 12.4 |
| W(N.1) | OK | 2.4 | 544 | 91% | (1) SIDE | 0.500 | 11.6 |
| W(O.1) | OK | 2.2 | 549 | 92% | (1) SIDE | 0.500 | 11.8 |
| W(P.1) | OK | 3.9 | 510 | 85% | (1) SIDE | 0.500 | 10.9 |
| W(P.2) | OK | 7.8 | 510 | 85% | (1) SIDE | 0.750 | 10.9 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **NA.1**

$C_u = 0.142$ Wall Weight = **9** psf
 $S_{DS} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{DS} = 0.77$ Floor Dead = **25** psf
 Trib Width = **0.67** ft $1 + 0.145 S_{DS} = 1.13$
 Trib Area = **0.00** ft² Resists uplift only (due to near walls)
 $L = 34.8$ ft Total Wall Length
 $L_{HD} = 33.3$ ft Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|---------|------|---------|-------|-------|--------|
| ROOF | DF | 256 | A | 0.56 | 0.5 | 0.34 | (4) 2x4 | 0.395 | 0.011 | OK |
| 4TH | DF | 503 | B | 0.84 | 0.625 | 0.74 | (4) 2x4 | 0.686 | 0.013 | OK |
| 3RD | DF | 625 | B | 1.04 | 0.75 | 1.00 | (5) 2x4 | 0.970 | 0.016 | OK |
| N/A | DF | 625 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 625 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 625 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | V _u plf | Add Load lbs | V k | SV k | P' k | W' klf | h ft | Sh ft | M _{OT} kft | M _R kft | T _{ASD} k |
|-------|-----------------------|-----------------|---------|---------|---------|-----------|---------|----------|------------------------|-----------------------|-----------------------|
| ROOF | 358 | 0 | 12.45 K | 12.45 | 0.00 | 0.11 | 11.3 ft | 11.3 | 140.7 | 68.6 | 1.4 |
| 4TH | 346 | 0 | 12.03 K | 24.47 | 0.00 | 0.10 | 9.3 ft | 20.6 | 368.3 | 129.2 | 4.9 |
| 3RD | 171 | 0 | 5.95 K | 30.43 | 0.00 | 0.10 | 9.3 ft | 29.9 | 651.2 | 189.8 | 9.6 |
| N/A | 0 | 0 | 0.00 K | 30.43 | 0.00 | 0.02 | 0.0 ft | 29.9 | 651.2 | 199.8 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 30.43 | 0.00 | 0.02 | 0.0 ft | 29.9 | 651.2 | 209.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 30.43 | 0.00 | 0.02 | 0.0 ft | 29.9 | 651.2 | 219.9 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u plf | G _s k-in | D _s in | A _{chord} in ² | E psi | h ft | d _{NALL} in | Sd _{NALL} in | d _{HD} in | Sh ft | Sd _{HD} in | d _{TOT} in | Stretch in |
|-------|-----------------------|------------------------|----------------------|---------------------------------------|----------|---------|-------------------------|--------------------------|-----------------------|----------|------------------------|------------------------|---------------|
| ROOF | 358 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.249 | 0.964 | 0.061 | 26.9 | 0.218 | 1.182 | 0.180 |
| 4TH | 704 | 19 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.319 | 0.715 | 0.050 | 16.6 | 0.095 | 0.810 | 0.180 |
| 3RD | 876 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.396 | 0.396 | 0.050 | 8.3 | 0.050 | 0.446 | 0.180 |
| N/A | 876 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 876 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 876 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

CHORDS - COMPRESSION CONTROLS

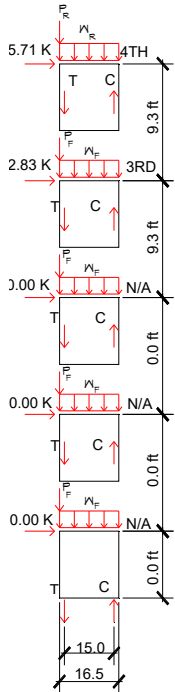
| Level | D k | L k | S k | E k | C _{ASD} k | h ft | C _p | f _c psi | F _{cp} psi | F _{c'} psi | f _c /F _{cp} | f _c /F _{c'} | MAX |
|-------|--------|--------|--------|--------|-----------------------|---------|----------------|-----------------------|------------------------|------------------------|---------------------------------|---------------------------------|-------|
| ROOF | 0.00 | 0.00 | 0.00 | 4.0 | 2.891 | 10.3 | 0.147 | 138 | 625 | 349 | 0.220 | 0.395 | 0.395 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.6 | 7.570 | 8.3 | 0.221 | 360 | 625 | 526 | 0.577 | 0.686 | 0.686 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.7 | 13.386 | 8.3 | 0.221 | 510 | 625 | 526 | 0.816 | 0.970 | 0.970 |
| N/A | 0.00 | 0.00 | 0.00 | 18.7 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.7 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.7 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**

MULTI-STORY SHEARWALL DESIGN:

WALL **WA.2**

$C_6 = 0.142$ Wall Weight = **9** psf
 $S_{DS} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{DS} = 0.77$ Floor Dead = **25** psf
 Trib Width = **1.33** ft $1 + 0.145 S_{DS} = 1.13$
 Trib Area = **0.00** ft² Resists uplift only (due to near walls)
 $L = 16.5$ ft Total Wall Length
 $L_{HD} = 15.0$ ft Distance from Holddown to comp post



| Level | DF? | Sv | WALL | % | HOLDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|---------|------|---------|-------|-------|--------|
| ROOF | DF | 256 | A | 0.56 | 0.5 | 0.54 | (4) 2x6 | 0.140 | 0.015 | OK |
| 4TH | DF | 503 | B | 0.84 | 0.625 | 0.99 | (4) 2x6 | 0.367 | 0.015 | OK |
| 3RD | DF | 625 | B | 1.04 | 0.875 | 0.93 | (4) 2x6 | 0.649 | 0.018 | OK |
| N/A | DF | 625 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 625 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 625 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |

| Level | V _u | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|----------------|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | K | K | K | Klf | ft | ft | kft | kft | K |
| ROOF | 358 | 0 | 5.91 K | 5.91 | 0.00 | 0.13 | 11.3 ft | 11.3 | 66.8 | 17.1 | 2.3 |
| 4TH | 346 | 0 | 5.71 K | 11.62 | 0.00 | 0.12 | 9.3 ft | 20.6 | 174.9 | 33.0 | 6.6 |
| 3RD | 171 | 0 | 2.83 K | 14.45 | 0.00 | 0.12 | 9.3 ft | 29.9 | 309.2 | 48.9 | 12.2 |
| N/A | 0 | 0 | 0.00 K | 14.45 | 0.00 | 0.03 | 0.0 ft | 29.9 | 309.2 | 53.5 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 14.45 | 0.00 | 0.03 | 0.0 ft | 29.9 | 309.2 | 58.0 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 14.45 | 0.00 | 0.03 | 0.0 ft | 29.9 | 309.2 | 62.5 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _s | D _s | A _{chord} | E | h | d _{NALL} | Sd _{NALL} | d _{HD} | Sh | Sd _{HD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 358 | 15 | 0.180 | 33 | 1.50E+06 | 10.3 | 0.250 | 0.969 | 0.136 | 26.9 | 0.482 | 1.451 | 0.180 |
| 4TH | 704 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.320 | 0.719 | 0.112 | 16.6 | 0.211 | 0.930 | 0.180 |
| 3RD | 876 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.398 | 0.398 | 0.112 | 8.3 | 0.112 | 0.510 | 0.180 |
| N/A | 876 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 876 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 876 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

CHORDS - COMPRESSION CONTROLS

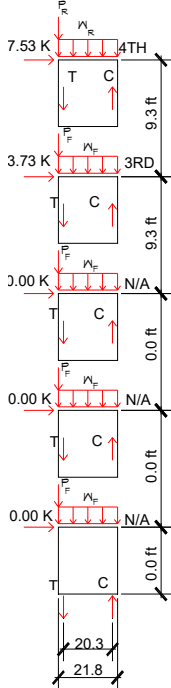
| Level | D | L | S | E | C _{ASD} | h | C _p | f _c | F _{cp} | F _{c'} | f _c /F _{cp} | f _c /F _{c'} | MAX |
|-------|------|------|------|------|------------------|------|----------------|----------------|-----------------|-----------------|---------------------------------|---------------------------------|-------|
| | k | k | k | k | k | ft | | psi | psi | psi | | | |
| ROOF | 0.00 | 0.00 | 0.00 | 4.0 | 2.891 | 10.3 | 0.340 | 88 | 625 | 808 | 0.140 | 0.108 | 0.140 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.6 | 7.570 | 8.3 | 0.486 | 229 | 625 | 1154 | 0.367 | 0.199 | 0.367 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.7 | 13.386 | 8.3 | 0.486 | 406 | 625 | 1154 | 0.649 | 0.351 | 0.649 |
| N/A | 0.00 | 0.00 | 0.00 | 18.7 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.7 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.7 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**

MULTI-STORY SHEARWALL DESIGN:

WALL **WA.3**

$C_b = 0.142$ Wall Weight = **9** psf
 $S_{D5} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{D5} = 0.117$ Floor Dead = **25** psf
 Trib Width = **10.50** ft $1 + 0.145 S_{D5} = 1.13$
 Trib Area = **0.00** ft² Resists uplift only (due to near walls)
 $L = 21.8$ ft Total Wall Length
 $L_{HD} = 20.3$ ft Distance from Holddown to comp post



WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS | |
|-------|-----|-----|------|------|----------|------|------|-----|-------|--------|----|
| ROOF | DF | 256 | A | 0.56 | NONE | 0.76 | (4) | 2x4 | 0.395 | 0.013 | OK |
| 4TH | DF | 503 | B | 0.84 | 0.5 | 0.56 | (4) | 2x4 | 0.686 | 0.014 | OK |
| 3RD | DF | 625 | B | 1.04 | 0.625 | 0.83 | (5) | 2x4 | 0.970 | 0.017 | OK |
| N/A | DF | 625 | B | 0.00 | NONE | 0.00 | (4) | 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 625 | B | 0.00 | NONE | 0.00 | (4) | 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 625 | B | 0.00 | NONE | 0.00 | (4) | 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | V _u | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|----------------|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | kif | ft | ft | kft | kft | k |
| ROOF | 358 | 0 | 7.79 K | 7.79 | 0.00 | 0.29 | 11.3 ft | 11.3 | 88.0 | 68.8 | 0.5 |
| 4TH | 346 | 0 | 7.53 K | 15.32 | 0.00 | 0.35 | 9.3 ft | 20.6 | 230.5 | 150.6 | 2.4 |
| 3RD | 171 | 0 | 3.73 K | 19.04 | 0.00 | 0.35 | 9.3 ft | 29.9 | 407.6 | 232.5 | 5.5 |
| N/A | 0 | 0 | 0.00 K | 19.04 | 0.00 | 0.26 | 0.0 ft | 29.9 | 407.6 | 294.6 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 19.04 | 0.00 | 0.26 | 0.0 ft | 29.9 | 407.6 | 356.7 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 19.04 | 0.00 | 0.26 | 0.0 ft | 29.9 | 407.6 | 418.8 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _s | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 358 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.251 | 0.970 | 0.100 | 26.9 | 0.357 | 1.327 | 0.180 |
| 4TH | 704 | 19 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.321 | 0.719 | 0.083 | 16.6 | 0.156 | 0.875 | 0.180 |
| 3RD | 876 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.398 | 0.398 | 0.083 | 8.3 | 0.083 | 0.481 | 0.180 |
| N/A | 0 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 876 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 876 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

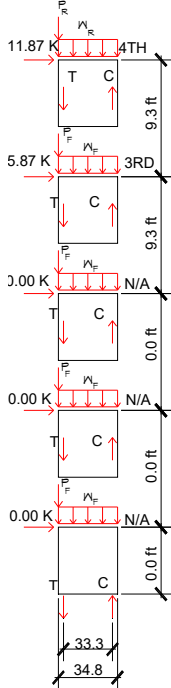
CHORDS - COMPRESSION CONTROLS

| 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 | 4.0 | 2.891 | 10.3 | 0.147 | 138 | 625 | 349 | 0.220 | 0.395 | 0.395 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.6 | 7.570 | 8.3 | 0.221 | 360 | 625 | 526 | 0.577 | 0.686 | 0.686 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.7 | 13.386 | 8.3 | 0.221 | 510 | 625 | 526 | 0.816 | 0.970 | 0.970 |
| N/A | 0.00 | 0.00 | 0.00 | 18.7 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.7 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.7 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **WB.1**

$C_p = 0.142$ Wall Weight = **9** psf
 $S_{D5} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{D5} = 0.77$ Trib Width = **7.13** ft Floor Dead = **25** psf
 Trib Area = **0.00** ft² $1 + 0.145 S_{D5} = 1.13$
 $L = 34.8$ ft Resists uplift only (due to near walls)
 $L_{HD} = 33.3$ ft Total Wall Length
 Distance from Holddown to comp post



| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 252 | A | 0.55 | NONE | 0.00 | (4) 2x4 | 0.389 | 0.011 | OK |
| 4TH | DF | 496 | B | 0.83 | 0.5 | 0.22 | (4) 2x4 | 0.676 | 0.013 | OK |
| 3RD | DF | 617 | B | 1.03 | 0.5 | 0.76 | (5) 2x4 | 0.957 | 0.016 | OK |
| N/A | DF | 617 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 617 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 617 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

| Level | V _u | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|----------------|----------|---------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | kif | ft | ft | kft | kft | k |
| ROOF | 353 | 0 | 12.28 K | 12.28 | 0.00 | 0.23 | 11.3 ft | 11.3 | 138.8 | 138.8 | 0.0 |
| 4TH | 341 | 0 | 11.87 K | 24.15 | 0.00 | 0.26 | 9.3 ft | 20.6 | 363.3 | 296.9 | 0.9 |
| 3RD | 169 | 0 | 5.87 K | 30.02 | 0.00 | 0.26 | 9.3 ft | 29.9 | 642.5 | 455.0 | 3.3 |
| N/A | 0 | 0 | 0.00 K | 30.02 | 0.00 | 0.18 | 0.0 ft | 29.9 | 642.5 | 562.6 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 30.02 | 0.00 | 0.18 | 0.0 ft | 29.9 | 642.5 | 670.1 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 30.02 | 0.00 | 0.18 | 0.0 ft | 29.9 | 642.5 | 777.7 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _s | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 353 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.246 | 0.951 | 0.061 | 26.9 | 0.218 | 1.169 | 0.180 |
| 4TH | 695 | 19 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.315 | 0.705 | 0.050 | 16.6 | 0.095 | 0.801 | 0.180 |
| 3RD | 864 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.391 | 0.391 | 0.050 | 8.3 | 0.050 | 0.441 | 0.180 |
| N/A | 864 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 864 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 864 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

CHORDS - COMPRESSION CONTROLS

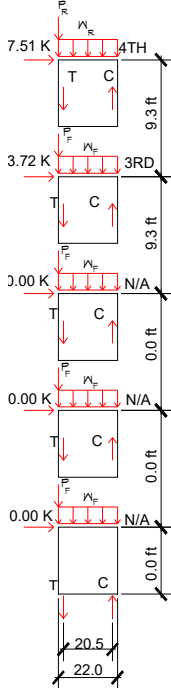
| Level | D | L | S | E | C _{ASD} | h | C _p | f _c | F _{cp} | F _{c'} | f _c /F _{cp} | f _c /F _{c'} | MAX |
|-------|------|------|------|------|------------------|------|----------------|----------------|-----------------|-----------------|---------------------------------|---------------------------------|-------|
| | k | k | k | k | k | ft | | psi | psi | psi | | | |
| ROOF | 0.00 | 0.00 | 0.00 | 4.0 | 2.852 | 10.3 | 0.147 | 136 | 625 | 349 | 0.217 | 0.389 | 0.389 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.5 | 7.468 | 8.3 | 0.221 | 356 | 625 | 526 | 0.569 | 0.676 | 0.676 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.5 | 13.207 | 8.3 | 0.221 | 503 | 625 | 526 | 0.805 | 0.957 | 0.957 |
| N/A | 0.00 | 0.00 | 0.00 | 18.5 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.5 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.5 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**

MULTI-STORY SHEARWALL DESIGN:

WALL **WB.2**

$C_p = 0.142$ Wall Weight = **9** psf
 $S_{D5} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{D5} = 0.77$ Trib Width = **4.75** ft Floor Dead = **25** psf
 Trib Area = **0.00** ft² $1 + 0.145 S_{D5} = 1.13$
 $L = 22.0$ ft Resists uplift only (due to near walls)
 $L_{HD} = 20.5$ ft Total Wall Length
 Distance from Holddown to comp post



WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 252 | A | 0.55 | 0.5 | 0.32 | (4) 2x4 | 0.389 | 0.013 | OK |
| 4TH | DF | 496 | B | 0.83 | 0.625 | 0.67 | (4) 2x4 | 0.676 | 0.014 | OK |
| 3RD | DF | 617 | B | 1.03 | 0.75 | 0.91 | (5) 2x4 | 0.957 | 0.017 | OK |
| N/A | DF | 617 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 617 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 617 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | V_u plf | Add Load lbs | V k | SV k | P' k | W' kif | h ft | Sh ft | M_{OT} kft | M_R kft | T_{ASD} k |
|-------|--------------|-----------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| ROOF | 353 | 0 | 7.77 K | 7.77 | 0.00 | 0.19 | 11.3 ft | 11.3 | 87.9 | 45.3 | 1.4 |
| 4TH | 341 | 0 | 7.51 K | 15.29 | 0.00 | 0.20 | 9.3 ft | 20.6 | 230.0 | 94.3 | 4.5 |
| 3RD | 169 | 0 | 3.72 K | 19.00 | 0.00 | 0.20 | 9.3 ft | 29.9 | 406.8 | 143.3 | 8.8 |
| N/A | 0 | 0 | 0.00 K | 19.00 | 0.00 | 0.12 | 0.0 ft | 29.9 | 406.8 | 172.0 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 19.00 | 0.00 | 0.12 | 0.0 ft | 29.9 | 406.8 | 200.8 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 19.00 | 0.00 | 0.12 | 0.0 ft | 29.9 | 406.8 | 229.5 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V_u plf | G_s k-in | D_s in | A_{chord} in ² | E psi | h ft | d_{WALL} in | $S_{d,WALL}$ in | d_{HD} in | Sh ft | $S_{d,HD}$ in | d_{TOT} in | Stretch in |
|-------|--------------|---------------|-------------|--------------------------------|----------|---------|------------------|--------------------|----------------|----------|------------------|-----------------|---------------|
| ROOF | 353 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.247 | 0.957 | 0.099 | 26.9 | 0.353 | 1.310 | 0.180 |
| 4TH | 695 | 19 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.317 | 0.709 | 0.082 | 16.6 | 0.155 | 0.864 | 0.180 |
| 3RD | 864 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.392 | 0.392 | 0.082 | 8.3 | 0.082 | 0.474 | 0.180 |
| N/A | 864 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 864 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 864 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

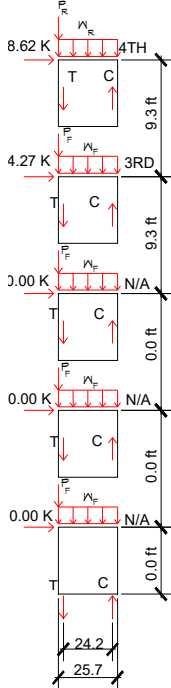
CHORDS - COMPRESSION CONTROLS

| Level | D k | L k | S k | E k | C_{ASD} k | h ft | C_p | f_c psi | F_{cp} psi | F_c' psi | f_c/F_{cp} | f_c/F_c' | MAX |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| ROOF | 0.00 | 0.00 | 0.00 | 4.0 | 2.852 | 10.3 | 0.147 | 136 | 625 | 349 | 0.217 | 0.389 | 0.389 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.5 | 7.468 | 8.3 | 0.221 | 356 | 625 | 526 | 0.569 | 0.676 | 0.676 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.5 | 13.207 | 8.3 | 0.221 | 503 | 625 | 526 | 0.805 | 0.957 | 0.957 |
| N/A | 0.00 | 0.00 | 0.00 | 18.5 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.5 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.5 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **WC.1**

$C_s = 0.142$ Wall Weight = **9** psf
 $S_{Ds} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{Ds} = 0.77$ Trib Width = **5.00** ft Floor Dead = **25** psf
 Trib Area = **0.00** ft² $1 + 0.145 S_{Ds} = 1.13$
 $L = 25.7$ ft Resists uplift only (due to near walls)
 $L_{HD} = 24.2$ ft Total Wall Length
 Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 248 | A | 0.54 | 0.5 | 0.23 | (4) 2x4 | 0.383 | 0.008 | OK |
| 4TH | DF | 488 | B | 0.81 | 0.5 | 0.84 | (4) 2x4 | 0.665 | 0.011 | OK |
| 3RD | DF | 607 | B | 1.01 | 0.75 | 0.77 | (5) 2x4 | 0.941 | 0.014 | OK |
| N/A | DF | 607 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 607 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 607 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | V_u plf | Add Load lbs | V k | SV k | P' k | W' kif | h ft | Sh ft | M_{OT} kft | M_R kft | T_{ASD} k |
|-------|--------------|-----------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| ROOF | 348 | 0 | 8.92 K | 8.92 | 0.00 | 0.19 | 11.3 ft | 11.3 | 100.8 | 63.2 | 1.0 |
| 4TH | 336 | 0 | 8.62 K | 17.54 | 0.00 | 0.21 | 9.3 ft | 20.6 | 264.0 | 131.9 | 9.6 |
| 3RD | 166 | 0 | 4.27 K | 21.81 | 0.00 | 0.21 | 9.3 ft | 29.9 | 466.8 | 200.7 | 7.4 |
| N/A | 0 | 0 | 0.00 K | 21.81 | 0.00 | 0.13 | 0.0 ft | 29.9 | 466.8 | 241.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 21.81 | 0.00 | 0.13 | 0.0 ft | 29.9 | 466.8 | 283.1 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 21.81 | 0.00 | 0.13 | 0.0 ft | 29.9 | 466.8 | 324.2 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V_u plf | G_s k-in | D_s in | A_{chord} in ² | E psi | h ft | d_{WALL} in | $S_{d,WALL}$ in | d_{HD} in | Sh ft | $S_{d,HD}$ in | d_{TOT} in | Stretch in |
|-------|--------------|---------------|-------------|--------------------------------|----------|---------|------------------|--------------------|----------------|----------|------------------|-----------------|---------------|
| ROOF | 348 | 15 | 0.088 | 21 | 1.50E+06 | 10.3 | 0.243 | 0.939 | 0.041 | 26.9 | 0.041 | 0.980 | 0.088 |
| 4TH | 683 | 19 | 0.000 | 21 | 1.50E+06 | 8.3 | 0.311 | 0.696 | 0.000 | 16.6 | 0.000 | 0.696 | 0.000 |
| 3RD | 850 | 19 | 0.000 | 26 | 1.50E+06 | 8.3 | 0.385 | 0.385 | 0.000 | 8.3 | 0.000 | 0.385 | 0.000 |
| N/A | 850 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 850 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 850 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

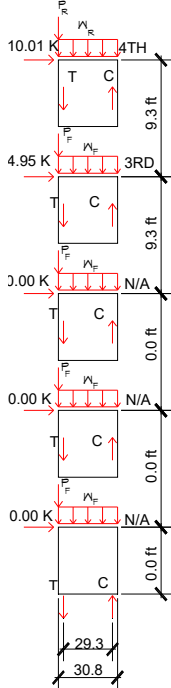
CHORDS - COMPRESSION CONTROLS

| Level | D k | L k | S k | E k | C_{ASD} k | h ft | C_p | f_c psi | F_{cp} psi | F_c' psi | f_c/F_{cp} | f_c/F_c' | MAX |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| ROOF | 0.00 | 0.00 | 0.00 | 3.9 | 2.805 | 10.3 | 0.147 | 134 | 625 | 349 | 0.214 | 0.383 | 0.383 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.3 | 7.345 | 8.3 | 0.221 | 350 | 625 | 526 | 0.560 | 0.665 | 0.665 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.2 | 12.988 | 8.3 | 0.221 | 495 | 625 | 526 | 0.792 | 0.941 | 0.941 |
| N/A | 0.00 | 0.00 | 0.00 | 18.2 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.2 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.2 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **WD.1, WE.1, WF.1, WG.1, WH.1**

$C_p = 0.142$ Wall Weight = **9** psf
 $S_{D5} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{D5} = 0.119$ Floor Dead = **25** psf
 Trib Width = **11.00** ft $1 + 0.145 S_{D5} = 1.13$
 Trib Area = **0.00** ft² Resists uplift only (due to near walls)
 $L = 30.8$ ft Total Wall Length
 $L_{HD} = 29.3$ ft Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 241 | A | 0.52 | NONE | 0.00 | (2) 2x4 | 0.742 | 0.011 | OK |
| 4TH | DF | 473 | B | 0.79 | NONE | 0.00 | (3) 2x4 | 0.860 | 0.013 | OK |
| 3RD | DF | 588 | B | 0.98 | NONE | 0.88 | (5) 2x4 | 0.912 | 0.015 | OK |
| N/A | DF | 588 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 588 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 588 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | V _u | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|----------------|----------|---------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | kif | ft | ft | kft | kft | k |
| ROOF | 337 | 0 | 10.36 K | 10.36 | 0.00 | 0.30 | 11.3 ft | 11.3 | 117.0 | 141.7 | 0.0 |
| 4TH | 325 | 0 | 10.01 K | 20.37 | 0.00 | 0.36 | 9.3 ft | 20.6 | 306.4 | 311.3 | 0.0 |
| 3RD | 161 | 0 | 4.95 K | 25.32 | 0.00 | 0.36 | 9.3 ft | 29.9 | 541.9 | 480.9 | 0.6 |
| N/A | 0 | 0 | 0.00 K | 25.32 | 0.00 | 0.28 | 0.0 ft | 29.9 | 541.9 | 610.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 25.32 | 0.00 | 0.28 | 0.0 ft | 29.9 | 541.9 | 740.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 25.32 | 0.00 | 0.28 | 0.0 ft | 29.9 | 541.9 | 870.9 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _s | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 337 | 15 | 0.180 | 11 | 1.50E+06 | 10.3 | 0.238 | 0.912 | 0.070 | 26.9 | 0.247 | 1.159 | 0.180 |
| 4TH | 662 | 19 | 0.180 | 16 | 1.50E+06 | 8.3 | 0.302 | 0.674 | 0.057 | 16.6 | 0.108 | 0.782 | 0.180 |
| 3RD | 823 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.373 | 0.373 | 0.057 | 8.3 | 0.057 | 0.430 | 0.180 |
| N/A | 823 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 823 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 823 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

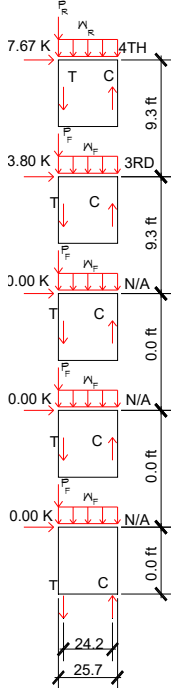
CHORDS - COMPRESSION CONTROLS

| 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 | 3.8 | 2.719 | 10.3 | 0.147 | 259 | 625 | 349 | 0.414 | 0.742 | 0.742 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.0 | 7.118 | 8.3 | 0.221 | 452 | 625 | 526 | 0.723 | 0.860 | 0.860 |
| 3RD | 0.00 | 0.00 | 0.00 | 17.6 | 12.588 | 8.3 | 0.221 | 480 | 625 | 526 | 0.767 | 0.912 | 0.912 |
| N/A | 0.00 | 0.00 | 0.00 | 17.6 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | | | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.6 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | | | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.6 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | | | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL W1.1

$C_p = 0.142$ Wall Weight = 9 psf
 $S_{Ds} = 0.92$ sec Roof Dead = 18 psf
 $0.9 \cdot 0.145 S_{Ds} = 0.117$ Floor Dead = 25 psf
 Trib Width = 7.38 ft $1 + 0.145 S_{Ds} = 1.13$
 Trib Area = 0.00 ft² Resists uplift only (due to near walls)
 $L = 25.7$ ft Total Wall Length
 $L_{HD} = 24.2$ ft Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 221 | A | 0.48 | NONE | 0.29 | (4) 2x4 | 0.341 | 0.011 | OK |
| 4TH | DF | 434 | B | 0.72 | 0.5 | 0.39 | (4) 2x4 | 0.592 | 0.012 | OK |
| 3RD | DF | 540 | B | 0.90 | 0.5 | 0.98 | (5) 2x4 | 0.838 | 0.015 | OK |
| N/A | DF | 540 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 540 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 540 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | V _u | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|----------------|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | kif | ft | ft | kft | kft | k |
| ROOF | 309 | 0 | 7.94 K | 7.94 | 0.00 | 0.23 | 11.3 ft | 11.3 | 89.7 | 77.2 | 0.191 |
| 4TH | 299 | 0 | 7.67 K | 15.61 | 0.00 | 0.27 | 9.3 ft | 20.6 | 234.9 | 165.6 | 1.668 |
| 3RD | 148 | 0 | 3.80 K | 19.41 | 0.00 | 0.27 | 9.3 ft | 29.9 | 415.4 | 253.9 | 4.189 |
| N/A | 0 | 0 | 0.00 K | 19.41 | 0.00 | 0.18 | 0.0 ft | 29.9 | 415.4 | 314.6 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 19.41 | 0.00 | 0.18 | 0.0 ft | 29.9 | 415.4 | 375.4 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 19.41 | 0.00 | 0.18 | 0.0 ft | 29.9 | 415.4 | 436.1 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _s | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 309 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.216 | 0.835 | 0.084 | 26.9 | 0.299 | 1.135 | 0.180 |
| 4TH | 608 | 19 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.277 | 0.619 | 0.069 | 16.6 | 0.131 | 0.750 | 0.180 |
| 3RD | 756 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.343 | 0.343 | 0.069 | 8.3 | 0.069 | 0.412 | 0.180 |
| N/A | 756 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 756 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 756 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

CHORDS - COMPRESSION CONTROLS

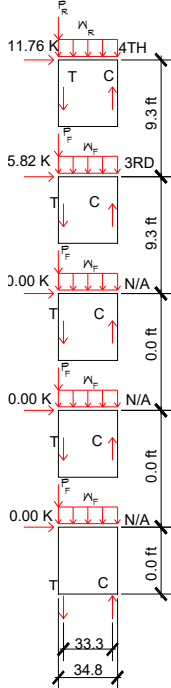
| Level | D | L | S | E | C _{ASD} | h | C _p | f _c | F _{cp} | F _{c'} | f _c /F _{cp} | f _c /F _{c'} | MAX |
|-------|------|------|------|------|------------------|------|----------------|----------------|-----------------|-----------------|---------------------------------|---------------------------------|-------|
| | k | k | k | k | k | ft | | psi | psi | psi | | | |
| ROOF | 0.00 | 0.00 | 0.00 | 3.5 | 2.497 | 10.3 | 0.147 | 119 | 625 | 349 | 0.190 | 0.341 | 0.341 |
| 4TH | 0.00 | 0.00 | 0.00 | 9.2 | 6.537 | 8.3 | 0.221 | 311 | 625 | 526 | 0.498 | 0.592 | 0.592 |
| 3RD | 0.00 | 0.00 | 0.00 | 16.2 | 11.560 | 8.3 | 0.221 | 440 | 625 | 526 | 0.705 | 0.838 | 0.838 |
| N/A | 0.00 | 0.00 | 0.00 | 16.2 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | | | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 16.2 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | | | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 16.2 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | | | 0.000 |

STATUS: **OK**

MULTI-STORY SHEARWALL DESIGN:

WALL **WK.1**

$C_b = 0.142$ Wall Weight = **9** psf
 $S_{D5} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{D5} = 0.77$ Trib Width = **7.00** ft Floor Dead = **25** psf
 Trib Area = **0.00** ft² $1 + 0.145 S_{D5} = 1.13$
 $L = 34.8$ ft Resists uplift only (due to near walls)
 $L_{HD} = 33.3$ ft Total Wall Length
 Distance from Holddown to comp post



WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 250 | A | 0.54 | NONE | 0.00 | (4) 2x4 | 0.386 | 0.011 | OK |
| 4TH | DF | 492 | B | 0.82 | 0.5 | 0.22 | (4) 2x4 | 0.671 | 0.013 | OK |
| 3RD | DF | 612 | B | 1.02 | 0.5 | 0.77 | (5) 2x4 | 0.949 | 0.016 | OK |
| N/A | DF | 612 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 612 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 612 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | V_u plf | Add Load lbs | V k | SV k | P' k | W' kif | h ft | Sh ft | M_{OT} kft | M_R kft | T_{ASD} k |
|-------|--------------|-----------------|---------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| ROOF | 350 | 0 | 12.18 K | 12.18 | 0.00 | 0.23 | 11.3 ft | 11.3 | 137.6 | 137.5 | 0.0 |
| 4TH | 339 | 0 | 11.76 K | 23.94 | 0.00 | 0.26 | 9.3 ft | 20.6 | 360.2 | 293.7 | 0.9 |
| 3RD | 168 | 0 | 5.82 K | 29.76 | 0.00 | 0.26 | 9.3 ft | 29.9 | 637.1 | 449.9 | 3.3 |
| N/A | 0 | 0 | 0.00 K | 29.76 | 0.00 | 0.18 | 0.0 ft | 29.9 | 637.1 | 555.5 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 29.76 | 0.00 | 0.18 | 0.0 ft | 29.9 | 637.1 | 661.2 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 29.76 | 0.00 | 0.18 | 0.0 ft | 29.9 | 637.1 | 766.9 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V_u plf | G_s k-in | D_s in | A_{chord} in ² | E psi | h ft | d_{WALL} in | $S_{d,WALL}$ in | d_{HD} in | Sh ft | $S_{d,HD}$ in | d_{TOT} in | Stretch in |
|-------|--------------|---------------|-------------|--------------------------------|----------|---------|------------------|--------------------|----------------|----------|------------------|-----------------|---------------|
| ROOF | 350 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.244 | 0.943 | 0.061 | 26.9 | 0.218 | 1.161 | 0.180 |
| 4TH | 689 | 19 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.312 | 0.699 | 0.050 | 16.6 | 0.095 | 0.795 | 0.180 |
| 3RD | 857 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.387 | 0.387 | 0.050 | 8.3 | 0.050 | 0.438 | 0.180 |
| N/A | 857 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 857 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 857 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

CHORDS - COMPRESSION CONTROLS

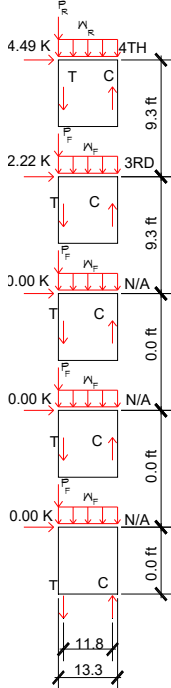
| Level | D k | L k | S k | E k | C_{ASD} k | h ft | C_p | f_c psi | F_{cp} psi | F_c' psi | f_c/F_{cp} | f_c/F_c' | MAX |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| ROOF | 0.00 | 0.00 | 0.00 | 4.0 | 2.828 | 10.3 | 0.147 | 135 | 625 | 349 | 0.215 | 0.386 | 0.386 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.4 | 7.405 | 8.3 | 0.221 | 353 | 625 | 526 | 0.564 | 0.671 | 0.671 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.3 | 13.095 | 8.3 | 0.221 | 499 | 625 | 526 | 0.798 | 0.949 | 0.949 |
| N/A | 0.00 | 0.00 | 0.00 | 18.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**

MULTI-STORY SHEARWALL DESIGN:

WALL **WK.2, WK.3**

$C_s = 0.142$ Wall Weight = **9** psf
 $S_{D5} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{D5} = 0.77$ Trib Width = **2.50** ft Floor Dead = **25** psf
 Trib Area = **0.00** ft² $1 + 0.145 S_{D5} = 1.13$
 $L = 13.3$ ft Resists uplift only (due to near walls)
 $L_{HD} = 11.8$ ft Total Wall Length
 Distance from Holddown to comp post



WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 250 | A | 0.54 | 0.5 | 0.55 | (4) 2x6 | 0.137 | 0.017 | OK |
| 4TH | DF | 492 | B | 0.82 | 0.75 | 0.69 | (4) 2x6 | 0.359 | 0.016 | OK |
| 3RD | DF | 612 | B | 1.02 | 0.875 | 0.94 | (4) 2x6 | 0.635 | 0.019 | OK |
| N/A | DF | 612 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 612 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 612 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|-----|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | kif | ft | ft | kft | kft | k |
| ROOF | 350 | 0 | 4.64 K | 4.64 | 0.00 | 0.15 | 11.3 ft | 11.3 | 52.5 | 12.9 | 2.3 |
| 4TH | 339 | 0 | 4.49 K | 9.13 | 0.00 | 0.15 | 9.3 ft | 20.6 | 137.4 | 25.7 | 6.7 |
| 3RD | 168 | 0 | 2.22 K | 11.35 | 0.00 | 0.15 | 9.3 ft | 29.9 | 242.9 | 38.5 | 12.2 |
| N/A | 0 | 0 | 0.00 K | 11.35 | 0.00 | 0.06 | 0.0 ft | 29.9 | 242.9 | 44.0 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 11.35 | 0.00 | 0.06 | 0.0 ft | 29.9 | 242.9 | 49.5 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 11.35 | 0.00 | 0.06 | 0.0 ft | 29.9 | 242.9 | 55.0 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | G _s | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|-----|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 350 | 15 | 0.180 | 33 | 1.50E+06 | 10.3 | 0.246 | 0.951 | 0.173 | 26.9 | 0.616 | 1.567 | 0.180 |
| 4TH | 689 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.315 | 0.706 | 0.142 | 16.6 | 0.270 | 0.975 | 0.180 |
| 3RD | 857 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.391 | 0.391 | 0.142 | 8.3 | 0.142 | 0.533 | 0.180 |
| N/A | 857 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 857 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 857 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

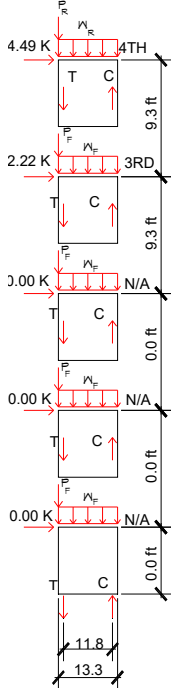
CHORDS - COMPRESSION CONTROLS

| 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 | 4.0 | 2.828 | 10.3 | 0.340 | 86 | 625 | 808 | 0.137 | 0.106 | 0.137 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.4 | 7.405 | 8.3 | 0.486 | 224 | 625 | 1154 | 0.359 | 0.194 | 0.359 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.3 | 13.095 | 8.3 | 0.486 | 397 | 625 | 1154 | 0.635 | 0.344 | 0.635 |
| N/A | 0.00 | 0.00 | 0.00 | 18.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL WK.4, WK.5, WK.6, WK.7

$C_b = 0.142$ Wall Weight = 9 psf
 $S_{D5} = 0.92$ sec Roof Dead = 18 psf
 $0.9 \cdot 0.145 S_{D5} = 0.117$ Trib Width = 2.50 ft Floor Dead = 25 psf
 Trib Area = 0.00 ft² $1 + 0.145 S_{D5} = 1.13$
 $L = 19.0$ ft Resists uplift only (due to near walls)
 $L_{HD} = 17.5$ ft Total Wall Length
 Distance from Holddown to comp post



| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 250 | A | 0.54 | 0.5 | 0.45 | (4) 2x6 | 0.137 | 0.014 | OK |
| 4TH | DF | 492 | B | 0.82 | 0.75 | 0.59 | (4) 2x6 | 0.359 | 0.014 | OK |
| 3RD | DF | 612 | B | 1.02 | 0.875 | 0.82 | (4) 2x6 | 0.635 | 0.017 | OK |
| N/A | DF | 612 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 612 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 612 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |

| Level | V _u | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|----------------|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | kif | ft | ft | kft | kft | k |
| ROOF | 350 | 0 | 6.66 K | 6.66 | 0.00 | 0.15 | 11.3 ft | 11.3 | 75.2 | 26.5 | 1.9 |
| 4TH | 339 | 0 | 6.43 K | 13.09 | 0.00 | 0.15 | 9.3 ft | 20.6 | 197.0 | 52.9 | 5.7 |
| 3RD | 168 | 0 | 3.18 K | 16.27 | 0.00 | 0.15 | 9.3 ft | 29.9 | 348.3 | 79.3 | 10.7 |
| N/A | 0 | 0 | 0.00 K | 16.27 | 0.00 | 0.06 | 0.0 ft | 29.9 | 348.3 | 90.5 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 16.27 | 0.00 | 0.06 | 0.0 ft | 29.9 | 348.3 | 101.8 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 16.27 | 0.00 | 0.06 | 0.0 ft | 29.9 | 348.3 | 113.1 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _s | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 350 | 15 | 0.180 | 33 | 1.50E+06 | 10.3 | 0.244 | 0.946 | 0.116 | 26.9 | 0.413 | 1.359 | 0.180 |
| 4TH | 689 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.313 | 0.702 | 0.096 | 16.6 | 0.181 | 0.883 | 0.180 |
| 3RD | 857 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.389 | 0.389 | 0.096 | 8.3 | 0.096 | 0.484 | 0.180 |
| N/A | 857 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 857 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 857 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

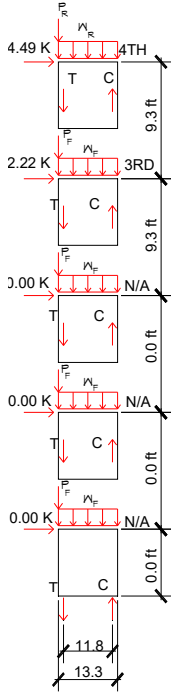
CHORDS - COMPRESSION CONTROLS

| 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 | 4.0 | 2.828 | 10.3 | 0.340 | 86 | 625 | 808 | 0.137 | 0.106 | 0.137 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.4 | 7.405 | 8.3 | 0.486 | 224 | 625 | 1154 | 0.359 | 0.194 | 0.359 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.3 | 13.095 | 8.3 | 0.486 | 397 | 625 | 1154 | 0.635 | 0.344 | 0.635 |
| N/A | 0.00 | 0.00 | 0.00 | 18.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **WK.8**

$C_b = 0.142$ Wall Weight = **9** psf
 $S_{D5} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{D5} = 0.117$ Trib Width = **5.00** ft Floor Dead = **25** psf
 Trib Area = **0.00** ft² $1 + 0.145 S_{D5} = 1.13$
 $L = 23.3$ ft Resists uplift only (due to near walls)
 $L_{HD} = 21.8$ ft Total Wall Length
 Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 250 | A | 0.54 | 0.5 | 0.28 | (4) 2x4 | 0.386 | 0.013 | OK |
| 4TH | DF | 492 | B | 0.82 | 0.5 | 0.96 | (4) 2x4 | 0.671 | 0.014 | OK |
| 3RD | DF | 612 | B | 1.02 | 0.75 | 0.85 | (5) 2x4 | 0.949 | 0.017 | OK |
| N/A | DF | 612 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 612 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 612 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | V _u | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|----------------|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | kif | ft | ft | kft | kft | k |
| ROOF | 350 | 0 | 8.15 K | 8.15 | 0.00 | 0.19 | 11.3 ft | 11.3 | 92.1 | 51.8 | 1.2 |
| 4TH | 339 | 0 | 7.87 K | 16.02 | 0.00 | 0.21 | 9.3 ft | 20.6 | 241.0 | 108.2 | 4.1 |
| 3RD | 168 | 0 | 3.90 K | 19.91 | 0.00 | 0.21 | 9.3 ft | 29.9 | 426.2 | 164.6 | 8.2 |
| N/A | 0 | 0 | 0.00 K | 19.91 | 0.00 | 0.13 | 0.0 ft | 29.9 | 426.2 | 198.4 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 19.91 | 0.00 | 0.13 | 0.0 ft | 29.9 | 426.2 | 232.2 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 19.91 | 0.00 | 0.13 | 0.0 ft | 29.9 | 426.2 | 266.0 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _s | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 350 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.245 | 0.948 | 0.094 | 26.9 | 0.333 | 1.280 | 0.180 |
| 4TH | 689 | 19 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.314 | 0.703 | 0.077 | 16.6 | 0.146 | 0.848 | 0.180 |
| 3RD | 857 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.389 | 0.389 | 0.077 | 8.3 | 0.077 | 0.466 | 0.180 |
| N/A | 857 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 857 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 857 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

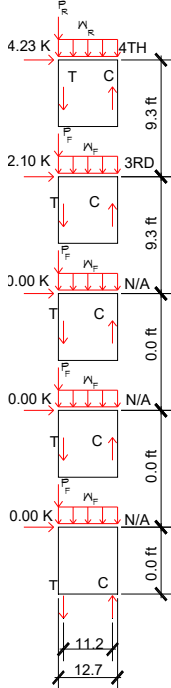
CHORDS - COMPRESSION CONTROLS

| 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 | 4.0 | 2.828 | 10.3 | 0.147 | 195 | 625 | 349 | 0.215 | 0.386 | 0.386 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.4 | 7.405 | 8.3 | 0.221 | 353 | 625 | 526 | 0.564 | 0.671 | 0.671 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.3 | 13.095 | 8.3 | 0.221 | 499 | 625 | 526 | 0.798 | 0.949 | 0.949 |
| N/A | 0.00 | 0.00 | 0.00 | 18.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL WL.1

$C_b = 0.142$ Wall Weight = 9 psf
 $S_{D5} = 0.92$ sec Roof Dead = 18 psf
 $0.9 \cdot 0.145 S_{D5} = 0.117$ Floor Dead = 25 psf
 Trib Width = 2.50 ft $1 + 0.145 S_{D5} = 1.13$
 Trib Area = 0.00 ft² Resists uplift only (due to near walls)
 $L = 12.7$ ft Total Wall Length
 $L_{HD} = 11.2$ ft Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 247 | A | 0.54 | 0.5 | 0.55 | (4) 2x6 | 0.135 | 0.018 | OK |
| 4TH | DF | 486 | B | 0.81 | 0.75 | 0.69 | (4) 2x6 | 0.354 | 0.016 | OK |
| 3RD | DF | 604 | B | 1.01 | 0.875 | 0.94 | (4) 2x6 | 0.627 | 0.019 | OK |
| N/A | DF | 604 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 604 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 604 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | V_u plf | Add Load lbs | V k | SV k | P' k | W' kif | h ft | Sh ft | M_{OT} kft | M_R kft | T_{ASD} k |
|-------|--------------|-----------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| ROOF | 346 | 0 | 4.38 K | 4.38 | 0.00 | 0.15 | 11.3 ft | 11.3 | 49.5 | 11.8 | 2.4 |
| 4TH | 334 | 0 | 4.23 K | 8.62 | 0.00 | 0.15 | 9.3 ft | 20.6 | 129.7 | 23.5 | 6.7 |
| 3RD | 165 | 0 | 2.10 K | 10.71 | 0.00 | 0.15 | 9.3 ft | 29.9 | 229.3 | 35.2 | 12.2 |
| N/A | 0 | 0 | 0.00 K | 10.71 | 0.00 | 0.06 | 0.0 ft | 29.9 | 229.3 | 40.3 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 10.71 | 0.00 | 0.06 | 0.0 ft | 29.9 | 229.3 | 45.3 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 10.71 | 0.00 | 0.06 | 0.0 ft | 29.9 | 229.3 | 50.3 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V_u plf | G_s k-in | D_s in | A_{chord} in ² | E psi | h ft | d_{WALL} in | $S_{d,WALL}$ in | d_{HD} in | Sh ft | $S_{d,HD}$ in | d_{TOT} in | Stretch in |
|-------|--------------|---------------|-------------|--------------------------------|----------|---------|------------------|--------------------|----------------|----------|------------------|-----------------|---------------|
| ROOF | 346 | 15 | 0.180 | 33 | 1.50E+06 | 10.3 | 0.243 | 0.940 | 0.182 | 26.9 | 0.648 | 1.588 | 0.180 |
| 4TH | 680 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.311 | 0.697 | 0.150 | 16.6 | 0.284 | 0.981 | 0.180 |
| 3RD | 845 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.386 | 0.386 | 0.150 | 8.3 | 0.150 | 0.536 | 0.180 |
| N/A | 845 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 845 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 845 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

CHORDS - COMPRESSION CONTROLS

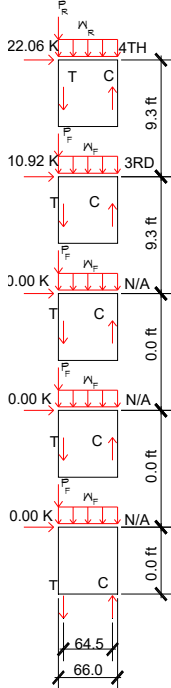
| Level | D k | L k | S k | E k | C_{ASD} k | h ft | C_p | f_c psi | F_{cp} psi | F_c' psi | f_c/F_{cp} | f_c/F_c' | MAX |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| ROOF | 0.00 | 0.00 | 0.00 | 3.9 | 2.792 | 10.3 | 0.340 | 85 | 625 | 808 | 0.135 | 0.105 | 0.135 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.2 | 7.309 | 8.3 | 0.486 | 221 | 625 | 1154 | 0.354 | 0.192 | 0.354 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.1 | 12.926 | 8.3 | 0.486 | 392 | 625 | 1154 | 0.627 | 0.339 | 0.627 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**

MULTI-STORY SHEARWALL DESIGN:

WALL **WL.2**

$C_p = 0.142$ Wall Weight = **9** psf
 $S_{D5} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{D5} = 0.77$ Floor Dead = **25** psf
 Trib Width = **7.50** ft $1 + 0.145 S_{D5} = 1.13$
 Trib Area = **0.00** ft² Resists uplift only (due to near walls)
 $L = 66.0$ ft Total Wall Length
 $L_{HD} = 64.5$ ft Distance from Holddown to comp post



| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 247 | A | 0.54 | NONE | 0.00 | (4) 2x6 | 0.135 | 0.009 | OK |
| 4TH | DF | 486 | B | 0.81 | NONE | 0.00 | (4) 2x6 | 0.354 | 0.012 | OK |
| 3RD | DF | 604 | B | 1.01 | NONE | 0.00 | (4) 2x6 | 0.627 | 0.015 | OK |
| N/A | DF | 604 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 604 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 604 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |

| Level | V_u | Add Load | V | SV | P' | W' | h | Sh | M_{OT} | M_R | T_{ASD} |
|-------|-------|----------|---------|-------|------|------|---------|------|----------|--------|-----------|
| | plf | lbs | k | k | k | kif | ft | ft | kft | kft | k |
| ROOF | 346 | 0 | 22.83 K | 22.83 | 0.00 | 0.24 | 11.3 ft | 11.3 | 258.0 | 515.5 | 0.0 |
| 4TH | 334 | 0 | 22.06 K | 44.89 | 0.00 | 0.27 | 9.3 ft | 20.6 | 675.4 | 1106.2 | 0.0 |
| 3RD | 165 | 0 | 10.92 K | 55.80 | 0.00 | 0.27 | 9.3 ft | 29.9 | 1194.4 | 1696.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 55.80 | 0.00 | 0.19 | 0.0 ft | 29.9 | 1194.4 | 2105.3 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 55.80 | 0.00 | 0.19 | 0.0 ft | 29.9 | 1194.4 | 2513.6 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 55.80 | 0.00 | 0.19 | 0.0 ft | 29.9 | 1194.4 | 2922.0 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V_u | G_s | D_s | A_{chord} | E | h | d_{WALL} | $S_{d,WALL}$ | d_{HD} | Sh | $S_{d,HD}$ | d_{TOT} | Stretch |
|-------|-------|-------|-------|-----------------|----------|------|------------|--------------|----------|------|------------|-----------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 346 | 15 | 0.180 | 33 | 1.50E+06 | 10.3 | 0.238 | 0.925 | 0.032 | 26.9 | 0.112 | 1.037 | 0.180 |
| 4TH | 680 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.306 | 0.687 | 0.026 | 16.6 | 0.049 | 0.736 | 0.180 |
| 3RD | 845 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.381 | 0.381 | 0.026 | 8.3 | 0.026 | 0.406 | 0.180 |
| N/A | 845 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 845 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 845 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

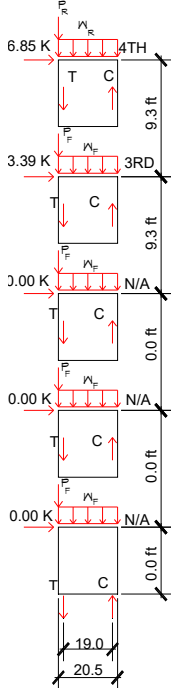
CHORDS - COMPRESSION CONTROLS

| 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 | 3.9 | 2.792 | 10.3 | 0.340 | 85 | 625 | 808 | 0.135 | 0.105 | 0.135 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.2 | 7.309 | 8.3 | 0.486 | 221 | 625 | 1154 | 0.354 | 0.192 | 0.354 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.1 | 12.926 | 8.3 | 0.486 | 392 | 625 | 1154 | 0.627 | 0.339 | 0.627 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **WL.3, WL.4**

$C_p = 0.142$ Wall Weight = **9** psf
 $S_{D5} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{D5} = 0.117$ Floor Dead = **25** psf
 Trib Width = **3.17** ft $1 + 0.145 S_{D5} = 1.13$
 Trib Area = **0.00** ft² Resists uplift only (due to near walls)
 $L = 20.5$ ft Total Wall Length
 $L_{HD} = 19.0$ ft Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS | |
|-------|-----|-----|------|------|----------|------|------|-----|-------|--------|----|
| ROOF | DF | 247 | A | 0.54 | 0.5 | 0.39 | (4) | 2x6 | 0.135 | 0.013 | OK |
| 4TH | DF | 486 | B | 0.81 | 0.75 | 0.54 | (4) | 2x6 | 0.354 | 0.014 | OK |
| 3RD | DF | 604 | B | 1.01 | 0.875 | 0.75 | (4) | 2x6 | 0.627 | 0.017 | OK |
| N/A | DF | 604 | B | 0.00 | NONE | 0.00 | (4) | 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 604 | B | 0.00 | NONE | 0.00 | (4) | 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 604 | B | 0.00 | NONE | 0.00 | (4) | 2x6 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | V _u | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|----------------|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | kif | ft | ft | kft | kft | k |
| ROOF | 346 | 0 | 7.09 K | 7.09 | 0.00 | 0.16 | 11.3 ft | 11.3 | 80.1 | 33.3 | 1.7 |
| 4TH | 334 | 0 | 6.85 K | 13.94 | 0.00 | 0.16 | 9.3 ft | 20.6 | 209.8 | 67.6 | 5.1 |
| 3RD | 165 | 0 | 3.39 K | 17.33 | 0.00 | 0.16 | 9.3 ft | 29.9 | 371.0 | 101.8 | 9.8 |
| N/A | 0 | 0 | 0.00 K | 17.33 | 0.00 | 0.08 | 0.0 ft | 29.9 | 371.0 | 118.4 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 17.33 | 0.00 | 0.08 | 0.0 ft | 29.9 | 371.0 | 135.0 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 17.33 | 0.00 | 0.08 | 0.0 ft | 29.9 | 371.0 | 151.6 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _s | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 346 | 15 | 0.180 | 33 | 1.50E+06 | 10.3 | 0.241 | 0.933 | 0.107 | 26.9 | 0.381 | 1.313 | 0.180 |
| 4TH | 680 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.308 | 0.692 | 0.088 | 16.6 | 0.167 | 0.859 | 0.180 |
| 3RD | 845 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.383 | 0.383 | 0.088 | 8.3 | 0.088 | 0.472 | 0.180 |
| N/A | 845 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 845 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 845 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

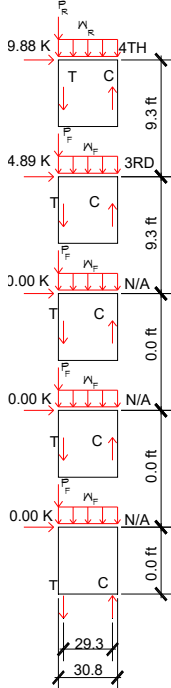
CHORDS - COMPRESSION CONTROLS

| 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 | 3.9 | 2.792 | 10.3 | 0.340 | 85 | 625 | 808 | 0.135 | 0.105 | 0.135 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.2 | 7.309 | 8.3 | 0.486 | 221 | 625 | 1154 | 0.354 | 0.192 | 0.354 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.1 | 12.926 | 8.3 | 0.486 | 392 | 625 | 1154 | 0.627 | 0.339 | 0.627 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **WM.1**

$C_p = 0.142$ Wall Weight = **9** psf
 $S_{D5} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{D5} = 0.77$ Floor Dead = **25** psf
 Trib Width = **11.00** ft $1 + 0.145 S_{D5} = 1.13$
 Trib Area = **0.00** ft² Resists uplift only (due to near walls)
 $L = 30.8$ ft Total Wall Length
 $L_{HD} = 29.3$ ft Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDOWN | % | Post | % | Drift | CHECKS | |
|-------|-----|-----|------|------|---------|------|------|-----|-------|--------|----|
| ROOF | DF | 238 | A | 0.52 | NONE | 0.00 | (4) | 2x4 | 0.366 | 0.011 | OK |
| 4TH | DF | 467 | B | 0.78 | NONE | 0.00 | (4) | 2x4 | 0.637 | 0.012 | OK |
| 3RD | DF | 581 | B | 0.97 | NONE | 0.63 | (5) | 2x4 | 0.901 | 0.015 | OK |
| N/A | DF | 581 | B | 0.00 | NONE | 0.00 | (5) | 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 581 | B | 0.00 | NONE | 0.00 | (5) | 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 581 | B | 0.00 | NONE | 0.00 | (5) | 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|-----|----------|---------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | kif | ft | ft | kft | kft | k |
| ROOF | 333 | 0 | 10.23 K | 10.23 | 0.00 | 0.30 | 11.3 ft | 11.3 | 115.6 | 141.7 | 0.0 |
| 4TH | 321 | 0 | 9.88 K | 20.11 | 0.00 | 0.36 | 9.3 ft | 20.6 | 302.6 | 311.3 | 0.0 |
| 3RD | 159 | 0 | 4.89 K | 25.00 | 0.00 | 0.36 | 9.3 ft | 29.9 | 535.1 | 480.9 | 0.4 |
| N/A | 0 | 0 | 0.00 K | 25.00 | 0.00 | 0.28 | 0.0 ft | 29.9 | 535.1 | 610.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 25.00 | 0.00 | 0.28 | 0.0 ft | 29.9 | 535.1 | 740.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 25.00 | 0.00 | 0.28 | 0.0 ft | 29.9 | 535.1 | 870.9 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | G _s | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|-----|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 333 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.232 | 0.896 | 0.070 | 26.9 | 0.247 | 1.144 | 0.180 |
| 4TH | 654 | 19 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.297 | 0.665 | 0.057 | 16.6 | 0.108 | 0.773 | 0.180 |
| 3RD | 813 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.368 | 0.368 | 0.057 | 8.3 | 0.057 | 0.425 | 0.180 |
| N/A | 813 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 813 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 813 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

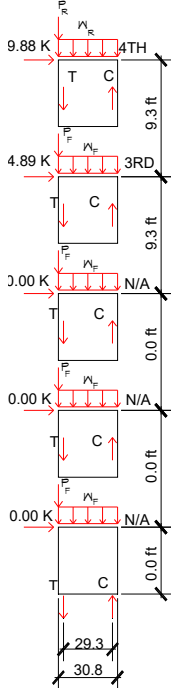
CHORDS - COMPRESSION CONTROLS

| 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 | 3.8 | 2.685 | 10.3 | 0.147 | 128 | 625 | 349 | 0.205 | 0.366 | 0.366 |
| 4TH | 0.00 | 0.00 | 0.00 | 9.8 | 7.029 | 8.3 | 0.221 | 335 | 625 | 526 | 0.536 | 0.637 | 0.637 |
| 3RD | 0.00 | 0.00 | 0.00 | 17.4 | 12.429 | 8.3 | 0.221 | 474 | 625 | 526 | 0.758 | 0.901 | 0.901 |
| N/A | 0.00 | 0.00 | 0.00 | 17.4 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.4 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.4 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **WM.2**

$C_b = 0.142$ Wall Weight = **9** psf
 $S_{D5} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{D5} = 0.117$ Trib Width = **3.25** ft Floor Dead = **25** psf
 Trib Area = **0.00** ft² $1 + 0.145 S_{D5} = 1.13$
 $L = 16.0$ ft Resists uplift only (due to near walls)
 $L_{HD} = 14.5$ ft Total Wall Length
 Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|------|-----|-------|----------|
| ROOF | DF | 238 | A | 0.52 | 0.5 | 0.44 | (4) | 2x6 | 0.130 | 0.015 OK |
| 4TH | DF | 467 | B | 0.78 | 0.625 | 0.83 | (4) | 2x6 | 0.341 | 0.014 OK |
| 3RD | DF | 581 | B | 0.91 | 0.875 | 0.79 | (4) | 2x6 | 0.603 | 0.017 OK |
| N/A | DF | 581 | B | 0.00 | NONE | 0.00 | (4) | 2x6 | 0.000 | 0.000 OK |
| N/A | DF | 581 | B | 0.00 | NONE | 0.00 | (4) | 2x6 | 0.000 | 0.000 OK |
| N/A | DF | 581 | B | 0.00 | NONE | 0.00 | (4) | 2x6 | 0.000 | 0.000 OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|-----|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | kif | ft | ft | kft | kft | k |
| ROOF | 333 | 0 | 5.32 K | 5.32 | 0.00 | 0.16 | 11.3 ft | 11.3 | 60.1 | 20.5 | 1.9 |
| 4TH | 321 | 0 | 5.14 K | 10.46 | 0.00 | 0.16 | 9.3 ft | 20.6 | 157.4 | 41.6 | 5.5 |
| 3RD | 159 | 0 | 2.54 K | 13.01 | 0.00 | 0.16 | 9.3 ft | 29.9 | 278.4 | 62.7 | 10.4 |
| N/A | 0 | 0 | 0.00 K | 13.01 | 0.00 | 0.08 | 0.0 ft | 29.9 | 278.4 | 73.1 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 13.01 | 0.00 | 0.08 | 0.0 ft | 29.9 | 278.4 | 83.5 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 13.01 | 0.00 | 0.08 | 0.0 ft | 29.9 | 278.4 | 93.9 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | G _s | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|-----|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 333 | 15 | 0.180 | 33 | 1.50E+06 | 10.3 | 0.232 | 0.900 | 0.140 | 26.9 | 0.499 | 1.399 | 0.180 |
| 4TH | 654 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.298 | 0.667 | 0.115 | 16.6 | 0.218 | 0.886 | 0.180 |
| 3RD | 813 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.370 | 0.370 | 0.115 | 8.3 | 0.115 | 0.485 | 0.180 |
| N/A | 813 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 813 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 813 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

CHORDS - COMPRESSION CONTROLS

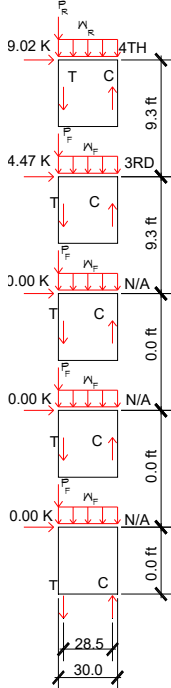
| Level | D | L | S | E | C _{ASD} | h | C _p | f _c | F _{cp} | F _{c'} | f _c /F _{cp} | f _c /F _{c'} | MAX |
|-------|------|------|------|------|------------------|------|----------------|----------------|-----------------|-----------------|---------------------------------|---------------------------------|-------|
| | k | k | k | k | k | ft | | psi | psi | psi | | | |
| ROOF | 0.00 | 0.00 | 0.00 | 3.8 | 2.685 | 10.3 | 0.340 | 81 | 625 | 808 | 0.130 | 0.101 | 0.130 |
| 4TH | 0.00 | 0.00 | 0.00 | 9.8 | 7.029 | 8.3 | 0.486 | 213 | 625 | 1154 | 0.341 | 0.185 | 0.341 |
| 3RD | 0.00 | 0.00 | 0.00 | 17.4 | 12.429 | 8.3 | 0.486 | 377 | 625 | 1154 | 0.603 | 0.326 | 0.603 |
| N/A | 0.00 | 0.00 | 0.00 | 17.4 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.4 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.4 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**

MULTI-STORY SHEARWALL DESIGN:

WALL **WN.1, WN.2**

$C_p = 0.142$ Wall Weight = **9** psf
 $S_{D5} = 0.92$ sec Roof Dead = **18** psf
 $0.9-0.14S_{D5} = 0.77$ Trib Width = **8.00** ft Floor Dead = **25** psf
 Trib Area = **0.00** ft² $1+0.14S_{D5} = 1.13$
 $L = 30.0$ ft Resists uplift only (due to near walls)
 $L_{HD} = 28.5$ ft Total Wall Length
 Distance from Holddown to comp post



WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS | |
|-------|-----|-----|------|------|----------|------|------|-----|-------|--------|----|
| ROOF | DF | 222 | A | 0.48 | NONE | 0.00 | (4) | 2x4 | 0.343 | 0.011 | OK |
| 4TH | DF | 437 | A | 0.95 | NONE | 0.75 | (4) | 2x4 | 0.596 | 0.014 | OK |
| 3RD | DF | 544 | B | 0.91 | 0.5 | 0.55 | (5) | 2x4 | 0.843 | 0.014 | OK |
| N/A | DF | 544 | B | 0.00 | NONE | 0.00 | (5) | 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 544 | B | 0.00 | NONE | 0.00 | (5) | 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 544 | B | 0.00 | NONE | 0.00 | (5) | 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | MOT | MR | TASD |
|-------|-----|----------|--------|-------|------|------|---------|------|-------|-------|------|
| | plf | lbs | k | k | k | kif | ft | ft | kft | kft | k |
| ROOF | 311 | 0 | 9.34 K | 9.34 | 0.00 | 0.25 | 11.3 ft | 11.3 | 105.5 | 110.6 | 0.0 |
| 4TH | 301 | 0 | 9.02 K | 18.36 | 0.00 | 0.28 | 9.3 ft | 20.6 | 276.3 | 238.2 | 0.5 |
| 3RD | 149 | 0 | 4.47 K | 22.83 | 0.00 | 0.28 | 9.3 ft | 29.9 | 488.6 | 365.9 | 2.4 |
| N/A | 0 | 0 | 0.00 K | 22.83 | 0.00 | 0.20 | 0.0 ft | 29.9 | 488.6 | 455.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 22.83 | 0.00 | 0.20 | 0.0 ft | 29.9 | 488.6 | 545.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 22.83 | 0.00 | 0.20 | 0.0 ft | 29.9 | 488.6 | 635.9 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | Gs | Ds | Achord | E | h | dWALL | sdWALL | dHD | Sh | sdHD | dTOT | Stretch |
|-------|-----|------|-------|--------|----------|------|-------|--------|-------|------|-------|-------|---------|
| | plf | k-in | in | in2 | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 311 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.217 | 0.903 | 0.071 | 26.9 | 0.254 | 1.157 | 0.180 |
| 4TH | 612 | 15 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.342 | 0.686 | 0.059 | 16.6 | 0.111 | 0.797 | 0.180 |
| 3RD | 761 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.345 | 0.345 | 0.059 | 8.3 | 0.059 | 0.403 | 0.180 |
| N/A | 761 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 761 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 761 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

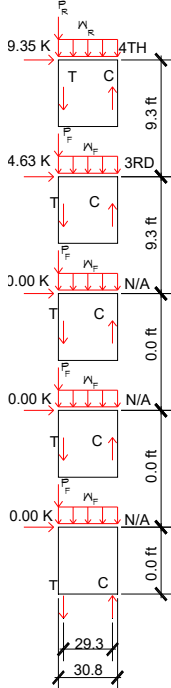
CHORDS - COMPRESSION CONTROLS

| Level | D | L | S | E | CASD | h | Cp | fc | Fcp | Fc' | fc/Fcp | fc/Fc' | MAX |
|-------|------|------|------|------|--------|------|-------|-----|-----|-----|--------|--------|-------|
| | k | k | k | k | k | ft | | psi | psi | psi | | | |
| ROOF | 0.00 | 0.00 | 0.00 | 9.5 | 2.513 | 10.3 | 0.147 | 120 | 625 | 349 | 0.191 | 0.343 | 0.343 |
| 4TH | 0.00 | 0.00 | 0.00 | 9.2 | 6.579 | 8.3 | 0.221 | 313 | 625 | 526 | 0.501 | 0.596 | 0.596 |
| 3RD | 0.00 | 0.00 | 0.00 | 16.3 | 11.634 | 8.3 | 0.221 | 443 | 625 | 526 | 0.709 | 0.843 | 0.843 |
| N/A | 0.00 | 0.00 | 0.00 | 16.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | | | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 16.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | | | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 16.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | | | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **NO.1**

$C_p = 0.142$ Wall Weight = **9** psf
 $S_{D5} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{D5} = 0.117$ Trib Width = **8.00** ft Floor Dead = **25** psf
 Trib Area = **0.00** ft² $1 + 0.145 S_{D5} = 1.13$
 $L = 30.8$ ft Resists uplift only (due to near walls)
 $L_{HD} = 29.3$ ft Total Wall Length
 Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 225 | A | 0.49 | NONE | 0.00 | (4) 2x4 | 0.347 | 0.011 | OK |
| 4TH | DF | 442 | A | 0.96 | NONE | 0.62 | (4) 2x4 | 0.602 | 0.014 | OK |
| 3RD | DF | 549 | B | 0.92 | 0.5 | 0.52 | (5) 2x4 | 0.852 | 0.015 | OK |
| N/A | DF | 549 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 549 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 549 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | V_u plf | Add Load lbs | V k | SV k | P' k | W' kif | h ft | Sh ft | M_{OT} kft | M_R kft | T_{ASD} k |
|-------|--------------|-----------------|--------|---------|---------|-----------|---------|----------|-----------------|--------------|----------------|
| ROOF | 315 | 0 | 9.67 K | 9.67 | 0.00 | 0.25 | 11.3 ft | 11.3 | 109.3 | 116.2 | 0.0 |
| 4TH | 304 | 0 | 9.35 K | 19.02 | 0.00 | 0.28 | 9.3 ft | 20.6 | 286.2 | 250.3 | 0.4 |
| 3RD | 150 | 0 | 4.63 K | 23.65 | 0.00 | 0.28 | 9.3 ft | 29.9 | 506.1 | 384.4 | 2.2 |
| N/A | 0 | 0 | 0.00 K | 23.65 | 0.00 | 0.20 | 0.0 ft | 29.9 | 506.1 | 479.0 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 23.65 | 0.00 | 0.20 | 0.0 ft | 29.9 | 506.1 | 573.5 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 23.65 | 0.00 | 0.20 | 0.0 ft | 29.9 | 506.1 | 668.1 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V_u plf | G_s k-in | D_s in | A_{chord} in ² | E psi | h ft | d_{WALL} in | $S_{d,WALL}$ in | d_{HD} in | Sh ft | $S_{d,HD}$ in | d_{TOT} in | Stretch in |
|-------|--------------|---------------|-------------|--------------------------------|----------|---------|------------------|--------------------|----------------|----------|------------------|-----------------|---------------|
| ROOF | 315 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.219 | 0.912 | 0.070 | 26.9 | 0.247 | 1.160 | 0.180 |
| 4TH | 619 | 15 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.345 | 0.693 | 0.057 | 16.6 | 0.108 | 0.802 | 0.180 |
| 3RD | 769 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.348 | 0.348 | 0.057 | 8.3 | 0.057 | 0.405 | 0.180 |
| N/A | 769 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 769 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 769 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

CHORDS - COMPRESSION CONTROLS

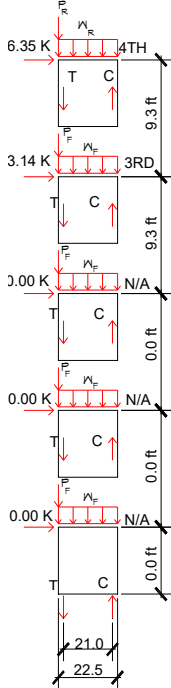
| Level | D k | L k | S k | E k | C_{ASD} k | h ft | C_p | f_c psi | F_{cp} psi | F_c' psi | f_c/F_{cp} | f_c/F_c' | MAX |
|-------|--------|--------|--------|--------|----------------|---------|-------|--------------|-----------------|---------------|--------------|------------|-------|
| ROOF | 0.00 | 0.00 | 0.00 | 3.6 | 2.539 | 10.3 | 0.147 | 121 | 625 | 349 | 0.193 | 0.347 | 0.347 |
| 4TH | 0.00 | 0.00 | 0.00 | 9.3 | 6.649 | 8.3 | 0.221 | 317 | 625 | 526 | 0.507 | 0.602 | 0.602 |
| 3RD | 0.00 | 0.00 | 0.00 | 16.5 | 11.757 | 8.3 | 0.221 | 448 | 625 | 526 | 0.717 | 0.852 | 0.852 |
| N/A | 0.00 | 0.00 | 0.00 | 16.5 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 16.5 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 16.5 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**

MULTI-STORY SHEARWALL DESIGN:

WALL **WP.1**

$C_b = 0.142$ Wall Weight = **9** psf
 $S_{D5} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{D5} = 0.117$ Floor Dead = **25** psf
 Trib Width = **8.00** ft $1 + 0.145 S_{D5} = 1.13$
 Trib Area = **5.00** ft² Resists uplift only (due to near walls)
 $L = 22.5$ ft Total Wall Length
 $L_{HD} = 21.0$ ft Distance from Holddown to comp post



WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 209 | A | 0.45 | NONE | 0.26 | (4) 2x4 | 0.322 | 0.012 | OK |
| 4TH | DF | 410 | A | 0.89 | 0.5 | 0.36 | (4) 2x4 | 0.559 | 0.014 | OK |
| 3RD | DF | 510 | B | 0.85 | 0.5 | 0.91 | (4) 2x4 | 0.988 | 0.015 | OK |
| N/A | DF | 510 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 510 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 510 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | V _u | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|----------------|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | kif | ft | ft | kft | kft | k |
| ROOF | 292 | 0 | 6.57 K | 6.57 | 0.09 | 0.25 | 11.3 ft | 11.3 | 74.2 | 64.2 | 0.2 |
| 4TH | 282 | 0 | 6.35 K | 12.92 | 0.13 | 0.28 | 9.3 ft | 20.6 | 194.4 | 138.8 | 1.5 |
| 3RD | 140 | 0 | 3.14 K | 16.06 | 0.13 | 0.28 | 9.3 ft | 29.9 | 343.7 | 213.5 | 3.9 |
| N/A | 0 | 0 | 0.00 K | 16.06 | 0.13 | 0.20 | 0.0 ft | 29.9 | 343.7 | 266.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 16.06 | 0.13 | 0.20 | 0.0 ft | 29.9 | 343.7 | 320.3 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 16.06 | 0.13 | 0.20 | 0.0 ft | 29.9 | 343.7 | 373.8 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _s | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 292 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.204 | 0.851 | 0.097 | 26.9 | 0.345 | 1.196 | 0.180 |
| 4TH | 574 | 15 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.322 | 0.647 | 0.080 | 16.6 | 0.151 | 0.798 | 0.180 |
| 3RD | 714 | 19 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.325 | 0.325 | 0.080 | 8.3 | 0.080 | 0.405 | 0.180 |
| N/A | 714 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 714 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 714 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

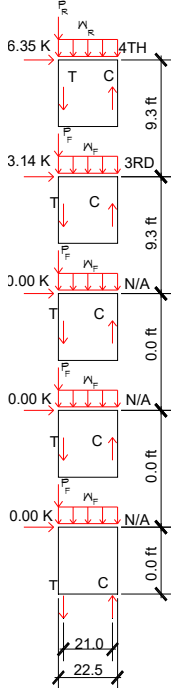
CHORDS - COMPRESSION CONTROLS

| 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 | 3.3 | 2.357 | 10.3 | 0.147 | 112 | 625 | 349 | 0.180 | 0.322 | 0.322 |
| 4TH | 0.00 | 0.00 | 0.00 | 8.6 | 6.171 | 8.3 | 0.221 | 294 | 625 | 526 | 0.470 | 0.559 | 0.559 |
| 3RD | 0.00 | 0.00 | 0.00 | 15.3 | 10.912 | 8.3 | 0.221 | 520 | 625 | 526 | 0.831 | 0.988 | 0.988 |
| N/A | 0.00 | 0.00 | 0.00 | 15.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 15.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 15.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **W.F.2**

$C_b = 0.142$ Wall Weight = **9** psf
 $S_{D5} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.145 S_{D5} = 0.117$ Floor Dead = **25** psf
 Trib Width = **6.00** ft $1 + 0.145 S_{D5} = 1.13$
 Trib Area = **0.00** ft² Resists uplift only (due to near walls)
 $L = 15.0$ ft Total Wall Length
 $L_{HD} = 13.5$ ft Distance from Holddown to comp post



| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 209 | A | 0.45 | 0.5 | 0.30 | (4) 2x4 | 0.322 | 0.015 | OK |
| 4TH | DF | 410 | A | 0.89 | 0.5 | 0.94 | (4) 2x4 | 0.559 | 0.016 | OK |
| 3RD | DF | 510 | B | 0.85 | 0.75 | 0.81 | (4) 2x4 | 0.988 | 0.016 | OK |
| N/A | DF | 510 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 510 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 510 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | OK |

| Level | V _u | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|----------------|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | kif | ft | ft | kft | kft | k |
| ROOF | 292 | 0 | 4.38 K | 4.38 | 0.00 | 0.21 | 11.3 ft | 11.3 | 49.5 | 23.6 | 1.3 |
| 4TH | 282 | 0 | 4.23 K | 8.61 | 0.00 | 0.23 | 9.3 ft | 20.6 | 129.6 | 49.9 | 4.0 |
| 3RD | 140 | 0 | 2.09 K | 10.71 | 0.00 | 0.23 | 9.3 ft | 29.9 | 229.2 | 76.2 | 7.8 |
| N/A | 0 | 0 | 0.00 K | 10.71 | 0.00 | 0.15 | 0.0 ft | 29.9 | 229.2 | 93.0 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 10.71 | 0.00 | 0.15 | 0.0 ft | 29.9 | 229.2 | 109.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 10.71 | 0.00 | 0.15 | 0.0 ft | 29.9 | 229.2 | 126.8 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _s | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 292 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.207 | 0.858 | 0.151 | 26.9 | 0.536 | 1.394 | 0.180 |
| 4TH | 574 | 15 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.324 | 0.652 | 0.124 | 16.6 | 0.235 | 0.886 | 0.180 |
| 3RD | 714 | 19 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.328 | 0.328 | 0.124 | 8.3 | 0.124 | 0.452 | 0.180 |
| N/A | 714 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 714 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 714 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

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 | 3.3 | 2.357 | 10.3 | 0.147 | 112 | 625 | 349 | 0.180 | 0.322 | 0.322 |
| 4TH | 0.00 | 0.00 | 0.00 | 8.6 | 6.171 | 8.3 | 0.221 | 294 | 625 | 526 | 0.470 | 0.559 | 0.559 |
| 3RD | 0.00 | 0.00 | 0.00 | 15.3 | 10.912 | 8.3 | 0.221 | 520 | 625 | 526 | 0.831 | 0.988 | 0.988 |
| N/A | 0.00 | 0.00 | 0.00 | 15.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 15.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 15.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |



Project: Mercer Island Mixed Use
 Sheet: _____ of _____
 Originating Office: Seattle

Job Number: 19028
 Name: AED
 Date: 9/8/2023

MULTISTORY SHEARWALL DESIGN

ENTER ALL LOADS UNFACTORED

| | | | | |
|---------------|--------------|-----|-------------|-------------|
| $C_s =$ | <u>0.142</u> | | Drift Limit | |
| $SDS =$ | <u>0.92</u> | | $D =$ | <u>0.02</u> |
| ROOF DL = | <u>18</u> | psf | $C_d =$ | <u>4.0</u> |
| FLOOR DL = | <u>25</u> | psf | | |
| WALL WT = | <u>9</u> | psf | | |
| FLOOR DEPTH = | <u>1</u> | ft | | |

LOAD COMBOS - ALLOWABLE STRESS DESIGN

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

| SPECIES | F_{cp} | G |
|---------|----------------|-------------|
| HF | <u>405 psi</u> | <u>0.43</u> |
| DF | <u>625 psi</u> | <u>0.5</u> |
| DFpl | <u>625 psi</u> | <u>0.43</u> |

CONT. ROD HOLDOWNS

| TYPE | T_{ALLOW} | GRADE |
|-----------------|------------------|------------------|
| <u>0.500 in</u> | <u>4270 lbs</u> | <u>ASTM A307</u> |
| <u>0.625 in</u> | <u>6675 lbs</u> | <u>ASTM A307</u> |
| <u>0.750 in</u> | <u>9610 lbs</u> | <u>ASTM A307</u> |
| <u>0.875 in</u> | <u>13080 lbs</u> | <u>ASTM A307</u> |
| <u>1.000 in</u> | <u>17080 lbs</u> | <u>ASTM A307</u> |
| <u>1.125 in</u> | <u>21620 lbs</u> | <u>ASTM A307</u> |
| <u>1.250 in</u> | <u>26690 lbs</u> | <u>ASTM A307</u> |
| <u>1.500 in</u> | <u>38495 lbs</u> | <u>ASTM A307</u> |
| <u>1.750 in</u> | <u>52315 lbs</u> | <u>ASTM A307</u> |
| HDU-02 | <u>3075 lbs</u> | <u>0.088 in</u> |
| HDU-04 | <u>4565 lbs</u> | <u>0.114 in</u> |
| HDU-05 | <u>5645 lbs</u> | <u>0.115 in</u> |
| HDU-08 | <u>7870 lbs</u> | <u>0.113 in</u> |
| HDU-11 | <u>11175 lbs</u> | <u>0.137 in</u> |
| HDU-14 | <u>14445 lbs</u> | <u>0.177 in</u> |

SHEARWALL TYPES

| TYPE | V_{ALLOW} | G_a |
|----------|-----------------|-------------------|
| <u>A</u> | <u>460 plf</u> | <u>15.00 k-in</u> |
| <u>B</u> | <u>600 plf</u> | <u>18.50 k-in</u> |
| <u>C</u> | <u>920 plf</u> | <u>30.00 k-in</u> |
| <u>D</u> | <u>1200 plf</u> | <u>37.00 k-in</u> |

POST TYPES

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



Project: Mercer Island Mixed Use
 Sheet: _____ of _____
 Originating Office: Seattle

Job Number: 19028
 Name: AED
 Date: 09/08/23

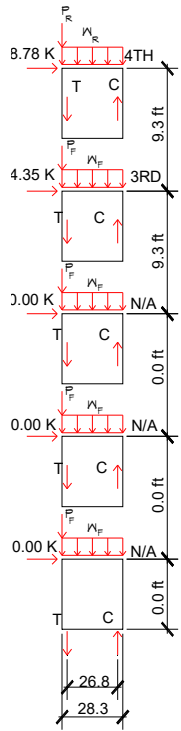
MULTISTORY SHEARWALL DESIGN - SUMMARY

| LABEL | STATUS | Tmax (K) | Vmax (plf) | D/C - (1) SIDED SW | SHEATHING | CONT. HOLDOWN ROD DIAMETER | Cmax (K) |
|---------|--------|----------|------------|-----------------------|-----------|-------------------------------|----------|
| W(1.1) | OK | 6.0 | 560.2 | 93% | (1) SIDE | 0.625 | 12.0 |
| W(1.2) | OK | 9.4 | 560 | 93% | (1) SIDE | 0.750 | 12.0 |
| W(1.9) | OK | 10.7 | 560 | 93% | (1) SIDE | 0.875 | 12.0 |
| W(1.10) | OK | 9.9 | 560 | 93% | (1) SIDE | 0.875 | 12.7 |
| W(2.1) | OK | 0.0 | 571 | 95% | (1) SIDE | NONE | 12.2 |
| W(2.2) | OK | 11.9 | 571 | 95% | (1) SIDE | 0.875 | 12.2 |
| W(2.4) | OK | 9.6 | 571 | 95% | (1) SIDE | 0.750 | 12.2 |
| W(2.11) | OK | 4.7 | 571 | 95% | (1) SIDE | 0.625 | 12.2 |
| W(3.1) | OK | 4.5 | 603 | 100% | (1) SIDE | 0.625 | 12.9 |
| W(3.2) | OK | 11.1 | 603 | 100% | (1) SIDE | 0.875 | 12.9 |
| W(4.1) | OK | 6.7 | 430 | 72% | (1) SIDE | 0.750 | 12.7 |
| W(5.1) | OK | 2.2 | 575 | 96% | (1) SIDE | 0.500 | 14.5 |
| W(7.2) | OK | 3.9 | 575 | 96% | (1) SIDE | 0.500 | 13.0 |
| W(8.1) | OK | 5.0 | 573 | 95% | (1) SIDE | 0.625 | 14.8 |
| W(8.2) | OK | 5.0 | 573 | 95% | (1) SIDE | 0.625 | 13.0 |
| W(9.1) | OK | 11.3 | 588 | 98% | (1) SIDE | 0.875 | 12.6 |
| W(9.2) | OK | 12.5 | 588 | 98% | (1) SIDE | 0.875 | 12.6 |
| W(9.7) | OK | 7.9 | 588 | 98% | (1) SIDE | 0.750 | 13.4 |
| W(10.1) | OK | 12.5 | 606 | 101% | (1) SIDE | 0.875 | 13.0 |
| W(10.2) | OK | 10.2 | 606 | 101% | (1) SIDE | 0.875 | 13.0 |
| W(10.4) | OK | 10.9 | 606 | 101% | (1) SIDE | 0.875 | 13.0 |
| W(10.5) | OK | 13.2 | 606 | 101% | (1) SIDE | 0.875 | 13.0 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **W1.1**

| | |
|---|--|
| $C_s = 0.142$ | Wall Weight = 9 psf |
| $S_{D5} = 0.92$ sec | Roof Dead = 18 psf |
| $0.9 + 0.14S_{D5} = 0.77$ | Floor Dead = 25 psf |
| Trib Width = 4.30 ft | $1 + 0.14S_{D5} = 1.13$ |
| Trib Area = 0.00 ft ² | <i>Resists uplift only (due to near walls)</i> |
| $L = 28.3$ ft | <i>Total Wall Length</i> |
| $L_{HD} = 26.8$ ft | <i>Distance from Holddown to comp post</i> |


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|------|-----|-------|-----------------|
| ROOF | DF | 229 | A | 0.50 | NONE | 0.97 | (4) | 2x4 | 0.354 | 0.011 OK |
| 4TH | DF | 451 | A | 0.93 | 0.5 | 0.65 | (4) | 2x4 | 0.614 | 0.015 OK |
| 3RD | DF | 560 | B | 0.93 | 0.625 | 0.90 | (5) | 2x4 | 0.869 | 0.015 OK |
| N/A | DF | 560 | B | 0.00 | NONE | 0.00 | (5) | 2x4 | 0.000 | 0.000 OK |
| N/A | DF | 560 | B | 0.00 | NONE | 0.00 | (5) | 2x4 | 0.000 | 0.000 OK |
| N/A | DF | 560 | B | 0.00 | NONE | 0.00 | (5) | 2x4 | 0.000 | 0.000 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 | kft | kft | k |
| ROOF | 321 | 0 | 9.09 K | 9.09 | 0.00 | 0.18 | 11.3 ft | 11.3 | 102.7 | 73.3 | 0.630 |
| 4TH | 310 | 0 | 8.78 K | 17.87 | 0.00 | 0.20 | 9.3 ft | 20.6 | 268.9 | 152.1 | 2.795 |
| 3RD | 153 | 0 | 4.35 K | 22.22 | 0.00 | 0.20 | 9.3 ft | 29.9 | 475.5 | 230.8 | 6.036 |
| N/A | 0 | 0 | 0.00 K | 22.22 | 0.00 | 0.11 | 0.0 ft | 29.9 | 475.5 | 275.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 22.22 | 0.00 | 0.11 | 0.0 ft | 29.9 | 475.5 | 321.1 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 22.22 | 0.00 | 0.11 | 0.0 ft | 29.9 | 475.5 | 366.2 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V_u | G_a | D_s | A_{chord} | E | h | d_{WALL} | S_{dWALL} | d_{HD} | Sh | S_{dHD} | d_{TOT} | Stretch |
|-------|-------|-------|-------|-----------------|----------|------|------------|-------------|----------|------|-----------|-----------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 321 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.224 | 0.931 | 0.076 | 26.9 | 0.270 | 1.201 | 0.180 |
| 4TH | 631 | 15 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.352 | 0.703 | 0.062 | 16.6 | 0.118 | 0.826 | 0.180 |
| 3RD | 784 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.355 | 0.355 | 0.062 | 8.3 | 0.062 | 0.418 | 0.180 |
| N/A | 784 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 784 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 784 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

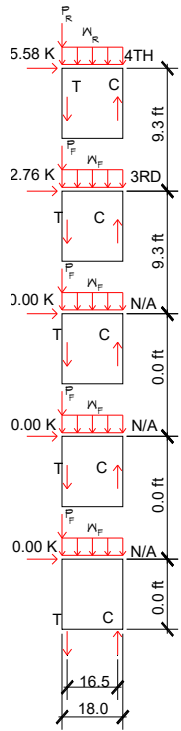
CHORDS - COMPRESSION CONTROLS

| 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 | 3.6 | 2.590 | 10.3 | 0.147 | 123 | 625 | 349 | 0.197 | 0.354 | 0.354 |
| 4TH | 0.00 | 0.00 | 0.00 | 9.5 | 6.780 | 8.3 | 0.221 | 323 | 625 | 526 | 0.517 | 0.614 | 0.614 |
| 3RD | 0.00 | 0.00 | 0.00 | 16.8 | 11.989 | 8.3 | 0.221 | 457 | 625 | 526 | 0.731 | 0.869 | 0.869 |
| N/A | 0.00 | 0.00 | 0.00 | 16.8 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | | | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 16.8 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | | | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 16.8 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | | | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **W1.2, W1.3, W1.4, W1.5, W1.6, W1.7, W1.8**

$C_s = 0.142$ Wall Weight = **9** psf
 $S_{DS} = 0.92$ sec Roof Dead = **18** psf
 $0.9 + 0.14S_{DS} = 0.77$ Floor Dead = **25** psf
 Trib Width = **3.17** ft $1 + 0.14S_{DS} = 1.13$
 Trib Area = **0.00** ft² *Resists uplift only (due to near walls)*
 $L = 18.0$ ft *Total Wall Length*
 $L_{HD} = 16.5$ ft *Distance from Holddown to comp post*


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 229 | A | 0.50 | 0.5 | 0.38 | (4) 2x4 | 0.354 | 0.014 | OK |
| 4TH | DF | 451 | A | 0.98 | 0.625 | 0.74 | (4) 2x4 | 0.614 | 0.016 | OK |
| 3RD | DF | 560 | B | 0.93 | 0.75 | 0.98 | (4) 2x6 | 0.581 | 0.016 | OK |
| N/A | DF | 560 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 560 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 560 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | 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 | kft | kft | k |
| ROOF | 321 | 0 | 5.77 K | 5.77 | 0.00 | 0.16 | 11.3 ft | 11.3 | 65.3 | 25.7 | 1.6 |
| 4TH | 310 | 0 | 5.58 K | 11.35 | 0.00 | 0.16 | 9.3 ft | 20.6 | 170.9 | 52.1 | 5.0 |
| 3RD | 153 | 0 | 2.76 K | 14.12 | 0.00 | 0.16 | 9.3 ft | 29.9 | 302.1 | 78.5 | 9.4 |
| N/A | 0 | 0 | 0.00 K | 14.12 | 0.00 | 0.08 | 0.0 ft | 29.9 | 302.1 | 91.3 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 14.12 | 0.00 | 0.08 | 0.0 ft | 29.9 | 302.1 | 104.1 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 14.12 | 0.00 | 0.08 | 0.0 ft | 29.9 | 302.1 | 116.9 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 321 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.226 | 0.937 | 0.123 | 26.9 | 0.439 | 1.375 | 0.180 |
| 4TH | 631 | 15 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.355 | 0.711 | 0.101 | 16.6 | 0.192 | 0.903 | 0.180 |
| 3RD | 784 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.356 | 0.356 | 0.101 | 8.3 | 0.101 | 0.458 | 0.180 |
| N/A | 784 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 784 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 784 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

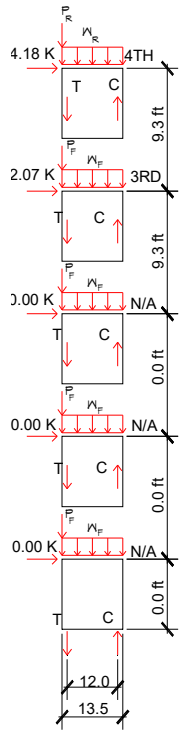
CHORDS - COMPRESSION CONTROLS

| 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 | 3.6 | 2.590 | 10.3 | 0.147 | 123 | 625 | 349 | 0.197 | 0.354 | 0.354 |
| 4TH | 0.00 | 0.00 | 0.00 | 9.5 | 6.780 | 8.3 | 0.221 | 323 | 625 | 526 | 0.517 | 0.614 | 0.614 |
| 3RD | 0.00 | 0.00 | 0.00 | 16.8 | 11.989 | 8.3 | 0.486 | 363 | 625 | 1154 | 0.581 | 0.315 | 0.581 |
| N/A | 0.00 | 0.00 | 0.00 | 16.8 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 16.8 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 16.8 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **W1.9**

$C_s = 0.142$ Wall Weight = **9** psf
 $S_{DS} = 0.92$ sec Roof Dead = **18** psf
 $0.9 + 0.14S_{DS} = 0.77$ Floor Dead = **25** psf
 Trib Width = **3.17** ft $1 + 0.14S_{DS} = 1.13$
 Trib Area = **0.00** ft² Resists uplift only (due to near walls)
 $L = 13.5$ ft Total Wall Length
 $L_{HD} = 12.0$ ft Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|---------|------|---------|-------|-------|--------|
| ROOF | DF | 229 | A | 0.50 | 0.5 | 0.46 | (4) 2x6 | 0.126 | 0.017 | OK |
| 4TH | DF | 451 | A | 0.93 | 0.625 | 0.86 | (4) 2x6 | 0.329 | 0.017 | OK |
| 3RD | DF | 560 | B | 0.93 | 0.875 | 0.81 | (4) 2x6 | 0.581 | 0.018 | OK |
| N/A | DF | 560 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 560 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 560 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | 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 | kft | kft | k |
| ROOF | 321 | 0 | 4.33 K | 4.33 | 0.00 | 0.16 | 11.3 ft | 11.3 | 48.9 | 14.5 | 2.0 |
| 4TH | 310 | 0 | 4.18 K | 8.52 | 0.00 | 0.16 | 9.3 ft | 20.6 | 128.1 | 29.3 | 5.7 |
| 3RD | 153 | 0 | 2.07 K | 10.59 | 0.00 | 0.16 | 9.3 ft | 29.9 | 226.6 | 44.1 | 10.7 |
| N/A | 0 | 0 | 0.00 K | 10.59 | 0.00 | 0.08 | 0.0 ft | 29.9 | 226.6 | 51.3 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 10.59 | 0.00 | 0.08 | 0.0 ft | 29.9 | 226.6 | 58.6 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 10.59 | 0.00 | 0.08 | 0.0 ft | 29.9 | 226.6 | 65.8 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 321 | 15 | 0.180 | 33 | 1.50E+06 | 10.3 | 0.225 | 0.937 | 0.170 | 26.9 | 0.603 | 1.540 | 0.180 |
| 4TH | 631 | 15 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.354 | 0.712 | 0.140 | 16.6 | 0.264 | 0.976 | 0.180 |
| 3RD | 784 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.358 | 0.358 | 0.140 | 8.3 | 0.140 | 0.497 | 0.180 |
| N/A | 784 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 784 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 784 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

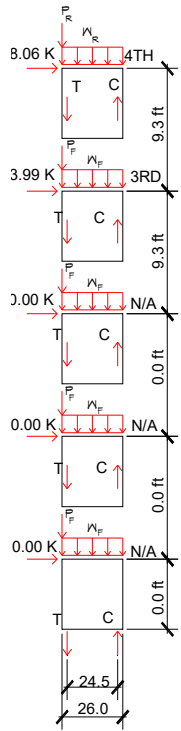
CHORDS - COMPRESSION CONTROLS

| 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 | 3.6 | 2.590 | 10.3 | 0.340 | 78 | 625 | 808 | 0.126 | 0.097 | 0.126 |
| 4TH | 0.00 | 0.00 | 0.00 | 9.5 | 6.780 | 8.3 | 0.486 | 205 | 625 | 1154 | 0.329 | 0.178 | 0.329 |
| 3RD | 0.00 | 0.00 | 0.00 | 16.8 | 11.989 | 8.3 | 0.486 | 363 | 625 | 1154 | 0.581 | 0.315 | 0.581 |
| N/A | 0.00 | 0.00 | 0.00 | 16.8 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 16.8 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 16.8 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **W1.10**

$C_s = 0.142$ Wall Weight = **9** psf
 $S_{DS} = 0.92$ sec Roof Dead = **18** psf
 $0.9 + 0.14S_{DS} = 0.77$ Floor Dead = **25** psf
 Trib Width = **0.67** ft $1 + 0.14S_{DS} = 1.13$
 Trib Area = **0.00** ft² *Resists uplift only (due to near walls)*
 $L = 26.0$ ft *Total Wall Length*
 $L_{HD} = 24.5$ ft *Distance from Holddown to comp post*


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|---------|------|---------|-------|-------|--------|
| ROOF | DF | 229 | A | 0.50 | 0.5 | 0.47 | (4) 2x4 | 0.768 | 0.012 | OK |
| 4TH | DF | 451 | A | 0.93 | 0.625 | 0.81 | (4) 2x4 | 0.680 | 0.015 | OK |
| 3RD | DF | 560 | B | 0.93 | 0.875 | 0.75 | (5) 2x4 | 0.922 | 0.015 | OK |
| N/A | DF | 560 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 560 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 560 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|-----|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | k/ft | ft | ft | kft | kft | k |
| ROOF | 321 | 0 | 8.34 K | 8.34 | 0.00 | 0.14 | 14.5 ft | 14.5 | 121.0 | 48.2 | 2.0 |
| 4TH | 310 | 0 | 8.06 K | 16.40 | 0.00 | 0.10 | 9.3 ft | 23.8 | 273.5 | 82.1 | 5.4 |
| 3RD | 153 | 0 | 3.99 K | 20.39 | 0.00 | 0.10 | 9.3 ft | 33.1 | 463.1 | 116.0 | 9.9 |
| N/A | 0 | 0 | 0.00 K | 20.39 | 0.00 | 0.02 | 0.0 ft | 33.1 | 463.1 | 121.6 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 20.39 | 0.00 | 0.02 | 0.0 ft | 33.1 | 463.1 | 127.2 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 20.39 | 0.00 | 0.02 | 0.0 ft | 33.1 | 463.1 | 132.8 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|-----|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 321 | 15 | 0.180 | 21 | 1.50E+06 | 13.5 | 0.297 | 1.005 | 0.107 | 30.1 | 0.366 | 1.371 | 0.180 |
| 4TH | 631 | 15 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.353 | 0.703 | 0.068 | 16.6 | 0.129 | 0.838 | 0.180 |
| 3RD | 784 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.356 | 0.356 | 0.068 | 8.3 | 0.068 | 0.424 | 0.180 |
| N/A | 784 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 784 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 784 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

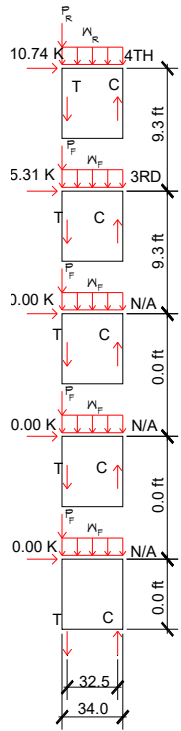
CHORDS - COMPRESSION CONTROLS

| 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 | 4.7 | 3.323 | 13.5 | 0.087 | 158 | 625 | 625 | 0.206 | 0.253 | 0.768 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.5 | 7.513 | 8.3 | 0.221 | 358 | 625 | 625 | 0.526 | 0.572 | 0.680 |
| 3RD | 0.00 | 0.00 | 0.00 | 17.8 | 12.723 | 8.3 | 0.221 | 485 | 625 | 625 | 0.526 | 0.775 | 0.922 |
| N/A | 0.00 | 0.00 | 0.00 | 17.8 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.8 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.8 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **W2.1**

$C_s = 0.142$ Wall Weight = **9** psf
 $S_{DS} = 0.92$ sec Roof Dead = **18** psf
 $0.9 + 0.14S_{DS} = 0.77$ Trib Width = **10.67** ft Floor Dead = **25** psf
 Trib Area = **0.00** ft² $1 + 0.14S_{DS} = 1.13$
 $L = 34.0$ ft Resists uplift only (due to near walls)
 $L_{HD} = 32.5$ ft Total Wall Length
 Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 233 | A | 0.51 | NONE | 0.00 | (4) 2x4 | 0.360 | 0.010 | OK |
| 4TH | DF | 459 | A | 1.00 | NONE | 0.00 | (4) 2x4 | 0.626 | 0.014 | OK |
| 3RD | DF | 571 | B | 0.95 | NONE | 0.00 | (5) 2x4 | 0.885 | 0.015 | OK |
| N/A | DF | 571 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 571 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 571 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|-----|----------|---------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | k/ft | ft | ft | kft | kft | k |
| ROOF | 327 | 0 | 11.11 K | 11.11 | 0.00 | 0.29 | 11.3 ft | 11.3 | 125.6 | 169.7 | 0.0 |
| 4TH | 316 | 0 | 10.74 K | 21.85 | 0.00 | 0.35 | 9.3 ft | 20.6 | 328.8 | 372.2 | 0.0 |
| 3RD | 156 | 0 | 5.31 K | 27.16 | 0.00 | 0.35 | 9.3 ft | 29.9 | 581.4 | 574.7 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 27.16 | 0.00 | 0.27 | 0.0 ft | 29.9 | 581.4 | 728.8 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 27.16 | 0.00 | 0.27 | 0.0 ft | 29.9 | 581.4 | 882.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 27.16 | 0.00 | 0.27 | 0.0 ft | 29.9 | 581.4 | 1037.0 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|-----|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 327 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.227 | 0.947 | 0.063 | 26.9 | 0.223 | 1.170 | 0.180 |
| 4TH | 643 | 15 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.358 | 0.720 | 0.052 | 16.6 | 0.097 | 0.817 | 0.180 |
| 3RD | 799 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.361 | 0.361 | 0.052 | 8.3 | 0.052 | 0.413 | 0.180 |
| N/A | 799 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 799 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 799 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

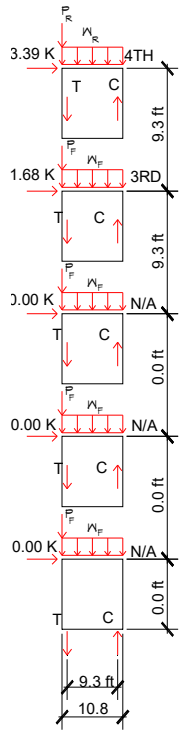
CHORDS - COMPRESSION CONTROLS

| 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 | 3.7 | 2.638 | 10.3 | 0.147 | 126 | 625 | 625 | 0.201 | 0.360 | 0.360 |
| 4TH | 0.00 | 0.00 | 0.00 | 9.7 | 6.907 | 8.3 | 0.221 | 329 | 625 | 625 | 0.526 | 0.626 | 0.626 |
| 3RD | 0.00 | 0.00 | 0.00 | 17.1 | 12.214 | 8.3 | 0.221 | 465 | 625 | 625 | 0.744 | 0.885 | 0.885 |
| N/A | 0.00 | 0.00 | 0.00 | 17.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0.000 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0.000 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0.000 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **W2.2, W2.3, W2.10**

| | |
|---|--|
| $C_s = 0.142$ | Wall Weight = 9 psf |
| $S_{DS} = 0.92$ sec | Roof Dead = 18 psf |
| $0.9 + 0.14S_{DS} = 0.77$ | Floor Dead = 25 psf |
| Trib Width = 3.17 ft | $1 + 0.14S_{DS} = 1.13$ |
| Trib Area = 0.00 ft ² | <i>Resists uplift only (due to near walls)</i> |
| $L = 10.8$ ft | <i>Total Wall Length</i> |
| $L_{HD} = 9.3$ ft | <i>Distance from Holddown to comp post</i> |


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 233 | A | 0.51 | 0.5 | 0.54 | (4) 2x6 | 0.128 | 0.020 | OK |
| 4TH | DF | 459 | A | 1.00 | 0.625 | 0.97 | (4) 2x6 | 0.335 | 0.019 | OK |
| 3RD | DF | 571 | B | 0.95 | 0.875 | 0.91 | (4) 2x6 | 0.592 | 0.020 | OK |
| N/A | DF | 571 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 571 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 571 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|-----|----------|--------|------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | k/ft | ft | ft | kft | kft | k |
| ROOF | 327 | 0 | 3.51 K | 3.51 | 0.00 | 0.16 | 11.3 ft | 11.3 | 39.7 | 9.2 | 2.3 |
| 4TH | 316 | 0 | 3.39 K | 6.91 | 0.00 | 0.16 | 9.3 ft | 20.6 | 104.0 | 18.6 | 6.5 |
| 3RD | 156 | 0 | 1.68 K | 8.59 | 0.00 | 0.16 | 9.3 ft | 29.9 | 183.8 | 28.0 | 11.9 |
| N/A | 0 | 0 | 0.00 K | 8.59 | 0.00 | 0.08 | 0.0 ft | 29.9 | 183.8 | 32.6 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 8.59 | 0.00 | 0.08 | 0.0 ft | 29.9 | 183.8 | 37.1 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 8.59 | 0.00 | 0.08 | 0.0 ft | 29.9 | 183.8 | 41.7 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|-----|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 327 | 15 | 0.180 | 33 | 1.50E+06 | 10.3 | 0.231 | 0.959 | 0.220 | 26.9 | 0.782 | 1.741 | 0.180 |
| 4TH | 643 | 15 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.362 | 0.728 | 0.181 | 16.6 | 0.342 | 1.071 | 0.180 |
| 3RD | 799 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.366 | 0.366 | 0.181 | 8.3 | 0.181 | 0.547 | 0.180 |
| N/A | 799 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 799 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 799 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

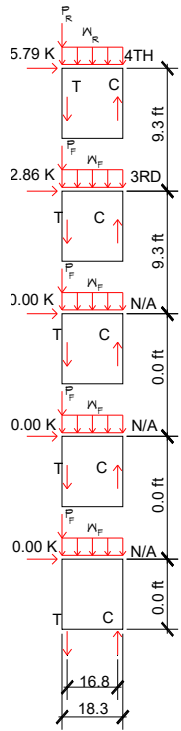
CHORDS - COMPRESSION CONTROLS

| 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 | 3.7 | 2.638 | 10.3 | 0.340 | 80 | 625 | 808 | 0.128 | 0.099 | 0.128 |
| 4TH | 0.00 | 0.00 | 0.00 | 9.7 | 6.907 | 8.3 | 0.486 | 209 | 625 | 1154 | 0.335 | 0.181 | 0.335 |
| 3RD | 0.00 | 0.00 | 0.00 | 17.1 | 12.214 | 8.3 | 0.486 | 370 | 625 | 1154 | 0.592 | 0.321 | 0.592 |
| N/A | 0.00 | 0.00 | 0.00 | 17.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **W2.4, W2.5, W2.6, W2.7, W2.8, W2.9**

$C_s = 0.142$ Wall Weight = **9** psf
 $S_{DS} = 0.92$ sec Roof Dead = **18** psf
 $0.9 - 0.14S_{DS} = 0.77$ Floor Dead = **25** psf
 Trib Width = **3.17** ft $1 + 0.14S_{DS} = 1.13$
 Trib Area = **0.00** ft² *Resists uplift only (due to near walls)*
 $L = 18.3$ ft *Total Wall Length*
 $L_{HD} = 16.8$ ft *Distance from Holddown to comp post*


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|---------|------|------|-----|-------|-----------------|
| ROOF | DF | 233 | A | 0.51 | 0.5 | 0.39 | (4) | 2x6 | 0.128 | 0.014 OK |
| 4TH | DF | 459 | A | 1.00 | 0.625 | 0.76 | (4) | 2x6 | 0.335 | 0.016 OK |
| 3RD | DF | 571 | B | 0.95 | 0.75 | 1.00 | (4) | 2x6 | 0.592 | 0.017 OK |
| N/A | DF | 571 | B | 0.00 | NONE | 0.00 | (4) | 2x6 | 0.000 | 0.000 OK |
| N/A | DF | 571 | B | 0.00 | NONE | 0.00 | (4) | 2x6 | 0.000 | 0.000 OK |
| N/A | DF | 571 | B | 0.00 | NONE | 0.00 | (4) | 2x6 | 0.000 | 0.000 OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|-----|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | k/lf | ft | ft | kft | kft | k |
| ROOF | 327 | 0 | 5.99 K | 5.99 | 0.00 | 0.16 | 11.3 ft | 11.3 | 67.7 | 26.7 | 1.7 |
| 4TH | 316 | 0 | 5.79 K | 11.78 | 0.00 | 0.16 | 9.3 ft | 20.6 | 177.2 | 54.0 | 5.1 |
| 3RD | 156 | 0 | 2.86 K | 14.64 | 0.00 | 0.16 | 9.3 ft | 29.9 | 313.4 | 81.4 | 9.6 |
| N/A | 0 | 0 | 0.00 K | 14.64 | 0.00 | 0.08 | 0.0 ft | 29.9 | 313.4 | 94.7 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 14.64 | 0.00 | 0.08 | 0.0 ft | 29.9 | 313.4 | 107.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 14.64 | 0.00 | 0.08 | 0.0 ft | 29.9 | 313.4 | 121.2 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|-----|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 327 | 15 | 0.180 | 33 | 1.50E+06 | 10.3 | 0.228 | 0.950 | 0.121 | 26.9 | 0.430 | 1.380 | 0.180 |
| 4TH | 643 | 15 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.359 | 0.722 | 0.099 | 16.6 | 0.188 | 0.910 | 0.180 |
| 3RD | 799 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.363 | 0.363 | 0.099 | 8.3 | 0.099 | 0.462 | 0.180 |
| N/A | 799 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 799 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 799 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

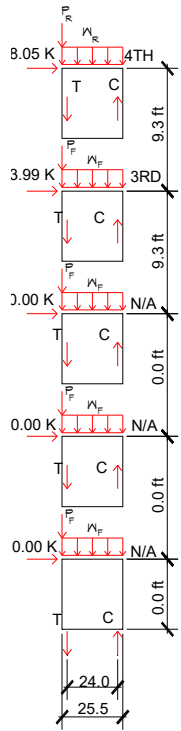
CHORDS - COMPRESSION CONTROLS

| 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 | 3.7 | 2.638 | 10.3 | 0.340 | 80 | 625 | 625 | 808 | 0.128 | 0.099 | 0.128 |
| 4TH | 0.00 | 0.00 | 0.00 | 9.7 | 6.907 | 8.3 | 0.486 | 209 | 625 | 625 | 1154 | 0.335 | 0.181 | 0.335 |
| 3RD | 0.00 | 0.00 | 0.00 | 17.1 | 12.214 | 8.3 | 0.486 | 370 | 625 | 625 | 1154 | 0.592 | 0.321 | 0.592 |
| N/A | 0.00 | 0.00 | 0.00 | 17.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **M2.11**

| | |
|---|--|
| $C_s = 0.142$ | Wall Weight = 9 psf |
| $S_{DS} = 0.92$ sec | Roof Dead = 18 psf |
| $0.9 + 0.14S_{DS} = 0.77$ | Floor Dead = 25 psf |
| Trib Width = 7.75 ft | $1 + 0.14S_{DS} = 1.13$ |
| Trib Area = 0.00 ft ² | <i>Resists uplift only (due to near walls)</i> |
| $L = 25.5$ ft | <i>Total Wall Length</i> |
| $L_{HD} = 24.0$ ft | <i>Distance from Holddown to comp post</i> |


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 233 | A | 0.51 | NONE | 0.44 | (4) 2x6 | 0.128 | 0.012 | OK |
| 4TH | DF | 459 | A | 1.00 | 0.5 | 0.45 | (4) 2x6 | 0.335 | 0.015 | OK |
| 3RD | DF | 571 | B | 0.95 | 0.625 | 0.70 | (4) 2x6 | 0.592 | 0.015 | OK |
| N/A | DF | 571 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 571 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |
| N/A | DF | 571 | B | 0.00 | NONE | 0.00 | (4) 2x6 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|-----|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | k/ft | ft | ft | kft | kft | k |
| ROOF | 327 | 0 | 8.33 K | 8.33 | 0.00 | 0.24 | 11.3 ft | 11.3 | 94.2 | 78.4 | 0.3 |
| 4TH | 316 | 0 | 8.05 K | 16.39 | 0.00 | 0.28 | 9.3 ft | 20.6 | 246.6 | 168.6 | 1.9 |
| 3RD | 156 | 0 | 3.99 K | 20.37 | 0.00 | 0.28 | 9.3 ft | 29.9 | 436.0 | 258.8 | 4.7 |
| N/A | 0 | 0 | 0.00 K | 20.37 | 0.00 | 0.19 | 0.0 ft | 29.9 | 436.0 | 321.8 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 20.37 | 0.00 | 0.19 | 0.0 ft | 29.9 | 436.0 | 384.8 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 20.37 | 0.00 | 0.19 | 0.0 ft | 29.9 | 436.0 | 447.8 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|-----|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 327 | 15 | 0.180 | 33 | 1.50E+06 | 10.3 | 0.227 | 0.946 | 0.085 | 26.9 | 0.302 | 1.248 | 0.180 |
| 4TH | 643 | 15 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.358 | 0.720 | 0.070 | 16.6 | 0.192 | 0.852 | 0.180 |
| 3RD | 799 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.362 | 0.362 | 0.070 | 8.3 | 0.070 | 0.431 | 0.180 |
| N/A | 799 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 799 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 799 | 19 | 0.000 | 33 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

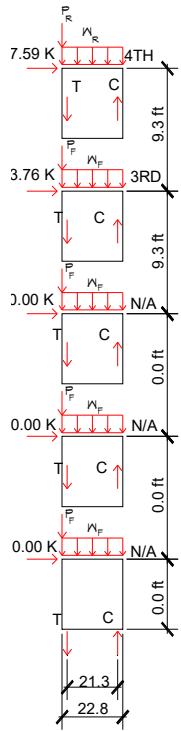
CHORDS - COMPRESSION CONTROLS

| 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 | 3.7 | 2.638 | 10.3 | 0.340 | 80 | 625 | 808 | 0.128 | 0.099 | 0.128 |
| 4TH | 0.00 | 0.00 | 0.00 | 9.7 | 6.907 | 8.3 | 0.486 | 209 | 625 | 1154 | 0.335 | 0.181 | 0.335 |
| 3RD | 0.00 | 0.00 | 0.00 | 17.1 | 12.214 | 8.3 | 0.486 | 370 | 625 | 1154 | 0.592 | 0.321 | 0.592 |
| N/A | 0.00 | 0.00 | 0.00 | 17.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **WB.1**

$C_s = 0.142$ Wall Weight = **9** psf
 $S_{DS} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.14S_{DS} = 0.77$ Floor Dead = **25** psf
 Trib Width = **10.63** ft $1 + 0.14S_{DS} = 1.13$
 Trib Area = **0.00** ft² *Resists uplift only (due to near walls)*
 $L = 22.8$ ft *Total Wall Length*
 $L_{HD} = 21.3$ ft *Distance from Holddown to comp post*


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 247 | A | 0.54 | NONE | 0.36 | (4) 2x4 | 0.380 | 0.013 | OK |
| 4TH | DF | 485 | B | 0.81 | 0.5 | 0.42 | (4) 2x4 | 0.661 | 0.014 | OK |
| 3RD | DF | 603 | B | 1.00 | 0.625 | 0.68 | (5) 2x4 | 0.935 | 0.017 | OK |
| N/A | DF | 603 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 603 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 603 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|-----|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | k/lf | ft | ft | kft | kft | k |
| ROOF | 345 | 0 | 7.85 K | 7.85 | 0.00 | 0.29 | 11.3 ft | 11.3 | 88.8 | 75.8 | 0.2 |
| 4TH | 334 | 0 | 7.59 K | 15.44 | 0.00 | 0.35 | 9.3 ft | 20.6 | 232.4 | 166.2 | 1.8 |
| 3RD | 165 | 0 | 3.76 K | 19.20 | 0.00 | 0.35 | 9.3 ft | 29.9 | 410.9 | 256.6 | 4.5 |
| N/A | 0 | 0 | 0.00 K | 19.20 | 0.00 | 0.27 | 0.0 ft | 29.9 | 410.9 | 325.3 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 19.20 | 0.00 | 0.27 | 0.0 ft | 29.9 | 410.9 | 394.1 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 19.20 | 0.00 | 0.27 | 0.0 ft | 29.9 | 410.9 | 462.8 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|-----|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 345 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.242 | 0.934 | 0.096 | 26.9 | 0.341 | 1.275 | 0.180 |
| 4TH | 679 | 19 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.309 | 0.692 | 0.079 | 16.6 | 0.149 | 0.842 | 0.180 |
| 3RD | 844 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.383 | 0.383 | 0.079 | 8.3 | 0.079 | 0.462 | 0.180 |
| N/A | 844 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 844 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 844 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

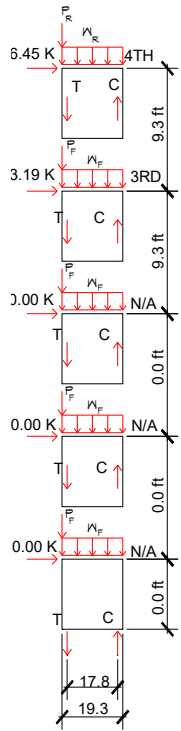
CHORDS - COMPRESSION CONTROLS

| 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 | 3.9 | 2.787 | 10.3 | 0.147 | 133 | 625 | 625 | 349 | 0.212 | 0.380 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.2 | 7.296 | 8.3 | 0.221 | 347 | 625 | 625 | 526 | 0.556 | 0.661 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.1 | 12.903 | 8.3 | 0.221 | 492 | 625 | 625 | 526 | 0.786 | 0.935 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **WB.2**

$C_s = 0.142$ Wall Weight = **9** psf
 $S_{DS} = 0.92$ sec Roof Dead = **18** psf
 $0.9 + 0.14S_{DS} = 0.77$ Floor Dead = **25** psf
 Trib Width = **1.33** ft $1 + 0.14S_{DS} = 1.13$
 Trib Area = **0.00** ft² Resists uplift only (due to near walls)
 $L = 19.3$ ft Total Wall Length
 $L_{HD} = 17.8$ ft Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 247 | A | 0.54 | 0.5 | 0.47 | (4) 2x4 | 0.380 | 0.014 | OK |
| 4TH | DF | 485 | B | 0.81 | 0.625 | 0.89 | (4) 2x4 | 0.661 | 0.014 | OK |
| 3RD | DF | 603 | B | 1.00 | 0.875 | 0.85 | (5) 2x4 | 0.935 | 0.017 | OK |
| N/A | DF | 603 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 603 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 603 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|-----|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | k/lf | ft | ft | kft | kft | k |
| ROOF | 345 | 0 | 6.67 K | 6.67 | 0.00 | 0.13 | 11.3 ft | 11.3 | 75.4 | 23.5 | 2.0 |
| 4TH | 334 | 0 | 6.45 K | 13.12 | 0.00 | 0.12 | 9.3 ft | 20.6 | 197.5 | 45.3 | 6.0 |
| 3RD | 165 | 0 | 3.19 K | 16.31 | 0.00 | 0.12 | 9.3 ft | 29.9 | 349.2 | 67.2 | 11.1 |
| N/A | 0 | 0 | 0.00 K | 16.31 | 0.00 | 0.03 | 0.0 ft | 29.9 | 349.2 | 73.4 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 16.31 | 0.00 | 0.03 | 0.0 ft | 29.9 | 349.2 | 79.6 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 16.31 | 0.00 | 0.03 | 0.0 ft | 29.9 | 349.2 | 85.8 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|-----|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 345 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.242 | 0.937 | 0.114 | 26.9 | 0.406 | 1.343 | 0.180 |
| 4TH | 679 | 19 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.310 | 0.694 | 0.094 | 16.6 | 0.178 | 0.872 | 0.180 |
| 3RD | 844 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.384 | 0.384 | 0.094 | 8.3 | 0.094 | 0.478 | 0.180 |
| N/A | 844 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 844 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 844 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

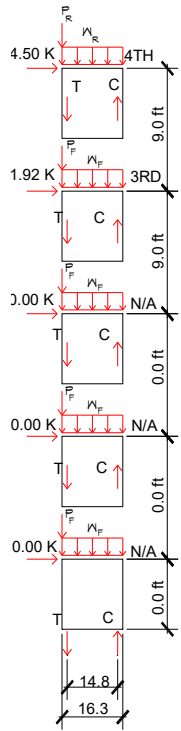
CHORDS - COMPRESSION CONTROLS

| 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 | 3.9 | 2.787 | 10.3 | 0.147 | 133 | 625 | 349 | 0.212 | 0.380 | 0.380 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.2 | 7.296 | 8.3 | 0.221 | 347 | 625 | 526 | 0.556 | 0.661 | 0.661 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.1 | 12.903 | 8.3 | 0.221 | 492 | 625 | 526 | 0.786 | 0.935 | 0.935 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **W4.1**

| | |
|---|--|
| $C_s = 0.142$ | Wall Weight = 9 psf |
| $S_{D5} = 0.92$ sec | Roof Dead = 18 psf |
| $0.9 \cdot 0.145 S_{D5} = 0.77$ | Floor Dead = 25 psf |
| Trib Width = 10.63 ft | $1 + 0.145 S_{D5} = 1.13$ |
| Trib Area = 0.00 ft ² | <i>Resists uplift only (due to near walls)</i> |
| $L = 16.3$ ft | <i>Total Wall Length</i> |
| $L_{HD} = 14.8$ ft | <i>Distance from Holddown to comp post</i> |


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|------|-----|-------|-----------------|
| ROOF | DF | 176 | A | 0.38 | 0.5 | 0.52 | (7) | 2x4 | 0.963 | 0.015 OK |
| 4TH | DF | 346 | A | 0.75 | 0.5 | 0.45 | (7) | 2x4 | 0.393 | 0.013 OK |
| 3RD | DF | 430 | A | 0.93 | 0.75 | 0.70 | (7) | 2x4 | 0.615 | 0.016 OK |
| N/A | DF | 430 | B | 0.00 | NONE | 0.00 | (7) | 2x4 | 0.000 | 0.000 OK |
| N/A | DF | 430 | B | 0.00 | NONE | 0.00 | (7) | 2x4 | 0.000 | 0.000 OK |
| N/A | DF | 430 | B | 0.00 | NONE | 0.00 | (7) | 2x4 | 0.000 | 0.000 OK |

HOLDDOWN

| Level | V_u | Add Load | V | SV | P' | W' | h | Sh | M_{OT} | M_R | T_{ASD} |
|-------|-------|----------|--------|-------|------|------|---------|------|----------|-------|-----------|
| | plf | k | k | k | k | k/lf | ft | ft | k/ft | k/ft | k |
| ROOF | 246 | 1.24 | 5.26 K | 5.26 | 0.00 | 0.36 | 18.7 ft | 18.7 | 98.2 | 47.9 | 2.2 |
| 4TH | 238 | 0.62 | 4.50 K | 9.76 | 0.00 | 0.35 | 9.0 ft | 27.7 | 186.0 | 94.1 | 4.1 |
| 3RD | 118 | 0 | 1.92 K | 11.68 | 0.00 | 0.35 | 9.0 ft | 36.7 | 291.1 | 140.3 | 6.7 |
| N/A | 0 | 0 | 0.00 K | 11.68 | 0.00 | 0.27 | 0.0 ft | 36.7 | 291.1 | 175.8 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 11.68 | 0.00 | 0.27 | 0.0 ft | 36.7 | 291.1 | 211.2 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 11.68 | 0.00 | 0.27 | 0.0 ft | 36.7 | 291.1 | 246.6 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V_u | G_a | D_s | A _{chord} | E | h | d_{WALL} | Sd_{WALL} | d_{HD} | Sh | Sd_{HD} | d_{TOT} | Stretch |
|-------|-------|-------|-------|--------------------|----------|------|------------|-------------|----------|------|-----------|-----------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 246 | 15 | 0.180 | 37 | 1.50E+06 | 17.7 | 0.303 | 0.887 | 0.227 | 33.7 | 0.753 | 1.640 | 0.180 |
| 4TH | 484 | 15 | 0.180 | 37 | 1.50E+06 | 8.0 | 0.260 | 0.584 | 0.109 | 16.0 | 0.206 | 0.791 | 0.180 |
| 3RD | 601 | 15 | 0.180 | 37 | 1.50E+06 | 8.0 | 0.324 | 0.324 | 0.109 | 8.0 | 0.109 | 0.433 | 0.180 |
| N/A | 601 | 19 | 0.000 | 37 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 601 | 19 | 0.000 | 37 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 601 | 19 | 0.000 | 37 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

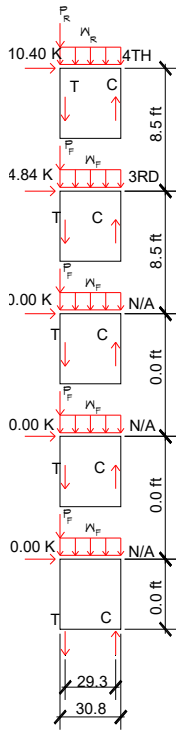
CHORDS - COMPRESSION CONTROLS

| 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 | 6.0 | 4.293 | 17.7 | 0.051 | 117 | 625 | 121 | 0.187 | 0.963 | 0.963 |
| 4TH | 0.00 | 0.00 | 0.00 | 11.4 | 8.135 | 8.0 | 0.237 | 221 | 625 | 563 | 0.354 | 0.393 | 0.393 |
| 3RD | 0.00 | 0.00 | 0.00 | 17.8 | 12.733 | 8.0 | 0.237 | 346 | 625 | 563 | 0.554 | 0.615 | 0.615 |
| N/A | 0.00 | 0.00 | 0.00 | 17.8 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | | | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.8 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | | | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.8 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | | | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **W5.1, W6.1, W7.1**

$C_s = 0.142$ Wall Weight = **9** psf
 $S_{DS} = 0.92$ sec Roof Dead = **18** psf
 $0.9 + 0.14S_{DS} = 0.77$ Floor Dead = **25** psf
 Trib Width = **10.63** ft $1 + 0.14S_{DS} = 1.13$
 Trib Area = **0.00** ft² Resists uplift only (due to near walls)
 $L = 30.8$ ft Total Wall Length
 $L_{HD} = 29.3$ ft Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|---------|------|---------|-------|-------|--------|
| ROOF | DF | 235 | A | 0.51 | 0.5 | 0.17 | (8) 2x4 | 0.967 | 0.012 | OK |
| 4TH | DF | 462 | B | 0.77 | 0.5 | 0.23 | (4) 2x4 | 0.703 | 0.012 | OK |
| 3RD | DF | 575 | B | 0.96 | 0.5 | 0.52 | (5) 2x4 | 0.882 | 0.015 | OK |
| N/A | DF | 575 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 575 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 575 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|-----|----------|---------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | k | k | k | k | k/lf | ft | ft | kft | kft | k |
| ROOF | 329 | 1.24 | 11.36 K | 11.36 | 0.00 | 0.36 | 18.7 ft | 18.7 | 212.1 | 169.9 | 0.7 |
| 4TH | 318 | 0.62 | 10.40 K | 21.75 | 0.00 | 0.34 | 8.5 ft | 27.2 | 397.0 | 331.6 | 1.0 |
| 3RD | 157 | 0 | 4.84 K | 26.59 | 0.00 | 0.34 | 8.5 ft | 35.7 | 623.0 | 493.4 | 2.2 |
| N/A | 0 | 0 | 0.00 K | 26.59 | 0.00 | 0.27 | 0.0 ft | 35.7 | 623.0 | 618.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 26.59 | 0.00 | 0.27 | 0.0 ft | 35.7 | 623.0 | 744.5 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 26.59 | 0.00 | 0.27 | 0.0 ft | 35.7 | 623.0 | 870.1 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|-----|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 329 | 15 | 0.180 | 42 | 1.50E+06 | 17.7 | 0.396 | 0.989 | 0.115 | 32.7 | 0.379 | 1.367 | 0.180 |
| 4TH | 647 | 19 | 0.180 | 21 | 1.50E+06 | 7.5 | 0.265 | 0.593 | 0.052 | 15.0 | 0.098 | 0.692 | 0.180 |
| 3RD | 804 | 19 | 0.180 | 26 | 1.50E+06 | 7.5 | 0.328 | 0.328 | 0.052 | 7.5 | 0.052 | 0.381 | 0.180 |
| N/A | 804 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 804 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 804 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

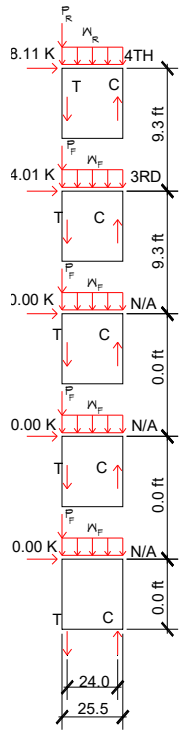
CHORDS - COMPRESSION CONTROLS

| 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 | 6.9 | 4.926 | 17.7 | 0.051 | 117 | 625 | 625 | 121 | 0.188 | 0.967 | 0.967 |
| 4TH | 0.00 | 0.00 | 0.00 | 12.9 | 9.221 | 7.5 | 0.267 | 439 | 625 | 625 | 634 | 0.703 | 0.692 | 0.703 |
| 3RD | 0.00 | 0.00 | 0.00 | 20.3 | 14.472 | 7.5 | 0.267 | 551 | 625 | 625 | 634 | 0.882 | 0.869 | 0.882 |
| N/A | 0.00 | 0.00 | 0.00 | 20.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 20.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 20.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **WT.2**

| | |
|---|--|
| $C_s = 0.142$ | Wall Weight = 9 psf |
| $S_{DS} = 0.92$ sec | Roof Dead = 1 psf |
| $0.9 \cdot 0.14S_{DS} = 0.77$ | Floor Dead = 25 psf |
| Trib Width = 12.88 ft | $1 + 0.14S_{DS} = 1.13$ |
| Trib Area = 0.00 ft ² | <i>Resists uplift only (due to near walls)</i> |
| $L = 25.5$ ft | <i>Total Wall Length</i> |
| $L_{HD} = 24.0$ ft | <i>Distance from Holddown to comp post</i> |


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|---------|------|---------|-------|-------|--------|
| ROOF | DF | 235 | A | 0.51 | 0.5 | 0.50 | (4) 2x4 | 0.787 | 0.013 | OK |
| 4TH | DF | 462 | A | 1.00 | 0.5 | 0.58 | (4) 2x4 | 0.698 | 0.015 | OK |
| 3RD | DF | 575 | B | 0.96 | 0.5 | 0.92 | (5) 2x4 | 0.945 | 0.016 | OK |
| N/A | DF | 575 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 575 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 575 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|-----|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | k/lf | ft | ft | kft | kft | k |
| ROOF | 329 | 0 | 8.39 K | 8.39 | 0.00 | 0.14 | 14.5 ft | 14.5 | 121.7 | 46.6 | 2.1 |
| 4TH | 318 | 0 | 8.11 K | 16.50 | 0.00 | 0.41 | 9.3 ft | 29.8 | 275.1 | 178.5 | 2.5 |
| 3RD | 157 | 0 | 4.01 K | 20.51 | 0.00 | 0.41 | 9.3 ft | 33.1 | 465.8 | 310.3 | 3.9 |
| N/A | 0 | 0 | 0.00 K | 20.51 | 0.00 | 0.32 | 0.0 ft | 33.1 | 465.8 | 415.0 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 20.51 | 0.00 | 0.32 | 0.0 ft | 33.1 | 465.8 | 519.6 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 20.51 | 0.00 | 0.32 | 0.0 ft | 33.1 | 465.8 | 624.3 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|-----|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 329 | 15 | 0.180 | 21 | 1.50E+06 | 13.5 | 0.305 | 1.031 | 0.109 | 30.1 | 0.374 | 1.405 | 0.180 |
| 4TH | 647 | 15 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.362 | 0.727 | 0.070 | 16.6 | 0.192 | 0.859 | 0.180 |
| 3RD | 804 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.365 | 0.365 | 0.070 | 8.3 | 0.070 | 0.434 | 0.180 |
| N/A | 804 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 804 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 804 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

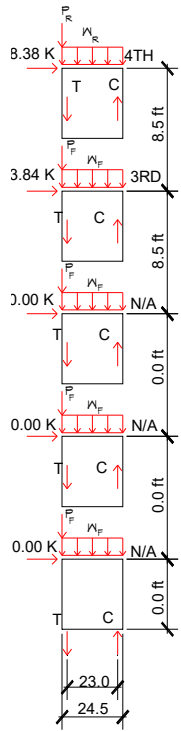
CHORDS - COMPRESSION CONTROLS

| 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 | 4.8 | 3.408 | 13.5 | 0.087 | 162 | 625 | 625 | 0.260 | 0.787 | 0.787 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.8 | 7.706 | 8.3 | 0.221 | 367 | 625 | 625 | 0.587 | 0.698 | 0.698 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.3 | 13.049 | 8.3 | 0.221 | 497 | 625 | 625 | 0.795 | 0.945 | 0.945 |
| N/A | 0.00 | 0.00 | 0.00 | 18.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.3 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **WB.1**

$C_s = 0.142$ Wall Weight = **9** psf
 $S_{DS} = 0.92$ sec Roof Dead = **18** psf
 $0.9 + 0.14S_{DS} = 0.77$ Floor Dead = **25** psf
 Trib Width = **11.00** ft $1 + 0.14S_{DS} = 1.13$
 Trib Area = **0.00** ft² Resists uplift only (due to near walls)
 $L = 24.5$ ft Total Wall Length
 $L_{HD} = 23.0$ ft Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|---------|------|---------|-------|-------|--------|
| ROOF | DF | 234 | A | 0.51 | 0.5 | 0.40 | (2) 4x6 | 0.445 | 0.013 | OK |
| 4TH | DF | 461 | A | 1.00 | 0.5 | 0.66 | (4) 2x4 | 0.718 | 0.015 | OK |
| 3RD | DF | 573 | B | 0.95 | 0.625 | 0.75 | (5) 2x4 | 0.899 | 0.015 | OK |
| N/A | DF | 573 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 573 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 573 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|-----|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | k | k | k | k | k/ft | ft | ft | kft | kft | k |
| ROOF | 328 | 1.24 | 9.28 K | 9.28 | 0.00 | 0.37 | 18.7 ft | 18.7 | 173.2 | 109.9 | 1.700 |
| 4TH | 317 | 0.62 | 8.38 K | 17.66 | 0.00 | 0.35 | 8.5 ft | 21.2 | 323.3 | 215.3 | 2.830 |
| 3RD | 157 | 0 | 3.84 K | 21.50 | 0.00 | 0.35 | 8.5 ft | 35.7 | 506.0 | 320.8 | 4.914 |
| N/A | 0 | 0 | 0.00 K | 21.50 | 0.00 | 0.28 | 0.0 ft | 35.7 | 506.0 | 403.4 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 21.50 | 0.00 | 0.28 | 0.0 ft | 35.7 | 506.0 | 485.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 21.50 | 0.00 | 0.28 | 0.0 ft | 35.7 | 506.0 | 568.4 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|-----|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 328 | 15 | 0.180 | 39 | 1.50E+06 | 17.7 | 0.397 | 1.051 | 0.146 | 32.7 | 0.481 | 1.532 | 0.180 |
| 4TH | 645 | 15 | 0.180 | 21 | 1.50E+06 | 7.5 | 0.325 | 0.654 | 0.067 | 15.0 | 0.125 | 0.779 | 0.180 |
| 3RD | 802 | 19 | 0.180 | 26 | 1.50E+06 | 7.5 | 0.328 | 0.328 | 0.067 | 7.5 | 0.067 | 0.395 | 0.180 |
| N/A | 802 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 802 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 802 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

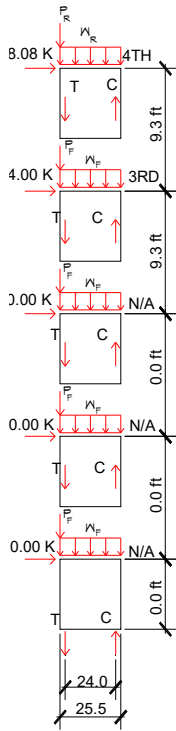
CHORDS - COMPRESSION CONTROLS

| 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 | 7.1 | 5.049 | 17.7 | 0.124 | 131 | 625 | 625 | 0.210 | 0.445 | 0.445 |
| 4TH | 0.00 | 0.00 | 0.00 | 13.2 | 9.425 | 7.5 | 0.267 | 449 | 625 | 625 | 0.718 | 0.708 | 0.718 |
| 3RD | 0.00 | 0.00 | 0.00 | 20.7 | 14.753 | 7.5 | 0.267 | 562 | 625 | 625 | 0.899 | 0.886 | 0.899 |
| N/A | 0.00 | 0.00 | 0.00 | 20.7 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 20.7 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 20.7 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **W8.2**

| | |
|---|--|
| $C_s = 0.142$ | Wall Weight = 9 psf |
| $S_{DS} = 0.92$ sec | Roof Dead = 1 psf |
| $0.9 \cdot 0.14S_{DS} = 0.77$ | Floor Dead = 25 psf |
| Trib Width = 10.75 ft | $1 + 0.14S_{DS} = 1.13$ |
| Trib Area = 0.00 ft ² | <i>Resists uplift only (due to near walls)</i> |
| $L = 25.5$ ft | <i>Total Wall Length</i> |
| $L_{HD} = 24.0$ ft | <i>Distance from Holddown to comp post</i> |


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|---------|------|---------|-------|-------|--------|
| ROOF | DF | 234 | A | 0.51 | 0.5 | 0.50 | (4) 2x4 | 0.785 | 0.013 | OK |
| 4TH | DF | 461 | A | 1.00 | 0.5 | 0.71 | (4) 2x4 | 0.696 | 0.015 | OK |
| 3RD | DF | 573 | B | 0.95 | 0.625 | 0.75 | (5) 2x4 | 0.942 | 0.016 | OK |
| N/A | DF | 573 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 573 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 573 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | 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 | kft | kft | k |
| ROOF | 328 | 0 | 8.36 K | 8.36 | 0.00 | 0.14 | 14.5 ft | 14.5 | 121.3 | 45.9 | 2.136 |
| 4TH | 317 | 0 | 8.08 K | 16.44 | 0.00 | 0.35 | 9.3 ft | 29.8 | 274.2 | 160.5 | 3.011 |
| 3RD | 157 | 0 | 4.00 K | 20.44 | 0.00 | 0.35 | 9.3 ft | 33.1 | 464.3 | 275.1 | 4.993 |
| N/A | 0 | 0 | 0.00 K | 20.44 | 0.00 | 0.27 | 0.0 ft | 33.1 | 464.3 | 362.5 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 20.44 | 0.00 | 0.27 | 0.0 ft | 33.1 | 464.3 | 449.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 20.44 | 0.00 | 0.27 | 0.0 ft | 33.1 | 464.3 | 537.2 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 328 | 15 | 0.180 | 21 | 1.50E+06 | 13.5 | 0.304 | 1.028 | 0.109 | 30.1 | 0.374 | 1.402 | 0.180 |
| 4TH | 645 | 15 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.361 | 0.724 | 0.070 | 16.6 | 0.192 | 0.856 | 0.180 |
| 3RD | 802 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.364 | 0.364 | 0.070 | 8.3 | 0.070 | 0.433 | 0.180 |
| N/A | 802 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 802 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 802 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

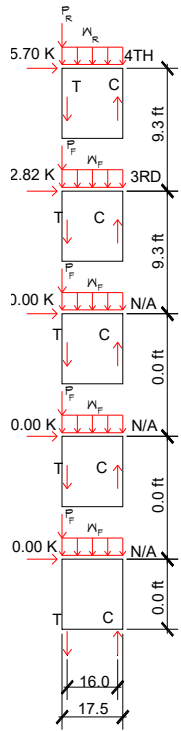
CHORDS - COMPRESSION CONTROLS

| 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 | 4.8 | 3.397 | 13.5 | 0.087 | 162 | 625 | 625 | 0.259 | 0.785 | 0.785 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.8 | 7.681 | 8.3 | 0.221 | 366 | 625 | 625 | 0.585 | 0.696 | 0.696 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.2 | 13.006 | 8.3 | 0.221 | 495 | 625 | 625 | 0.793 | 0.942 | 0.942 |
| N/A | 0.00 | 0.00 | 0.00 | 18.2 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0.000 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.2 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0.000 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.2 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0.000 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **W9.1**

$C_s = 0.142$ Wall Weight = **9** psf
 $S_{DS} = 0.92$ sec Roof Dead = **1** psf
 $0.9 + 0.14S_{DS} = 0.77$ Floor Dead = **25** psf
 Trib Width = **1.33** ft $1 + 0.14S_{DS} = 1.13$
 Trib Area = **0.00** ft² Resists uplift only (due to near walls)
 $L = 17.5$ ft Total Wall Length
 $L_{HD} = 16.0$ ft Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 241 | A | 0.52 | 0.5 | 0.52 | (4) 2x4 | 0.371 | 0.014 | OK |
| 4TH | DF | 473 | B | 0.79 | 0.625 | 0.42 | (4) 2x4 | 0.645 | 0.014 | OK |
| 3RD | DF | 588 | B | 0.98 | 0.875 | 0.86 | (5) 2x4 | 0.912 | 0.017 | OK |
| N/A | DF | 588 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 588 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 588 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | 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/lf | ft | ft | kft | kft | k |
| ROOF | 337 | 0 | 5.90 K | 5.90 | 0.00 | 0.10 | 11.3 ft | 11.3 | 66.6 | 15.8 | 2.2 |
| 4TH | 326 | 0 | 5.70 K | 11.60 | 0.00 | 0.12 | 9.3 ft | 20.6 | 174.5 | 33.7 | 6.2 |
| 3RD | 161 | 0 | 2.82 K | 14.42 | 0.00 | 0.12 | 9.3 ft | 29.9 | 308.5 | 51.6 | 11.3 |
| N/A | 0 | 0 | 0.00 K | 14.42 | 0.00 | 0.03 | 0.0 ft | 29.9 | 308.5 | 56.7 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 14.42 | 0.00 | 0.03 | 0.0 ft | 29.9 | 308.5 | 61.8 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 14.42 | 0.00 | 0.03 | 0.0 ft | 29.9 | 308.5 | 66.9 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 337 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.237 | 0.916 | 0.127 | 26.9 | 0.452 | 1.368 | 0.180 |
| 4TH | 663 | 19 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.303 | 0.679 | 0.105 | 16.6 | 0.198 | 0.877 | 0.180 |
| 3RD | 824 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.376 | 0.376 | 0.105 | 8.3 | 0.105 | 0.480 | 0.180 |
| N/A | 824 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 824 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 824 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

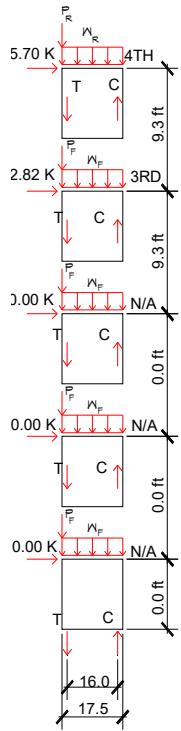
CHORDS - COMPRESSION CONTROLS

| 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 | 3.8 | 2.720 | 10.3 | 0.147 | 130 | 625 | 625 | 0.207 | 0.371 | 0.371 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.0 | 7.122 | 8.3 | 0.221 | 339 | 625 | 625 | 0.543 | 0.645 | 0.645 |
| 3RD | 0.00 | 0.00 | 0.00 | 17.6 | 12.594 | 8.3 | 0.221 | 480 | 625 | 625 | 0.768 | 0.912 | 0.912 |
| N/A | 0.00 | 0.00 | 0.00 | 17.6 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0.000 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.6 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0.000 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.6 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0.000 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **W9.2, W9.3, W9.4, W9.5, W9.6**

$C_s = 0.142$ Wall Weight = **9** psf
 $S_{DS} = 0.92$ sec Roof Dead = **1** psf
 $0.9 \cdot 0.14S_{DS} = 0.77$ Floor Dead = **25** psf
 Trib Width = **3.17** ft $1 + 0.14S_{DS} = 1.13$
 Trib Area = **0.00** ft² *Resists uplift only (due to near walls)*
 $L = 11.0$ ft *Total Wall Length*
 $L_{HD} = 9.5$ ft *Distance from Holddown to comp post*


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|---------|------|---------|-------|-------|--------|
| ROOF | DF | 241 | A | 0.52 | 0.5 | 0.62 | (4) 2x4 | 0.371 | 0.020 | OK |
| 4TH | DF | 473 | B | 0.79 | 0.75 | 0.72 | (4) 2x4 | 0.645 | 0.017 | OK |
| 3RD | DF | 588 | B | 0.98 | 0.875 | 0.95 | (5) 2x4 | 0.912 | 0.020 | OK |
| N/A | DF | 588 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 588 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 588 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | 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 | kft | kft | k |
| ROOF | 337 | 0 | 3.71 K | 3.71 | 0.00 | 0.10 | 11.3 ft | 11.3 | 41.9 | 6.3 | 2.635 |
| 4TH | 326 | 0 | 3.58 K | 7.29 | 0.00 | 0.16 | 9.3 ft | 20.6 | 109.7 | 16.2 | 6.933 |
| 3RD | 161 | 0 | 1.77 K | 9.06 | 0.00 | 0.16 | 9.3 ft | 29.9 | 193.9 | 26.0 | 12.471 |
| N/A | 0 | 0 | 0.00 K | 9.06 | 0.00 | 0.08 | 0.0 ft | 29.9 | 193.9 | 30.8 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 9.06 | 0.00 | 0.08 | 0.0 ft | 29.9 | 193.9 | 35.6 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 9.06 | 0.00 | 0.08 | 0.0 ft | 29.9 | 193.9 | 40.4 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 337 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.241 | 0.928 | 0.214 | 26.9 | 0.762 | 1.690 | 0.180 |
| 4TH | 663 | 19 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.307 | 0.687 | 0.176 | 16.6 | 0.333 | 1.021 | 0.180 |
| 3RD | 824 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.380 | 0.380 | 0.176 | 8.3 | 0.176 | 0.556 | 0.180 |
| N/A | 824 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 824 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 824 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

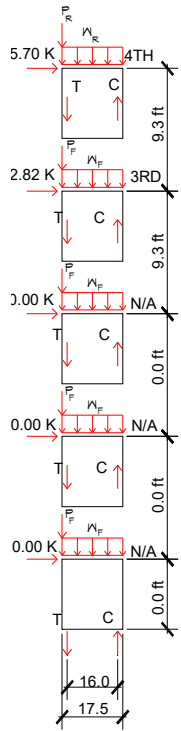
CHORDS - COMPRESSION CONTROLS

| 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 | 3.8 | 2.720 | 10.3 | 0.147 | 130 | 625 | 625 | 0.207 | 0.371 | 0.371 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.0 | 7.122 | 8.3 | 0.221 | 339 | 625 | 625 | 0.543 | 0.645 | 0.645 |
| 3RD | 0.00 | 0.00 | 0.00 | 17.6 | 12.594 | 8.3 | 0.221 | 480 | 625 | 625 | 0.768 | 0.912 | 0.912 |
| N/A | 0.00 | 0.00 | 0.00 | 17.6 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.6 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 17.6 | 0.000 | 0.0 | 0.000 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **W9.7**

$C_s = 0.142$ Wall Weight = **9** psf
 $S_{DS} = 0.92$ sec Roof Dead = **1** psf
 $0.9 + 0.14S_{DS} = 0.77$ Floor Dead = **25** psf
 Trib Width = **6.00** ft $1 + 0.14S_{DS} = 1.13$
 Trib Area = **0.00** ft² *Resists uplift only (due to near walls)*
 $L = 25.5$ ft *Total Wall Length*
 $L_{HD} = 24.0$ ft *Distance from Holddown to comp post*


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|---------|------|---------|-------|-------|--------|
| ROOF | DF | 241 | A | 0.52 | 0.5 | 0.54 | (4) 2x4 | 0.806 | 0.013 | OK |
| 4TH | DF | 473 | B | 0.79 | 0.625 | 0.68 | (4) 2x4 | 0.715 | 0.013 | OK |
| 3RD | DF | 588 | B | 0.98 | 0.75 | 0.82 | (5) 2x4 | 0.968 | 0.016 | OK |
| N/A | DF | 588 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 588 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 588 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|-----|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | k/lf | ft | ft | kft | kft | k |
| ROOF | 337 | 0 | 8.59 K | 8.59 | 0.00 | 0.14 | 14.5 ft | 14.5 | 124.6 | 44.4 | 2.3 |
| 4TH | 326 | 0 | 8.30 K | 16.90 | 0.00 | 0.23 | 9.3 ft | 29.8 | 281.7 | 120.4 | 4.5 |
| 3RD | 161 | 0 | 4.11 K | 21.01 | 0.00 | 0.23 | 9.3 ft | 33.1 | 477.1 | 196.3 | 7.9 |
| N/A | 0 | 0 | 0.00 K | 21.01 | 0.00 | 0.15 | 0.0 ft | 33.1 | 477.1 | 245.1 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 21.01 | 0.00 | 0.15 | 0.0 ft | 33.1 | 477.1 | 293.9 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 21.01 | 0.00 | 0.15 | 0.0 ft | 33.1 | 477.1 | 342.6 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|-----|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 337 | 15 | 0.180 | 21 | 1.50E+06 | 13.5 | 0.312 | 0.987 | 0.109 | 30.1 | 0.374 | 1.360 | 0.180 |
| 4TH | 663 | 19 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.301 | 0.675 | 0.070 | 16.6 | 0.192 | 0.807 | 0.180 |
| 3RD | 824 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.374 | 0.374 | 0.070 | 8.3 | 0.070 | 0.443 | 0.180 |
| N/A | 824 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 824 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 824 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

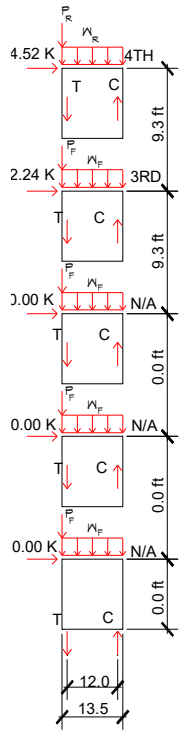
CHORDS - COMPRESSION CONTROLS

| 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 | 4.9 | 3.490 | 13.5 | 0.087 | 166 | 625 | 625 | 0.266 | 0.806 | 0.806 |
| 4TH | 0.00 | 0.00 | 0.00 | 11.0 | 7.892 | 8.3 | 0.221 | 376 | 625 | 625 | 0.601 | 0.715 | 0.715 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.7 | 13.364 | 8.3 | 0.221 | 509 | 625 | 625 | 0.815 | 0.968 | 0.968 |
| N/A | 0.00 | 0.00 | 0.00 | 18.7 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0.000 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.7 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0.000 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.7 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0.000 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **W10.1, W10.6**

| | |
|---|--|
| $C_p = 0.142$ | Wall Weight = 9 psf |
| $S_{DS} = 0.92$ sec | Roof Dead = 18 psf |
| $0.9 + 0.14S_{DS} = 0.77$ | Floor Dead = 25 psf |
| Trib Width = 1.33 ft | $1 + 0.14S_{DS} = 1.13$ |
| Trib Area = 0.00 ft ² | <i>Resists uplift only (due to near walls)</i> |
| $L = 13.5$ ft | <i>Total Wall Length</i> |
| $L_{HD} = 12.0$ ft | <i>Distance from Holddown to comp post</i> |


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 248 | A | 0.54 | 0.5 | 0.57 | (4) 2x4 | 0.382 | 0.017 | OK |
| 4TH | DF | 487 | B | 0.81 | 0.75 | 0.71 | (4) 2x4 | 0.664 | 0.016 | OK |
| 3RD | DF | 606 | B | 1.01 | 0.875 | 0.95 | (5) 2x4 | 0.939 | 0.019 | OK |
| N/A | DF | 606 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 606 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 606 | B | 0.00 | NONE | 0.00 | (5) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|-----|----------|--------|-------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | k/ft | ft | ft | kft | kft | k |
| ROOF | 347 | 0 | 4.68 K | 4.68 | 0.00 | 0.13 | 11.3 ft | 11.3 | 52.9 | 11.4 | 2.415 |
| 4TH | 335 | 0 | 4.52 K | 9.21 | 0.00 | 0.12 | 9.3 ft | 20.6 | 138.5 | 22.1 | 6.828 |
| 3RD | 166 | 0 | 2.24 K | 11.45 | 0.00 | 0.12 | 9.3 ft | 29.9 | 245.0 | 32.8 | 12.480 |
| N/A | 0 | 0 | 0.00 K | 11.45 | 0.00 | 0.03 | 0.0 ft | 29.9 | 245.0 | 35.8 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 11.45 | 0.00 | 0.03 | 0.0 ft | 29.9 | 245.0 | 38.8 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 11.45 | 0.00 | 0.03 | 0.0 ft | 29.9 | 245.0 | 41.9 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|-----|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 347 | 15 | 0.180 | 21 | 1.50E+06 | 10.3 | 0.246 | 0.949 | 0.170 | 26.9 | 0.603 | 1.552 | 0.180 |
| 4TH | 682 | 19 | 0.180 | 21 | 1.50E+06 | 8.3 | 0.314 | 0.703 | 0.140 | 16.6 | 0.264 | 0.967 | 0.180 |
| 3RD | 848 | 19 | 0.180 | 26 | 1.50E+06 | 8.3 | 0.389 | 0.389 | 0.140 | 8.3 | 0.140 | 0.528 | 0.180 |
| N/A | 848 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 848 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 848 | 19 | 0.000 | 26 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

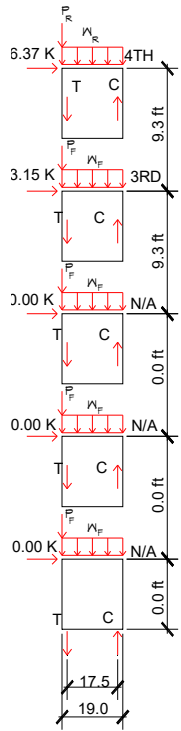
CHORDS - COMPRESSION CONTROLS

| 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 | 3.9 | 2.800 | 10.3 | 0.147 | 133 | 625 | 625 | 349 | 0.213 | 0.382 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.3 | 7.330 | 8.3 | 0.221 | 349 | 625 | 625 | 526 | 0.558 | 0.664 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.1 | 12.962 | 8.3 | 0.221 | 494 | 625 | 625 | 526 | 0.790 | 0.939 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **W10.2, W10.3**

$C_s = 0.142$ Wall Weight = **9** psf
 $S_{DS} = 0.92$ sec Roof Dead = **18** psf
 $0.9 + 0.14S_{DS} = 0.77$ Floor Dead = **25** psf
 Trib Width = **3.17** ft $1 + 0.14S_{DS} = 1.13$
 Trib Area = **0.00** ft² *Resists uplift only (due to near walls)*
 $L = 19.0$ ft *Total Wall Length*
 $L_{HD} = 17.5$ ft *Distance from Holddown to comp post*


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|---------|------|---------|-------|-------|--------|
| ROOF | DF | 248 | A | 0.54 | 0.5 | 0.42 | (4) 2x6 | 0.136 | 0.014 | OK |
| 4TH | DF | 487 | B | 0.81 | 0.75 | 0.56 | (4) 2x6 | 0.355 | 0.014 | OK |
| 3RD | DF | 606 | B | 1.01 | 0.875 | 0.78 | (4) 2x6 | 0.628 | 0.017 | OK |
| N/A | DF | 606 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 606 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 606 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | 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 | kft | kft | k |
| ROOF | 347 | 0 | 6.59 K | 6.59 | 0.00 | 0.16 | 11.3 ft | 11.3 | 74.5 | 28.6 | 1.8 |
| 4TH | 335 | 0 | 6.37 K | 12.96 | 0.00 | 0.16 | 9.3 ft | 20.6 | 195.0 | 58.0 | 5.4 |
| 3RD | 166 | 0 | 3.15 K | 16.11 | 0.00 | 0.16 | 9.3 ft | 29.9 | 344.8 | 87.4 | 10.2 |
| N/A | 0 | 0 | 0.00 K | 16.11 | 0.00 | 0.08 | 0.0 ft | 29.9 | 344.8 | 101.7 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 16.11 | 0.00 | 0.08 | 0.0 ft | 29.9 | 344.8 | 116.0 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 16.11 | 0.00 | 0.08 | 0.0 ft | 29.9 | 344.8 | 130.3 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 347 | 15 | 0.180 | 33 | 1.50E+06 | 10.3 | 0.242 | 0.936 | 0.116 | 26.9 | 0.413 | 1.350 | 0.180 |
| 4TH | 682 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.310 | 0.694 | 0.096 | 16.6 | 0.181 | 0.875 | 0.180 |
| 3RD | 848 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.385 | 0.385 | 0.096 | 8.3 | 0.096 | 0.481 | 0.180 |
| N/A | 848 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 848 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 848 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

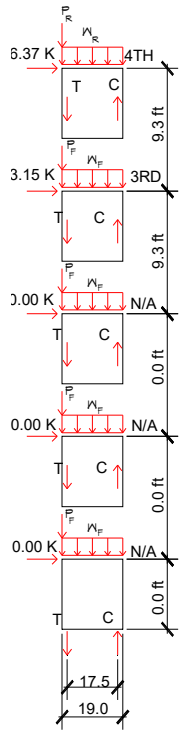
CHORDS - COMPRESSION CONTROLS

| 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 | 3.9 | 2.800 | 10.3 | 0.340 | 85 | 85 | 625 | 808 | 0.136 | 0.105 | 0.136 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.3 | 7.330 | 8.3 | 0.486 | 222 | 222 | 625 | 1154 | 0.355 | 0.192 | 0.355 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.1 | 12.962 | 8.3 | 0.486 | 393 | 393 | 625 | 1154 | 0.628 | 0.340 | 0.628 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 0 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 0 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **M10.4**

$C_s = 0.142$ Wall Weight = **9** psf
 $S_{DS} = 0.92$ sec Roof Dead = **18** psf
 $0.9 \cdot 0.14S_{DS} = 0.77$ Floor Dead = **25** psf
 Trib Width = **3.17** ft $1 + 0.14S_{DS} = 1.13$
 Trib Area = **0.00** ft² Resists uplift only (due to near walls)
 $L = 16.3$ ft Total Wall Length
 $L_{HD} = 14.8$ ft Distance from Holddown to comp post


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|---------|------|---------|-------|-------|--------|
| ROOF | DF | 248 | A | 0.54 | 0.5 | 0.47 | (4) 2x6 | 0.136 | 0.015 | OK |
| 4TH | DF | 487 | B | 0.81 | 0.75 | 0.61 | (4) 2x6 | 0.355 | 0.015 | OK |
| 3RD | DF | 606 | B | 1.01 | 0.875 | 0.84 | (4) 2x6 | 0.628 | 0.018 | OK |
| N/A | DF | 606 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 606 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 606 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | 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 | kft | kft | K |
| ROOF | 347 | 0 | 5.64 K | 5.64 | 0.00 | 0.16 | 11.3 ft | 11.3 | 63.7 | 20.9 | 2.0 |
| 4TH | 335 | 0 | 5.45 K | 11.08 | 0.00 | 0.16 | 9.3 ft | 20.6 | 166.8 | 42.4 | 5.9 |
| 3RD | 166 | 0 | 2.70 K | 13.78 | 0.00 | 0.16 | 9.3 ft | 29.9 | 294.9 | 63.9 | 10.9 |
| N/A | 0 | 0 | 0.00 K | 13.78 | 0.00 | 0.08 | 0.0 ft | 29.9 | 294.9 | 74.4 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 13.78 | 0.00 | 0.08 | 0.0 ft | 29.9 | 294.9 | 84.8 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 13.78 | 0.00 | 0.08 | 0.0 ft | 29.9 | 294.9 | 95.3 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | V _u | G _a | D _s | A _{chord} | E | h | d _{WALL} | S _{dWALL} | d _{HD} | Sh | S _{dHD} | d _{TOT} | Stretch |
|-------|----------------|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 347 | 15 | 0.180 | 33 | 1.50E+06 | 10.3 | 0.242 | 0.938 | 0.138 | 26.9 | 0.491 | 1.429 | 0.180 |
| 4TH | 682 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.310 | 0.696 | 0.113 | 16.6 | 0.215 | 0.911 | 0.180 |
| 3RD | 848 | 19 | 0.180 | 33 | 1.50E+06 | 8.3 | 0.386 | 0.386 | 0.113 | 8.3 | 0.113 | 0.499 | 0.180 |
| N/A | 848 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 848 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 848 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

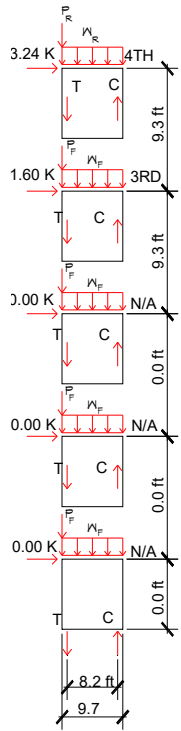
CHORDS - COMPRESSION CONTROLS

| 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 | 3.9 | 2.800 | 10.3 | 0.340 | 85 | 625 | 625 | 808 | 0.136 | 0.105 | 0.136 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.3 | 7.330 | 8.3 | 0.486 | 222 | 625 | 625 | 1154 | 0.355 | 0.192 | 0.355 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.1 | 12.962 | 8.3 | 0.486 | 393 | 625 | 625 | 1154 | 0.628 | 0.340 | 0.628 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0 | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | 0 | 0 | 0.000 |

STATUS: **OK**
MULTI-STORY SHEARWALL DESIGN:

 WALL **M10.5**

| | |
|---|--|
| $C_s = 0.142$ | Wall Weight = 9 psf |
| $S_{DS} = 0.92$ sec | Roof Dead = 18 psf |
| $0.9 + 0.14S_{DS} = 0.77$ | Floor Dead = 25 psf |
| Trib Width = 3.17 ft | $1 + 0.14S_{DS} = 1.13$ |
| Trib Area = 0.00 ft ² | <i>Resists uplift only (due to near walls)</i> |
| L = 9.7 ft | <i>Total Wall Length</i> |
| $L_{HD} = 8.2$ ft | <i>Distance from Holddown to comp post</i> |


WALL SUMMARY

| Level | DF? | Sv | WALL | % | HOLDDOWN | % | Post | % | Drift | CHECKS |
|-------|-----|-----|------|------|----------|------|---------|-------|-------|--------|
| ROOF | DF | 248 | A | 0.54 | 0.5 | 0.61 | (4) 2x4 | 0.382 | 0.020 | OK |
| 4TH | DF | 487 | B | 0.81 | 0.75 | 0.76 | (4) 2x4 | 0.664 | 0.017 | OK |
| 3RD | DF | 606 | B | 1.01 | 0.875 | 1.01 | (5) 2x4 | 0.939 | 0.020 | OK |
| N/A | DF | 606 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 606 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | OK |
| N/A | DF | 606 | B | 0.00 | NONE | 0.00 | (4) 2x4 | 0.000 | 0.000 | OK |

HOLDDOWN

| Level | Vu | Add Load | V | SV | P' | W' | h | Sh | M _{OT} | M _R | T _{ASD} |
|-------|-----|----------|--------|------|------|------|---------|------|-----------------|----------------|------------------|
| | plf | lbs | k | k | k | k/ft | ft | ft | kft | kft | k |
| ROOF | 347 | 0 | 3.35 K | 3.35 | 0.00 | 0.16 | 11.3 ft | 11.3 | 37.9 | 7.4 | 2.6 |
| 4TH | 335 | 0 | 3.24 K | 6.59 | 0.00 | 0.16 | 9.3 ft | 20.6 | 99.2 | 15.0 | 7.3 |
| 3RD | 166 | 0 | 1.60 K | 8.20 | 0.00 | 0.16 | 9.3 ft | 29.9 | 175.5 | 22.6 | 13.2 |
| N/A | 0 | 0 | 0.00 K | 8.20 | 0.00 | 0.08 | 0.0 ft | 29.9 | 175.5 | 26.3 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 8.20 | 0.00 | 0.08 | 0.0 ft | 29.9 | 175.5 | 30.0 | 0.0 |
| N/A | 0 | 0 | 0.00 K | 8.20 | 0.00 | 0.08 | 0.0 ft | 29.9 | 175.5 | 33.7 | 0.0 |

DEFLECTION - PER SDPWS 4.3.2

| Level | Vu | G _a | D _s | A _{chord} | E | h | d _{WALL} | Sd _{WALL} | d _{HD} | Sh | Sd _{HD} | d _{TOT} | Stretch |
|-------|-----|----------------|----------------|--------------------|----------|------|-------------------|--------------------|-----------------|------|------------------|------------------|---------|
| | plf | k-in | in | in ² | psi | ft | in | in | in | ft | in | in | in |
| ROOF | 347 | 15 | 0.160 | 21 | 1.50E+06 | 10.3 | 0.250 | 0.961 | 0.221 | 26.9 | 0.742 | 1.702 | 0.160 |
| 4TH | 682 | 19 | 0.160 | 21 | 1.50E+06 | 8.3 | 0.318 | 0.711 | 0.182 | 16.6 | 0.324 | 1.035 | 0.160 |
| 3RD | 848 | 19 | 0.140 | 26 | 1.50E+06 | 8.3 | 0.392 | 0.392 | 0.159 | 8.3 | 0.159 | 0.552 | 0.140 |
| N/A | 848 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 848 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |
| N/A | 848 | 19 | 0.000 | 21 | 1.50E+06 | 0.0 | 0.000 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.000 |

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 | 3.9 | 2.800 | 10.3 | 0.147 | 133 | 625 | 625 | 349 | 0.213 | 0.382 |
| 4TH | 0.00 | 0.00 | 0.00 | 10.3 | 7.330 | 8.3 | 0.221 | 349 | 625 | 625 | 526 | 0.558 | 0.664 |
| 3RD | 0.00 | 0.00 | 0.00 | 18.1 | 12.962 | 8.3 | 0.221 | 494 | 625 | 625 | 526 | 0.790 | 0.939 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | | 0.000 |
| N/A | 0.00 | 0.00 | 0.00 | 18.1 | 0.000 | 0.0 | 0.000 | 0 | 625 | 625 | 0 | | 0.000 |

DIAPHRAGM

$F_{px} = 274.8 \text{ K}$ (L4 Controls)

$\frac{F_{px}}{V} = \frac{274.8}{389} = 0.706$ (Distributed Shear Factor)

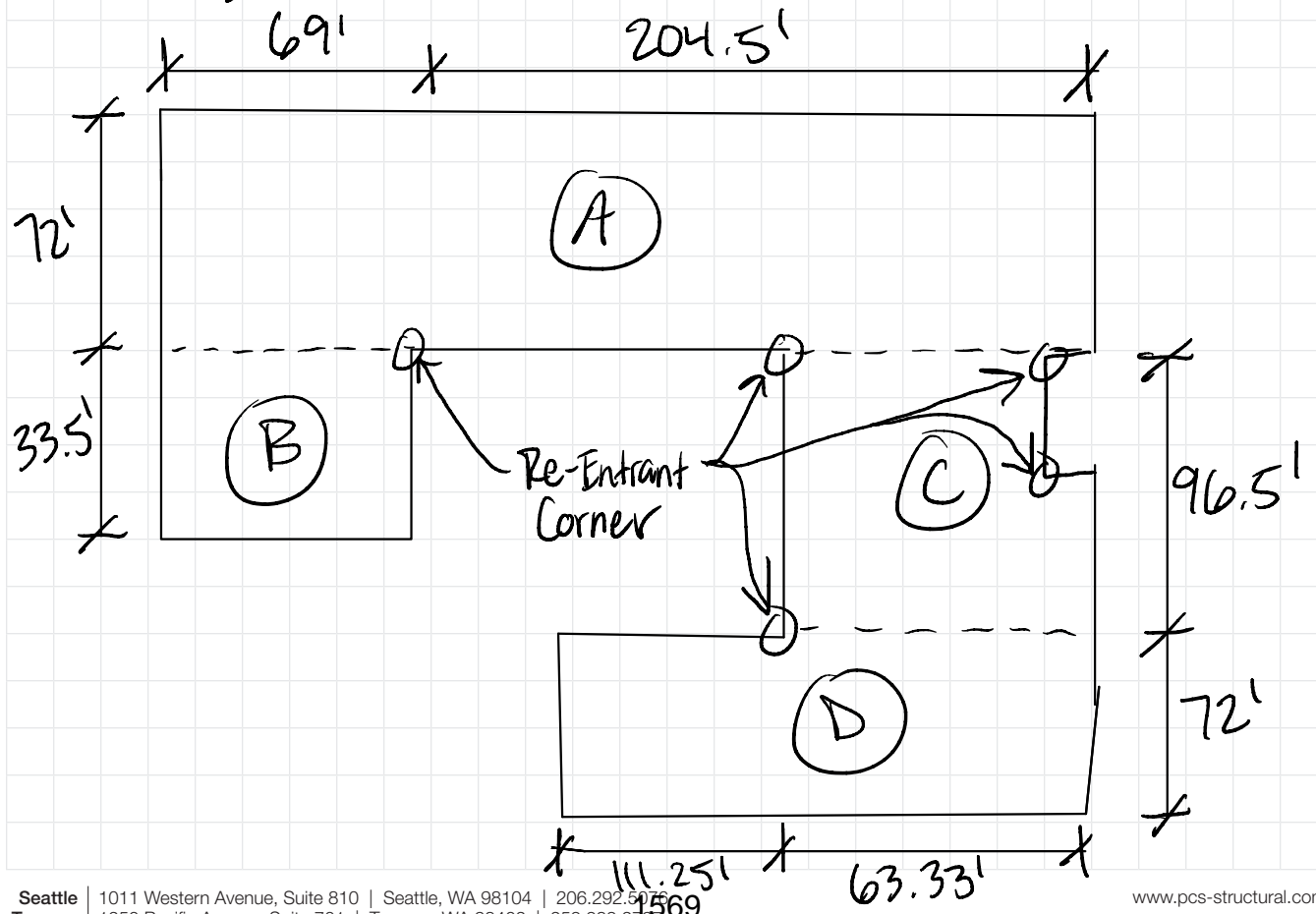
E/W

$W(A) = 2.58 \times 0.706 = 1.82 \text{ KLF}$

$W(B) = 0.62 = 0.44 \text{ KLF}$

$W(C) = 0.60 = 0.42 \text{ KLF}$

$W(D) = 1.59 = 1.12 \text{ KLF}$



Chords:

(A) : $M = \frac{wl^2}{8} = \frac{(1.82)(72^2)}{8} = 1179.4 \text{ k-FT}$

$T=C = \frac{1179.4}{69' + 204.5'} = 4.31 \text{ K}$

$Z' = (141)(1.6) (\text{ALL OTHER CONSTANTS} = 1.0)$

$Z' = 225 \text{ lbs/Nail}$

16d Nails = $\frac{4310}{225} = \underline{\underline{20}}$

(B) :

$M = \frac{wl^2}{8} = \frac{(0.44)(33.5^2)}{8} = 61.7 \text{ k-FT}$

$T=C = \frac{61.7}{69'} = 0.9 \text{ K}$

16d Nails = $\frac{900}{225} = \underline{\underline{4}}$

①:

$$M = \frac{wl^2}{8} = \frac{(0.42)(96.5^2)}{8} = 488.9 \text{ K-FT}$$

$$T = C = \frac{488.9}{63.33'} = 7.72 \text{ K}$$

$$\# \text{ 16d Nails} = \frac{7720}{225} = \underline{\underline{35}}$$

②:

$$M = \frac{(1.12)(72^2)}{8} = 725.8 \text{ K-FT}$$

$$T = C = \frac{725.8}{111.25 + 63.33} = 4.2 \text{ K}$$

(20) 16d Nails

Max Tension Force = 7.72 K

Try CS14 Strap Fully Nailed w/ 10d's

$$\text{Length Req'd} = \frac{2.49 \text{ K}}{2.5'} = 1 \text{ K/FT}$$

8'-0" STRAP OK ✓

Check Diaphragm w/ Re-entrant Straps:

Highest Strap Shear = 7.72K ←

Re-entrant corner
@ Grid D/4.5 +

Diaphragm Capacity = 240 plf (ASD)

$$\frac{7.72 \text{ K} \cdot 1000}{240 \text{ plf}} = \underline{\underline{32'}} \text{ Strap End Length}$$

Re-entrant corner @ Grid D/8.2, I/3.2
= 4.31 K

$$\frac{4.31 \cdot 1000}{240 \text{ plf}} = \underline{\underline{18'}} \text{ Strap End Length}$$

DIAPHRAGM CHECKS AT SHEAR WALLS

23/32" (3/4") W/ 10d @ 6" O.C.

CAPACITY = 240 PLF (ASD)

PROJECT # 19028

ENGR: AED

DATE: 9/11/2023

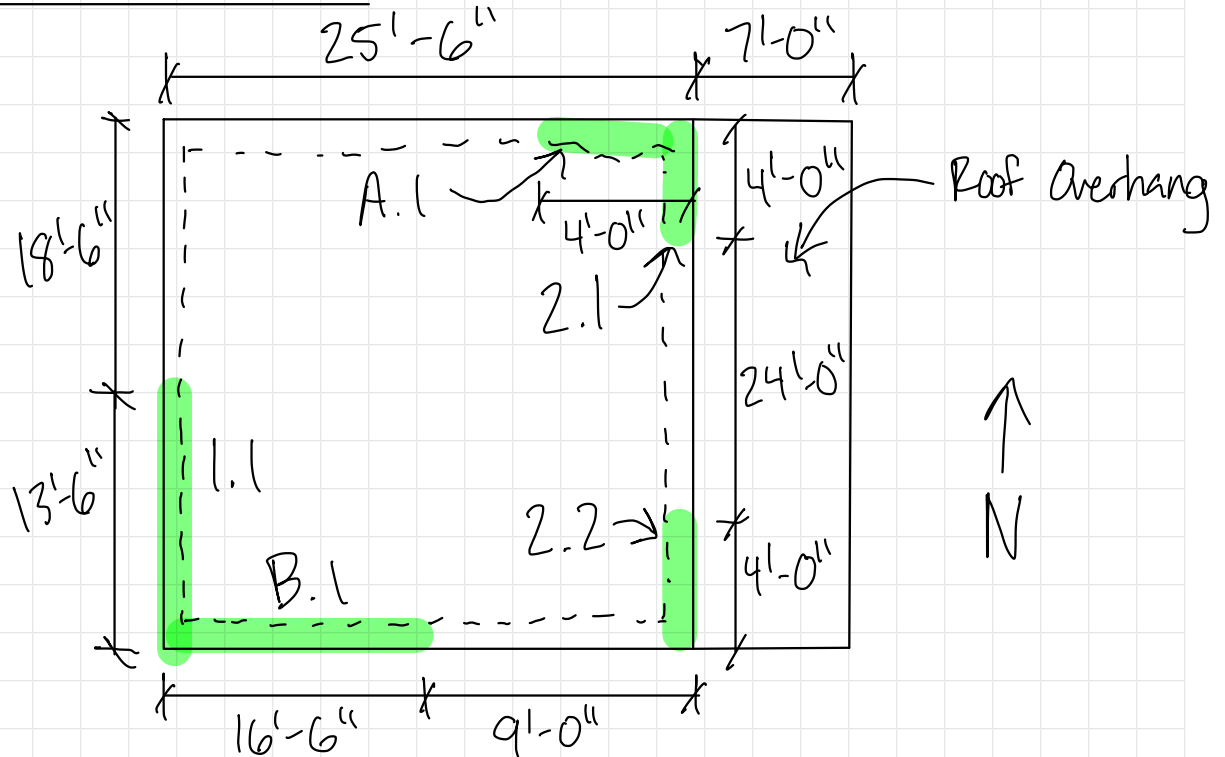
| LVL 3 | | | | | | | | | |
|--------|----------|------------|------------|-----|--------|----------|------------|------------|---|
| E-W | | | | N-S | | | | | |
| F.px = | 272.05 | kips (ASD) | Multiplier | 1 | F.px = | 272.05 | kips (ASD) | Multiplier | 1 |
| SW | vu (plf) | Sheathing | Spacing | | SW | vu (plf) | Sheathing | Spacing | |
| 1 | 195 | 23/32" | 10d @ 6" | | A | 217 | 23/32" | 10d @ 6" | |
| 2 | 198 | 23/32" | 10d @ 6" | | B | 215 | 23/32" | 10d @ 6" | |
| 3 | 210 | 23/32" | 10d @ 6" | | C | 211 | 23/32" | 10d @ 6" | |
| 4 | 149 | 23/32" | 10d @ 6" | | D | 204 | 23/32" | 10d @ 6" | |
| 5 | 188 | 23/32" | 10d @ 6" | | E | 198 | 23/32" | 10d @ 6" | |
| 6 | 194 | 23/32" | 10d @ 6" | | F | 191 | 23/32" | 10d @ 6" | |
| 7 | 200 | 23/32" | 10d @ 6" | | G | 187 | 23/32" | 10d @ 6" | |
| 8 | 199 | 23/32" | 10d @ 6" | | H | 172 | 23/32" | 10d @ 6" | |
| 9 | 205 | 23/32" | 10d @ 6" | | I | 188 | 23/32" | 10d @ 6" | |
| 10 | 211 | 23/32" | 10d @ 6" | | K | 213 | 23/32" | 10d @ 6" | |
| | | | | | L | 210 | 23/32" | 10d @ 6" | |
| | | | | | M | 202 | 23/32" | 10d @ 6" | |
| | | | | | N | 189 | 23/32" | 10d @ 6" | |
| | | | | | O | 191 | 23/32" | 10d @ 6" | |
| | | | | | P | 177 | 23/32" | 10d @ 6" | |

| LVL 4 | | | | | | | | | |
|--------|----------|------------|----------|------|--------|----------|------------|----------|------|
| E-W | | | | N-S | | | | | |
| F.px = | 274.82 | kips (ASD) | Ratio | 0.99 | F.px = | 274.82 | kips (ASD) | Ratio | 0.99 |
| SW | vu (plf) | Sheathing | Spacing | | SW | vu (plf) | Sheathing | Spacing | |
| 1 | 197 | 23/32" | 10d @ 6" | | A | 220 | 23/32" | 10d @ 6" | |
| 2 | 200 | 23/32" | 10d @ 6" | | B | 217 | 23/32" | 10d @ 6" | |
| 3 | 212 | 23/32" | 10d @ 6" | | C | 213 | 23/32" | 10d @ 6" | |
| 4 | 151 | 23/32" | 10d @ 6" | | D | 207 | 23/32" | 10d @ 6" | |
| 5 | 190 | 23/32" | 10d @ 6" | | E | 200 | 23/32" | 10d @ 6" | |
| 6 | 196 | 23/32" | 10d @ 6" | | F | 193 | 23/32" | 10d @ 6" | |
| 7 | 202 | 23/32" | 10d @ 6" | | G | 189 | 23/32" | 10d @ 6" | |
| 8 | 201 | 23/32" | 10d @ 6" | | H | 174 | 23/32" | 10d @ 6" | |
| 9 | 207 | 23/32" | 10d @ 6" | | I | 190 | 23/32" | 10d @ 6" | |
| 10 | 213 | 23/32" | 10d @ 6" | | K | 215 | 23/32" | 10d @ 6" | |
| | | | | | L | 212 | 23/32" | 10d @ 6" | |
| | | | | | M | 204 | 23/32" | 10d @ 6" | |
| | | | | | N | 191 | 23/32" | 10d @ 6" | |
| | | | | | O | 193 | 23/32" | 10d @ 6" | |
| | | | | | P | 179 | 23/32" | 10d @ 6" | |

| ROOF | | | | | | | | | |
|--------|----------|------------|----------|------|--------|----------|------------|----------|------|
| E-W | | | | N-S | | | | | |
| F.px = | 176.98 | kips (ASD) | Ratio | 1.55 | F.px = | 176.98 | kips (ASD) | Ratio | 1.55 |
| SW | vu (plf) | Sheathing | Spacing | | SW | vu (plf) | Sheathing | Spacing | |
| 1 | 127 | 23/32" | 10d @ 6" | | A | 141 | 23/32" | 10d @ 6" | |
| 2 | 129 | 23/32" | 10d @ 6" | | B | 140 | 23/32" | 10d @ 6" | |
| 3 | 136 | 23/32" | 10d @ 6" | | C | 137 | 23/32" | 10d @ 6" | |
| 4 | 97 | 23/32" | 10d @ 6" | | D | 133 | 23/32" | 10d @ 6" | |
| 5 | 122 | 23/32" | 10d @ 6" | | E | 129 | 23/32" | 10d @ 6" | |
| 6 | 126 | 23/32" | 10d @ 6" | | F | 124 | 23/32" | 10d @ 6" | |
| 7 | 130 | 23/32" | 10d @ 6" | | G | 122 | 23/32" | 10d @ 6" | |
| 8 | 130 | 23/32" | 10d @ 6" | | H | 112 | 23/32" | 10d @ 6" | |
| 9 | 133 | 23/32" | 10d @ 6" | | I | 122 | 23/32" | 10d @ 6" | |
| 10 | 137 | 23/32" | 10d @ 6" | | K | 138 | 23/32" | 10d @ 6" | |
| | | | | | L | 137 | 23/32" | 10d @ 6" | |
| | | | | | M | 131 | 23/32" | 10d @ 6" | |
| | | | | | N | 123 | 23/32" | 10d @ 6" | |
| | | | | | O | 124 | 23/32" | 10d @ 6" | |
| | | | | | P | 115 | 23/32" | 10d @ 6" | |

PAVILION LATERAL

= Shear Wall



SEISMIC

Seismic Weight

Roof → $w = 20 \text{ psf}$ (I-Joist + Typ. Roofing)

Area = 1040 SF

$$W_R = (20 \text{ psf})(1040 \text{ SF}) + (12 \text{ psf}) \left(\frac{13.5'}{2} \right) (115')$$

Ext. walls

↑ Avg. Wall Height

$$W_R = 30.2 \text{ K}$$

$$V_{\text{seismic}} = C_s \cdot W = (0.142)(30.2 \text{ K})$$

$$V_{\text{seismic}} = \underline{4.29 \text{ K}} \quad (3 \text{ K ASD})$$

WIND: Check if E/W Controls ($k_{ze}=1.0$)

$$P_{\text{wall, windward}} = (16 \text{ psf})(216 \text{ sf}) = 3.46 \text{ k}$$

$$P_{\text{wall, leeward}} = (16 \text{ psf})(216 \text{ sf}) = 3.46 \text{ k}$$

$$V_{\text{wind}} = 6.92 \text{ k} \quad (4.2 \text{ k ASD}) \leftarrow \text{Controls E/W}$$

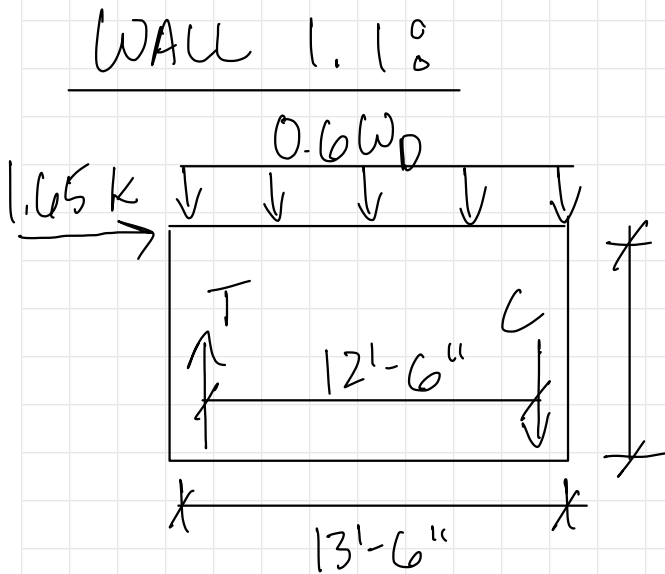
Check if N/S Controls ($k_{ze}=1.0$)

$$P_{\text{wall, windward}} = (16 \text{ psf})(172 \text{ sf}) = 2.75 \text{ k}$$

$$P_{\text{wall, leeward}} = (16 \text{ psf})(172 \text{ sf}) = 2.75 \text{ k}$$

$$V_{\text{wind}} = 5.5 \text{ k} \quad (3.3 \text{ k ASD}) \quad \circ\circ \quad \text{Wind Controls Both Directions}$$

| |
|--|
| $V_{\text{N/S}} = 3.3 \text{ k} \quad (\text{wind})$ $V_{\text{E/W}} = 4.2 \text{ k} \quad (\text{wind})$ |
|--|



$$W_D = [(20 \text{ psf})(12.75') + (10 \text{ psf})(11.5')] \\ W_D = 370 \text{ plf}$$

$$V_{\text{roof}} = \frac{1.65 \text{ k} \cdot 1000}{13.5'} = 123 \text{ plf}$$

$$V_{\text{ALLOW}} = 645 \text{ plf} > 123 \checkmark \text{ OK}$$

10d @ 4" ↗

$$M_{OT} = (1.65 \text{ k})(12.75') = 21.04 \text{ K-FT}$$

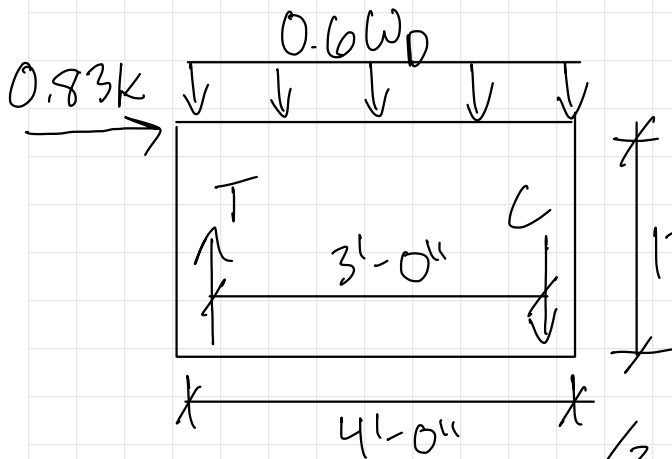
$$M_R = (0.6)(370 \text{ plf})(13.5')\left(\frac{13.5'}{2}\right) = 20.23 \text{ K-FT}$$

$$T = \frac{M_{OT} - M_R}{12.5'} = \frac{21.04 \text{ K-FT} - 20.23 \text{ K-FT}}{12.5'}$$

$$T = 0.07 \text{ K}$$

NO HOLDOWN REQ'D

WALL 2.1+2.2



$$W_D = [(20 \text{ psf})(19.75') + (10 \text{ psf})(13.5')] \\ W_D = 530 \text{ plf}$$

Aspect Ratio
 Reduction = $1.25 - 0.125 \left(\frac{13.75'}{4} \right) = 0.82$

$\sqrt{3.44:1}$ OK for blocked shear wall
 $< 3.5:1$

$$V_{\text{roof}} = \frac{0.83k \cdot 1000}{41} = 208 \text{ plf}$$

$$V_{\text{ALLOW}} = (0.82)(645 \text{ plf}) = 529 > 208 \quad \checkmark \text{ OK}$$

10d @ 4" ↗

$$M_{OT} = (0.83k)(13.75') = 11.41 \text{ K-FT}$$

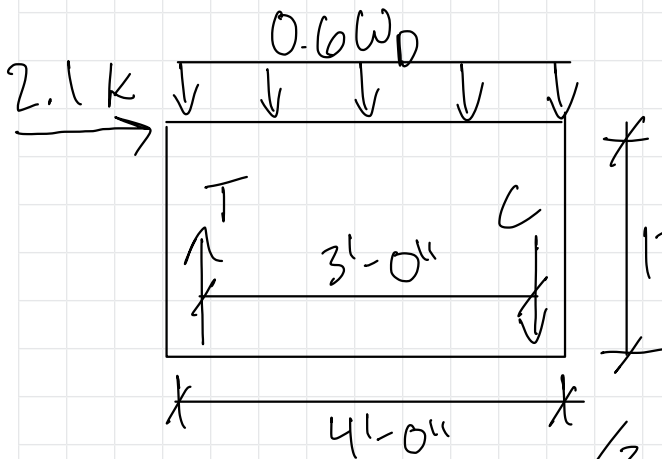
$$M_R = (0.6)(530 \text{ plf})(41') \left(\frac{41'}{2} \right) = 2.54 \text{ K-FT}$$

$$T = \frac{M_{OT} - M_R}{31} = \frac{11.41 \text{ K-FT} - 2.54 \text{ K-FT}}{31}$$

$$T = 2.96 \text{ K}$$

USE HDU 4

WALL A.1



$$W_D = [(20 \text{ psf})(11') + (10 \text{ psf})(13')] \\ W_D = 150 \text{ plf}$$

Aspect Ratio
 Reduction = $1.25 - 0.125 \left(\frac{13.75'}{4} \right) \\ = \underline{0.82}$

$\sqrt{3.44:1}$ OK for blocked shear wall
 $< 3.5:1$

$$V_{\text{roof}} = \frac{2.1 \text{ k} \cdot 1000}{4'} = 525 \text{ plf}$$

$$V_{\text{ALLOW}} = (0.82)(645 \text{ plf}) = 529 > 525 \checkmark \underline{\underline{\text{OK}}}$$

10d @ 4" ↗

$$M_{\text{OT}} = (2.1 \text{ k})(13.75') = 28.88 \text{ K-FT}$$

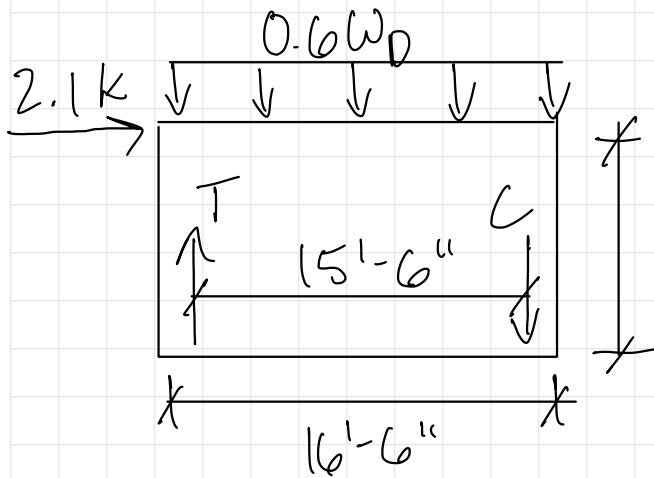
$$M_R = (0.6)(150 \text{ plf})(4') \left(\frac{4'}{2} \right) = 0.72 \text{ K-FT}$$

$$T = \frac{M_{\text{OT}} - M_R}{3'} = \frac{28.88 \text{ K-FT} - 0.72 \text{ K-FT}}{3'}$$

$$T = 9.39 \text{ K}$$

USE HDU 11

WALL B. 1°



$$W_D = [(20 \text{ psf})(1') + (10 \text{ psf})(11.5')]]$$

$$W_D = 135 \text{ plf}$$

$$V_{\text{roof}} = \frac{2.1 \text{ k} \cdot 1000}{16.5'} = 128 \text{ plf}$$

$$V_{\text{Allow}} = 645 \text{ plf} > 128 \checkmark \text{ OK}$$

10d @ 4" ↗

$$M_{OT} = (2.1 \text{ k})(11.5') = 24.2 \text{ k-FT}$$

$$M_R = (0.6)(135 \text{ plf})(11.5')\left(\frac{11.5'}{2}\right) = 5.36 \text{ k-FT}$$

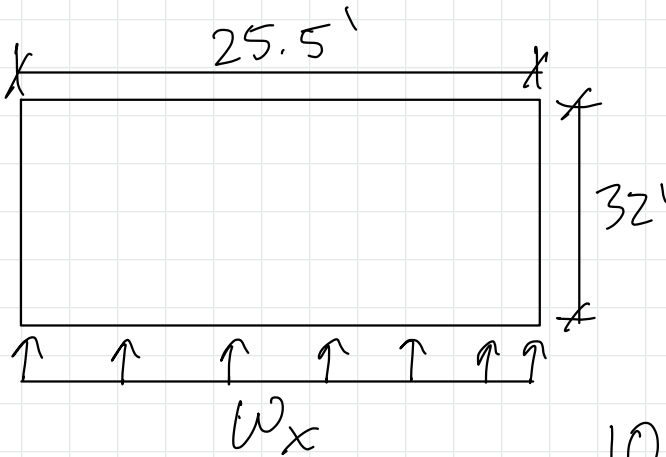
$$T = \frac{M_{OT} - M_R}{15.5'} = \frac{24.2 \text{ k-FT} - 5.36 \text{ k-FT}}{15.5'}$$

$$T = 1.22 \text{ k}$$

USE HDU 4

DIAPHRAGM CHECK:

N/S: Wind Controls

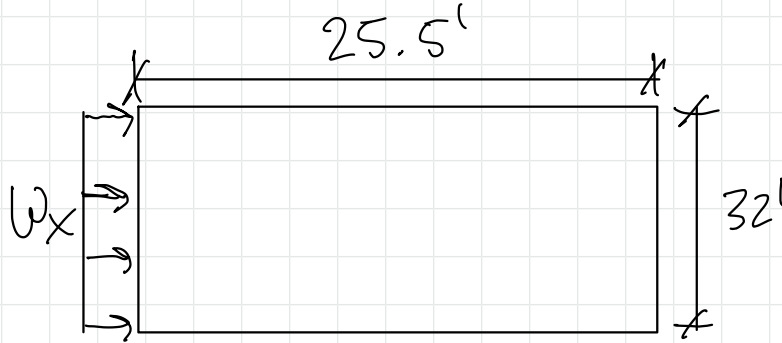


$$W = \frac{3.3k}{25.5'} = 130 \text{ PLF} < 265 \text{ PLF} \checkmark \text{ OK}$$

$$T_{\text{chord}} = \frac{(130)(25.5^2)}{8 \times 32'} = 330 \# \checkmark \text{ OK}$$

BY INSPECTION

E/W :



10d @ 6" O.C.)

$$W = \frac{4.2 \text{ k}}{32'} = 132 \text{ PLF} < 265 \text{ PLF} \checkmark \text{ OK}$$

$$T_{\text{chord}} = \frac{(132)(32^2)}{8 \times 25.5'} = 663 \# \checkmark \text{ OK}$$

BY INSPECTION

Check nailing into 1-3/4" SCL Rim:

16d Sole Nailing → 3.5" Max. Spacing w/ 1.25" max penetration

16d length = 3.5" \downarrow PL
Penetration = 3.5" - 1.5" \downarrow SH'T'G - 0.75" \downarrow SH'T'G
= 1.25" ✓ OK

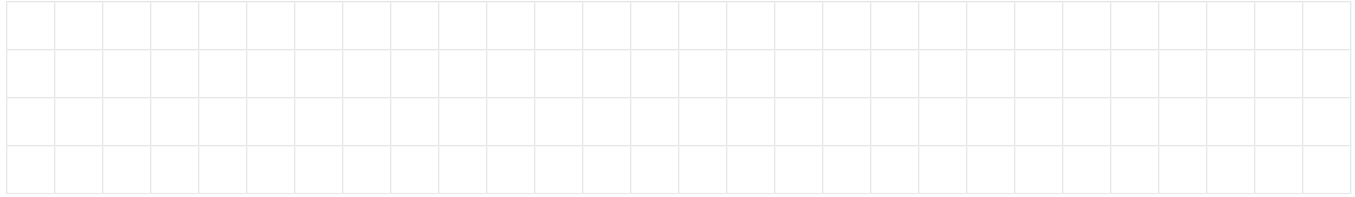
(2) Rows OK w/
1/2" stagger
Per TrusJoist Tech.
Bulletin

SEE 1/S500

SDS Sole Screws: → 6" Max. Spacing
Per TrusJoist Tech.
Bulletin

Screw spacing OK ✓
SEE 1/S500

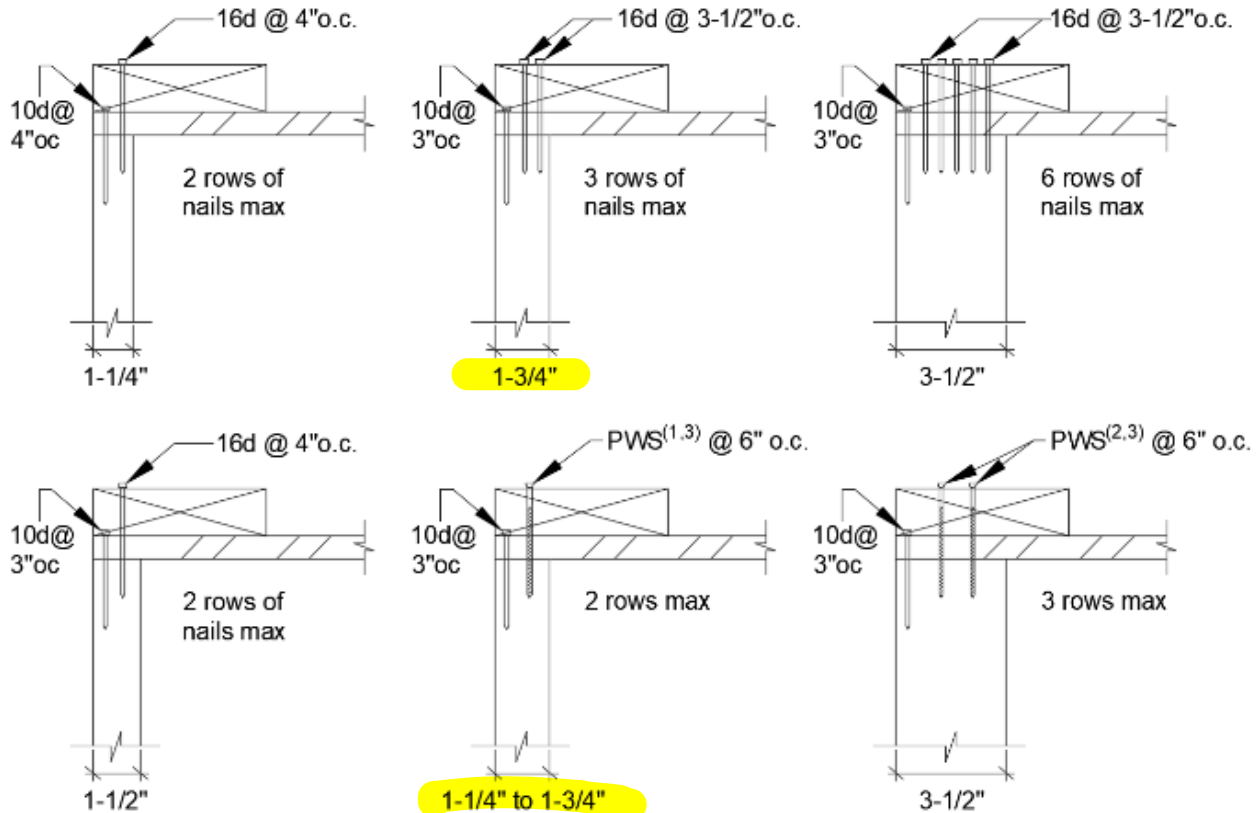
Nailing Criteria Includes Allowance
For Diaphragm Nails



Weyerhaeuser publishes two documents to help an engineer of record to correctly specify TimberStrand® LSL to avoid potential splitting and achieve lateral shear transfer.

- [ICC-ES ESR-1387](#)
- [Technical Bulletin TB-206](#)

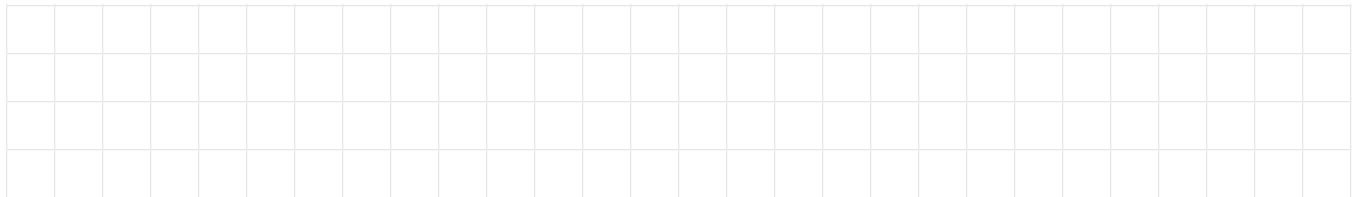
Section details below summarize the fastener minimum spacings, maximum number of rows and width requirements: (Note: PWS = Proprietary Wood Screws; 1.25" & 1.5" widths are 1.3E grade, while 1.75" & 3.5" are 1.55E grade. Minimum edge distances and spacing between rows per TB-206).



- (1) For 1-3/4" TimberStrand® LSL, a single row of Strong-Tie® SDWS Timber screws or SDWH Hex screws may be installed at 4" o.c. to attach the wall plate to rim board.
- (2) For 3-1/2" TimberStrand® LSL, two rows of Strong-Tie® SDWS Timber screws or SDWH Hex screws may be installed at 4" o.c. to attach the wall plate to rim board.
- (3) For additional information, reference Simpson Strong-Tie® engineering letter, *Sole or Top Plate to Rim/Blocking using SDWS and SDWH Screw (L-F-PLTRMBLK21)*.

Expires January 2023

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MISC DESIGN

PARAPET CHECKS

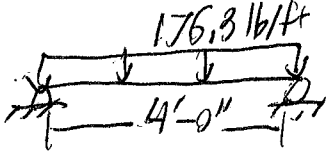
$$q_p = 32 \text{ psf} + 15 \text{ psf} = 47 \text{ psf}$$

$GC_{pn} = +1.5$ windward

$$P_p = q_p (GC_{pn}) = 47 \text{ psf} \cdot 1.5 = 70.5 \text{ psf}$$

4' 5" parapet wall height \Rightarrow 2.5' Trib to parapet wall header

$$70.5 \text{ psf} \cdot 2.5' = 176.3 \text{ plf}$$



$$M_u = 353 \text{ lb-ft} \quad N_u = 353 \text{ lb}$$

(2) 2x6 $F_b = 700 \text{ psi}$ (DF-L TA 4A NDS Supp.)

$C_D = 1.6$ (TA 2.3.2, wind) $C_M = 1.0$ (sealed inside wall, dry)

$C_t = 1.0$ (No sustained high temps) $C_L = 1.0$ (fully laterally supported w/ sheathing)

$C_F = 1.0$ (TA 4A NDS Supp.) $C_{Fu} = 1.0$ (loaded short face)

$C_i = 1.0$ (Not incised) $C_r = 1.0$ (stud header)

$$F'_b = F_b \cdot C_D \cdot C_M \cdot C_t \cdot C_L \cdot C_{Fu} \cdot C_i \cdot C_r = 700 \cdot 1.6 = 1120 \text{ psi}$$

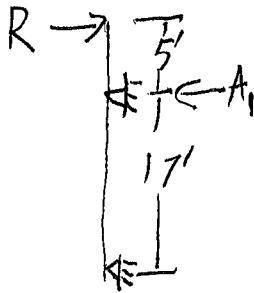
$$f_b = \frac{353 \cdot 12 \text{ in}}{2 \cdot 7.56 \text{ in}^3} = 280 \text{ psi} < 2240 \text{ psi} \checkmark$$

$$\times 2 \text{ studs} = 2240 \text{ psi}$$

S_{xx} strong axis bending

Case 4 A 35 F_t loading From SST manual = 650 lb > 353 lb \checkmark

Check SCL cal.



$R = 353 \text{ lb}$ $M_{\max} = 353 \cdot 5 = 1765 \text{ lb}\cdot\text{ft} = 21,180 \text{ lb}\cdot\text{in}$

$\frac{21,180 \text{ lb}\cdot\text{in}}{2.756 \text{ in}^3} = 1400 \text{ psi} < \frac{1700 \text{ psi}}{1.25} = 1360 \text{ psi} \checkmark$
 2720 psi

$F_b = 1700 \text{ psi}$ for 2x SCL

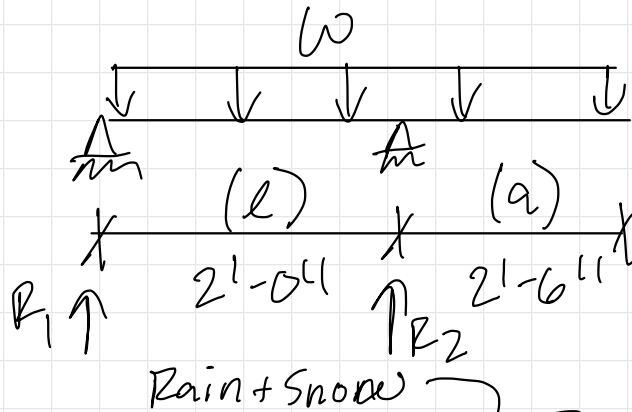
$F_b' = 1.6 \cdot 1700 \text{ psi} = 2720 \text{ psi}$

$A_1 = \frac{R}{17'} (17+5') = 457 \text{ lb}$

A35 cap. F1 Case 4 loading $\approx 650 \text{ lb}$ 2 connectors $\Rightarrow 1300 \text{ lb cap} > 457 \text{ lb demand} \checkmark$

Check Outrigger Hanger's

Trib. = 2' O.C.



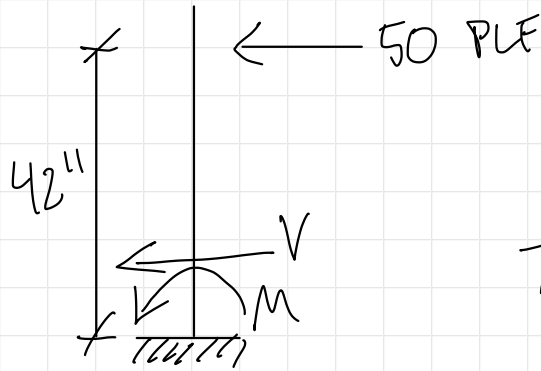
$$W = (23 \text{ PSF}) \text{ DL} + (30 \text{ PSF}) = 53 \text{ PSF}$$

$$R_1 = \frac{W}{2l} (l^2 - a^2) = \frac{53}{2 \cdot 2'} (2^2 - 2.5^2)$$

$$R_1 = -30 \# \times \overset{\text{Trib.} \downarrow}{2'} = -60 \#$$

Simpson LB uplift capacity = 380# ✓
 LB HGR OK

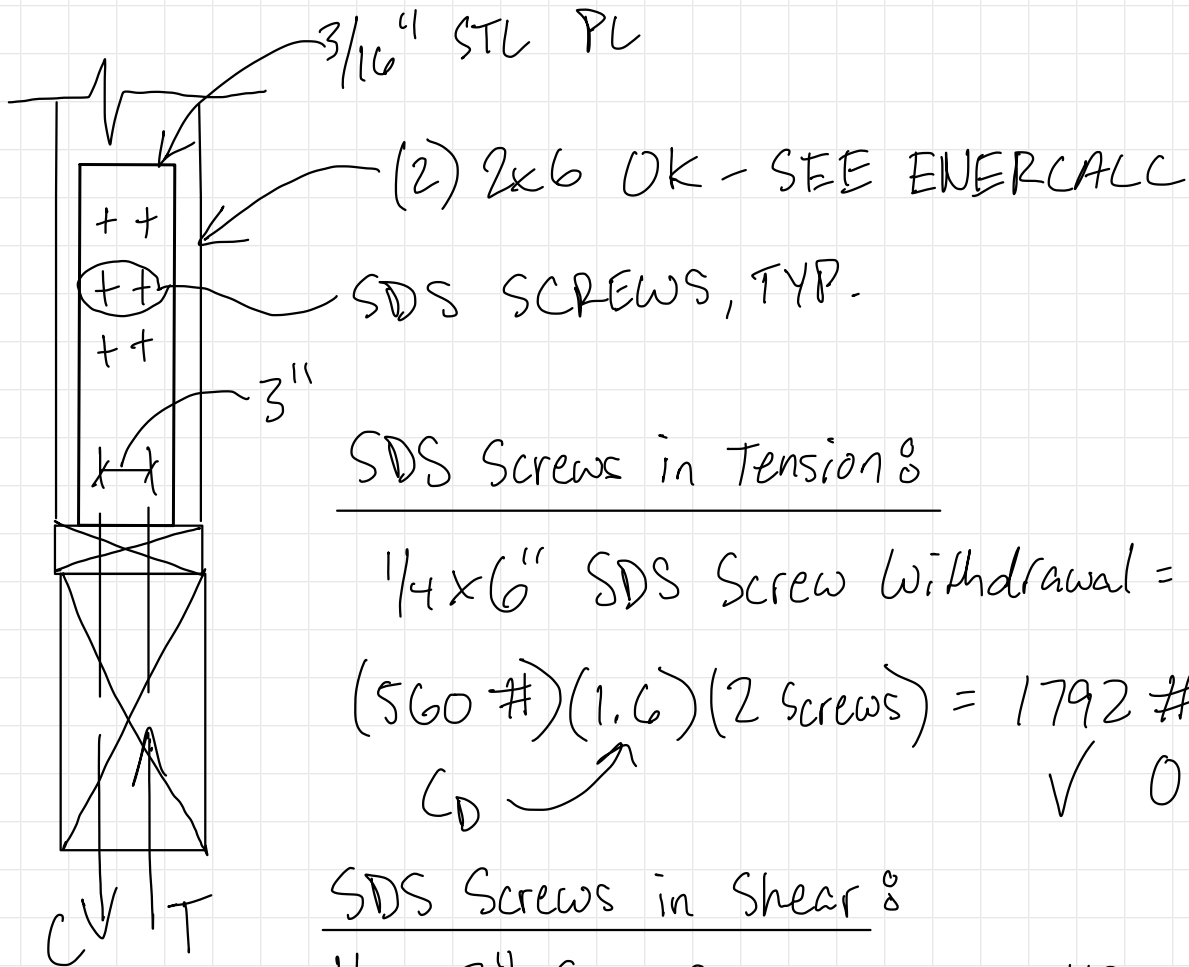
Check Partial Height Wall : AT LEVEL 4M LOFTS



$$V = (50 \text{ plf}) \left(\frac{32''}{12''} \right) = 134 \#$$

$$M = (134)(42'') = 5628 \text{ in-}\#$$

$$T = C = \frac{M}{d} = \frac{5628}{3''} = 1876 \#$$



SDS Screws in Tension :

$$\frac{1}{4} \times 6'' \text{ SDS Screw Withdrawal} = 560 \#$$

$$(560 \#)(1.6)(2 \text{ screws}) = 1792 \#$$

C_D ↗ ✓ OK

SDS Screws in Shear :

$$\frac{1}{4} \times 3'' \text{ SDS Screw Shear} = 420 \#$$

$$(420 \#)(1.6)(3 \text{ screws}) = 2016 \# \checkmark \text{ OK}$$

check shear in diaphragm nailing

48" Tributary to each guard post

(2) 10d @ 6" spacing $\frac{48"}{3"} = 16$ nails $\frac{3}{4}"$ thick Diaphragm STTG

10d common nails ($D = 0.198"$)

$$Z = 105 \text{ lb (TA 12N NDS)}$$

$$Z' = 2 \cdot C_b \cdot C_m \cdot C_t \cdot C_g \cdot C_A \cdot C_{eg} \cdot C_{di} \cdot C_{tn} = 105 \text{ lb}$$

$$C_b, C_m, C_t, C_g, C_{tn} = 1.0 \text{ (see prev. calc)}$$

$$C_g = 1.0 \text{ (} D < 1/4", 11.3.6 \text{ NDS)} \quad C_A = 1.0 \text{ (} D < 1/4", \text{ NDS } 12.5.1)$$

$$C_{di} = 1.0 \text{ (Don't use diaphragm factor)}$$

$$\text{Total capacity} = 16 \cdot 105 \text{ lb} = 1680 \text{ LB} > 1066.7 \text{ LB} \quad \checkmark$$

Z (12d common nail, $D = 0.148"$) side member I-joist flange = $1-1/2"$

$Z = 118 \text{ (DF}_{12} \text{ATA 12N)}$ $Z' = Z = 118 \text{ lb}$ $\frac{48"}{16"} = 3$ $\cdot 2$ nails per joist = 6 nails
 48" Tribj (2) 12d nails spaced at 16" O.C for each Joist

$$\frac{48"}{16"} = 3 \quad 3 \cdot 2 \text{ nails per joist} = 6 \text{ nails}$$

$$12d \text{ nail cap} = 6 \cdot 118 \text{ lb} = 708 \text{ lb}$$

A35 connector case 4 loading spaced at 16" O.C \Rightarrow 6 A35 connections

From SST conn. Table A35 cap. = 590 lb (Top is restrained to protect against loads in both directions)

$$6 \cdot 590 \text{ lb} = 3540 \text{ lb} > 1066.7 \text{ LB}$$

Wood Column

Project File: Out of Plane Beam Calc.ec6

LIC# : KW-06014122, Build:20.23.08.30

PCS STRUCTURAL SOLUTIONS

(c) ENERCALC INC 1983-2023

DESCRIPTION: Partial Height Wall

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : IBC 2018

General Information

| | | | |
|--|-------------------------|---------------------|--|
| Analysis Method | Allowable Stress Design | Wood Section Name | 2-2x6 |
| End Fixities | Top Free, Bottom Fixed | Wood Grading/Manuf. | Graded Lumber |
| Overall Column Height | 4 ft | Wood Member Type | Sawn |
| <i>(Used for non-slender calculations)</i> | | | |
| Wood Species | Douglas Fir-Larch | Exact Width | 3.0 in |
| Wood Grade | No.2 | Exact Depth | 5.50 in |
| Fb + | 900 psi | Area | 16.50 in ² |
| Fb - | 900 psi | Ix | 41.594 in ⁴ |
| Fc - Prll | 1350 psi | Iy | 12.375 in ⁴ |
| Fc - Perp | 625 psi | | |
| E : Modulus of Elasticity . . . | x-x Bending | y-y Bending | Axial |
| | Basic | 1600 | 1600 |
| | Minimum | 580 | 580 |
| | | | 1600 ksi |
| | | | Column Buckling Condition: |
| | | | ABOUT X-X Axis: Lux = 4 ft, Kx = 2.1 |
| | | | Fully braced against buckling ABOUT Y-Y Axis |

Applied Loads

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

Column self weight included : 14.305 lbs * Dead Load Factor

BENDING LOADS . . .

Lat. Point Load at 3.50 ft creating Mx-x, L = 0.20 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.4818 : 1**
 Load Combination +D+L
 Governing NDS Formula Comp + Mxx, NDS Eq. 3.9-3
 Location of max.above base 0.0 ft
 At maximum location values are .
 Applied Axial 0.01431 k
 Applied Mx -0.70 k-ft
 Applied My 0.0 k-ft
 Fc : Allowable 1,002.62 psi

Maximum SERVICE Lateral Load Reactions . .
 Top along Y-Y 0.0 k Bottom along Y-Y 0.20 k
 Top along X-X 0.0 k Bottom along X-X 0.0 k

Maximum SERVICE Load Lateral Deflections . . .
 Along Y-Y 0.08969 in at 4.0 ft above base
 for load combination : +D+L
 Along X-X 0.0 in at 0.0 ft above base
 for load combination : n/a

PASS Maximum Shear Stress Ratio = **0.1010 : 1**
 Load Combination +D+L
 Location of max.above base 3.490 ft
 Applied Design Shear 27.273 psi
 Allowable Shear 180.0 psi

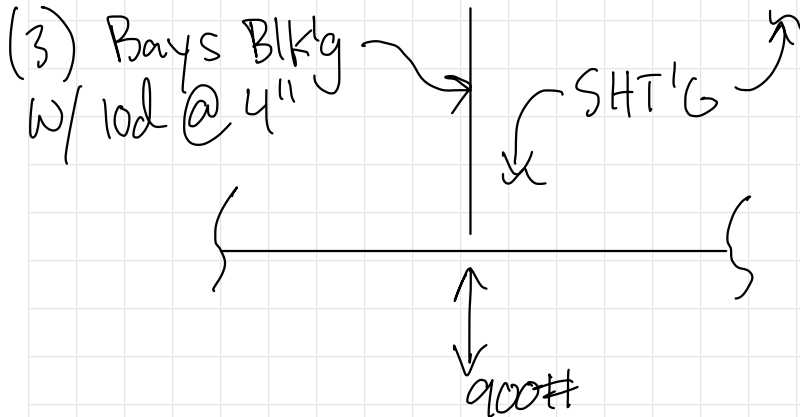
Other Factors used to calculate allowable stresses . . .
 Bending Compression Tension

Maximum Reactions

Note: Only non-zero reactions are listed.

| Load Combination | X-X Axis Reaction | | k | Y-Y Axis Reaction | | Axial Reaction | My - End Moments | | Mx - End Moments | |
|------------------|-------------------|-------|---|-------------------|-------|----------------|------------------|-------|------------------|-------|
| | @ Base | @ Top | | @ Base | @ Top | | @ Base | @ Top | @ Base | @ Top |
| D Only | | | | | | 0.014 | | | | |
| +D+L | | | | 0.200 | | 0.014 | | | | 0.700 |
| +D+0.750L | | | | 0.150 | | 0.014 | | | | 0.525 |
| +0.60D | | | | | | 0.009 | | | | |
| L Only | | | | 0.200 | | | | | | 0.700 |

Check Blocking/Diaphragm @ Bolt-On Balc.:



Joist Spacing = 16" O.C.

(3) Bays @ 16" = 48" / 4" Nail spacing = 12 Nails

10d Nail = 105 # (NDS Table 12N)
 (All CFACTORS = 1.0)

Total Capacity = (12)(105#) = 1260# > 900#

✓ OK

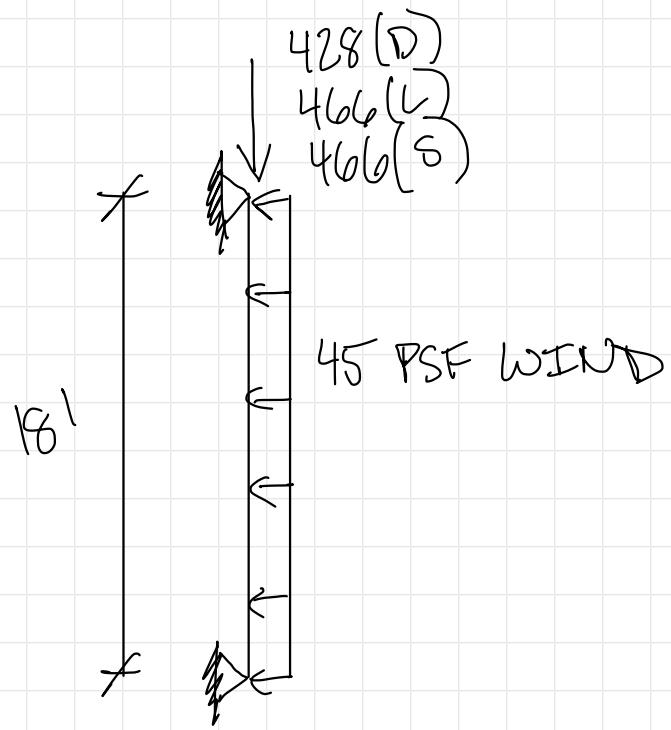
Diaphragm Capacity = 240 plf

Demand = (900# / 4') = 225 plf < 240 plf ✓

Diaphragm OK

Check Studs Out-Of-Plane

GEOMETRY AND LOADING REPRESENTS WORST CASE STUD LOADING AND HEIGHT - WALL TYPE 7



Wall Type 7 OK ✓

Reaction at Top/Base = 540 lbs / 2 studs
 = 270 lbs per stud

IBC Min. Nailing = (2) 16d (0.162") END NAIL

(2) 16d cap. = (1.6)(141)(2) = 451 lbs > 270 lbs ✓

Reaction @ Top/Base OK



Project: Mercer Island Job Number: 19-028

Sheet: 1 of Name: AK

Originating Office: Seattle Date: 12/07/22

STUD WALL DESIGN - C.2

2018 NDS/2018 IBC

WALL DATA

| | | | | | | | |
|---------------------|----------|-----------------|-----------------------|-------------|------------------------|------------------|-------------|
| LUMBER TYPE: | | DF#2 | APPLIED LOADS: | | $P_{DEAD} =$ | 428 | LBS |
| $F_b =$ | 900 | PSI | $W_{WIND} =$ | 45.0 | $P_{LIVE} =$ | 466 | LBS |
| $F_c =$ | 1350 | PSI | $W_{SEISMIC} =$ | 5.0 | $P_{SNOW} =$ | 466 | LBS |
| $F_{c\perp} =$ | 625 | PSI | | | $P_{WIND} =$ | 0 | LBS |
| $E =$ | 1.60E+06 | PSI | | | $P_{SEISMIC} =$ | 0 | LBS |
| STUD SIZE: | | (2) 2x6 | MISCELLANEOUS: | | HEIGHT = | 18 | FT |
| $A_x =$ | 16.50 | IN ² | | | SPACING = | 16 | IN |
| $S_x =$ | 15.13 | IN ³ | | | ECCENTRICITY = | 0.1 | IN |
| $I_x =$ | 41.59 | IN ⁴ | | | $C_{F(Compression)} =$ | 1.10 | (NDS 4.3.6) |
| $C_{F(BENDING)} =$ | 1.3 | (NDS 4.3.6) | | | APPLY? | | |
| $F_{cE} =$ | 311.2 | PSI | $C_{SYS(BENDING)} =$ | 1.35 | YES | (SDPWS T3.1.1.1) | |
| $C_b =$ | 1.13 | (NDS 3.10.4) | $C_{F(BENDING)} =$ | 1.15 | YES | (NDS 4.3.9) | |

LOAD CASES - IBC 1605.3.1

| | | | |
|--------|---|--------|--|
| CASE 1 | DEAD + LIVE + 5 PSF LAT. | CASE 4 | DEAD + 0.45WIND + 0.75LIVE + 0.75SNOW |
| CASE 2 | DEAD + SNOW + 5 PSF LAT. | CASE 5 | DEAD + 0.60WIND |
| CASE 3 | DEAD + 0.75LIVE + 0.75SNOW + 5 PSF LAT. | CASE 6 | DEAD + 0.75SEISMIC |
| | | CASE 7 | DEAD + 0.53SEISMIC + 0.75LIVE + 0.75SNOW |

ALLOWABLE STRESSES - C_d PER NDS T2.3.2, C_p PER NDS 3.7.1, ASSUME $C_m, C_t, C_i, C_L = 1.0$

| CASE | C_D | F_c^* | F_{cE}/F_c^* | C_P | F_c' | F_b' | $F_{c\perp}$ |
|-------|-------|---------|----------------|-------|--------|--------|--------------|
| 1 | 1.00 | 1485 | 0.21 | 0.200 | 296 | 1346 | 703 |
| 2 & 3 | 1.15 | 1708 | 0.18 | 0.175 | 299 | 1547 | 703 |
| 4 & 5 | 1.60 | 2376 | 0.13 | 0.127 | 302 | 2527 | 703 |
| 6 & 7 | 1.60 | 2376 | 0.13 | 0.127 | 302 | 2153 | 703 |

APPLIED STRESSES - NDS CHAPTER 3 DESIGN EQUATIONS

| CASE | $P_{APPLIED}$ | F_c | $M_{LAT. LOAD}$ | $M_{ECC.}$ | M_{TOTAL} | F_b |
|------|---------------|-------|-----------------|------------|-------------|-------|
| 1 | 894 | 54 | 270 | 7 | 275 | 218 |
| 2 | 894 | 54 | 270 | 7 | 275 | 218 |
| 3 | 1127 | 68 | 270 | 9 | 276 | 219 |
| 4 | 1127 | 68 | 1094 | 9 | 1099 | 872 |
| 5 | 428 | 26 | 1458 | 4 | 1460 | 1159 |
| 6 | 428 | 26 | 189 | 4 | 191 | 152 |
| 7 | 1127 | 68 | 143 | 9 | 149 | 118 |

DESIGN CHECKS - COMBINED STRESS CHECK PER NDS EQN 3.9-3

| CASE | F_c/F_c' | F_b/F_b' | $F_c/F_{c\perp}$ | Combined | F_c/F_{cE} | Deflection | L/? |
|------------|-------------|-------------|------------------|-------------|--------------|-------------|--------------|
| 1 | 0.18 | 0.16 | 0.08 | 0.23 | 0.17 | 0.24 | L/897 |
| 2 | 0.18 | 0.14 | 0.08 | 0.20 | 0.17 | 0.24 | L/897 |
| 3 | 0.23 | 0.14 | 0.10 | 0.23 | 0.22 | 0.24 | L/893 |
| 4* | 0.23 | 0.35 | 0.10 | 0.49 | 0.22 | 0.50 | L/432 |
| 5* | 0.09 | 0.46 | 0.04 | 0.51 | 0.08 | 0.66 | L/326 |
| 6 | 0.09 | 0.07 | 0.04 | 0.08 | 0.08 | 0.17 | L/1289 |
| 7 | 0.23 | 0.05 | 0.10 | 0.12 | 0.22 | 0.13 | L/1655 |
| MAX. ----> | 0.23 | 0.46 | 0.10 | 0.51 | 0.22 | 0.66 | L/326 |
| | O.K. | O.K. | O.K. | O.K. | O.K. | | |

* Deflections reduced by 0.42 per IBC Table 1604.3 footnote f. Increase deflection by 1.4 for jambs supporting glass.

PLATE BENDING - *ALIGN STUDS WITH JOISTS WHERE POSSIBLE*

MISCELLANEOUS:

$C_{Fu} =$ 1.15 (NDS 4.3.7)
 $F_v =$ **150** PSI

ALLOWABLE STRESSES:

$F_v' =$ 173 PSI
 $F_b' =$ 1547 PSI

STUD REACTIONS (OUT - OF - PLANE)

540 LB

DBL TOP PLATE PROPERTIES:

$A_x =$ 16.50 IN²
 $S_x =$ 4.13 IN³
 $I_x =$ 3.09 IN⁴

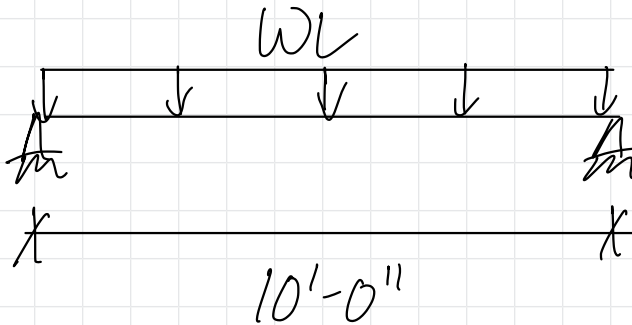
APPLIED STRESSES:

$F_v =$ **54** PSI <--- O.K.
 $F_b =$ **867** PSI <--- O.K.
 $\Delta_{MAX} =$ **0.015** IN

Check Worst Case BM Out-of-Plane:

Trib. = $\frac{18'}{2} = 9'$

Wind Area = 90 sf $\xrightarrow{\text{use}}$ 50 sf
 Pressures
 (Conservative)



$WL = (9')(31 \text{ PSF}) = 279 \text{ PLF}$

See Enercalc Report

6x10 or 5-1/4 x 9 1/2 SCL OK

Wood Beam

Project File: Out of Plane Beam Calc.ec6

LIC# : KW-06014122, Build:20.22.10.25

PCS STRUCTURAL SOLUTIONS

(c) ENERCALC INC 1983-2022

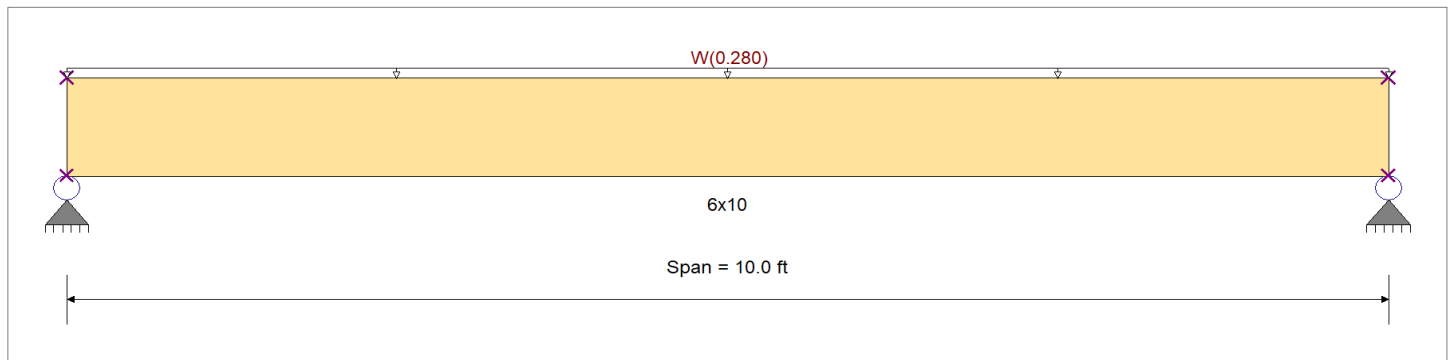
DESCRIPTION: Solid Sawn BM

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : IBC 2015

Material Properties

| | | | |
|---|-----------|-------------|---------------------------|
| Analysis Method : Allowable Stress Design | Fb + | 1,350.0 psi | E : Modulus of Elasticity |
| Load Combination : IBC 2015 | Fb - | 1,350.0 psi | Ebend- xx |
| | Fc - Prll | 925.0 psi | Eminbend - xx |
| Wood Species : Douglas Fir-Larch | Fc - Perp | 625.0 psi | |
| Wood Grade : No.1 | Fv | 170.0 psi | Density |
| Beam Bracing : Completely Unbraced | Ft | 675.0 psi | 31.210pcf |



Applied Loads

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

Beam self weight NOT internally calculated and added
 Loads on all spans...
 Uniform Load on ALL spans : W = 0.280 k/ft

DESIGN SUMMARY

Design OK

| | | | | | |
|-------------------------------------|----------|----------------|-----------------------------------|-------|------------------|
| Maximum Bending Stress Ratio | = | 0.143 1 | Maximum Shear Stress Ratio | = | 0.075 : 1 |
| Section used for this span | | 6x10 | Section used for this span | | 6x10 |
| fb: Actual | = | 304.61 psi | fv: Actual | = | 20.42 psi |
| F'b | = | 2,130.74 psi | F'v | = | 272.00 psi |
| Load Combination | | +0.60W | Load Combination | | +0.60W |
| Location of maximum on span | = | 5.000ft | Location of maximum on span | = | 0.000 ft |
| Span # where maximum occurs | = | Span # 1 | Span # where maximum occurs | = | Span # 1 |
| Maximum Deflection | | | | | |
| Max Downward Transient Deflection | 0.101 in | Ratio = | 1190 | >=360 | Span: 1 : W Only |
| Max Upward Transient Deflection | 0 in | Ratio = | 0 | <360 | n/a |
| Max Downward Total Deflection | 0.060 in | Ratio = | 1984 | >=180 | Span: 1 : +0.60W |
| Max Upward Total Deflection | 0 in | Ratio = | 0 | <180 | n/a |

Maximum Forces & Stresses for Load Combinations

| Load Combination | Segment Length | Span # | Max Stress Ratios | | | | | | | | Moment Values | | | Shear Values | | | | |
|------------------|------------------|--------|-------------------|-------|------|------|----------------|------|----------------|-----------------|----------------|----------------|------|--------------|---------|------|------|-------|
| | | | M | V | CD | CM | C _t | CLx | C _F | C _{fu} | C _i | C _r | M | fb | F'b | V | fv | F'v |
| | Length = 10.0 ft | 1 | | | 0.90 | 1.00 | 1.00 | 0.99 | 1.000 | 1.00 | 1.00 | 1.00 | | | 0.0 | 0.00 | 0.0 | 0.0 |
| +0.60W | | | | | | 1.00 | 1.00 | 0.99 | 1.000 | 1.00 | 1.00 | 1.00 | | | 0.0 | 0.00 | 0.0 | 0.0 |
| | Length = 10.0 ft | 1 | 0.143 | 0.075 | 1.60 | 1.00 | 1.00 | 0.99 | 1.000 | 1.00 | 1.00 | 1.00 | 2.10 | 304.6 | 2,130.7 | 0.71 | 20.4 | 272.0 |
| +0.450W | | | | | | 1.00 | 1.00 | 0.99 | 1.000 | 1.00 | 1.00 | 1.00 | | | 0.0 | 0.00 | 0.0 | 0.0 |
| | Length = 10.0 ft | 1 | 0.107 | 0.056 | 1.60 | 1.00 | 1.00 | 0.99 | 1.000 | 1.00 | 1.00 | 1.00 | 1.58 | 228.5 | 2,130.7 | 0.53 | 15.3 | 272.0 |

Overall Maximum Deflections

| Load Combination | Span | Max. "-" Defl | Location in Span | Load Combination | Max. "+" Defl | Location in Span |
|------------------|------|---------------|------------------|------------------|---------------|------------------|
| W Only | 1 | 0.1008 | 5.036 | | 0.0000 | 0.000 |

Project Title: Mercer Island Mixed Use
Engineer: AED
Project ID: 19028
Project Descr:

Wood Beam

Project File: Out of Plane Beam Calc.ec6

LIC# : KW-06014122, Build:20.22.10.25

PCS STRUCTURAL SOLUTIONS

(c) ENERCALC INC 1983-2022

DESCRIPTION: Solid Sawn BM

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

| Load Combination | Support 1 | Support 2 |
|-------------------------------------|-----------|-----------|
| Max Upward from all Load Conditions | 1.400 | 1.400 |
| Max Upward from Load Combinations | 0.840 | 0.840 |
| Max Upward from Load Cases | 1.400 | 1.400 |
| +0.60W | 0.840 | 0.840 |
| +0.450W | 0.630 | 0.630 |
| W Only | 1.400 | 1.400 |

Wood Beam

Project File: Out of Plane Beam Calc.ec6

LIC#: KW-06014122, Build:20.22.10.25

PCS STRUCTURAL SOLUTIONS

(c) ENERCALC INC 1983-2022

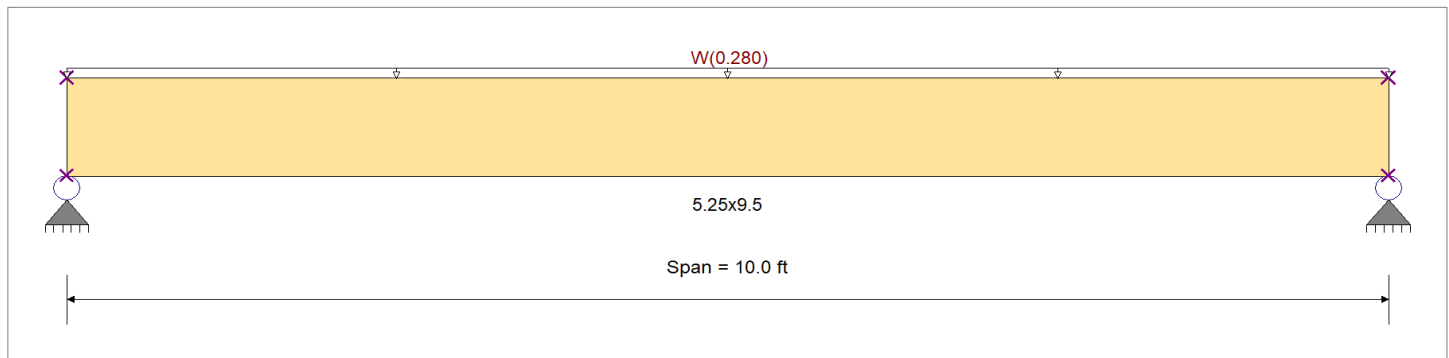
DESCRIPTION: SCL BM B8

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : IBC 2015

Material Properties

| | | | |
|---|-----------|-------------|---------------------------|
| Analysis Method : Allowable Stress Design | Fb + | 2,400.0 psi | E : Modulus of Elasticity |
| Load Combination : IBC 2015 | Fb - | 2,400.0 psi | Ebend- xx |
| | Fc - Prll | 2,500.0 psi | Eminbend - xx |
| Wood Species : iLevel Truss Joist | Fc - Perp | 425.0 psi | |
| Wood Grade : Parallam PSL 1.8E | Fv | 190.0 psi | Density |
| Beam Bracing : Completely Unbraced | Ft | 1,755.0 psi | 45.070pcf |



Applied Loads

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

Beam self weight NOT internally calculated and added
 Loads on all spans...
 Uniform Load on ALL spans : W = 0.280 k/ft

DESIGN SUMMARY

Design OK

| | | | | | | | |
|-------------------------------------|---|-----------------|---------|-----------------------------------|-------|------------------|-----|
| Maximum Bending Stress Ratio | = | 0.085 | 1 | Maximum Shear Stress Ratio | = | 0.070 | : 1 |
| Section used for this span | | 5.25x9.5 | | Section used for this span | | 5.25x9.5 | |
| fb: Actual | = | 319.11 psi | | fv: Actual | = | 21.39 psi | |
| F'b | = | 3,771.87 psi | | F'v | = | 304.00 psi | |
| Load Combination | | +0.60W | | Load Combination | | +0.60W | |
| Location of maximum on span | = | 5.000ft | | Location of maximum on span | = | 0.000ft | |
| Span # where maximum occurs | = | Span # 1 | | Span # where maximum occurs | = | Span # 1 | |
| Maximum Deflection | | | | | | | |
| Max Downward Transient Deflection | | 0.094 in | Ratio = | 1278 | >=360 | Span: 1 : W Only | |
| Max Upward Transient Deflection | | 0 in | Ratio = | 0 | <360 | n/a | |
| Max Downward Total Deflection | | 0.056 in | Ratio = | 2130 | >=180 | Span: 1 : +0.60W | |
| Max Upward Total Deflection | | 0 in | Ratio = | 0 | <180 | n/a | |

Maximum Forces & Stresses for Load Combinations

| Load Combination | Segment Length | Span # | Max Stress Ratios | | | | | | | | Moment Values | | | Shear Values | | | | |
|------------------|------------------|--------|-------------------|-------|------|------|----------------|------|----------------|-----------------|----------------|----------------|------|--------------|---------|------|------|-------|
| | | | M | V | CD | CM | C _t | CLx | C _F | C _{fu} | C _i | C _r | M | fb | F'b | V | fv | F'v |
| | Length = 10.0 ft | 1 | | | 0.90 | 1.00 | 1.00 | 0.99 | 1.000 | 1.00 | 1.00 | 1.00 | | | 0.0 | 0.00 | 0.0 | 0.0 |
| +0.60W | | | | | | 1.00 | 1.00 | 0.99 | 1.000 | 1.00 | 1.00 | 1.00 | | | 0.0 | 0.00 | 0.0 | 0.0 |
| | Length = 10.0 ft | 1 | 0.085 | 0.070 | 1.60 | 1.00 | 1.00 | 0.98 | 1.000 | 1.00 | 1.00 | 1.00 | 2.10 | 319.1 | 3,771.9 | 0.71 | 21.4 | 304.0 |
| +0.450W | | | | | | 1.00 | 1.00 | 0.98 | 1.000 | 1.00 | 1.00 | 1.00 | | | 0.0 | 0.00 | 0.0 | 0.0 |
| | Length = 10.0 ft | 1 | 0.063 | 0.053 | 1.60 | 1.00 | 1.00 | 0.98 | 1.000 | 1.00 | 1.00 | 1.00 | 1.58 | 239.3 | 3,771.9 | 0.53 | 16.0 | 304.0 |

Overall Maximum Deflections

| Load Combination | Span | Max. "-" Defl | Location in Span | Load Combination | Max. "+" Defl | Location in Span |
|------------------|------|---------------|------------------|------------------|---------------|------------------|
| W Only | 1 | 0.0939 | 5.036 | | 0.0000 | 0.000 |

Project Title: Mercer Island Mixed Use
Engineer: AED
Project ID: 19028
Project Descr:

Wood Beam

Project File: Out of Plane Beam Calc.ec6

LIC# : KW-06014122, Build:20.22.10.25

PCS STRUCTURAL SOLUTIONS

(c) ENERCALC INC 1983-2022

DESCRIPTION: SCL BM

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

| Load Combination | Support 1 | Support 2 |
|-------------------------------------|-----------|-----------|
| Max Upward from all Load Conditions | 1.400 | 1.400 |
| Max Upward from Load Combinations | 0.840 | 0.840 |
| Max Upward from Load Cases | 1.400 | 1.400 |
| +0.60W | 0.840 | 0.840 |
| +0.450W | 0.630 | 0.630 |
| W Only | 1.400 | 1.400 |

| | | | |
|----------|-------------------------|----------|-----------|
| Job: | MERCER ISLAND MIXED USE | Job No.: | 19-028 |
| Subject: | TOWNHOUSE SNOW DRIFT | Date: | 9/28/2021 |
| | | By: | AED |

**Per ASCE 7-10-Code for Buildings with Flat or Low Slope Roofs (<= 5 deg. or 1 in./ft.)
for Balanced Snow, Drift, and Rain-on-Snow Surcharge Loadings**

➔ **Input Data:**

| | |
|------------------------------|-----------|
| Building Risk Category = | II |
| Ground Snow Load, p_g = | 20.00 psf |
| Roof Snow P_f = | 14.00 psf |
| Length of High Roof, L_u = | 24.00 ft |
| Length of Low Roof, L_L = | 24.00 ft |
| Obstruction Height, h_o = | 2.00 ft |
| Exposure Factor, C_e = | 1 |
| Thermal Factor, C_t = | 1 |

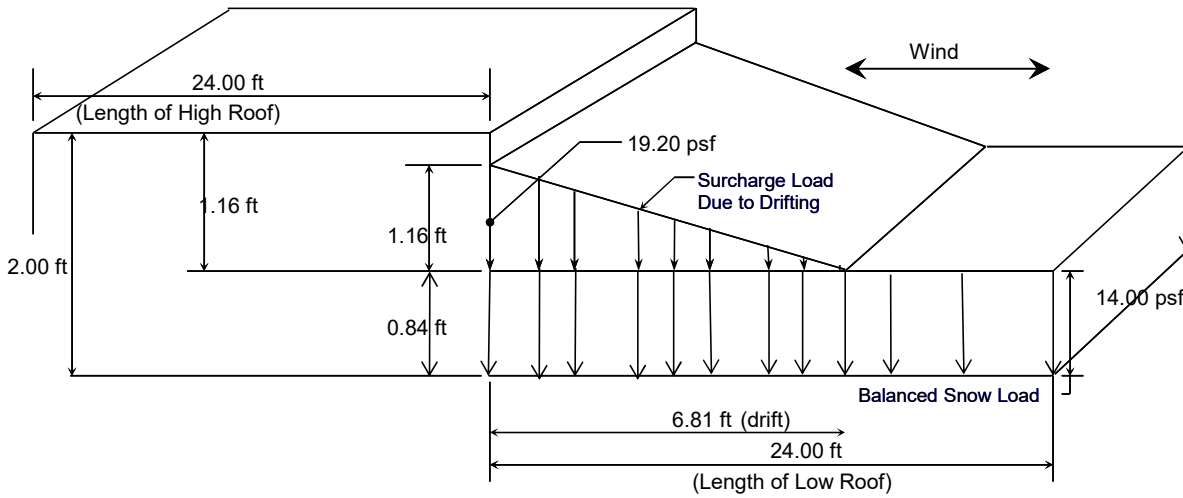
Table 1.5-1, page 2
 Figure 7-1, page 32 and Table 7-1, page 30, (Verify w/ local jurisdiction)
 As per local jurisdiction
 Length of Roof Upwind of the Snow Drift
 Length of Roof Downwind of the Snow Drift
 High Roof - Low Roof Elevations
 Table 7-2, page 30
 Table 7-3, page 30

➔ **Results:**

| | |
|-----------------------------------|-----------|
| Importance Factor, I_s = | 1.00 |
| Snow Density, g = | 16.60 pcf |
| Flat Roof Snow Load, p_f = | 14.00 psf |
| $P_{f(USE)}$ = | 14.00 psf |
| Balanced Snow Load Ht., h_b = | 0.84 ft |
| Clear Height, h_c = | 1.16 ft |
| Leeward Drift Height, h_{dL} = | 1.40 ft |
| Windward Drift Height, h_{dW} = | 1.05 ft |
| Design Drift Height, h_d = | 1.16 ft |
| Ratio, h_c/h_b = | 1.37 |
| Drift Length, w = | 6.81 ft |
| Drift Length, $w_{(MAX)}$ = | 9.25 ft |
| Drift Length, $w_{(USE)}$ = | 6.81 ft |
| Wt. of Drift at High End, p_d = | 19.20 psf |
| *Total Snow Load, $p_{(TOTAL)}$ = | 33.20 psf |

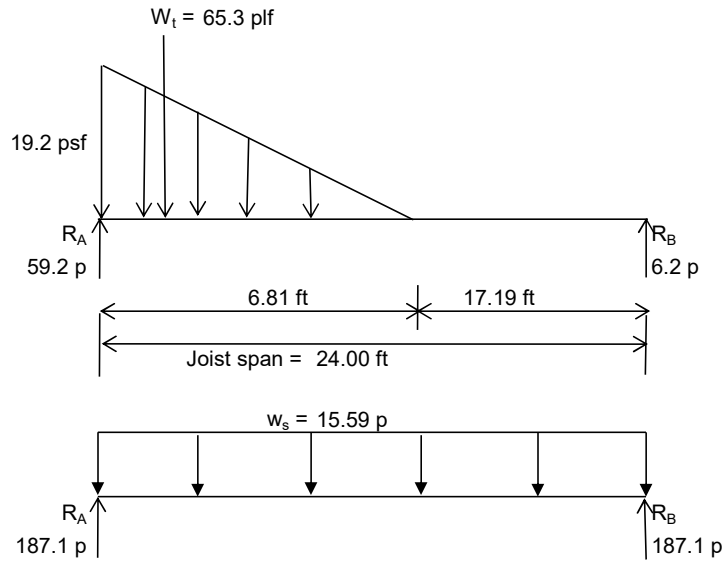
Table 1.5-2, page 5
 $g = 0.13 * p_g + 14 \leq 30$ (Eqn. 7.7-1, page 33)
 $p_f = 0.7 * C_e * C_t * I_s * p_g$ (Eqn. 7.3-1, page 29)
 $P_{f(USE)}$ = maximum of: p_f or p_f
 $h_b = p_{f(USE)} / g$ (Section 7.1, page 29)
 $h_c = h_o - h_b \geq 0$ (Section 7.1, page 29)
 $h_{dL} = 0.43 * L_u^{1/3} * (p_g + 10)^{1/4 - 1.5}$, with $L_u \geq 20'$ (Figure 7-9)
 $h_{dW} = 0.75 * (0.43 * L_L^{1/3} * (p_g + 10)^{1/4 - 1.5})$, with $L_L \geq 20'$
 h_d = minimum of: (maximum of: (h_{dL} or h_{dW})) or h_c
 If $h_c/h_b \geq 0.2$, then snow drifts are required to be applied
 If $h_d \leq h_c$: $w = 4 * h_d$, if $h_d > h_c$: $w = 4 * h_d^2 / h_c$ (Sect. 7.7.1)
 $w_{(MAX)}$ = minimum of: $8 * h_c$ or L_L
 $w_{(USE)}$ = minimum of: w or $w_{(MAX)}$
 $p_d = h_d * g$ (maximum value)
 $p_{(TOTAL)} = p_{f(USE)} + p_d$

| | | | |
|----------|-------------------------|----------|-----------|
| Job: | MERCER ISLAND MIXED USE | Job No.: | 19-028 |
| Subject: | TOWNHOUSE SNOW DRIFT | Date: | 9/28/2021 |
| | | By: | AED |



Configuration of Snow Drift on Lower Roof

➔ **Equivalent uniform load on low roof joist due to snow drift:**



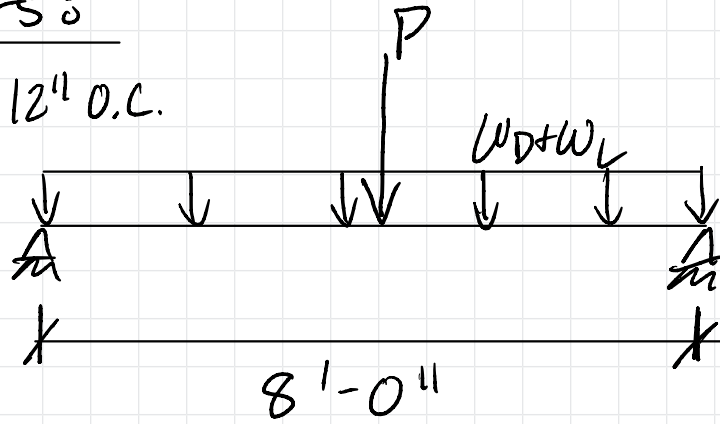
| | |
|---|------------|
| Location of max. moment, L_i = | 4.71 ft |
| Maximum moment, M_{max} = | 114.80 pft |
| Equivalent uniform load due to drift, w_e = | 1.59 psf |
| Total snow load on joist, w_s = | 15.59 psf |

WOOD STAIR DETAILS

Stair Details

Stringers

Spaced @ 12" O.C.



Case 1

$$W_D = 25 \text{ PSF} \times (1') = 25 \text{ PLF}$$

$$W_L = 100 \text{ PSF} \times (1') = 100 \text{ PLF}$$

$$M_{\max} = \frac{wl^2}{8} = 1000 \text{ FT-lbs} = 12,000 \text{ in-lbs}$$

$$V_{\max} = \frac{wl}{2} = 500 \text{ lbs}$$

Case 2

$$P = 300 \#$$

$$M_{\max} = \frac{Pl}{4} = 600 \text{ ft-lbs}$$

$$V_{\max} = 150 \text{ lbs}$$

∴ Case 1 Controls

2x12 SCL Stringer w/ 2x6 Strongbacks

$$F_b = 1700 \text{ PSI}$$

All adjustment factors = 1.0

2x12 SCL Stringer is notched, so analyze as (2) 2x6 SCL Members

$$S = 2 \times 7.56 = 15.12 \text{ in}^3$$

$$F_b = \frac{12,000}{15.12} = 794 \text{ PSI} < 1700 \text{ PSI}$$

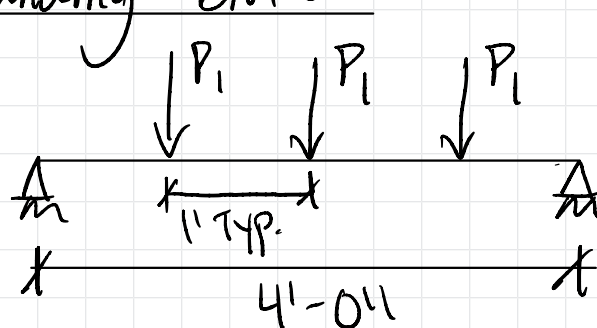
✓ OK

Check Simpson Hanger :

$$\text{HUC26-2 Capacity} = 1,190 \# > 500 \#$$

✓ OK

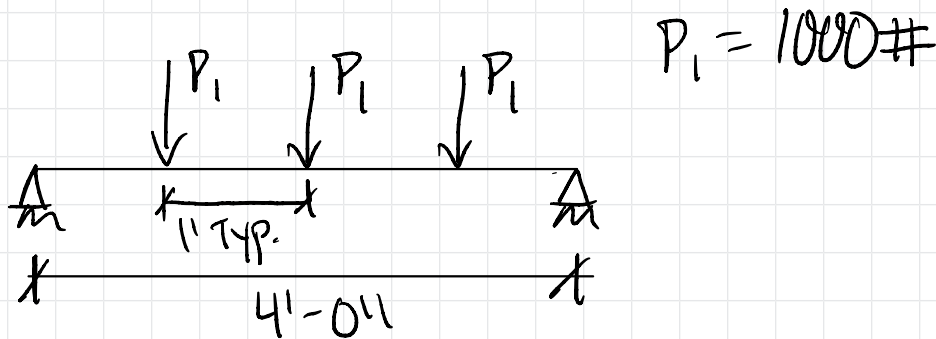
Check Landing BM :



$$P_1 = 500 \#$$

✓ OK
SEE FORTE

Check Center BMS



✓ OK - SEE FORTE

Check Conc. Ledger

(4) $5/8'' \phi$ A.B.'s

500# Shear to bolt } $5/8'' \phi$ A.B. OK ✓
 2000# Tension to bolt } Per Hilti

| Level | | | |
|-----------------|---------|---------------------------|----------|
| Member Name | Results | Current Solution | Comments |
| Typ. Landing BM | Passed | 1 piece(s) 4 x 10 DF No.2 | |
| Typ Center BM | Passed | 1 piece(s) 4 x 10 DF No.2 | |

| | |
|--|------------------|
| <p>ForteWEB Software Operator</p> <p>Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com</p> | <p>Job Notes</p> |
|--|------------------|

2021

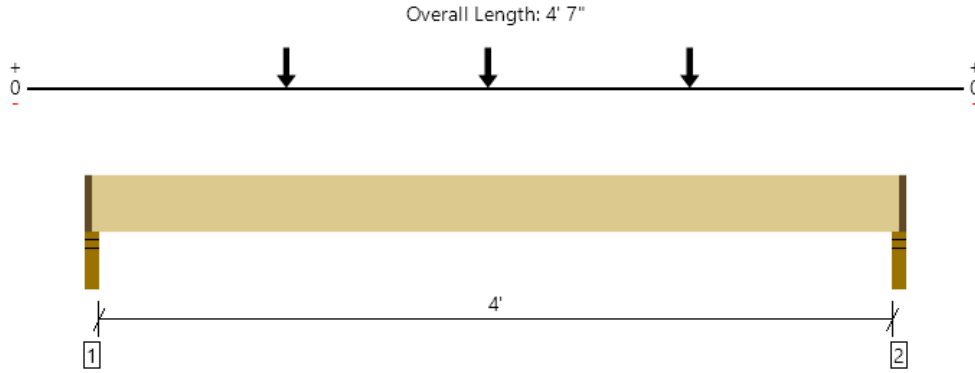


5/17/2021 9:31:52 PM UTC

ForteWEB v3.2

File Name: Stairs

Level, Typ. Landing BM
1 piece(s) 4 x 10 DF No.2



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|-----------------|------|-----------------------------|
| Member Reaction (lbs) | 782 @ 2" | 3828 (1.75") | Passed (20%) | -- | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 775 @ 1' 3/4" | 3885 | Passed (20%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 1049 @ 2' 3" | 4492 | Passed (23%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.007 @ 2' 3 1/2" | 0.106 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.009 @ 2' 3 1/2" | 0.213 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------------|-------|------------------|
| | Total | Available | Required | Dead | Floor Live | Total | |
| 1 - Stud wall - DF | 3.50" | 1.75" | 1.50" | 171 | 612 | 783 | 1 3/4" Rim Board |
| 2 - Stud wall - DF | 3.50" | 1.75" | 1.50" | 165 | 588 | 753 | 1 3/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 4' 4" o/c | |
| Bottom Edge (Lu) | 4' 4" o/c | |

•Maximum allowable bracing intervals based on applied load.

| Vertical Loads | Location (Side) | Tributary Width | Dead (0.90) | Floor Live (1.00) | Comments |
|-----------------------|---------------------|-----------------|-------------|-------------------|--------------|
| 0 - Self Weight (PLF) | 1 3/4" to 4' 5 1/4" | N/A | 8.2 | -- | |
| 1 - Point (lb) | 1' 1 1/2" (Front) | N/A | 100 | 400 | Default Load |
| 2 - Point (lb) | 2' 3" (Front) | N/A | 100 | 400 | Default Load |
| 3 - Point (lb) | 3' 4 1/2" (Front) | N/A | 100 | 400 | Default Load |

Weyerhaeuser Notes

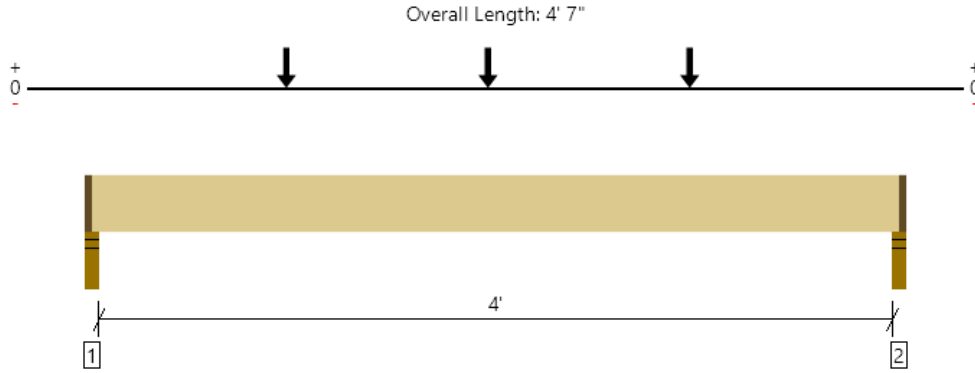
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

| | |
|---|-----------|
| ForteWEB Software Operator | Job Notes |
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



Level, Typ Center BM
1 piece(s) 4 x 10 DF No.2



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

| Design Results | Actual @ Location | Allowed | Result | LDF | Load: Combination (Pattern) |
|-----------------------|-------------------|--------------|-----------------|------|-----------------------------|
| Member Reaction (lbs) | 1547 @ 2" | 3828 (1.75") | Passed (40%) | -- | 1.0 D + 1.0 L (All Spans) |
| Shear (lbs) | 1539 @ 1' 3/4" | 3885 | Passed (40%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Moment (Ft-lbs) | 2080 @ 2' 3" | 4492 | Passed (46%) | 1.00 | 1.0 D + 1.0 L (All Spans) |
| Live Load Defl. (in) | 0.014 @ 2' 3 1/2" | 0.106 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |
| Total Load Defl. (in) | 0.017 @ 2' 3 1/2" | 0.213 | Passed (L/999+) | -- | 1.0 D + 1.0 L (All Spans) |

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

| Supports | Bearing Length | | | Loads to Supports (lbs) | | | Accessories |
|--------------------|----------------|-----------|----------|-------------------------|------------|-------|------------------|
| | Total | Available | Required | Dead | Floor Live | Total | |
| 1 - Stud wall - DF | 3.50" | 1.75" | 1.50" | 323 | 1224 | 1547 | 1 3/4" Rim Board |
| 2 - Stud wall - DF | 3.50" | 1.75" | 1.50" | 312 | 1176 | 1488 | 1 3/4" Rim Board |

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

| Lateral Bracing | Bracing Intervals | Comments |
|------------------|-------------------|----------|
| Top Edge (Lu) | 4' 4" o/c | |
| Bottom Edge (Lu) | 4' 4" o/c | |

•Maximum allowable bracing intervals based on applied load.

| Vertical Loads | Location (Side) | Tributary Width | Dead (0.90) | Floor Live (1.00) | Comments |
|-----------------------|---------------------|-----------------|-------------|-------------------|--------------|
| 0 - Self Weight (PLF) | 1 3/4" to 4' 5 1/4" | N/A | 8.2 | -- | |
| 1 - Point (lb) | 1' 1 1/2" (Top) | N/A | 200 | 800 | Default Load |
| 2 - Point (lb) | 2' 3" (Top) | N/A | 200 | 800 | Default Load |
| 3 - Point (lb) | 3' 4 1/2" (Top) | N/A | 200 | 800 | Default Load |

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

| ForteWEB Software Operator | Job Notes |
|---|-----------|
| Alex Davis PCS Structural Solutions (206) 292-5076 adavis@pcs-structural.com | |



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| | | | |
|------------------|-------------------------|------------|-----------|
| Company: | | Page: | 1 |
| Address: | | Specifier: | |
| Phone Fax: | | E-Mail: | |
| Design: | Concrete - May 17, 2021 | Date: | 5/17/2021 |
| Fastening point: | | | |

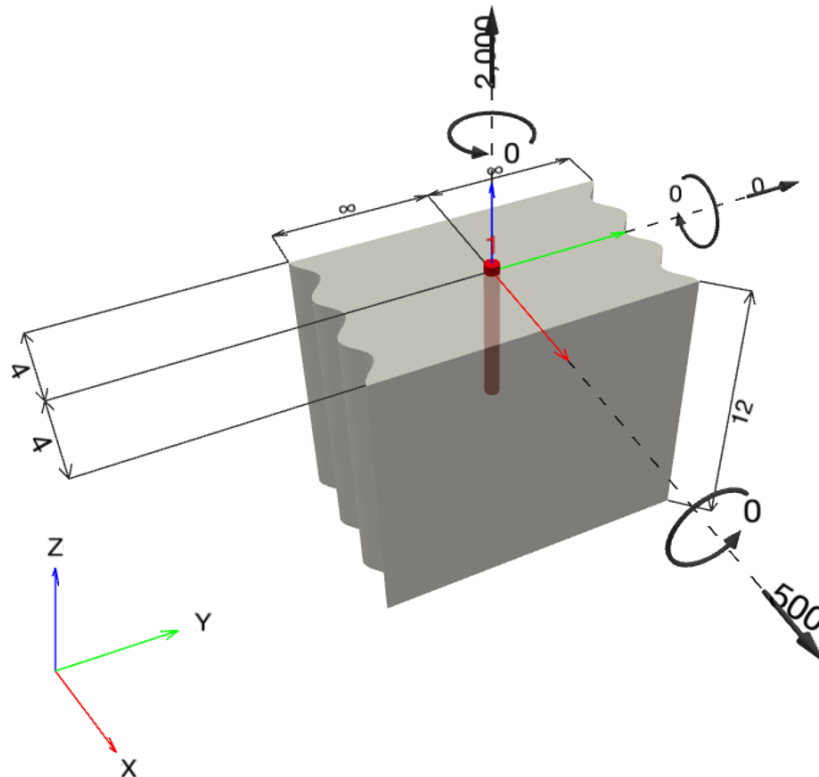
Specifier's comments:

1 Input data

| | |
|----------------------------------|--|
| Anchor type and diameter: | Hex Head ASTM F 1554 GR. 36 5/8 |
| Item number: | not available |
| Effective embedment depth: | $h_{ef} = 6.000$ in. |
| Material: | ASTM F 1554 |
| Evaluation Service Report: | Hilti Technical Data |
| Issued Valid: | - - |
| Proof: | Design Method ACI 318-14 / CIP |
| Stand-off installation: | |
| Profile: | |
| Base material: | cracked concrete, 4000, $f'_c = 4,000$ psi; $h = 12.000$ in. |
| Reinforcement: | tension: condition B, shear: condition B; edge reinforcement: none or < No. 4 bar |



Geometry [in.] & Loading [lb, in.lb]



Input data and results must be checked for conformity with the existing conditions and for plausibility!
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| Address: | | Specifier: | |
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| Design: | Concrete - May 17, 2021 | Date: | 5/17/2021 |
| Fastening point: | | | |

1.1 Design results

| Case | Description | Forces [lb] / Moments [in.lb] | Seismic | Max. Util. Anchor [%] |
|------|---------------|---|---------|-----------------------|
| 1 | Combination 1 | N = 2,000; V _x = 500; V _y = 0; M _x = 0; M _y = 0; M _z = 0; | no | 35 |



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| | | | |
|------------------|-------------------------|------------|-----------|
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| Address: | | Specifier: | |
| Phone Fax: | | E-Mail: | |
| Design: | Concrete - May 17, 2021 | Date: | 5/17/2021 |
| Fastening point: | | | |

2 Proof I Utilization (Governing Cases)

| Loading | Proof | Design values [lb] | | Utilization | Status |
|---------|---------------------------------------|--------------------|----------|-------------------------|--------|
| | | Load | Capacity | β_N / β_V [%] | |
| Tension | Concrete Breakout Failure | 2,000 | 5,784 | 35 / - | OK |
| Shear | Concrete edge failure in direction x+ | 500 | 2,971 | - / 17 | OK |

| Loading | β_N | β_V | ζ | Utilization $\beta_{N,V}$ [%] | Status |
|----------------------------------|-----------|-----------|---------|-------------------------------|--------|
| Combined tension and shear loads | 0.346 | 0.168 | 5/3 | 23 | OK |

3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

Fastening meets the design criteria!



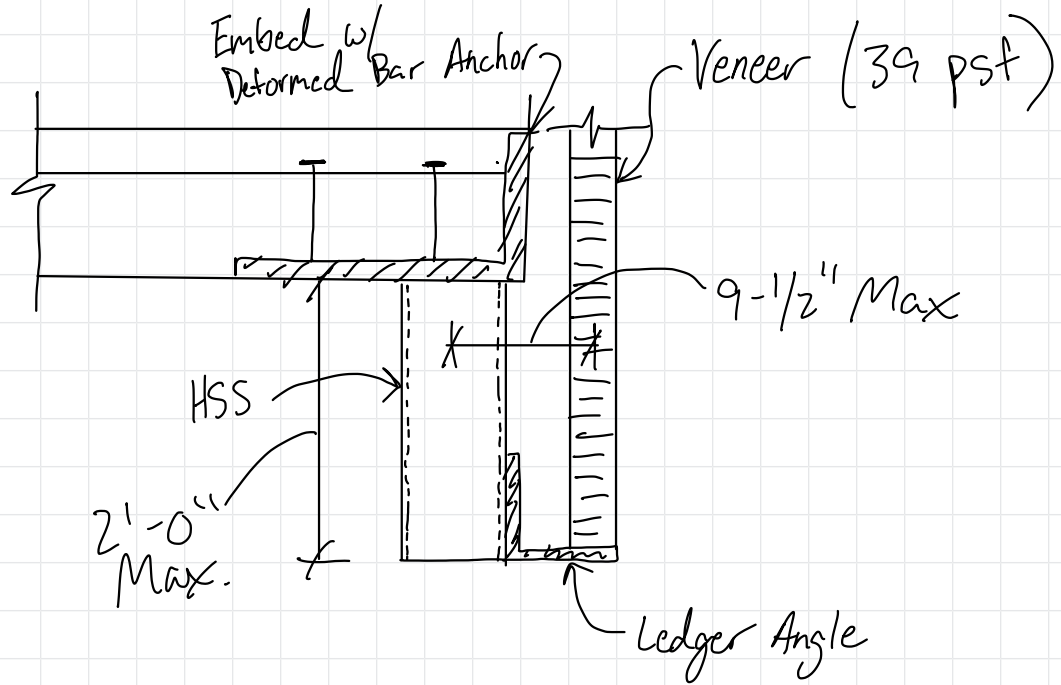
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| | | | |
|------------------|-------------------------|------------|-----------|
| Company: | | Page: | 4 |
| Address: | | Specifier: | |
| Phone Fax: | | E-Mail: | |
| Design: | Concrete - May 17, 2021 | Date: | 5/17/2021 |
| Fastening point: | | | |

4 Remarks; Your Cooperation Duties

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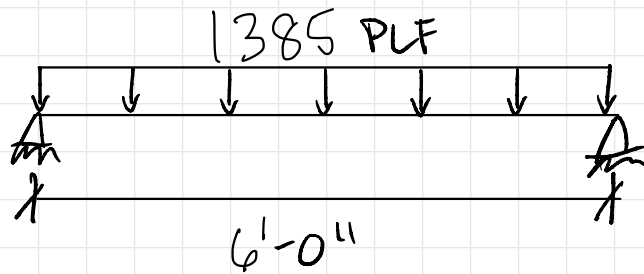
VENEER SUPPORT



Max. Veneer Height = 35.5 FT

Spacing of HSS SUPPORTS = 6' O.C.

Ledger Angle :



$$1.4(1385 \text{ PLF}) = 1939 \text{ PLF}$$

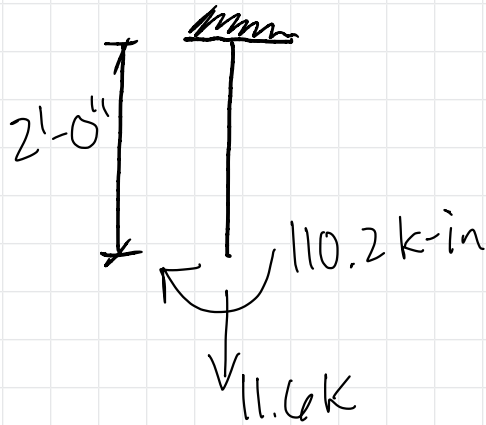
$$M_{\text{max}} = \frac{wL^2}{8} = \frac{(1939)(6^2)}{8} = 8725.5 \text{ FT-LB}$$

$$= 104.7 \text{ K-IN}$$

$$(0.9)(36 \text{ KSI}) = \frac{104.7}{S_{\text{req}}} \rightarrow S_{\text{req}} = 3.23 \text{ in}^2 \text{ L6x6x1/2}$$

(S=4.59 in²) ✓ OK

HSS SUPPORT:



$$(0.9)(46 \text{ ksi}) = \frac{110.2}{S} + \frac{11.6}{A}$$

Try HSS 5x5x1/4 ($S = 5.08 \text{ in}^3$, $A = 4.3 \text{ in}^2$)

$$\frac{110.2}{5.08} + \frac{11.6}{4.3} = 24.4 \text{ ksi} < 41.4 \text{ ksi}$$

✓ HSS Bending OK

$$S_{\text{weld}} = 5.08 \text{ in}^3, A_{\text{weld}} = 4.3 \text{ in}^2$$

$$\sigma_{\text{weld}} = 24.4 \text{ ksi}$$

$$\sigma_{\text{Allow.}} = (0.6)(70 \text{ ksi}) = 42 \text{ ksi} \quad \checkmark \text{ OK}$$

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| | | | |
|------------------|-------------------------|------------|------------|
| Company: | | Page: | 1 |
| Address: | | Specifier: | |
| Phone Fax: | | E-Mail: | |
| Design: | Concrete - Oct 11, 2023 | Date: | 10/11/2023 |
| Fastening point: | | | |

Specifier's comments:

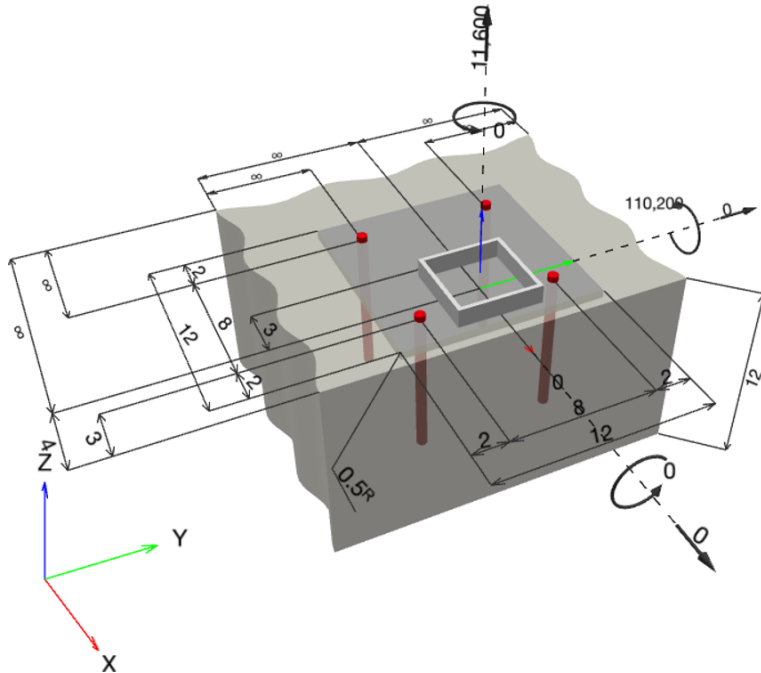
1 Input data

| | |
|----------------------------------|--|
| Anchor type and diameter: | AWS D1.1 GR. B 5/8 |
| Item number: | not available |
| Effective embedment depth: | $h_{ef} = 9.000$ in. |
| Material: | |
| Evaluation Service Report: | Hilti Technical Data |
| Issued Valid: | - - |
| Proof: | Design Method ACI 318-14 / CIP |
| Stand-off installation: | $e_b = 0.000$ in. (no stand-off); $t = 0.500$ in. |
| Anchor plate ^R : | $l_x \times l_y \times t = 12.000$ in. x 12.000 in. x 0.500 in.; (Recommended plate thickness: not calculated) |
| Profile: | Square HSS (AISC), HSS5X5X.250; (L x W x T) = 5.000 in. x 5.000 in. x 0.250 in. |
| Base material: | cracked concrete, 5000 , $f'_c = 5,000$ psi; $h = 12.000$ in. |
| Reinforcement: | tension: condition A, shear: condition A; edge reinforcement: > No. 4 bar |



^R - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.] & Loading [lb, in.lb]



Input data and results must be checked for conformity with the existing conditions and for plausibility!
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|---------------------------------|------------|------------|
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| Address: | Specifier: | |
| Phone Fax: | E-Mail: | |
| Design: Concrete - Oct 11, 2023 | Date: | 10/11/2023 |
| Fastening point: | | |

1.1 Design results

| Case | Description | Forces [lb] / Moments [in.lb] | Seismic | Max. Util. Anchor [%] |
|------|---------------|---|---------|-----------------------|
| 1 | Combination 1 | N = 11,600; V _x = 0; V _y = 0; M _x = 0; M _y = -110,200; M _z = 0; | no | 94 |

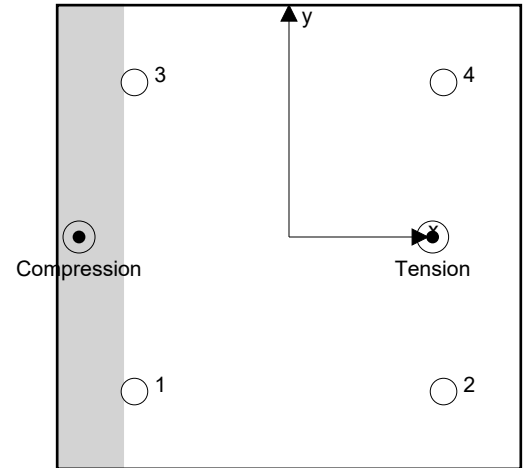
2 Load case/Resulting anchor forces

Anchor reactions [lb]

Tension force: (+Tension, -Compression)

| Anchor | Tension force | Shear force | Shear force x | Shear force y |
|--------|---------------|-------------|---------------|---------------|
| 1 | 402 | 0 | 0 | 0 |
| 2 | 10,964 | 0 | 0 | 0 |
| 3 | 402 | 0 | 0 | 0 |
| 4 | 10,964 | 0 | 0 | 0 |

max. concrete compressive strain: 0.25 [‰]
 max. concrete compressive stress: 1,094 [psi]
 resulting tension force in (x/y)=(3.717/-0.000): 22,732 [lb]
 resulting compression force in (x/y)=(-5.435/0.000): 11,132 [lb]



Anchor forces are calculated based on the assumption of a rigid anchor plate.

3 Tension load

| | Load N _{ua} [lb] | Capacity ϕ N _n [lb] | Utilization $\beta_N = N_{ua} / \phi N_n$ | Status |
|--|---------------------------|-------------------------------------|---|--------|
| Steel Strength* | 10,964 | 14,966 | 74 | OK |
| Pullout Strength* | 10,964 | 25,760 | 43 | OK |
| Concrete Breakout Failure** | 22,732 | 24,300 | 94 | OK |
| Concrete Side-Face Blowout, direction x+** | 21,929 | 35,268 | 63 | OK |

* highest loaded anchor **anchor group (anchors in tension)



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| | | | |
|------------------|-------------------------|------------|------------|
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| Address: | | Specifier: | |
| Phone Fax: | | E-Mail: | |
| Design: | Concrete - Oct 11, 2023 | Date: | 10/11/2023 |
| Fastening point: | | | |

3.1 Steel Strength

$N_{sa} = A_{se,N} f_{uta}$ ACI 318-14 Eq. (17.4.1.2)
 $\phi N_{sa} \geq N_{ua}$ ACI 318-14 Table 17.3.1.1

Variables

| | |
|--------------------------------|-----------------|
| $A_{se,N}$ [in. ²] | f_{uta} [psi] |
| 0.31 | 65,000 |

Calculations

| |
|---------------|
| N_{sa} [lb] |
| 19,955 |

Results

| | | | |
|---------------|----------------|--------------------|---------------|
| N_{sa} [lb] | ϕ_{steel} | ϕN_{sa} [lb] | N_{ua} [lb] |
| 19,955 | 0.750 | 14,966 | 10,964 |

3.2 Pullout Strength

$N_{pN} = \psi_{c,p} N_p$ ACI 318-14 Eq. (17.4.3.1)
 $N_p = 8 A_{brg} f'_c$ ACI 318-14 Eq. (17.4.3.4)
 $\phi N_{pN} \geq N_{ua}$ ACI 318-14 Table 17.3.1.1

Variables

| | | | |
|--------------|-------------------------------|-------------|--------------|
| $\psi_{c,p}$ | A_{brg} [in. ²] | λ_a | f'_c [psi] |
| 1.000 | 0.92 | 1.000 | 5,000 |

Calculations

| |
|------------|
| N_p [lb] |
| 36,800 |

Results

| | | | |
|---------------|-------------------|--------------------|---------------|
| N_{pn} [lb] | $\phi_{concrete}$ | ϕN_{pn} [lb] | N_{ua} [lb] |
| 36,800 | 0.700 | 25,760 | 10,964 |

Input data and results must be checked for conformity with the existing conditions and for plausibility!
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| | | | |
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3.3 Concrete Breakout Failure

$$N_{cbg} = \left(\frac{A_{Nc}}{A_{Nc0}} \right) \psi_{ec,N} \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b \quad \text{ACI 318-14 Eq. (17.4.2.1b)}$$

$$\phi N_{cbg} \geq N_{ua} \quad \text{ACI 318-14 Table 17.3.1.1}$$

$$A_{Nc} \text{ see ACI 318-14, Section 17.4.2.1, Fig. R 17.4.2.1(b)}$$

$$A_{Nc0} = 9 h_{ef}^2 \quad \text{ACI 318-14 Eq. (17.4.2.1c)}$$

$$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2 e_N}{3 h_{ef}}} \right) \leq 1.0 \quad \text{ACI 318-14 Eq. (17.4.2.4)}$$

$$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}} \right) \leq 1.0 \quad \text{ACI 318-14 Eq. (17.4.2.5b)}$$

$$\psi_{cp,N} = \text{MAX} \left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}} \right) \leq 1.0 \quad \text{ACI 318-14 Eq. (17.4.2.7b)}$$

$$N_b = k_c \lambda_a \sqrt{f_c} h_{ef}^{1.5} \quad \text{ACI 318-14 Eq. (17.4.2.2a)}$$

Variables

| h_{ef} [in.] | $e_{c1,N}$ [in.] | $e_{c2,N}$ [in.] | $c_{a,min}$ [in.] | $\psi_{c,N}$ |
|----------------|------------------|------------------|-------------------|--------------|
| 9.000 | 3.717 | 0.000 | 3.000 | 1.000 |
| c_{ac} [in.] | k_c | λ_a | f_c [psij] | |
| - | 24 | 1.000 | 5,000 | |

Calculations

| A_{Nc} [in. ²] | A_{Nc0} [in. ²] | $\psi_{ec1,N}$ | $\psi_{ec2,N}$ | $\psi_{ed,N}$ | $\psi_{cp,N}$ | N_b [lb] |
|------------------------------|-------------------------------|----------------|----------------|---------------|---------------|------------|
| 857.50 | 729.00 | 0.784 | 1.000 | 0.767 | 1.000 | 45,821 |

Results

| N_{cbg} [lb] | $\phi_{concrete}$ | ϕN_{cbg} [lb] | N_{ua} [lb] |
|----------------|-------------------|---------------------|---------------|
| 32,400 | 0.750 | 24,300 | 22,732 |



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| Fastening point: | | | |

3.4 Concrete Side-Face Blowout, direction x+

$N_{sb} = 160 c_{a1} \sqrt{A_{brg}} \lambda_a \sqrt{f'_c}$ ACI 318-14 Eq. (17.4.4.1)
 $N_{sbg} = \alpha_{group} N_{sb}$ ACI 318-14 Eq. (17.4.4.2)
 $\phi N_{sbg} \geq N_{ua}$ ACI 318-14 Table 17.3.1.1
 $\alpha_{group} = \left(1 + \frac{s}{6 c_{a1}}\right)$ see ACI 318-14, Section 17.4.4.2, Eq. (17.4.4.2)

Variables

| c_{a1} [in.] | c_{a2} [in.] | A_{brg} [in. ²] | λ_a | f'_c [psi] | s [in.] |
|----------------|----------------|-------------------------------|-------------|--------------|-----------|
| 3.000 | - | 0.92 | 1.000 | 5,000 | 8.000 |

Calculations

| α_{group} | N_{sb} [lb] |
|------------------|---------------|
| 1.444 | 32,555 |

Results

| N_{sbg} [lb] | $\phi_{concrete}$ | ϕN_{sbg} [lb] | $N_{ua,edge}$ [lb] |
|----------------|-------------------|---------------------|--------------------|
| 47,024 | 0.750 | 35,268 | 21,929 |



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| Fastening point: | | | |

4 Shear load

| | Load V_{ua} [lb] | Capacity ϕV_n [lb] | Utilization $\beta_v = V_{ua} / \phi V_n$ | Status |
|---------------------------------------|--------------------|--------------------------|---|--------|
| Steel Strength* | N/A | N/A | N/A | N/A |
| Steel failure (with lever arm)* | N/A | N/A | N/A | N/A |
| Pryout Strength* | N/A | N/A | N/A | N/A |
| Concrete edge failure in direction ** | N/A | N/A | N/A | N/A |

* highest loaded anchor **anchor group (relevant anchors)

5 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2021, ETAG 001/Annex C, EOTA TR029 etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies where the potential concrete failure surfaces are crossed by supplementary reinforcement proportioned to tie the potential concrete failure prism into the structural member. Condition B applies where such supplementary reinforcement is not provided, or where pullout or pryout strength governs.
- For additional information about ACI 318 strength design provisions, please go to <https://submittals.us.hilti.com/PROFISAnchorDesignGuide/>

Fastening meets the design criteria!

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| | |
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6 Installation data

Profile: Square HSS (AISC), HSS5X5X.250; (L x W x T) = 5.000 in. x 5.000 in. x 0.250 in.

Hole diameter in the fixture: $d_f = 0.687$ in.

Plate thickness (input): 0.500 in.

Recommended plate thickness: not calculated

Anchor type and diameter: AWS D1.1 GR. B 5/8

Item number: not available

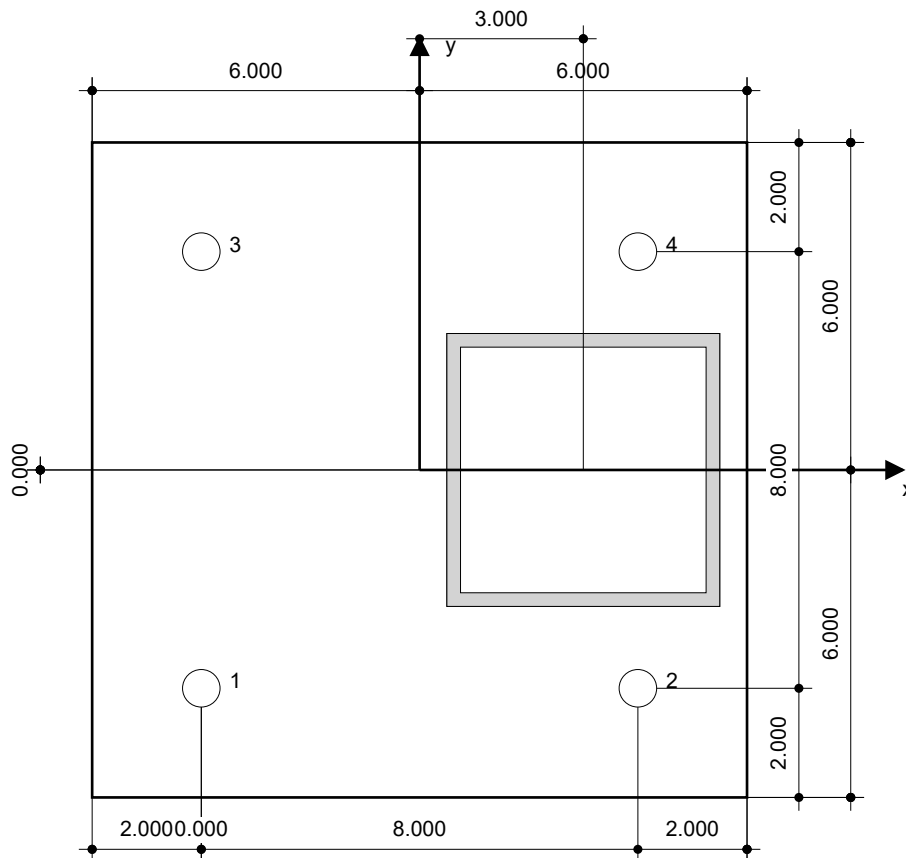
Maximum installation torque: -

Hole diameter in the base material: - in.

Hole depth in the base material: 9.000 in.

Minimum thickness of the base material: 9.813 in.

Hilti AWS welded headed stud anchor with 9 in embedment, 5/8, Steel galvanized, installation per instruction for use



Coordinates Anchor [in.]

| Anchor | x | y | C _{-x} | C _{+x} | C _{-y} | C _{+y} |
|--------|--------|--------|-----------------|-----------------|-----------------|-----------------|
| 1 | -4.000 | -4.000 | - | 11.000 | - | - |
| 2 | 4.000 | -4.000 | - | 3.000 | - | - |
| 3 | -4.000 | 4.000 | - | 11.000 | - | - |
| 4 | 4.000 | 4.000 | - | 3.000 | - | - |



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7 Remarks; Your Cooperation Duties

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METAL SCREEN SUPPORT

Node Coordinates

| | Label | X [ft] | Y [ft] | Z [ft] | Detach From Diaphragm |
|----|-------|--------|--------|--------|-----------------------|
| 1 | N1 | 0 | 0 | 0 | |
| 2 | N2 | 5 | 0 | 0 | |
| 3 | N3 | 10 | 0 | 0 | |
| 4 | N4 | 15 | 0 | 0 | |
| 5 | N5 | 20 | 0 | 0 | |
| 6 | N6 | 25 | 0 | 0 | |
| 7 | N7 | 0 | 11 | 0 | |
| 8 | N8 | 5 | 11 | 0 | |
| 9 | N9 | 10 | 11 | 0 | |
| 10 | N10 | 15 | 11 | 0 | |
| 11 | N11 | 20 | 11 | 0 | |
| 12 | N12 | 25 | 11 | 0 | |
| 13 | N13 | 0 | 0 | -1.5 | |
| 14 | N14 | 25 | 0 | -1.5 | |

Node Boundary Conditions

| | Node Label | X [k/in] | Y [k/in] | Z [k/in] |
|---|------------|----------|----------|----------|
| 1 | N7 | Reaction | Reaction | Reaction |
| 2 | N8 | Reaction | Reaction | Reaction |
| 3 | N9 | Reaction | Reaction | Reaction |
| 4 | N10 | Reaction | Reaction | Reaction |
| 5 | N11 | Reaction | Reaction | Reaction |
| 6 | N12 | Reaction | Reaction | Reaction |
| 7 | N13 | Reaction | Reaction | Reaction |
| 8 | N14 | Reaction | Reaction | Reaction |

Hot Rolled Steel Properties

| | Label | E [ksi] | G [ksi] | Nu | Therm. Coeff. [1e ⁵ F ⁻¹] | Density [k/ft ³] | Yield [ksi] | Ry | Fu [ksi] | Rt |
|---|----------------|---------|---------|-----|--|------------------------------|-------------|-----|----------|-----|
| 1 | A36 L | 29000 | 11154 | 0.3 | 0.65 | 0.49 | 36 | 1.5 | 58 | 1.2 |
| 2 | A572Grade50 CT | 29000 | 11154 | 0.3 | 0.65 | 0.49 | 50 | 1.1 | 58 | 1.2 |
| 3 | A992 W | 29000 | 11154 | 0.3 | 0.65 | 0.49 | 50 | 1.1 | 58 | 1.2 |
| 4 | A500 42 | 29000 | 11154 | 0.3 | 0.65 | 0.49 | 42 | 1.3 | 58 | 1.1 |
| 5 | A500 46 TS | 29000 | 11154 | 0.3 | 0.65 | 0.49 | 46 | 1.2 | 58 | 1.1 |

General Materials Properties

| | Label | E [ksi] | G [ksi] | Nu | Therm. Coeff. [1e ⁵ F ⁻¹] | Density [k/ft ³] | Plate Methodology |
|---|-------------|---------|---------|------|--|------------------------------|-------------------|
| 1 | gen Conc3NW | 3155 | 1372 | 0.15 | 0.6 | 0.145 | Isotropic |
| 2 | gen Conc4NW | 3644 | 1584 | 0.15 | 0.6 | 0.145 | Isotropic |
| 3 | gen Conc3LW | 2085 | 906 | 0.15 | 0.6 | 0.11 | Isotropic |
| 4 | gen Conc4LW | 2408 | 1047 | 0.15 | 0.6 | 0.11 | Isotropic |
| 5 | gen Alum | 10600 | 4077 | 0.3 | 1.29 | 0.173 | Isotropic |
| 6 | gen Steel | 29000 | 11154 | 0.3 | 0.65 | 0.49 | Isotropic |
| 7 | RIGID | 1e+7 | | 0 | 0 | 0 | Isotropic |

Member Primary Data

| | Label | I Node | J Node | Section/Shape | Type | Design List | Material | Design Rule |
|---|-------|--------|--------|---------------|--------|-------------|------------|-------------|
| 1 | M1 | N1 | N2 | HSS7X5X4 | Column | Tube | A500 46 TS | Typical |
| 2 | M2 | N2 | N3 | HSS7X5X4 | Column | Tube | A500 46 TS | Typical |
| 3 | M3 | N3 | N4 | HSS7X5X4 | Column | Tube | A500 46 TS | Typical |

Member Primary Data (Continued)

| | Label | I Node | J Node | Section/Shape | Type | Design List | Material | Design Rule |
|----|-------|--------|--------|---------------|--------|-------------|------------|-------------|
| 4 | M4 | N4 | N5 | HSS7X5X4 | Column | Tube | A500 46 TS | Typical |
| 5 | M5 | N5 | N6 | HSS7X5X4 | Column | Tube | A500 46 TS | Typical |
| 6 | M6 | N1 | N7 | HSS4X4X4 | Column | Tube | A500 46 TS | Typical |
| 7 | M7 | N2 | N8 | HSS4X4X4 | Column | Tube | A500 46 TS | Typical |
| 8 | M8 | N3 | N9 | HSS4X4X4 | Column | Tube | A500 46 TS | Typical |
| 9 | M9 | N4 | N10 | HSS4X4X4 | Column | Tube | A500 46 TS | Typical |
| 10 | M10 | N5 | N11 | HSS4X4X4 | Column | Tube | A500 46 TS | Typical |
| 11 | M11 | N6 | N12 | HSS4X4X4 | Column | Tube | A500 46 TS | Typical |
| 12 | M12 | N1 | N13 | HSS5X5X4 | Column | Tube | A500 46 TS | Typical |
| 13 | M13 | N6 | N14 | HSS5X5X4 | Column | Tube | A500 46 TS | Typical |

Member Advanced Data

| | Label | Physical | Deflection Ratio Options | Seismic DR |
|----|-------|----------|--------------------------|------------|
| 1 | M1 | Yes | ** NA ** | None |
| 2 | M2 | Yes | ** NA ** | None |
| 3 | M3 | Yes | ** NA ** | None |
| 4 | M4 | Yes | ** NA ** | None |
| 5 | M5 | Yes | ** NA ** | None |
| 6 | M6 | Yes | ** NA ** | None |
| 7 | M7 | Yes | ** NA ** | None |
| 8 | M8 | Yes | ** NA ** | None |
| 9 | M9 | Yes | ** NA ** | None |
| 10 | M10 | Yes | ** NA ** | None |
| 11 | M11 | Yes | ** NA ** | None |
| 12 | M12 | Yes | ** NA ** | None |
| 13 | M13 | Yes | ** NA ** | None |

Hot Rolled Steel Design Parameters

| | Label | Shape | Length [ft] | Lcomp top [ft] | Channel Conn. | a [ft] | Function |
|----|-------|----------|-------------|----------------|---------------|--------|----------|
| 1 | M1 | HSS7X5X4 | 5 | Lbyy | N/A | N/A | Lateral |
| 2 | M2 | HSS7X5X4 | 5 | Lbyy | N/A | N/A | Lateral |
| 3 | M3 | HSS7X5X4 | 5 | Lbyy | N/A | N/A | Lateral |
| 4 | M4 | HSS7X5X4 | 5 | Lbyy | N/A | N/A | Lateral |
| 5 | M5 | HSS7X5X4 | 5 | Lbyy | N/A | N/A | Lateral |
| 6 | M6 | HSS4X4X4 | 11 | Lbyy | N/A | N/A | Lateral |
| 7 | M7 | HSS4X4X4 | 11 | Lbyy | N/A | N/A | Lateral |
| 8 | M8 | HSS4X4X4 | 11 | Lbyy | N/A | N/A | Lateral |
| 9 | M9 | HSS4X4X4 | 11 | Lbyy | N/A | N/A | Lateral |
| 10 | M10 | HSS4X4X4 | 11 | Lbyy | N/A | N/A | Lateral |
| 11 | M11 | HSS4X4X4 | 11 | Lbyy | N/A | N/A | Lateral |
| 12 | M12 | HSS5X5X4 | 1.5 | Lbyy | N/A | N/A | Lateral |
| 13 | M13 | HSS5X5X4 | 1.5 | Lbyy | N/A | N/A | Lateral |

Plate Surface Loads (BLC 3 : Wind)

| | Plate Label | Direction | Magnitude [ksf, F] |
|---|-------------|-----------|--------------------|
| 1 | P1 | Z | -0.025 |

Basic Load Cases

| | BLC Description | Category | Y Gravity | Nodal | Surface(Plate/Wall) |
|---|-----------------|----------|-----------|-------|---------------------|
| 1 | Dead | None | -1 | | |
| 2 | Live | None | | | |
| 3 | Wind | None | | | 1 |
| 4 | Snow | None | | | |
| 5 | EQ | None | | 1 | |
| 6 | Live Rf | None | | | |
| 7 | Wind Pos | None | | | |

Load Combinations

| | Description | Solve | P-Delta | BLC | Factor | BLC | Factor | BLC | Factor | BLC | Factor |
|----|--------------------------|-------|---------|-----|--------|-----|--------|-----|--------|-----|--------|
| 1 | Dead | Yes | Y | 1 | 1 | | | | | | |
| 2 | Live | Yes | Y | 2 | 1 | | | | | | |
| 3 | Service | | Y | 1 | 1 | 2 | 1 | | | | |
| 4 | EQ | Yes | Y | 5 | 1 | | | | | | |
| 5 | Live Rf | Yes | Y | 6 | 1 | | | | | | |
| 6 | Wind Pos | Yes | Y | 7 | 1 | | | | | | |
| 7 | 1.4D | Yes | Y | 1 | 1.4 | | | | | | |
| 8 | 1.2D+1.6L+.5Lr | Yes | Y | 1 | 1.2 | 2 | 1.6 | 6 | 0.5 | | |
| 9 | 1.2D+1.6L+.5S | Yes | Y | 1 | 1.2 | 2 | 1.6 | 4 | 0.5 | | |
| 10 | 1.2D+1.6Lr+.5L | Yes | Y | 1 | 1.2 | 6 | 1.6 | 2 | 0.5 | | |
| 11 | 1.2D+1.6Lr+.8W | Yes | Y | 1 | 1.2 | 6 | 1.6 | 3 | 0.8 | | |
| 12 | 1.2D+1.6S+.5L | Yes | Y | 1 | 1.2 | 4 | 1.6 | 2 | 0.5 | | |
| 13 | 1.2D+1.6S+.8W | Yes | Y | 1 | 1.2 | 4 | 1.6 | 3 | 0.8 | | |
| 14 | 1.2D+1.6W+.5L+.5Lr | Yes | Y | 1 | 1.2 | 3 | 1.6 | 2 | 0.5 | 6 | 0.5 |
| 15 | 1.2D+1.6W+.5L+.5S | Yes | Y | 1 | 1.2 | 3 | 1.6 | 2 | 0.5 | 4 | 0.5 |
| 16 | 1.2D+1E+.5L+.2S | Yes | Y | 1 | 1.2 | 5 | 1 | 2 | 0.5 | 4 | 0.2 |
| 17 | .9D-1.6W | Yes | Y | 1 | 0.9 | 3 | -1.6 | | | | |
| 18 | .9D-1E | Yes | Y | 1 | 0.9 | 5 | -1 | | | | |
| 19 | (.9+.2Sds)D+pQE+.5L+0.2S | Yes | Y | 1 | 0.9 | 5 | 1 | 2 | 0.5 | 4 | 0.2 |
| 20 | (.9-.2Sds)D-pQE | Yes | Y | 1 | 0.9 | 5 | -1 | | | | |

Load Combination Design

| | Description | Service | Hot Rolled | Cold Formed | Wood | Concrete | Masonry | Aluminum | Stainless | Connection |
|----|--------------------------|---------|------------|-------------|------|----------|---------|----------|-----------|------------|
| 1 | Dead | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 2 | Live | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 3 | Service | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 4 | EQ | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 5 | Live Rf | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 6 | Wind Pos | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 7 | 1.4D | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 8 | 1.2D+1.6L+.5Lr | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 9 | 1.2D+1.6L+.5S | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 10 | 1.2D+1.6Lr+.5L | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 11 | 1.2D+1.6Lr+.8W | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 12 | 1.2D+1.6S+.5L | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 13 | 1.2D+1.6S+.8W | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 14 | 1.2D+1.6W+.5L+.5Lr | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 15 | 1.2D+1.6W+.5L+.5S | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 16 | 1.2D+1E+.5L+.2S | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 17 | .9D-1.6W | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 18 | .9D-1E | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 19 | (.9+.2Sds)D+pQE+.5L+0.2S | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |



Load Combination Design (Continued)

| Description | Service | Hot Rolled | Cold Formed | Wood | Concrete | Masonry | Aluminum | Stainless | Connection |
|--------------------|---------|------------|-------------|------|----------|---------|----------|-----------|------------|
| 20 (.9-.2Sds)D-pQE | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

AISC 14TH (360-10): LRFD Member Steel Code Checks

| LC | Member | Shape | UC Max | Loc[ft] | Shear UC | Loc[ft] | Dir | phi*Pnc[k] | phi*Pnt[k] | phi*Mnyy[k-ft] | phi*Mnzz[k-ft] | Cb | Eqn | |
|----|--------|-------|----------|---------|----------|---------|-----|------------|------------|----------------|----------------|--------|-------|--------|
| 1 | 1 | M1 | HSS7X5X4 | 0 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.394 | H1-1b* |
| 2 | 1 | M2 | HSS7X5X4 | 0 | 5 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.573 | H1-1b* |
| 3 | 1 | M3 | HSS7X5X4 | 0 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.369 | H1-1b* |
| 4 | 1 | M4 | HSS7X5X4 | 0 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.573 | H1-1b* |
| 5 | 1 | M5 | HSS7X5X4 | 0 | 5 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.394 | H1-1b* |
| 6 | 1 | M6 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 7 | 1 | M7 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 8 | 1 | M8 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 9 | 1 | M9 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 10 | 1 | M10 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 11 | 1 | M11 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 12 | 1 | M12 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.116 | H1-1b* |
| 13 | 1 | M13 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.116 | H1-1b* |
| 14 | 2 | M1 | HSS7X5X4 | 0 | 5 | 0 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1 | H1-1b* |
| 15 | 2 | M2 | HSS7X5X4 | 0 | 5 | 0 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1 | H1-1b* |
| 16 | 2 | M3 | HSS7X5X4 | 0 | 5 | 0 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1 | H1-1b* |
| 17 | 2 | M4 | HSS7X5X4 | 0 | 5 | 0 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1 | H1-1b* |
| 18 | 2 | M5 | HSS7X5X4 | 0 | 5 | 0 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1 | H1-1b* |
| 19 | 2 | M6 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 20 | 2 | M7 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 21 | 2 | M8 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 22 | 2 | M9 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 23 | 2 | M10 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 24 | 2 | M11 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 25 | 2 | M12 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1 | H1-1b* |
| 26 | 2 | M13 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1 | H1-1b* |
| 27 | 4 | M1 | HSS7X5X4 | 0.155 | 5 | 0.004 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.494 | H1-1b* |
| 28 | 4 | M2 | HSS7X5X4 | 0.155 | 5 | 0.003 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.105 | H1-1b* |
| 29 | 4 | M3 | HSS7X5X4 | 0.155 | 5 | 0.005 | 5 | z | 204.39 | 216.936 | 33.914 | 42.78 | 1.914 | H1-1b* |
| 30 | 4 | M4 | HSS7X5X4 | 0.155 | 5 | 0.011 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.146 | H1-1b* |
| 31 | 4 | M5 | HSS7X5X4 | 0.155 | 5 | 0.017 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.785 | H1-1b* |
| 32 | 4 | M6 | HSS4X4X4 | 0.093 | 11 | 0.001 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.668 | H1-1b* |
| 33 | 4 | M7 | HSS4X4X4 | 0.013 | 0 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 34 | 4 | M8 | HSS4X4X4 | 0.019 | 0 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 35 | 4 | M9 | HSS4X4X4 | 0.019 | 0 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 36 | 4 | M10 | HSS4X4X4 | 0.016 | 0 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 37 | 4 | M11 | HSS4X4X4 | 0.087 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.666 | H1-1b* |
| 38 | 4 | M12 | HSS5X5X4 | 0.58 | 0 | 0.195 | 1.5 | z | 176.98 | 178.02 | 26.255 | 26.255 | 1.667 | H1-1b |
| 39 | 4 | M13 | HSS5X5X4 | 0.555 | 0 | 0.184 | 1.5 | z | 176.98 | 178.02 | 26.255 | 26.255 | 1.667 | H1-1b |
| 40 | 5 | M1 | HSS7X5X4 | 0 | 5 | 0 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1 | H1-1b* |
| 41 | 5 | M2 | HSS7X5X4 | 0 | 5 | 0 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1 | H1-1b* |
| 42 | 5 | M3 | HSS7X5X4 | 0 | 5 | 0 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1 | H1-1b* |
| 43 | 5 | M4 | HSS7X5X4 | 0 | 5 | 0 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1 | H1-1b* |
| 44 | 5 | M5 | HSS7X5X4 | 0 | 5 | 0 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1 | H1-1b* |
| 45 | 5 | M6 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 46 | 5 | M7 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 47 | 5 | M8 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 48 | 5 | M9 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 49 | 5 | M10 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 50 | 5 | M11 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 51 | 5 | M12 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1 | H1-1b* |

AISC 14TH (360-10): LRFD Member Steel Code Checks (Continued)

| LC | Member | Shape | UC Max | Loc[ft] | Shear UC | Loc[ft] | Dir | phi*Pnc[k] | phi*Pnt[k] | phi*Mnyy[k-ft] | phi*Mnzz[k-ft] | Cb | Eqn | |
|-----|--------|-------|----------|---------|----------|---------|-----|------------|------------|----------------|----------------|--------|-------|--------|
| 52 | 5 | M13 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1 | H1-1b* |
| 53 | 6 | M1 | HSS7X5X4 | 0 | 5 | 0 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1 | H1-1b* |
| 54 | 6 | M2 | HSS7X5X4 | 0 | 5 | 0 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1 | H1-1b* |
| 55 | 6 | M3 | HSS7X5X4 | 0 | 5 | 0 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1 | H1-1b* |
| 56 | 6 | M4 | HSS7X5X4 | 0 | 5 | 0 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1 | H1-1b* |
| 57 | 6 | M5 | HSS7X5X4 | 0 | 5 | 0 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1 | H1-1b* |
| 58 | 6 | M6 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 59 | 6 | M7 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 60 | 6 | M8 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 61 | 6 | M9 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 62 | 6 | M10 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 63 | 6 | M11 | HSS4X4X4 | 0 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1 | H1-1b* |
| 64 | 6 | M12 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1 | H1-1b* |
| 65 | 6 | M13 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1 | H1-1b* |
| 66 | 7 | M1 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.394 | H1-1b |
| 67 | 7 | M2 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.573 | H1-1b |
| 68 | 7 | M3 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.369 | H1-1b |
| 69 | 7 | M4 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.573 | H1-1b |
| 70 | 7 | M5 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.394 | H1-1b |
| 71 | 7 | M6 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 72 | 7 | M7 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 73 | 7 | M8 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 74 | 7 | M9 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 75 | 7 | M10 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 76 | 7 | M11 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 77 | 7 | M12 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.116 | H1-1b* |
| 78 | 7 | M13 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.116 | H1-1b* |
| 79 | 8 | M1 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.394 | H1-1b |
| 80 | 8 | M2 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.573 | H1-1b |
| 81 | 8 | M3 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.369 | H1-1b |
| 82 | 8 | M4 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.573 | H1-1b |
| 83 | 8 | M5 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.394 | H1-1b |
| 84 | 8 | M6 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 85 | 8 | M7 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 86 | 8 | M8 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 87 | 8 | M9 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 88 | 8 | M10 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 89 | 8 | M11 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 90 | 8 | M12 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.116 | H1-1b* |
| 91 | 8 | M13 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.116 | H1-1b* |
| 92 | 9 | M1 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.394 | H1-1b |
| 93 | 9 | M2 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.573 | H1-1b |
| 94 | 9 | M3 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.369 | H1-1b |
| 95 | 9 | M4 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.573 | H1-1b |
| 96 | 9 | M5 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.394 | H1-1b |
| 97 | 9 | M6 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 98 | 9 | M7 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 99 | 9 | M8 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 100 | 9 | M9 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 101 | 9 | M10 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 102 | 9 | M11 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 103 | 9 | M12 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.116 | H1-1b* |
| 104 | 9 | M13 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.116 | H1-1b* |
| 105 | 10 | M1 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.394 | H1-1b |
| 106 | 10 | M2 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.573 | H1-1b |

AISC 14TH (360-10): LRFD Member Steel Code Checks (Continued)

| LC | Member | Shape | UC Max | Loc[ft] | Shear UC | Loc[ft] | Dir | phi*Pnc[k] | phi*Pnt[k] | phi*Mnyy[k-ft] | phi*Mnzz[k-ft] | Cb | Eqn | |
|-----|--------|-------|----------|---------|----------|---------|-----|------------|------------|----------------|----------------|--------|-------|--------|
| 107 | 10 | M3 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.369 | H1-1b |
| 108 | 10 | M4 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.573 | H1-1b |
| 109 | 10 | M5 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.394 | H1-1b |
| 110 | 10 | M6 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 111 | 10 | M7 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 112 | 10 | M8 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 113 | 10 | M9 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 114 | 10 | M10 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 115 | 10 | M11 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 116 | 10 | M12 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.116 | H1-1b* |
| 117 | 10 | M13 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.116 | H1-1b* |
| 118 | 11 | M1 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.395 | H1-1b |
| 119 | 11 | M2 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.574 | H1-1b |
| 120 | 11 | M3 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.369 | H1-1b |
| 121 | 11 | M4 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.574 | H1-1b |
| 122 | 11 | M5 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.395 | H1-1b |
| 123 | 11 | M6 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 124 | 11 | M7 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 125 | 11 | M8 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 126 | 11 | M9 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 127 | 11 | M10 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 128 | 11 | M11 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 129 | 11 | M12 | HSS5X5X4 | 0.008 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.119 | H1-1b* |
| 130 | 11 | M13 | HSS5X5X4 | 0.008 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.119 | H1-1b* |
| 131 | 12 | M1 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.394 | H1-1b |
| 132 | 12 | M2 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.573 | H1-1b |
| 133 | 12 | M3 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.369 | H1-1b |
| 134 | 12 | M4 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.573 | H1-1b |
| 135 | 12 | M5 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.394 | H1-1b |
| 136 | 12 | M6 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 137 | 12 | M7 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 138 | 12 | M8 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 139 | 12 | M9 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 140 | 12 | M10 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 141 | 12 | M11 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 142 | 12 | M12 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.116 | H1-1b* |
| 143 | 12 | M13 | HSS5X5X4 | 0 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.116 | H1-1b* |
| 144 | 13 | M1 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.395 | H1-1b |
| 145 | 13 | M2 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.574 | H1-1b |
| 146 | 13 | M3 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.369 | H1-1b |
| 147 | 13 | M4 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.574 | H1-1b |
| 148 | 13 | M5 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.395 | H1-1b |
| 149 | 13 | M6 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 150 | 13 | M7 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 151 | 13 | M8 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 152 | 13 | M9 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 153 | 13 | M10 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 154 | 13 | M11 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 155 | 13 | M12 | HSS5X5X4 | 0.008 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.119 | H1-1b* |
| 156 | 13 | M13 | HSS5X5X4 | 0.008 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.119 | H1-1b* |
| 157 | 14 | M1 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.395 | H1-1b |
| 158 | 14 | M2 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.574 | H1-1b |
| 159 | 14 | M3 | HSS7X5X4 | 0 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.369 | H1-1b* |
| 160 | 14 | M4 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.574 | H1-1b |
| 161 | 14 | M5 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.395 | H1-1b |



AISC 14TH (360-10): LRFD Member Steel Code Checks (Continued)

| LC | Member | Shape | UC Max | Loc[ft] | Shear UC | Loc[ft] | Dir | phi*Pnc[k] | phi*Pnt[k] | phi*Mnyy[k-ft] | phi*Mnzz[k-ft] | Cb | Eqn | |
|-----|--------|-------|----------|---------|----------|---------|-----|------------|------------|----------------|----------------|--------|-------|--------|
| 162 | 14 | M6 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 163 | 14 | M7 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 164 | 14 | M8 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 165 | 14 | M9 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 166 | 14 | M10 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 167 | 14 | M11 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 168 | 14 | M12 | HSS5X5X4 | 0.016 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.129 | H1-1b* |
| 169 | 14 | M13 | HSS5X5X4 | 0.016 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.129 | H1-1b* |
| 170 | 15 | M1 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.395 | H1-1b |
| 171 | 15 | M2 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.574 | H1-1b |
| 172 | 15 | M3 | HSS7X5X4 | 0 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.369 | H1-1b* |
| 173 | 15 | M4 | HSS7X5X4 | 0.001 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.574 | H1-1b |
| 174 | 15 | M5 | HSS7X5X4 | 0.001 | 0 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.395 | H1-1b |
| 175 | 15 | M6 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 176 | 15 | M7 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 177 | 15 | M8 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 178 | 15 | M9 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 179 | 15 | M10 | HSS4X4X4 | 0.002 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 180 | 15 | M11 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 181 | 15 | M12 | HSS5X5X4 | 0.016 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.129 | H1-1b* |
| 182 | 15 | M13 | HSS5X5X4 | 0.016 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.129 | H1-1b* |
| 183 | 16 | M1 | HSS7X5X4 | 0.155 | 5 | 0.005 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.696 | H1-1b* |
| 184 | 16 | M2 | HSS7X5X4 | 0.155 | 5 | 0.004 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.246 | H1-1b* |
| 185 | 16 | M3 | HSS7X5X4 | 0.155 | 5 | 0.005 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.588 | H1-1b* |
| 186 | 16 | M4 | HSS7X5X4 | 0.155 | 5 | 0.012 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.92 | H1-1b* |
| 187 | 16 | M5 | HSS7X5X4 | 0.155 | 5 | 0.018 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.425 | H1-1b* |
| 188 | 16 | M6 | HSS4X4X4 | 0.094 | 11 | 0.001 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.668 | H1-1b* |
| 189 | 16 | M7 | HSS4X4X4 | 0.014 | 0 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 190 | 16 | M8 | HSS4X4X4 | 0.018 | 0 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 191 | 16 | M9 | HSS4X4X4 | 0.02 | 0 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 192 | 16 | M10 | HSS4X4X4 | 0.015 | 0 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 193 | 16 | M11 | HSS4X4X4 | 0.087 | 0 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.666 | H1-1b* |
| 194 | 16 | M12 | HSS5X5X4 | 0.58 | 0 | 0.195 | 1.5 | z | 176.98 | 178.02 | 26.255 | 26.255 | 1.651 | H1-1b |
| 195 | 16 | M13 | HSS5X5X4 | 0.554 | 0 | 0.184 | 1.5 | z | 176.98 | 178.02 | 26.255 | 26.255 | 1.679 | H1-1b |
| 196 | 17 | M1 | HSS7X5X4 | 0 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.394 | H1-1b* |
| 197 | 17 | M2 | HSS7X5X4 | 0 | 5 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.573 | H1-1b* |
| 198 | 17 | M3 | HSS7X5X4 | 0 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.37 | H1-1b* |
| 199 | 17 | M4 | HSS7X5X4 | 0 | 5 | 0.001 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.573 | H1-1b* |
| 200 | 17 | M5 | HSS7X5X4 | 0 | 5 | 0.001 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.394 | H1-1b* |
| 201 | 17 | M6 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 202 | 17 | M7 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 203 | 17 | M8 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 204 | 17 | M9 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 205 | 17 | M10 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 206 | 17 | M11 | HSS4X4X4 | 0.001 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b* |
| 207 | 17 | M12 | HSS5X5X4 | 0.015 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.132 | H1-1b* |
| 208 | 17 | M13 | HSS5X5X4 | 0.015 | 1.5 | 0 | 1.5 | y | 176.98 | 178.02 | 26.255 | 26.255 | 1.132 | H1-1b* |
| 209 | 18 | M1 | HSS7X5X4 | 0.146 | 5 | 0.006 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.352 | H1-1b* |
| 210 | 18 | M2 | HSS7X5X4 | 0.146 | 5 | 0.005 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.997 | H1-1b* |
| 211 | 18 | M3 | HSS7X5X4 | 0.146 | 5 | 0.005 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 3 | H1-1b* |
| 212 | 18 | M4 | HSS7X5X4 | 0.146 | 5 | 0.011 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.311 | H1-1b* |
| 213 | 18 | M5 | HSS7X5X4 | 0.146 | 5 | 0.016 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.095 | H1-1b* |
| 214 | 18 | M6 | HSS4X4X4 | 0.154 | 0 | 0.001 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.668 | H1-1b* |
| 215 | 18 | M7 | HSS4X4X4 | 0.014 | 0 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 216 | 18 | M8 | HSS4X4X4 | 0.016 | 0 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |

AISC 14TH (360-10): LRFD Member Steel Code Checks (Continued)

| | LC | Member | Shape | UC Max | Loc[ft] | Shear UC | Loc[ft] | Dir | phi*Pnc[k] | phi*Pnt[k] | phi*Mnyy[k-ft] | phi*Mnzz[k-ft] | Cb | Eqn |
|-----|----|--------|----------|--------|---------|----------|---------|-----|------------|------------|----------------|----------------|-------|--------|
| 217 | 18 | M9 | HSS4X4X4 | 0.016 | 0 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 218 | 18 | M10 | HSS4X4X4 | 0.015 | 0 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 219 | 18 | M11 | HSS4X4X4 | 0.053 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.666 | H1-1b* |
| 220 | 18 | M12 | HSS5X5X4 | 0.599 | 0 | 0.201 | 1.5 | z | 176.98 | 178.02 | 26.255 | 26.255 | 1.678 | H1-1b |
| 221 | 18 | M13 | HSS5X5X4 | 0.536 | 0 | 0.178 | 1.5 | z | 176.98 | 178.02 | 26.255 | 26.255 | 1.657 | H1-1b |
| 222 | 19 | M1 | HSS7X5X4 | 0.155 | 5 | 0.004 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.644 | H1-1b* |
| 223 | 19 | M2 | HSS7X5X4 | 0.155 | 5 | 0.004 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.211 | H1-1b* |
| 224 | 19 | M3 | HSS7X5X4 | 0.155 | 5 | 0.005 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.457 | H1-1b* |
| 225 | 19 | M4 | HSS7X5X4 | 0.155 | 5 | 0.012 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.977 | H1-1b* |
| 226 | 19 | M5 | HSS7X5X4 | 0.155 | 5 | 0.018 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.51 | H1-1b* |
| 227 | 19 | M6 | HSS4X4X4 | 0.093 | 11 | 0.001 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.668 | H1-1b* |
| 228 | 19 | M7 | HSS4X4X4 | 0.014 | 0 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 229 | 19 | M8 | HSS4X4X4 | 0.018 | 0 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 230 | 19 | M9 | HSS4X4X4 | 0.02 | 0 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 231 | 19 | M10 | HSS4X4X4 | 0.015 | 0 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 232 | 19 | M11 | HSS4X4X4 | 0.087 | 0 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.666 | H1-1b* |
| 233 | 19 | M12 | HSS5X5X4 | 0.58 | 0 | 0.195 | 1.5 | z | 176.98 | 178.02 | 26.255 | 26.255 | 1.655 | H1-1b |
| 234 | 19 | M13 | HSS5X5X4 | 0.555 | 0 | 0.184 | 1.5 | z | 176.98 | 178.02 | 26.255 | 26.255 | 1.676 | H1-1b |
| 235 | 20 | M1 | HSS7X5X4 | 0.146 | 5 | 0.006 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.352 | H1-1b* |
| 236 | 20 | M2 | HSS7X5X4 | 0.146 | 5 | 0.005 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 1.997 | H1-1b* |
| 237 | 20 | M3 | HSS7X5X4 | 0.146 | 5 | 0.005 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 3 | H1-1b* |
| 238 | 20 | M4 | HSS7X5X4 | 0.146 | 5 | 0.011 | 5 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.311 | H1-1b* |
| 239 | 20 | M5 | HSS7X5X4 | 0.146 | 5 | 0.016 | 0 | y | 204.39 | 216.936 | 33.914 | 42.78 | 2.095 | H1-1b* |
| 240 | 20 | M6 | HSS4X4X4 | 0.154 | 0 | 0.001 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.668 | H1-1b* |
| 241 | 20 | M7 | HSS4X4X4 | 0.014 | 0 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 242 | 20 | M8 | HSS4X4X4 | 0.016 | 0 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 243 | 20 | M9 | HSS4X4X4 | 0.016 | 0 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 244 | 20 | M10 | HSS4X4X4 | 0.015 | 0 | 0 | 11 | z | 84.082 | 139.518 | 16.181 | 16.181 | 1.667 | H1-1b |
| 245 | 20 | M11 | HSS4X4X4 | 0.053 | 11 | 0 | 11 | y | 84.082 | 139.518 | 16.181 | 16.181 | 1.666 | H1-1b* |
| 246 | 20 | M12 | HSS5X5X4 | 0.599 | 0 | 0.201 | 1.5 | z | 176.98 | 178.02 | 26.255 | 26.255 | 1.678 | H1-1b |
| 247 | 20 | M13 | HSS5X5X4 | 0.536 | 0 | 0.178 | 1.5 | z | 176.98 | 178.02 | 26.255 | 26.255 | 1.657 | H1-1b |

DETENTION VAULT DETAILS


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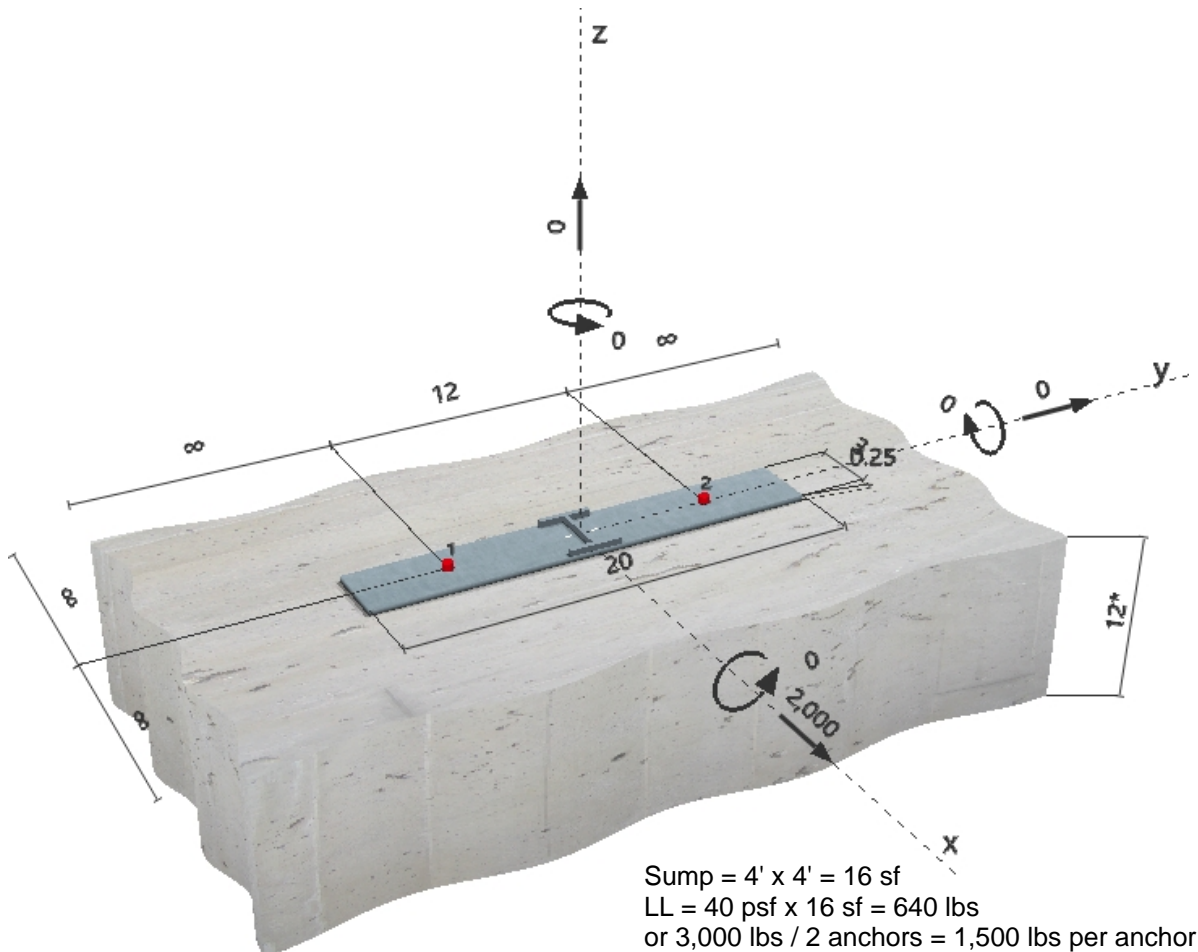
Company:
 Specifier:
 Address:
 Phone | Fax:
 E-Mail:

Page:
 Project:
 Sub-Project | Pos. No.:
 Date:

1
 Mercer Island Apts
 Sump Grate Conn
 12/12/2012

Specifier's comments:
1 Input data

| | | |
|----------------------------------|--|---|
| Anchor type and diameter: | Kwik Bolt TZ - SS 316 1/2 (3 1/4) |  |
| Effective embedment depth: | $h_{ef,act} = 3.250 \text{ in.}$, $h_{nom} = 3.625 \text{ in.}$ | |
| Material: | AISI 316 | |
| Evaluation Service Report: | ESR-1917 | |
| Issued Valid: | 5/1/2017 5/1/2019 | |
| Proof: | Design method ACI 318-14 / Mech. | |
| Stand-off installation: | $e_b = 0.000 \text{ in.}$ (no stand-off); $t = 0.250 \text{ in.}$ | |
| Anchor plate: | $l_x \times l_y \times t = 3.000 \text{ in.} \times 20.000 \text{ in.} \times 0.250 \text{ in.}$; (Recommended plate thickness: not calculated) | |
| Profile: | S shape (AISC); (L x W x T x FT) = 3.000 in. x 2.330 in. x 0.170 in. x 0.260 in. | |
| Base material: | cracked concrete, 4000, $f'_c = 4000 \text{ psi}$; $h = 12.000 \text{ in.}$ | |
| Installation: | hammer drilled hole, Installation condition: Dry | |
| Reinforcement: | tension: condition B, shear: condition B; no supplemental splitting reinforcement present edge reinforcement: none or < No. 4 bar | |

Geometry [in.] & Loading [lb, in.lb]


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 Company:
 Specifier:
 Address:
 Phone | Fax: |
 E-Mail:

 Page:
 Project:
 Sub-Project | Pos. No.:
 Date:

 2
 Mercer Island Apts
 Sump Grate Conn
 12/12/2022

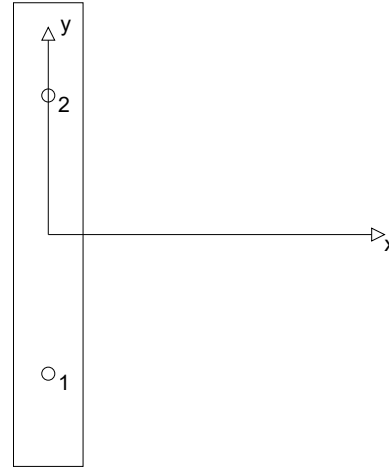
2 Load case/Resulting anchor forces

Load case: Design loads

Anchor reactions [lb]

Tension force: (+Tension, -Compression)

| Anchor | Tension force | Shear force | Shear force x | Shear force y |
|--------|---------------|-------------|---------------|---------------|
| 1 | 0 | 1000 | 1000 | 0 |
| 2 | 0 | 1000 | 1000 | 0 |

 max. concrete compressive strain: - [%]
 max. concrete compressive stress: - [psi]
 resulting tension force in (x/y)=(0.000/0.000): 0 [lb]
 resulting compression force in (x/y)=(0.000/0.000): 0 [lb]


3 Tension load

| | Load N_{ua} [lb] | Capacity ϕN_n [lb] | Utilization $\beta_N = N_{ua}/\phi N_n$ | Status |
|------------------------------|--------------------|--------------------------|---|--------|
| Steel Strength* | N/A | N/A | N/A | N/A |
| Pullout Strength* | N/A | N/A | N/A | N/A |
| Concrete Breakout Strength** | N/A | N/A | N/A | N/A |

* anchor having the highest loading **anchor group (anchors in tension)

4 Shear load

| | Load V_{ua} [lb] | Capacity ϕV_n [lb] | Utilization $\beta_V = V_{ua}/\phi V_n$ | Status |
|---------------------------------------|--------------------|--------------------------|---|--------|
| Steel Strength* | 1000 | 4472 | 23 | OK |
| Steel failure (with lever arm)* | N/A | N/A | N/A | N/A |
| Pryout Strength** | 2000 | 17639 | 12 | OK |
| Concrete edge failure in direction ** | N/A | N/A | N/A | N/A |

* anchor having the highest loading ** anchor group (relevant anchors)

4.1 Steel Strength

V_{sa} = ESR value refer to ICC-ES ESR-1917
 $\phi V_{steel} \geq V_{ua}$ ACI 318-14 Table 17.3.1.1

Variables

| | |
|--------------------------------|-----------------|
| $A_{se,V}$ [in. ²] | f_{uta} [psi] |
| 0.10 | 115000 |

Calculations

| |
|---------------|
| V_{sa} [lb] |
| 6880 |

Results

| | | | |
|---------------|----------------|--------------------|---------------|
| V_{sa} [lb] | ϕ_{steel} | ϕV_{sa} [lb] | V_{ua} [lb] |
| 6880 | 0.650 | 4472 | 1000 |

4.2 Pryout Strength

$$V_{cp} = k_{cp} \left[\left(\frac{A_{Nc}}{A_{Nc0}} \right) \psi_{ec,N} \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b \right] \quad \text{ACI 318-14 Eq. (17.5.3.1b)}$$

$$\phi V_{cp} \geq V_{ua} \quad \text{ACI 318-14 Table 17.3.1.1}$$

$$A_{Nc} \text{ see ACI 318-14, Section 17.4.2.1, Fig. R 17.4.2.1(b)}$$

$$A_{Nc0} = 9 h_{ef}^2 \quad \text{ACI 318-14 Eq. (17.4.2.1c)}$$

$$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2 e_N}{3 h_{ef}}} \right) \leq 1.0 \quad \text{ACI 318-14 Eq. (17.4.2.4)}$$

$$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}} \right) \leq 1.0 \quad \text{ACI 318-14 Eq. (17.4.2.5b)}$$

$$\psi_{cp,N} = \text{MAX} \left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}} \right) \leq 1.0 \quad \text{ACI 318-14 Eq. (17.4.2.7b)}$$

$$N_b = k_c \lambda_a \sqrt{f_c} h_{ef}^{1.5} \quad \text{ACI 318-14 Eq. (17.4.2.2a)}$$

Variables

| | | | | |
|----------|----------------|------------------|------------------|-------------------|
| k_{cp} | h_{ef} [in.] | $e_{c1,N}$ [in.] | $e_{c2,N}$ [in.] | $c_{a,min}$ [in.] |
| 2 | 3.250 | 0.000 | 0.000 | ∞ |

| | | | | |
|--------------|----------------|-------|-------------|-------------|
| $\psi_{c,N}$ | c_{ac} [in.] | k_c | λ_a | f_c [psi] |
| 1.000 | 6.000 | 17 | 1.000 | 4000 |

Calculations

| | | | | | | |
|------------------------------|-------------------------------|----------------|----------------|---------------|---------------|------------|
| A_{Nc} [in. ²] | A_{Nc0} [in. ²] | $\psi_{ec1,N}$ | $\psi_{ec2,N}$ | $\psi_{ed,N}$ | $\psi_{cp,N}$ | N_b [lb] |
| 190.13 | 95.06 | 1.000 | 1.000 | 1.000 | 1.000 | 6299 |

Results

| | | | |
|---------------|-------------------|--------------------|---------------|
| V_{cp} [lb] | $\phi_{concrete}$ | ϕV_{cp} [lb] | V_{ua} [lb] |
| 25198 | 0.700 | 17639 | 2000 |

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5 Warnings

- The anchor design methods in PROFIS Anchor require rigid anchor plates per current regulations (ETAG 001/Annex C, EOTA TR029, etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Anchor calculates the minimum required anchor plate thickness with FEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid base plate assumption is valid is not carried out by PROFIS Anchor. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies when supplementary reinforcement is used. The Φ factor is increased for non-steel Design Strengths except Pullout Strength and Pryout strength. Condition B applies when supplementary reinforcement is not used and for Pullout Strength and Pryout Strength. Refer to your local standard.
- Refer to the manufacturer's product literature for cleaning and installation instructions.
- Checking the transfer of loads into the base material and the shear resistance are required in accordance with ACI 318 or the relevant standard!
- Hilti post-installed anchors shall be installed in accordance with the Hilti Manufacturer's Printed Installation Instructions (MPII). Reference ACI 318-14, Section 17.8.1.

Fastening meets the design criteria!

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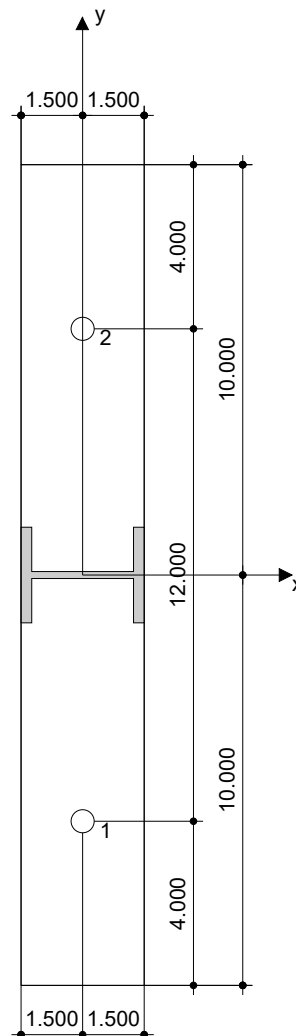
6 Installation data

Anchor plate, steel: -
 Profile: S shape (AISC); 3.000 x 2.330 x 0.170 x 0.260 in.
 Hole diameter in the fixture: $d_f = 0.563$ in.
 Plate thickness (input): 0.250 in.
 Recommended plate thickness: not calculated
 Drilling method: Hammer drilled
 Cleaning: Manual cleaning of the drilled hole according to instructions for use is required.

Anchor type and diameter: Kwik Bolt TZ - SS 316 1/2 (3 1/4)
 Installation torque: 480.001 in.lb
 Hole diameter in the base material: 0.500 in.
 Hole depth in the base material: 4.000 in.
 Minimum thickness of the base material: 8.000 in.

6.1 Recommended accessories

| Drilling | Cleaning | Setting |
|--|--|--|
| <ul style="list-style-type: none"> Suitable Rotary Hammer Properly sized drill bit | <ul style="list-style-type: none"> Manual blow-out pump | <ul style="list-style-type: none"> Torque controlled cordless impact tool (Hilti Safeset System) Torque wrench Hammer |



Coordinates Anchor in.

| Anchor | x | y | C-x | C+y | C-y | C+y |
|--------|-------|--------|-----|-----|-----|-----|
| 1 | 0.000 | -6.000 | - | - | - | - |
| 2 | 0.000 | 6.000 | - | - | - | - |



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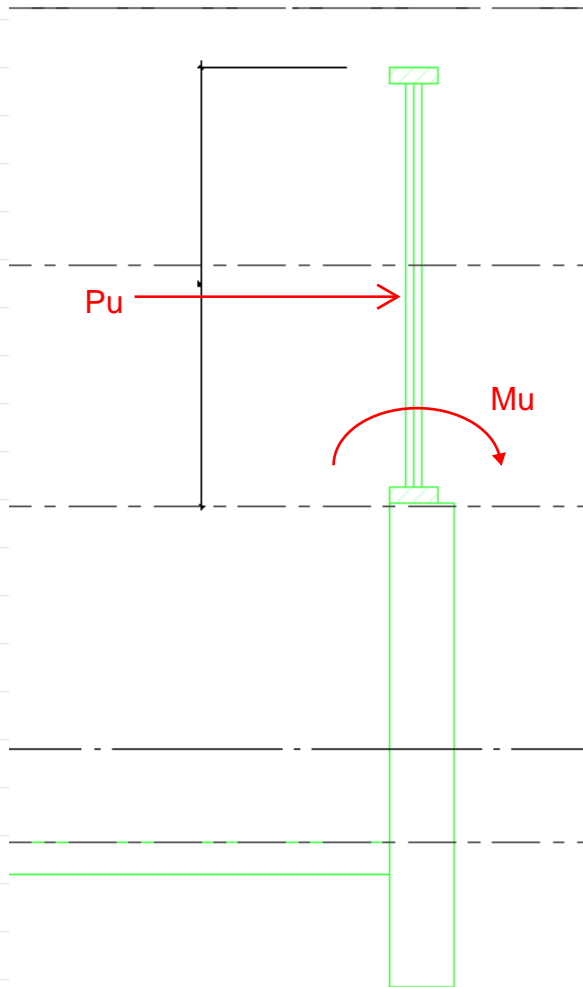
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7 Remarks; Your Cooperation Duties

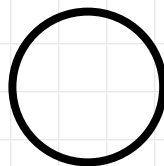
- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.

LOADING DOCK FENCE



$$P_u = 1.7(25 \text{ psf})(5'/2)(8') = 850 \text{ lbs}$$

$$M_u = 850 \text{ lbs}(2.5') = 2125 \text{ lbs}$$



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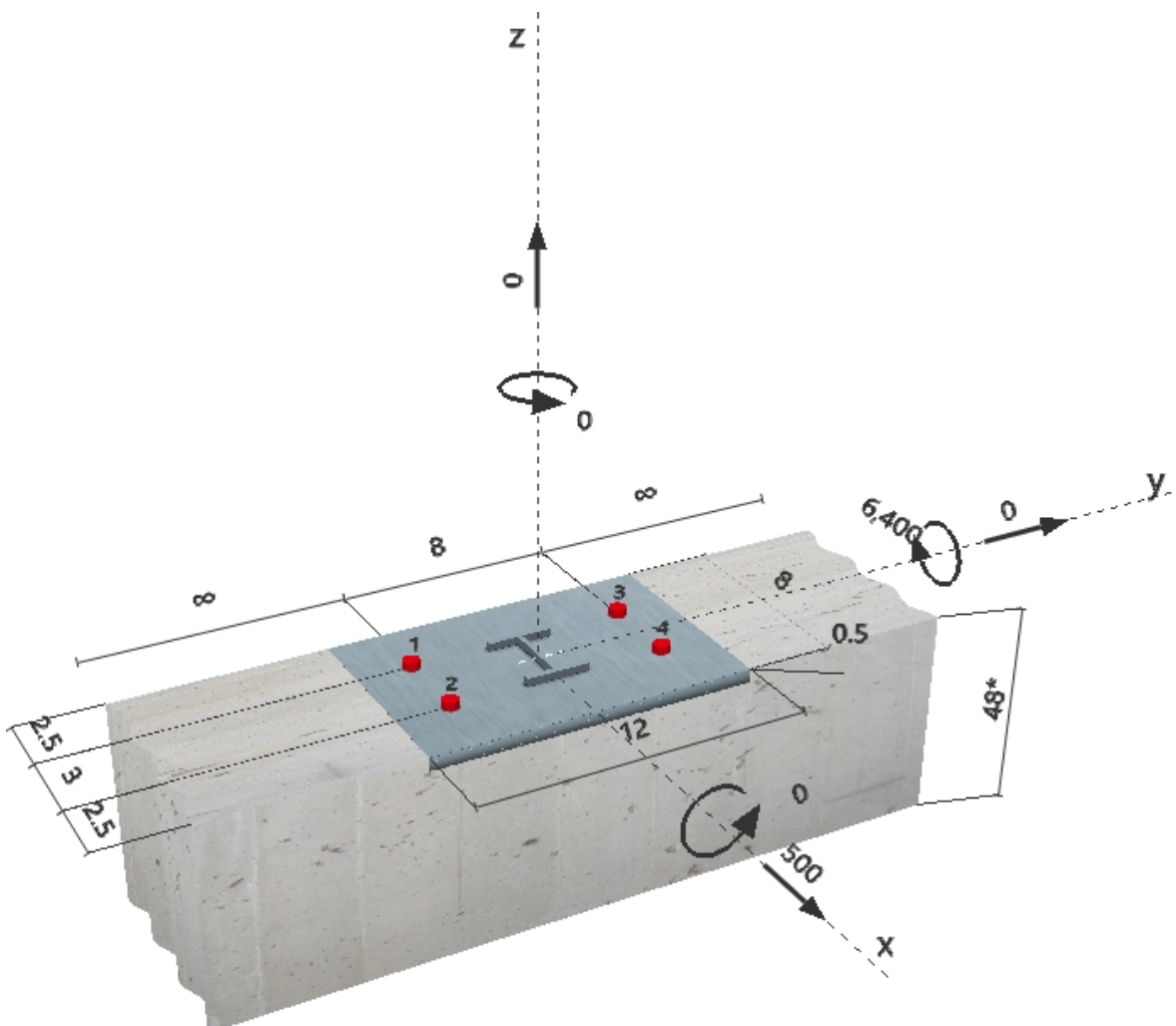
Specifier's comments: Loading Dock Fence

1 Input data

| | |
|------------------------------------|---|
| Anchor type and diameter: | AWS D1.1 GR. B 5/8 |
| Effective embedment depth: | $h_{ef} = 4.724$ in. |
| Material: | |
| Proof: | Design method ACI 318-08 / CIP |
| Stand-off installation: | $e_b = 0.000$ in. (no stand-off); $t = 0.500$ in. |
| Anchor plate: | $l_x \times l_y \times t = 8.000$ in. \times 12.000 in. \times 0.500 in.; (Recommended plate thickness: not calculated) |
| Profile: | S shape (AISC); (L x W x T x FT) = 3.000 in. \times 2.330 in. \times 0.170 in. \times 0.260 in. |
| Base material: | cracked concrete, 2500, $f'_c = 2500$ psi; $h = 48.000$ in. |
| Reinforcement: | tension: condition B, shear: condition B; edge reinforcement: none or $<$ No. 4 bar |
| Seismic loads (cat. C, D, E, or F) | no |



Geometry [in.] & Loading [lb, in.lb]



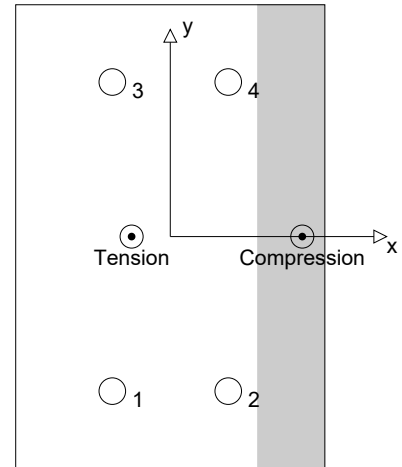
2 Load case/Resulting anchor forces

Load case: Design loads

Anchor reactions [lb]

Tension force: (+Tension, -Compression)

| Anchor | Tension force | Shear force | Shear force x | Shear force y |
|--------|---------------|-------------|---------------|---------------|
| 1 | 604 | 125 | 125 | 0 |
| 2 | 121 | 125 | 125 | 0 |
| 3 | 604 | 125 | 125 | 0 |
| 4 | 121 | 125 | 125 | 0 |

max. concrete compressive strain: 0.03 [%]
max. concrete compressive stress: 138 [psi]
resulting tension force in (x/y)=(-1.001/0.000): 1449 [lb]
resulting compression force in (x/y)=(3.416/0.000): 1449 [lb]


3 Tension load

| | Load N_{ua} [lb] | Capacity ϕN_n [lb] | Utilization $\beta_N = N_{ua}/\phi N_n$ | Status |
|--|--------------------|--------------------------|---|--------|
| Steel Strength* | 604 | 14966 | 5 | OK |
| Pullout Strength* | 604 | 12880 | 5 | OK |
| Concrete Breakout Strength** | 1449 | 5379 | 27 | OK |
| Concrete Side-Face Blowout, direction ** | N/A | N/A | N/A | N/A |

* anchor having the highest loading **anchor group (anchors in tension)

3.1 Steel Strength

$$N_{sa} = A_{se,N} f_{uta} \quad \text{ACI 318-08 Eq. (D-3)}$$

$$\phi N_{sa} \geq N_{ua} \quad \text{ACI 318-08 Eq. (D-1)}$$

Variables

| $A_{se,N}$ [in. ²] | f_{uta} [psi] |
|--------------------------------|-----------------|
| 0.31 | 65000 |

Calculations

| N_{sa} [lb] |
|---------------|
| 19955 |

Results

| N_{sa} [lb] | ϕ_{steel} | ϕN_{sa} [lb] | N_{ua} [lb] |
|---------------|----------------|--------------------|---------------|
| 19955 | 0.750 | 14966 | 604 |

3.2 Pullout Strength

$$N_{pN} = \psi_{c,p} N_p \quad \text{ACI 318-08 Eq. (D-14)}$$

$$N_p = 8 A_{brg} f'_c \quad \text{ACI 318-08 Eq. (D-15)}$$

$$\phi N_{pN} \geq N_{ua} \quad \text{ACI 318-08 Eq. (D-1)}$$

Variables

| $\psi_{c,p}$ | A_{brg} [in. ²] | f'_c [psi] |
|--------------|-------------------------------|--------------|
| 1.000 | 0.92 | 2500 |

Calculations

| N_p [lb] |
|------------|
| 18400 |

Results

| N_{pN} [lb] | $\phi_{concrete}$ | ϕN_{pN} [lb] | N_{ua} [lb] |
|---------------|-------------------|--------------------|---------------|
| 18400 | 0.700 | 12880 | 604 |

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3.3 Concrete Breakout Strength

$$N_{cbg} = \left(\frac{A_{Nc}}{A_{Nc0}} \right) \psi_{ec,N} \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b \quad \text{ACI 318-08 Eq. (D-5)}$$

$$\phi N_{cbg} \geq N_{ua} \quad \text{ACI 318-08 Eq. (D-1)}$$

 A_{Nc} see ACI 318-08, Part D.5.2.1, Fig. RD.5.2.1(b)

$$A_{Nc0} = 9 h_{ef}^2 \quad \text{ACI 318-08 Eq. (D-6)}$$

$$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2 e_{c1,N}}{3 h_{ef}}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-9)}$$

$$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-11)}$$

$$\psi_{cp,N} = \text{MAX} \left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-13)}$$

$$N_b = k_c \lambda \sqrt{f_c} h_{ef}^{1.5} \quad \text{ACI 318-08 Eq. (D-7)}$$

Variables

| h_{ef} [in.] | $e_{c1,N}$ [in.] | $e_{c2,N}$ [in.] | $c_{a,min}$ [in.] | $\psi_{c,N}$ |
|----------------|------------------|------------------|-------------------|--------------|
| 4.724 | 1.001 | 0.000 | 2.500 | 1.000 |
| c_{ac} [in.] | k_c | λ | f_c [psij] | |
| 0.000 | 24 | 1 | 2500 | |

Calculations

| A_{Nc} [in. ²] | A_{Nc0} [in. ²] | $\psi_{ec1,N}$ | $\psi_{ec2,N}$ | $\psi_{ed,N}$ | $\psi_{cp,N}$ | N_b [lb] |
|------------------------------|-------------------------------|----------------|----------------|---------------|---------------|------------|
| 177.39 | 200.88 | 0.876 | 1.000 | 0.806 | 1.000 | 12323 |

Results

| N_{cbg} [lb] | $\phi_{concrete}$ | ϕN_{cbg} [lb] | N_{ua} [lb] |
|----------------|-------------------|---------------------|---------------|
| 7684 | 0.700 | 5379 | 1449 |

4 Shear load

| | Load V_{ua} [lb] | Capacity ϕV_n [lb] | Utilization $\beta_V = V_{ua}/\phi V_n$ | Status |
|---|--------------------|--------------------------|---|--------|
| Steel Strength* | 125 | 12971 | 1 | OK |
| Steel failure (with lever arm)* | N/A | N/A | N/A | N/A |
| Pryout Strength** | 500 | 12276 | 5 | OK |
| Concrete edge failure in direction x+** | 500 | 6354 | 8 | OK |

* anchor having the highest loading ** anchor group (relevant anchors)

4.1 Steel Strength

$$V_{sa} = A_{se,V} f_{uta} \quad \text{ACI 318-08 Eq. (D-19)}$$

$$\phi V_{steel} \geq V_{ua} \quad \text{ACI 318-08 Eq. (D-2)}$$

Variables

| | |
|--------------------------------|-----------------|
| $A_{se,V}$ [in. ²] | f_{uta} [psi] |
| 0.31 | 65000 |

Calculations

| |
|---------------|
| V_{sa} [lb] |
| 19955 |

Results

| | | | |
|---------------|----------------|--------------------|---------------|
| V_{sa} [lb] | ϕ_{steel} | ϕV_{sa} [lb] | V_{ua} [lb] |
| 19955 | 0.650 | 12971 | 125 |

4.2 Pryout Strength

$$V_{cp} = k_{cp} \left[\left(\frac{A_{Nc}}{A_{Nc0}} \right) \psi_{ec,N} \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b \right] \quad \text{ACI 318-08 Eq. (D-31)}$$

$$\phi V_{cp} \geq V_{ua} \quad \text{ACI 318-08 Eq. (D-2)}$$

$$A_{Nc} \text{ see ACI 318-08, Part D.5.2.1, Fig. RD.5.2.1(b)}$$

$$A_{Nc0} = 9 h_{ef}^2 \quad \text{ACI 318-08 Eq. (D-6)}$$

$$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2 e_N}{3 h_{ef}}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-9)}$$

$$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-11)}$$

$$\psi_{cp,N} = \text{MAX} \left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-13)}$$

$$N_b = k_c \lambda \sqrt{f_c} h_{ef}^{1.5} \quad \text{ACI 318-08 Eq. (D-7)}$$

Variables

| | | | | |
|----------|----------------|------------------|------------------|-------------------|
| k_{cp} | h_{ef} [in.] | $e_{c1,N}$ [in.] | $e_{c2,N}$ [in.] | $c_{a,min}$ [in.] |
| 2 | 4.724 | 0.000 | 0.000 | 2.500 |

| | | | | |
|--------------|----------------|-------|-----------|-------------|
| $\psi_{c,N}$ | c_{ac} [in.] | k_c | λ | f_c [psi] |
| 1.000 | - | 24 | 1 | 2500 |

Calculations

| | | | | | | |
|------------------------------|-------------------------------|----------------|----------------|---------------|---------------|------------|
| A_{Nc} [in. ²] | A_{Nc0} [in. ²] | $\psi_{ec1,N}$ | $\psi_{ec2,N}$ | $\psi_{ed,N}$ | $\psi_{cp,N}$ | N_b [lb] |
| 177.39 | 200.88 | 1.000 | 1.000 | 0.806 | 1.000 | 12323 |

Results

| | | | |
|---------------|-------------------|--------------------|---------------|
| V_{cp} [lb] | $\phi_{concrete}$ | ϕV_{cp} [lb] | V_{ua} [lb] |
| 17537 | 0.700 | 12276 | 500 |

4.3 Concrete edge failure in direction x+

$$V_{cbg} = \left(\frac{A_{Vc}}{A_{Vc0}} \right) \Psi_{ec,V} \Psi_{ed,V} \Psi_{c,V} \Psi_{h,V} \Psi_{parallel,V} V_b \quad \text{ACI 318-08 Eq. (D-22)}$$

$$\phi V_{cbg} \geq V_{ua} \quad \text{ACI 318-08 Eq. (D-2)}$$

$$A_{Vc} \text{ see ACI 318-08, Part D.6.2.1, Fig. RD.6.2.1(b)}$$

$$A_{Vc0} = 4.5 c_{a1}^2 \quad \text{ACI 318-08 Eq. (D-23)}$$

$$\Psi_{ec,V} = \left(\frac{1}{1 + \frac{2e_v}{3c_{a1}}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-26)}$$

$$\Psi_{ed,V} = 0.7 + 0.3 \left(\frac{c_{a2}}{1.5c_{a1}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-28)}$$

$$\Psi_{h,V} = \sqrt{\frac{1.5c_{a1}}{h_a}} \geq 1.0 \quad \text{ACI 318-08 Eq. (D-29)}$$

$$V_b = \left(8 \left(\frac{l_e}{d_a} \right)^{0.2} \sqrt{d_a} \right) \lambda \sqrt{f_c} c_{a1}^{1.5} \quad \text{ACI 318-08 Eq. (D-25)}$$

Variables

| c_{a1} [in.] | c_{a2} [in.] | e_{cV} [in.] | $\Psi_{c,V}$ | h_a [in.] |
|----------------|----------------|----------------|--------------|-------------|
| 5.500 | - | 0.000 | 1.000 | 48.000 |

| l_e [in.] | λ | d_a [in.] | f_c [psi] | $\Psi_{parallel,V}$ |
|-------------|-----------|-------------|-------------|---------------------|
| 4.724 | 1.000 | 0.625 | 2500 | 1.000 |

Calculations

| A_{Vc} [in. ²] | A_{Vc0} [in. ²] | $\Psi_{ec,V}$ | $\Psi_{ed,V}$ | $\Psi_{h,V}$ | V_b [lb] |
|------------------------------|-------------------------------|---------------|---------------|--------------|------------|
| 202.13 | 136.13 | 1.000 | 1.000 | 1.000 | 6113 |

Results

| V_{cbg} [lb] | $\phi_{concrete}$ | ϕV_{cbg} [lb] | V_{ua} [lb] |
|----------------|-------------------|---------------------|---------------|
| 9077 | 0.700 | 6354 | 500 |

5 Combined tension and shear loads

| β_N | β_V | ζ | Utilization $\beta_{N,V}$ [%] | Status |
|-----------|-----------|---------|-------------------------------|--------|
| 0.269 | 0.079 | 5/3 | 13 | OK |

$$\beta_{NV} = \beta_N^{\zeta} + \beta_V^{\zeta} \leq 1$$

6 Warnings

- The anchor design methods in PROFIS Anchor require rigid anchor plates per current regulations (ETAG 001/Annex C, EOTA TR029, etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Anchor calculates the minimum required anchor plate thickness with FEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid base plate assumption is valid is not carried out by PROFIS Anchor. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies when supplementary reinforcement is used. The Φ factor is increased for non-steel Design Strengths except Pullout Strength and Pryout strength. Condition B applies when supplementary reinforcement is not used and for Pullout Strength and Pryout Strength. Refer to your local standard.
- Checking the transfer of loads into the base material and the shear resistance are required in accordance with ACI 318 or the relevant standard!

Fastening meets the design criteria!

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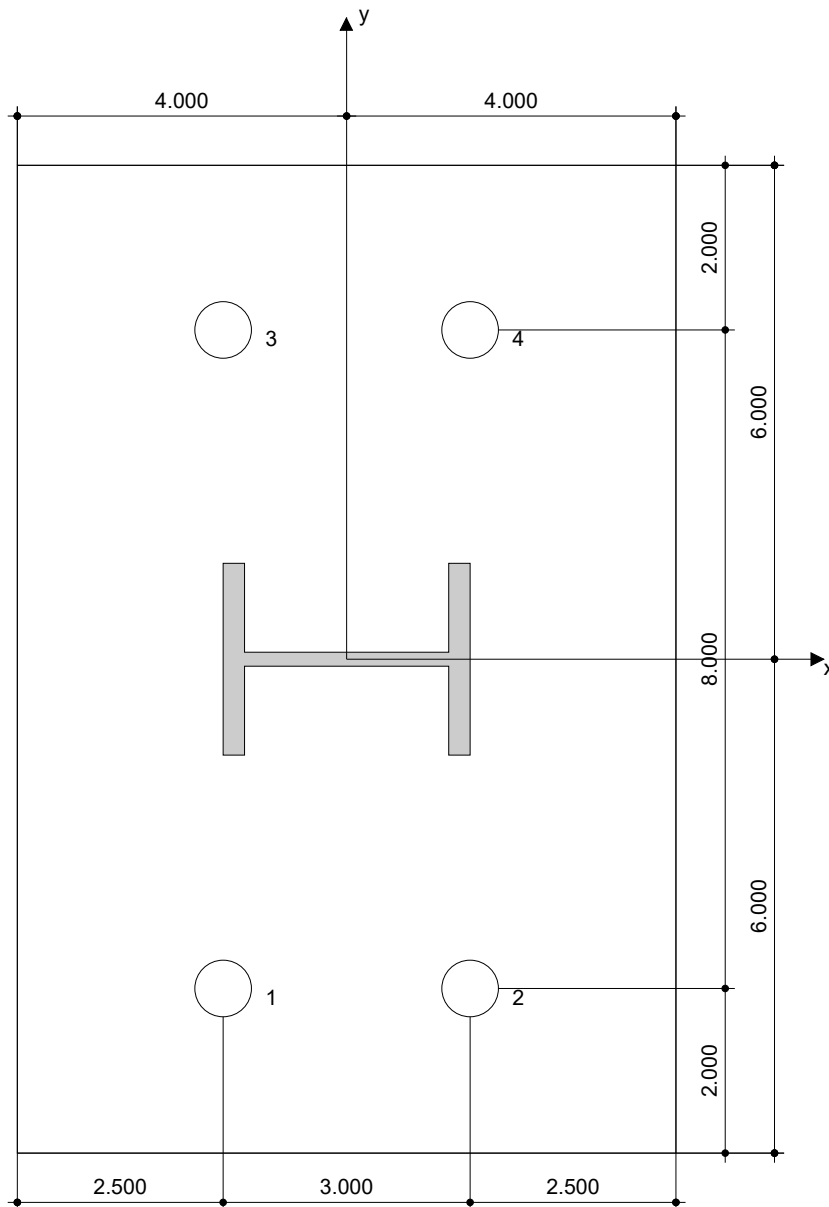
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7 Installation data

Anchor plate, steel: -
 Profile: S shape (AISC); 3.000 x 2.330 x 0.170 x 0.260 in.
 Hole diameter in the fixture: $d_f = 0.688$ in.
 Plate thickness (input): 0.500 in.
 Recommended plate thickness: not calculated
 Drilling method: -
 Cleaning: No cleaning of the drilled hole is required

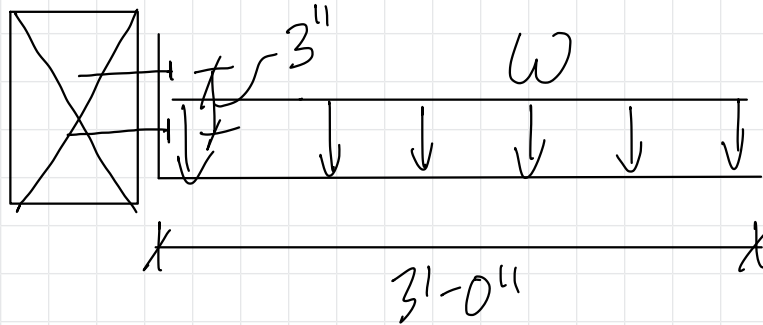
Anchor type and diameter: AWS D1.1 GR. B 5/8
 Installation torque: -
 Hole diameter in the base material: - in.
 Hole depth in the base material: 4.724 in.
 Minimum thickness of the base material: 5.537 in.



Coordinates Anchor in.

| Anchor | x | y | C _{-x} | C _{+x} | C _{-y} | C _{+y} |
|--------|--------|--------|-----------------|-----------------|-----------------|-----------------|
| 1 | -1.500 | -4.000 | 2.500 | 5.500 | - | - |
| 2 | 1.500 | -4.000 | 5.500 | 2.500 | - | - |
| 3 | -1.500 | 4.000 | 2.500 | 5.500 | - | - |
| 4 | 1.500 | 4.000 | 5.500 | 2.500 | - | - |

Check Bent PL Canopy:



Try 1/4" STL PL:

$$W = 1.2D + 1.6S + 0.5W$$

$$W = 1.2(10.5 \text{ PSF}) + 1.6(25 \text{ PSF}) + 0.5(19 \text{ PSF})$$

$$W = 62 \text{ PSF}$$

$$M_{\max} = \frac{Wl^2}{2} = \frac{(62)(3^2)}{2} = 279 \text{ FT}\cdot\#$$

$$= 3.4 \text{ k}\cdot\text{in}$$

$$S_{\text{req}} = \frac{3.4 \text{ k}\cdot\text{in}}{(0.9)(36)} = 0.105 \text{ in}^3$$

$$S_{\text{provided}} = \frac{(12'')(0.25^2)}{6} = 0.125 \text{ in}^3 \checkmark \quad \frac{1}{4}'' \text{ STL PL OK}$$

Check 1/2" ϕ Lag Screws

$V_{APP} = 186 \text{ PLF}$ \swarrow CD

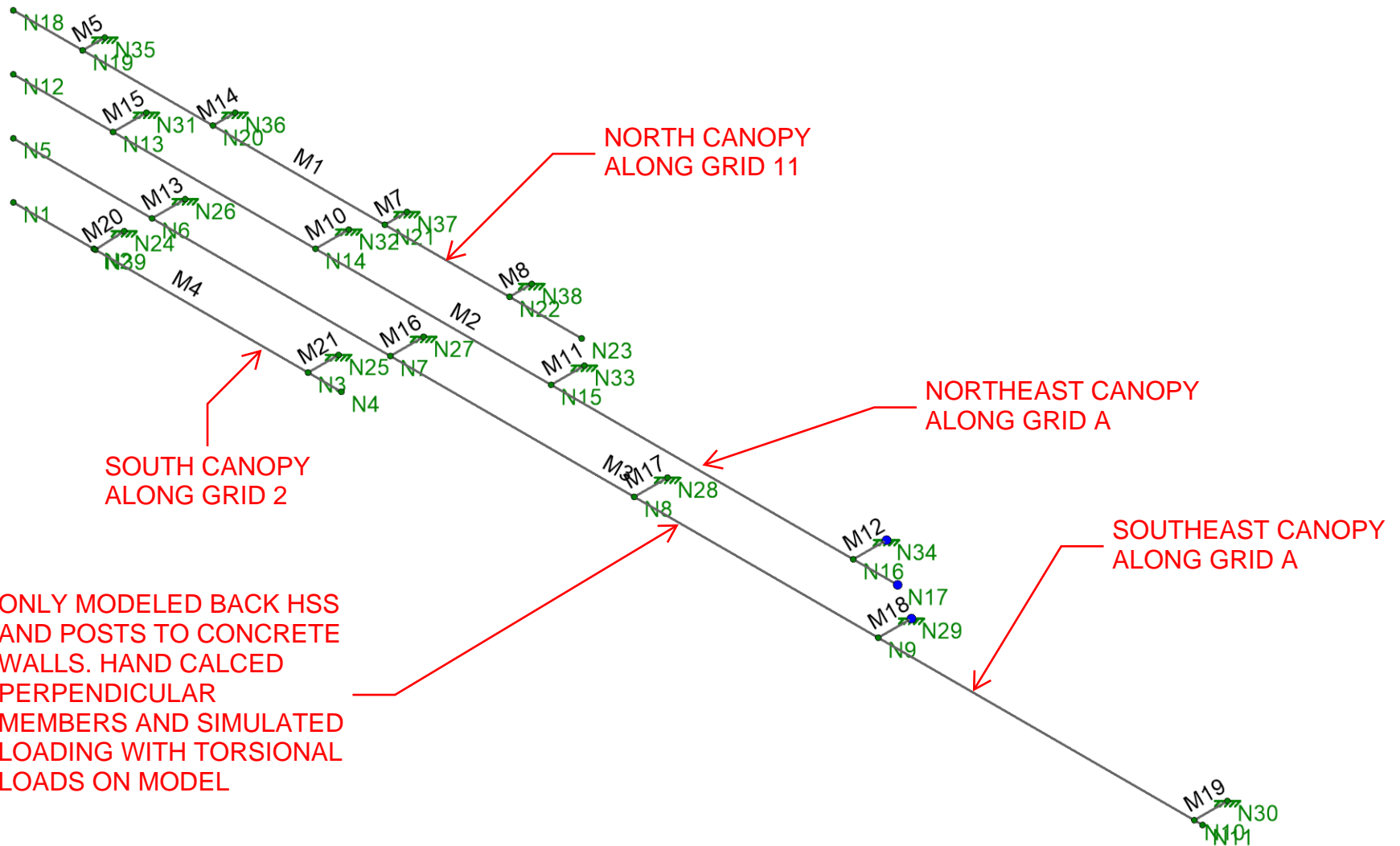
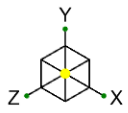
$V_{CAP} = 2 \times 1.6 \times 320 \# = 1024 \# \checkmark \text{ OK}$
 # of screws \nearrow

$T_{APP} = \frac{M}{d} = \frac{3.4}{3"} = 1.13 \text{ K}$

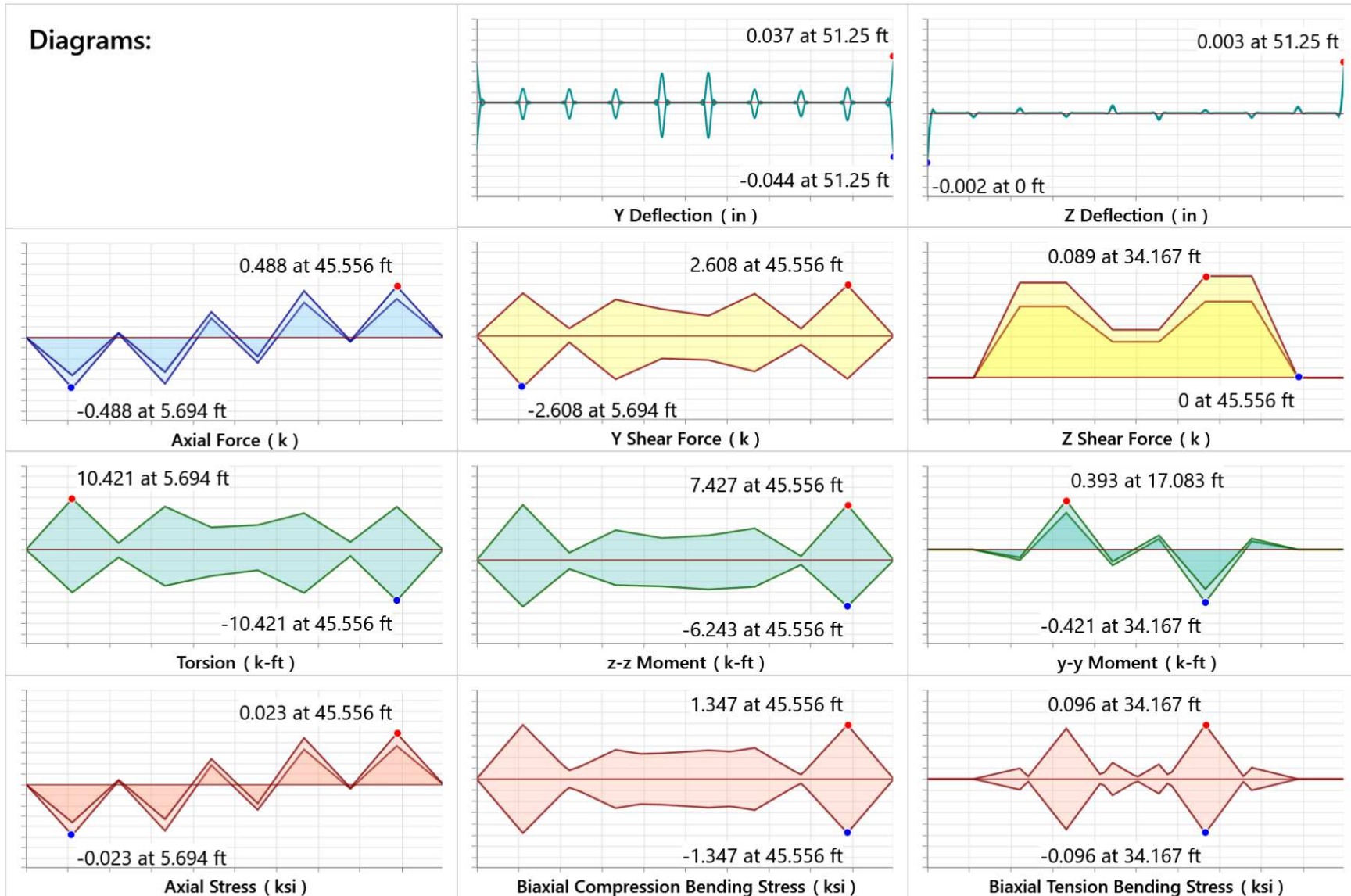
$T_{CAP} = 378 \#/\text{in} \times 1.6 \times (2.19") = 1.3 \text{ K} \checkmark \text{ OK}$
 CD \downarrow
 T-E
 (Thread Length) \nearrow

1/2" ϕ x 4" Long Lag Screws OK \checkmark

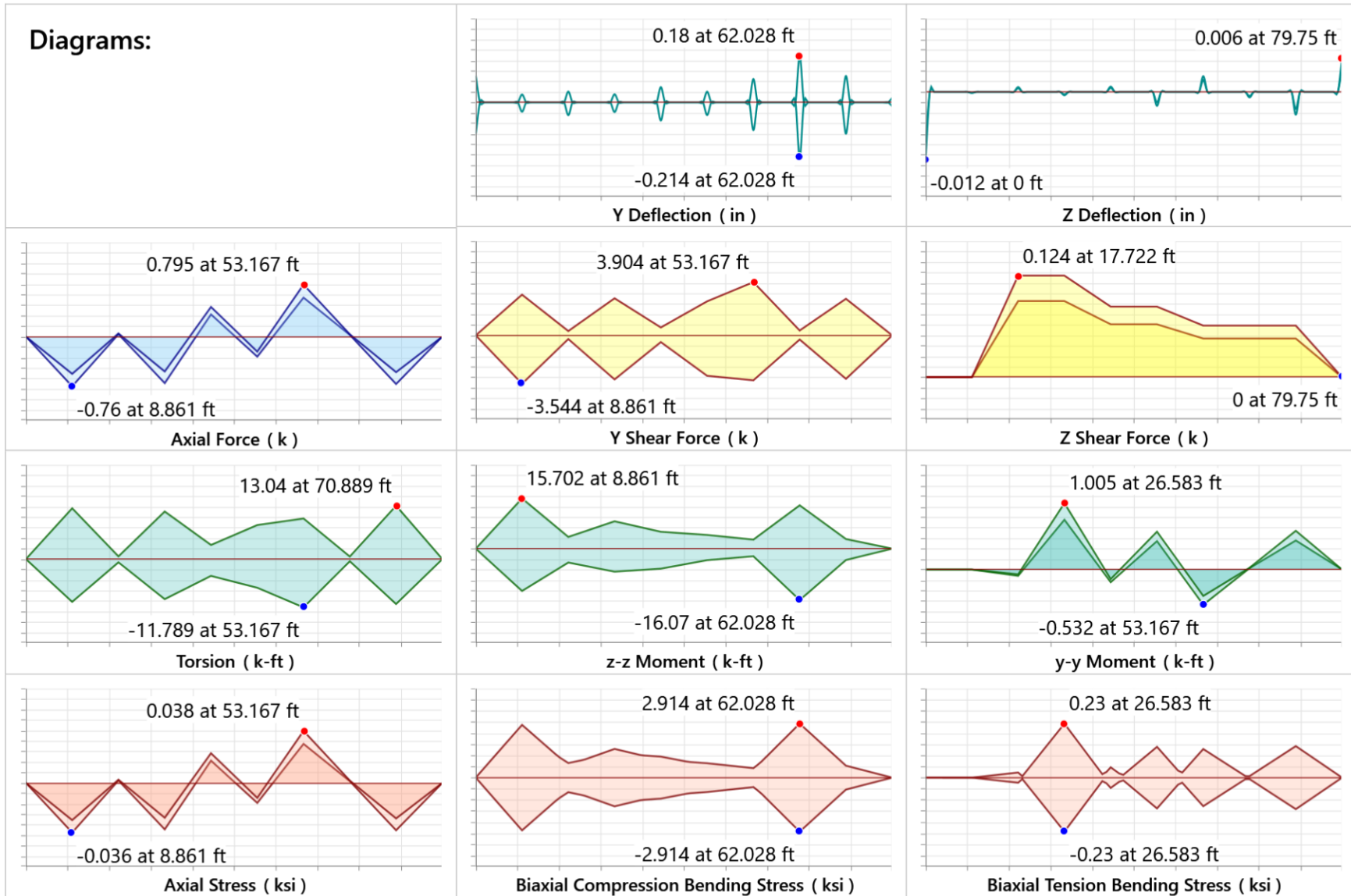
CANOPY



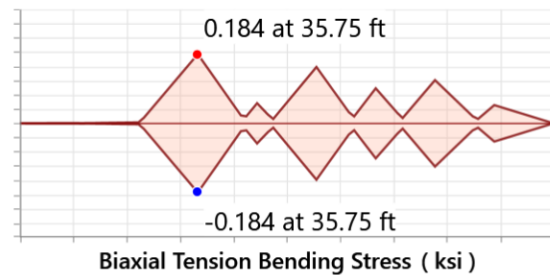
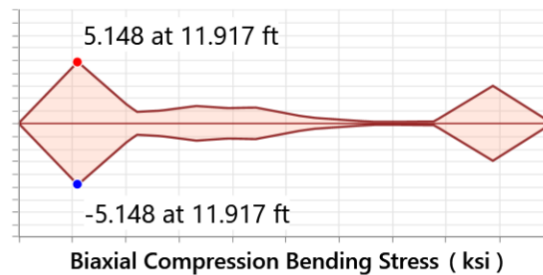
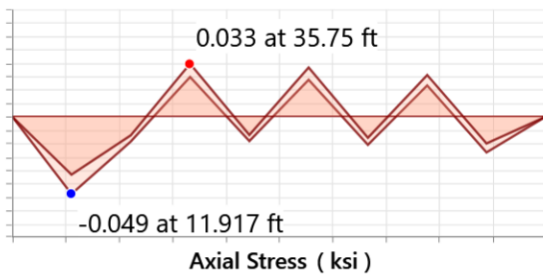
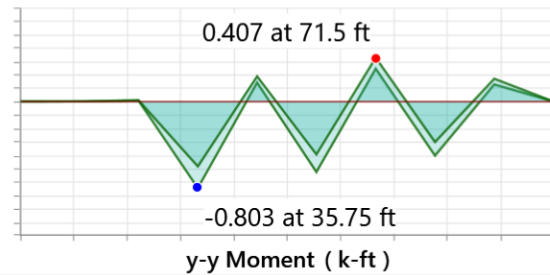
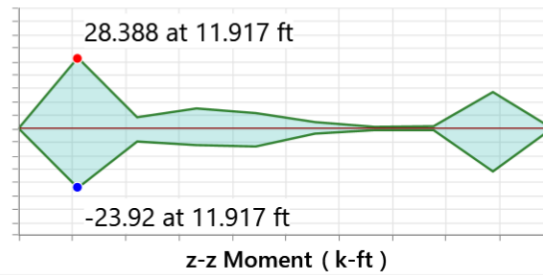
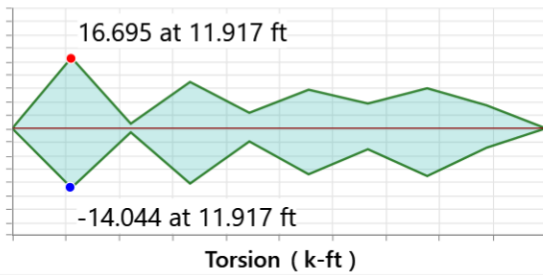
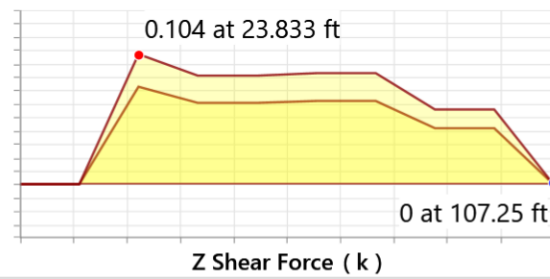
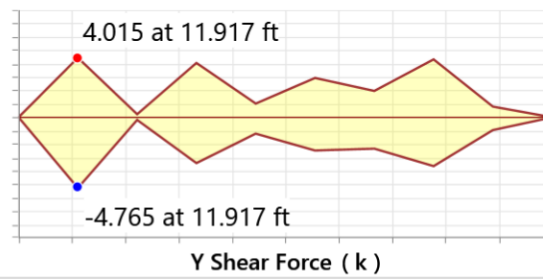
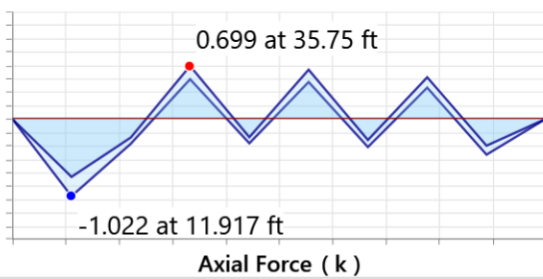
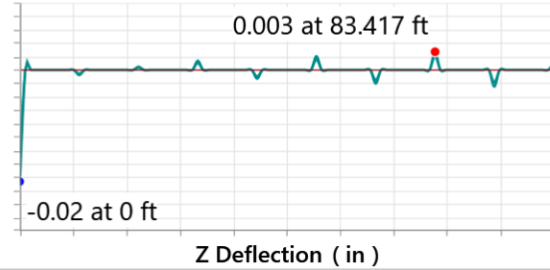
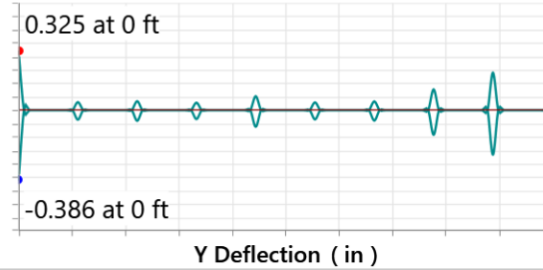
| | | |
|--------------------------|---------------------|---------------------------|
| PCS Structural Solutions | HSS Canopy Supports | SK-1 |
| AMP | | Oct 29, 2020 |
| 19028 MIMU | | 19028 Canopy Supports.r3d |



MEMBER M2

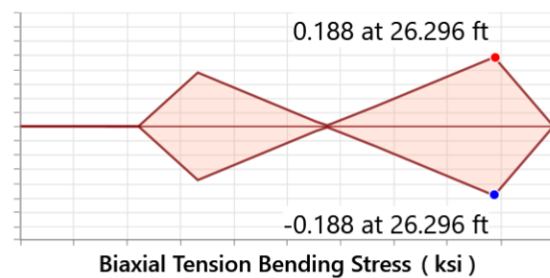
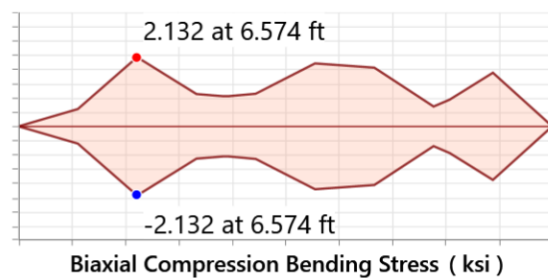
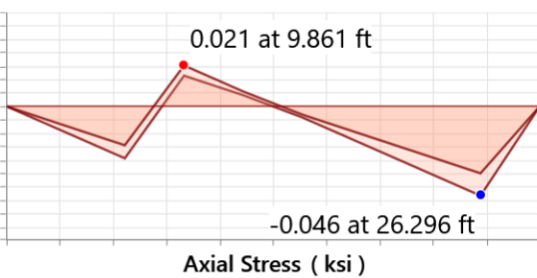
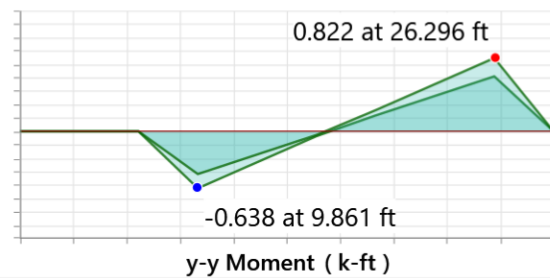
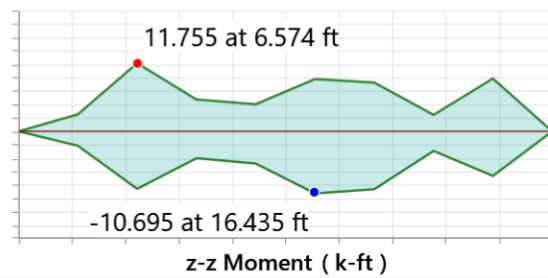
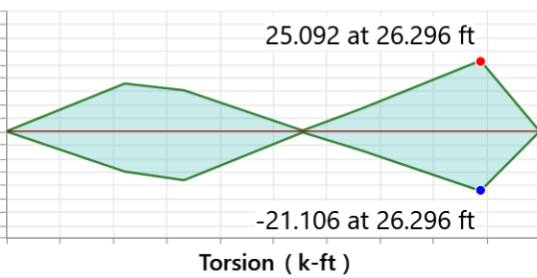
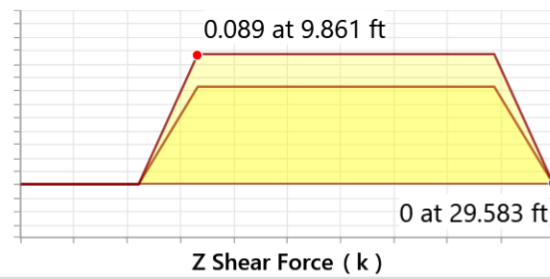
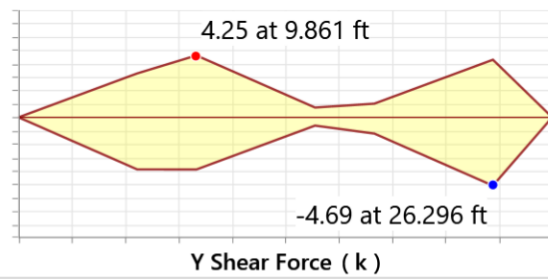
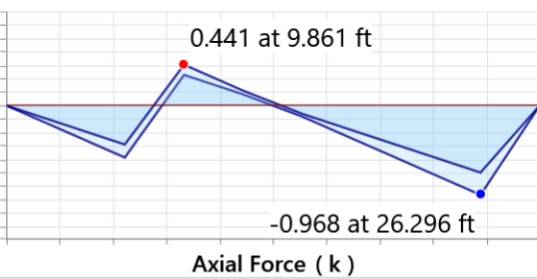
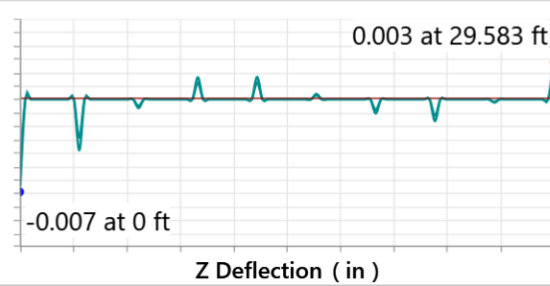
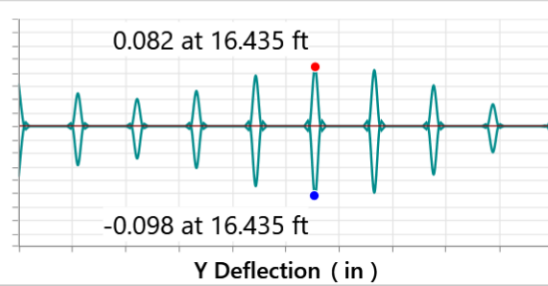


Diagrams:



MEMBER M4

Diagrams:



Nodes

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [deg F] | Detach From Dia... |
|----|-------|---------|--------|--------|--------------|--------------------|
| 1 | N1 | 0 | 0 | 0 | | |
| 2 | N2 | 7.25 | 0 | 0 | | |
| 3 | N3 | 26.583 | 0 | 0 | | |
| 4 | N4 | 29.583 | 0 | 0 | | |
| 5 | N24 | 7.25 | 0 | -2.75 | | |
| 6 | N25 | 26.583 | 0 | -2.75 | | |
| 7 | N5 | 0 | 5 | 0 | | |
| 8 | N6 | 12.5 | 5 | 0 | | |
| 9 | N7 | 34 | 5 | 0 | | |
| 10 | N8 | 56 | 5 | 0 | | |
| 11 | N9 | 78 | 5 | 0 | | |
| 12 | N10 | 106.5 | 5 | 0 | | |
| 13 | N11 | 107.25 | 5 | 0 | | |
| 14 | N12 | 0 | 10 | 0 | | |
| 15 | N13 | 9 | 10 | 0 | | |
| 16 | N14 | 27.25 | 10 | 0 | | |
| 17 | N15 | 48.5 | 10 | 0 | | |
| 18 | N16 | 75.75 | 10 | 0 | | |
| 19 | N17 | 79.75 | 10 | 0 | | |
| 20 | N18 | 0 | 15 | 0 | | |
| 21 | N19 | 6.25 | 15 | 0 | | |
| 22 | N20 | 18 | 15 | 0 | | |
| 23 | N21 | 33.5 | 15 | 0 | | |
| 24 | N22 | 44.75 | 15 | 0 | | |
| 25 | N23 | 51.25 | 15 | 0 | | |
| 26 | N26 | 12.5 | 5 | -3 | | |
| 27 | N27 | 34 | 5 | -3 | | |
| 28 | N28 | 56 | 5 | -3 | | |
| 29 | N29 | 78 | 5 | -3 | | |
| 30 | N30 | 106.5 | 5 | -3 | | |
| 31 | N31 | 9 | 10 | -3 | | |
| 32 | N32 | 27.25 | 10 | -3 | | |
| 33 | N33 | 48.5 | 10 | -3 | | |
| 34 | N34 | 75.75 | 10 | -3 | | |
| 35 | N35 | 6.25 | 15 | -2 | | |
| 36 | N36 | 18 | 15 | -2 | | |
| 37 | N37 | 33.5 | 15 | -2 | | |
| 38 | N38 | 44.75 | 15 | -2 | | |
| 39 | N39 | 7.39575 | 0 | 0 | | |

10PSF(9.5')²/2

Member Distributed Loads (BLC 1 : Dead)

| | Member Label | Direction | Start Magnitud... | End Magnitude... | Start Location [...] | End Location [...] | Inactive [(k, k-f...] |
|---|--------------|-----------|-------------------|------------------|----------------------|--------------------|-----------------------|
| 1 | M4 | Y | -0.095 | -0.095 | 0 | %100 | Active |
| 2 | M3 | Y | -0.07 | -0.07 | 0 | %100 | Active |
| 3 | M2 | Y | -0.07 | -0.07 | 0 | %100 | Active |
| 4 | M1 | Y | -0.08 | -0.08 | 0 | %100 | Active |
| 5 | M4 | Mx | 0.451 | 0.451 | 0 | %100 | Active |
| 6 | M3 | Mx | 0.245 | 0.245 | 0 | %100 | Active |
| 7 | M2 | Mx | 0.245 | 0.245 | 0 | %100 | Active |
| 8 | M1 | Mx | 0.32 | 0.32 | 0 | %100 | Active |

Member Distributed Loads (BLC 2 : Snow)

| | Member Label | Direction | Start Magnitud... | End Magnitude... | Start Location [...] | End Location [...] | Inactive [(k, k-f...] |
|---|--------------|-----------|-------------------|------------------|----------------------|--------------------|-----------------------|
| 1 | M4 | Y | -0.238 | -0.238 | 0 | %100 | Active |
| 2 | M3 | Y | -0.175 | -0.175 | 0 | %100 | Active |
| 3 | M2 | Y | -0.175 | -0.175 | 0 | %100 | Active |
| 4 | M1 | Y | -0.2 | -0.2 | 0 | %100 | Active |

Member Distributed Loads (BLC 2 : Snow) (Continued)

| | Member Label | Direction | Start Magnitud... | End Magnitude... | Start Location [...] | End Location [...] | Inactive [(k, k-f... |
|---|--------------|-----------|-------------------|------------------|----------------------|--------------------|----------------------|
| 5 | M4 | Mx | 1.128 | 1.128 | 0 | %100 | Active |
| 6 | M3 | Mx | 0.613 | 0.613 | 0 | %100 | Active |
| 7 | M2 | Mx | 0.613 | 0.613 | 0 | %100 | Active |
| 8 | M1 | Mx | 0.8 | 0.8 | 0 | %100 | Active |

Member Distributed Loads (BLC 3 : Wind Down Draft)

| | Member Label | Direction | Start Magnitud... | End Magnitude... | Start Location [...] | End Location [...] | Inactive [(k, k-f... |
|---|--------------|-----------|-------------------|------------------|----------------------|--------------------|----------------------|
| 1 | M4 | Y | -0.43 | -0.43 | 0 | %100 | Active |
| 2 | M3 | Y | -0.316 | -0.316 | 0 | %100 | Active |
| 3 | M2 | Y | -0.316 | -0.316 | 0 | %100 | Active |
| 4 | M1 | Y | -0.362 | -0.362 | 0 | %100 | Active |
| 5 | M4 | Mx | 2.04 | 2.04 | 0 | %100 | Active |
| 6 | M1 | Mx | 1.446 | 1.446 | 0 | %100 | Active |
| 7 | M2 | Mx | 1.107 | 1.107 | 0 | %100 | Active |
| 8 | M3 | Mx | 1.107 | 1.107 | 0 | %100 | Active |

Member Distributed Loads (BLC 4 : Wind Uplift)

| | Member Label | Direction | Start Magnitud... | End Magnitude... | Start Location [...] | End Location [...] | Inactive [(k, k-f... |
|---|--------------|-----------|-------------------|------------------|----------------------|--------------------|----------------------|
| 1 | M4 | Mx | -2.577 | -2.577 | 0 | %100 | Active |
| 2 | M1 | Mx | -1.827 | -1.827 | 0 | %100 | Active |
| 3 | M3 | Mx | -1.399 | -1.399 | 0 | %100 | Active |
| 4 | M2 | Mx | -1.399 | -1.399 | 0 | %100 | Active |
| 5 | M4 | Y | 0.544 | 0.544 | 0 | %100 | Active |
| 6 | M3 | Y | 0.4 | 0.4 | 0 | %100 | Active |
| 7 | M2 | Y | 0.4 | 0.4 | 0 | %100 | Active |
| 8 | M1 | Y | 0.457 | 0.457 | 0 | %100 | Active |

Basic Load Cases

| | BLC Desc... | Category | X Gravity | Y Gravity | Z Gravity | Nodal | Point | Distributed | Area(Me... | Surface(P... |
|---|-------------|----------|-----------|-----------|-----------|-------|-------|-------------|------------|--------------|
| 1 | Dead | DL | -1 | | | | | 8 | | |
| 2 | Snow | SL | | | | | | 8 | | |
| 3 | Wind Dow... | WL | | | | | | 8 | | |
| 4 | Wind Uplift | WL | | | | | | 8 | | |

Load Combinations

| | De... | So... | PD... | SR... | BLC Fa... | BLC Fa... | BLC Fa... | BLC Fa... | BLC Fa... | BLC Fa... | BLC Fa... | BLC Fa... | BLC Fa... | BLC Fa... |
|---|--------|-------|-------|-------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 1 | 1.2... | Yes | Y | | 1 | 1.2 | 2 | 1.6 | | | | | | |
| 2 | 1.2... | Yes | Y | | 1 | 1.2 | 3 | 1 | | | | | | |
| 3 | 0.9... | Yes | Y | | 1 | 0.9 | 4 | 1 | | | | | | |
| 4 | D | Yes | Y | | 1 | 1 | | | | | | | | |

Node Reactions

| | Node... | | X [k] | LC | Y [k] | LC | Z [k] | LC | MX [k-ft] | LC | MY [k-ft] | LC | MZ [k-ft] | LC |
|----|---------|-----|-------|----|--------|----|--------|----|-----------|----|-----------|----|-----------|----|
| 1 | N35 | max | 1.19 | 2 | 5.607 | 2 | 0.084 | 2 | 28.305 | 3 | 1.696 | 2 | 1.753 | 3 |
| 2 | | min | 0.893 | 3 | -4.713 | 3 | 0.063 | 3 | -33.662 | 2 | 1.272 | 3 | -2.085 | 2 |
| 3 | N36 | max | 1.348 | 2 | 6.201 | 2 | -0.031 | 3 | 31.143 | 3 | 1.727 | 2 | 2.039 | 2 |
| 4 | | min | 1.011 | 3 | -5.213 | 3 | -0.041 | 1 | -37.037 | 2 | 1.295 | 3 | -1.714 | 3 |
| 5 | N37 | max | 1.35 | 2 | 6.004 | 2 | 0.047 | 2 | 30.527 | 3 | 1.72 | 2 | 1.888 | 3 |
| 6 | | min | 1.012 | 3 | -5.047 | 3 | 0.035 | 3 | -36.304 | 2 | 1.29 | 3 | -2.246 | 2 |
| 7 | N38 | max | 1.192 | 2 | 5.661 | 2 | -0.067 | 3 | 28.361 | 3 | 1.689 | 2 | 2.654 | 2 |
| 8 | | min | 0.894 | 3 | -4.759 | 3 | -0.089 | 1 | -33.729 | 2 | 1.266 | 3 | -2.231 | 3 |
| 9 | N31 | max | 1.825 | 2 | 7.406 | 2 | 0.124 | 2 | 40.267 | 3 | 3.912 | 2 | 2.155 | 3 |
| 10 | | min | 1.369 | 3 | -6.24 | 3 | 0.093 | 3 | -47.834 | 2 | 2.934 | 3 | -2.557 | 2 |
| 11 | N32 | max | 2.182 | 2 | 7.354 | 2 | -0.028 | 3 | 42.261 | 3 | 4.173 | 2 | 1.157 | 2 |
| 12 | | min | 1.636 | 3 | -6.195 | 3 | -0.038 | 1 | -50.205 | 2 | 3.13 | 3 | -0.974 | 3 |
| 13 | N33 | max | 2.118 | 2 | 10.411 | 2 | -0.017 | 3 | 53.666 | 3 | 4.208 | 2 | 5.172 | 2 |

Node Reactions (Continued)

| Node... | | X [k] | LC | Y [k] | LC | Z [k] | LC | MX [k-ft] | LC | MY [k-ft] | LC | MZ [k-ft] | LC | |
|---------|---------|-------|-------|-------|---------|-------|--------|-----------|---------|-----------|-------|-----------|---------|---|
| 14 | | min | 1.589 | 3 | -8.771 | 3 | -0.023 | 1 | -63.75 | 2 | 3.156 | 3 | -4.358 | 3 |
| 15 | N34 | max | 1.742 | 2 | 6.729 | 2 | -0.047 | 3 | 38.42 | 3 | 3.947 | 2 | 11.331 | 3 |
| 16 | | min | 1.307 | 3 | -5.669 | 3 | -0.063 | 1 | -45.641 | 2 | 2.961 | 3 | -13.45 | 2 |
| 17 | N30 | max | 1.752 | 2 | 5.626 | 2 | -0.045 | 3 | 32.843 | 3 | 3.988 | 2 | 14.43 | 3 |
| 18 | | min | 1.314 | 3 | -4.74 | 3 | -0.06 | 1 | -39.017 | 2 | 2.991 | 3 | -17.128 | 2 |
| 19 | N29 | max | 2.201 | 2 | 10.786 | 2 | -0.022 | 3 | 55.694 | 3 | 4.404 | 2 | 6.433 | 2 |
| 20 | | min | 1.651 | 3 | -9.087 | 3 | -0.029 | 1 | -66.16 | 2 | 3.303 | 3 | -5.42 | 3 |
| 21 | N28 | max | 2.251 | 2 | 8.522 | 2 | 0.002 | 2 | 47.792 | 3 | 4.436 | 2 | 0.997 | 3 |
| 22 | | min | 1.689 | 3 | -7.18 | 3 | 0.002 | 3 | -56.775 | 2 | 3.327 | 3 | -1.183 | 2 |
| 23 | N27 | max | 2.307 | 2 | 8.224 | 2 | -0.013 | 3 | 46.712 | 3 | 4.508 | 2 | 1.772 | 2 |
| 24 | | min | 1.73 | 3 | -6.928 | 3 | -0.017 | 1 | -55.493 | 2 | 3.381 | 3 | -1.493 | 3 |
| 25 | N26 | max | 1.972 | 2 | 9.742 | 2 | 0.104 | 2 | 51.783 | 3 | 4.359 | 2 | 7.139 | 3 |
| 26 | | min | 1.479 | 3 | -8.208 | 3 | 0.078 | 3 | -61.513 | 2 | 3.269 | 3 | -8.472 | 2 |
| 27 | N24 | max | 1.523 | 2 | 9.615 | 2 | 0.089 | 2 | 58.27 | 3 | 2.993 | 2 | 4.143 | 2 |
| 28 | | min | 1.142 | 3 | -8.103 | 3 | 0.067 | 3 | -69.224 | 2 | 2.244 | 3 | -3.492 | 3 |
| 29 | N25 | max | 1.486 | 2 | 6.479 | 2 | -0.067 | 3 | 43.258 | 3 | 2.915 | 2 | 6.766 | 3 |
| 30 | | min | 1.114 | 3 | -5.46 | 3 | -0.089 | 1 | -51.393 | 2 | 2.186 | 3 | -8.028 | 2 |
| 31 | Totals: | max | 26.44 | 2 | 114.366 | 2 | 0 | 2 | | | | | | |
| 32 | | min | 19.83 | 3 | -96.314 | 3 | 0 | 3 | | | | | | |

LRFD

| Member | Shape | Code... | Loc [ft] | LC | Shear... | Loc [ft] | Dir | LC | phi*P... | phi*P... | phi*M... | phi*M... | Cb | Eqn | |
|--------|-------|---------|----------|--------|----------|----------|---------|----|----------|----------|----------|----------|---------|-------|-------|
| 1 | M1 | HSS1... | 0.031 | 45.038 | 2 | 0.074 | 18.119 | y | 2 | 125.432 | 945 | 232.125 | 307.875 | 2.181 | H1-1b |
| 2 | M2 | HSS1... | 0.085 | 49.139 | 2 | 0.105 | 75.722 | y | 2 | 51.801 | 945 | 232.125 | 307.875 | 2.079 | H1-1b |
| 3 | M3 | HSS1... | 0.113 | 78 | 2 | 0.109 | 106.167 | y | 2 | 28.642 | 945 | 232.125 | 307.875 | 2.357 | H1-1b |
| 4 | M4 | HSS1... | 0.060 | 7.47 | 2 | 0.128 | 26.296 | y | 2 | 376.059 | 945 | 232.125 | 307.875 | 1.573 | H1-1b |
| 5 | M5 | HSS1... | 0.117 | 2 | 2 | 0.027 | 2 | y | 2 | 941.028 | 945 | 232.125 | 307.875 | 1.156 | H1-1b |
| 6 | M7 | HSS1... | 0.125 | 2 | 2 | 0.029 | 2 | y | 2 | 941.028 | 945 | 232.125 | 307.875 | 1.154 | H1-1b |
| 7 | M8 | HSS1... | 0.117 | 2 | 2 | 0.030 | 2 | y | 2 | 941.028 | 945 | 232.125 | 307.875 | 1.157 | H1-1b |
| 8 | M10 | HSS1... | 0.181 | 3 | 2 | 0.028 | 3 | y | 2 | 936.087 | 945 | 232.125 | 307.875 | 1.216 | H1-1b |
| 9 | M11 | HSS1... | 0.225 | 3 | 2 | 0.056 | 3 | y | 2 | 936.087 | 945 | 232.125 | 307.875 | 1.247 | H1-1b |
| 10 | M12 | HSS1... | 0.165 | 3 | 2 | 0.082 | 3 | y | 2 | 936.087 | 945 | 232.125 | 307.875 | 1.218 | H1-1b |
| 11 | M13 | HSS1... | 0.219 | 3 | 2 | 0.069 | 3 | y | 2 | 936.087 | 945 | 232.125 | 307.875 | 1.238 | H1-1b |
| 12 | M14 | HSS1... | 0.128 | 2 | 2 | 0.028 | 2 | y | 2 | 941.028 | 945 | 232.125 | 307.875 | 1.156 | H1-1b |
| 13 | M15 | HSS1... | 0.172 | 3 | 2 | 0.035 | 3 | y | 2 | 936.087 | 945 | 232.125 | 307.875 | 1.231 | H1-1b |
| 14 | M16 | HSS1... | 0.200 | 3 | 2 | 0.034 | 3 | y | 2 | 936.087 | 945 | 232.125 | 307.875 | 1.219 | H1-1b |
| 15 | M17 | HSS1... | 0.204 | 3 | 2 | 0.032 | 3 | y | 2 | 936.087 | 945 | 232.125 | 307.875 | 1.222 | H1-1b |
| 16 | M18 | HSS1... | 0.234 | 3 | 2 | 0.063 | 3 | y | 2 | 936.087 | 945 | 232.125 | 307.875 | 1.246 | H1-1b |
| 17 | M19 | HSS1... | 0.144 | 3 | 2 | 0.095 | 3 | y | 2 | 936.087 | 945 | 232.125 | 307.875 | 1.212 | H1-1b |
| 18 | M20 | HSS1... | 0.238 | 2.754 | 2 | 0.032 | 2.754 | y | 2 | 937.484 | 945 | 232.125 | 307.875 | 1.182 | H1-1b |
| 19 | M21 | HSS1... | 0.180 | 2.75 | 2 | 0.056 | 2.75 | y | 2 | 937.505 | 945 | 232.125 | 307.875 | 1.163 | H1-1b |

LEVEL 1 CANOPY DESIGN

DEAD LOAD DESIGN

| | | |
|---------------------|-------|----------------------------------|
| 5/8" SHT'G | 2 PSF | } USE DL= 10 PSF CONSERVATIVE |
| DENSGLASS | 2 PSF | |
| CHERRY PANEL SOFFIT | 1 PSF | |

$SL = 25 \text{ PSF}$

WIND DEMAND

$A_{EFF} = 6'(7') = 42 \text{ SF (AVERAGE)}$
 $= 6.125'(8') = 49 \text{ SF (MOST)}$

WALL ZONE 5 = 45.2 PSF, -57.1 PSF [PER DESIGN CRITERIA]

$1.2D + W + 0.5S$

$W_u = 1.2(10 \text{ PSF}) + 45.2 \text{ PSF} + 0.5(25 \text{ PSF}) = 69.7 \text{ PSF}$

$0.9D + W$

$W_u = 0.9(10 \text{ PSF}) - 57.1 \text{ PSF} = -48.1 \text{ PSF}$

LEVEL 1 CANOPY DESIGN

MEMBER DESIGN: EDGE CHANNEL

$$M_u = 69.7 \text{ PSF} (8'/2) (6.25')^2 / 8 = 1361 \# \cdot \text{FT}$$

↑ CONSV. TO ASSUME SIMPLE SPAN

$$V_u = 69.7 \text{ PSF} (8'/2) (6.25') / 2 = 871 \#$$

TRY C4x7.25

$$\phi M_{np} = 0.9 (36 \text{ ksi}) (2.84 \text{ in}^3) = 92.0 \text{ k} \cdot \text{IN} = 7668 \# \cdot \text{FT}$$

$$\phi V_n = 0.9 (0.6) (36 \text{ ksi}) (4") (0.321") = 25.0 \text{ k}$$

C4x7.25 SUFFICIENT

MEMBER DESIGN: TAPERED MEMBER

$$M_u = 69.7 \text{ PSF} (6.25') (8')^2 / 2 = 13.94 \text{ k} \cdot \text{FT} = 167.28 \text{ k} \cdot \text{IN}$$

$$V_u = 69.7 \text{ PSF} (6.25') (8') = 3.485 \text{ k}$$

$$M_u = 69.7 \text{ PSF} (6.25') (9.5')^2 / 2 = 19.7 \text{ k} \cdot \text{FT} = 236 \text{ k} \cdot \text{IN}$$

$$V_u = 69.7 \text{ PSF} (6.25') (9.5') = 4.14 \text{ k}$$

TRY $d = 12"$

$$t_{web, min} = 3.485 \text{ k} / (0.9 (0.6) (36 \text{ ksi}) (12")) = 0.015"$$

TRY $1/4" \times 12"$

$$\Delta_{max} = \frac{8' (12' / 4)}{240} = 0.4"$$

$$I_{min} = \frac{69.7 \text{ PSF} (6.25') (8')^4 (12'')^3}{3 (29000000 \text{ PSI}) (0.4'')} = 88.6 \text{ in}^4$$

$$I = 0.25' (12'')^3 / 12 = 36 \text{ in}^4$$

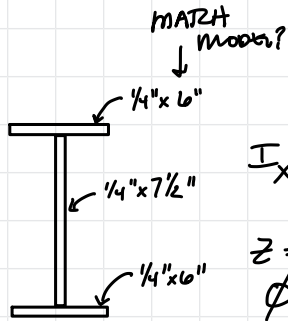
$$A_{T \& B \text{ PLATE}} = \frac{(88.6 \text{ in}^4 - 36 \text{ in}^4)}{(12'')^2} = 0.4 \text{ in}^2$$

TRY $1/4" \times 6" \text{ T \& B PLATE}$

LEVEL 1 CANOPY DESIGN

TAPERED WF MEMBER

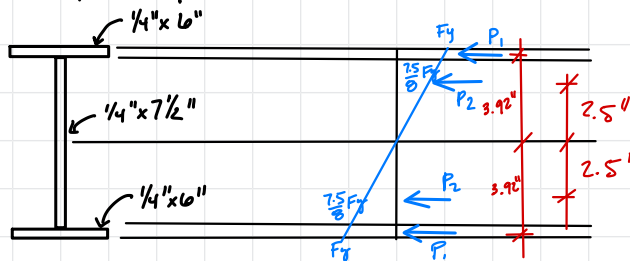
DEEPEST SECTION



$$I_x = \frac{(0.25)(7.5)^3}{12} + 2 \frac{(0.25)^3(6)}{12} + 2(0.25)(6)(3.875)^2 = 53.9 \text{ in}^4$$

$$z = 2(0.25)(6)(3.875) + 2(0.25)(3.75)(1.875) = 15.14 \text{ in}^3$$

$$\phi M_{np} = 0.9(36 \text{ ksi})(15.14 \text{ in}^3) = 490 \text{ k-in}$$



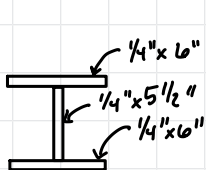
$$P_1 = \frac{7.5}{8} F_y (0.25)(6) + \frac{0.5}{8} F_y \left(\frac{1}{2}\right)(0.25)(6) = 1.45 \text{ in}^2 F_y$$

$$P_2 = \frac{1}{2} \left(\frac{7.5}{8} F_y\right) (3.75)(0.25) = 0.44 \text{ in}^2 F_y$$

$$S_x = 2(0.44 \text{ in}^2)(2.5) + 2(1.45 \text{ in}^2)(3.92) = 13.57 \text{ in}^3$$

$$\phi M_{ny} = 0.9(36 \text{ ksi})(13.57 \text{ in}^3) = 440 \text{ k-in} > M_u$$

SHALLOWEST SECTION



$$I = \frac{(0.25)(5.5)^3}{12} + \frac{(0.25)^3(6)}{12} + 2(0.25)(6)(2.875)^2 = 28.4 \text{ in}^4$$

$$\Delta_{DL} = \frac{0.063 \text{ kLF} (8)^4 (12)^3}{3(29000 \text{ ksi})(28.4 \text{ in}^4)} = 0.18$$

$\frac{L}{533}$ DEFLECTION OKAY

USE B.U. SECTION W/ 1/4" x 6" FLANGES AND 1/4" WFL THAT TAPERS FROM 8" TO 6"

LEVEL 1 CANOPY DESIGN

BACK HSS DESIGN

TORSION + BENDING

DEMAND [PER RISR MODEL]

$$\left. \begin{aligned} M_{u, \text{MAJOR}} &= 28.4 \text{ k}\cdot\text{FT} \\ M_{u, \text{MINOR}} &= 1.12 \text{ k}\cdot\text{FT} \\ T_u &= 25.09 \text{ k}\cdot\text{FT} \\ V_{u, \text{MAJOR}} &= 6.07 \text{ k} \\ V_{u, \text{MINOR}} &= 0.12 \text{ k} \end{aligned} \right\} \begin{array}{l} \text{DO NOT OCCUR SIMULTANEOUSLY} \\ \text{CONSV. TO CONSIDER TOGETHER} \end{array}$$

$$\phi T_n = \phi F_{cr} C$$

$$\frac{h}{t} = \frac{12''}{0.375''} = 32 \leq 2.45 \sqrt{E/F_y} = 59$$

$$F_{cr} = 0.6 F_y$$

$$\phi T_n = 0.9(0.6)(50 \text{ ksi})(62.1 \text{ in}^3) = 1677 \text{ k}\cdot\text{in} \sim 139.7 \text{ k}\cdot\text{FT}$$

HSS12x8x³/₈

$$\phi M_n, \text{MAJOR} = 183 \text{ k}\cdot\text{FT}$$

$$\phi M_n, \text{MINOR} = 130 \text{ k}\cdot\text{FT}$$

$$\phi T_n = 139.7 \text{ k}\cdot\text{FT}$$

$$\phi V_n, \text{MAJOR} = 0.9(0.6)(50 \text{ ksi})(2)(12'')(0.375'') = 243 \text{ k}$$

$$\phi V_n, \text{MINOR} = 0.9(0.6)(50 \text{ ksi})(2)(8'')(0.375'') = 162 \text{ k}$$

$$\left(\frac{P_u}{\phi P_n} + \frac{M_u}{\phi M_n} \right) + \left(\frac{V_u}{\phi V_n} + \frac{T_u}{\phi T_n} \right)^2 \leq 1.0$$

$$\frac{28.4}{183} + \frac{1.12}{130} + \left(\frac{6.07}{243} + \frac{0.12}{162} + \frac{25}{139.7} \right)^2 = 0.21 < 1.0$$

HSS12x8x³/₈ SUFFICIENT

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| | | | |
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Specifier's comments:

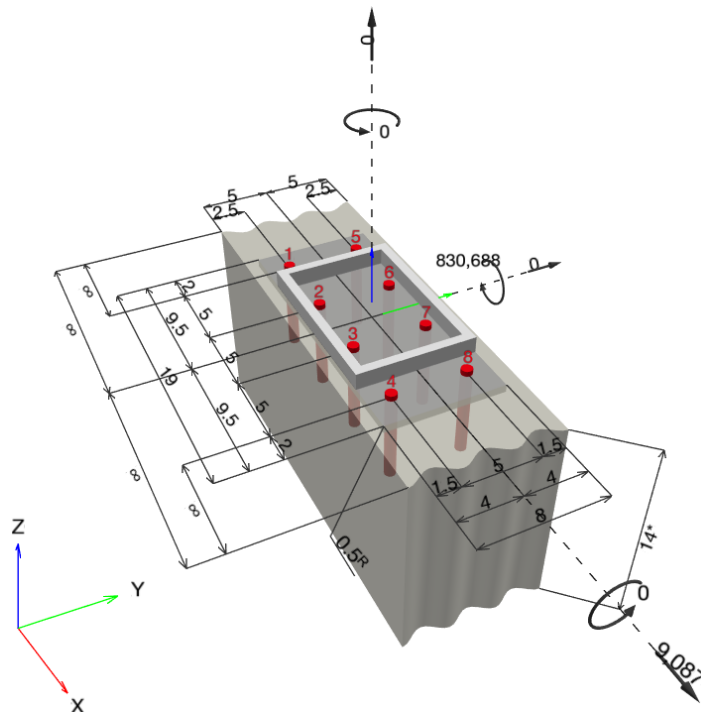
1 Input data

| | |
|------------------------------------|--|
| Anchor type and diameter: | AWS D1.1 GR. B 3/4 |
| Item number: | not available |
| Effective embedment depth: | $h_{ef} = 6.000$ in. |
| Material: | |
| Proof: | Design Method ACI 318-08 / CIP |
| Stand-off installation: | $e_b = 0.000$ in. (no stand-off); $t = 0.500$ in. |
| Anchor plate ^R : | $l_x \times l_y \times t = 19.000$ in. x 8.000 in. x 0.500 in.; (Recommended plate thickness: not calculated) |
| Profile: | Rectangular HSS (AISC), HSS12X8X.625; (L x W x T) = 12.000 in. x 8.000 in. x 0.625 in. |
| Base material: | cracked concrete, 5000 , $f'_c = 5,000$ psi; $h = 14.000$ in. |
| Reinforcement: | tension: condition A, shear: condition B; anchor reinforcement: tension edge reinforcement: none or < No. 4 bar |
| Seismic loads (cat. C, D, E, or F) | no |



^R - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.] & Loading [lb, in.lb]



Input data and results must be checked for conformity with the existing conditions and for plausibility!
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| Fastening point: | | | |

1.1 Design results

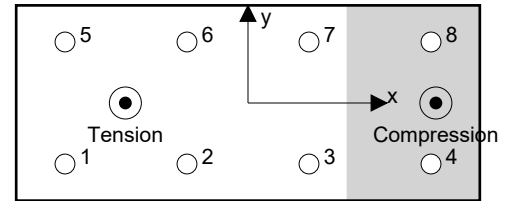
| Case | Description | Forces [lb] / Moments [in.lb] | Seismic | Max. Util. Anchor [%] |
|------|---------------|---|---------|-----------------------|
| 1 | Combination 1 | N = 0; V _x = 9,087; V _y = 0; M _x = 0; M _y = 830,688; M _z = 0; | no | 98 |

2 Load case/Resulting anchor forces

Anchor reactions [lb]

Tension force: (+Tension, -Compression)

| Anchor | Tension force | Shear force | Shear force x | Shear force y |
|--------|---------------|-------------|---------------|---------------|
| 1 | 19,123 | 1,136 | 1,136 | 0 |
| 2 | 10,880 | 1,136 | 1,136 | 0 |
| 3 | 2,637 | 1,136 | 1,136 | 0 |
| 4 | 0 | 1,136 | 1,136 | 0 |
| 5 | 19,123 | 1,136 | 1,136 | 0 |
| 6 | 10,880 | 1,136 | 1,136 | 0 |
| 7 | 2,637 | 1,136 | 1,136 | 0 |
| 8 | 0 | 1,136 | 1,136 | 0 |



max. concrete compressive strain: 0.69 [%o]
 max. concrete compressive stress: 3,021 [psi]
 resulting tension force in (x/y)=(-5.025/0.000): 65,279 [lb]
 resulting compression force in (x/y)=(7.700/0.000): 65,279 [lb]

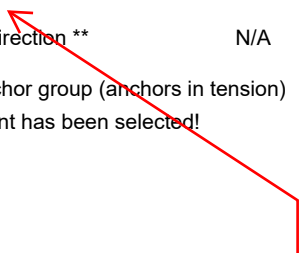
Anchor forces are calculated based on the assumption of a rigid anchor plate.

3 Tension load

| | Load N _{ua} [lb] | Capacity ϕN_n [lb] | Utilization $\beta_N = N_{ua} / \phi N_n$ | Status |
|--|---------------------------|--------------------------|---|--------|
| Steel Strength* | 19,123 | 21,547 | 89 | OK |
| Pullout Strength* | 19,123 | 21,980 | 88 | OK |
| Concrete Breakout Failure** ¹ | N/A | N/A | N/A | N/A |
| Concrete Side-Face Blowout, direction ** | N/A | N/A | N/A | N/A |

* highest loaded anchor **anchor group (anchors in tension)

¹ Tension Anchor Reinforcement has been selected!



ADD ANCHOR REINF. TO CONTROL BREAKOUT



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| | | | |
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| Fastening point: | | | |

3.1 Steel Strength

$$N_{sa} = A_{se,N} f_{uta} \quad \text{ACI 318-08 Eq. (D-3)}$$

$$\phi N_{sa} \geq N_{ua} \quad \text{ACI 318-08 Eq. (D-1)}$$

Variables

| | |
|--------------------------------|-----------------|
| $A_{se,N}$ [in. ²] | f_{uta} [psi] |
| 0.44 | 65,000 |

Calculations

| |
|---------------|
| N_{sa} [lb] |
| 28,730 |

Results

| | | | |
|---------------|----------------|--------------------|---------------|
| N_{sa} [lb] | ϕ_{steel} | ϕN_{sa} [lb] | N_{ua} [lb] |
| 28,730 | 0.750 | 21,547 | 19,123 |

3.2 Pullout Strength

$$N_{pN} = \psi_{c,p} N_p \quad \text{ACI 318-08 Eq. (D-14)}$$

$$N_p = 8 A_{brg} f'_c \quad \text{ACI 318-08 Eq. (D-15)}$$

$$\phi N_{pN} \geq N_{ua} \quad \text{ACI 318-08 Eq. (D-1)}$$

Variables

| | | |
|--------------|-------------------------------|--------------|
| $\psi_{c,p}$ | A_{brg} [in. ²] | f'_c [psi] |
| 1.000 | 0.79 | 5,000 |

Calculations

| |
|------------|
| N_p [lb] |
| 31,400 |

Results

| | | | |
|---------------|-------------------|--------------------|---------------|
| N_{pn} [lb] | $\phi_{concrete}$ | ϕN_{pn} [lb] | N_{ua} [lb] |
| 31,400 | 0.700 | 21,980 | 19,123 |



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| | | | |
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| Fastening point: | | | |

4 Shear load

| | Load V_{ua} [lb] | Capacity ϕV_n [lb] | Utilization $\beta_v = V_{ua} / \phi V_n$ | Status |
|---|--------------------|--------------------------|---|--------|
| Steel Strength* | 1,136 | 18,674 | 7 | OK |
| Steel failure (with lever arm)* | N/A | N/A | N/A | N/A |
| Pryout Strength** | 9,087 | 27,859 | 33 | OK |
| Concrete edge failure in direction y+** | 9,087 | 35,587 | 26 | OK |

* highest loaded anchor **anchor group (relevant anchors)

4.1 Steel Strength

$V_{sa} = A_{se,V} f_{uta}$ ACI 318-08 Eq. (D-19)
 $\phi V_{steel} \geq V_{ua}$ ACI 318-08 Eq. (D-2)

Variables

| $A_{se,V}$ [in. ²] | f_{uta} [psi] |
|--------------------------------|-----------------|
| 0.44 | 65,000 |

Calculations

| |
|---------------|
| V_{sa} [lb] |
| 28,730 |

Results

| V_{sa} [lb] | ϕ_{steel} | ϕV_{sa} [lb] | V_{ua} [lb] |
|---------------|----------------|--------------------|---------------|
| 28,730 | 0.650 | 18,674 | 1,136 |



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4.2 Pryout Strength

$$V_{cp,g} = k_{cp} \left[\left(\frac{A_{Nc}}{A_{Nc0}} \right) \psi_{ec,N} \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b \right] \quad \text{ACI 318-08 Eq. (D-31)}$$

$$\phi V_{cp,g} \geq V_{ua} \quad \text{ACI 318-08 Eq. (D-2)}$$

A_{Nc} see ACI 318-08, Part D.5.2.1, Fig. RD.5.2.1(b)

$$A_{Nc0} = 9 h_{ef}^2 \quad \text{ACI 318-08 Eq. (D-6)}$$

$$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2 e_N}{3 h_{ef}}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-9)}$$

$$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-11)}$$

$$\psi_{cp,N} = \text{MAX} \left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-13)}$$

$$N_b = k_c \lambda \sqrt{f_c} h_{ef}^{1.5} \quad \text{ACI 318-08 Eq. (D-7)}$$

Variables

| | | | | |
|--------------|----------------|------------------|------------------|-------------------|
| k_{cp} | h_{ef} [in.] | $e_{c1,N}$ [in.] | $e_{c2,N}$ [in.] | $c_{a,min}$ [in.] |
| 2 | 6.000 | 0.000 | 0.000 | 2.500 |
| $\psi_{c,N}$ | c_{ac} [in.] | k_c | λ | f_c [psi] |
| 1.000 | - | 24 | 1 | 5,000 |

Calculations

| | | | | | | |
|------------------------------|-------------------------------|----------------|----------------|---------------|---------------|------------|
| A_{Nc} [in. ²] | A_{Nc0} [in. ²] | $\psi_{ec1,N}$ | $\psi_{ec2,N}$ | $\psi_{ed,N}$ | $\psi_{cp,N}$ | N_b [lb] |
| 330.00 | 324.00 | 1.000 | 1.000 | 0.783 | 1.000 | 24,942 |

Results

| | | | |
|-----------------|-------------------|----------------------|---------------|
| $V_{cp,g}$ [lb] | $\phi_{concrete}$ | $\phi V_{cp,g}$ [lb] | V_{ua} [lb] |
| 39,799 | 0.700 | 27,859 | 9,087 |

Input data and results must be checked for conformity with the existing conditions and for plausibility!
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4.3 Concrete edge failure in direction y+

$$V_{cbg} = \left(\frac{A_{Vc}}{A_{Vc0}} \right) \Psi_{ec,V} \Psi_{ed,V} \Psi_{c,V} \Psi_{h,V} \Psi_{parallel,V} V_b \quad \text{ACI 318-08 Eq. (D-22)}$$

$$\phi V_{cbg} \geq V_{ua} \quad \text{ACI 318-08 Eq. (D-2)}$$

$$A_{Vc} \text{ see ACI 318-08, Part D.6.2.1, Fig. RD.6.2.1(b)}$$

$$A_{Vc0} = 4.5 c_{a1}^2 \quad \text{ACI 318-08 Eq. (D-23)}$$

$$\Psi_{ec,V} = \left(\frac{1}{1 + \frac{2e_v}{3c_{a1}}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-26)}$$

$$\Psi_{ed,V} = 0.7 + 0.3 \left(\frac{c_{a2}}{1.5c_{a1}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-28)}$$

$$\Psi_{h,V} = \sqrt{\frac{1.5c_{a1}}{h_a}} \geq 1.0 \quad \text{ACI 318-08 Eq. (D-29)}$$

$$V_b = \left(8 \left(\frac{l_e}{d_a} \right)^{0.2} \sqrt{d_a} \right) \lambda \sqrt{f'_c} c_{a1}^{1.5} \quad \text{ACI 318-08 Eq. (D-25)}$$

Variables

| | | | | |
|----------------|----------------|----------------|--------------|---------------------|
| c_{a1} [in.] | c_{a2} [in.] | e_{cV} [in.] | $\Psi_{c,V}$ | h_a [in.] |
| 7.500 | - | 0.000 | 1.000 | 14.000 |
| l_e [in.] | λ | d_a [in.] | f'_c [psi] | $\Psi_{parallel,V}$ |
| 6.000 | 1.000 | 0.750 | 5,000 | 2.000 |

Calculations

| | | | | | |
|------------------------------|-------------------------------|---------------|---------------|--------------|------------|
| A_{Vc} [in. ²] | A_{Vc0} [in. ²] | $\Psi_{ec,V}$ | $\Psi_{ed,V}$ | $\Psi_{h,V}$ | V_b [lb] |
| 421.88 | 253.12 | 1.000 | 1.000 | 1.000 | 15,252 |

Results

| | | | |
|----------------|-------------------|---------------------|---------------|
| V_{cbg} [lb] | $\phi_{concrete}$ | ϕV_{cbg} [lb] | V_{ua} [lb] |
| 50,839 | 0.700 | 35,587 | 9,087 |

5 Combined tension and shear loads

| | | | | |
|-----------|-----------|---------|-------------------------------|--------|
| β_N | β_V | ζ | Utilization $\beta_{N,V}$ [%] | Status |
| 0.887 | 0.326 | 5/3 | 98 | OK |

$$\beta_{NV} = \beta_N^{\zeta} + \beta_V^{\zeta} \leq 1$$

Input data and results must be checked for conformity with the existing conditions and for plausibility!
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6 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2018, ETAG 001/Annex C, EOTA TR029 etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies where the potential concrete failure surfaces are crossed by supplementary reinforcement proportioned to tie the potential concrete failure prism into the structural member. Condition B applies where such supplementary reinforcement is not provided, or where pullout or pryout strength governs.
- For additional information about ACI 318 strength design provisions, please go to <https://submittals.us.hilti.com/PROFISAnchorDesignGuide/>
- The design of Anchor Reinforcement is beyond the scope of PROFIS Engineering. Refer to ACI 318-08, Part D.5.2.9 for information about Anchor Reinforcement.
- Anchor Reinforcement has been selected as a design option, calculations should be compared with PROFIS Engineering calculations.

Fastening meets the design criteria!

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7 Installation data

Profile: Rectangular HSS (AISC), HSS12X8X.625; (L x W x T) = 12.000 in. x 8.000 in. x 0.625 in.

Hole diameter in the fixture: $d_f = 0.812$ in.

Plate thickness (input): 0.500 in.

Recommended plate thickness: not calculated

Anchor type and diameter: AWS D1.1 GR. B 3/4

Item number: not available

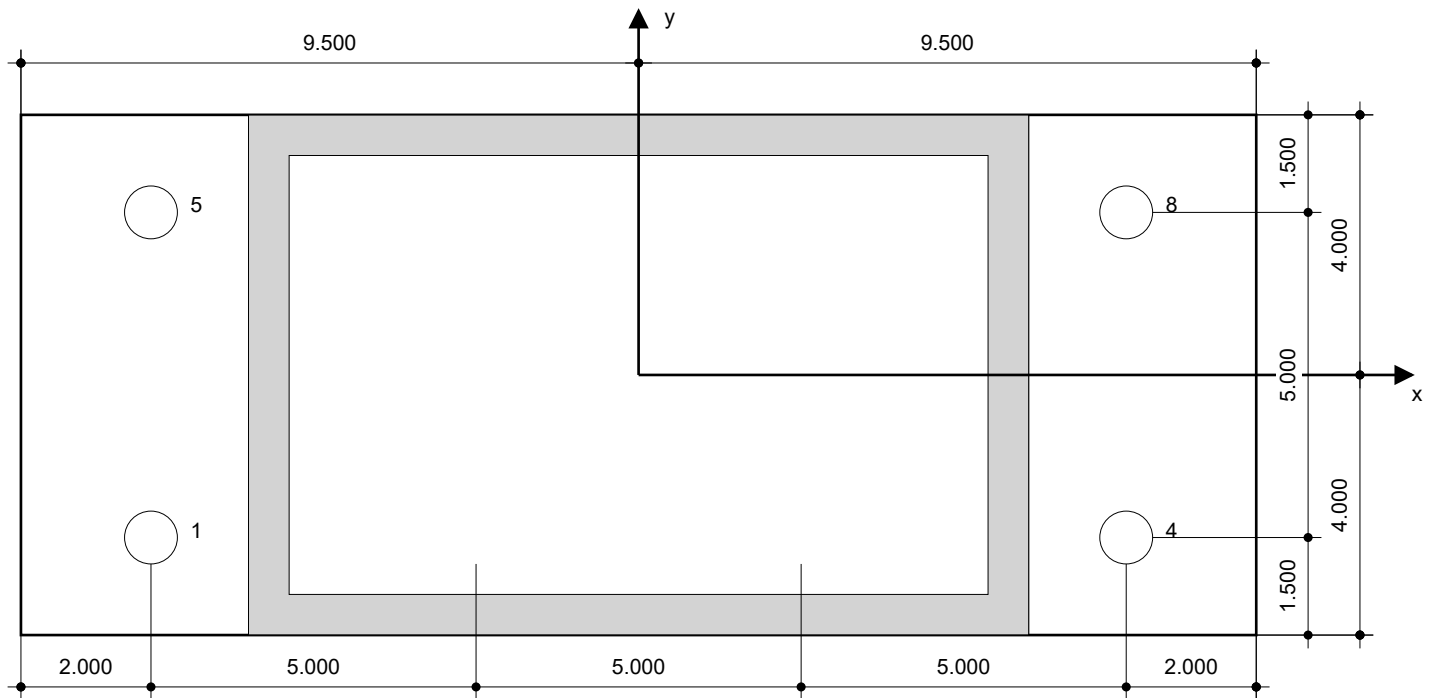
Installation torque: -

Hole diameter in the base material: - in.

Hole depth in the base material: 6.000 in.

Minimum thickness of the base material: 6.875 in.

Hilti AWS welded headed stud anchor with 6 in embedment, 3/4, Steel galvanized, installation per instruction for use



Coordinates Anchor [in.]

| Anchor | x | y | C _{-x} | C _{+x} | C _{-y} | C _{+y} | Anchor | x | y | C _{-x} | C _{+x} | C _{-y} | C _{+y} |
|--------|--------|--------|-----------------|-----------------|-----------------|-----------------|--------|--------|-------|-----------------|-----------------|-----------------|-----------------|
| 1 | -7.500 | -2.500 | - | - | 2.500 | 7.500 | 5 | -7.500 | 2.500 | - | - | 7.500 | 2.500 |
| 2 | -2.500 | -2.500 | - | - | 2.500 | 7.500 | 6 | -2.500 | 2.500 | - | - | 7.500 | 2.500 |
| 3 | 2.500 | -2.500 | - | - | 2.500 | 7.500 | 7 | 2.500 | 2.500 | - | - | 7.500 | 2.500 |
| 4 | 7.500 | -2.500 | - | - | 2.500 | 7.500 | 8 | 7.500 | 2.500 | - | - | 7.500 | 2.500 |

Input data and results must be checked for conformity with the existing conditions and for plausibility!
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LEVEL 1 CANOPY DESIGN

SIZE BASE PLATE

PER PROFIT, TENSION IN OUTERMOST ANCHORS

$$M_u = (2)(19.123k) \times (1.5") = 57.4 k \cdot in$$

$$t = \sqrt{\frac{57.4 k \cdot in}{0.9 (36 ksi) (8") / 6}} = 1.15"$$

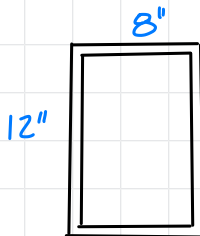
$$t = \sqrt{\frac{57.4 k \cdot in}{0.9 (50 ksi) (8") / 6}} = 0.98"$$

USE 1" GR50 BASE PL

WELD HSS MEMBER TO BASE PLATE

$$M_u = 69.224 k \cdot FT = 830.7 k \cdot in$$

$$V_u = 8.103 k$$



$$R_{ux} = 8.103 k / 24" = 0.34 k/in$$

$$R_{un} = 830.7 k \cdot in / (8" (12") + (12")^2 / 3) = 5.77 k/in$$

$$R_u = \sqrt{(5.77 k/in)^2 + (0.34 k/in)^2} = 5.78 k/in$$

$$\theta = \tan^{-1}(5.77 / 0.34) = 86.6^\circ$$

$$D_{min} = \frac{5.78 k/in}{1.392 k/in (1 + 0.5 \sin^2(86.6^\circ))} = 2.8$$

USE 3/16" FILLET WELD ALL AROUND

LEVEL 1 CANOPY DESIGN

CONNECTION TAPERED MEMBER TO HSS

$$M_u = 69.7 \text{ PSF} (6.25') (8')^2 / 2 = 13.94 \text{ k}\cdot\text{FT} = 167.28 \text{ k}\cdot\text{IN}$$

$$V_u = 69.7 \text{ PSF} (6.25') (8') = 3.485 \text{ k}$$

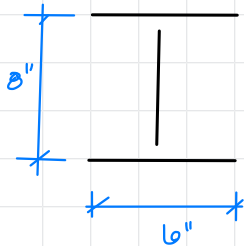
$$M_u = 69.7 \text{ PSF} (6.25') (9.5')^2 / 2 = 19.7 \text{ k}\cdot\text{FT} = 236 \text{ k}\cdot\text{IN}$$

$$V_u = 69.7 \text{ PSF} (6.25') (9.5') = 4.14 \text{ k}$$

$$R_{uv} = 4.14 \text{ k} / 6'' = 0.69 \text{ k/in}$$

$$R_{un} = 236 \text{ k}\cdot\text{IN} / [(6'')^2 / 6] = 39.3 \text{ k}\cdot\text{IN}$$

NOT WORK
FIELD WELD?



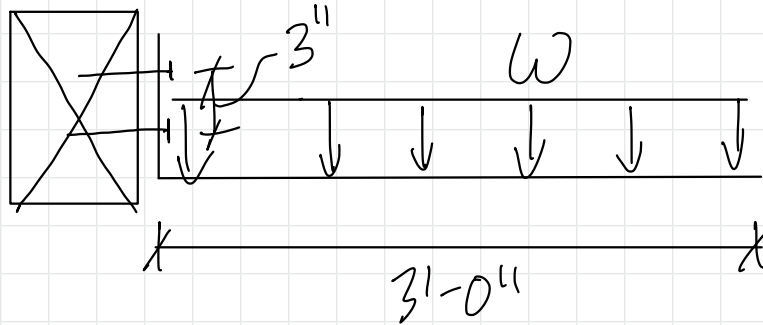
$$R_{uv} = 4.14 \text{ k} / 6'' = 0.69 \text{ k/in}$$

$$R_{un} = \frac{236 \text{ k}\cdot\text{IN}}{(6'')(8'')} = 4.92 \text{ k/in}$$

$$D_{min} = \frac{4.92 \text{ k/in}}{(1.392 \text{ k/in})(1.5)} = 2.4$$

USE 3/16" FILLET WELD MINIMUM

Check Bent PL Canopy:



Try 1/4" STL PL:

$$W = 1.2D + 1.6S + 0.5W$$

$$W = 1.2(10.5 \text{ PSF}) + 1.6(25 \text{ PSF}) + 0.5(19 \text{ PSF})$$

$$W = 62 \text{ PSF}$$

$$M_{\max} = \frac{Wl^2}{2} = \frac{(62)(3^2)}{2} = 279 \text{ FT}\cdot\#$$

$$= 3.4 \text{ k}\cdot\text{in}$$

$$S_{\text{req}} = \frac{3.4 \text{ k}\cdot\text{in}}{(0.9)(36)} = 0.105 \text{ in}^3$$

$$S_{\text{provided}} = \frac{(12'')(0.25^2)}{6} = 0.125 \text{ in}^3 \checkmark \quad \frac{1}{4}'' \text{ STL PL OK}$$

Check 1/2" ϕ Lag Screws

$V_{APP} = 186 \text{ PLF}$ \swarrow C_D

$V_{CAP} = 2 \times 1.6 \times 320 \# = 1024 \# \checkmark \underline{\underline{OK}}$
 # of screws \nearrow

$T_{APP} = \frac{M}{d} = \frac{3.4}{3"} = 1.13 \text{ K}$

$T_{CAP} = 378 \#/\text{in} \times 1.6 \times (2.19") = 1.3 \text{ K} \checkmark \underline{\underline{OK}}$
 \swarrow C_D
 \nearrow T-E (Thread Length)

1/2" ϕ x 4" Long Lag Screws OK \checkmark

END